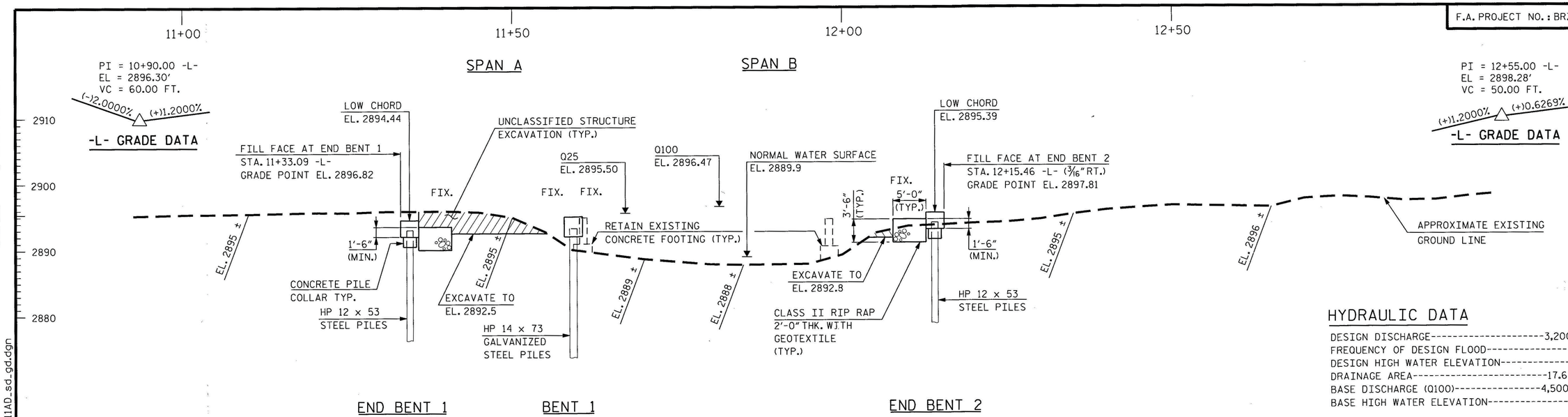
F.A. PROJECT NO. : BRZ-1372(2)

BD-5111AD

BRIDGE NO. 506 ASHE COUNTY



HYDRAULIC DATA

DESIGN DISCHARGE----------3,200 C.F.S.
FREQUENCY OF DESIGN FLOOD----------25 YR.
DESIGN HIGH WATER ELEVATION----------2895.5
DRAINAGE AREA----------17.6 SQ. MI.
BASE DISCHARGE (Q100)----------4,500 C.F.S.
BASE HIGH WATER ELEVATION----------2896.47

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE----------4,104 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD------50 YR. +
OVERTOPPING FLOOD ELEVATION----------2896.5

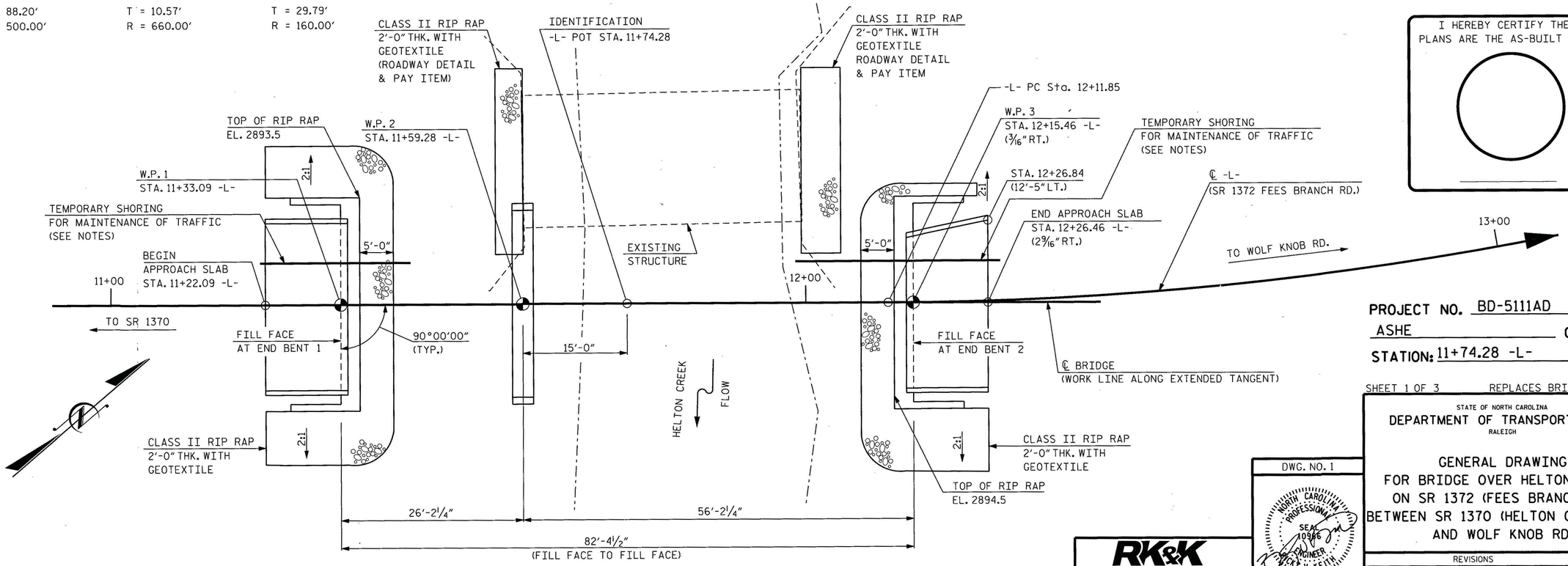
-L- HORIZONTAL CURVE DATA

PI Sta 13+00.05	PI Sta 15+29.27	PI Sta 15+68.62
Δ = 20° 00' 31.1" (LT)	Δ = 1° 50' 07.1" (LT)	Δ = 20° 23' 52.7" (LT)
D = 11° 27' 33.0"	D = 8° 40' 52.2"	D = 35° 48' 35.5"
L = 174.61'	L = 21.14'	L = 56.96'
T = 88.20'	T = 10.57'	T = 29.79'
R = 500.00'	R = 660.00'	R = 160.00'

SECTION ALONG ℄ -L-

PLAN

(PILES NOT SHOWN IN PLAN VIEW)



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER HELTON CREEK
ON SR 1372 (FEES BRANCH RD.)
BETWEEN SR 1370 (HELTON CREEK RD.)
AND WOLF KNOB RD.

DWG. NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 035486 ENGINEER R. V. KEITH
10/10/2013

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

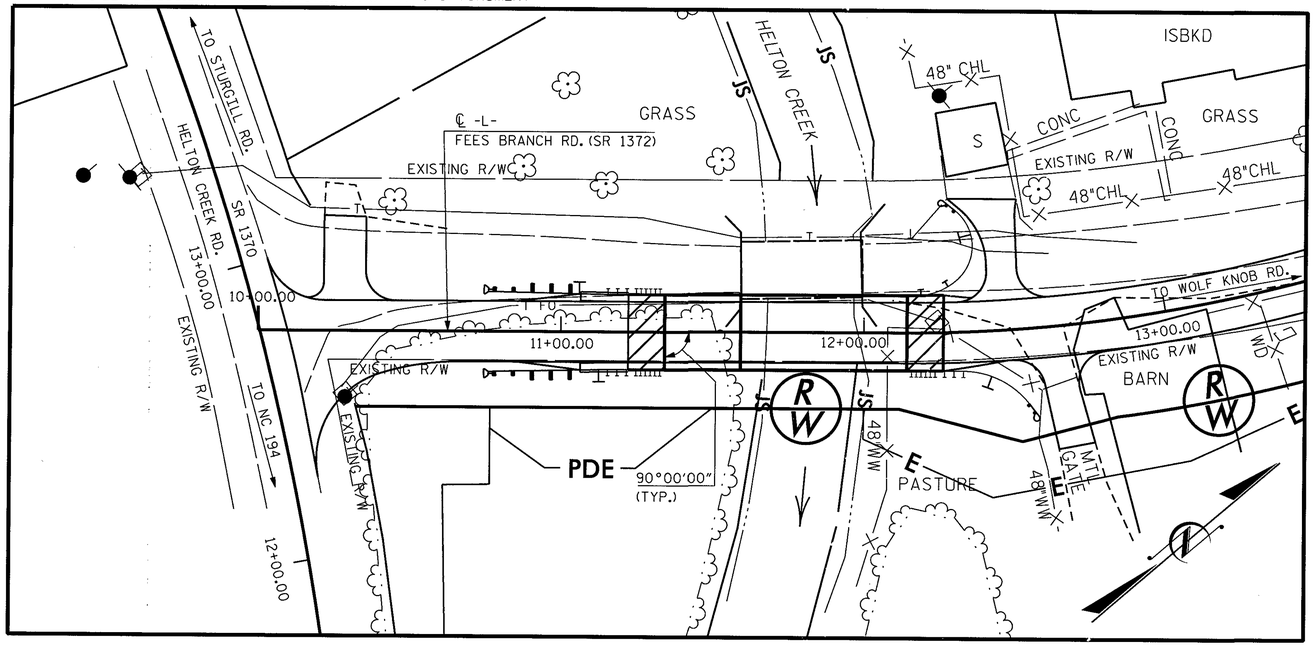
DRAWN BY : W.R. PARRISH DATE : SEPT. 2013
CHECKED BY : R.V. KEITH DATE : SEPT. 2013

fweeden
10/8/2013
M:\projects\2009\09085_NCDOT_Div_OnCall\P01_Div11Bridges_GRP4\BD5111AD_Ashe506\Design\Structures\DGN\BD-5111AD_sd_gd.dgn

TOTAL BILL OF MATERIALS

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION NOT IN SOIL	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		HP 14 X 73 GALVANIZED STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LIN. FT.	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE						LUMP SUM							160.5			LUMP SUM	18	720
END BENT NO. 1		25.0		LUMP SUM	12.5		1749	5	150					118	132			
BENT 1		21.0			9.1		1579			5	150	5						
END BENT NO. 2		25.0		LUMP SUM	12.5		1749	5	150					114	128			
TOTAL	LUMP SUM	71.0	1	LUMP SUM	34.1	LUMP SUM	5,077	10	300	5	150	5	160.5	232	260	LUMP SUM	18	720

BD5111AD-1 EL = 2,896.81' -L- STA. 10+17.12 37.01' LT. GPS MONUMENT



LOCATION SKETCH

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

DRAWN BY : W.R. PARRISH DATE : SEPT. 2013
CHECKED BY : R.V. KEITH DATE : SEPT. 2013

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

DWG. NO. 2

NORTH CAROLINA PROFESSIONAL SEAL 10956 ENGINEER RICKY V. KEITH
10/10/2013

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER HELTON CREEK
ON SR 1372 (FEES BRANCH RD.)
BETWEEN SR 1370 (HELTON CREEK RD.)
AND WOLF KNOB RD.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			25

fweeden
10/8/2013 M:\projects\2009\09085_NCDOT_Div_OnCall\P01_Div11Bridges_GRP4\BD5111AD_Ashe506\Design\Structures\DGN\BD-5111AD_sd_loc_.dgn

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 40'-6" WITH AN ASPHALT WEARING SURFACE OVER A TIMBER FLOOR ON I-BEAM SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 19.1' ON A SUBSTRUCTURE CONSISTING OF TIMBER CAPS/TIMBER POST & SILLS AND LOCATED UPSTREAM OF THE PROPOSED STRUCTURE LOCATION SHALL BE REMOVED, WITH THE EXCEPTION OF THE EXISTING CONCRETE ABUTMENT FOOTINGS WHICH ARE TO REMAIN IN PLACE.
THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
SEE SPECIAL PROVISION FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 11+74.28 -L-".

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION 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 40 FEET LEFT 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 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.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 11+74.28 -L-".

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 CONSTRUCTION STAGING, SEE TRAFFIC CONTROL PLANS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLAN.
FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THIS BRIDGE IS TO BE LAYED OUT WITH THE ℄ OF THE BRIDGE ALONG THE TANGENT PORTION OF THE ℄ -L-. BEYOND THE -L- PC STATION 12+11.85 THE ℄ BRIDGE/WORK LINE WILL CONTINUE ALONG THE EXTENDED TANGENT TO THE END OF THE APPROACH SLAB AT END BENT 2.

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.

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.

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

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 2880. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN ELEVATION 2867 FEET.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2887 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS

PILE EXCAVATION MAY BE REQUIRED TO INSTALL AT BENT NO. 1. IF REQUIRED, EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2884 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS..

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2887 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS, AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISIONS.

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER HELTON CREEK
ON SR 1372 (FEES BRANCH RD.)
BETWEEN SR 1370 (HELTON CREEK RD.)
AND WOLF KNOB RD.

DWG. NO. 2A

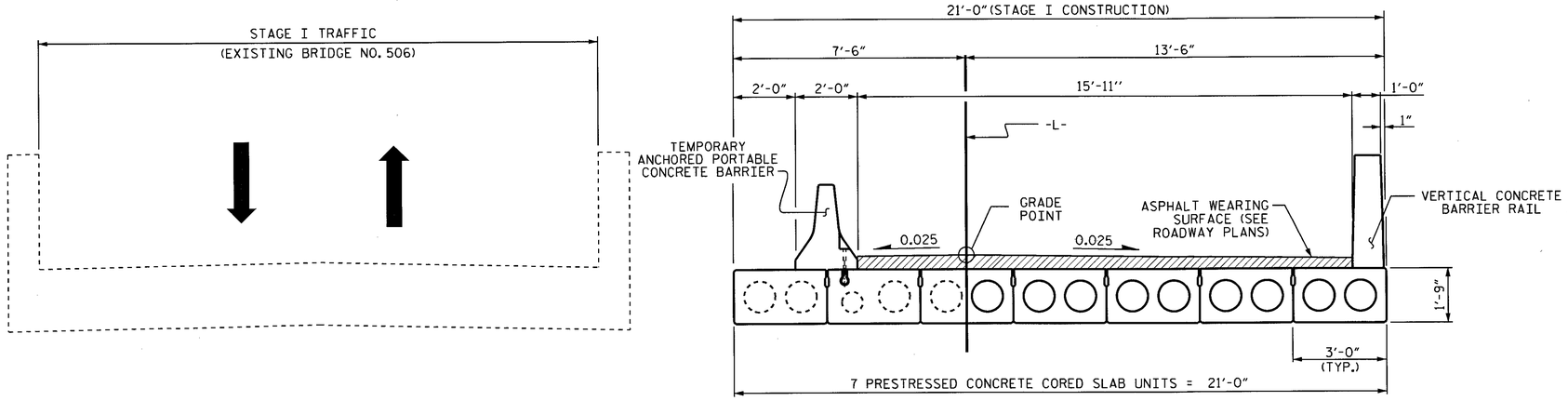
NORTH CAROLINA PROFESSIONAL SEAL 10966 ENGINEER RONDAL V. KEITH
10/10/2013

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

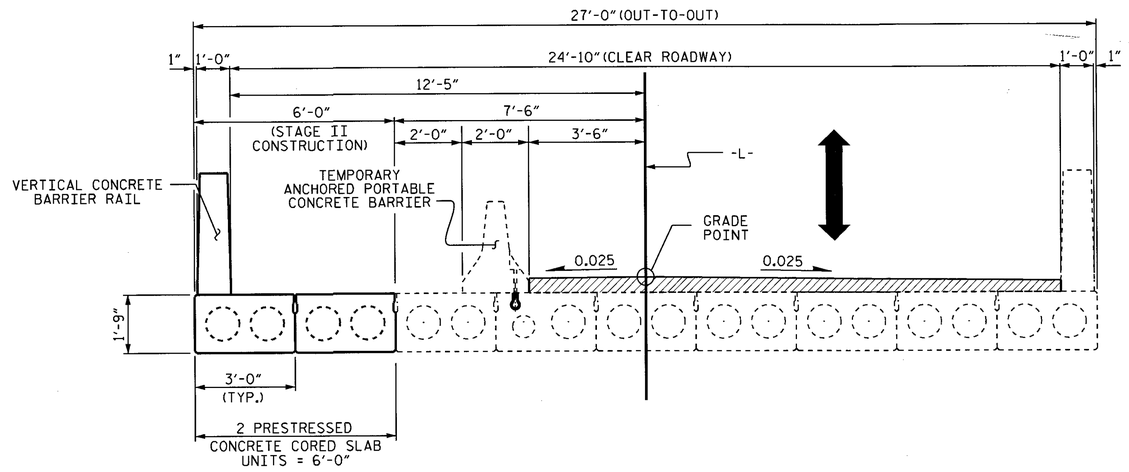
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2A
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W.R. PARRISH DATE : SEPT. 2013
CHECKED BY : R.V. KEITH DATE : SEPT. 2013

fweeden
10/9/2013 M:\projects\2009\09085_NCDOT_Div_OnCall\P01_Div11Bridges.GRP4\BD5111AD_Ashe506\Design\Structures\DGN\BD-5111AD_sd_sn.dgn



STAGE I



STAGE II

STAGING SEQUENCE

NOTES

FOR TEMPORARY ANCHORED PORTABLE CONCRETE BARRIER, SEE TRAFFIC CONTROL PLANS.

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL R. MCROY, JR.
8-14-13

DRAWN BY : M.A. LEBLANC DATE : 5/13
CHECKED BY : J.R. MCROY DATE : 5/13

12-AUG-2013 09:11
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maleblanc

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.05	--	1.75	0.284	2.51	A	EL	12.00	0.591	**1.05**	A	EL	**1.20**	0.80	0.284	2.29	A	EL	12.00	
		HL-93(Opr)	N/A	--	1.37	--	1.35	0.284	3.25	A	EL	12.00	0.591	1.37	A	EL	1.20	N/A	--	--	--	--		
		HS-20(Inv)	36.000	2	1.22	43.88	1.75	0.284	3.72	A	EL	12.00	0.591	**1.22**	A	EL	**1.20**	0.80	0.284	3.39	A	EL	12.00	
		HS-20(Opr)	36.000	--	1.58	56.89	1.35	0.284	4.82	A	EL	12.00	0.591	1.58	A	EL	1.20	N/A	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.82	38.13	1.4	0.284	6.76	A	EL	12.00	0.591	2.82	A	EL	1.20	0.80	0.284	4.94	A	EL	12.00	
		SNGARBS2	20.000	--	2.26	45.25	1.4	0.284	6.32	A	EL	12.00	0.591	2.26	A	EL	1.20	0.80	0.284	4.62	A	EL	12.00	
		SNAGRIS2	22.000	--	2.22	48.76	1.4	0.284	6.76	A	EL	12.00	0.591	2.22	A	EL	1.20	0.80	0.284	4.94	A	EL	12.00	
		SNCOTTS3	27.250	--	1.43	39.05	1.4	0.284	3.53	A	EL	12.00	0.591	1.43	A	EL	1.20	0.80	0.284	2.58	A	EL	12.00	
		SNAGGRS4	34.925	--	1.38	48.14	1.4	0.284	3.52	A	EL	12.00	0.591	1.38	A	EL	1.20	0.80	0.284	2.57	A	EL	12.00	
		SNS5A	35.550	--	1.44	51.21	1.4	0.284	3.42	A	EL	12.00	0.591	1.44	A	EL	1.20	0.80	0.284	2.49	A	EL	12.00	
		SNS6A	39.950	--	1.38	55.18	1.4	0.284	3.20	A	EL	12.00	0.591	1.38	A	EL	1.20	0.80	0.284	2.34	A	EL	12.00	
		SNS7B	42.000	--	1.39	58.44	1.4	0.284	3.20	A	EL	12.00	0.591	1.39	A	EL	1.20	0.80	0.284	2.32	A	EL	12.00	
	TTST	TNAGRIT3	33.000	--	1.69	55.82	1.4	0.284	4.50	A	EL	12.00	0.591	1.69	A	EL	1.20	0.80	0.284	3.29	A	EL	12.00	
		TNT4A	33.075	--	1.54	50.77	1.4	0.284	3.91	A	EL	12.00	0.591	1.53	A	EL	1.20	0.80	0.284	2.86	A	EL	12.00	
		TNT6A	41.600	--	1.45	60.18	1.4	0.284	3.67	A	EL	12.00	0.591	1.45	A	EL	1.20	0.80	0.284	2.68	A	EL	12.00	
		TNT7A	42.000	--	1.44	60.47	1.4	0.284	3.80	A	EL	12.00	0.591	1.44	A	EL	1.20	0.80	0.284	2.77	A	EL	12.00	
		TNT7B	42.000	--	1.39	58.36	1.4	0.284	3.42	A	EL	12.00	0.591	1.39	A	EL	1.20	0.80	0.284	2.5	A	EL	12.00	
		TNAGRIT4	43.000	--	1.39	59.62	1.4	0.284	3.67	A	EL	12.00	0.591	1.39	A	EL	1.20	0.80	0.284	2.67	A	EL	12.00	
		TNAGT5A	45.000	--	1.42	63.66	1.4	0.284	3.67	A	EL	12.00	0.591	1.41	A	EL	1.20	0.80	0.284	2.67	A	EL	12.00	
		TNAGT5B	45.000	3	1.28	57.72	1.4	0.284	3.61	A	EL	14.40	0.591	**1.28**	A	EL	**1.20**	0.80	0.284	2.65	A	EL	14.40	

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.

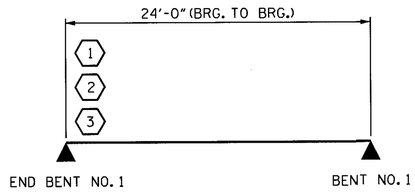
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.
2.
3.
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



LRFR SUMMARY

FOR SPAN 'A'

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 25' CORED SLAB UNIT 90° SKEW
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LEBLANC, JR. 8-12-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY :	M.A. LEBLANC	DATE :	5/13
CHECKED BY :	J.R. MCROY	DATE :	5/13
DRAWN BY : CVC	6/10		
CHECKED BY : DNS	6/10		

12-AUG-2013 09:08
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maleblanc

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	(1)	**1.02**	--	1.75	0.275	1.03	B	EL	27.00	0.523	**1.02**	B	EL	**2.70**	0.80	0.275	1.09	B	EL	27.00	
		HL-93(Opr)	N/A	--	1.32	--	1.35	0.275	1.33	B	EL	27.00	0.523	1.32	B	EL	2.70	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	**1.23**	44.22	1.75	0.275	1.29	B	EL	27.00	0.523	**1.23**	B	EL	**2.70**	0.80	0.275	1.36	B	EL	27.00	
		HS-20(Opr)	36.000	--	1.59	57.32	1.35	0.275	1.67	B	EL	27.00	0.523	1.59	B	EL	2.70	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.86	38.65	1.4	0.275	3.38	B	EL	27.00	0.523	3.53	B	EL	2.70	0.80	0.275	2.86	B	EL	27.00	
		SNGARBS2	20.000	--	2.22	44.45	1.4	0.275	2.62	B	EL	27.00	0.523	2.55	B	EL	2.70	0.80	0.275	2.22	B	EL	27.00	
		SNAGRIS2	22.000	--	2.14	47.17	1.4	0.275	2.53	B	EL	27.00	0.523	2.38	B	EL	2.70	0.80	0.275	2.14	B	EL	27.00	
		SNCOTTS3	27.250	--	1.43	38.89	1.4	0.275	1.68	B	EL	27.00	0.523	1.77	B	EL	2.70	0.80	0.275	1.43	B	EL	27.00	
		SNAGGRS4	34.925	--	1.23	42.83	1.4	0.275	1.45	B	EL	27.00	0.523	1.49	B	EL	2.70	0.80	0.275	1.23	B	EL	27.00	
		SNS5A	35.550	--	1.20	42.55	1.4	0.275	1.41	B	EL	27.00	0.523	1.53	B	EL	2.70	0.80	0.275	1.20	B	EL	27.00	
		SNS6A	39.950	--	1.11	44.46	1.4	0.275	1.31	B	EL	27.00	0.523	1.40	B	EL	2.70	0.80	0.275	1.11	B	EL	27.00	
		SNS7B	42.000	--	1.06	44.53	1.4	0.275	1.25	B	EL	27.00	0.523	1.40	B	EL	2.70	0.80	0.275	1.06	B	EL	27.00	
	TTST	TNAGRIT3	33.000	--	1.36	44.93	1.4	0.275	1.61	B	EL	27.00	0.523	1.66	B	EL	2.70	0.80	0.275	1.36	B	EL	27.00	
		TNT4A	33.075	--	1.37	45.36	1.4	0.275	1.62	B	EL	27.00	0.523	1.61	B	EL	2.70	0.80	0.275	1.37	B	EL	27.00	
		TNT6A	41.600	--	1.14	47.25	1.4	0.275	1.34	B	EL	27.00	0.523	1.52	B	EL	2.70	0.80	0.275	1.14	B	EL	27.00	
		TNT7A	42.000	--	1.15	48.28	1.4	0.275	1.36	B	EL	27.00	0.523	1.44	B	EL	2.70	0.80	0.275	1.15	B	EL	27.00	
		TNT7B	42.000	--	1.20	50.39	1.4	0.275	1.42	B	EL	27.00	0.523	1.35	B	EL	2.70	0.80	0.275	1.20	B	EL	27.00	
		TNAGRIT4	43.000	--	1.14	48.82	1.4	0.275	1.34	B	EL	27.00	0.523	1.30	B	EL	2.70	0.80	0.275	1.14	B	EL	27.00	
		TNAGT5A	45.000	--	1.06	47.87	1.4	0.275	1.25	B	EL	27.00	0.523	1.31	B	EL	2.70	0.80	0.275	1.06	B	EL	27.00	
		TNAGT5B	45.000	(3)	**1.04**	47.02	1.4	0.275	1.23	B	EL	27.00	0.523	1.24	B	EL	2.70	0.80	0.275	**1.04**	B	EL	**27.00**	

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

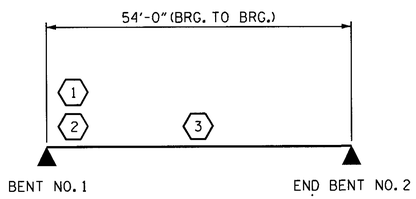
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'B'

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 55' CORED SLAB UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL ALEXANDER LEBLANC, JR. 6-14-13

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

SHEET NO. S-5

TOTAL SHEETS 25

ASSEMBLED BY :	M.A. LEBLANC	DATE :	5/13
CHECKED BY :	J.R. MCROY	DATE :	5/13
DRAWN BY :	CVC	6/10	
CHECKED BY :	DNS	6/10	

12-AUG-2013 09:08
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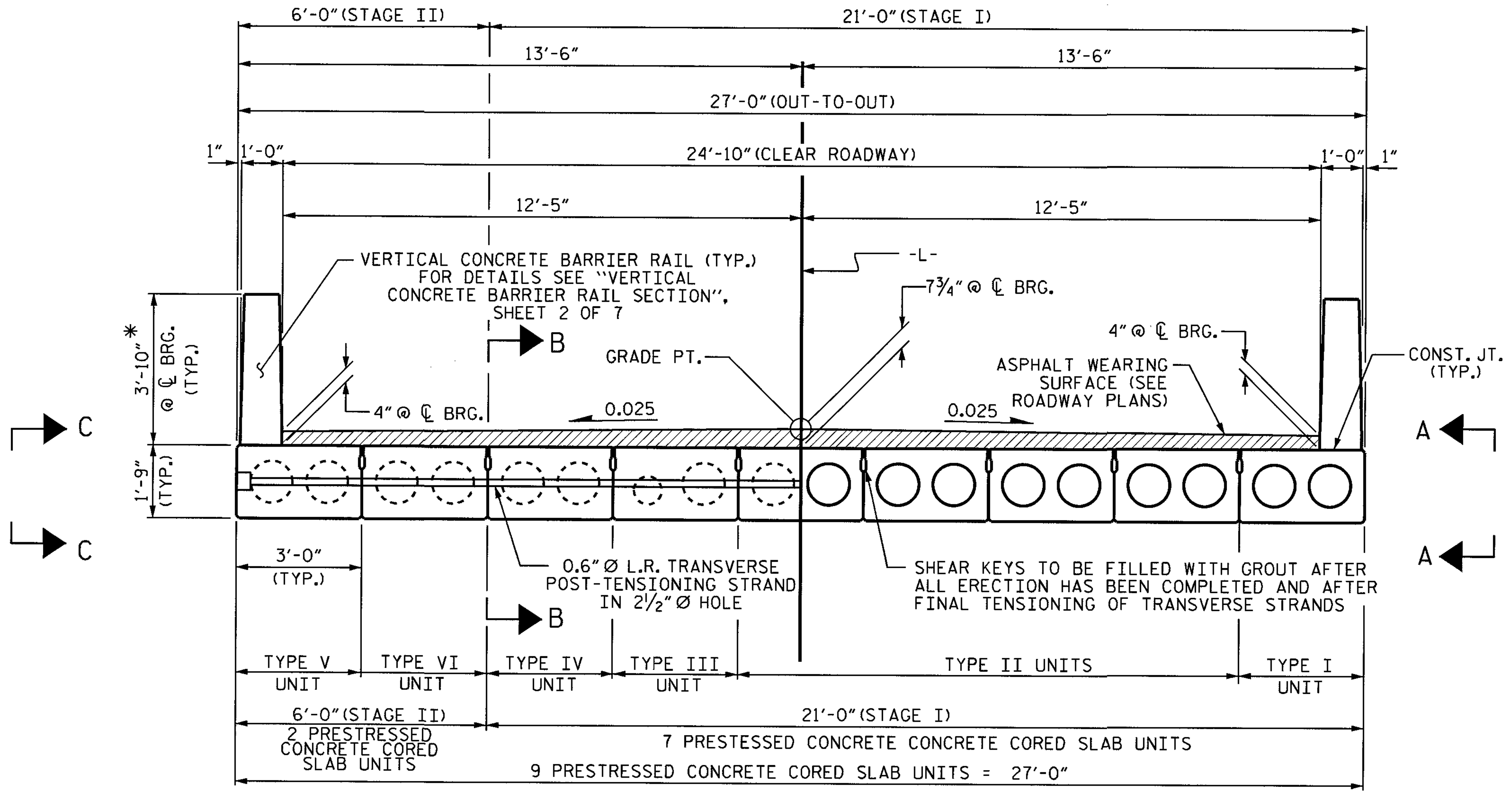
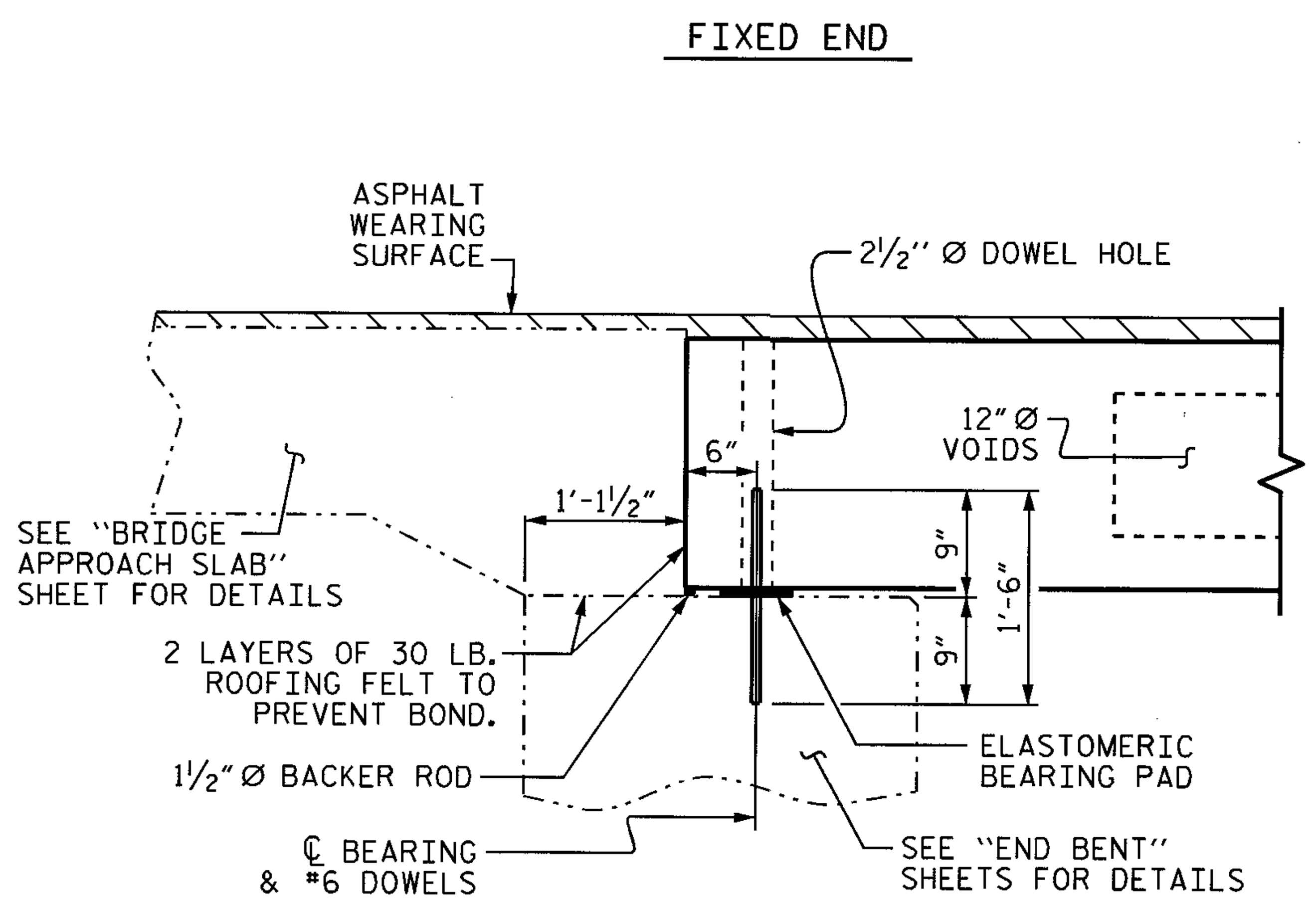
maleblanc

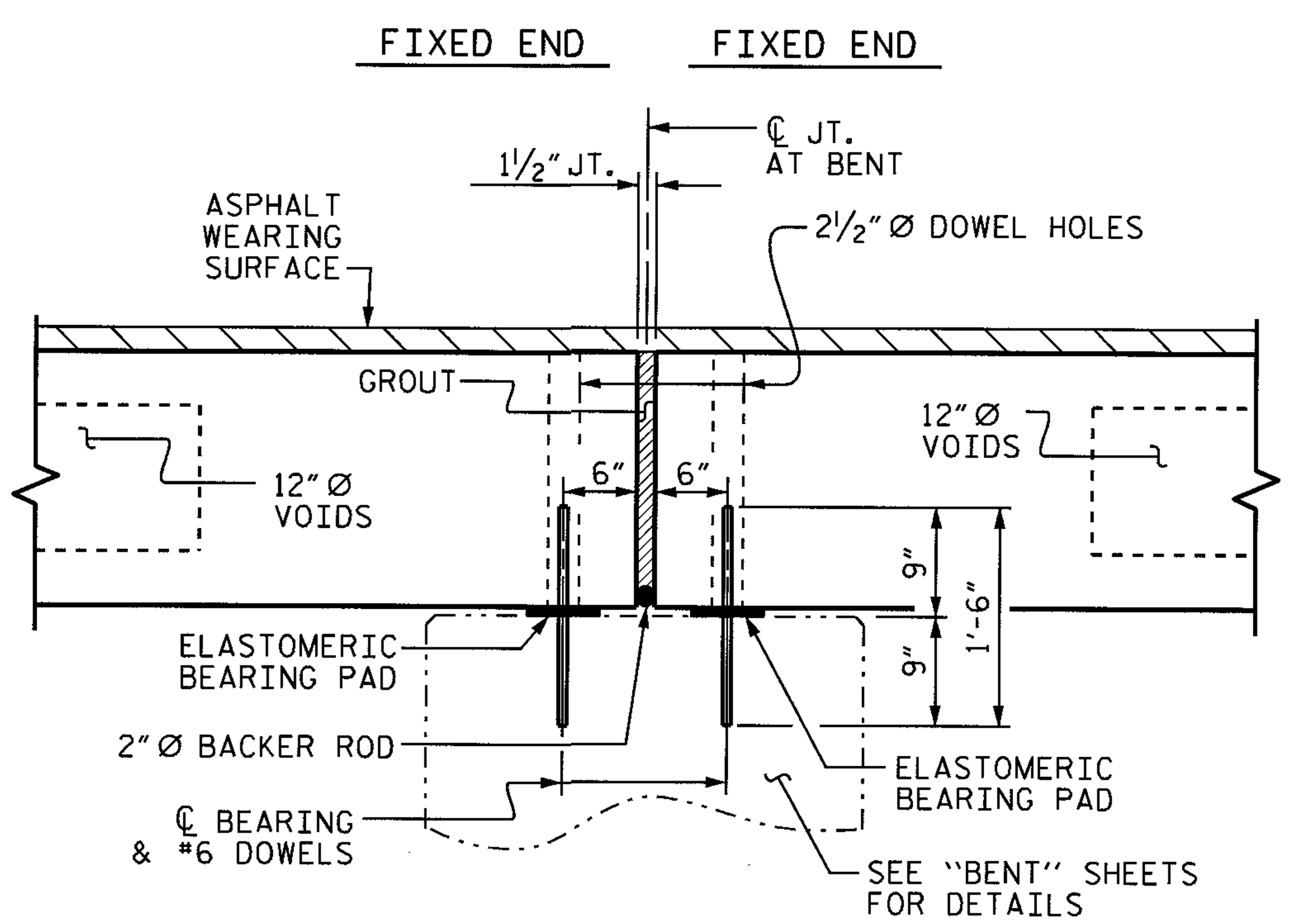


TYPICAL SECTION

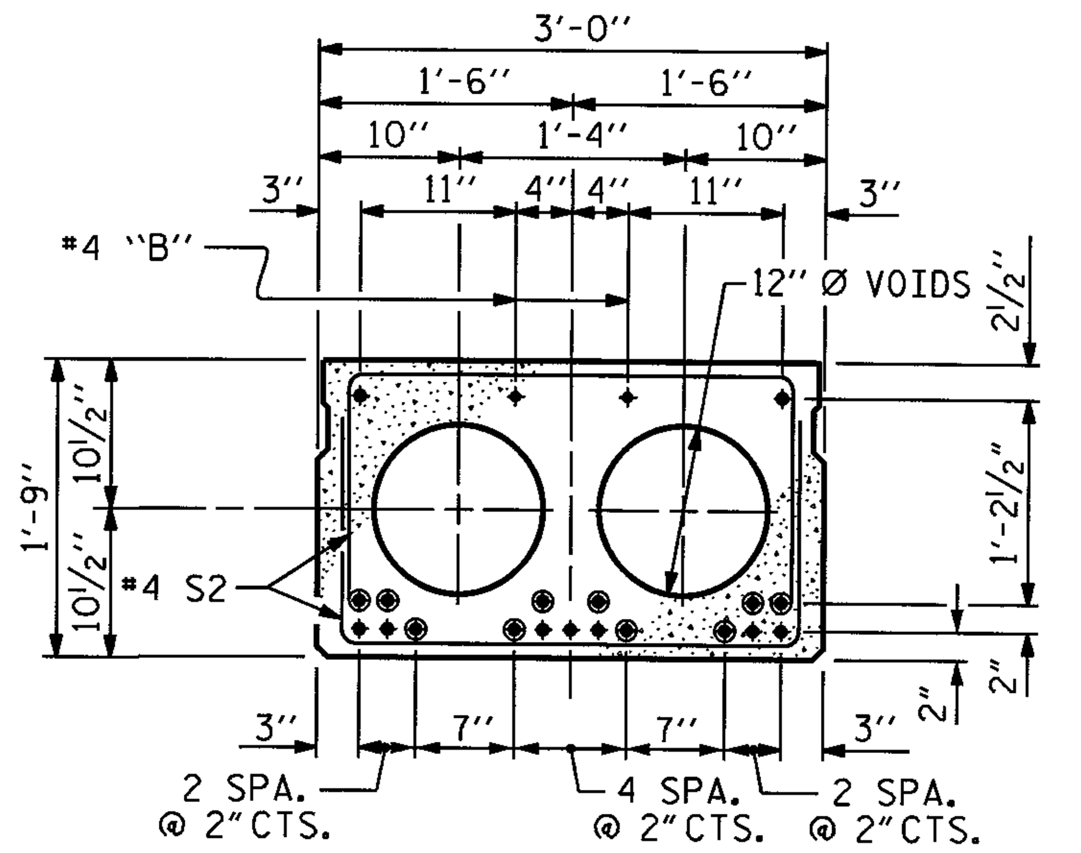
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL, SHEET 2 OF 7.



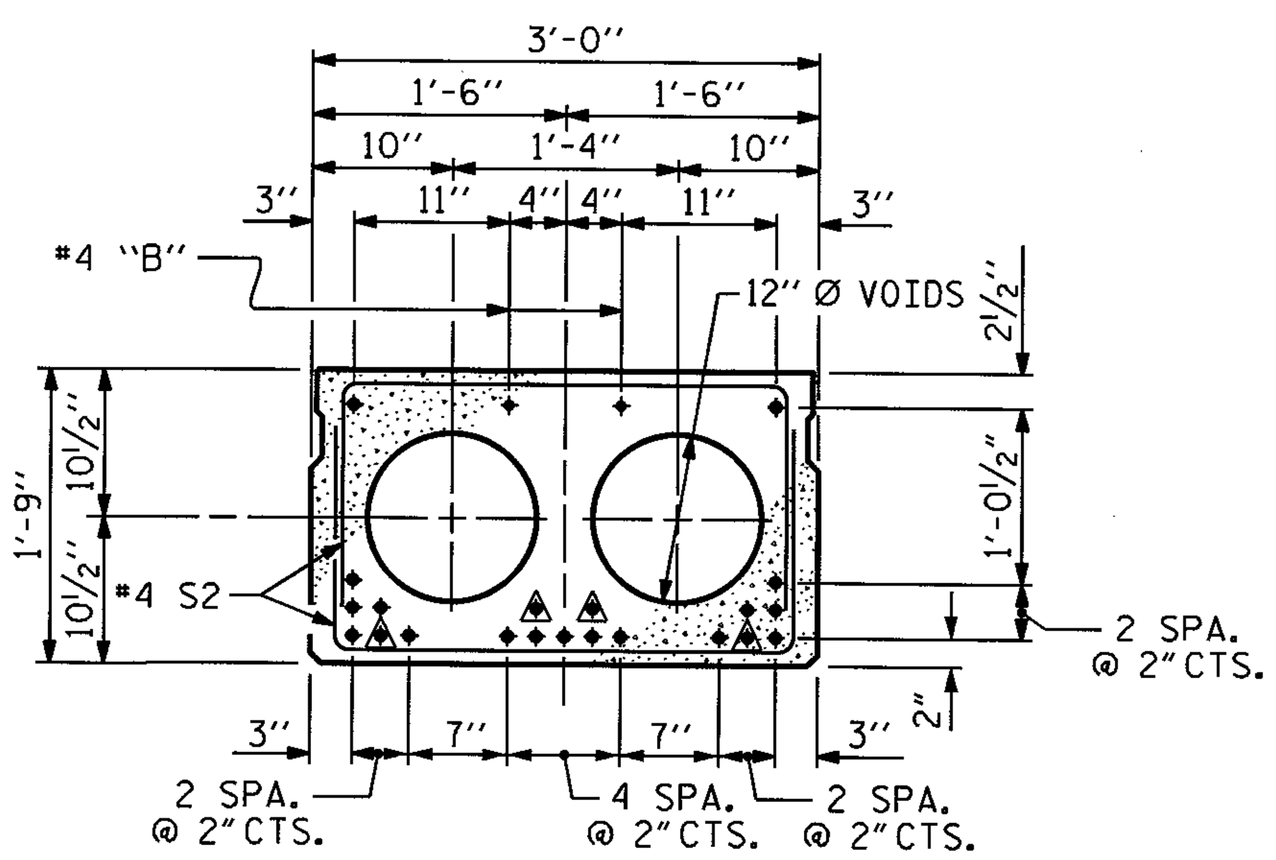
SECTION AT END BENT



SECTION AT BENT

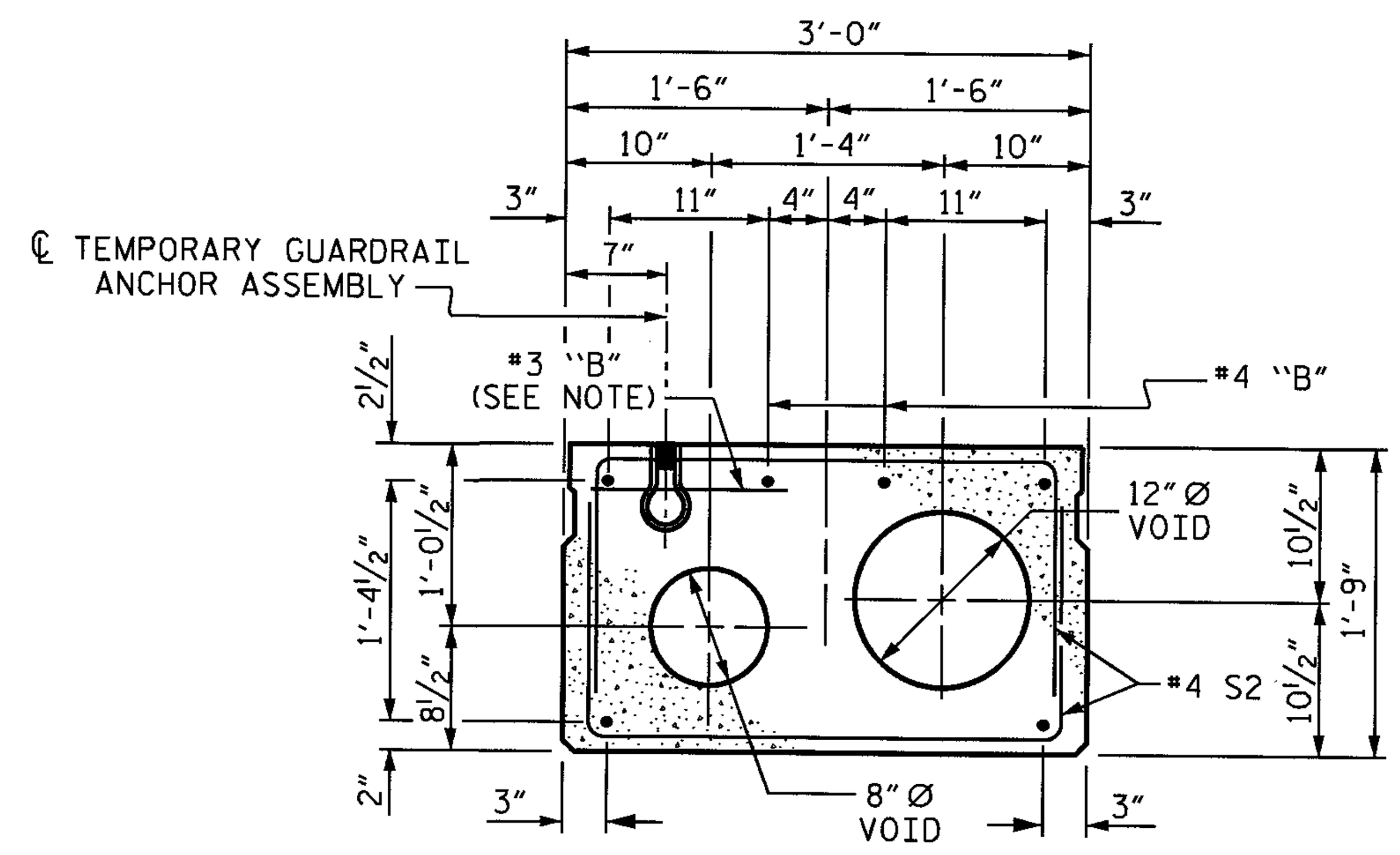


INTERIOR SLAB SECTION
(25' UNIT)
TYPE II, IV & VI (9 STRANDS REQUIRED)



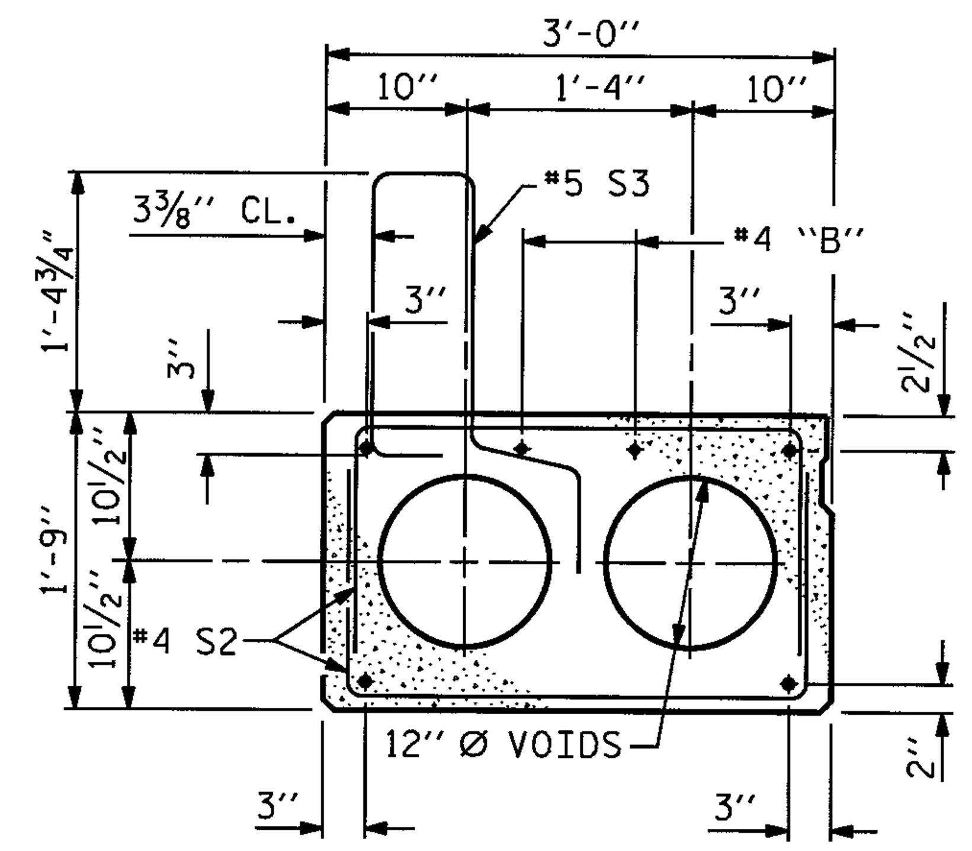
INTERIOR SLAB SECTION
(55' UNIT)
TYPE II, IV & VI (21 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



INTERIOR SLAB SECTION
TYPE III
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II, IV & VI)

NOTE: FOR LOCATION OF CONCRETE INSERTS, SEE "ANCHORAGE DETAIL FOR ANCHORED PORTABLE CONCRETE BARRIER DETAILS" SHEET.



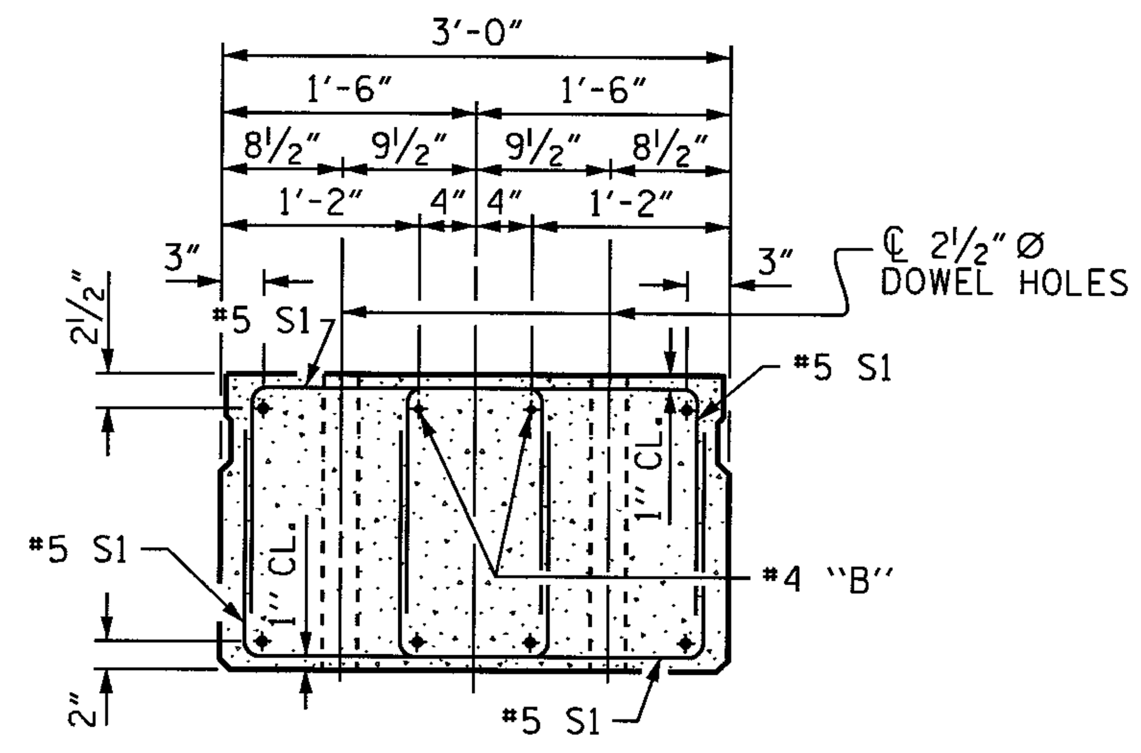
EXT. SLAB SECTION

TYPE I & V
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II, IV & VI)

▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES.
(STRAND LAYOUT NOT SHOWN.)
INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL B. CLAWSON, JR.
8-14-13

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-6
1			3					TOTAL SHEETS
2			4					25

DRAWN BY :	M.A. LEBLANC	DATE :	5/13
CHECKED BY :	J.R. MCROY	DATE :	5/13
DESIGN ENGINEER OF RECORD:	M.A. LEBLANC	DATE :	8/13

12-AUG-2013 09:35
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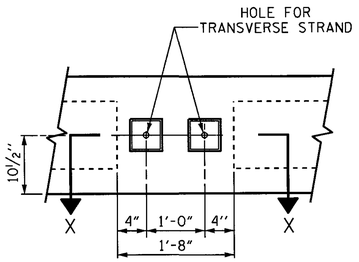
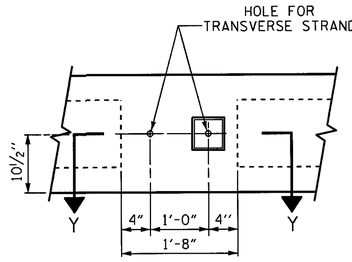
maleblanc



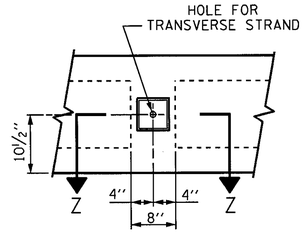
VIEW A-A

SEE SHEET 1 OF 7



VIEW B-B

SEE SHEET 1 OF 7

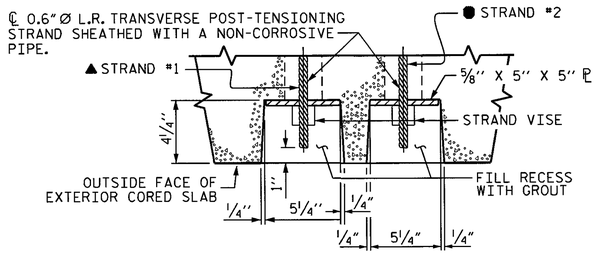


VIEW C-C

SEE SHEET 1 OF 7

▲ STRAND #1 GOES THRU 7 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)

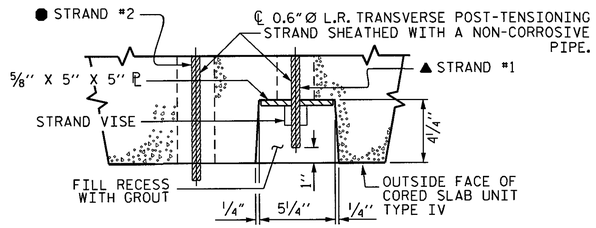
● STRAND #2 GOES THRU ALL 9 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)



SECTION X-X

(TYPE I UNIT)

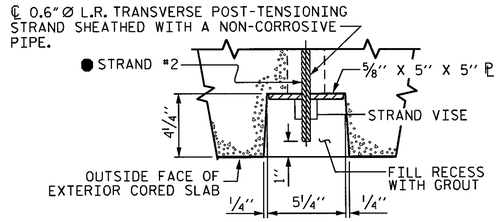
UP STATION



SECTION Y-Y

(TYPE IV UNIT)

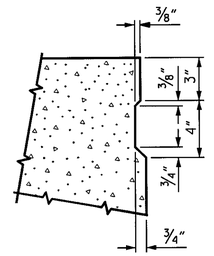
UP STATION



SECTION Z-Z

(TYPE V UNIT)

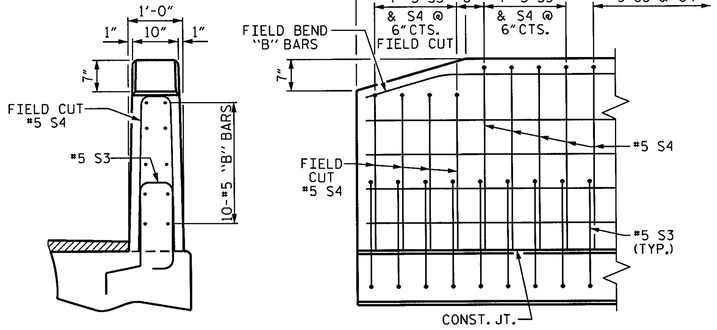
UP STATION



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

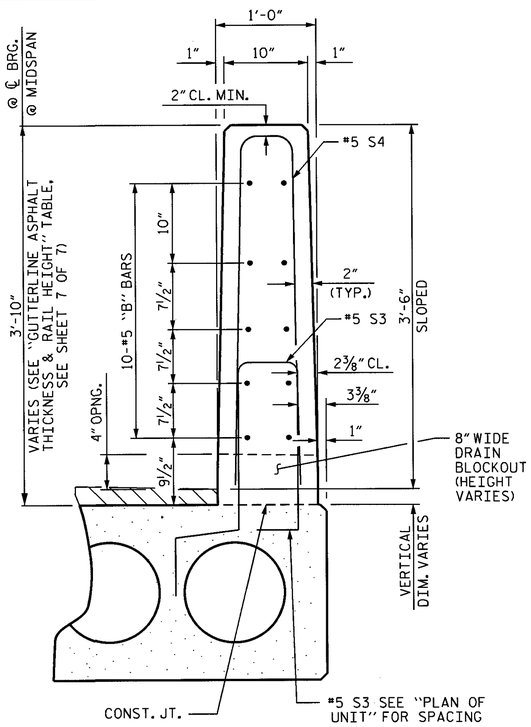
GROUTED RECESS AT END OF POST-TENSIONED STRAND



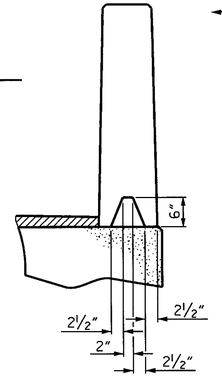
END VIEW

SIDE VIEW

END OF RAIL DETAILS



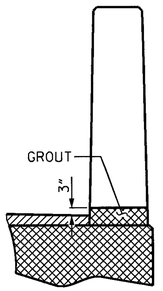
VERTICAL CONCRETE BARRIER RAIL SECTION



SECTION S-S

AT DAM IN OPEN JOINT

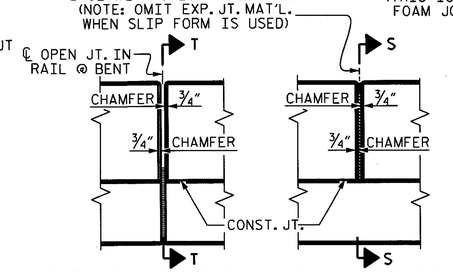
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



SECTION T-T

AT OPEN JOINT AT BENT

(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



ELEVATION AT EXPANSION JOINTS

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. HECK, JR.
8-14-13

DRAWN BY :	M.A. LEBLANC	DATE :	5/13
CHECKED BY :	J.R. MCROY	DATE :	5/13
DESIGN ENGINEER OF RECORD:	M.A. LEBLANC	DATE :	8/13

12-AUG-2013 09:37
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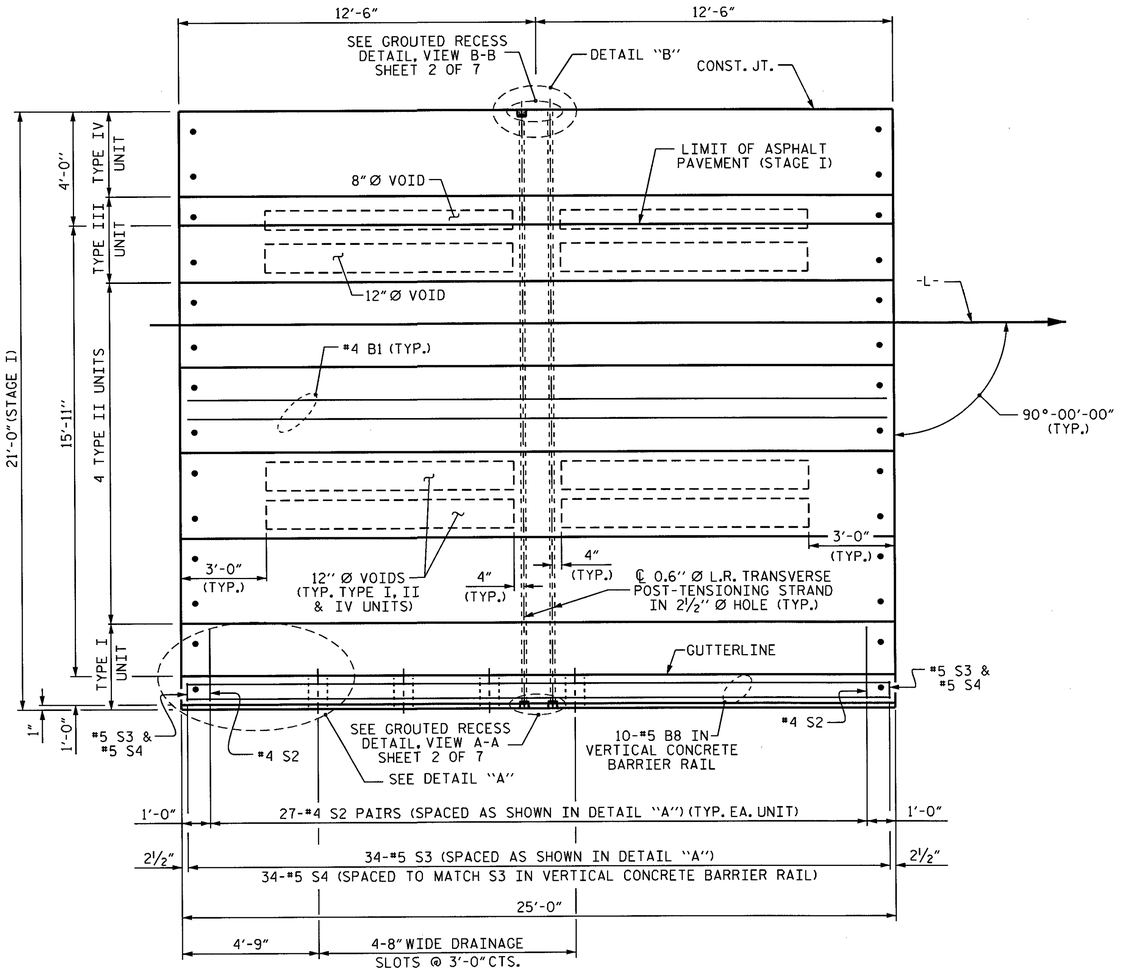
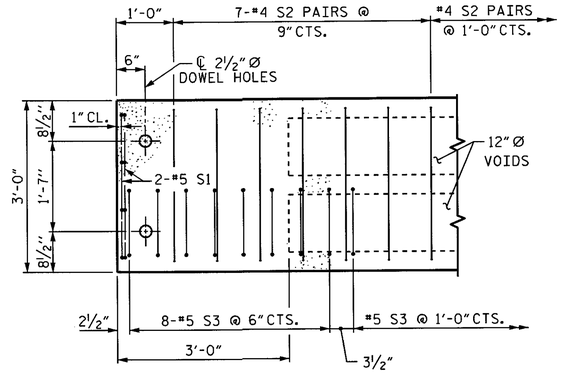
maleblanc



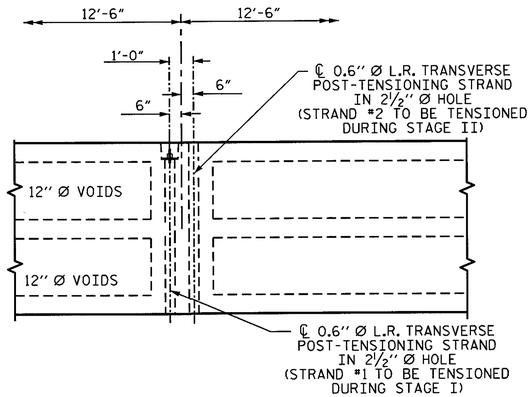
PLAN OF UNIT
(STAGE I)

NOTE: FOR CONCRETE INSERT SPACING IN TYPE III UNITS, SEE "ANCHORAGE DETAIL FOR ANCHORED PORTABLE CONCRETE BARRIER DETAILS" SHEET.



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL "B"

#4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF 25' UNIT STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LEBLANC, JR.
8-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:37
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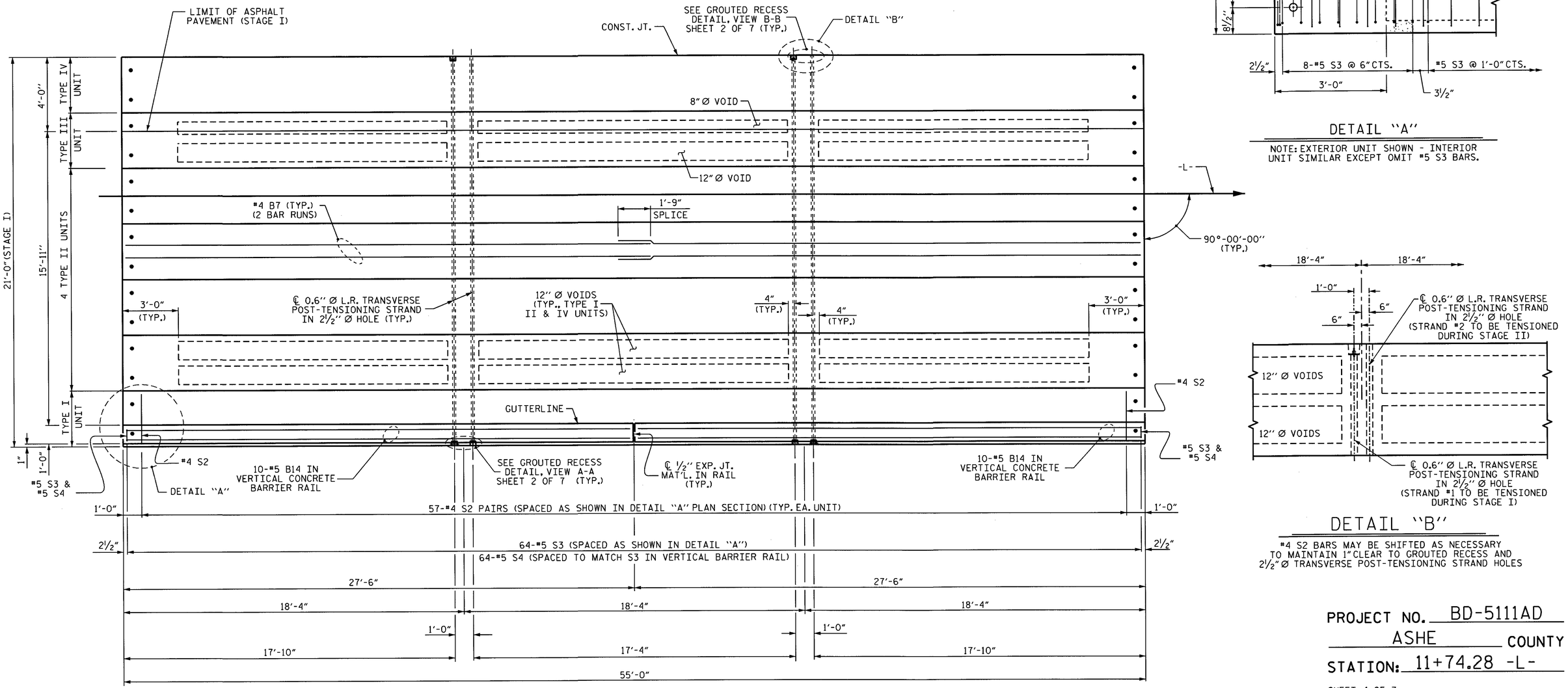
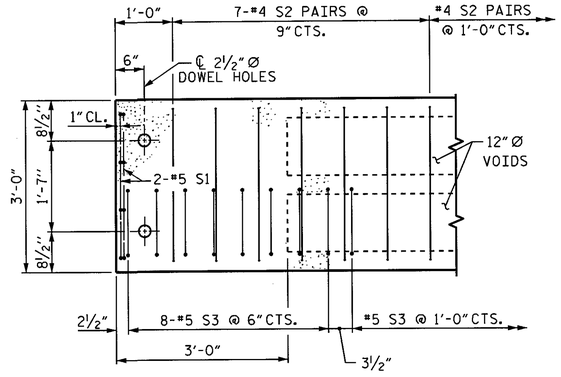
maleblanc



PLAN OF UNIT
(STAGE I)

NOTE: FOR CONCRETE INSERT SPACING IN TYPE III UNITS, SEE "ANCHORAGE DETAIL FOR ANCHORED PORTABLE CONCRETE BARRIER DETAILS" SHEET.



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT *5 S3 BARS.

DETAIL "B"

*4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF 55' UNIT STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LECLERC, JR.
8-12-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:36
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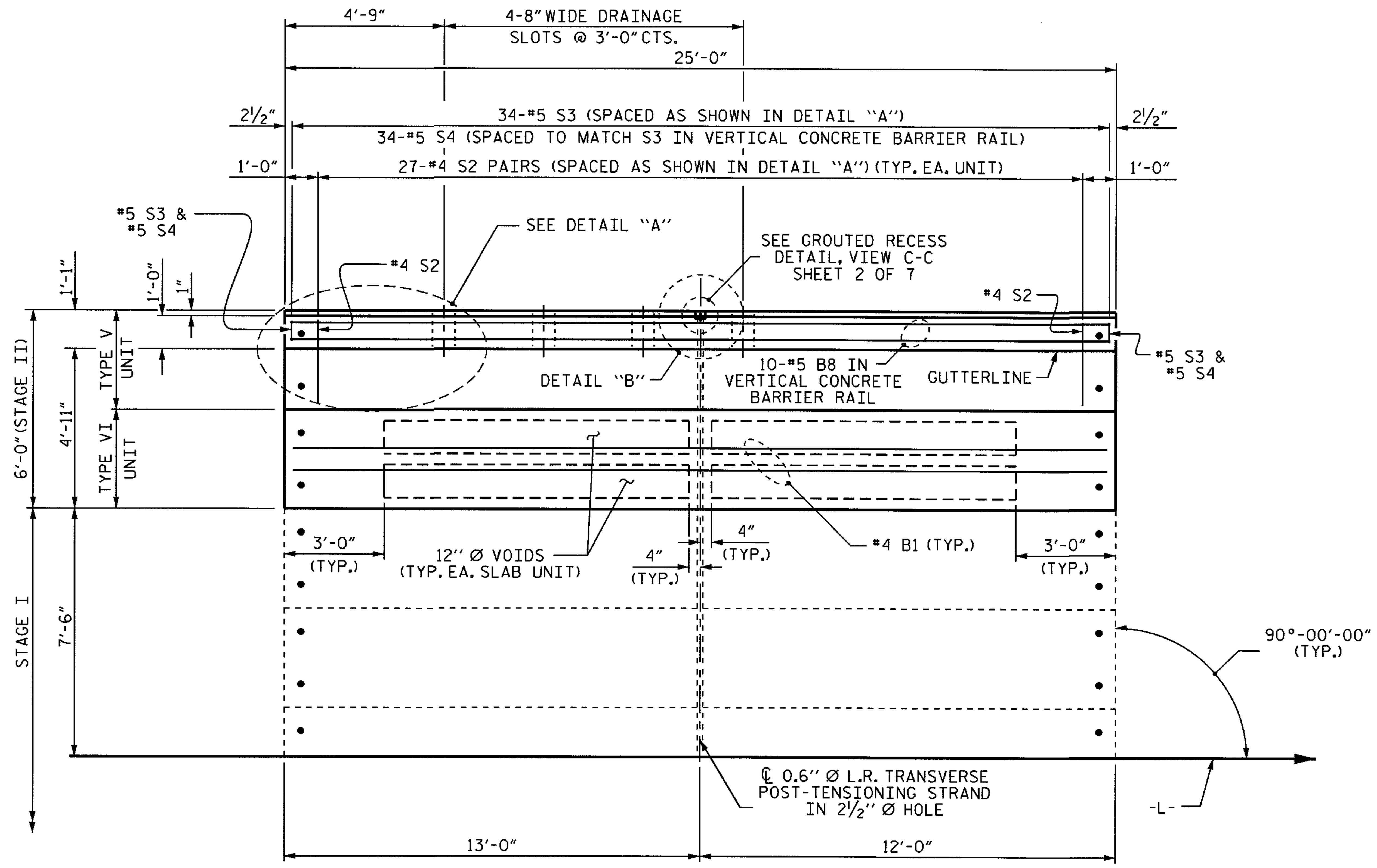
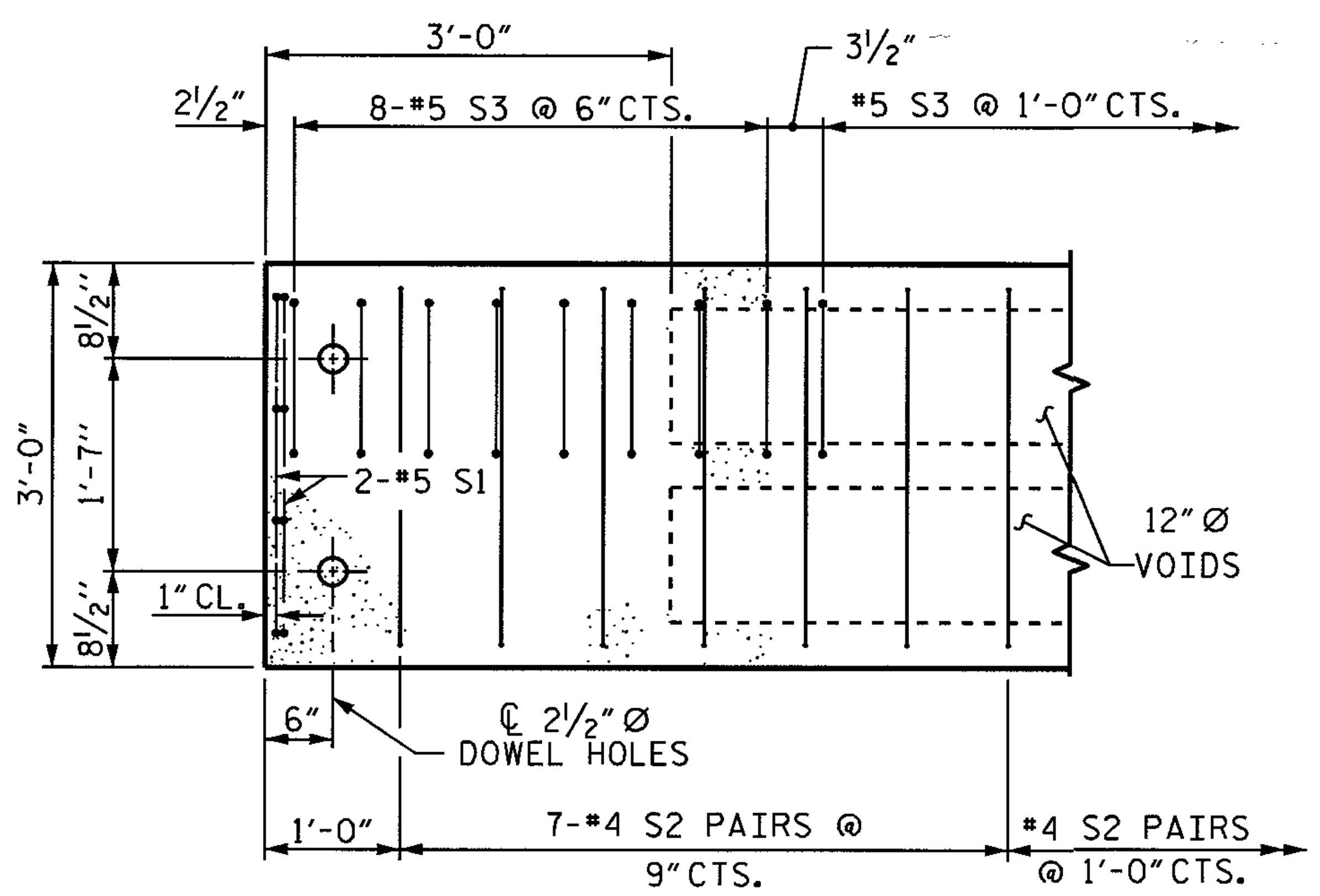
maleblanc



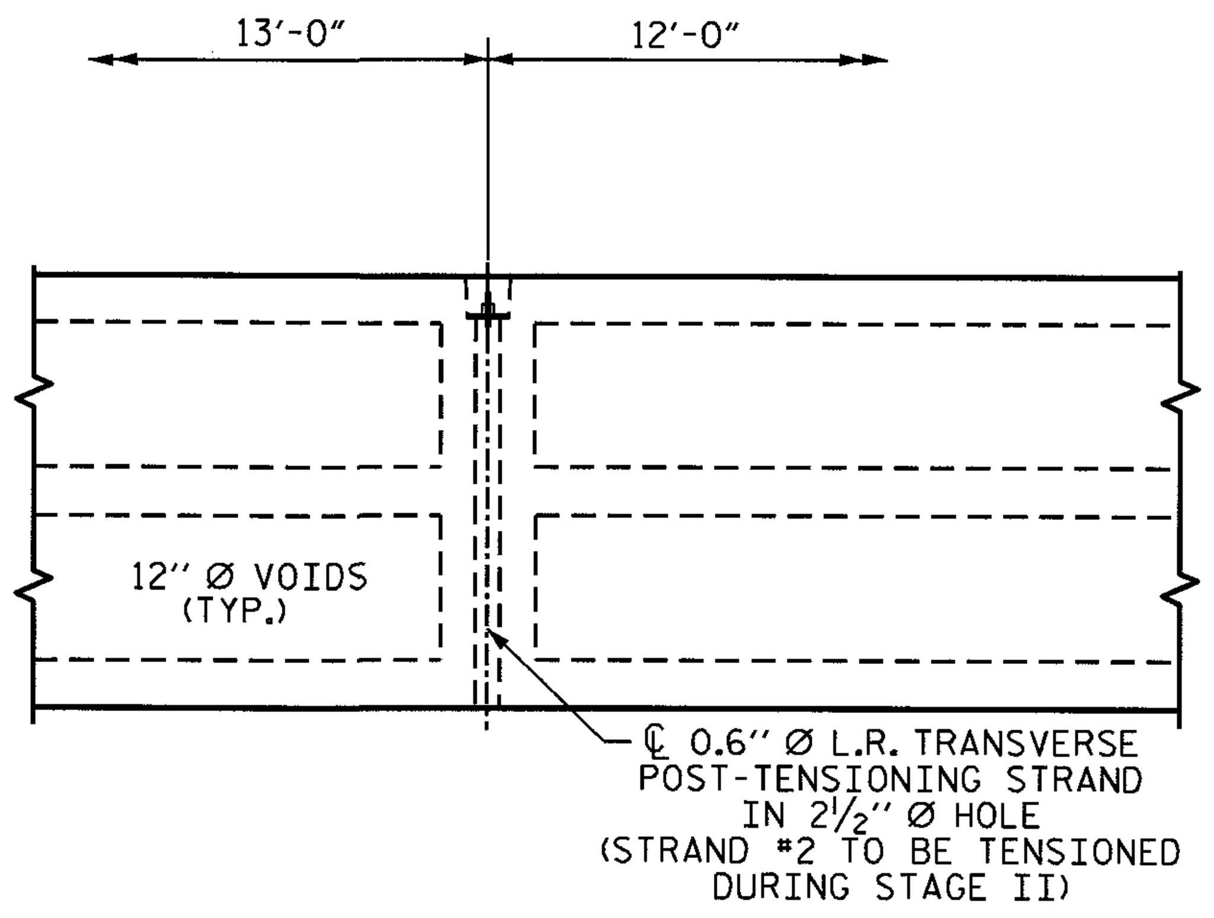
PLAN OF UNIT

(STAGE II)



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL "B"

#4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF 25' UNIT
STAGE II

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-10
1			3					TOTAL SHEETS
2			4					25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL L. GILCHEEK, JR.
8-14-13

DRAWN BY :	M.A. LEBLANC	DATE :	7/13
CHECKED BY :	J.R. MCROY	DATE :	7/13
DESIGN ENGINEER OF RECORD:	M.A. LEBLANC	DATE :	8/13

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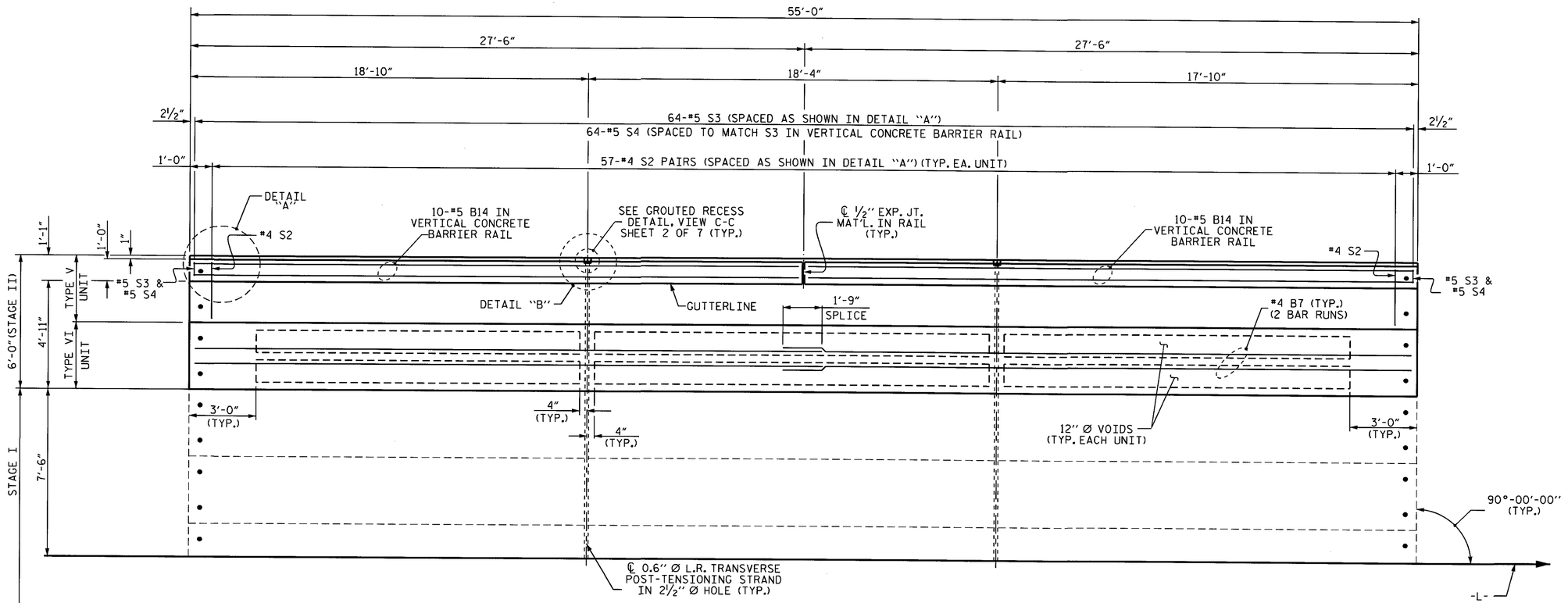
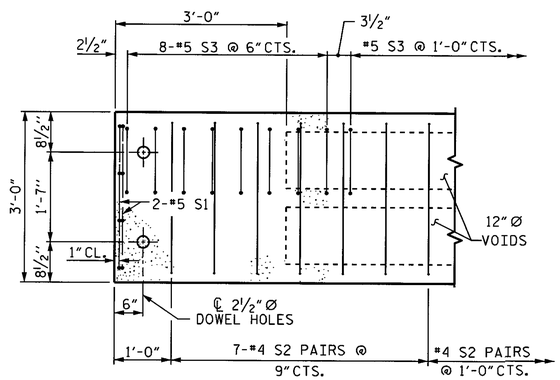
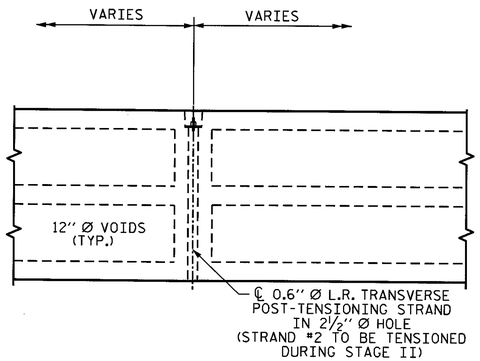
maleblanc



PLAN OF UNIT
(STAGE II)



DETAIL "A"
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL "B"
#4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF 55' UNIT STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER JOHN R. MARSHALL MCROY
8-16-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

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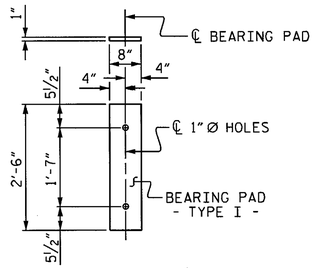
maleblanc



FIXED END
(TYPE I - 36 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

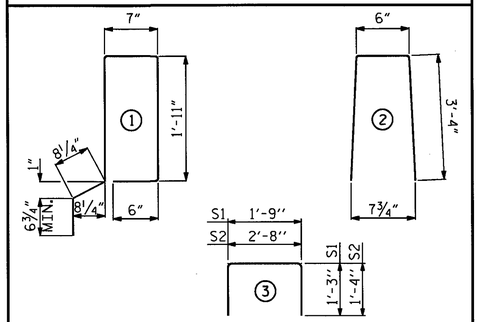
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	55' UNIT					
✳B14	40	40	#5	STR	27'-1"	1130
✳S4	128	128	#5	2	7'-2"	957
✳EPOXY COATED REINFORCING STEEL				LBS.		2087
CLASS AA CONCRETE				CU.YDS.		14.4
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		110.25

CONCRETE RELEASE STRENGTH

UNIT	PSI
25' UNITS	4000
55' UNITS	5200

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

				EXTERIOR UNIT TYPE I		EXTERIOR UNIT TYPE V		INTERIOR UNIT TYPE II & IV		INTERIOR UNIT TYPE VI		INTERIOR UNIT TYPE III	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-8"	33	24'-8"	33	24'-8"	33	24'-8"	33	24'-8"	33
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	54	#4	3	5'-4"	192	5'-4"	192	5'-4"	192	5'-4"	192	5'-4"	192
✳S3	34	#5	1	6'-2"	219	6'-2"	219						
REINFORCING STEEL			LBS.		260		260		260		260		260
✳EPOXY COATED REINFORCING STEEL			LBS.		219		219						
5000 P.S.I. CONCRETE			CU. YDS.		3.9		3.8		3.9		3.8		4.1
0.6"Ø L.R. STRANDS			No.		9		9		9		9		9

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

				EXTERIOR UNIT TYPE I		EXTERIOR UNIT TYPE V		INTERIOR UNIT TYPE II & IV		INTERIOR UNIT TYPE VI		INTERIOR UNIT TYPE III	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406
✳S3	64	#5	1	6'-2"	412	6'-2"	412						
REINFORCING STEEL			LBS.		516		516		516		516		516
✳EPOXY COATED REINFORCING STEEL			LBS.		412		412						
6500 P.S.I. CONCRETE			CU. YDS.		8.0		7.9		8.0		7.9		8.8
0.6"Ø L.R. STRANDS			No.		21		21		21		21		21

CORED SLABS REQUIRED

25' CORED SLAB UNIT					55' CORED SLAB UNIT				
		NUMBER	LENGTH	TOTAL LENGTH			NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	1	25'-0"	25'-0"	STAGE I	TYPE I	1	55'-0"	55'-0"
	TYPE II	4	25'-0"	100'-0"		TYPE II	4	55'-0"	220'-0"
	TYPE III	1	25'-0"	25'-0"		TYPE III	1	55'-0"	55'-0"
	TYPE IV	1	25'-0"	25'-0"		TYPE IV	1	55'-0"	55'-0"
	STAGE I TOTAL	7		175'-0"		STAGE I TOTAL	7		385'-0"
STAGE II	TYPE V	1	25'-0"	25'-0"	STAGE II	TYPE V	1	55'-0"	55'-0"
	TYPE VI	1	25'-0"	25'-0"		TYPE VI	1	55'-0"	55'-0"
	STAGE II TOTAL	2		50'-0"		STAGE II TOTAL	2		110'-0"
	TOTAL	9		225'-0"		TOTAL	9		495'-0"

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
25' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	5/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	0" ↓
FINAL CAMBER	5/16" ↑
55' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 15/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	5/8" ↓
FINAL CAMBER	2 5/16" ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS

	0.6"Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	25' UNIT					
✳B8	20	20	#5	STR	24'-7"	513
✳S4	68	68	#5	2	7'-2"	508
✳EPOXY COATED REINFORCING STEEL				LBS.		1021
CLASS AA CONCRETE				CU.YDS.		6.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		50.25

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

24'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
25' UNIT	3 11/16"	3'-9 11/16"
55' UNIT	1 11/16"	3'-7 11/16"

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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½"Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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. A 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.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. CRESCENZI, JR.
9-27-13

DRAWN BY : M.A. LEBLANC DATE : 5/13
CHECKED BY : J.R. MCROY DATE : 5/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

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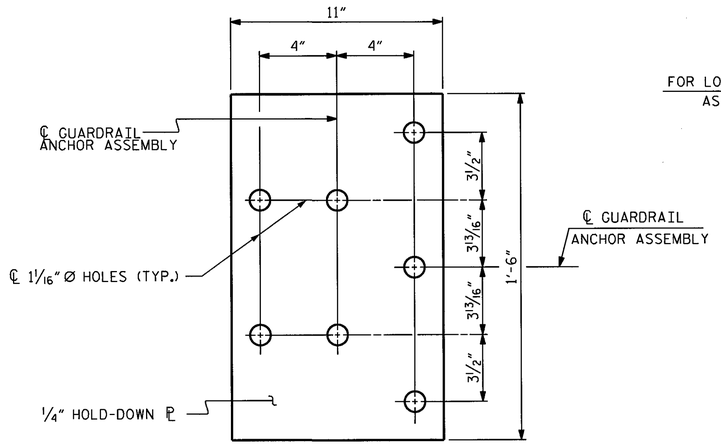
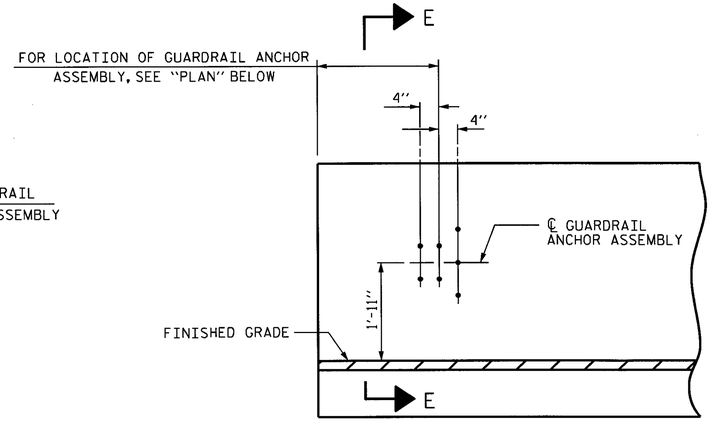


PLAN



ELEVATION

NOTES

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

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.)

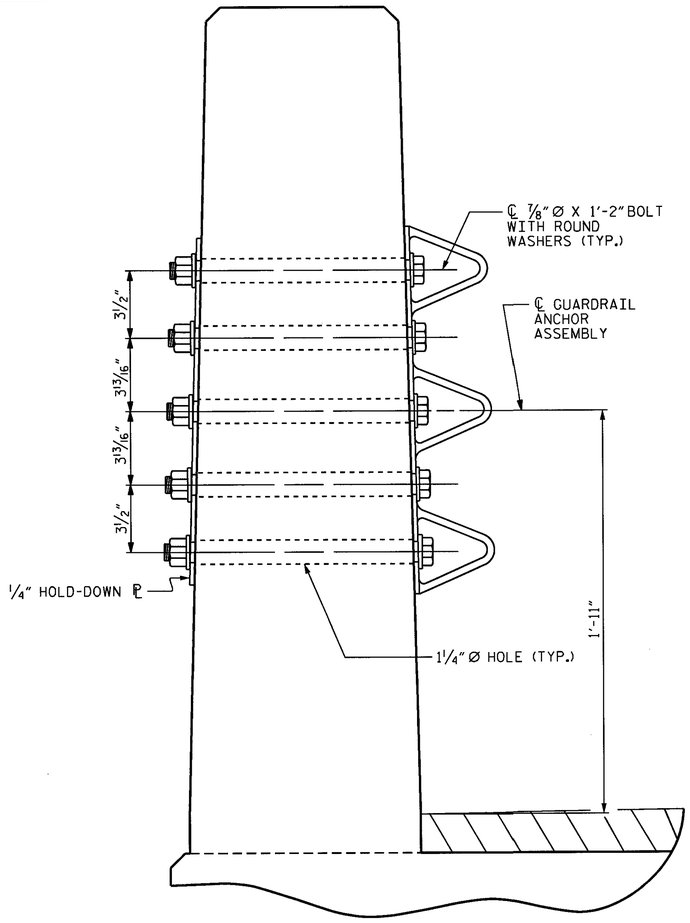
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

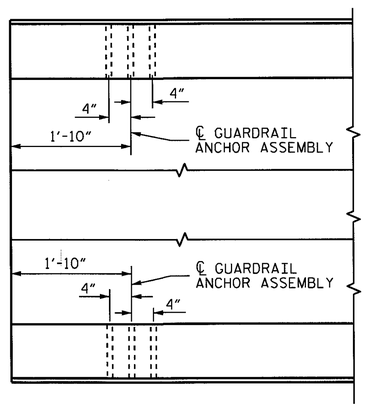
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.



SECTION E-E



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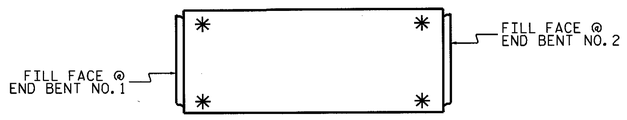

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

ASSEMBLED BY : M.A. LEBLANC	DATE : 5/13	ADDED 5/6/10	
CHECKED BY : J.R. MCROY	DATE : 5/13	REV. 10/1/11	MAA/GM
DRAWN BY : MAA 5/10		REV. 12/5/11	MAA/GM
CHECKED BY : GM 5/10			

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PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

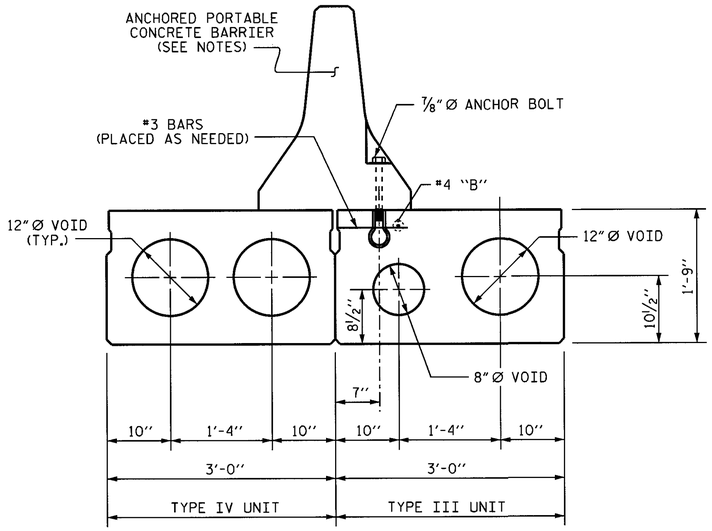
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

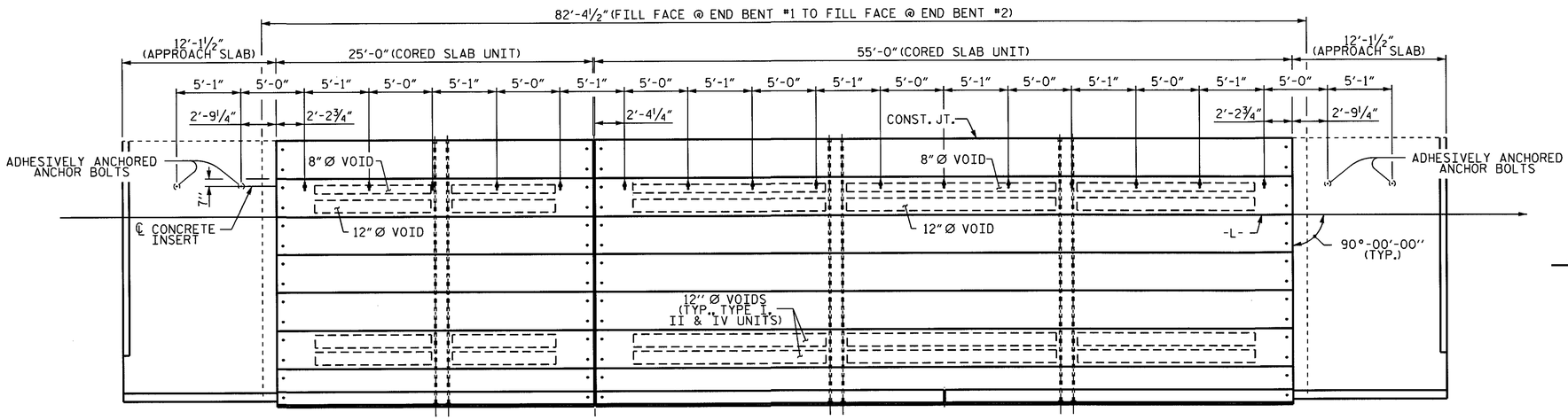
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL C. BREEK, JR.
9-27-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			25

STD. NO. GRA3



CONCRETE INSERT LOCATION



CONCRETE INSERT SPACING FOR ANCHORED PORTABLE CONCRETE BARRIER - STAGE I

NOTES

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1⅝".

B. 1 - ⅞" Ø X 8½" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø X 8½" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

D. STRUCTURAL CONCRETE INSERT ASSEMBLIES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

THE COST OF THE STRUCTURAL CONCRETE INSERT ASSEMBLY, COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR 3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS.

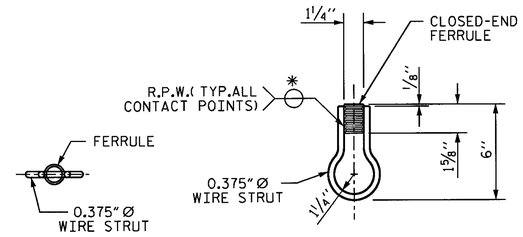
TO FACILITATE PLACEMENT OF STRUCTURAL CONCRETE INSERT ASSEMBLIES, #3 BARS MAY BE TIED TO THE #4 "B" BARS IN THE CORED SLAB UNITS. THE COST OF THE #3 BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR 3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS.

STIRRUPS IN THE CORED SLAB UNITS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR STRUCTURAL CONCRETE INSERT ASSEMBLIES.

FERRULES TO BE PLUGGED DURING CASTING OF THE CORED SLAB UNITS AS RECOMMENDED BY THE MANUFACTURER.

ANCHORED PORTABLE CONCRETE BARRIER SHALL BE AS SPECIFIED IN ROADWAY STANDARD NO. 1170.01. SEE TRAFFIC CONTROL PLANS.

AFTER REMOVAL OF ANCHORED PORTABLE CONCRETE BARRIER, THE STRUCTURAL CONCRETE INSERTS SHALL BE FILLED WITH GROUT.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAIL FOR ANCHORED PORTABLE CONCRETE BARRIER DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. BRACK, JR. 8-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

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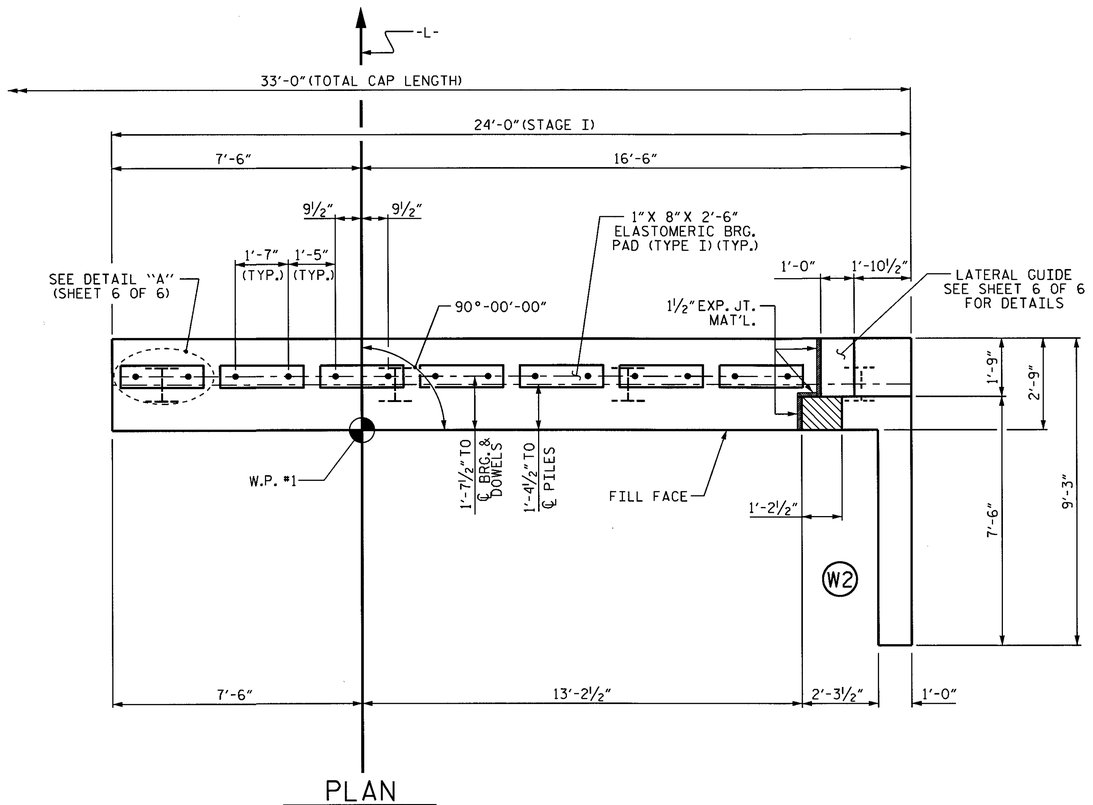

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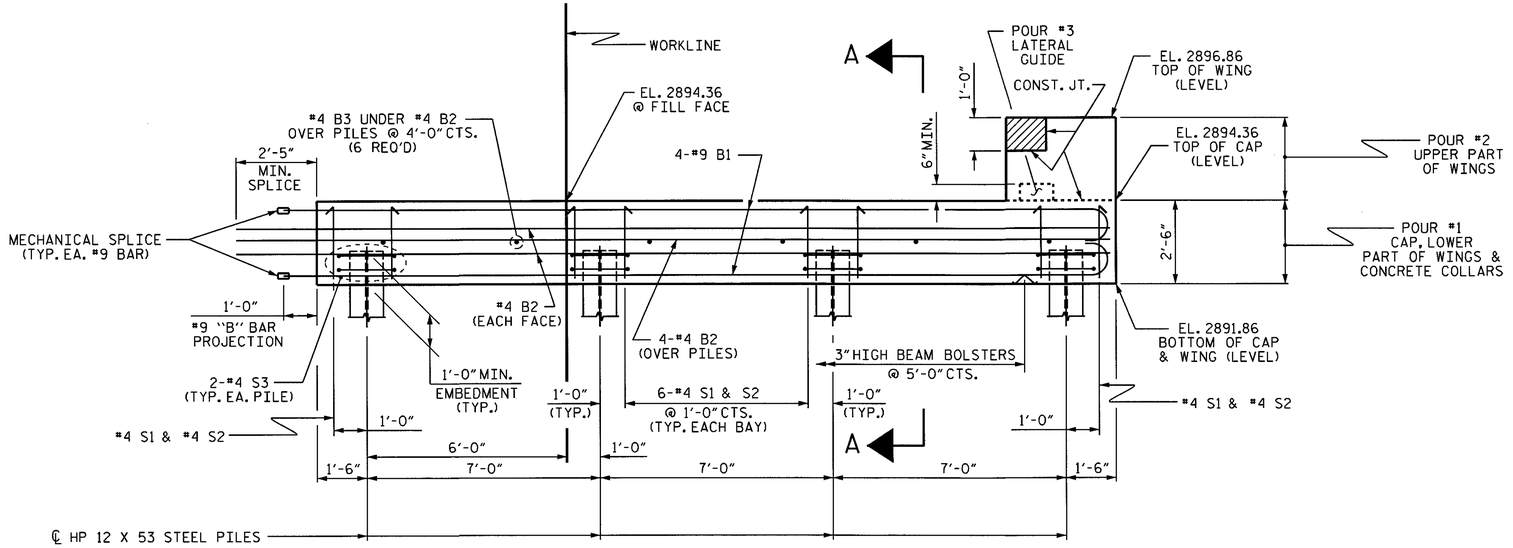

ELEVATION

WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 6 OF 6.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 6 OF 6.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 6 OF 6.

FOR WING DETAILS, SEE SHEET 5 OF 6.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDES IF APPROVED BY THE ENGINEER.

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1
(STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LEBLANC, JR.
8-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
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DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

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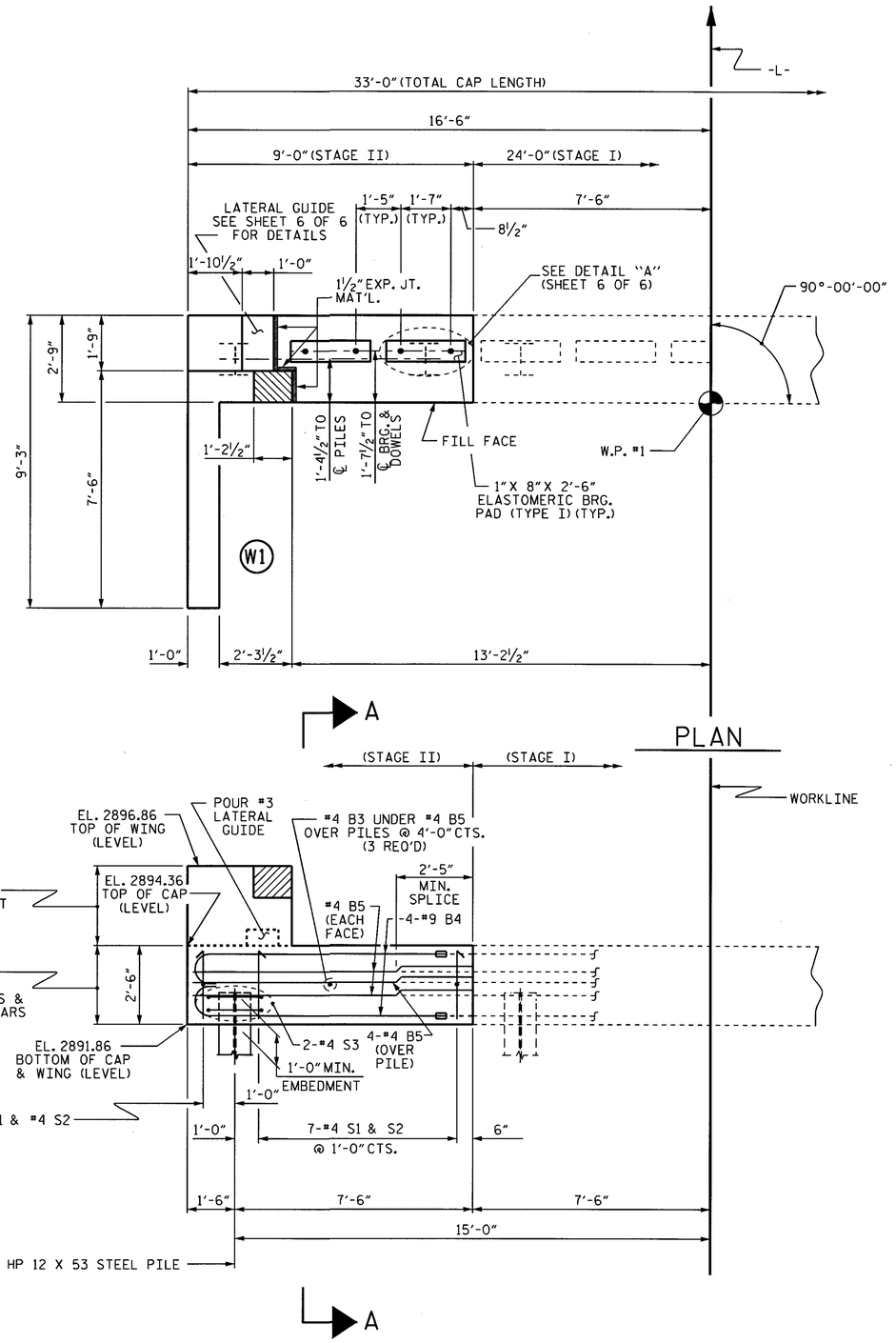
maleblanc



ELEVATION

WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 6 OF 6.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 6 OF 6.

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:15
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maleblanc

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LEBLANC, JR.
8-14-13

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

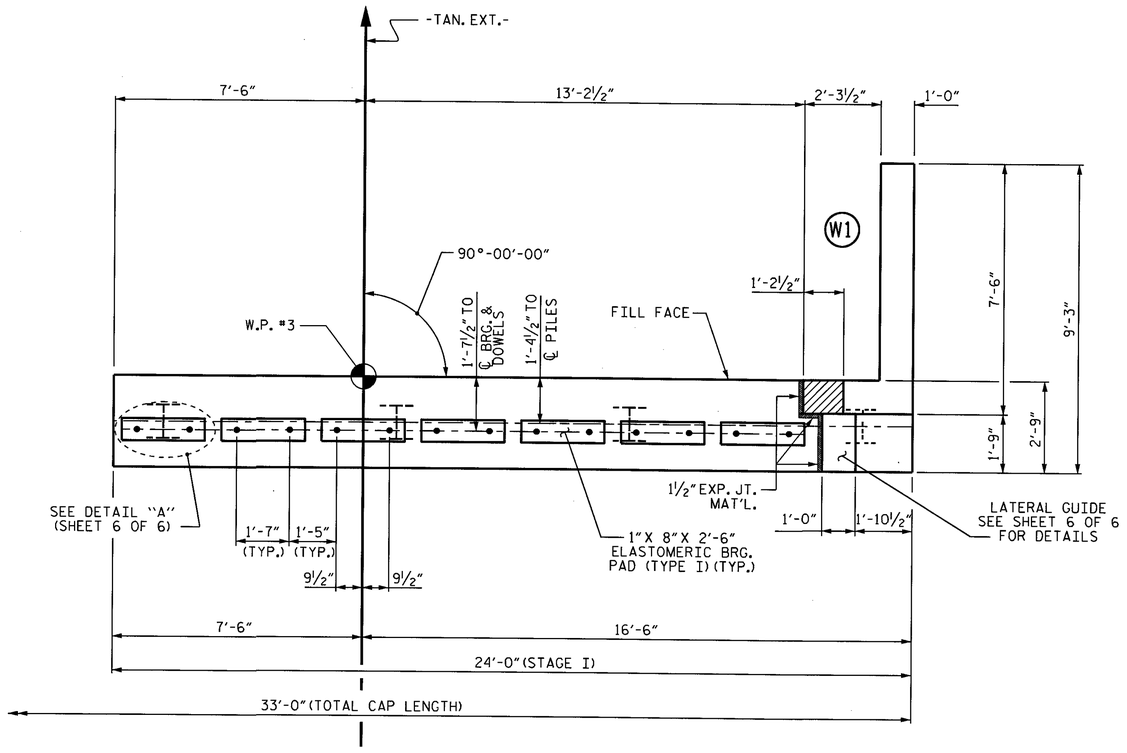
SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

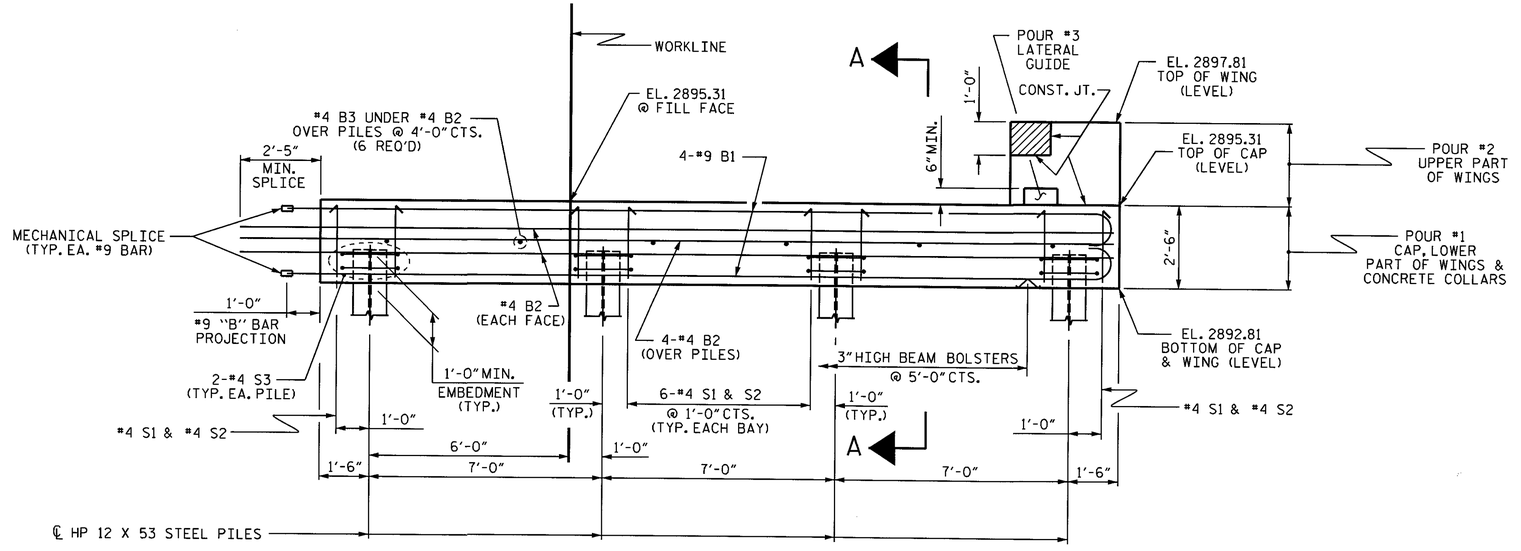
SUBSTRUCTURE

END BENT No. 1
(STAGE II)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			25



PLAN



ELEVATION

WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 6 OF 6.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 6 OF 6.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 6 OF 6.

FOR WING DETAILS, SEE SHEET 5 OF 6.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDES IF APPROVED BY THE ENGINEER.

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
(STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL ANDREW LEBLANC, JR.
6-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:15
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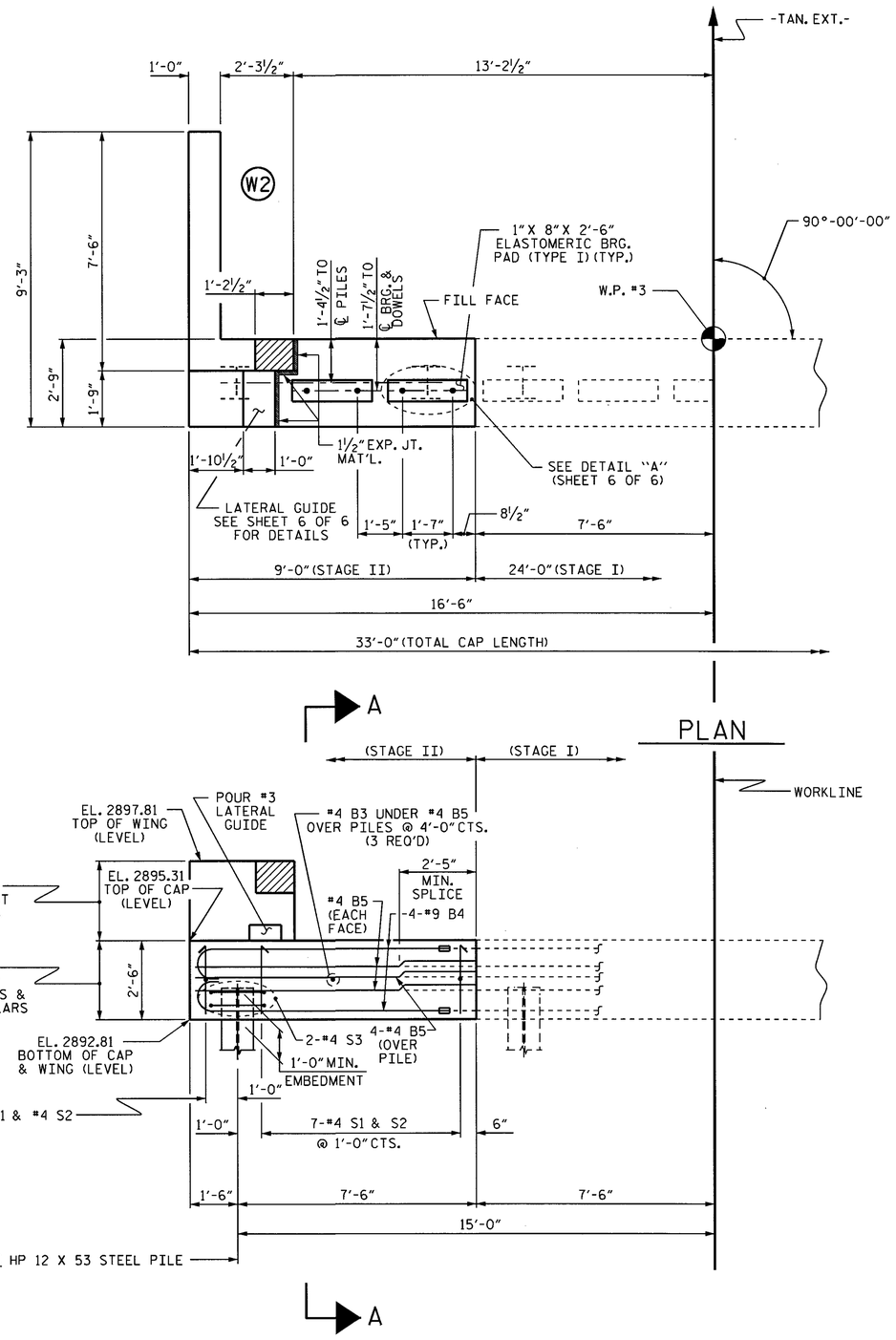
maleblanc



ELEVATION

WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 6 OF 6.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 6 OF 6.

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:15
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maleblanc

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. LEBLANC
8-14-13

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

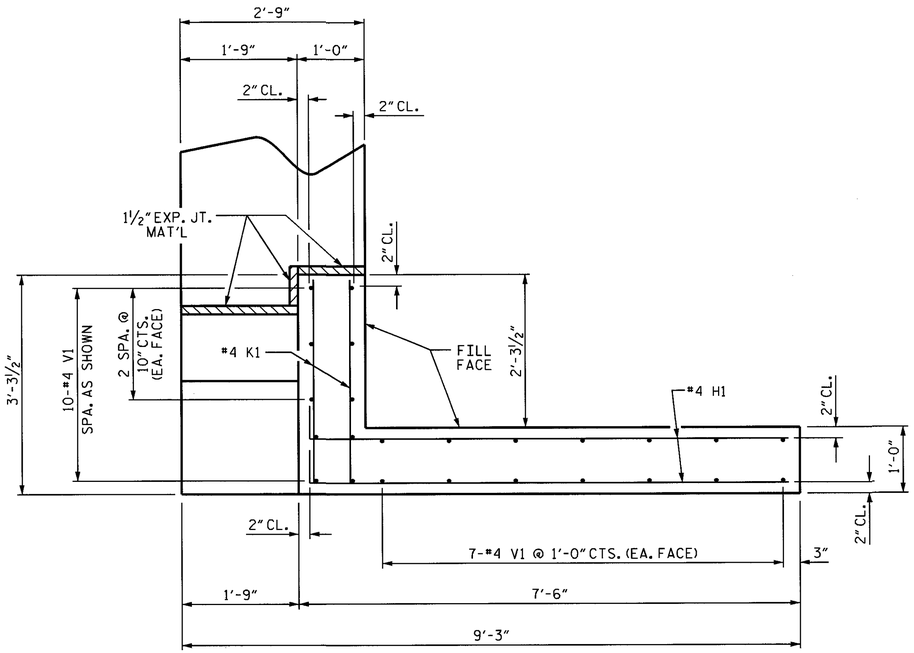
SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

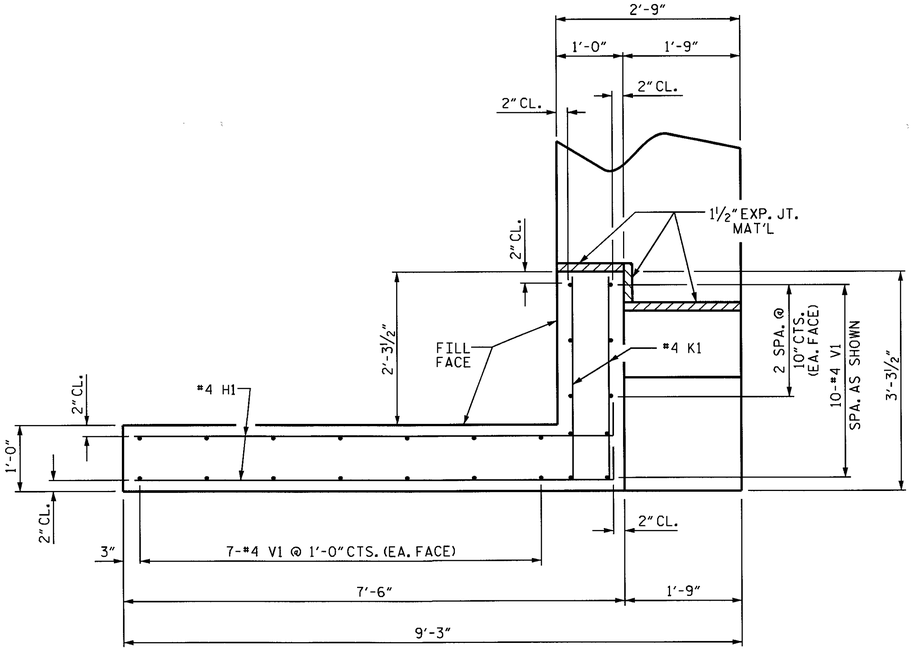
SUBSTRUCTURE

END BENT No. 2
(STAGE II)

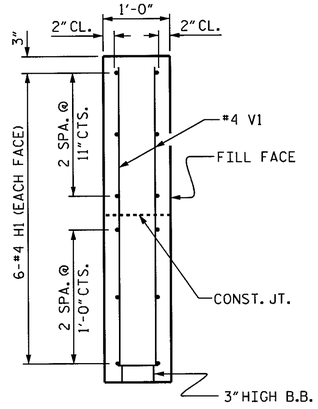
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			25



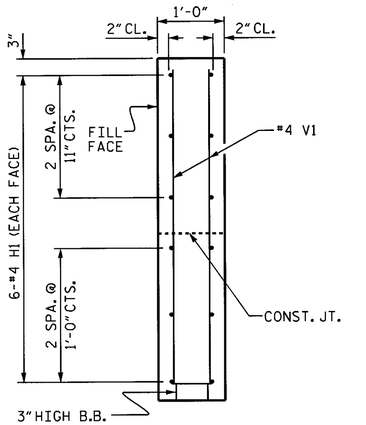
PLAN OF WING (W1)



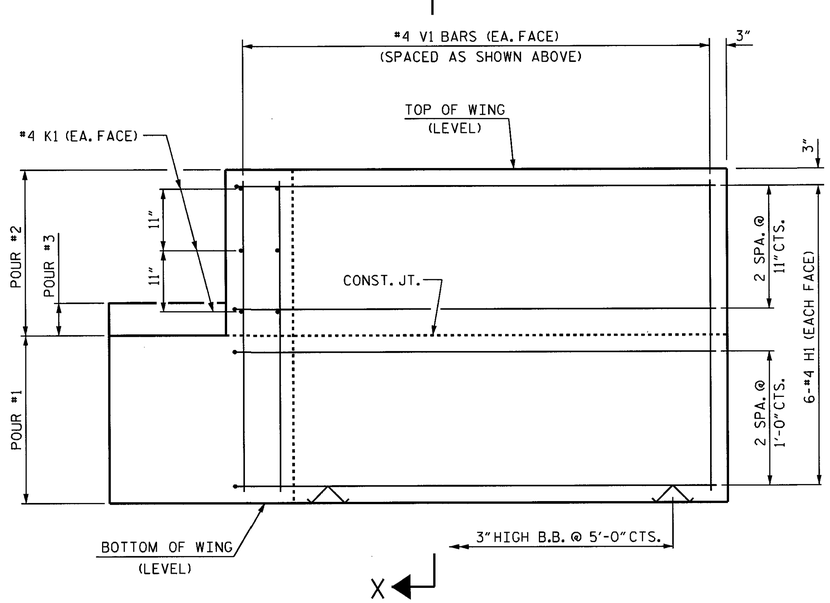
PLAN OF WING (W2)



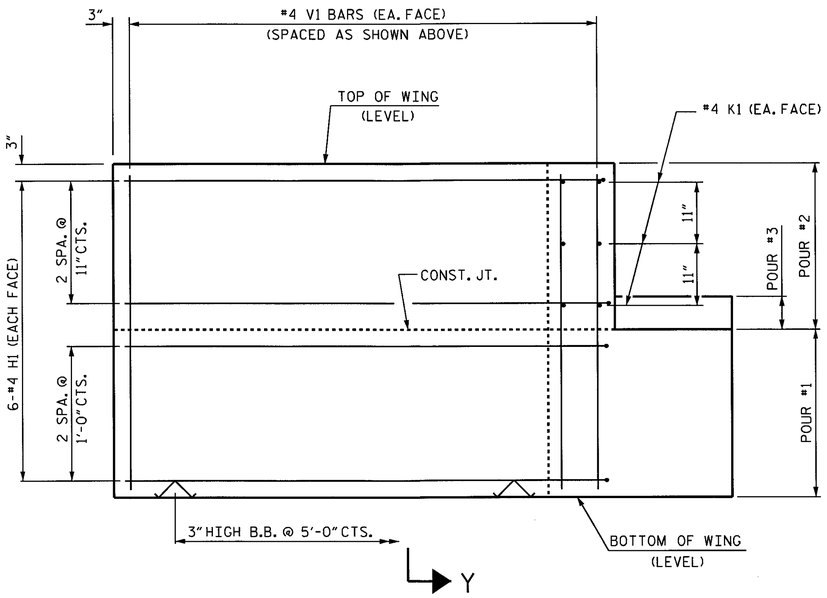
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL F. MCREE, JR.
8-14-13

ASSEMBLED BY : M.A. LEBLANC	DATE : 5/13
CHECKED BY : J.R. MCROY	DATE : 5/13
DRAWN BY : DGE 02/10	
CHECKED BY : MKT 02/10	

12-AUG-2013 09:16
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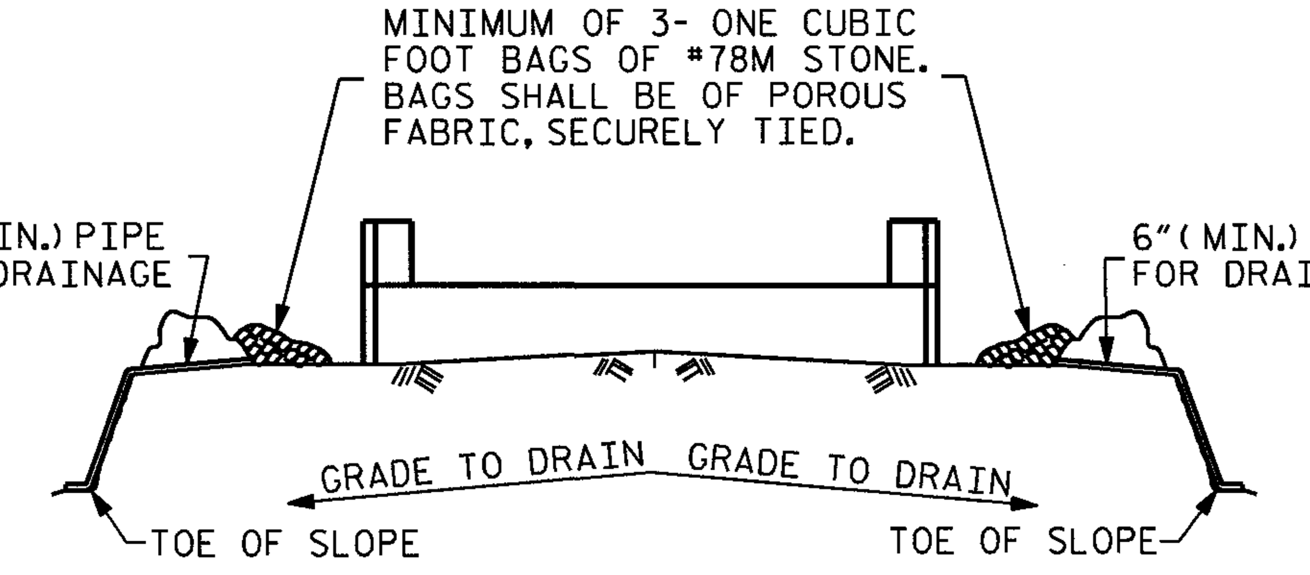
maleblanc

STD. NO. EB_27_90S

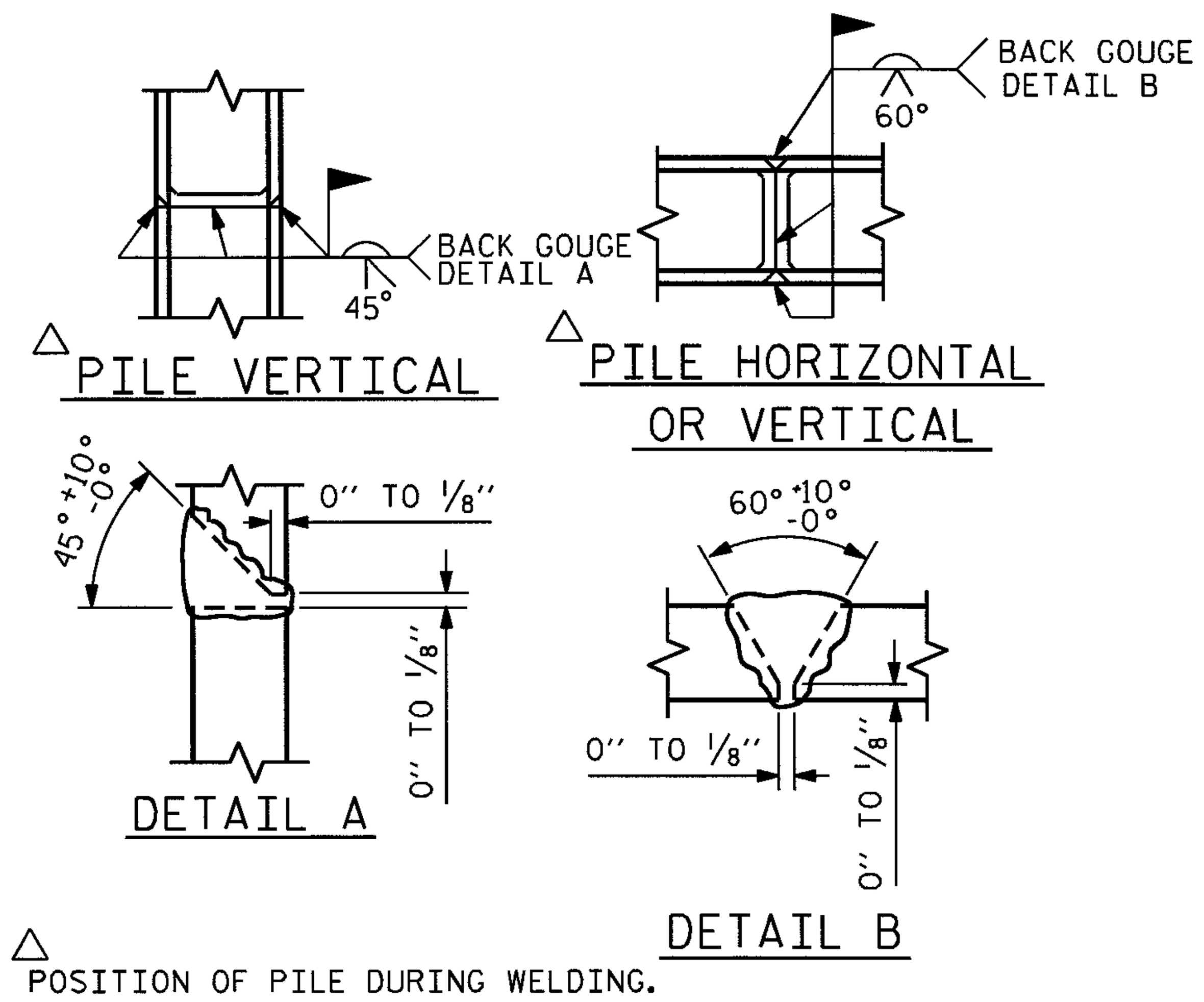


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

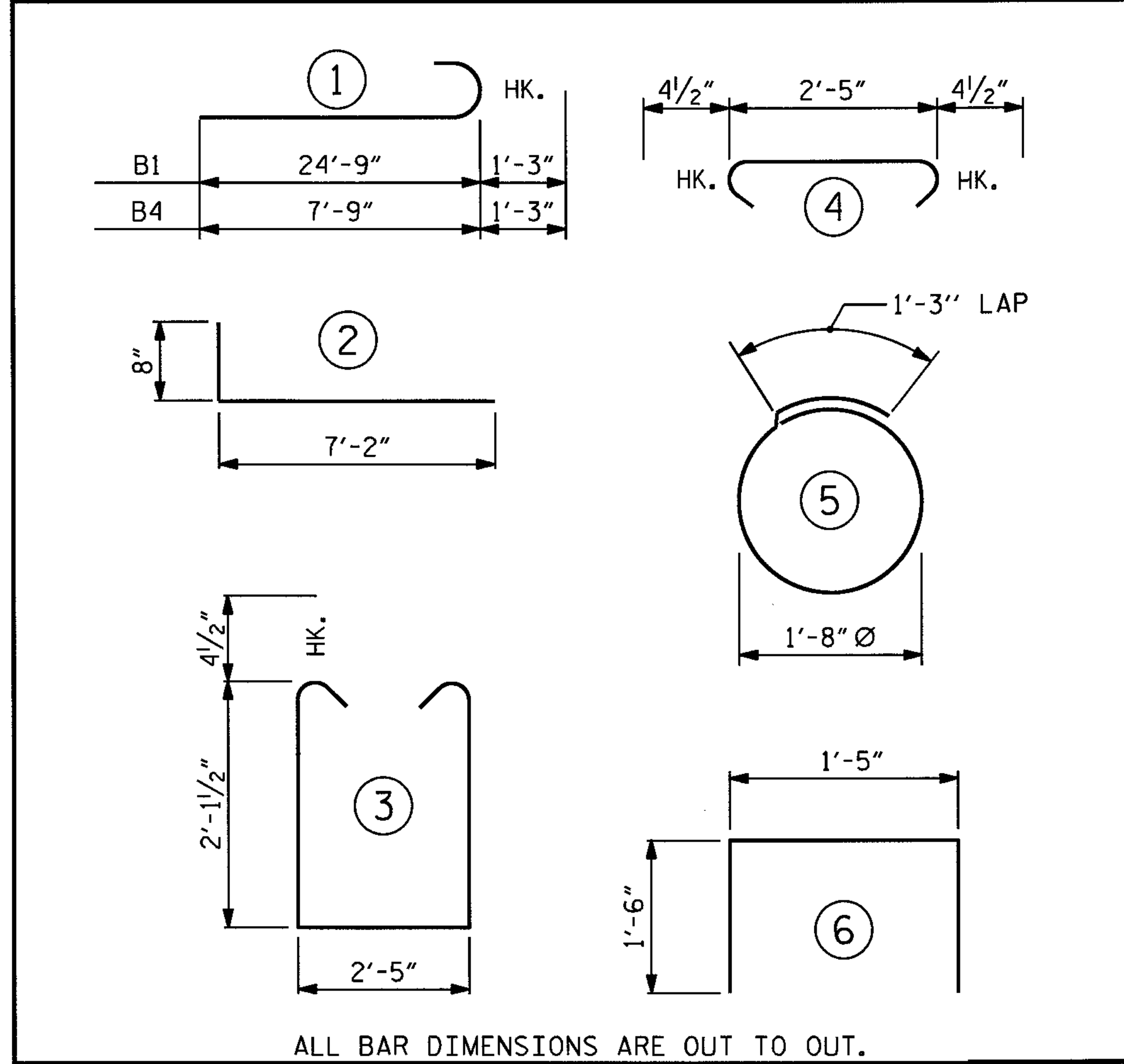
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT, STAGE I)		CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT, STAGE II)	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	7.4 C.Y.	POUR #1 CAP, LOWER PART OF WINGS & COLLARS	3.1 C.Y.
POUR #2 UPPER PART OF WINGS	0.9 C.Y.	POUR #2 UPPER PART OF WINGS	0.9 C.Y.
POUR #3 LATERAL GUIDES	0.1 C.Y.	POUR #3 LATERAL GUIDES	0.1 C.Y.
TOTAL CLASS A CONCRETE	8.4 C.Y.	TOTAL CLASS A CONCRETE	4.1 C.Y.

BILL OF MATERIAL
FOR ONE END BENT
STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	26'-0"	707
B2	8	#4	STR	26'-3"	140
B3	6	#4	STR	2'-5"	10
D1	14	#6	STR	1'-6"	32
H1	12	#4	2	7'-10"	63
K1	6	#4	STR	2'-11"	12
S1	20	#4	3	7'-5"	99
S2	20	#4	4	3'-2"	42
S3	8	#4	5	6'-6"	35
S4	2	#4	6	4'-5"	6
V1	24	#4	STR	4'-8"	75

REINFORCING STEEL (FOR ONE END BENT, STAGE I) 1221 LBS.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	3	#4	STR	2'-5"	5
B4	8	#9	1	9'-0"	245
B5	8	#4	STR	8'-10"	47
D1	4	#6	STR	1'-6"	9
H1	12	#4	2	7'-10"	63
K1	6	#4	STR	2'-11"	12
S1	8	#4	3	7'-5"	40
S2	8	#4	4	3'-2"	17
S3	2	#4	5	6'-6"	9
S4	2	#4	6	4'-5"	6
V1	24	#4	STR	4'-8"	75

REINFORCING STEEL (FOR ONE END BENT, STAGE II) 528 LBS.

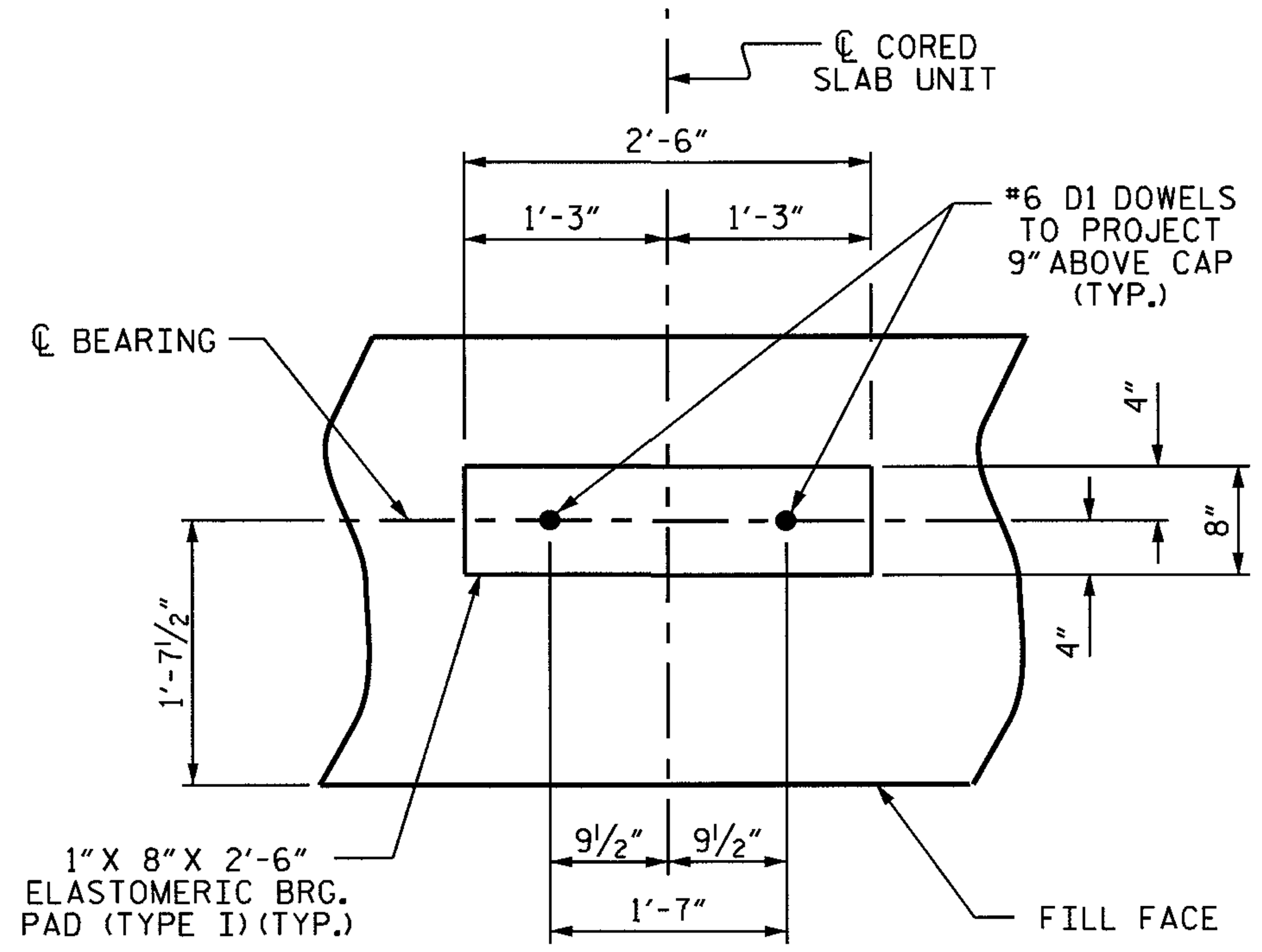
(FOR ONE END BENT)
HP 12 X 53 STEEL PILES

STAGE I

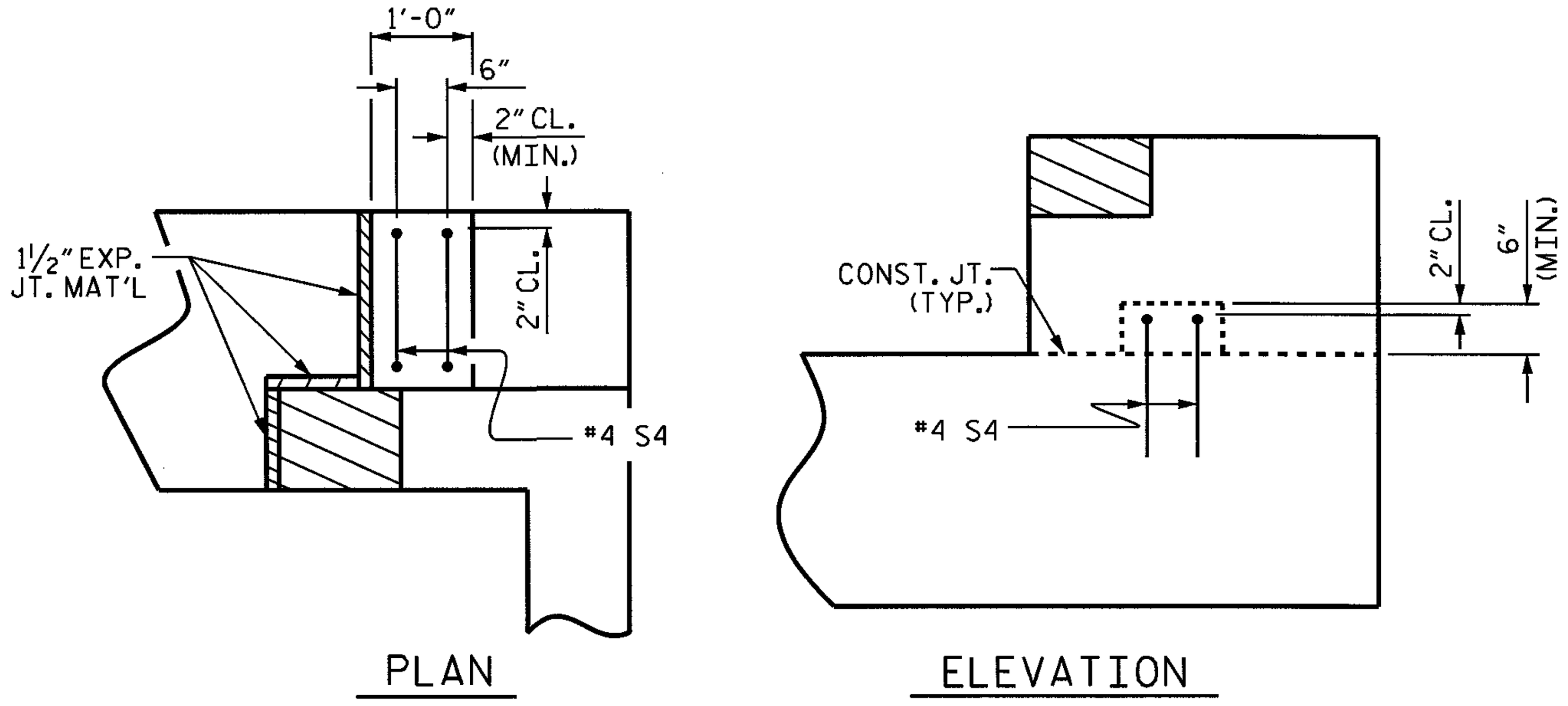
NO: 4	LIN. FT.= 120
PILE EXCAVATION	LIN. FT.= 20

STAGE II

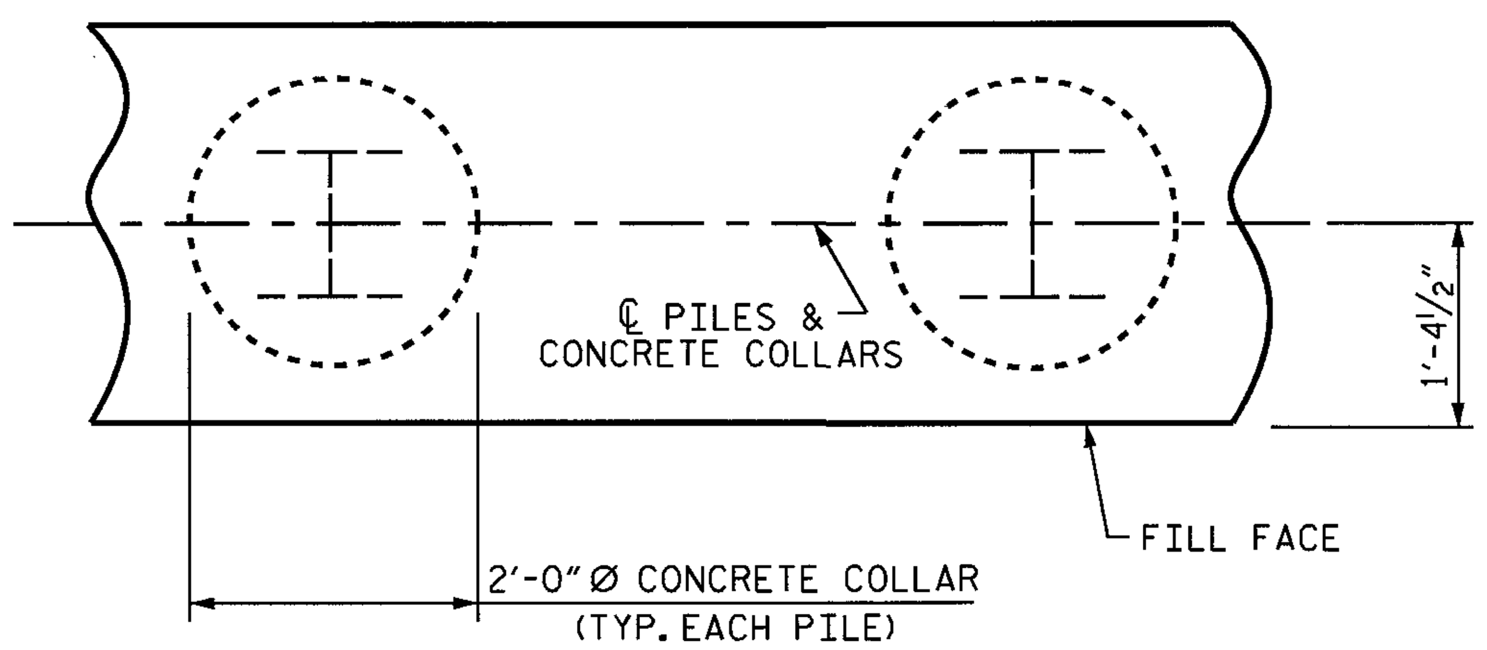
NO: 1	LIN. FT.= 30
PILE EXCAVATION	LIN. FT.= 5

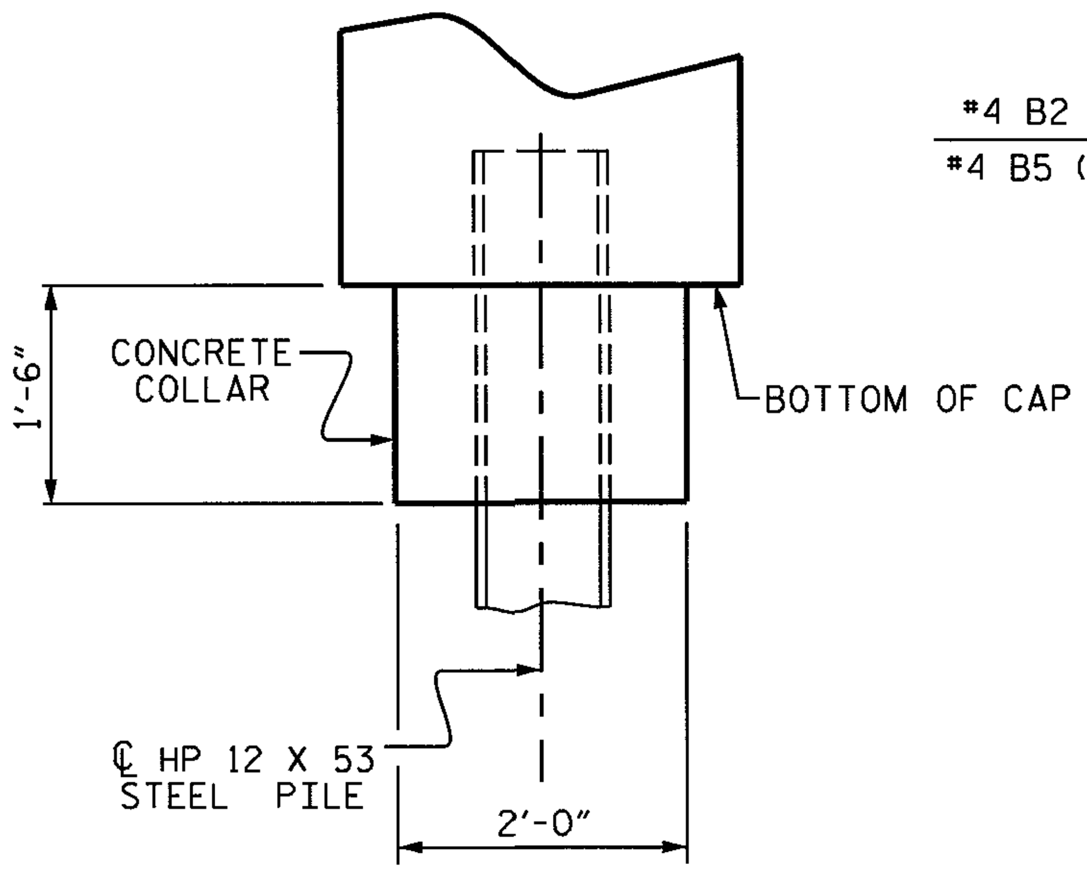


DETAIL "A"
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

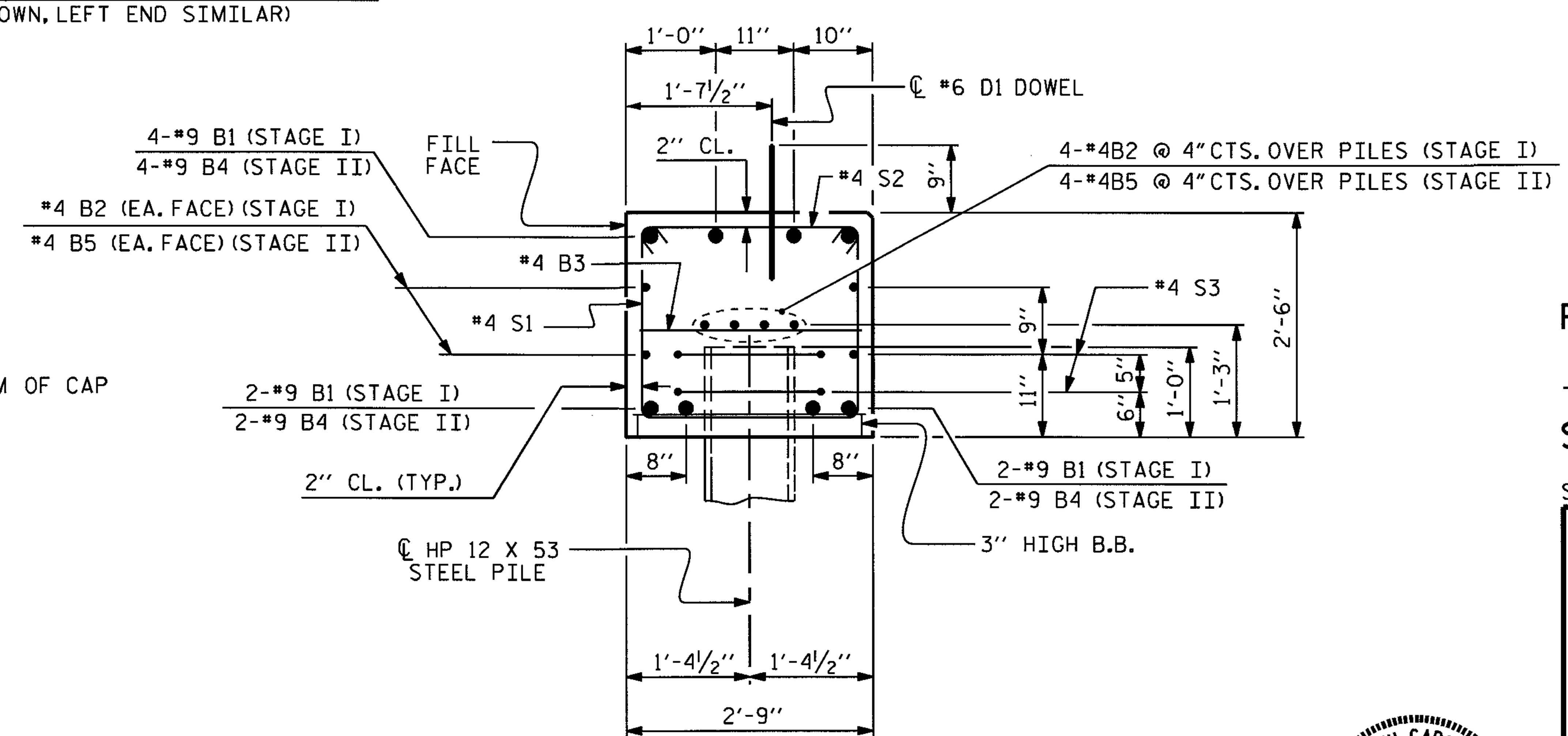


LATERAL GUIDE DETAILS
(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)





CORROSION PROTECTION FOR STEEL PILES DETAIL
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



SECTION A-A
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

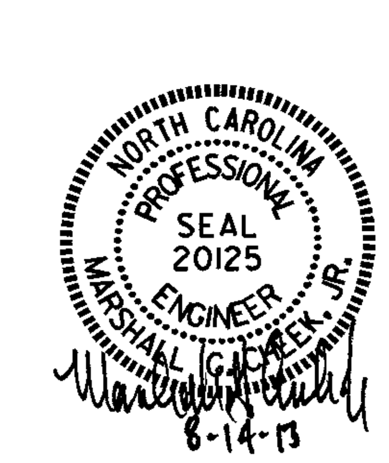
PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2
DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	M.A. LEBLANC	DATE :	7/13
CHECKED BY :	J.R. MCROY	DATE :	7/13
DESIGN ENGINEER OF RECORD:	M.A. LEBLANC	DATE :	8/13

12-AUG-2013 09:16
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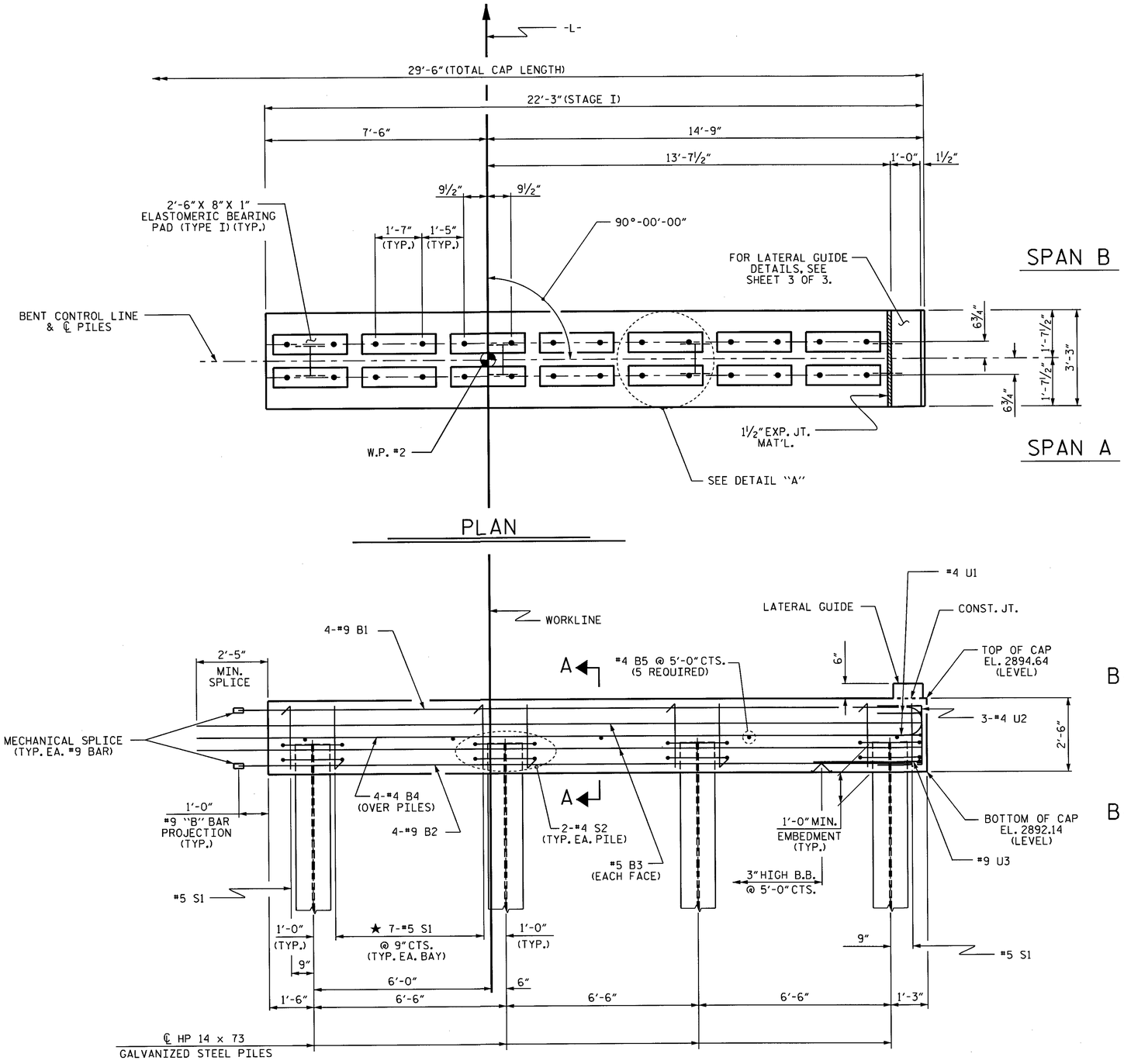
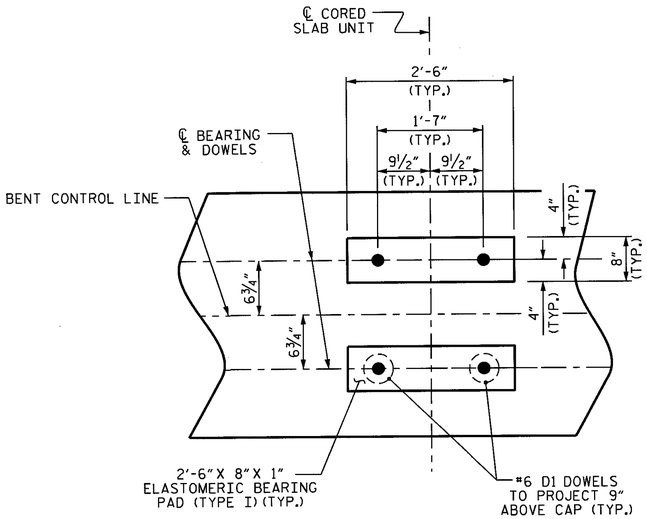
maleblanc



ELEVATION

FOR SECTION A-A & VIEW B-B, SEE SHEET 3 OF 3
★ INVERT ALTERNATE STIRRUPS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

GALVANIZE THE FULL LENGTH OF EACH INTERIOR BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDES IF APPROVED BY THE ENGINEER.

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1 (STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL GLICHEK, JR.
8-14-13

DRAWN BY :	M.A. LEBLANC	DATE :	7/13
CHECKED BY :	J.R. MCROY	DATE :	7/13
DESIGN ENGINEER OF RECORD:	M.A. LEBLANC	DATE :	8/13

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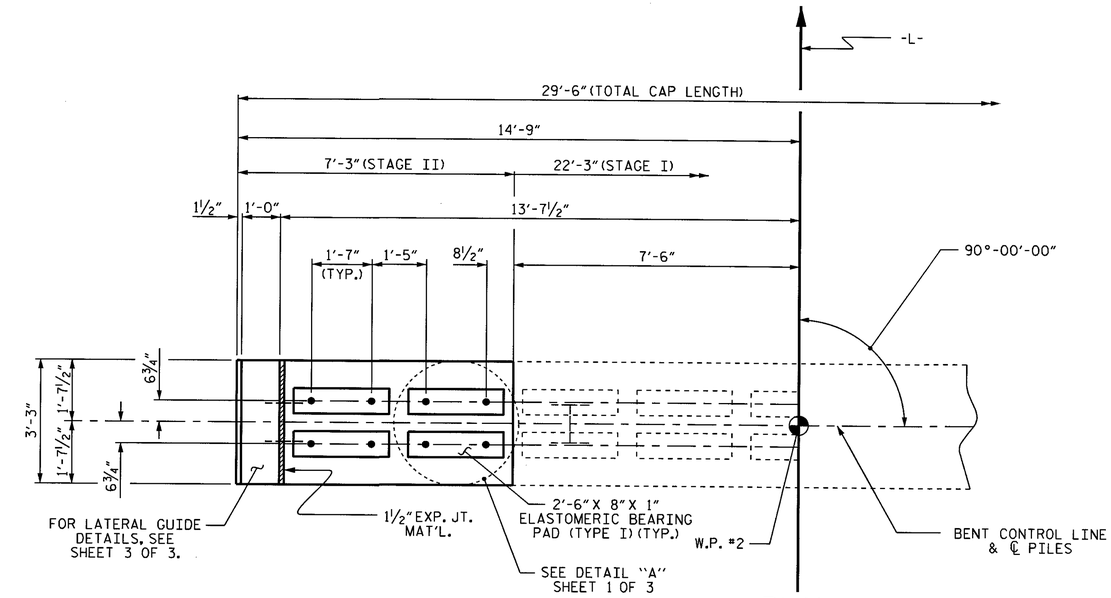
maleblanc



ELEVATION

FOR SECTION A-A & VIEW B-B, SEE SHEET 3 OF 3
★ INVERT ALTERNATE STIRRUPS.

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1
(STAGE II)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL LEE CREEK, JR.
8-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

12-AUG-2013 09:17
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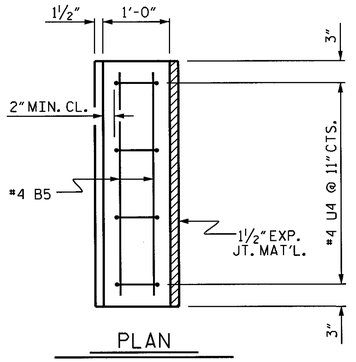
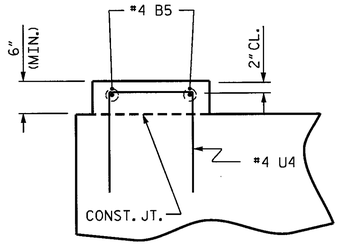


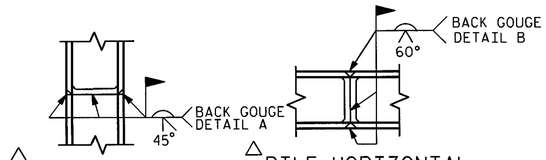
PLAN



ELEVATION

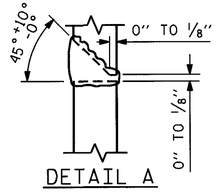
LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

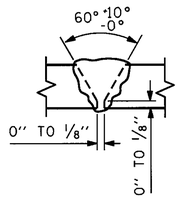


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



DETAIL A

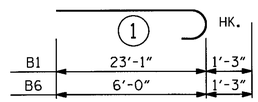


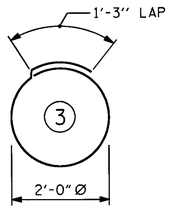
DETAIL B

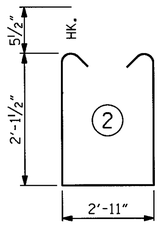
△ POSITION OF PILE DURING WELDING.

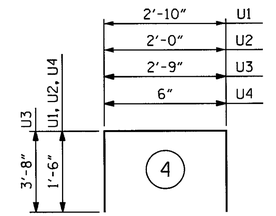
PILE SPLICE DETAILS

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT.

CLASS A CONCRETE BREAKDOWN (STAGE I)	
POUR #1 (CAP)	6.7 C.Y.
POUR #2 (LATERAL GUIDE)	0.1 C.Y.
TOTAL CLASS A CONCRETE	6.8 C.Y.

CLASS A CONCRETE BREAKDOWN (STAGE II)	
POUR #1 (CAP)	2.2 C.Y.
POUR #2 (LATERAL GUIDE)	0.1 C.Y.
TOTAL CLASS A CONCRETE	2.3 C.Y.

HP 14 X 73 GALVANIZED STEEL PILES

STAGE I		
No. 4	LIN. FT.	120
PILE EXCAVATION	LIN. FT.	16.8
STEEL PILE POINTS	4 EACH	
STAGE II		
No. 1	LIN. FT.	30
PILE EXCAVATION	LIN. FT.	4.2
STEEL PILE POINTS	1 EACH	

BILL OF MATERIAL

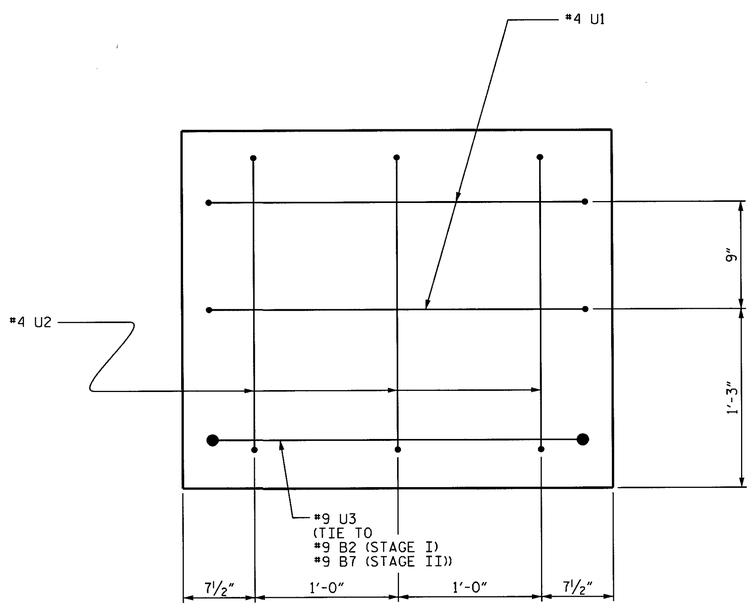
FOR ONE BENT

STAGE I

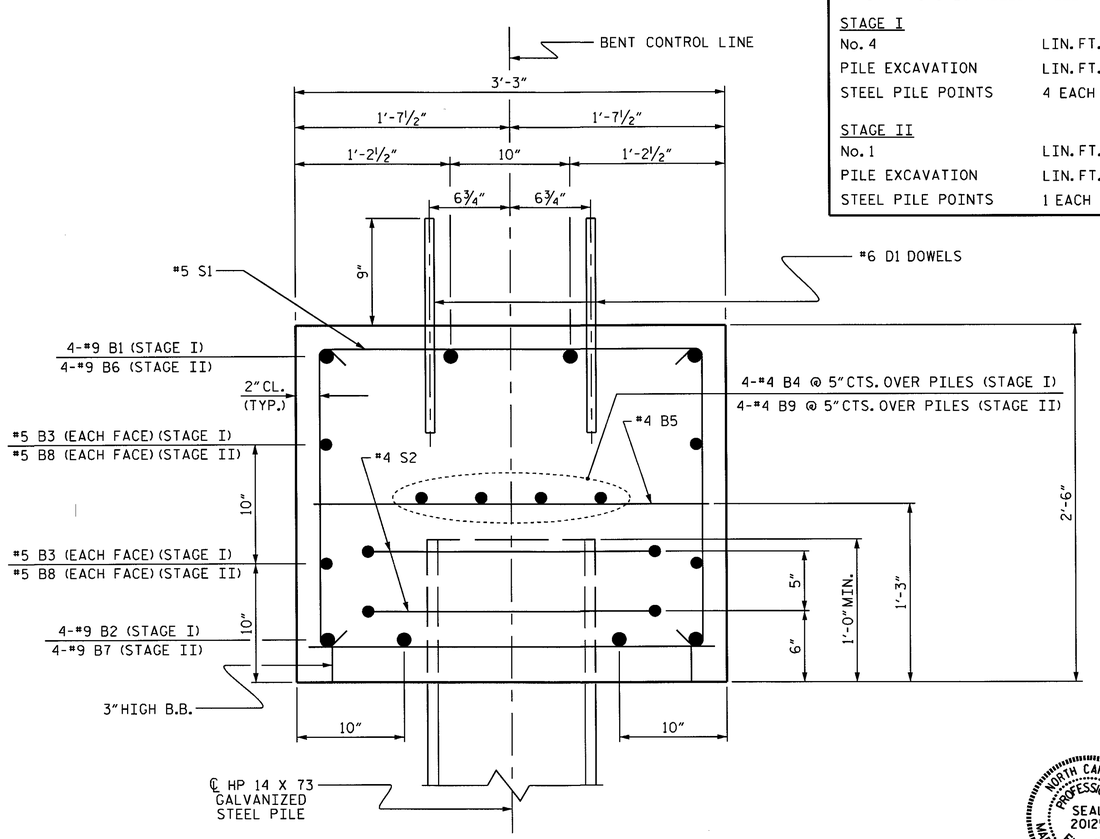
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	24'-4"	331
B2	4	#9	STR	23'-1"	314
B3	4	#5	STR	24'-6"	102
B4	4	#4	STR	24'-6"	65
B5	7	#4	STR	2'-11"	14
D1	28	#6	STR	1'-6"	63
S1	23	#5	2	8'-1"	194
S2	8	#4	3	7'-7"	41
U1	2	#4	4	5'-10"	8
U2	3	#4	4	5'-0"	10
U3	1	#9	4	10'-1"	34
U4	4	#4	4	3'-6"	9
REINFORCING STEEL					1185 LBS

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	4	#9	1	7'-3"	99
B7	4	#9	STR	6'-0"	82
B8	4	#5	STR	7'-1"	30
B9	4	#4	STR	7'-1"	19
B5	4	#4	STR	2'-11"	8
D1	8	#6	STR	1'-6"	18
S1	8	#5	2	8'-1"	67
S2	2	#4	3	7'-7"	10
U1	2	#4	4	5'-10"	8
U2	3	#4	4	5'-0"	10
U3	1	#9	4	10'-1"	34
U4	4	#4	4	3'-6"	9
REINFORCING STEEL					394 LBS



VIEW B-B



SECTION A-A

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

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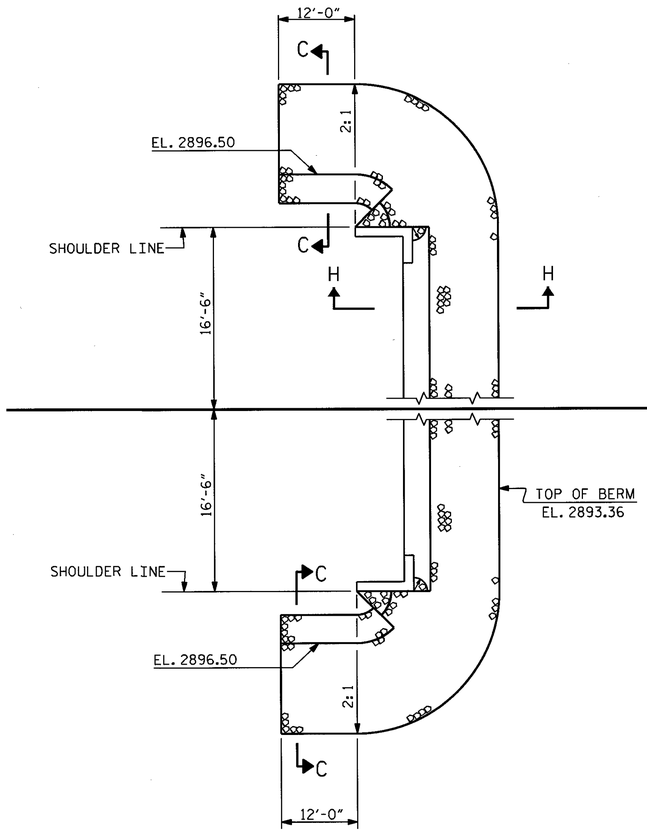
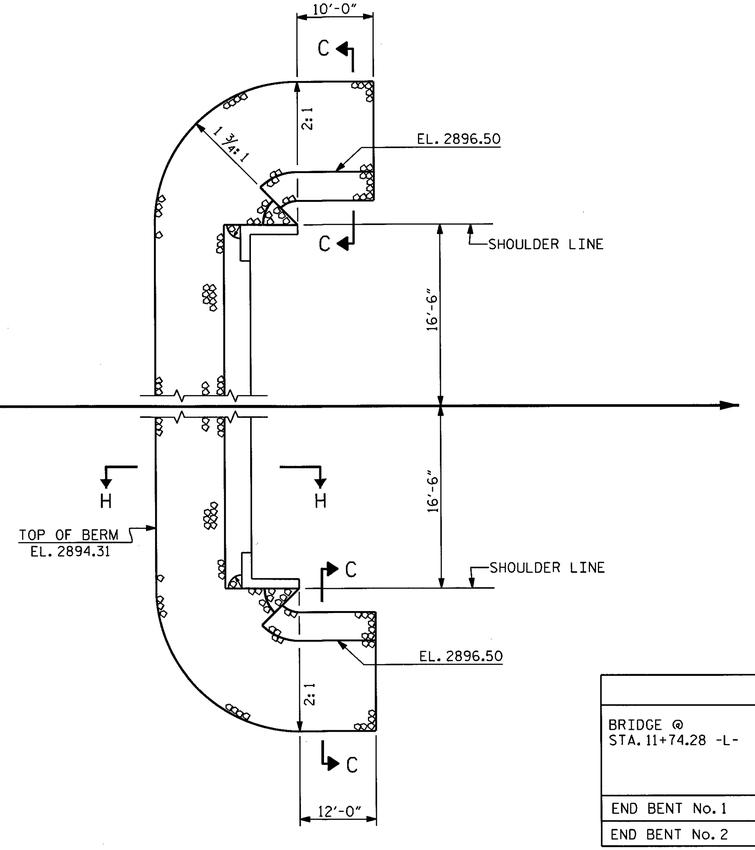
wjharris



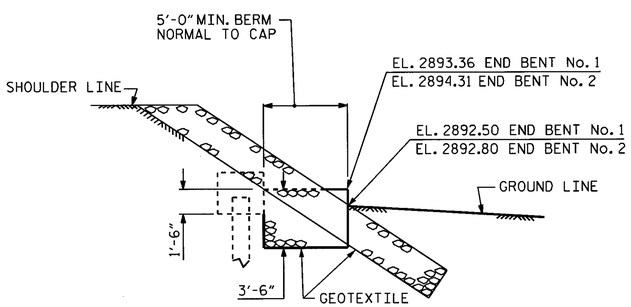
END BENT No. 1



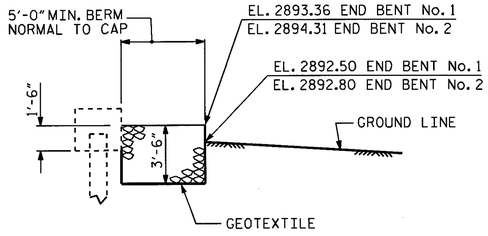
END BENT No. 2

ESTIMATED QUANTITIES

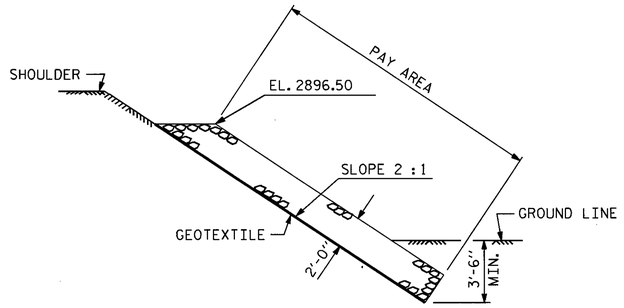
BRIDGE @ STA. 11+74.28 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	118	132
END BENT No. 2	114	128



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. BD-5111AD
ASHE COUNTY
STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

ASSEMBLED BY : D. HODGE	DATE : 6/13
CHECKED BY : M.G. CHEEK	DATE : 6/13
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. CHEEK, JR.
10-1-13

01-OCT-2013 07:54
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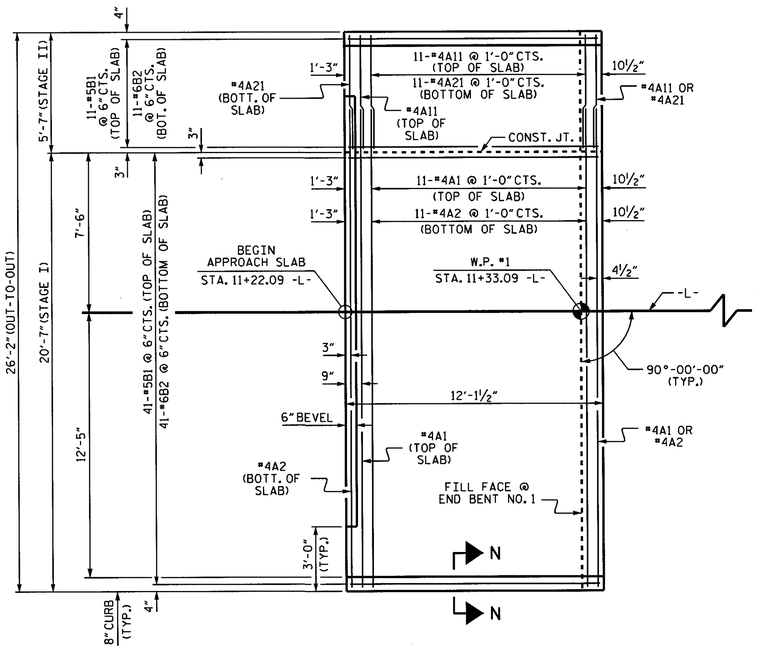
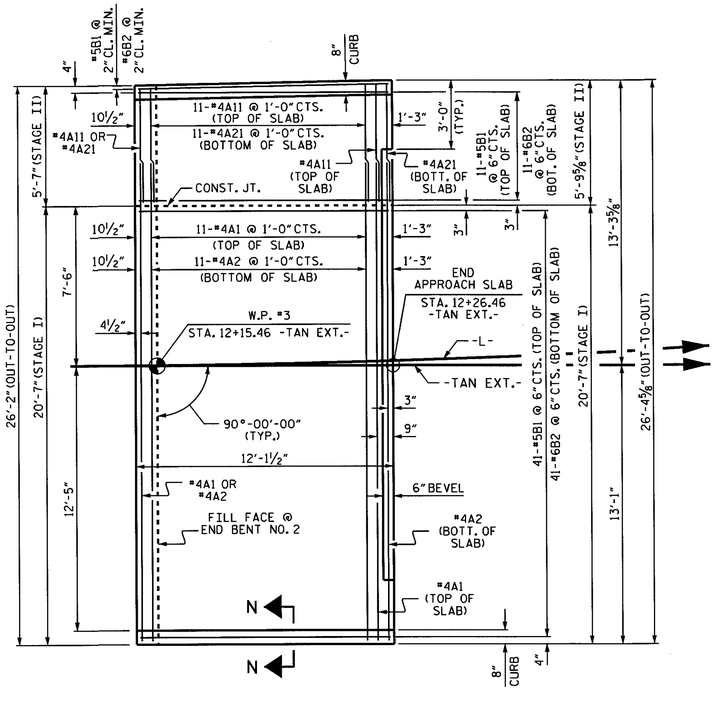
dahodge

STD. NO. RR1



PLAN @ END BENT NO. 1



PLAN @ END BENT NO. 2

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4"Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

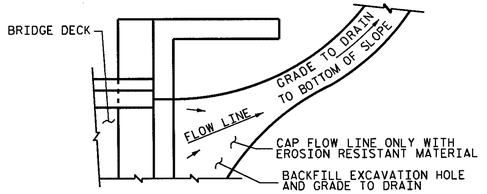
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

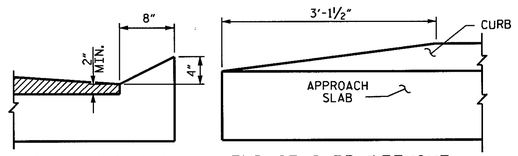
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



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.

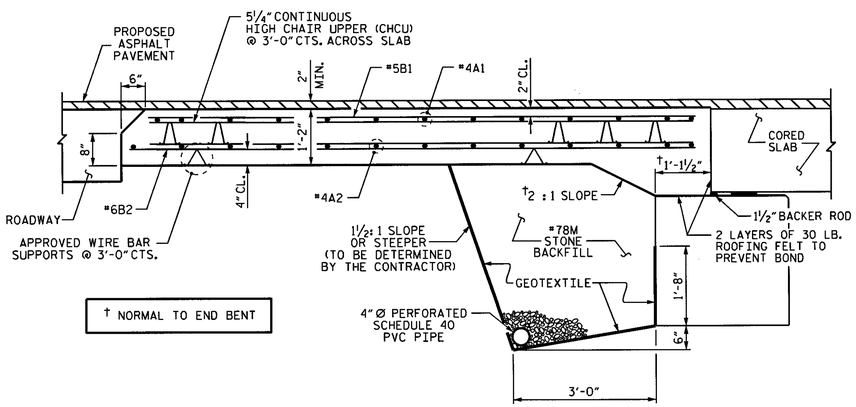
TEMPORARY DRAINAGE DETAIL



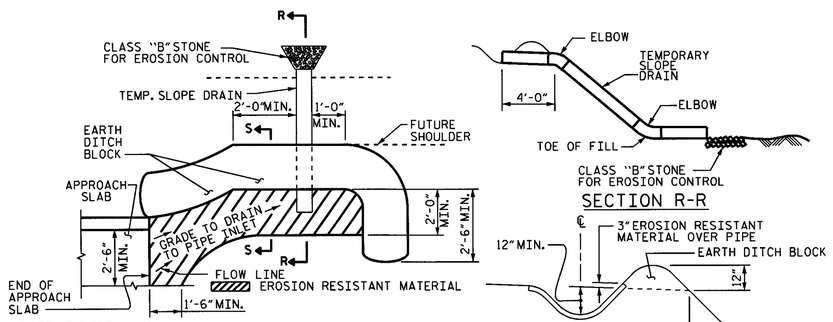
SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

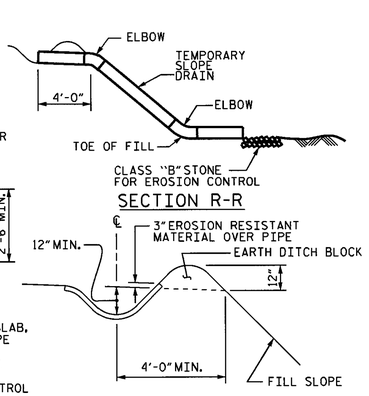


SECTION THRU SLAB



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)

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

BILL OF MATERIAL

APPROACH SLAB AT EB NO. 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	22'-5"	195
A2	13	#4	STR	22'-2"	192
* B1	41	#5	STR	11'-2"	478
B2	41	#6	STR	11'-8"	718
REINFORCING STEEL				LBS.	910
* EPOXY COATED REINFORCING STEEL				LBS.	673
CLASS AA CONCRETE				C.Y.	12.0

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A11	13	#4	STR	5'-5"	47
A21	13	#4	STR	5'-5"	47
* B1	11	#5	STR	11'-2"	128
B2	11	#6	STR	11'-8"	193
REINFORCING STEEL				LBS.	240
* EPOXY COATED REINFORCING STEEL				LBS.	175
CLASS AA CONCRETE				C.Y.	3.3

APPROACH SLAB AT EB NO. 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	22'-5"	195
A2	13	#4	STR	22'-2"	192
* B1	41	#5	STR	11'-2"	478
B2	41	#6	STR	11'-8"	718
REINFORCING STEEL				LBS.	910
* EPOXY COATED REINFORCING STEEL				LBS.	673
CLASS AA CONCRETE				C.Y.	12.0

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A11	13	#4	STR	5'-5"	47
A21	13	#4	STR	5'-5"	47
* B1	12	#5	STR	11'-2"	140
B2	12	#6	STR	11'-8"	210
REINFORCING STEEL				LBS.	257
* EPOXY COATED REINFORCING STEEL				LBS.	187
CLASS AA CONCRETE				C.Y.	3.4

* THESE BARS ARE EPOXY COATED

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
8-14-13

DRAWN BY : M.A. LEBLANC DATE : 7/13
CHECKED BY : J.R. MCROY DATE : 7/13
DESIGN ENGINEER OF RECORD: M.A. LEBLANC DATE : 8/13

13-AUG-2013 13:31
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moleblanc

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 2012 "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.

PROJECT NO. BD-5111AD

ASHE COUNTY

STATION: 11+74.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

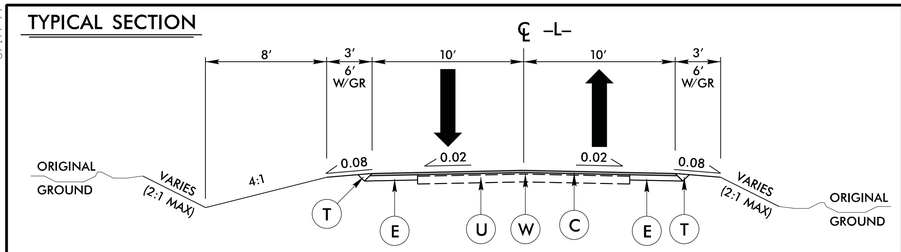
NORTH CAROLINA PROFESSIONAL SEAL 036611 ENGINEER RICKY V. KEITH
10/10/2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25A
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W.R. PARRISH DATE : SEPT. 2013
CHECKED BY : R.V. KEITH DATE : SEPT. 2013

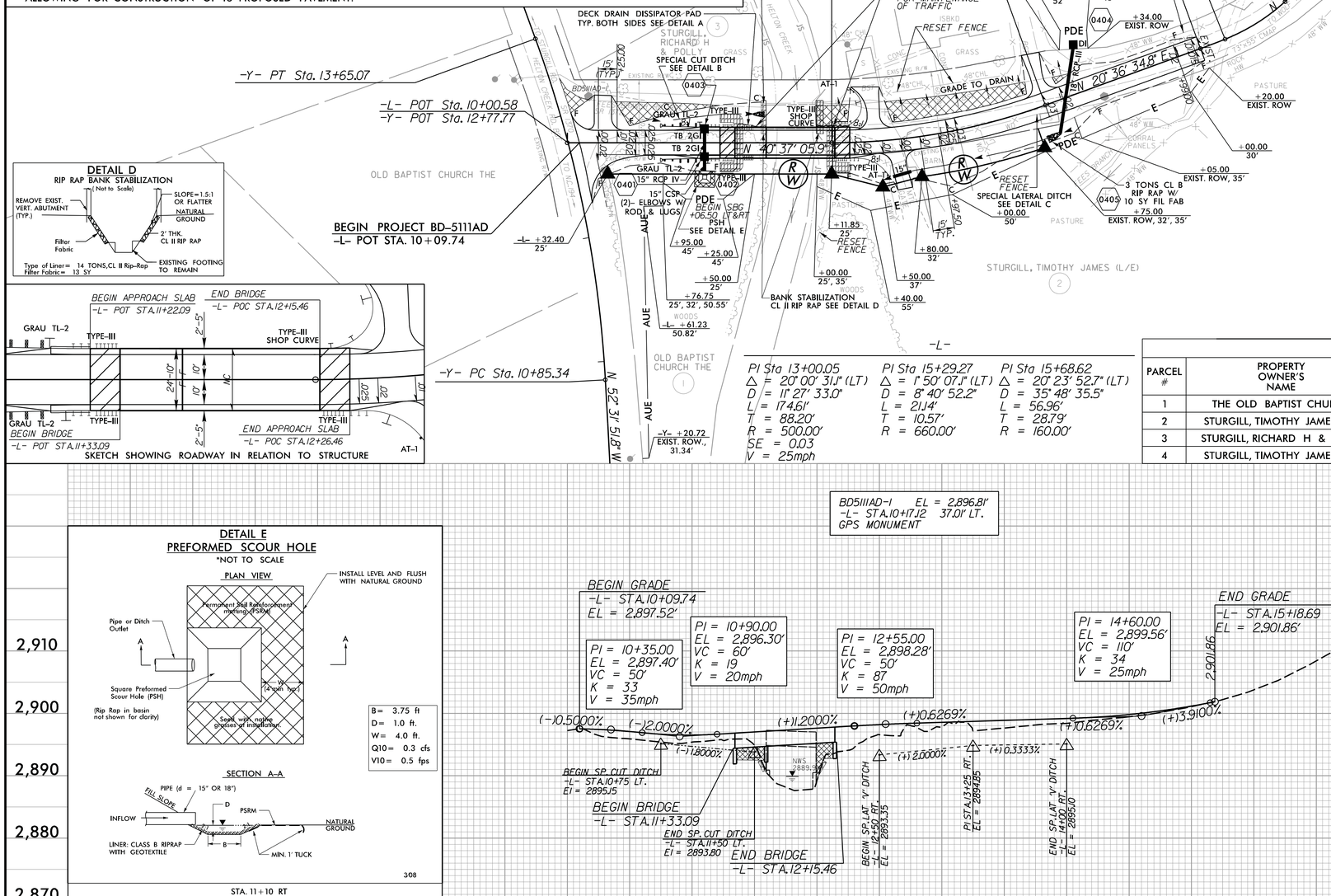
8/17/99

TYPICAL SECTION

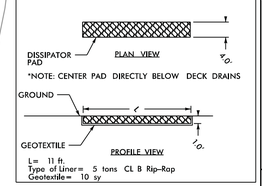


*WHERE PROPOSED PAVEMENT OVERLAPS EXISTING PAVEMENT USED AS DETOUR, A TEMPORARY FILL SLOPE WILL BE CONSTRUCTED ALLOWING FOR CONSTRUCTION OF 18' PROPOSED PAVEMENT.

PAVEMENT SCHEDULE	
C	1½" SURFACE COURSE, TYPE SF9.5A
E	5½" BASE COURSE, TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT.
W	WEDGING

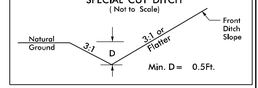


DETAIL A
DECK DRAIN DISSIPATOR PAD
(Not to Scale)



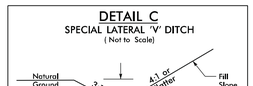
FROM STA. 11+38 TO STA. 11+49 LT & RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 10+75 TO STA. 11+50 LT

DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



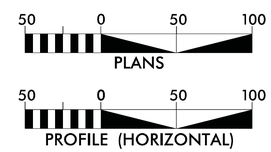
FROM STA. 12+50 TO STA. 14+00 RT

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	RDY-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 23982 ENGINEER STEPHEN E. ROBERTS

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 23090 ENGINEER AUDREY B. BURNETTE

GRAPHIC SCALES



DESIGN SPEED = 25 mph
ADT = 150 (2000)

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)

Type of Liner= 14 TONS,CL II Rip-Rap
Filter Fabric= 13 SY

SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

PI Sta 13+00.05	PI Sta 15+29.27	PI Sta 15+68.62
△ = 20° 00' 31.1" (LT)	△ = 1° 50' 07.1" (LT)	△ = 20° 23' 52.7" (LT)
D = 11° 27' 33.0"	D = 8° 40' 52.2"	D = 35° 48' 35.5"
L = 174.61'	L = 211.4'	L = 56.96'
T = 88.20'	T = 10.57'	T = 28.79'
R = 500.00'	R = 660.00'	R = 160.00'
SE = 0.03		
V = 25mph		

* FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

RIGHT–OF–WAY AREAS

PARCEL #	PROPERTY OWNER'S NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTRUCTION EASEMENT	PERMANENT DRAINAGE EASEMENT	AERIAL UTILITY EASEMENT	PERMANENT UTILITY EASEMENT
1	THE OLD BAPTIST CHURCH	N/A	0.048 Ac.	N/A	N/A	0 Ac.	0.025 Ac.	0.081 Ac.	0 Ac.
2	STURGILL, TIMOTHY JAMES (L/E)	N/A	0.089 Ac.	N/A	N/A	0.101 Ac.	0.012 Ac.	0 Ac.	0 Ac.
3	STURGILL, RICHARD H & POLLY	N/A	0 Ac.	N/A	N/A	0 Ac.	0 Ac.	0 Ac.	0 Ac.
4	STURGILL, TIMOTHY JAMES (L/E)	N/A	0 Ac.	N/A	N/A	0 Ac.	0.008 Ac.	0 Ac.	0 Ac.

DETAIL E
PREFORMED SCOUR HOLE
*NOT TO SCALE

B=	3.75 ft
D=	1.0 ft.
W=	4.0 ft.
Q10=	0.3 cfs
V10=	0.5 fps

308

STA. 11+10 RT

BD5111AD-1 EL = 2,896.81'
–L– STA.10+17.12 37.01' LT.
GPS MONUMENT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5111AD-1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 1035302.1109(ft) EASTING: 1262958.3171(ft)
ELEVATION: 2896.8102(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000038250
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5111AD-1" TO –L– STATION 10+00 IS S 24° 33' 32.30" E 40.78 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

2,960 2,950 2,940 2,930 2,920 2,910 2,900 2,890

10+00 11+00 12+00 13+00 14+00 15+00 16+00

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609–3960
NC LICENSE NO. F–0112 • (919) 878–9560

10/22/2013
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mpatt

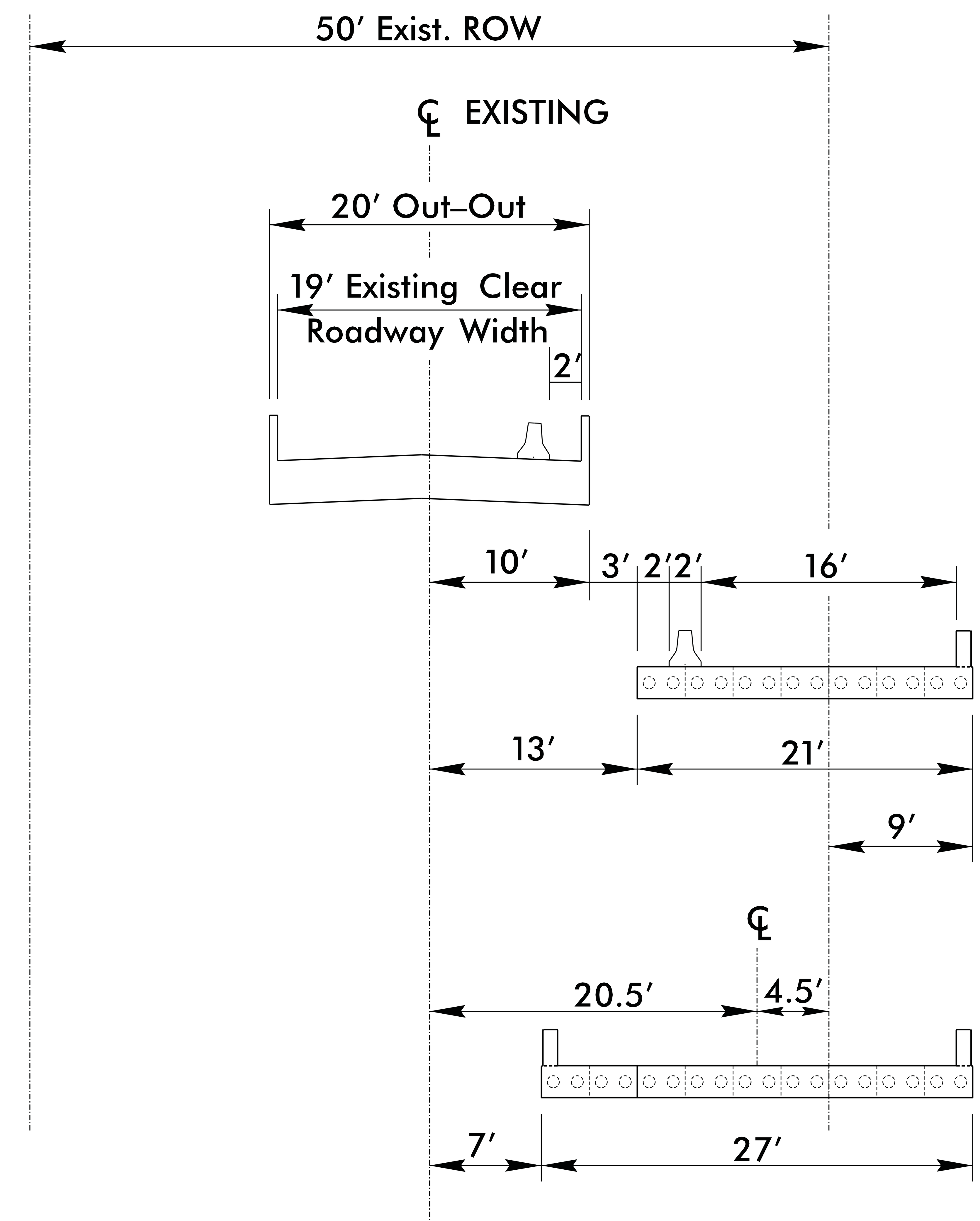
PHASED CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	RDY-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23982 ENGINEER STEPHEN E. ROBERTS

10-17-13



Phase 1

Phase 2

TIP PROJECT: ASHE BD-5111AD

STATE PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	TCP-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED TRAFFIC CONTROL, MARKING & DELINEATION

ASHE COUNTY

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-PROJECT SERVICES UNTI-N.C. DEPARTMENT OF TRANSPORTATION-RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

TEMP. PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY BREAKDOWN	PAY ITEM	TOTAL QUANTITY
	PAVEMENT MARKING LINES		PAINT (4")	
PA	WHITE EDGELINE 2X	1156 LF		TOTAL 1156 LF

2X = TWO APPLICATIONS

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY BREAKDOWN	PAY ITEM	TOTAL QUANTITY
	PAVEMENT MARKING LINES		PAINT (4")	
PA	WHITE EDGELINE 2X	2036 LF		
PI	YELLOW DOUBLE CENTER 2X	2036 LF		TOTAL 4072 LF

2X = TWO APPLICATIONS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

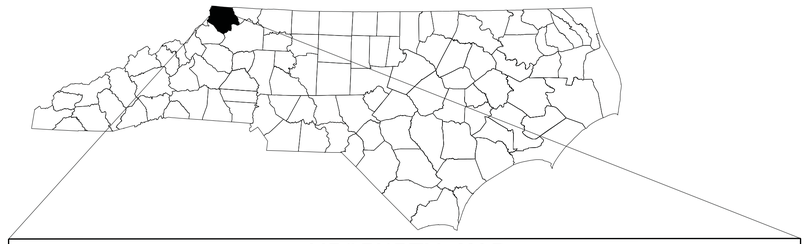
TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- DRUM
- TEMPORARY CRASH CUSHION
- PORTABLE CONCRETE BARRIER
- FLAGGER
- TRUCK MOUNTED ATTENUATOR (TMA)

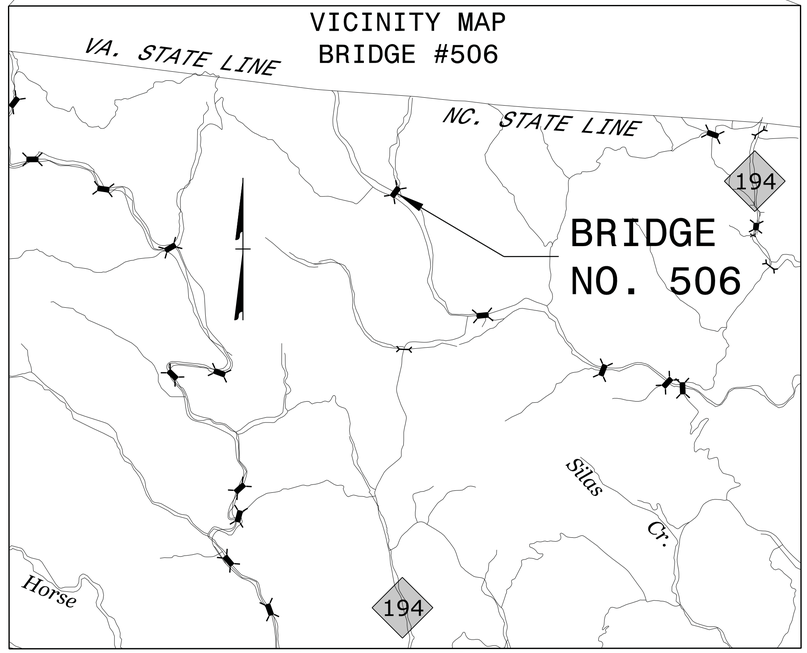
TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN

INDEX OF SHEETS



VICINITY MAP
BRIDGE #506



PLANS PREPARED BY :
RK&K
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
FOR
DIVISION OF HIGHWAYS

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER
Aug 5, 2013

K. W. BISBY, PE — TRAFFIC CONTROL ENGINEER
M. A. COLE — TRAFFIC CONTROL PROJECT DESIGNER

6/5/2013
M:\projects\2009\09085.NCDOT_Div_OnCall\P01_Div1Bridges_GRP4\BD5111AD_Ashe506\Design\Traffic\TrafficControl\TCP\BD5111AD_TCP_tcp01.dgn
mccole

PROJ. REFERENCE NO.	SHEET NO.
BD-5111AD	TCP-2

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A. REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B. WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

C. WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D. WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E. DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

F. BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

   BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

   BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

   BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

G. DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) (500') IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

SIGNING

H. INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

TRAFFIC BARRIER

I. INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

   DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

   ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE/RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

   INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

   INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER IS REMOVED.

J. PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

   PROTECT THE APPROACH END OF MOVEABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVEABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LES	15 FT
45 - 50	20 FT
55	25 FT
60 MPH OR HIGHER	30 FT

TRAFFIC CONTROL DEVICES

K. SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY WHEN LANE CLOSURES ARE NOT IN EFFECT. WHEN SKINNY DRUMS ARE ALLOWED REFER TO SECTION 1180 OF STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OR AS SHOWN IN THE PLANS.

L. PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

M. INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS SHOWN IN THE PAVEMENT MARKING PLAN.

N. INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD TYPE	MARKING	MARKER
ASPHALT	PAINT	RAISED
CONCRETE	COLD APPLIED PLASTIC (TYPE IV)	RAISED

O. INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE.

P. PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

Q. TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

R. REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

TRAFFIC CONTROL PHASING

PHASE I

STEP 1:

ERECT ADVANCED WORK ZONE SIGNS ON SR 1372 (FEES BRANCH RD) AND SR 1370 (HELTON CREEK RD) IN ACCORDANCE WITH RDWY STD 1101.01 SHEET 3 AND TCP-3.

STEP 2:

USING RDWY STD 1101.02 SHEET 1, CONSTRUCT STAGE I STRUCTURE AND ROADWAY APPROACHES FROM -L- STA 10+09 TO -L- STA 15+18, UP TO THE EDGE AND ELEVATION OF THE EXISTING SR 1372 (FEES BRANCH RD) PAVEMENT, (SEE TCP-3, ROADWAY AND STRUCTURE PLANS).

PHASE II

NOTE:

COMPLETE THE WORK REQUIRED IN PHASE II, STEP 1 IN A CONTINUOUS OPERATION.

STEP 1:

USING RDWY STD 1101.02 SHEET 1 (ALTERNATING LANE CLOSURES), WEDGE/PLACE REMAINING PAVEMENT AND TEMPORARY PAVEMENT MARKINGS AND SHIFT SR 1372 (FEES BRANCH RD) TRAFFIC ONTO THE COMPLETED STAGE I STRUCTURE AND ROADWAY APPROACHES, (SEE TCP-4).

STEP 2:

REMOVE EXISTING BRIDGE NO. 506 AND CONSTRUCT STAGE II STRUCTURE AND ROADWAY APPROACHES FROM -L- STA 10+09 TO -L- STA 15+18, EXCLUDING THE FINAL LAYER OF SURFACE COURSE, (SEE TCP-4, ROADWAY AND STRUCTURE PLANS).

PHASE III

STEP 1:

USING RDWY STD 1101.02 SHEET 1 (ALTERNATING LANE CLOSURES), PLACE THE FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS AND MARKERS FROM -L- STA. 10+09 TO -L- STA. 15+18.

STEP 2:

REMOVE TRAFFIC CONTROL DEVICES AND OPEN SR 1372 (FEES BRANCH RD) TO IT FINAL TRAFFIC PATTERN.

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BISHOP

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

GENERAL NOTES AND TRAFFIC CONTROL PHASING

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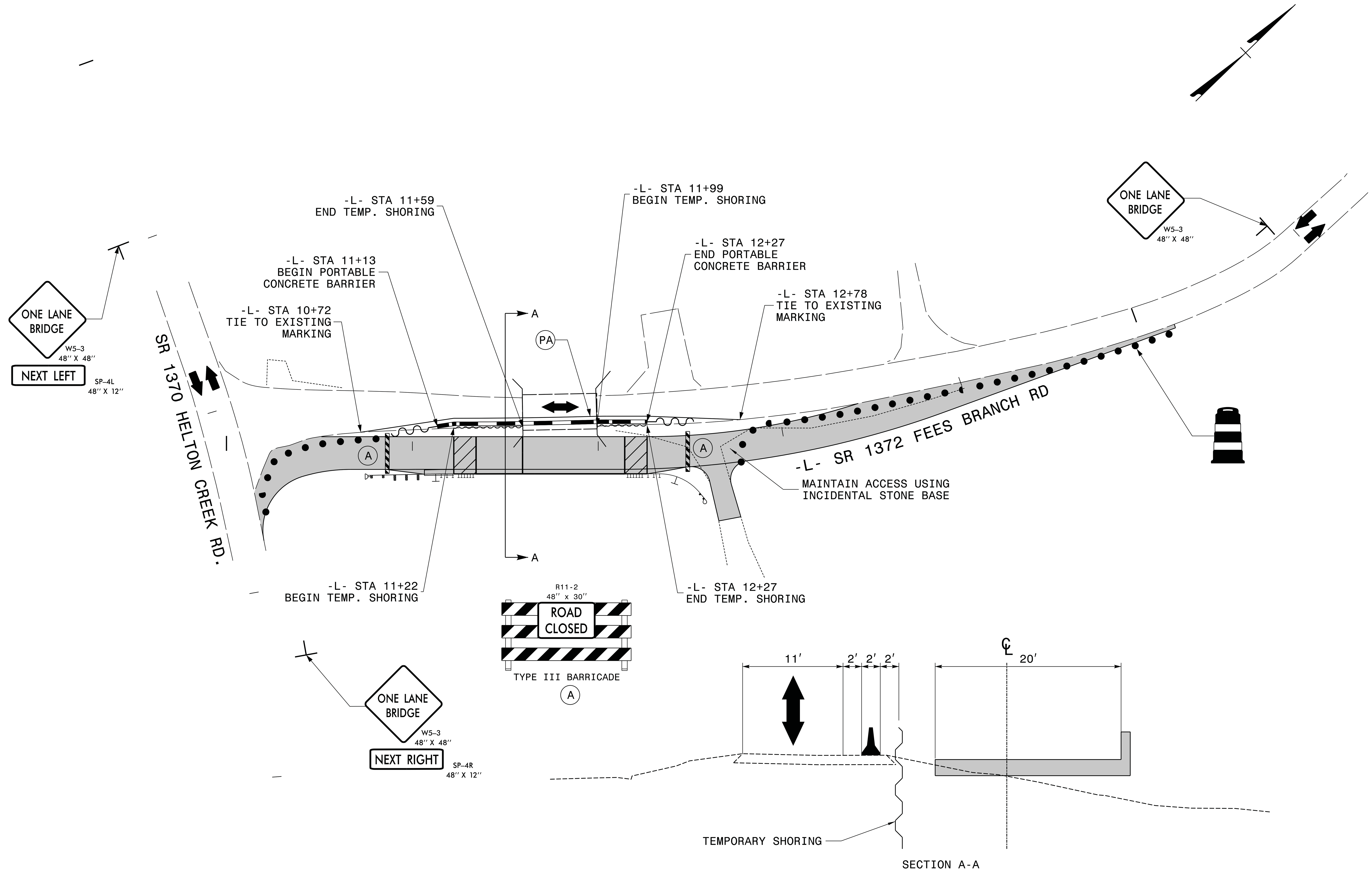
6/5/2013
mcole

PROJ. REFERENCE NO.	SHEET NO.
BD-5111AD	TCP-3



PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

APPROVED:________ DATE:________

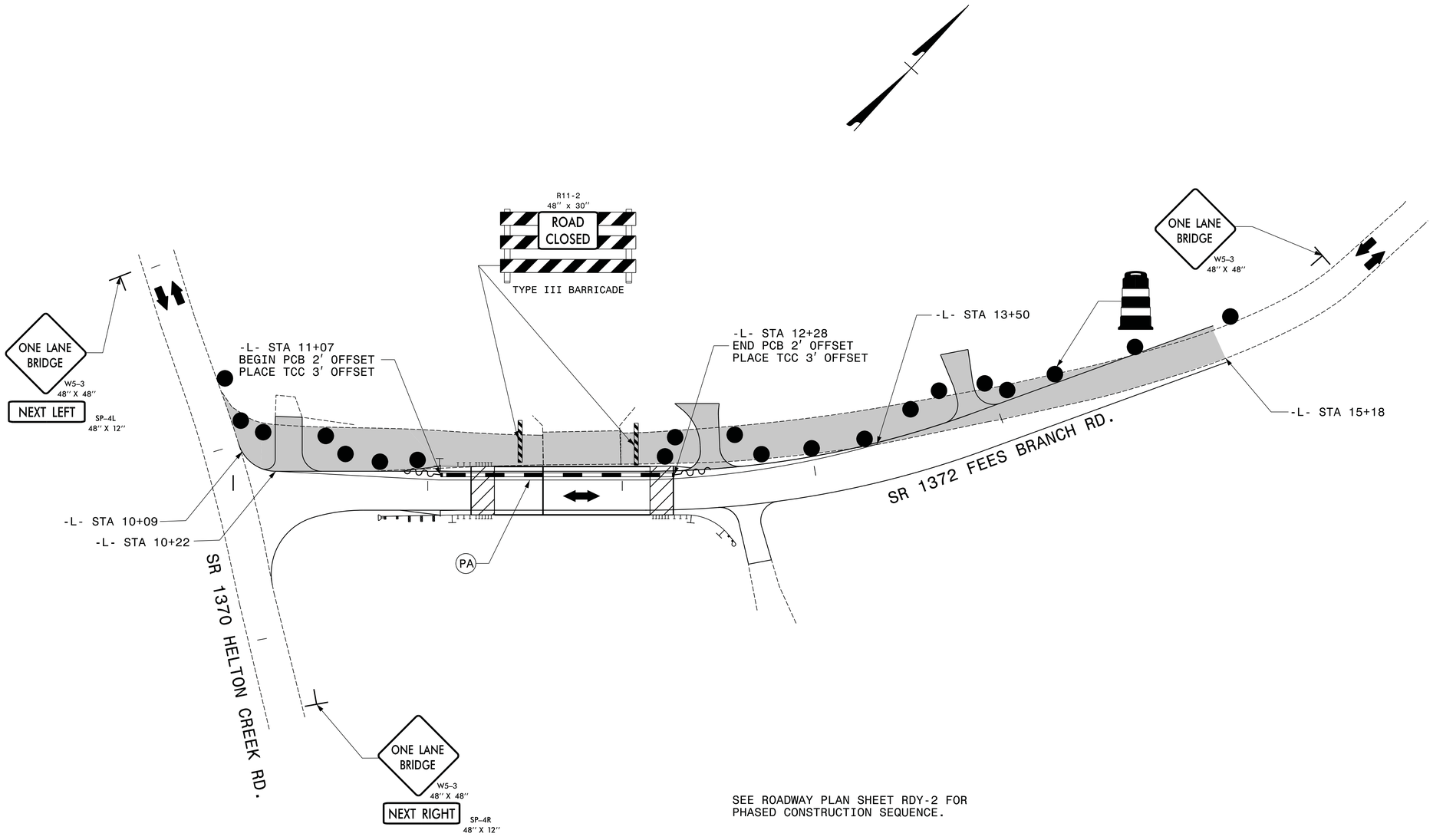
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE I DETAIL

PROJ. REFERENCE NO.	SHEET NO.
BD-5111AD	TCP-4



SEE ROADWAY PLAN SHEET RDY-2 FOR
PHASED CONSTRUCTION SEQUENCE.

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21047 ENGINEER KEVIN W. BLISS

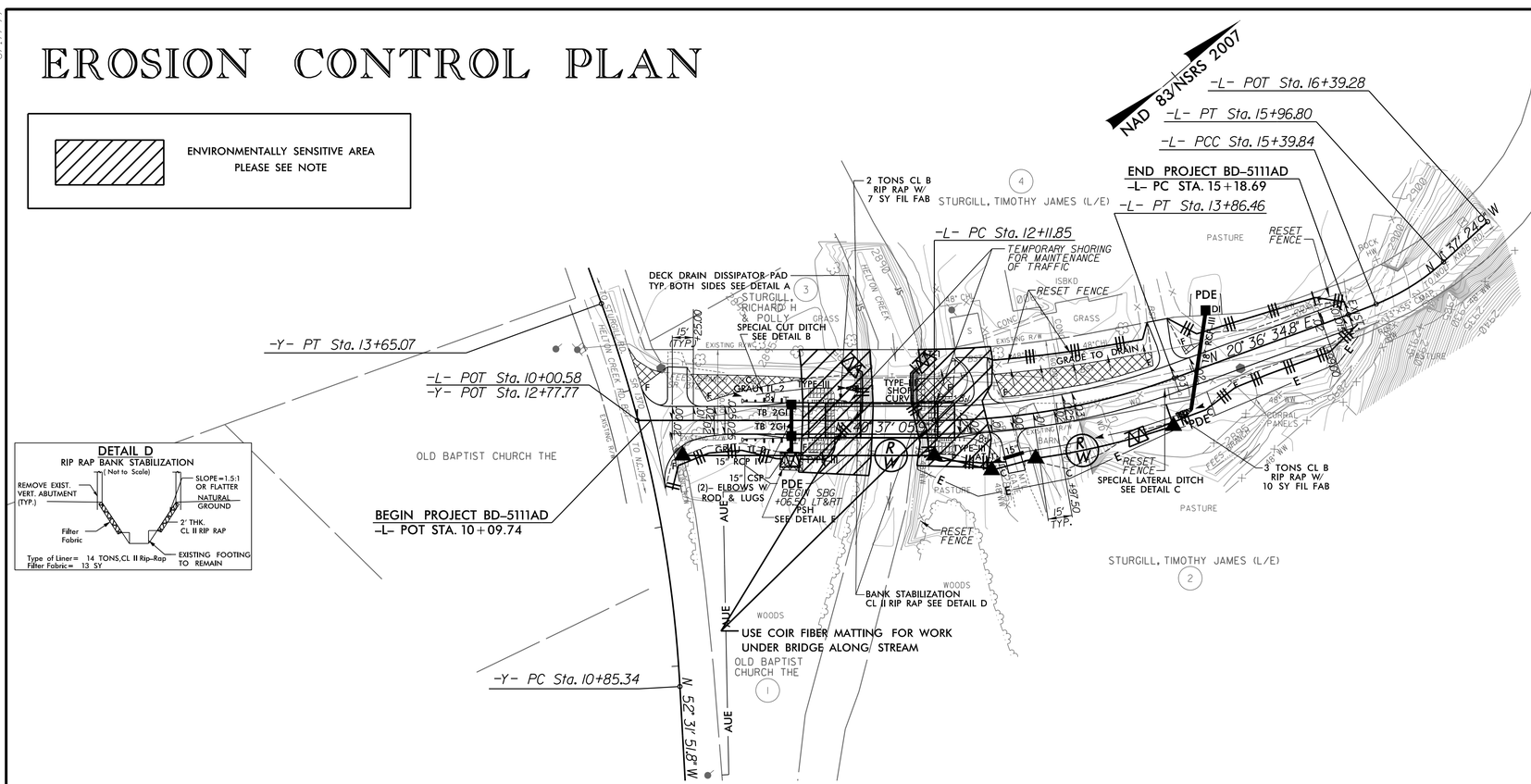
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PHASE II DETAIL

8/17/99

EROSION CONTROL PLAN

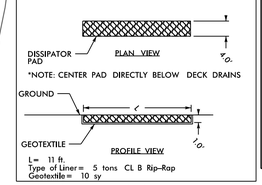
ENVIRONMENTALLY SENSITIVE AREA
PLEASE SEE NOTE



DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)

Type of Liner = 14 TONS, CL II Rip-Rap
Filter Fabric = 13 SY

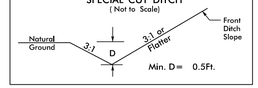
DETAIL A
DECK DRAIN DISSIPATOR PAD
(Not to Scale)



L = 11 ft.
Type of Liner = 5 tons CL B Rip-Rap
Geotextile = 10 sy

FROM STA. 11+38 TO STA. 11+49 LT & RT

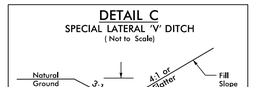
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 0.5Ft.

FROM STA. 10+75 TO STA. 11+50 LT

DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.8 Ft.

FROM STA. 12+50 TO STA. 14+00 RT

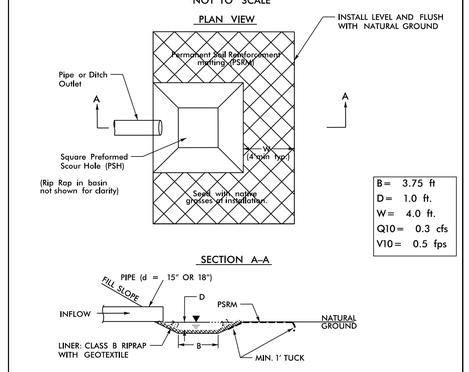
NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	EC-1/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

DETAIL E
PREFORMED SCOUR HOLE
*NOT TO SCALE



B = 3.75 ft
D = 1.0 ft.
W = 4.0 ft.
Q10 = 0.3 cfs
V10 = 0.5 fps

308

STA. 11+10 RT

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1632.03	Rock Inlet Sediment Trap Type C	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle	
	Wattle with Polyacrylamide (PAM)	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	

2012 STANDARD SPECIFICATIONS

2012 STANDARD DRAWINGS

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

AUDREY BURNETTE
LEVEL IIIA NAME

3081
LEVEL IIIA CERTIFICATION NO.

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. _____
to Sta. _____
Refer To E. C. Special Provisions for Special Considerations.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

9/20/2013
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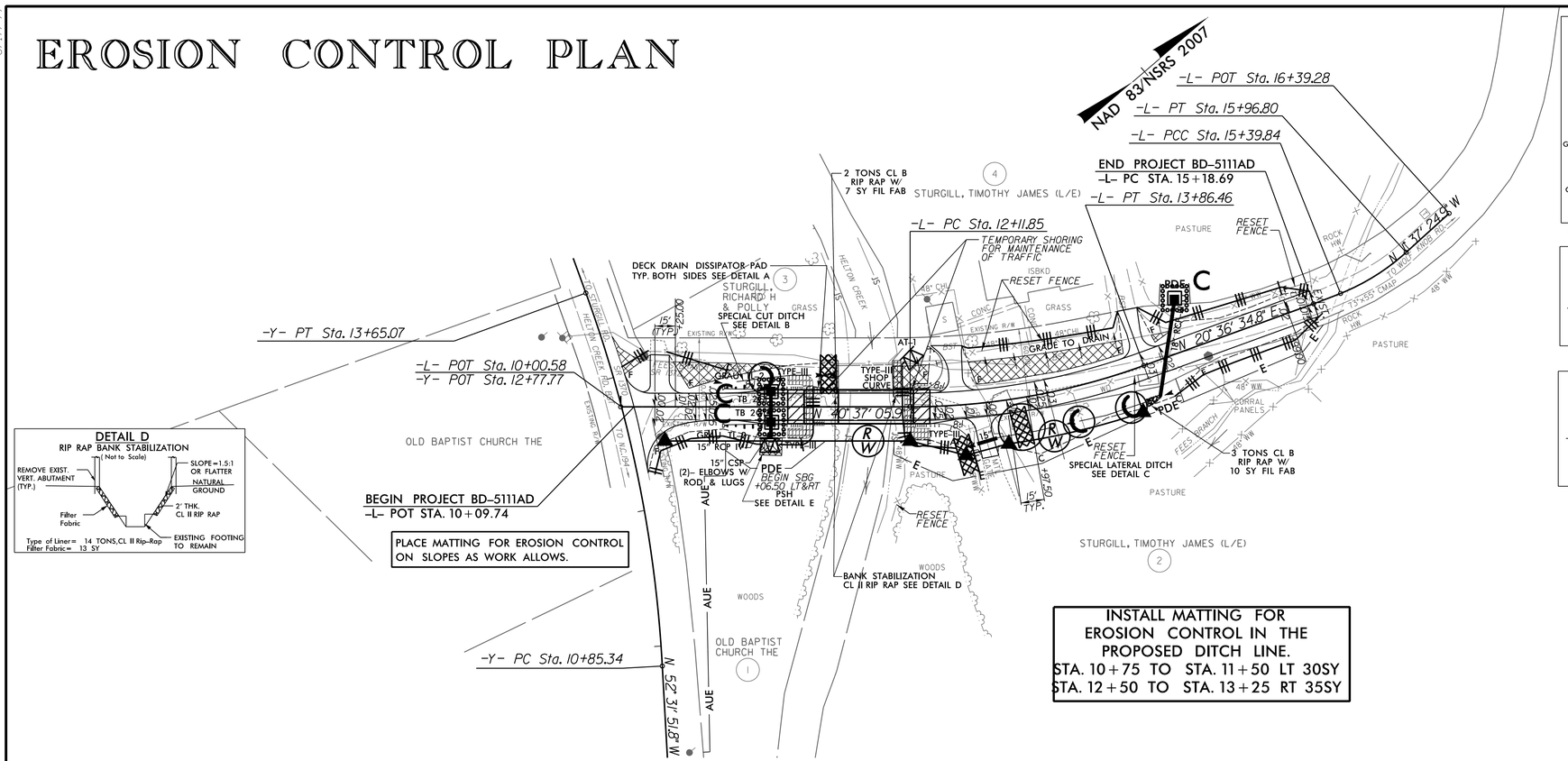
ksmith

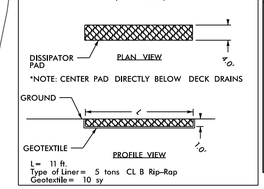
8/17/99

EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	EC-2/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

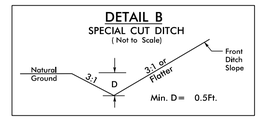


DETAIL A
DECK DRAIN DISSIPATOR PAD
(Not to Scale)



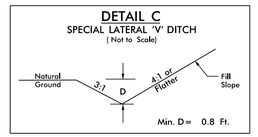
FROM STA. 11+38 TO STA. 11+49 LT & RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 10+75 TO STA. 11+50 LT

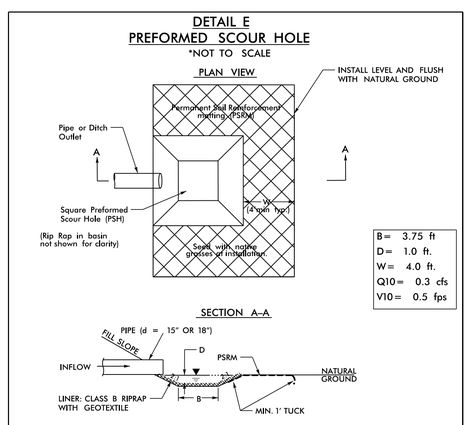
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 12+50 TO STA. 14+00 RT

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)

DETAIL E
PREFORMED SCOUR HOLE
*NOT TO SCALE



B=	3.75 ft
D=	1.0 ft.
W=	4.0 ft.
Q10=	0.3 cfs
V10=	0.5 fps

STA. 11+10 RT

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

2012 STANDARD SPECIFICATIONS

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TRD
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1632.03	Rock Inlet Sediment Trap Type C	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle	
	Wattle with Polyacrylamide (PAM)	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	

2012 STANDARD DRAWINGS

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

AUDREY BURNETTE
LEVEL IIIA NAME

3081
LEVEL IIIA CERTIFICATION NO.

PLANS PREPARED BY :
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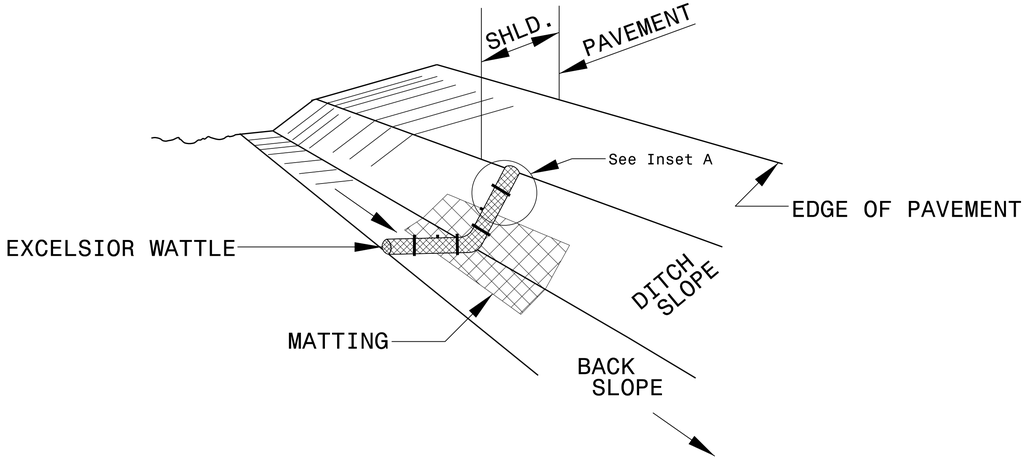
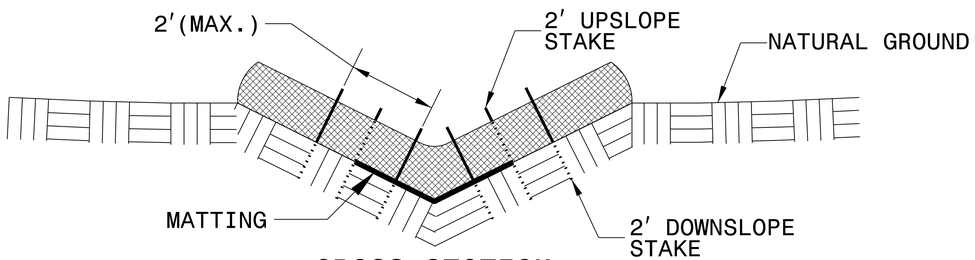
PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	EC-2A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

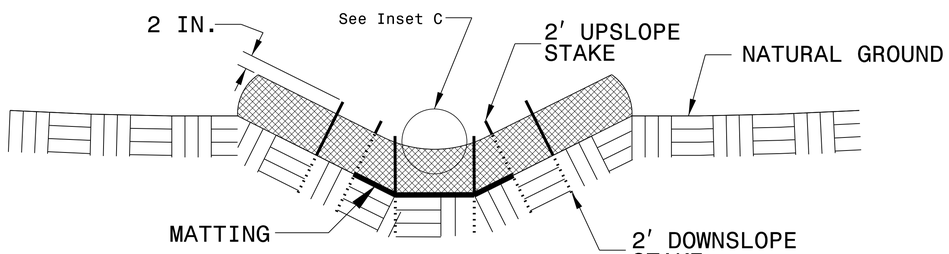
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

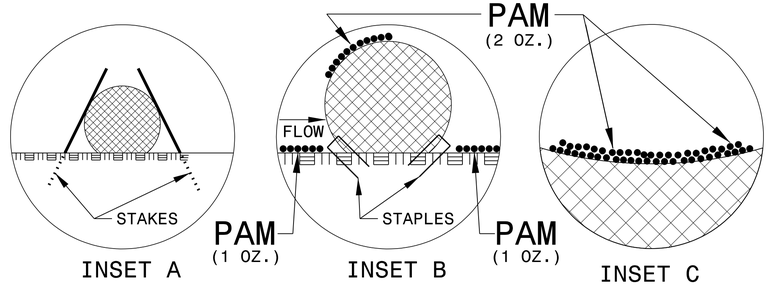
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

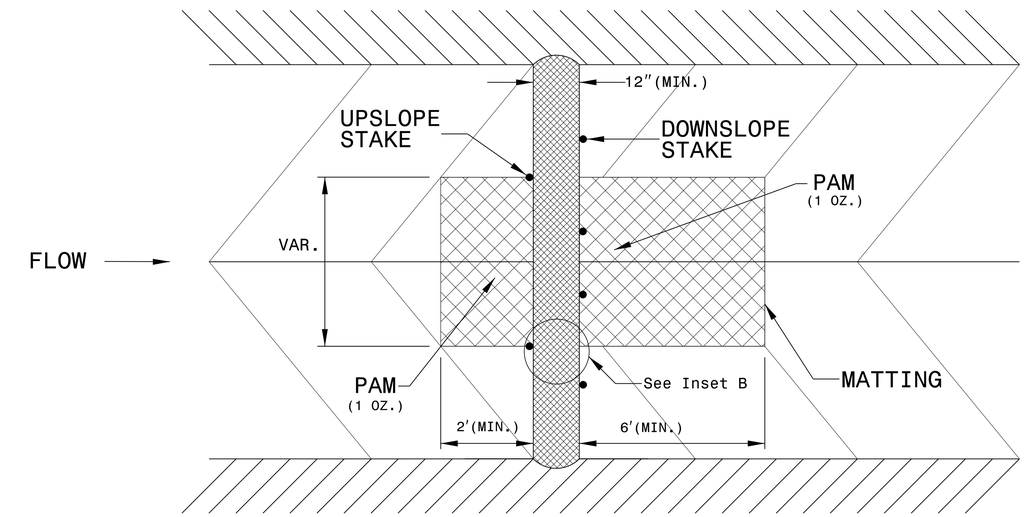
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

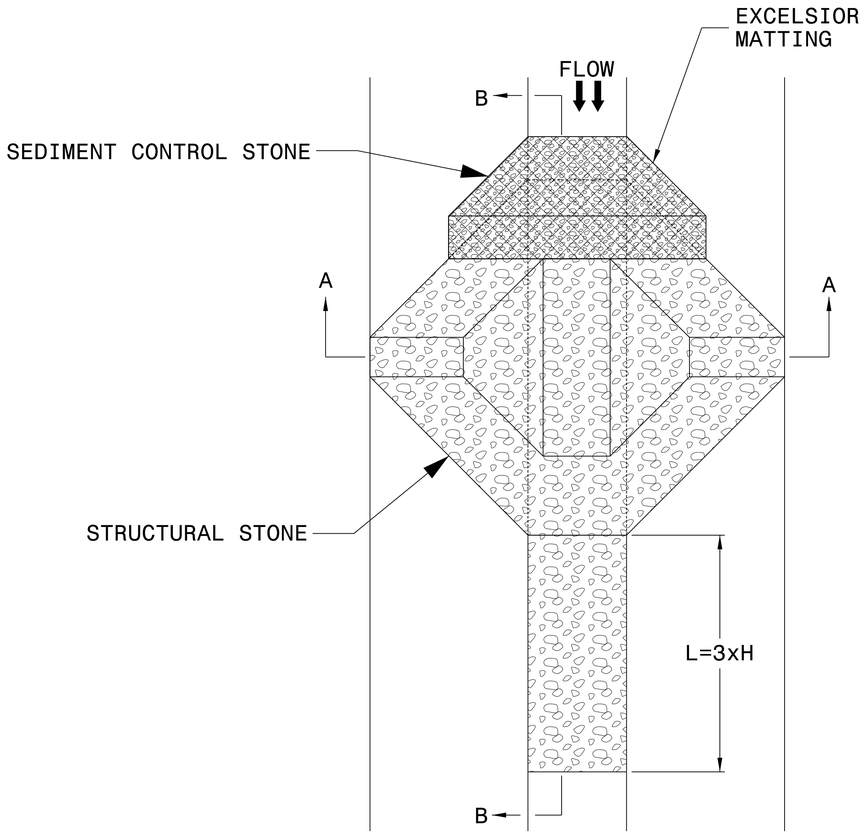




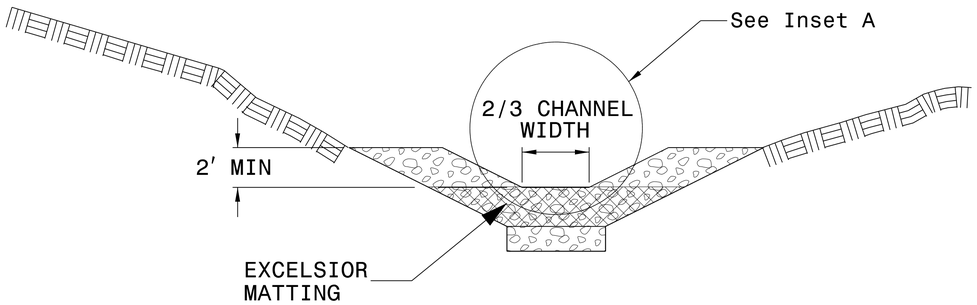
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	EC-2B

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



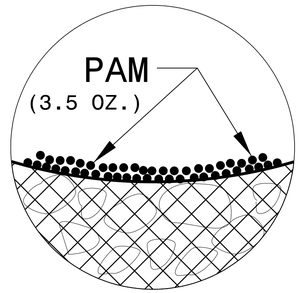
SECTION A-A

NOTES

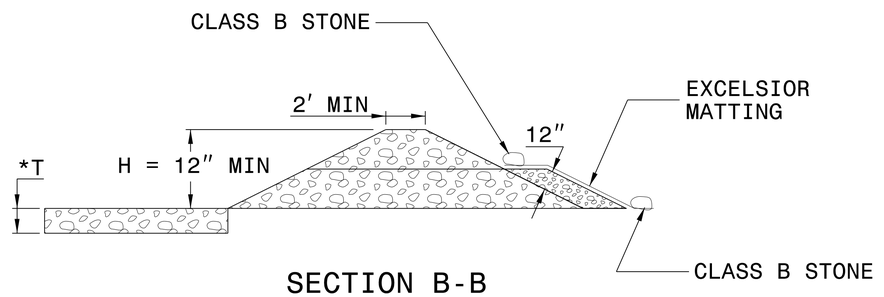
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

*T = 12" MIN., 18" MAX.

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

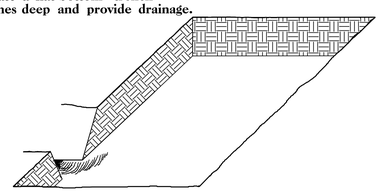
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5111AD	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

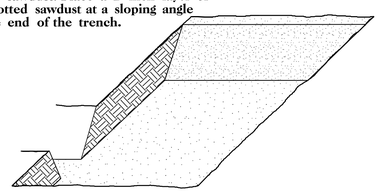
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

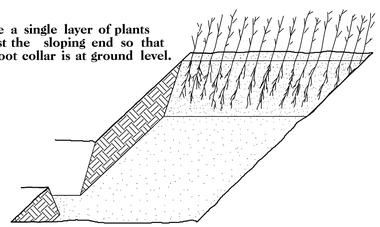
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



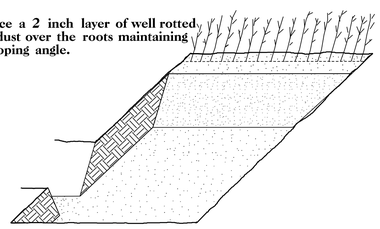
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

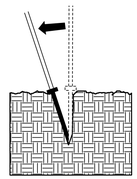


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

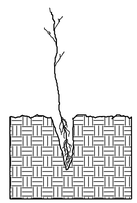


6. Repeat layers of plants and sawdust as neeessary and water thoroughly.

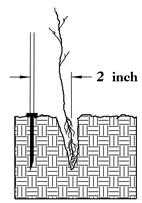
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



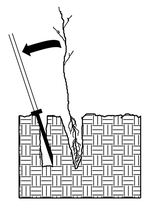
1. Insert planting bar as shown and pull handle toward planter.



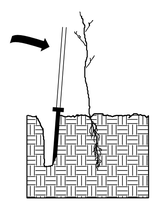
2. Remove planting bar and place seedling at correct depth.



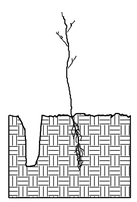
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

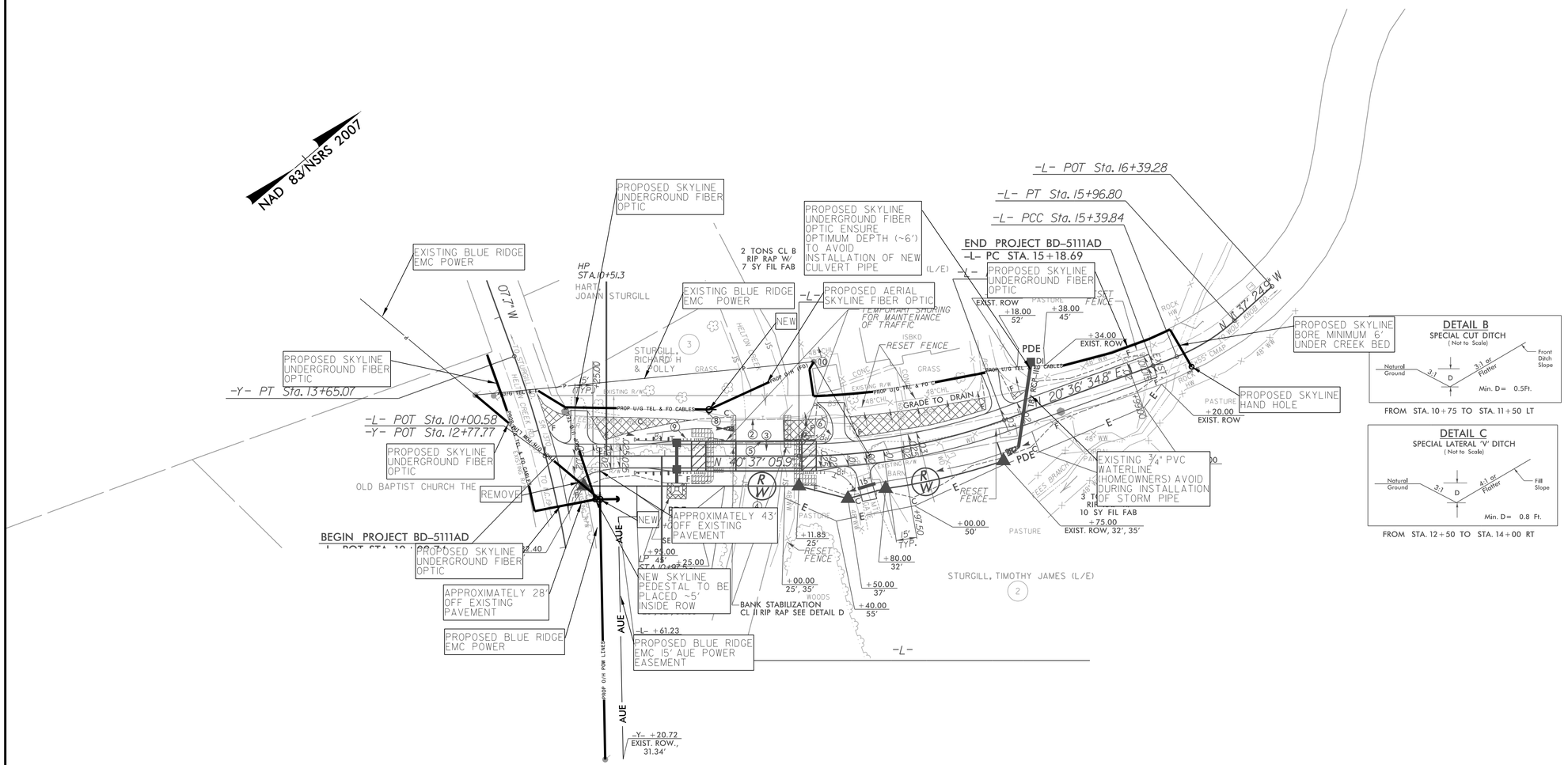
REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

PROJECT REFERENCE NO.	SHEET NO.
BD-5111AD	UO-1

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 10+75 TO STA. 11+50 LT

DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 12+50 TO STA. 14+00 RT

NOTES:

1.SKYLINE TELEPHONE CABLES ARE TO BE ABANDONED IN PLACE

UTILITY OWNERS ON PROJECT

SKYLINE – TELEPHONE AND FIBER OPTIC

BLUE RIDGE EMC – POWER

PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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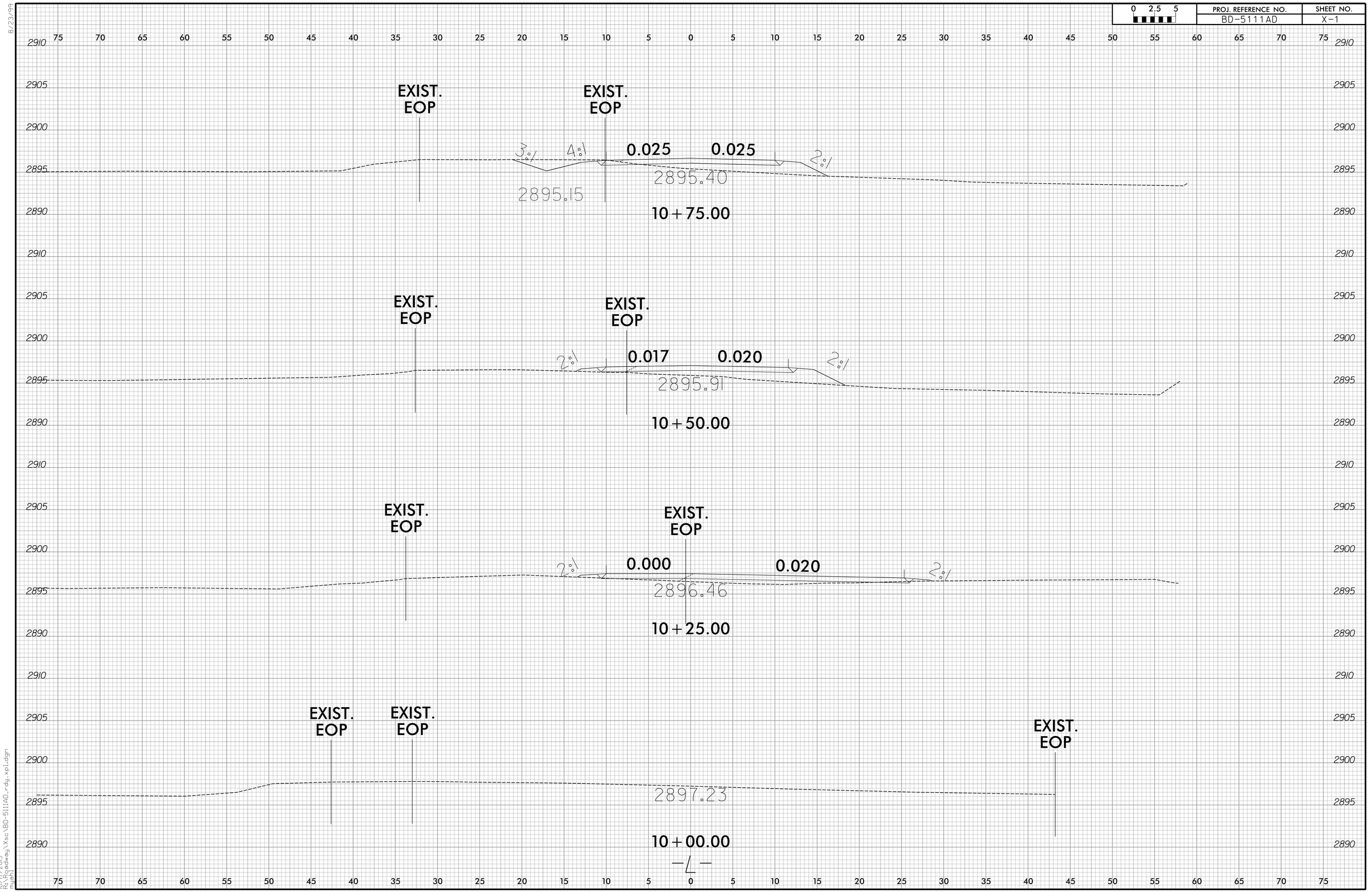
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5111AD	X-1



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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
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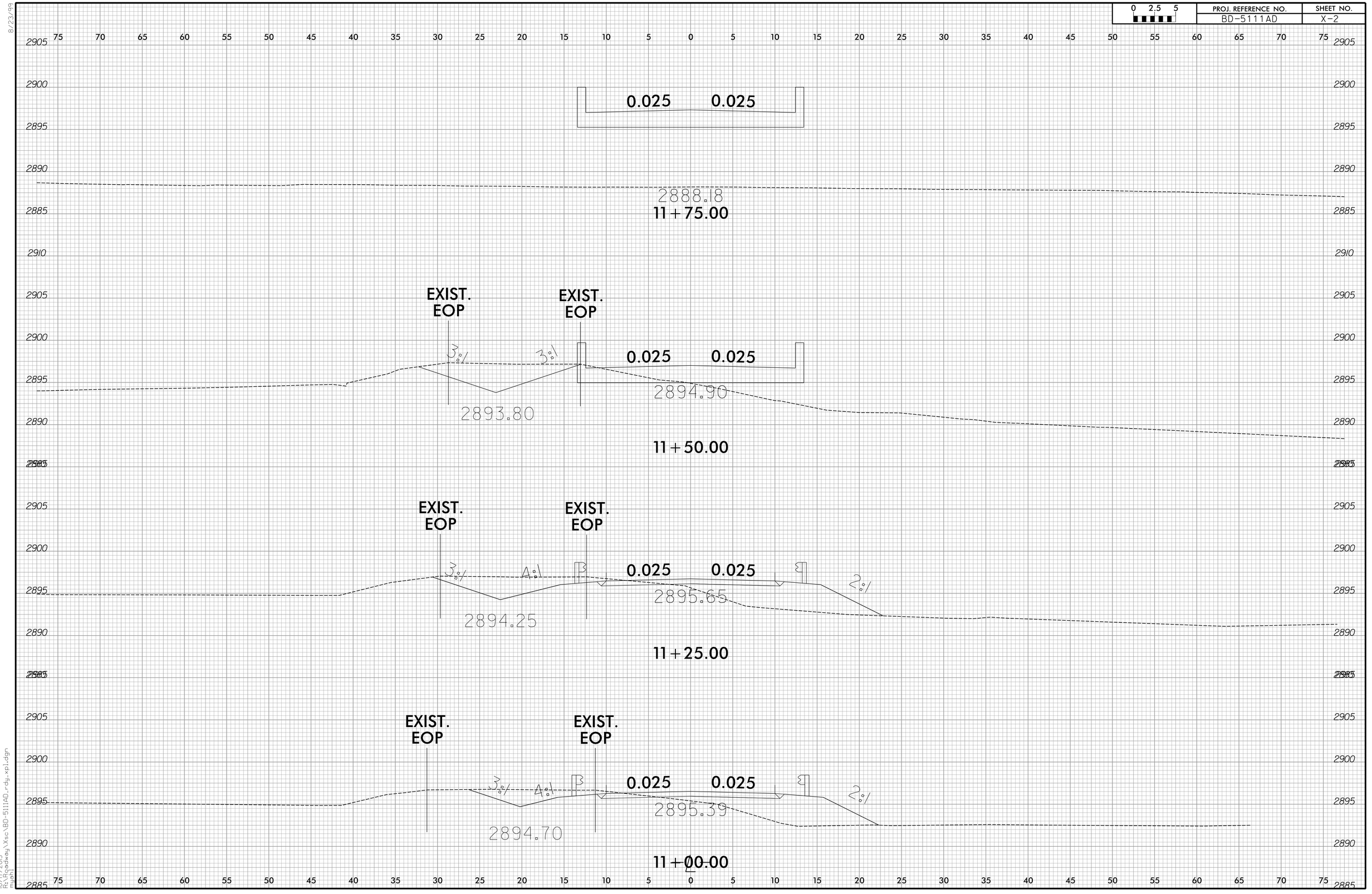

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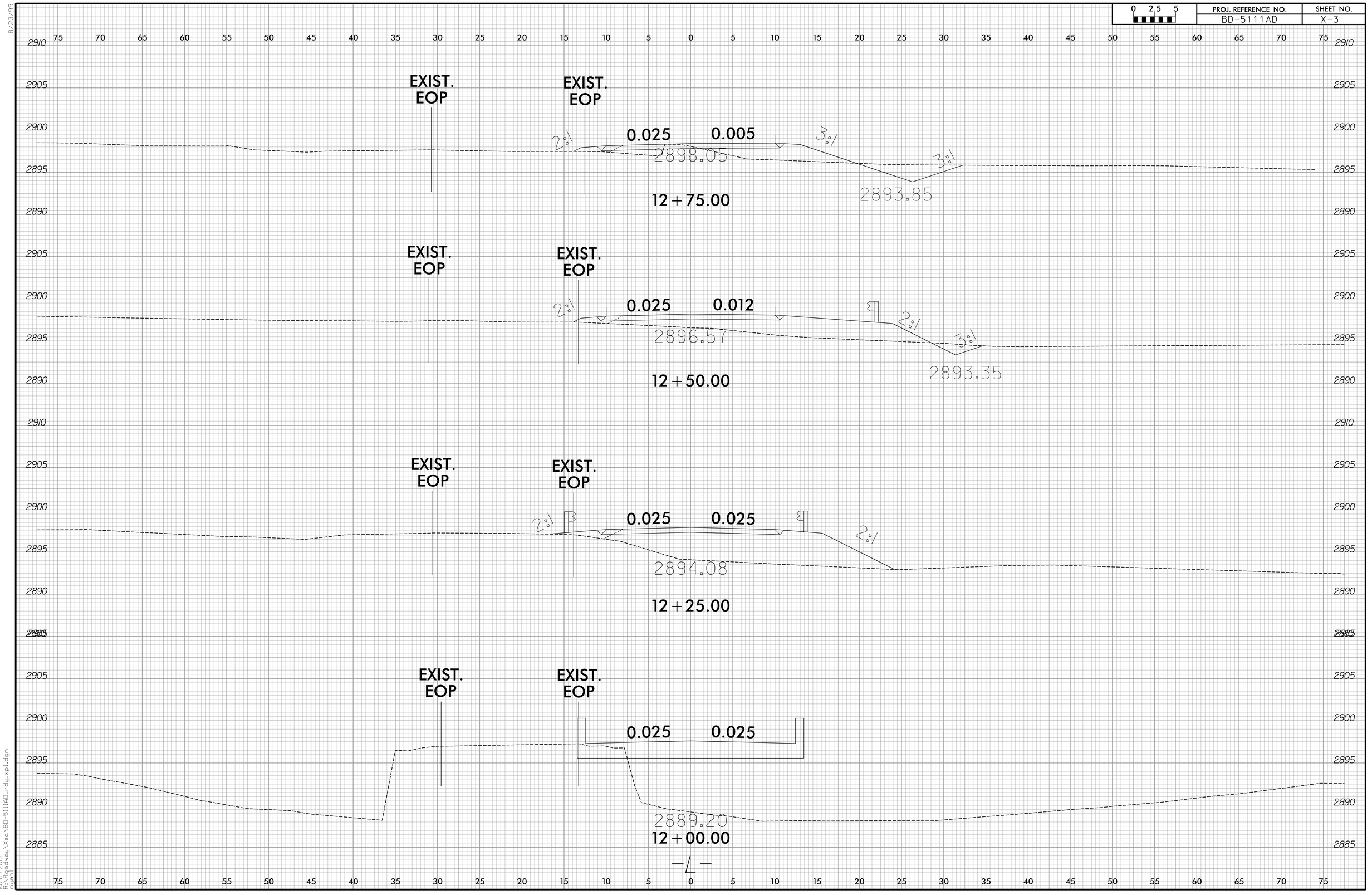
mahl

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5111AD	X-3



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mujahid

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5111AD	X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2910 2905 2900 2895 2890

EXIST. EOP

EXIST. EOP

2% 0.030 0.030 3:1 3:1

2898.14

2895.02

13+75.00

EXIST. EOP

EXIST. EOP

2% 0.030 0.030 3:1 3:1

2897.64

2894.93

13+50.00

EXIST. EOP

EXIST. EOP

2% 0.030 0.030 3:1 3:1

2897.19

2894.85

13+25.00

EXIST. EOP

EXIST. EOP

2% 0.025 0.022 3:1 3:1

2897.78

2894.35

13+00.00

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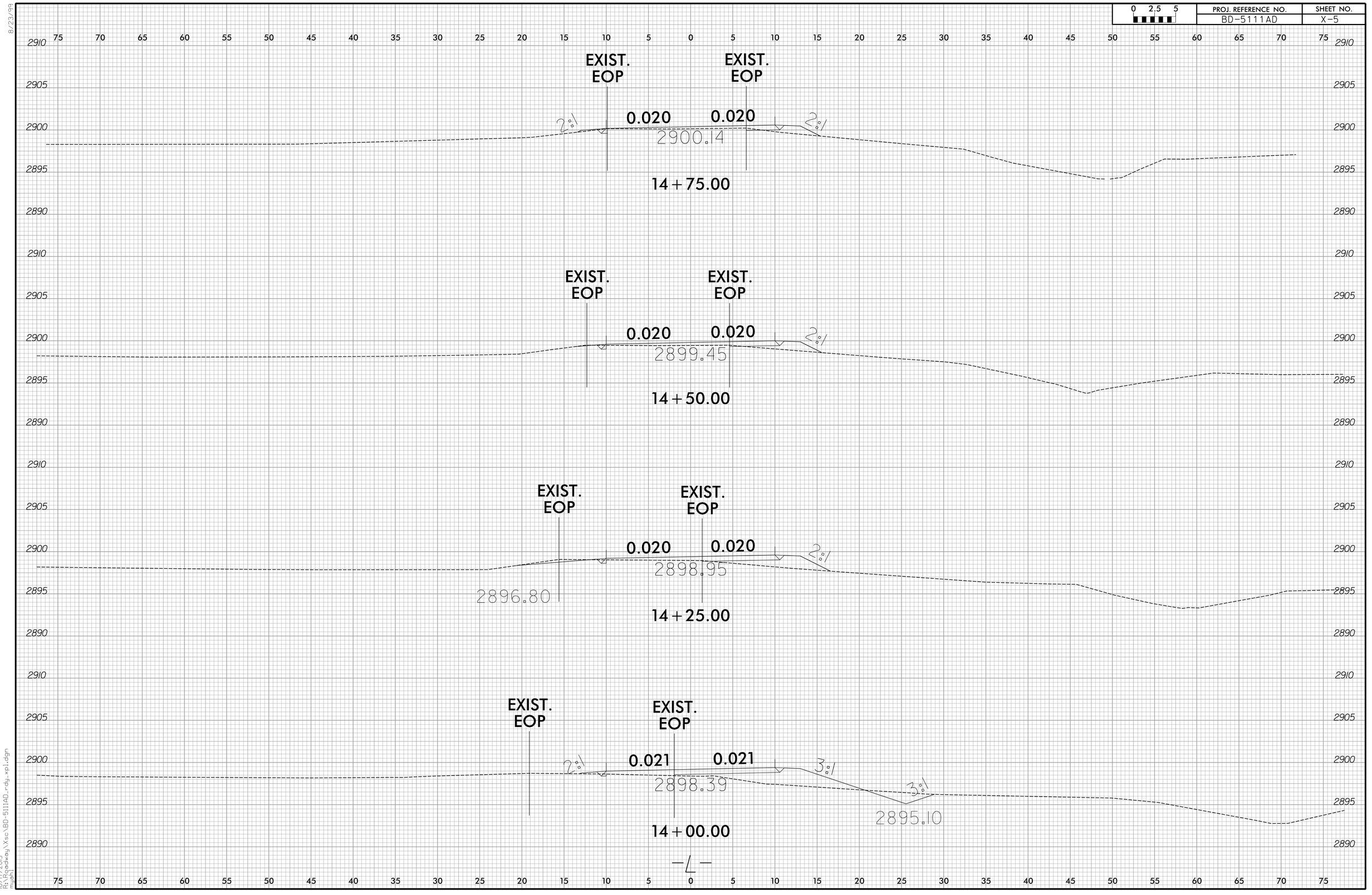
mjahl

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5111AD	X-5



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mujahid

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5111AD	X-6

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2925
2920
2915
2910
2905
2900
2895
2890

EXIST. EOP

EXIST. EOP

2902.21

15+25.00

EXIST. EOP

EXIST. EOP

2%

0.019

0.020

2%

2901.07

15+00.00

10/17/2013
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mujahid