



THE BEAVER EXCAVATING COMPANY

July 10, 2013

Ohio Department of Transportation
District 1
11885 N. McCullough St.
Lima, OH 45801-0040

Attn: Darren Schimmoeller
District Construction Administrator

Re: ODOT Project ALL-75-5.53
PID No.: 76691
Final VECP (1)

Mr. Schimmoeller:

In accordance with the Standard Procedure for Value Engineering in Construction No. 510-008, The Beaver Excavating Company is hereby in submission of a Value Engineering Change Proposal (VECP) affecting Bridge No. ALL-75-0703 L&R, (I-75 over S.R. 117 & S.R. 309).

Description:

The VECP changes the 213.67 ft long three-span configuration to a 123.00 ft long single span arrangement utilizing the same superstructure type. We are proposing using prestressed concrete I-beams (WF66-49, draped strands) and reinforced concrete deck supported on Semi-Integral reinforced concrete wall abutments founded on a single row of drilled shafts embedded into rock. There will be turn-back wing walls for each stage of construction. These wingwalls will be an integral part of the abutment and would assist in the overall stability in addition to retaining soil. These wingwalls are permanent and will look like counterforts after all stages are built. The concrete abutment walls will essentially be located where the original piers providing the same horizontal clearance between the proposed abutments as that shown between the original piers. The centerline of bearing will be offset per the ODOT Bridge Design Manual. The minimum vertical clearance will remain the same as the original design. No concrete barrier is needed in front of this type of reinforced concrete abutments. Please see attached for preliminary sketches and design assumptions.

Compliance with the Standard Procedure for Value Engineering:

- This VECP will result in cost savings and will not alter the essential functions and characteristics of the structure/project.



- The proposed structure does not reduce the service life in comparison to the original design.
- The proposed structure will reduce future maintenance in comparison with the original design.
- No traffic control changes or additional ROW will be required to complete the proposed structure.
- The total cost savings to the project will be 234,561.40 resulting in a minimum cost savings to the Department of \$117,280.70. (See attached breakdown)

Your review of this VECP in a timely manner is highly appreciated. Please feel free to contact us should you have any questions or need additional information.

Sincerely,

THE BEAVER EXCAVATING COMPANY

Clay Korner

Cc: Luke Johansen, PE – ODOT District 1
Brian Francis, Beaver Excavating
Ted Wellman, Beaver Excavating Co.

ITEMIZED SUMMARY OF CHANGES

VECP (1) Structure ALL-75-0703R - SR309

Non-Performed Items

Line#	Item Code	Description	Unit	Bid Qty	Proposed Qty	Unit Bid Price	Net Change
573	505E11100	PILE DRIVING EQUIP. MOBIL.	LS	1	-	\$ 13,000.00	\$ (13,000.00)
574	507E00100	STEEL PILES HP10X42, FURNISHED	FT	1,320	-	\$ 18.00	\$ (23,760.00)
575	507E00150	STEEL PILES HP10X42, DRIVEN	FT	1,200	-	\$ 15.00	\$ (18,000.00)
576	507E93300	STEEL POINTS OR SHOES	EA	24	-	\$ 84.00	\$ (2,016.00)
583	515E15040	DRAPED STRAND PREST CONC I-BM, LVL 3, T4	EA	18	-	\$ 19,900.00	\$ (358,200.00)
587	516E14014	INTEGRAL ABUTMENT EXPANSION JOINT SEAL	FT	48	-	\$ 25.00	\$ (1,200.00)
588	516E44101	BRG/INT LAM/PLATE, APP : 12" X 16" X 2.35	EA	12	-	\$ 635.00	\$ (7,620.00)
589	516E44101	BRG/INT LAM/PLATE, APP : 12" X 22" X 2.87"	EA	12	-	\$ 740.00	\$ (8,880.00)
590	516E44101	BRG/INT LAM/PLATE, APP : 7" X 14" X 1.75"	EA	12	-	\$ 900.00	\$ (10,800.00)
594	524E94904	DRILLED SHAFTS, 48", INTO	FT	48	-	\$ 880.00	\$ (42,240.00)
595	524E94906	DRILLED SHAFTS, 54", ABOVE BEDROCK	FT	272	-	\$ 650.00	\$ (176,800.00)
597	601E21000	CONCRETE SLOPE PROT	SY	442	-	\$ 78.00	\$ (34,476.00)
604	898E20100	QC/QA CONCRETE, CLASS QSC1, SUBSTRUCTURE	CY	108	-	\$ 660.00	\$ (71,280.00)
605	898E20161	QC/QA CONCRETE, CLASS QSC1, APP	CY	207	-	\$ 440.00	\$ (91,080.00)
610	505E11100	PILE DRIVING EQUIP. MOBIL.	LS	1	-	\$ 13,000.00	\$ (13,000.00)
611	507E00100	STEEL PILES HP10X42, FURNISHED	FT	1,320	-	\$ 17.70	\$ (23,364.00)
612	507E00150	STEEL PILES HP10X42, DRIVEN	FT	1,200	-	\$ 15.40	\$ (18,480.00)
613	507E93300	STEEL POINTS OR SHOES	EA	24	-	\$ 84.00	\$ (2,016.00)
620	515E15040	DRAPED STRAND PREST CONC I-BM, LVL 3, T4	EA	18	-	\$ 19,900.00	\$ (358,200.00)
624	516E14014	INTEGRAL ABUTMENT EXPANSION JOINT SEAL	FT	48	-	\$ 25.00	\$ (1,200.00)
625	516E44101	BRG/INT LAM/PLATE, APP : 12" X 16" X 2.35	EA	12	-	\$ 635.00	\$ (7,620.00)
626	516E44101	BRG/INT LAM/PLATE, APP : 12" X 22" X 2.87"	EA	12	-	\$ 740.00	\$ (8,880.00)
627	516E44101	BRG/INT LAM/PLATE, APP : 7" X 14" X 1.75"	EA	12	-	\$ 900.00	\$ (10,800.00)
631	524E94904	DRILLED SHAFTS, 48", INTO	FT	48	-	\$ 875.00	\$ (42,000.00)
632	524E94906	DRILLED SHAFTS, 54", ABOVE BEDROCK	FT	272	-	\$ 620.00	\$ (168,640.00)
634	601E21000	CONCRETE SLOPE PROT	SY	442	-	\$ 78.00	\$ (34,476.00)
641	898E20100	QC/QA CONCRETE, CLASS QSC1, SUBSTRUCTURE	CY	108	-	\$ 660.00	\$ (71,280.00)
642	898E20161	QC/QA CONCRETE, CLASS QSC1, APP	CY	207	-	\$ 440.00	\$ (91,080.00)
NON-PERFORMED TOTAL = \$							\$ (1,710,388.00)

Quantity Change Items

Line#	Item Code	Description	Unit	Bid Qty	Proposed Qty	Unit Bid Price	Net Change
577	509E10000	EPOXY COATED REINFORCING STEEL	Page 1 of 3		144,202	\$ 1.02	\$ (33,250.98)
578	511E71200	CONCRETE, MISC.: FORMING OF ROUGH CUT ST	SF	1,931	5,130	\$ 14.50	\$ 46,385.50

579	512E10051	SLG OF CONC SURF (NON-EPOXY), APP	SY	836	1,070	\$	8.50	\$	1,989.00
580	512E10101	SLG OF CONC SURF (EPOXY-URETHANE), APP	SY	678	360	\$	18.50	\$	(5,883.00)
581	512E10300	SEALING CONC BRIDGE DECKS W/HMWM RESIN	SY	95	80	\$	16.00	\$	(240.00)
582	512E33000	TYPE 2 WATERPROOFING	SY	13	24	\$	26.00	\$	286.00
584	515E20000	INTERMEDIATE DIAPHRAGMS	EA	25	15	\$	1,075.00	\$	(10,750.00)
585	516E13600	1" PREFORMED EXP JT FILLER	SF	214	14	\$	4.25	\$	(850.00)
586	516E13900	2" PREFORMED EXP JT FILLER	SF	193	320	\$	5.50	\$	698.50
591	518E21200	POROUS BACKFILL W/FILT FABRIC	CY	102	275	\$	65.00	\$	11,245.00
592	518E40000	6" PERF CORR. PLASTIC PIPE	FT	171	200	\$	13.00	\$	377.00
593	518E40011	6" NON-PERF CORR PLAST PIPE, APP	FT	10	40	\$	20.00	\$	600.00
598	625E25400	CONDUIT, 2", 725.04	FT	568	420	\$	22.00	\$	(3,256.00)
601	898E10200	QC/QA CONCRETE, CLASS QSC2, SPRSTRC	CY	395	230	\$	635.00	\$	(104,775.00)
602	898E10705	QC/QA CONCRETE, CLASS QSC2, SPRSTRC, APP	SY	262	315	\$	280.00	\$	14,840.00
603	898E11001	QC/QA CONCRETE, CLASS QSC2, SPRSTRC, APP	CY	59	45	\$	560.00	\$	(7,840.00)
614	509E10000	EPOXY COATED REINFORCING STEEL	LB	176,801	144,202	\$	0.83	\$	(27,057.17)
615	511E71200	CONCRETE, MISC.: FORMING OF ROUGH CUT ST	SF	1,931	5,130	\$	14.25	\$	45,585.75
616	512E10051	SLG OF CONC SURF (NON-EPOXY), APP	SY	836	1,070	\$	8.50	\$	1,989.00
617	512E10101	SLG OF CONC SURF (EPOXY-URETHANE), APP	SY	678	360	\$	18.50	\$	(5,883.00)
618	512E10300	SEALING CONC BRIDGE DECKS W/HMWM RESIN	SY	95	80	\$	16.00	\$	(240.00)
619	512E33000	TYPE 2 WATERPROOFING	SY	13	24	\$	26.00	\$	286.00
621	515E20000	INTERMEDIATE DIAPHRAGMS	EA	25	15	\$	1,100.00	\$	(11,000.00)
622	516E13600	1" PREFORMED EXP JT FILLER	SF	214	14	\$	4.50	\$	(900.00)
623	516E13900	2" PREFORMED EXP JT FILLER	SF	101	320	\$	5.50	\$	1,204.50
628	518E21200	POROUS BACKFILL W/FILT FABRIC	CY	102	275	\$	55.00	\$	9,515.00
629	518E40000	6" PERF CORR. PLASTIC PIPE	FT	171	200	\$	13.50	\$	391.50
630	518E40011	6" NON-PERF CORR PLAST PIPE, APP	FT	10	40	\$	19.50	\$	585.00
635	625E25400	CONDUIT, 2", 725.04	FT	568	420	\$	22.00	\$	(3,256.00)
638	898E10200	QC/QA CONCRETE, CLASS QSC2, SPRSTRC	CY	395	230	\$	640.00	\$	(105,600.00)
639	898E10705	QC/QA CONCRETE, CLASS QSC2, SPRSTRC, APP	SY	262	315	\$	290.00	\$	15,370.00
640	898E11001	QC/QA CONCRETE, CLASS QSC2, SPRSTRC, APP	CY	59	45	\$	560.00	\$	(7,840.00)

QUANTITY ADJUSTED TOTAL = \$ (177,273.40)

New / Additional Work Items

Line#	Item Code	Description	Unit	Bid Qty	Proposed Qty	Unit Bid Price	Net Change
NEW	515E16000	PRESTRESSED CONCRETE I-BEAM MEMBERS, MISC.: (WF66-49, DRAPED STRANDS)	EA	-	12	\$ 31,000.00	\$ 372,000.00
NEW	516E14020	SEMI-INTEGRAL ABUTMENT EXPANSION JT SEAL	FT	-	240	\$ 25.00	\$ 6,000.00
NEW	516E44101	ELAS BEARING 12X26X2.50 W/ 13X27X2 LOAD PLATES	EA	-	24	\$ 1,200.00	\$ 28,800.00
NEW	524E94702	DRILLED SHAFTS, 36" DIAM. INTO BEDROCK	FT	-	260	\$ 425.00	\$ 110,500.00
NEW	524E94704	DRILLED SHAFTS, 36" DIAM. ABOVE BEDROCK	FT	-	1,630	\$ 300.00	\$ 489,000.00
NEW	898E20161	QC/QA CONC., CLASS QSC2, SUBSTRUCTURE (ABUT INCL FOOTING)	CY	-	1,320	\$ 490.00	\$ 646,800.00

ADDITIONAL WORK ITEMS TOTAL = \$ 1,653,100.00

PROPOSED GUARANTEED MINIMUM SAVINGS = \$ (234,561.40)



E.L. ROBINSON
ENGINEERING

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Wastewater Systems Development

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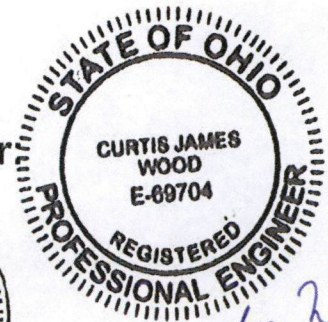
PID 76691

ALL-75-5.53

Bridge No. ALL-75-0703 L&R

Abutment Finite Element Analysis Report

Prepared for



Curtis Wood
7-3-2013

Central Office

1980 W. Broad Street
Columbus, OH 43223

July 3, 2013

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APPENDIX C: DESIGN CALCULATIONS

I. INTRODUCTION

The ALL-75-0703 VECP involved redesigning the bridge from a three span bridge to a single span bridge. The original bridge design had a length of 213'-8" while the proposed single span bridge is reduced to a length of 123'-0". The reduction in bridge length necessitates an increase in the height of the abutments. The new abutments will be wall type abutments with turnback wingwalls. Additional counterforts were added at the stage construction locations and at the middle of the abutment. These counterforts are used for soil retention during stage construction along with providing support to the abutments. The abutments, wingwalls, and counterforts will be supported on 3'-0" diameter drilled shafts. This report describes the analysis and design methods used to design the abutments for the ALL-75-0703 VECP. The proposed abutments for ALL-75-0703 were modeled in the 3D finite element analysis (FEA) program STAAD.Pro. The overall STAAD.Pro model can be seen in Figures 1 and 2. The analysis and design recommendations are based on the requirements of the 2007 ODOT Bridge Design Manual and the 2012 AASHTO LRFD Specifications.

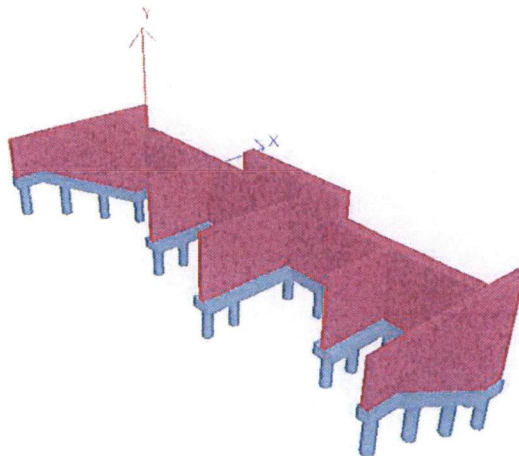
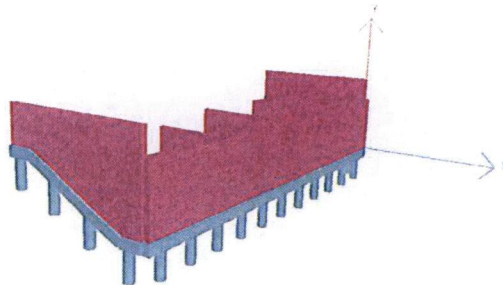


Figure 1 - FEA Model

*Figure 2 -FEA Model*

II. ANALYSIS AND DESIGN METHODS

The abutments were modeled in STAAD.Pro, a 3D FEA program. Stage 1 and Stage 2 construction were investigated with separate models. The model for final condition was the same as Stage 2, with modified load combinations. The walls were modeled as quadrilateral plate elements. Plate mesh size was approximately 1'x1' with some variation due to local geometries. In order to better capture transverse shear results, the bottom 3'-8" of the abutment wall was modeled as a beam element. The drilled shafts and wall footings were modeled as beam elements. The drilled shafts were modeled using an equivalent depth to fixity based on geotechnical conditions and using the program L-Pile. Beam end offsets were used to capture the distances between the bottom of wall and middle of the footings and the top of the drilled shafts. Due to soil capacities, the torsional restraint was released at the base support of the drilled shafts. It was assumed that the drilled shafts were fully fixed at the connection into the footing. The overall model layout can be seen in Appendix A.

All loads required by the 2007 ODOT Bridge Design Manual and the 2012 AASHTO LRFD Specifications were applied to the finite element (FE) model. The horizontal earth load was modeled using an active pressure applied to the back face of the walls. The vertical earth load was modeled as a uniform force applied to the length of the footings. Superstructure loads were applied as concentrated nodal loads.

III. RESULTS

The FEA model results showed two way bending within the abutment wall and wingwall/counterfort walls. The moment contours for the Final Condition from the FEA model can be seen in Appendix B. The reinforcing for the abutment walls, footings and drilled shafts were all designed based on the FEA results. Additional reinforcing steel was added at all corners between the abutment wall and either the wingwalls or counterforts. Also, a chamfer was added to reduce stress concentrations in these transitions. The bottom of the abutment wall was reinforced in a manner similar to a beam section. This will resist the localized forces due to the connection of drilled shafts to the abutment wall. Additional vertical reinforcing steel was added at the drilled shafts to distribute the forces from the drilled shafts to the entire wall.

Globally, the overturning forces are resisted by a combination of axial compression in the drilled shafts along the abutment face and uplift in the drilled shafts located in the wingwalls and counterfort walls. Locally, between the counterfort walls, the drilled shafts resist horizontal earth moments through the moment capacities of the shafts. Sliding is resisted by the shear capacities of the drilled shafts. The forces from the FEA model transmitted to the top of the drilled shafts can be seen in Appendix B.

The governing factor in the layout of the drilled shafts was controlling the uplift forces in the counterfort wall drilled shafts. The counterfort walls were extended to a distance behind the abutments that exceeded what was needed for stage construction, but reduced the uplift to a manageable level.

Results from the FEA model were used to calculate required reinforcing steel in the abutment and drilled shafts. These calculations can be seen in Appendix C.

ALL-75-0703

Abutment Design

APPENDICES

APPENDIX A
STAAD.PRO FEA MODEL

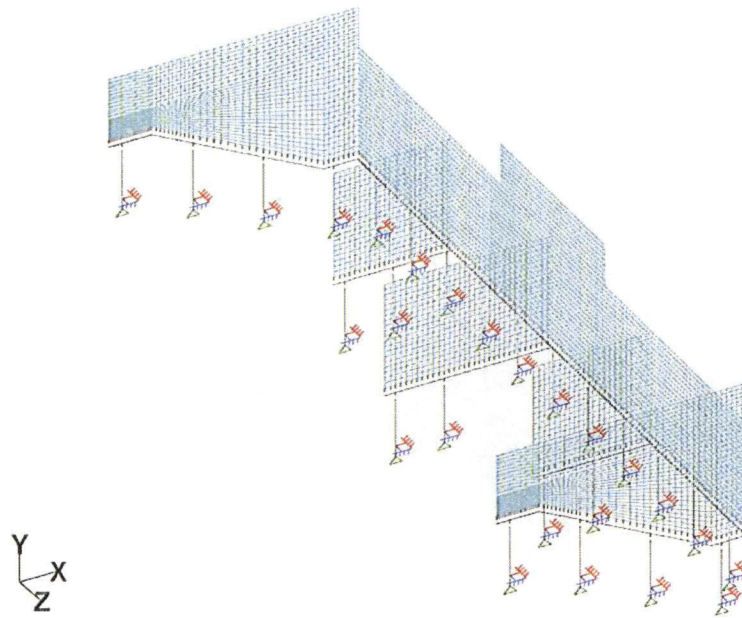


Figure B1 -FE Model Overview

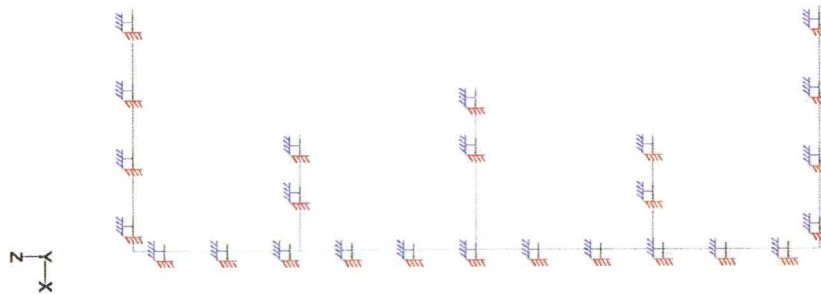


Figure B2 - FE Model View from Positive Y

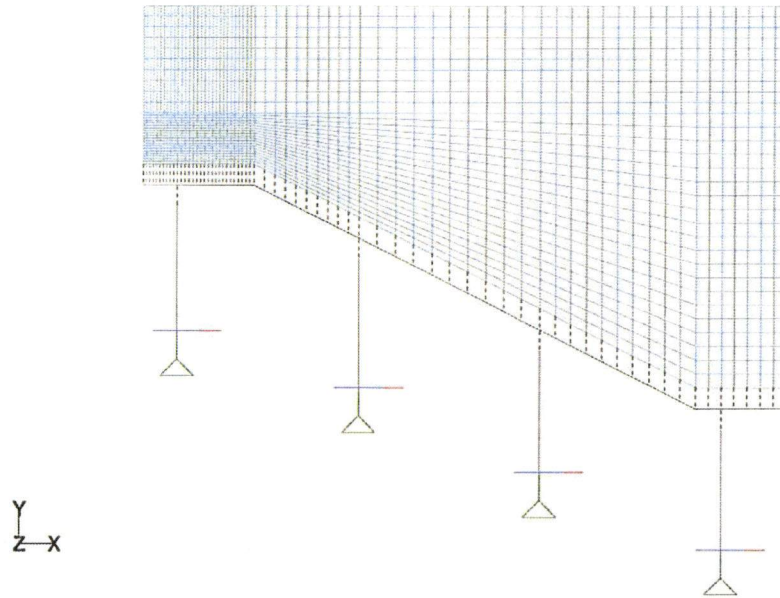


Figure B3 - FE Wingwall Model View from Positive Z

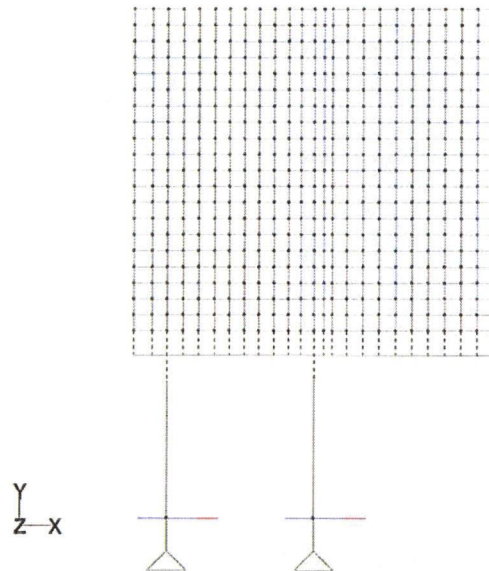


Figure B4 - FE Typical Counterfort Model View from Positive Z

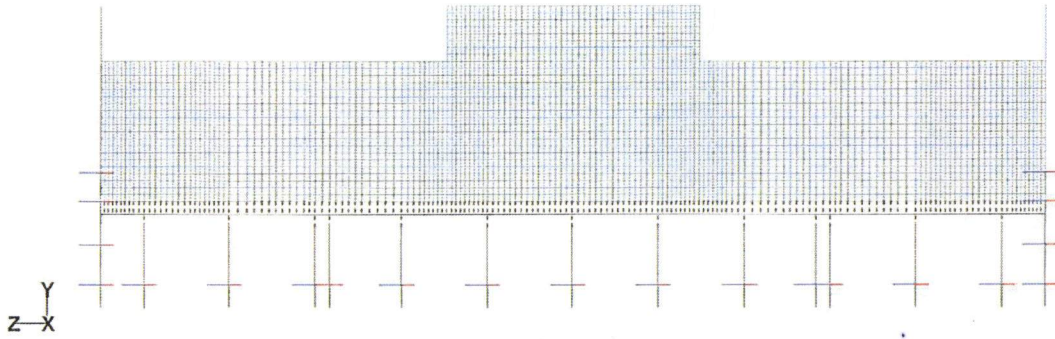


Figure B5 - FE Abutment Model View from Positive X

APPENDIX B
STAAD.PRO FEA RESULTS

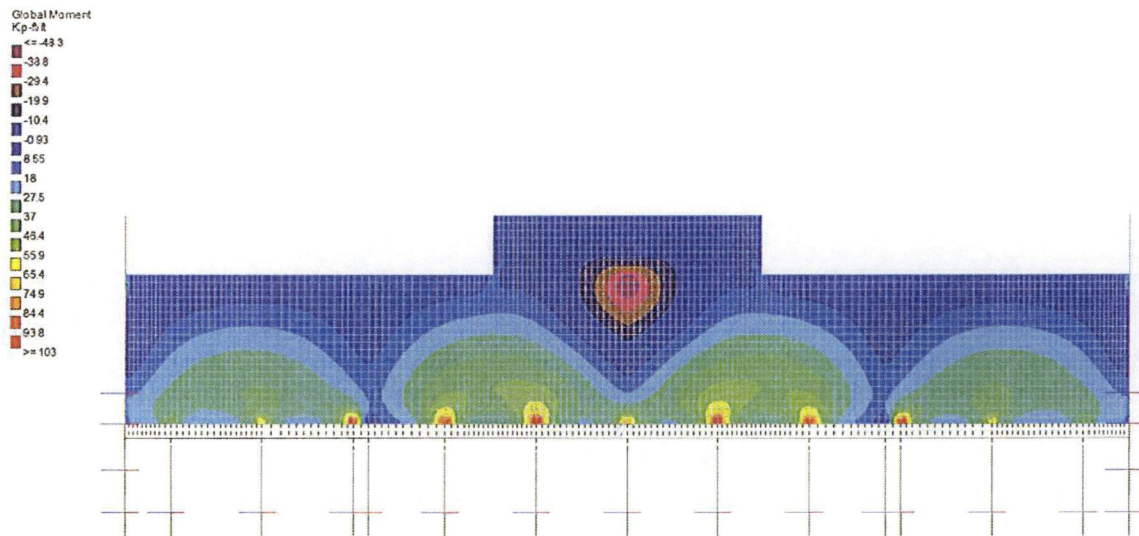


Figure B 1 – Moments about Global Z

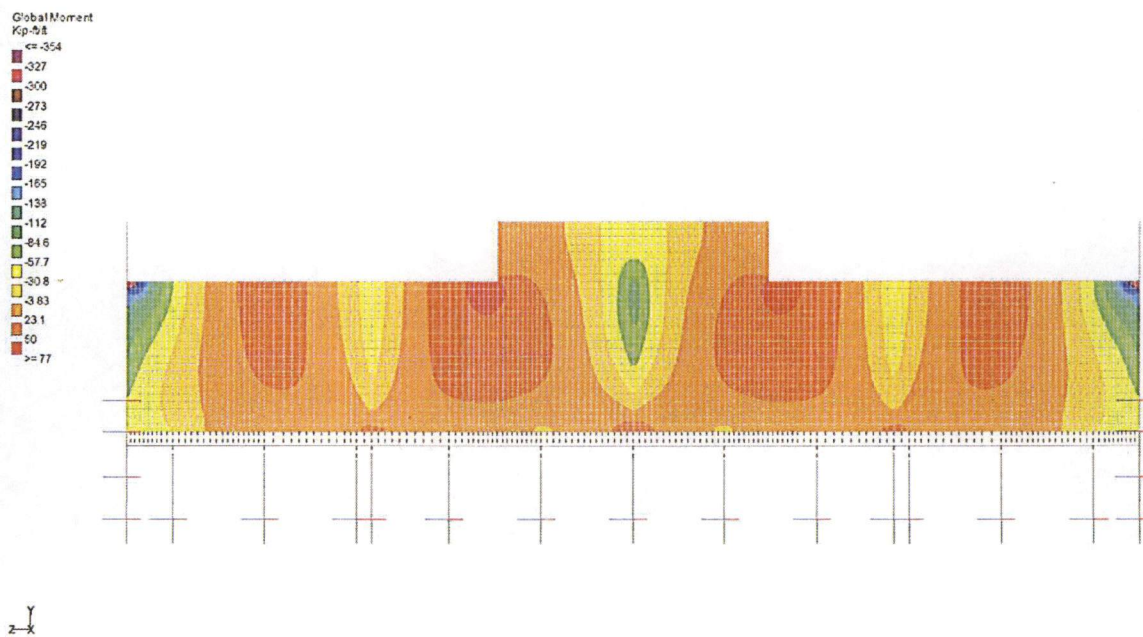


Figure B 2 - Moment about Global Y

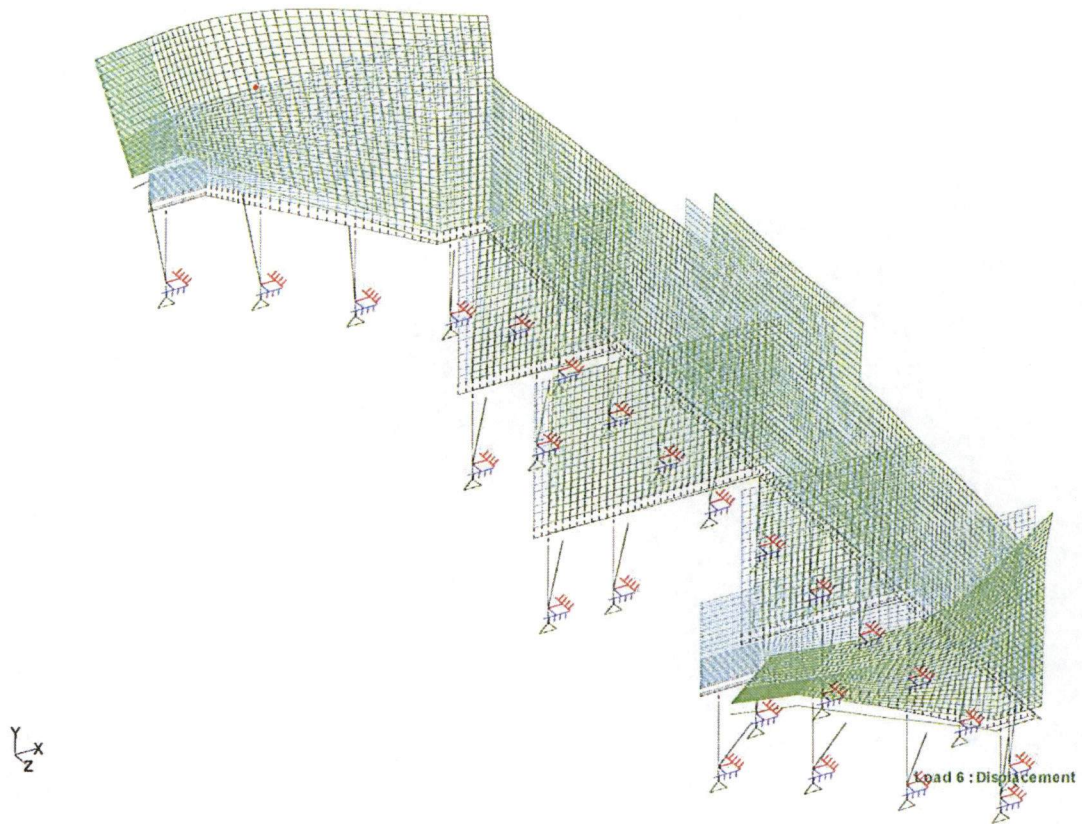


Figure B 3 - Exaggerated Deflections
 (Maximum Deflection: Wingwall = 0.54"; Abutment = 0.16")

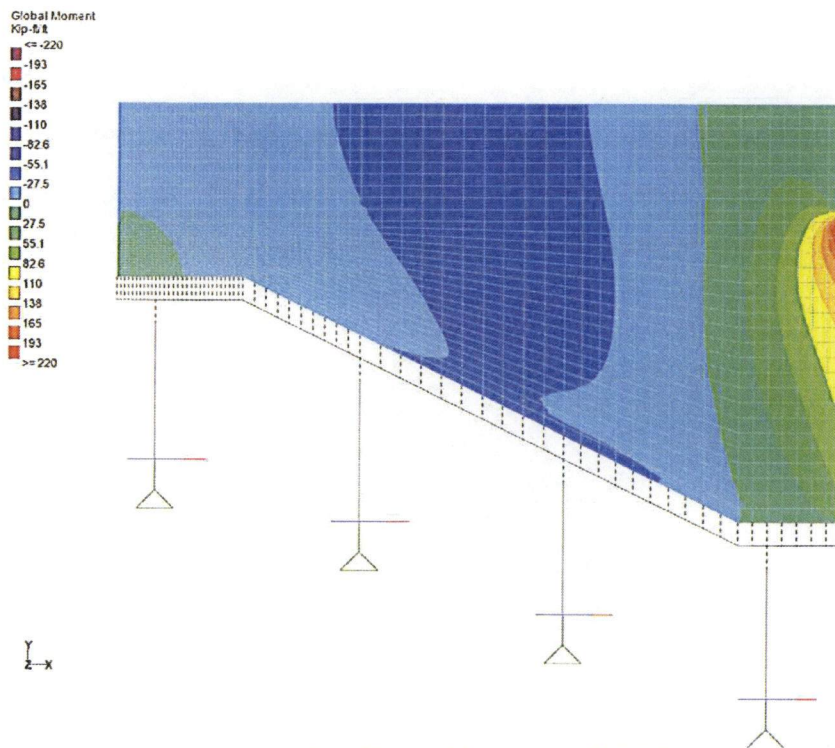


Figure B 4 - Wingwall Moment about Global Y

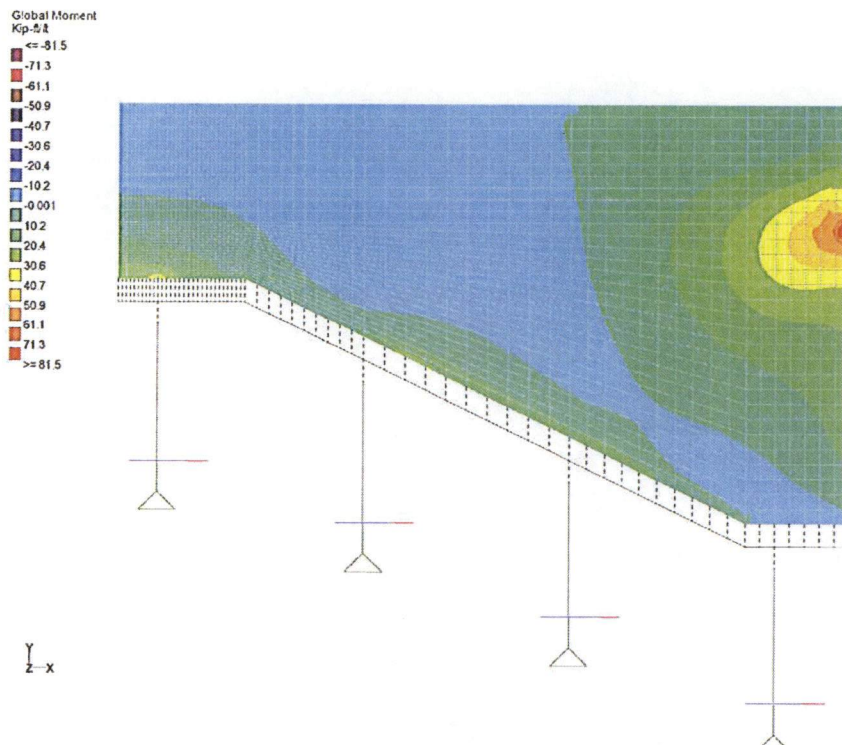


Figure B 5 - Wingwall Moment about Global X

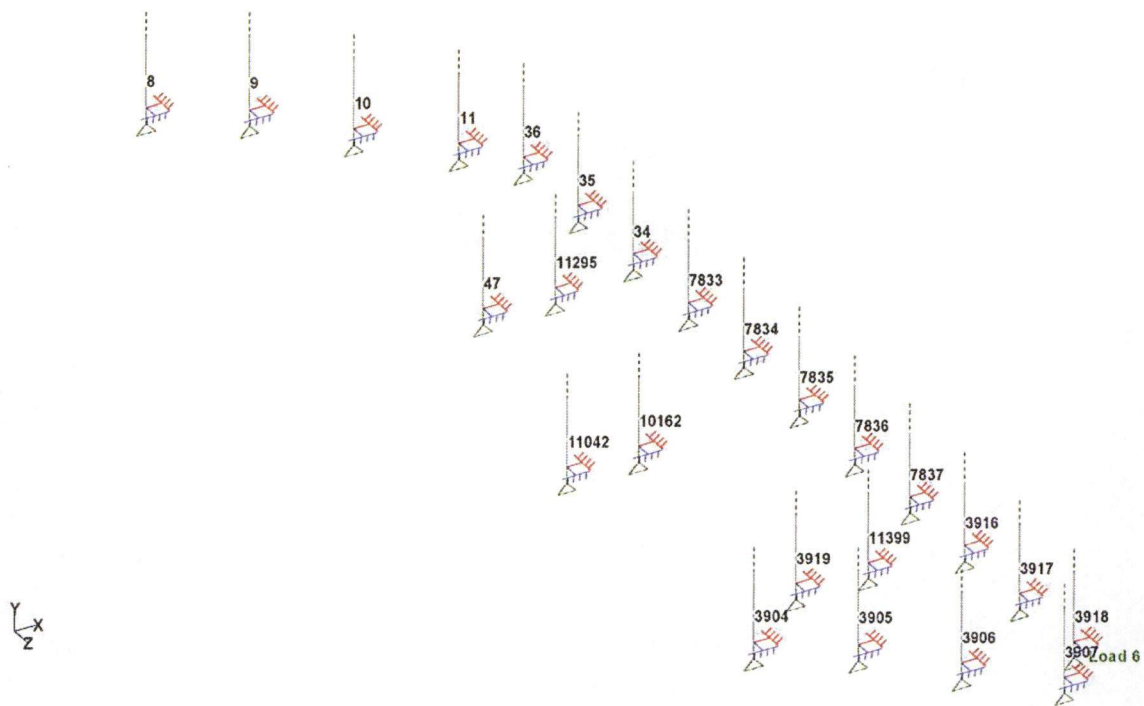


Figure B 6 - Drilled Shaft Numbers from STAAD.Pro


E.L. ROBINSON
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 1801 Watermark Drive, Suite 310 • Columbus, Ohio 43215
614-586-0642 • Fax 614-586-0648

JOB 76691 - ALL-75-703

SHEET NO

OF

CALCULATED BY

CJW

DATE

6/27/2013

CHECKED BY

DATE

SUBJECT Drilled Shaft Loads

STAGE 2/FINAL DRILLED SHAFT LOADS

	Beam	L/C	Axial Force kip	Shear-Y kip	Shear-Z kip	Torsion kip- ft	Moment-Y kip- ft	Moment-Z kip- ft
Wingwall	8	Strength I Max	-48.6	76.4	-71.7	0.0	-323.9	301.0
		Strength I Min	-48.9	68.4	-66.6	0.0	-301.7	270.2
		Strength IV (max)	-18.0	64.5	-51.2	0.0	-226.6	252.6
		Service I	-25.5	50.3	-45.8	0.0	-206.5	197.5
		Strength IV (min)	-31.4	61.4	-51.3	0.0	-227.4	242.6
	9	Strength I Max	86.8	76.1	-102.6	0.0	-97.5	318.5
		Strength I Min	59.1	68.4	-94.7	0.0	-93.3	287.0
		Strength IV (max)	112.1	64.9	-80.6	0.0	-43.7	271.3
		Service I	71.5	50.1	-66.3	0.0	-59.8	209.4
		Strength IV (min)	63.1	62.4	-80.8	0.0	-43.9	262.5
	10	Strength I Max	208.7	78.9	-48.9	0.0	-121.4	307.7
		Strength I Min	150.8	72.0	-44.7	0.0	-114.7	281.9
		Strength IV (max)	222.0	67.8	-43.1	0.0	-67.6	264.6
		Service I	159.7	51.7	-32.0	0.0	-75.8	201.0
		Strength IV (min)	130.3	67.4	-43.2	0.0	-67.7	265.5
	11	Strength I Max	410.8	63.2	6.6	0.0	-90.0	232.1
		Strength I Min	308.0	59.4	6.6	0.0	-84.8	220.5
		Strength IV (max)	391.4	54.4	3.9	0.0	-66.2	200.0
		Service I	301.3	40.8	4.0	0.0	-57.2	148.8
		Strength IV (min)	242.4	57.7	4.7	0.0	-69.1	216.8
Abutment	34	Strength I Max	784.8	136.0	-12.3	0.0	48.3	444.2
		Strength I Min	594.1	124.3	-11.4	0.0	44.8	408.6
		Strength IV (max)	747.2	120.3	-11.4	0.0	45.2	393.1
		Service I	571.0	89.1	-8.2	0.0	32.3	289.9
		Strength IV (min)	481.2	120.7	-11.4	0.0	45.2	400.5
	35	Strength I Max	658.5	72.6	-15.6	0.0	66.1	227.5
		Strength I Min	488.5	66.1	-13.3	0.0	56.5	209.6
		Strength IV (max)	622.8	65.6	-14.1	0.0	60.3	206.5
		Service I	482.1	47.7	-10.6	0.0	45.3	148.6
		Strength IV (min)	379.3	65.8	-12.1	0.0	51.5	212.1
	36	Strength I Max	610.0	47.8	-14.9	0.0	59.4	146.1
		Strength I Min	456.6	44.6	-11.9	0.0	46.8	139.2
		Strength IV (max)	571.8	42.5	-13.6	0.0	55.1	129.4
		Service I	445.0	31.0	-10.4	0.0	42.0	93.5
		Strength IV (min)	353.2	44.5	-10.2	0.0	39.8	142.1
1st Counterfort	47	Strength I Max	-246.4	134.7	5.7	0.0	-10.7	505.7
		Strength I Min	-245.4	123.4	5.3	0.0	-9.9	466.1
		Strength IV (max)	-169.1	117.5	4.5	0.0	-8.6	439.9
		Service I	-147.0	88.0	3.7	0.0	-6.9	328.8
		Strength IV (min)	-217.0	118.6	4.6	0.0	-8.7	450.5

Abutment	3904	Strength I Max	-48.6	76.4	71.7	0.0	323.9	301.0
		Strength I Min	-48.9	68.4	66.6	0.0	301.7	270.1
		Strength IV (max)	-18.0	64.5	51.2	0.0	226.6	252.6
		Service I	-25.5	50.3	45.8	0.0	206.5	197.5
		Strength IV (min)	-31.4	61.4	51.3	0.0	227.4	242.6
	3905	Strength I Max	86.8	76.1	102.6	0.0	97.5	318.5
		Strength I Min	59.1	68.4	94.7	0.0	93.3	287.0
		Strength IV (max)	112.1	64.9	80.6	0.0	43.7	271.3
		Service I	71.5	50.1	66.3	0.0	59.8	209.4
		Strength IV (min)	63.1	62.4	80.8	0.0	43.9	262.5
	3906	Strength I Max	208.7	78.9	48.9	0.0	121.4	307.7
		Strength I Min	150.8	72.0	44.7	0.0	114.7	281.9
		Strength IV (max)	222.0	67.8	43.1	0.0	67.6	264.6
		Service I	159.7	51.7	32.0	0.0	75.8	201.0
		Strength IV (min)	130.3	67.4	43.2	0.0	67.7	265.5
	3907	Strength I Max	410.8	63.2	-6.6	0.0	90.0	232.1
		Strength I Min	308.0	59.4	-6.6	0.0	84.8	220.5
		Strength IV (max)	391.4	54.4	-3.9	0.0	66.2	200.0
		Service I	301.3	40.8	-4.0	0.0	57.2	148.8
		Strength IV (min)	242.4	57.7	-4.7	0.0	69.1	216.8
	3916	Strength I Max	784.9	136.1	12.3	0.0	-48.3	444.2
		Strength I Min	594.1	124.3	11.4	0.0	-44.8	408.6
		Strength IV (max)	747.3	120.3	11.4	0.0	-45.2	393.1
		Service I	571.0	89.1	8.2	0.0	-32.3	289.9
		Strength IV (min)	481.3	120.7	11.4	0.0	-45.2	400.5
	3917	Strength I Max	658.5	72.6	15.6	0.0	-66.1	227.5
		Strength I Min	488.5	66.1	13.3	0.0	-56.5	209.6
		Strength IV (max)	622.8	65.6	14.1	0.0	-60.3	206.5
		Service I	482.1	47.7	10.6	0.0	-45.3	148.6
		Strength IV (min)	379.3	65.8	12.1	0.0	-51.5	212.1
	3918	Strength I Max	610.1	47.8	14.9	0.0	-59.4	146.1
		Strength I Min	456.6	44.6	11.9	0.0	-46.8	139.2
		Strength IV (max)	571.8	42.5	13.6	0.0	-55.1	129.4
		Service I	445.0	31.0	10.4	0.0	-42.0	93.5
		Strength IV (min)	353.2	44.5	10.2	0.0	-39.8	142.1
3rd Counterfort	3919	Strength I Max	-246.5	134.7	-5.7	0.0	10.7	505.7
		Strength I Min	-245.4	123.4	-5.3	0.0	9.9	466.1
		Strength IV (max)	-169.2	117.5	-4.5	0.0	8.6	439.9
		Service I	-147.0	88.0	-3.7	0.0	6.9	328.8
		Strength IV (min)	-217.0	118.6	-4.6	0.0	8.7	450.5
	7833	Strength I Max	688.1	112.4	-0.4	0.0	-2.7	314.3
		Strength I Min	520.0	102.6	-1.4	0.0	2.3	289.2
		Strength IV (max)	667.6	99.0	-0.9	0.0	0.2	279.1
		Service I	504.1	73.6	-0.1	0.0	-2.5	205.1
		Strength IV (min)	428.7	99.2	-2.8	0.0	8.4	284.8
	7834	Strength I Max	627.9	122.1	-1.9	0.0	6.9	349.2
		Strength I Min	478.8	111.2	-2.4	0.0	9.2	319.4
		Strength IV (max)	623.5	105.9	-2.3	0.0	8.8	304.6
		Service I	462.1	80.0	-1.2	0.0	4.3	228.3
		Strength IV (min)	409.6	105.2	-3.4	0.0	13.6	305.6
	7835	Strength I Max	722.4	208.1	0.0	0.0	0.0	741.9
		Strength I Min	562.4	188.3	0.0	0.0	0.0	670.7

Abutment		Strength IV (max)	718.1	179.0	0.0	0.0	0.0	640.6
		Service I	527.4	136.9	0.0	0.0	0.0	488.5
		Strength IV (min)	495.6	174.3	0.0	0.0	0.0	622.3
	7836	Strength I Max	627.9	122.1	1.9	0.0	-6.9	349.2
		Strength I Min	478.8	111.2	2.4	0.0	-9.2	319.4
		Strength IV (max)	623.5	105.9	2.3	0.0	-8.8	304.6
		Service I	462.1	80.0	1.2	0.0	-4.3	228.4
		Strength IV (min)	409.6	105.2	3.4	0.0	-13.6	305.7
	7837	Strength I Max	688.1	112.4	0.4	0.0	2.7	314.3
		Strength I Min	520.0	102.6	1.4	0.0	-2.3	289.2
		Strength IV (max)	667.6	99.0	0.9	0.0	-0.2	279.1
		Service I	504.1	73.6	0.1	0.0	2.6	205.1
		Strength IV (min)	428.7	99.2	2.8	0.0	-8.4	284.8
Middle Counterfort	10162	Strength I Max	139.3	187.4	0.0	0.0	0.0	744.9
		Strength I Min	75.0	171.7	0.0	0.0	0.0	684.3
		Strength IV (max)	203.0	157.4	0.0	0.0	0.0	623.2
		Service I	123.0	122.0	0.0	0.0	0.0	483.5
		Strength IV (min)	85.2	157.8	0.0	0.0	0.0	629.6
	11042	Strength I Max	-196.8	170.8	0.0	0.0	0.0	657.6
		Strength I Min	-208.5	156.4	0.0	0.0	0.0	604.3
		Strength IV (max)	-106.7	143.1	0.0	0.0	0.0	548.8
		Service I	-109.7	111.1	0.0	0.0	0.0	426.7
1st Counterfort		Strength IV (min)	-170.2	143.6	0.0	0.0	0.0	554.7
	11295	Strength I Max	194.4	145.3	1.1	0.0	3.9	562.3
		Strength I Min	119.5	133.3	1.0	0.0	3.4	518.9
		Strength IV (max)	226.4	127.3	0.4	0.0	4.8	492.2
		Service I	157.9	94.9	0.6	0.0	3.0	365.8
3rd Counterfort		Strength IV (min)	97.9	128.9	0.6	0.0	4.1	505.0
	11399	Strength I Max	194.4	145.4	-1.1	0.0	-3.9	562.5
		Strength I Min	119.6	133.3	-1.0	0.0	-3.4	519.1
		Strength IV (max)	226.5	127.4	-0.4	0.0	-4.8	492.3
		Service I	158.0	94.9	-0.6	0.0	-3.0	365.9
		Strength IV (min)	97.9	128.9	-0.6	0.0	-4.1	505.2

ALL-75-0703

Abutment Design

APPENDIX C
DESIGN CALCULATIONS



E.L. ROBINSON
ENGINEERING

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JOB ALL-75-0703 REBAR
SHEET NO. _____ OF _____
CALCULATED BY BMG DATE 6/25/13
CHECKED BY _____ DATE _____
SCALE _____

$$R = \frac{M_u}{\phi b d^2}, \quad \rho = 0.85 \left(\frac{f'_c}{f_y} \right) \left[1 - \sqrt{1 - \frac{2R}{0.85 f'_c}} \right], \quad A_{s, req} = \rho b d$$

COUNTERFORT LOADS

• HORIZONTAL $M_u = 7.73 \text{ K}\cdot\text{ft}/\text{ft}$

$d = 14.875$ assuming #6 bars

$R = \frac{7.73}{0.9(1)(14.875^2)} = 0.039$

$\rho = 0.85 \left(\frac{4}{60} \right) \left[1 - \sqrt{1 - \frac{2(0.039)}{0.85(4)}} \right] = 0.00065$

$A_{s, req} = 0.00065 \times 12" \times 14.875" = 0.116 \text{ in}^2/\text{ft}$

USED #6 @ 12" = $0.44 \text{ in}^2/\text{ft} > 0.116 \text{ in}^2/\text{ft}$ OK ✓

• VERTICAL $M_u = 21 \text{ K}\cdot\text{ft}/\text{ft}$

$d = 15.625 \text{ in}$

$A_{s, req} = 0.30 \text{ in}^2/\text{ft}$

USED #6 @ 12" = $0.44 \text{ in}^2/\text{ft} > 0.30 \text{ in}^2/\text{ft}$ OK ✓

WINDWALL LOADS

• Horiz. $M_u = 124 \text{ K}\cdot\text{ft}/\text{ft}$

$d = 17.875 \text{ in}$

$A_{s, req} = 1. \text{ in}^2/\text{ft}$

@ CORNER MAX MOMENT, #6 + #8 bars used

USED #6 @ 9" w/ #8 @ 9" = $1.64 \text{ in}^2/\text{ft} > 1.63 \text{ in}^2/\text{ft}$ OK ✓

• VERTICAL $M_u = 51 \text{ K}\cdot\text{ft}/\text{ft}$

$d = 18.625 \text{ in}$

$A_{s, req} = 0.62 \text{ in}^2/\text{ft}$

USED #6 @ 8" = $0.66 \text{ in}^2/\text{ft} > 0.62 \text{ in}^2/\text{ft}$ OK ✓



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JOB ALL-75-0703 REBAR
SHEET NO _____ OF _____
CALCULATED BY BMG DATE 6/25/13
CHECKED BY _____ DATE _____
SCALE _____

ABUTMENT STEM

- HORIZONTAL $M_u = 165 \text{ K}\cdot\text{ft}/\text{ft}$
 $d = 40.625''$ (#6's hor, #8 vert.)

$$A_{s, req} = 0.92 \text{ in}^2/\text{ft}$$

$$\text{USED } \#6 + \#8 @ 9'' = 1.64 \text{ in}^2/\text{ft} > 0.92 \text{ in}^2/\text{ft} \text{ OK} \checkmark$$

← Between Drilled shafts
 $M_u = 55 \text{ K}\cdot\text{ft}/\text{ft}$, used #6 @ 9"
OK ✓ SEE

- VERTICAL $M_u = 103 \text{ K}\cdot\text{ft}/\text{ft}$ (at drilled shafts)

$$d = 41.5''$$

$$A_{s, req} = 0.56 \text{ in}^2/\text{ft}$$

$$\text{USED } \#6 + \#8 @ 12'' = 1.23 \text{ in}^2/\text{ft} > 0.56 \text{ in}^2/\text{ft} \text{ OK} \checkmark$$

$$M_u = 56 \text{ K}\cdot\text{ft}/\text{ft}$$

$$d = 33.625''$$

$$A_{s, req} = 0.37 \text{ in}^2/\text{ft}$$

$$\text{USED } \#6 @ 12'' = 0.44 \text{ in}^2/\text{ft} > 0.37 \text{ in}^2/\text{ft} \text{ OK} \checkmark$$

SHEAR REINFORCEMENT LFD 5.8.3.3

$$\text{MAX } V_u = \sqrt{240^2 + 1117^2} = 267 \text{ K}, B = 2.0, \theta = 45^\circ$$

$$V_n = V_c + V_c + V_p$$

$$d_v = 0.9 d_e = 0.9 (39.75'') = 35.78''$$

$$V_n = 0.25 f_c b_o d_v + V_p$$

$$V_c = 0.0316 B \sqrt{f_c} b_o d_v$$

$$V_c = 0.0316 (2) (\sqrt{4}) (44'') (35.78'')$$

$$V_c = 199.00 \text{ K}$$

$$V_s = 0.44 \text{ in}^2 (60) (35.78'') \cot \theta / 6$$

$$V_s = 157 \text{ K}$$

$$V_n = 199 \text{ K} + 157 \text{ K} = 356 \text{ K}$$

$$\phi V_n = 320 \text{ K} > 267 \text{ K} \text{ OK} \checkmark$$



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JOB ALL-75-0702

SHEET NO _____

OF _____

CALCULATED BY BMG

DATE 6/25/12

CHECKED BY _____

DATE _____

SCALE _____

ABUTMENT FOOTING

$$M_u = 300 \text{ K}\cdot\text{ft}$$

$$d = 40.75"$$

$$\text{USED } 6\#8 = 4.74 \text{ in}^2$$

$$\begin{aligned}\phi M_n &= 0.9 (4.74 \text{ in}^2) (60 \text{ ksi}) (40.75" - 1.9"/2) / 12 \\ &= 849 \text{ K}\cdot\text{ft} > 300 \text{ K}\cdot\text{ft} \quad \text{OK} \checkmark\end{aligned}$$

E.L. Robinson Engineering	Project: ALL-75-0703	Engineer: CJW Date: 20-Jun-13	Project # 76691
ShortCol Copyright © 2007	Subject: Drilled shaft design - Abutment & Wingwalls	Checker: Date:	Page: 1

Last modified: 08-Nov-11

Reinforced concrete column capacity

Materials:

Concrete $f'_c = 4$ ksi $\gamma_c = 150$ lb/ft³
Steel $f_y = 60$ ksi $E_c = 3,834$ ksi
Ultimate conc. strain $\epsilon_c = -0.003$ $E_s = 29,000$ ksi

Design Code: AASHTO LRFD-static

Resistance Factors $\phi_b = 0.9$ $\phi_c = 0.75$

Confinement: Spiral

Section Properties:

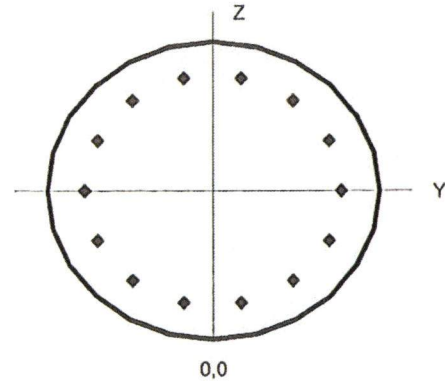
Diameter = 36 in Width =

$A_c = 1017.88$ in² $A_T = 1090.5$ in²
 $I_c = 82448$ in⁴ $I_T = 89497$ in⁴
 $Y_{bc} = 18$ in $Y_{bT} = 18.00$ in

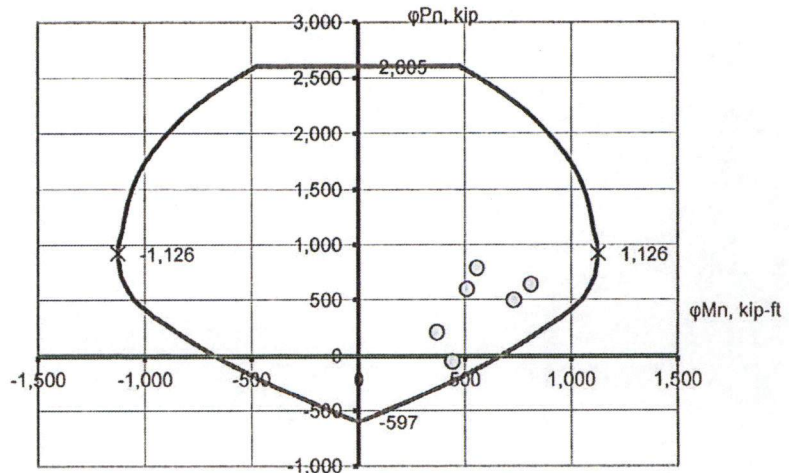
Reinforcing bars:

Bar Area = 0.79 in²
No. bars = 14 (< 100)
 $\Sigma(A_s) = 11.06$ in²
 $A_s/A_c = 1.09\%$
Edge dist. = 4.064 in

Reinforcing Bar No.	Area A_s in ²	Coordinates, in	
		Y (from ctr.)	Z (from bot.)
1	0.79	13.94	18.00
2	0.79	12.56	24.05
3	0.79	8.69	28.90
4	0.79	3.10	31.59
5	0.79	-3.10	31.59
6	0.79	-8.69	28.90
7	0.79	-12.56	24.05
8	0.79	-13.94	18.00
9	0.79	-12.56	11.95
10	0.79	-8.69	7.10
11	0.79	-3.10	4.41
12	0.79	3.10	4.41
13	0.79	8.69	7.10
14	0.79	12.56	11.95



Axial Force/Bending Moment Interaction Diagram



Positive moment corresponds to tension in bottom fibers of the section
Positive axial force is compressive force

Description	Factored Loads		Capacity	Demand/ Capacity Ratio
	Pu kip	Mu kip-ft	φMn kip-ft	
1	791	557	1119	50%
2	600	510	1083	47%
3	-50	442	625	71%
4	213	370	851	43%
5	642	809	1094	74%
6	501	730	1051	69%

E.L. Robinson Engineering	Project: ALL-75-0703	Engineer: CJW	Project # 76691
ShortCol Copyright © 2007	Subject: Drilled shaft design	Date: 20-Jun-13	Page: 1

Last modified: 08-Nov-11

Reinforced concrete column capacity

Materials:

Concrete $f'_c = 4$ ksi $\gamma_c = 150$ lb/ft³
Steel $f_y = 60$ ksi $E_c = 3,834$ ksi
Ultimate conc. strain $\epsilon_c = -0.003$ $E_s = 29,000$ ksi

Design Code: AASHTO LRFD-static

Resistance Factors $\phi_b = 0.9$ $\phi_c = 0.75$

Confinement: Spiral

Section Properties:

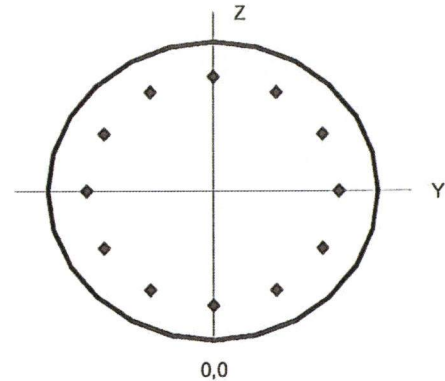
Diameter = 36 in Width =

$A_c = 1017.88$ in² $A_T = 1140.7$ in²
 $I_c = 82448$ in⁴ $I_T = 94138.87$ in⁴
 $Y_{bc} = 18$ in $Y_{bT} = 18.00$ in

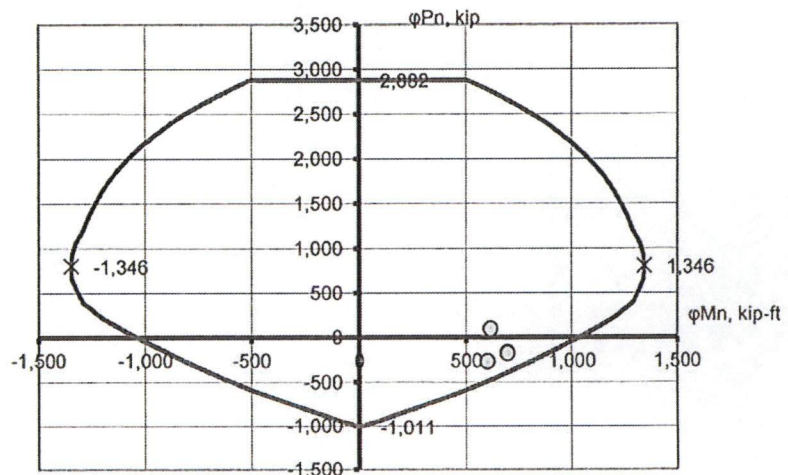
Reinforcing bars:

Bar Area = 1.56 in²
No. bars = 12 (< 100)
 $\Sigma(A_s) = 18.72$ in²
 $A_s/A_c = 1.84\%$
Edge dist. = 4.205 in

Reinforcing Bar No.	Area A_s in ²	Coordinates, in	
		Y (from ctr.)	Z (from bot.)
1	1.56	13.80	18.00
2	1.56	11.95	24.90
3	1.56	6.90	29.95
4	1.56	0.00	31.80
5	1.56	-6.90	29.95
6	1.56	-11.95	24.90
7	1.56	-13.80	18.00
8	1.56	-11.95	11.10
9	1.56	-6.90	6.05
10	1.56	0.00	4.21
11	1.56	6.90	6.05
12	1.56	11.95	11.10



Axial Force/Bending Moment Interaction Diagram



Positive moment corresponds to tension in bottom fibers of the section
Positive axial force is compressive force

Description	Factored Loads		Capacity	Demand/ Capacity Ratio
	Pu kip	Mu kip-ft	φMn kip-ft	
1	-270	600	810	74%
2	-168	695	897	77%
3	-181	695	886	78%
4	94	614	1110	55%
5				
6				



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JOB ALL-75-703 Abutment
SHEET NO 1 OF
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SCALE Shear Capacity of Shafts

$$V_n = \min \left\{ V_c + V_s, 0.25 f_c' b_v d_v \right\}$$

AASHTO 5.8.3.3-1
5.8.3.3-2

$$V_c = 0.0316 \beta \sqrt{f_c'} b_v d_v \quad \text{AASHTO 5.8.3.3-3}$$

$$d_v = 0.9 d_e \quad (5.8.2.9-2)$$

$$d_e = \frac{D}{2} + \frac{D_r}{17} = \frac{36''}{2} + \frac{27.25''}{17} = 26.8''$$

$$D = 36''$$

$$D_r = 36'' - 2(3'') - 2(1/2'') - 1.25'' = 27.75''$$

$$d_v = 0.9(26.8'') = 24.2''$$

$$b_v = 36''$$

$$\beta = \frac{4.8}{(1 + 750 E_s)} \quad (5.8.3.4.2-1)$$

$$1/5 \quad A_v \geq 0.0316 \sqrt{f_c'} \frac{b_v S}{f_y}$$

$$S \leq \frac{0.4 \text{ in}^2}{0.0316 \sqrt{4} \left(\frac{36''}{60 \text{ ksi}} \right)} = 10.5'' \quad \text{OK}$$

$$E_s = \frac{m_u l}{d_v} + 0.5 N_u + V_u = \frac{598 \text{ ft-k}(12) + 270 \text{ k}(0.2) + 158 \text{ k}}{24.2''}$$

$$29000 \text{ ksi} (1.56 \text{ in}^2)(5)$$

(assuming 5 #11

in tension side)

$$E_s = 0.0026$$



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JOB ALL-75-703
SHEET NO 2 OF
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SCALE Pile shear Capacity

$$\beta = \frac{1.8}{1.750(0.0026)} = 1.62$$

$$\theta = 29 + 3500 E_s = 29 + 3500(0.0026) = 38^\circ$$

$$\alpha = 90^\circ$$

$$V_c = 0.0316 (1.62) \sqrt{4 \text{ ksi}} (136" \times 24.2") = 89^k$$

$$V_s = \frac{A_v S_y d_v (\cot \theta + \cot \alpha) \sin \alpha}{s}$$

$$= \frac{0.4 \text{ in}^2 (60 \text{ ksi}) (24.2") (\cot 38^\circ + \cot 90) \sin 90}{4.5"} = 165^k$$

$$V_s = 165^k$$

$$V_n = 165^k + 89^k = 254^k$$

$$\phi V_n = 0.9 (254^k) = 228^k > V_u = 208^k \quad \underline{\text{OK}}$$

USE #4 spiral @ 4 1/2" Pitch

(MEETS BDM 303.4.3)



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JOB ALL-75-0703 VECF PID 76691 SPN 130002

SHEET NO 1 OF 1

CALCULATED BY P. Narsavage DATE 6/17/2013

CHECKED BY DATE

SUBJECT Drilled shaft design

LRFD Axial Compressive Resistance of Drilled Shaft in Rock

AASHTO LRFD Bridge Design Specification, Section 10.8, and Brown, D.A. and Castelli, R.J. (2010) *Drilled Shafts: Construction Procedures and LRFD Design Methods*, FHWA NHI-10-016, Geotech. Eng. Circular No. 10, Federal Highway Admin., Wash., D.C.

Drilled shaft dimensions

D = 36 inch diameter of drilled shaft in rock (ODOT BDM requires min. 36" or 42" for shaft supporting a column.)
A_p = 7.07 ft² area of shaft tip
2.0 ft Neglect the top (x) feet of the rock socket for side resistance
(Not required by AASHTO LRFD, but 2 feet required by ODOT Bridge Design Manual, 202.2.3.3)

Rock properties

q_u = 5000 psi uniaxial compressive strength of rock
720 ksf
RQD = 0% rock quality designation
(range of 20 to 100 apply to these methods)

Resistance factors

φ_{qs} = 0.55 side resistance in rock
φ_{qp} = 0.50 tip resistance in rock
φ_{up} = 0.40 uplift resistance in rock
See Table 10.5.5.2.4-1 for resistance factors

Side resistance in rock

AASHTO LRFD Bridge Design Specifications, 10.8.3.5.4b

$$q_s = 0.65 \alpha_E p_a \sqrt{\frac{q_u}{p_a}} < 7.8 p_a \sqrt{\frac{f'_c}{p_a}}$$

p_a = 2.12 ksf atmospheric pressure
f'_c = 4.0 ksi concrete compressive strength

α_E = 0.35

$$0.65 \alpha_E p_a \sqrt{\frac{q_u}{p_a}} = 8.9 \text{ ksf} \quad 7.8 p_a \sqrt{\frac{f'_c}{p_a}} = 22.7 \text{ ksf}$$

q_s = 8.9 ksf

Use Table 13-3 in GEC 10 to determine α_E from RQD

RQD	Joint modification factor, α _E	
	Closed joints	Open or gouge-filled joints
100	1.00	0.85
70	0.85	0.55
50	0.60	0.55
30	0.50	0.50
20	0.45	0.45

Interpolated values for design RQD

0	0.35	0.45
---	------	------

Tip resistance in rock

AASHTO LRFD Bridge Design Specifications, 10.8.3.5.4c

Note: the rock must be tightly jointed with no compressible material or gouge filled seams.

$$q_p = 2.5 q_u$$

q_p = 1800.0 ksf

$$\phi_{qp} q_p A_p = 6363 \text{ kips}$$

Total factored resistance

D _b ft	A _s ft ²	φ _{qs} q _s A _s kips	R _R kips	Uplift
				φ _{up} q _s A _s kips
2	0.00	0.0	6363.0	0.0
3	9.42	46.1	6409.1	33.5
4	18.85	92.3	6455.3	67.1
4.5	23.56	115.3	6478.3	83.9

D_b = depth of embedment in bearing layer
(length of rock socket)

A_s = side surface area in rock socket



E.L. ROBINSON ENGINEERING

Computation for: Beam Design

Project Name: ALL-75-0703

Project Number: 76691

Designer: TE Date: April 30, 2013

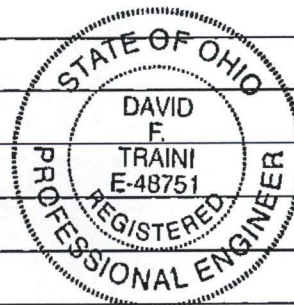
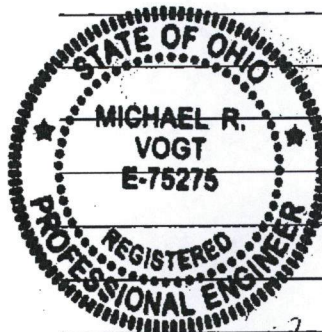
Checker: MRV Date: May 1, 2013

Updater: _____ Date: _____

Rechecker: _____ Date: _____

File Names: HARD COPIES ATTACHED

Comments: _____



[Signature]
6/3/13

Reviewed by *[Signature]*



Bentley		EL ROBINSON		Sheet # 2
Program: LEAP CONSPAN V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04, ALL-75-0703 BEAM RUN.cst		www.bentley.com Phone: 1-800-778-4277		Date Apr/30/2013
PROJECT DATA		BEAM 2 - INTERIOR		Checked

Project: ALL-75-0703	Design Date: Apr/30/2013
Checked By: TJE	Date Checked: 7/6/13
User job number: 76891	State: OH, State Job #: 76891
Specification: AASHTO LRFD - 8th Edition, 2012	Design Code: US
Span Type: Simple Span	Beam Type: No
Comments: BEAVER VECF	File Name: \\cserve02\projects\76891\structures\ALL075_0703\CONSPAN\2013-04-04, ALL-75-0703 BEAM RUN.cst

Bentley		EL ROBINSON		Sheet # 2
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BRIDGE LAYOUT		GEOMETRY DATA		Checked

Overall Width (ft): 47.000	Left curb (ft): 1.500	Right curb (ft): 1.500	Curb-to-curb width (ft): 44.000
Number of spans: 1	Number of lanes: 3	Lane width (ft): 12.000	ERT Deck thick (in): 7.500
Structural thick (in): 12.000	Haunch thickness (in): 2.000	Bridge c/s Mill (x) (ft4): 7703431.50	

SPAN DATA

Precast length, ft = 123.000	Bearing-to-bearing, ft = 121.333	Release span, ft = 123.000
------------------------------	----------------------------------	----------------------------

No	ID	Loc	Area	Height	Yb	B-topg	B-crb
1	WF86-49	ft	in ²	in	in	in	ft
2	WF86-49	ft	in ²	in	in	in	ft
3	WF86-49	ft	in ²	in	in	in	ft
4	WF86-49	ft	in ²	in	in	in	ft
5	WF86-49	ft	in ²	in	in	in	ft
6	WF86-49	ft	in ²	in	in	in	ft

MATERIAL DATA - Project Level

As defined in Material Tab. For beam level properties look at Beam Specific output.

CONCRETE PROPERTIES

Precast Release	Precast Final	C.I.P
f _c (ksi)	5,500	7,000
f _{ck} (ksi)	150,000	150,000
E _c (ksi)	4,496,060	5,072,240
K ₁	1,000	1,000
Thermal coeff. (1/F)	0.00000500	1,000

STRAND AND REBAR PROPERTIES

PRESTRESSED STEEL:

Bentley E.L. ROBINSON ENGINEERING

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Version: 12.01.00.57 Designed TUE

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File Name: 2013-04-04 ALL-75-0703 BEAM RUN.caf

6/10-270K-L, Low relaxation strands

Depressed at 0.37L

Strand Diameter = 0.600 in

Tensile Strength(fu) = 270.0 ksi

Use transformed strand and rebar. No

REINFORCING STEEL:

Tension/Shear steel: fy = 60.0 ksi Es = 29000 ksi fs = 24.0 ksi

Bentley E.L. ROBINSON ENGINEERING

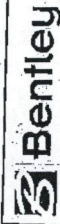
Program: LEAP CONSPAN V8i (SELECTseries 5) Job # 70891

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Program: LEAP CONSPAN V8i (SELECTseries 5)

Version: 12.01.00.57

File Name: 2013-04-04 ALL-75-0703 BEAM RUN.caf

Loads generated using Permanent Load Wizard: YES

Left Barrier Weight, klf	0.582
Right Barrier Weight, klf	0.521
Left Curb Weight, klf	0.000
Right Curb Weight, klf	0.000
Left Sidewalk, klf	0.000
Right Sidewalk, klf	0.000
Future Sidewalk, klf	0.000
Future Wearing Surface, ksf	0.060
Sacrificial Wearing Surface, in	1.000
Stay in Place Deck Forms, klf	0.000

DEAD LOADS ON PRECAST

UNITS: (Point kips, Location: ft, Line: klf, Trapez: Mf)

Span	Beam	DC/DW	Type	Mag.1	Loc.1	Mag.2	Loc.2	Description
1	1	DC	Line	0.094	0.000	0.000	121.333	Sacrificial Wearing Surface
1	1	DC	Trapez	0.062	0.000	0.000	60.667	Additional Haunch
1	1	DC	Trapez	0.000	60.667	0.062	121.333	Additional Haunch
1	1	DC	Trapez	0.049	0.000	0.027	60.667	Overhang Concrete
1	1	DC	Trapez	0.000	60.667	0.049	121.333	Overhang Concrete
1	2	DC	Line	0.100	0.000	0.100	121.333	Sacrificial Wearing Surface
1	2	DC	Trapez	0.059	0.000	0.000	60.667	Additional Haunch
1	2	DC	Trapez	0.000	60.667	0.059	121.333	Additional Haunch
1	3	DC	Line	0.100	0.000	0.100	121.333	Sacrificial Wearing Surface
1	3	DC	Trapez	0.059	0.000	0.000	60.667	Additional Haunch
1	3	DC	Trapez	0.000	60.667	0.059	121.333	Additional Haunch
1	4	DC	Line	0.100	0.000	0.100	121.333	Sacrificial Wearing Surface
1	4	DC	Trapez	0.059	0.000	0.000	60.667	Additional Haunch
1	4	DC	Trapez	0.000	60.667	0.059	121.333	Additional Haunch
1	5	DC	Line	0.100	0.000	0.100	121.333	Sacrificial Wearing Surface
1	5	DC	Trapez	0.059	0.000	0.000	60.667	Additional Haunch
1	5	DC	Trapez	0.000	60.667	0.059	121.333	Additional Haunch
1	6	DC	Line	0.094	0.000	0.059	121.333	Sacrificial Wearing Surface
1	6	DC	Trapez	0.062	0.000	0.000	60.667	Additional Haunch
1	6	DC	Trapez	0.000	60.667	0.062	121.333	Additional Haunch
1	6	DC	Trapez	0.049	0.000	0.027	60.667	Overhang Concrete
1	6	DC	Trapez	0.000	60.667	0.049	121.333	Overhang Concrete

DIAPHRAGM LOADS

Span	Beam	Load (kips)	Location (ft)
1	1	0.226	30.333
1	1	0.226	60.667
1	1	0.226	91.000

Units: U.S. Units

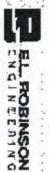
Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.

Design Code: AASHTO LRFD

Units: U.S. Units

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Sheet # 5

Job # 76861

Program: LEAP CONSPAN V8 (SELECTseries 5)
Version: 12.01.00.57E.L. Robinson Engineering
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File Name: 2013-04-04 ALL-75-0703 BEAM RUN.csl

Date

Span	Beam	Load	Location
1	2	0.451	30.333
1	2	0.451	60.667
1	2	0.451	91.000
1	3	0.451	30.333
1	3	0.451	60.667
1	3	0.451	91.000
1	4	0.451	30.333
1	4	0.451	60.667
1	4	0.451	91.000
1	5	0.451	30.333
1	5	0.451	60.667
1	5	0.451	91.000
1	6	0.226	30.333
1	6	0.226	60.667
1	6	0.226	91.000

DEAD LOADS ON COMPOSITE

UNITS: Point kips, Location: ft, Line: klf, Trapez: klf, Area: ksf, Width: ft

Span	DC/DW	Type	Mag.1	Loc.1	Mag.2	Loc.2	Description
1	DC	Line	0.582	0.000	0.582	121.333	Left Barrier Weight
1	DC	Line	0.521	0.000	0.521	121.333	Right Barrier Weight
1	DW	Area	0.060	44.000	-	-	Future Wearing Surface

TEMPERATURE LOADS - NONE

LIVE LOADS

Live load deflection: not included.

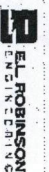
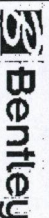
ID	Type
Design Lane	Design Lane
Design Tandem	Design Tandem
Design Truck	Design Truck

Pedestrian Load - NONE

Units: U.S. Units

Design Code: AASHTO LRFD

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Sheet # 6

Job # 76861

Program: LEAP CONSPAN V8 (SELECTseries 5)
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LIVE LOADS USED

LIVE LOAD LIBRARY: ODOT Live Load Library.csl

1. ID: Design Lane

Description	Design Lane
Type	Design Lane

Lane Load: Intensity = 0.64 klf, Width = 10.00 ft

2. ID: Design Tandem

Description	Design Tandem
Type	Design Tandem

First Axis Magnitude = 25.00 k, Wheel Spacing = 6.00 ft, Truck Width = 10.00 ft

Magnitude, Max Spacing, Min Spacing, Increment

k	ft	ft	ft
1	25.00	4.00	4.00
1	25.00	4.00	0.00

3. ID: Design Truck

Description	Design Truck as in AASHTO-LRFD
Type	Design Truck

First Axis Magnitude = 8.00 k, Wheel Spacing = 6.00 ft, Truck Width = 10.00 ft

Magnitude, Max Spacing, Min Spacing, Increment

k	ft	ft	ft
1	32.00	14.00	14.00
2	32.00	30.00	14.00
2	32.00	30.00	2.00

4. ID: Fatigue Truck

Description	Fatigue Truck as in AASHTO-LRFD
Type	Fatigue Truck

First Axis Magnitude = 8.00 k, Wheel Spacing = 6.00 ft, Truck Width = 10.00 ft

Magnitude, Max Spacing, Min Spacing, Increment

k	ft	ft	ft
1	32.00	14.00	14.00
2	32.00	30.00	14.00
2	32.00	30.00	0.00

RATING LOADS - NONE

Units: U.S. Units

Design Code: AASHTO LRFD

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Bentley		E.L. ROBINSON ENGINEERING		Sheet # 7	Job # 76891
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File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com		Checked	
		Phone: 1-800-778-4277		Date	

ANALYSIS DATA

Truck Impact:	1.330
Lane Impact:	1.000
Strength II Impact:	1.330
Fatigue Impact:	1.130

DISTRIBUTION FACTORS (A17.4.6.2.2):

Is Span Post-tensioned:	NO
Include Rigid Cross Section Assumption (A17.4.6.2.2.2):	YES
ADTT (Average Daily Truck Traffic):	5000
Percent of the specified force effect:	1.00

NOTE: Beam specific dead and live load DFs are printed in beam level reports.

LOAD FACTORS: (Table 3.4.1-1 & 3.4.1-2)

Live	DC(max)	DC(min)	DW(max)	DW(min)
Service I:	1.00	1.00	1.00	-
Service II:	0.80	1.00	1.00	-
Strength I:	1.75	1.25	1.50	0.85
Fatigue I:	1.50	-	-	-

Utility Factor:	1.00
Redundancy Factor:	1.00
Importance Factor:	1.00

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 8	Job # 76891
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Designed TJE	
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File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com		Checked	
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PROJECT DESIGN PARAMETERS

Trans len mult:	Bonded	1.00
	Debonded	1.00
Dev len mult:	Bonded	1.60
	Debonded	2.00

Camber & Deflection Multiplier (PCI ref.)

	Erection	Final
Prestress:	1.80	2.20
Self. Wt:	1.85	2.40
Deck + Haunch:	2.40	2.30
Diaphragm:	3.00	3.00
DL-Pre:	3.00	3.00
DL-Comp:	3.00	3.00

MOMENT AND SHEAR PROVISIONS:

Ultimate Moment Capacity, M_{nprvd} computed: AASHTO equations
Horizontal Shear, Beam and Slab effects in Vc: INCLUDED

STRESS LIMITS AT RELEASE BEFORE LOSSES:

	PRECAST	DECK
Strength	5.50 ksi	ksi
Elasticity	4496.1 ksi	ksi
Max comp	3.30 ksi	ksi
Max tens	-0.20 ksi	ksi
Max tens, w/fatfr	-0.56 ksi	ksi

STRESS LIMITS AT FINAL AFTER LOSSES:

	PRECAST	DECK
Strength	7.00 ksi	4.50 ksi
Elasticity	5072.24 ksi	4066.84 ksi

STRESS LIMITS AT FINAL 1 (P/S + DL + LL):

	PRECAST	DECK
Max comp	4.20 ksi	2.70 ksi

STRESS LIMITS AT FINAL 2 (P/S + DL):

	PRECAST	DECK
Max comp	3.15 ksi	2.02 ksi



Sheet # 9
Job # 76691

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			Date

FATIGUE: STRESS LIMITS AT FINAL 3 (50% P/S + 50% D.L. + F.L.) (Art. 5.5.3.1)

PRECAST	DECK
Max comp	2.80 ksi
	- ksi

SERVICE III (Tension):

PRECAST	DECK
Max tens	-0.25 ksi
	-0.40 ksi

RESISTANCE FACTORS (Art. 5.5.4.2):

Flexure Reinforced	0.75
Compression controlled sections	0.90
Tension controlled sections	0.75
Flexure Prestressed	0.75
Compression controlled sections	1.00
Tension controlled sections	0.90
Shear	0.90

PRESTRESS LOSSES:

Time Dependent Losses, Refined Method (Art. 5.9.5.4)	Days to release = 0.75
Rel. Humid. (RH) = 70.0 %	

* Actual span - to depth
ratio check
45 days ✓
10,000 days ✓
0.75 days ✓

Units: U.S. Units

Design Code: AASHTO LRFD

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Sheet # 10
Job # 76691

Program:	LEAP CONSPAN V8i (SELECTseries 5)	E.L. Robinson Engineering	Designed TJE
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File Name:	2013-4-04_Alt-75-0703 BEAM RUN(4)		Checked
			Date

RATING PARAMETERS

Rating Factors	References	Values
Condition Factor	Table 6A.4.2.3-1	1.00
System Factor for Flexural Effect	Art. 6A.4.2.4	1.00
System Factor for Shear Effect	Section C3.6.1.4.2	1.00
ADTT	Art. 6A.4.3.3	0.33
Dynamic Load Factor for Design Level	Table C5.6.4.3-1	0.33
Dynamic Load Factor for Legal and Permit Level		

For Flexural Effect: Condition Factor = 1.00 >= 0.85 (Art. 6A.4.2.1) OK
For Shear Effect: Condition Factor = System Factor = 1.00 >= 0.85 (Art. 6A.4.2.1 and 6A.4.2.4) OK

Dead Load Factors (Table 6A.4.2.2-1)	DC	DW
Limit State	1.25	1.50
Strength I	1.25	1.50
Strength II	1.00	1.00
Service I	1.00	1.00
Service III	1.00	1.00

Allowable Stresses (ksi)	Concrete Compression	Concrete Tension	Steel
Rating Level	0.60 x f _{cc} = 4.20	0.19 x sqrt(f _{cc}) = 0.50	0.50 x f _y = 218.70
Design Inventory	0.60 x f _{cc} = 4.20	0.19 x sqrt(f _{cc}) = 0.50	0.50 x f _y = 218.70
Design Operating	0.60 x f _{cc} = 4.20	0.19 x sqrt(f _{cc}) = 0.50	0.50 x f _y = 218.70
Legal	0.60 x f _{cc} = 4.20	0.19 x sqrt(f _{cc}) = 0.50	0.50 x f _y = 218.70
Permit	0.60 x f _{cc} = 4.20	0.19 x sqrt(f _{cc}) = 0.50	0.50 x f _y = 218.70

Consider shear reinf. across plane (FDOT alternative): No

Units: U.S. Units

Design Code: AASHTO LRFD

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Bentley		E.L. ROBINSON ENGINEERING		Sheet # 11
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				Checked
				Date

BEAM SPECIFIC MATERIAL PROPERTIES:

Span#, Beam#	Tendon-ID	Girder-fc	Girder-fc	Deck-fc
Span:1, Beam:2	8/10-270K-LL	5.50	7.00	4.50

Span:1, Beam:2

PRESTRESSED STEEL:

41 strands, 6/10-270K-LL, Low relaxation strands
Depressed at 0.37L (46.00 ft from member end)

END PATTERN (Vcg = 10.93 in):

10 @ 2,000 in	10 @ 4,000 in	10 @ 6,000 in	5 @ 8,000 in
1 @ 44,000 in	1 @ 56,000 in	1 @ 58,000 in	1 @ 60,000 in
1 @ 62,000 in			

MID PATTERN (Vcg = 4.83 in):

(A) Draped:

1 @ 2,000 in	1 @ 4,000 in	1 @ 6,000 in	1 @ 8,000 in
1 @ 10,000 in			

(B) Straight:

10 @ 2,000 in	10 @ 4,000 in	10 @ 6,000 in	5 @ 8,000 in
---------------	---------------	---------------	--------------

REINFORCING STEEL:

Tension	steel:
fy	60.0 ksi
Es	29,000 ksi
f's	24.0 ksi

Stirrups:

# legs	Size	fy (ksi)	Area (in ²)	Spacing (in)	Start (ft)	End (ft)	Extends into Deck
2	US#5(M16)	60.0	0.62	3.00	0.1259	2.1259	No
2	US#5(M16)	60.0	0.62	6.00	2.1259	4.1259	No
2	US#5(M13)	60.0	0.40	12.00	4.1259	118.8701	No
2	US#5(M16)	60.0	0.62	6.00	118.8701	120.8701	No

$$h/4 = \frac{66''}{4} = 16.5'' \Rightarrow 1.375'$$

$$2.1259' > 1.375' \checkmark$$

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 12
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
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				Checked
				Date

# legs	Size	fy (ksi)	Area (in ²)	Spacing (in)	Start (ft)	End (ft)	Extends into Deck
2	US#5(M16)	60.0	0.62	3.00	120.8701	122.8701	No

Top Steel:

$$122.8701 - 120.8701 = 2'-0" > 1.375'$$

#bars	Size	Dist. from Top (in)	Area (in ²)	Start (ft)	End (ft)	Side Cover (in)
4	US#5(M16)	2.88	1.240	0.0000	122.0000	3.00

Bottom Steel:

#bars	Size	Dist. from Top (in)	Area (in ²)	Start (ft)	End (ft)	Side Cover (in)
2	US#5(M16)	2.81	0.620	122.0000	122.0000	3.00

does not affect design
OK

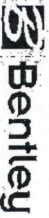
Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.



Sheet # 13
Job # 78891

Program:	LEAP CONSPAN V8 (SELECTseries 5)	E.L. Robinson Engineering	Designed TJE
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		www.bentley.com	Checked
File Name:	2013-04-04_ALL-75-0703 BEAM RUN.csl	Phone: 1-800-778-4277	Date

PROPERTIES

Span: 1, Beam: 2
PRECAST DATA:

Section ID	WF66-49
Type	I-Girder
Flg width	Top 49.000 in Bot 40.000 in
thick	Top 5.000 in Bot 5.500 in
Stems	No 1
	Top 8.000 in
	Bot 8.000 in
Shear width	8.000 in

Minimum Thickness Criteria, Article 5.14.1.2.2 checked: OK.

GENERAL BRIDGE DATA:

Bridge Width	47.00 ft
Curb-to-curb	44.00 ft
Beam Spac. L-L/ft	8.00 8.00 ft
Lane width	12.00 ft
Number of lanes	3
Interior/Exterior	Interior
Start Skew Angle	0.00 degrees
End Skew Angle	0.00 degrees

TOPPING DATA:

Deck	Thickness	7.500 in
Haunch:	Thickness	2.000 in
	Wch	49.000 in
Effective width		96.000 in (Art. 4.6.2.6.1)

GENERAL LOAD DATA:

DEAD LOADS ON PRECAST
UNITS: (Point kips, Location: ft, Line: kft, Trapez: kft)

DC/DW	Type	Mag.1	Loc.1	Mag.2	Loc.2	Description
DC	Line	0.100	0.000	0.100	121.333	Sacrificial Wearing Surface
DC	Trapez	0.059	0.000	0.000	60.657	Additional Haunch
DC	Trapez	0.000	60.657	0.059	121.333	Additional Haunch

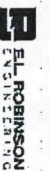
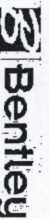
Diaphragm loads:
(kips, ft)

Mag. Loc.

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.



Sheet # 14
Job # 78891

Program:	LEAP CONSPAN V8 (SELECTseries 5)	E.L. Robinson Engineering	Designed TJE
Version:	12.01.00.57	Copyright © Bentley Systems, Inc. 2012	Date Apr/30/2013
		www.bentley.com	Checked
File Name:	2013-04-04_ALL-75-0703 BEAM RUN.csl	Phone: 1-800-778-4277	Date

PROPERTIES

Mag. Loc.
0.45 30.33
0.45 60.67
0.45 91.00

Dead loads on composite: See Project Info for composite loads

GENERAL SPAN DATA:

Overall length	123.000 ft
Release length	123.000 ft
Design length	121.333 ft

KERN POINTS:

Upper	51.37 in
Lower	14.51 in

DISTRIBUTION FACTORS (Art. 4.6.2.2):

Type k, with deck

internally generated

Live Moment (2+ lanes loaded)	0.687 (Calculated)
Live Moment (1 lane loaded)	0.473 (Calculated)
Live Shear (2+ lanes loaded)	0.825 (Calculated)
Live Shear (1 lane loaded)	0.681 (Calculated)

Pedestrian	0.167 (Calculated)
Comp. DC	0.167 (Calculated)
Comp. DW	0.167 (Calculated)

Dead Loads and Pedestrian Load distributed equally to all beams (Art. 4.6.2.2.1)
RESISTANCE FACTORS (Art. 5.5.4.2):

Flexure Reinforced	
Compression controlled sections	0.75
Tension controlled sections	0.90
Flexure Prestressed	
Compression controlled sections	0.75
Tension controlled sections	1.00
Shear	0.90

SECTION PROPERTIES:

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 15
Program: LEAP® CONSPAN® VII (SELECTseries 5)		E.L. Robinson Engineering		Job # 78881
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04-ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-778-4277		Date Apr/30/2013
				Checked
				Date

PRECAST		COMPOSITE	
Area	1117.9 in ²	1773.8 in ²	#
Total Height	66.00 in	75.50 in	
Mom. of Inertia (I _{xx})	679964 in ⁴	1291363 in ⁴	#
Ht. of c.g.	32.86 in	47.03 in	
Density	150.00 pcf	150.00 pcf	
Self-weight	1164.5 plf	2016.6 plf	
Mom. of Inertia (I _{yy})	103844.0 in ⁴		
Poisson's Ratio	0.2		
Thermal Coeff.	0.000065000 1/°F		

(#) Of Total Section using E_{ci}/E_c = 0.8019
Use transformed strand and rebar: No

Span:1, Beam:2

STRESS LIMITS (Art. 5.3.4):

STRESS LIMITS AT RELEASE BEFORE LOSSES:

	PRECAST	DECK
Strength	5.50 ksi	4.50 ksi
Elasticity	4496.1 ksi	4066.84 ksi
Max comp	3.30 ksi	
Max tens	-0.20 ksi	
Max tens, wire/cf	-0.58 ksi	

STRESS LIMITS AT FINAL AFTER LOSSES:

	PRECAST	DECK
Strength	7.00 ksi	4.50 ksi
Elasticity	5072.24 ksi	4066.84 ksi

STRESS LIMITS AT FINAL 1 (P/S + DL + LL):

	PRECAST	DECK
Max comp	4.20 ksi	2.70 ksi

STRESS LIMITS AT FINAL 2 (P/S + DL):

	PRECAST	DECK
Max comp	3.15 ksi	2.03 ksi

FATIGUE (STRESS LIMITS AT FINAL 3 (50% P/S + 50% DL + F.L.L.) (Art. 5.5.3.1):

	PRECAST	DECK
Max comp	2.80 ksi	- ksi

SERVICE III (Tension):

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 10
Program: LEAP® CONSPAN® VII (SELECTseries 5)		E.L. Robinson Engineering		Job # 78881
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04-ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-778-4277		Date Apr/30/2013
				Checked
				Date

	PRECAST	DECK
Max tens	-0.25 ksi	-0.40 ksi

Span:1, Beam:2

PRESTRESSED STEEL:

41 strands, 6/10-270K-L, Low relaxation strands
Depressed at 0.371 (46.00 ft from member end)

END PATTERN (Y_{cg} = 10.93 in):

10 @ 2.000 in	10 @ 4.000 in	10 @ 6.000 in	6 @ 8.000 in
1 @ 44.000 in	1 @ 56.000 in	1 @ 56.000 in	1 @ 60.000 in
1 @ 62.000 in			

MID PATTERN (Y_{cg} = 4.83 in):

(A) Draped:

1 @ 2.000 in	1 @ 4.000 in	1 @ 6.000 in	1 @ 8.000 in
1 @ 10.000 in			

(B) Straight:

10 @ 2.000 in	10 @ 4.000 in	10 @ 6.000 in	6 @ 8.000 in
---------------	---------------	---------------	--------------

Strand Diameter	0.600 in
Strand Area	0.217 in ²
Total Strand Area	8.897 in ²
Trans. Len, bonded	30.000 ft
Trans. Len, debonded	3.000 ft
Dev. Len, bonded	11.574 ft
Dev. Len, debonded	14.467 ft
Holddown Force	49.819 kips
Tensile Strength(f _{pu})	270.0 ksi
Initial Prestress = 0.75f _{pu}	202.5 ksi
Initial Pst	1801.6 kips
Beam Shrink (P/AE)	0.490 in

internally calculated
checked before: ok

Span:1, Beam:2
ESTIMATED QUANTITIES

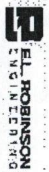
Prestressing	Strands	Beam	Concrete	Stirrups	Longitudinal Bars
(lb/1000ft)	(lb)	Vol(C.Y.)	Wt(LB)	(LB)	(LB)
5042.895	740	35.367	143236.031	1132.038	514.835

Span:1, Beam:2

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.



Sheet # 17

Job # 76891

Program: LEAP CONSPAN V8i (SELECTseries 5)
Version: 12.01.00.57
Copyright © Bentley Systems, Inc. 2012
www.bentley.com Phone: 1-800-778-4277

Designed: TJE
Date: Apr/30/2013
Checked:
Date:

File Name: 2013-04-04_ALL-75-0700 BEAM RUN.csl

REINFORCING STEEL

Tension	steel
f _y	60.0 ksi
E _s	29000 ksi
f _s	24.0 ksi

Stirrups:

# legs	Size	f _y (ksi)	Area (in ²)	Spacing (in)	Start (ft)	End (ft)	Extends into Deck
2	US#5M16	60.0	0.62	3.00	0.1299	2.1299	No
2	US#5M16	60.0	0.62	6.00	2.1299	4.1299	No
2	US#4M13	60.0	0.40	12.00	4.1299	118.8701	No
2	US#5M16	60.0	0.62	6.00	118.8701	120.8701	No
2	US#5M16	60.0	0.62	3.00	120.8701	122.8701	No

Top Steel:

#bars	Size	Dist. from Top (in)	Area (in ²)	Start (ft)	End (ft)	Side Cover (in)
4	US#5M16	2.88	1.240	0.0000	122.0000	3.00

Bottom Steel:

#bars	Size	Dist. from Top (in)	Area (in ²)	Start (ft)	End (ft)	Side Cover (in)
-------	------	---------------------	-------------------------	------------	----------	-----------------

LOSSES

Note: Values are calculated at Midspan

Str. area	8.8970 in ²
V _{og}	4.83 in
P _{unit}	1801.6 kips
Ecc	28.03 in
Days to release	0.73
Rel. Humid. (RH)	70.0 %
E _s	28500.0 ksi
E _{ci}	4496 ksi
Deck Placement Time	45.00 days
Final Time	10000.00 days

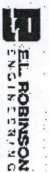
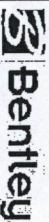
Calculated interval 11

Psi beam	Td _f = 0.8037	Td _f = 0.5280	Td _f = 1.5067
Psi deck	Td _f = 2.1273		
K _c	K _{cd} = 0.8081	K _{cd} = 0.8163	
Eps beam	Td _f = 0.000200	Td _f = 0.000175	Td _f = 0.000375
Eps deck	Td _f = 0.000630		
V/S ratio:	= 4.12		

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.



Sheet # 18

Job # 76891

Program: LEAP CONSPAN V8i (SELECTseries 5)
Version: 12.01.00.57
Copyright © Bentley Systems, Inc. 2012
www.bentley.com Phone: 1-800-778-4277

Designed: TJE
Date: Apr/30/2013
Checked:
Date:

File Name: 2013-04-04_ALL-75-0700 BEAM RUN.csl

AASHTO LOSSES

Elastic Shortening 14.95 ksi (Eq 5.9.5.2.3a-1), (E_{sp} = 2,359 ksi)

Elastic Gains	Gains	Adjustment
due to Precast Loads	-5.05 ksi	0.45 ksi
due to Composite Loads	-2.53 ksi	0.22 ksi
due to Live Loads	-4.49 ksi	0.50 ksi

Time Dependent Losses (Refined Method (Art.5.9.5.4))

Steel relaxation*	Transfer	⇒	Deck Placement	⇒	Final
Concrete shrinkage	1.91 ksi	(Eq 5.9.5.4.2b-1)		1.91 ksi	(Eq 5.9.5.4.3c-1)
Concrete creep	4.61 ksi	(Eq 5.9.5.4.2a-1)		4.07 ksi	(Eq 5.9.5.4.3a-1)
Deck Shrinkage	9.71 ksi	(Eq 5.9.5.4.2b-1)		1.57 ksi	(Eq 5.9.5.4.3b-1)
Initial Loss				-1.15 ksi	(Eq 5.9.5.4.3d-1)
Total Prestress Losses	14.95 ksi	(7.38 %)	Long Term Loss	22.63 ksi	(11.18 %)
				26.68 ksi	(13.18 %)

* Steel relaxation is computed using AASHTO method
Prestressing Stress Limit Check (Table 5.9.3.1)
Initial f_{pi} = 202.5 ksi < 0.75 f_{pu}. OK
Initial f_{pe} = 175.8 ksi < 0.80 f_{py}. OK

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 19	Job # 76891
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Designed TJE	
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Date Apr/30/2013	
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com		Checked	Date
		Phone: 1-800-778-4277			

REAR AND MOMENT ENVELOPE : Span : 1, Beam : 2, SERVICE I
Shears: kips, Moments: kft

Location	ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspace
Self wt.:	M	0.00	2.17	3.15	11.47	23.77	36.07	48.37	60.67
(Max)	V	0.00	150.3	216.5	733.5	1350.2	1790.6	2054.9	2143.0
DL-Prec.:	M	70.6	68.1	67.0	57.3	43.0	28.6	14.3	0.0
DL-Prec.:	V	7.9	7.5	7.4	6.1	4.4	2.8	1.3	0.0
DL-Prec.:	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DL-Prec.:	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deck +:	M	0.00	110.0	158.4	536.7	987.9	1310.2	1503.6	1568.0
Deck +:	V	51.7	49.8	49.0	41.9	31.4	21.0	10.5	0.0
Haunch (Max)	M	-0.00	1.5	2.1	7.8	16.1	21.9	24.6	27.4
Diaphragm:	M	-0.00	0.7	0.7	0.7	0.7	0.2	0.2	0.2
DL-Comp:	M	-0.00	23.7	34.2	115.8	213.1	282.7	324.4	338.3
DL-Comp:	V	11.2	10.8	10.6	9.0	6.8	4.5	2.3	0.0
DL-Comp:	M	0.00	56.8	81.8	277.2	510.1	676.6	776.4	809.7
DL-Comp:	V	26.7	25.7	25.3	21.6	16.2	10.8	5.4	0.0
LL +:	M	-0.00	184.9	266.2	896.1	1540.8	2155.1	2462.2	2549.6
LL +:	V	105.0	102.4	101.2	91.0	76.6	62.2	42.1	27.7
LL +:	M	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
LL +:	V	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
LL +:	M	105.0	102.4	101.2	91.0	77.7	65.0	52.9	41.5
LL +:	V	-0.00	192.1	275.5	896.1	1536.7	2155.1	2462.2	2549.6
Total:	M	-0.00	543.8	783.0	2649.0	4852.3	6424.6	7338.5	7656.2
Total:	V	273.7	265.0	261.1	227.7	179.1	130.2	76.1	27.9
Total:	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total:	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total:	M	273.7	265.0	261.1	227.7	180.1	132.9	86.9	41.7
Total:	V	-0.00	551.0	792.3	2649.0	4758.2	6219.9	7025.8	7200.4

Location	ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspace
Self wt.:	M	72.97	85.27	97.57	109.87	118.19	119.17	121.33	121.33
(Max)	V	2054.9	1790.6	1350.2	733.5	216.5	150.3	105.3	0.0
DL-Prec.:	M	14.3	28.6	43.0	57.3	67.0	68.1	70.6	70.6
DL-Prec.:	V	212.5	187.7	144.1	79.9	23.9	16.6	0.0	0.0
DL-Prec.:	M	1.3	2.8	4.4	6.1	7.4	7.5	7.9	7.9
DL-Prec.:	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deck +:	M	1503.6	1310.2	987.9	536.7	158.4	110.0	0.0	0.0
Deck +:	V	10.5	21.0	31.4	41.9	49.0	49.8	51.7	51.7
Diaphragm:	M	24.6	21.8	16.1	7.8	2.1	1.5	-0.0	-0.0
DL-Comp:	M	324.4	282.7	213.1	115.8	34.2	23.7	0.0	0.0
DL-Comp:	V	776.4	676.6	510.1	277.2	81.8	56.8	-0.0	-0.0
DL-Comp:	M	5.4	10.8	16.2	21.6	25.3	25.7	26.7	26.7

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 20	Job # 76891
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Designed TJE	
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Date Apr/30/2013	
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com		Checked	Date
		Phone: 1-800-778-4277			

Location	ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspace
Self wt.:	M	2462.2	2155.1	1640.8	898.1	266.2	184.9	105.0	0.0
(Max)	V	42.1	62.2	76.6	91.0	101.2	102.4	105.0	0.0
DL-Prec.:	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DL-Prec.:	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DL-Prec.:	M	52.9	65.0	77.7	91.0	101.2	102.4	105.0	0.0
DL-Prec.:	V	2129.5	1950.4	1536.7	898.1	275.5	192.1	0.0	0.0
Deck +:	M	7358.5	6424.6	4852.3	2649.0	783.0	543.8	0.0	0.0
Deck +:	V	76.1	130.2	179.1	227.7	261.1	265.0	273.7	273.7
Diaphragm:	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DL-Comp:	M	86.9	132.9	180.1	227.7	261.1	265.0	273.7	273.7
DL-Comp:	V	7025.8	6219.9	4758.2	2649.0	792.3	551.0	0.0	0.0

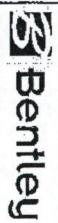
REACTIONS (kips), SERVICE I

Load Type	Left Support	Right Support
Self Wt.	70.6	70.6
Deck-Haunch	51.7	51.7
Diaphragm	0.7	0.7
DL-Prec.(DC)	7.9	7.9
DL-Prec.(DW)	0.0	0.0
DL-Comp.(DC)	66.9	66.9
DL-Comp.(DW)	160.2	160.2
Live	105.3	105.3
Pedestrian	0.0	0.0

Upward reactions are positive.
Live Load reactions are per lane with no distribution factor and no impact.
Reactions are not multiplied by Load Modifiers (ductility, redundancy and operational importance).
Non-composite load types are per beam.
Composite and Pedestrian load types are per total bridge width.

SHEAR AND MOMENT ENVELOPE : Span : 1, Beam : 2, SERVICE III
Shears: kips, Moments: kft

Location	ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspace
Self wt.:	M	0.00	2.17	3.15	11.47	23.77	36.07	48.37	60.67
(Max)	V	70.6	68.1	67.0	57.3	43.0	28.6	14.3	0.0
DL-Prec.:	M	0.00	15.6	23.9	79.9	144.1	187.7	212.5	220.3
DL-Prec.:	V	7.9	7.5	7.4	6.1	4.4	2.8	1.3	0.0
DL-Prec.:	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DL-Prec.:	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deck +:	M	0.00	110.0	158.4	536.7	987.9	1310.2	1503.6	1568.0
Deck +:	V	51.7	49.8	49.0	41.9	31.4	21.0	10.5	0.0

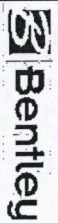


Sheet # 21
Job # 76691

Program: LEAP CONSPAN V8 (SELECT series 5)
Version: 12.01.00.57
Copyright © Bentley Systems, Inc. 2012
File Name: 2013-04-04 ALL-75-0703 BEAM RUN.csl
E.L. Robinson Engineering
www.elrobinson.com
Phone: 1-800-778-4277
Designed: TJE
Date: Apr/30/2013
Checked:

Location	ft	0.50L	0.70L	0.80L	0.90L	H/2	Trans	Bearing
Self wt.:	M	72.97	85.27	97.57	109.87	118.19	121.33	0.0
DC(Min):	M	205.49	1790.6	1350.2	733.5	216.5	150.3	0.0
DC(Max):	M	14.3	28.6	43.0	57.3	68.1	70.6	0.0
DL-Comp:	M	212.5	187.7	144.1	79.9	23.9	16.6	0.0
DL-Prec:	M	1.3	2.8	4.4	6.1	7.4	7.5	0.0
DC(Min):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Max):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Comp:	M	1503.6	1310.2	987.9	536.7	158.4	110.0	0.0
DL-Prec:	M	10.5	21.0	31.4	41.9	49.0	51.7	0.0
DC(Min):	M	24.6	21.8	16.1	7.8	2.1	1.5	0.0
DC(Max):	M	0.2	0.2	0.7	0.7	0.7	0.7	0.0
DL-Comp:	M	324.4	282.7	213.1	115.8	34.2	23.7	0.0
DL-Prec:	M	2.3	4.5	6.8	9.0	10.6	10.8	0.0
DC(Min):	M	776.4	676.6	510.1	277.2	81.8	56.8	0.0
DC(Max):	M	5.4	10.8	16.2	21.6	25.3	25.7	0.0
DL-Comp:	M	1958.8	1724.1	1312.7	718.5	212.9	147.9	0.0
DL-Prec:	M	33.7	49.8	61.3	72.8	80.9	81.9	0.0
DC(Min):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Max):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Comp:	M	42.3	52.0	62.1	72.8	80.9	81.9	0.0
DL-Prec:	M	1703.6	1560.3	1229.4	718.5	220.4	153.7	0.0
DC(Min):	M	6866.1	5953.6	4534.2	2469.4	728.8	506.6	0.0
DC(Max):	M	67.7	117.7	163.8	209.5	240.9	244.6	0.0
DL-Comp:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Prec:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Min):	M	76.3	119.9	164.6	209.5	240.9	244.6	0.0
DC(Max):	M	6599.9	5829.8	4450.9	2469.4	737.2	512.6	0.0

Unit: U.S. Units
Design Code: AASHTO LRFD
Printed on: May 1, 2013 @ 11:03 A.M.



Sheet # 22
Job # 76691

Program: LEAP CONSPAN V8 (SELECT series 5)
Version: 12.01.00.57
Copyright © Bentley Systems, Inc. 2012
File Name: 2013-04-04 ALL-75-0703 BEAM RUN.csl
E.L. Robinson Engineering
www.elrobinson.com
Phone: 1-800-778-4277
Designed: TJE
Date: Apr/30/2013
Checked:

Location	ft	0.50L	0.70L	0.80L	0.90L	H/2	Trans	Bearing
Self wt.:	M	72.97	85.27	97.57	109.87	118.19	121.33	0.0
DC(Min):	M	205.49	1790.6	1350.2	733.5	216.5	150.3	0.0
DC(Max):	M	14.3	28.6	43.0	57.3	68.1	70.6	0.0
DL-Comp:	M	212.5	187.7	144.1	79.9	23.9	16.6	0.0
DL-Prec:	M	1.3	2.8	4.4	6.1	7.4	7.5	0.0
DC(Min):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Max):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Comp:	M	1503.6	1310.2	987.9	536.7	158.4	110.0	0.0
DL-Prec:	M	10.5	21.0	31.4	41.9	49.0	51.7	0.0
DC(Min):	M	24.6	21.8	16.1	7.8	2.1	1.5	0.0
DC(Max):	M	0.2	0.2	0.7	0.7	0.7	0.7	0.0
DL-Comp:	M	324.4	282.7	213.1	115.8	34.2	23.7	0.0
DL-Prec:	M	2.3	4.5	6.8	9.0	10.6	10.8	0.0
DC(Min):	M	776.4	676.6	510.1	277.2	81.8	56.8	0.0
DC(Max):	M	5.4	10.8	16.2	21.6	25.3	25.7	0.0
DL-Comp:	M	1958.8	1724.1	1312.7	718.5	212.9	147.9	0.0
DL-Prec:	M	33.7	49.8	61.3	72.8	80.9	81.9	0.0
DC(Min):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Max):	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Comp:	M	42.3	52.0	62.1	72.8	80.9	81.9	0.0
DL-Prec:	M	1703.6	1560.3	1229.4	718.5	220.4	153.7	0.0
DC(Min):	M	6866.1	5953.6	4534.2	2469.4	728.8	506.6	0.0
DC(Max):	M	67.7	117.7	163.8	209.5	240.9	244.6	0.0
DL-Comp:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Prec:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Min):	M	76.3	119.9	164.6	209.5	240.9	244.6	0.0
DC(Max):	M	6599.9	5829.8	4450.9	2469.4	737.2	512.6	0.0

Unit: U.S. Units
Design Code: AASHTO LRFD
Printed on: May 1, 2013 @ 11:03 A.M.

Bentley		EL ROBINSON ENGINEERING		Sheet # 23
Program: LEAP CONSPAN V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76991
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.cel		www.bentley.com Phone: 1-800-776-4277		Date Apr/30/2013
				Checked
				Date

	0.60L	0.70L	0.80L	0.90L	H/2	Trans	Beating
(Max)	V	17.9	35.8	53.7	71.6	83.7	88.3
Self wt.:	M	1849.4	1611.5	1215.1	660.2	194.8	135.3
(Min)	V	12.9	25.8	38.7	51.6	50.3	61.3
DL-Prec:	M	265.6	294.6	160.1	99.9	29.8	20.7
DC(Max)	V	1.8	3.4	5.4	7.6	9.2	9.4
DL-Prec:	M	191.2	188.9	129.7	71.9	21.5	14.9
DC(Min)	V	1.2	2.5	3.9	5.5	6.6	6.8
DL-Prec:	M	0.0	0.0	0.0	0.0	0.0	0.0
DW(Max)	V	0.0	0.0	0.0	0.0	0.0	0.0
DL-Prec:	M	0.0	0.0	0.0	0.0	0.0	0.0
DW(Min)	V	0.0	0.0	0.0	0.0	0.0	0.0
Deck +:	M	1879.4	1637.7	1234.9	670.9	198.0	137.5
Haunch (Max)	V	13.1	26.2	39.3	52.4	61.3	62.3
Deck +:	M	1353.2	1179.2	889.1	493.0	142.6	99.0
Haunch (Min)	V	9.4	18.9	28.3	37.7	44.1	44.9
Diaphragm:	M	30.7	27.3	20.1	9.7	2.7	1.8
(Max)	V	0.3	0.3	0.8	0.8	0.8	0.8
Diaphragm:	M	22.1	19.6	14.5	7.0	1.9	1.3
(Min)	V	0.2	0.2	0.6	0.6	0.6	0.6
DL-Comp:	M	405.5	353.3	266.4	144.7	42.7	29.7
DC(Max)	V	2.8	5.7	8.5	11.3	13.2	13.4
DL-Comp:	M	291.9	254.4	191.8	104.2	30.8	21.4
DC(Min)	V	2.0	4.1	6.1	8.1	9.5	9.7
DL-Comp:	M	1164.6	1014.8	765.2	415.7	122.7	85.2
DW(Max)	V	8.1	16.2	24.4	32.5	38.0	38.6
DL-Comp:	M	504.7	439.8	331.6	180.1	53.2	36.9
DW(Min)	V	3.5	7.0	10.6	14.1	16.5	16.7
LL +:	M+	4308.9	3771.4	2871.4	1571.7	465.8	323.6
LL +:	M-	V	73.7	108.9	134.1	159.3	177.1
LL +:	M-	0.0	0.0	0.0	0.0	0.0	0.0
LL +:	Vmx	92.5	113.7	135.9	159.3	177.1	193.8
Total:	M+	3726.6	3413.2	2699.3	1571.7	482.1	336.1
Total:	M-	10623.4	9277.4	7025.8	3929.6	1132.3	786.4
Total:	V	117.5	196.6	266.3	335.6	383.3	388.9
Total:	M-	0.0	0.0	0.0	0.0	0.0	0.0
Total:	Vmx	136.4	201.3	268.0	335.6	383.3	398.9
Total:	M	10041.0	8919.2	6843.7	3929.6	1148.6	799.0

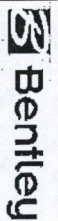


Sheet # 25
Job # 70891

Program:	LEAP CONSPAN V8 (SELECTseries 5)	Copyright © Bentley Systems, Inc. 2012	Designed TJE
Version:	12.01.00.57	www.bentley.com	Date Apr/20/2013
File Name:	2013-04-04 ALL-75-0703 BEAM RUN.csl	Phone: 1-800-778-4277	Checked

LL + I:	Beating	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspan
M	59.9	58.6	58.0	52.8	45.8	38.7	31.7	24.7
M+	0.0	87.5	125.8	420.5	755.3	969.8	1064.0	1037.9
V	228.6	221.2	217.9	189.5	148.3	102.6	61.5	20.8
Total:	M+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M	228.6	221.2	217.9	189.5	148.3	106.7	65.7	24.9
Total:	M	0.0	446.4	642.6	2171.4	3578.8	5239.3	5960.3

Location,	ft	0.60L	0.70L	0.80L	0.90L	H/2	Trans	Beating
Self wt.:	M	72.97	86.27	97.57	109.87	118.19	119.47	121.33
(Max)	V	2054.9	1790.6	1350.2	733.5	216.5	150.3	70.6
Self wt.:	M	14.3	28.6	43.0	57.3	67.0	68.1	70.6
(Min)	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Prec.:	M	212.5	187.7	144.1	79.9	23.9	16.6	0.0
DC(Max)	V	1.3	2.8	4.4	6.1	7.4	7.5	7.9
DL-Prec.:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DC(Min)	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Prec.:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DW(Max)	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DW(Min)	M	1503.6	1310.2	987.9	536.7	158.4	110.0	0.0
Deck +:	V	10.5	21.0	31.4	41.9	49.0	49.8	51.7
Haunch (Max)	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deck +:	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haunch (Min)	M	24.6	21.8	16.1	7.8	2.1	1.5	-0.0
Diaphragm:	V	0.2	0.2	0.7	0.7	0.7	0.7	0.7
(Max)	M	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
Diaphragm:	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(Min)	M	324.4	282.7	213.1	115.8	34.2	23.7	-0.0
DL-Comp:	V	2.3	4.5	6.8	9.0	10.6	10.8	11.2
DC(Max)	M	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
DC(Min)	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DL-Comp:	M	776.4	676.6	510.1	277.2	81.8	56.8	-0.0
DW(Max)	V	5.4	10.8	16.2	21.6	25.3	25.7	26.7
DL-Comp:	M	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
DW(Min)	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LL + I:	M+	1114.5	989.2	755.3	420.5	125.8	87.5	0.0
LL + I:	V	27.6	34.7	45.8	52.8	58.0	58.6	59.9
LL + I:	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LL + I:	V	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	M+	6010.7	5258.7	3976.8	2171.4	642.6	446.4	0.0
Total:	V	61.6	102.6	148.3	189.5	217.9	228.6	228.6
Total:	M	5960.3	5239.3	3976.8	2171.4	446.4	0.0	0.0



Sheet # 26
Job # 70891

Program:	LEAP CONSPAN V8 (SELECTseries 5)	Copyright © Bentley Systems, Inc. 2012	Designed TJE
Version:	12.01.00.57	www.bentley.com	Date Apr/20/2013
File Name:	2013-04-04 ALL-75-0703 BEAM RUN.csl	Phone: 1-800-778-4277	Checked

LL + I:	Beating	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspan
M	59.9	58.6	58.0	52.8	45.8	38.7	31.7	24.7
M+	0.0	87.5	125.8	420.5	755.3	969.8	1064.0	1037.9
V	228.6	221.2	217.9	189.5	148.3	102.6	61.5	20.8
Total:	M+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M	228.6	221.2	217.9	189.5	148.3	106.7	65.7	24.9
Total:	M	0.0	446.4	642.6	2171.4	3578.8	5239.3	5960.3

Bentley		EL ROBINSON ENGINEERING		Sheet # 27	Job # 76891
Program: LEAP CONSPAN V8i (SELECTseries S)		E.L. Robinson Engineering		Designed TJE	
Version: 12.01 00.57		Copyright © Bentley Systems, Inc. 2012		Date Apr/30/2013	
File Name: 2013-04-04_ ALL-75-0703 BEAM RUN.cel		www.bentley.com		Phone: 1-800-778-4277	Checked
				Date	

POSITIVE ENVELOPE STRESSES

Span : 1, Beam : 2, SERVICE I

RELEASE STRESSES, (ksi) (LOSS = 7.38 %)

Location, ft	Trans	0.10L /0.90L	0.20L /0.80L	0.30L /0.70L	0.40L /0.60L	Midspan	Depress.
Beam-Self	3.00	12.30	24.60	36.90	49.20	61.50	46.00
Precast-top	0.123	0.464	0.824	1.082	1.237	1.288	1.206
Precast-bottom	-0.122	-0.460	-0.817	-1.073	-1.226	-1.277	-1.196
Prestress	-0.323	-0.424	-0.556	-0.689	-0.787	-0.787	-0.787
Precast-top	3.293	3.392	3.524	3.655	3.752	3.752	3.752
Total	-0.201	0.040	0.288	0.393	0.450	0.501	0.419
Precast-top	3.171	2.933	2.706	2.582	2.526	2.475	2.557

SERVICE I

POSITIVE ENVELOPE STRESSES, (ksi) (LOSS = 13.18 %)

Location, ft	Bearing	Trans	H/2	0.10L /0.90L	0.20L /0.80L	0.30L /0.70L	0.40L /0.60L	Midspan
Prestress	0.00	2.17	3.15	11.47	23.77	36.07	48.37	60.67
Precast-top	-0.078	-0.303	-0.313	-0.397	-0.521	-0.646	-0.738	-0.738
Precast-bottom	0.852	3.087	3.087	3.180	3.303	3.427	3.518	3.518
Self wt.	-0.000	0.088	0.127	0.429	0.750	1.047	1.202	1.253
Precast-top	-0.000	-0.087	-0.126	-0.425	-0.783	-1.038	-1.192	-1.243
DL-Pre (DC)	0.000	0.010	0.014	0.047	0.084	0.110	0.124	0.129
Precast-top	-0.000	-0.010	-0.014	-0.046	-0.084	-0.109	-0.123	-0.128
DL-Pre (DW)	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Precast-top	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:09 A.M.

Bentley		EL ROBINSON ENGINEERING		Sheet # 28	Job # 76891
Program: LEAP CONSPAN V8i (SELECTseries S)		E.L. Robinson Engineering		Designed TJE	
Version: 12.01 00.57		Copyright © Bentley Systems, Inc. 2012		Date Apr/30/2013	
File Name: 2013-04-04_ ALL-75-0703 BEAM RUN.cel		www.bentley.com		Phone: 1-800-778-4277	Checked
				Date	

	Bearing	Trans	H/2	0.10L /0.90L	0.20L /0.80L	0.30L /0.70L	0.40L /0.60L	Midspan
Diaphragm	-0.000	0.001	0.001	0.005	0.009	0.013	0.014	0.015
Precast-top	-0.000	-0.001	-0.001	-0.004	-0.009	-0.013	-0.014	-0.015
Deck + Haunch	-0.000	0.064	0.063	0.314	0.578	0.768	0.879	0.917
Precast-top	-0.000	-0.064	-0.062	-0.311	-0.573	-0.760	-0.872	-0.909
DL-Comp (DC)	-0.000	0.004	0.006	0.020	0.038	0.060	0.057	0.060
Precast-top	0.000	-0.010	-0.015	-0.051	-0.093	-0.124	-0.142	-0.148
DL-Comp (DW)	-0.000	0.010	0.014	0.049	0.090	0.119	0.137	0.143
Precast-top	0.000	-0.025	-0.036	-0.121	-0.223	-0.296	-0.339	-0.354
LL+I(+)	0.000	0.033	0.047	0.158	0.289	0.390	0.434	0.450
Precast-top	-0.000	-0.081	-0.115	-0.392	-0.717	-0.942	-1.075	-1.114
Final 1 (P/S + DL + LL)	-0.078	-0.084	-0.011	0.625	1.357	1.840	2.110	2.230
Precast-top	0.852	2.809	2.697	1.828	0.822	0.146	-0.240	-0.394
Final 2 (P/S + DL)	-0.078	-0.126	-0.058	0.466	1.067	1.460	1.878	1.780
Precast-top	0.852	2.890	2.814	2.221	1.539	1.088	0.835	0.721

Span : 1, Beam : 2, SERVICE III

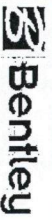
RELEASE STRESSES, (ksi) (LOSS = 7.38 %)

Location, ft	Trans	0.10L /0.90L	0.20L /0.80L	0.30L /0.70L	0.40L /0.60L	Midspan	Depress.
Beam-Self	3.00	12.30	24.60	36.90	49.20	61.50	46.00
Precast-top	0.123	0.464	0.824	1.082	1.237	1.288	1.206
Precast-bottom	-0.122	-0.460	-0.817	-1.073	-1.226	-1.277	-1.196
Prestress	-0.323	-0.424	-0.556	-0.689	-0.787	-0.787	-0.787
Precast-top	3.293	3.392	3.524	3.655	3.752	3.752	3.752

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:05 A.M.



Sheet # 26

Job # 78881

Program: LEARN CONSPAN VBA (SELECTseries 5)

Version: 12.01.00.57

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File Name: 2013-04-04 ALL-75-0703 BEAM RUN-CEL

www.bentley.com Phone: 1-800-778-4277

Designed TJE

Date Apr/30/2013

Checked

Date

	Trans	0.10L	0.20L	0.30L	0.40L	Midspan	Depress.
Total	-0.201	0.040	0.288	0.393	0.450	0.501	0.419
Precast-top	3.171	2.833	2.706	2.582	2.526	2.475	2.557
Bottom	0.644	0.000	0.000	0.000	0.000	0.000	0.000
As top, in2	1.240	1.240	1.240	1.240	1.240	1.240	1.240
Asl. Blvd. in2	1.240	1.240	1.240	1.240	1.240	1.240	1.240

SERVICE III

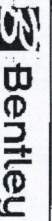
POSITIVE ENVELOPE STRESSES, (ksi) (LOSS = 13.18 %)

Location, ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspan
0.00	2.17	3.15	11.47	23.77	36.07	48.37	60.67	60.67
Prestress	-0.078	-0.303	-0.313	-0.397	-0.521	-0.646	-0.738	-0.738
Precast-top	0.852	3.087	3.097	3.180	3.303	3.427	3.518	3.518
Bottom	-0.000	0.088	0.127	0.429	0.790	1.047	1.202	1.253
Self wt.	-0.000	-0.087	-0.126	-0.425	-0.783	-1.038	-1.192	-1.243
Precast-top	0.000	0.010	0.014	0.047	0.084	0.110	0.124	0.129
Bottom	-0.000	-0.010	-0.014	-0.046	-0.084	-0.109	-0.123	-0.128
DL-Prec (D/C)	0.000	0.010	0.014	0.047	0.084	0.110	0.124	0.129
Precast-top	-0.000	-0.010	-0.014	-0.046	-0.084	-0.109	-0.123	-0.128
Bottom	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
DL-Prec (D/M)	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Precast-top	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Bottom	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Diaphragm	-0.000	0.001	0.001	0.005	0.009	0.013	0.014	0.016
Precast-top	-0.000	-0.001	-0.001	-0.004	-0.008	-0.013	-0.014	-0.016
Bottom	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Deck + Haunch	-0.000	0.064	0.093	0.314	0.578	0.766	0.879	0.917
Precast-top	-0.000	-0.064	-0.092	-0.311	-0.573	-0.760	-0.872	-0.909
Bottom	-0.000	0.004	0.006	0.020	0.038	0.050	0.057	0.060
DL-Comp (D/C)	0.000	0.004	0.006	0.020	0.038	0.050	0.057	0.060
Precast-top	0.000	-0.010	-0.015	-0.051	-0.093	-0.124	-0.142	-0.148
Bottom	-0.000	0.010	0.014	0.049	0.090	0.119	0.137	0.143
DL-Comp (D/M)	-0.000	0.010	0.014	0.049	0.090	0.119	0.137	0.143
Precast-top	-0.000	-0.010	-0.014	-0.049	-0.090	-0.119	-0.137	-0.143
Bottom	-0.000	0.010	0.014	0.049	0.090	0.119	0.137	0.143

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on May 1, 2013 @ 11:03 A.M.



Sheet # 30

Job # 78881

Program: LEARN CONSPAN VBA (SELECTseries 5)

Version: 12.01.00.57

Copyright © Bentley Systems, Inc. 2012

File Name: 2013-04-04 ALL-75-0703 BEAM RUN-CEL

www.bentley.com Phone: 1-800-778-4277

Designed TJE

Date Apr/30/2013

Checked

Date

	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspan
Bottom	0.000	-0.025	-0.038	-0.121	-0.223	-0.296	-0.339	-0.354
LL+(-)	0.000	0.026	0.038	0.122	0.231	0.304	0.347	0.360
Precast-top	-0.000	-0.055	-0.093	-0.314	-0.574	-0.753	-0.861	-0.891
Bottom	-0.078	-0.100	-0.021	0.593	1.299	1.764	2.024	2.140
Final 1 (P/S + DL + LL)	0.852	2.825	2.721	1.807	0.965	0.394	-0.025	-0.171

Span : 1, Beam : 2, FATIGUE I

POSITIVE ENVELOPE STRESSES, (ksi)

Location, ft	Bearing	Trans	H/2	0.10L	0.20L	0.30L	0.40L	Midspan
0.00	2.17	3.15	11.47	23.77	36.07	48.37	60.67	60.67
F _{LL} +(-)	-0.000	0.015	0.022	0.074	0.133	0.174	0.196	0.197
Precast-top	-0.000	-0.038	-0.055	-0.184	-0.330	-0.432	-0.487	-0.488
Bottom	-0.039	-0.048	-0.007	0.307	0.667	0.904	1.035	1.087
Final 3 (50% P/S + 50% DL + F _{LL})	0.426	1.407	1.352	0.927	0.439	0.112	-0.039	-0.129

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on May 1, 2013 @ 11:03 A.M.

Bentley

EL ROBINSON
ENGINEERING

Sheet # 33

Job # 78891

Program: LEAP CONSPAN V8 (SELECTseries 5)

Copyright © Bentley Systems, Inc. 2012

Designed TJE

Date Apr/20/2013

Checked

File Name: 2013-04-04 ALL-75-0703 BEAM RUN-01

www.bentley.com Phone: 1-800-778-4277

Date

Checked

Location (ft)

Av-hreq

dv

s_max

Av-hmin

Av-hsm

Av-hrg

Av-hrvd

Av-hmin

Av-hsm

Av-hrg

Av-hrvd

Av-hmin

Av-hsm

Av-hrg

Av-hrvd

Av-hmin

Av-hsm

Av-hrg

Av-hrvd

Av-hmin

Av-hsm

Av-hrg

Av-hrvd

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Bentley		E.L. ROBINSON ENGINEERING		Sheet # 35
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-778-4277		Date Apr/30/2013
				Checked
				Date

	Release	Multi	Erection	Multi	Final
Self Wt.	-1.868	1.85	-3.456	2.40	-4.484
Deck + Haunch			-1.146	2.30	-2.635
DL-Prec. (DC)			-0.163	3.00	-0.490
Diaphragm			-0.019	3.00	-0.057
DL-Prec. (DW)			0.000	3.00	0.000
DL-Comp. (DC)			-0.130	3.00	-0.380
DL-Comp. (DW)			-0.312	3.00	-0.935
Live Load					
Total	1.955		1.659		-0.576

	Release	Multi	Erection	Multi	Final
At 0.5 x L = 60.67 ft	3.961	1.80	7.184	2.20	8.781
Prestress			-3.629	2.40	-4.708
Self Wt.	-1.962	1.85	-1.205	2.30	-2.771
Deck + Haunch			-0.172	3.00	-0.515
DL-Prec. (DC)			-0.020	3.00	-0.050
Diaphragm			0.000	3.00	0.000
DL-Prec. (DW)			-0.137	3.00	-0.411
DL-Comp. (DC)			-0.328	3.00	-0.983
DL-Comp. (DW)					
Live Load					
Total	2.030		1.655		-0.665

	Release	Multi	Erection	Multi	Final
At 0.6 x L = 72.97 ft	3.925	1.80	6.884	2.20	8.414
Prestress			-3.456	2.40	-4.484
Self Wt.	-1.968	1.85	-1.146	2.30	-2.635
Deck + Haunch			-0.163	3.00	-0.490
DL-Prec. (DC)			-0.019	3.00	-0.057
Diaphragm			0.000	3.00	0.000
DL-Prec. (DW)			-0.130	3.00	-0.380
DL-Comp. (DC)			-0.312	3.00	-0.935
DL-Comp. (DW)					
Live Load					
Total	1.955		1.659		-0.576

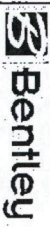
	Release	Multi	Erection	Multi	Final
At 0.7 x L = 85.27 ft	3.326	1.80	5.987	2.20	7.317
Prestress			-2.951	2.40	-3.828
Self Wt.	-1.595	1.85	-0.974	2.30	-2.239
Deck + Haunch			-0.139	3.00	-0.417
DL-Prec. (DC)			-0.016	3.00	-0.048
Diaphragm			0.000	3.00	0.000
DL-Prec. (DW)			-0.111	3.00	-0.332
DL-Comp. (DC)			-0.265	3.00	-0.794
DL-Comp. (DW)					
Live Load					
Total					

Bentley		E.L. ROBINSON ENGINEERING		Sheet # 36
Program: LEAP® CONSPAN® V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-778-4277		Date Apr/30/2013
				Checked
				Date

	Release	Multi	Erection	Multi	Final
Total			1.731		1.532
					-0.341

	Release	Multi	Erection	Multi	Final
At 0.8 x L = 97.57 ft	2.509	1.80	4.516	2.20	5.520
Prestress			-2.155	2.40	-2.796
Self Wt.	-1.165	1.85	-0.703	2.30	-1.517
Deck + Haunch			-0.101	3.00	-0.302
DL-Prec. (DC)			-0.012	3.00	-0.035
Diaphragm			0.000	3.00	0.000
DL-Prec. (DW)			-0.080	3.00	-0.240
DL-Comp. (DC)			-0.191	3.00	-0.573
DL-Comp. (DW)					
Live Load					
Total	1.344		1.275		-0.042

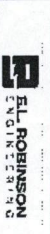
	Release	Multi	Erection	Multi	Final
At 0.9 x L = 109.87 ft	1.393	1.80	2.507	2.20	3.064
Prestress			-1.139	2.40	-1.478
Self Wt.	-0.616	1.85	-0.358	2.30	-0.824
Deck + Haunch			-0.051	3.00	-0.154
DL-Prec. (DC)			-0.006	3.00	-0.018
Diaphragm			0.000	3.00	0.000
DL-Prec. (DW)			-0.041	3.00	-0.122
DL-Comp. (DC)			-0.097	3.00	-0.292
DL-Comp. (DW)					
Live Load					
Total	0.777		0.814		0.177

				Sheet # 37
Program: LEAP CONSPAN V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-776-4277		Date Apr/03/2013
ULTIMATE MOMENT		Date		Checked

ULTIMATE - Span : 1, Beam : 2, STRENGTH!
(Mr-prvd computed by AASHTO equations, Art. 5.7.3.2/5.7.3.3)

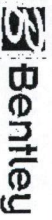
Location (ft)	dp	As	fps	c	a	Mr-prvd	c/dt	Phi	Mr	min Mr	Crkg	Mu-plf
Transfer	2.17	in	ksi	in	in	k.ft			k.ft	k.ft	Ratio	Ratio
785.4	65.0	5.975	254.0	5.2	4.3	8256.7	0.071T	1.00	-	-	-	-
H/2	3.15								-	-	-	-
1132.3	65.1	6.308	253.7	5.5	4.5	8705.3	0.074T	1.00	-	-	-	-
0.1L	11.47								-	-	-	-
3823.6	66.2	8.897	251.3	7.6	6.3	12211.3	0.104T	1.00	-	-	-	-
0.2L	23.77								-	-	-	-
7025.8	67.8	8.897	251.5	7.6	6.3	12536.4	0.104T	1.00	9823.1	9344.4	1.28	-
0.3L	36.07								-	-	-	-
9277.4	69.5	8.897	251.7	7.7	6.3	12861.6	0.104T	1.00	9867.8	9867.8	1.30	-
0.4L	48.37								-	-	-	-
10623.4	70.7	8.897	251.8	7.7	6.3	13102.2	0.104T	1.00	9938.7	9938.7	1.32	-
0.5L	60.67								-	-	-	-
11047.5	70.7	8.897	251.8	7.7	6.3	13102.2	0.104T	1.00	9885.4	9885.4	1.33	-
0.6L	72.97								-	-	-	-
10623.4	70.7	8.897	251.8	7.7	6.3	13102.2	0.104T	1.00	9938.7	9938.7	1.32	-
0.7L	85.27								-	-	-	-
9277.4	69.5	8.897	251.7	7.7	6.3	12861.6	0.104T	1.00	9867.8	9867.8	1.30	-
0.8L	97.57								-	-	-	-
7025.8	67.8	8.897	251.5	7.6	6.3	12536.4	0.104T	1.00	9823.1	9344.4	1.28	-
0.9L	109.87								-	-	-	-
3823.6	66.2	8.897	251.3	7.6	6.3	12211.3	0.104T	1.00	9865.7	5093.3	1.24	-
H/2	118.19								-	-	-	-
1132.3	65.1	6.308	253.7	5.5	4.5	8705.3	0.074T	1.00	-	-	-	-
Transfer	118.17								-	-	-	-
785.4	65.0	5.975	254.0	5.2	4.3	8256.7	0.071T	1.00	-	-	-	-

Legend: C = Compressor-Controlled (c/dt > 0.600)
I = In-Transition (0.60 >= c/dt > 0.375)
T = Tension-Controlled (c/dt <= 0.375)
Note : It used for calculating Mr is computed using AASHTO method (Art.5.4.2.6.)
Consider Bottom Tension Steel Contribution : NO

				Sheet # 38
Program: LEAP CONSPAN V8i (SELECTseries 5)		E.L. Robinson Engineering		Job # 76891
Version: 12.01.00.57		Copyright © Bentley Systems, Inc. 2012		Designed TJE
File Name: 2013-04-04_ALL-75-0703 BEAM RUN.csl		www.bentley.com Phone: 1-800-776-4277		Date Apr/03/2013
DEFLECTION		Date		Checked

Span : 1, Beam : 2, Groups 1-23, Units: ksi

Grp	Sr	Ys,in	3,00ft
1	2	E 2.00	Ft 0.073
2	1	E 62.00	Ft 0.072
3	1	E 62.00	Ft 0.167
4	1	E 62.00	Ft 0.058
5	1	E 62.00	Ft 0.244
6	1	E 62.00	Ft 0.048
7	2	E 62.00	Ft 0.324
8	2	E 62.00	Ft 0.042
9	2	E 62.00	Ft 0.399
10	2	E 62.00	Ft 0.399
11	2	E 62.00	Ft 0.401
12	2	E 62.00	Ft 0.401
13	2	E 62.00	Ft 0.401
14	2	E 62.00	Ft 0.401
15	2	E 62.00	Ft 0.401
16	2	E 62.00	Ft 0.401
17	2	E 62.00	Ft 0.401
18	2	E 62.00	Ft 0.401
19	2	E 62.00	Ft 0.401
20	2	E 62.00	Ft 0.401
21	2	E 62.00	Ft 0.401
22	2	E 62.00	Ft 0.401
23	2	E 62.00	Ft 0.401



Sheet # 41

Job # 73891

Program: LEAP CONSPAVE V8 (SELECTseries S)

Version: 12.01.00.57

Copyright © Bentley Systems, Inc. 2012

www.bentley.com

Phone: 1-800-776-4277

File Name: 2013-04-04_Alt-75-0703 BEAM RUN.csl

Date

Date

Date

Service I Limit State - Compressive

Specification

Service I Limit State - Compressive

Precast Top

Precast Bot

Service III Limit State - Tensile

Precast Top

Precast Bot

Fatigue I Limit State - Compressive

Precast Top

Precast Bot

Stresses

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	Release	Multi	Erection	Multi	Final
Prestress	3.591	1.80	7.184	2.20	8.781
Self Wt.	-1.952	1.85	-3.629	2.40	-4.708
Deck + Haunch			-1.205	2.30	-2.771
DL-Prec. (DC)			-0.172	3.00	-0.515
Diaphragm			-0.020	3.00	-0.050
DL-Prec. (DW)			0.000	3.00	0.000
DL-Comp. (DC)			-0.137	3.00	-0.411
DL-Comp. (DW)			-0.328	3.00	-0.953
Live Load					
Total	2.030		1.695		-0.665

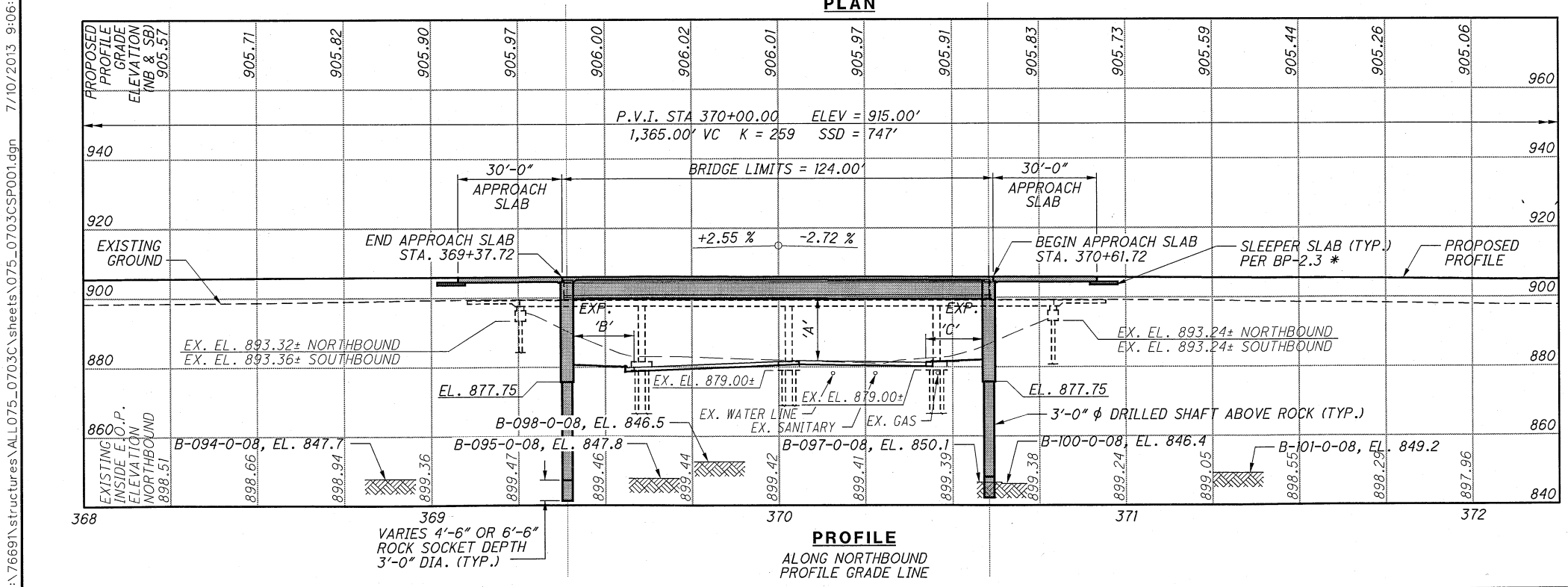
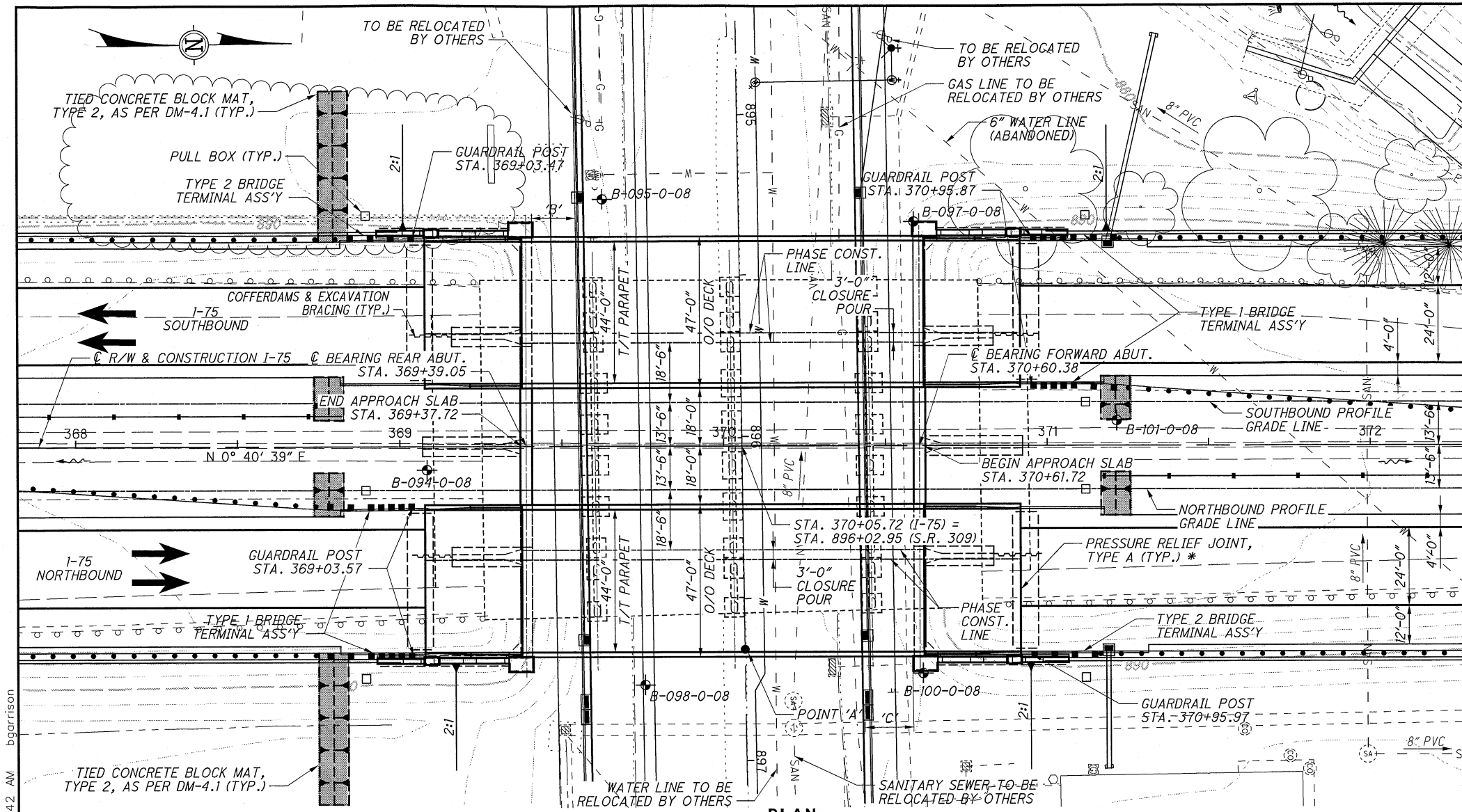
Positive values indicate upward deflection.

CAMBER/DEFLECTION: PCI Design Handbook - 4th Ed. Table 4.6.2
0.5 x L = 60.67 ft

Units: U.S. Units

Design Code: AASHTO LRFD

Printed on: May 1, 2013 @ 11:03 A.M.



NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2015 ADT = 49,540 2015 ADTT = 21,302
2035 ADT = 60,240 2035 ADTT = 25,903
DIRECTIONAL DISTRIBUTION =

LEGEND

- ◆ BORING LOCATION
- 17.00' REQUIRED MINIMUM VERTICAL CLEARANCE
POINT 'A' - 17.18' ACTUAL MINIMUM VERTICAL CLEARANCE
- 15.00' REQUIRED MINIMUM HORIZONTAL CLEARANCE
POINT 'B' - 15.92' ACTUAL MINIMUM HORIZONTAL CLEARANCE
POINT 'C' - 15.92' ACTUAL MINIMUM HORIZONTAL CLEARANCE

* USE PRESSURE RELIEF JOINT FOR RIGID PAVEMENT OPTION ONLY.

SOIL BORING LOCATIONS

BORING	STATION, OFFSET	APPROX. TOP OF ROCK
B-094-0-08	STA. 368+99, 7.2' RT.	847.7
B-095-0-08	STA. 369+53, 76.6' LT.	847.8
B-097-0-08	STA. 370+50, 69.5' LT.	850.1
B-098-0-08	STA. 369+67, 73.6' RT.	846.5
B-100-0-08	STA. 370+52, 70.1' RT.	846.4
B-101-0-08	STA. 371+13, 7.8' LT.	849.2

EXISTING STRUCTURE

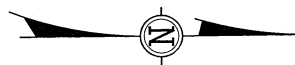
TYPE: CONTINUOUS 4-SPAN REINFORCED CONCRETE SLAB WITH REINFORCED CONCRETE SUBSTRUCTURE

SPANS: 34'± - 42.5'± - 42.5'± - 34'± c/c BRGS.
ROADWAY: 90.5'± TOE/TOE PARAPETS
LOADING: CF-2000 (51)
SKEW: 0°47.5' RF ±
APPROACH SLABS: AS-I-54 (15' LONG)
ALIGNMENT: TANGENT
CROWN: NORMAL 3/16" / FT.
STRUCTURE FILE NUMBER: 0202010
DATE BUILT: 1956
WEARING SURFACE: MICROSILICA MODIFIED CONCRETE

PROPOSED STRUCTURE

TYPE: SINGLE SPAN COMPOSITE PRESTRESSED CONCRETE I-BEAM WITH REINFORCED CONCRETE DECK AND SEMI-INTEGRAL ABUTMENTS
SPANS: 121'-4" C/C BEARINGS
ROADWAY: 44'-0" TOE/TOE PARAPET
LOADING: HL-93
FUTURE WEARING SURFACE (FWS) OF 0.060 kips/ ft²
SKEW: NONE
APPROACH SLABS: 30'-0" LONG (AS-I-81) MODIFIED
WEARING SURFACE: 1" MONOLITHIC
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
COORDINATES: LATITUDE 40°43'48"
LONGITUDE 84°4'30"

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWING(S):

AS-1-81	REVISED	07-19-02
BR-1	REVISED	07-19-02
PCB-91	REVISED	07-19-02
PSID-1-13	REVISED	01-18-13
SICD-1-96	REVISED	07-19-02

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800	DATED	1-20-12
832	DATED	05-05-09
898	DATED	10-21-11

DESIGN SPECIFICATIONS

DESIGN SPECIFICATIONS: THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 5TH EDITION, INCLUDING THE 2010 INTERIM SPECIFICATIONS2010 AND THE ODOT BRIDGE DESIGN MANUAL, 2007 EXCEPT AS NOTED ELSEWHERE IN THE PLANS.

LOAD MODIFIER FOR OPERATIONAL IMPORTANCE

OPERATIONAL IMPORTANCE: A LOAD MODIFIER OF 1.00 HAS BEEN ASSUMED FOR THE DESIGN OF THIS STRUCTURE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, ARTICLE 1.3.5 AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

DESIGN LOADING

DESIGN LOADING: HL-93

FUTURE WEARING SURFACE (FWS) OF 0.060 KIPS/SQ.FT.

DESIGN DATA

DESIGN DATA:

CONCRETE CLASS QSC2 - COMPRESSIVE STRENGTH 4.5 KSI
(SUPERSTRUCTURE)

CONCRETE CLASS QSC1 - COMPRESSIVE STRENGTH 4.0 KSI
(SUBSTRUCTURE)

CONCRETE CLASS S MODIFIED - COMPRESSIVE STRENGTH 4.0 KSI
(DRILLED SHAFT)

REINFORCING STEEL - MINIMUM YIELD STRENGTH 60 KSI

STRUCTURAL STEEL - ASTM A709 GRADE 50 - YIELD STRENGTH
50 KSI

STEEL H-PILES - ASTM A709 GRADE 50 - YIELD STRENGTH
50 KSI

CONCRETE FOR PRESTRESSED BEAMS:

COMPRESSIVE STRENGTH (FINAL) - 7.0 KSI

COMPRESSIVE STRENGTH (RELEASE) - 5.5 KSI

PRESTRESSING STRAND:

AREA = 0.217 SQ.IN.

ULTIMATE STRENGTH = 270 KSI

INITIAL STRESS = 202.5 KSI (LOW RELAXATION STRANDS)

DECK PROTECTION METHOD

EPOXY COATED REINFORCING STEEL

2.5" CONCRETE COVER

SEALING OF CONCRETE SURFACES

MONOLITHIC WEARING SURFACE

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1 INCH THICK.

**ITEM 512-SEALING OF CONCRETE SURFACES (EPOXY-URETHANE).
AS PER PLAN**

EPOXY-URETHANE FOR THE BEAMS SHALL BE FEDERAL COLOR STANDARD NUMBER 25095. EPOXY-URETHANE FOR THE ABUTMENT DIAPHRAGM, PARAPET ACCENTS AND TOWER CAPS SHALL BE FEDERAL COLOR STANDARD NUMBER 37875. EPOXY-URETHANE FOR DECK EDGE BELOW PARAPET AND WINGWALL COPING SHALL BE FEDERAL COLOR STANDARD NUMBER 36373. ALL CONCRETE SHALL BE SEALED AS PER PLAN DETAILS.

**ITEM 512 - SEALING OF CONCRETE SURFACES (NON-EPOXY) (CLEAR).
AS PER PLAN**

THE NON-EPOXY (CLEAR) SEALER SHALL BE USED ON THE FOLLOWING SURFACES ACCORDING TO THE DETAILS IN PLANS:

1. ABUTMENT AND WINGWALL FACES.
2. PARAPETS.
3. TOWER FACES.

PAYMENT FOR SEALING SURFACES OF ITEMS 1, 2, AND 3 SHALL BE INCLUDED IN THIS ITEM 512.

ITEM 202. STRUCTURE REMOVED. OVER 20 FOOT SPAN. AS PER PLAN:

STRUCTURE REMOVAL SHALL BE IN ACCORDANCE WITH 202 EXCEPT THAT THE PIERS SHALL BE COMPLETELY REMOVED, INCLUDING PILING, TO 1 FOOT BELOW THE SUBGRADE.

ITEM 202. PORTIONS OF STRUCTURE REMOVED. AS PER PLAN:

THIS WORK CONSISTS OF REMOVING THE EXISTING C.I.P. WALL FROM APPROXIMATE STATION 368+82 TO STATION 369+47 AT AN OFFSET OF 70+ FEET LEFT TO THE LIMITS SHOWN ON SHEET [2/38]. THIS ITEM INCLUDES THE REMOVAL OF EXISITNG SHEET PILING AS NECESSARY FOR REMOVAL OF THE CONCRETE WALL AND CONSTRUCTION OF THE REAR ABUTMENT.

ITEM 503. COFFERDAMS AND EXCAVATION BRACING. AS PER PLAN:

TEMPORARY SHEETING WILL BE REQUIRED TO CONSTRUCT ABUTMENT. TEMPORARY SHEETING SHALL HAVE A MINIMUM SECTION MODULUS OF 20 IN /FT BASED ON A 32 KSI ALLOWABLE STRENGTH. LENGTH TO INCLUDE 20 FOOT MINIMUM EMBEDMENT.

THE CONTRACTOR HAS THE OPTION TO DESIGN A DIFFERENT EXCAVATION SUPPORT SYSTEM. IF THE CONTRACTOR CHOOSES TO REDESIGN THE TEMPORARY SUPPORT SYSTEM THEY SHALL PREPARE AND SUBMIT PLANS AND CALCULATIONS FOR THESE ITEMS IN ACCORDANCE WITH CMS 501.05.

PAYMENT FOR THE TEMPORARY SHEETING SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 203 EMBANKMENT. AS PER PLAN

PLACE AND COMPACT EMBANKMENT MATERIAL IN 6 INCH LIFTS FOR THE CONSTRUCTION OF THE APPROACH EMBANKMENT.

ABUT. = ABUTMENT
APPROX. = APPROXIMATE
ASS'Y. = ASSEMBLY
BRG. = BEARING
C/C = CENTER TO CENTER
C.I.P. = CAST-IN-PLACE
C.J. = CONSTRUCTION JOINT
CLR. = CLEAR
CONST. = CONSTRUCTION
DIA. = DIAMETER
DWG. = DRAWING
E.F. = EACH FACE
EL. = ELEVATION
EST. = ESTIMATE
EX. = EXISTING

ABBREVIATIONS:

F.A. = FORWARD ABUTMENT
F.F. = FAR FACE
FWD. = FORWARD
LT. = LEFT
MAX. = MAXIMUM
MIN. = MINIMUM
N.F. = NEAR FACE
N.P.C.P.P. = NON-PERFORATED
CORRUGATED PLASTIC PIPE
O/O = OUT TO OUT
P.C.P.P. = PERFORATED CORRUGATED
PLASTIC PIPE
P.E.J.F. = PREFORMED EXPANSION
JOINT FILLER

P.F.J. = PRECOMPRESSED
FOAM JOINT
PROP. = PROPOSED
R.A. = REAR ABUTMENT
RT. = RIGHT
SER. = SERIES
SPA. = SPACES
STA. = STATION
STD. = STANDARD
T/T = TOE TO TOE
T/S = TOP OF SLOPE
TYP. = TYPICAL
D.S. = DOWN STATION
U.S. = UP STATION

GENERAL NOTES

BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53

PID No. 76691

3/38



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ITEM 511-CONCRETE, MISC.: FORMING OF ROUGH CUT STONE FINISH USING FORMLINERS

DESCRIPTION;
CONCRETE FORMLINERS SHALL BE USED ON THE FOLLOWING SURFACES ACCORDING TO THE DETAILS IN PLANS:

- 1.ABUTMENT AND WINGWALL FACES.
- 2.PARAPETS.
- 3.TOWER FACES.

THE FORMLINER USED SHALL MEET THE DETAILS SHOWN IN THE PLANS FOR STAGGERED (INTERLOCKING) PATTERNS, INCLUDING DEPTH OF RELIEF AND SIZE OF STONE PATTERN. HORIZONTAL JOINTS IN THE STONE PATTERN SHALL BE ALIGNED AND AT THE SAME ELEVATION. THE FINISHED TEXTURE OF THE ROUGH CUT STONE SHALL BE SIMILAR TO THAT OF RUBBED CONCRETE.

FORMLINERS FOR PATTERN 1 SHALL MATCH THE DIMENSIONAL SPECIFICATIONS OF THE FOLLOWING MANUFACTURER OR APPROVED EQUAL:

PATTERN #1104-R2 (RANDOM CUT STONE)
CUSTOM ROCK
2020 WEST 7TH STREET
ST. PAUL, MN 55116
651-699-1345
WWW.CUSTOM-ROCK.COM

FORMLINERS FOR PATTERN 2 SHALL MATCH THE DIMENSIONAL SPECIFICATIONS OF THE FOLLOWING MANUFACTURER OR APPROVED EQUAL:

PATTERN #1599 (RANDOM CUT STONE)
SPEC FORMLINERS, INC.
530 E. DYER RD.
SANTA ANA, CA 92707
888-429-9550
WWW.SPECFORMLINERS.COM

THE FORMLINER MANUFACTURER SHALL SUBMIT EVIDENCE OF AT LEAST TWO SIMILAR ARCHITECTURAL CONCRETE CONSTRUCTION PROJECTS WITHIN THE PAST FIVE YEARS FOR A REVIEW AND APPROVAL BY THE ENGINEER. COMPLETE SHOP DRAWINGS DETAILING THE STONE PATTERNS SHALL BE SUBMITTED IN ACCORDANCE WITH 501.04 FOR APPROVAL PRIOR TO PLACING ANY CONCRETE WHERE THE FORMLINERS WILL BE USED. SHOP DRAWINGS SHALL INCLUDE FORMLINER INSTALLATION AND CASTING INSTRUCTIONS, AND INDICATE FORMLINER BACKUP, REVEAL, AND CHAMFER STRIP LOCATIONS. THE CONTRACTOR SHALL COORDINATE WITH THE FORMLINER MANUFACTURER TO ASSURE UNDERSTANDING OF FORMLINER USE, TEST PANEL MOCK-UP REQUIREMENTS, AND FINAL CONSTRUCTION PROCEDURES.

MATERIALS:

THE FORMLINER SHALL BE FABRICATED WITH SHAPES THAT ALLOW REMOVAL OF THE FORMS WITHOUT DAMAGE OR VISUAL IMPAIRMENT OF THE CONCRETE, AND SHALL HAVE 1/8" MINIMUM RADII WITH NO SHARP EDGES. THE FORMLINER SHALL BE CAPABLE OF WITHSTANDING APPLIED CONCRETE POUR PRESSURE WITHOUT LEAKAGE, PHYSICAL DEFECT, OR VISUAL IMPAIRMENT.

CONSTRUCTION REQUIREMENTS:

FORMLINERS SHALL BE CLEANED BEFORE EACH USE. DAMAGED FORMLINERS WHOSE CONTINUED USE OR REPAIR WOULD NEGATIVELY IMPACT THE AESTHETICS OF THE FINISHED CONCRETE SHALL BE REPLACED. FORMLINER JOINTS SHALL BE SEALED TO PREVENT CEMENT PASTE FROM BLEEDING. FORMLINERS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED SHOP DRAWINGS. CHAMFERED CORNERS SHALL FORM SMOOTH, SOLID UNBROKEN CONTINUOUS SURFACES WHICH ARE UNIFORMLY STRAIGHT. AN APPROVED COMPATIBLE FORMLINER RELEASE AGENT SHALL BE APPLIED AT A RATE RECOMMENDED BY THE MANUFACTURER.

THE CONCRETE COPING SHALL BE CAST WITH NO FORMLINER USED.

AS PART OF THIS ITEM, A 7 FEET BY 3 FEET SECTION OF WALL THAT COMPRISES A MINIMUM OF ONE COMPLETE STONE BLOCK WILL BE CAST BY THE CONTRACTOR FOR EACH PATTERN USED FOR APPROVAL BY THE ENGINEER. IF THE SECTION DOES NOT MEET THE ENGINEER'S APPROVAL, THE PROPOSED FORMLINER MAY BE REJECTED. THE SECTION MUST BE APPROVED BEFORE PLACING ANY CONCRETE WHERE THE FORMLINERS WILL BE USED. REJECTION OF THE SECTION WILL REQUIRE CONSTRUCTION OF ANOTHER SECTION UNTIL APPROVAL IS GRANTED. THE WALL SECTION SHALL USE ACTUAL PROJECT SPECIFIC MATERIALS, METHODS, AND WORKMANSHIP, INCLUDING CONCRETE MIX (CEMENT TYPE, AGGREGATE GRADATION, SLUMP, WATER/ CEMENT RATIO, PLASTICIZERS, AND ADDITIVES), FORMLINER AND FORMWORK SYSTEMS, INSERTS, FORM RELEASE AGENTS, PLACEMENT RATE, FORM PRESSURES, AND JOINT SEALING, VIBRATING, AND STRIPPING PRACTICES. ANY INTENDED PATCHING OR REPAIR PROCEDURES FOR THE CORRECTION OF MINOR DEFECTS THAT DO NOT RESULT IN REJECTION OF THE ENTIRE WALL SECTION SHALL BE DEMONSTRATED ON THE SECTION.

THE ACCEPTED WALL SECTION SHALL BE THE STANDARD BY WHICH THE FINAL CONSTRUCTION WILL BE EVALUATED FOR TECHNICAL AND AESTHETIC MERIT. THE WALL SECTION SHALL BE CONSTRUCTED AT THE CONSTRUCTION SITE, OR AT AN ALTERNATIVE LOCATION AGREED UPON BY THE ENGINEER. UPON COMPLETION OF THE FINAL CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF THE WALL SECTION MOCK-UP.

PORTIONS OF THE STRUCTURE DETAILED IN THE PLAN SET SHALL BE CAST WITH STONE FACING FORMLINER TEXTURE AND BE SEALED WITH ITEM 512 - SEALING OF CONCRETE SURFACES (NON-EPOXY (CLEAR)).

METHOD OF MEASUREMENT:

ROUGH CUT STONE FORMLINERS WILL NOT BE MEASURED INDIVIDUALLY FOR PAYMENT UNDER THIS ITEM.

BASIS OF PAYMENT:

ITEM 511-CONCRETE, MISC.: FORMING OF ROUGH CUT STONE FINISH USING FORMLINERS WILL BE PAID FOR AT THE CONTRACT SQ. YD PRICE. THE WORK SHALL INCLUDE FABRICATION AND ERECTION OF FORMLINERS, ALL CONCRETE MATERIAL SHOWN ON THE PLANS, PREPARATION OF FORMLINER SHOP DRAWINGS, AND CONSTRUCTION AND REMOVAL OF THE PRE-CONSTRUCTION WALL SECTION, AND SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM.

THE DEPARTMENT WILL PAY FOR SEALING OF CONCRETE SURFACES SEPARATELY UNDER ITEM 512-SEALING OF CONCRETE SURFACES (NON-EPOXY (CLEAR)). SEE THE GENERAL SEALING OF CONCRETE SURFACES PLAN NOTE FOR REQUIREMENTS FOR THE NON-EPOXY (CLEAR) SEALER.

EXISTING STRUCTURE PLANS:

CONSTRUCTION PLANS FOR THE EXISTING BRIDGE ARE ON FILE AT THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT ONE OFFICE, 1885 NORTH MCCULLOUGH ST., LIMA, OHIO 45801 AND ARE AVAILABLE FOR REFERENCE.

DRILLED SHAFTS

THE MAXIMUM FACTORED COMPRESSIVE LOAD TO BE SUPPORTED BY EACH DRILLED SHAFT IS 785 KIPS AT THE ABUTMENTS. THIS LOAD IS RESISTED BY SIDE RESISTANCE WITHIN A PORTION OF THE BEDROCK SOCKET AND ALSO BY TIP RESISTANCE. THE FACTORED RESISTANCE DEVELOPED BY SIDE RESISTANCE IS 115 KIPS, ASSUMED TO ACT ALONG THE BOTTOM 2.5 FEET OF THE BEDROCK SOCKET FOR ABUTMENTS. THE FACTORED RESISTANCE PROVIDED BY THE DRILLED SHAFT TIP IS 2605 KIPS.

DECK PLACEMENT DESIGN ASSUMPTIONS:

THE FOLLOWING ASSUMPTIONS OF CONSTRUCTION MEANS AND METHODS WERE MADE FOR THE ANALYSIS AND DESIGN OF THE SUPERSTRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE FALSEWORK SUPPORT SYSTEM WITHIN THESE PARAMETERS AND WILL ASSUME RESPONSIBILITY FOR SUPERSTRUCTURE ANALYSIS FOR DEVIATION FROM THESE DESIGN ASSUMPTIONS. AN EIGHT WHEEL FINISHING MACHINE WITH A MAXIMUM WHEEL LOAD OF 1.07 KIPS FOR A TOTAL MACHINE LOAD OF 8.59 KIPS. A MINIMUM OUT-TO-OUT WHEEL SPACING AT EACH END OF THE MACHINE OF 103". A MAXIMUM SPACING OF OVERHANG FALSEWORK BRACKETS OF 48 IN. A MAXIMUM DISTANCE FROM THE CENTERLINE OF THE FASCIA GIRDER TO THE FACE OF THE SAFETY HANDRAIL OF 65".

ITEM 518 - 6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN

ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET OF THE DRAINAGE PIPES, STEEL BOLTS OR RODS FOR THE ANIMAL GUARDS SHALL BE GALVANIZED PER CMS 711.02. SEE STD DWG. DM 1.1 FOR ADDITIONAL DETAILS AND NOTES. THE ANIMAL GUARDS AND CRUSHED AGGREGATE SLOPE PROTECTION ARE INCIDENTAL TO ITEM 518 - 6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN.

ITEM 898 - QC/QA CONCRETE, CLASS QSC2, SUPERSTRUCTURE (PARAPET). AS PER PLAN

ITEM 898 - QC/QA CONCRETE, CLASS QSC1, SUBSTRUCTURE (ABUTMENT INCLUDING FOOTING). AS PER PLAN

THIS ITEM 898 SHALL CONTAIN INTEGRALLY COLORED CONCRETE USING CHROMIX ADMIXTURES AS PROVIDED BY L. M. SCOFIELD COMPANY, DOUGLASVILLE, GEORGIA (800) 800-9000 OR AN APPROVED EQUAL. USE FEDERAL COLOR NUMBER 36373.

IT IS NOT NECESSARY FOR THE CONTRACTOR TO PROVIDE INTEGRAL COLORING IN THE LARGE AND SMALL TOWER CAPS AND THE ABUTMENT FOOTING.

ITEM 898 - QC/QA CONCRETE, CLASS QSC2, SUPERSTRUCTURE (APPROACH SLAB). AS PER PLAN

THE ACCEPTED QUANTITIES SHALL INCLUDE: CONCRETE, CONCRETE BARRIER, REINFORCING STEEL, JOINT FILLERS, JOINT SEALERS, JOINT SEALS, AND WATERPROOFING.

THIS ITEM 898 SHALL CONTAIN INTEGRALLY COLORED CONCRETE USING CHROMIX ADMIXTURES AS PROVIDED BY L. M. SCOFIELD COMPANY, DOUGLASVILLE, GEORGIA (800) 800-9000 OR AN APPROVED EQUAL. USE FEDERAL COLOR NUMBER 36373 FOR ONLY THE APPROACH SLAB PARAPETS.

GENERAL NOTES

BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53

PID No. 76691

4 / 38



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CALC. BY: GMW DATE: 5/14/13
CHECK BY: BMG DATE: 6/21/13

CALC. BY: GMW

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ALL-75-0703
PID No. 76691

ESTIMATED QUANTITIES

DESIGNED TJE	CHECKED BMG/DFT
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BMG
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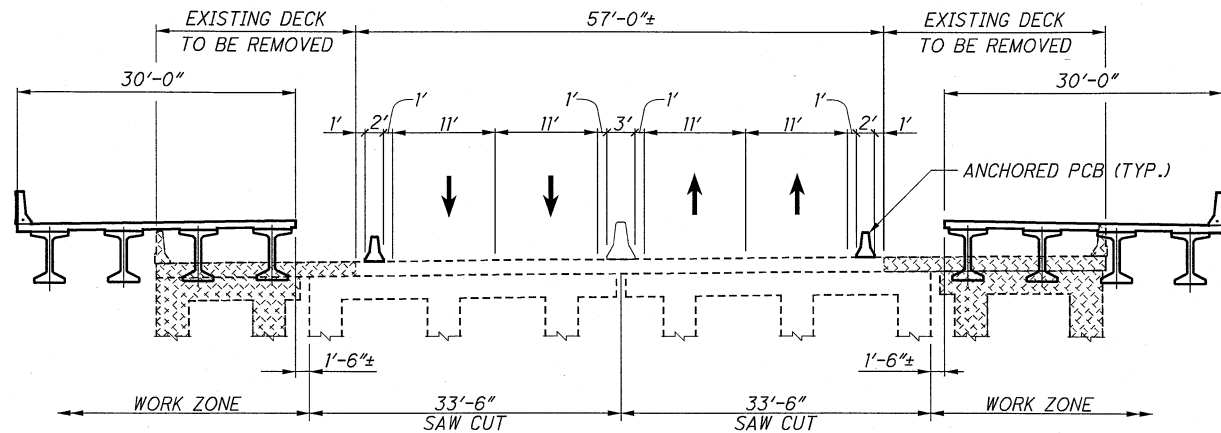
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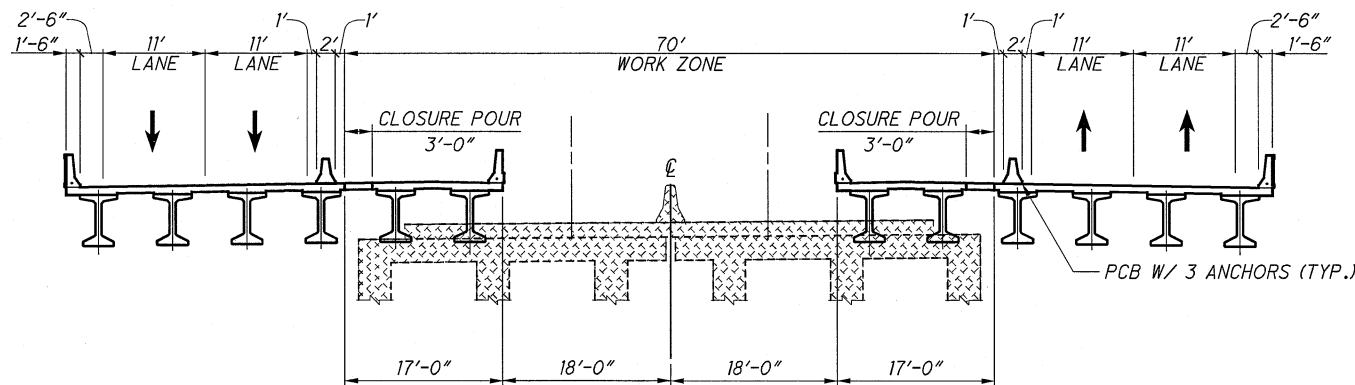


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SECTION A-A PHASE I



SECTION A-A PHASE II

LEGEND:

- STRUCTURE REMOVAL
- PROPOSED
- PORTABLE CONCRETE BARRIER (PCB)
(TO BE ANCHORED ON BRIDGES AS SHOWN)

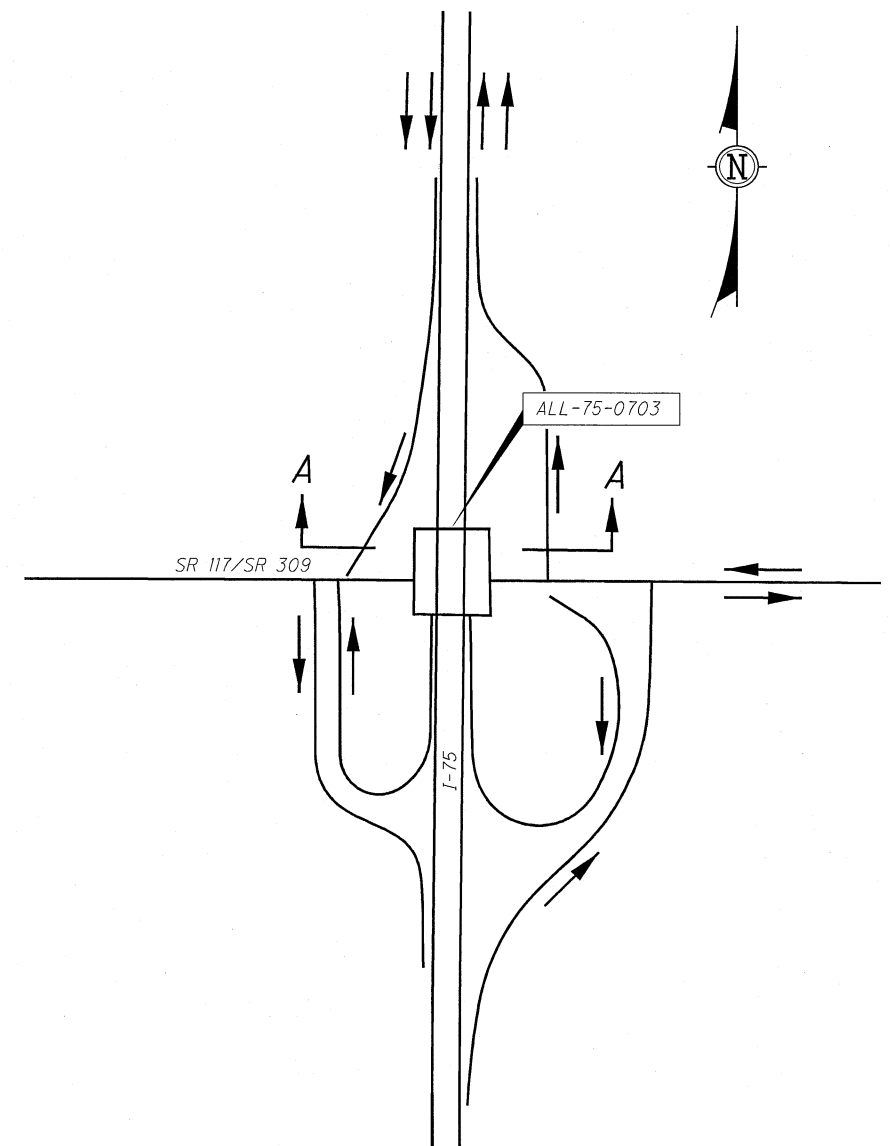
SEQUENCE OF CONSTRUCTION

PHASE I

1. INSTALL PORTABLE CONCRETE BARRIER ON THE EXISTING STRUCTURE AND SHIFT LANES.
2. REMOVE THE OUTSIDE PORTIONS OF THE EXISTING STRUCTURE, KEEP THE EXISTING SPILL THROUGH SLOPES IN PLACE AS NECESSARY TO SUPPORT EXISTING ABUTMENT LEFT IN PLACE. KEEP EXISTING THREE COLUMN PIERS IN PLACE.
3. REMOVE THE EXISTING RETAINING WALL.
4. CONSTRUCT THE PROPOSED WESTERN PORTION OF THE SOUTHBOUND STRUCTURE AND EASTERN PORTION OF NORTHBOUND STRUCTURE TO LIMITS SHOWN, INCLUDING ABUTMENTS CONSTRUCTED THROUGH REMAINING PORTIONS OF EXISTING SLOPES.

PHASE II

1. INSTALL PORTABLE CONCRETE BARRIER ON THE NEWLY CONSTRUCTED STRUCTURES AND SHIFT LANES.
2. REMOVE THE REMAINING PORTION OF THE EXISTING STRUCTURE AND THE EXISTING SPILL THROUGH SLOPES.
3. CONSTRUCT THE REMAINDER OF THE SOUTHBOUND AND NORTHBOUND STRUCTURE TO LIMITS SHOWN NOT INCLUDING THE CLOSURE POUR.
4. COMPLETE THE CLOSURE POUR.



MAINTENANCE OF TRAFFIC
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53
PID No. 76691

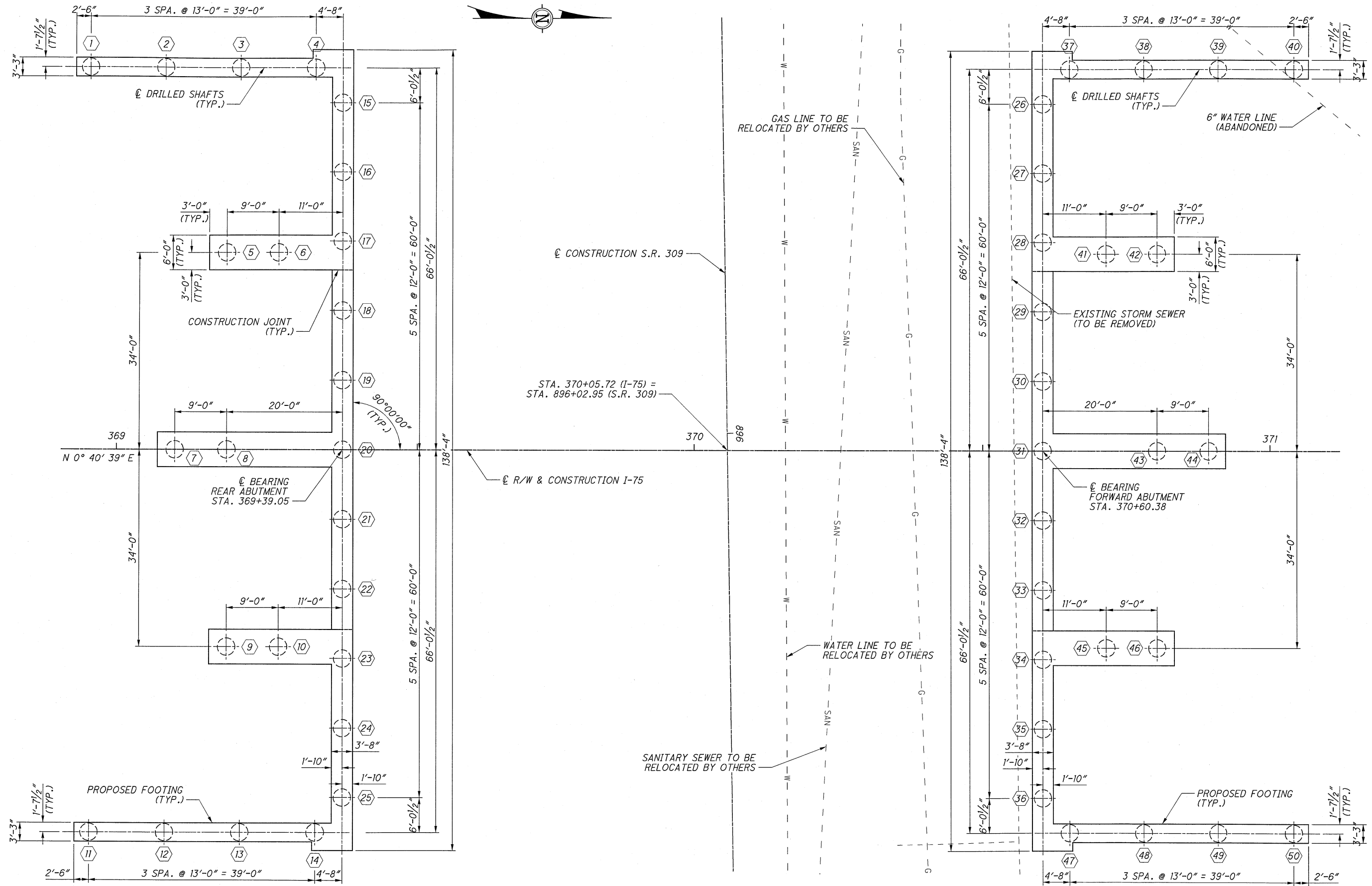
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www.elrobinsonengineering.com

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FOUNDATION LAYOUT

LEGEND:

1 - PROPOSED 3'-0" ϕ DRILLED SHAFT

NOTES:

1. FOR DRILLED SHAFT DETAILS, SEE SHEET 12/38.

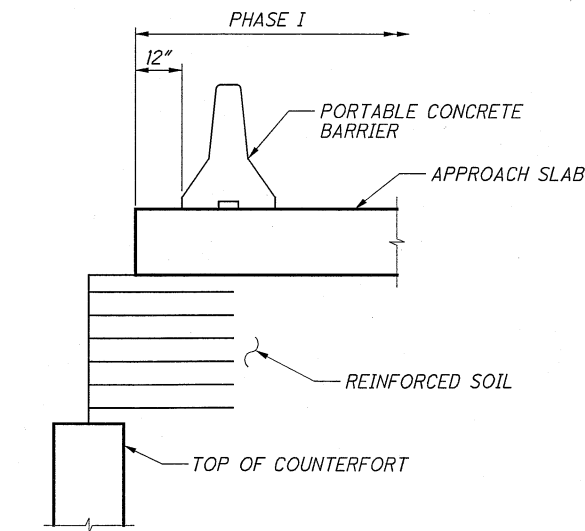
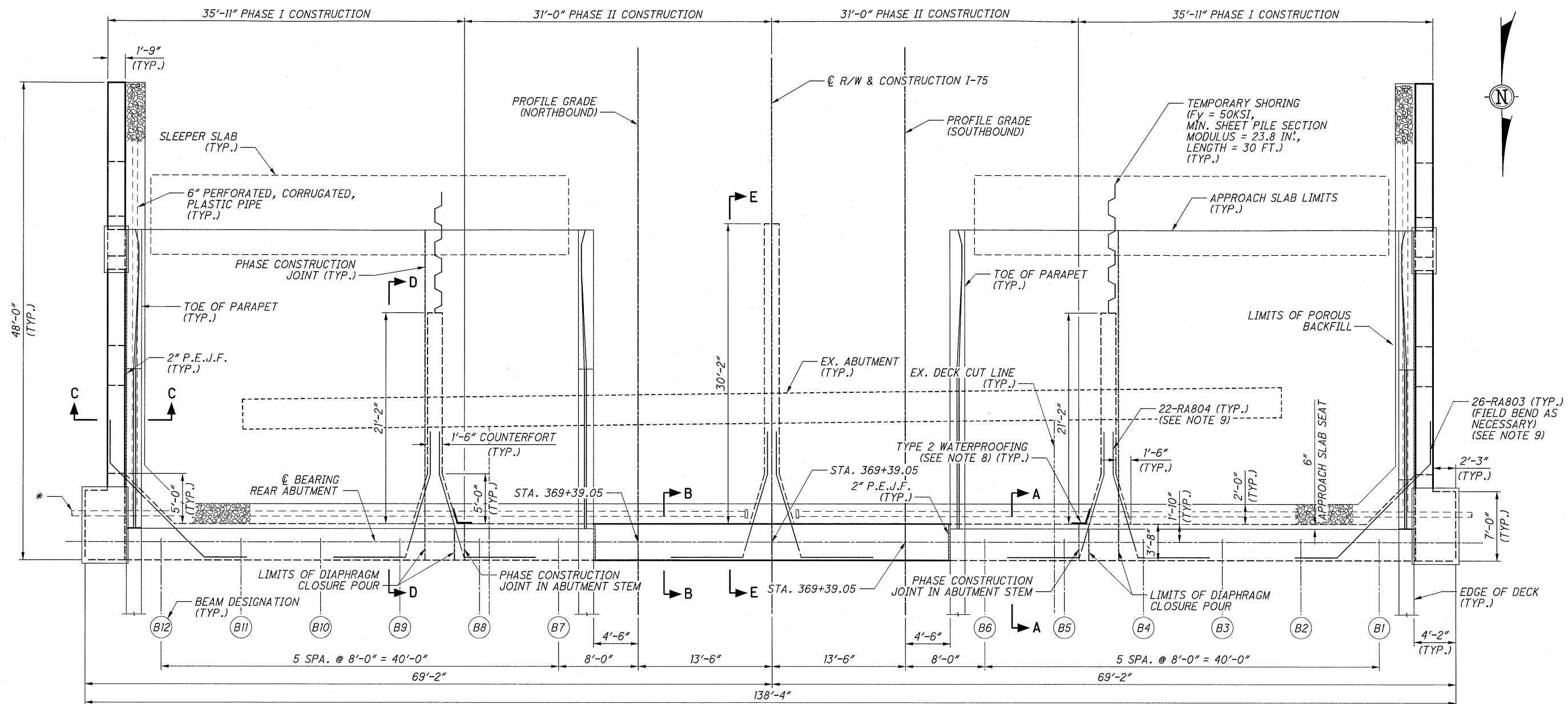
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FOUNDATION LAYOUT PLAN
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

DESIGNED	BMG	CHECKED	CJW
DRAWN	BMG	REVIEWED	
REVIEWED	DFT	DATE	6/2013
STRUCTURE FILE NUMBER	LEFT: 0202037	RIGHT:	0202053

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PHASE CONSTRUCTION DETAIL

PLAN
(FOOTING NOT SHOWN)

* - 6" NON-PERFORATED, CORRUGATED, PLASTIC PIPE (SEE NOTE 7) (TYP.)

NOTES:

1. FOR SECTIONS A-A AND B-B, SEE SHEET 12/38.
2. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.
3. FOR REAR ABUTMENT ELEVATION, SEE SHEET 10/38.
4. FOR WINGWALL ELEVATION, SEE SHEET 11/38.
5. FOR SECTION C-C, SEE SHEET 13/38.
6. FOR SECTIONS D-D AND E-E, SEE SHEET 14/38.
7. 6" NON-PERFORATED, CORRUGATED, PLASTIC PIPE AT ENDS SPLICED TO PERFORATED PIPE AND OUTLET AS SHOWN IN PIPE TERMINATION DETAIL ON SHEET 12/38.
8. TYPE 2 WATERPROOFING (3'-0" WIDE) SHALL BE USED TO SEAL THE PHASE CONSTRUCTION JOINT FROM THE BOTTOM OF ABUTMENT STEM TO BELOW THE SEMI-INTEGRAL JOINT. NEOPRENE SHEETING SHALL BE USED TO SEAL THE SEMI-INTEGRAL JOINT.
9. RA803 AND RA804 TO MATCH RA602, RA603, RA801 AND RA802 BARS IN ABUTMENT STEM.
10. FOR REINFORCING BAR SHCHEDULE, SEE SHEETS 34/38 THRU 36/38.

REAR ABUTMENT PLAN
ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53
PID No. 76691

9/38



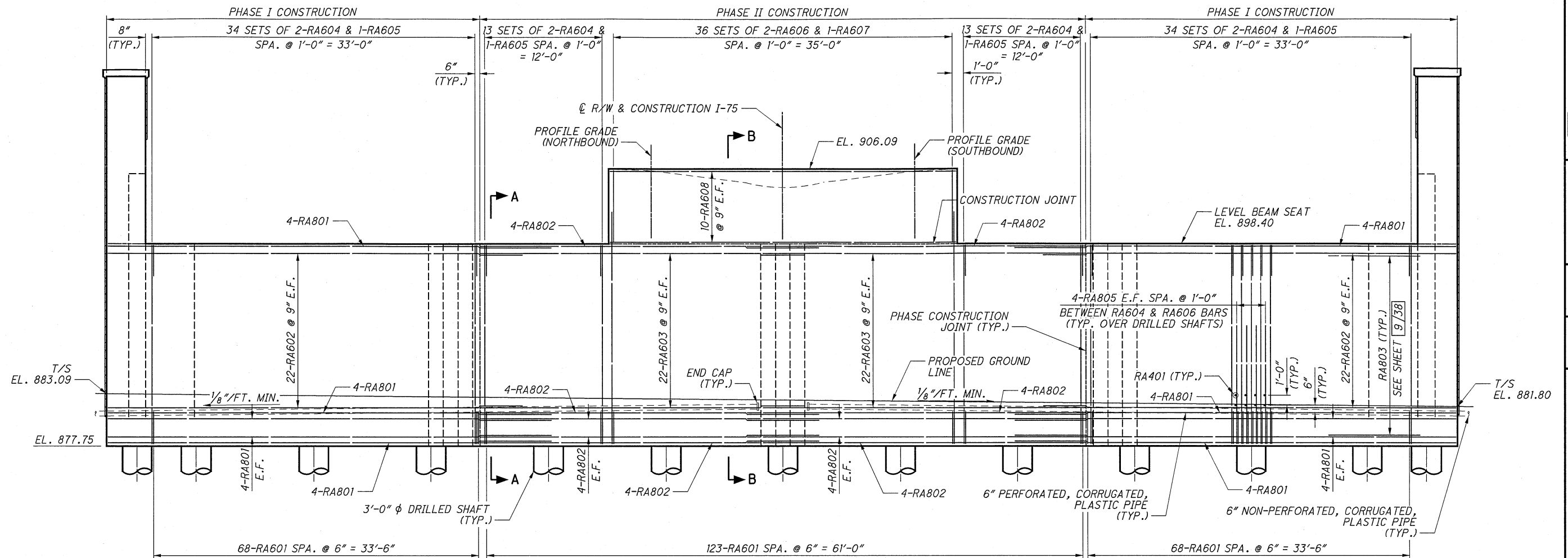
E.L. ROBINSON
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DATE 6/2013
REVIEWED DFT
STRUCTURE FILE NUMBER
LEFT: 0202037
RIGHT: 0202053

DRAWN BMG
REVIEWED

DESIGNED BMG
CHECKED CJW

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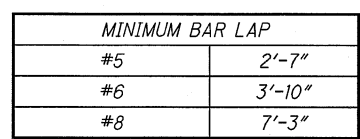
ELEVATION

MINIMUM BAR LAP	
#6	4'-4"
#8	7'-3"

NOTES:

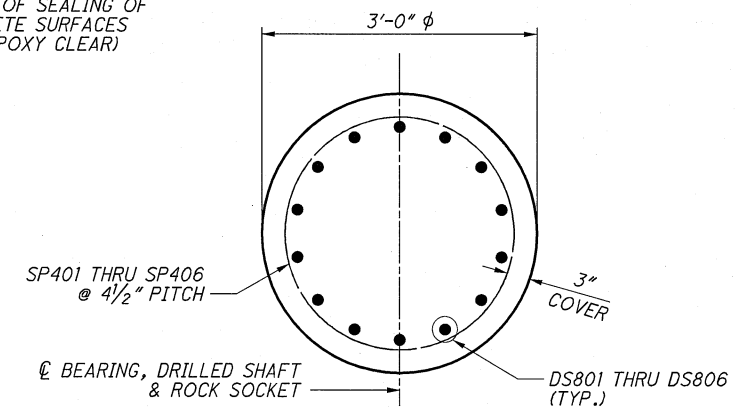
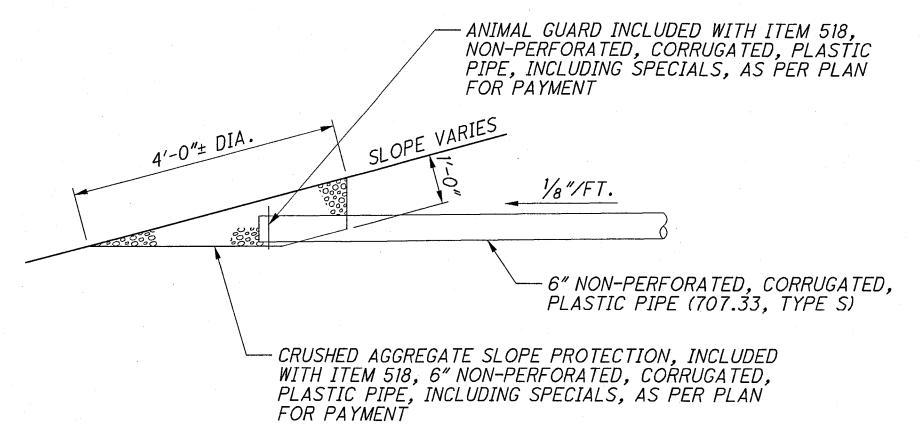
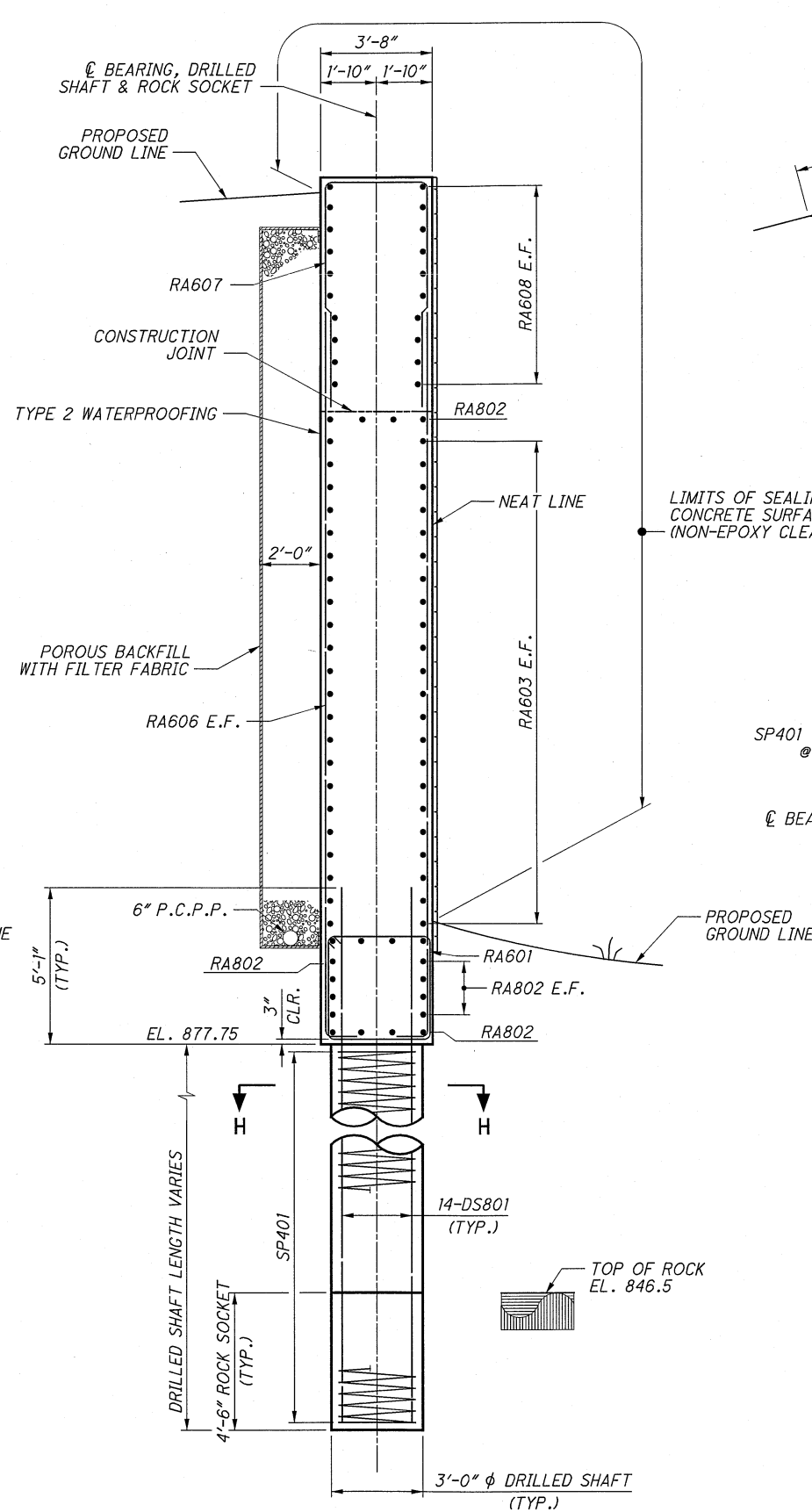
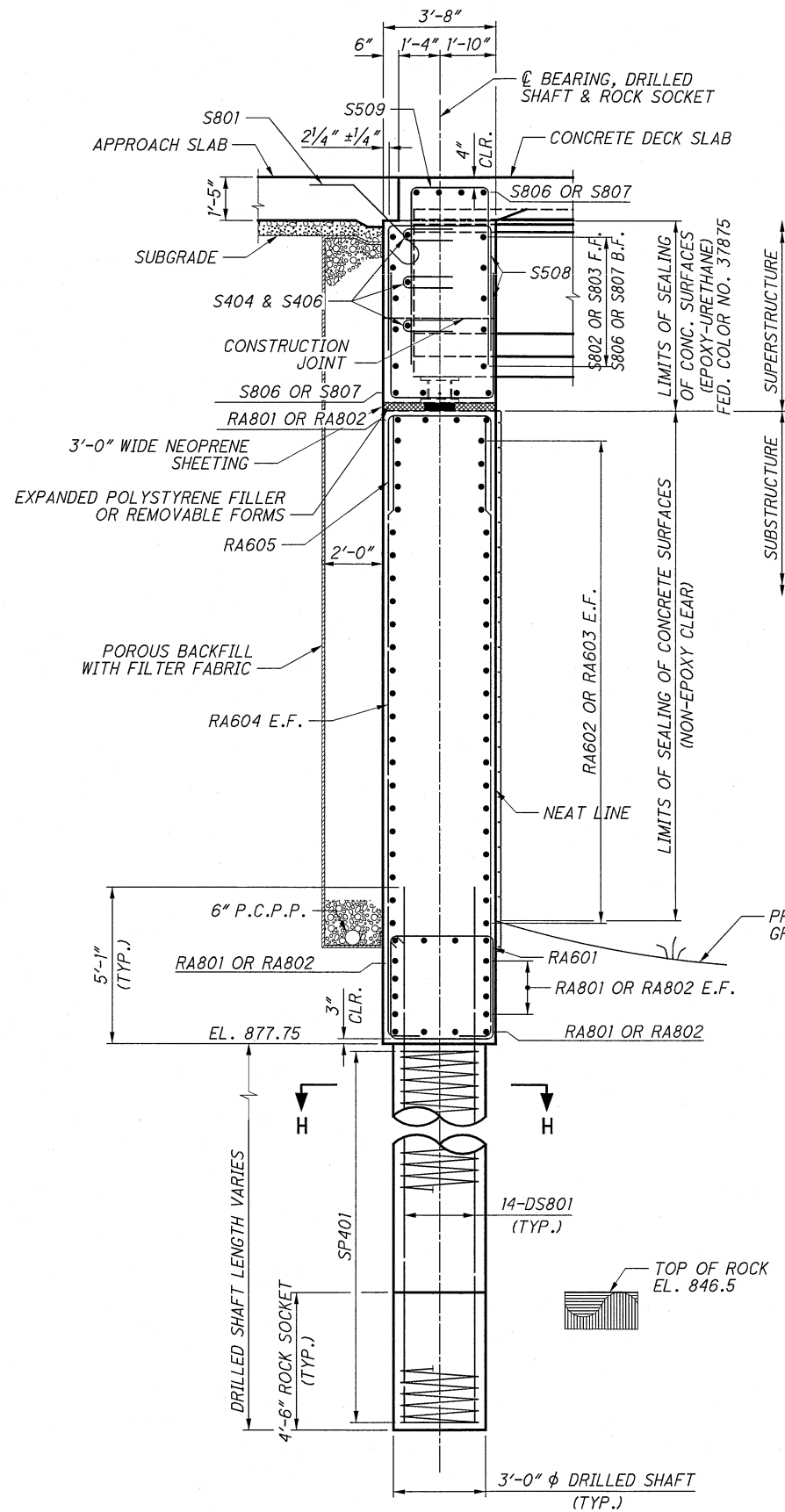
1. FOR SECTION A-A & B-B, SEE SHEET **12/38**.
2. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET **8/38**.
3. FOR ADDITIONAL SEMI-INTEGRAL ABUTMENT DETAILS, SEE ODOT STD. DRAWING SICD-1-96.
4. FOR REAR ABUTMENT DIAPHRAGM REINFORCEMENT AND DETAILS, SEE SHEET **30/38**.
5. FOR WINGWALL REINFORCEMENT AND DETAILS, SEE SHEET **11/38**.
6. FOR REINFORCING BAR SHCHEDULE, SEE SHEETS **34/38** THRU **36/38**.
7. FOR AESTHETIC DETAILS, SEE SHEET **37/38**.





1. FOR SECTION C-C, G-G AND F-F, SEE SHEET 13/38.
2. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.
3. FOR REAR ABUTMENT PLAN, SEE SHEET 9/38.
4. FOR REAR ABUTMENT ELEVATION, SEE SHEET 10/38.
5. FOR AESTHETIC DETAILS, SEE SHEET 37/38.

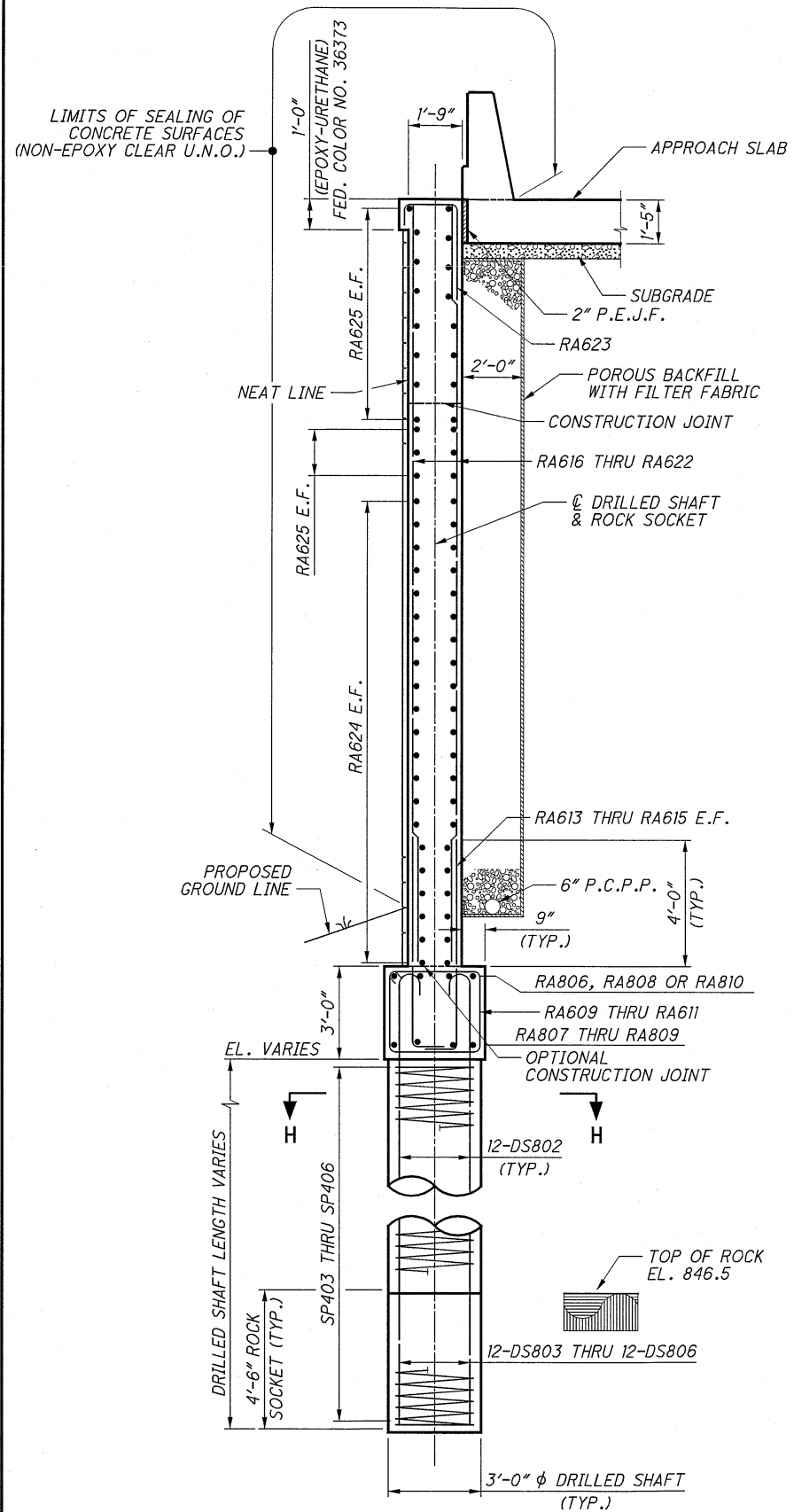
ELEVATION
(RIGHT WINGWALL SHOWN, LEFT WINGWALL SIMILAR)



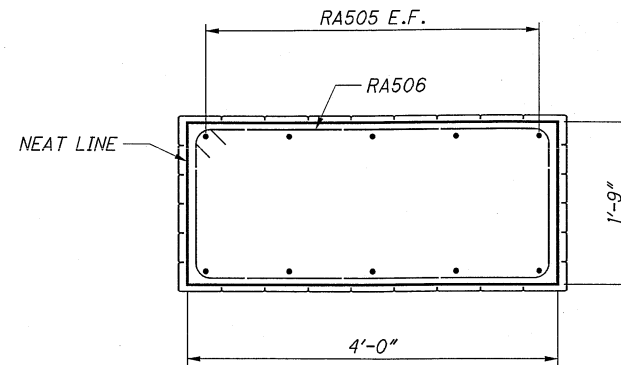
NOTES:

1. FOR DIAPHRAGM DETAILS AND REINFORCEMENT, SEE SHEET 30/38.
2. FOR ADDITIONAL BEARING DETAILS, SEE SHEET 25/38.
3. FOR LOCATION OF SECTION A-A AND B-B, SEE SHEET 16/38.
4. FOR AESTHETIC DETAILS, SEE SHEET 37/38.

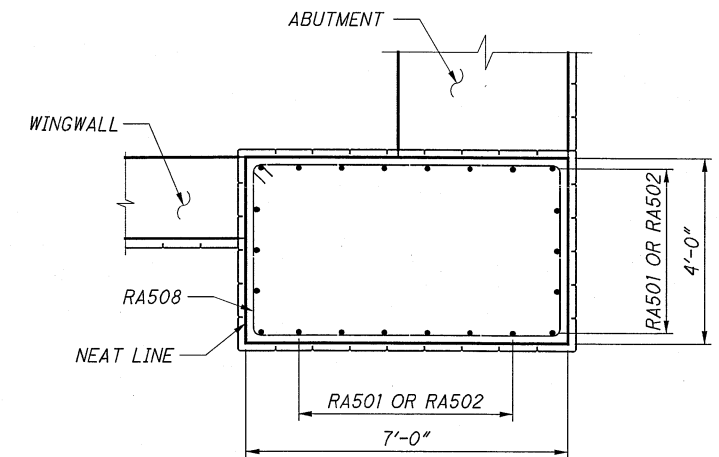
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SECTION C-C



SECTION F-F

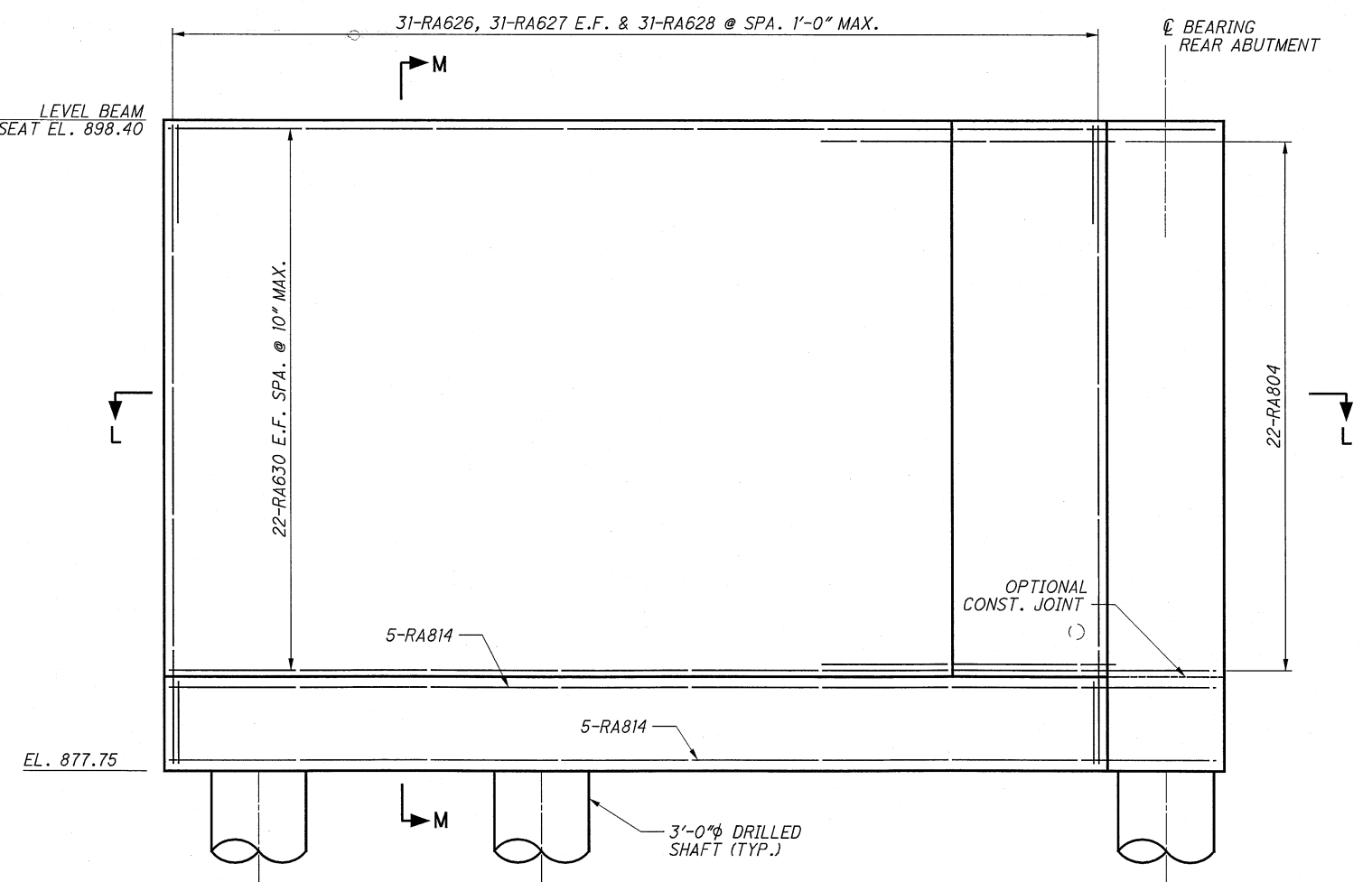
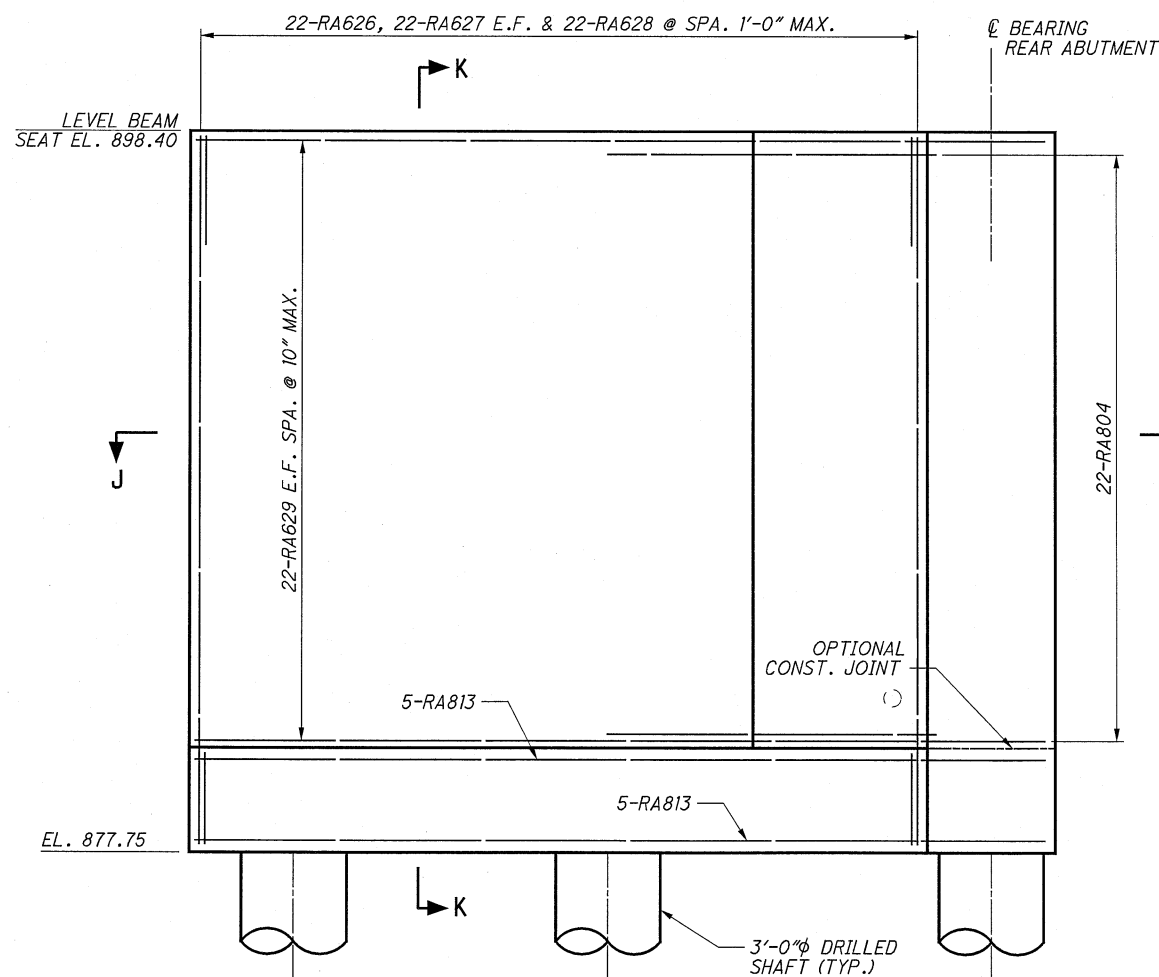
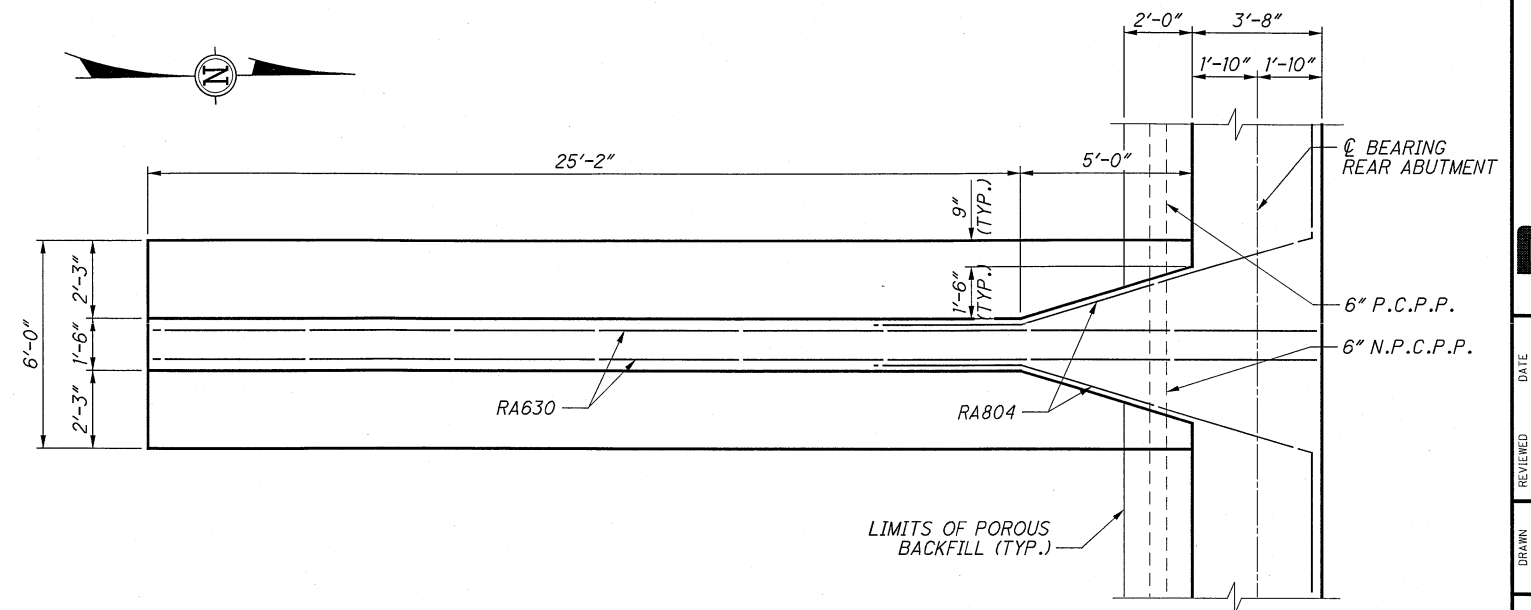
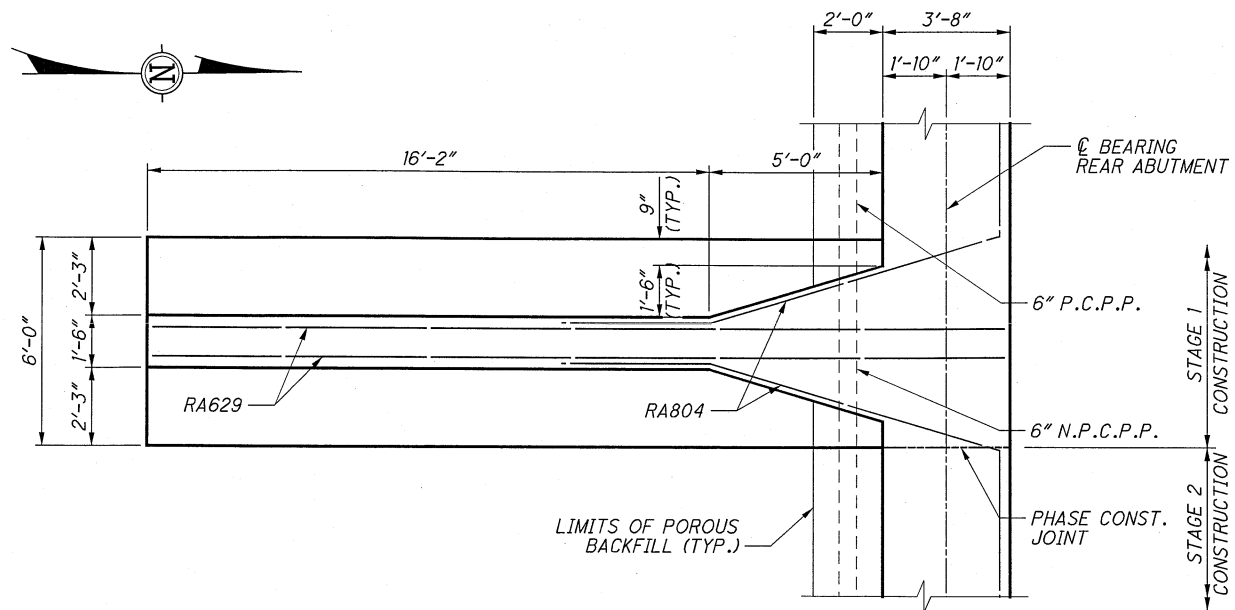


SECTION G-G

NOTES:

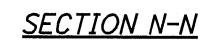
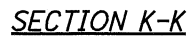
1. FOR ADDITIONAL BEARING DETAILS, SEE SHEET 25/38.
2. FOR SECTION H-H, SEE SHEET 12/38.
3. FOR LOCATION OF SECTION C-C, F-F AND G-G, SEE SHEET 11/38.
4. FOR AESTHETIC DETAILS, SEE SHEET 37/38.

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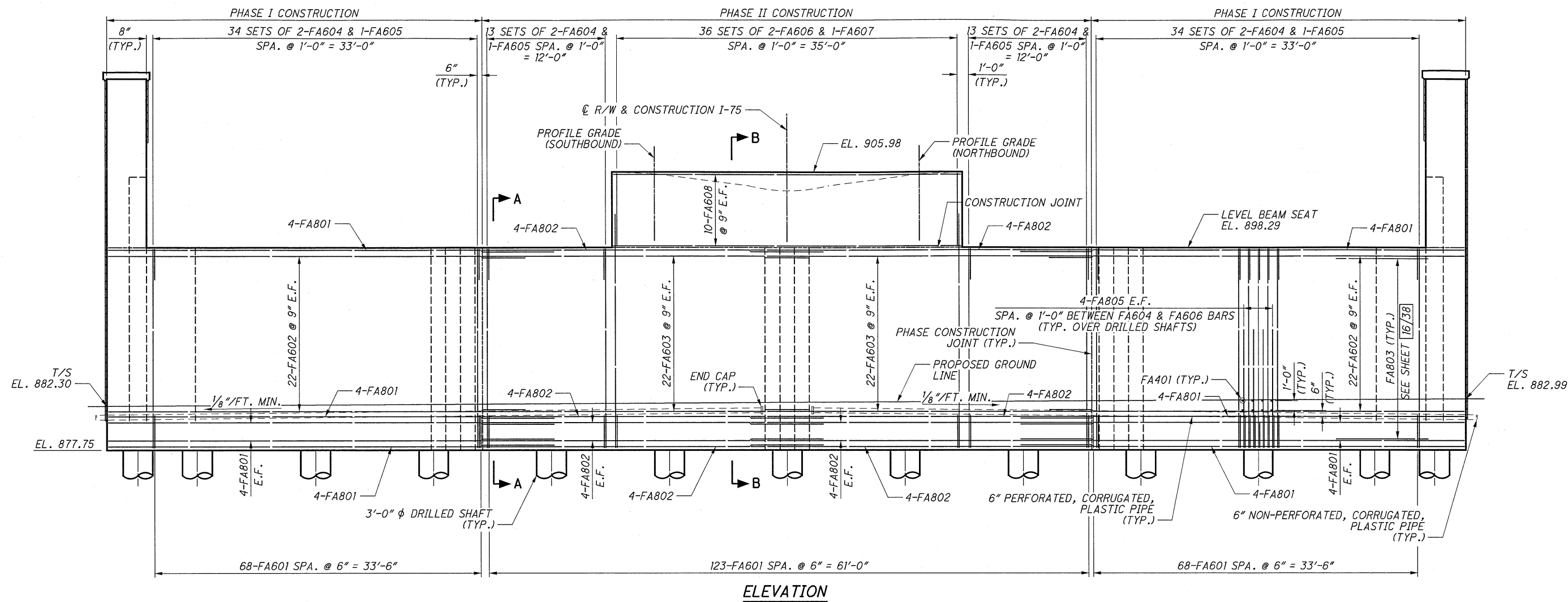
NOTES:

1. FOR LOCATION OF SECTIONS D-D AND E-E, SEE SHEET 9/38.
2. FOR SECTIONS K-K AND M-M, SEE SHEET 15/38.
3. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.
4. FOR REAR ABUTMENT PLAN, SEE SHEET 9/38.
5. FOR REAR ABUTMENT ELEVATION, SEE SHEET 10/38.



1. FOR LOCATION OF SECTIONS K-K AND M-M, SEE SHEET 14/38.
2. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.

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ELEVATION

MINIMUM BAR LAP	
#6	4'-4"
#8	7'-3"

NOTES:

1. FOR SECTION A-A & B-B, SEE SHEET 19/38.
2. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.
3. FOR ADDITIONAL SEMI-INTEGRAL ABUTMENT DETAILS, SEE ODOT STD. DRAWING SICD-1-96.
4. FOR FORWARD ABUTMENT DIAPHRAGM REINFORCEMENT AND DETAILS, SEE SHEET 30/38.
5. FOR WINGWALL REINFORCEMENT AND DETAILS, SEE SHEET 18/38.
6. FOR REINFORCING BAR SCHEDULE, SEE SHEETS 34/38 THRU 36/38.
7. FOR AESTHETIC DETAILS, SEE SHEET 37/38.

FORWARD ABUTMENT ELEVATION
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53
PID No. 76691

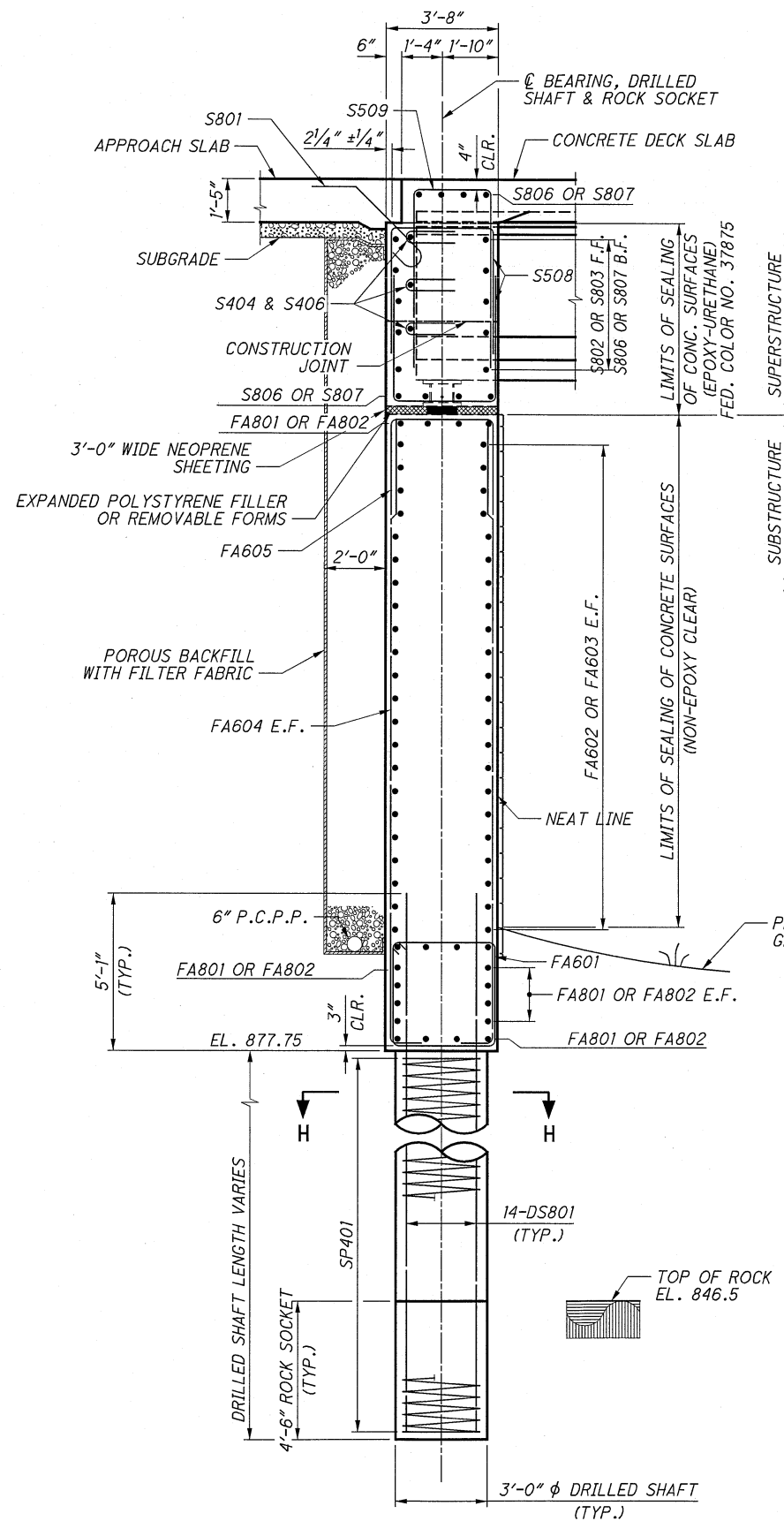
17/38



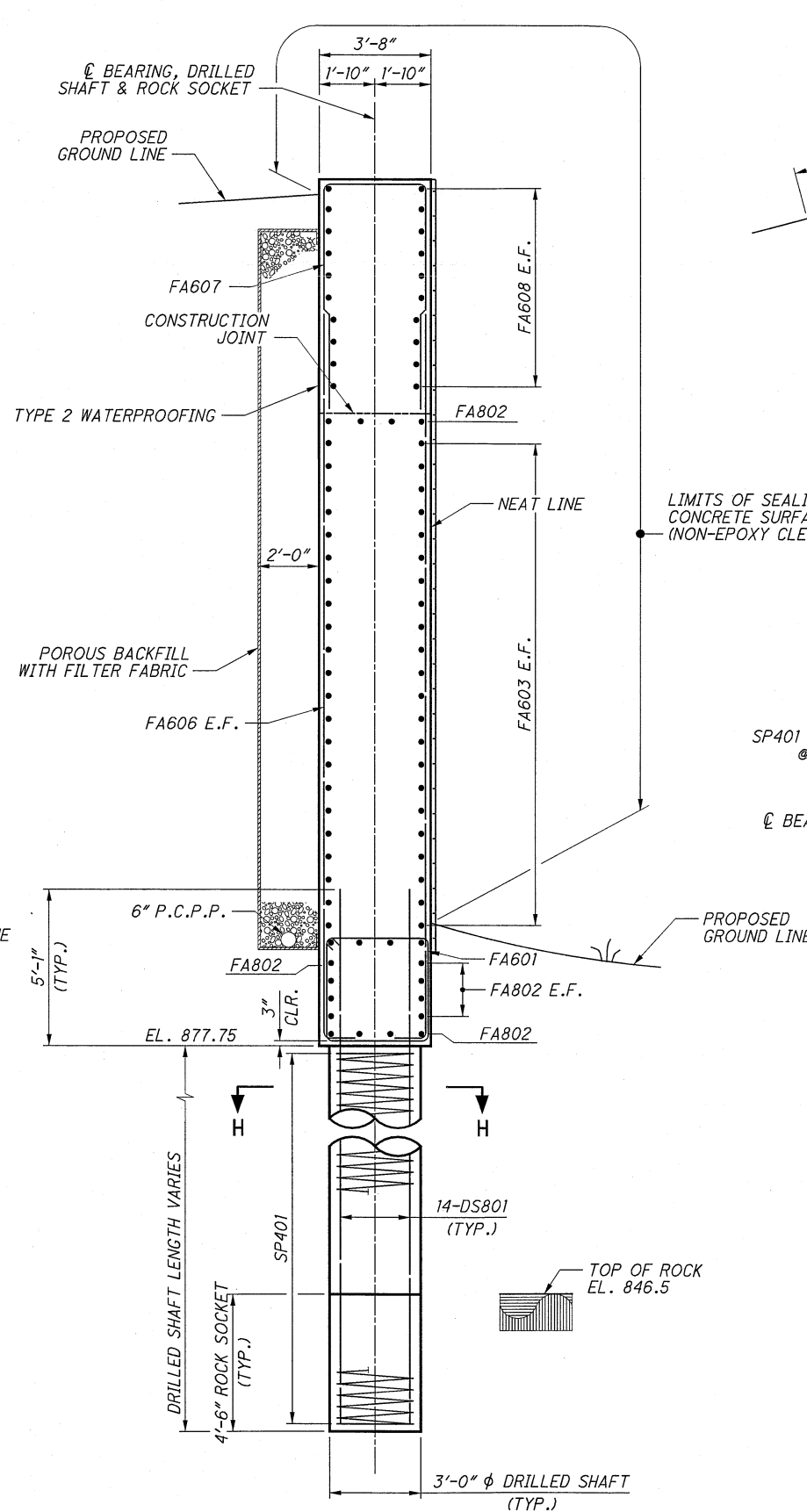
E.L. ROBINSON
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DESIGNED: BMG
CHECKED: CJW
DRAWN: BMG
REVIEWED: DFT
DATE: 6/2013
STRUCTURE FILE NUMBER: 0202037
LEFT: 0202037
RIGHT: 0202053

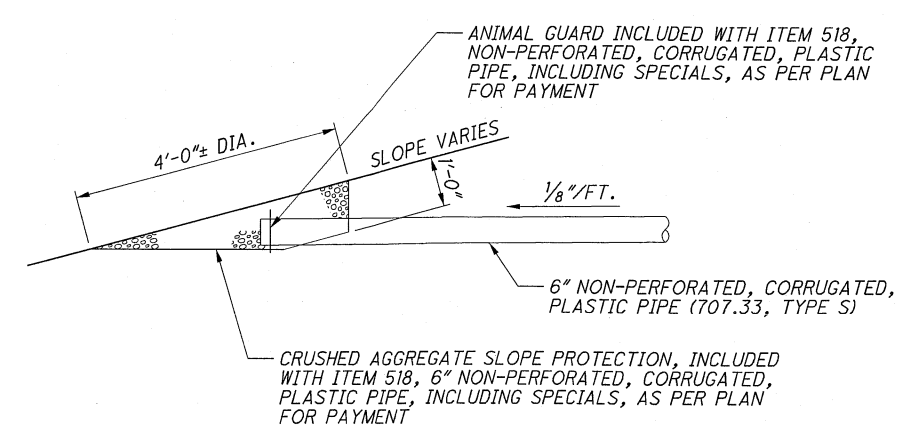
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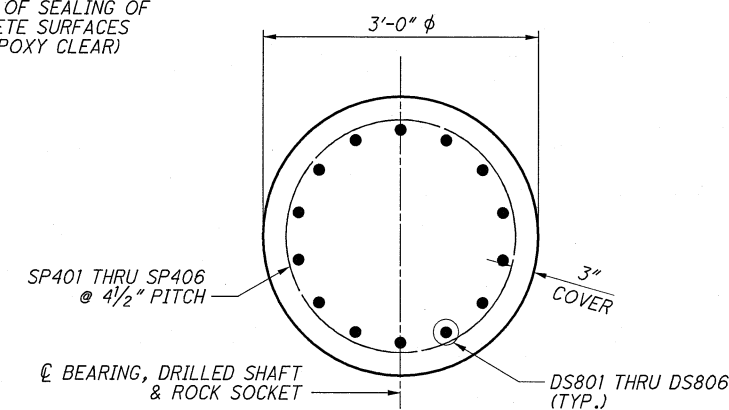
SECTION A-A



SECTION B-B



TERMINATION OF 6" N.P.C.P.P. DETAIL



SECTION H-H

NOTES:

1. FOR DIAPHRAGM DETAILS AND REINFORCEMENT, SEE SHEET 30/38.
2. FOR ADDITIONAL BEARING DETAILS, SEE SHEET 25/38.
3. FOR LOCATION OF SECTION A-A AND B-B, SEE SHEET 16/38.
4. FOR AESTHETIC DETAILS, SEE SHEET 37/38.

FORWARD ABUTMENT DETAILS

ALL-75-5.53

PID No. 76691

ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

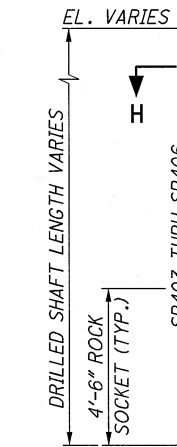
19/38



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RIGHT: 0202053

DRAWN: BMG
CHECKED: CJW
DESIGNED: BMG



SECTION C-C



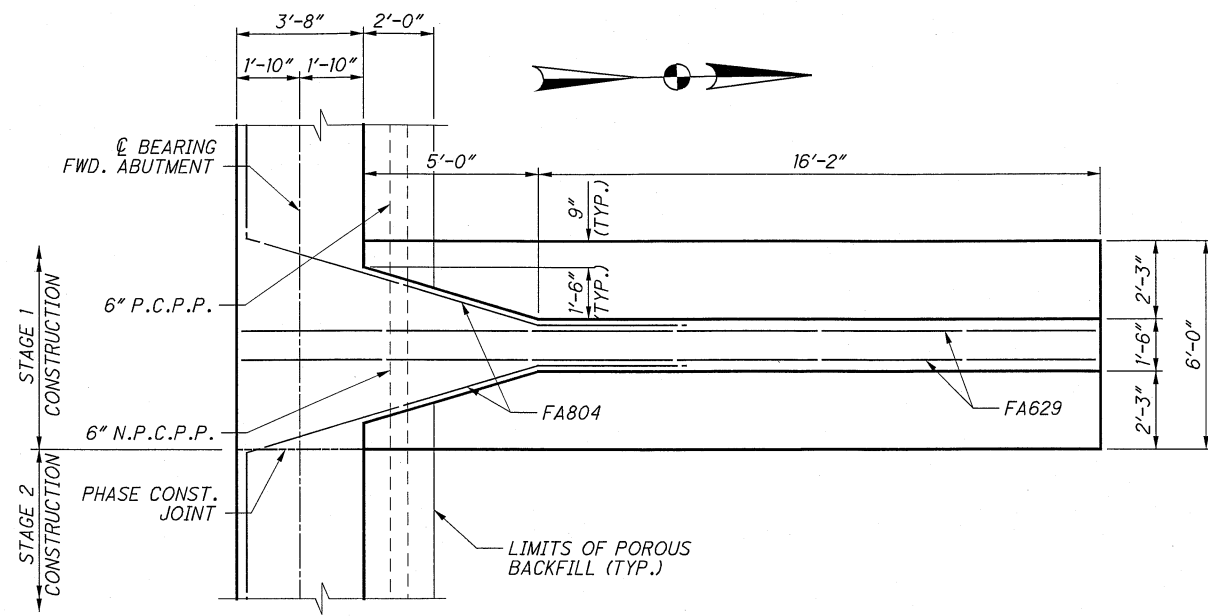
SECTION F-F



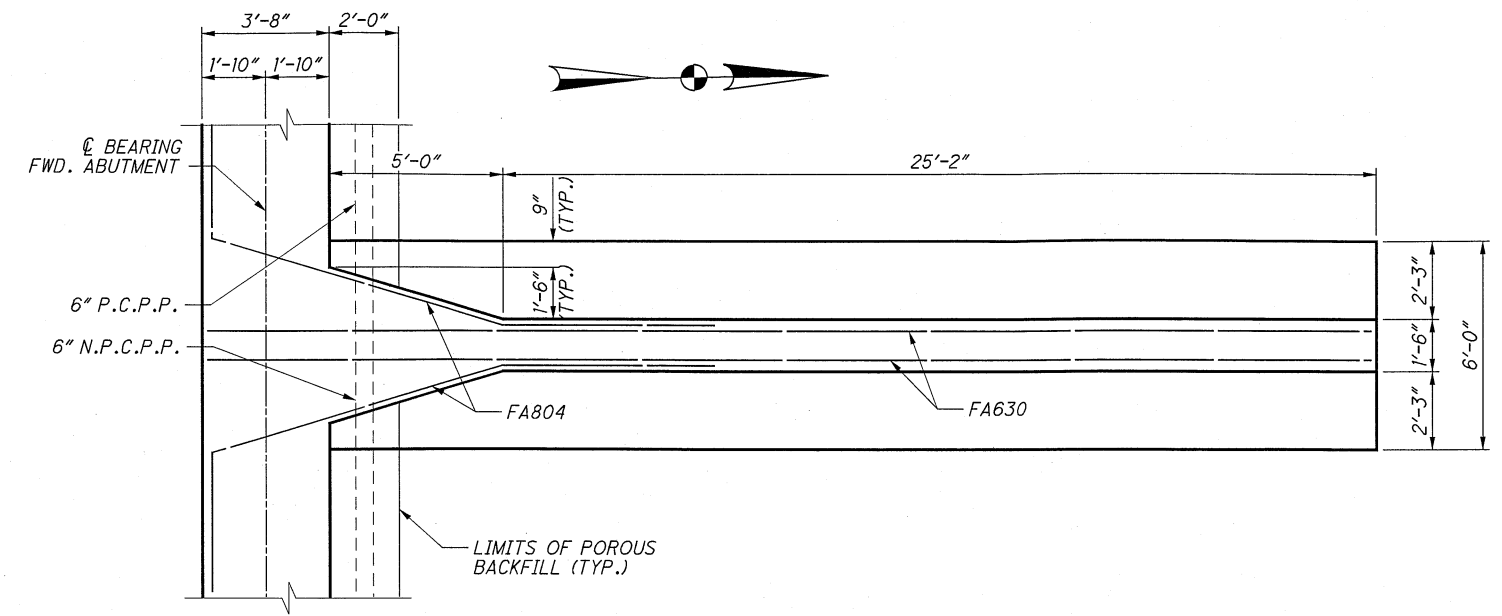
SECTION G-G

1. FOR ADDITIONAL BEARING DETAILS, SEE SHEET 25/38

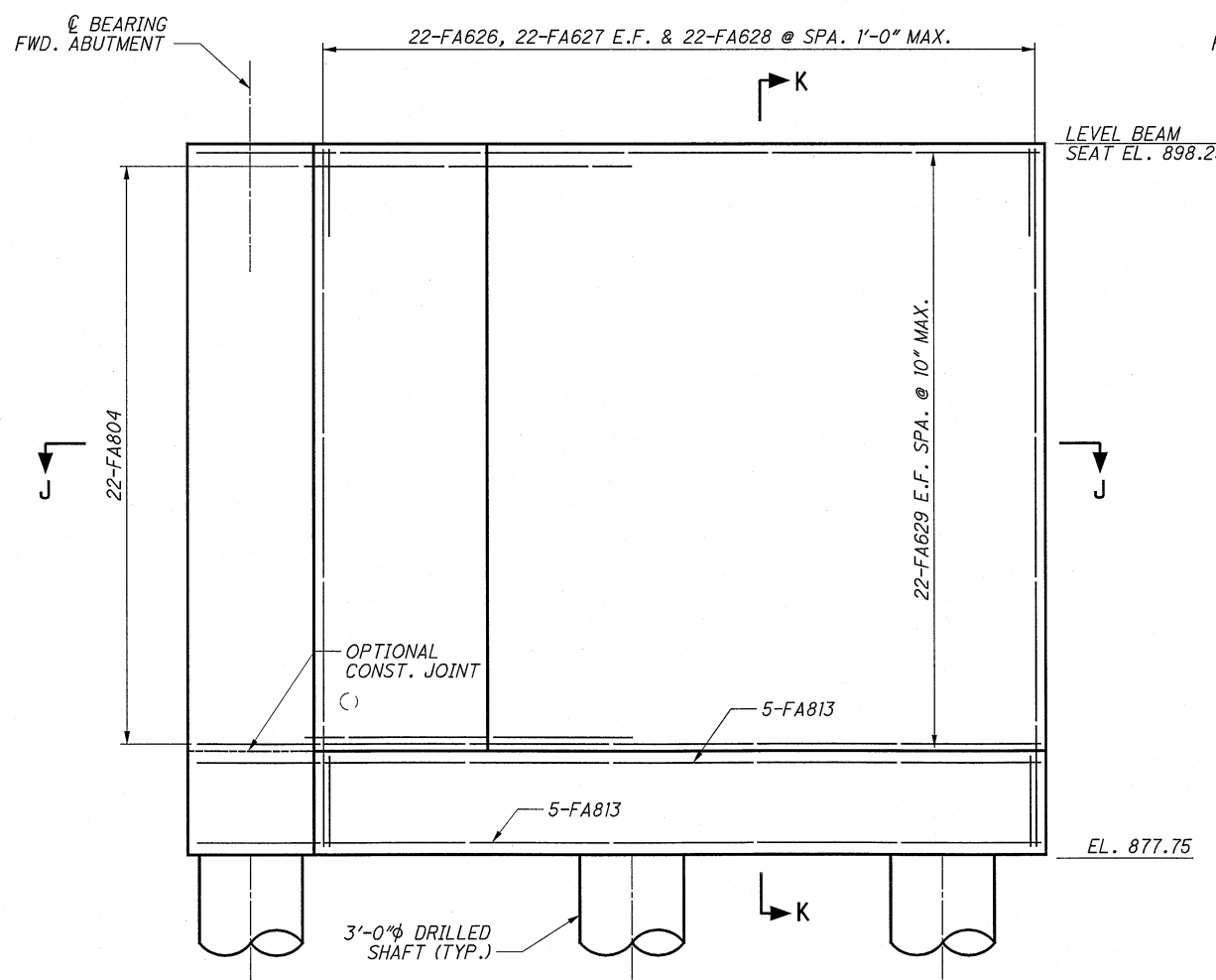
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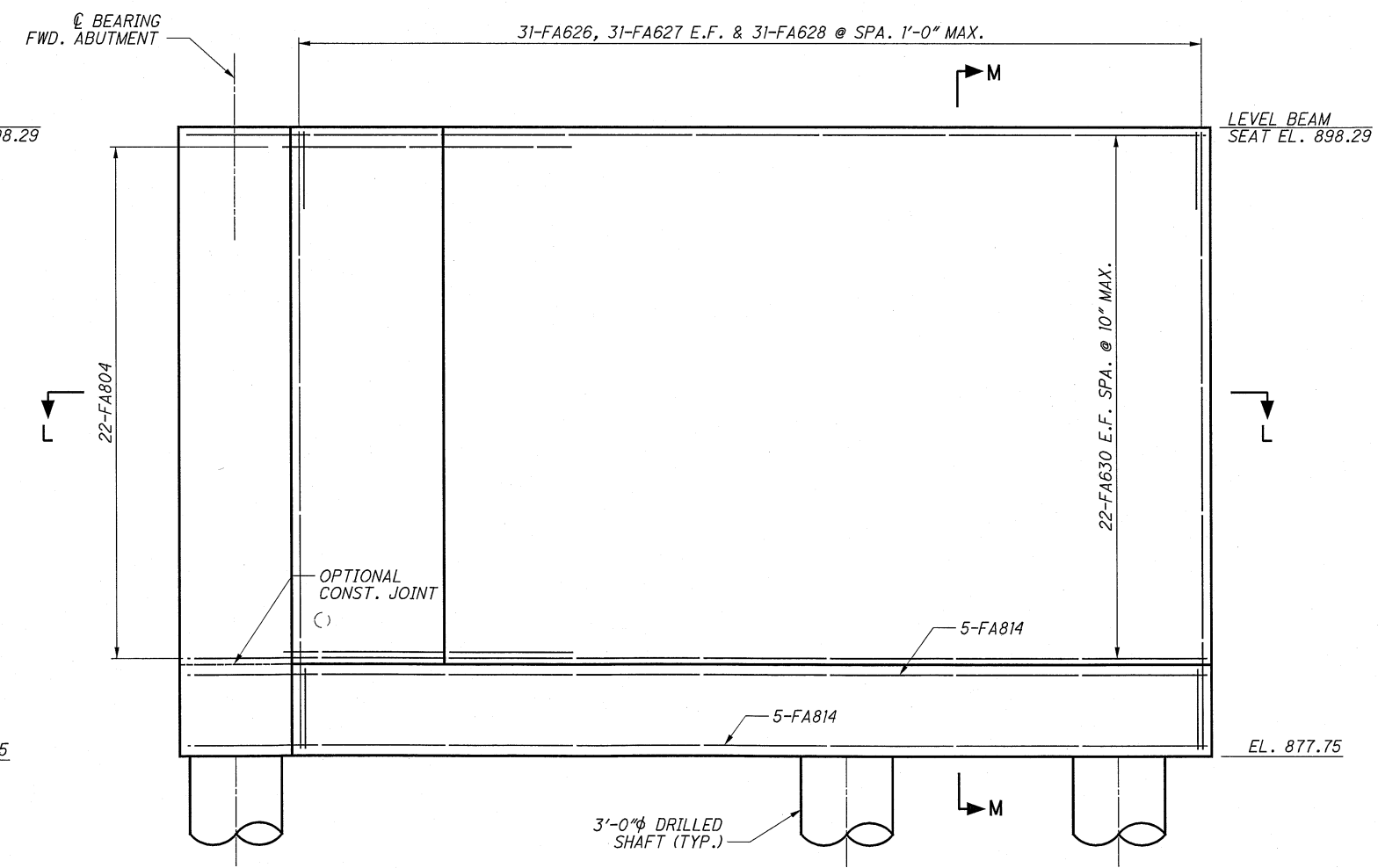
SECTION J-J
(LEFT SIDE SHOWN RIGHT SIDE OPPOSITE HAND)



SECTION L-L



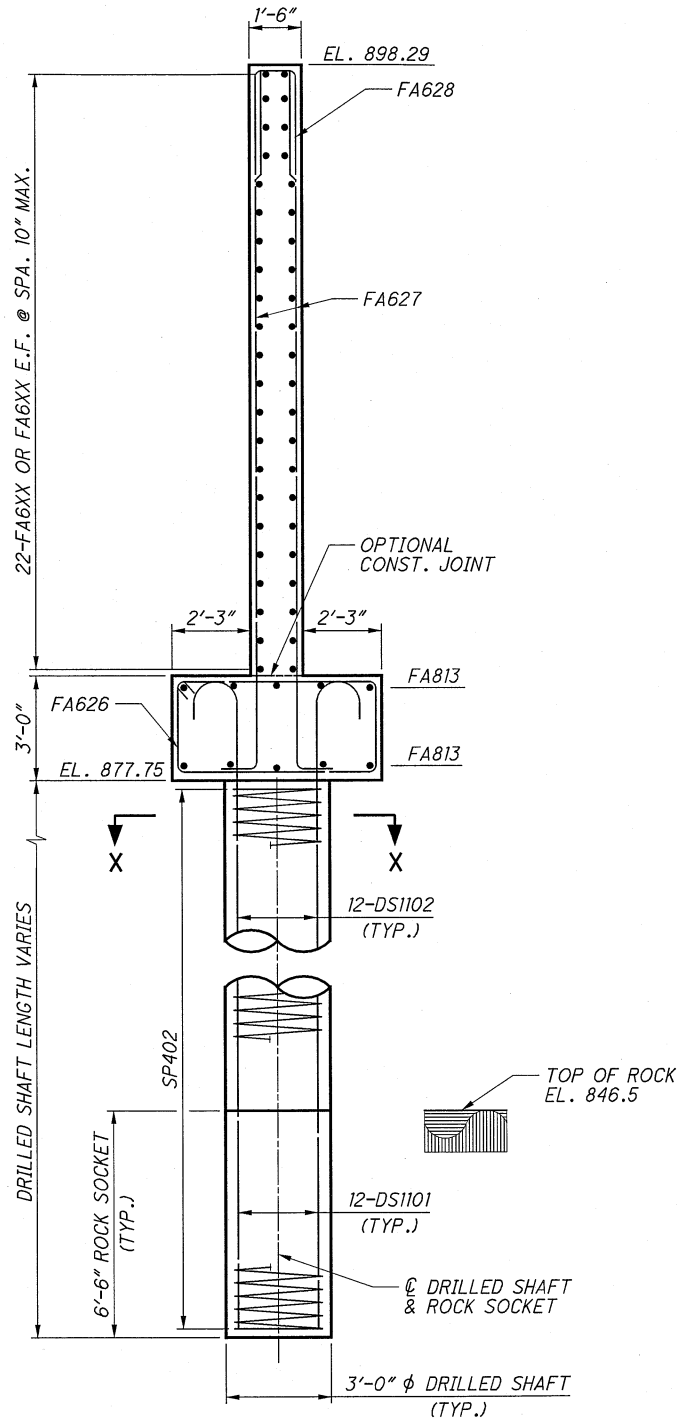
SECTION D-D
(LEFT SIDE SHOWN RIGHT SIDE OPPOSITE HAND)



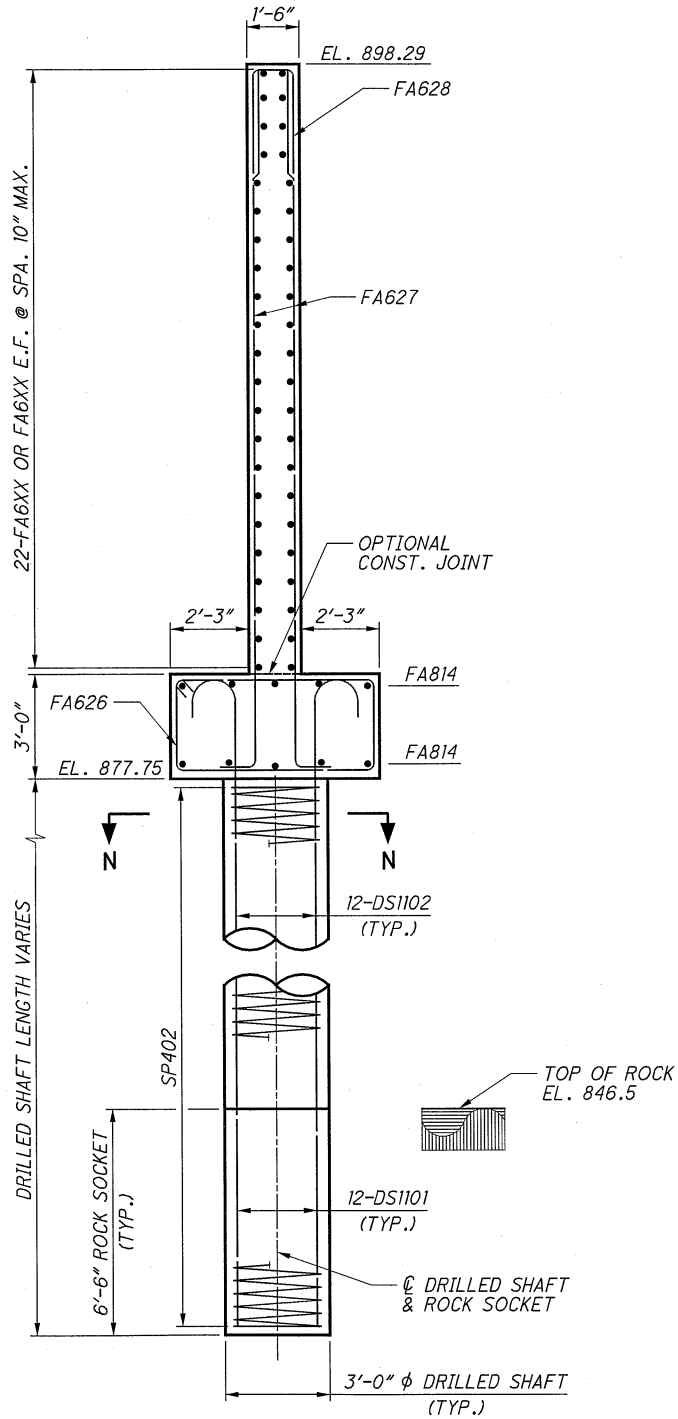
SECTION E-E

- NOTES:
1. FOR LOCATION OF SECTIONS D-D AND E-E, SEE SHEET 16/38.
 2. FOR SECTIONS K-K AND L-L, SEE SHEET 22/38.
 3. FOR DRILLED SHAFT LAYOUT AND NOTES, SEE SHEET 8/38.
 4. FOR FORWARD ABUTMENT PLAN, SEE SHEET 16/38.
 5. FOR FORWARD ABUTMENT ELEVATION, SEE SHEET 17/38.

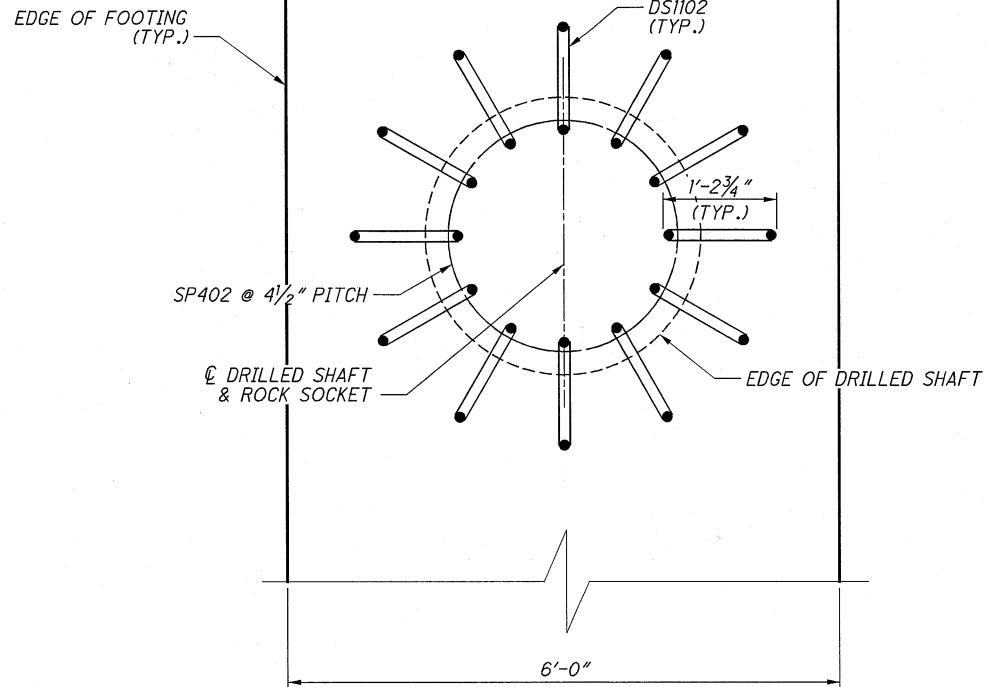
EL. ROBINSON ENGINEERING 1801 Walnut Drive, Suite 310, Columbus, Ohio 43215 www.elrobinsonengineering.com	
DESIGNED BMG	CHECKED CJW
DRAWN FIB	REVIEWED DFT
DATE 6/2013	STRUCTURE FILE NUMBER 0202053
RIGHT: 0202053	
FORWARD ABUTMENT DETAILS ALL-75-0703 L&R I-75 OVER S.R. 117 & S.R. 309	
ALL-75-5.53	PID No. 76691
21	38



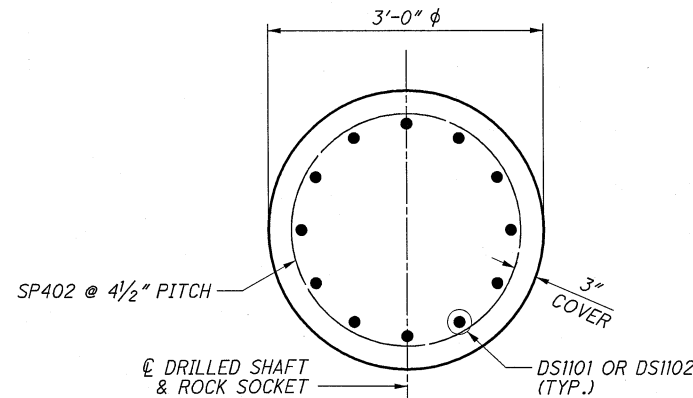
SECTION K-K



SECTION M-M



DRILLED SHAFT REINFORCING DETAIL



SECTION N-N

FORWARD ABUTMENT DETAILS
ALL-75-0703 L&R

ALL-75-5.53
PID No. 76691

22 / 38

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DESIGNED	DRAWN	REVIEWED	DATE
BMG	BMG	DFT	6/2013
CHECKED	REVISED	STRUCTURE FILE NUMBER	
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FORWARD ABUTMENT DE
ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R.

10

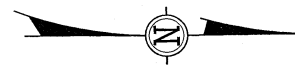
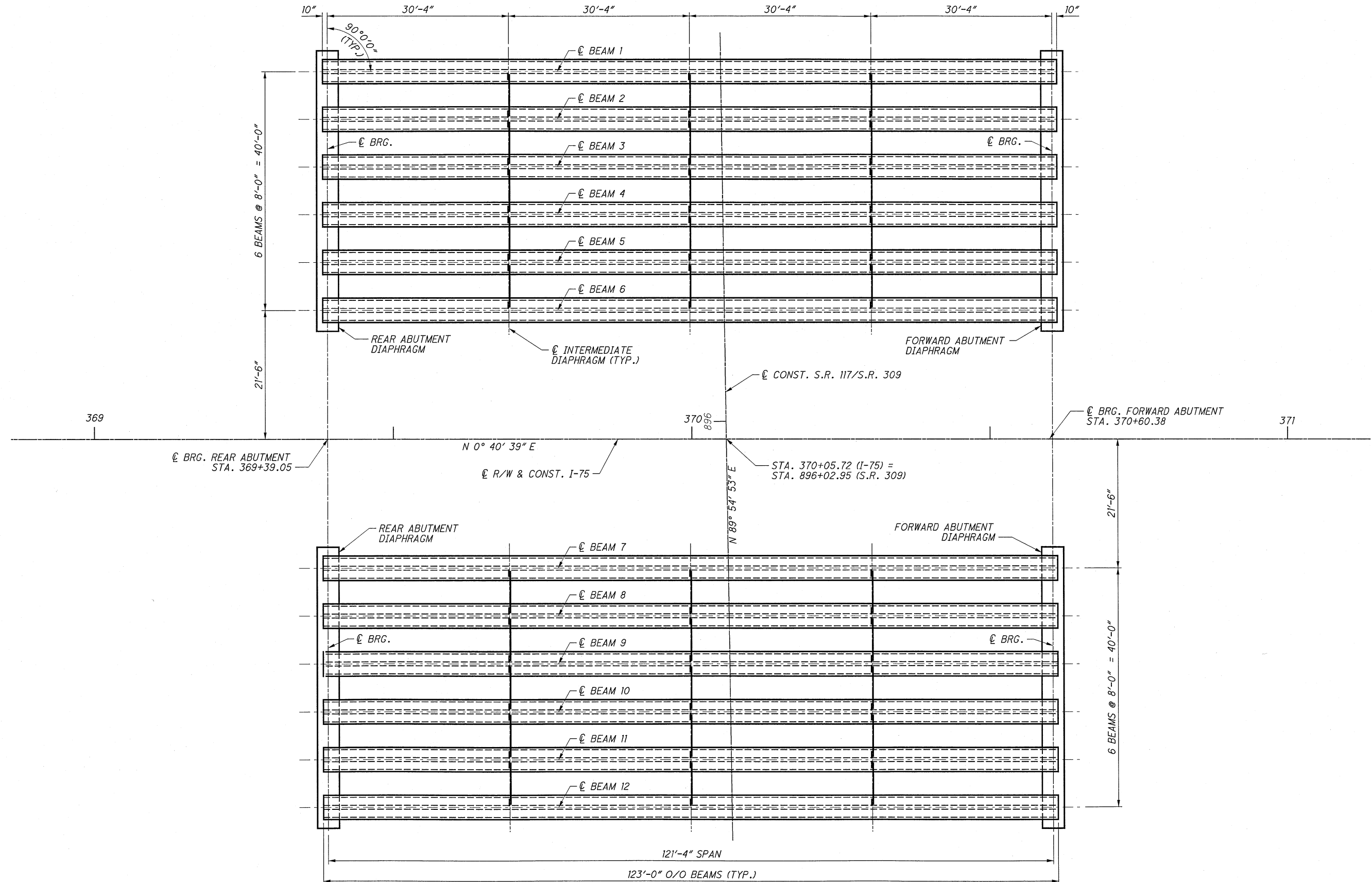
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PID No. 76691

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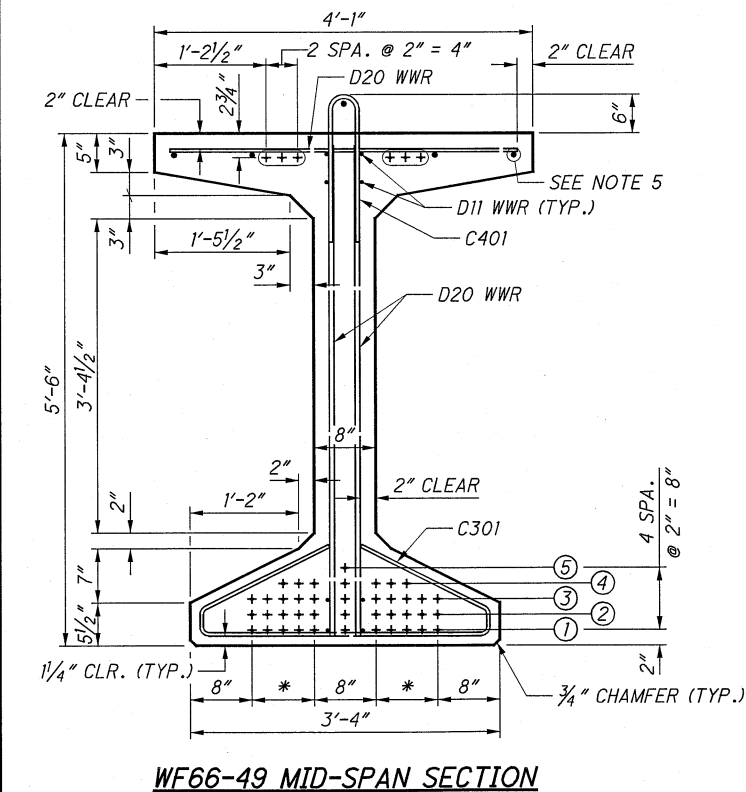
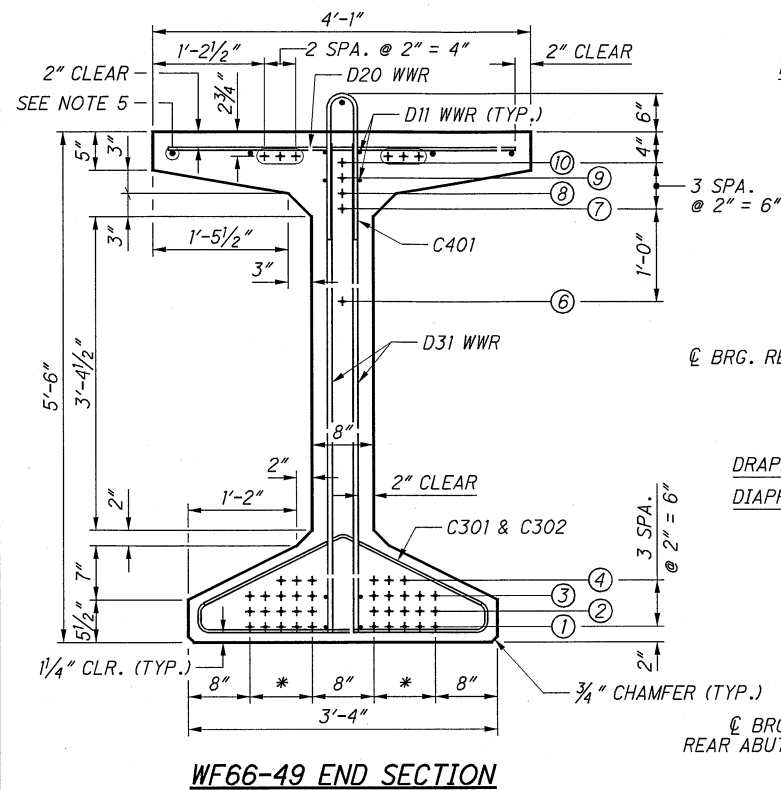
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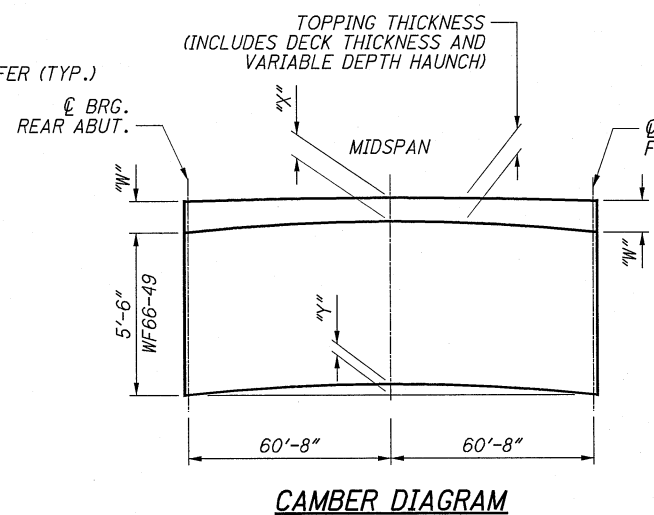
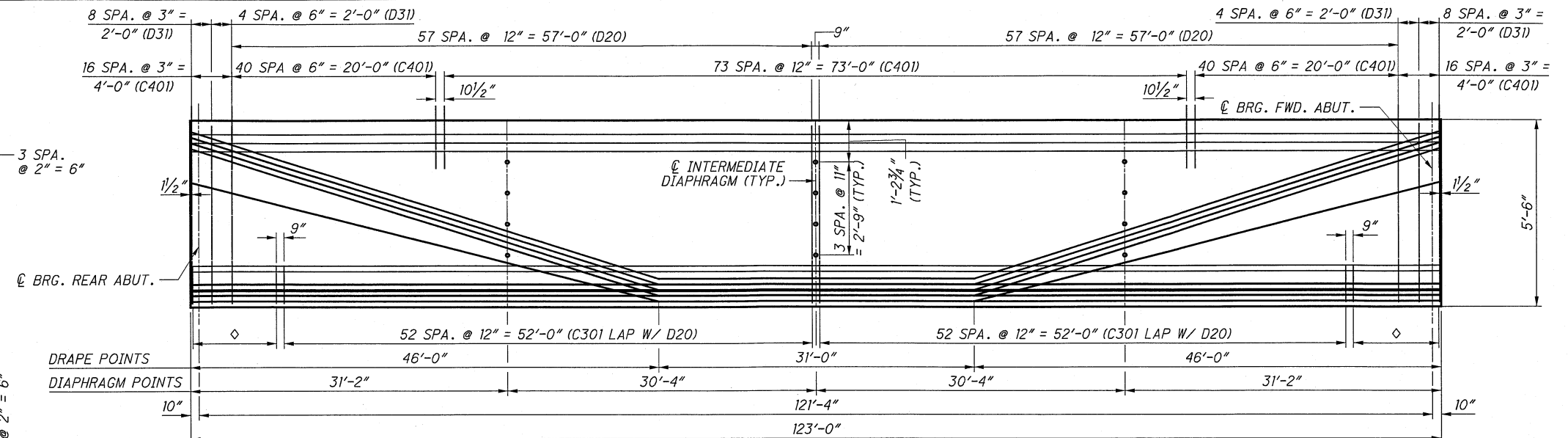


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	MRV	
FRAMING PLAN		
BRIDGE NO. ALL-75-0703 L&R		
I-75 OVER S.R. 117 & S.R. 309		
ALL-75-5.53	PID No. 76691	
23	38	

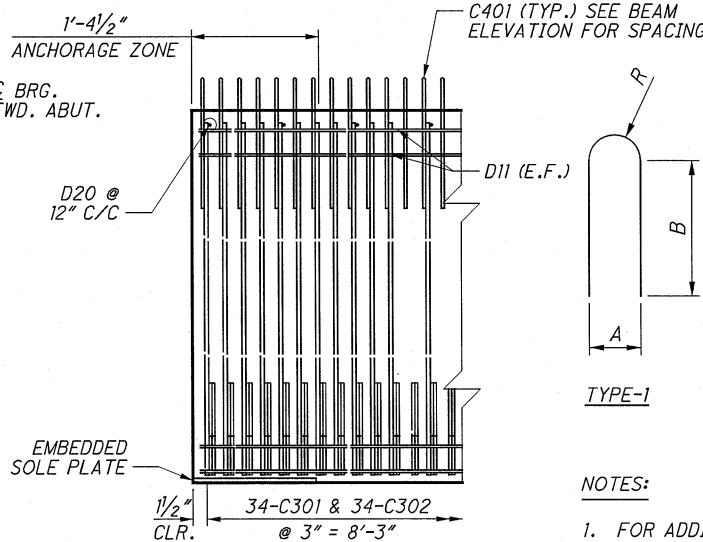
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BEAM PRESTRESSING STRANDS, MATERIALS, AND REINFORCEMENT																				
BEAM MARK	NUMBER OF STRANDS PER ROW										TOTAL STRANDS	CONCRETE STRENGTHS		C301 BARS REQ'D	C302 BARS REQ'D	C401 BARS REQ'D				
	END SECTION					MID-SPAN						f'ci	f'c							
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩							⑪	⑫	⑬	⑭
	BARS PER BEAM																			
B2 - B6	10	10	10	6	1	1	1	1	1	11	11	11	7	1	41	5500 psi	7000 psi	172	68	188



TOPPING THICKNESS TABLE					
SOUTHBOUND			NORTHBOUND		
SPAN 1			SPAN 1		
BEAM	"W"	"X"	BEAM	"W"	"X"
B1	11 3/4"	10 1/2"	B7	11 3/4"	10 1/2"
B2	11 5/8"	10 1/2"	B8	11 5/8"	10 1/2"
B3	11 5/8"	10 1/2"	B9	11 5/8"	10 1/2"
B4	11 5/8"	10 1/2"	B10	11 5/8"	10 1/2"
B5	11 5/8"	10 1/2"	B11	11 5/8"	10 1/2"
B6	11 3/4"	10 1/2"	B12	11 3/4"	10 1/2"

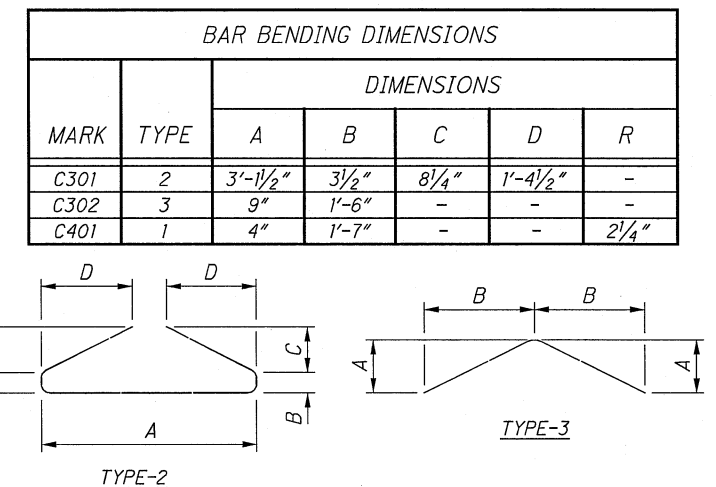


ANCHORAGE REINFORCEMENT

LEGEND:

- ⑨ - INDICATES STRAND ROW
- ◇ - C301 & C302, 33 SPA. @ 3" = 8'-3"
- * - 4 SPA. @ 2" = 8"

BEAM CAMBER AT MIDSPAN	
CAMBER AT TIME OF RELEASE (SEE NOTE 5)	2"
CAMBER AT TIME OF ERECTION (SEE NOTE 6)	3 1/2"
LONG-TERM CAMBER (SEE NOTE 7)	5 1/8"



NOTES:

- FOR ADDITIONAL DETAILS AND NOTES, SEE ODOT STANDARD DRAWING PSID-1-13.
- ALL PRESTRESSING STRANDS SHALL BE GRADE 270 KIPS SEVEN WIRE, UNCOATED, LOW RELAXATION STRAND, WITH A NOMINAL AREA OF 0.217 SQUARE INCHES.
- ALL MILD REINFORCING STEEL SHALL BE EPOXY COATED, GRADE 60.
- FOUR D31 BARS SHALL BE PROVIDED IN THE TOP FLANGE PER PSID-1-13.
- CAMBER AT TIME OF RELEASE = 1.00 x (PRESTRESS CAMBER AT RELEASE) - 1.00 x (BEAM SELF-WEIGHT DEFLECTION)
- CAMBER AT ERECTION = 1.80 x (PRESTRESS CAMBER AT RELEASE) - 1.85 x (BEAM SELF-WEIGHT DEFLECTION)
- LONG-TERM CAMBER = 2.45 x (PRESTRESS CAMBER AT RELEASE) - 2.40 x (BEAM SELF-WEIGHT DEFLECTION)
- INITIAL FORCE PER STRAND = 43,900 POUNDS/STRAND / TOTAL HOLD-DOWN CAPACITY REQUIRED = 19,800 POUNDS
- DECK SLAB THICKNESS FOR CONCRETE QUANTITY: THE TOPPING THICKNESSES SHOWN FROM THE TOP OF THE DECK SLAB TO THE TOP OF THE TOP FLANGE ALONG THE CENTERLINE OF THE I-BEAM ARE THEORETICAL DIMENSIONS. THE HAUNCH DEPTH IS THE TOPPING THICKNESS MINUS THE DESIGN SLAB THICKNESS. THE DEPARTMENT WILL PAY FOR SUPERSTRUCTURE CONCRETE BASED ON THE DESIGN SLAB THICKNESS AND THE AVERAGE OF THE THEORETICAL HAUNCH DEPTHS AT MID-SPAN AND AT EACH BEAM BEARING EVEN THOUGH DEVIATION FROM THE DIMENSIONS SHOWN MAY BE NECESSARY TO PLACE THE DECK SURFACE AT THE FINISHED GRADE. ONCE ALL BEAMS ARE SET IN THEIR FINAL POSITION, THE ACTUAL CAMBER FOR EACH MEMBER WILL BE THE TOP OF BEAM ELEVATION AT MID-SPAN MINUS THE AVERAGE TOP OF BEAM ELEVATION AT EACH BEARING. THE ACTUAL TOPPING THICKNESS AT MID-SPAN WILL BE THE THEORETICAL DIMENSION PLUS OR MINUS THE DIFFERENCE BETWEEN THE ACTUAL AND ANTICIPATED CAMBER.

SUPERSTRUCTURE DETAILS

BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53

PID No. 76691

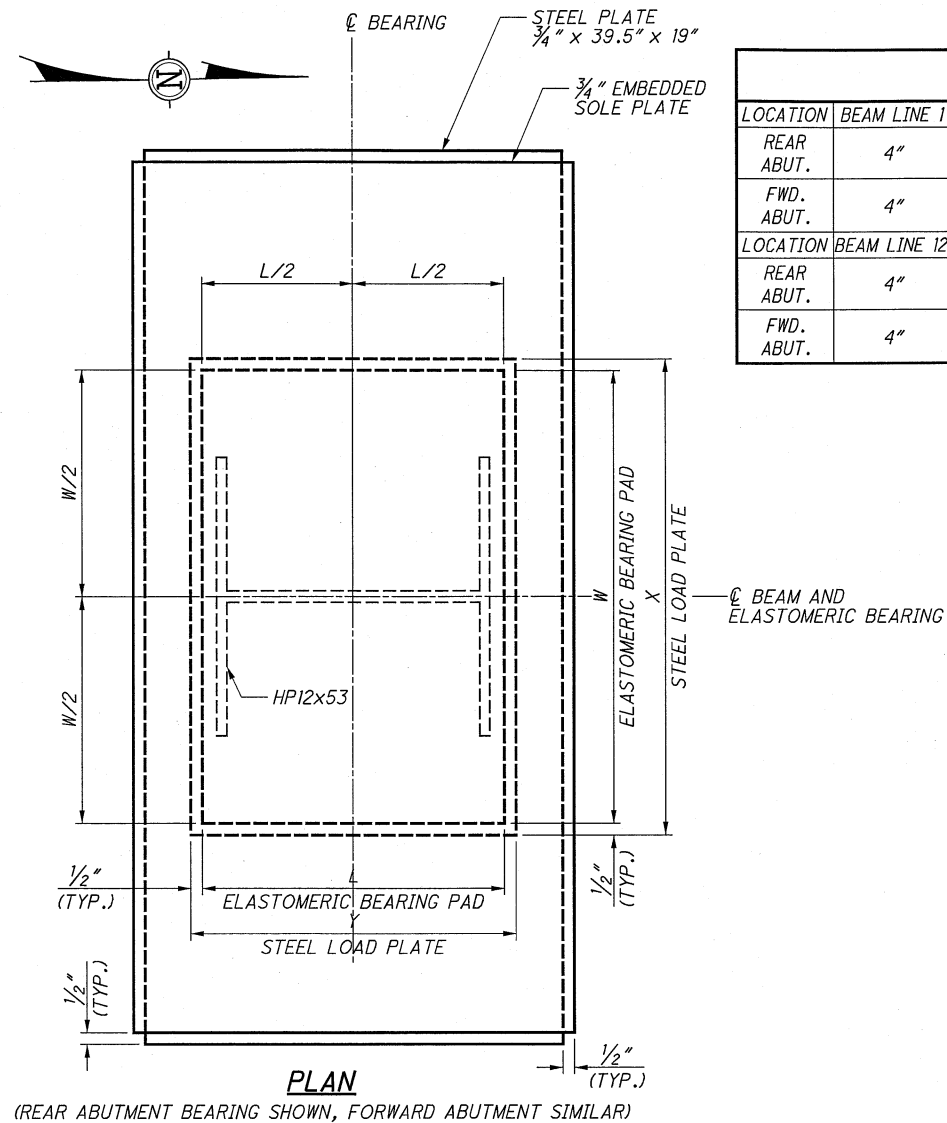
24 / 38



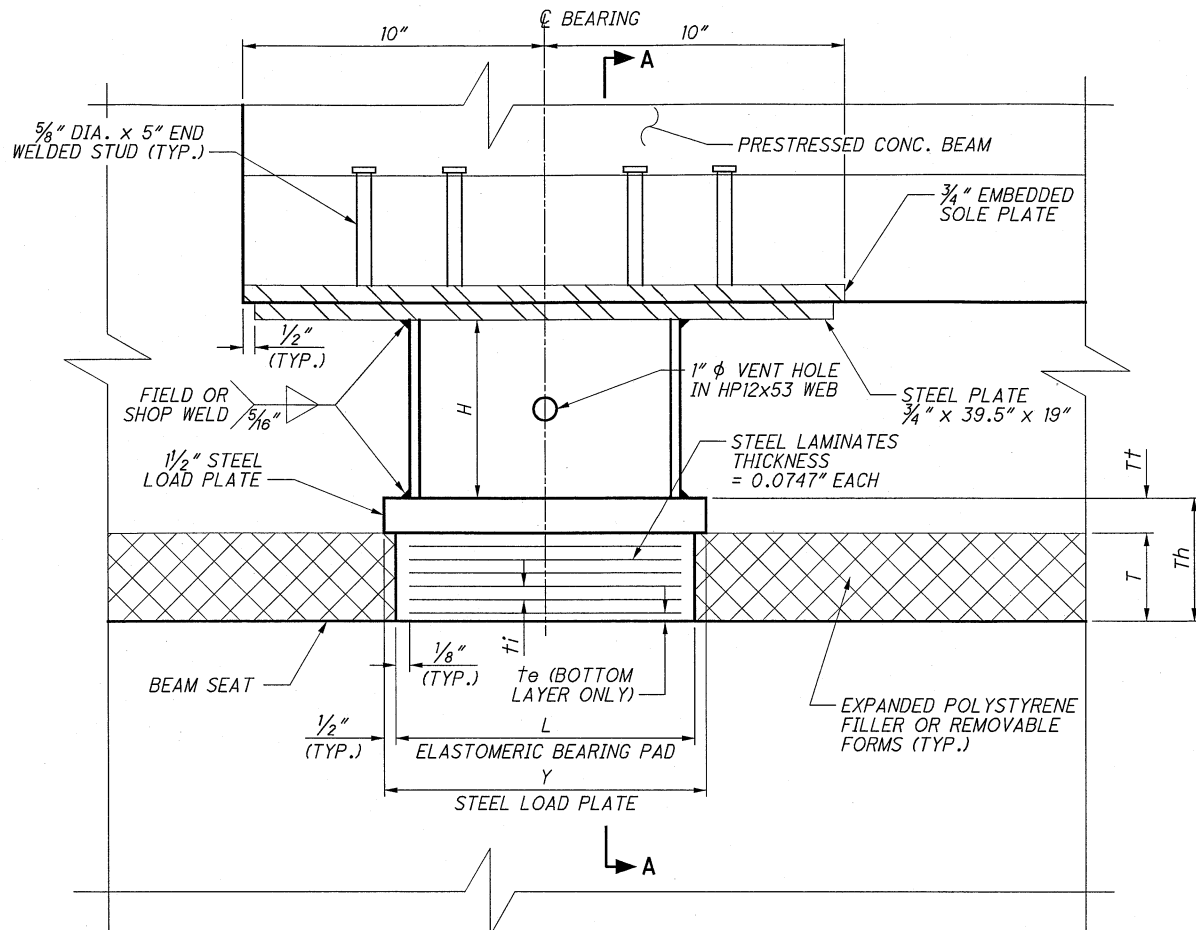
E.L. ROBINSON
ENGINEERING
1801 Walmark Drive, Suite 310 Columbus, Ohio 43215
www.elrobinsonengineering.com

DATE 6/2013
REVIEWED DFT
STRUCTURE FILE NUMBER LEFT: 0202037 RIGHT: 0202053
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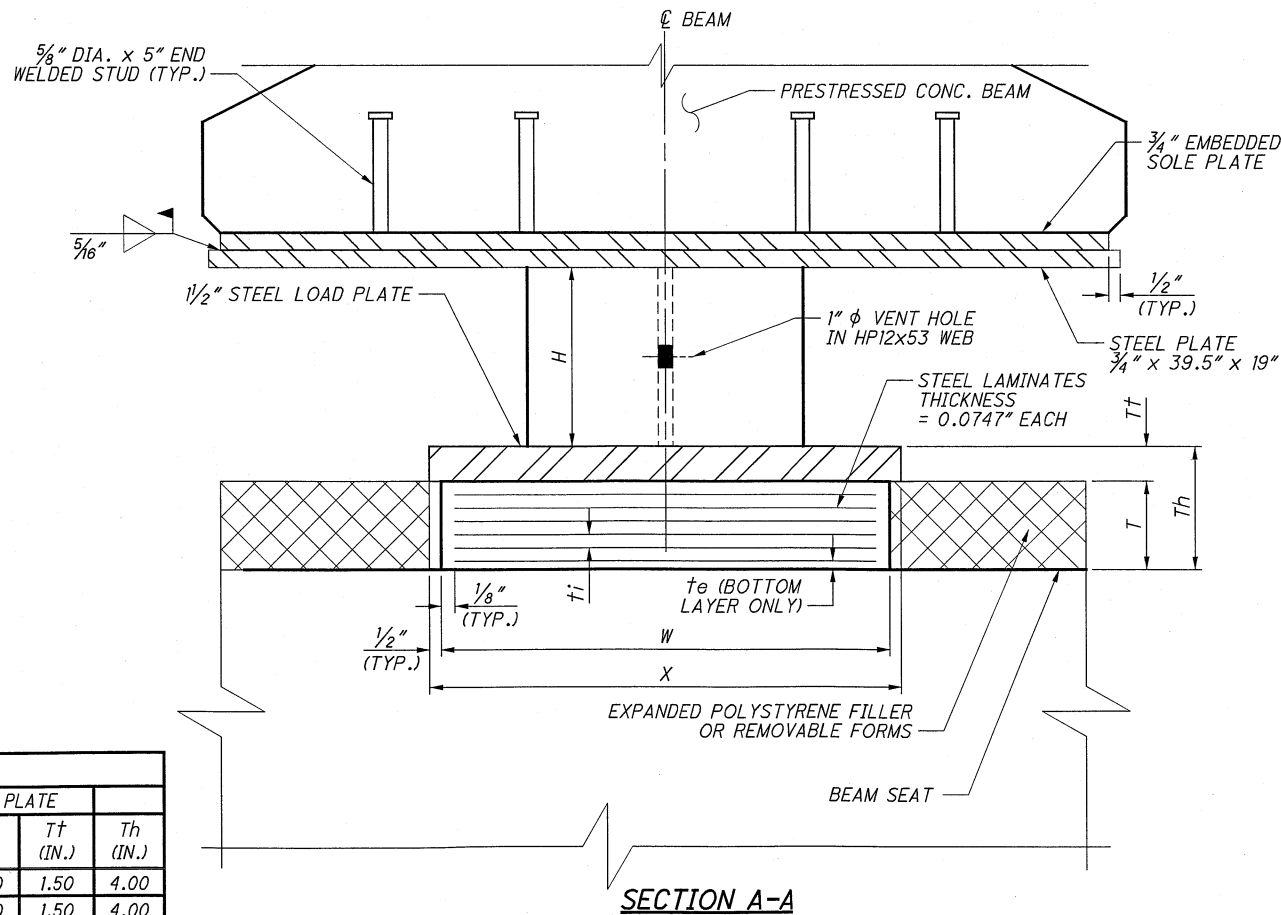
H-PILE 'H' DIMENSION						
LOCATION	BEAM LINE 1	BEAM LINE 2	BEAM LINE 3	BEAM LINE 4	BEAM LINE 5	BEAM LINE 6
REAR ABUT.	4"	5 $\frac{5}{16}"$	7 $\frac{1}{8}"$	8 $\frac{5}{8}"$	10 $\frac{3}{16}"$	10 $\frac{1}{8}"$
FWD. ABUT.	4"	5 $\frac{5}{16}"$	7 $\frac{1}{8}"$	8 $\frac{5}{8}"$	10 $\frac{3}{16}"$	10 $\frac{1}{8}"$
LOCATION	BEAM LINE 12	BEAM LINE 11	BEAM LINE 10	BEAM LINE 9	BEAM LINE 8	BEAM LINE 7
REAR ABUT.	4"	5 $\frac{5}{16}"$	7 $\frac{1}{8}"$	8 $\frac{5}{8}"$	10 $\frac{3}{16}"$	10 $\frac{1}{8}"$
FWD. ABUT.	4"	5 $\frac{5}{16}"$	7 $\frac{1}{8}"$	8 $\frac{5}{8}"$	10 $\frac{3}{16}"$	10 $\frac{1}{8}"$



NOTES:

- ELASTOMERIC BEARINGS: THE ELASTOMER SHALL HAVE A HARDNESS OF 50 DUROMETER. THE BEARINGS WERE DESIGNED IN ACCORDANCE WITH SECTION 14.7.6 (METHOD A) OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. THE LONG TERM COMPRESSION PROOF LOAD TEST (AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION II, SECTION 18.7.2.6) IS NOT REQUIRED.
- LOAD PLATES & HP 12X53 BEARINGS PEDESTALS: THE STEEL LOAD PLATE SHALL MEET THE GRADE 50 REQUIREMENTS OF STRUCTURAL STEEL ASTM A709 AND SHALL BE GALVANIZED PER CMS 711.02.
- THE STEEL LOAD PLATE SHALL BE BONDED BY VULCANIZATION TO THE ELASTOMER DURING THE MOLDING PROCESS.
- ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UP-STATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER THE BEARING IS INSTALLED.
- FOR ADDITIONAL EMBEDDED LOAD PLATE NOTES AND DETAILS, REFER TO STD. DWG. PSID-1-13.
- TOTAL DESIGN LOAD FOR BEARINGS EQUALS THE SUM OF THE DEAD LOADS AND LIVE LOADS TABULATED IN THE BEARING TABLE. IMPACT IS NOT INCLUDED. LOADS ARE UNFACTORED.
- BASIS OF PAYMENT: THE UNIT BID PRICE SHALL INCLUDE THE LOAD PLATE, HP 12X53 PEDESTAL, STEEL PLATE, AND ALL MATERIALS, LABOR, TESTING AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL LAMINATED ELASTOMERIC BEARINGS. FOR THE ABUTMENTS, PAYMENT WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 516, EACH, ELASTOMERIC BEARINGS WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN, 26"x12"x2.5".

ELASTOMERIC BEARING DATA																	
LOCATION	Type	BEAM NO.	NO. REQ'D	DL (KIP)	LL W/O IMPACT (KIP)	MAX DESIGN LOAD (DL+LL)	L (IN.)	W (IN.)	t _i (IN.)	NO. OF t _i 's	t _e (IN.)	NO. INTERNAL LAMINATES	T (IN.)	STEEL LOAD PLATE			Th (IN.)
														X (IN.)	Y (IN.)	T† (IN.)	
REAR ABUTMENT	EXP	1 THRU 12	12	195	90	285	12.0	26.0	0.50	4	0.25	4	2.50	27.00	13.00	1.50	4.00
FORWARD ABUTMENT	EXP	1 THRU 12	12	195	90	285	12.0	26.0	0.50	4	0.25	4	2.50	27.00	13.00	1.50	4.00



ELASTOMERIC BEARING DETAILS

BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53

PID No. 76691

25/38

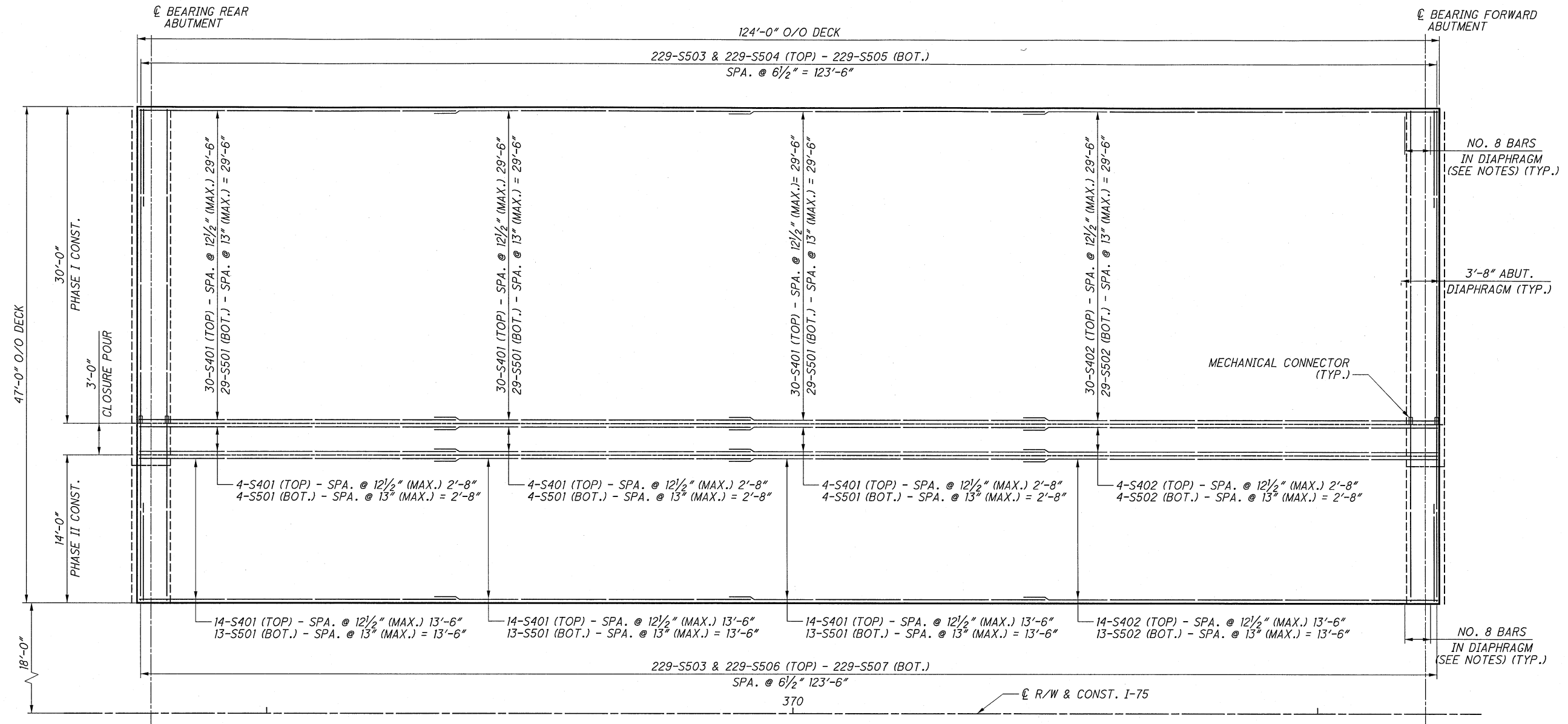
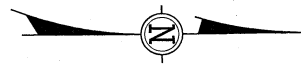


E.L. ROBINSON
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www.elrobinsonengineering.com

DATE 05/2013
REVIEWED DFT
STRUCTURE FILE NUMBER
LEFT: 0202037
RIGHT: 0202053

DRAWN FIB
CHECKED MRV
DESIGNED TJE

P:\76691\structures\ALL075_0703C\sheets\075_0703CDP001.dgn 7/10/2013 9:07:06 AM bgarrison



DECK PLAN
(LEFT BRIDGE SHOWN, RIGHT BRIDGE OPPOSITE HAND)

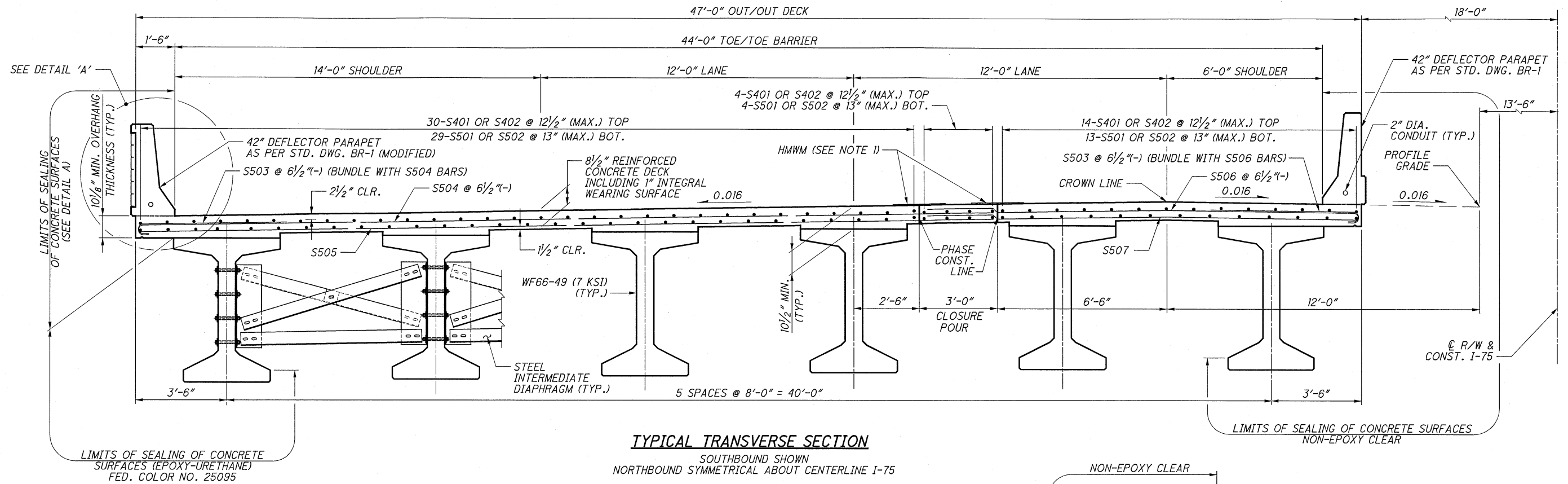
MINIMUM BAR LAP	
#4	2'-0"
#5	2'-6"

NOTES:

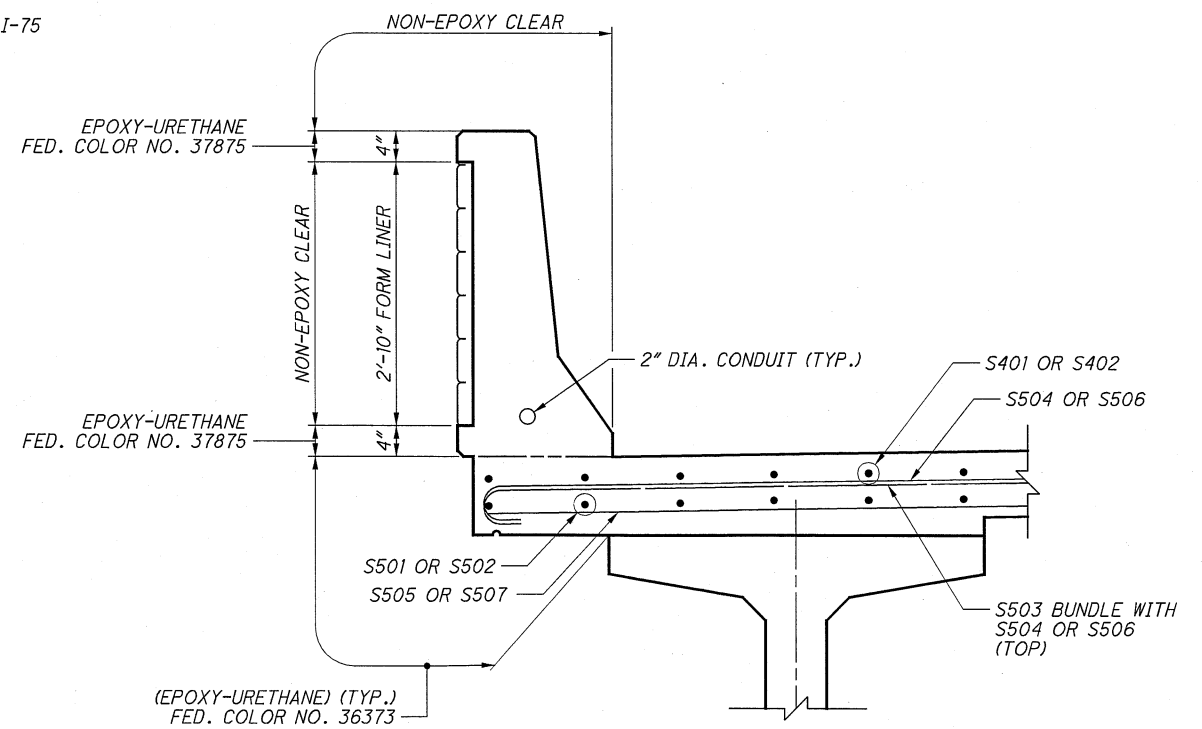
- FOR TRANSVERSE SECTION AND ADDITIONAL NOTES, SEE SHEET 27/38.
- FOR ABUTMENT DETAILS, INCLUDING NO. 8 BARS IN DIAPHRAGM, SEE SHEETS 9/38 THROUGH 22/38.
- FOR PARAPET DETAIL, SEE SHEETS 31/38 & 32/38.
- FOR SCREED ELEVATIONS, TOP OF HAUNCH, AND FINAL DECK SURFACE ELEVATIONS, SEE SHEETS 28/38 AND 29/38.
- FOR PHASE CONSTRUCTION DETAILS, SEE SHEET 7/38.



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TYPICAL TRANSVERSE SECTION
SOUTHBOUND SHOWN
NORTHBOUND SYMMETRICAL ABOUT CENTERLINE I-75



DETAIL A

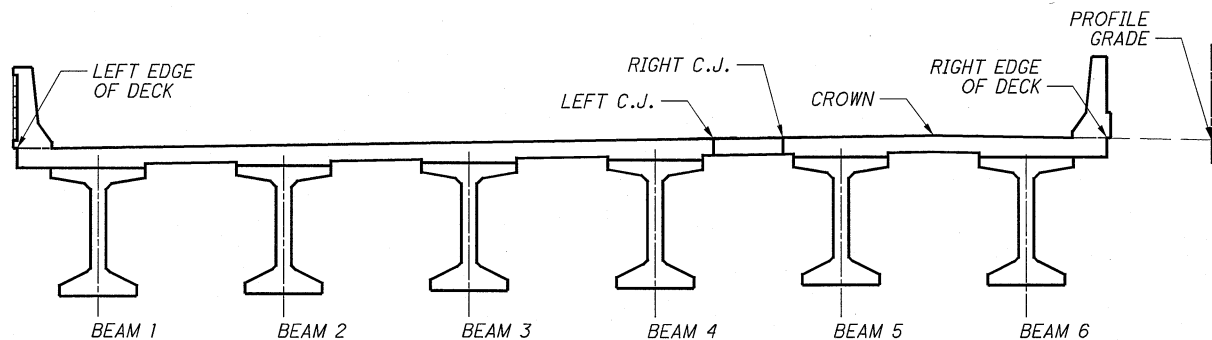
NOTES:

1. HMWM SEALER SHALL BE 2'-0" WIDE, CENTERED ON EACH CONSTRUCTION JOINT.
2. SEE PSID-I-13 FOR INTERMEDIATE DIAPHRAGM DETAILS.

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SCREED ELEVATIONS (SOUTHBOUND)										
LOCATION	LEFT EDGE OF DECK		LEFT C.J.		RIGHT C.J.		CROWN		RIGHT EDGE OF DECK	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BRG. R.A.	369+39.05	905.57	369+39.05	906.03	369+39.05	906.08	369+39.05	906.18	369+39.05	906.09
0.1L	369+51.18	905.63	369+51.18	906.08	369+51.18	906.13	369+51.18	906.24	369+51.18	906.14
0.2L	369+63.32	905.67	369+63.32	906.13	369+63.32	906.18	369+63.32	906.28	369+63.32	906.18
0.3L	369+75.45	905.70	369+75.45	906.16	369+75.45	906.21	369+75.45	906.31	369+75.45	906.21
0.4L	369+87.58	905.72	369+87.58	906.18	369+87.58	906.23	369+87.58	906.33	369+87.58	906.23
0.5L	369+99.72	905.72	369+99.72	906.18	369+99.72	906.22	369+99.72	906.33	369+99.72	906.23
0.6L	370+11.85	905.70	370+11.85	906.16	370+11.85	906.20	370+11.85	906.31	370+11.85	906.21
0.7L	370+23.98	905.66	370+23.98	906.12	370+23.98	906.17	370+23.98	906.27	370+23.98	906.17
0.8L	370+36.11	905.61	370+36.11	906.06	370+36.11	906.11	370+36.11	906.22	370+36.11	906.12
0.9L	370+48.25	905.54	370+48.25	906.00	370+48.25	906.05	370+48.25	906.15	370+48.25	906.05
℄ BRG. F.A.	370+60.38	905.47	370+60.38	905.92	370+60.38	905.97	370+60.38	906.08	370+60.38	905.98

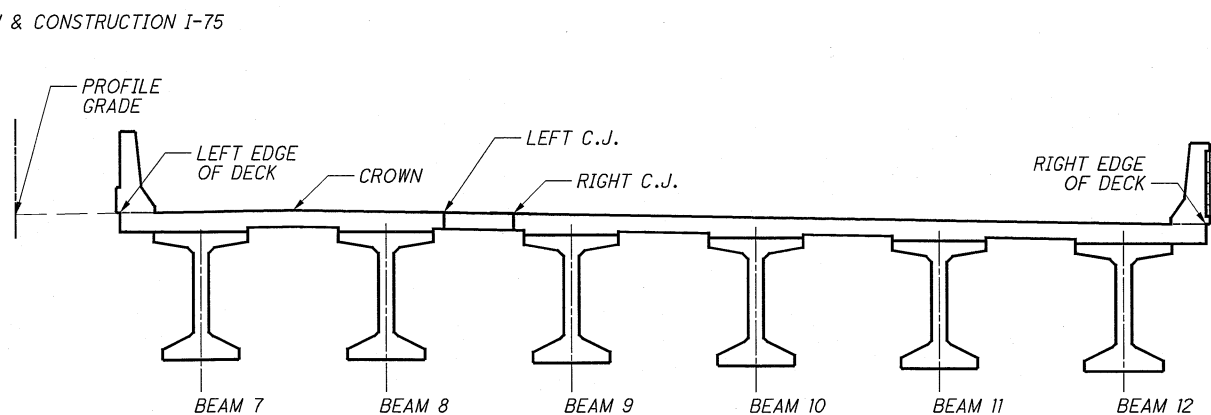
SCREED DECK ELEVATIONS (NORTHBOUND)										
LOCATION	LEFT EDGE OF DECK		CROWN		LEFT C.J.		RIGHT C.J.		RIGHT EDGE OF DECK	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BRG. R.A.	369+39.05	906.09	369+39.05	906.18	369+39.05	906.08	369+39.05	906.03	369+39.05	905.57
0.1L	369+51.18	906.14	369+51.18	906.24	369+51.18	906.13	369+51.18	906.08	369+51.18	905.63
0.2L	369+63.32	906.18	369+63.32	906.28	369+63.32	906.18	369+63.32	906.13	369+63.32	905.67
0.3L	369+75.45	906.21	369+75.45	906.31	369+75.45	906.21	369+75.45	906.16	369+75.45	905.70
0.4L	369+87.58	906.23	369+87.58	906.33	369+87.58	906.23	369+87.58	906.18	369+87.58	905.72
0.5L	369+99.72	906.23	369+99.72	906.33	369+99.72	906.22	369+99.72	906.18	369+99.72	905.72
0.6L	370+11.85	906.21	370+11.85	906.31	370+11.85	906.20	370+11.85	906.16	370+11.85	905.70
0.7L	370+23.98	906.17	370+23.98	906.27	370+23.98	906.17	370+23.98	906.12	370+23.98	905.66
0.8L	370+36.11	906.12	370+36.11	906.22	370+36.11	906.11	370+36.11	906.06	370+36.11	905.61
0.9L	370+48.25	906.05	370+48.25	906.15	370+48.25	906.05	370+48.25	906.00	370+48.25	905.54
℄ BRG. F.A.	370+60.38	905.98	370+60.38	906.08	370+60.38	905.97	370+60.38	905.92	370+60.38	905.47



SOUTHBOUND

TOP OF HAUNCH ELEVATIONS (SOUTHBOUND)												
LOCATION	BEAM 1		BEAM 2		BEAM 3		BEAM 4		BEAM 5		BEAM 6	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BRG. R.A.	369+39.05	905.61	369+39.05	905.73	369+39.05	905.15	369+39.05	905.28	369+39.05	905.41	369+39.05	905.41
0.1L	369+51.18	905.66	369+51.18	905.79	369+51.18	905.21	369+51.18	905.33	369+51.18	905.46	369+51.18	905.46
0.2L	369+63.32	905.70	369+63.32	905.83	369+63.32	905.25	369+63.32	905.38	369+63.32	905.51	369+63.32	905.51
0.3L	369+75.45	905.73	369+75.45	905.87	369+75.45	905.28	369+75.45	905.41	369+75.45	905.54	369+75.45	905.54
0.4L	369+87.58	905.75	369+87.58	905.88	369+87.58	905.30	369+87.58	905.43	369+87.58	905.56	369+87.58	905.55
0.5L	369+99.72	905.75	369+99.72	905.88	369+99.72	905.30	369+99.72	905.43	369+99.72	905.56	369+99.72	905.55
0.6L	370+11.85	905.73	370+11.85	905.86	370+11.85	905.28	370+11.85	905.41	370+11.85	905.54	370+11.85	905.53
0.7L	370+23.98	905.69	370+23.98	905.82	370+23.98	905.24	370+23.98	905.37	370+23.98	905.50	370+23.98	905.50
0.8L	370+36.11	905.64	370+36.11	905.77	370+36.11	905.19	370+36.11	905.32	370+36.11	905.44	370+36.11	905.44
0.9L	370+48.25	905.57	370+48.25	905.70	370+48.25	905.12	370+48.25	905.25	370+48.25	905.38	370+48.25	905.38
℄ BRG. F.A.	370+60.38	905.50	370+60.38	905.63	370+60.38	905.05	370+60.38	905.17	370+60.38	905.30	370+60.38	905.30

TOP OF HAUNCH ELEVATIONS (NORTHBOUND)												
LOCATION	BEAM 7		BEAM 8		BEAM 9		BEAM 10		BEAM 11		BEAM 12	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
℄ BRG. R.A.	369+39.05	905.41	369+39.05	905.41	369+39.05	905.28	369+39.05	905.15	369+39.05	905.73	369+39.05	905.61
0.1L	369+51.18	905.46	369+51.18	905.46	369+51.18	905.33	369+51.18	905.21	369+51.18	905.79	369+51.18	905.66
0.2L	369+63.32	905.51	369+63.32	905.51	369+63.32	905.38	369+63.32	905.25	369+63.32	905.83	369+63.32	905.70
0.3L	369+75.45	905.54	369+75.45	905.54	369+75.45	905.41	369+75.45	905.28	369+75.45	905.87	369+75.45	905.73
0.4L	369+87.58	905.55	369+87.58	905.56	369+87.58	905.43	369+87.58	905.30	369+87.58	905.88	369+87.58	905.75
0.5L	369+99.72	905.55	369+99.72	905.56	369+99.72	905.43	369+99.72	905.30	369+99.72	905.88	369+99.72	905.75
0.6L	370+11.85	905.53	370+11.85	905.54	370+11.85	905.41	370+11.85	905.28	370+11.85	905.86	370+11.85	905.73
0.7L	370+23.98	905.50	370+23.98	905.50	370+23.98	905.37	370+23.98	905.24	370+23.98	905.82	370+23.98	905.69
0.8L	370+36.11	905.44	370+36.11	905.44	370+36.11	905.32	370+36.11	905.19	370+36.11	905.77	370+36.11	905.64
0.9L	370+48.25	905.38	370+48.25	905.38	370+48.25	905.25	370+48.25	905.12	370+48.25	905.70	370+48.25	905.57
℄ BRG. F.A.	370+60.38	905.30	370+60.38	905.30	370+60.38	905.17	370+60.38	905.05	370+60.38	905.63	370+60.38	905.50



NORTHBOUND

TYPICAL CROSS SECTION

NOTES:

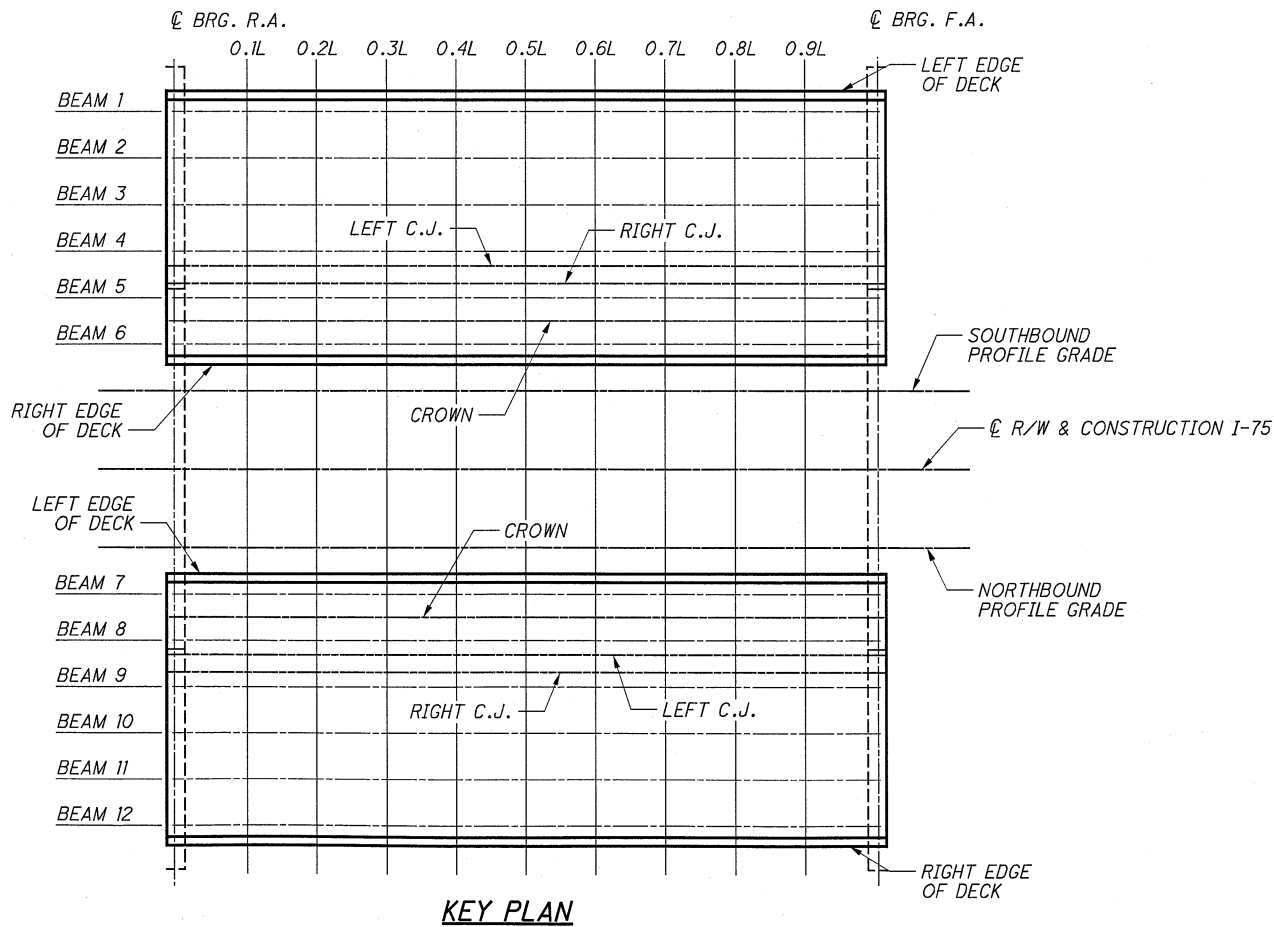
1. SCREED ELEVATIONS SHOWN REPRESENT THE THEORETICAL DECK SURFACE LOCATION PRIOR TO DEFLECTIONS CAUSED BY DECK PLACEMENT AND OTHER ANTICIPATED DEAD LOADS.
2. TOP OF HAUNCH ELEVATIONS SHOWN REPRESENT THE THEORETICAL LOCATION OF THE BOTTOM OF THE DECK ABOVE THE BEAM/GIRDER HAUNCH PRIOR TO DEFLECTIONS CAUSED BY DECK PLACEMENT AND OTHER ANTICIPATED DEAD LOADS.
3. FOR FINAL DECK ELEVATIONS AND DECK KEY PLAN, SEE SHEET 29/38.



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FINAL DECK ELEVATIONS (SOUTHBOUND)																						
LOCATION	LEFT EDGE OF DECK		BEAM 1		BEAM 2		BEAM 3		BEAM 4		LEFT C.J.		RIGHT C.J.		BEAM 5		CROWN		BEAM 6		RIGHT EDGE OF DECK	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
☉ BRG. R.A.	369+39.05	905.57	369+39.05	905.61	369+39.05	905.73	369+39.05	905.86	369+39.05	905.99	369+39.05	906.03	369+39.05	906.08	369+39.05	906.12	369+39.05	906.18	369+39.05	906.12	369+39.05	906.09
0.1L	369+51.18	905.59	369+51.18	905.62	369+51.18	905.75	369+51.18	905.88	369+51.18	906.01	369+51.18	906.05	369+51.18	906.09	369+51.18	906.13	369+51.18	906.20	369+51.18	906.13	369+51.18	906.10
0.2L	369+63.32	905.60	369+63.32	905.63	369+63.32	905.76	369+63.32	905.89	369+63.32	906.01	369+63.32	906.05	369+63.32	906.10	369+63.32	906.14	369+63.32	906.21	369+63.32	906.14	369+63.32	906.11
0.3L	369+75.45	905.60	369+75.45	905.63	369+75.45	905.76	369+75.45	905.89	369+75.45	906.02	369+75.45	906.06	369+75.45	906.11	369+75.45	906.15	369+75.45	906.21	369+75.45	906.15	369+75.45	906.11
0.4L	369+87.58	905.60	369+87.58	905.63	369+87.58	905.76	369+87.58	905.89	369+87.58	906.02	369+87.58	906.06	369+87.58	906.10	369+87.58	906.14	369+87.58	906.21	369+87.58	906.14	369+87.58	906.11
0.5L	369+99.72	905.59	369+99.72	905.62	369+99.72	905.75	369+99.72	905.88	369+99.72	906.01	369+99.72	906.05	369+99.72	906.10	369+99.72	906.14	369+99.72	906.20	369+99.72	906.14	369+99.72	906.10
0.6L	370+11.85	905.58	370+11.85	905.61	370+11.85	905.74	370+11.85	905.87	370+11.85	905.99	370+11.85	906.03	370+11.85	906.08	370+11.85	906.12	370+11.85	906.19	370+11.85	906.12	370+11.85	906.09
0.7L	370+23.98	905.56	370+23.98	905.59	370+23.98	905.72	370+23.98	905.85	370+23.98	905.98	370+23.98	906.02	370+23.98	906.06	370+23.98	906.10	370+23.98	906.17	370+23.98	906.10	370+23.98	906.07
0.8L	370+36.11	905.53	370+36.11	905.57	370+36.11	905.69	370+36.11	905.82	370+36.11	905.95	370+36.11	905.99	370+36.11	906.04	370+36.11	906.08	370+36.11	906.14	370+36.11	906.08	370+36.11	906.05
0.9L	370+48.25	905.50	370+48.25	905.54	370+48.25	905.66	370+48.25	905.79	370+48.25	905.92	370+48.25	905.96	370+48.25	906.01	370+48.25	906.05	370+48.25	906.11	370+48.25	906.05	370+48.25	906.02
☉ BRG. F.A.	370+60.38	905.47	370+60.38	905.50	370+60.38	905.63	370+60.38	905.76	370+60.38	905.88	370+60.38	905.92	370+60.38	905.97	370+60.38	906.01	370+60.38	906.08	370+60.38	906.01	370+60.38	905.98

FINAL DECK ELEVATIONS (NORTHBOUND)																						
LOCATION	LEFT EDGE OF DECK		BEAM 7		CROWN		BEAM 8		LEFT C.J.		RIGHT C.J.		BEAM 9		BEAM 10		BEAM 11		BEAM 12		RIGHT EDGE OF DECK	
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.
☉ BRG. R.A.	369+39.05	906.09	369+39.05	906.12	369+39.05	906.18	369+39.05	906.12	369+39.05	906.08	369+39.05	906.03	369+39.05	905.99	369+39.05	905.86	369+39.05	905.73	369+39.05	905.61	369+39.05	905.57
0.1L	369+51.18	906.10	369+51.18	906.13	369+51.18	906.20	369+51.18	906.13	369+51.18	906.09	369+51.18	906.05	369+51.18	906.01	369+51.18	905.88	369+51.18	905.75	369+51.18	905.62	369+51.18	905.59
0.2L	369+63.32	906.11	369+63.32	906.14	369+63.32	906.21	369+63.32	906.14	369+63.32	906.10	369+63.32	906.05	369+63.32	906.01	369+63.32	905.89	369+63.32	905.76	369+63.32	905.63	369+63.32	905.60
0.3L	369+75.45	906.11	369+75.45	906.15	369+75.45	906.21	369+75.45	906.15	369+75.45	906.11	369+75.45	906.06	369+75.45	906.02	369+75.45	905.89	369+75.45	905.76	369+75.45	905.63	369+75.45	905.60
0.4L	369+87.58	906.11	369+87.58	906.14	369+87.58	906.21	369+87.58	906.14	369+87.58	906.10	369+87.58	906.06	369+87.58	906.02	369+87.58	905.89	369+87.58	905.76	369+87.58	905.63	369+87.58	905.60
0.5L	369+99.72	906.10	369+99.72	906.14	369+99.72	906.20	369+99.72	906.14	369+99.72	906.10	369+99.72	906.05	369+99.72	906.01	369+99.72	905.88	369+99.72	905.75	369+99.72	905.62	369+99.72	905.59
0.6L	370+11.85	906.09	370+11.85	906.12	370+11.85	906.19	370+11.85	906.12	370+11.85	906.08	370+11.85	906.03	370+11.85	905.99	370+11.85	905.87	370+11.85	905.74	370+11.85	905.61	370+11.85	905.58
0.7L	370+23.98	906.07	370+23.98	906.10	370+23.98	906.17	370+23.98	906.10	370+23.98	906.06	370+23.98	906.02	370+23.98	905.98	370+23.98	905.85	370+23.98	905.72	370+23.98	905.59	370+23.98	905.56
0.8L	370+36.11	906.05	370+36.11	906.08	370+36.11	906.14	370+36.11	906.08	370+36.11	906.04	370+36.11	905.99	370+36.11	905.95	370+36.11	905.82	370+36.11	905.69	370+36.11	905.57	370+36.11	905.53
0.9L	370+48.25	906.02	370+48.25	906.05	370+48.25	906.11	370+48.25	906.05	370+48.25	906.01	370+48.25	905.96	370+48.25	905.92	370+48.25	905.79	370+48.25	905.66	370+48.25	905.54	370+48.25	905.50
☉ BRG. F.A.	370+60.38	905.98	370+60.38	906.01	370+60.38	906.08	370+60.38	906.01	370+60.38	905.97	370+60.38	905.92	370+60.38	905.88	370+60.38	905.76	370+60.38	905.63	370+60.38	905.50	370+60.38	905.47



NOTES:

1. FINAL DECK SURFACE ELEVATIONS SHOWN REPRESENT THE DECK SURFACE LOCATION AFTER ALL ANTICIPATED DEAD LOAD DEFLECTIONS HAVE OCCURRED.
2. FOR SCREED AND TOP OF HAUNCH ELEVATIONS, SEE SHEET 28/38.

FINAL DECK SURFACE ELEVATIONS

BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53

PID No. 76691

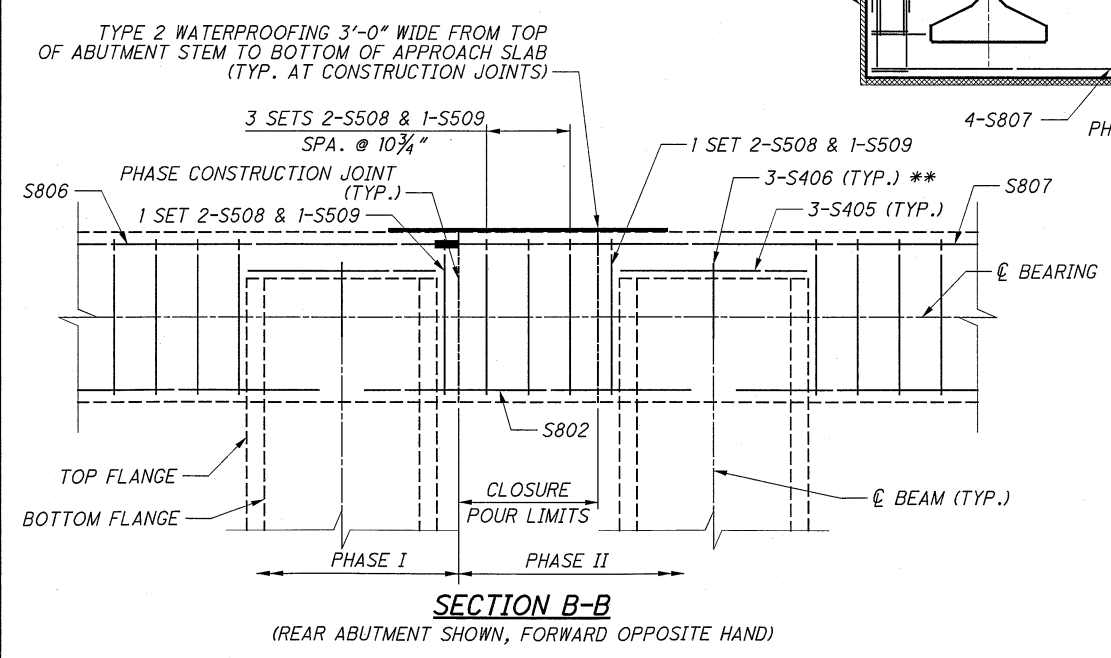
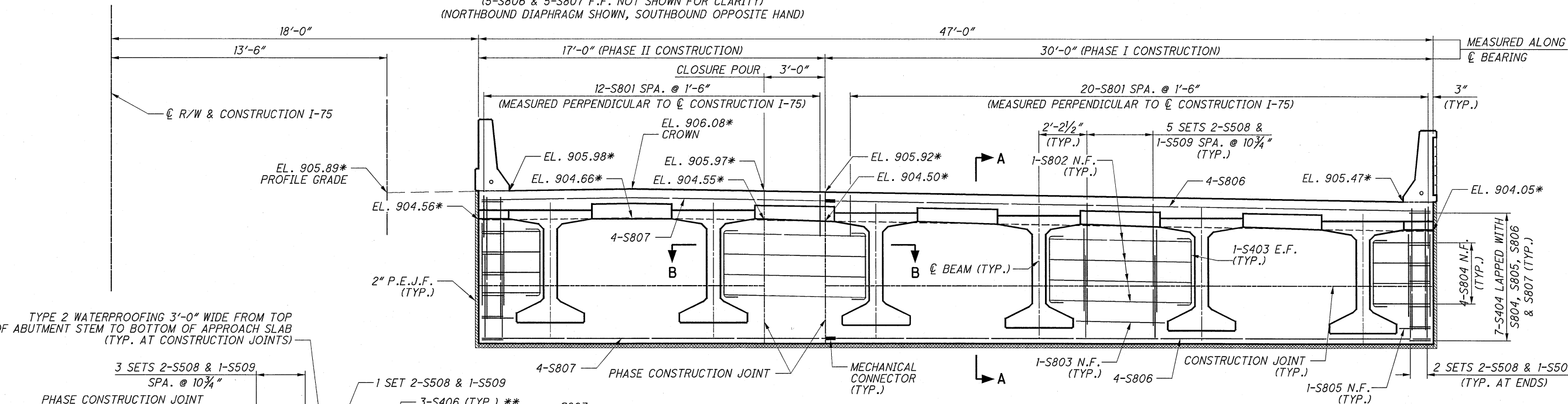
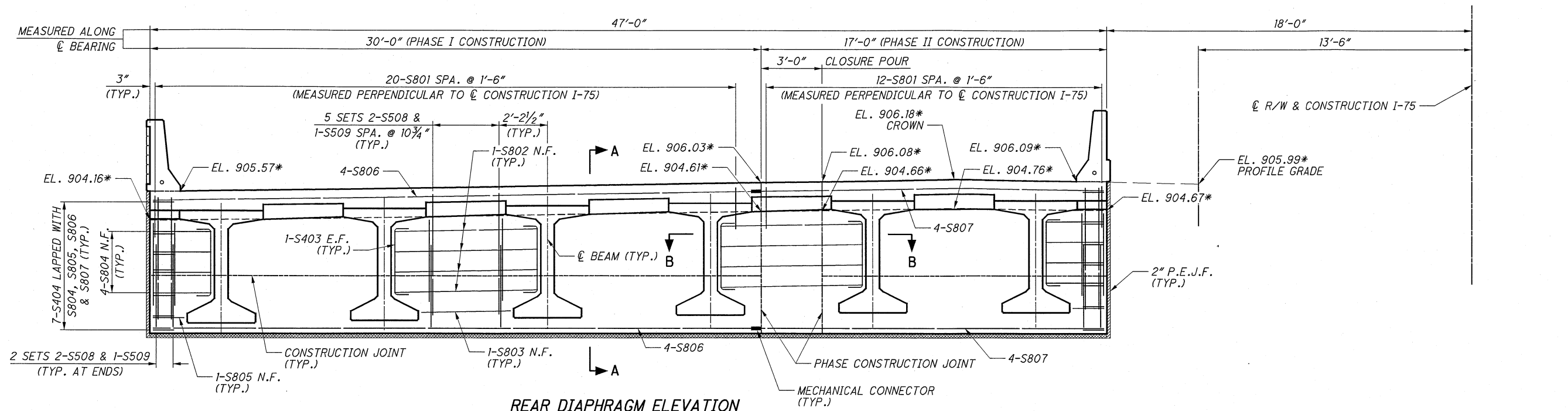
29/38



E.L. ROBINSON
ENGINEERING
1801 Wadmark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

REVIEWED DATE 6/2013
DFT
STRUCTURE FILE NUMBER
LEFT: 0202037
RIGHT: 0202053

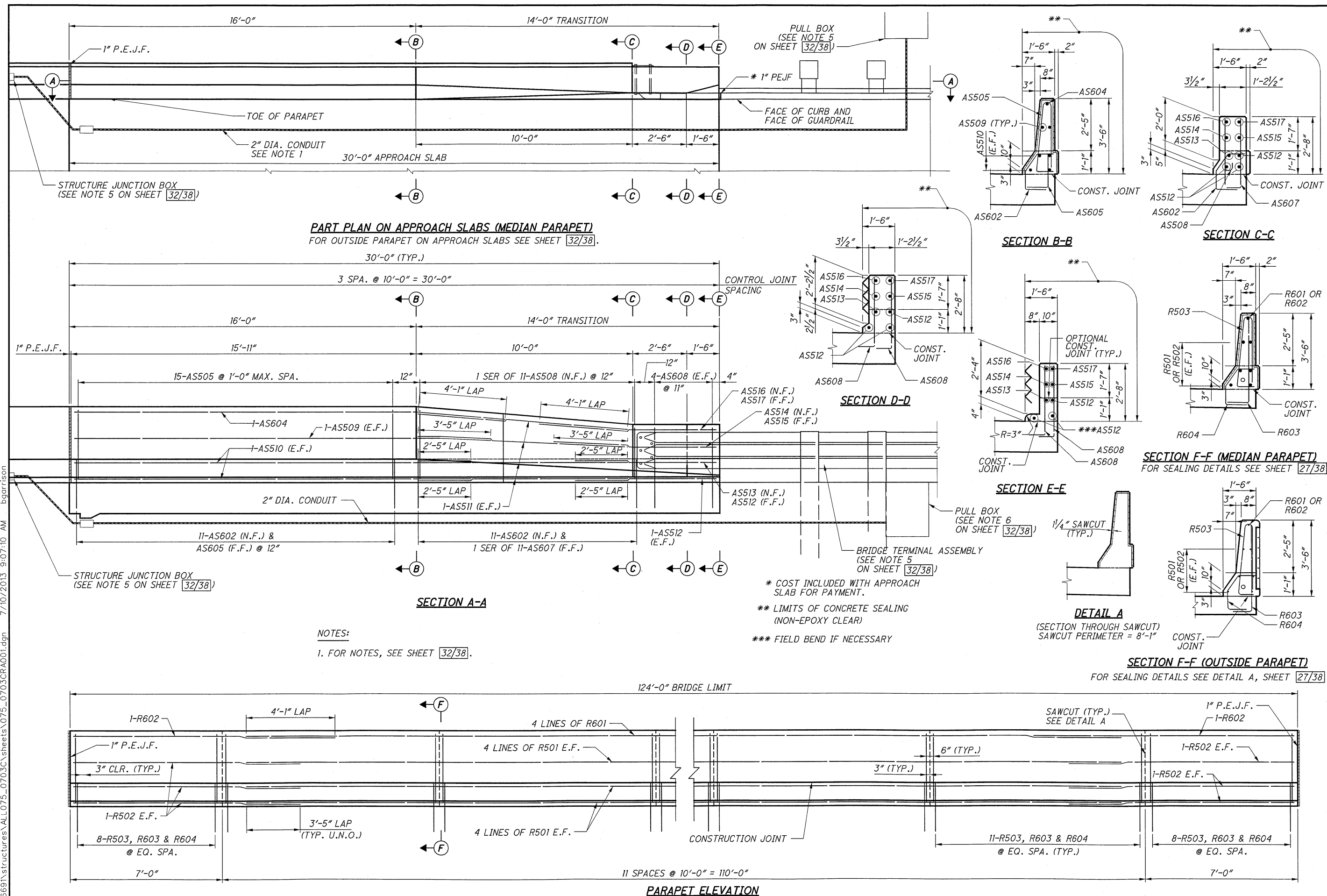
DRAWN BMG
DESIGNED BMG
CHECKED GMW
REVISED

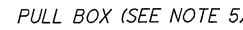


LEGEND:

- ** - S406 TO BE INCLUDED IN BEAM
- NOTES:**
- FOR SECTION A-A, SEE SHEET [12/38].
 - FOR BEARING DETAILS, SEE SHEET [25/38].
 - PLACE VERTICAL BARS PARALLEL TO BEAM.
 - FOR ADDITIONAL DETAILS AND NOTES, SEE ODOT STANDARD DRAWING PSID-1-13.
 - FOR REINFORCING BAR SCHEDULE, SEE SHEETS [34/38] THRU [36/38].
 - ABUTMENT DIAPHRAGM CONCRETE, PHASED CONSTRUCTION: PLACE THE DIAPHRAGM CONCRETE ENCASEING THE STRUCTURAL MEMBER ENDS OF AN INDIVIDUAL PHASE WITH THE DECK CONCRETE OR AT LEAST 48 HOURS BEFORE PLACEMENT OF THE DECK CONCRETE. IF PLACED SEPARATELY LOCATE THE HORIZONTAL CONSTRUCTION JOINT BETWEEN THE DIAPHRAGM AND DECK CONCRETE AT THE APPROACH SLAB SEAT. PLACE CLOSURE POUR CONCRETE IN THE DIAPHRAGM AND DECK CONCURRENTLY.

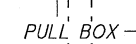
MINIMUM BAR LAP	
#5	2'-6"





PROVIDE 7/8" DIA. ANCHORS AS
PER GR-3.5. ANCHORS ARE INCLUDED
WITH TYPE I BRIDGE TERMINAL
ASSEMBLY FOR PAYMENT.

FOR MEDIAN PARAPET DETAILS SEE SHEET 31/38



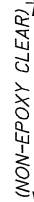
2" DIA. LIGHTING
CONDUIT SEE NOTE 3—

NORTHBOUND		SOUTHBOUND	
STATION	SIDE	STATION	SIDE
368+79	LT. & RT.	368+79	LT. & RT.
371+12	LT. & RT.	371+12	LT. & RT.

SECTION A-A

SECTION E-E

(FOR TOWER REINFORCING, SEE SHEET 12/38)

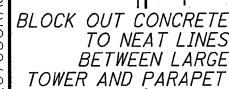


LIMITS OF SEALING OF CONCRETE SURFACES
(EPOXY-URETHANE) FED. COLOR NO. 37875

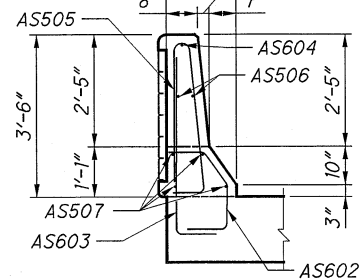
— PROVIDE CROWN AT
CENTER OF CAP

10"
-0 1/2"
ION-EPOXY
(CLEAR)

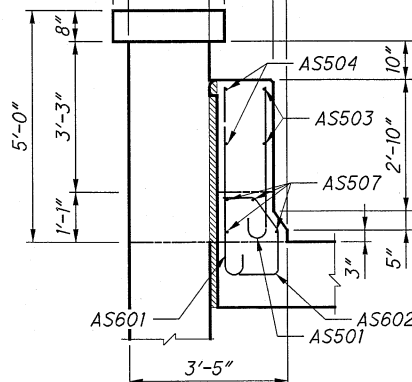
SECTION B-B



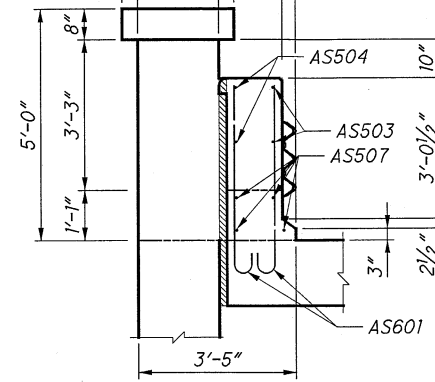
SECTION C-C



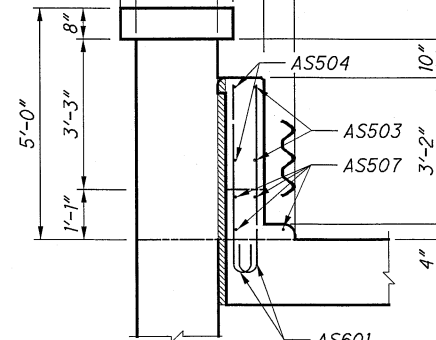
SECTION D-D



SECTION E-E
PARAPET DETAIL

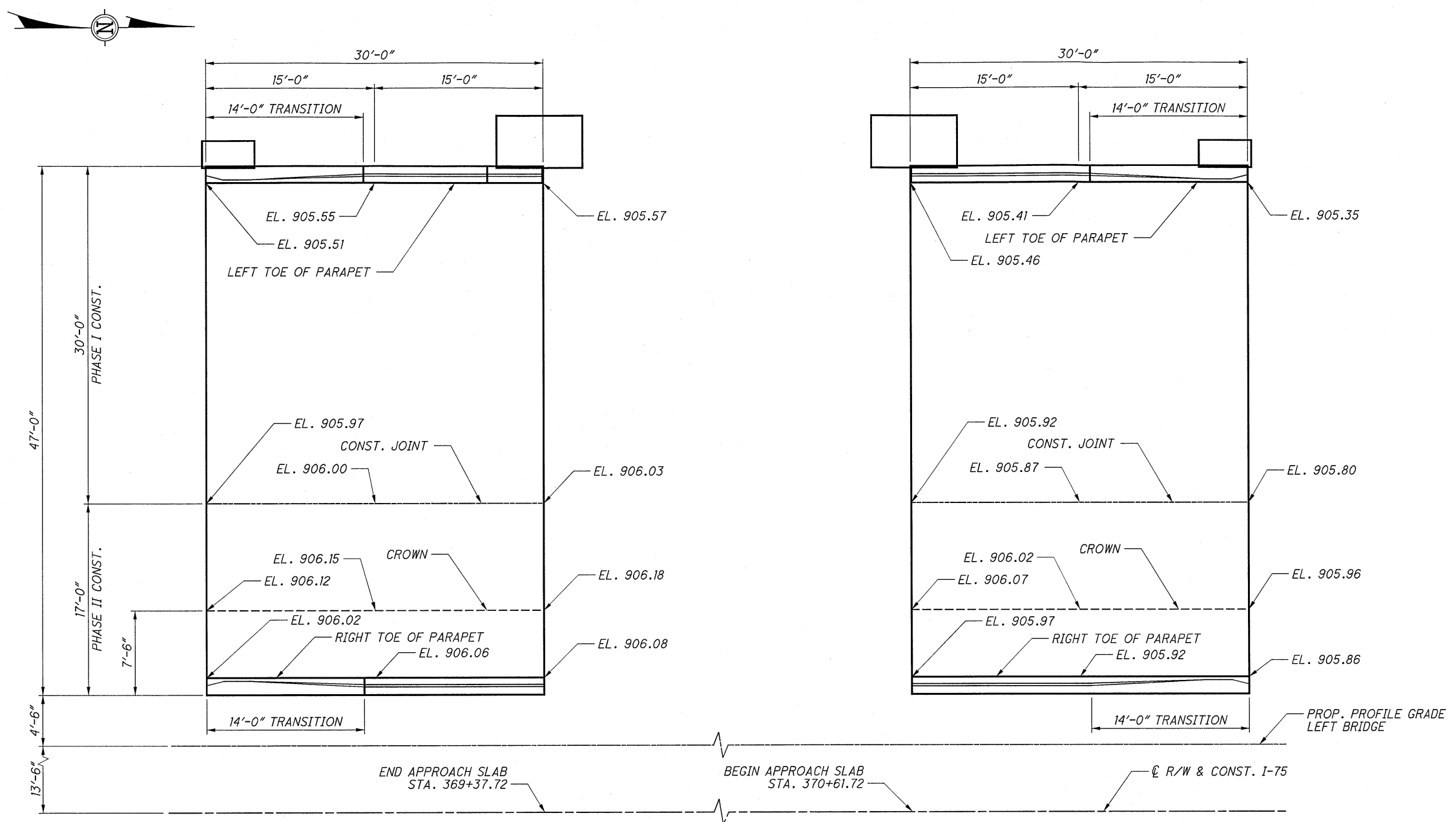


SECTION F-F



- NOTES:**
1. FOR AESTHETIC DETAILS, SEE SHEET .
 2. FOR ADDITIONAL NOTES AND DETAILS, SEE STANDARD CONSTRUCTION DRAWING BR-1.
 3. THE COST OF THE APPROACH SLAB PARAPET, EXCLUDING SEALING AND FORMLINER, SHALL BE INCLUDED WITH ITEM 898, QC/QA CONCRETE, CLASS QSC 2, SUPERSTRUCTURE (APPROACH SLAB), (T=15"), AS PER PLAN.
 4. ALL LABOR AND MATERIAL, EXCLUDING SEALING AND FORMLINER, NECESSARY TO CONSTRUCT TOWER SHOWN IN SECTION D-D, E-E, AND F-F SHALL BE INCLUDED WITH APPROACH SLAB FOR PAYMENT.
 5. FOR ADDITIONAL NOTES AND DETAILS OF PULL BOXES, STRUCTURE JUNCTION BOXES, AND CONDUIT, SEE STANDARD CONSTRUCTION DRAWING HL-30.11, HL-30.31, HL-30.32. SEE SHEETS [5/38] AND [6/38] FOR QUANTITIES FOR THESE ITEMS.
 6. FOR BIDGE TERMINAL ASSEMBLIES SEE ROADWAY STANDARD DRAWINGS GR-3.1 AND GR-3.2. SEE ROADWAY PLANS FOR DETAILS AND PAYMENT.

P:\76691\structures\ALL075_0703C\sheets\075_0703CMD002.dgn 7/10/2013 9:07:12 AM bgarrison



APPROACH SLAB PLAN - LEFT BRIDGE
(LEFT BRIDGE SHOWN, RIGHT BRIDGE OPPOSITE HAND)

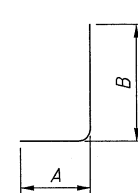
- NOTES:**
1. SEE ODOT STD. DWG. AS-I-81 FOR ADDITIONAL APPROACH SLAB DETAILS.
 2. FOR PARAPET AND TRANSITION DETAILS, SEE SHEET **31/38** & **32/38**.

EL. ROBINSON ENGINEERING 1801 Walmark Drive, Suite 310 - Columbus, Ohio 43215 www.elrobinsonengineering.com	DESIGNED FIB	CHECKED DFT	DRAWN FIB	REVIEWED RER	DATE 6/2013
	STRUCTURE FILE NUMBER LEFT: 0202037 RIGHT: 0202053				
APPROACH SLAB PLAN BRIDGE NO. ALL-75-0703 L&R I-75 OVER S.R. 117 & S.R. 309					
ALL -75- 5.53 PID No. 76691					
33 / 38					

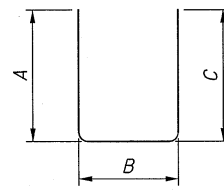
MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
REAR ABUTMENT													
RA401	48	40	88	4'-1"	240	34	3'-4"						
RA501	44		44	23'-10"	1094	1	0'-10"	23'-2"					
RA502	44		44	18'-1"	830	1	0'-10"	17'-5"					
RA503	12		12	7'-4"	92	STR							
RA504	26		26	4'-4"	118	STR							
RA505	20		20	7'-9"	162	2	0'-10"	6'-4"	0'-10"				
RA506	10		10	10'-10"	113	3	3'-8"	1'-5"					
RA507	12		12	2'-1"	26	STR							
RA508	72		72	21'-4"	1602	3	6'-8"	3'-8"					
RA601	136	123	259	14'-0"	5446	3	3'-4"	3'-3"					
RA602	88		88	42'-4"	5595	STR							
RA603		88	88	33'-2"	4384	STR							
RA604	136	52	188	21'-0"	5930	1	1'-0"	20'-2"					
RA605	68	26	94	9'-2"	1294	2	3'-1"	3'-4"	3'-1"				
RA606		72	72	24'-6"	2650	1	1'-0"	23'-8"					
RA607		36	36	17'-8"	955	2	7'-4"	3'-4"	7'-4"				
RA608		20	20	35'-4"	1061	STR							
RA609	28		28	11'-10"	498	3	2'-11"	2'-7"					
RA610	70		70	12'-6"	1314	3	2'-11"	2'-11"					
	4 SR		4 SR	12'-7"				2'-11 1/2"					
RA611	OF		OF	TO	610	3	2'-11"	TO					0'-3 3/4"
	7		7	16'-4"				4'-10"					
RA612	16		16	14'-10"	356	3	4'-5"	2'-7"					
RA613	56		56	7'-7"	638	1	1'-0"	6'-9"					
RA614	140		140	7'-11"	1665	1	1'-0"	7'-1"					
	8 SR		8 SR	8'-1"				7'-3"					
RA615	OF		OF	TO	757	1	1'-0"	TO					0'-3 1/2"
	7		7	9'-10"				9'-0"					
RA616	52		52	8'-7"	670	STR							
	4 SR		4 SR	8'-7"									
RA617	OF		OF	TO	465	STR							0'-3 3/4"
	8		8	10'-9"									
	4 SR		4 SR	11'-1"									
RA618	OF		OF	TO	505	STR							0'-3 3/4"
	7		7	12'-11"									
	4 SR		4 SR	13'-3"									
RA619	OF		OF	TO	1191	STR							0'-4"
	13		13	17'-3"									
	4 SR		4 SR	17'-7"									
RA620	OF		OF	TO	778	STR							0'-3 3/4"
	7		7	19'-5"									
	4 SR		4 SR	19'-9"									
RA621	OF		OF	TO	1847	STR							0'-4"
	14		14	24'-2"									
RA622	4		4	24'-6"	147	STR							
RA623	126		126	5'-2"	978	2	0'-8"	1'-8 1/2"	3'-1"				
	4 SR		4 SR	7'-5"									
RA624	OF		OF	TO	2828	STR							1'-6"
	21		21	37'-5"									
RA625	44		44	47'-8"	3150	STR							
RA626	44	31	75	17'-4"	1953	3	5'-8"	2'-7"					
RA627	88	62	150	21'-1"	4750	1	1'-0"	20'-3"					
RA628	44	31	75	7'-0"	789	2	3'-1"	1'-2"	3'-1"				
RA629	88		88	24'-6"	3238	STR							
RA630		44	44	33'-6"	2214	STR							
RA801	40		40	45'-3"	4833	STR							
RA802		40	40	34'-8"	3702	STR							
RA803	52		52	21'-9"	3020	13	4'-3"	9'-5"	9'-5"	4'-3"			
RA804	88	44	132	20'-1"	7078	13	4'-3"	8'-4"	2'-6"	7'-3"			
RA805	48	40	88	13'-1"	3074	1	1'-4"	12'-0"					
RA806	8		8	15'-9"	336	19	8'-6"	6'-6"	3'-3"				
RA807	8		8	15'-2"	324	19	7'-11"	6'-6"	3'-3"				

MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
REAR ABUTMENT (CONTINUED)													
RA808	16		16	33'-5"	1428	STR							
RA809	8		8	15'-4"	328	19	8'-1"	6'-6"	3'-3"				
RA810	8		8	14'-8"	313	19	7'-5"	6'-6"	3'-3"				
RA811	16		16	7'-8"	328	STR							
RA812	16		16	9'-8"	413	STR							
RA813	20		20	24'-6"	1308	STR							
RA814		10	10	33'-6"	894	STR							
DS801	84	70	154	42'-0"	*17270	STR							
DS802	112		112	30'-0"	*8971	16	29'-2"						
DS803	28		28	27'-8"	*2068	STR							
DS804	28		28	23'-0"	*1719	STR							
DS805	28		28	16'-5"	*1227	STR							
DS806	28		28	11'-10"	*885	STR							
DS1101	48	24	72	20'-0"	*7651	STR							
DS1102	48	24	72	30'-0"	*11476	16	28'-5"						
SP401	6	5	11	36'-10"	*5744	27	0'-4 1/2"	2'-6"					
SP402	4	2	6	38'-9"	*3291	27	0'-4 1/2"	2'-6"					
SP403	2		2	51'-5"	*1446	27	0'-4 1/2"	2'-6"					
SP404	2		2	46'-7"	*1313	27	0'-4 1/2"	2'-6"					
SP405	2		2	40'-2"	*1136	27	0'-4 1/2"	2'-6"					
SP406	2		2	35'-8"	*1012	27	0'-4 1/2"	2'-6"					
SUB-TOTAL					90,312								

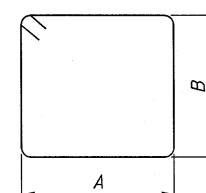
* - FOR INFORMATION ONLY



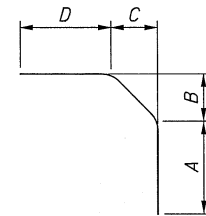
TYPE-1



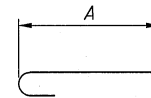
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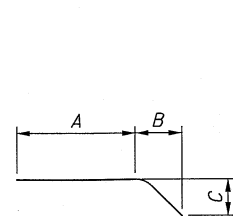
TYPE-3



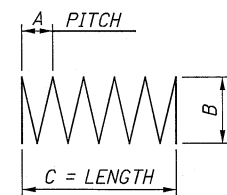
TYPE-13



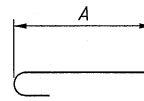
TYPE-16



TYPE-19



TYPE-27



TYPE-34

NOTES:

THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGIT WHERE FOUR ARE USED INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S601:

- S: LOCATION OF THE BARS IN THE STRUCTURE (SUPERSTRUCTURE)
6: BAR SIZE DIMENSION NO. 6
01: SEQUENCE NUMBER

BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BAR BEND AT THE END OF THE BAR. ALL REINFORCING STEEL IS TO BE EPOXY COATED. STRAIGHT ARE INDICATED BY "STR".

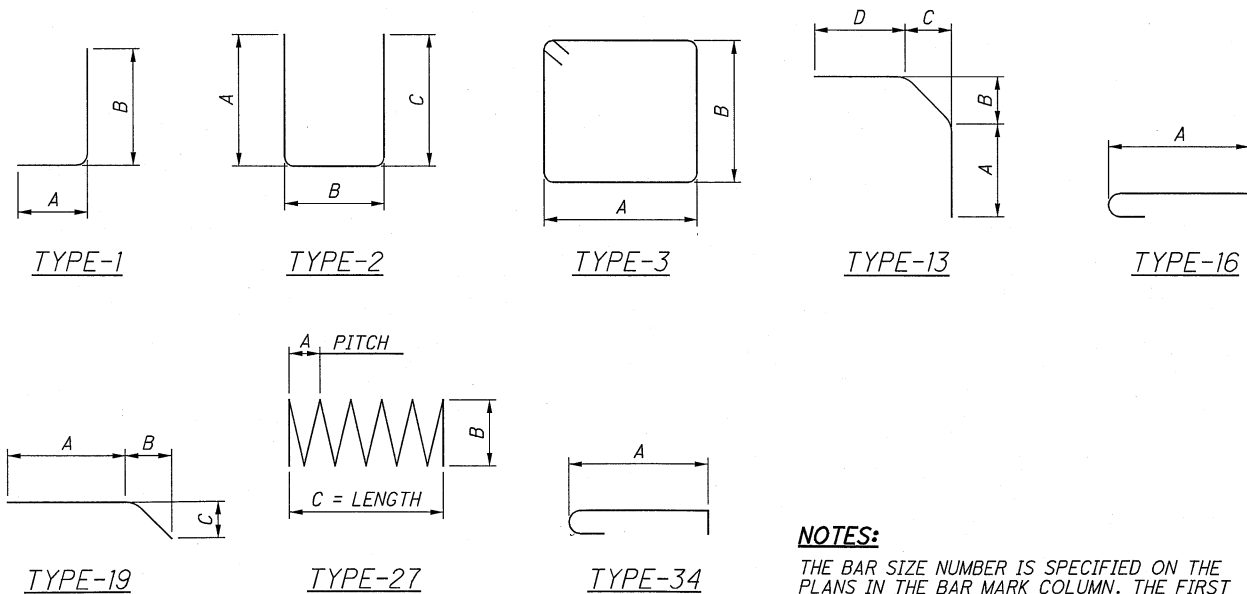


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MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
FORWARD ABUTMENT													
FA401	48	40	88	4'-1"	240	34	3'-4"						
FA501	44		44	23'-8"	1086	1	0'-10"	23'-0"					
FA502	44		44	18'-1"	830	1	0'-10"	17'-5"					
FA503	12		12	7'-4"	92	STR							
FA504	26		26	4'-4"	118	STR							
FA505	20		20	7'-9"	162	2	0'-10"	6'-4"	0'-10"				
FA506	10		10	10'-10"	113	3	3'-8"	1'-5"					
FA507	12		12	2'-1"	26	STR							
FA508	72		72	21'-4"	1602	3	6'-8"	3'-8"					
FA601	136	123	259	14'-0"	5446	3	3'-4"	3'-3"					
FA602	88		88	42'-4"	5595	STR							
FA603		88	88	33'-2"	4384	STR							
FA604	136	52	188	20'-11"	5906	1	1'-0"	20'-1"					
FA605	68	26	94	9'-2"	1294	2	3'-1"	3'-4"	3'-1"				
FA606		72	72	24'-6"	2650	1	1'-0"	23'-8"					
FA607		36	36	17'-8"	955	2	7'-4"	3'-4"	7'-4"				
FA608		20	20	35'-4"	1061	STR							
FA609	28		28	11'-10"	498	3	2'-11"	2'-7"					
FA610	70		70	12'-6"	1314	3	2'-11"	2'-11"					
	4 SR		4 SR	12'-7"				2'-11 1/2"					
FA611	OF		OF	TO	610	3	2'-11"	TO					0'-3 3/4"
	7		7	16'-4"				4'-10"					
FA612	16		16	14'-10"	356	3	4'-5"	2'-7"					
FA613	56		56	7'-7"	638	1	1'-0"	6'-9"					
FA614	140		140	7'-11"	1665	1	1'-0"	7'-1"					
	8 SR		8 SR	8'-1"				7'-3"					
FA615	OF		OF	TO	757	1	1'-0"	TO					0'-3 1/2"
	7		7	9'-10"				9'-0"					
FA616	52		52	8'-4"	651	STR							
	4 SR		4 SR	8'-5"									
FA617	OF		OF	TO	455	STR							0'-3 1/2"
	8		8	10'-6"									
	4 SR		4 SR	10'-10"									
FA618	OF		OF	TO	496	STR							0'-3 3/4"
	7		7	12'-9"									
	4 SR		4 SR	13'-1"									
FA619	OF		OF	TO	1178	STR							0'-4"
	13		13	17'-1"									
	4 SR		4 SR	17'-5"									
FA620	OF		OF	TO	771	STR							0'-3 3/4"
	7		7	19'-3"									
	4 SR		4 SR	19'-7"									
FA621	OF		OF	TO	1833	STR							0'-4"
	14		14	24'-0"									
FA622	4		4	24'-3"	146	STR							
FA623	126		126	5'-2"	978	2	0'-8"	1'-8 1/2"	3'-1"				
	4 SR		4 SR	7'-5"									
FA624	OF		OF	TO	2828	STR							1'-6"
	21		21	37'-5"									
FA625	44		44	47'-8"	3150	STR							
FA626	44	31	75	17'-4"	1953	3	5'-8"	2'-7"					
FA627	88	62	150	21'-0"	4731	1	1'-0"	20'-2"					
FA628	44	31	75	7'-0"	789	2	3'-1"	1'-2"	3'-1"				
FA629	88		88	24'-6"	3238	STR							
FA630		44	44	33'-6"	2214	STR							
FA801	40		40	45'-3"	4833	STR							
FA802		40	40	34'-8"	3702	STR							
FA803	52		52	21'-9"	3020	13	4'-3"	9'-5"	9'-5"	4'-3"			
FA804	88	44	132	20'-1"	7078	13	4'-3"	8'-4"	2'-6"	7'-3"			
FA805	48	40	88	13'-1"	3074	1	1'-4"	12'-0"					
FA806	8		8	15'-9"	336	19	8'-6"	6'-6"	3'-3"				
FA807	8		8	15'-2"	324	19	7'-11"	6'-6"	3'-3"				

MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
FORWARD ABUTMENT (CONTINUED)													
FA808	16		16	33'-5"	1428	STR							
FA809	8		8	15'-4"	328	19	8'-1"	6'-6"	3'-3"				
FA810	8		8	14'-8"	313	19	7'-5"	6'-6"	3'-3"				
FA811	16		16	7'-8"	328	STR							
FA812	16		16	9'-8"	413	STR							
FA813	20		20	24'-6"	1308	STR							
FA814		10	10	33'-6"	894	STR							
DS801	84	70	154	42'-0"	*17270	STR							
DS802	112		112	30'-0"	*8971	16	29'-2"						
DS803	28		28	27'-8"	*2068	STR							
DS804	28		28	23'-0"	*1719	STR							
DS805	28		28	16'-5"	*1227	STR							
DS806	28		28	11'-10"	*885	STR							
DS1101	48	24	72	20'-0"	*7651	STR							
DS1102	48	24	72	30'-0"	*11476	16	28'-5"						
SP401	6	5	11	36'-10"	*5744	27	0'-4 1/2"	2'-6"					
SP402	4	2	6	38'-9"	*3291	27	0'-4 1/2"	2'-6"					
SP403	2		2	51'-5"	*1446	27	0'-4 1/2"	2'-6"					
SP404	2		2	46'-7"	*1313	27	0'-4 1/2"	2'-6"					
SP405	2		2	40'-2"	*1136	27	0'-4 1/2"	2'-6"					
SP406	2		2	35'-8"	*1012	27	0'-4 1/2"	2'-6"					
SUB-TOTAL					90,188								

* - FOR INFORMATION ONLY



NOTES:

THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGIT WHERE FOUR ARE USED INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S601:

S: LOCATION OF THE BARS IN THE STRUCTURE (SUPERSTRUCTURE)
6: BAR SIZE DIMENSION NO. 6
01: SEQUENCE NUMBER

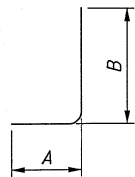
BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BAR BEND AT THE END OF THE BAR. ALL REINFORCING STEEL IS TO BE EPOXY COATED. STRAIGHT ARE INDICATED BY "STR".



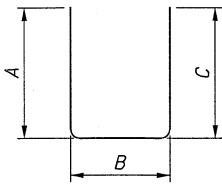
P:\76691\structures\ALL075_0703C\sheets\075_0703CRL002.dgn 7/10/2013 9:07:14 AM bgarrison

MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
SUPERSTRUCTURE - SOUTHBOUND													
S401	90	54	144	30'-0"	2886	STR							
S402	30	18	48	40'-0"	1283	STR							
S403	32	16	48	4'-5"	142	2	0'-8"	3'-3"	0'-8"				
S404	14	14	28	5'-1"	95	2	1'-0"	3'-4"	1'-0"				
S405	24	12	36	4'-0"	96	STR							
S406	24	12	36	3'-9"	*	24	0'-4 1/2"	1'-7"				0'-1 3/4"	
S501	87	51	138	30'-0"	4318	STR							
S502	29	17	46	41'-6"	1991	STR							
S503	229	229	458	9'-7"	4578	16	9'-0"						
S504	229		229	33'-2"	7922	16	32'-7"						
S505	229		229	32'-7"	7782	STR							
S506		229	229	17'-4"	4140	16	16'-9"						
S507		229	229	16'-9"	4001	STR							
S508	72	44	116	11'-5"	1381	2	4'-2"	3'-4"	4'-2"				
S509	36	22	58	14'-1"	852	2	5'-11"	2'-6"	5'-11"				
S801	40	24	64	4'-9"	812	18	1'-0"	1'-0"	2'-10"				
S802	32	8	40	7'-0"	748	STR							
S803	8	2	10	4'-4"	116	STR							
S804	8	8	16	2'-10"	121	STR							
S805	2	2	4	1'-6"	16	STR							
S806	26		26	29'-10"	2071	35	29'-10"						
S807		26	26	16'-10"	1169	36	16'-10"						
SUB-TOTAL					46,520								
PARAPETS - SOUTHBOUND													
R501	24	24	48	30'-0"	1502	STR							
R502	12	12	24	10'-5"	261	STR							
R503	137	137	274	6'-11"	1977	23	0'-8"	3'-3"	3'-0"			0'-1 1/2"	
R601	4	4	8	30'-0"	360	STR							
R602	2	2	4	12'-1"	73	STR							
R603	137	137	274	4'-8"	1921	1	1'-0"	3'-10"					
R604	137	137	274	3'-3"	1338	14	0'-10 1/2"	0'-11 1/2"	0'-8 1/2"	0'-6"	0'-9"		
SUB-TOTAL					7,432								

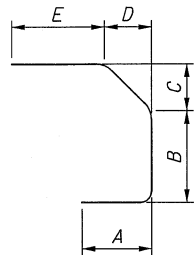
* S406 TO BE INCLUDED IN BEAM



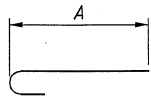
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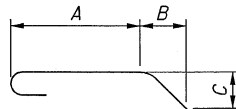
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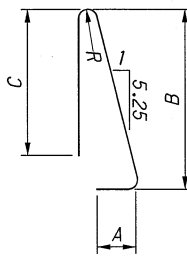
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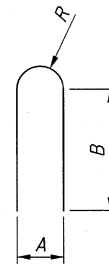
TYPE-16



TYPE-18



TYPE-23



TYPE-24

MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
SUPERSTRUCTURE - NORTHBOUND													
S401	90	54	144	30'-0"	2886	STR							
S402	30	18	48	40'-0"	1283	STR							
S403	32	16	24	4'-5"	142	2	0'-8"	3'-3"	0'-8"				
S404	14	14	14	5'-1"	96	2	1'-0"	3'-4"	1'-0"				
S405	24	12	18	4'-0"	96	STR							
S406	24	12	18	3'-9"	*	24	0'-4 1/2"	1'-7"				0'-1 3/4"	
S501	87	51	138	30'-0"	4318	STR							
S502	29	17	46	41'-6"	1991	STR							
S503	229	229	458	9'-7"	4578	16	9'-0"						
S504	229		229	33'-2"	7922	16	32'-7"						
S505	229		229	32'-7"	7782	STR							
S506		229	229	17'-4"	4140	16	16'-9"						
S507		229	229	16'-9"	4001	STR							
S508	72	44	116	11'-5"	1381	2	4'-2"	3'-4"	4'-2"				
S509	36	22	58	14'-1"	852	2	5'-11"	2'-6"	5'-11"				
S801	40	24	64	4'-9"	812	18	1'-0"	1'-0"	2'-10"				
S802	32	8	40	7'-0"	748	STR							
S803	8	2	10	4'-4"	116	STR							
S804	8	8	16	2'-10"	121	STR							
S805	2	2	4	1'-6"	16	STR							
S806	26		26	29'-10"	2071	35	29'-10"						
S807		26	26	16'-10"	1169	36	16'-10"						
SUB-TOTAL					46,520								
PARAPETS - NORTHBOUND													
R501	24	24	48	30'-0"	1502	STR							
R502	12	12	24	10'-5"	261	STR							
R503	137	137	274	6'-11"	1977	23	0'-8"	3'-3"	3'-0"			0'-1 1/2"	
R601	4	4	8	30'-0"	360	STR							
R602	2	2	4	12'-1"	73	STR							
R603	137	137	274	4'-8"	1921	1	1'-0"	3'-10"					
R604	137	137	274	3'-3"	1338	14	0'-10 1/2"	0'-11 1/2"	0'-8 1/2"	0'-6"	0'-9"		
SUB-TOTAL					7,432								

* S406 TO BE INCLUDED IN BEAM

NOTES:

THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGIT WHERE FOUR ARE USED INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S601:

S: LOCATION OF THE BARS IN THE STRUCTURE (SUPERSTRUCTURE)
6: BAR SIZE DIMENSION NO. 6
01: SEQUENCE NUMBER

BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BAR BEND AT THE END OF THE BAR. ALL REINFORCING STEEL IS TO BE EPOXY COATED. STRAIGHT ARE INDICATED BY "STR".

ALL-75-5.53
PID No. 76691

REINFORCING STEEL LIST (3 OF 4)
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

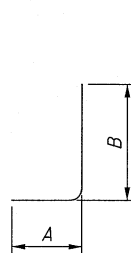
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CHECKED: GMW
DRAWN: BMG
REVIEWED: BMG
DATE: 6/2013
DFT: 0202037
STRUCTURE FILE NUMBER: 0202053
LEFT: 0202037
RIGHT: 0202053

EL. ROBINSON
ENGINEERING
1801 Walmark Drive, Suite 310 - Columbus, Ohio 43215
www.elrobinsonengineering.com

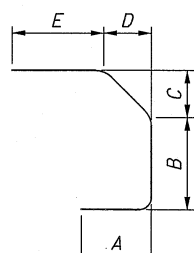
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MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
APPROACH SLAB - SOUTHBOUND													
AS501	22		22	3'-9"	86	16	3'-2"						
AS502	NOT USED												
AS503	4		4	13'-10"	58	25	10'-0"	2'-5"	1'-4"	0'-1 1/2"	0'-5"		
AS504	4		4	13'-8"	57	STR							
AS505	36	30	66	6'-11"	476	23	0'-8"	3'-3"	3'-0"			0'-1 1/2"	
AS506	4		4	19'-2"	80	STR							
AS507	8		8	29'-7"	247	STR							
		2 SR	2 SR	2'-11"			2'-4"						
AS508		OF	OF	TO	76	16	TO						0'-1"
		11	11	3'-9"			3'-2"						
AS509		4	4	19'-3"	80	STR							
AS510		8	8	18'-3"	152	STR							
AS511		16	16	10'-0"	167	STR							
AS512		6	6	6'-6"	41	STR							
AS513		2	2	6'-6"	14	19	5'-2"	1'-4"	0'-4"				
AS514		2	2	7'-6"	16	STR							
AS515		2	2	7'-6"	16	19	6'-2"	1'-4"	0'-4"				
AS516		2	2	8'-2"	17	STR							
AS517		2	2	8'-2"	17	19	6'-10"	1'-4"	0'-4"				
AS601	38		38	4'-8"	266	16	4'-0"						
AS602	58	44	102	3'-3"	498	14	0'-10 1/2"	1'-0"	0'-8 1/2"	0'-6"	0'-9"		
AS603	36		36	4'-7"	248	1	1'-0"	3'-9"					
AS604	2	2	4	20'-1"	121	STR							
AS605		22	22	2'-6"	83	1	1'-0"	1'-8"					
AS606	NOT USED												
		2 SR	2 SR	4'-1"				3'-3"					
AS607		OF	OF	TO	149	1	1'-0"	TO					0'-1"
		11	11	4'-10"				4'-0"					
AS608		16	16	4'-1"	98	1	1'-0"	3'-3"					
SUB-TOTAL					3,063								

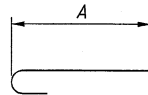
MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS						
	PHASE I	PHASE II	TOTAL				A	B	C	D	E	R	INC
APPROACH SLAB - SOUTHBOUND													
AS501	22		22	3'-9"	86	16	3'-2"						
AS502	NOT USED												
AS503	4		4	13'-10"	58	25	10'-0"	2'-5"	1'-4"	0'-1 1/2"	0'-5"		
AS504	4		4	13'-8"	57	STR							
AS505	36	30	66	6'-11"	476	23	0'-8"	3'-3"	3'-0"			0'-1 1/2"	
AS506	4		4	19'-2"	80	STR							
AS507	8		8	29'-7"	247	STR							
		2 SR	2 SR	2'-11"			2'-4"						
AS508		OF	OF	TO	76	16	TO						0'-1"
		11	11	3'-9"			3'-2"						
AS509		4	4	19'-3"	80	STR							
AS510		8	8	18'-3"	152	STR							
AS511		16	16	10'-0"	167	STR							
AS512		6	6	6'-6"	41	STR							
AS513		2	2	6'-6"	14	19	5'-2"	1'-4"	0'-4"				
AS514		2	2	7'-6"	16	STR							
AS515		2	2	7'-6"	16	19	6'-2"	1'-4"	0'-4"				
AS516		2	2	8'-2"	17	STR							
AS517		2	2	8'-2"	17	19	6'-10"	1'-4"	0'-4"				
AS601	38		38	4'-8"	266	16	4'-0"						
AS602	58	44	102	3'-3"	498	14	0'-10 1/2"	1'-0"	0'-8 1/2"	0'-6"	0'-9"		
AS603	36		36	4'-7"	248	1	1'-0"	3'-9"					
AS604	2	2	4	20'-1"	121	STR							
AS605		22	22	2'-6"	83	1	1'-0"	1'-8"					
AS606	NOT USED												
		2 SR	2 SR	4'-1"				3'-3"					
AS607		OF	OF	TO	149	1	1'-0"	TO					0'-1"
		11	11	4'-10"				4'-0"					
AS608		16	16	4'-1"	98	1	1'-0"	3'-3"					
SUB-TOTAL					3,063								



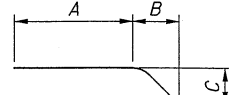
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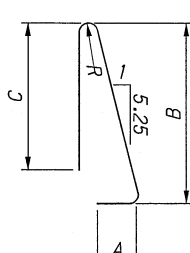
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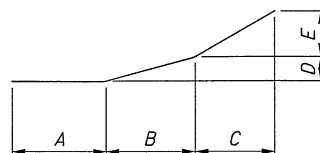
TYPE-16



TYPE-19



TYPE-23



TYPE-25

* REINFORCING BAR UTILIZES A MECHANICAL CONNECTOR. BAR LENGTH ADJUSTMENT AND/OR END PREPARATION MAY BE NECESSARY DEPENDING UPON THE TYPE OF CONNECTOR USED.

NOTES:

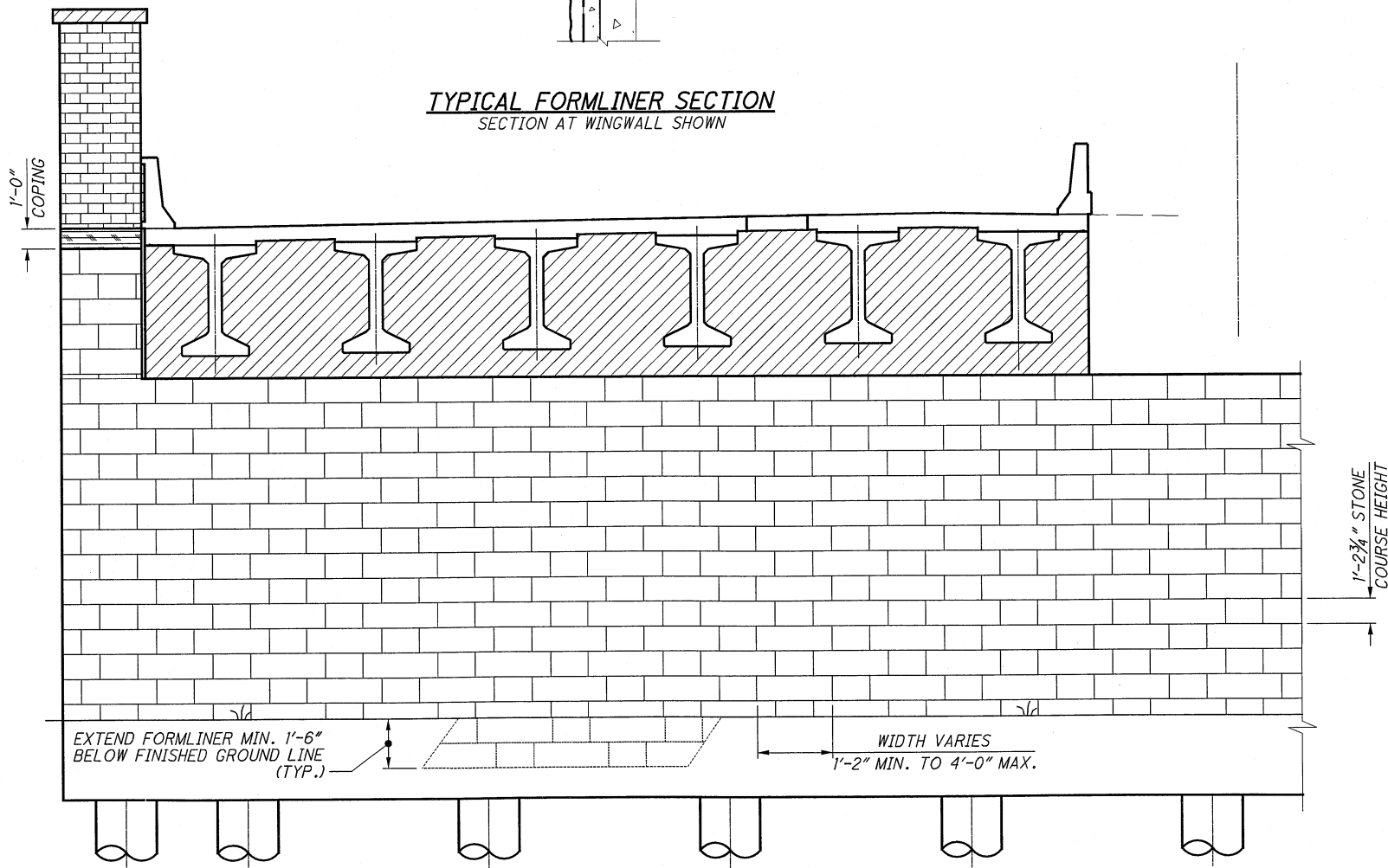
THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGIT WHERE FOUR ARE USED INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S601:

S: LOCATION OF THE BARS IN THE STRUCTURE (SUPERSTRUCTURE)
6: BAR SIZE DIMENSION NO. 6
01: SEQUENCE NUMBER

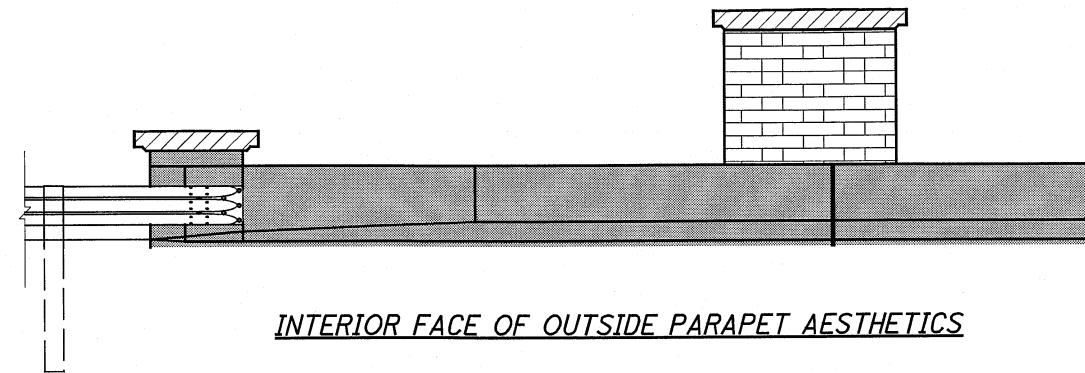
BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BAR BEND AT THE END OF THE BAR. ALL REINFORCING STEEL IS TO BE EPOXY COATED. STRAIGHT ARE INDICATED BY "STR".



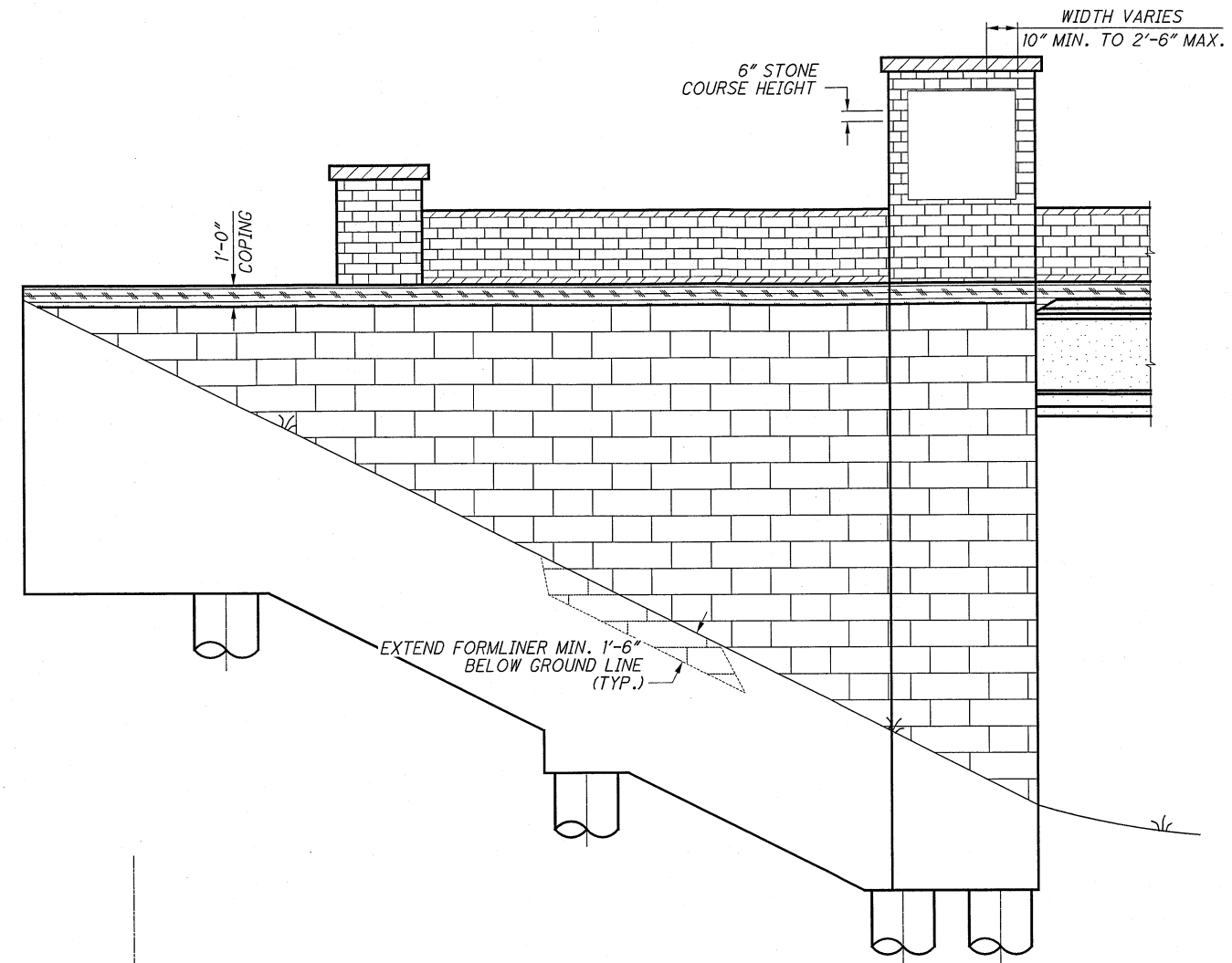
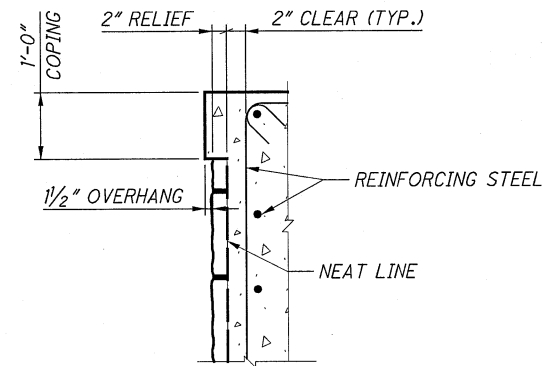
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TYPICAL FORMLINER SECTION
SECTION AT WINGWALL SHOWN



INTERIOR FACE OF OUTSIDE PARAPET AESTHETICS



LEGEND:

-  FORMLINER PATTERN 1:
- ROUGH CUT STONE FORMLINER W/ 2" RELIEF
AND INTEGRALLY COLORED CONCRETE,
FEDERAL COLOR NO. 36373, GRAY
-  FORMLINER PATTERN 2:
- ROUGH CUT STONE FORMLINER W/ 1 5/8" RELIEF
AND INTEGRALLY COLORED CONCRETE,
FEDERAL COLOR NO. 36373, GRAY
-  -INTEGRALLY COLORED CONCRETE
FEDERAL COLOR NO. 36373, GRAY
-  -EPOXY-URETHANE SEALER
FEDERAL COLOR NO. 25095, BLUE
-  -EPOXY-URETHANE SEALER
FEDERAL COLOR NO. 37875, WHITE
-  -EPOXY-URETHANE SEALER
FEDERAL COLOR NO. 36373, GRAY

AESTHETIC DETAILS
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53
PID No. 76691

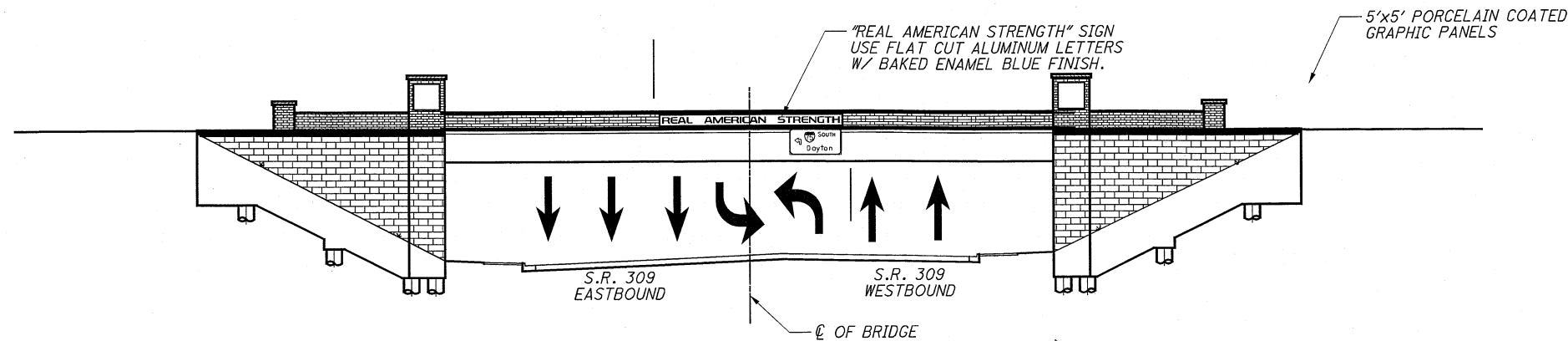
37/38



E.L. ROBINSON
ENGINEERING
1801 Walmark Drive, Suite 310 • Columbus, Ohio 43215
www.elrobinsonengineering.com

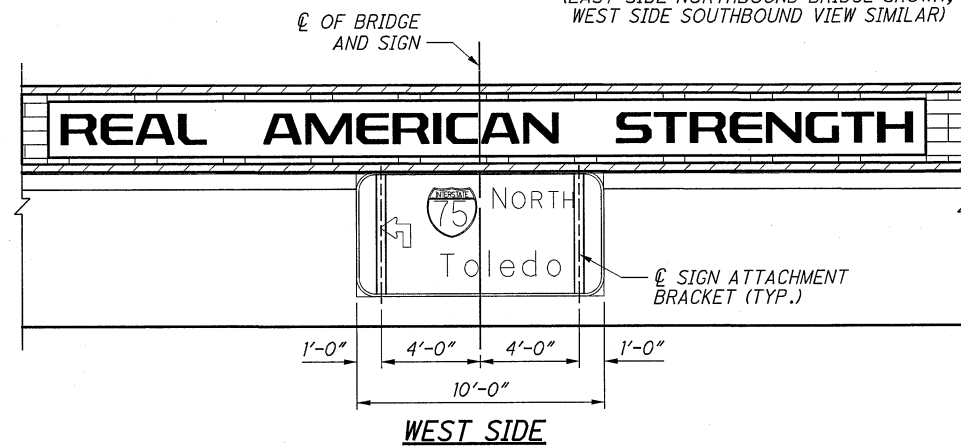
DATE: 6/2013
REVIEWED: RER
DESIGNED: BMG
CHECKED: DFT
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P:\76691\structures\ALL075_0703C\sheets\075_0703CMD004.dgn 7/10/2013 9:07:17 AM bgarrison

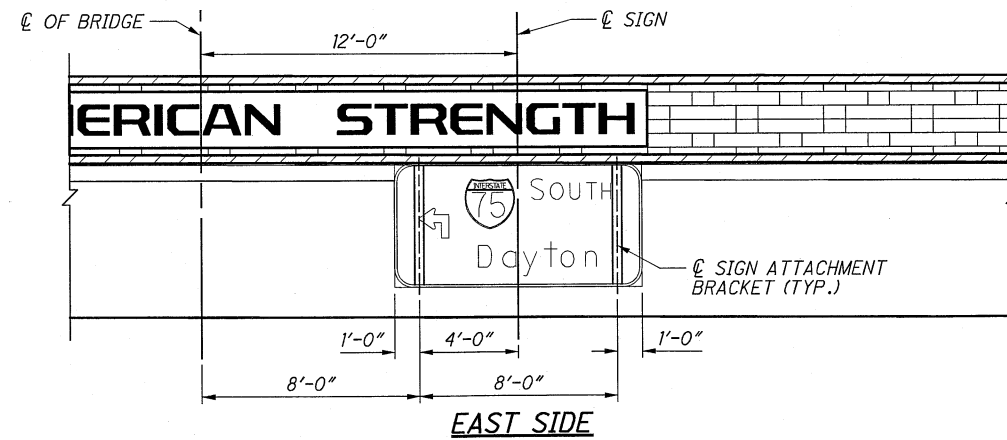


ELEVATION VIEW

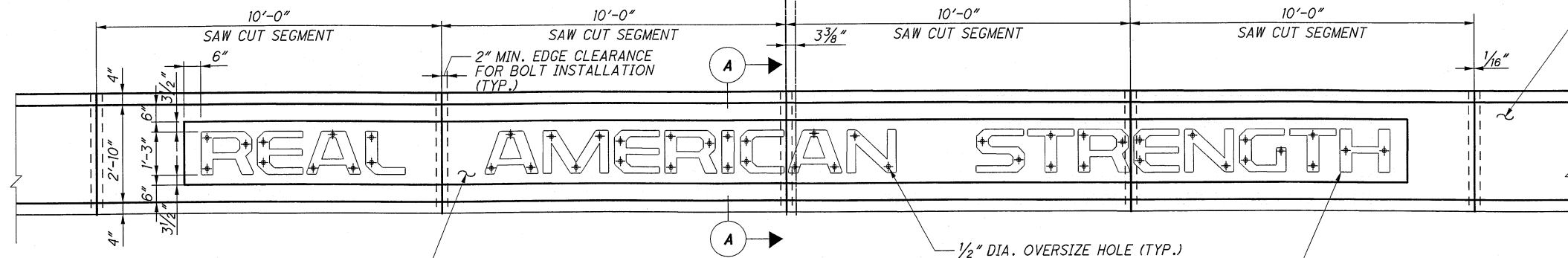
(EAST SIDE NORTHBOUND BRIDGE SHOWN, WEST SIDE SOUTHBOUND VIEW SIMILAR)



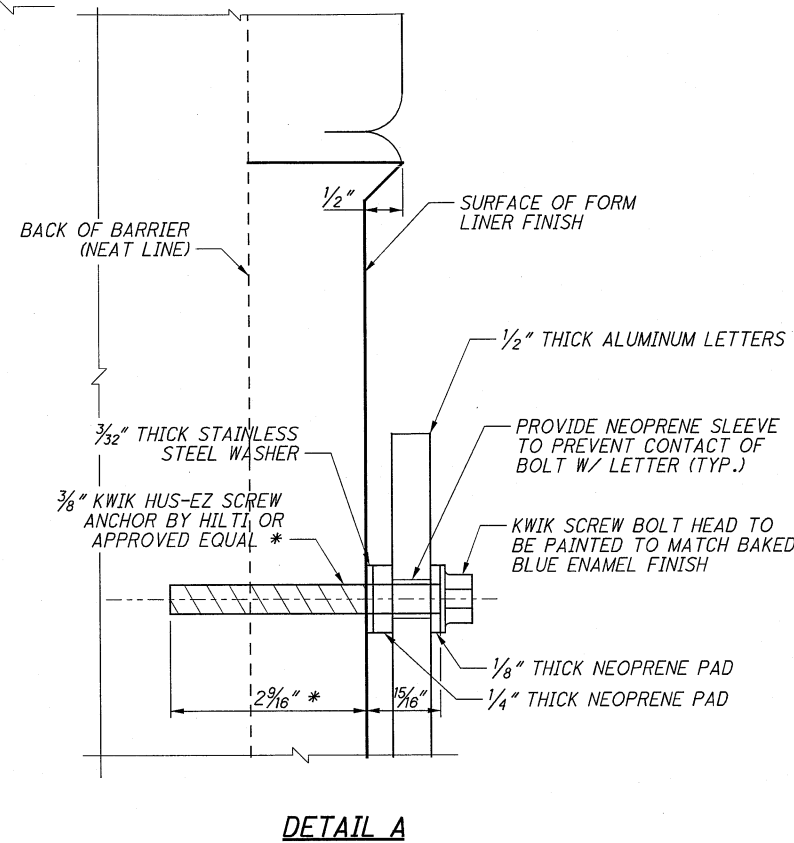
WEST SIDE



EAST SIDE

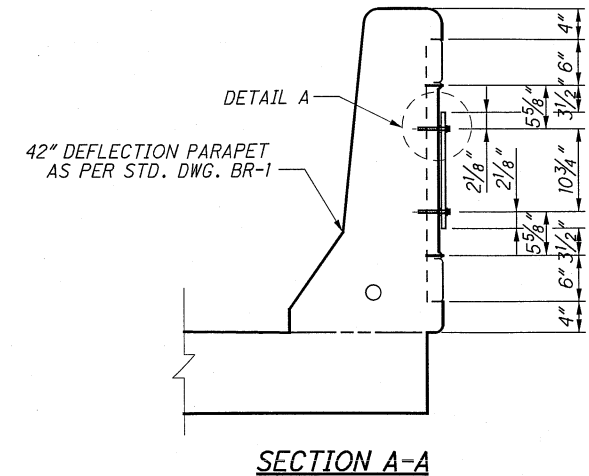


"REAL AMERICAN STRENGTH" SIGN



DETAIL A

* CONTRACTOR TO REFER TO MANUFACTURER SPECIFICATIONS FOR PROPER ANCHOR BOLT INSTALLATION



SECTION A-A

NOTES:

1. 1/8" AND 1/4" THICK WHITE ELASTOMERIC PADS, ASTM D4637, TYPE I (DUROMETER 50-55) OR APPROVED EQUAL SHALL BE PROVIDED BETWEEN BOLT HEADS AND WASHERS AND THE PLAQUE FACES TO PROTECT THE PORCELAIN ENAMEL COATING.
2. FOR NOTES SEE SHEET [37/38].
3. SEE STANDARD DRAWING TC-18.24 FOR ADDITIONAL NOTES AND DETAILS REGARDING THE MOUNTED SIGN SUPPORT. THE VERTICAL LOCATION OF THE LOWER ANCHOR BOLT SHALL BE A MINIMUM OF 26 INCHES FROM THE BOTTOM OF THE BEAM. ALL WORK NECESSARY TO FABRICATE AND INSTALL THE BOTTOM SIGN CONNECTIONS SHALL BE BASED ON THE FINAL ANCHOR BOLT LOCATIONS IN THE BEAMS, BASED ON FIELD MEASUREMENT.

DESIGN AGENCY
PARSONS BRINCKERHOFF
2545 FARMERS DRIVE
SUITE 350
COLUMBUS, OHIO 43235

DATE
05/24/12

REVIEWED
EBS
STRUCTURE FILE NUMBER
LEFT: 0202037
RIGHT: 0202053

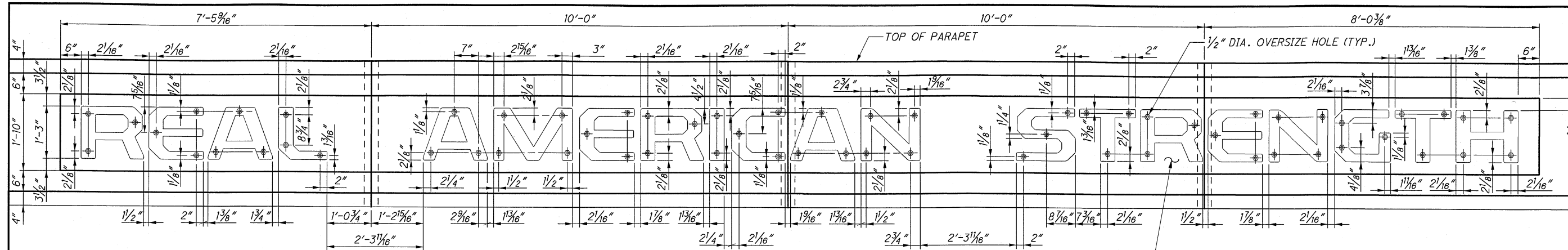
DRAWN
TLP
CHECKED
EJC

AESTHETICS DETAILS
BRIDGE NO. ALL-75-0703 L&R
I-75 OVER S.R. 117 & S.R. 309

ALL-75-5.53
PID No. 76691

38/38





LETTERING HOLE LAYOUT
(HOLES IN PARAPET TO BE FIELD DRILLED PER
ANCHOR MANUFACTURER'S SPECIFICATIONS)

NOTE:
ONLY ONE RECURRING LETTER WAS DIMENSIONED TO PROVIDE
CLARITY FOR THE DRAWING. IF LETTER IS NOT DIMENSIONED,
LOOK TO SIMILAR LETTER FOR THE DIMENSIONING AND
CONSTRUCT SIMILIAR.

NOTES:

1. ALL HARDWARE, INCLUDING ANCHOR BOLTS AND WASHERS SHALL BE STAINLESS STEEL.
2. TO ENSURE CORROSION DOES NOT OCCUR BETWEEN THE STEEL PARTS AND ALUMINUM PARTS, PREVENT CONTACT BETWEEN ALUMINUM AND STEEL PARTS WITH A MINIMUM 1/16 INCH THICK CHLOROPRENE OR NEOPRENE GASKET OR APPROVED EQUAL.
3. HOLES IN BRIDGE PARAPET AND TOWERS ARE FIELD DRILLED AND SHALL BE PREPARED PER THE ANCHOR BOLT MANUFACTURERS GUIDELINES.
4. "REAL AMERICAN STRENGTH" SHALL BE FASTENED PER THE DETAIL ON THE EAST SIDE OF THE NORTHBOUND STRUCTURE AND THE WEST SIDE OF THE SOUTHBOUND STRUCTURE VISIBLE TO MOTORISTS TRAVELING EAST AND WEST ON S.R. 309. THE GEAR PLAQUES WILL BE FASTENED TO THE OUTSIDE FACE OF ALL FOUR LARGE BRIDGE TOWERS, VISIBLE TO S.R. 309 TRAFFIC.
5. TRUE TYPE FONT REXLIA FREE WILL BE USED FOR ALL BRIDGE AESTHETIC LETTERING. USE 15 INCH TALL LETTERS FOR "REAL AMERICAN STRENGTH". THE FONT IS AVAILABLE FROM THE CITY OF LIMA AND THE LOCAL COMMUNITY BRANDING COMMITTEE WEBSITE, WWW.REALAMERICANSTRENGTH.COM.

ITEM SPECIAL 530 - STRUCTURE, MISC. BRIDGE MOUNTED DISPLAYS:

THIS ITEM INCLUDES MOUNTING OF ALUMINUM LETTERS AND FOUR "GEAR LOGO" PLAQUES TO THE PROPOSED BRIDGE. THIS INCLUDES THE PHRASE "REAL AMERICAN STRENGTH" ON THE EAST AND WEST OUTSIDE PARAPETS OF THE BRIDGES AND ONE 5' X 5' "GEAR LOGO" PLAQUE ON EACH OF THE FOUR LARGE TOWERS/PILASTERS.

THE CITY OF LIMA SHALL PROVIDE THE GRAPHIC IMAGES FOR THE GEAR LOGO SHOWN AND ANY ADDITIONAL INFORMATION TO ACCURATELY REPRODUCE THE DISPLAYS SHOWN ON THESE SHEETS. THE GEAR LOGO PLAQUES SHALL BE COMPRISED OF PORCELAIN ENAMEL COATED GRAPHIC PANELS SUPPLIED BY ADVANCED SIGNS, 2222 ASHMORE AVENUE, CHATANOOGA, TN 37415, PHONE 866-780-0619 OR AN APPROVED EQUAL. THEY SHALL BE ATTACHED TO THE CONCRETE TOWERS BY STAINLESS STEEL HILTI KWIK HUS-EZ SCREW ANCHORS OR APPROVED EQUAL.

THE CONTRACTOR IN COORDINATION WITH THE DISPLAY PROVIDER SHALL PROVIDE SHOP DRAWINGS AND SAMPLES OF WORK FOR APPROVAL BY THE ENGINEER AND CITY OF LIMA. THE ENGINEER SHALL DETERMINE WHEN ADDITIONAL REVIEW WILL BE REQUIRED BY FHWA. THE CONTRACTOR AND SUPPLIER MUST COORINATE THESE DRAWINGS. ENSURE THAT THE SHOP DRAWINGS MEET PROJECT REQUIREMENTS, INCLUDING MATERIALS, FIELD MEASUREMENTS, CONSTRUCTION SPECIFICATIONS, CONTRACT DOCUMENTS, PERFORMANCE CRITERIA, AND SIMILAR DATA.

THE CITY OF LIMA WILL NOT MAKE ALLOWANCE FOR ADDITIONAL COST OR DELAYS TO THE CONTRACTOR FOR INCORRECT MANUFACTURING AS A RESULT OF FAILURE TO COORDINATE.

FOR THE SHOP DRAWINGS, THE CONTRACTOR SHALL VERIFY AND ADJUST ACCORDINGLY THE DIMENSIONS FOR THE LETTER AND PLAQUE CONNECTIONS WITH FIELD MEASUREMENTS OF THE MOUNTING SURFACES. THE REQUIRED SHOP DRAWINGS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FEATURES OUTLINED ABOVE, AN ELEVATION VIEW INCLUDING DIMENSIONS FROM THE CENTER OF THE DISPLAY TO THE MOUNTING HOLES, AND DIMENSIONS AND FABRICATION DETAILS OF ANY CONNECTION TEMPLATES OR OTHER DEVICES OR HARDWARE. THE DISPLAYS SHALL NOT BE MANUFACTURED UNTIL RECEIVING APPROVAL OF THE SHOP DRAWINGS.

ALL COSTS ASSOCIATED WITH THE DISPLAYS, INCLUDING ADDITIONAL WORK DESCRIBED ABOVE, AS WELL AS THE COMPLETE INSTALLATION AND ASSEMBLY OF THE DISPLAYS (INCLUDING OVERHEAD AND PROFIT) SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR ITEM SPECIAL 530 - STRUCTURE, MISC.: BRIDGE MOUNTED DISPLAYS.

