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14+00 15+00

SPAN A

BEGIN BRIDGE
FILL FACE @ END BENT 1
STA. 13+64.00 -L-
G.P. EL. 401.97

BEGIN FRONT SLOPE
STA. 13+52.30 -L-
G.P. EL. 401.93

FIX.
1'-7" BERM (TYP.)
LOW CHORD @ END BENT 1
EL. 396.16
APPROXIMATE NATURAL GROUND LINE
EL. 401 ±
UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)
BASE DISCHARGE (Q100) EL. 391.00
N.W.S. EL. 382.80 4-4-2017
EL. 383 ±
EL. 382 ±
EL. 383 ±
2'-0" MIN. PILE EMBED. (TYP.)
HP 12 X 53 STEEL PILES (TYP. EA. END BENT)
SLOPE TO DRAIN (TYP.)
EXCAVATE TO EL. 388.00 ± (TYP.)
BANK STABILIZATION (ROADWAY DETAIL AND PAY ITEM)
EL. 382 ±

END BENT 1

END BRIDGE
FILL FACE @ END BENT 2
STA. 14+64.00 -L-
G.P. EL. 402.31

FIX.
1'-0" MIN. EARTH BERM (TYP.)
LOW CHORD @ END BENT 2
EL. 396.49
BEGIN FRONT SLOPE
STA. 14+75.90 -L-
G.P. EL. 402.35
1'-6" TO UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)
EL. 402 ±
EXISTING SUBSTRUCTURE (TYP.)
EL. 386 ±
1'-0" MIN. (TYP.)
SLOPE 1½:1 (TYP.)
CLASS II RIP RAP (TYP.)
BANK STABILIZATION (ROADWAY DETAIL AND PAY ITEM)
EL. 402 ±

END BENT 2

SECTION ALONG ℄ SURVEY -L-

(-)1.5467% (+)0.3418%

PVI STA. 12+25.00
EL. = 401.49
VC = 150'

(+)0.3418% (+)3.3000%

PVI STA. 16+20.00
EL. = 402.84
VC = 260'

GRADE DATA -L-

HYDRAULIC DATA:

DESIGN DISCHARGE	= 1839 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEAR
DESIGN HIGH WATER ELEVATION	= 390.4
DRAINAGE AREA	= 5.1 SQ. MI.
BASE DISCHARGE (Q 100)	= 2139 CFS
BASE HIGH WATER ELEVATION	= 391.00

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 12000 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEAR
OVERTOPPING FLOOD ELEVATION	= 401.7 **

** OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 12+72.90 -L- AT ROADWAY CENTERLINE

TOTAL BRIDGE LENGTH = 100'-0" (FILL FACE TO FILL FACE)
50'-0"

CONTRACTOR MUST COMPLETELY REMOVE EXISTING CONCRETE ABUTMENTS INCLUDING ANY CONCRETE FOOTERS AND REMOVE OLD ABANDONED CONCRETE FOOTERS USING APPROVED NCDOT BMP METHODS.

NAD 83/NA 2011

W.P. #1
STA. 13+64.00 -L-
FILL FACE @ END BENT 1

BEGIN APPROACH SLAB
STA. 13+39.83 -L-

TO SR 1662

BEGIN FRONT SLOPE
STA. 13+52.30 -L-

CLASS II RIP RAP (TYP.)

EARTH BERM
EL. 390.98 (LEVEL)

1'-7" BERM (TYP.)

EXISTING SUBSTRUCTURE (TYP.)

TEMPORARY CAUSEWAY

℄ BRIDGE
STA. 14+14.00 -L-

90°-00'-00" (TYP.)

TABBS CREEK

BANK STABILIZATION (ROADWAY DETAIL AND PAY ITEM)

BANK STABILIZATION (ROADWAY DETAIL AND PAY ITEM)

EARTH BERM
EL. 391.31 (LEVEL)

W.P. #2
STA. 14+64.00 -L-
FILL FACE @ END BENT 2

END APPROACH SLAB
STA. 14+88.17 -L-

℄ SURVEY -L-

TO SR 1534

BEGIN FRONT SLOPE
STA. 14+75.90 -L-

1'-0" MIN. EARTH BERM (TYP.)

PLAN

(PILES NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJ.17BP.5.R.82

PROJECT NO. 17BP.5.R.82
GRANVILLE COUNTY
STATION: 14+14.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #40

DRAWN BY: T. BANKOVICH DATE: 2-19
CHECKED BY: T.J. BEACH DATE: 2-19
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER TED J. BEACH
2/5/2019

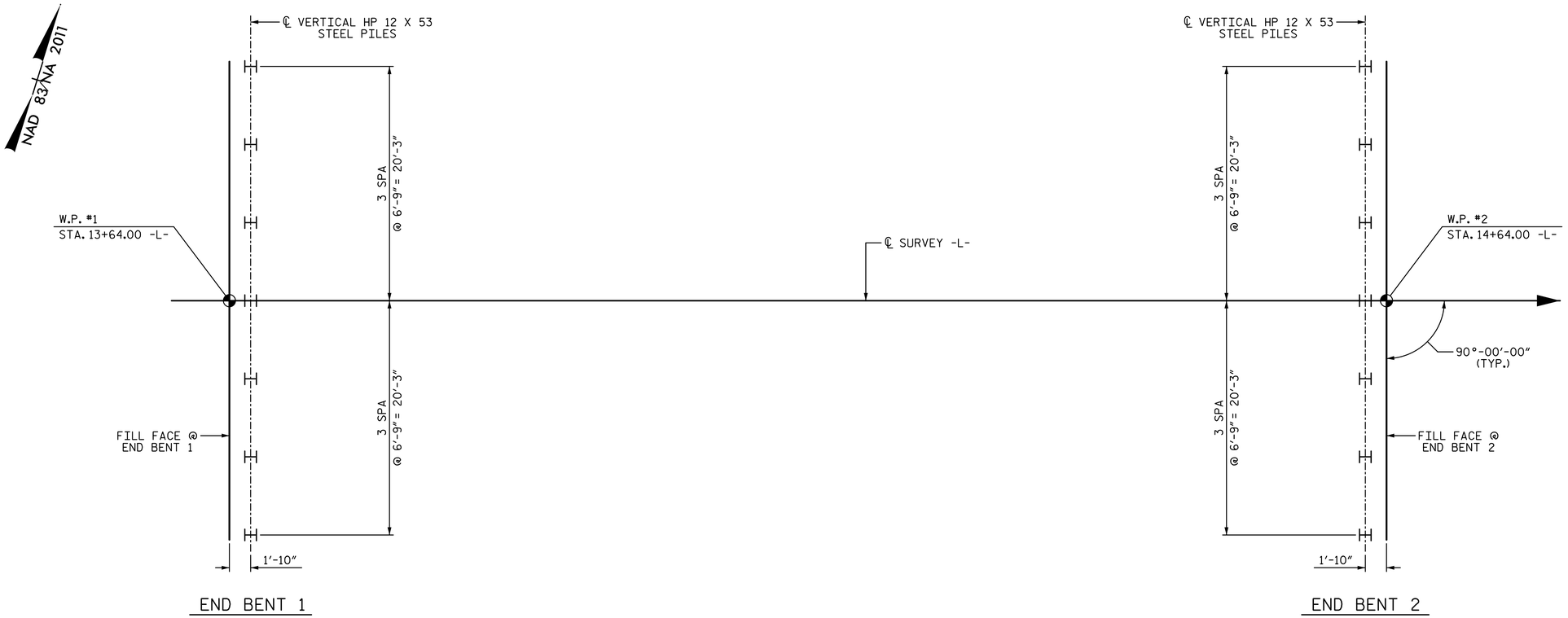
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 158
(WILLIAMSBORO RD)
OVER TABBS CREEK
BETWEEN SR 1662 AND SR 1534
34'-0" CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			24



FOUNDATION LAYOUT

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED-IN PILES ARE REQUIRED FOR INTEGRAL END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 384.2 FT. LT., 382.9 FT. RT., AND TO COMPETENT ROCK. FILL THE BOTTOM 3 FEET OF HOLES FOR PILE EXCAVATION WITH CONCRETE OR GROUT AND THE REST OF HOLES WITH CLASS II OR III SELECT MATERIAL THAT MEETS SECTION 1016 OF THE STANDARD SPECIFICATIONS. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DO NOT DRIVE PILES AT END BENT 2 AFTER PLACING PILES IN EXCAVATED HOLES.

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PROJECT NO. 17BP.5.R.82
GRANVILLE COUNTY
STATION: 14+14.00 -L-

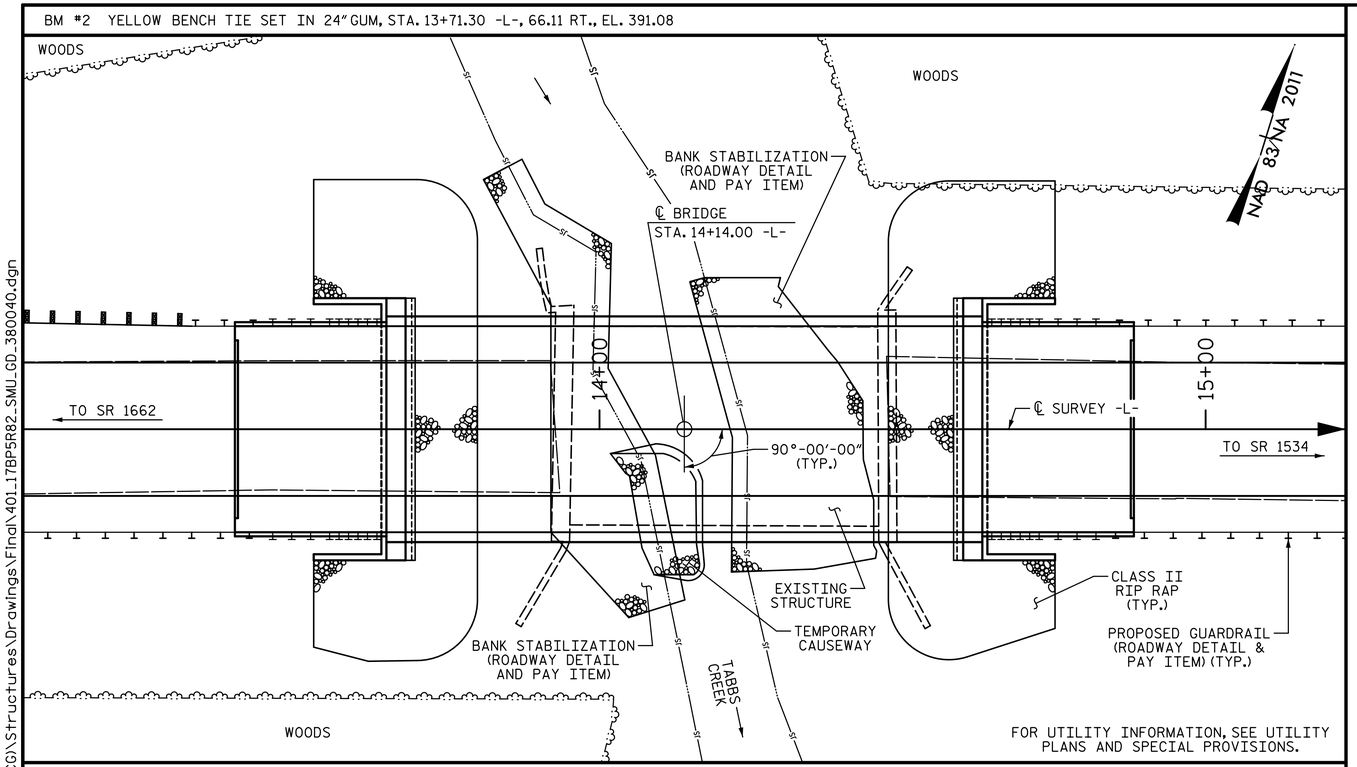
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 158
(WILLIAMSBORO RD)
OVER TABBS CREEK
BETWEEN SR 1662 AND SR 1534
34'-0" CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			24



LOCATION SKETCH

NOTES:

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 OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT. LEFT AND 40 FT. RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTS OF 1 SPAN @ 53'-0". THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 33'-0" WITH AN ASPHALT WEARING SURFACE ON PRESTRESSED CONCRETE DECK GIRDER SUPERSTRUCTURE. THE END BENTS CONSIST OF REINFORCED CONCRETE ABUTMENTS ON FOOTINGS. THE EXISTING STRUCTURE INCLUDING CONCRETE ABUTMENTS AND CONCRETE FOOTERS AND ALSO THE ABANDONED CONCRETE FOOTERS, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

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.

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

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

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

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 1024-6 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.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 14+14.00 -L-.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDER		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	LS	LS	LS	LF	LF	LS	SF	SF	CY	LS	LB	NO.	LF	EA	NO.	LF	EA	LF	TON	SY	LS
SUPERSTRUCTURE							3,725	4,536				4	391.00					196.70			
END BENT 1						LS			36.7		5,790			7	7	140	7		120	135	
END BENT 2				50.0	20.0	LS			36.8		5,806			7	7	70			135	150	
TOTAL	LS	LS	LS	50.0	20.0	LS	3,725	4,536	73.5	LS	11,596	4	391.00	14	14	210	7	196.70	255	285	LS

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 3 OF 3

DRAWN BY: T. BANKOVICH DATE: 2-19
CHECKED BY: T.J. BEACH DATE: 2-19
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

PLANS PREPARED BY:
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2/5/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 158 (WILLIAMSBORO RD) OVER TABBS CREEK BETWEEN SR 1662 AND SR 1534
34'-0" CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			24

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III 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⟩	1.26	- -	1.75	0.851	1.56	A	EL	48.2	0.983	1.40	A	I	6.1	0.80	0.797	1.26	A	I	48.2	
		HL-93 (OPERATING)	N/A		1.91	- -	1.35	0.851	1.95	A	EL	48.2	0.983	1.91	A	I	6.1	N/A	- -	- -	- -	- -	- -	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.74	62.6	1.75	0.851	2.16	A	EL	48.2	0.983	2.09	A	I	6.2	0.80	0.797	1.74	A	I	48.2	
		HS-20 (OPERATING)	36.000		2.70	97.2	1.35	0.851	2.70	A	EL	48.2	0.983	2.71	A	I	6.2	N/A	- -	- -	- -	- -	- -	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.30	44.6	1.40	0.851	4.96	A	EL	48.2	0.983	5.33	A	I	6.3	0.80	0.797	3.30	A	I	48.2	
		SNGARBS2	20.000		2.39	47.8	1.40	0.851	3.60	A	EL	48.2	0.983	3.70	A	I	6.3	0.80	0.797	2.39	A	I	48.2	
		SNAGRIS2	22.000		2.24	49.3	1.40	0.851	3.37	A	EL	48.2	0.983	3.40	A	I	6.3	0.80	0.797	2.24	A	I	48.2	
		SNCOTTS3	27.250		1.64	44.7	1.40	0.851	2.46	A	EL	48.2	0.983	2.58	A	I	6.2	0.80	0.797	1.64	A	I	48.2	
		SNAGGRS4	34.925		1.34	46.8	1.40	0.851	2.02	A	EL	48.2	0.983	2.01	A	I	6.2	0.80	0.797	1.34	A	I	48.2	
		SNS5A	35.550		1.32	46.9	1.40	0.851	1.98	A	EL	48.2	0.983	2.02	A	I	6.2	0.80	0.797	1.32	A	I	48.2	
		SNS6A	39.950		1.20	47.9	1.40	0.851	1.80	A	EL	48.2	0.983	1.77	A	I	6.2	0.80	0.797	1.20	A	I	48.2	
		SNS7B	42.000		1.14	47.9	1.40	0.851	1.72	A	EL	48.2	0.983	1.70	A	I	6.2	0.80	0.797	1.14	A	I	48.2	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.46	48.2	1.40	0.851	2.19	A	EL	48.2	0.983	2.25	A	I	6.2	0.80	0.797	1.46	A	I	48.2	
		TNT4A	33.075		1.46	48.3	1.40	0.851	2.20	A	EL	48.2	0.983	2.19	A	I	6.2	0.80	0.797	1.46	A	I	48.2	
		TNT6A	41.600		1.19	49.5	1.40	0.851	1.78	A	EL	48.2	0.983	1.81	A	I	6.2	0.80	0.797	1.19	A	I	48.2	
		TNT7A	42.000		1.19	50.0	1.40	0.851	1.78	A	EL	48.2	0.983	1.77	A	I	6.2	0.80	0.797	1.19	A	I	48.2	
		TNT7B	42.000		1.21	50.8	1.40	0.851	1.83	A	EL	48.2	0.983	1.66	A	I	6.2	0.80	0.797	1.21	A	I	48.2	
		TNAGRIT4	43.000		1.16	49.9	1.40	0.851	1.75	A	EL	48.2	0.983	1.59	A	I	6.2	0.80	0.797	1.16	A	I	48.2	
		TNAGT5A	45.000		1.10	49.5	1.40	0.851	1.66	A	EL	48.2	0.983	1.55	A	I	6.1	0.80	0.797	1.10	A	I	48.2	
		TNAGT5B	45.000	⟨3⟩	1.09	49.1	1.40	0.851	1.64	A	EL	48.2	0.983	1.49	A	I	6.1	0.80	0.797	1.09	A	I	48.2	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM ℄ BEARING.
2. BEARING TO BEARING LENGTH OF ALL GIRDERS = 96'-4"

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

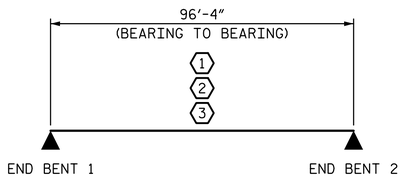
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



SPAN A

LRFR SUMMARY

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
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2/5/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: T. BANKOVICH DATE: 2-19
CHECKED BY: T.J. BEACH DATE: 2-19
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

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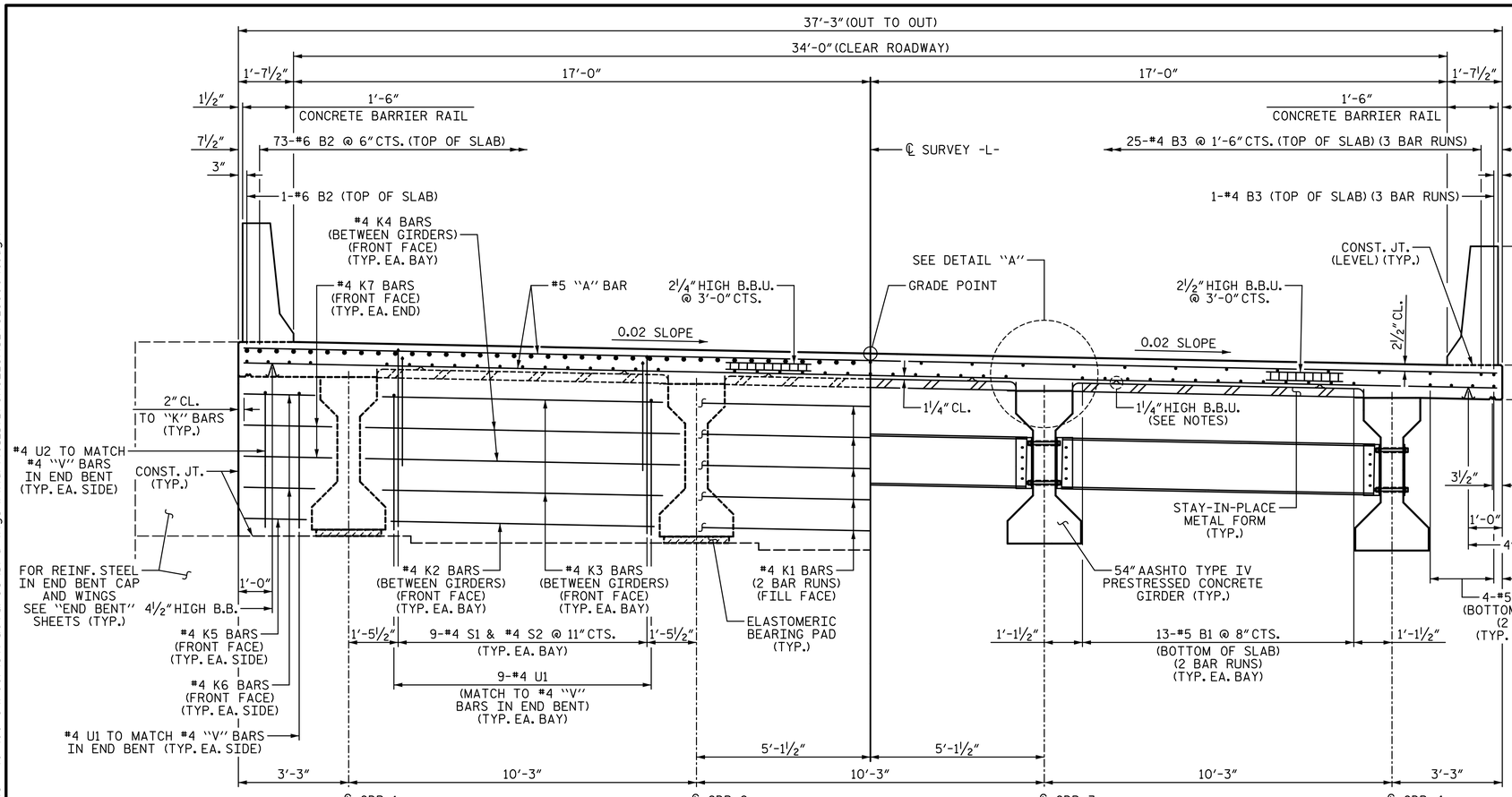
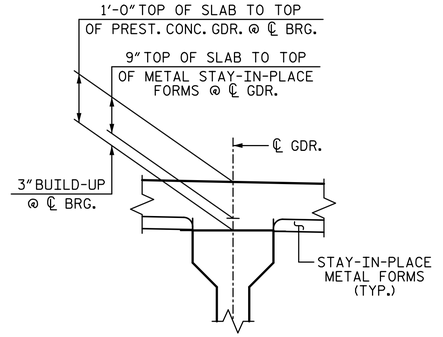


NOTES:

PROVIDE 1 1/4″ HIGH BEAM BOLSTERS UPPER AT 4′-0″ CTS. ATOP THE STAY-IN-PLACE METAL 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.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

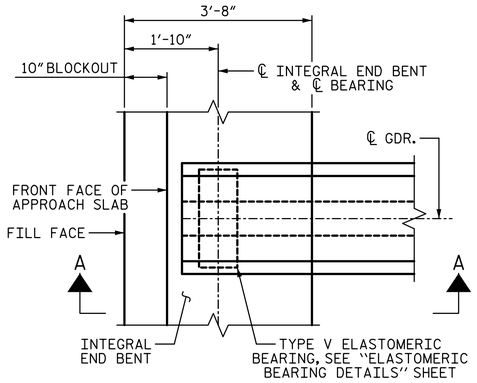


DETAIL ″A″

(TYP. EA. GDR.)

PARTIAL TYPICAL SECTION

(SHOWING INTEGRAL END BENT)

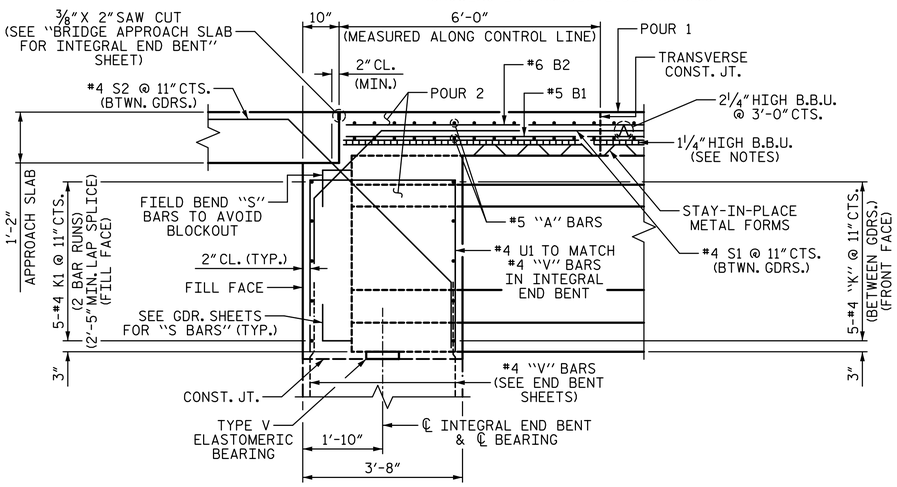


PLAN DETAIL OF END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
(″S″ BARS IN GIRDER NOT SHOWN FOR CLARITY)

PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)



SECTION A-A

SECTION THROUGH END BENT DIAPRHAGM

(SEE END BENT SHEETS FOR INTEGRAL END BENT REINFORCING DETAILS)
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. 17BP.5.R.82
GRANVILLE COUNTY
STATION: 14+14.00 -L-

STATE OF NORTH CAROLINA
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TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			24

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2/5/2019

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DESIGN ENGINEER OF RECORD:	T.J. BEACH	DATE:	2-19

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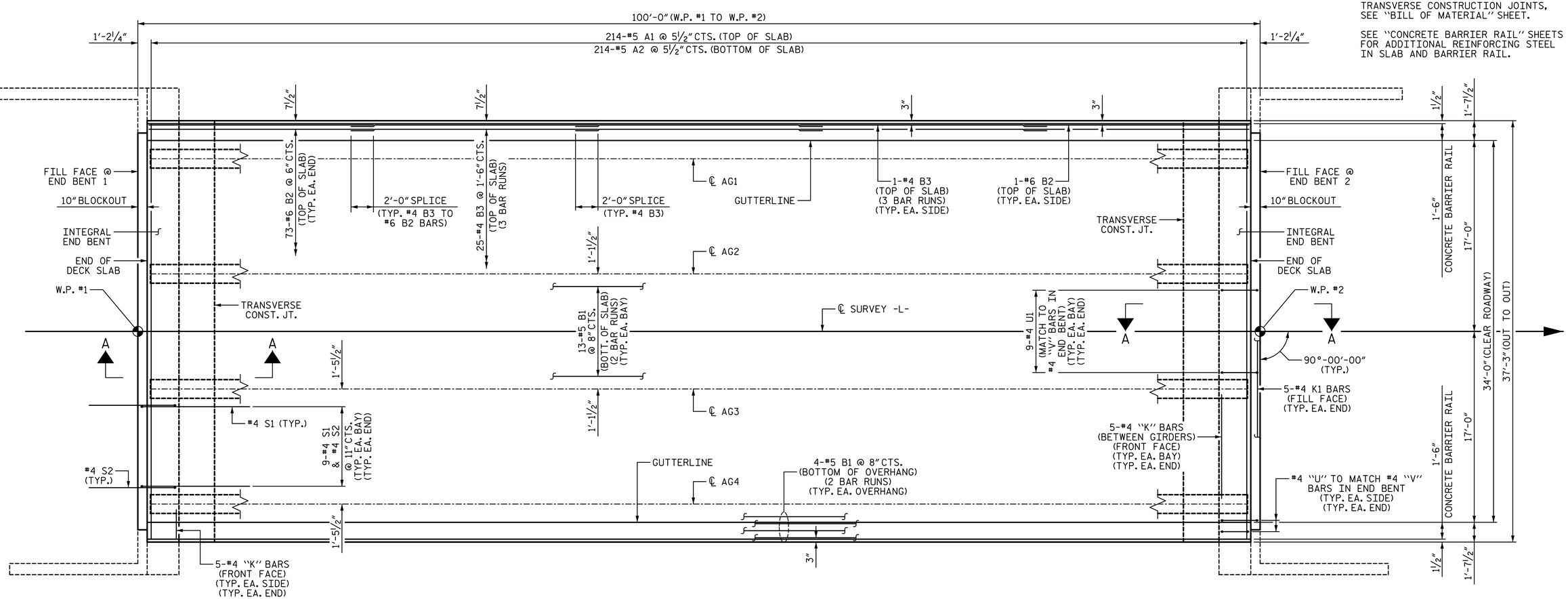
NOTES:

FOR SECITON A-A,
SEE "TYPICAL SECITON" SHEET.

FOR LOCATIONS OF INTERMEDIATE DIAPHRAGMS SEE "FRAMING PLAN" SHEET.

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

SEE "CONCRETE BARRIER RAIL" SHEETS FOR ADDITIONAL REINFORCING STEEL IN SLAB AND BARRIER RAIL.



PLAN OF SPAN A

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PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			24

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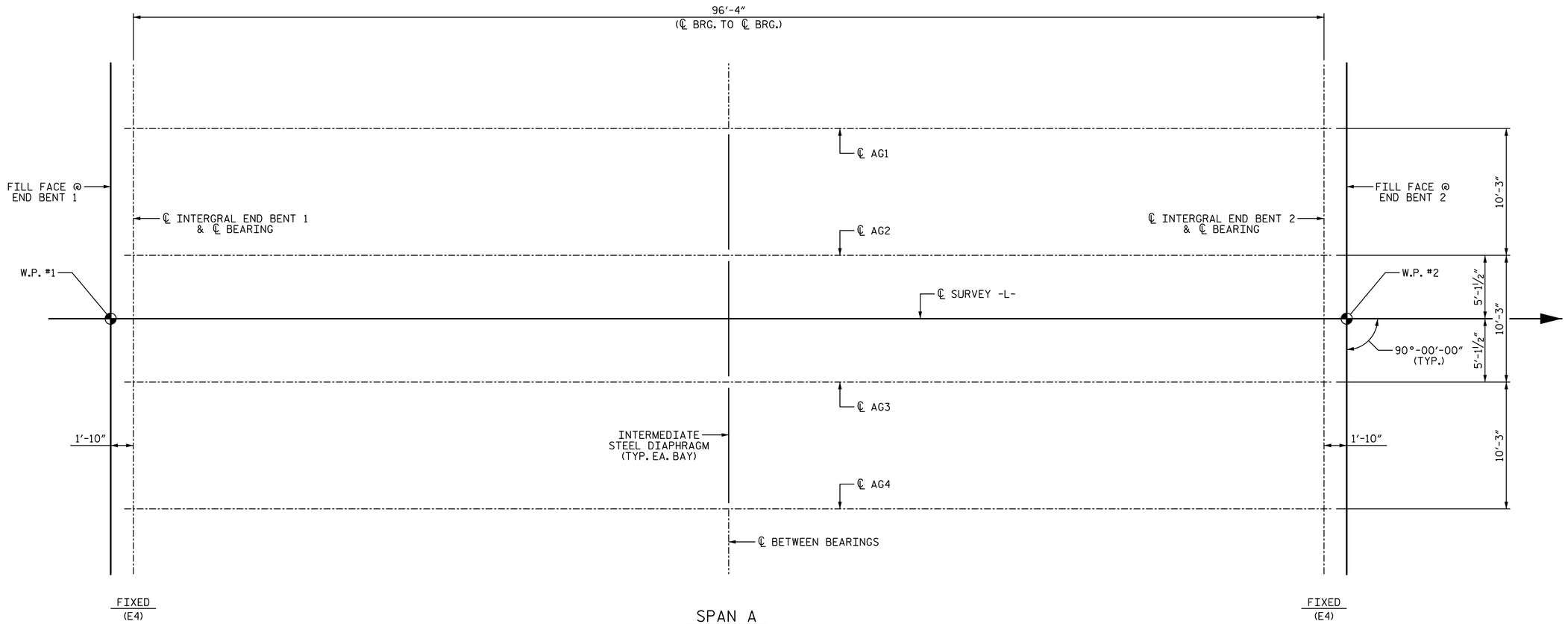
NOTES:

FOR DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.



SPAN A

FRAMING PLAN

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FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			24

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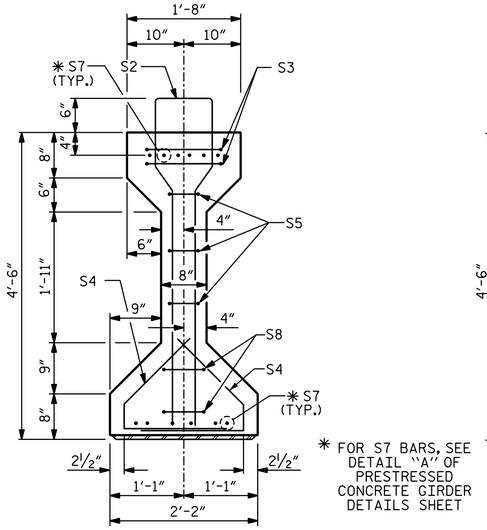
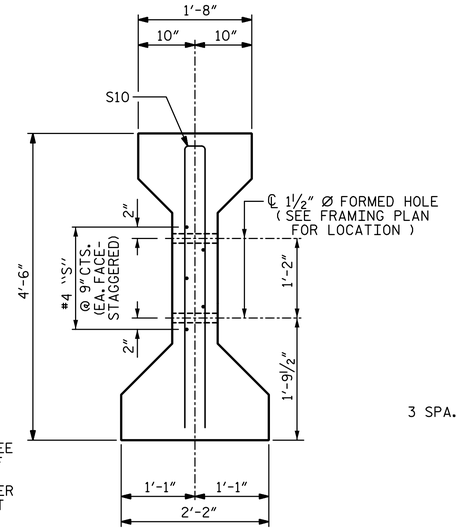
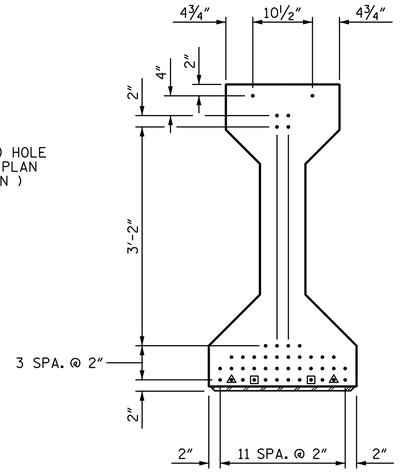


SECTION A-A

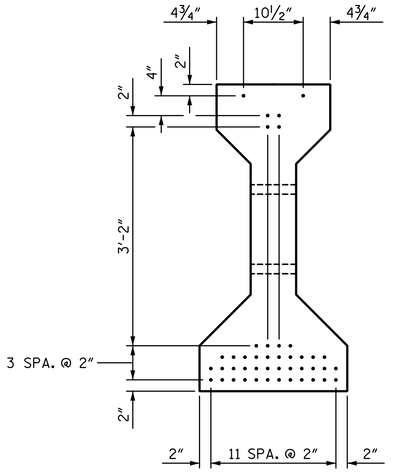


SECTION B-B
(S1 BARS NOT SHOWN)

✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET



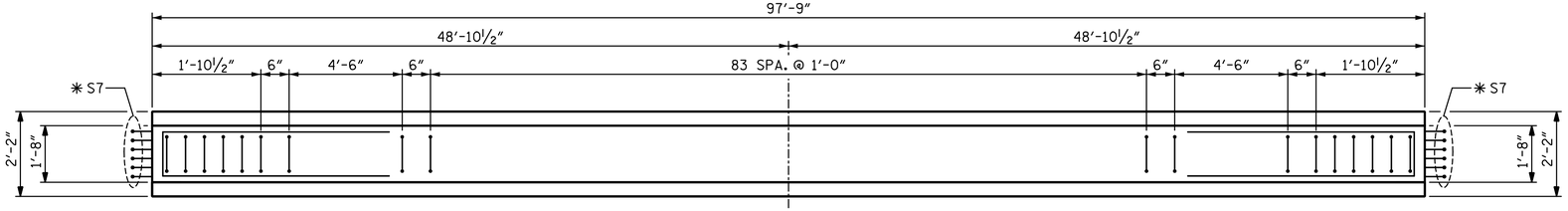
AT END OF GIRDER



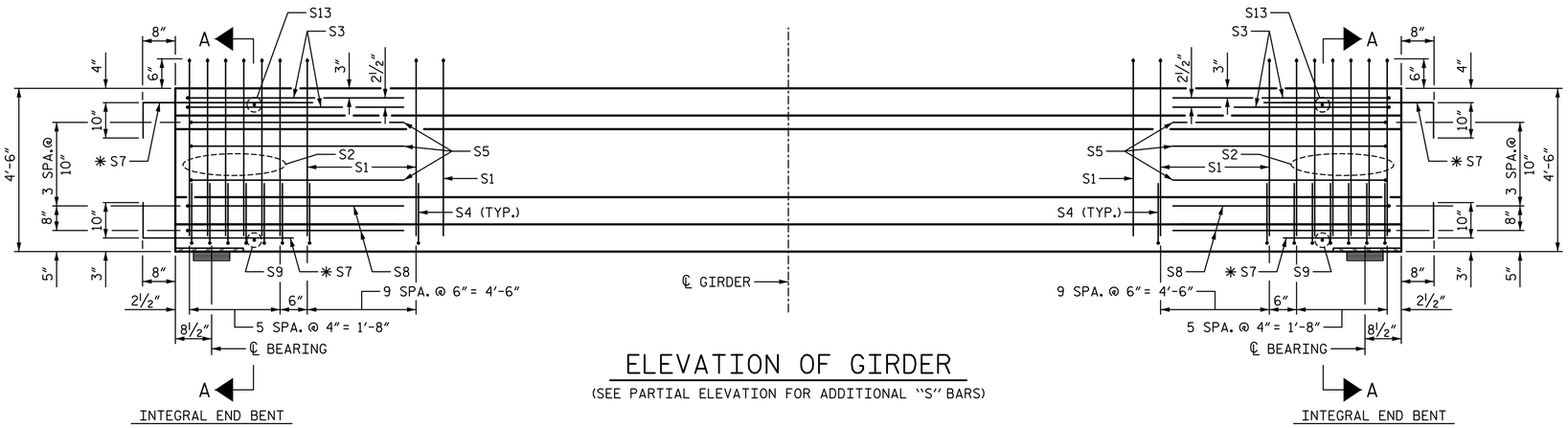
AT ℄ OF GIRDER

0.6"Ø LOW RELAXATION STRAND LAYOUT

- ● FULLY BONDED STRAND
- ◈ STRAND DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◙ STRAND DEBONDED FOR 12'-0" FROM END OF GIRDER



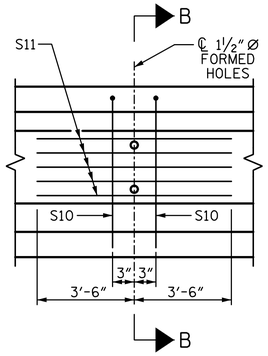
PLAN OF GIRDER



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

INTEGRAL END BENT

INTEGRAL END BENT



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6'' Ø L. R. GRADE 270 STRANDS

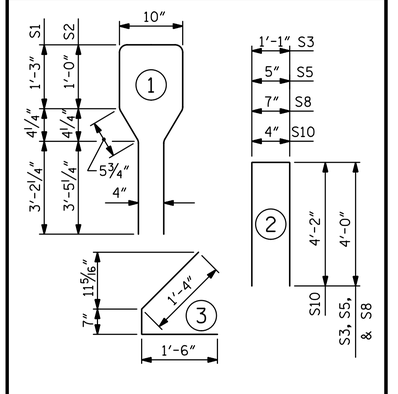
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	104	#4	1	10'-8"	741
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
✱S7	24	#5	STR	3'-8"	92
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#5	2	7'-0"	37
S13	2	#3	STR	1'-4"	1

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

SPAN A	REINFORCING STEEL LB.	9,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
ALL GIRDERS	1309	19.8	44

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	97'-9"	391.00

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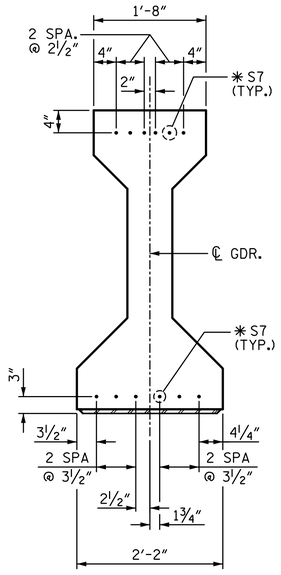
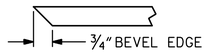
AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER

REVISIONS NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-8
TOTAL SHEETS 24

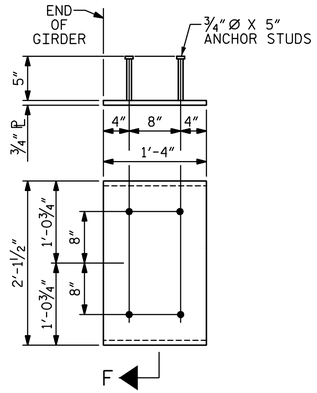


DETAIL "A"



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

NOTES:

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7000 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	GIRDER AG1 & AG4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.034	0.067	0.099	0.128	0.153	0.175	0.192	0.204	0.212	0.215	0.212	0.204	0.192	0.175	0.153	0.128	0.099	0.067	0.034	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.022	0.046	0.070	0.092	0.111	0.127	0.140	0.149	0.155	0.157	0.155	0.149	0.140	0.127	0.111	0.092	0.070	0.046	0.022	0
FINAL CAMBER ↑	0	⅛"	¼"	⅜"	7/16"	½"	9/16"	⅝"	⅝"	11/16"	11/16"	11/16"	⅝"	⅝"	9/16"	½"	7/16"	⅜"	¼"	⅛"	0
0.6" Ø LOW RELAXATION	**GIRDER AG2 & AG3**																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.034	0.067	0.099	0.128	0.153	0.175	0.192	0.204	0.212	0.215	0.212	0.204	0.192	0.175	0.153	0.128	0.099	0.067	0.034	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.024	0.053	0.079	0.104	0.126	0.144	0.159	0.169	0.176	0.178	0.176	0.169	0.159	0.144	0.126	0.104	0.079	0.053	0.024	0
FINAL CAMBER ↑	0	⅛"	3/16"	¼"	5/16"	5/16"	⅜"	⅜"	7/16"	7/16"	7/16"	7/16"	7/16"	⅜"	⅜"	5/16"	5/16"	¼"	3/16"	⅛"	0

✱INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

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PRESTRESSED CONCRETE GIRDER DETAILS

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
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2			4			24

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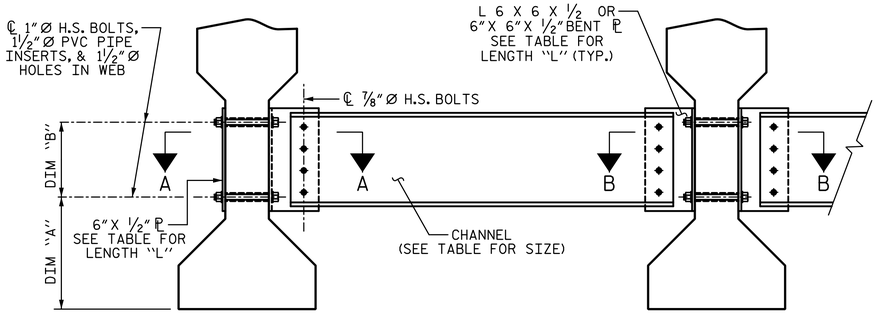
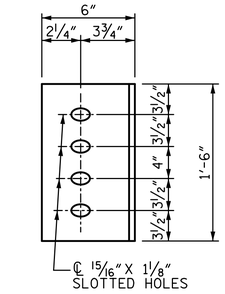
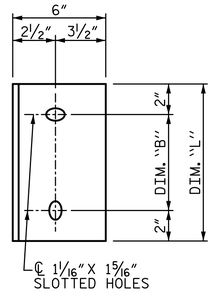


PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

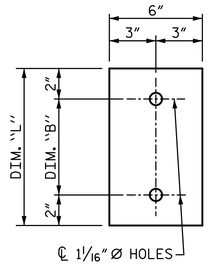
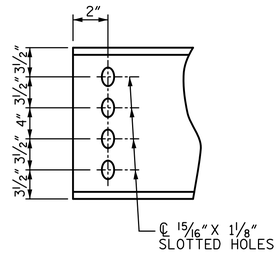
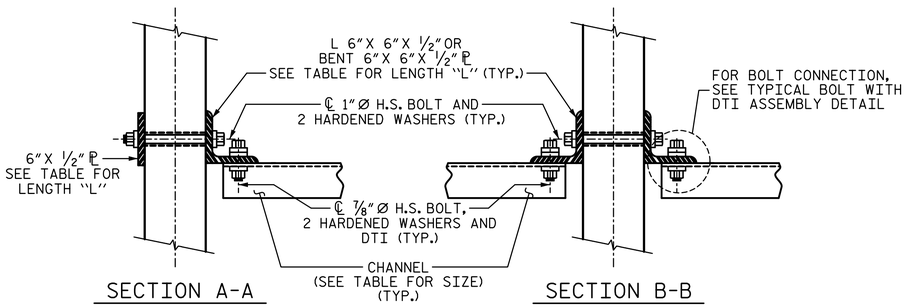


PLATE DETAILS

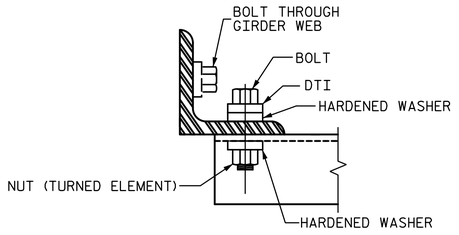


CHANNEL END



SECTION A-A SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES:

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"

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NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/5/2019

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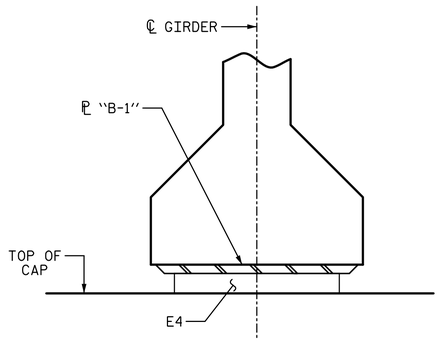
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

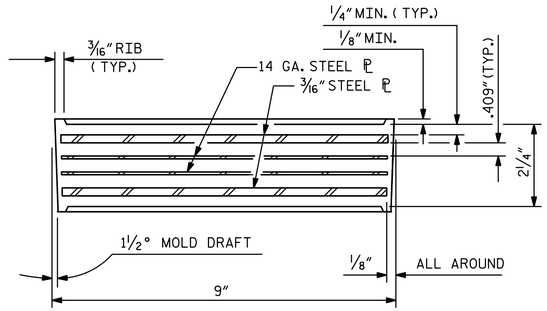
SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PREST. CONCRETE GIRDERS

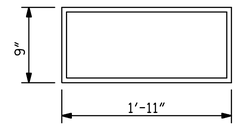
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			24



SECTION AT INTEGRAL END BENT



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

NOTES:

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

DRAWN BY: T. BANKOVICH DATE: 2-19
CHECKED BY: T.J. BEACH DATE: 2-19
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24390 TJ BEACH
2/5/2019

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ELASTOMERIC BEARING DETAILS

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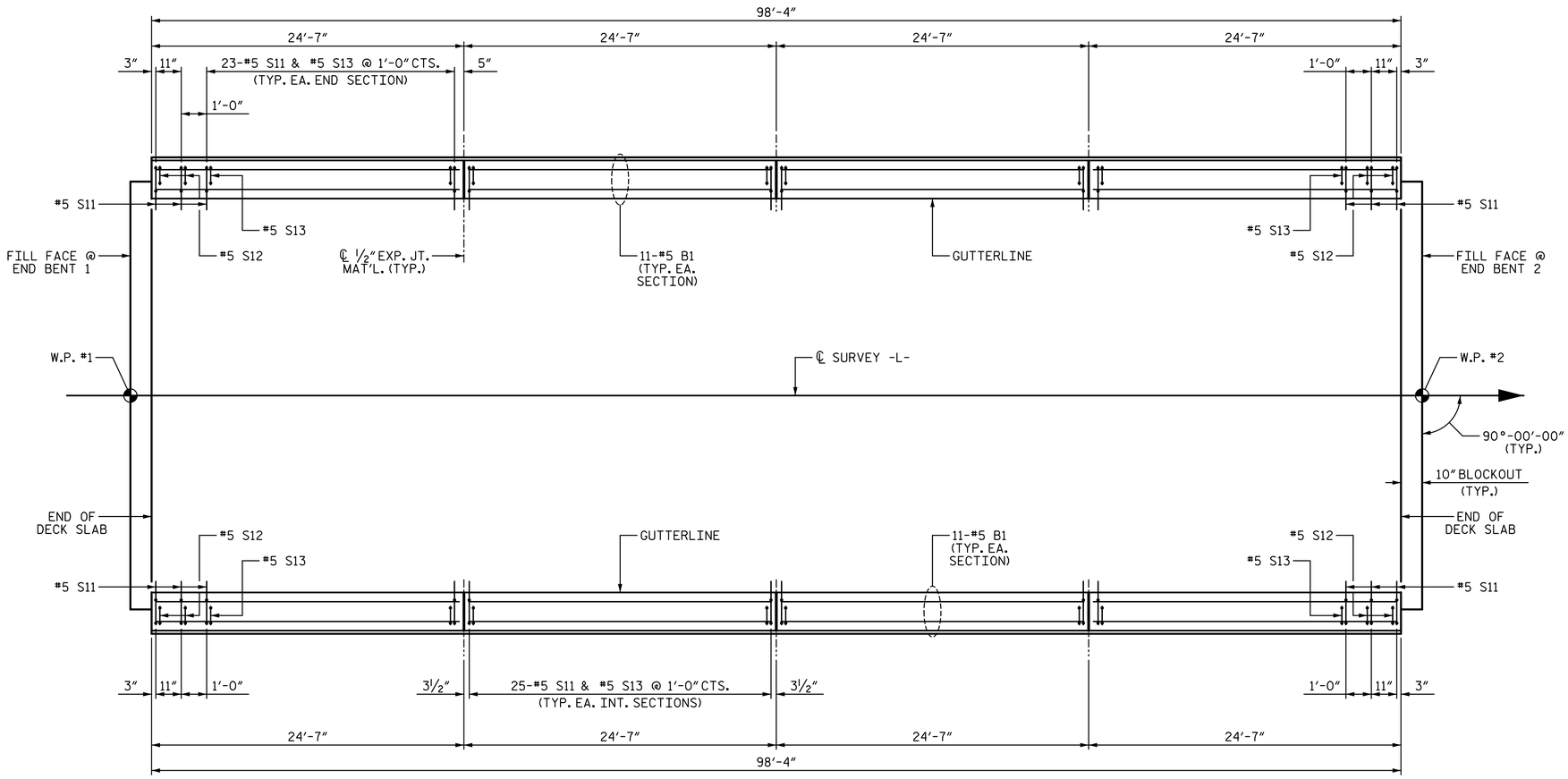
2			4			24



SPAN A

PLAN OF BARRIER RAIL

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

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1			3			TOTAL SHEETS
2			4			24

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2/5/2019

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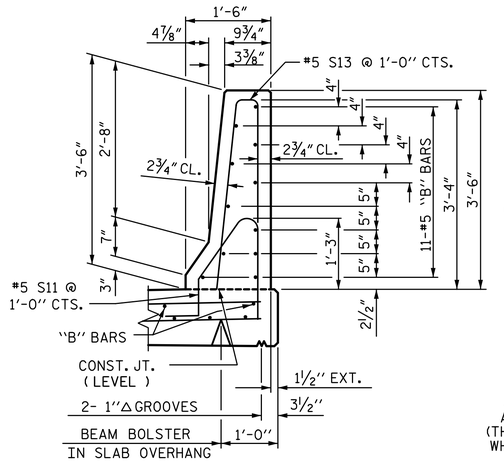
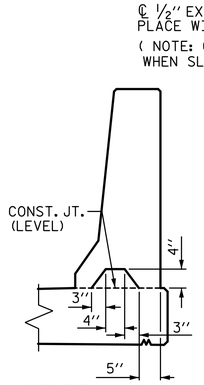
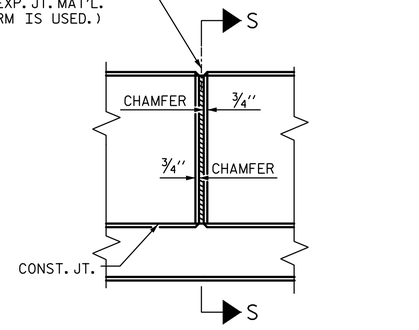


SECTION THRU RAIL



SECTION S-S

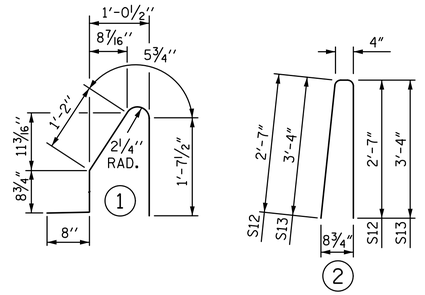
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

CONCRETE BARRIER RAIL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	88	#5	STR	24'-2"	2218
✳S11	200	#5	1	4'-8"	973
✳S12	8	#5	2	5'-6"	46
✳S13	192	#5	2	7'-0"	1402

EPOXY COATED REINFORCING STEEL	4639 LB
CLASS AA CONCRETE	26.7 CY
CONCRETE BARRIER RAIL	196.7 LF

✳ INDICATES EPOXY COATED REINFORCING STEEL

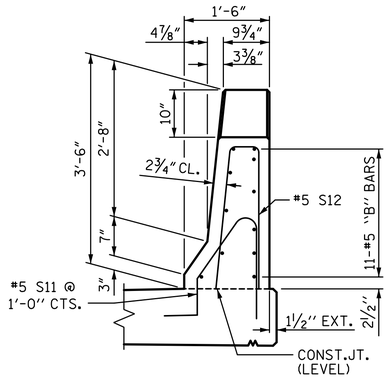
NOTES:

THE BARRIER RAIL IN THE 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.

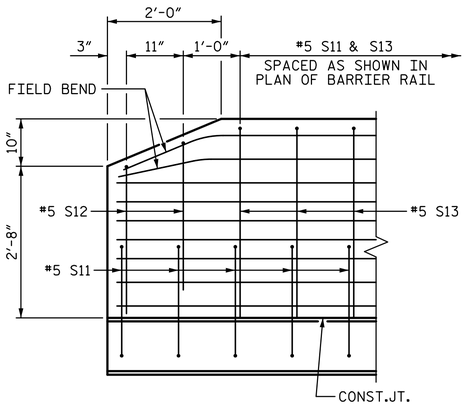
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, ½" 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.

#5 S11 AND #5 S13 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL.



END VIEW



SIDE VIEW

END OF RAIL DETAILS

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 2 OF 2

DRAWN BY: T. BANKOVICH DATE: 2-19

CHECKED BY: T.J. BEACH DATE: 2-19

DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

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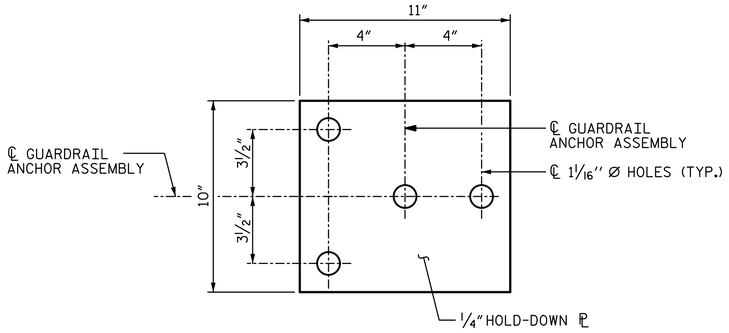
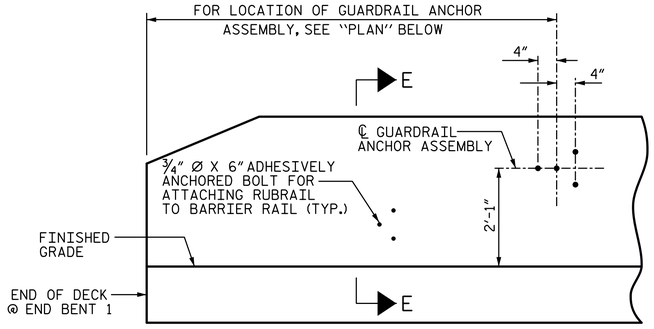
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			24



PLAN



ELEVATION

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.)

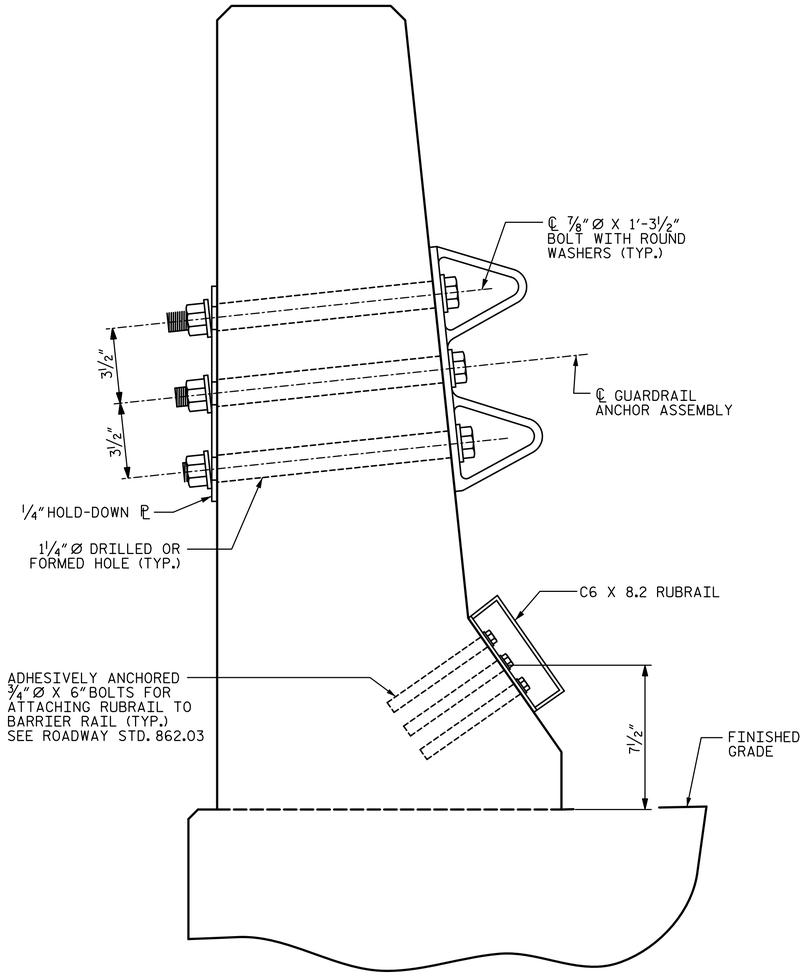
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			24

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CHECKED BY:	T.J. BEACH	DATE:	2-19
DESIGN ENGINEER OF RECORD:	T.J. BEACH	DATE:	2-19

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

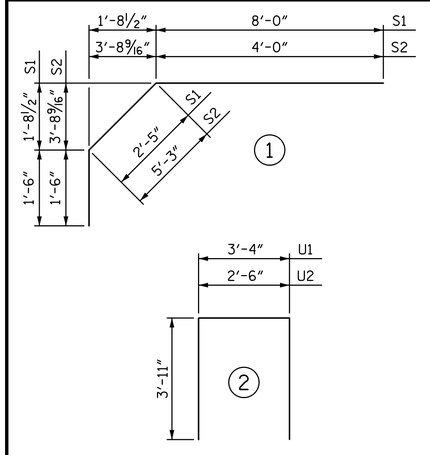
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2′-0″	1′-9″	2′-0″	1′-9″	2′-9″
#5	2′-6″	2′-2″	2′-6″	2′-2″	3′-5″
#6	3′-0″	2′-7″	3′-10″	2′-7″	4′-4″
#7	5′-3″	3′-6″			
#8	6′-10″	4′-7″			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	CY	LB	LB
POUR 1	105.5	--	--
POUR 2	58.6	--	--
TOTAL ✳✳	164.1	14,070	14,754

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

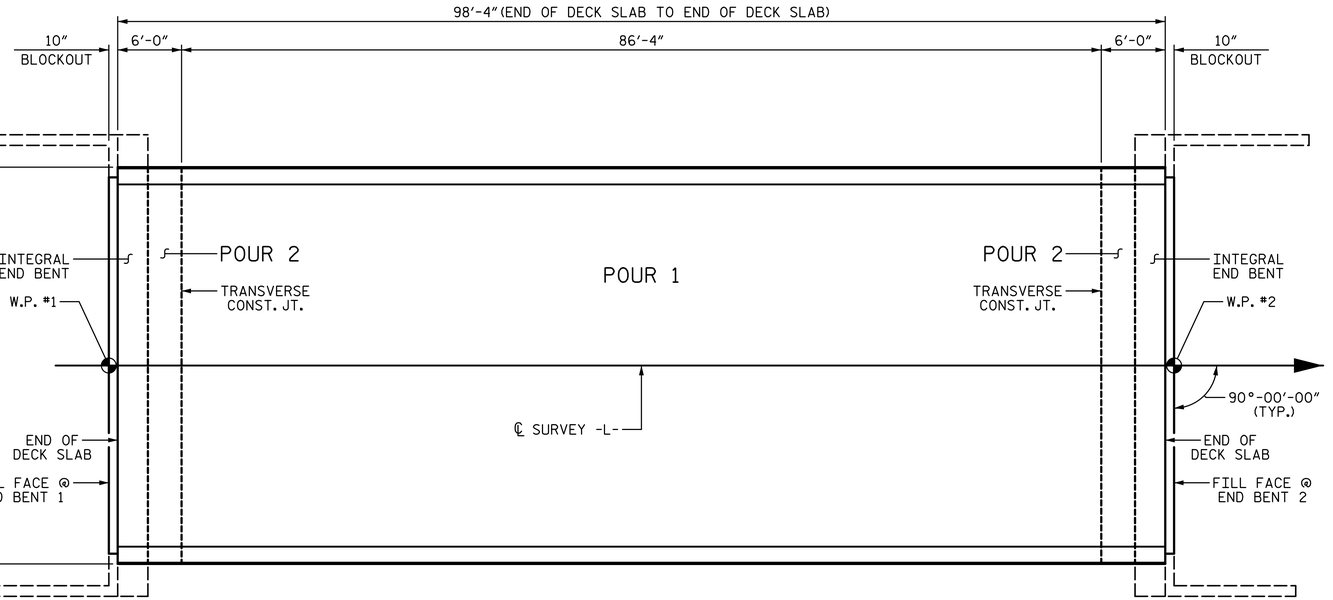
SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	214	#5	STR	36′-11″	8240
A2	214	#5	STR	36′-11″	8240
B1	94	#5	STR	50′-1″	4910
✳B2	150	#6	STR	20′-0″	4506
✳B3	81	#4	STR	22′-0″	1190
K1	20	#4	STR	19′-4″	258
K2	6	#4	STR	7′-9″	31
K3	12	#4	STR	8′-3″	66
K4	12	#4	STR	9′-3″	74
K5	4	#4	STR	1′-10″	5
K6	8	#4	STR	2′-1″	11
K7	8	#4	STR	2′-7″	14
✳S1	54	#4	1	11′-11″	430
✳S2	54	#4	1	10′-9″	388
U1	58	#4	2	11′-2″	433
U2	4	#4	2	10′-4″	28
REINFORCING STEEL					14070 LB
EPOXY COATED REINFORCING STEEL					14754 LB

✳ INDICATES EPOXY COATED REINFORCING STEEL

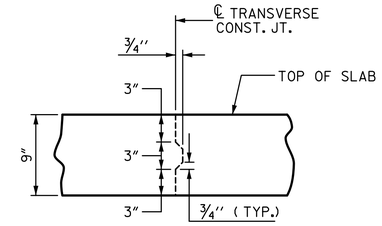
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,498	SQ. FT.
BRIDGE DECK	3,038	SQ. FT.
TOTAL	4,536	SQ. FT.



SPAN A

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB & POUR SEQUENCE
SQ. FT. = 3,725



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

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RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

DRAWN BY: T. BANKOVICH DATE: 2-19
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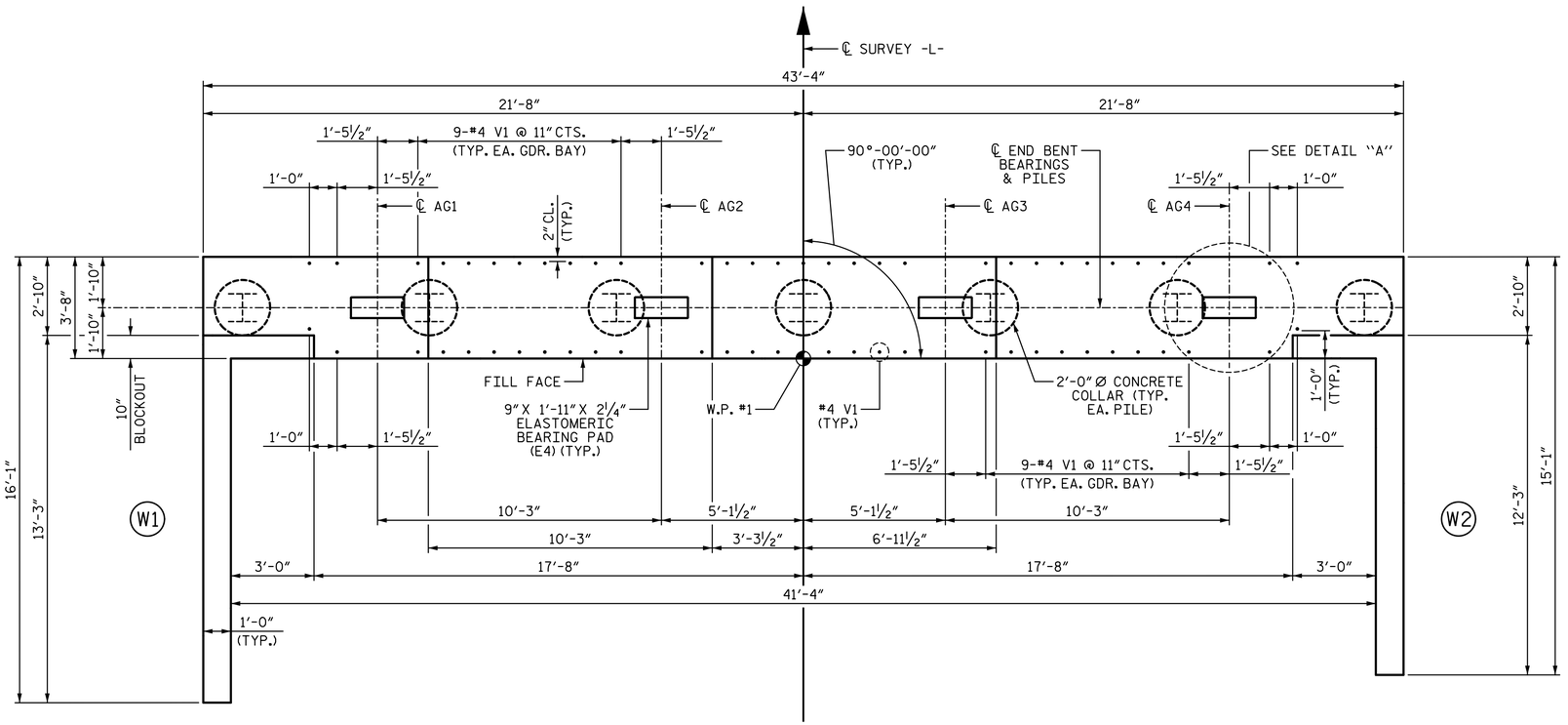
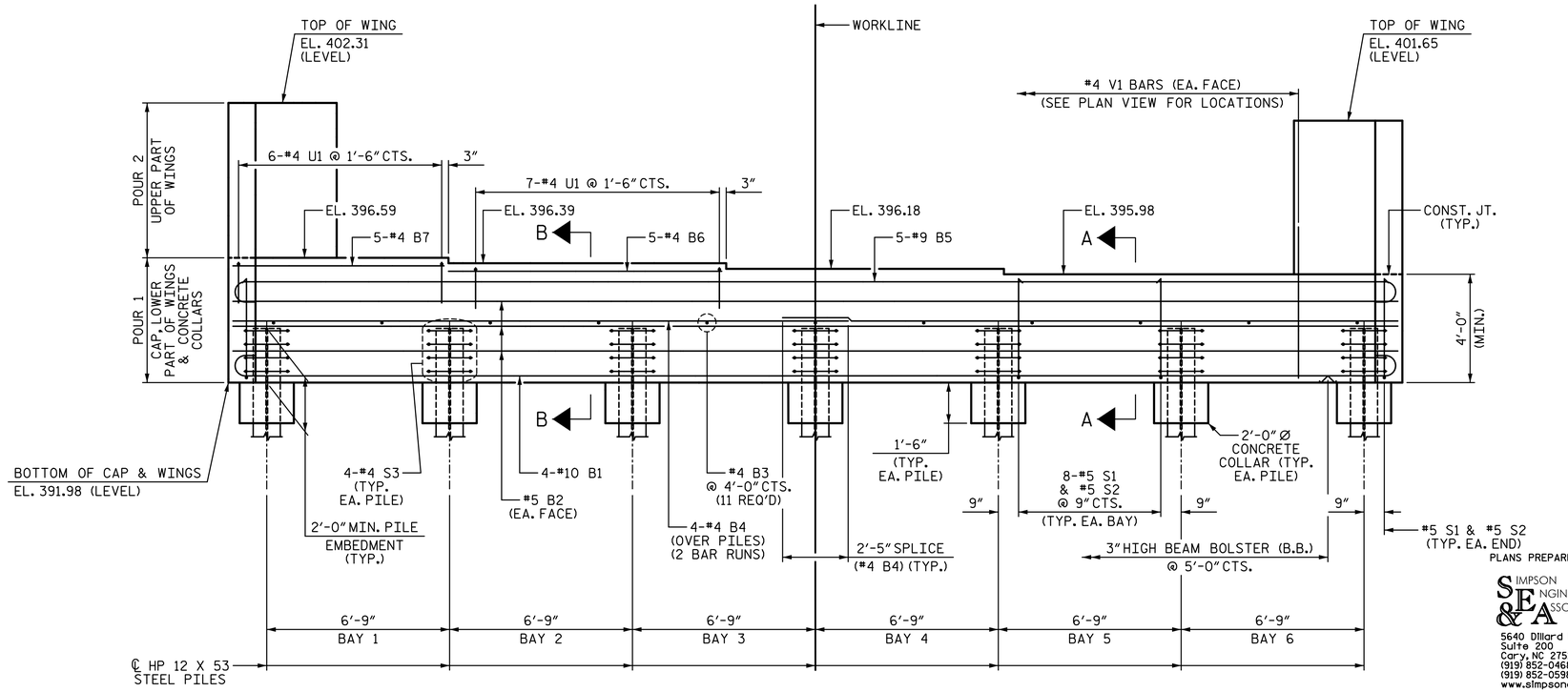


PLAN



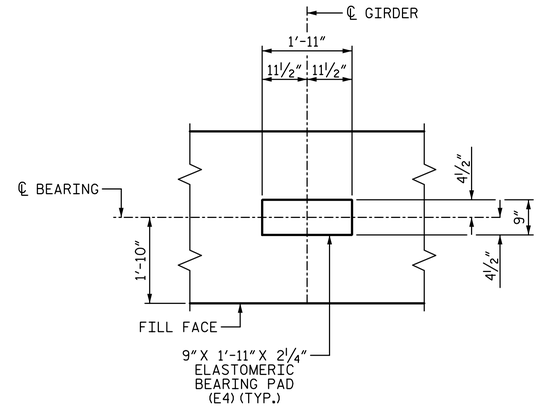
ELEVATION

NOTES:

#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR SECTION A-A AND B-B. SEE SHEET 3 OF 3.

THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: T. BANKOVICH DATE: 2-19
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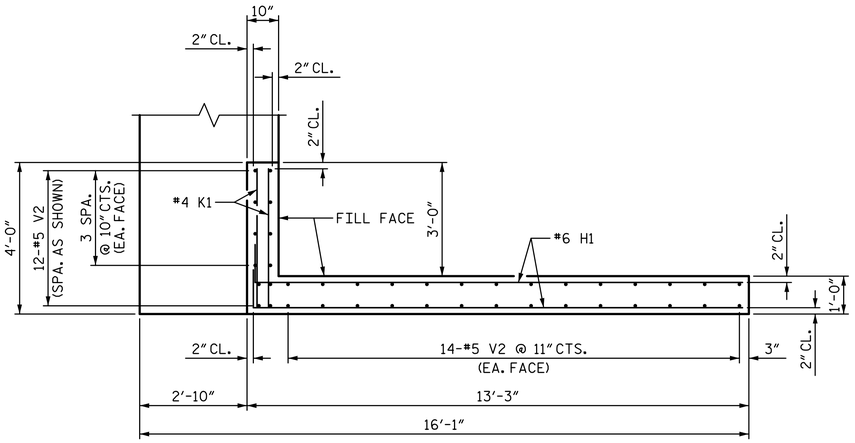
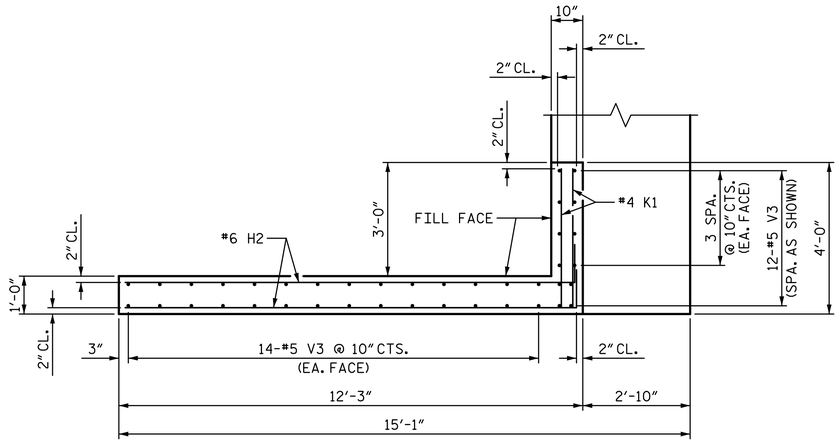
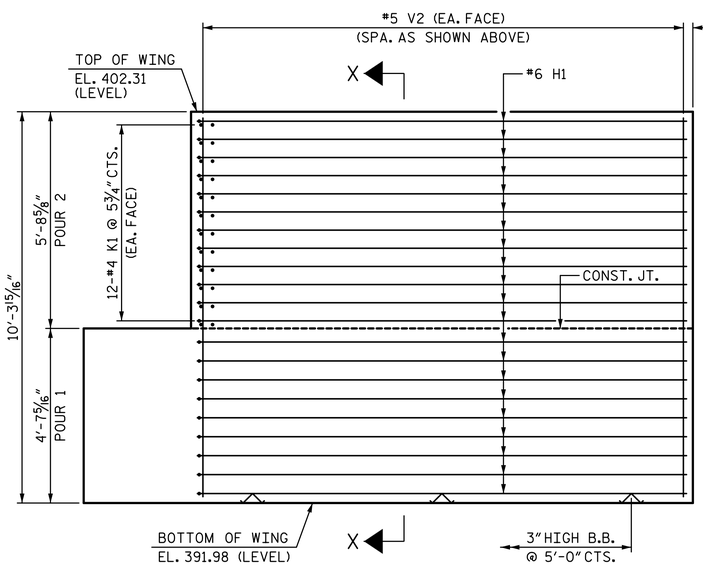


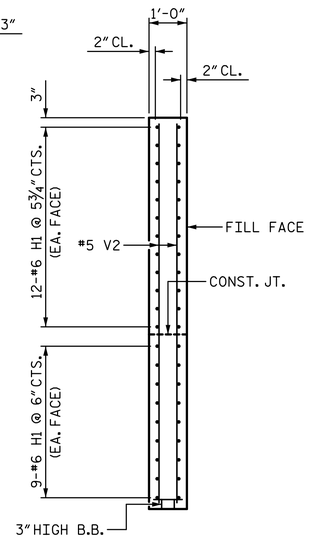
PLAN OF WING (W1)



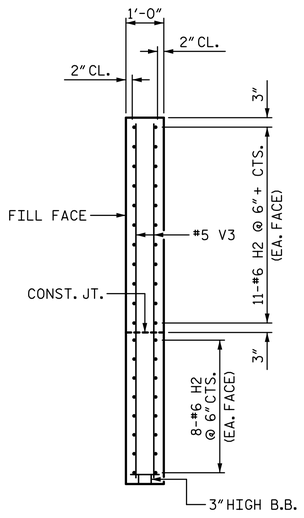
PLAN OF WING (W2)



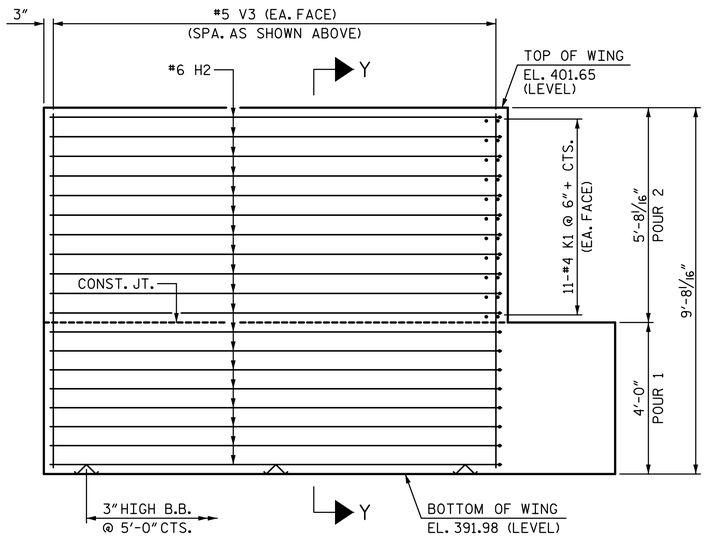
ELEVATION OF WING (W1)



SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W2)

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
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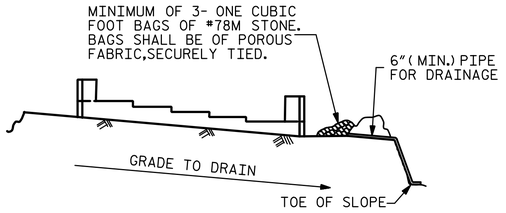
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/5/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY:	T. BANKOVICH	DATE:	2-19
CHECKED BY:	T.J. BEACH	DATE:	2-19
DESIGN ENGINEER OF RECORD:	T.J. BEACH	DATE:	2-19

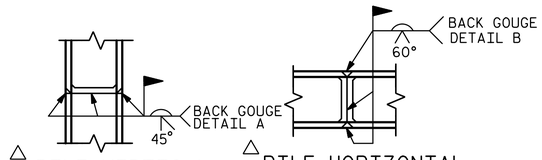


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

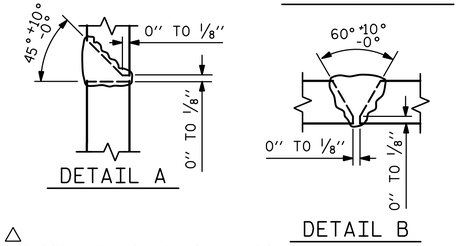
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ PILE VERTICAL

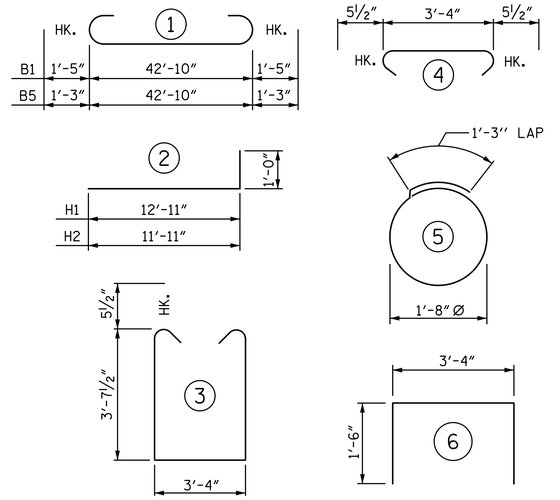
△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



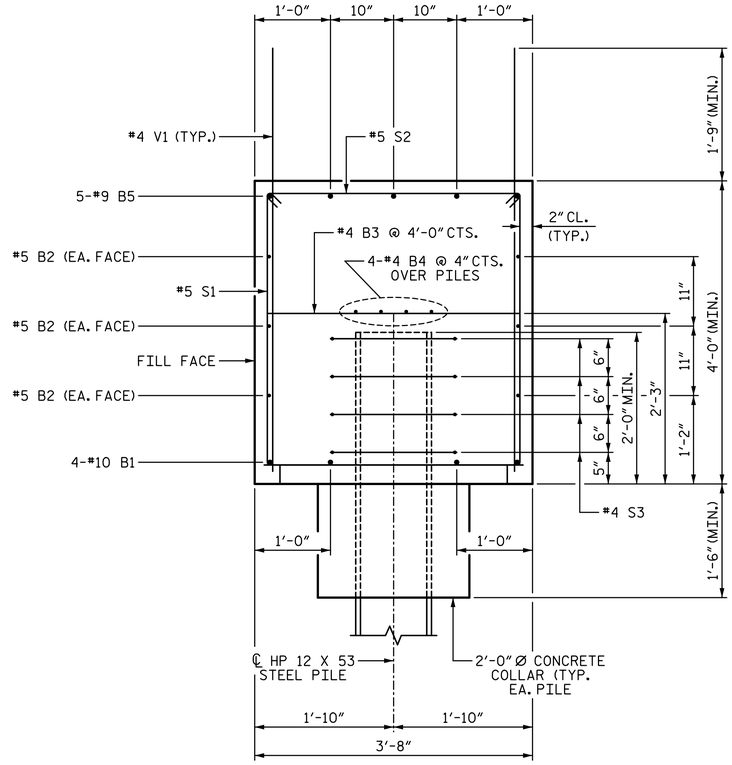
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

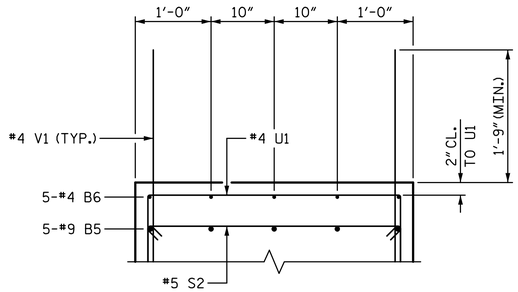
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	45'-8"	786
B2	6	#5	STR	43'-0"	269
B3	11	#4	STR	3'-4"	24
B4	8	#4	STR	22'-9"	122
B5	5	#9	1	45'-4"	771
B6	5	#4	STR	10'-1"	34
B7	5	#4	STR	7'-9"	26
H1	42	#6	2	13'-11"	878
H2	38	#6	2	12'-11"	737
K1	46	#4	STR	3'-8"	113
S1	50	#5	3	11'-6"	600
S2	50	#5	4	4'-3"	222
S3	28	#4	5	6'-6"	122
U1	13	#4	6	6'-4"	55
V1	62	#4	STR	5'-7"	231
V2	40	#5	STR	9'-11"	414
V3	40	#5	STR	9'-3"	386

TOTAL REINFORCING STEEL	5790 LB
CLASS A CONCRETE BREAKDOWN	
POUR 1 (CAP, COLLARS, & LOWER WINGS)	30.2 CY
POUR 2 (UPPER WINGS)	6.5 CY
TOTAL CLASS A CONCRETE	36.7 CY
HP 12 X 53 STEEL PILES	
NO. 7	140 LF
STEEL PILE POINTS	NO. 7
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	EA 7



SECTION A-A



SECTION B-B

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			24

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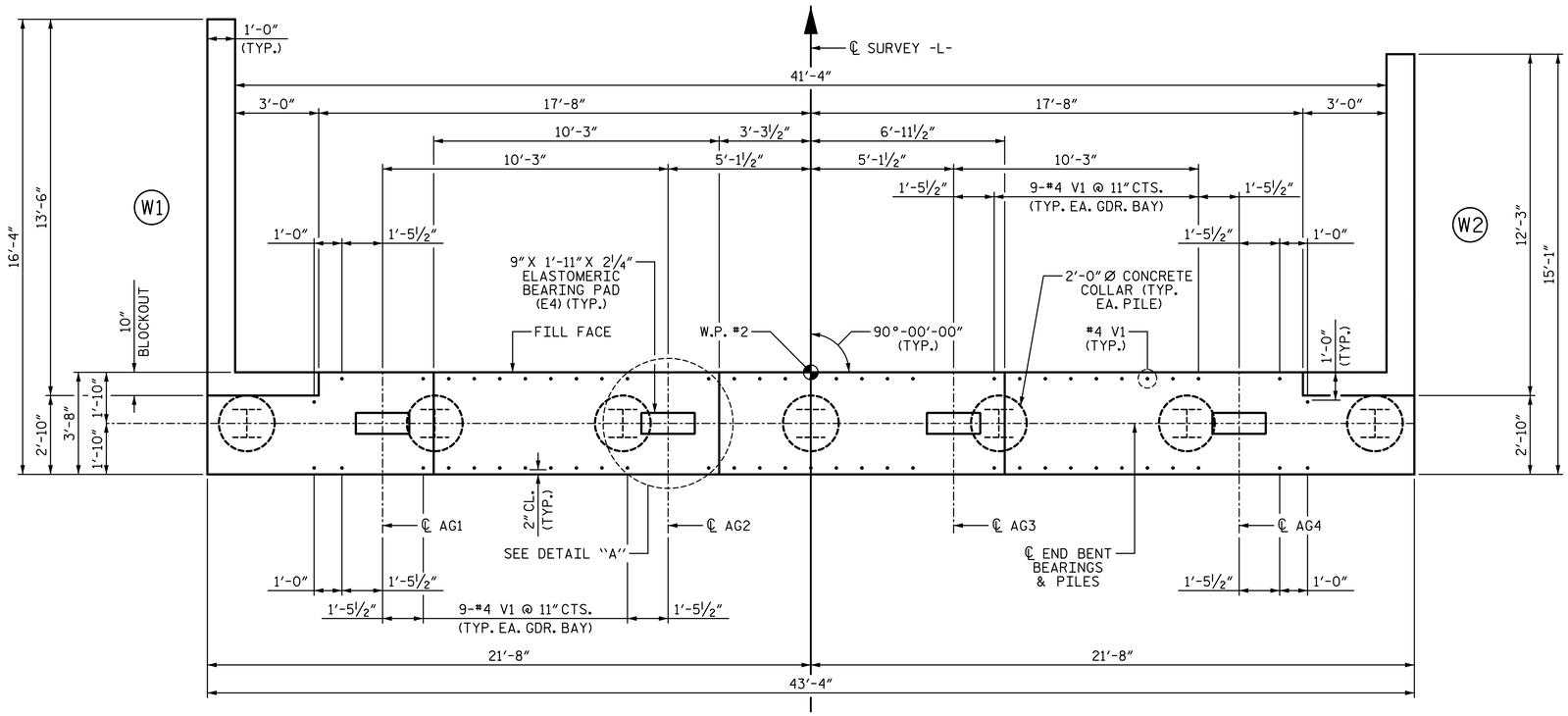
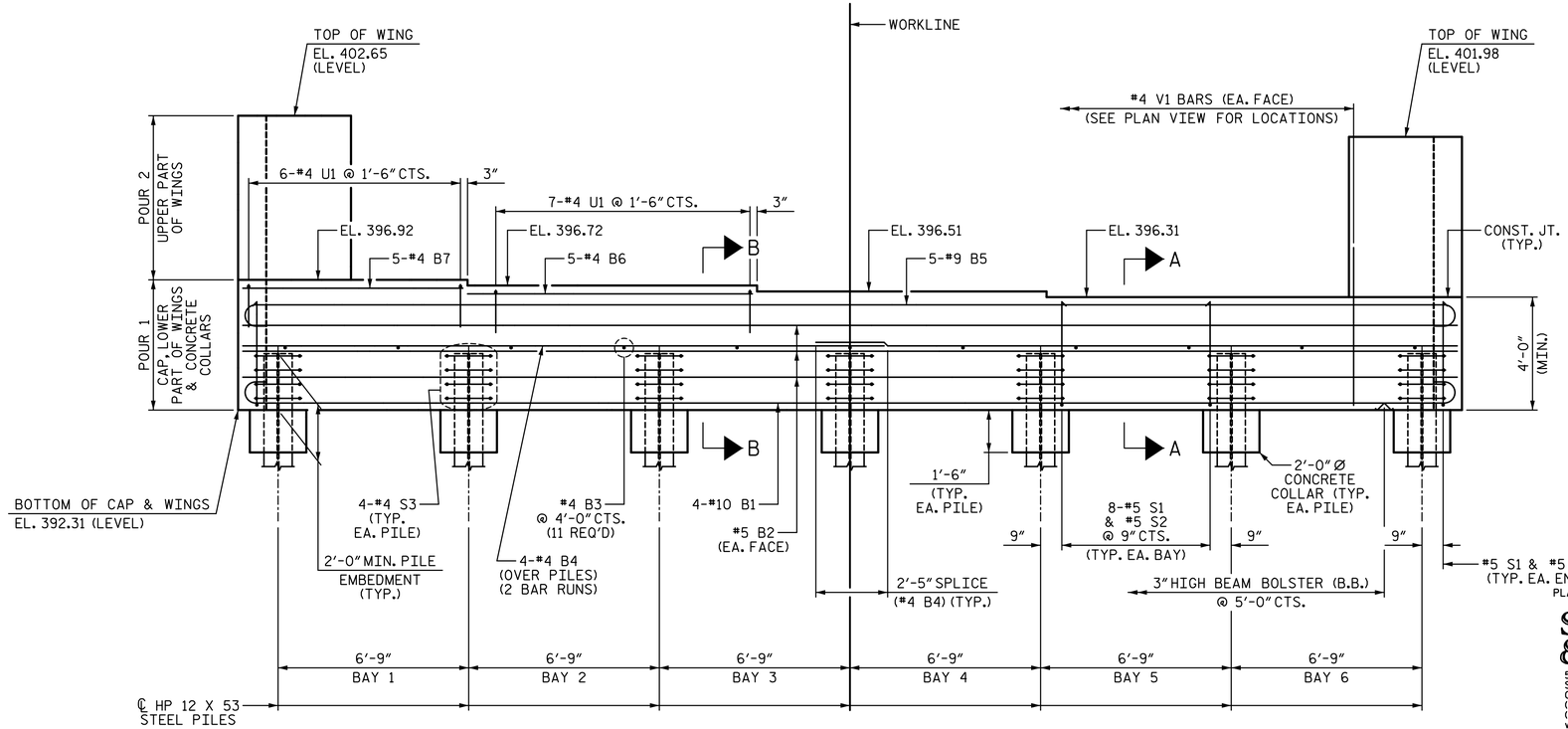
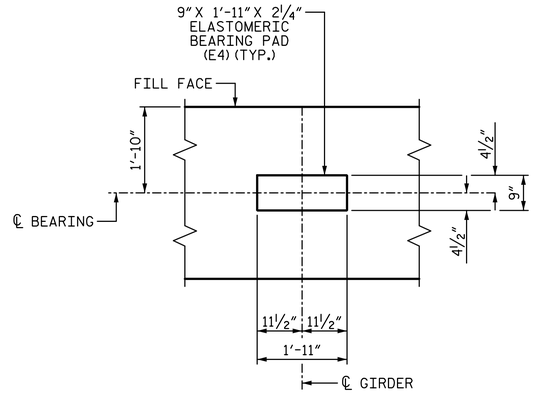
2/5/2019 6:50:08 AM G:\Projects\2016\Division 5 (Mott Macdonald)\17BP5R82 Granville #40 (90 54PCG)\Structures\Drawings\Final\401_17BP5R82_SMU_E1_380040.dgn



PLAN



ELEVATION



DETAIL "A"

(TYP. EA. GIRDER)

NOTES:

#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR SECTION A-A AND B-B. SEE SHEET 3 OF 3.

THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: T. BANKOVICH DATE: 2-19
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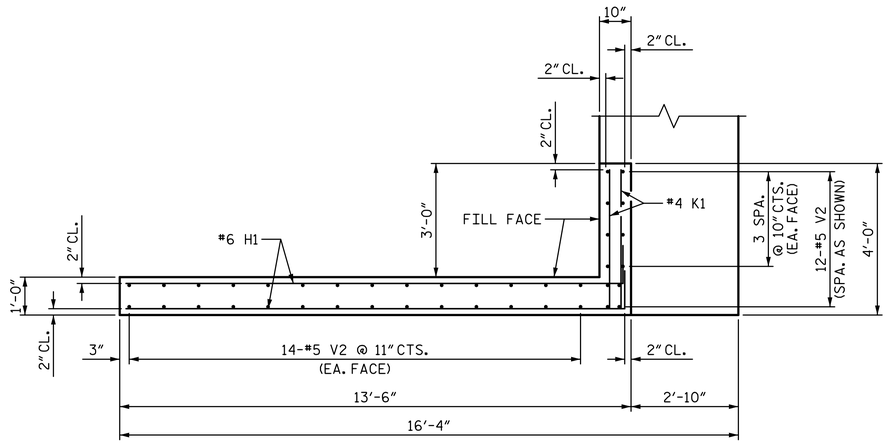
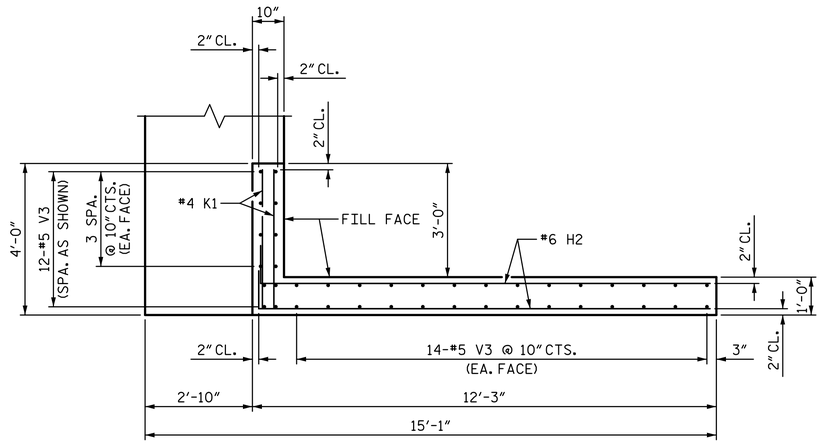
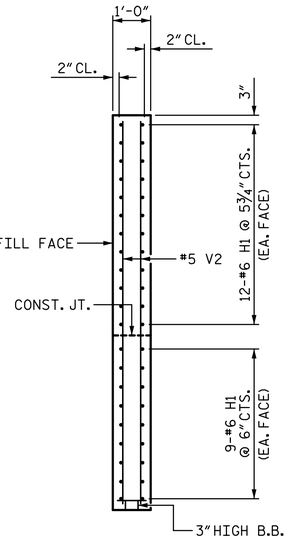


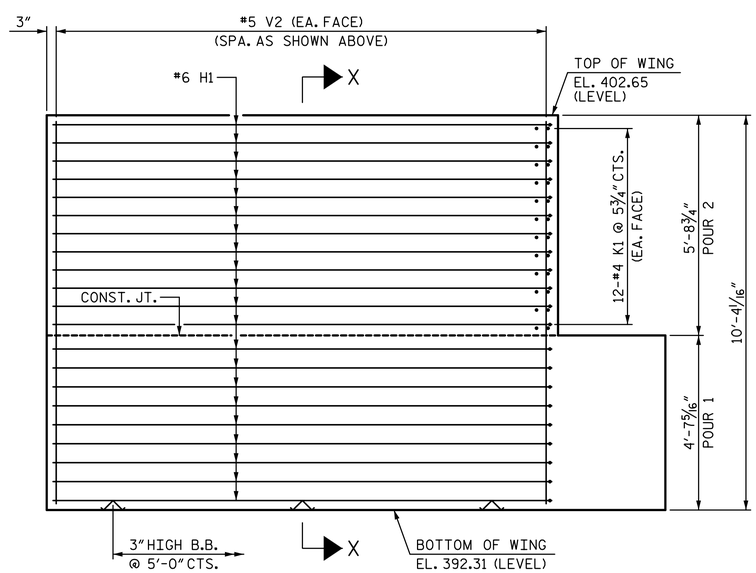
PLAN OF WING (W1)



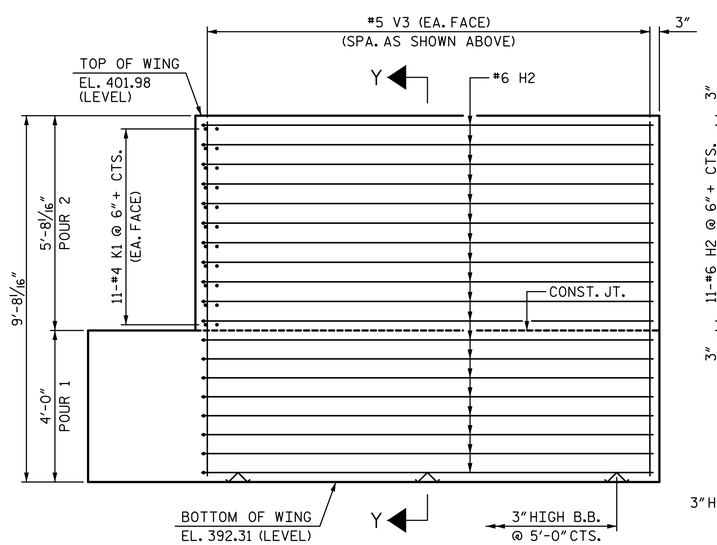
PLAN OF WING (W2)



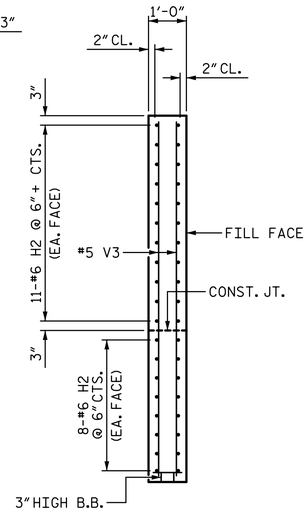
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

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2/5/2019

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1			3			TOTAL SHEETS
2			4			24

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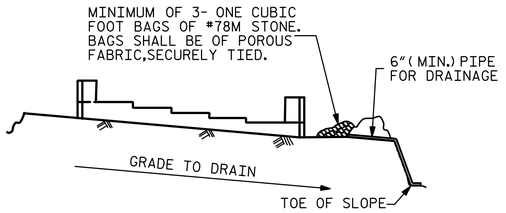

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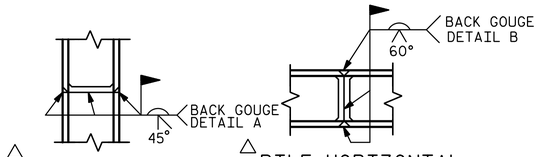
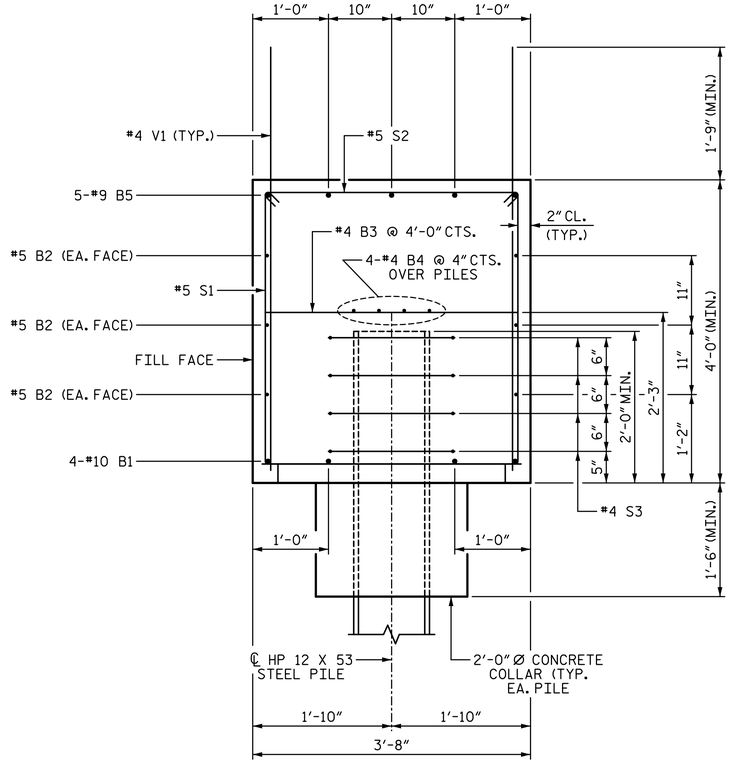
TEMPORARY DRAINAGE AT END BENT

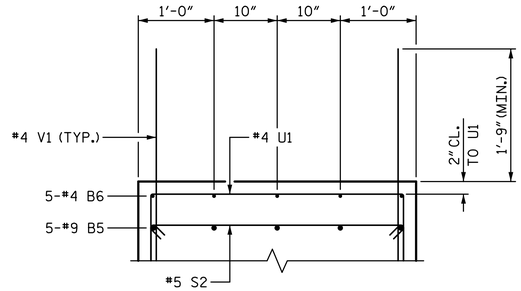


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

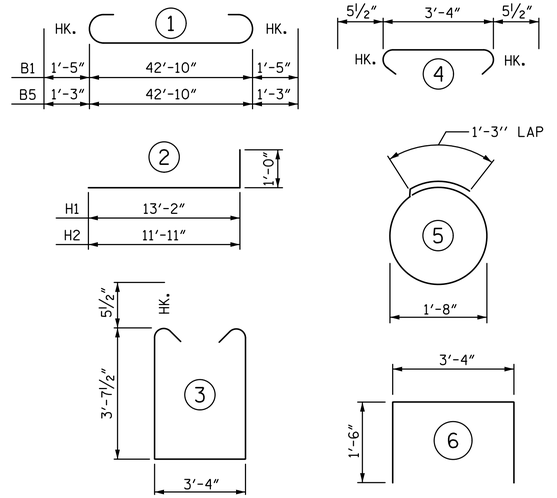


SECTION A-A



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	4	#10	1	45'-8"	786
B2	6	#5	STR	43'-0"	269
B3	11	#4	STR	3'-4"	24
B4	8	#4	STR	22'-9"	122
B5	5	#9	1	45'-4"	771
B6	5	#4	STR	10'-1"	34
B7	5	#4	STR	7'-9"	26
H1	42	#6	2	14'-2"	894
H2	38	#6	2	12'-11"	737
K1	46	#4	STR	3'-8"	113
S1	50	#5	3	11'-6"	600
S2	50	#5	4	4'-3"	222
S3	28	#4	5	6'-6"	122
U1	13	#4	6	6'-4"	55
V1	62	#4	STR	5'-7"	231
V2	40	#5	STR	9'-11"	414
V3	40	#5	STR	9'-3"	386
TOTAL REINFORCING STEEL					5806 LB

CLASS A CONCRETE BREAKDOWN	
POUR 1 (CAP, COLLARS, & LOWER WINGS)	30.3 CY
POUR 2 (UPPER WINGS)	6.5 CY
TOTAL CLASS A CONCRETE	36.8 CY
HP 12 X 53 STEEL PILES	
NO. 7	70 LF
PILE DRIVING EQUIPMENT SETUP	
HP 12 X 53 STEEL PILES	EA 7
PILE EXCAVATION IN SOIL	50 LF
PILE EXCAVATION NOT IN SOIL	20 LF

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 3 OF 3

DRAWN BY: T. BANKOVICH DATE: 2-19

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STATE OF NORTH CAROLINA
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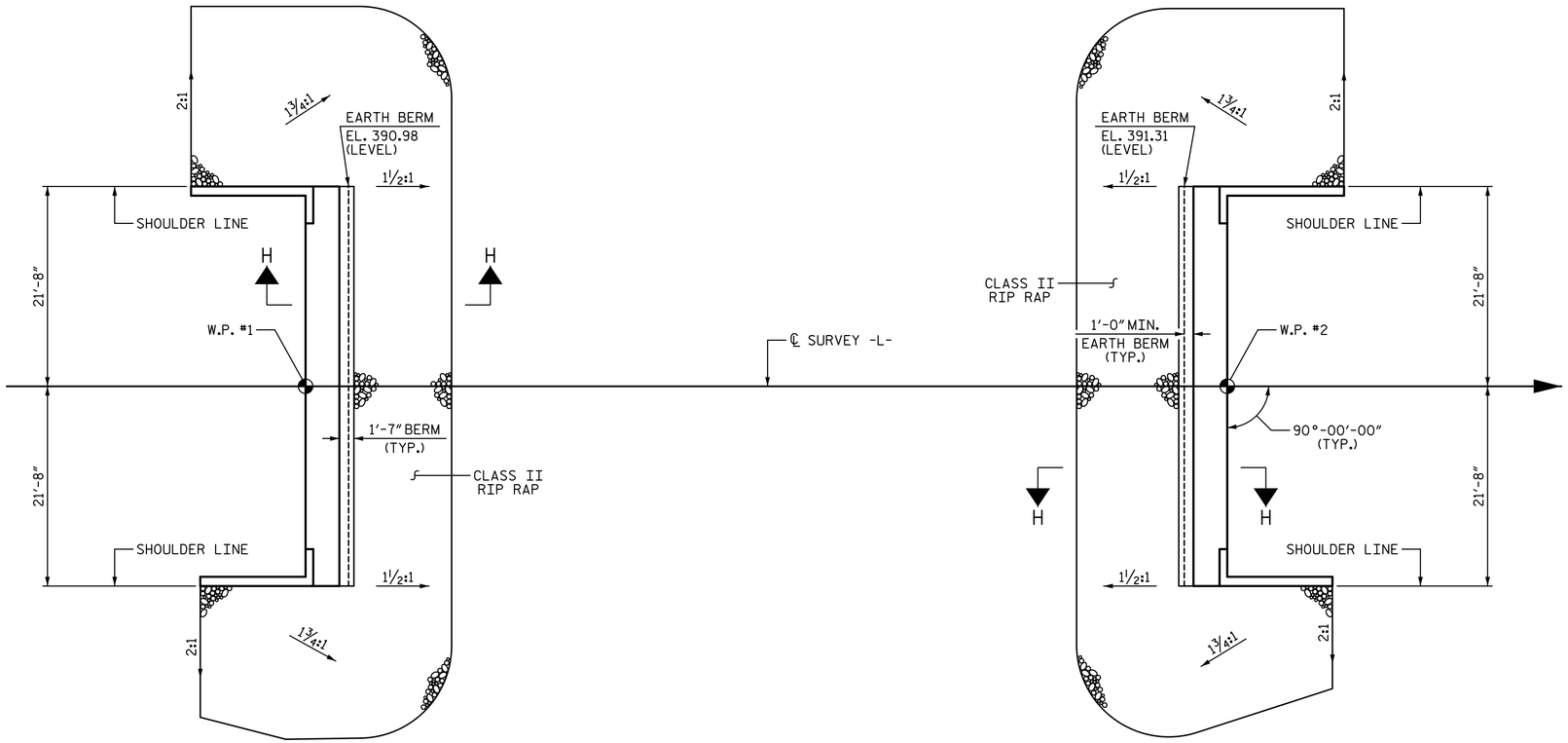
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			24

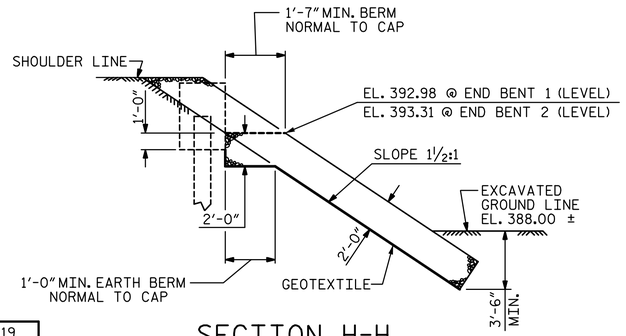


@ END BENT 1

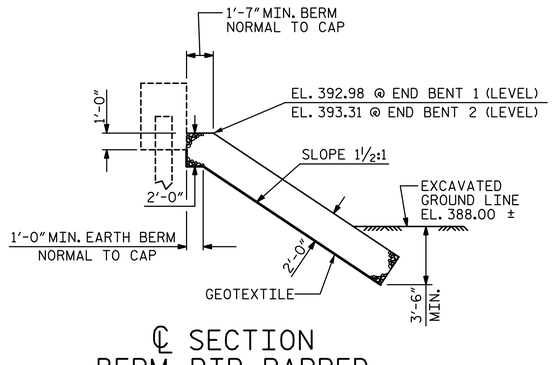
@ END BENT 2

PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+14.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	135
END BENT 2	135	150



SECTION H-H



℄ SECTION
BERM RIP RAPPED

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

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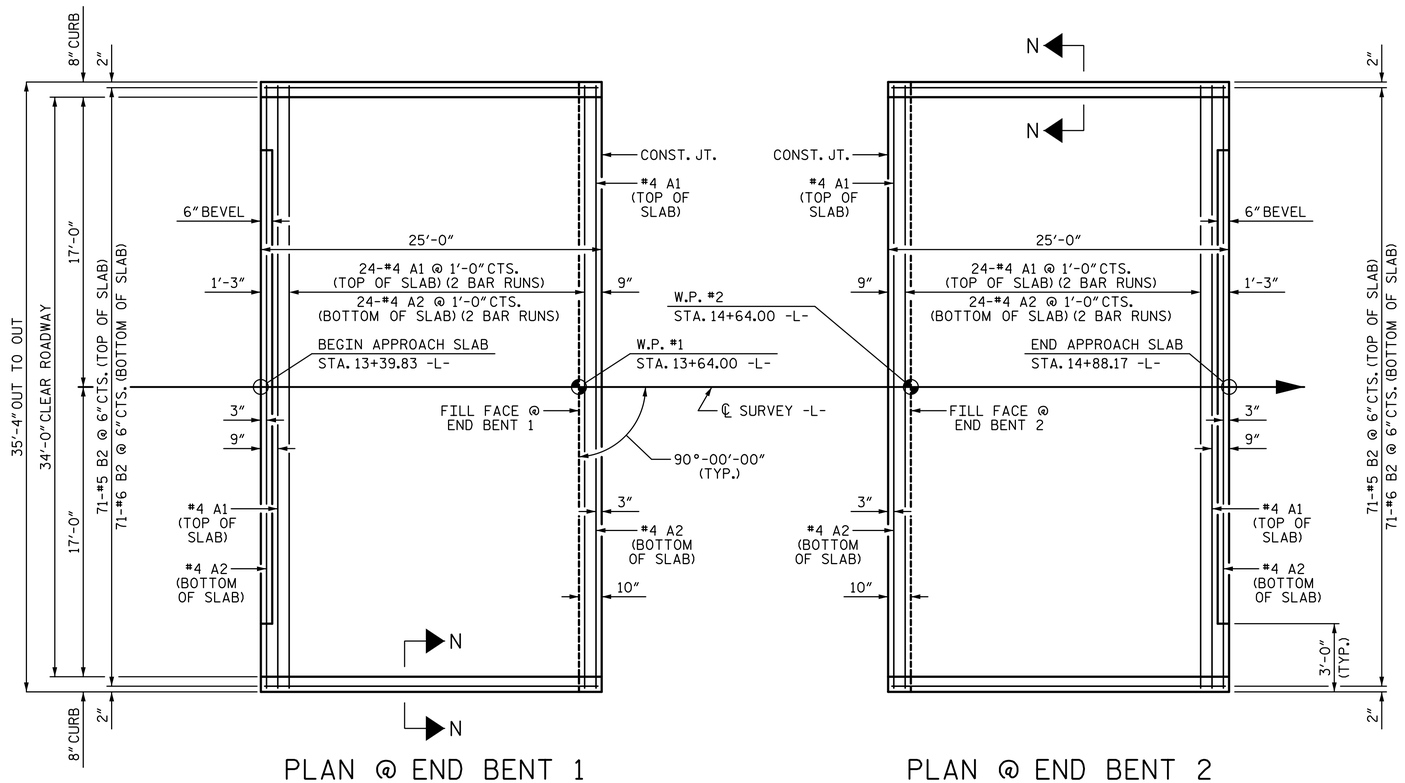
1			3		
2			4		

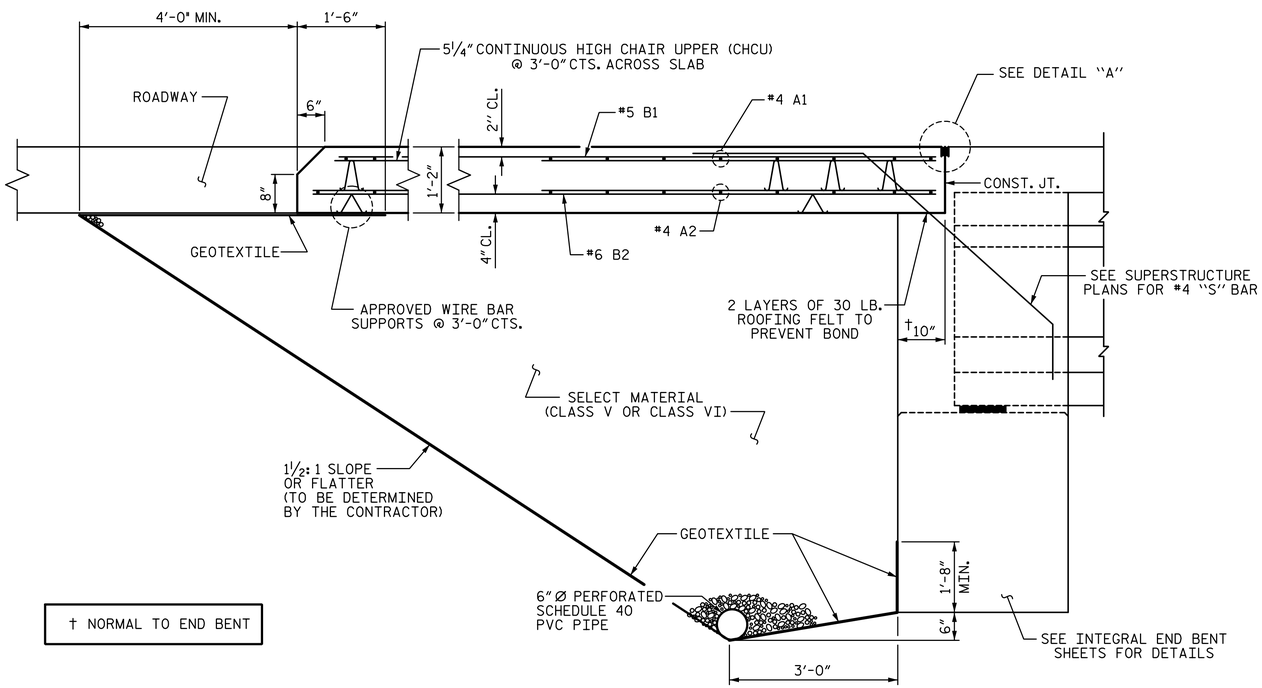
SHEET NO. S-22

TOTAL SHEETS 24



PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

NOTES:

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

BILL OF MATERIAL

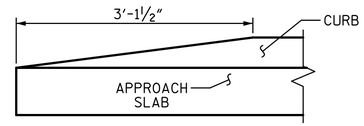
FOR ONE APPROACH SLAB (2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	52	#4	STR	18'-6"	643
A2	52	#4	STR	18'-5"	640
✳ B1	71	#5	STR	24'-4"	1802
B2	71	#6	STR	24'-8"	2631
REINFORCING STEEL					3271 LB
EPOXY COATED REINFORCING STEEL					2445 LB
CLASS A CONCRETE					38.0 CY

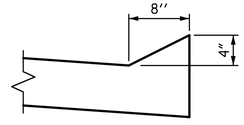
✳ INDICATES EPOXY COATED REINFORCING STEEL

SPLICE CHART

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

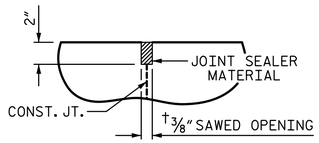


END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

CURB DETAILS



DETAIL "A"

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			24

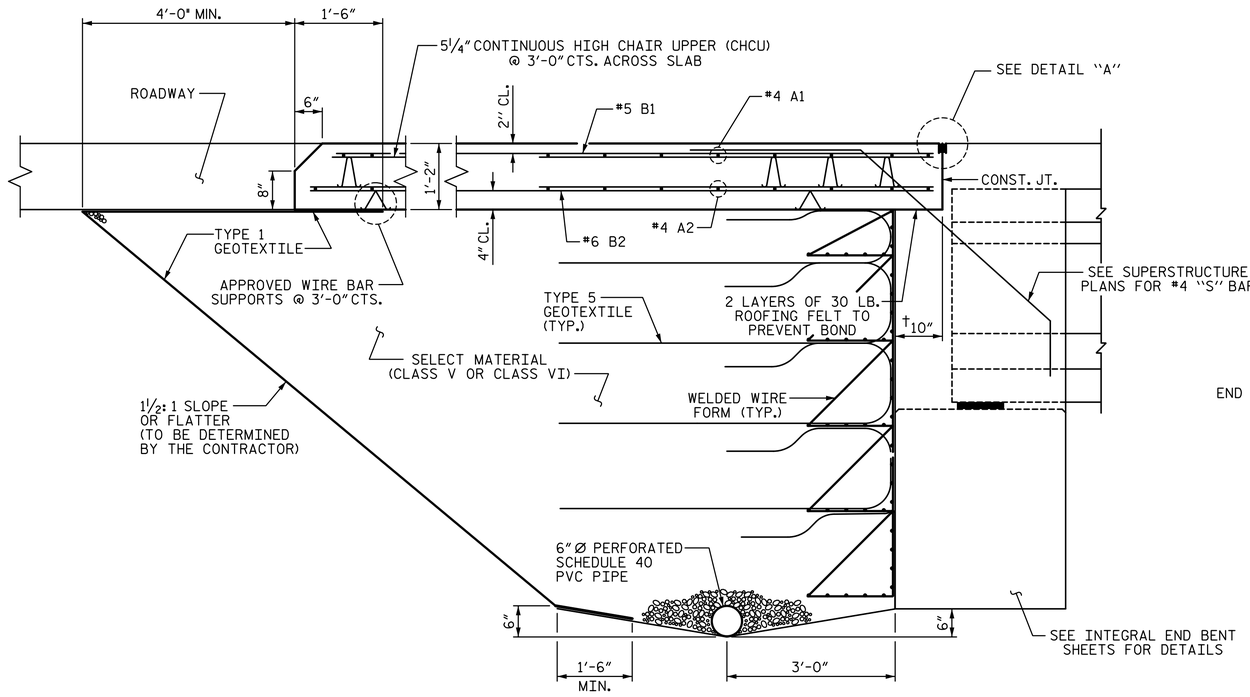
PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/5/2019

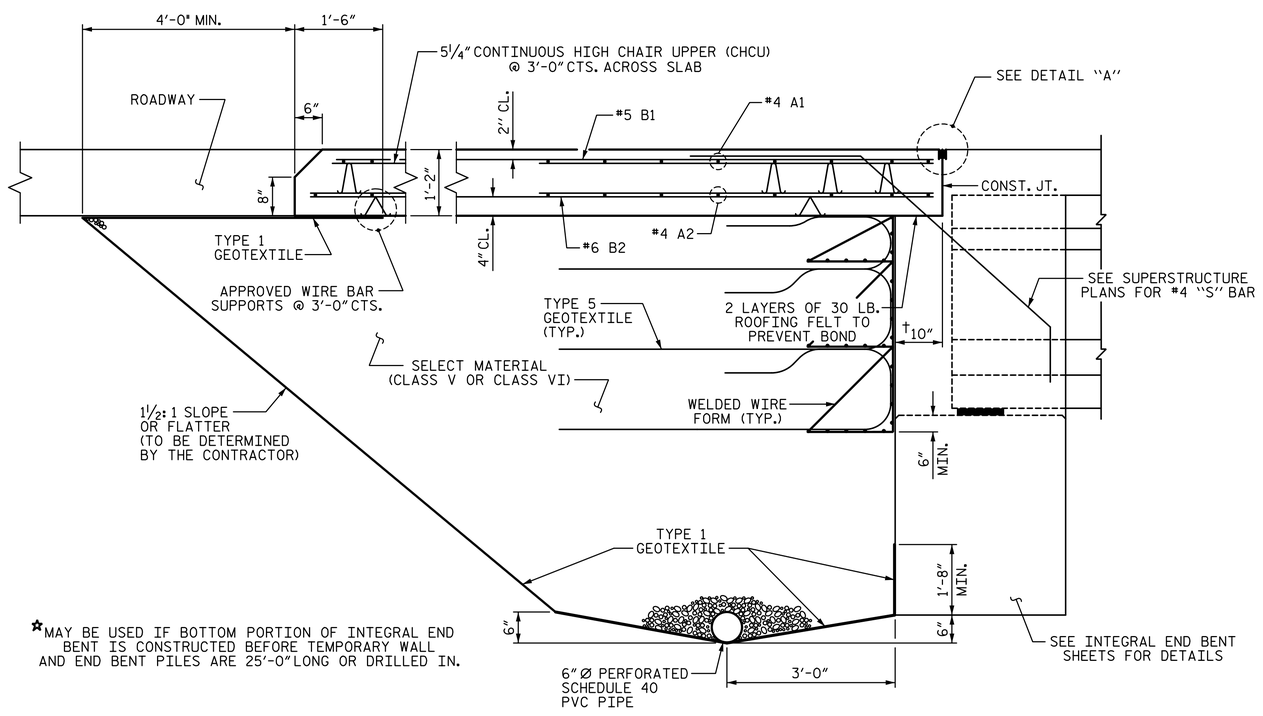
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: T. BANKOVICH DATE: 2-19
CHECKED BY: T.J. BEACH DATE: 2-19
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19



SECTION THRU SLAB

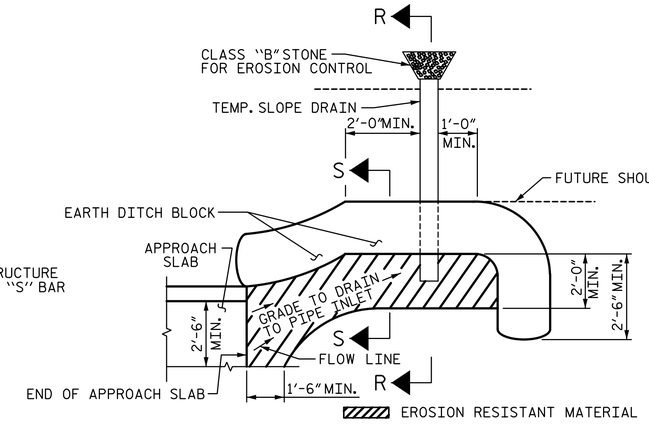
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB

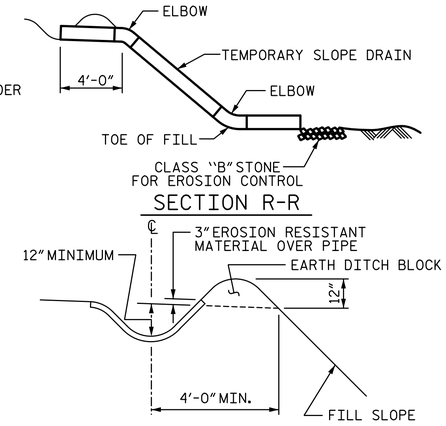
☆(TYPE A - ALTERNATE APPROACH FILL)

☆MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.



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 S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES:

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

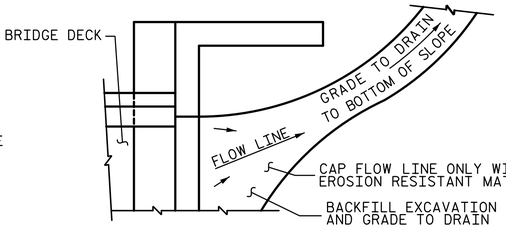
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



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

PROJECT NO. 17BP.5.R.82

GRANVILLE COUNTY

STATION: 14+14.00 -L-

SHEET 2 OF 2

DRAWN BY: T. BANKOVICH DATE: 2-19

CHECKED BY: T.J. BEACH DATE: 2-19

DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 2-19

PLANS PREPARED BY:
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			24

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT: ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990