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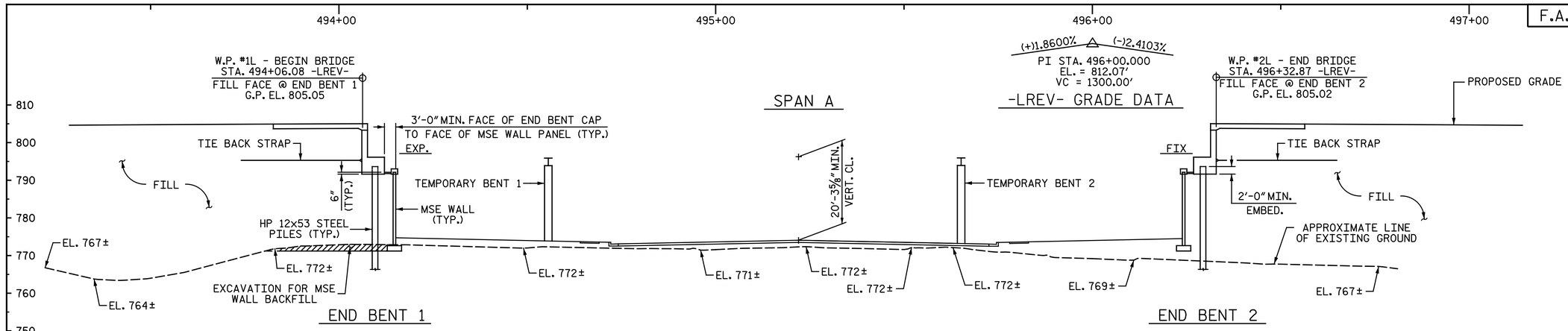
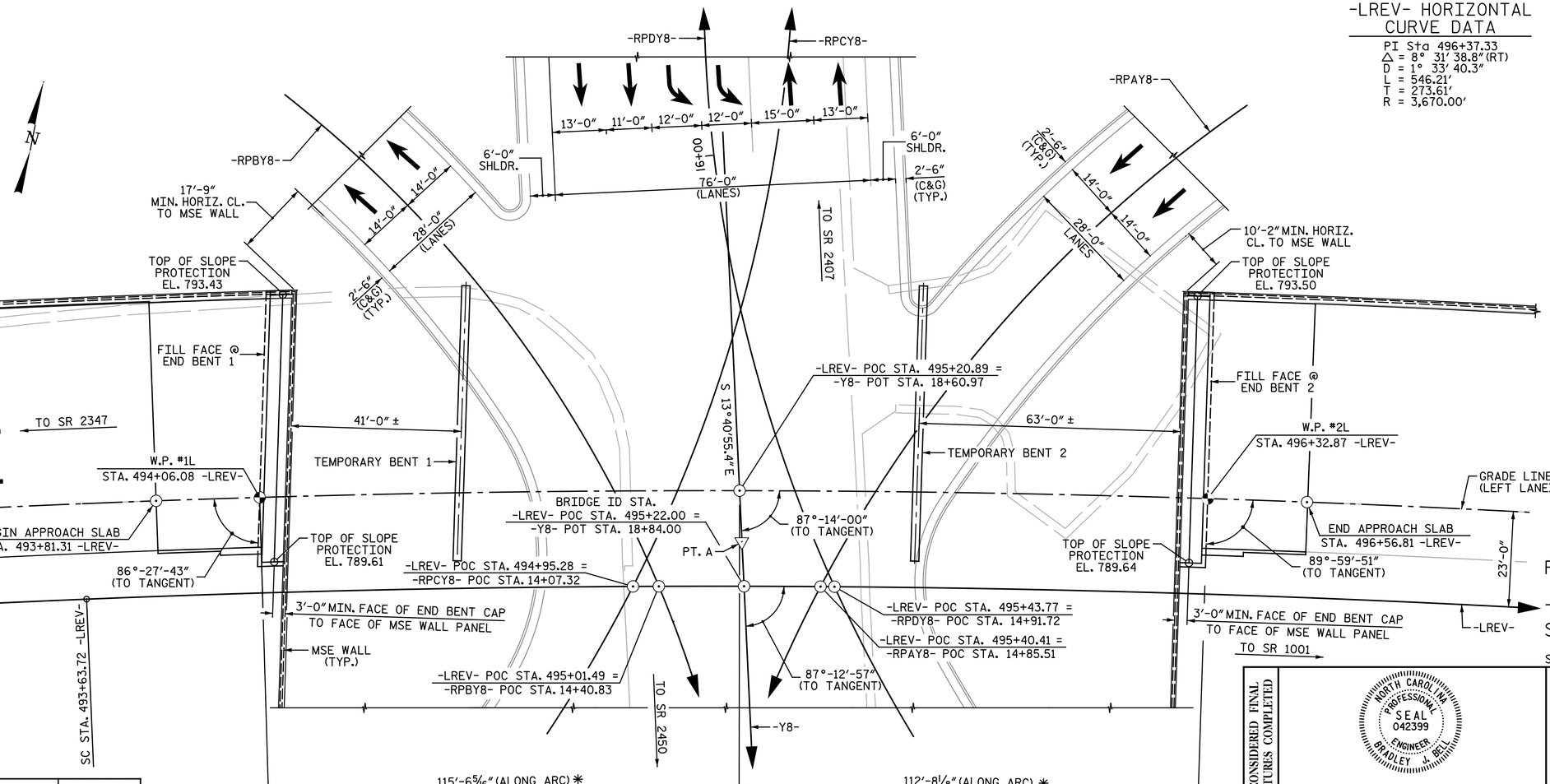
F.A. PROJECT NO. : NHF-0708(53)



SECTION ALONG GRADE LINE (LEFT LANE)

(END BENTS ON SECTION AT RIGHT ANGLES TO END BENTS)



PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

* MEASURED ALONG GRADE LINE (LEFT LANE)

-LREV- HORIZONTAL CURVE DATA

PI Sta 496+37.33
△ = 8° 31' 38.8"(RT)
D = 1° 33' 40.3"
L = 546.21'
T = 273.61'
R = 3,670.00'

-RPAY8- HORIZONTAL CURVE DATA

PI Sta 14+17.82
△ = 91° 15' 39.5"(LT)
D = 17° 37' 46.1"
L = 517.66'
T = 332.23'
R = 325.00'

-RPBY8- HORIZONTAL CURVE DATA

PI Sta 13+23.49
△ = 81° 15' 15.8"(RT)
D = 19° 25' 20.3"
L = 418.36'
T = 253.09'
R = 295.00'

-RPCY8- HORIZONTAL CURVE DATA

PI Sta 13+33.32
△ = 77° 21' 58.8"(LT)
D = 16° 00' 15.9"
L = 483.41'
T = 286.64'
R = 358.00'

-RPDY8- HORIZONTAL CURVE DATA

PI Sta 13+84.61
△ = 68° 34' 57.3"(RT)
D = 16° 22' 12.8"
L = 418.95'
T = 238.68'
R = 350.00'

POINT	STATION ON -Y8-	OFFSET	ELEVATION ON -Y8-
A	18+73.42	0.0	774.09

▽ - DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

DRAWN BY : M.D.M. / J.N.A. DATE : 9-2-15
CHECKED BY : B. J. BELL DATE : 2-19-16

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-
18+84.00 -Y8-
SHEET 1 OF 5 BRIDGE NO. 1180

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Docusigned by: Bradley J. Bell
5/17/2016

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON GREENSBORO WESTERN URBAN LOOP OVER LAWNDALE DRIVE BETWEEN SR 2347 AND SR 1001

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-1
1			3			TOTAL SHEETS
2			4			35

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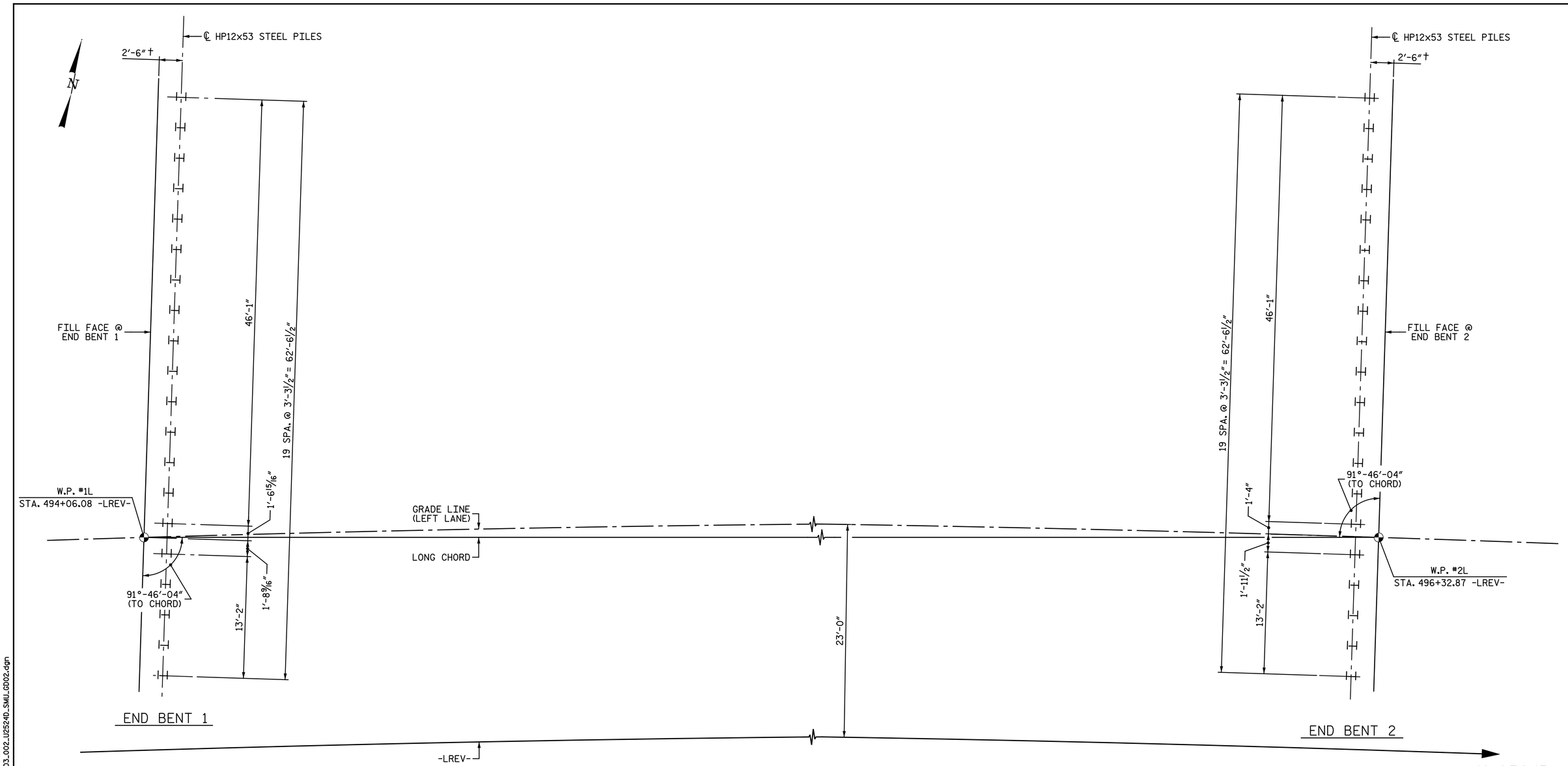

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINES.
ALL PILES ARE VERTICAL HP12x53 STEEL PILES, GRADE 50.

† MEASURED PERPENDICULAR TO FILL FACE AT END BENT

NOTES:

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 250 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 240 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 1 AND/OR END BENT NO. 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-
18+84.00 -Y8-
SHEET 2 OF 5

DRAWN BY : M. D. M./N.B.S. DATE : 2-12-16
CHECKED BY : B. J. BELL DATE : 3-20-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by Bradley J. Bell
5/17/2016

Michael Baker INTERNATIONAL
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON GREENSBORO WESTERN URBAN LOOP OVER LAWNDALE DRIVE BETWEEN SR 2347 AND SR 1001
LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-2
1			3			TOTAL SHEETS
2			4			35

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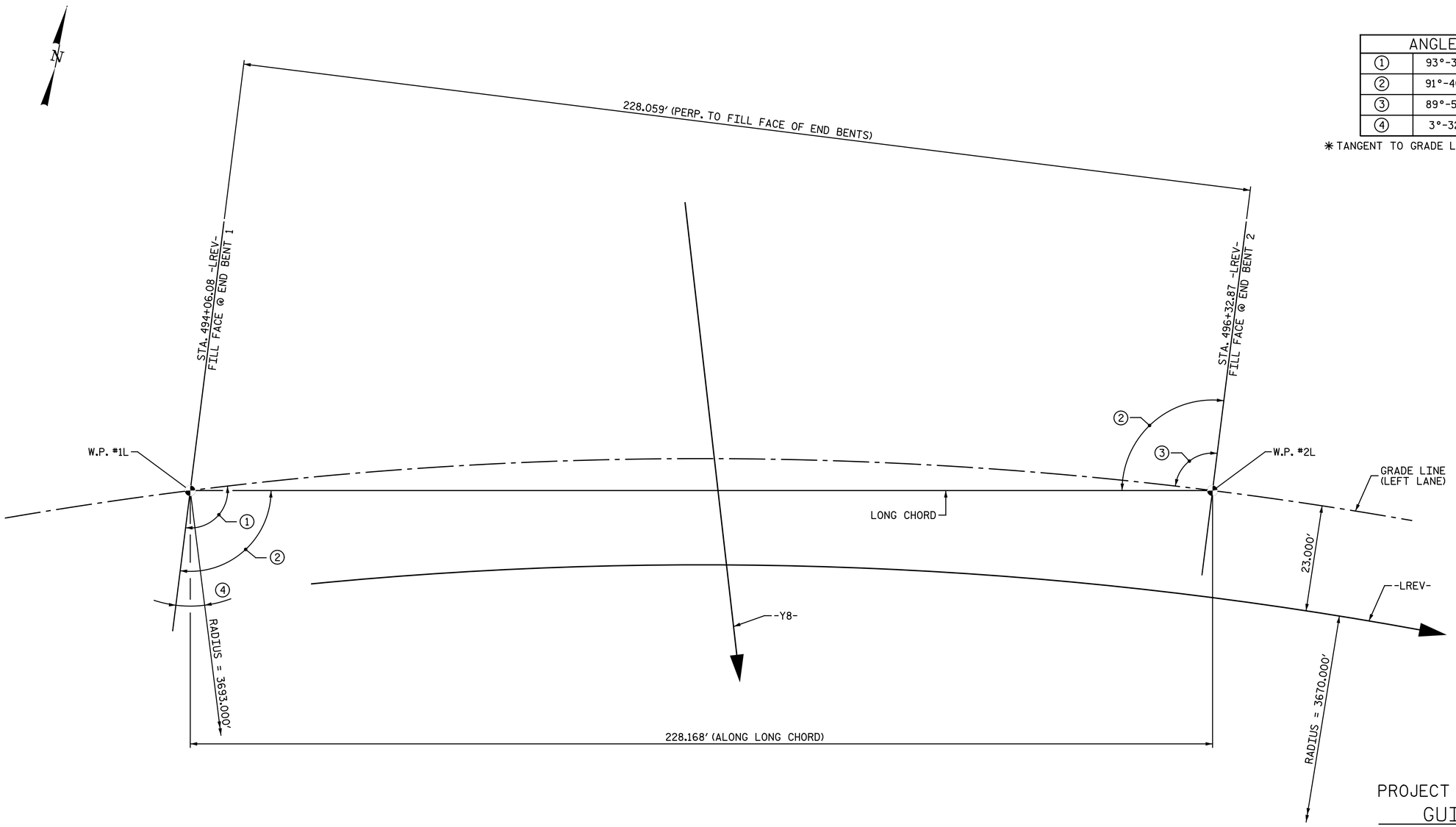
ANGLES	
①	93°-32′-17″ ✳
②	91°-46′-04″
③	89°-59′-51″ ✳
④	3°-32′-17″

✳ TANGENT TO GRADE LINE (LEFT LANE)



LONG CHORD LAYOUT

-LREV- HORIZONTAL CURVE DATA

PI Sta 496+37.33
△ = 8° 31′ 38.8″(RT)
D = 1° 33′ 40.3″
L = 546.21′
T = 273.61′
R = 3,670.00′

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-
18+84.00 -Y8-
SHEET 3 OF 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell
C41A3FBECA3C434...
5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON GREENSBORO WESTERN URBAN LOOP OVER LAWNDALE DRIVE BETWEEN SR 2347 AND SR 1001
LEFT LANES

Michael Baker INTERNATIONAL
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8000 Regency Parkway, Suite 600
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-3
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : C.E.M. / J.N.A. DATE : 8-07-15
CHECKED BY : B. J. BELL DATE : 2-19-16

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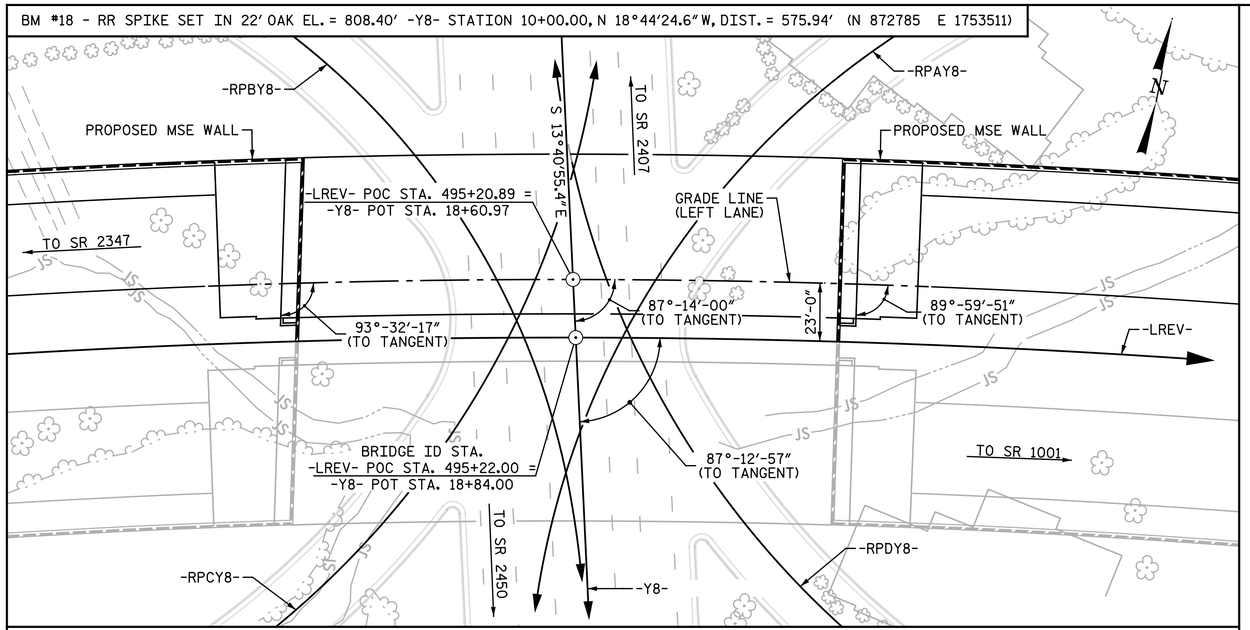

LOCATION SKETCH

NOTES:

ALL STATIONS SHOWN ARE ALONG -LREV- UNLESS NOTED OTHERWISE.

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

SEE RETAINING WALL SHEETS FOR MSE WALL PLANS AND DETAILS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 106 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

GIRDER ERECTION SEQUENCE:

END BENT BACKWALLS AND ALL ASSOCIATED MSE REINFORCEMENT SHALL BE IN PLACE PRIOR TO PLACING ANY STRUCTURAL STEEL.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

ONE EXTERIOR GIRDER AND ITS ADJACENT INTERIOR GIRDER SHALL BE ERECTED WITH ALL DIAPHRAGMS AND LATERAL BRACING BETWEEN THE GIRDERS IN PLACE AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDERS. THE REMAINING GIRDERS SHALL THEN BE ERECTED WITH ALL DIAPHRAGMS CONNECTING THE GIRDER TO THE PREVIOUSLY ERECTED GIRDERS INSTALLED AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDER.

GIRDERS SHALL BE ERECTED AS FOLLOWS: THE FIRST GIRDER SECTION FROM END BENT 1 TO TEMPORARY BENT 1 SHALL BE SET FOR GIRDERS G1L THRU G6L. THE NEXT SECTION OF GIRDER SHALL BE SET FROM THE FIRST GIRDER SECTION PREVIOUSLY ERECTED TO TEMPORARY BENT 2 FOR GIRDERS G1L THRU G6L. THE LAST GIRDER SECTION SHALL BE SET FROM GIRDER SECTION 2 TO END BENT 2 FOR GIRDERS G1L THRU G6L.

A MINIMUM OF TWO TEMPORARY BENTS SHALL BE USED.

TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL DIAPHRAGMS AND LATERAL BRACING ARE INSTALLED AND HIGH STRENGTH BOLTS TIGHTENED.

TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENERS, DIAPHRAGMS MUST BE ATTACHED.

THE LOCATION OF THE TEMPORARY BENTS SHOWN ON SHEET 1 ARE APPROXIMATE LOCATIONS AND SHALL BE ADJUSTED BY THE CONTRACTOR AS NECESSARY.

PLANS FOR TEMPORARY BENTS, ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

TEMPORARY BENTS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS TO THE ENGINEER FOR APPROVAL.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE END BENTS AND TEMPORARY ERECTION BENTS AND ENSURE PLUMBNESS OF THE GIRDER WEBS IN THE FINAL POSITION.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENTS, TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, AND LABOR NECESSARY TO PROVIDE THE TEMPORARY SUPPORTS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

THE CONTRACTOR'S ERECTION PLAN SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE DIAPHRAGMS AND ENSURE THE GIRDERS WILL REMAIN IN THE CAMBERED POSITION.

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

TOTAL BILL OF MATERIAL

LOCATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 x 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS	CONCRETE BARRIER RAIL WITH MOMENT SLAB
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE		14,286	15,746		LUMP SUM		895,790				471.7		LUMP SUM	LUMP SUM	
END BENT 1				71.6		14,465		20	1,100	5		15.5			314.5
END BENT 2				71.6		14,465		20	1,000			15.5			476.5
TOTAL	1	14,286	15,746	143.2	LUMP SUM	28,930	895,790	40	2,100	5	471.7	31.0	LUMP SUM	LUMP SUM	790.9

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-
18+84.00 -Y8-

SHEET 4 OF 5

DRAWN BY : C.E.M./N.B.S. DATE : 8-7-15
CHECKED BY : B. J. BELL DATE : 3-23-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON GREENSBORO WESTERN URBAN LOOP OVER LAWNDALE DRIVE BETWEEN SR 2347 AND SR 1001
LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-4
1			3			TOTAL SHEETS
2			4			35

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.07	--	1.75	0.924	1.20	A	EL	111.59	1.044	1.07	A	I	8.00	1.30	0.924	1.28	A	EL	111.59	1
		HL-93 (OPERATING)	N/A		1.39	--	1.35	0.924	1.56	A	EL	111.59	1.044	1.39	A	I	8.00	1.00	0.924	1.67	A	EL	111.59	1
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.88	67.78	1.75	0.924	2.17	A	EL	111.59	1.044	1.88	A	I	8.00	1.30	0.924	2.31	A	EL	111.59	1
		HS-20 (OPERATING)	36.000		2.44	87.86	1.35	0.924	2.81	A	EL	111.59	1.044	2.44	A	I	8.00	1.00	0.924	3.00	A	EL	111.59	1
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		6.35	79.41	1.40	0.924	7.45	A	EL	111.59	1.044	6.57	A	I	8.00	1.30	0.924	6.35	A	EL	111.59	1
		S3C	21.500		3.70	79.59	1.40	0.924	4.34	A	EL	111.59	1.044	3.83	A	I	8.00	1.30	0.924	3.70	A	EL	111.59	1
		S3A	22.750		3.50	79.67	1.40	0.924	4.11	A	EL	111.59	1.044	3.63	A	I	8.00	1.30	0.924	3.50	A	EL	111.59	1
		S4A	26.750		3.02	80.68	1.40	0.924	3.54	A	EL	111.59	1.044	3.11	A	I	8.00	1.30	0.924	3.02	A	EL	111.59	1
		S5A	30.500		2.65	80.88	1.40	0.924	3.11	A	EL	111.59	1.044	2.77	A	I	8.00	1.30	0.924	2.65	A	EL	111.59	1
		S6A	34.500		2.37	81.62	1.40	0.924	2.77	A	EL	111.59	1.044	2.46	A	I	8.00	1.30	0.924	2.37	A	EL	111.59	1
		S7B	38.500		2.13	82.07	1.40	0.924	2.50	A	EL	111.59	1.044	2.24	A	I	8.00	1.30	0.924	2.13	A	EL	111.59	1
		S7A	40.000	⟨3⟩	2.07	82.83	1.40	0.924	2.43	A	EL	111.59	1.044	2.19	A	I	8.00	1.30	0.924	2.07	A	EL	111.59	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.90	81.85	1.40	0.924	3.40	A	EL	111.59	1.044	2.97	A	I	8.00	1.30	0.924	2.90	A	EL	111.59	1
		T5B	32.000		2.55	81.71	1.40	0.924	2.99	A	EL	111.59	1.044	2.68	A	I	8.00	1.30	0.924	2.55	A	EL	111.59	1
		T6A	36.000		2.29	82.60	1.40	0.924	2.69	A	EL	111.59	1.044	2.41	A	I	8.00	1.30	0.924	2.29	A	EL	111.59	1
		T7A	40.000		2.09	83.46	1.40	0.924	2.45	A	EL	111.59	1.044	2.19	A	I	8.00	1.30	0.924	2.09	A	EL	111.59	1
		T7B	40.000		2.13	85.28	1.40	0.924	2.50	A	EL	111.59	1.044	2.15	A	I	8.00	1.30	0.924	2.13	A	EL	111.59	1
FATIGUE		HL-93 (INVENTORY)	(γ_{LL})=0.75																					

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.
2. FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDER DOES NOT INCLUDE FATIGUE-PRONE DETAILS.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

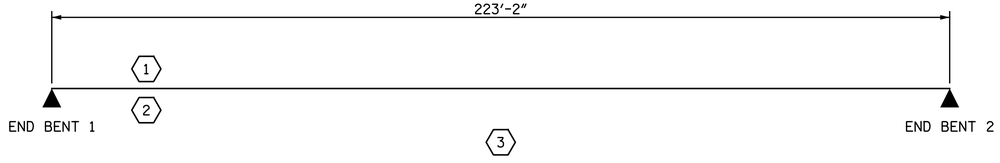
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-
18+84.00 -Y8-
SHEET 5 OF 5

DRAWN BY : M. D. MAYHEW DATE : 3-15-16
CHECKED BY : B. J. BELL DATE : 3-23-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Bradley J. Bell
5/17/2016

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LRFR SUMMARY
FOR STEEL GIRDERS
(INTERSTATE TRAFFIC)
LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-5
1			3			TOTAL SHEETS
2			4			35

cmayhew
5/17/2016 5:18:15 PM
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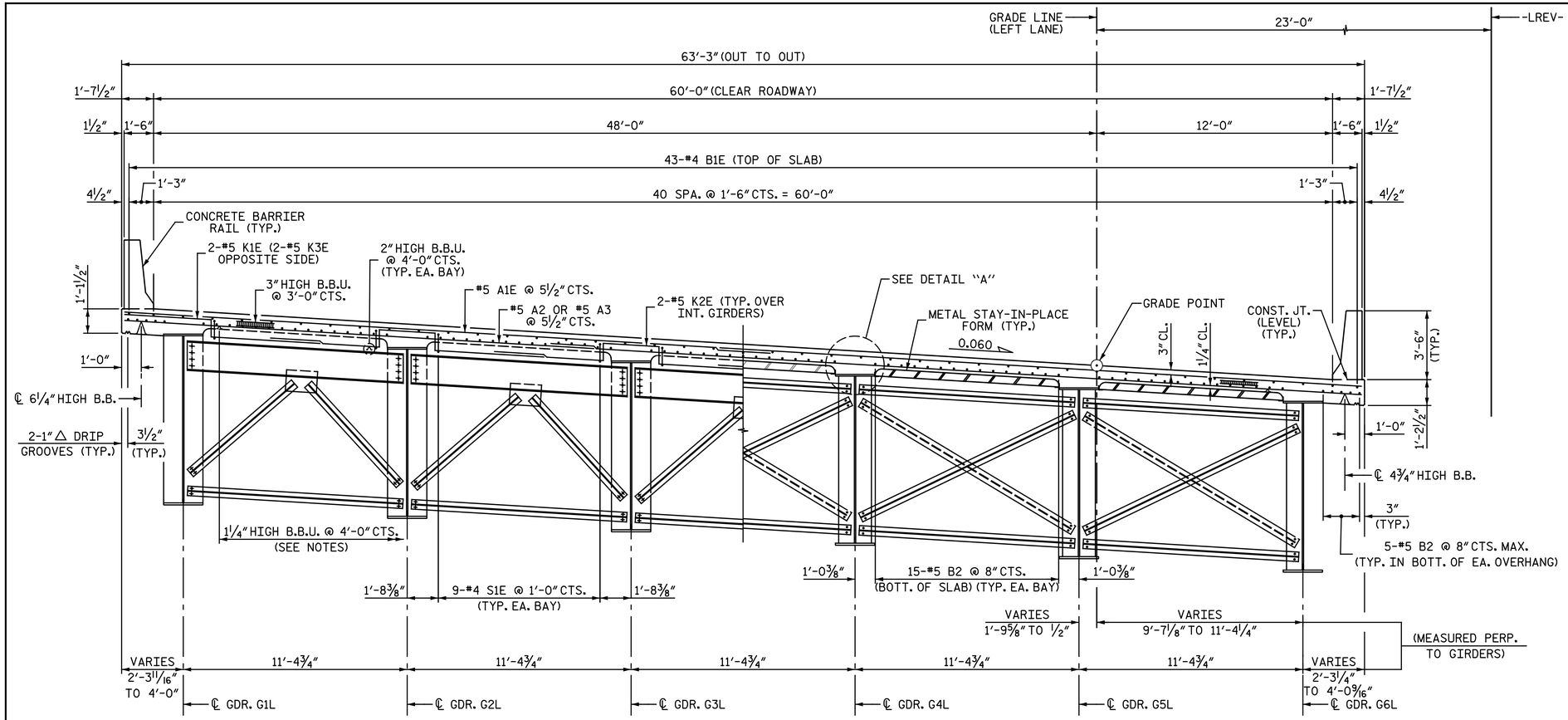


PARTIAL SECTION AT END BENT DIAPHRAGM

PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM

NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

PREVIOUSLY CAST CONCRETE SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.

BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FIRST AND LAST #5 "A" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR EXPANSION JOINT COMPONENTS.

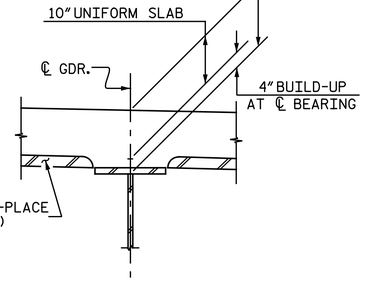
#5 G1E BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL-STAY-IN-PLACE FORM WORKING DRAWINGS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF ½". SEE SPECIAL PROVISION FOR DISC BEARINGS.

THE CONTRACTOR SHALL ENSURE THE STABILITY OF THE GIRDER WEB DURING CONSTRUCTION BASED ON THE OVERHANG SUPPORT SYSTEM USED.

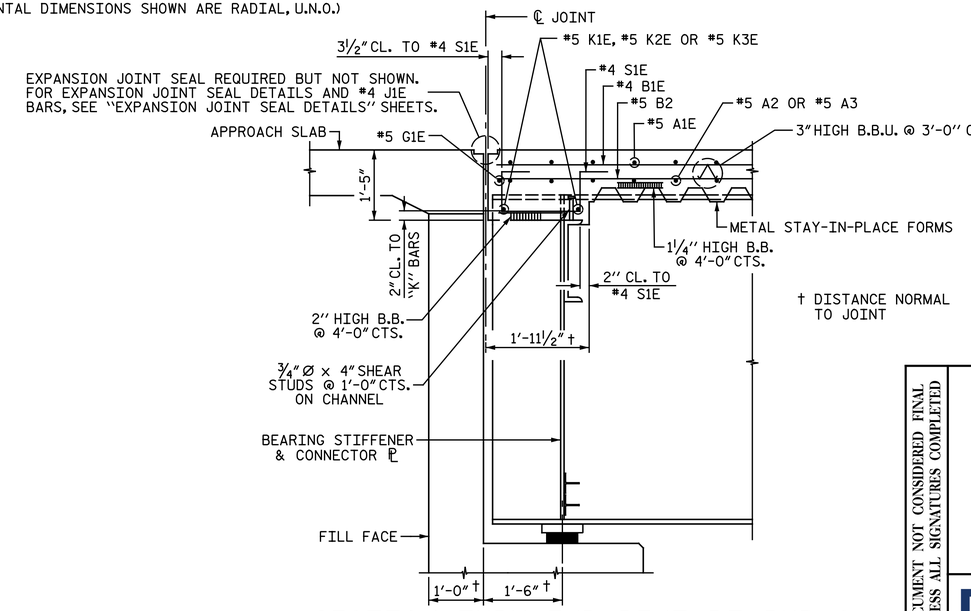
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



DETAIL "A"

TYPICAL SECTION

(ALL HORIZONTAL DIMENSIONS SHOWN ARE RADIAL, U.N.O.)



SECTION THRU END BENT DIAPHRAGM

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-6
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : M. D. MAYHEW DATE : 11-5-15

CHECKED BY : B. J. BELL DATE : 2-19-16

cmayhew
5/17/2016 5:18:16 PM
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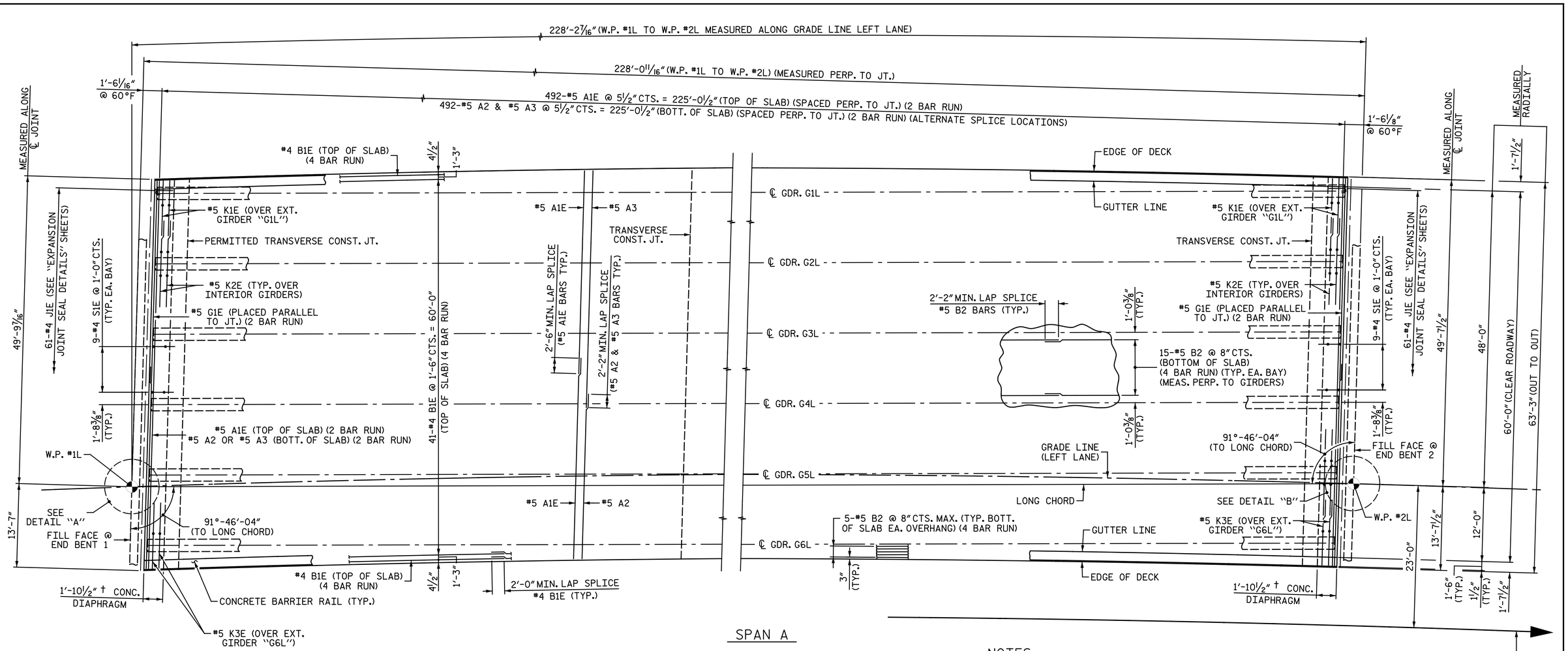


SPAN A

PLAN OF SPAN

† MEASURED PERPENDICULAR TO END BENT FILL FACE

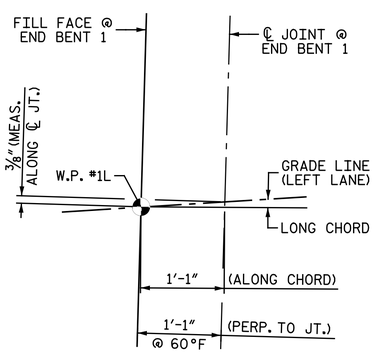
NOTES:

SEE "ARC OFFSETS" SHEET FOR OUTSIDE EDGE OF DECK CURVE EFFECTS.

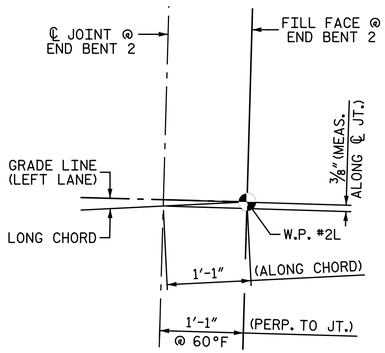
FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.

#5 "A" BARS ARE TO BE PLACED PARALLEL TO THE EXPANSION JOINT SEALS.

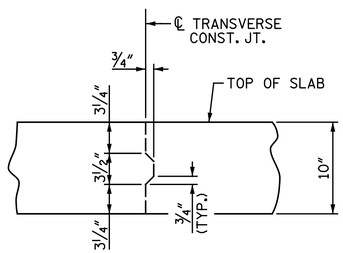
FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.



DETAIL "A"



DETAIL "B"



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWED. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DRAWN BY : M. D. MAYHEW DATE : 1-26-16

CHECKED BY : B. J. BELL DATE : 3-19-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C41A3FBECA3C434...

5/17/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-7
1			3			TOTAL SHEETS
2			4			35

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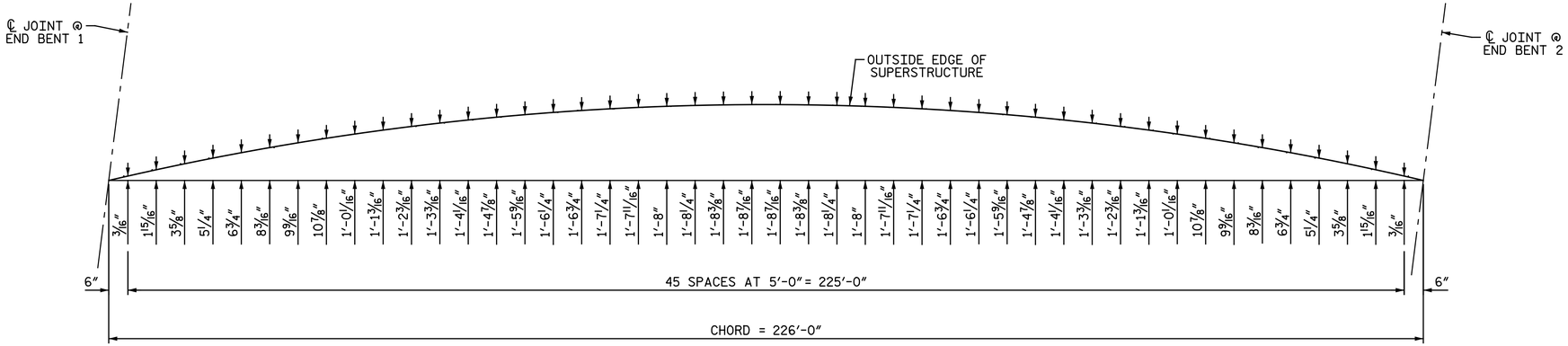
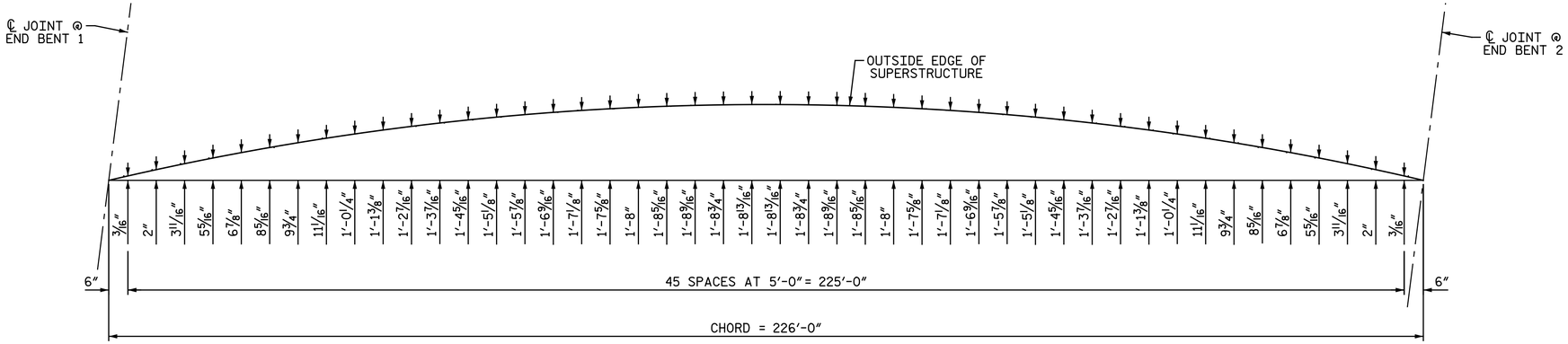


LEFT SIDE



RIGHT SIDE

ARC OFFSETS - SPAN A

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

ARC OFFSETS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-8
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : M. D. MAYHEW DATE : 8-24-15
CHECKED BY : B. J. BELL DATE : 3-23-16

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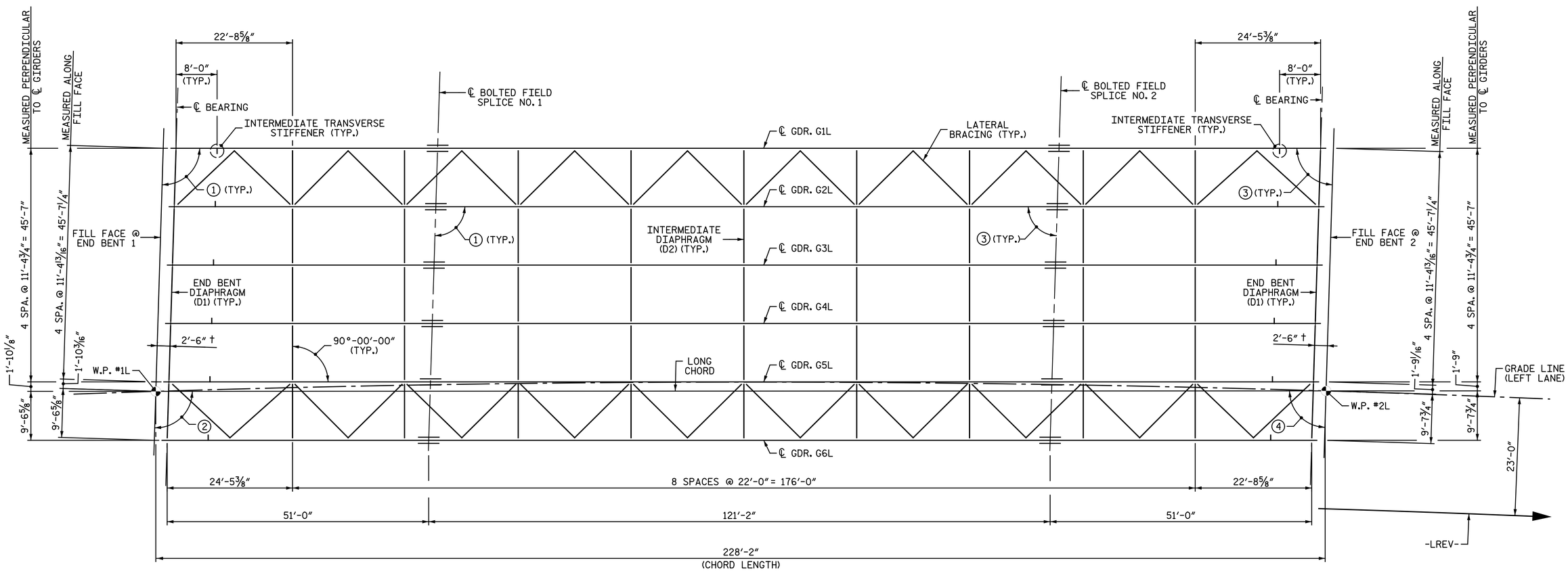

SPAN A

FRAMING PLAN

(ALL HORIZONTAL DIMENSIONS SHOWN ARE ALONG ℄ GIRDER, U.N.O.)

ANGLES	
①	91°-44′-39″
②	91°-46′-04″ ✱
③	88°-15′-21″
④	88°-13′-56″ ✱

✱ TO LONG CHORD

† MEASURED PERPENDICULAR TO END BENT FILL FACE

DRAWN BY : M. D. MAYHEW DATE : 11-5-15
CHECKED BY : B. J. BELL DATE : 3-23-16

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE ⅞″ DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS SHALL BE PLUMB IN THE FINAL CONDITION.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6″ MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1″ IF NECESSARY TO CLEAR FLANGE SPLICE WELDS.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

ENDS OF GIRDERS SHALL BE PLUMB IN THE FINAL CONDITION.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL ONLY FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C41A3FBECA3C434...

5/17/2016

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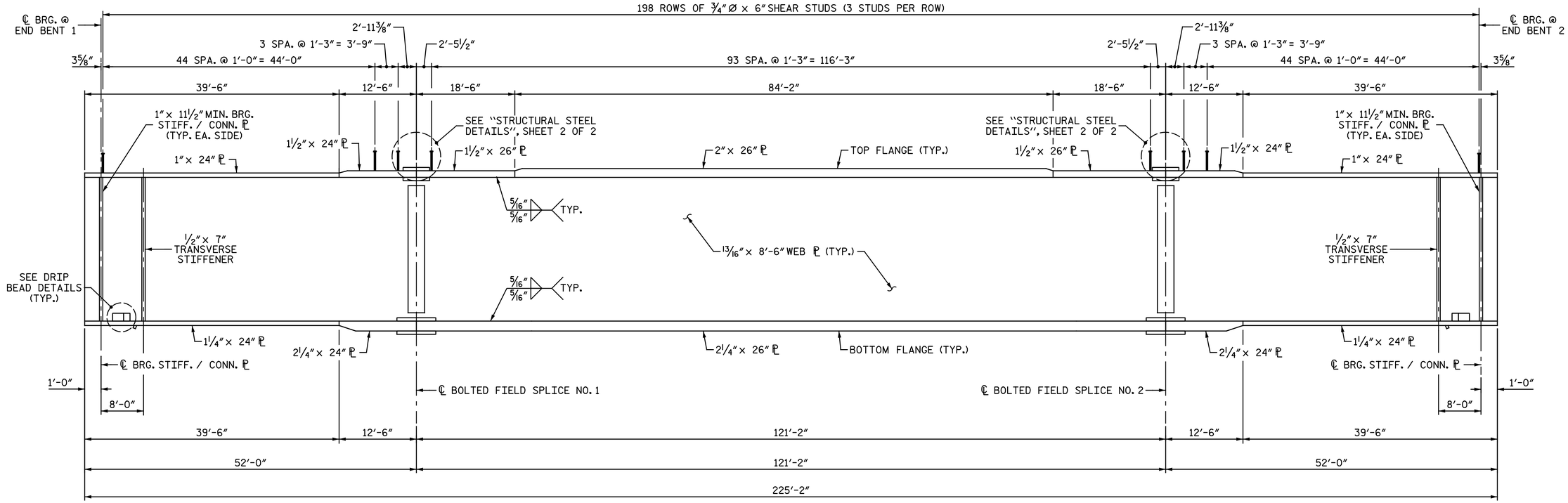
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

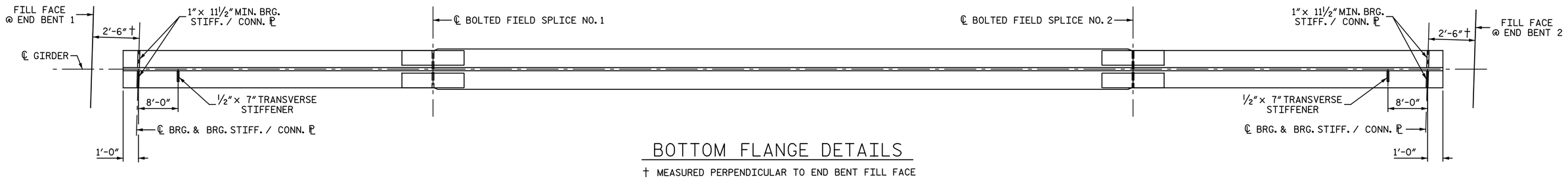
FRAMING PLAN

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-9
1			3			TOTAL SHEETS
2			4			35

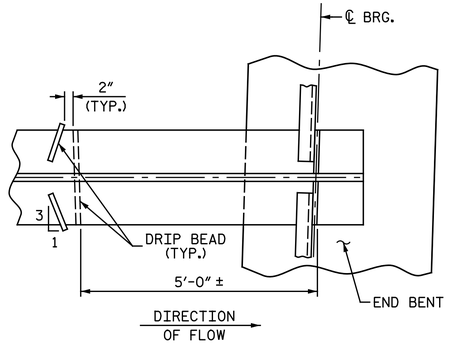


GIRDER ELEVATION

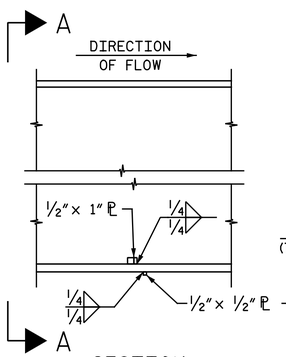


BOTTOM FLANGE DETAILS

† MEASURED PERPENDICULAR TO END BENT FILL FACE



PART PLAN - BOTTOM FLANGE
(END BENT 2 SHOWN, END BENT 1 SIMILAR)



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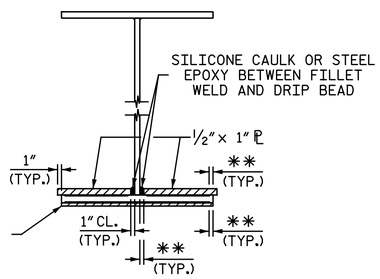

VIEW A-A

DRIP BEAD DETAILS

** SEE "STRUCTURAL STEEL DETAILS", SHEET 1 OF 2

NOTES:

TRANSVERSE STIFFENERS ARE TO BE PLACED ON ONE SIDE OF THE GIRDER ONLY. TRANSVERSE STIFFENERS ARE NOT TO BE PLACED ON OUTSIDE OF EXTERIOR GIRDER.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

DIMENSIONS ARE HORIZONTAL DIMENSIONS ALONG THE CENTERLINE OF GIRDER. NO CORRECTIONS HAVE BEEN MADE TO ADJUST FOR THE DISTANCE ALONG THE GRADE.

FOR SHEAR CONNECTOR TRANSVERSE SPACING, SEE "STRUCTURAL STEEL DETAILS", SHEET 1 OF 2.

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

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DocuSigned by: Bradley J. Bell
5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER DETAILS

LEFT LANES

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-10
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : M. D. MAYHEW DATE : 2-2-16
CHECKED BY : B. J. BELL DATE : 3-23-16

omayhew
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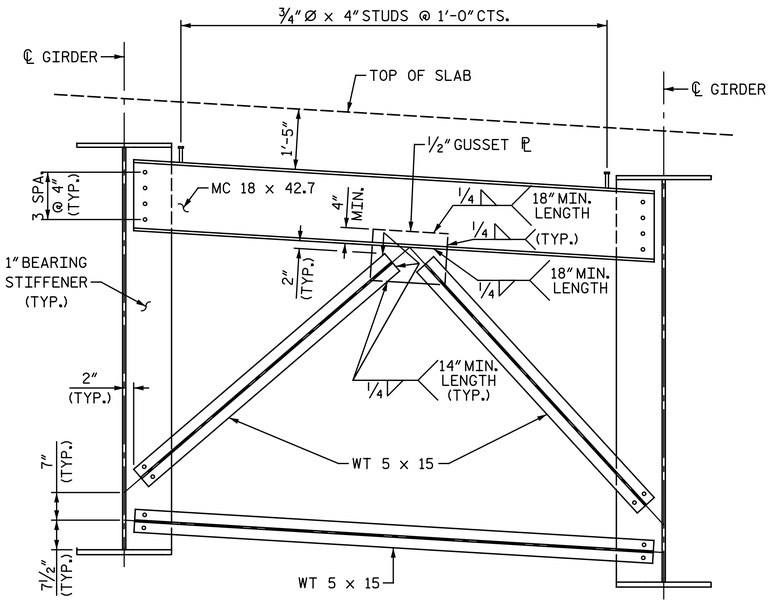
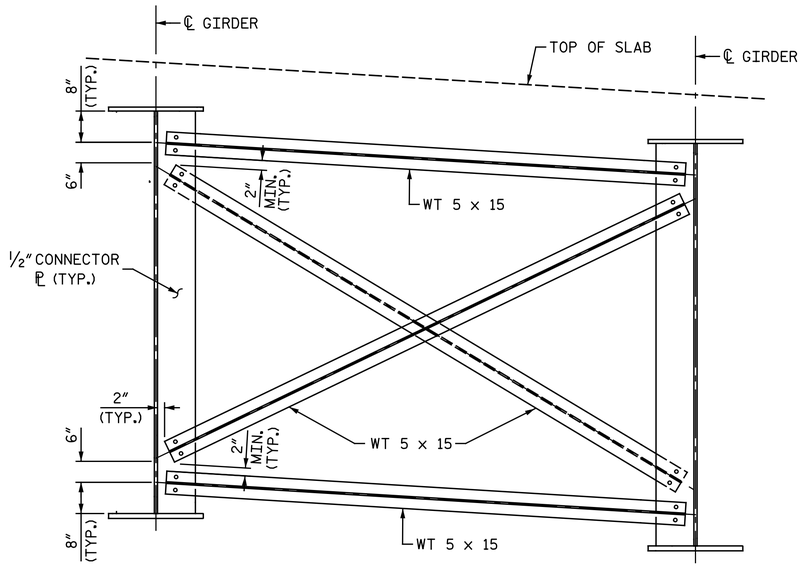
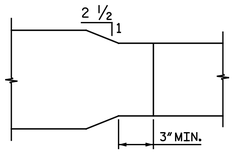


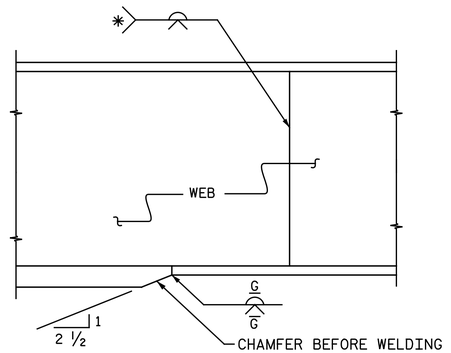
END BENT DIAPHRAGM (D1)



INTERMEDIATE DIAPHRAGM (D2)



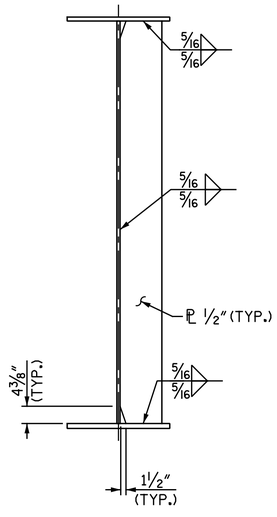
PLAN - FLANGE SPLICE



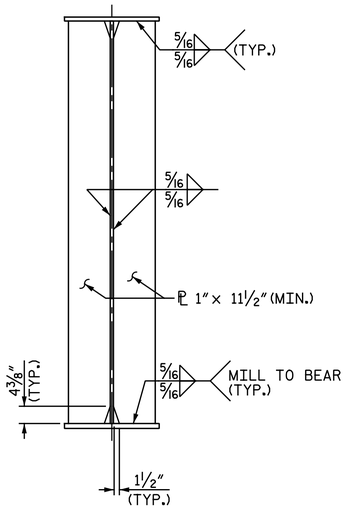
ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS

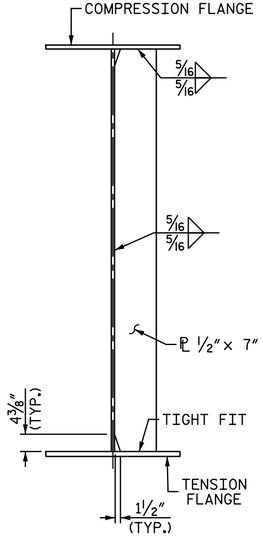


INTERMEDIATE DIAPHRAGM CONNECTOR ℙ

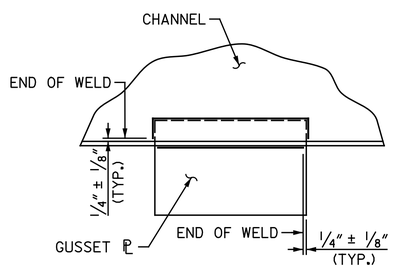


BEARING STIFFENER

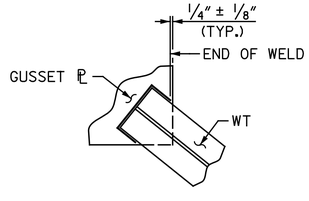
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE



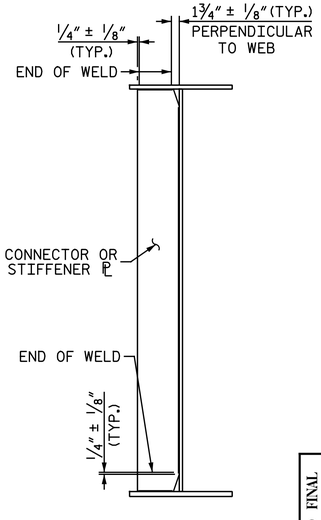
TRANSVERSE STIFFENER



TYPICAL GUSSET PLATE CONNECTION

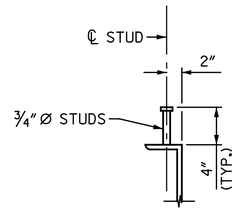


TYPICAL "TEE" TO GUSSET PLATE CONNECTION

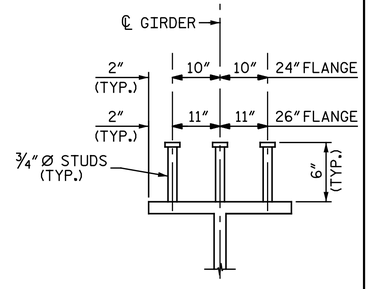


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTION

WELD TERMINATION DETAILS



DIAPHRAGM SHEAR CONNECTORS



GIRDER SHEAR CONNECTORS

SHEAR CONNECTOR DETAILS

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 1 OF 2

DRAWN BY : M. D. MAYHEW DATE : 2-2-16

CHECKED BY : B. J. BELL DATE : 3-23-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Docusigned by: Bradley J. Bell C41A3FBECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3- II
1			3			TOTAL SHEETS
2			4			35

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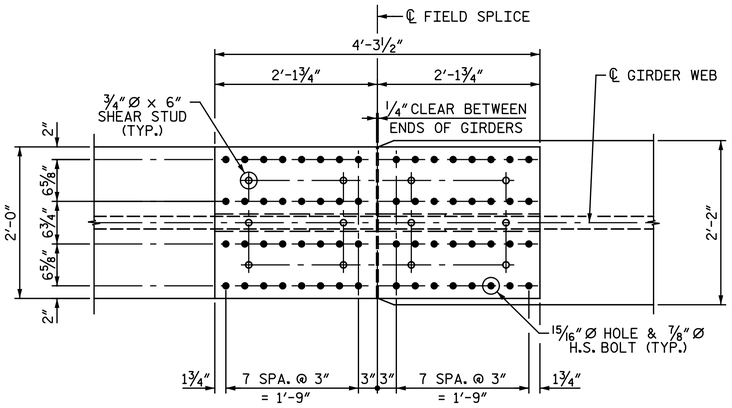
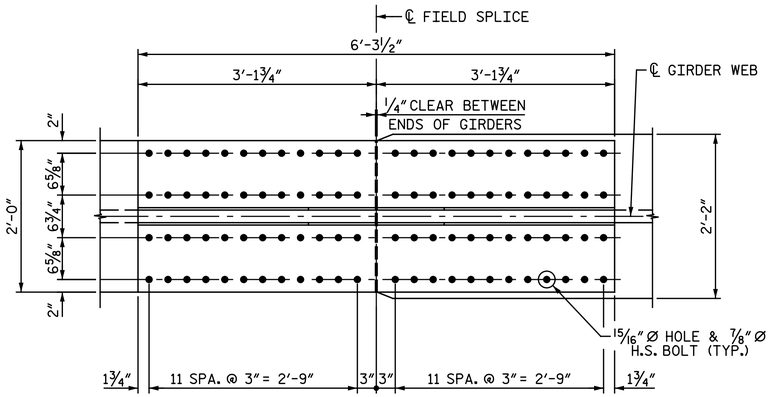
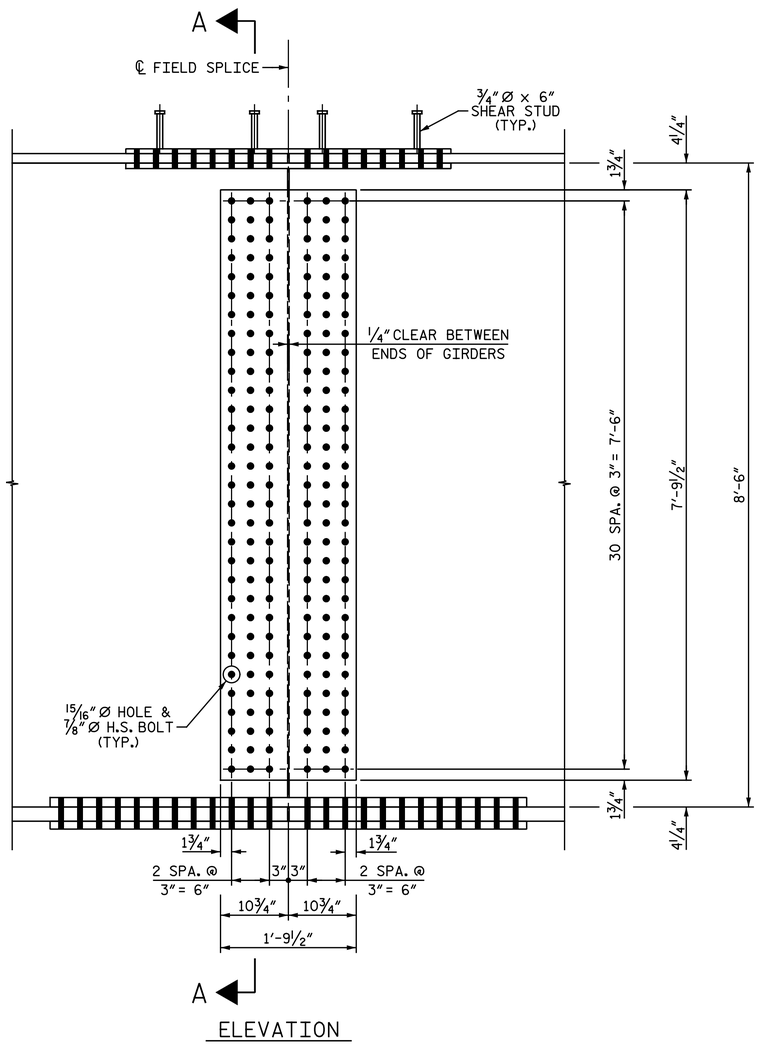


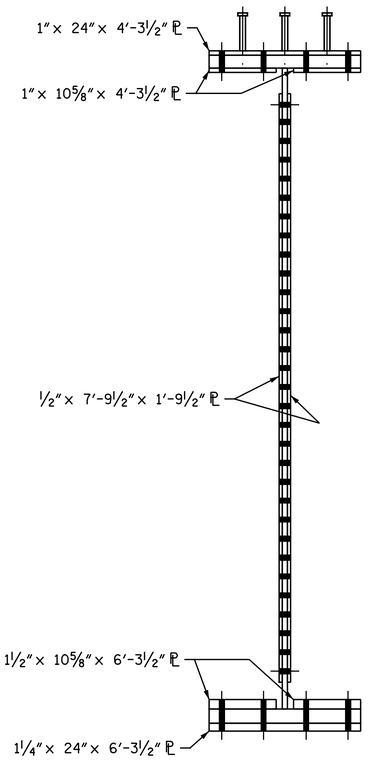
PLAN (TOP OF TOP FLANGE)



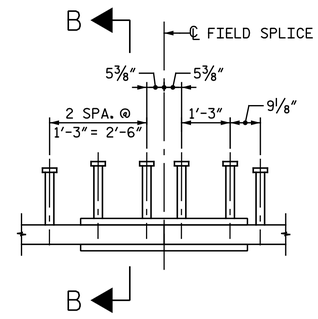
PLAN (TOP OF BOTTOM FLANGE)



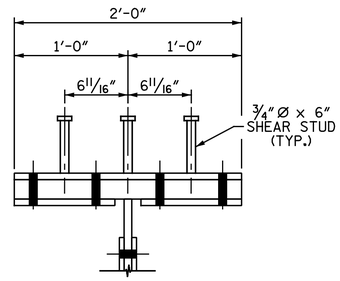
ELEVATION



SECTION A-A



ELEVATION



SECTION B-B

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(F. S. NO. 1 SHOWN, F. S. NO. 2 OPPOSITE)

DRAWN BY : M. D. MAYHEW DATE : 2-2-16
CHECKED BY : B. J. BELL DATE : 3-23-16

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

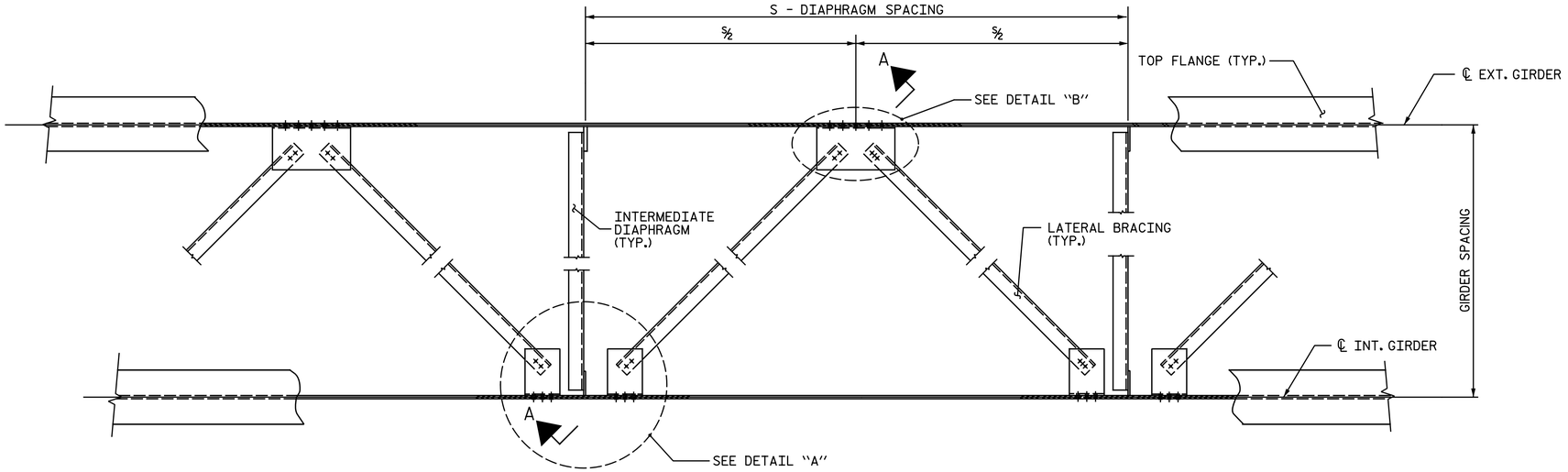
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

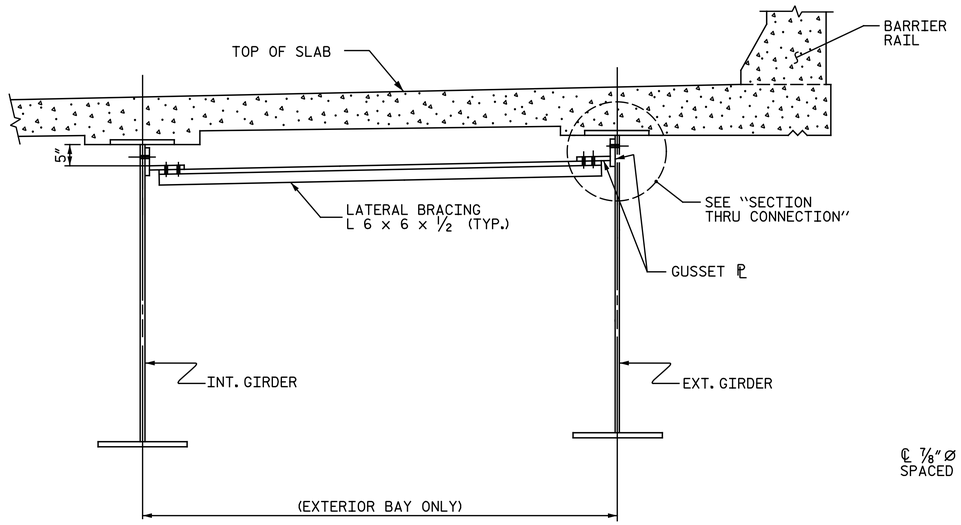
LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-12
1			3			TOTAL SHEETS
2			4			35

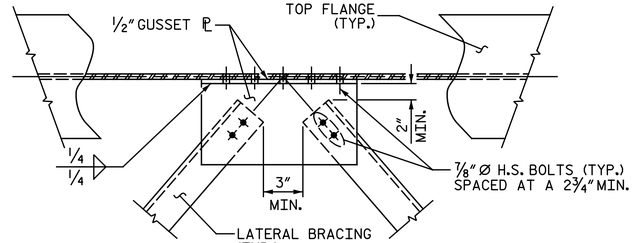


PART PLAN - NEAR TOP FLANGE LATERAL BRACING

(THROUGHOUT EXTERIOR BAYS ONLY)

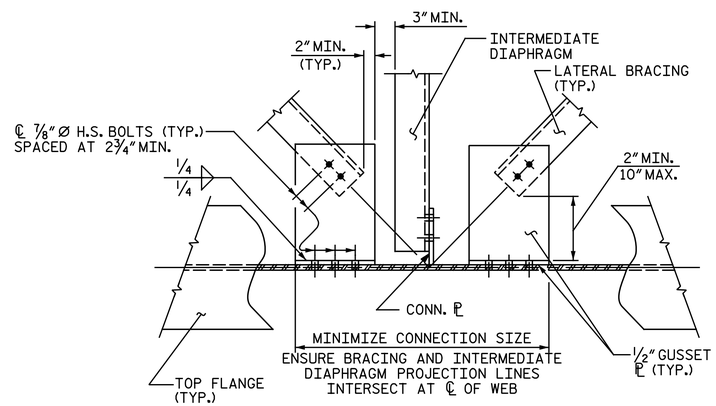


SECTION A-A



ENSURE BRACING PROJECTION LINES INTERSECT AT ℄ OF WEB

DETAIL "B"



ENSURE BRACING AND INTERMEDIATE DIAPHRAGM PROJECTION LINES INTERSECT AT ℄ OF WEB

DETAIL "A"

DETAIL AT END DIAPHRAGM SIMILAR.
MAINTAIN 3" MIN. CL. BETWEEN CONCRETE DIAPHRAGM AND GUSSET ℄.

NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

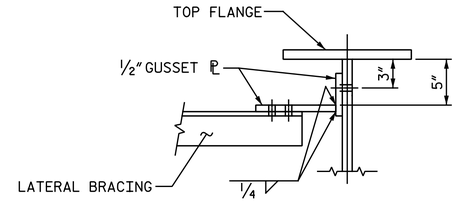
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE ⅞" Ø HIGH STRENGTH BOLTS.

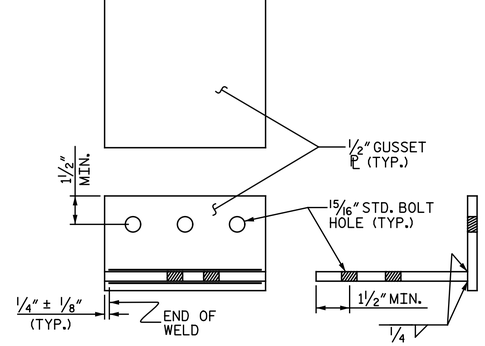
THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



SECTION THRU CONNECTION



CONNECTION DETAIL

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

ASSEMBLED BY: M. D. MAYHEW	DATE: 11-30-15
CHECKED BY : B. J. BELL	DATE: 3-23-16
DRAWN BY : WMC 6/11	ADDED: 10/31/11
CHECKED BY : GM 6/11	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by Bradley J. Bell
DN: C=US,E=BJBELL@DOT.NC.GOV,CN=Bradley J. Bell
5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

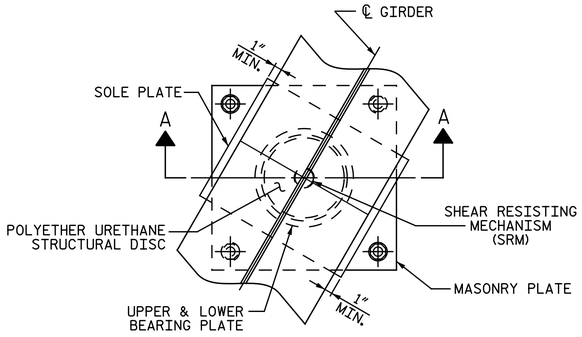
LATERAL BRACING

LEFT LANES

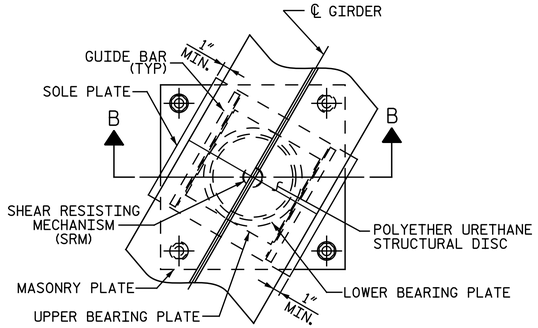
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-13
1			3			TOTAL SHEETS
2			4			35

cmayhew
5/17/2016 8:18:20 PM
Filename: Y:\Projects\NCDOT\U-2524D\Site_2\DWG\Left\Final\403.014_U2524D_SMU_SS03.dgn

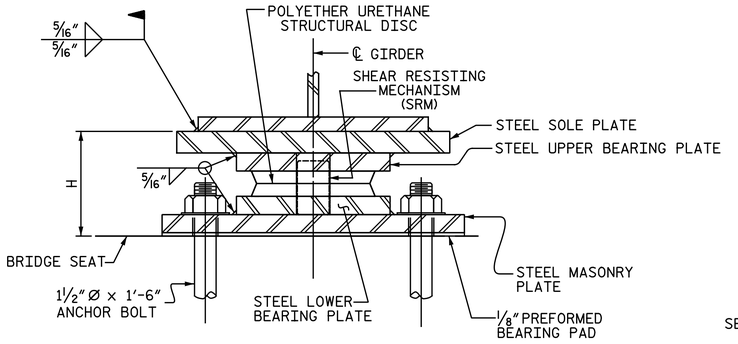
_U2524D_SMU_SS03.dgn



PLAN

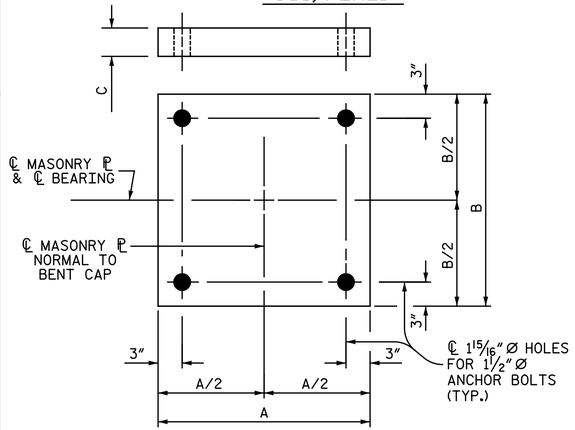


PLAN



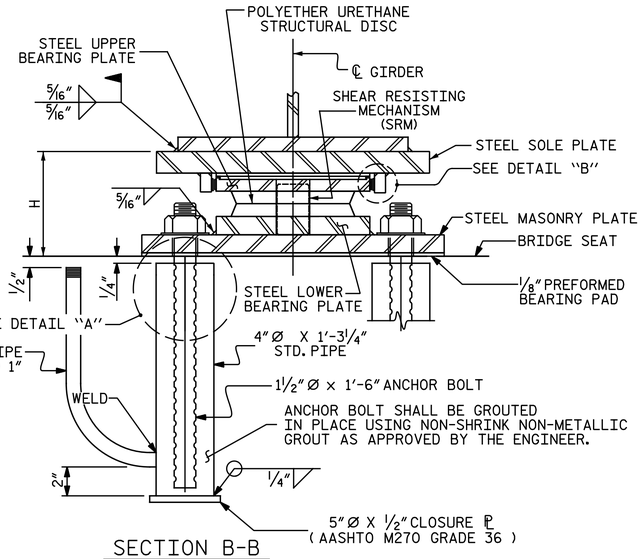
SECTION A-A

DB1, FIXED



PLAN

MASONRY PLATE DETAILS



SECTION B-B

DB2, EXP.

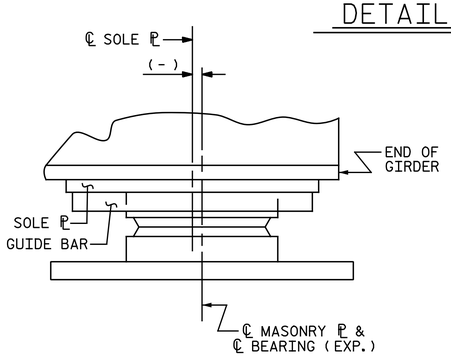
PLATE SETTING DATA

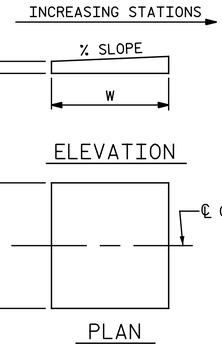
(EXPANSION DISC BEARINGS)

LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-5/16"	0"	5/16"	-1⅝"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



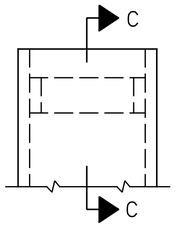


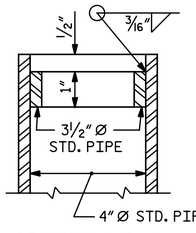
ELEVATION

PLAN

NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

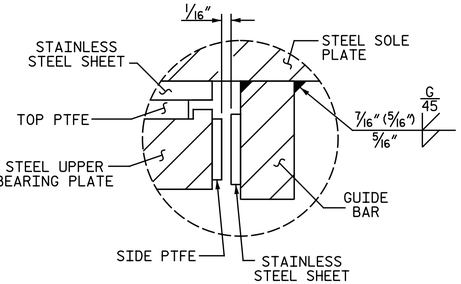
SOLE PLATE DETAILS





SECTION C-C

DETAIL "A"



DETAIL "B"

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL ¼ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS						LOADS AND MOVEMENT				
				BEARING	MASONRY PLATE			SOLE PLATE		UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY ℙ			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	L (IN.)	DEAD		LIVE		
										DC	DW	LL+IM		
DB1 (FIXED)	M1	END BENT 2	6	5½"	22½	22½	¾	0	26	294	38	170	104	0
DB2 (EXP.)	M2	END BENT 1	6	6½"	28½	28½	¾	0	26	294	38	170	104	3½

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-14
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : M. D. MAYHEW DATE : 11-30-15
CHECKED BY : B. J. BELL DATE : 3-23-16

DRAWN BY : TMG 08/13
CHECKED BY : EKP 10/13

REV.
REV.
REV.

amayhew
5/17/2016 5:18:20 PM
Filename: Y:\Projects\NCDOT\U-2524D\Stre_2\DWG\Left\Final\403_015_U2524D_SMU_BG.dgn

DEAD LOAD DEFLECTION AND CAMBER ORDINATES

SPAN A

	GIRDER G1L																													
30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.035	0.069	0.101	0.132	0.161	0.187	0.211	0.232	0.251	0.267	0.280	0.291	0.298	0.303	0.304	0.303	0.298	0.291	0.280	0.267	0.251	0.232	0.211	0.187	0.161	0.132	0.101	0.069	0.035	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.057	0.143	0.226	0.304	0.375	0.440	0.500	0.552	0.598	0.637	0.669	0.694	0.711	0.721	0.723	0.717	0.704	0.685	0.658	0.625	0.586	0.539	0.487	0.428	0.364	0.294	0.218	0.138	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.010	0.019	0.029	0.037	0.045	0.053	0.060	0.066	0.071	0.076	0.080	0.083	0.085	0.086	0.087	0.086	0.085	0.083	0.080	0.076	0.071	0.066	0.060	0.053	0.045	0.037	0.029	0.019	0.010	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.102	0.231	0.355	0.473	0.581	0.680	0.770	0.851	0.921	0.980	1.029	1.067	1.094	1.110	1.114	1.106	1.088	1.058	1.018	0.968	0.908	0.838	0.758	0.668	0.570	0.464	0.348	0.226	0.099	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.024	0.035	0.045	0.054	0.062	0.069	0.076	0.082	0.086	0.090	0.093	0.095	0.097	0.097	0.097	0.095	0.093	0.090	0.086	0.081	0.076	0.069	0.062	0.054	0.045	0.035	0.024	0.012	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.036	-0.046	-0.055	-0.064	-0.071	-0.078	-0.084	-0.089	-0.093	-0.096	-0.098	-0.099	-0.100	-0.099	-0.098	-0.096	-0.093	-0.089	-0.084	-0.078	-0.071	-0.064	-0.055	-0.046	-0.036	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 3/8″	3 1/16″	4 11/16″	6 3/16″	7 5/8″	8 15/16″	10 1/16″	11 1/8″	12″	12 13/16″	13 7/16″	13 15/16″	14 1/4″	14 1/2″	14 1/2″	14 7/16″	14 3/16″	13 13/16″	13 5/16″	12 5/8″	11 7/8″	10 15/16″	9 15/16″	8 3/4″	7 1/2″	6 1/8″	4 5/8″	3″	1 5/16″	0″

	GIRDER G2L																													
30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.037	0.073	0.108	0.141	0.172	0.199	0.225	0.248	0.267	0.284	0.299	0.310	0.318	0.322	0.324	0.322	0.318	0.310	0.299	0.284	0.267	0.248	0.225	0.199	0.172	0.141	0.108	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.057	0.144	0.227	0.305	0.377	0.442	0.501	0.554	0.600	0.639	0.671	0.696	0.713	0.723	0.725	0.720	0.707	0.687	0.661	0.627	0.588	0.541	0.489	0.430	0.365	0.295	0.219	0.139	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.007	0.013	0.020	0.026	0.032	0.037	0.042	0.046	0.050	0.053	0.056	0.058	0.059	0.060	0.060	0.060	0.059	0.058	0.056	0.053	0.050	0.046	0.042	0.037	0.032	0.026	0.020	0.013	0.007	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.101	0.231	0.354	0.472	0.580	0.678	0.768	0.848	0.917	0.977	1.025	1.063	1.090	1.105	1.109	1.102	1.084	1.054	1.015	0.965	0.905	0.835	0.755	0.666	0.568	0.462	0.347	0.225	0.099	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.024	0.035	0.045	0.054	0.063	0.070	0.077	0.082	0.087	0.091	0.094	0.096	0.098	0.098	0.097	0.096	0.094	0.091	0.087	0.082	0.077	0.070	0.063	0.054	0.045	0.035	0.024	0.013	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.036	-0.046	-0.056	-0.064	-0.072	-0.078	-0.084	-0.089	-0.093	-0.096	-0.098	-0.100	-0.100	-0.100	-0.098	-0.096	-0.093	-0.089	-0.084	-0.078	-0.072	-0.064	-0.056	-0.046	-0.036	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 3/8″	3 1/16″	4 11/16″	6 3/16″	7 5/8″	8 7/8″	10 1/16″	11 1/16″	11 15/16″	12 3/4″	13 3/8″	13 7/8″	14 1/4″	14 7/16″	14 1/2″	14 3/8″	14 3/16″	13 3/4″	13 1/4″	12 5/8″	11 13/16″	10 15/16″	9 7/8″	8 3/4″	7 1/2″	6 1/16″	4 9/16″	2 15/16″	1 5/16″	0″

	GIRDER G3L																													
30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.036	0.072	0.105	0.138	0.167	0.195	0.219	0.242	0.261	0.278	0.291	0.302	0.310	0.314	0.316	0.314	0.310	0.302	0.291	0.278	0.261	0.242	0.219	0.195	0.167	0.138	0.105	0.072	0.036	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.058	0.144	0.227	0.306	0.378	0.444	0.503	0.556	0.603	0.642	0.674	0.699	0.716	0.726	0.728	0.722	0.709	0.690	0.663	0.630	0.590	0.543	0.490	0.431	0.367	0.296	0.220	0.139	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.009	0.014	0.018	0.022	0.026	0.029	0.032	0.035	0.037	0.039	0.040	0.041	0.042	0.042	0.042	0.041	0.040	0.039	0.037	0.035	0.032	0.029	0.026	0.022	0.018	0.014	0.009	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.099	0.225	0.347	0.462	0.567	0.664	0.751	0.830	0.898	0.956	1.004	1.041	1.067	1.082	1.086	1.078	1.060	1.032	0.993	0.944	0.885	0.817	0.739	0.651	0.556	0.452	0.339	0.220	0.096	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.025	0.036	0.046	0.055	0.063	0.071	0.077	0.083	0.088	0.092	0.095	0.097	0.098	0.099	0.098	0.097	0.095	0.092	0.088	0.083	0.077	0.071	0.063	0.055	0.046	0.036	0.025	0.013	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.036	-0.046	-0.056	-0.064	-0.072	-0.079	-0.084	-0.089	-0.093	-0.096	-0.099	-0.100	-0.100	-0.100	-0.099	-0.096	-0.093	-0.089	-0.084	-0.079	-0.072	-0.064	-0.056	-0.046	-0.036	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 5/16″	2 15/16″	4 9/16″	6 1/16″	7 7/16″	8 3/4″	9 7/8″	10 7/8″	11 3/4″	12 1/2″	13 1/8″	13 5/8″	13 15/16″	14 3/16″	14 3/16″	14 1/8″	13 7/8″	13 1/2″	13″	12 3/8″	11 5/8″	10 3/4″	9 11/16″	8 9/16″	7 5/16″	5 15/16″	4 1/2″	2 15/16″	1 5/16″	0″

✳ INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.

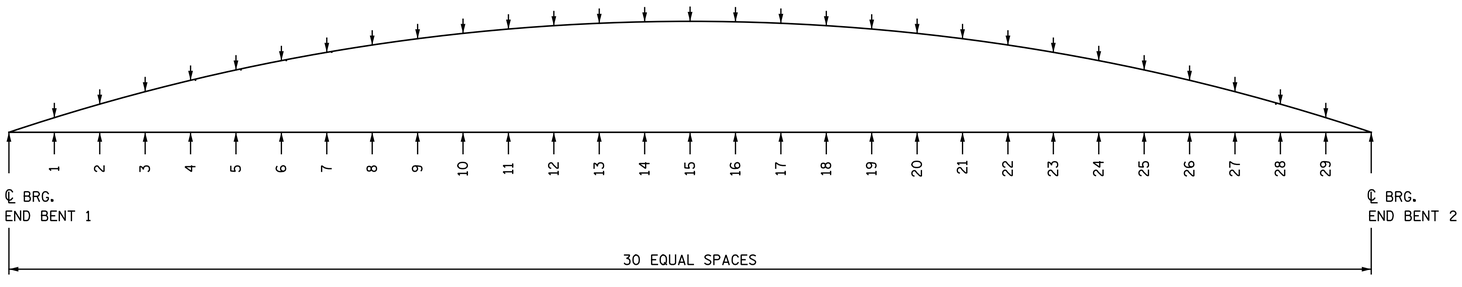
NOTES:

VALUES GIVEN ARE AT THIRTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

UPWARD DEFLECTIONS ARE INDICATED WITH A " - " SIGN.



SPAN A

SCHEMATIC CAMBER ORDINATES

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 1 OF 2

DRAWN BY : M. D. MAYHEW DATE : 2-5-16

CHECKED BY : B. J. BELL DATE : 2-5-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER ORDINATES

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-15
1			3			TOTAL SHEETS
2			4			35

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DEAD LOAD DEFLECTION AND CAMBER ORDINATES

SPAN A

GIRDER G4L

30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.036	0.072	0.105	0.138	0.167	0.195	0.219	0.242	0.261	0.278	0.291	0.302	0.310	0.314	0.316	0.314	0.310	0.302	0.291	0.278	0.261	0.242	0.219	0.195	0.167	0.138	0.105	0.072	0.036	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.058	0.144	0.227	0.306	0.378	0.444	0.503	0.556	0.603	0.642	0.674	0.699	0.716	0.726	0.728	0.722	0.709	0.690	0.663	0.630	0.590	0.543	0.490	0.431	0.367	0.296	0.220	0.139	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.009	0.014	0.018	0.022	0.026	0.029	0.032	0.035	0.037	0.039	0.040	0.041	0.042	0.042	0.042	0.041	0.040	0.039	0.037	0.035	0.032	0.029	0.026	0.022	0.018	0.014	0.009	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.099	0.225	0.347	0.462	0.567	0.664	0.751	0.830	0.898	0.956	1.004	1.041	1.067	1.082	1.086	1.078	1.060	1.032	0.993	0.944	0.885	0.817	0.739	0.651	0.556	0.452	0.339	0.220	0.096	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.025	0.036	0.046	0.055	0.064	0.071	0.078	0.084	0.089	0.093	0.096	0.098	0.099	0.100	0.099	0.098	0.096	0.093	0.089	0.084	0.078	0.071	0.064	0.055	0.046	0.036	0.025	0.013	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.036	-0.047	-0.056	-0.065	-0.072	-0.079	-0.085	-0.090	-0.094	-0.097	-0.099	-0.100	-0.101	-0.100	-0.099	-0.097	-0.094	-0.090	-0.085	-0.079	-0.072	-0.065	-0.056	-0.047	-0.036	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 5/16″	3″	4 9/16″	6 1/16″	7 1/2″	8 3/4″	9 7/8″	10 7/8″	11 13/16″	12 9/16″	13 1/8″	13 5/8″	13 15/16″	14 3/16″	14 1/4″	14 1/8″	13 7/8″	13 1/2″	13″	12 3/8″	11 5/8″	10 3/4″	9 11/16″	8 9/16″	7 5/16″	5 15/16″	4 1/2″	2 15/16″	1 5/16″	0″

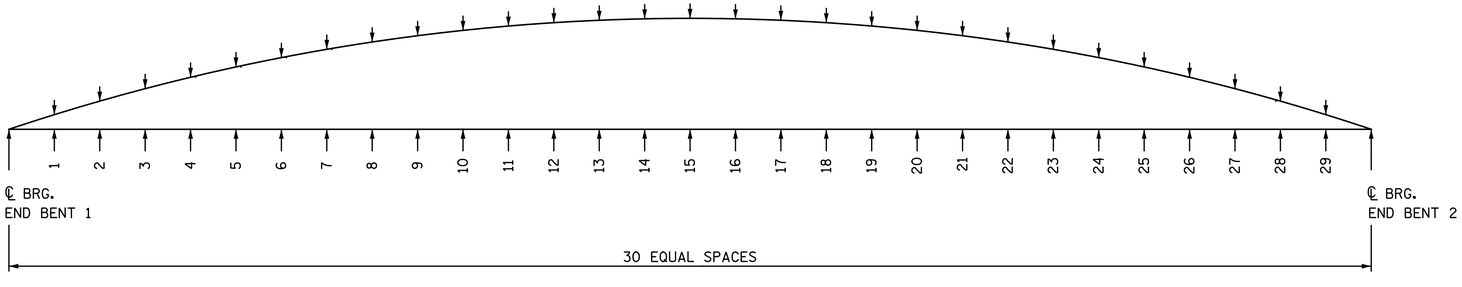
GIRDER G5L

30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.037	0.073	0.108	0.141	0.172	0.199	0.225	0.248	0.267	0.284	0.299	0.310	0.318	0.322	0.324	0.322	0.318	0.310	0.299	0.284	0.267	0.248	0.225	0.199	0.172	0.141	0.108	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.057	0.144	0.227	0.305	0.377	0.442	0.501	0.554	0.600	0.639	0.671	0.696	0.713	0.723	0.725	0.720	0.707	0.687	0.661	0.627	0.588	0.541	0.489	0.430	0.365	0.295	0.219	0.139	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.007	0.013	0.020	0.026	0.032	0.037	0.042	0.046	0.050	0.053	0.056	0.058	0.059	0.060	0.060	0.060	0.059	0.058	0.056	0.053	0.050	0.046	0.042	0.037	0.032	0.026	0.020	0.013	0.007	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.101	0.231	0.354	0.472	0.580	0.678	0.768	0.848	0.917	0.977	1.025	1.063	1.090	1.105	1.109	1.102	1.084	1.054	1.015	0.965	0.905	0.835	0.755	0.666	0.568	0.462	0.347	0.225	0.099	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.025	0.036	0.047	0.056	0.064	0.072	0.079	0.085	0.089	0.094	0.097	0.099	0.100	0.101	0.100	0.099	0.097	0.094	0.090	0.085	0.079	0.072	0.064	0.056	0.046	0.036	0.025	0.013	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.036	-0.047	-0.056	-0.065	-0.072	-0.079	-0.085	-0.090	-0.094	-0.097	-0.099	-0.101	-0.101	-0.101	-0.099	-0.097	-0.094	-0.090	-0.085	-0.079	-0.072	-0.065	-0.056	-0.047	-0.036	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 3/8″	3 1/16″	4 11/16″	6 1/4″	7 5/8″	8 15/16″	10 1/16″	11 1/8″	12″	12 13/16″	13 7/16″	13 15/16″	14 1/4″	14 1/2″	14 1/2″	14 7/16″	14 3/16″	13 3/16″	13 5/16″	12 5/8″	11 7/8″	10 15/16″	9 15/16″	8 3/4″	7 1/2″	6 1/8″	4 5/8″	3″	1 5/16″	0″

GIRDER G6L

30TH POINTS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.035	0.069	0.101	0.132	0.161	0.187	0.211	0.232	0.251	0.267	0.280	0.291	0.298	0.303	0.304	0.303	0.298	0.291	0.280	0.267	0.251	0.232	0.211	0.187	0.161	0.132	0.101	0.069	0.035	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	0.057	0.143	0.226	0.304	0.375	0.440	0.500	0.552	0.598	0.637	0.669	0.694	0.711	0.721	0.723	0.717	0.704	0.685	0.658	0.625	0.586	0.539	0.487	0.428	0.364	0.294	0.218	0.138	0.055	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.010	0.019	0.029	0.037	0.045	0.053	0.060	0.066	0.071	0.076	0.080	0.083	0.085	0.086	0.087	0.086	0.085	0.083	0.080	0.076	0.071	0.066	0.060	0.053	0.045	0.037	0.029	0.019	0.010	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.102	0.231	0.355	0.473	0.581	0.680	0.770	0.851	0.921	0.980	1.029	1.067	1.094	1.110	1.114	1.106	1.088	1.058	1.018	0.968	0.908	0.838	0.758	0.668	0.570	0.464	0.348	0.226	0.099	0.000
VERTICAL CURVE ORDINATE	0.000	0.013	0.025	0.037	0.047	0.056	0.065	0.073	0.079	0.085	0.090	0.094	0.098	0.100	0.101	0.102	0.101	0.100	0.098	0.094	0.090	0.085	0.079	0.073	0.065	0.056	0.047	0.037	0.025	0.013	0.000
SUPERELEVATION ORDINATE	0.000	-0.013	-0.025	-0.037	-0.047	-0.056	-0.065	-0.073	-0.079	-0.085	-0.090	-0.094	-0.097	-0.100	-0.101	-0.101	-0.101	-0.100	-0.097	-0.094	-0.090	-0.085	-0.079	-0.073	-0.065	-0.056	-0.047	-0.037	-0.025	-0.013	0.000
REQUIRED CAMBER	0″	1 3/8″	3 1/16″	4 11/16″	6 1/4″	7 5/8″	8 15/16″	10 1/8″	11 3/16″	12 1/16″	12 13/16″	13 1/2″	13 15/16″	14 5/16″	14 1/2″	14 9/16″	14 1/2″	14 1/4″	13 7/8″	13 3/8″	12 11/16″	11 15/16″	11″	9 15/16″	8 13/16″	7 1/2″	6 1/8″	4 5/8″	3″	1 3/8″	0″

✳ INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS. DEFLECTIONS BASED ON SLAB POUR SEQUENCE SHOWN ON "BILL OF MATERIAL" SHEET.



SPAN A

SCHEMATIC CAMBER ORDINATES

NOTES:

VALUES GIVEN ARE AT THIRTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

UPWARD DEFLECTIONS ARE INDICATED WITH A " - " SIGN.

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 2 OF 2

DRAWN BY : M. D. MAYHEW DATE : 2-5-16

CHECKED BY : B. J. BELL DATE : 2-5-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C414A3FBECA3C434...

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

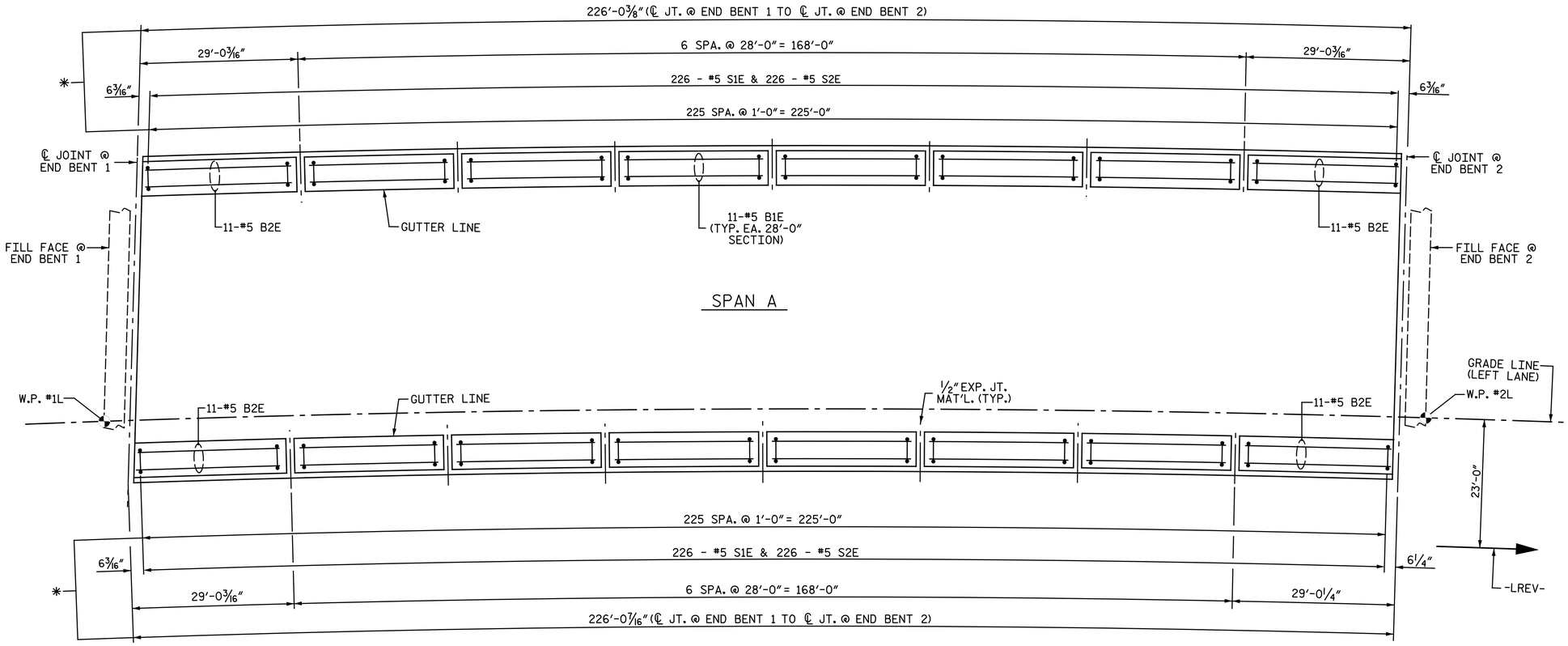
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER ORDINATES

LEFT LANES

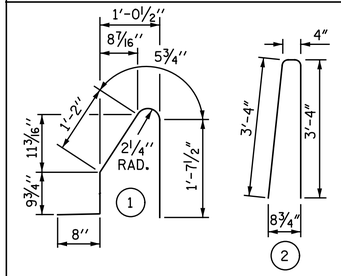
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-16
1			3			TOTAL SHEETS
2			4			35



PLAN OF BARRIER RAIL

✳ ARC LENGTHS MEASURED ALONG OUTSIDE EDGE OF CONCRETE BARRIER RAIL.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	132	#5	STR	27′-8″	3,809
B2E	44	#5	STR	28′-7″	1,312
S1E	452	#5	1	4′-9″	2,239
S2E	452	#5	2	7′-0″	3,300

EPOXY COATED REINFORCING STEEL ✳	10,660 LBS.
CLASS AA CONCRETE ✳	61.5 CU. YDS.
CONCRETE BARRIER RAIL ✳	451.7 LIN. FT.

✳ QUANTITIES DO NOT INCLUDE APPROACH SLAB BARRIER RAILS.

NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

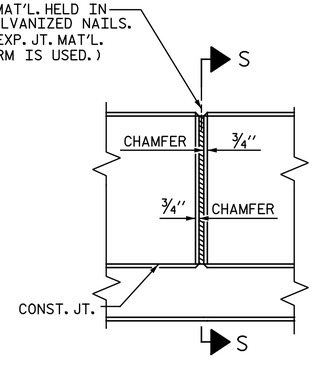
~~WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.~~

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

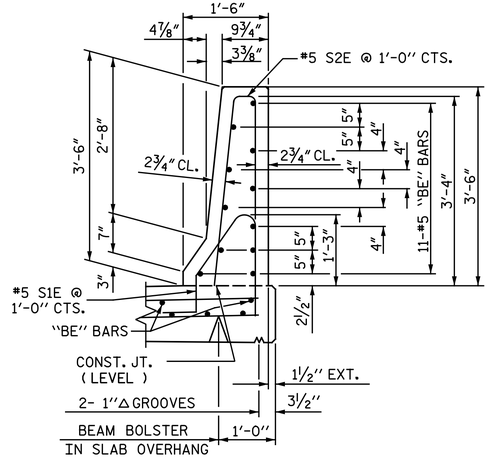
~~THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.~~

GROOVED CONTRACTION JOINTS, 1/2″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

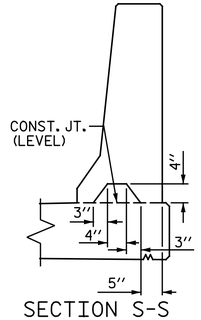
FOR BARRIER RAIL CONSTRUCTED ON APPROACH SLABS AND END OF RAIL DETAILS, SEE "BRIDGE APPROACH SLAB DETAILS", SHEETS 2 OF 3 AND 3 OF 3.



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL



SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-17
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-2-16		
CHECKED BY : B.J. BELL	DATE : 3-10-16		
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM	
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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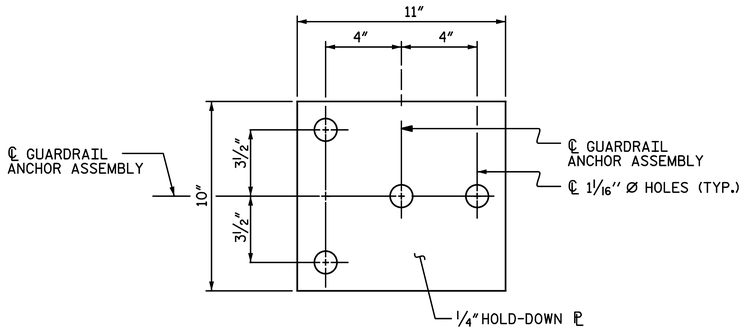
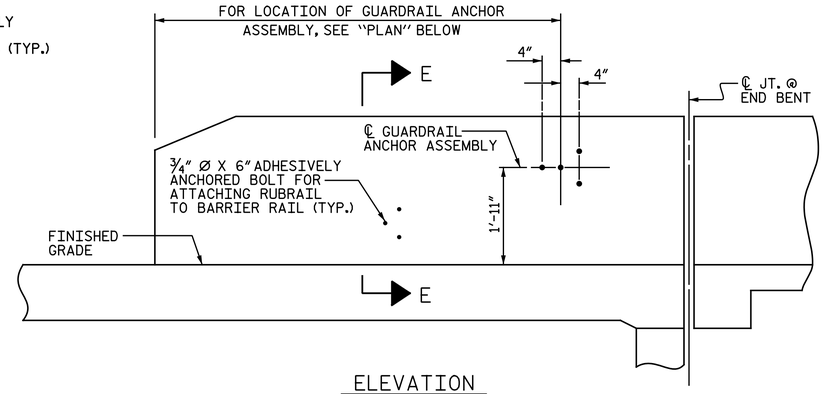
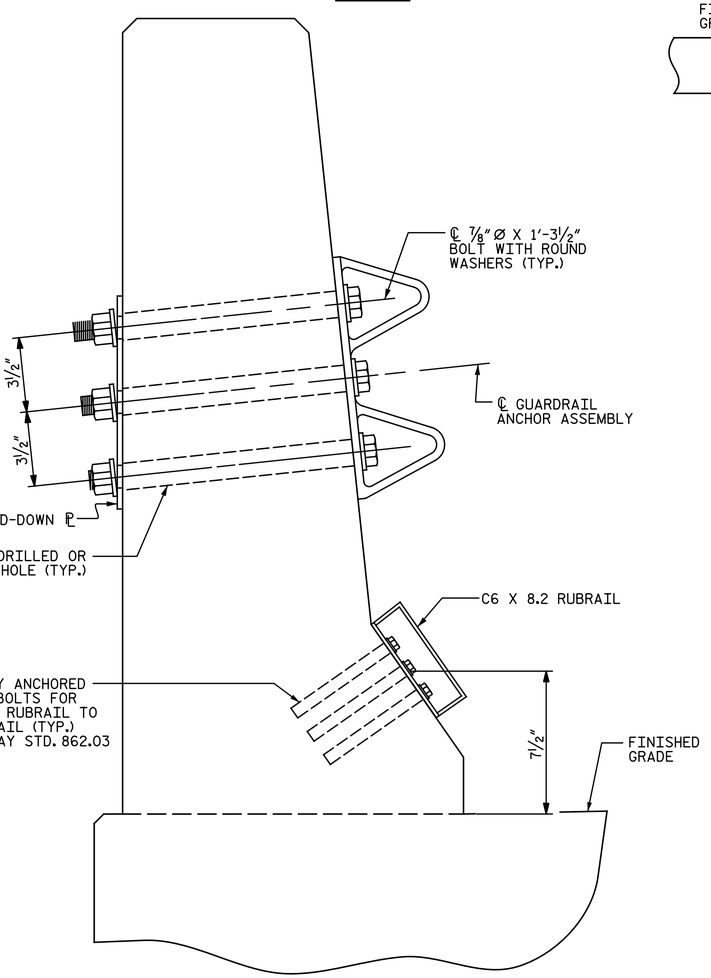


PLAN

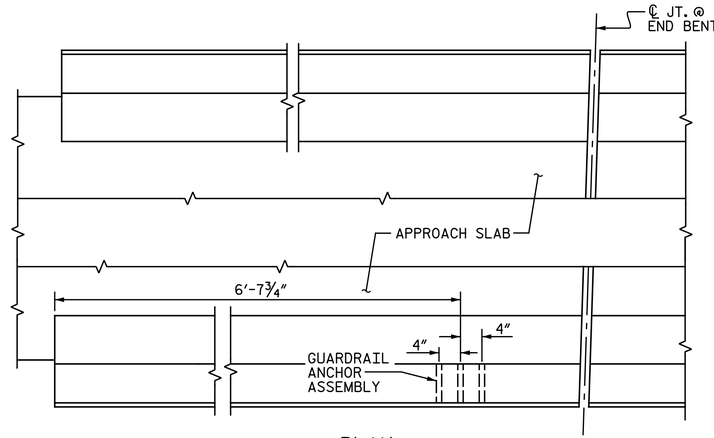


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR WITH ADDITION OF ANCHOR AT END OF MOMENT SLAB. ANCHOR AT END OF APPROACH SLAB SHOWN, ANCHOR AT END OF MOMENT SLAB SIMILAR.

NOTES:

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4″ HOLD-DOWN PLATE AND 4 - 7/8″ Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

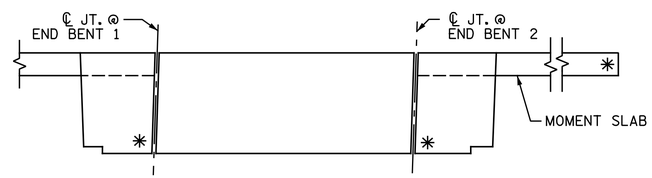
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 1/4″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4″Ø X 6″BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4″Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

ASSEMBLED BY : N. B. SPEAKS	DATE : 3-2-16		
CHECKED BY : B.J. BELL	DATE : 3-6-16		
DRAWN BY : TLA 5/06	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

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8000 Regency Parkway, Suite 600
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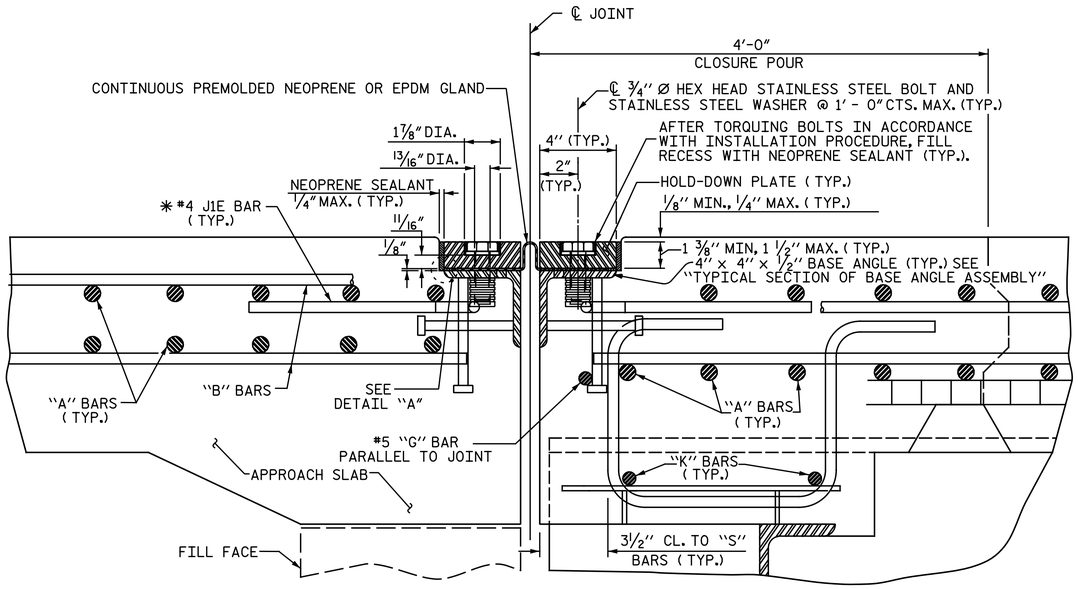
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-18
1			3			TOTAL SHEETS
2			4			35



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

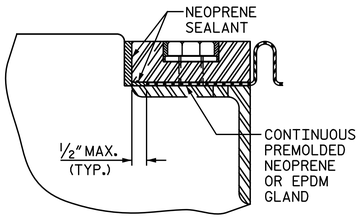
✳ THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1′-0″CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

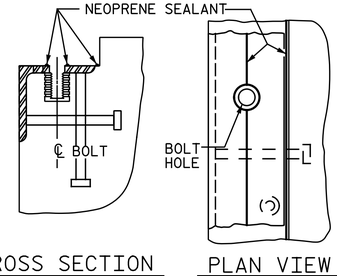
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛″TO 4¼″WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾″Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1″Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4″X 4″X ½″BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞″IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE ″INSTALLATION SKETCH″. PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE ″ TYPICAL SECTION OF BASE ANGLE ASSEMBLY″, SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20′ LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾″Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



DETAIL ″A″



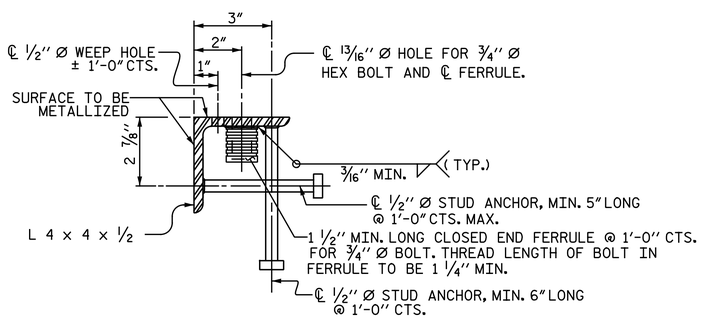
INSTALLATION SKETCH

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	86°-27′-43″	1¾″	2¼″	2″	1½″
END BENT 2	89°-59′-51″	0″	2″	2″	2″

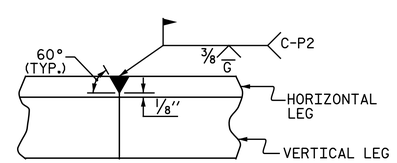
SKEW ANGLE IS BETWEEN FILL FACE AND TANGENT TO GRADE LINE (LEFT LANE).

END BENT 1 IS THE EXPANSION JOINT.

END BENT 2 IS THE FIXED JOINT WITH NO THERMAL MOVEMENTS.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C41A3FBECA3C434...

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

LEFT LANES

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-19
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : N. B. SPEAKS		DATE : 2-29-16	
CHECKED BY : B. J. BELL		DATE : 3-21-16	
DRAWN BY : REK 9/87	REV. 5/7/03R	RWW/JTE	
CHECKED BY : CRK 10/87	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

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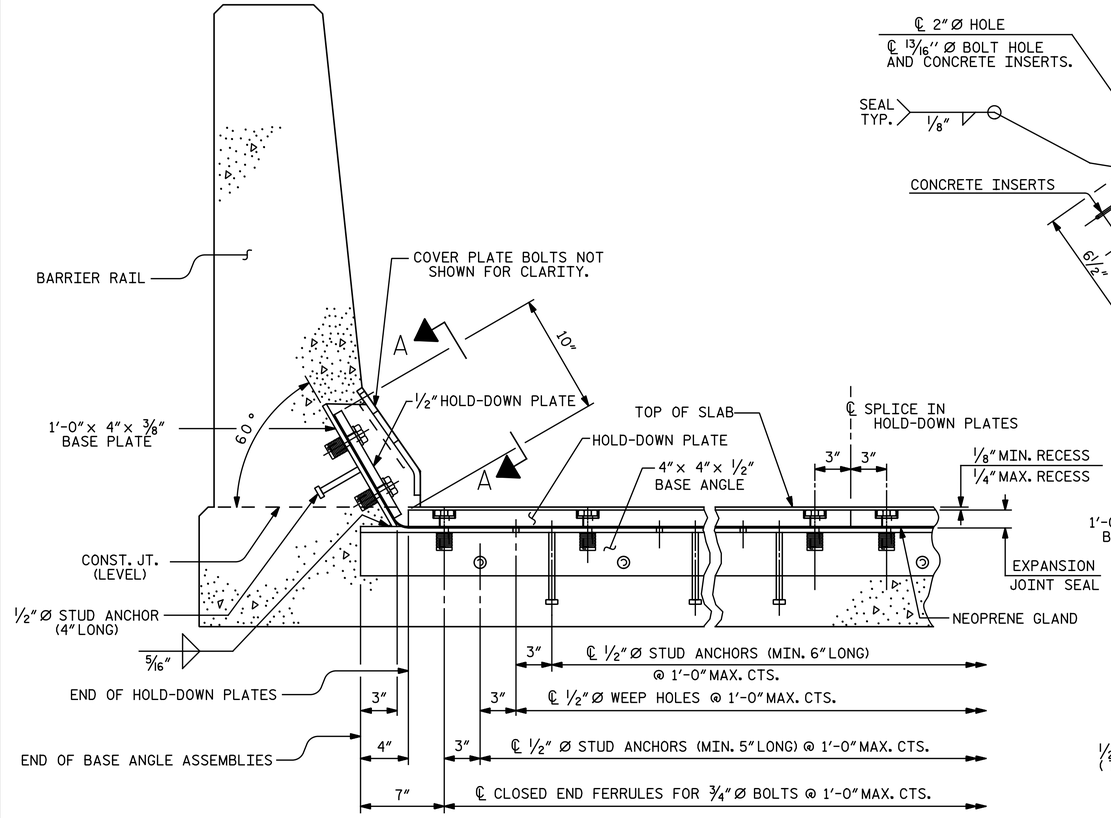
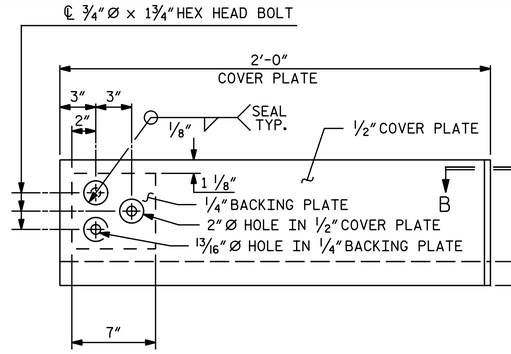
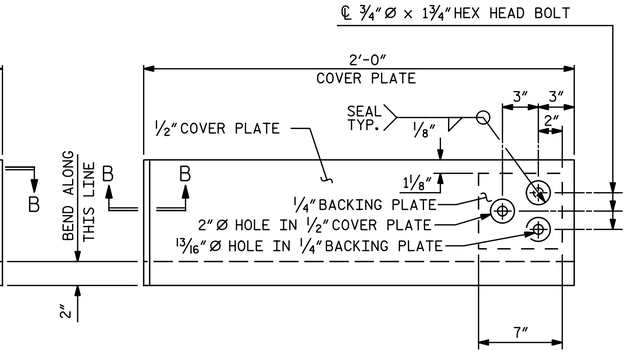


SECTION THRU RAIL NORMAL TO JOINT

END VIEW

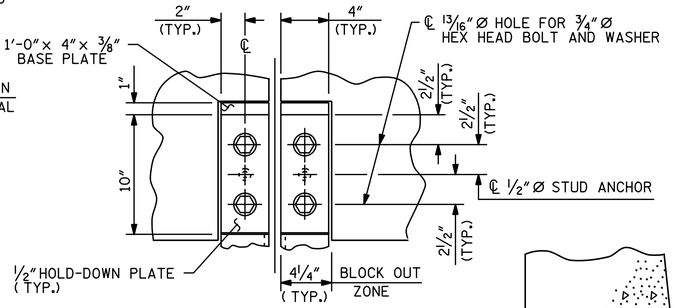


TYPE I - ELEVATION VIEW

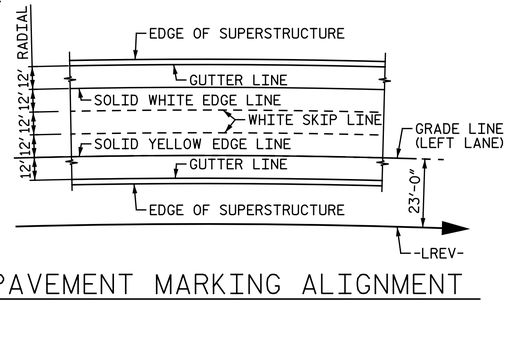


TYPE II - ELEVATION VIEW

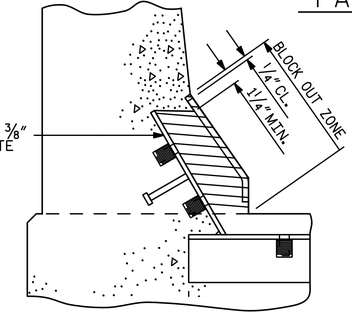
COVER PLATE DETAILS



SECTION A-A

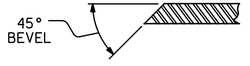


PAVEMENT MARKING ALIGNMENT

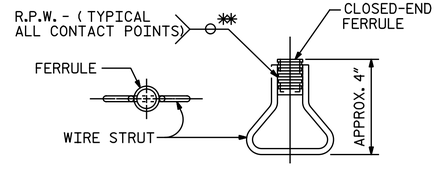


BLOCK OUT DETAIL

SEE "SECTION A-A" FOR OTHER DETAILS



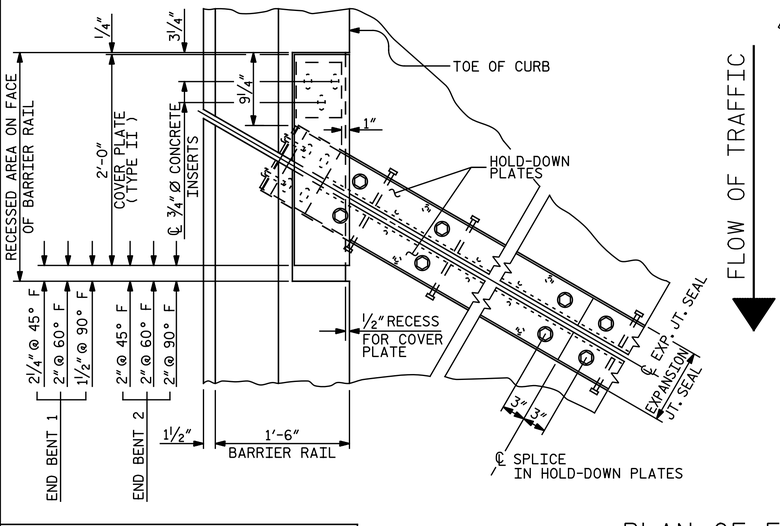
SECTION B - B



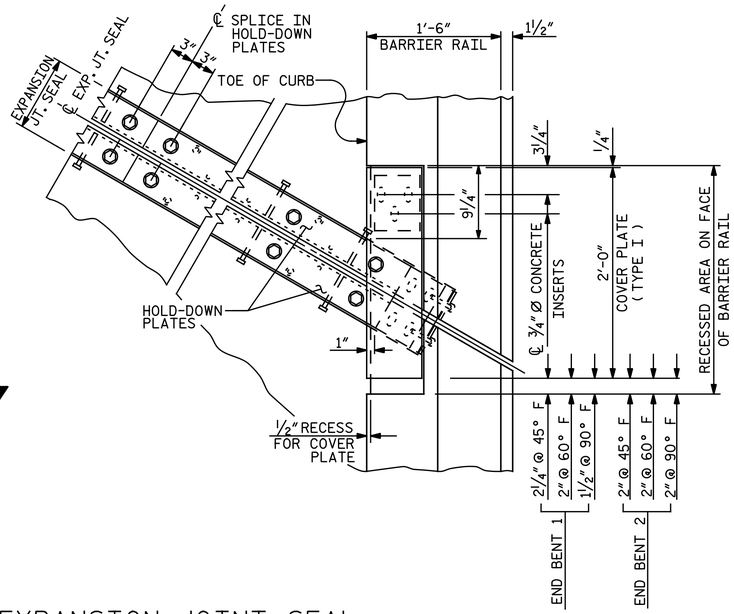
PLAN ELEVATION

CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



FLOW OF TRAFFIC



PLAN OF EXPANSION JOINT SEAL

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-20
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : M.D.M./N.B.S. DATE : 2-4-16
CHECKED BY : B.J. BELL DATE : 3-23-16

DRAWN BY : REK 9/87
CHECKED BY : CRK 10/87

REV. 10/1/11 MAA/GM
REV. 7/12 MAA/GM
REV. 6/13 MAA/GM

omayhew
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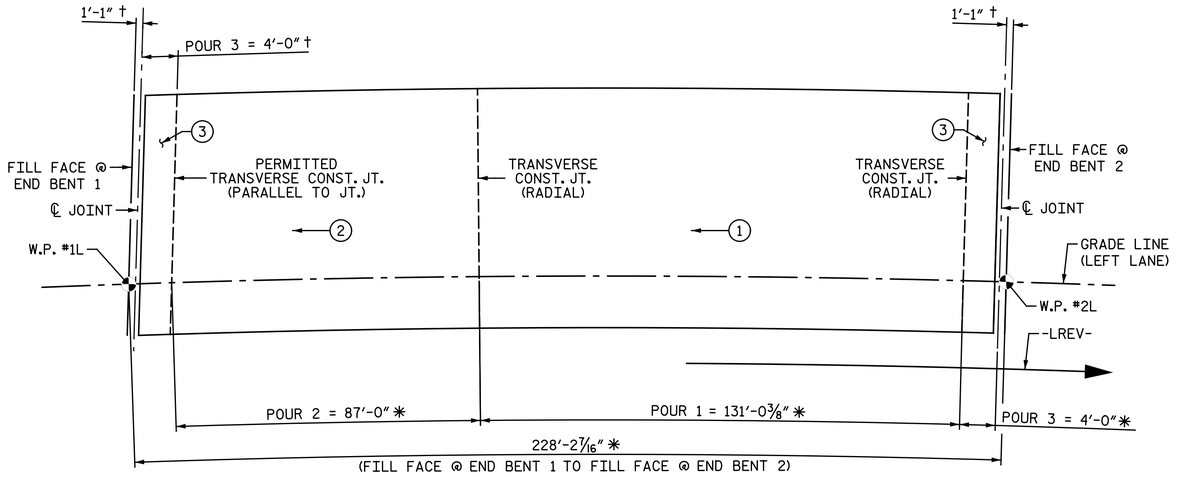
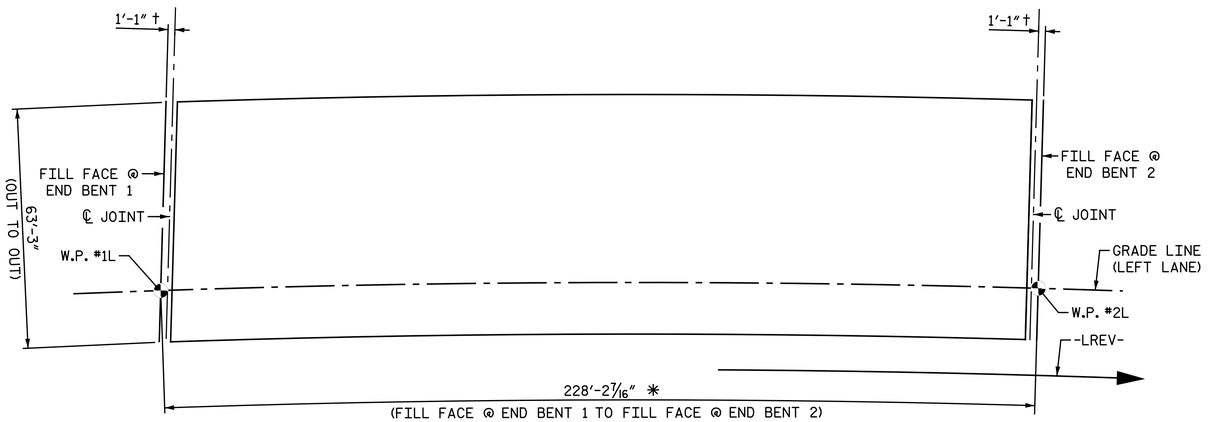


SLAB POURING SEQUENCE

✳ ARC DIMENSIONS MEASURED ALONG GRADE LINE (LEFT LANE)

† MEASURED PERPENDICULAR TO JOINT

(✳) INDICATES POUR AND DIRECTION



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 14,286)

✳ ARC DIMENSIONS MEASURED ALONG GRADE LINE (LEFT LANE)

† MEASURED PERPENDICULAR TO JOINT

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	984	#5	STR	32' - 10"	33,697
A2	492	#5	STR	26' - 11"	13,812
A3	492	#5	STR	38' - 4"	19,671
B1E	172	#4	STR	57' - 11"	6,654
B2	340	#5	STR	58' - 1"	20,597
G1E	4	#5	STR	32' - 10"	137
J1E	122	#4	4	1' - 5"	115
K1E	4	#5	1	9' - 10"	41
K2E	16	#5	2	15' - 7"	260
K3E	4	#5	1	11' - 7"	48
S1E	90	#4	3	4' - 1"	245
REINFORCING STEEL				LBS.	54,080
EPOXY COATED REINF. STEEL				LBS.	41,197

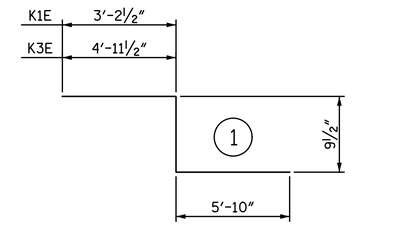
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

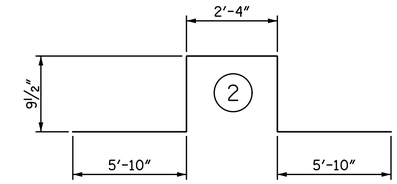
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

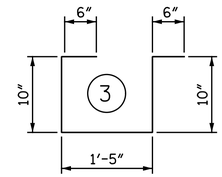
GROOVING BRIDGE FLOORS

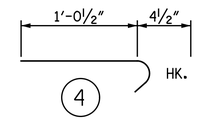
APPROACH SLABS	2,928	SQ.FT.
BRIDGE DECK	12,818	SQ.FT.
TOTAL	15,746	SQ.FT.

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	275.8		
POUR 2	181.6		
POUR 3	21.1		
TOTALS✳✳	478.5	54,080	41,197

✳✳QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DRAWN BY : M. D. MAYHEW DATE : 3-16-16

CHECKED BY : B. J. BELL DATE : 3-23-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
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Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-21
1			3			TOTAL SHEETS
2			4			35

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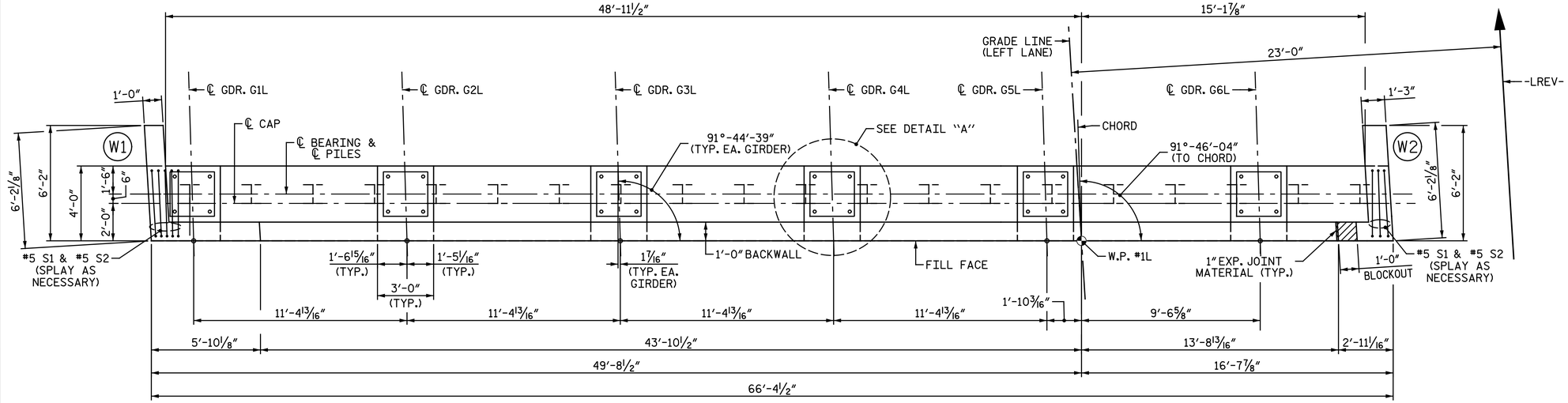
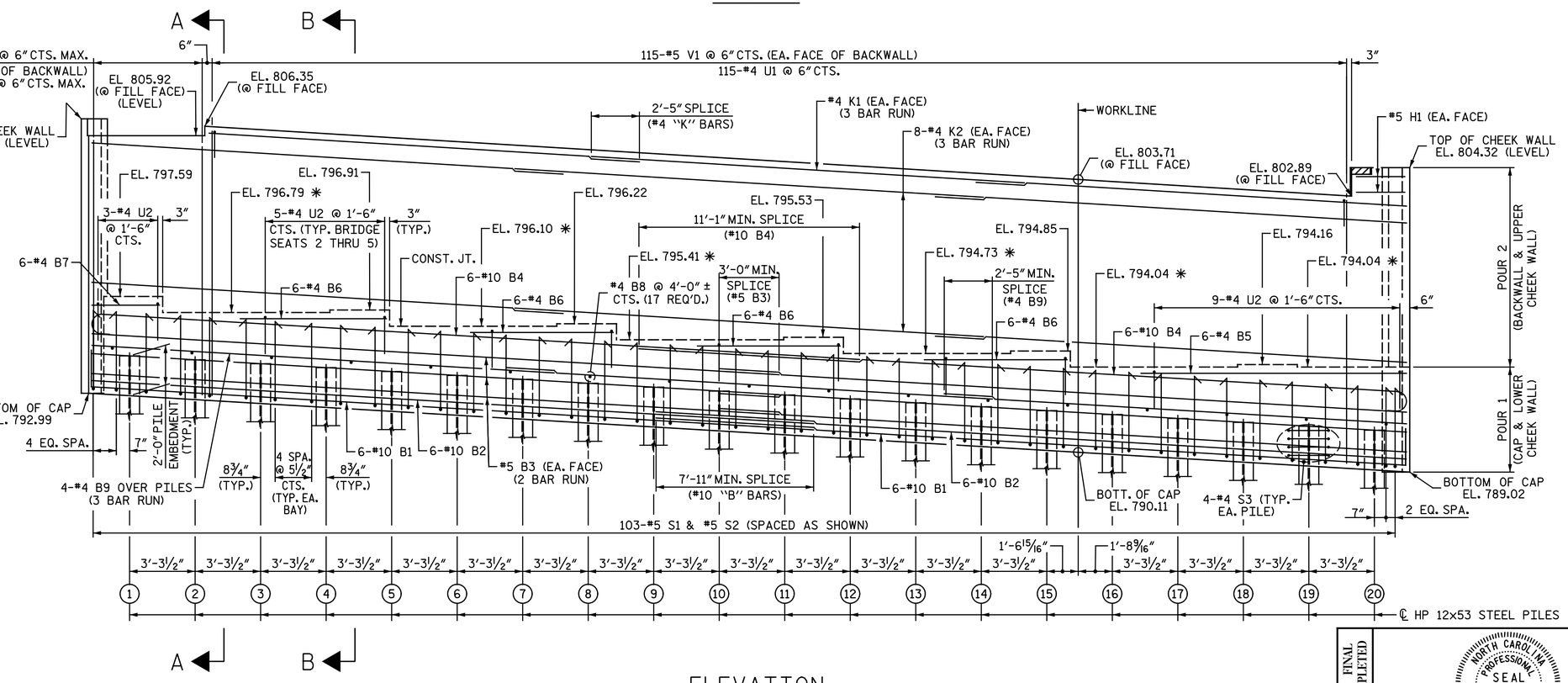


PLAN



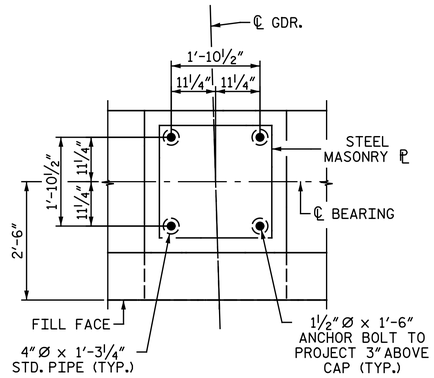
ELEVATION

✳ FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE ″END BENT 1 DETAILS″ SHEET.

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE ″END BENT 1 DETAILS″ SHEET.

FOR ADDITIONAL NOTES, SEE ″END BENT 1 DETAILS″ SHEET.



DETAIL ″A″

TOP OF PILE ELEVATIONS

PILE	ELEVATION
1	794.86
2	794.66
3	794.46
4	794.27
5	794.07
6	793.88
7	793.68
8	793.48
9	793.29
10	793.09
11	792.89
12	792.70
13	792.50
14	792.30
15	792.11
16	791.91
17	791.72
18	791.52
19	791.32
20	791.13

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C413AF8ECA3C434...

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-22
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : M. D. MAYHEW DATE : 3-7-16

CHECKED BY : A. M. HOUSTON DATE : 3-23-16

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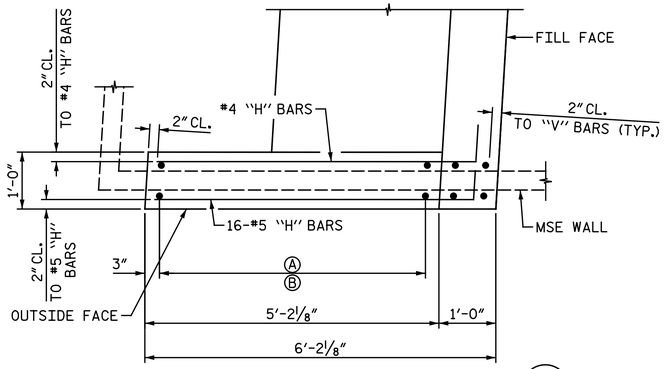
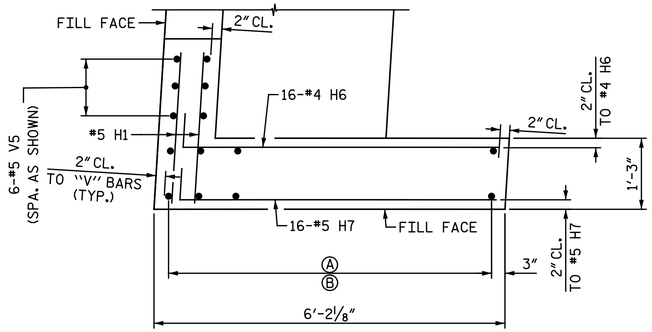


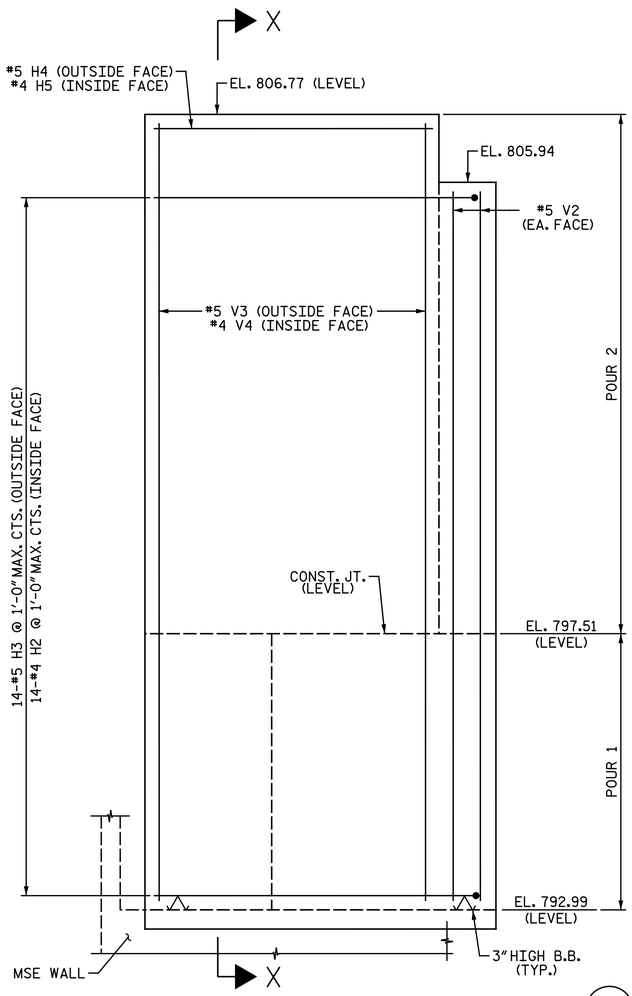
PLAN OF LEFT CHEEK WALL (W1)

Ⓐ 6-#5 V3 @ 1'-0" MAX. CTS. (OUTSIDE FACE)
Ⓑ 6-#4 V4 @ 1'-0" MAX. CTS. (INSIDE FACE)

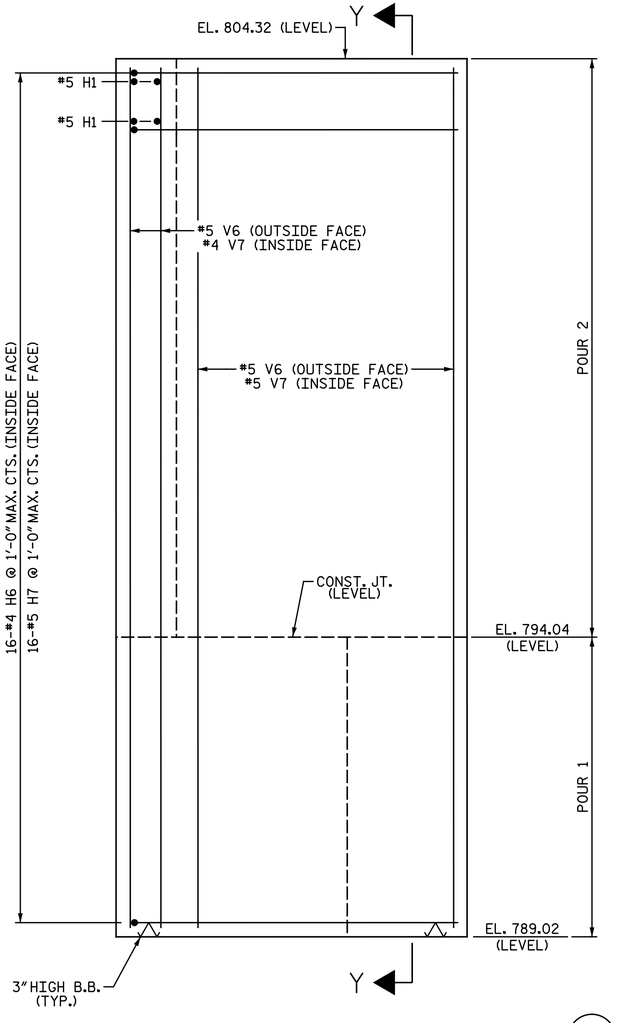


PLAN OF RIGHT CHEEK WALL (W2)

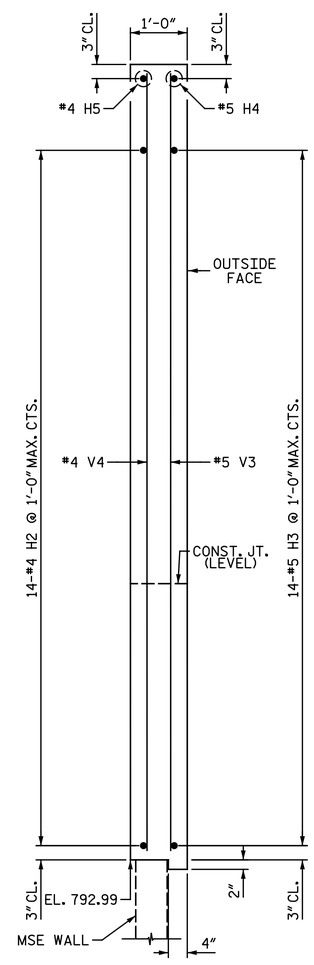
Ⓐ 8-#5 V6 @ 1'-0" MAX. CTS. (OUTSIDE FACE)
Ⓑ 8-#4 V7 @ 1'-0" MAX. CTS. (INSIDE FACE)



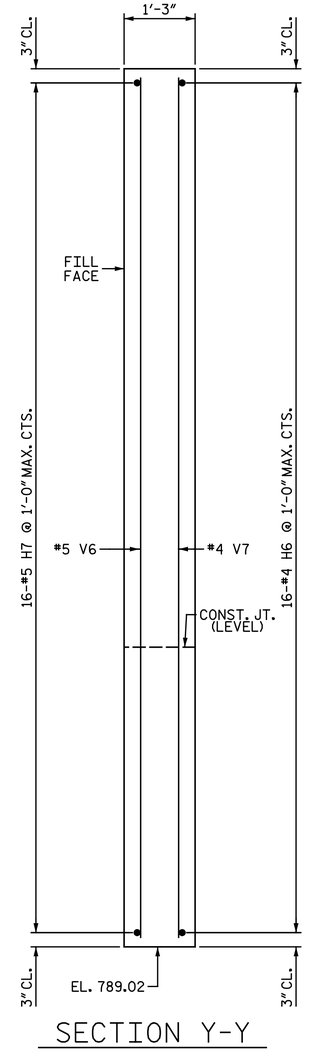
ELEVATION OF LEFT CHEEK WALL (W1)



ELEVATION OF RIGHT CHEEK WALL (W2)



SECTION X-X



SECTION Y-Y

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-
SHEET 2 OF 2

DRAWN BY : M. D. M./N. B. S. DATE : 3-7-16
CHECKED BY : A. M. HOUSTON DATE : 3-23-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

LEFT LANES

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
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2			4			35

omoyhew 5:18:26 PM 5/17/2016
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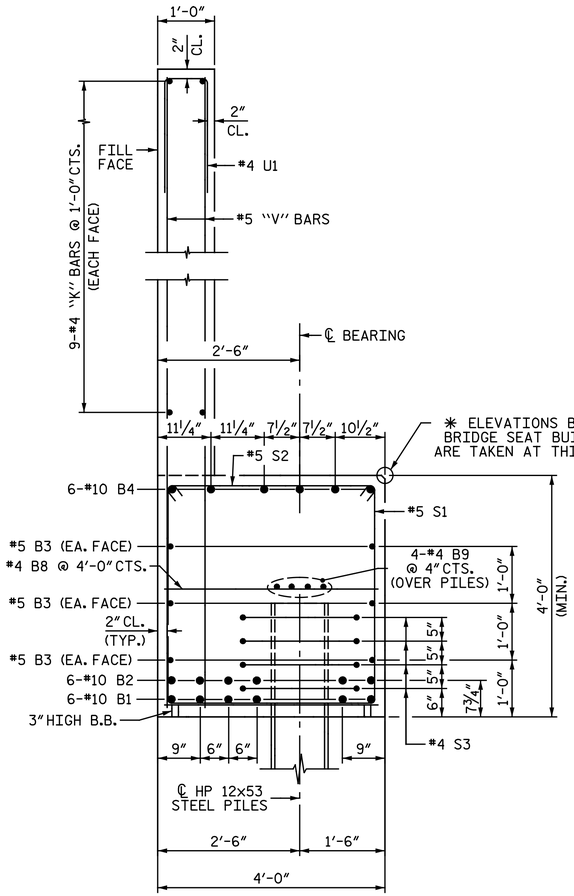
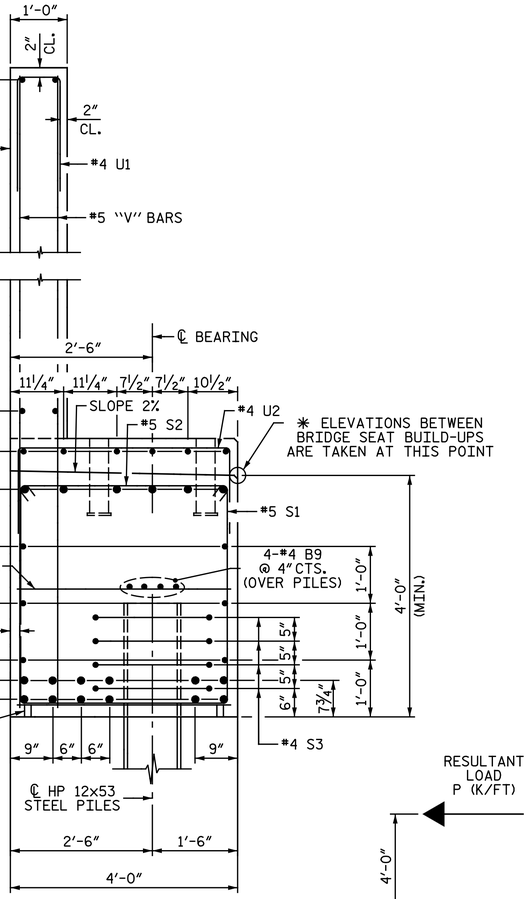


SECTION A-A

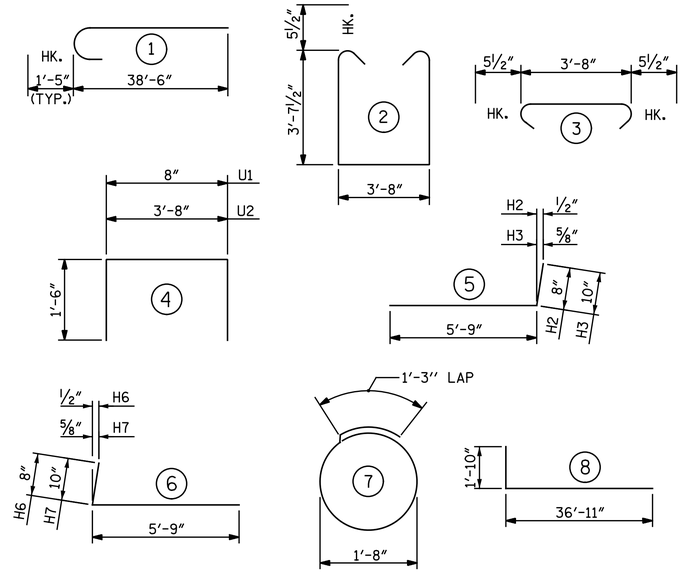


SECTION B-B

MSE REINFORCING STRAP LOAD DETAIL

LOAD CASE	RESULTANT LOAD, P (K/FT)
THERMAL CONTRACTION	4.89
LIVE LOAD BRAKING	0.72

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	8	38' - 9"	2,001
B2	12	#10	STR	36' - 11"	1,906
B3	12	#5	STR	34' - 6"	432
B4	12	#10	1	39' - 11"	2,061
B5	6	#4	STR	13' - 3"	53
B6	24	#4	STR	6' - 8"	107
B7	6	#4	STR	3' - 5"	14
B8	17	#4	STR	3' - 8"	42
B9	12	#4	STR	23' - 7"	189
H1	4	#5	STR	2' - 7"	11
H2	14	#4	5	6' - 5"	60
H3	14	#5	5	6' - 7"	96
H4	1	#5	STR	4' - 10"	5
H5	1	#4	STR	4' - 10"	3
H6	16	#4	6	6' - 5"	69
H7	16	#5	6	6' - 7"	110
K1	6	#4	STR	21' - 9"	87
K2	48	#4	STR	23' - 8"	759
S1	103	#5	2	11' - 10"	1,271
S2	103	#5	3	4' - 7"	492
S3	80	#4	7	6' - 6"	347
U1	127	#4	4	3' - 8"	311
U2	32	#4	4	6' - 8"	143
V1	230	#5	STR	13' - 2"	3,159
V2	24	#5	STR	12' - 4"	309
V3	6	#5	STR	13' - 1"	82
V4	6	#4	STR	13' - 4"	53
V5	6	#5	STR	14' - 3"	89
V6	8	#5	STR	14' - 11"	124
V7	8	#4	STR	14' - 11"	80

REINFORCING STEEL	LBS.	14,465
CLASS A CONCRETE		CU. YDS.
POUR 1 - CAP & LOWER CHEEK WALLS		44.6
POUR 2 - BACKWALL & UPPER CHEEK WALLS		27.0
TOTAL		71.6
HP 12 x 53 STEEL PILES		
NO. 20	L.F.	1100

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR PIPE INSERTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE CHEEK WALL SHALL BE POURED AFTER THE BARRIER RAIL (PARAPET AND END POST) ARE CAST IF SLIP FORMING IS USED.

FOR PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEET.

PROJECT NO. U-2524D

GUILFORD COUNTY

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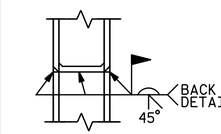
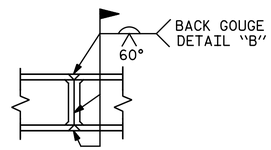
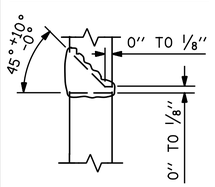


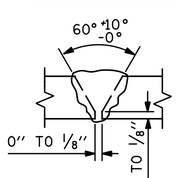
PILE VERTICAL



* PILE HORIZONTAL OR VERTICAL



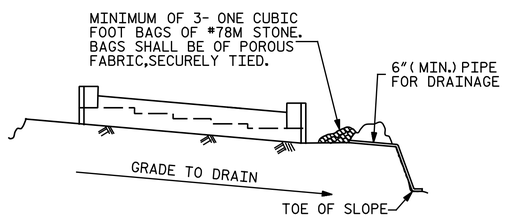
DETAIL "A"



DETAIL "B"

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAIL, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

PLANS, WORKING DRAWINGS AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS PRESENTED IN THE TABLE ABOVE. IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISIONS.

THE LOADS PRESENTED IN THE TABLE ABOVE ARE SERVICE LEVEL LOADS (NO LOAD FACTORS HAVE BEEN APPLIED). THE MSE REINFORCING STRAP DESIGNER SHALL USE THESE LOADS IN ALL APPLICABLE LOAD COMBINATIONS AS APPROPRIATE, IN COMBINATION WITH SOIL PRESSURE LOADS.

A MINIMUM OF TWO ROWS OF MSE REINFORCING STRAPS IS REQUIRED.

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Developed by Bradley J. Bell

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

LEFT LANES

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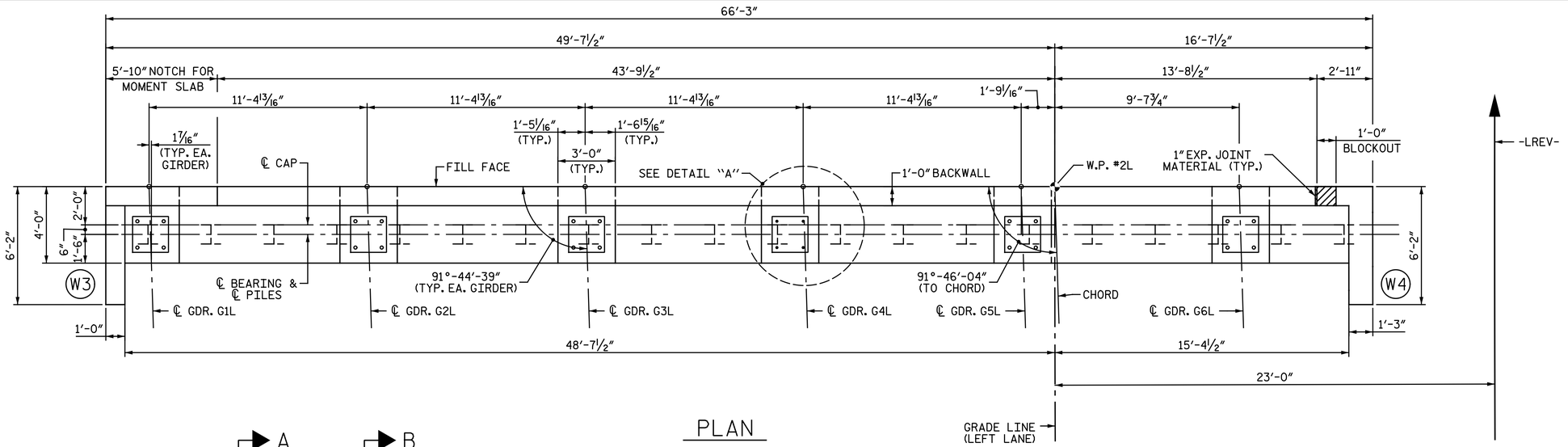
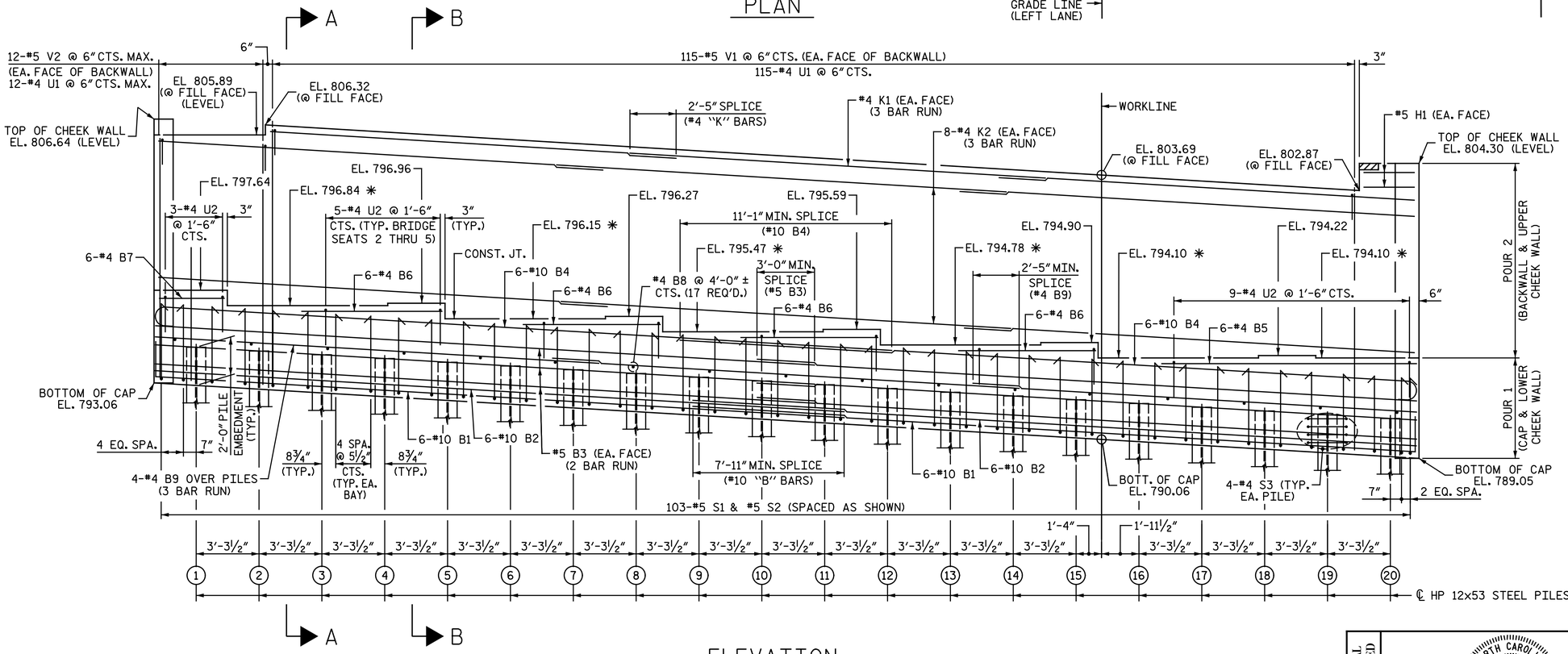


PLAN



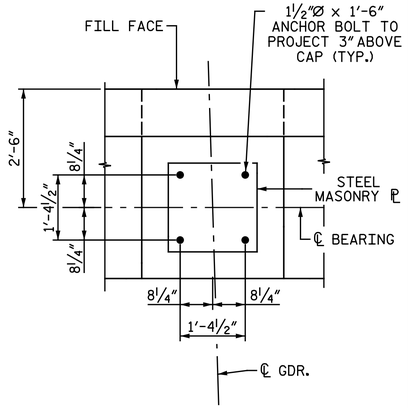
ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE "END BENT 2 DETAILS" SHEET.

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE "END BENT 2 DETAILS" SHEET.

FOR ADDITIONAL NOTES, SEE "END BENT 2 DETAILS" SHEET.



DETAIL "A"

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
1	794.93
2	794.73
3	794.53
4	794.33
5	794.13
6	793.93
7	793.73
8	793.53
9	793.33
10	793.13
11	792.93
12	792.74
13	792.54
14	792.34
15	792.14
16	791.94
17	791.74
18	791.54
19	791.34
20	791.14

PROJECT NO. U-2524D

GUILFORD COUNTY

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SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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5/17/2016

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Cary, North Carolina 27518
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

LEFT LANES

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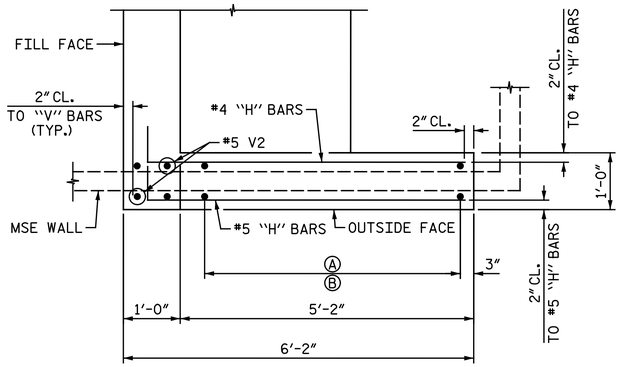
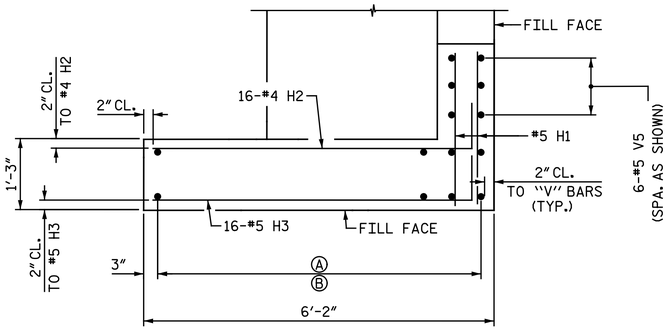


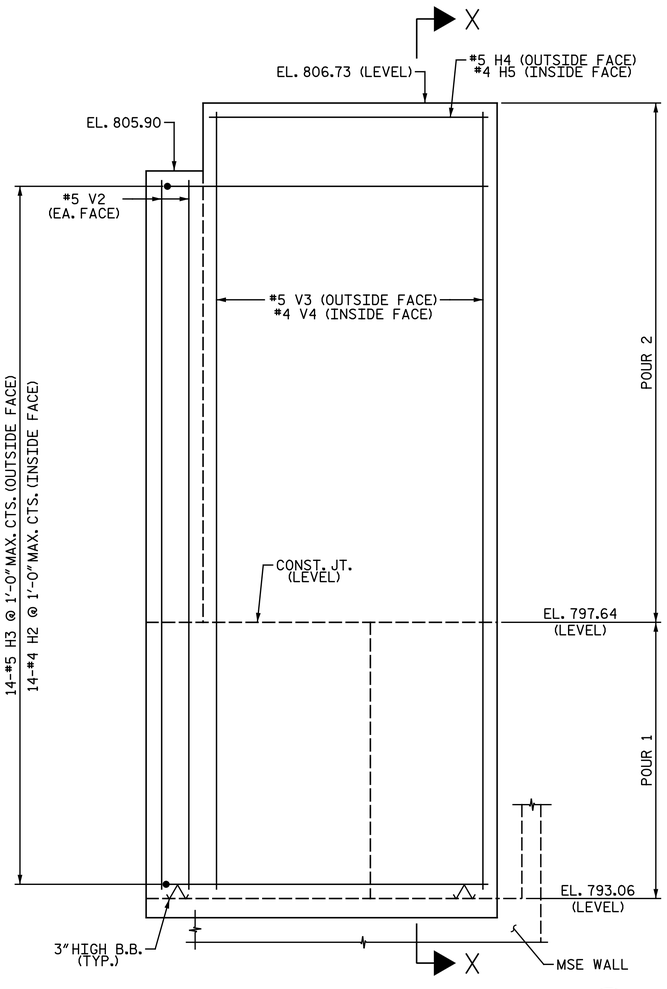
PLAN OF LEFT CHEEK WALL (W3)

Ⓐ 6-#5 V3 @ 1′-0″ MAX. CTS. (OUTSIDE FACE)
Ⓑ 6-#4 V4 @ 1′-0″ MAX. CTS. (INSIDE FACE)

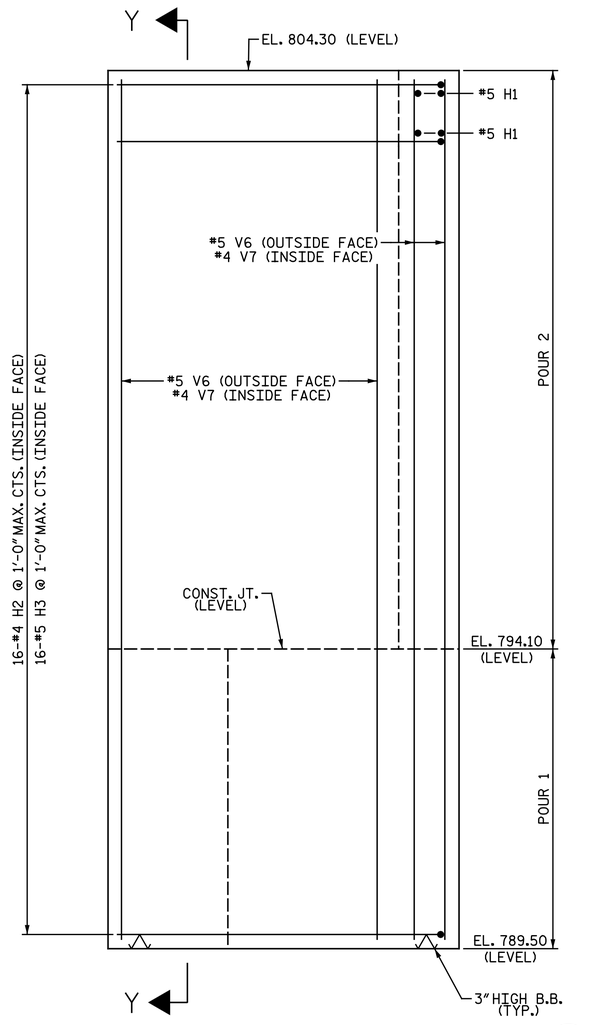


PLAN OF RIGHT CHEEK WALL (W4)

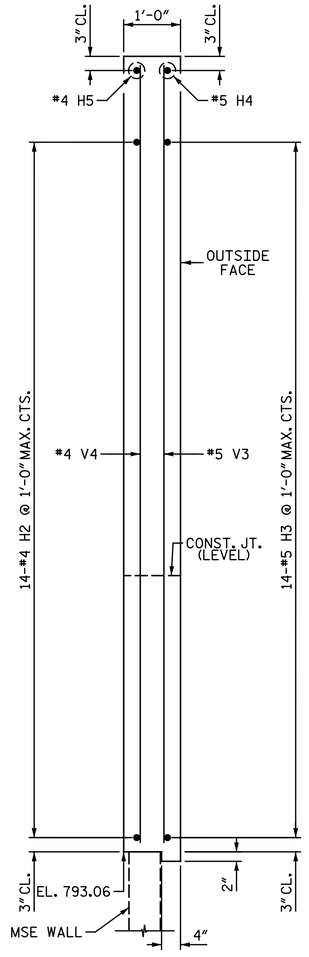
Ⓐ 8-#5 V6 @ 1′-0″ MAX. CTS. (OUTSIDE FACE)
Ⓑ 8-#4 V7 @ 1′-0″ MAX. CTS. (INSIDE FACE)



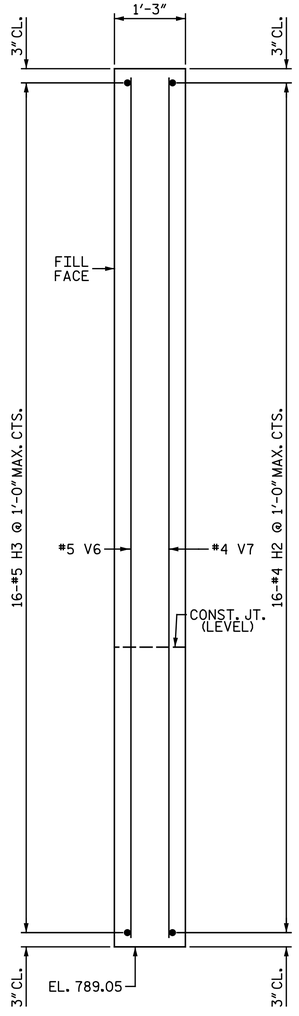
ELEVATION OF LEFT CHEEK WALL (W3)



ELEVATION OF RIGHT CHEEK WALL (W4)



SECTION X-X



SECTION Y-Y

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

SHEET 2 OF 2

DRAWN BY : M. D. MAYHEW DATE : 3-7-16
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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

LEFT LANES

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2			4			35

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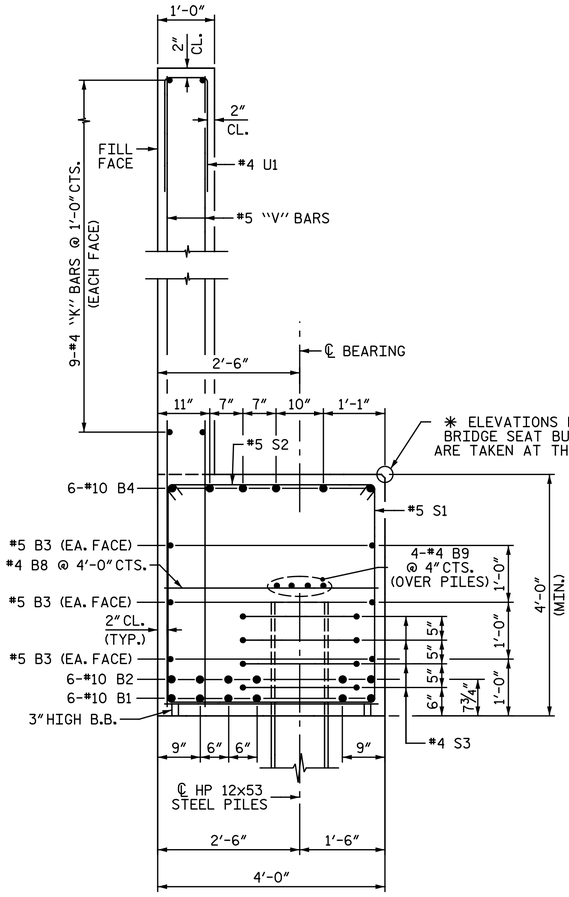
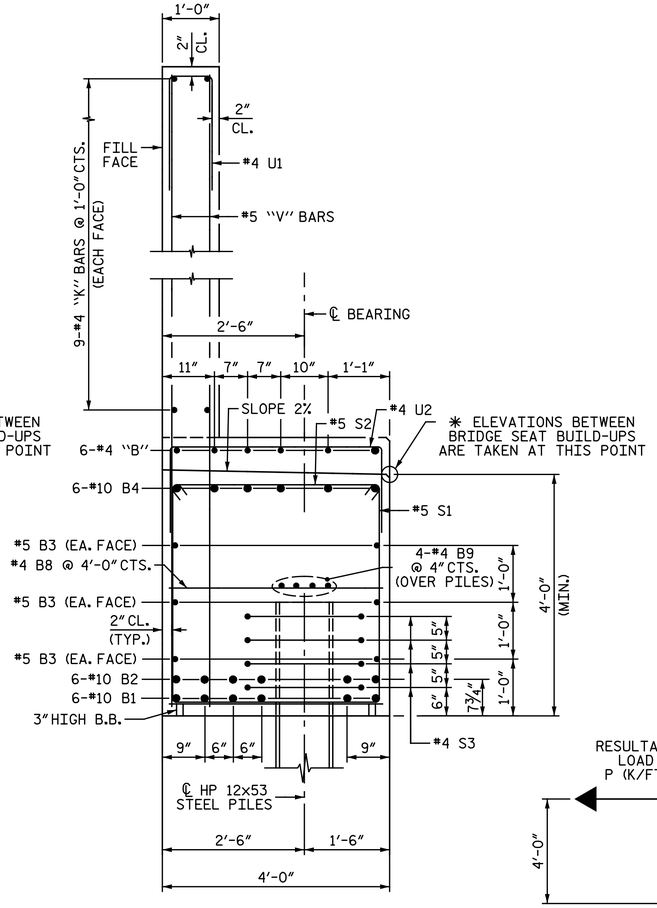
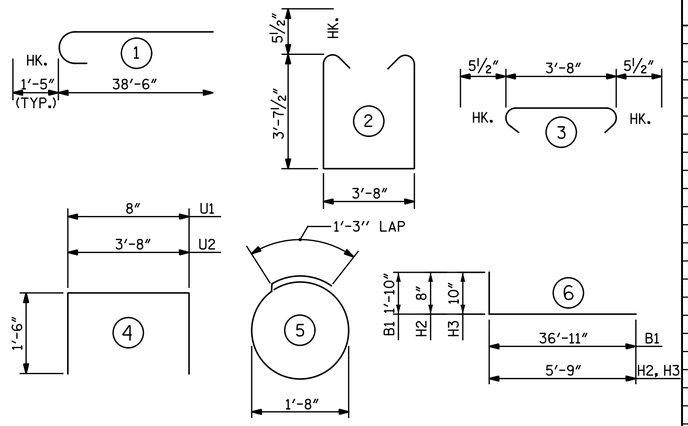


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	6	38' - 9"	2,001
B2	12	#10	STR	36' - 11"	1,906
B3	12	#5	STR	34' - 6"	432
B4	12	#10	1	39' - 11"	2,061
B5	6	#4	STR	13' - 3"	53
B6	24	#4	STR	6' - 8"	107
B7	6	#4	STR	3' - 5"	14
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H4	1	#5	STR	4' - 10"	5
H5	1	#4	STR	4' - 10"	3
K1	6	#4	STR	21' - 9"	87
K2	48	#4	STR	23' - 8"	759
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V5	6	#5	STR	14' - 3"	89
V6	8	#5	STR	14' - 11"	124
V7	8	#4	STR	14' - 11"	80

REINFORCING STEEL	LBS.	14,465
CLASS A CONCRETE		CU. YDS.
POUR 1 - CAP & LOWER CHEEK WALLS		44.6
POUR 2 - BACKWALL & UPPER CHEEK WALLS		27.0
TOTAL		71.6
HP 12 x 53 STEEL PILES NO. 20	L.F.	1000

MSE REINFORCING STRAP LOAD DETAIL

LOAD CASE	RESULTANT LOAD, P (K/FT)
LIVE LOAD BRAKING	1.33
THERMAL CONTRACTION	4.89
WIND ON SUPERSTRUCTURE	1.86
WIND ON LIVE LOAD	0.22

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAIL, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

PLANS, WORKING DRAWINGS AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS PRESENTED IN THE TABLE ABOVE. IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISIONS.

THE LOADS PRESENTED IN THE TABLE ABOVE ARE SERVICE LEVEL LOADS (NO LOAD FACTORS HAVE BEEN APPLIED). THE MSE REINFORCING STRAP DESIGNER USE THESE LOADS IN ALL APPLICABLE LOAD COMBINATIONS AS APPROPRIATE, IN COMBINATION WITH SOIL PRESSURE LOADS.

A MINIMUM OF TWO ROWS OF MSE REINFORCING STRAPS IS REQUIRED.

NOTES:

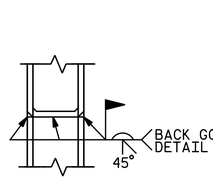
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

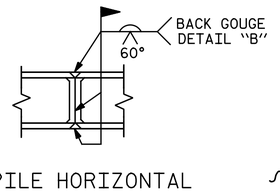
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

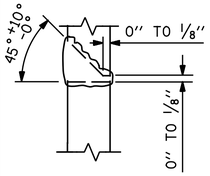
THE CONCRETE IN THE SHADED AREA OF THE CHEEK WALL SHALL BE POURED AFTER THE BARRIER RAIL (PARAPET AND END POST) ARE CAST IF SLIP FORMING IS USED.



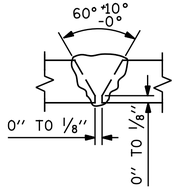
PILE VERTICAL



* PILE HORIZONTAL OR VERTICAL



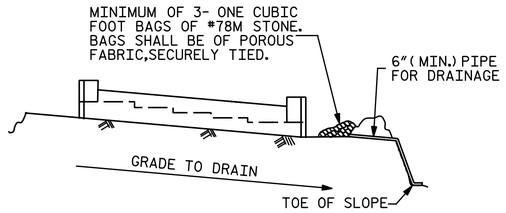
DETAIL "A"



DETAIL "B"

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DRAWN BY : M. D. MAYHEW DATE : 3-7-16

CHECKED BY : A. M. HOUSTON DATE : 3-25-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

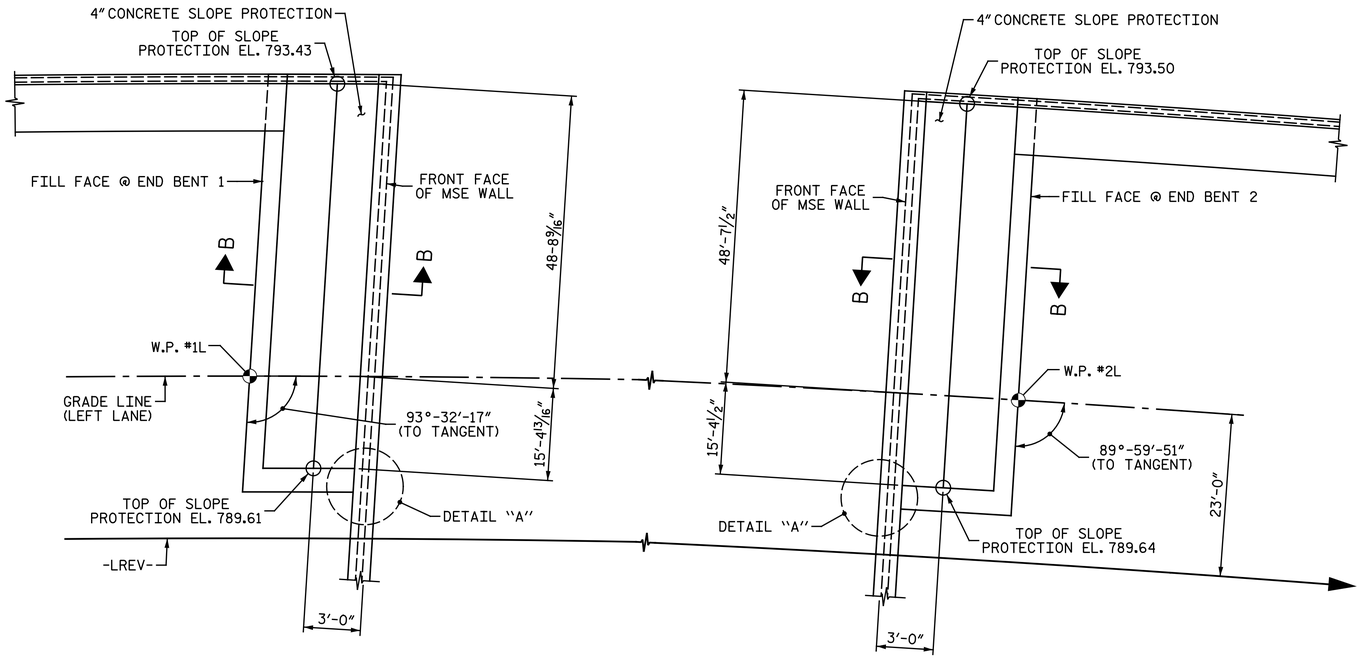
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-27
1			3			TOTAL SHEETS
2			4			35



PLAN AT END BENT 1

PLAN AT END BENT 2

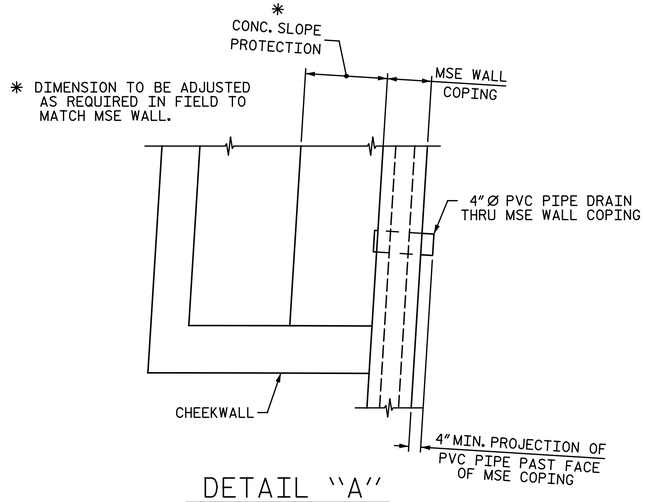
NOTES:

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

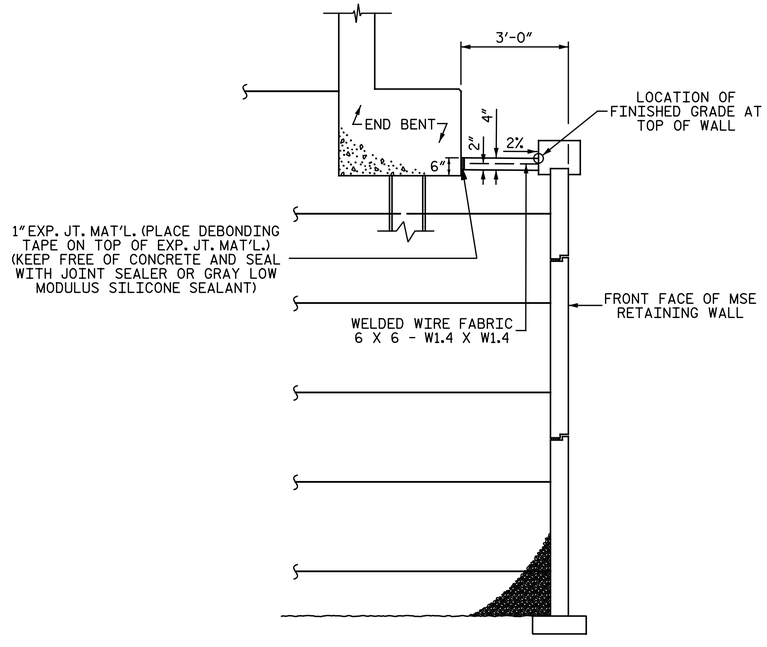
BRIDGE @ STA. 495+22.00 -LREV- (LEFT LANES)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	15.5	28
END BENT 2	15.5	28

* QUANTITY SHOWN IS BASED ON 5' POURS.

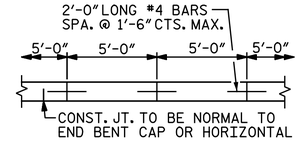


DETAIL "A"

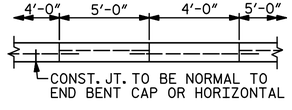
END BENT 1 SHOWN, END BENT 2 SIMILAR.



SECTION B-B



POURING DETAIL



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

DRAWN BY : C. E. MAYHEW DATE : 3-24-16

CHECKED BY : B. J. BELL DATE : 3-24-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C414AF8ECA3C434...

5/17/2016

Michael Baker INTERNATIONAL

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-28
1			3			TOTAL SHEETS
2			4			35

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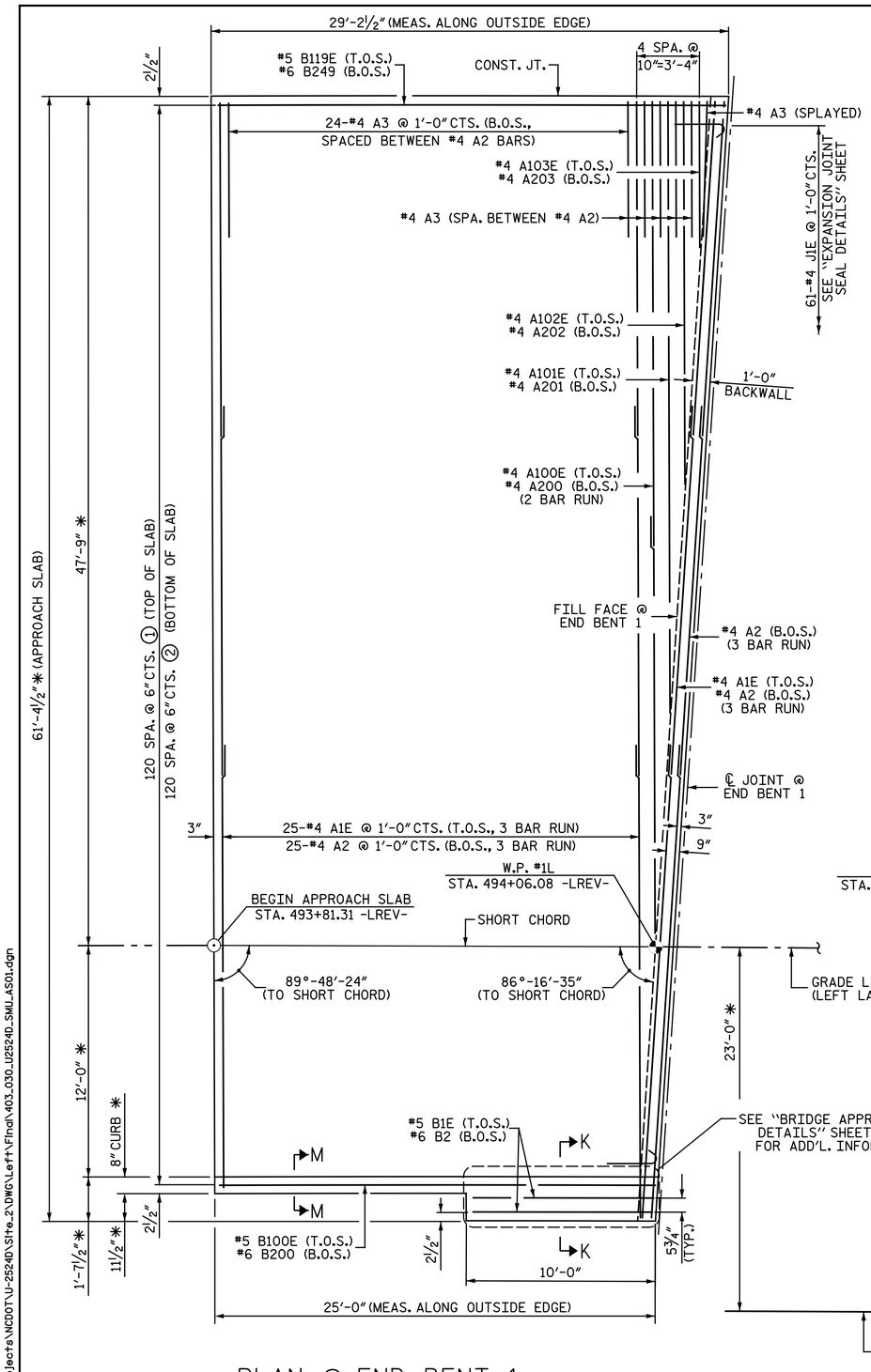
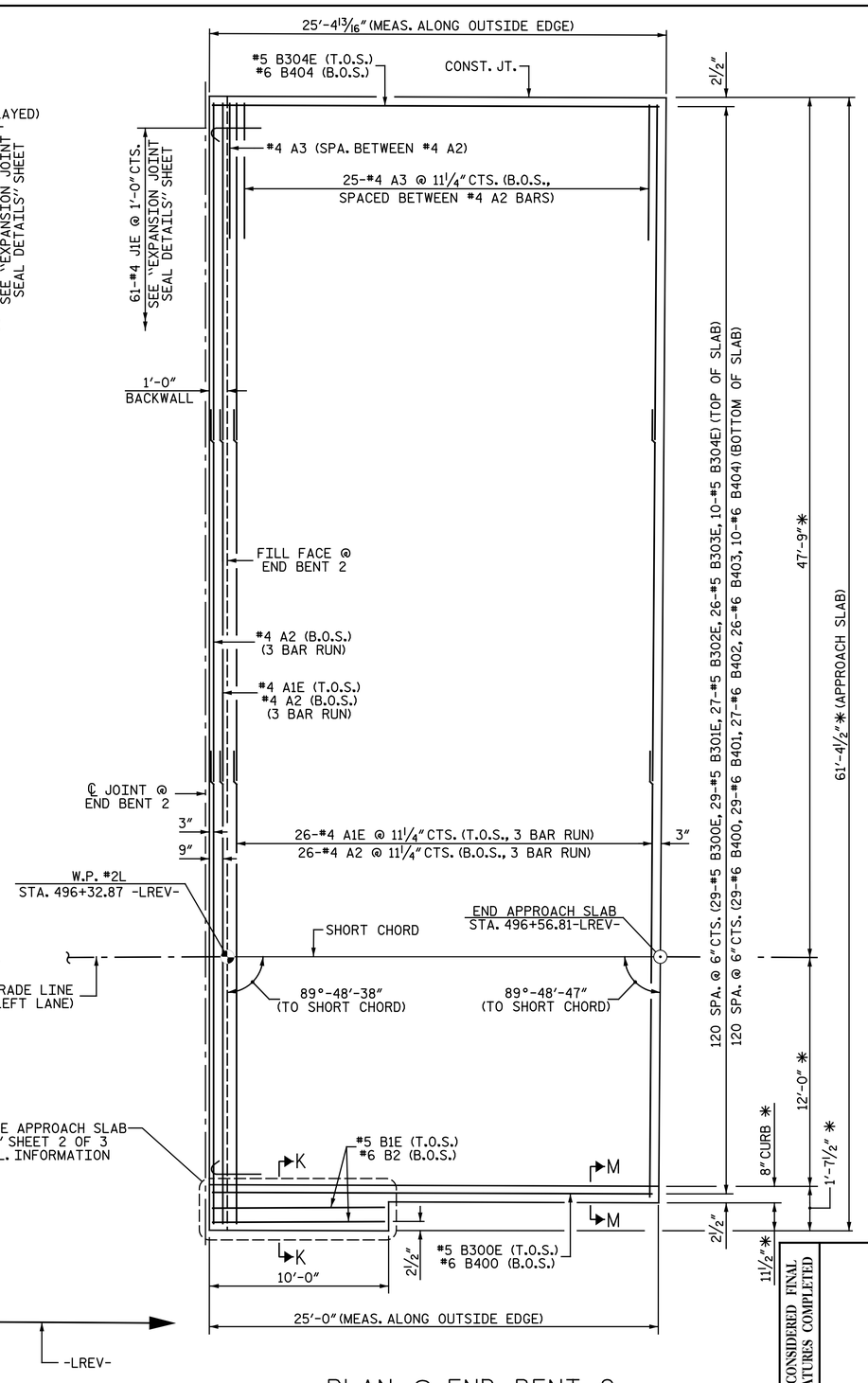


PLAN @ END BENT 1



PLAN @ END BENT 2

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

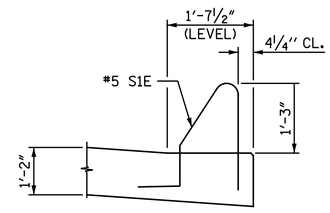
FOR MOMENT SLAB DETAILS, SEE "CONCRETE BARRIER RAIL WITH MOMENT SLAB" SHEET.

ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE NOT SHOWN.

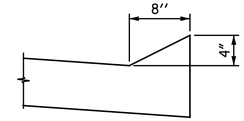
① 6-#5 B100E, 6-#5 B101E, 6-#5 B102E, 6-#5 B103E, 6-#5 B104E, 6-#5 B105E, 6-#5 B106E, 6-#5 B107E, 6-#5 B108E, 6-#5 B109E, 6-#5 B110E, 6-#5 B111E, 6-#5 B112E, 6-#5 B113E, 6-#5 B114E, 6-#5 B115E, 6-#5 B116E, 6-#5 B117E, 6-#5 B118E, 7-#5 B119E

② 2-#6 B200, 2-#6 B201, 2-#6 B202, 2-#6 B203, 3-#6 B204, 3-#6 B205, 2-#6 B206, 3-#6 B207, 2-#6 B208, 2-#6 B209, 3-#6 B210, 2-#6 B211, 3-#6 B212, 2-#6 B213, 3-#6 B214, 2-#6 B215, 2-#6 B216, 3-#6 B217, 2-#6 B218, 3-#6 B219, 2-#6 B220, 3-#6 B221, 2-#6 B222, 3-#6 B223, 2-#6 B224, 2-#6 B225, 3-#6 B226, 2-#6 B227, 3-#6 B228, 2-#6 B229, 3-#6 B230, 2-#6 B231, 2-#6 B232, 3-#6 B233, 2-#6 B234, 3-#6 B235, 2-#6 B236, 3-#6 B237, 2-#6 B238, 2-#6 B239, 3-#6 B240, 2-#6 B241, 3-#6 B242, 2-#6 B243, 2-#6 B244, 2-#6 B245, 2-#6 B246, 3-#6 B247, 2-#6 B248, 3-#6 B249

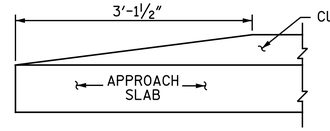
T.O.S. - DENOTES TOP OF SLAB
B.O.S. - DENOTES BOTTOM OF SLAB
✳ RADIAL DIMENSION



SECTION K-K



SECTION M-M



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

DRAWN BY : N.B.S. / M.D.M. DATE : 3-15-16
CHECKED BY : B. J. BELL DATE : 3-21-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell
5/17/2016

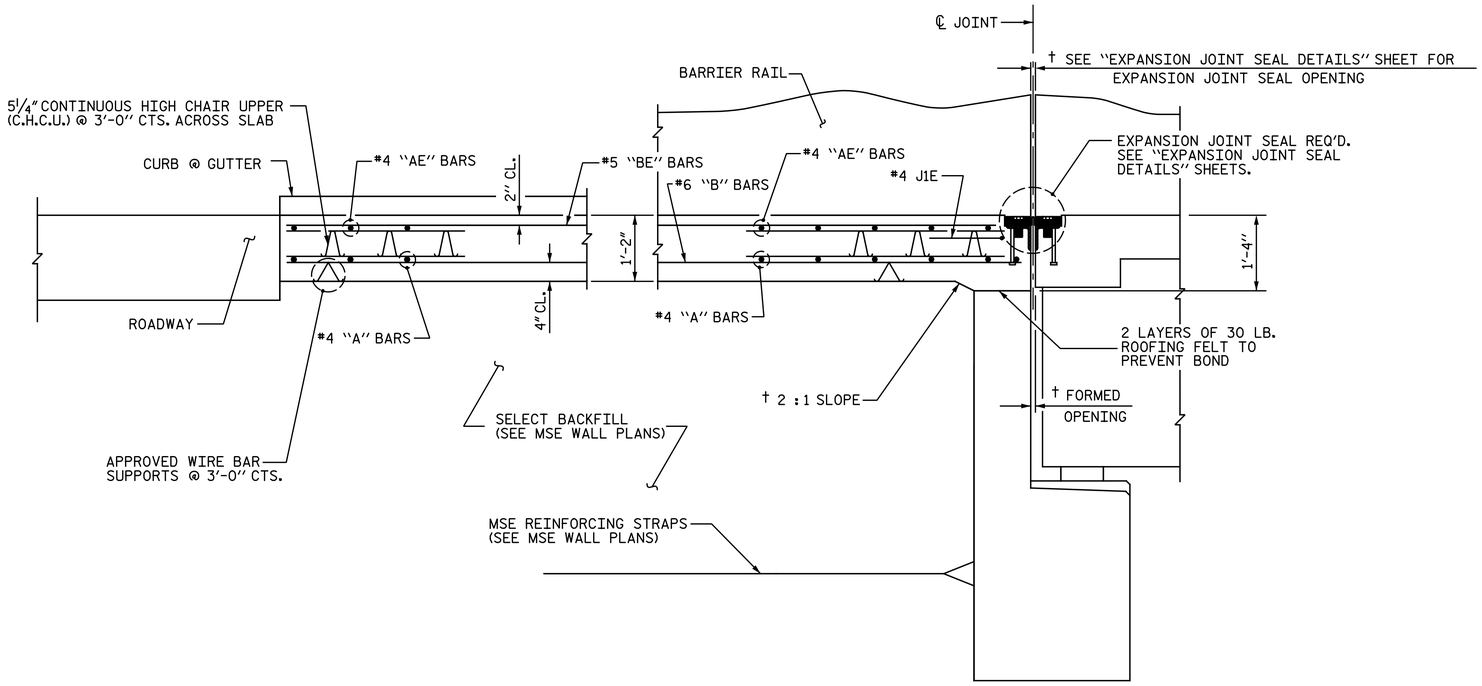
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR RIGID PAVEMENT

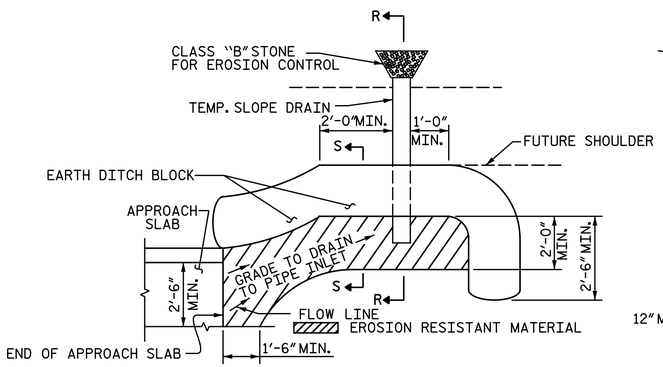
LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-29
1			3			TOTAL SHEETS
2			4			35



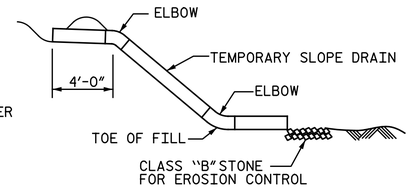
SECTION THRU SLAB

END BENT 1 SHOWN, END BENT 2 SIMILAR
† NORMAL TO END BENT

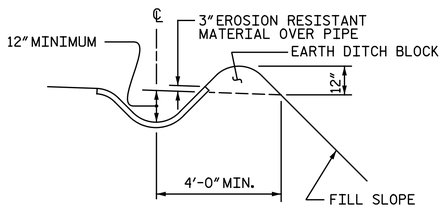


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

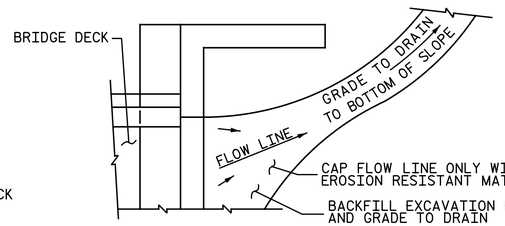
PLAN VIEW



SECTION R-R



SECTION S-S



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

DRAWN BY : N. B. SPEAKS DATE : 7-15-15
CHECKED BY : B. J. BELL DATE : 3-21-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Bradley J. Bell
5/17/2016

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

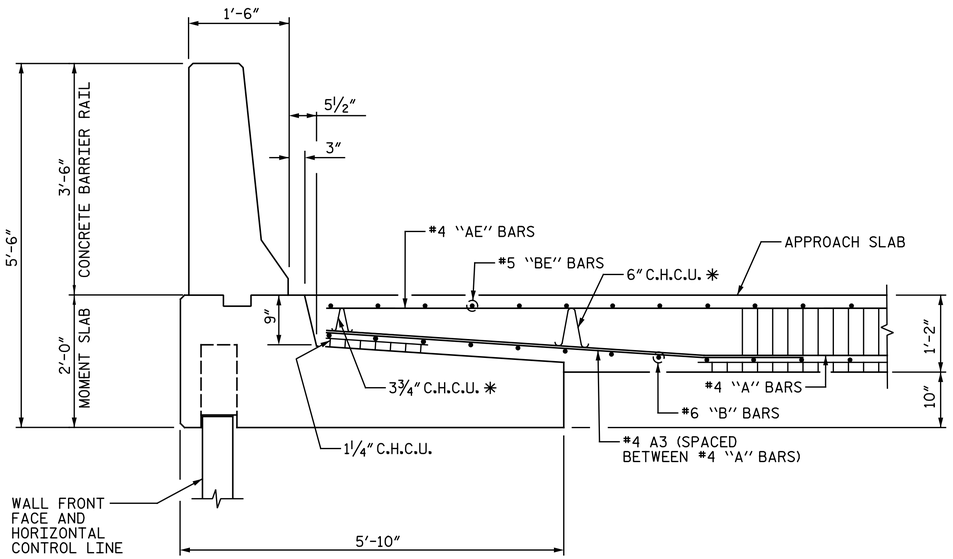
BRIDGE APPROACH SLAB DETAILS

LEFT LANES

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 495+22.00 -LREV-

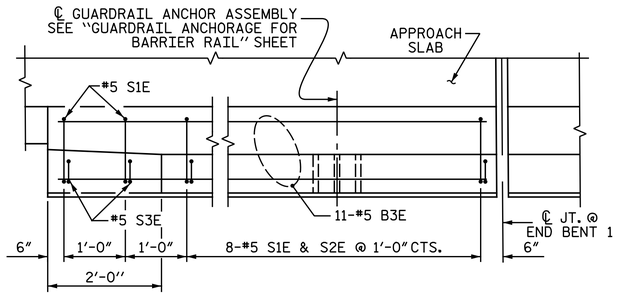
SHEET 1 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-30
1			3			TOTAL SHEETS
2			4			35

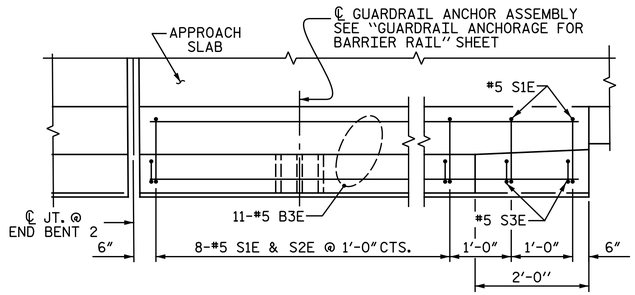


DETAILS AT MOMENT SLAB

✱ SPACE C.H.C.U. AS REQUIRED TO ACHIEVE SPECIFIED REBAR CLEAR COVERS.

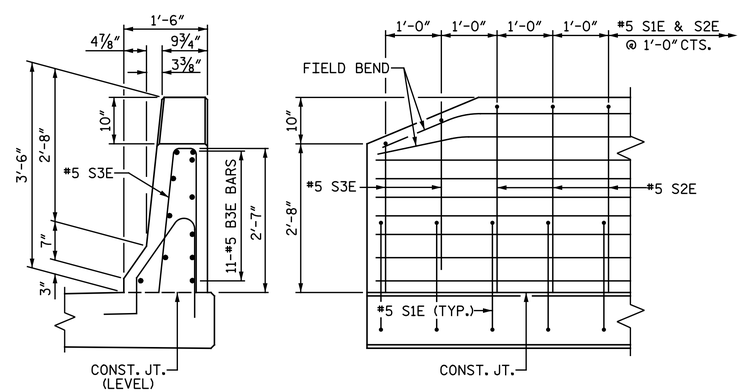


END BENT 1



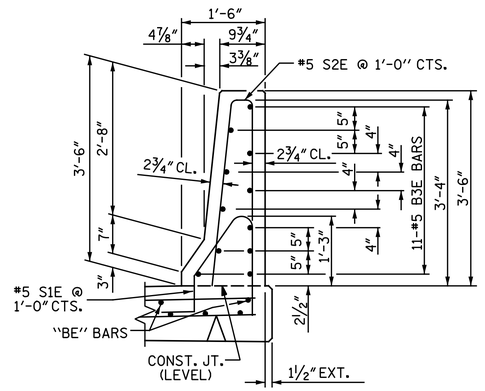
END BENT 2

PLAN OF BARRIER RAIL



END VIEW SIDE VIEW

END OF RAIL DETAILS



SECTION THRU RAIL

NOTES:

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSION STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR MOMENT SLAB DETAILS, SEE "CONCRETE BARRIER RAIL WITH MOMENT SLAB" SHEETS.

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

LEFT LANES

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-31
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : N. B. SPEAKS DATE : 7-15-15
CHECKED BY : B. J. BELL DATE : 3-21-16

amayhew
5/17/2016 5:18:37 PM
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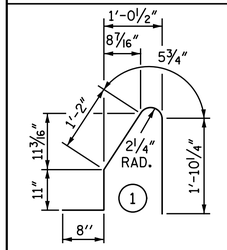
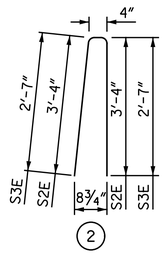
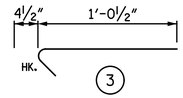
BAR TYPES







THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
APPROACH SLAB @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	78	#4	STR	21' - 9"	1,133	B211	2	#6	STR	25' - 7"	77
A2	81	#4	STR	21' - 7"	1,168	B212	3	#6	STR	25' - 8"	116
A100E	2	#4	STR	24' - 4"	33	B213	2	#6	STR	25' - 9"	77
A101E	1	#4	STR	34' - 5"	23	B214	3	#6	STR	25' - 10"	116
A102E	1	#4	STR	22' - 3"	15	B215	2	#6	STR	25' - 11"	78
A103E	1	#4	STR	10' - 1"	7	B216	2	#6	STR	26' - 0"	78
A200	2	#4	STR	24' - 3"	32	B217	3	#6	STR	26' - 1"	118
A201	1	#4	STR	34' - 5"	23	B218	2	#6	STR	26' - 2"	79
A202	1	#4	STR	22' - 3"	15	B219	3	#6	STR	26' - 3"	118
A203	1	#4	STR	10' - 1"	7	B220	2	#6	STR	26' - 4"	79
A3	29	#4	STR	7' - 6"	145	B221	3	#6	STR	26' - 5"	119
						B222	2	#6	STR	26' - 6"	80
B1E	2	#5	STR	9' - 4"	19	B223	3	#6	STR	26' - 7"	120
B2	2	#6	STR	9' - 8"	29	B224	2	#6	STR	26' - 8"	80
B100E	6	#5	STR	24' - 4"	152	B225	2	#6	STR	26' - 9"	80
B101E	6	#5	STR	24' - 7"	154	B226	3	#6	STR	26' - 10"	121
B102E	6	#5	STR	24' - 9"	155	B227	2	#6	STR	26' - 11"	81
B103E	6	#5	STR	25' - 0"	156	B228	3	#6	STR	27' - 0"	122
B104E	6	#5	STR	25' - 2"	157	B229	2	#6	STR	27' - 1"	81
B105E	6	#5	STR	25' - 5"	159	B230	3	#6	STR	27' - 2"	122
B106E	6	#5	STR	25' - 7"	160	B231	2	#6	STR	27' - 3"	82
B107E	6	#5	STR	25' - 10"	162	B232	2	#6	STR	27' - 4"	82
B108E	6	#5	STR	26' - 0"	163	B233	3	#6	STR	27' - 5"	124
B109E	6	#5	STR	26' - 3"	164	B234	2	#6	STR	27' - 6"	83
B110E	6	#5	STR	26' - 5"	165	B235	3	#6	STR	27' - 7"	124
B111E	6	#5	STR	26' - 8"	167	B236	2	#6	STR	27' - 8"	83
B112E	6	#5	STR	26' - 10"	168	B237	3	#6	STR	27' - 9"	125
B113E	6	#5	STR	27' - 1"	169	B238	2	#6	STR	27' - 10"	84
B114E	6	#5	STR	27' - 3"	171	B239	2	#6	STR	27' - 11"	84
B115E	6	#5	STR	27' - 6"	172	B240	3	#6	STR	28' - 0"	126
B116E	6	#5	STR	27' - 8"	173	B241	2	#6	STR	28' - 1"	84
B117E	6	#5	STR	27' - 10"	174	B242	3	#6	STR	28' - 2"	127
B118E	6	#5	STR	28' - 1"	176	B243	2	#6	STR	28' - 3"	85
B119E	7	#5	STR	28' - 3"	206	B244	2	#6	STR	28' - 4"	85
B200	2	#6	STR	24' - 8"	74	B245	2	#6	STR	28' - 5"	85
B201	2	#6	STR	24' - 9"	74	B246	2	#6	STR	28' - 6"	86
B202	2	#6	STR	24' - 10"	75	B247	3	#6	STR	28' - 7"	129
B203	2	#6	STR	24' - 11"	75	B248	2	#6	STR	28' - 8"	86
B204	3	#6	STR	25' - 0"	113	B249	3	#6	STR	28' - 9"	130
B205	3	#6	STR	25' - 1"	113						
B206	2	#6	STR	25' - 2"	76	J1E	61	#4	3	1' - 5"	58
B207	3	#6	STR	25' - 3"	114						
B208	2	#6	STR	25' - 4"	76						
B209	2	#6	STR	25' - 5"	76						
B210	3	#6	STR	25' - 6"	115						

REINFORCING STEEL	LBS.	6,236
EPOXY COATED REINF. STEEL	LBS.	4,611
CLASS AA CONCRETE	C.Y.	71.8

BILL OF MATERIAL
APPROACH SLAB @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	87	#4	STR	21' - 9"	1,264
A2	90	#4	STR	21' - 7"	1,298
A3	26	#4	STR	7' - 6"	130
B1E	2	#5	STR	9' - 4"	19
B2	2	#6	STR	9' - 8"	29
B300E	29	#5	STR	24' - 4"	736
B301E	29	#5	STR	24' - 5"	739
B302E	27	#5	STR	24' - 6"	690
B303E	26	#5	STR	24' - 7"	667
B304E	10	#5	STR	24' - 8"	257
B400	29	#6	STR	24' - 8"	1,074
B401	29	#6	STR	24' - 9"	1,078
B402	27	#6	STR	24' - 10"	1,007
B403	26	#6	STR	24' - 11"	973
B404	10	#6	STR	25' - 0"	376
J1E	61	#4	3	1' - 5"	58

REINFORCING STEEL	LBS.	6,023
EPOXY COATED REINF. STEEL	LBS.	4,372
CLASS AA CONCRETE	C.Y.	66.7

BILL OF MATERIAL
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3E	22	#5	STR	9' - 8"	222
S1E	20	#5	1	5' - 1"	106
S2E	16	#5	2	7' - 0"	117
S3E	4	#5	2	5' - 6"	23

EPOXY COATED REINF. STEEL	LBS.	468
CLASS AA CONCRETE	C.Y.	2.7
CONC. BARRIER RAIL	LIN. FT.	20.0

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell C41A3FBECA3C434...

5/17/2016

Michael Baker INTERNATIONAL

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Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-32
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : M. D. MAYHEW DATE : 3-18-16
CHECKED BY : N. B. SPEAKS DATE : 3-22-16

amayhew
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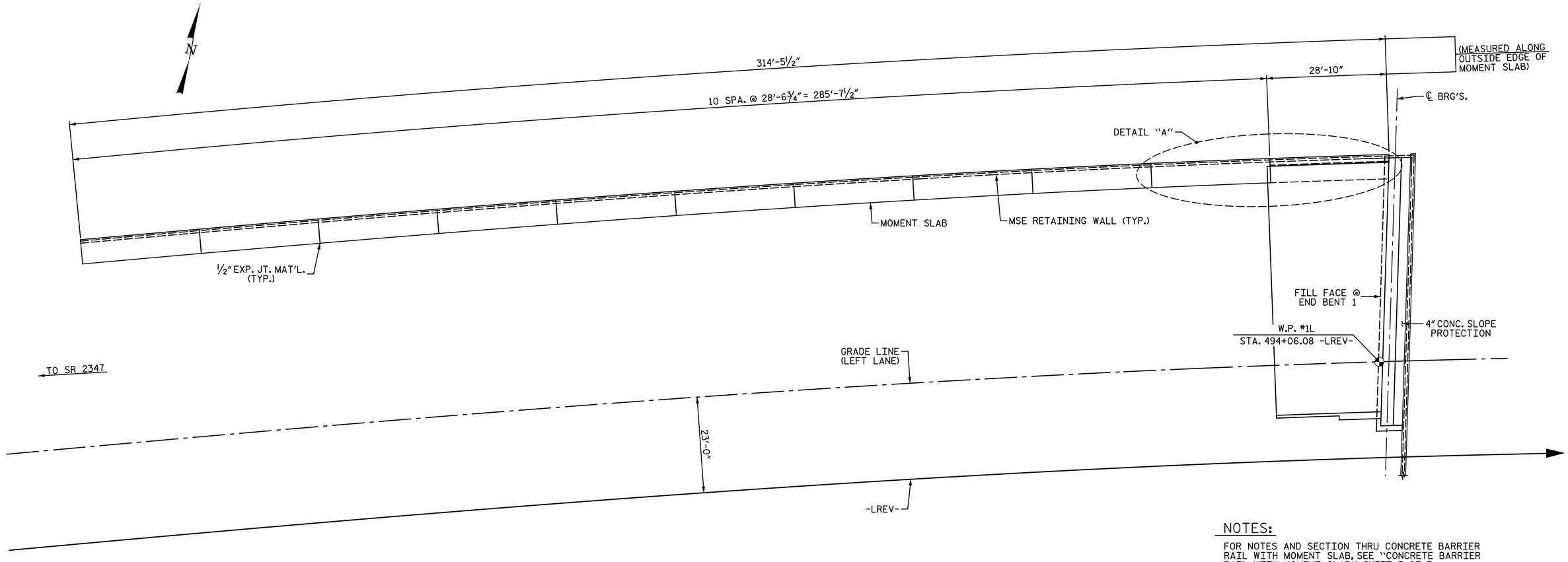
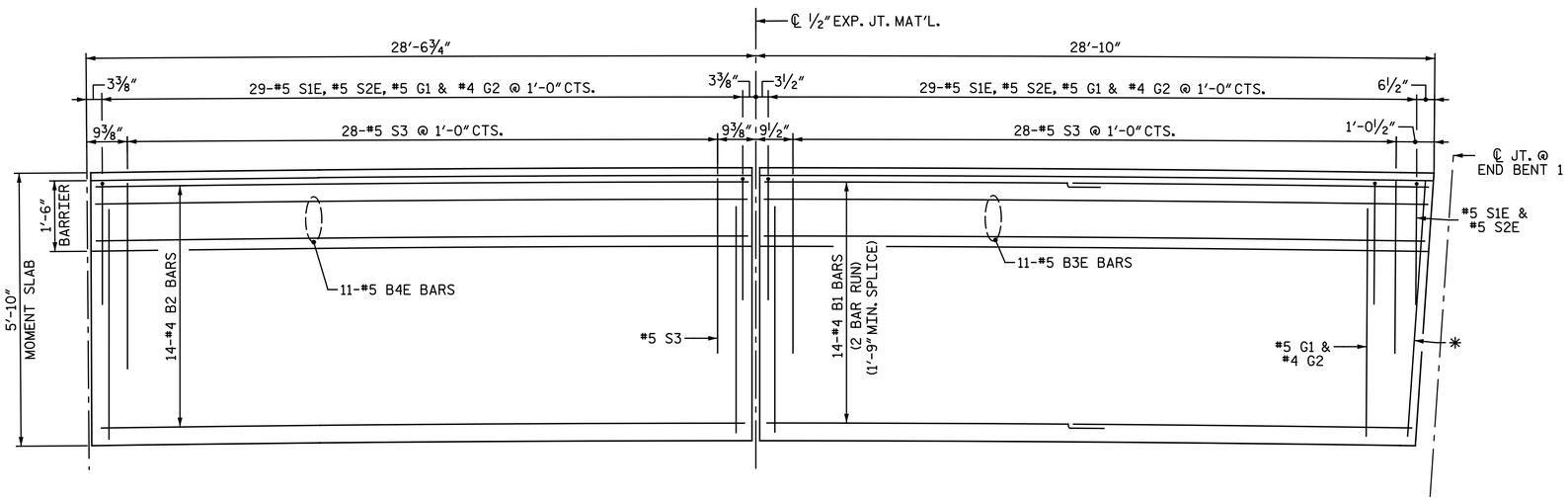


PLAN - END BENT 1

NOTES:

FOR NOTES AND SECTION THRU CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE "CONCRETE BARRIER RAIL WITH MOMENT SLAB", SHEET 3 OF 3.

FOR MSE WALL LAYOUT AND DETAILS, SEE RETAINING WALL SHEETS.



DETAIL "A"

*PLACE FIRST G1 & G2 BARS PARALLEL TO JOINT

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 1 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by Bradley J. Bell

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL WITH MOMENT SLAB

LEFT LANES

Michael Baker INTERNATIONAL

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-33
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : C. E. MAYHEW DATE : 2-25-16
CHECKED BY : B. J. BELL DATE : 3-23-16

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Filename: Y:\Projects\NCDOT\U-2524D\Site.2\DWG\Left\Final\403_034_U2524D_SMU_MSE01.dgn

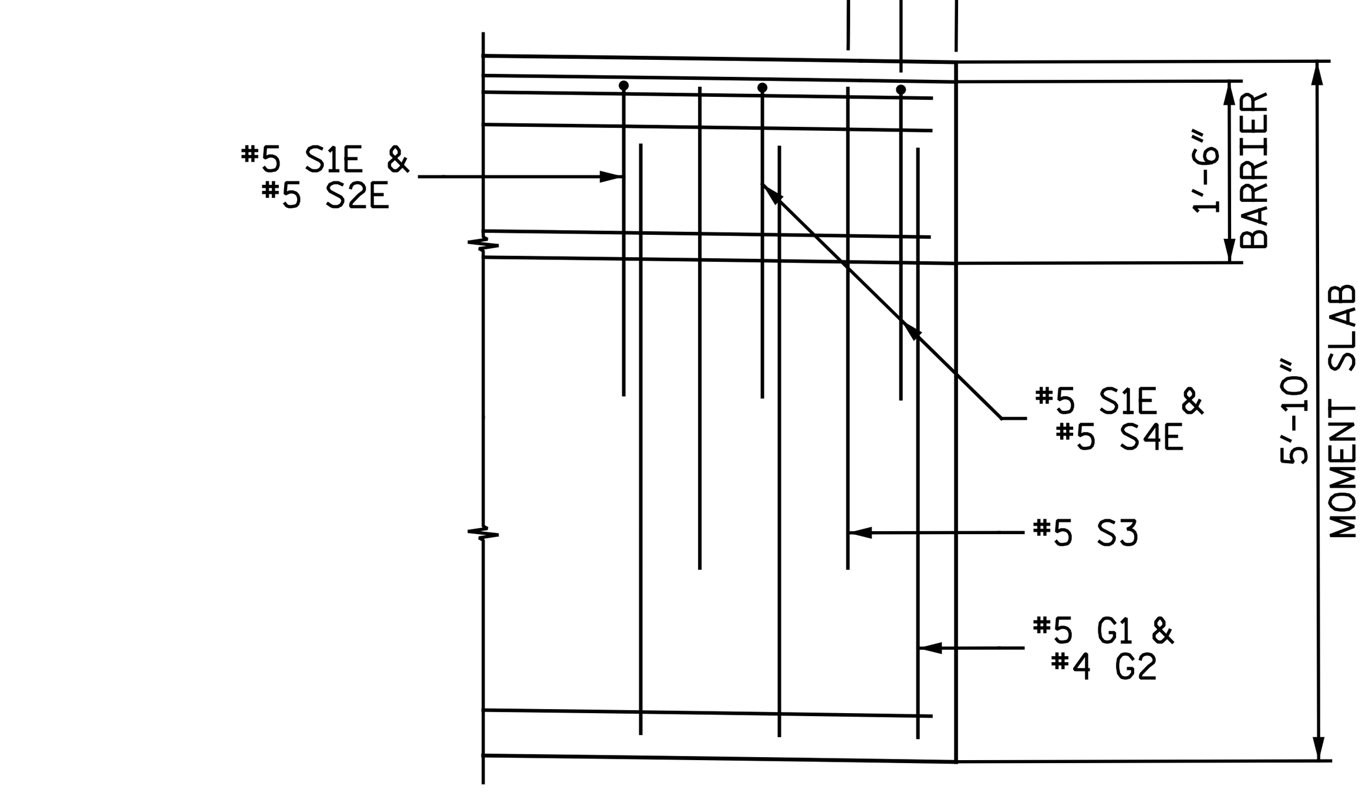
NOTES:

FOR NOTES AND SECTION THRU CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE "CONCRETE BARRIER RAIL WITH MOMENT SLAB", SHEET 3 OF 3.

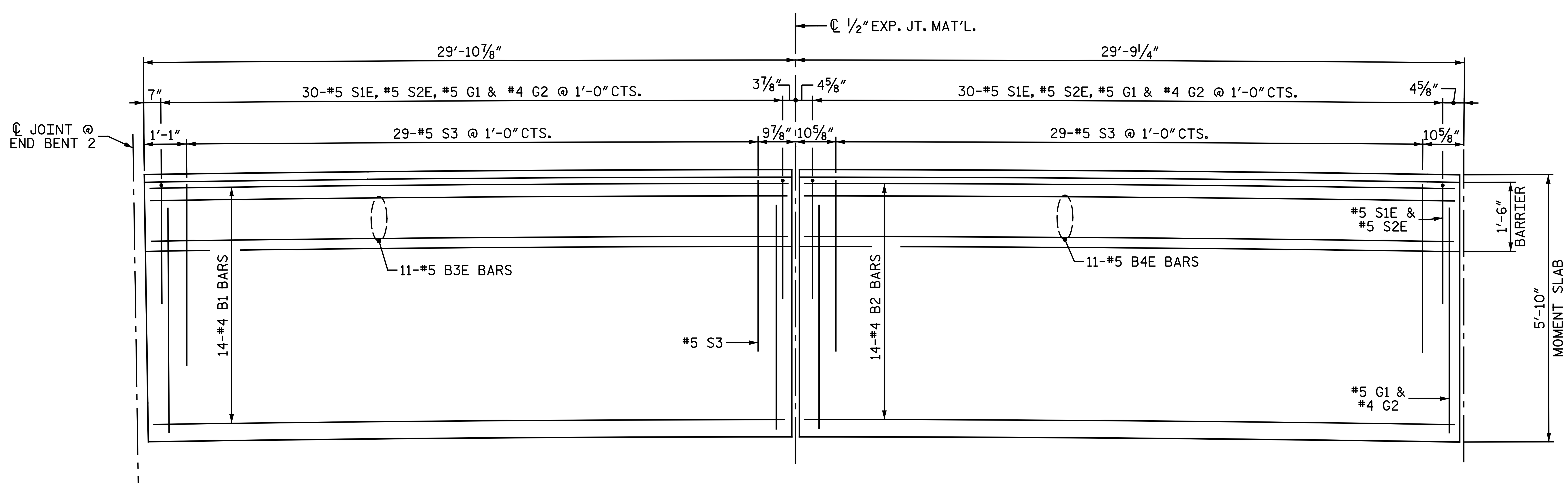
FOR END OF RAIL DETAILS, SEE "CONCRETE BARRIER RAIL WITH MOMENT SLAB", SHEET 3 OF 3.

FOR MSE WALL LAYOUT AND DETAILS, SEE RETAINING WALL SHEETS.

PLAN - END BENT 2



DETAIL "B"



DETAIL "A"

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 2 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell

5/17/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL WITH MOMENT SLAB

LEFT LANES

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REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S3-34
1			3					TOTAL SHEETS
2			4					35

DRAWN BY : C. E. MAYHEW DATE : 2-25-16
CHECKED BY : B. J. BELL DATE : 3-23-16

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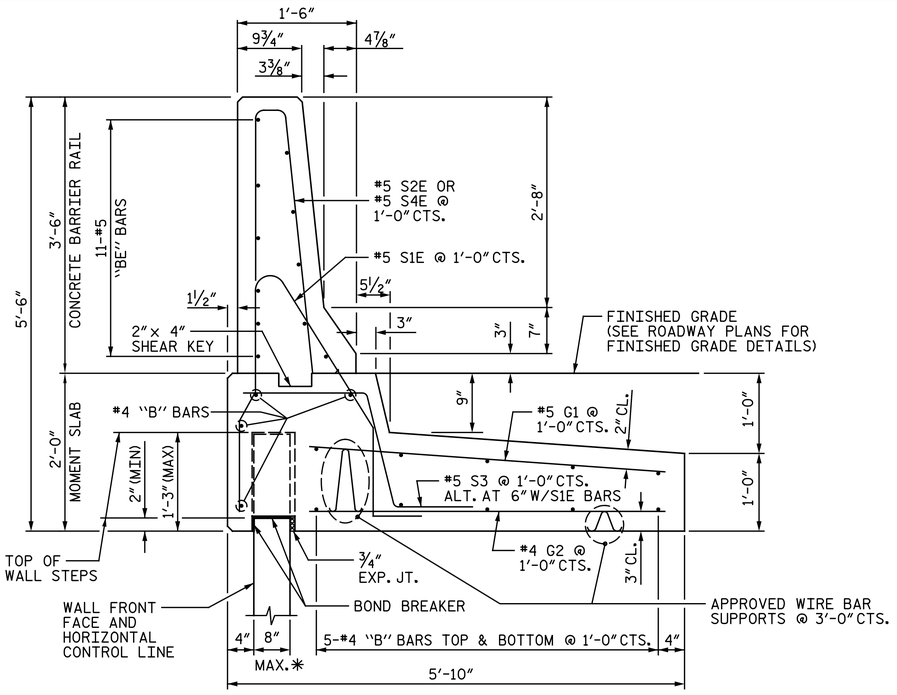


CONCRETE BARRIER RAIL WITH MOMENT SLAB

* NOTCH NOT PRESENT IN AREA ABOVE END BENT BACKWALL

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE CONCRETE BARRIER RAIL WITH MOMENT SLAB PROVISION.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AS SHOWN ON "CONCRETE BARRIER RAIL WITH MOMENT SLAB", SHEETS 1 OF 3 AND 2 OF 3.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

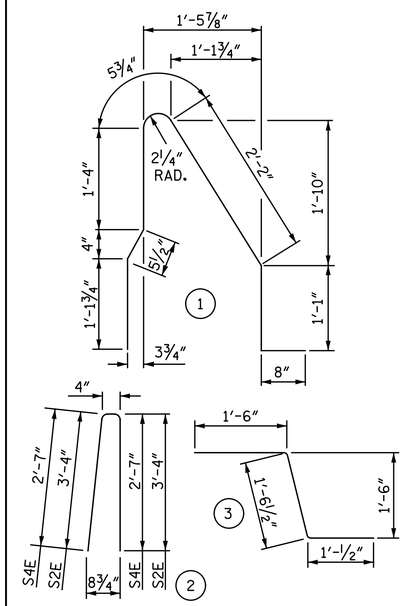
THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A BLOCK OUT IN THE MOMENT SLAB TO ACCOMODATE INSTALLATION OF THE EXPANSION JOINT ASSEMBLY. SEE "BLOCK OUT" DETAIL FOR GENERAL REQUIREMENTS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL END BENT 1

CONC. BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	28	#4	STR	15'-2"	284
B2	140	#4	STR	28'-2"	2,634
B3E	11	#5	STR	28'-4"	325
B4E	110	#5	STR	28'-2"	3,232
G1	319	#5	STR	4'-4"	1,442
G2	319	#4	STR	4'-4"	923
S1E	319	#5	1	7'-3"	2,412
S2E	319	#5	2	7'-0"	2,329
S3	308	#5	3	4'-1"	1,312

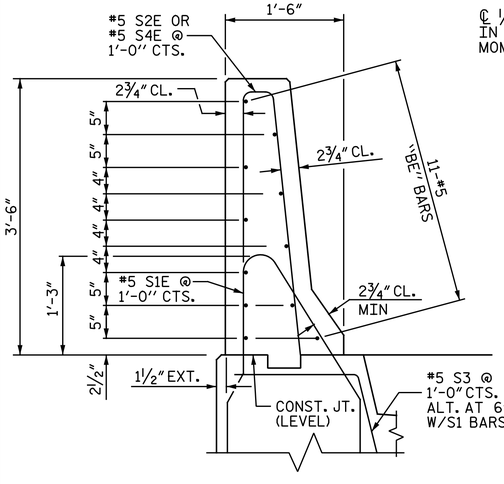
REINFORCING STEEL	LBS.	6,595
EPOXY COATED REINFORCING STEEL	LBS.	8,298
CLASS AA CONCRETE BARRIER RAIL	C.Y.	43.4
CLASS A CONCRETE MOMENT SLAB	C.Y.	95.1
CONCRETE BARRIER RAIL WITH MOMENT SLAB	LIN. FT.	314.5

BILL OF MATERIAL END BENT 2

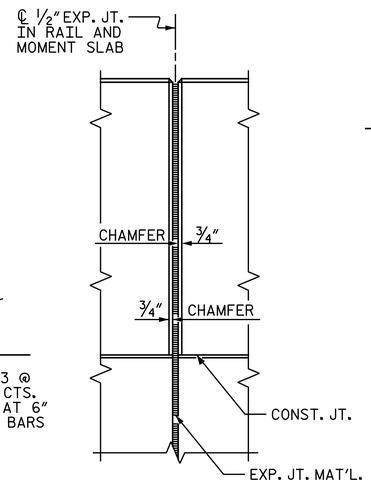
CONC. BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#4	STR	29'-6"	276
B2	210	#4	STR	29'-4"	4,115
B3E	11	#5	STR	29'-6"	338
B4E	165	#5	STR	29'-4"	5,048
G1	480	#5	STR	4'-4"	2,169
G2	480	#4	STR	4'-4"	1,389
S1E	480	#5	1	7'-3"	3,630
S2E	478	#5	2	7'-0"	3,490
S3	464	#5	3	4'-1"	1,976
S4E	2	#5	2	5'-6"	11

REINFORCING STEEL	LBS.	9,925
EPOXY COATED REINFORCING STEEL	LBS.	12,517
CLASS AA CONCRETE BARRIER RAIL	C.Y.	65.8
CLASS A CONCRETE MOMENT SLAB	C.Y.	144.1
CONCRETE BARRIER RAIL WITH MOMENT SLAB	LIN. FT.	476.5

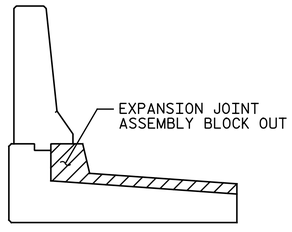


SECTION THRU RAIL

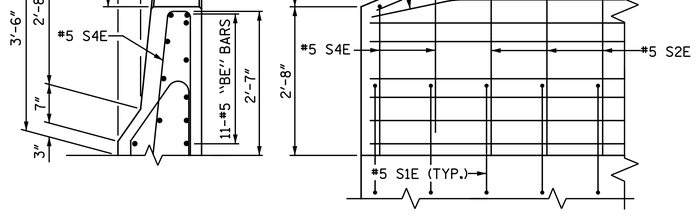


ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

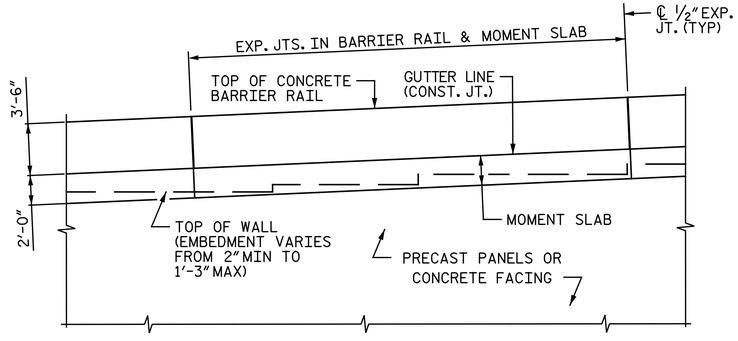


BLOCK OUT DETAIL



END VIEW SIDE VIEW

END OF RAIL DETAILS



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

CONCRETE BARRIER RAIL WITH MOMENT SLAB	
PAY LENGTH = 791.0	LIN FT

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 495+22.00 -LREV-

SHEET 3 OF 3

DRAWN BY : N. B. SPEAKS DATE : 3-25-16

CHECKED BY : B. J. BELL DATE : 3-30-16

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NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

Digitally signed by: Bradley J. Bell

5/17/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL WITH MOMENT SLAB

LEFT LANES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-35
1			3			TOTAL SHEETS
2			4			35