09/08/99

TIP PROJECT: BD-5109AC

CONTRACT: DI00124

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5109AC	1	

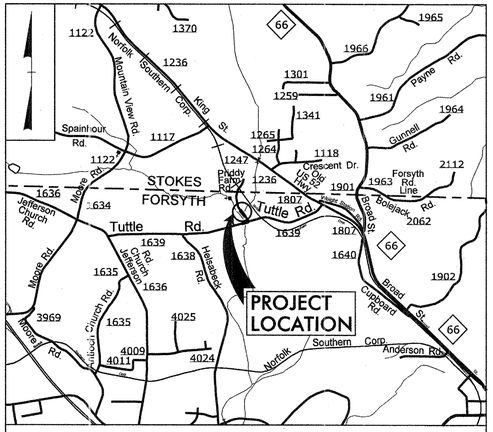
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45355.1.29	BRZ-1893(1)	PE
45355.2.29	BRZ-1893(1)	R/W, UTILITIES
17BP.9.R.64		CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

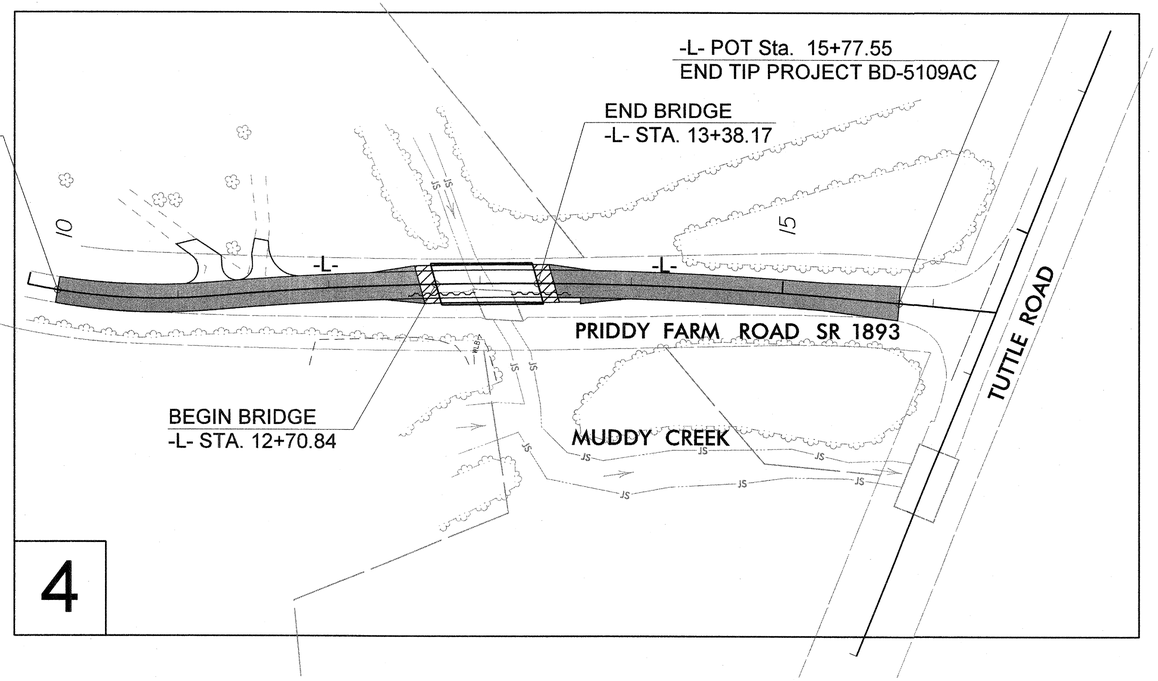
LOCATION: REPLACE EXISTING BRIDGE NO. 283 OVER MUDDY CREEK ON SR 1893 PRIDDY FARM RD.

TYPE OF WORK: GRADING, DRAINAGE, WIDENING, PAVING AND STRUCTURE.



VICINITY MAP

PART 2 OF 2



NAD 83
NC GRID

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 170
V = 35 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BD-5109AC	=	0.093 MI
LENGTH STRUCTURE TIP PROJECT BD-5109AC	=	0.013 MI
TOTAL LENGTH TIP PROJECT BD-5109AC	=	0.106 MI

PLANS PREPARED BY:
PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 13, 2015

LETTING DATE:
MARCH 23, 2016

NCDOT CONTACT: MATT JONES, PE
DIVISION BRIDGE - PROGRAM MANAGER

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh NC, 27610

TIM HAYES, PE
PROJECT ENGINEER

LAUREN WILSON, EI
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES D.N. HEAFNER

SIGNATURE: 2-29-16

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19583 ENGINEER TIMOTHY SCOTT HAYES P.E.

SIGNATURE: 2/29/16

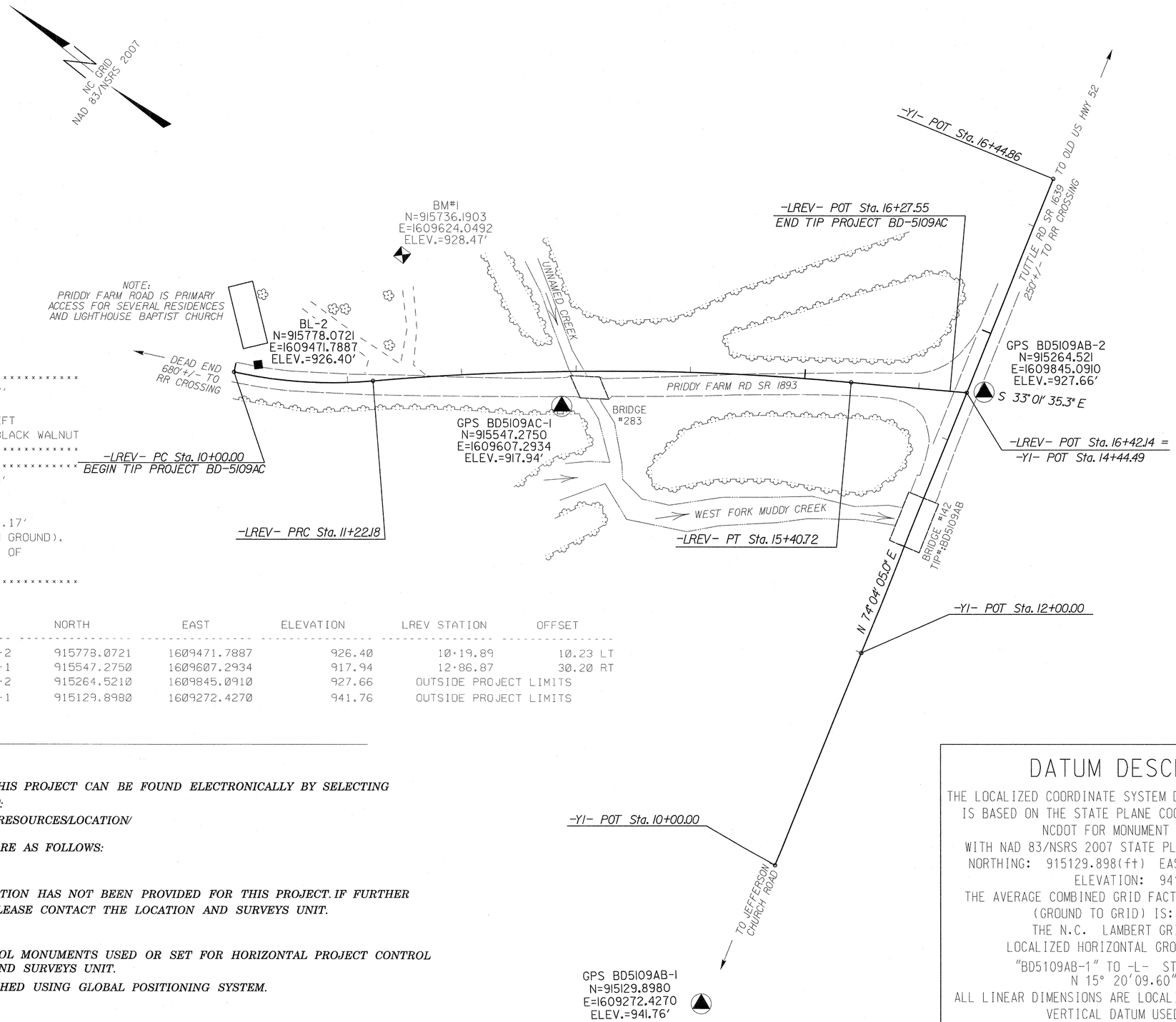
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

5:06:09 PM
BD-5109AC_rdy_tsh.dgn
2/29/2016

6/2/9

PROJECT REFERENCE NO.	SHEET NO.
BD5109AC	1C-1
Location and Surveys	

SURVEY CONTROL SHEET BD5109AC




```
**********************************************
BM#1       ELEVATION = 928.47'
N 915736       E 1609624
LREV STATION 11+56.00 106' LEFT
RR SPIKE IN SOUTH ROOT OF A BLACK WALNUT
**********************************************
**********************************************
BM#2       ELEVATION = 927.66'
N 915265       E 1609845
LREV STATION 16+42.00
S 39°55'31.66" E  DIST     15.17'
GPS BD5109AB-2(SET FLUSH WITH GROUND).
POINT LIES 4.3' SOUTH OF EDGE OF
TUTTLE ROAD.
**********************************************
```

BL_AC

POINT	DESC.	NORTH	EAST	ELEVATION	LREV STATION	OFFSET
AC2	BL-2	915778.0721	1609471.7887	926.40	10+19.89	10.23 LT
AC1	GPS BD5109AC-1	915547.2750	1609607.2934	917.94	12+86.87	30.20 RT
2	GPS BD5109AB-2	915264.5210	1609845.0910	927.66	OUTSIDE PROJECT LIMITS	
1	GPS BD5109AB-1	915129.8980	1609272.4270	941.76	OUTSIDE PROJECT LIMITS	

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   BD5109AC_LS_CONTROL.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

▲ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5109AB-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 915129.898(ft) EASTING: 1609272.427(ft) ELEVATION: 941.76(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999867881
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109AB-1" TO -L- STATION 10+00.00 IS N 15° 20' 09.60" E 685.33'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

10:09:08 AM
BD5109AC_Ls_1c.dgn
2/24/2016

PROJECT REFERENCE NO.	SHEET NO.
BD5109AC	1C-2
DIVISION NINE DDC	

SURVEY CONTROL SHEET BD5109AC

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+70.00	-30.00	915748.3092	1609513.8733
L	11+22.18	-50.00	915724.5946	1609559.1533
L	15+40.72	-50.00	915388.4382	1609821.9997
L	16+26.13	-50.00	915316.8278	1609868.5510

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+20.00	-50.00	915650.2159	1609625.7742
L	12+20.00	-70.00	915663.2534	1609640.9408
L	13+40.00	43.79	915497.8581	1609629.1870
L	13+40.00	60.00	915487.9161	1609616.3782
L	14+44.00	-72.00	915482.8363	1609784.4807
L	14+44.00	-85.00	915490.3550	1609795.0859
L	14+53.00	45.00	915407.9539	1609694.1287
L	14+53.00	60.00	915399.3244	1609681.8595
L	14+54.00	-85.00	915481.8959	1609801.0567
L	14+54.00	-50.00	915461.7723	1609772.4204
L	14+63.00	60.00	915391.3378	1609687.4521
L	14+63.00	37.52	915404.1955	1609705.8956

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	915790.8236	1609453.6822
PRC	11+22.18	915690.4830	1609522.5966
PT	15+40.72	915361.1868	1609780.0787
POT	16+42.14	915276.1535	1609835.3559

DATUM DESCRIPTION

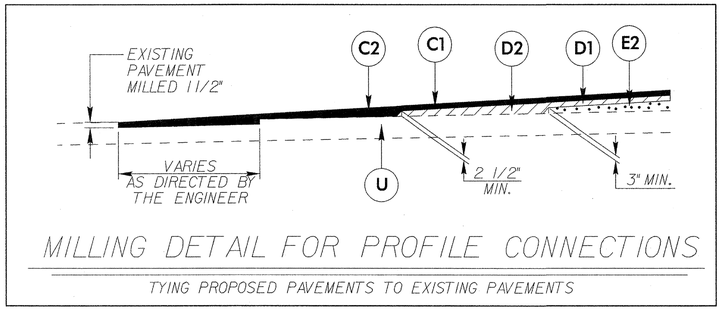
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5109AB-1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 915129.898(ft) EASTING: 1609272.427(ft)
ELEVATION: 941.76(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999867881
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109AB-1" TO -L- STATION 10+00.00 IS N 15° 20'09.60" E 685.33'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

6/2/99

PAVEMENT SCHEDULE

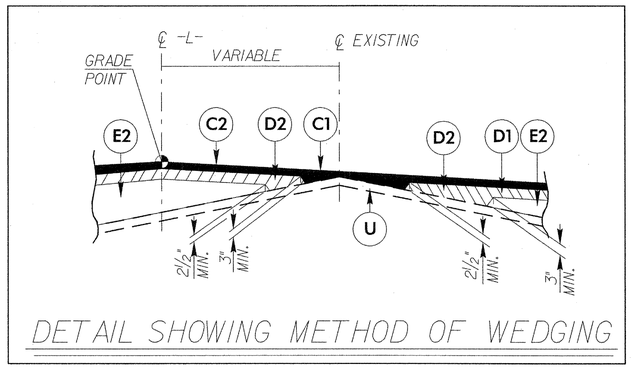
C1	PROPOSED APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD. IN EACH OF TWO LAYERS.
C2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2" IN DEPTH.
D1	PROPOSED APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD.
D2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 1/2" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.

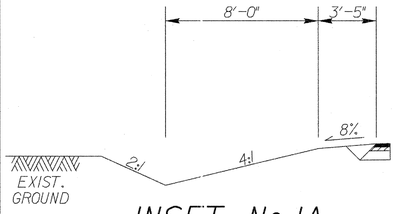


MILLING DETAIL FOR PROFILE CONNECTIONS

TYING PROPOSED PAVEMENTS TO EXISTING PAVEMENTS

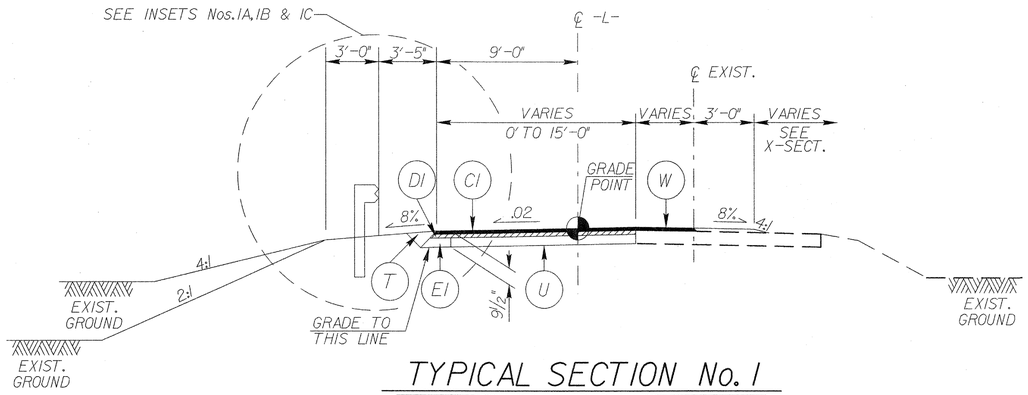


DETAIL SHOWING METHOD OF WEDGING



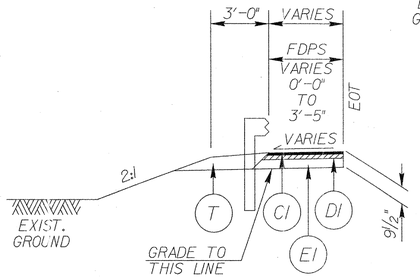
INSET No.1A

(SEE PLANS FOR DITCH LOCATION)



TYPICAL SECTION No. 1

TRANSITION FROM EXISTING TO T.S.NO.1 -L- STA.10+20.00 TO -L- STA.10+70.00
FROM -L- STA.10+20.00 TO -L- STA.12+70.84 (BEGIN BRIDGE)
FROM -L- STA.13+38.17 (END BRIDGE) TO -L- STA.15+27.55
TRANSITION FROM T.S.NO.1 TO EXISTING -L- STA.15+27.55 TO -L- STA.15+77.55

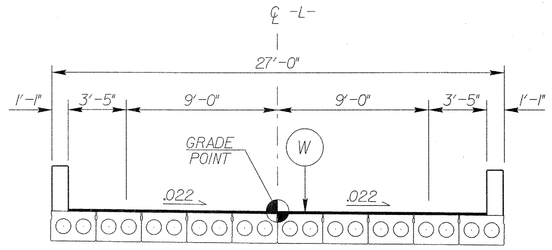


INSET No.1B

(SEE PLANS FOR PAVED SHOULDER LOCATION)

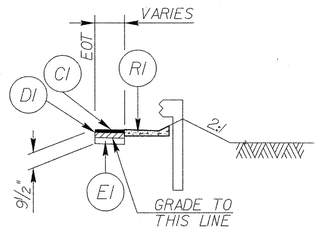
USE INSET No.1A IN CONJUCTION w/TYPICAL SECTION No.1 AS FOLLOWS:

FROM -L- STA.12+29.32 TO -L- STA.12+56.85 LT.
FROM -L- STA.12+35.69 TO -L- STA.12+63.05 RT.
FROM -L- STA.13+45.62 TO -L- STA.13+73.15 LT.
FROM -L- STA.13+66.70 TO -L- STA.13+98.34 LT.



TYPICAL SECTION No. 2

FROM -L- STA.12+70.84 (BEGIN BRIDGE) TO -L- STA.13+38.17 (END BRIDGE)



INSET No.1C

(SEE PLANS FOR C&G LOCATION)

USE INSET No.1B IN CONJUCTION w/TYPICAL SECTION No.1 AS FOLLOWS:

FROM -L- STA.13+52.27 TO -L- STA.13+66.70

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19563 ENGINEER TIMOTHY SCOTT HAYES
2/29/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601

10:26:29 AM
BD-5109AC_Rdy_typ.dgn
2/29/2016

6/2/99

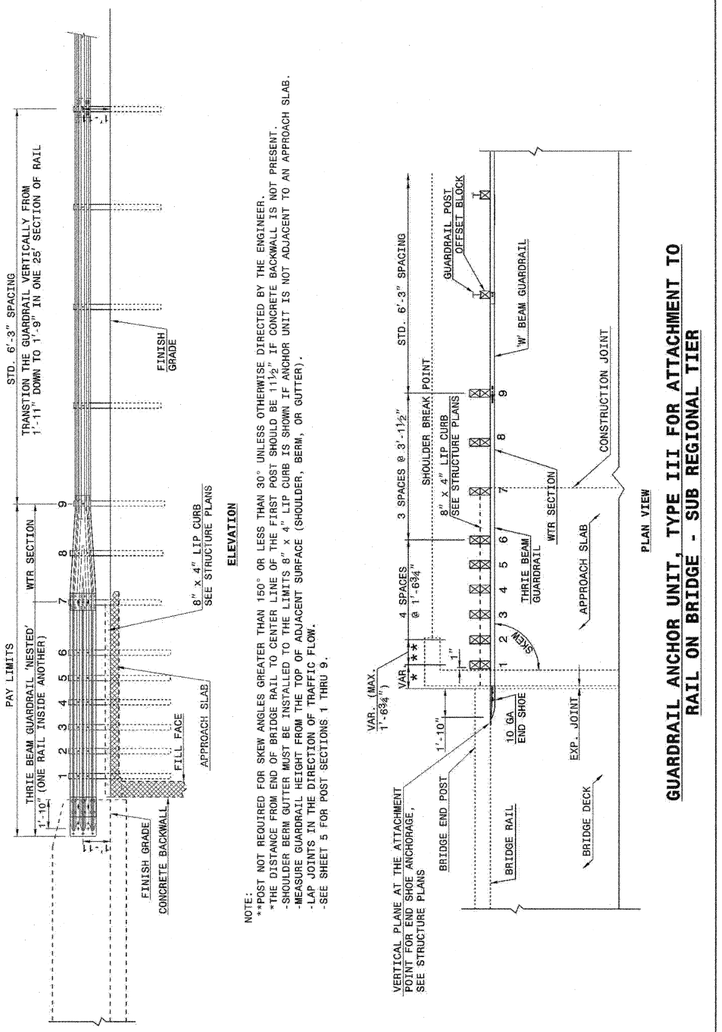
PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	2C-1

PROJECT REFERENCE NO.	SHEET NO.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 **862d03**



NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

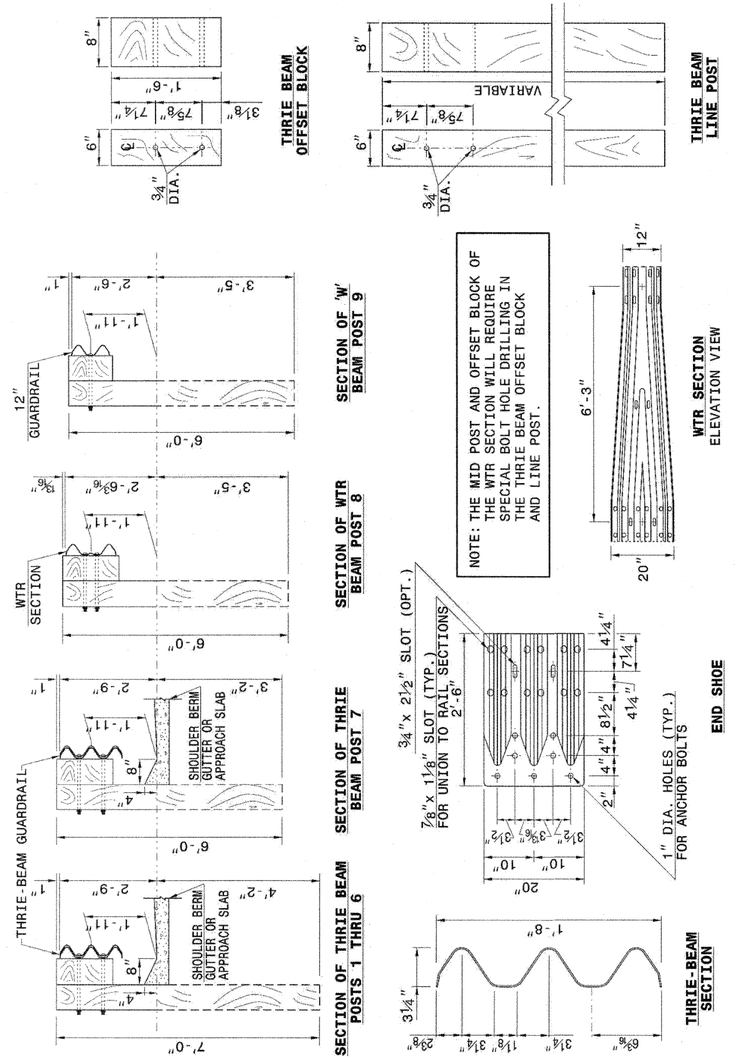
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 **862d03**

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7 **862d03**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III	SHEET 3 OF 7 **862d03**

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY:	J HOWERTON	DATE:	06-22-12
MODIFIED BY:		DATE:	
CHECKED BY:		DATE:	
FILE SPEC.:			

40545.PM
BD-5109AC_Rdy_2C-1.dgn
6/29/2016

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

Docusigned by: Shane C. Clark 1F4EB7E6D6AD4EA...

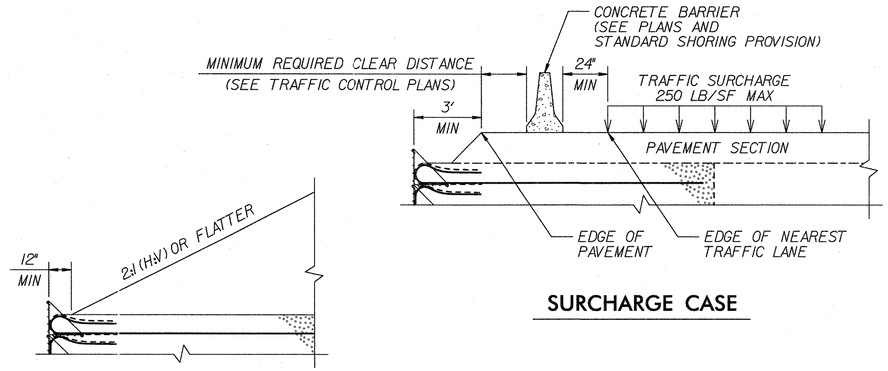
2/23/2016

SIGNATURE DATE

ENGINEER

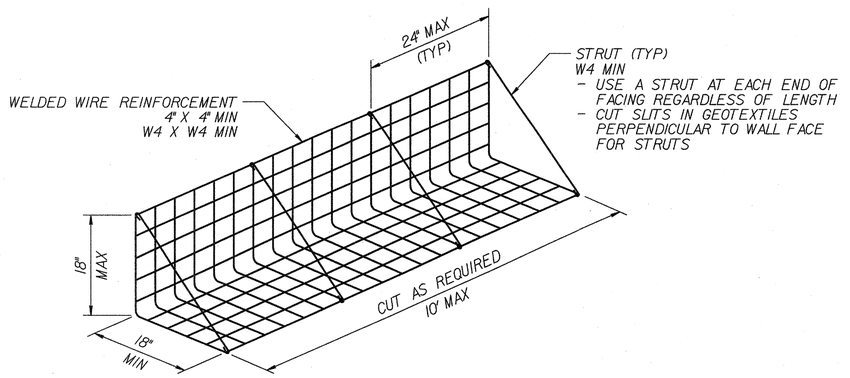
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

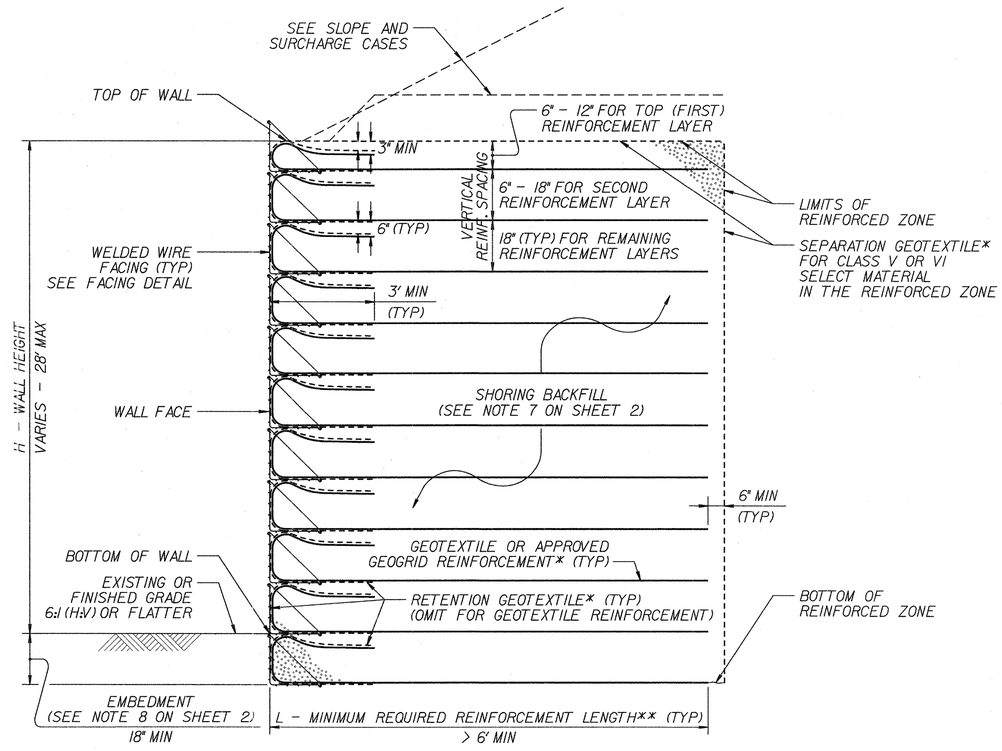


SURCHARGE CASE

SLOPE CASE

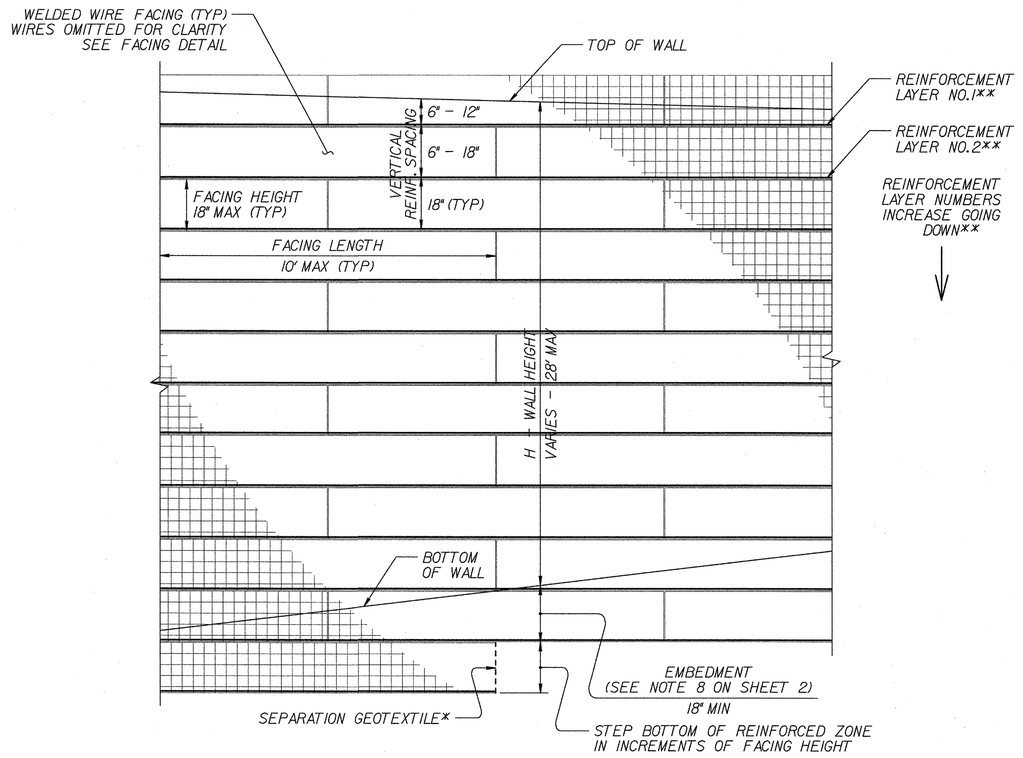


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C. CLARK

Shane C. Clark

1F4EB7E6D6AD4EA...

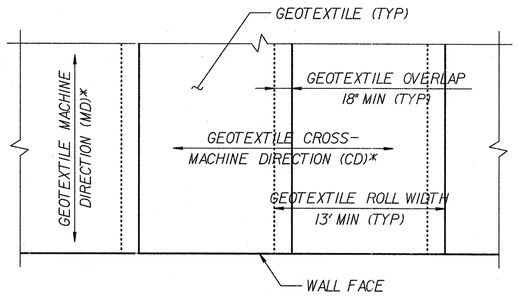
2/23/2016

SIGNATURE DATE

ENGINEER

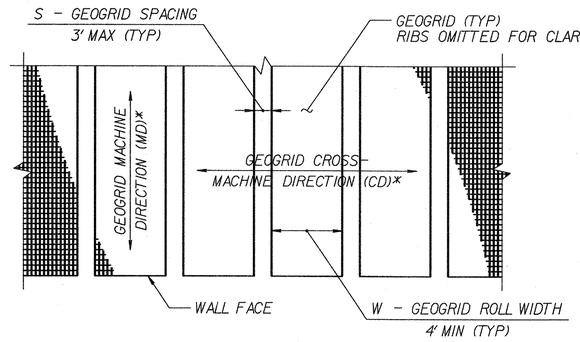
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



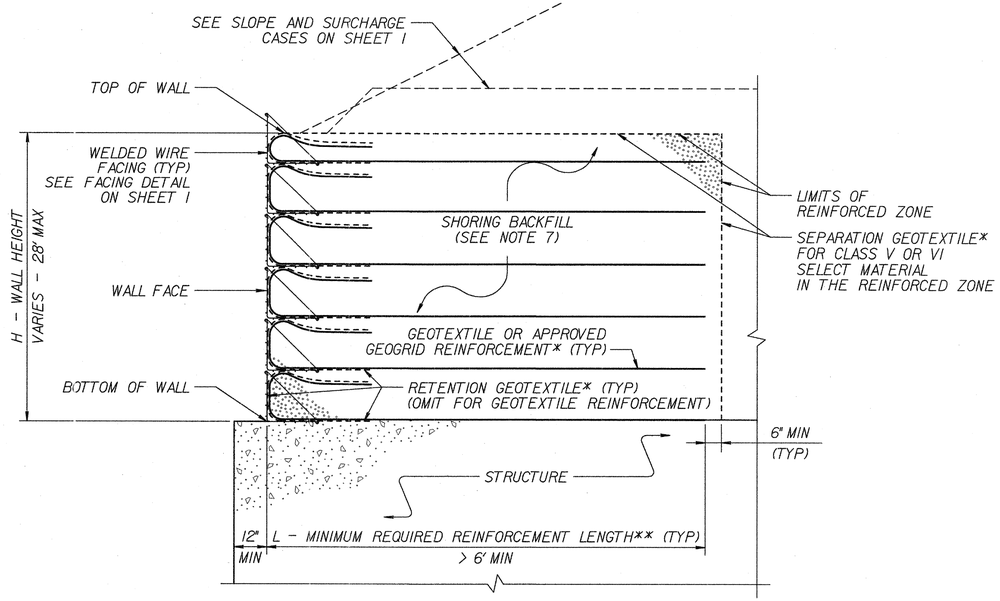
GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)

***SEE NOTE 12.**



TEMPORARY WALL ON STRUCTURE DETAIL

***SEE GEOSYNTHETIC PLACEMENT DETAILS.**

****SEE REINFORCEMENT TABLES ON SHEET 3.**

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:
    connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
    connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

Shane C. Clark

1F4E87E8D6AD4EA...

2/23/2016

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H – WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20′ > 0 TO 10 FOR H ≥ 20′	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20′ > 10 FOR H ≥ 20′	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 – 4	3
4 – 5.5	4
5.5 – 7	5
7 – 8.5	6
8.5 – 10	7
10 – 11.5	8
11.5 – 13	9
13 – 14.5	10
14.5 – 16	11
16 – 17.5	12
17.5 – 19	13
19 – 20.5	14
20.5 – 22	15
22 – 23.5	16
23.5 – 25	17
25 – 26.5	18
26.5 – 28	19
28 – 29.5	20

***BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.**

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
***SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350 TL-2	M-350	III	CAT-1	VI MOD	TYPE III SHOP CURVED	AT-1	EA	G	NG				
-L-	12+16.41	12+69.60	LT.	50'				12+69.60	3'-11"	6'-11"							1		1											
-L-	12+22.19	12+75.90	RT.	50'			12+75.90		3'-11"	6'-11"							1		1											
-L-	13+32.78	13+85.97	LT.	50'			13+32.78		3'-11"	6'-11"							1		1											
-L-	13+39.79	13+93.49	RT.	50'				13+39.79	3'-11"	6'-11"							1		1											
	LESS ANCHOR DEDUCTIONS																													
	TYPE 350 TL-2	4 @ 25.00'	=	100'																										
	TYPE III	4 @ 18.75'	=	75'																										
		TOTAL		25'													4		4											

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
10+20.00	12+70.84	55	274	219	0
13+38.17	15+77.55	61	174	113	0
SUBTOTALS:		116	448	332	0
WASTE TO REPLACE BORROW				0	0
PROJECT TOTALS:		116	448	332	0
SAY:		120		340	

NOTE:
1) APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."
2) EARTHWORK QUANTITIES EXCLUDE VOLUMES FOR "UNCLASSIFIED BRIDGE EXCAVATION".

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- RT.	13+51.88	13+66.60	14.7'
		TOTAL:	14.7'
		SAY:	15'

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	10+85.41	13+03.34	RT	204
-L-	13+20.57	15+69.51	RT	281
			TOTAL:	485
			SAY:	490

12/06/07

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12/06/07

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	3D-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"
13+64.50	RT	0403		918.78											
		0403	0404		915.53	915.45			16						
11+19.75	LT	0401													
11+60.00	LT	0402													
TOTALS									16						

STATION	C.S. PIPE (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15" CLASS III	18"	24"	30"	36"	42"	48"
13+64.50																					
11+19.75																					
11+60.00																					
TOTALS																					

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	LIN. *FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	
13+64.50						1							
11+19.75		40											
11+60.00		36											
TOTALS		76				1							

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.35							CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
13+64.50								1			1											
11+19.75																					50	DRIVEWAY PIPE: REMOVE EXIST. 18" RCP
11+60.00																						DRIVEWAY PIPE
TOTALS								1													50	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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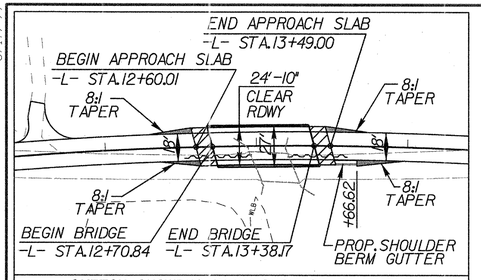
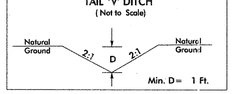


SKETCH SHOWING DIMENSION OF PAVEMENT AND SHOULDERS IN RELATION TO PROPOSED BRIDGE WIDTH

PAVED SHLD.

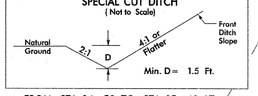
DETAIL A
TAIL 'V' DITCH
(Not to Scale)



Min. D= 1 Ft.

FROM -L- STA. 13+39 TO STA. 13+63 RT

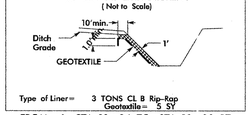
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM STA. 14+50 TO STA. 15+40 LT

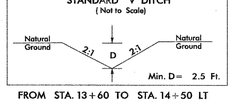
DETAIL B
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 3 TONS CL B Rip-Rap
Geotextile= 5 SY

FROM -L- STA. 13+34 TO STA. 13+39 RT

DETAIL D
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 2.5 Ft.

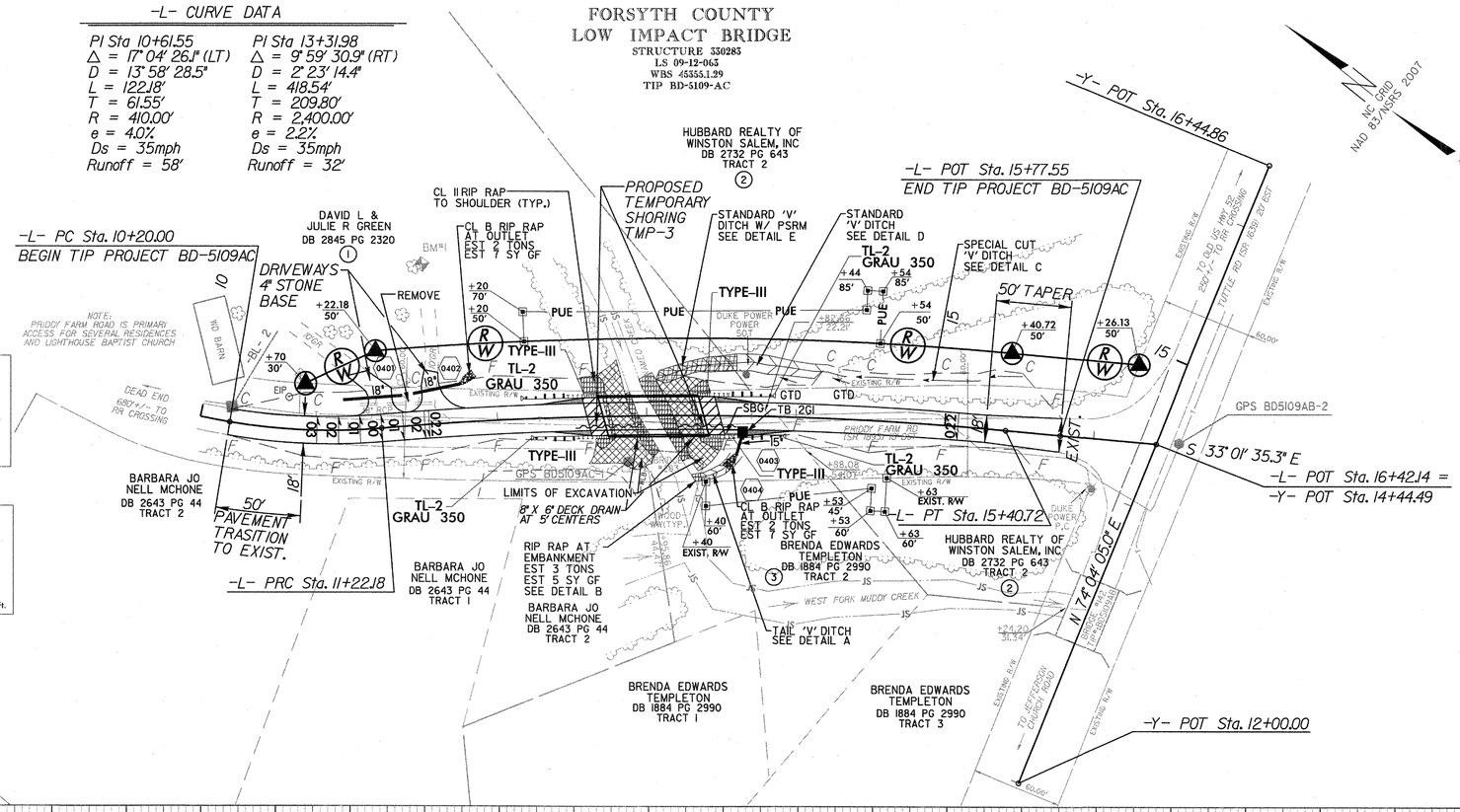
FROM STA. 13+60 TO STA. 14+50 LT

-L- CURVE DATA

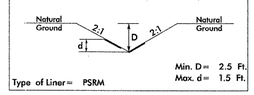
PI Sta 10+61.55	PI Sta 13+31.98
Δ = 17° 04' 26.1" (LT)	Δ = 9° 59' 30.9" (RT)
D = 13° 58' 28.5"	D = 2° 23' 14.4"
L = 122.18'	L = 418.54'
T = 61.55'	T = 209.80'
R = 410.00'	R = 2,400.00'
e = 4.0%	e = 2.2%
Ds = 35mph	Ds = 35mph
Runoff = 58'	Runoff = 32'

FORSYTH COUNTY
LOW IMPACT BRIDGE

STRUCTURE 330285
LS 09-12-063
WBS 45555.1.29
TIP BD-5109-AC

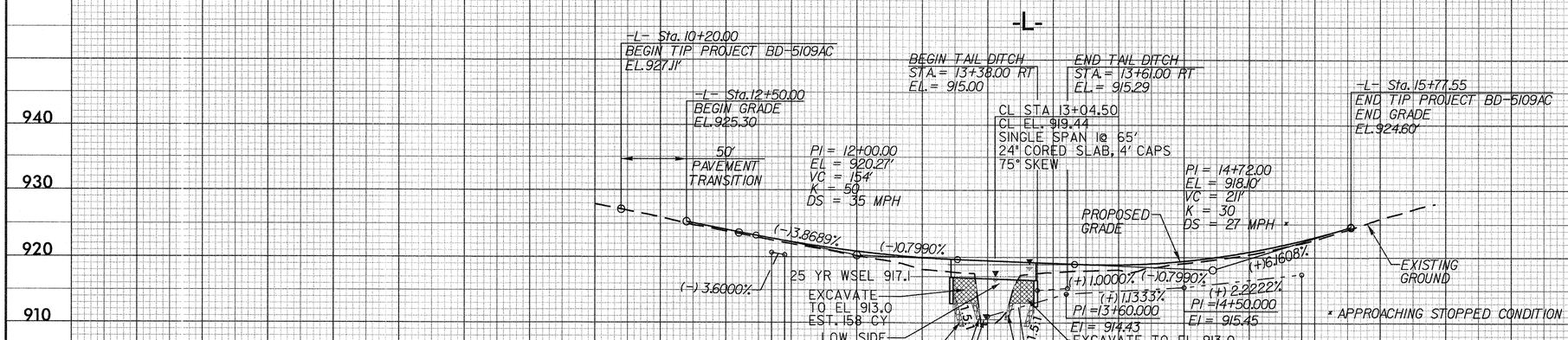


DETAIL E
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 2.5 Ft.
Max. d= 1.5 Ft.
Type of Liner= PSRM

FROM STA. 13+00 TO STA. 13+60 LT



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 917.1	FT
BASE DISCHARGE	= 1600	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 918.87	FT
OVERTOPPING DISCHARGE	= 1600	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 919.1	FT

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19683 ENGINEER TIMOTHY SCOTT HAYES
2/29/16

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W. HEARNER
2-29-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

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BD-5109AC

TIP PROJECT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	TMP-1

TRAFFIC MANAGEMENT PLAN

FORSYTH COUNTY

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE 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
1130.01	DRUM
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPE
1262.01	GUARDRAIL END DELINEATION

INDEX OF SHEETS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- NORTH ARROW
- PROPOSED PVMT. ----- EXIST. PVMT.
- WORK AREA
- MILL AND WEDGE
- REMOVAL OF EXISTING PAVEMENT

TRAFFIC CONTROL DEVICES

- TYPE I BARRICADE
- TYPE II BARRICADE
- TYPE III BARRICADE
- CONE
- DRUM / SKINNY DRUM
- FLASHING ARROW PANEL (TYPE C)
- STATIONARY SIGN
- PORTABLE SIGN
- STATIONARY OR PORTABLE SIGN
- CRASH CUSHION
- CHANGEABLE MESSAGE SIGN
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- POLICE
- FLAGGER

PAVEMENT MARKINGS

- CRYSTAL/CRYSTAL PAVEMENT MARKER
- YELLOW/YELLOW PAVEMENT MARKER
- CRYSTAL/RED PAVEMENT MARKER
- PAVEMENT MARKING SYMBOLS

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.

TRAFFIC PATTERN ALTERATIONS

C) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

D) 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.

E) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN ON THIS SHEET.

F) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

G) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

H) INSTALL AND ACTIVATE CMS SIGNS 2 WEEKS PRIOR TO ROAD CLOSURE.

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

J) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING
SR 1893 (PRIDDY FARM ROAD)	PAINT

K) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

L) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.

M) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19563 ENGINEER TIMOTHY SCOTT HAYES
12/29/16

PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

TIM HAYES, PE — *PROJECT ENGINEER*

ERIC MISAK — *PROJECT DESIGN*

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12/29/2016

TEMPORARY SHORING DATA

PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	TMP-2

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PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

NOTES FOR TEMPORARY SHORING No. 1

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

AFTER SURVEYING, IF TOPOGRAPHY ALLOWS AND APPROVED BY THE ENGINEER, USE A 1.5:1 (H:V) SLOPE OR FLATTER INSTEAD OF TEMPORARY SHORING FROM STATION 12+60 ± -L-, 5.0' RT ±, TO STATION 12+95 ± -L-, 5.0' RT ±AS SHOWN IN THE PLANS.

DESIGN TEMPORARY SHORING FROM STATION 12+60 ± -L-, 5.0' RT ±, TO STATION 12+95 ± -L-, 5.0' RT ±, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 30 DEGREES
COHESION (C) = 0 LB/SF
GROUNDWATER ELEVATION = 909 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 12+60 ± -L-, 5.0' RT ±, TO STATION 12+95 ± -L-, 5.0' RT ±. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION 12+60 ± -L-, 5.0' RT ±, TO STATION 12+95 ± -L-, 5.0' RT ± WILL NOT PENETRATE BELOW ELEVATION 900 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION 12+60 ± -L-, 5.0' RT ±, TO STATION 12+95 ± -L-, 5.0' RT ±. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

NOTES FOR TEMPORARY SHORING No. 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

AFTER SURVEYING, IF TOPOGRAPHY ALLOWS AND APPROVED BY THE ENGINEER, USE A 1.5:1 (H:V) SLOPE OR FLATTER INSTEAD OF TEMPORARY SHORING FROM STATION 13+15 ±-L-, 5.0' RT ±, TO STATION -L- 13+49 ±-L-, 5.0' RT±AS SHOWN IN THE PLANS.

DESIGN TEMPORARY SHORING FROM STATION 13+15 ±-L-, 5.0' RT ±, TO STATION -L- 13+49 ± -L-, 5.0' RT±, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ)= 120 LB/CF
FRICTION ANGLE (ϕ) = 30 DEGREES
COHESION (C) = 0 LB/SF
GROUNDWATER ELEVATION = 909 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 13+15 ±-L-, 5.0' RT ±, TO STATION -L- 13+49 ±-L-, 5.0' RT±. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION 13+15 ±-L-, 5.0' RT ±, TO STATION -L- 13+49 ±-L-, 5.0' RT±WILL NOT PENETRATE BELOW ELEVATION 900 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION 13+15 ±-L-, 5.0' RT ±, TO STATION -L- 13+49 ±-L-, 5.0' RT±. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

NOTES FOR TEMPORARY SHORING No. 3

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 12+60 ±, 3.0' RT ± , TO STATION 12+70±, 3.0' RT± FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ)= 120 LB/CF
FRICTION ANGLE (ϕ)= 30 DEGREES
COHESION (C) = 0 LB/SF
GROUNDWATER ELEVATION = 909 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 12+60 ±, 3.0' RT ± , TO STATION 12+70 ±, 3.0' RT±. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION 12+60 ±, 3.0' RT ± , TO STATION 12+70 ±, 3.0' RT± WILL NOT PENETRATE BELOW ELEVATION 900 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION 12+60 ±, 3.0' RT ± , TO STATION 12+70 ±, 3.0' RT±. SEE STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

NOTES FOR TEMPORARY SHORING No. 4

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 13+38±, 3.0' RT ±, TO STATION 13+49 ±, 3.0' RT± FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ)= 120 LB/CF
FRICTION ANGLE (ϕ)= 30 DEGREES
COHESION (C) = 0 LB/SF
GROUNDWATER ELEVATION = 909 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 13+38±, 3.0' RT ±, TO STATION 13+49 ±, 3.0' RT±. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION 13+38±, 3.0' RT ±, TO STATION 13+49 ±, 3.0' RT±WILL NOT PENETRATE BELOW ELEVATION 900 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION 13+38±, 3.0' RT ±, TO STATION 13+49 ±, 3.0' RT±. SEE STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

APPROVED: DocuSigned by: Shane C. Clark DATE: 3/2/2016

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

30 15 0 30 60
PLANS

BD-5109AC
TEMPORARY SHORING DATA

SCALE:	NONE
DATE:	06/03/14
DWG. BY:	RGK
DESIGN BY:	EDM
REVIEWED BY:	

REVISIONS

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$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	TMP-3

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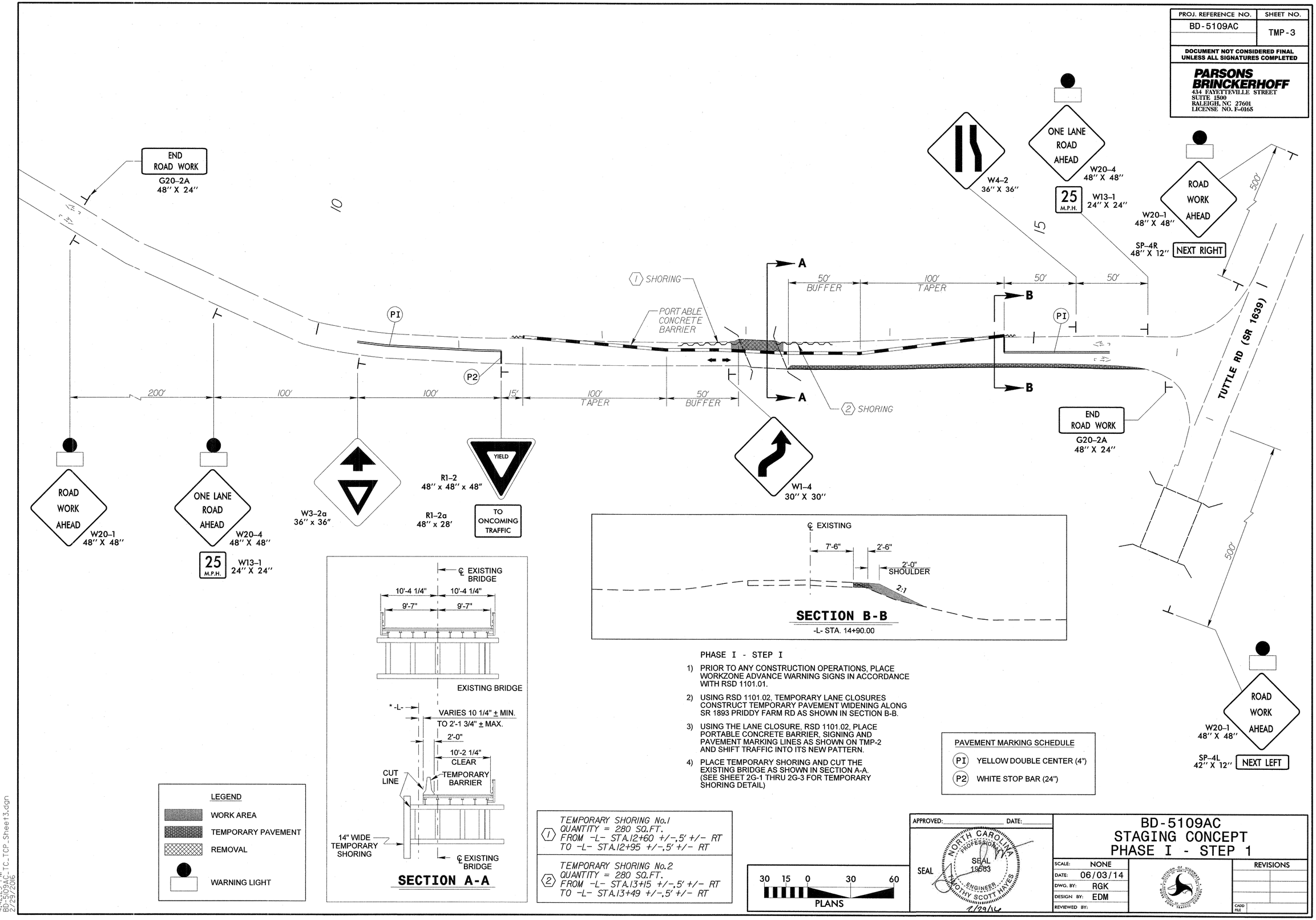

SECTION B-B
-L- STA. 14+90.00

SECTION A-A

PHASE I - STEP I

1) PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE WORKZONE ADVANCE WARNING SIGNS IN ACCORDANCE WITH RSD 1101.01.
2) USING RSD 1101.02, TEMPORARY LANE CLOSURES CONSTRUCT TEMPORARY PAVEMENT WIDENING ALONG SR 1893 PRIDDY FARM RD AS SHOWN IN SECTION B-B.
3) USING THE LANE CLOSURE, RSD 1101.02, PLACE PORTABLE CONCRETE BARRIER, SIGNING AND PAVEMENT MARKING LINES AS SHOWN ON TMP-2 AND SHIFT TRAFFIC INTO ITS NEW PATTERN.
4) PLACE TEMPORARY SHORING AND CUT THE EXISTING BRIDGE AS SHOWN IN SECTION A-A. (SEE SHEET 2G-1 THRU 2G-3 FOR TEMPORARY SHORING DETAIL)

PAVEMENT MARKING SCHEDULE	
P1	YELLOW DOUBLE CENTER (4")
P2	WHITE STOP BAR (24")

LEGEND	
	WORK AREA
	TEMPORARY PAVEMENT
	REMOVAL
	WARNING LIGHT

1 *TEMPORARY SHORING No.1*
QUANTITY = 280 SQ.FT.
FROM -L- STA.12+60 +/-,5' +/- RT
TO -L- STA.12+95 +/-,5' +/- RT

2 *TEMPORARY SHORING No.2*
QUANTITY = 280 SQ.FT.
FROM -L- STA.13+15 +/-,5' +/- RT
TO -L- STA.13+49 +/-,5' +/- RT

30 15 0 30 60
PLANS

APPROVED: _____ DATE: _____

SEAL 19583 NORTH CAROLINA PROFESSIONAL ENGINEER TIMOTHY SCOTT HAYES
7/29/16

BD-5109AC
STAGING CONCEPT
PHASE I - STEP 1

SCALE:	NONE
DATE:	06/03/14
DWG. BY:	RGK
DESIGN BY:	EDM
REVIEWED BY:	

REVISIONS

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7/29/2016

PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	TMP-4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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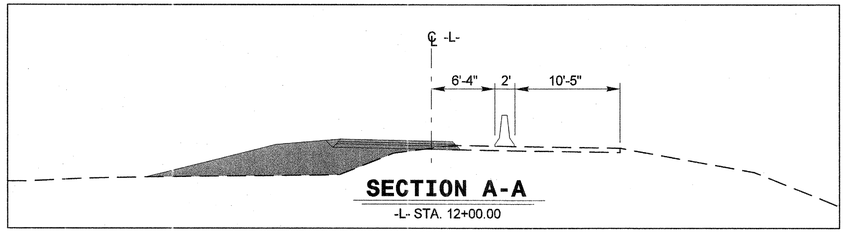
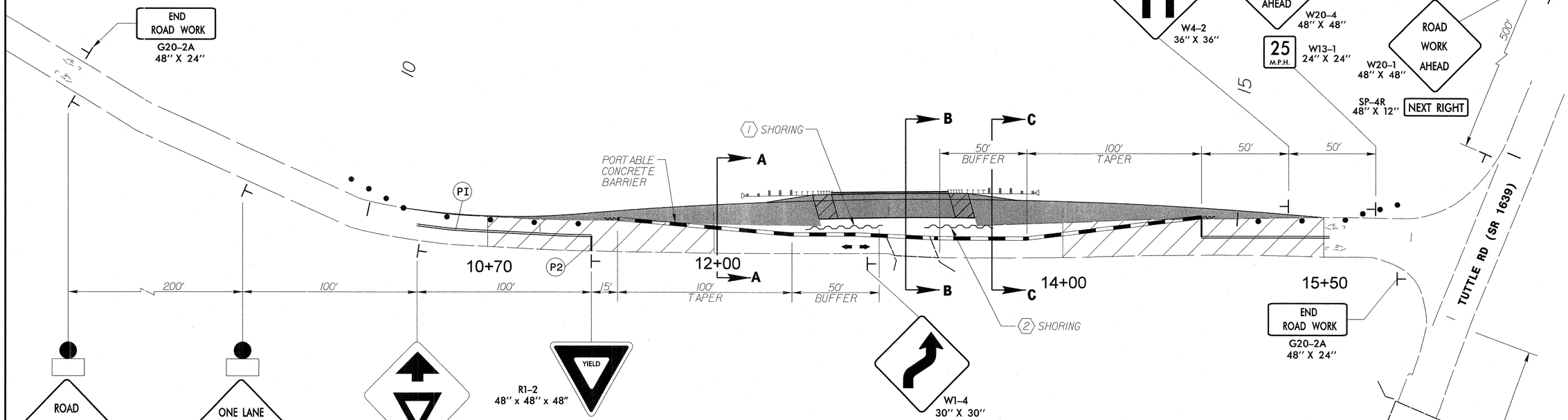
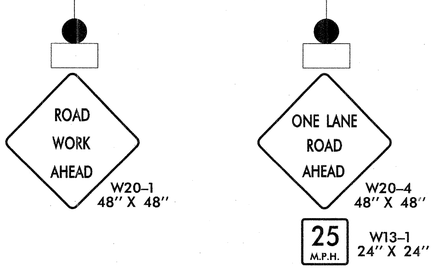
LICENSE NO. F-0165



SECTION A-A
-L- STA. 12+00.00



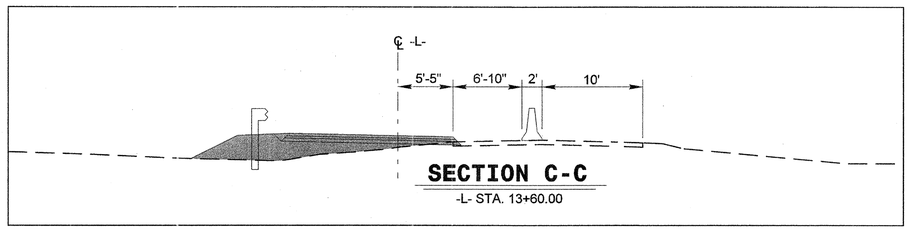


LEGEND

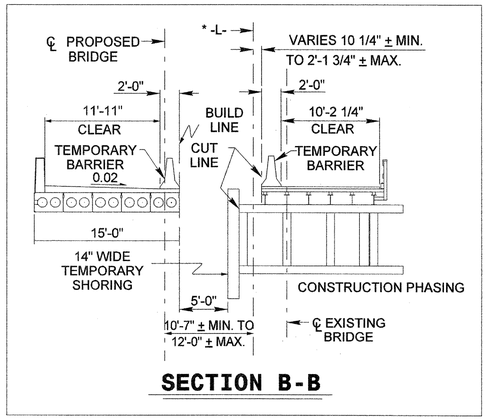
- WORK AREA
- TEMPORARY PAVEMENT
- REMOVAL
- WARNING LIGHT
- MILL & WEDGING

TEMPORARY SHORING No.1
QUANTITY = 280 SQ.FT.
FROM -L- STA.12+60 +/-, 5' +/- RT
TO -L- STA.12+95 +/-, 5' +/- RT

TEMPORARY SHORING No.2
QUANTITY = 280 SQ.FT.
FROM -L- STA.13+15 +/-, 5' +/- RT
TO -L- STA.13+49 +/-, 5' +/- RT



SECTION C-C
-L- STA. 13+60.00



SECTION B-B

PHASE I - STEP 2

1) WHILE MAINTAINING EXISTING TRAFFIC IN TEMPORARY PATTERN, CONSTRUCT THE NEW PROPOSED BRIDGE AND PAVEMENT WIDENING UP TO BUT NOT INCLUDING THE FINAL LAYER PAVEMENT SURFACE.

2) USING RSD 1101.02 (SHEET 1 OF 15) TEMPORARY LANE CLOSURE, MILL & WEDGE PRIDDY FARM ROAD FROM STA. 10+70 TO STA. 12+00 AND FROM STA. 14+00 TO 15+50 TO MAKE A PROPER TIE IN WITH THE PROPOSED WIDENING.

30 15 0 30 60
PLANS

APPROVED:_____ DATE:_____

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19683 ENGINEER TIMOTHY SCOTT HAYES
7/29/14

BD-5109AC
STAGING CONCEPT
PHASE I - STEP 2

SCALE:	NONE
DATE:	06/03/14
DWG. BY:	RGK
DESIGN BY:	EDM
REVIEWED BY:	

REVISIONS

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PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	TMP-5

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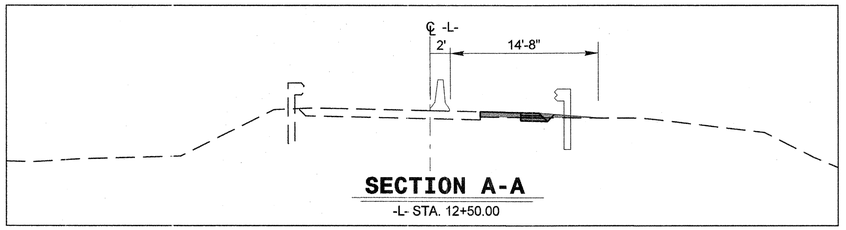
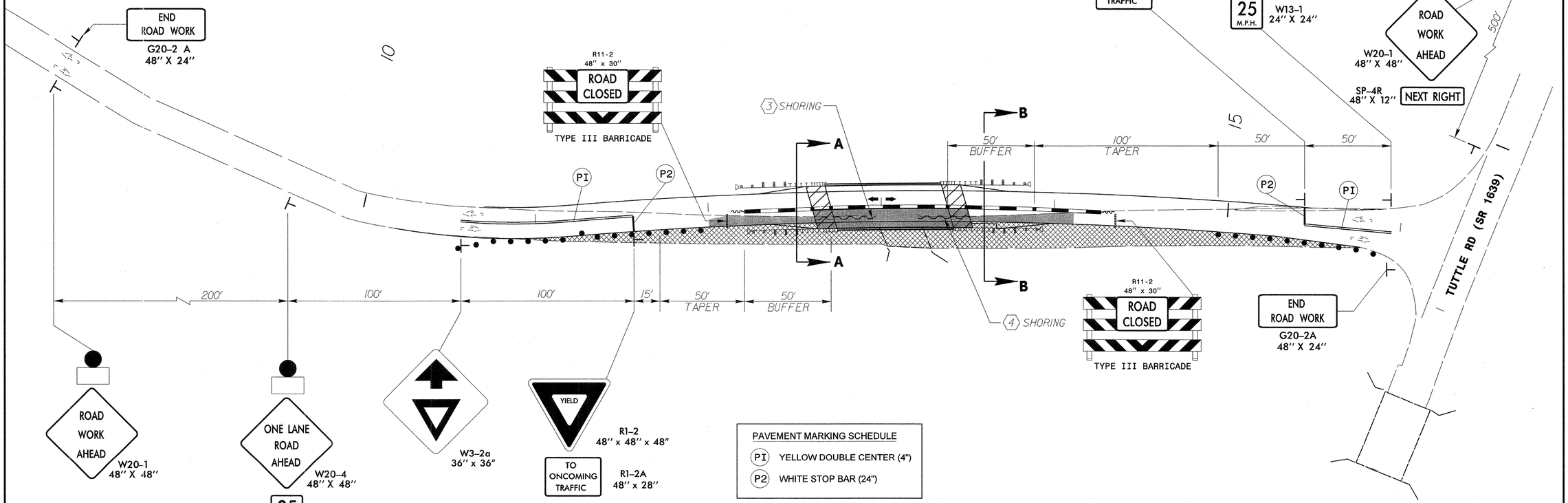




PAVEMENT MARKING SCHEDULE

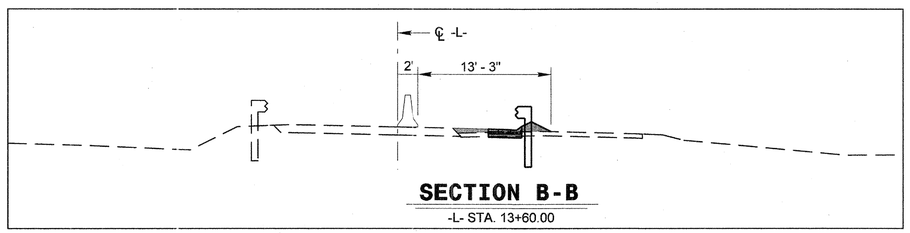
P1	YELLOW DOUBLE CENTER (4")
P2	WHITE STOP BAR (24")

3 *TEMPORARY SHORING No.1*
QUANTITY = 80 SQ.FT.
FROM -L- STA.12+60 +/-,3' +/- RT
TO -L- STA.12+70 +/-,3' +/- RT

4 *TEMPORARY SHORING No.2*
QUANTITY = 90 SQ.FT.
FROM -L- STA.13+38 +/-,3' +/- RT
TO -L- STA.13+49 +/-,3' +/- RT

LEGEND

- WORK AREA
- TEMPORARY PAVEMENT
- REMOVAL
- WARNING LIGHT



PHASE II

1) REMOVE TEMPORARY SHORING BACK TOWARDS THE PROPOSED BRIDGE FILL FACE AS NEEDED. USING THE LANE CLOSURE, RSD 1101.02, PLACE PORTABLE CONCRETE BARRIER, SIGNING AND PAVEMENT MARKING LINES AS SHOWN AND SHIFT TRAFFIC INTO ITS NEW PATTERN.

2) CONSTRUCT THE OTHER HALF OF THE PROPOSED BRIDGE AND UP TO BUT NOT INCLUDING THE FINAL LAYER OF PAVEMENT SURFACE.

30 15 0 30 60
PLANS

APPROVED:_____ DATE:_____

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19663 ENGINEER TIMOTHY SCOTT HAYES
1/29/16

BD-5109AC
STAGING CONCEPT
PHASE II - STEP 1

SCALE:	NONE
DATE:	06/03/14
DWG. BY:	RGK
DESIGN BY:	EDM
REVIEWED BY:	

REVISIONS

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2/29/2016

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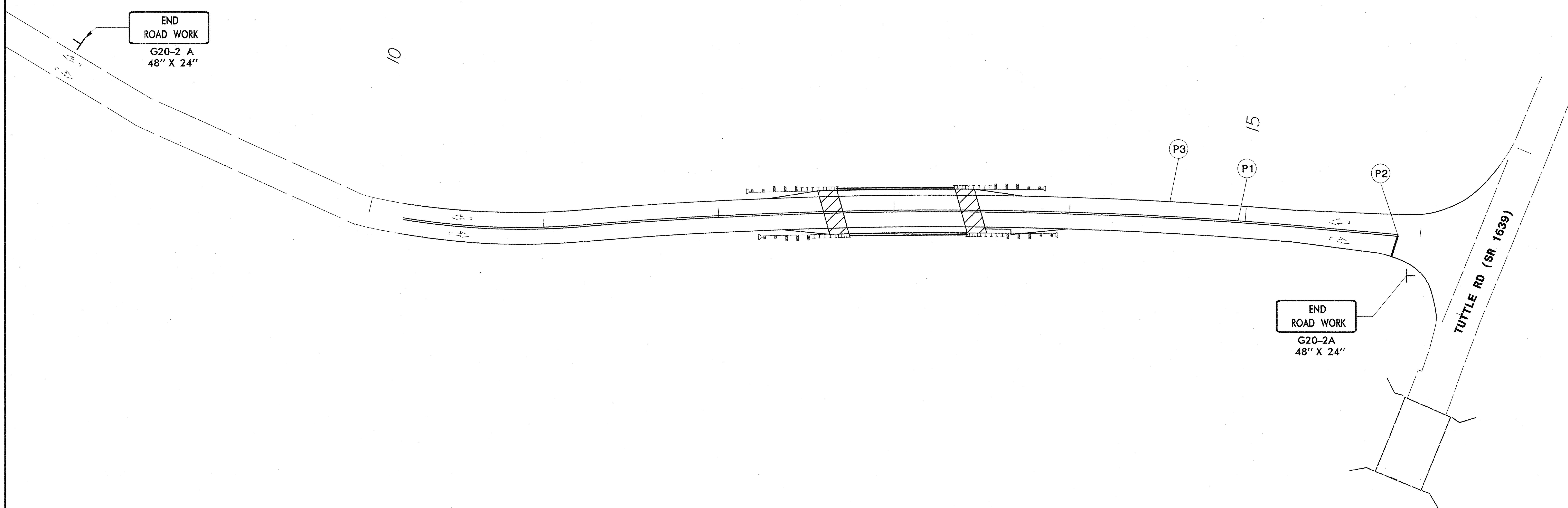

PHASE II - STEP II

1) USING RSD 1101.02, CLOSE LANE, COMPLETE PROPOSED PAVEMENT WEDGING, AND FINAL LAYER PAVEMENT SURFACE.

2) UPON COMPLETION OF ROADWAY, PLACE FINAL PAVEMENT MARKING IN ACCORDANCE WITH 1205.12. REMOVE CONSTRUCTION SIGNS AND OPEN LANE TO TRAFFIC.

PAVEMENT MARKING SCHEDULE

P1	YELLOW DOUBLE CENTER (4")
P2	WHITE STOP BAR (24")
P3	WHITE EDGE LINE (4")

30 15 0 30 60
PLANS

APPROVED: DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19563 ENGINEER TIMOTHY SCOTT HAYES

2/29/16

BD-5109AC
STAGING CONCEPT
PHASE II - STEP 2

SCALE:	NONE
DATE:	06/03/14
DWG. BY:	RGK
DESIGN BY:	EDM
REVIEWED BY:	

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

REVISIONS

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2/29/2016

PROJECT: BD-5109AC

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
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/Coir Fiber Wattle	W / CFW
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

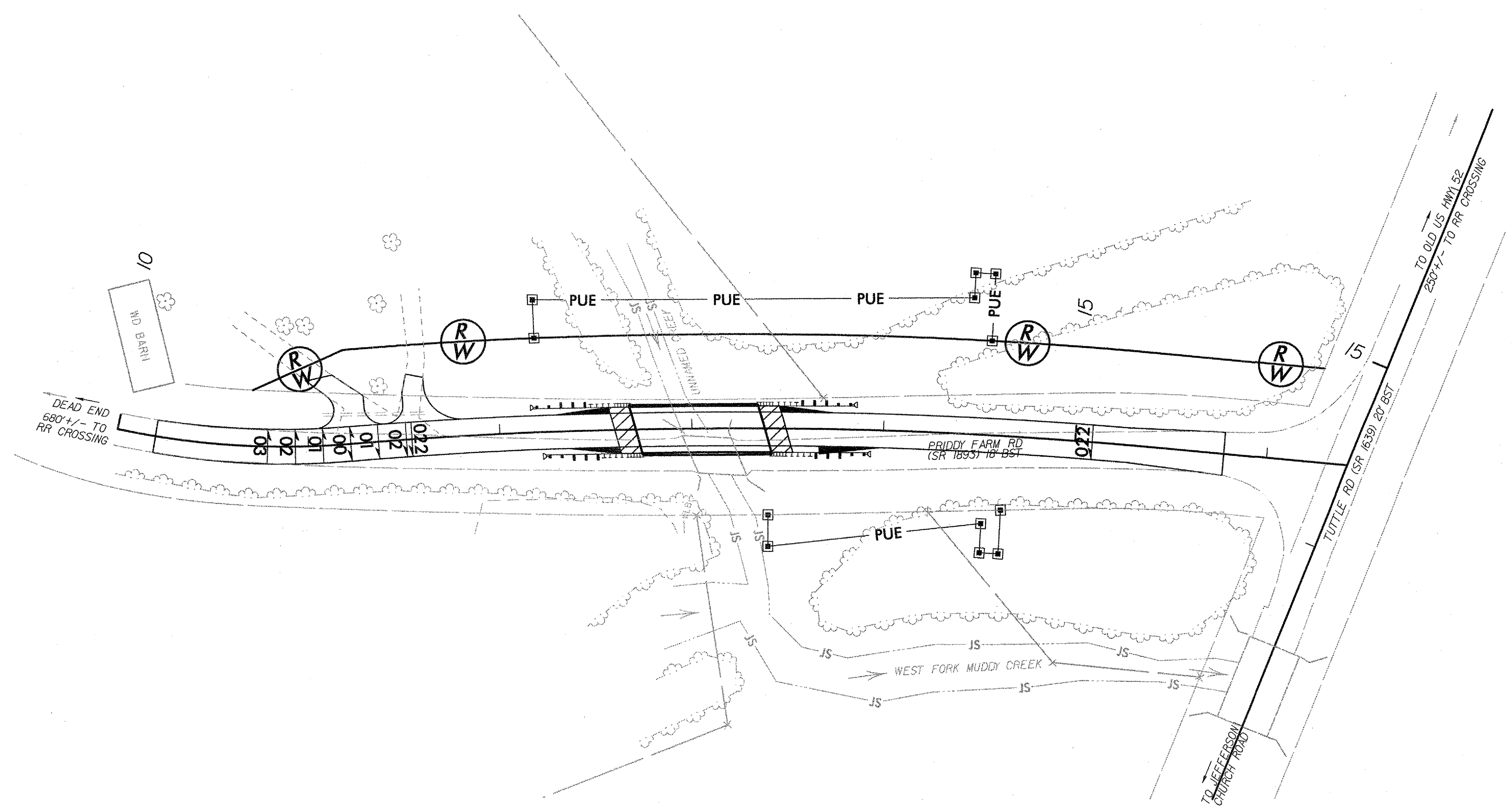
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

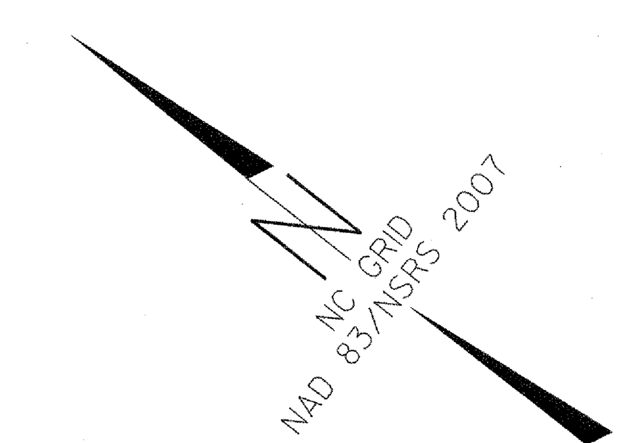
FORSYTH COUNTY

LOCATION: REPLACE EXISTING BRIDGE NO. 283 OVER UNNAMED CREEK ON SR 1893 PRIDDY FARM RD.

TYPE OF WORK: GRADING, DRAINAGE, CORED SLAB BRIDGE AND PAVEMENT MARKINGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5109AC	EC-1	
STATE PROJ. NO.	**F.A. PROJ. NO.**	**DESCRIPTION**	
45355.1.29	BRZ-1893 (1)	PE	
45355.2.29	BRZ-1893 (1)	RW/, UTILITIES	





THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

CHARLES HEAFNER
LEVEL III NAME

3440
LEVEL III CERTIFICATION NO.

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

GRAPHIC SCALES

30 15 0 30 60
PLANS

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.

PLANS PREPARED BY:	PLANS PREPARED FOR:
PARSONS BRINCKERHOFF 434 FAYETTEVILLE STREET SUITE 1500 RALEIGH, NC 27601 LICENSE NO. F-0165	***DIVISION OF HIGHWAYS*** *1000 Birch Ridge Dr.* *Raleigh NC, 27610*
2012 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: MAY 13, 2015	TIM HAYES, PE *PROJECT ENGINEER*
LETTING DATE: MARCH 9, 2016	LAUREN WILSON, EI *PROJECT DESIGN ENGINEER*
NCDOT CONTACT:	MATTHEW JONES, PE *DIVISION BRIDGE – PROGRAM MANAGER*

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	EC-2

PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

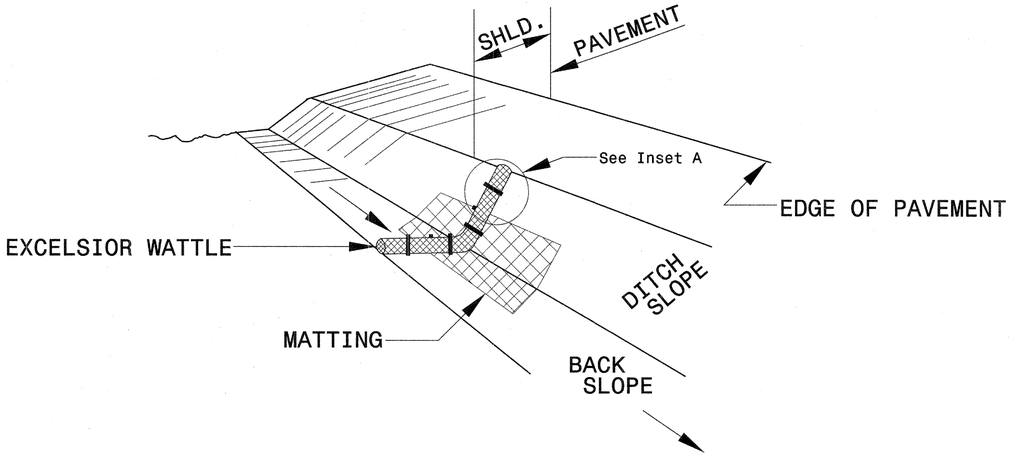
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

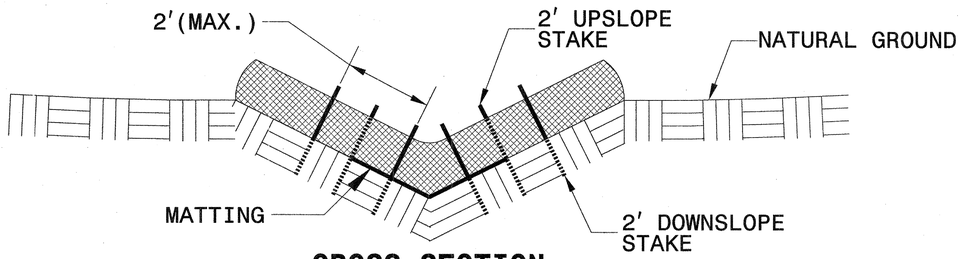
SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS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

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

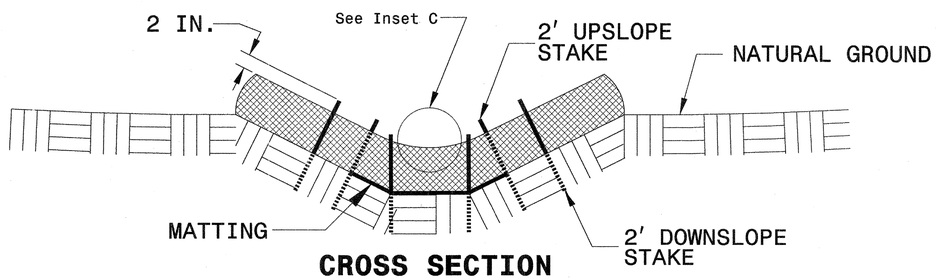
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



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.

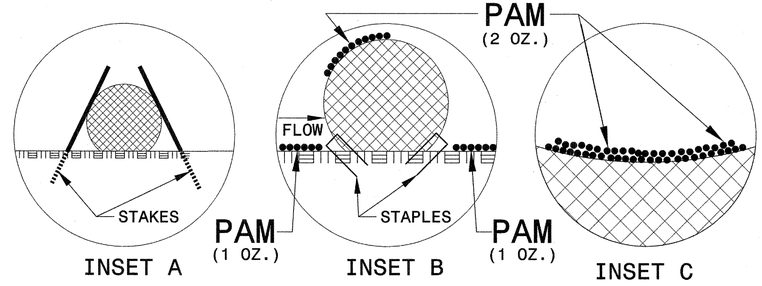
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

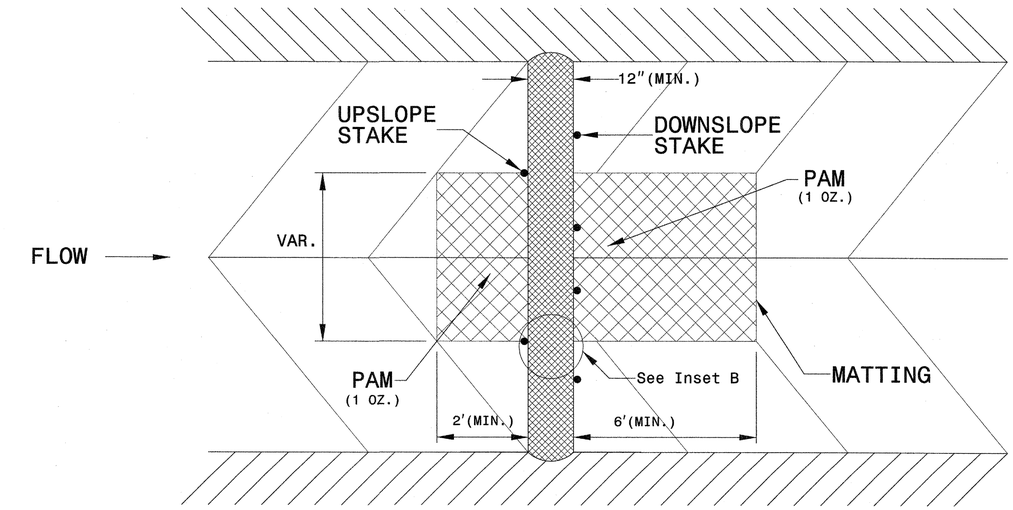
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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.





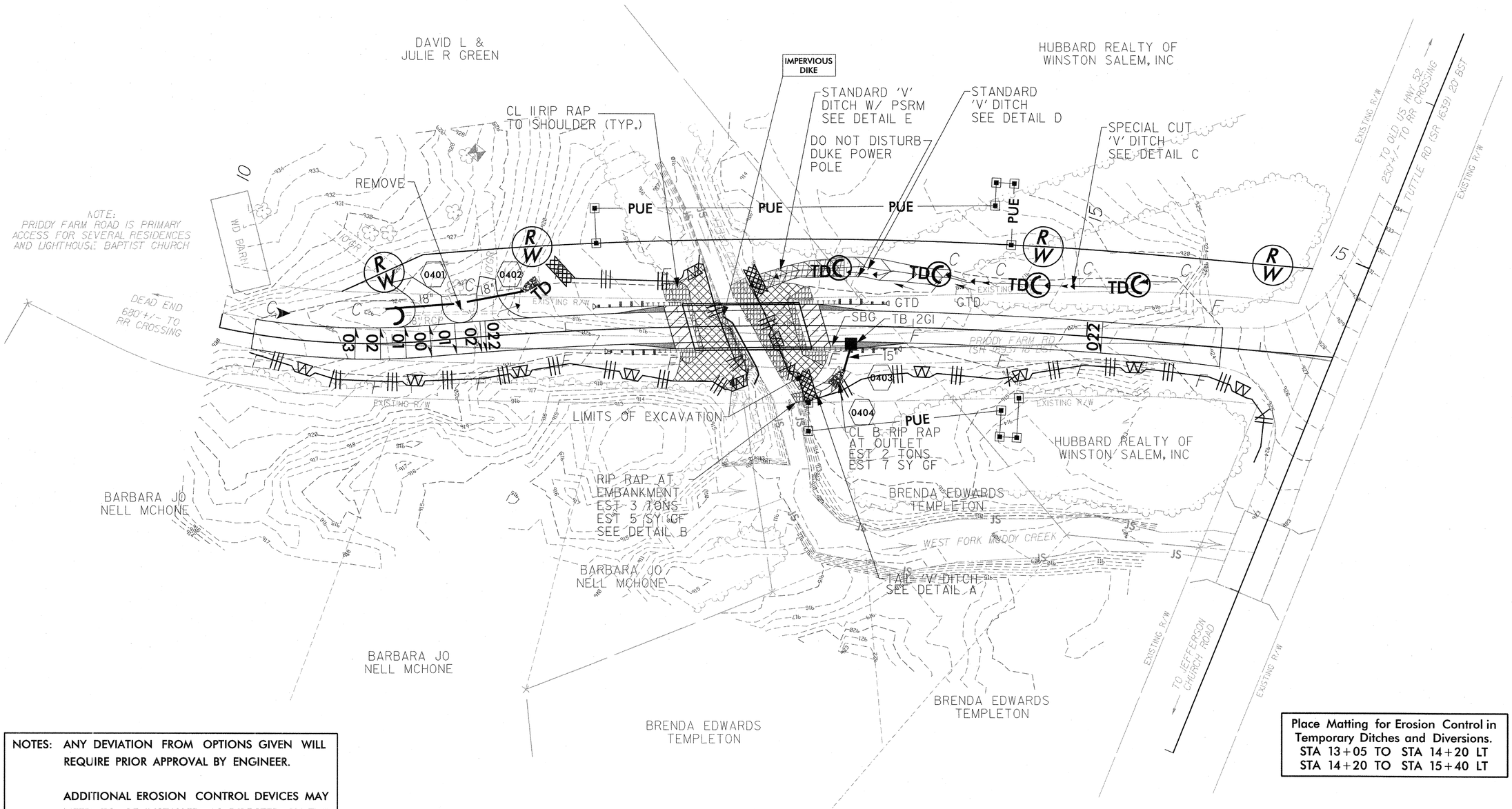
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	EC-3

PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1300
RALEIGH, NC 27601
LICENSE NO. F-0165

EROSION CONTROL PLAN

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4



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

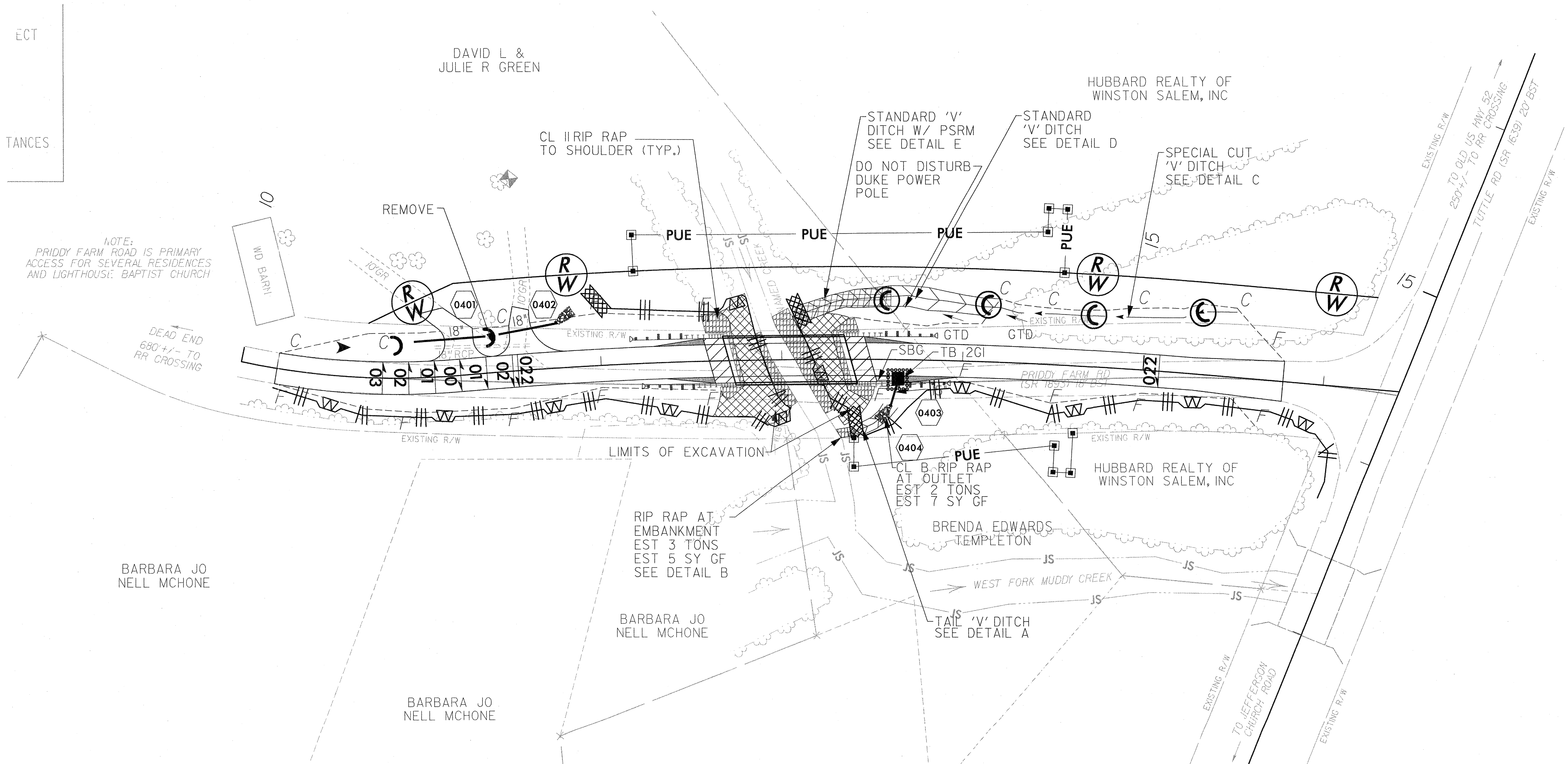
ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

Place Matting for Erosion Control in Temporary Ditches and Diversions.
STA 13+05 TO STA 14+20 LT
STA 14+20 TO STA 15+40 LT

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	EC-4

PARSONS BRINCKERHOFF
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
LICENSE NO. F-0165

EROSION CONTROL PLAN



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.

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
STA 10+20 TO STA 11+45 LT
STA 13+05 TO STA 14+20 LT
STA 14+20 TO STA 15+40 LT

09/08/99

TIP PROJECT: BD-5109AC

CONTRACT: DI00124

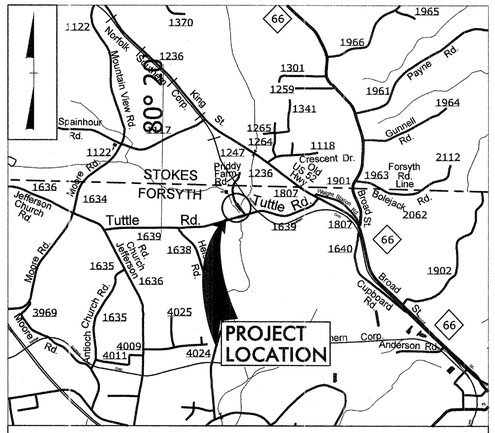
T.I.P. NO.	SHEET NO.
BD-5109AC	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

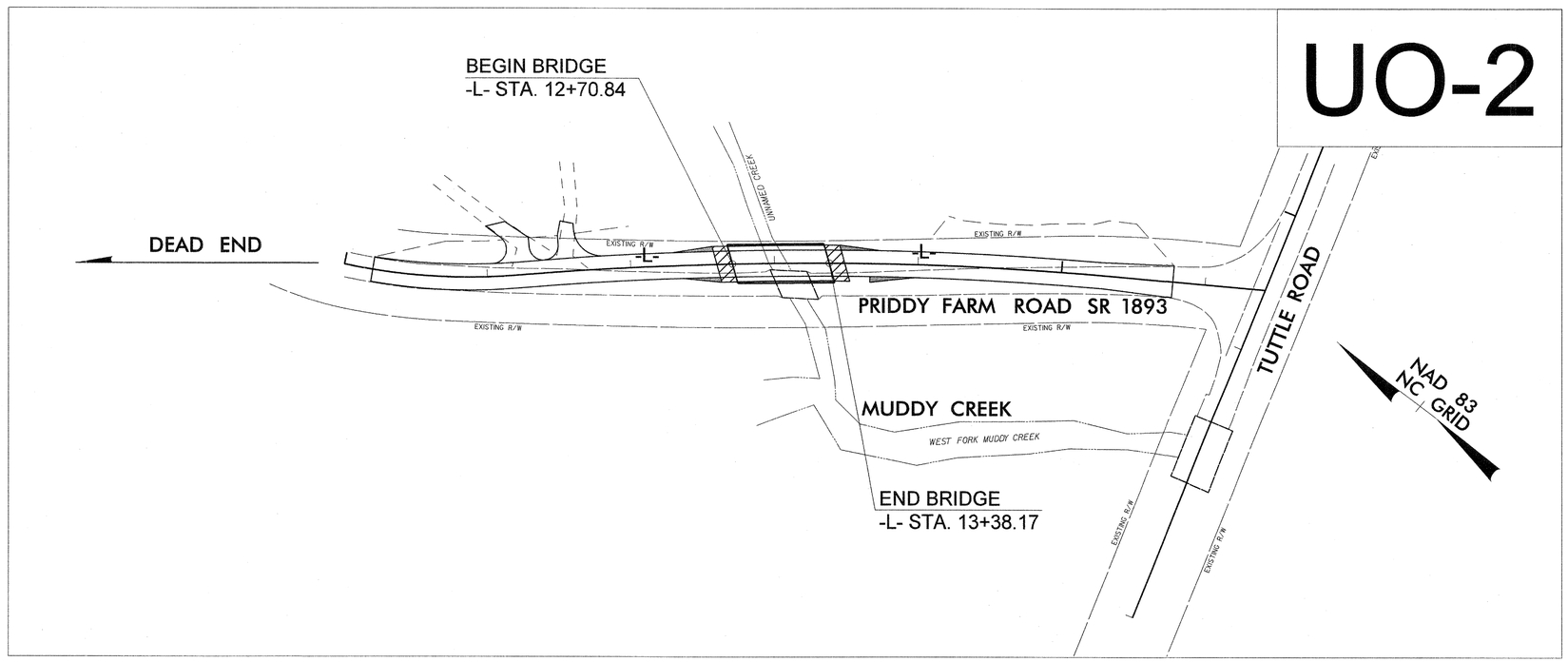
UTILITIES BY OTHERS PLANS
FORSYTH COUNTY

LOCATION: REPLACE EXISTING BRIDGE NO.283 OVER MUDDY CREEK ON SR 1893 PRIDDY FARM RD.

TYPE OF WORK: AERIAL AND BURIED UTILITIES



VICINITY MAP



GRAPHIC SCALES

50 25 0 50 100
PLANS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(1) POWER – DUKE ENERGY
Patrick Sizemore
PHONE (336) 917-2522
EMAIL Patrick.Sizemore@Duke-Energy.com

(2) TELEPHONE – WINDSTREAM
Robert Melton
PHONE (336) 785-6393
EMAIL Robert.Melton@Windstream.com

PLANS PREPARED BY:
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

UTILITIES PROJECT ENGINEER
Mary Jo Lee, P.E.

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Roger Worthington, P.E. UTILITIES SECTION ENGINEER

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
BD-5109AC	UO-2

UTILITIES BY OTHERS

CONTACT INFORMATION FOR UTILITIES

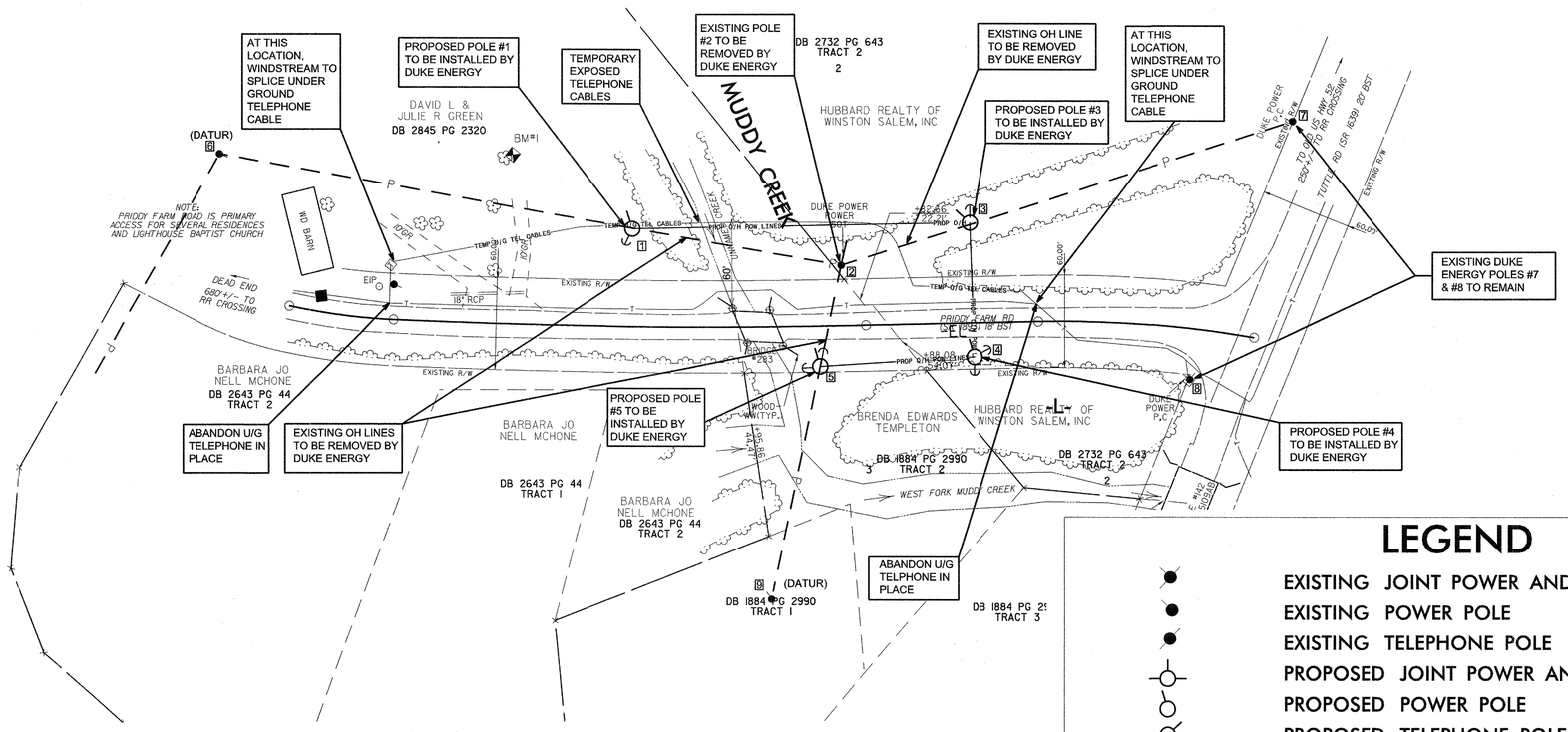
POWER: DUKE ENERGY: PATRICK SIZEMORE 336-917-2522 PATRICK.SIZEMORE@DUKE-ENERGY.COM
TELEPHONE: WINDSTREAM: ROBERT MELTON 336-785-6393 ROBERT.MELTON@WINDSTREAM.COM

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

50 25 0 50 100
PLANS

NAD 83
NC GRID



LEGEND

- EXISTING JOINT POWER AND TELEPHONE POLE
- EXISTING POWER POLE
- EXISTING TELEPHONE POLE
- PROPOSED JOINT POWER AND TELEPHONE POLE
- PROPOSED POWER POLE
- PROPOSED TELEPHONE POLE
- EXISTING U/G TELEPHONE LINE
- EXISTING O/H POWER LINE
- PROPOSED O/H POWER LINE
- PROPOSED U/G (FO) TELEPHONE LINE
- PROPOSED O/H (FO) TELEPHONE LINE
- PROPOSED U/G TELEPHONE LINE
- PROPOSED O/H TELEPHONE LINE
- TEMPORARY U/G TELEPHONE CABLES (EXPOSED)

PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	X-1

11+00.00

10+70.00

BEGIN TIP PROJECT BD-5109AC
-L- Sta. 10+20.00

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5109AC	X-2

8/23/99

7:54:55 AM
BD-5109AC_rdy_XPL.dgn
12/14/2015

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
BD-5109AC	X-3

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12/14/2015

8/23/99

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5109AC	X-4

930
925
920

16+30.00

925
920

15+80.00

END TIP PROJECT BD-5109AC –L– Sta. 15+77.55

925
920

0.005 923.03 0.027

4:1

15+50.00

915

925
920

0.022 920.81 0.022

4:1 4:1

2:1

916.57

915
910

15+00.00

905

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

7:56:09 AM
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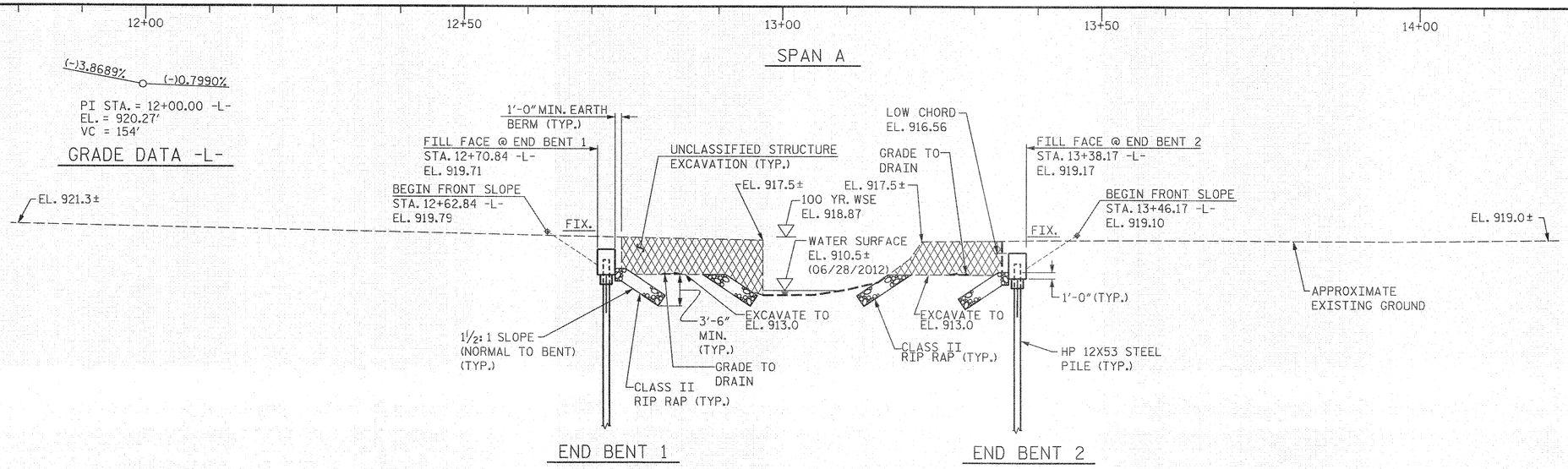
12/14/2015

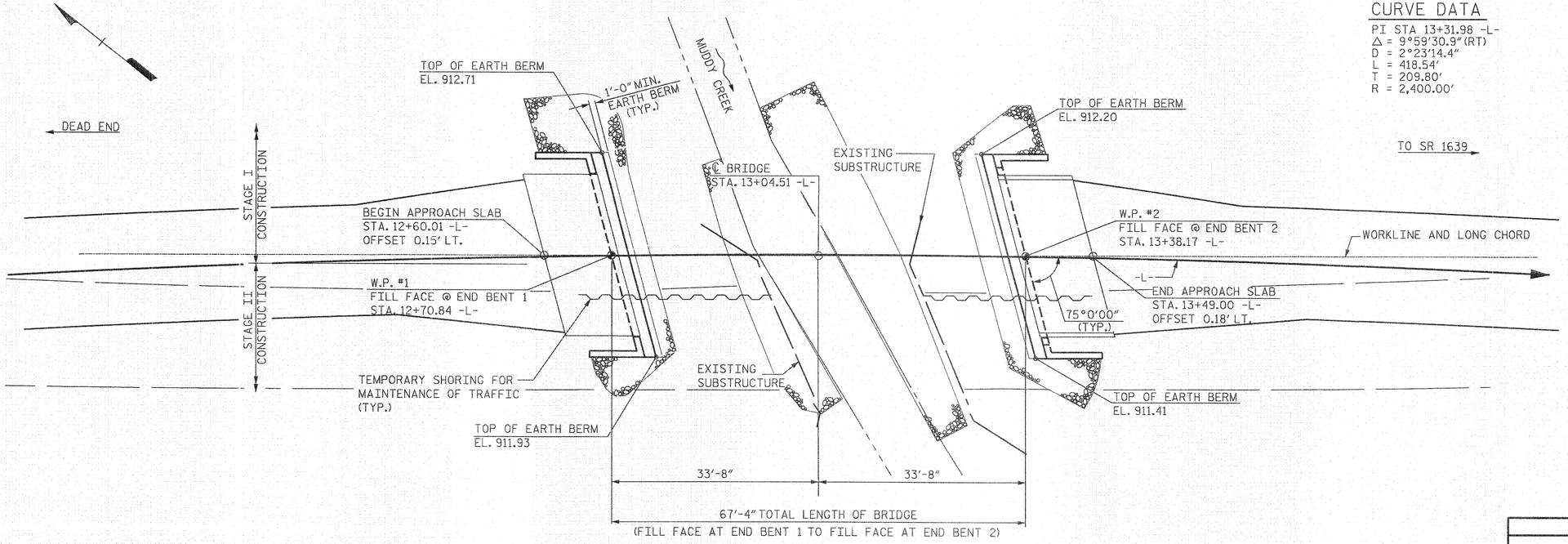
F.A. PROJECT NO. BRZ-1893(1)

SPAN A



SECTION ALONG -L-

END BENTS ARE AT RIGHT ANGLES



PLAN

PILES NOT SHOWN FOR CLARITY

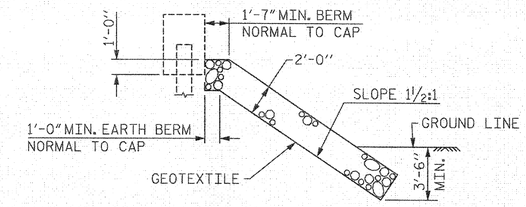
NOTE: WORKLINE FOR BRIDGE SHALL BE THE LONG CHORD BETWEEN FILL FACES AND IT'S EXTENSION.

HYDRAULIC DATA

DESIGN DISCHARGE	1000 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	917.1
DRAINAGE AREA	2.69 SQ.MI.
BASE DISCHARGE (Q100)	1600 CFS
BASE HIGH WATER ELEVATION	918.87

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	1600 CFS
FREQUENCY OF OVERTOPPING FLOOD	100+ YRS.
OVERTOPPING FLOOD ELEVATION	919.1



RIP RAP DETAIL

CURVE DATA

PI STA 13+31.98 -L-
△ = 9°59'30.9"(RT)
D = 2°23'14.4"
L = 418.54'
T = 209.80'
R = 2,400.00'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 283

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1893 OVER MUDDY CREEK BETWEEN SR 1639 AND DEAD END

	DESIGNED BY:	DATE:
	E. DAVIS	NOV. 2014
DRAWN BY:	E. DAVIS	NOV. 2014
CHECKED BY:	J. SHERMAN	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	JAN. 2016

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

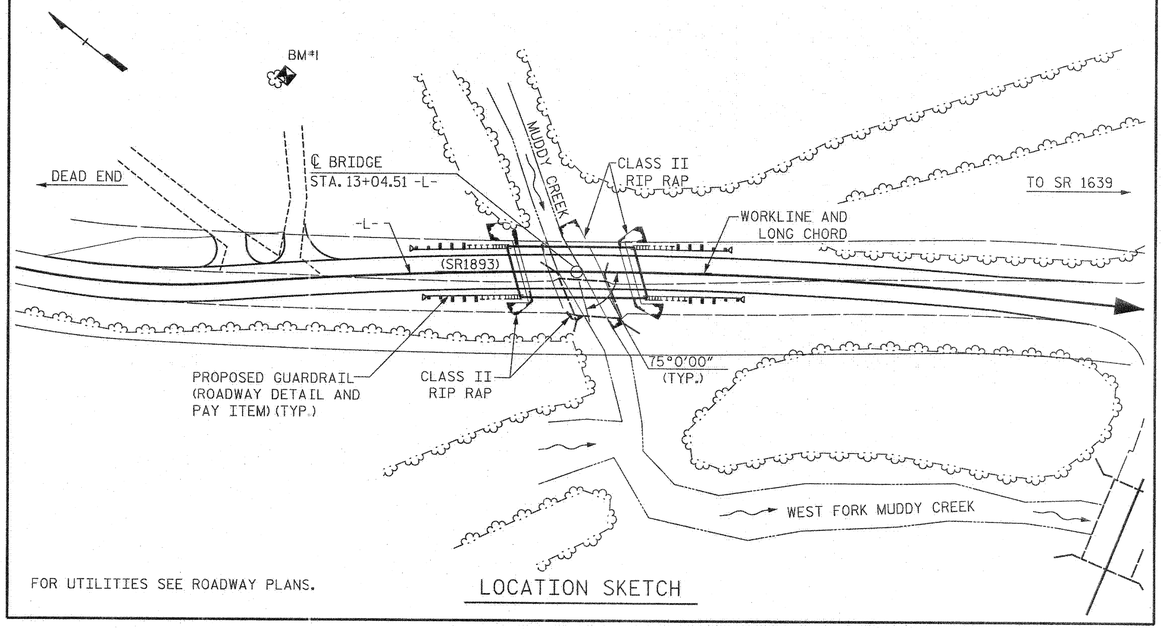
NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JACOB P. SHERMAN
1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

1/13/2016
BD-5109AC_GD_01.dgn

BM #1 : RR SPIKE IN SOUTH ROOT OF A BLACK WALNUT, STA. 11+56.47 -L-, 105.61' LT., EL. 928.47



FOR UTILITIES SEE ROADWAY PLANS.

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF ONE (1) 25'-8" SPAN, WITH A CLEAR ROADWAY WIDTH OF 19'-2" AND TIMBER DECK WITH ASPHALT OVERLAY ON STEEL I-BEAMS SUPPORTED BY TIMBER CAPS AND POSTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE THE LOAD LIMIT MAY BE REDUCED AS NECESSARY DURING THE LIFE OF THE PROJECT.

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 35 FT. EACH SIDE 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".

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.

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 COST 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 13+04.51 -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 LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

STEEL H PILE POINTS ARE REQUIRED FOR STEEL H PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 13+04.51 -L-	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 13+04.51 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS AT STATION 13+04.51 -L-	REINFORCING STEEL	HP 12x53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK) **	GEOTEXTILE FOR DRAINAGE **	ELASTOMERIC BEARINGS	3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS		ASBESTOS ASSESSMENT
	LUMP SUM	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE	LUMP SUM				LUMP SUM					130.26			LUMP SUM	9	585	LUMP SUM
END BENT NO. 1			LUMP SUM	19.6		2366	5	75	5		75	83				
END BENT NO. 2			LUMP SUM	19.6		2366	5	75	5		121	134				
TOTAL	LUMP SUM	1	LUMP SUM	39.2	LUMP SUM	4732	10	150	10	130.26	196	217	LUMP SUM	9	585	LUMP SUM

** INCLUDES QUANTITY REQUIRED FOR BANK PROTECTION

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1893 OVER MUDDY CREEK BETWEEN SR 1639 AND DEAD END

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

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JACOB P. SHERMAN
2/26/16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGNED BY:	E. DAVIS	DATE : NOV. 2014
DRAWN BY:	E. DAVIS	DATE : NOV. 2014
CHECKED BY:	J. SHERMAN	DATE : NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE : FEB. 2016

2/26/2016
BD-5109AC_SD_LS_02.dgn

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	1.03	--	1.75	0.269	1.06	65'	EL	31.982	0.608	1.05	65'	EL	3.198	0.80	0.269	**1.03**	65'	EL	**31.982**	
		HL-93(Opr)	N/A	--	1.362	--	1.35	0.269	1.38	65'	EL	31.982	0.608	1.36	65'	EL	3.198	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.296	46.666	1.75	0.269	1.36	65'	EL	31.982	0.608	**1.3**	65'	EL	**3.198**	0.80	0.269	1.32	65'	EL	31.982	
		HS-20(Opr)	36.000	--	1.68	60.493	1.35	0.269	1.76	65'	EL	31.982	0.608	1.68	65'	EL	3.198	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.898	39.127	1.4	0.269	3.74	65'	EL	31.982	0.608	3.82	65'	EL	3.198	0.80	0.269	2.90	65'	EL	31.982	
		SNGARBS2	20.000	--	2.194	43.878	1.4	0.269	2.83	65'	EL	31.982	0.608	2.73	65'	EL	3.198	0.80	0.269	2.19	65'	EL	31.982	
		SNAGRIS2	22.000	--	2.092	46.029	1.4	0.269	2.7	65'	EL	31.982	0.608	2.54	65'	EL	3.198	0.80	0.269	2.09	65'	EL	31.982	
		SNCOTTS3	27.250	--	1.443	39.328	1.4	0.269	1.86	65'	EL	31.982	0.608	1.91	65'	EL	3.198	0.80	0.269	1.44	65'	EL	31.982	
		SNAGGRS4	34.925	--	1.219	42.576	1.4	0.269	1.57	65'	EL	31.982	0.608	1.59	65'	EL	3.198	0.80	0.269	1.22	65'	EL	31.982	
		SNS5A	35.550	--	1.191	42.349	1.4	0.269	1.54	65'	EL	31.982	0.608	1.62	65'	EL	3.198	0.80	0.269	1.19	65'	EL	31.982	
		SNS6A	39.950	--	1.098	43.884	1.4	0.269	1.42	65'	EL	31.982	0.608	1.48	65'	EL	3.198	0.80	0.269	1.10	65'	EL	31.982	
		SNS7B	42.000	--	1.046	43.944	1.4	0.269	1.35	65'	EL	31.982	0.608	1.46	65'	EL	3.198	0.80	0.269	1.05	65'	EL	31.982	
	TTST	TNAGRIT3	33.000	--	1.341	44.258	1.4	0.269	1.73	65'	EL	31.982	0.608	1.76	65'	EL	3.198	0.80	0.269	1.34	65'	EL	31.982	
		TNT4A	33.075	--	1.349	44.604	1.4	0.269	1.74	65'	EL	31.982	0.608	1.71	65'	EL	3.198	0.80	0.269	1.35	65'	EL	31.982	
		TNT6A	41.600	--	1.108	46.092	1.4	0.269	1.43	65'	EL	31.982	0.608	1.56	65'	EL	3.198	0.80	0.269	1.11	65'	EL	31.982	
		TNT7A	42.000	--	1.116	46.888	1.4	0.269	1.44	65'	EL	31.982	0.608	1.52	65'	EL	3.198	0.80	0.269	1.12	65'	EL	31.982	
		TNT7B	42.000	--	1.162	48.806	1.4	0.269	1.5	65'	EL	31.982	0.608	1.42	65'	EL	3.198	0.80	0.269	1.16	65'	EL	31.982	
		TNAGRIT4	43.000	--	1.1	47.307	1.4	0.269	1.42	65'	EL	31.982	0.608	1.37	65'	EL	3.198	0.80	0.269	1.10	65'	EL	31.982	
		TNAGT5A	45.000	--	1.035	46.568	1.4	0.269	1.33	65'	EL	31.982	0.608	1.37	65'	EL	3.198	0.80	0.269	1.03	65'	EL	31.982	
		TNAGT5B	45.000	3	1.02	45.907	1.4	0.269	1.32	65'	EL	31.982	0.608	1.3	65'	EL	3.198	0.80	0.269	**1.02**	65'	EL	**31.982**	

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.

LOAD RATING IS FOR FINAL CONDITION WITHOUT REGARD TO STAGING.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

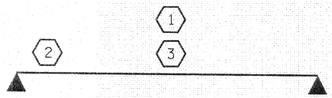
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

1/13/2016
BD-5109AC_STD_LR_03.dgn

DESIGNED BY:	E. DAVIS	DATE : NOV 2014
DRAWN BY:	E. DAVIS	DATE : NOV 2014
CHECKED BY:	J. SHERMAN	DATE : NOV 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE : JAN. 2016
DRAWN BY : CVC 6/10		
CHECKED BY : DNS 6/10		

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031288 ENGINEER JACOB P. SHERMAN 1-13-16

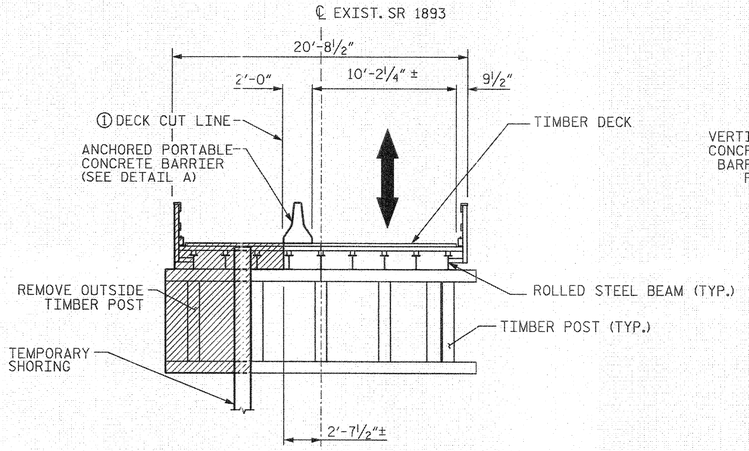
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR 65' CORED SLAB UNIT 75° SKEW
(NON-INTERSTATE TRAFFIC)

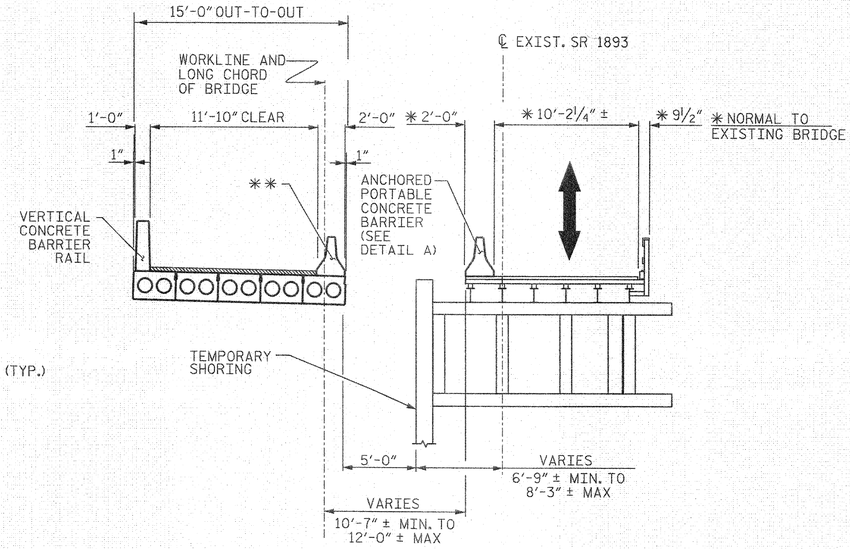
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			16

STD. NO. 24LRFR1_75&105S_65I



EXISTING BRIDGE

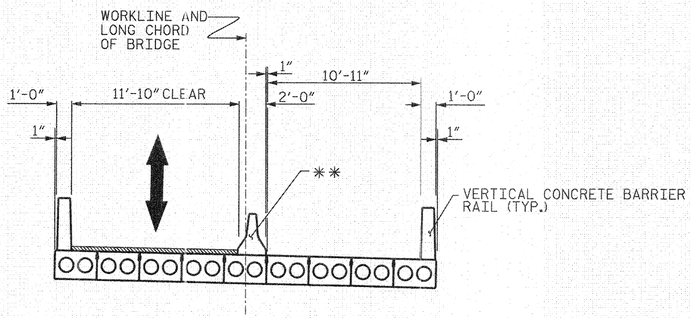
SHOWING DEMOLITION AND TEMPORARY SHORING TO BE PROVIDED DURING CONSTRUCTION
① CARE SHALL BE TAKEN TO ESTABLISH CUT LINE SUCH THAT EXISTING STEEL BEAMS ARE NOT DAMAGED.



STAGE I CONSTRUCTION

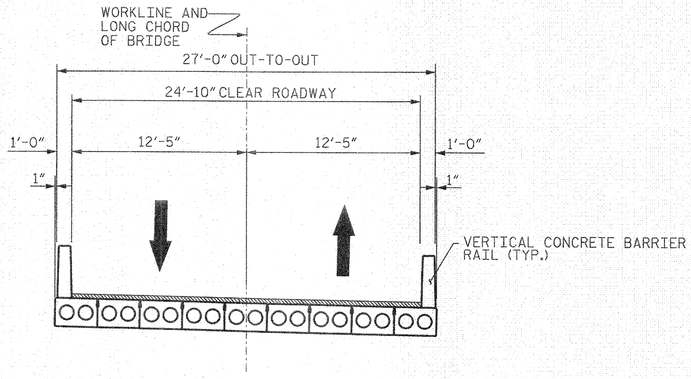
ALL DIMENSIONS NORMAL TO PROPOSED BRIDGE UNLESS OTHERWISE NOTED

** ANCHORED PORTABLE CONCRETE BARRIER (SEE ANCHORAGE DETAILS FOR PORTABLE CONCRETE BARRIER SHEET)



STAGE II CONSTRUCTION

ALL DIMENSIONS NORMAL TO PROPOSED BRIDGE



FINAL CONDITION

ALL DIMENSIONS NORMAL TO PROPOSED BRIDGE

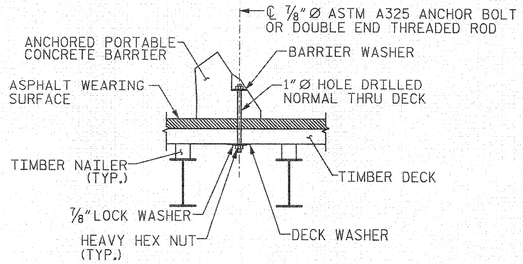
NOTES:

REFER TO ROADWAY PLANS FOR ADDITIONAL INFORMATION.

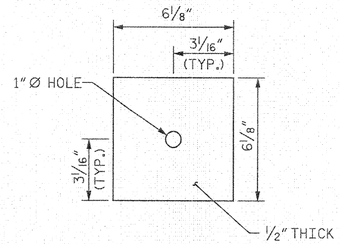
PAYMENT FOR PORTABLE CONCRETE BARRIER IS INCLUDED IN ROADWAY PAY ITEMS.

LEGEND:

AREA OF EXISTING BRIDGE TO BE REMOVED.

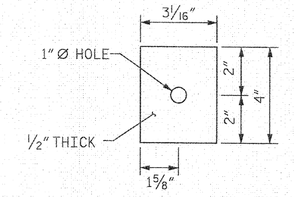


DETAIL A



DECK WASHER

(ASTM A709 GRADE 50)



BARRIER WASHER

(ASTM A709 GRADE 50)

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031988 ENGINEER JASON P. SHERMAN
1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

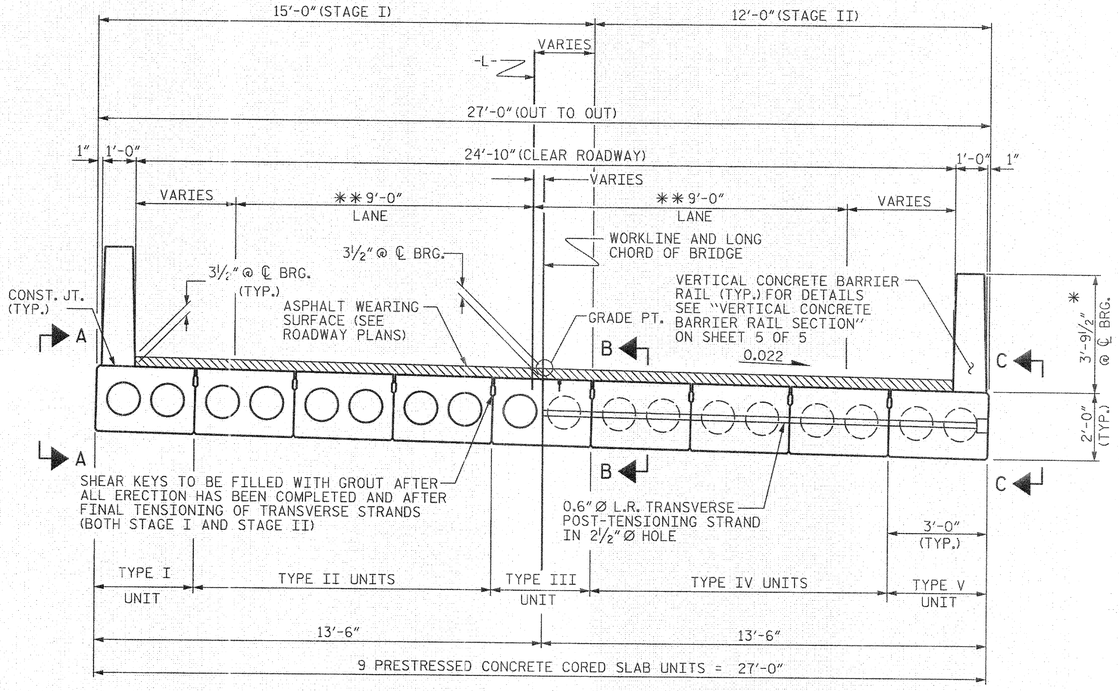
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STAGING SEQUENCE

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

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

1/11/2016
BD-5109AC_GD_CS_04.dgn



HALF SECTION THROUGH VOIDS

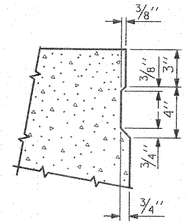
HALF SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

DIMENSIONS NORMAL TO WORKLINE UNLESS OTHERWISE NOTED

* 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 ON SHEET 5 OF 5.

** DIMENSION IS MEASURED RADIALLY TO -L-

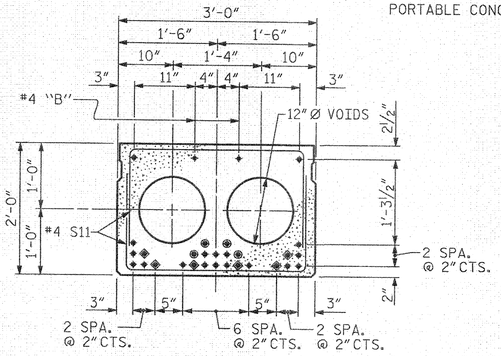


SHEAR KEY DETAIL

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

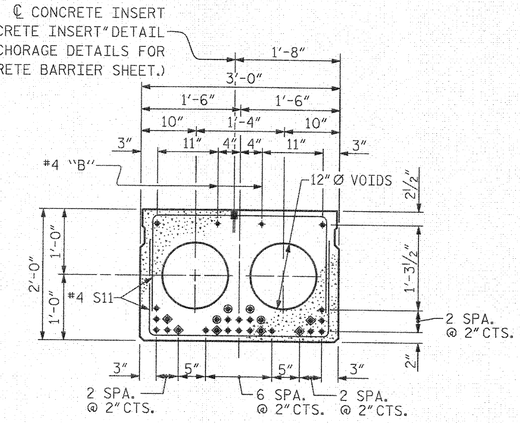
NOTES

SEE SHEET 2 OF 5 FOR SECTIONS A-A, B-B, AND C-C.



INTERIOR SLAB SECTION 0.6" Ø LOW RELAXATION STRAND LAYOUT

TYPE II & IV (24 STRANDS REQUIRED)



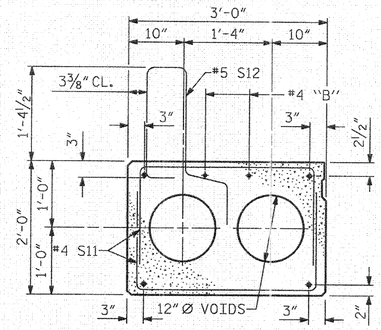
INTERIOR SLAB SECTION 0.6" Ø LOW RELAXATION STRAND LAYOUT

TYPE III (24 STRANDS REQUIRED)

◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

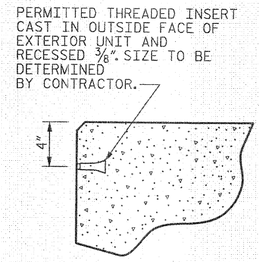
◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

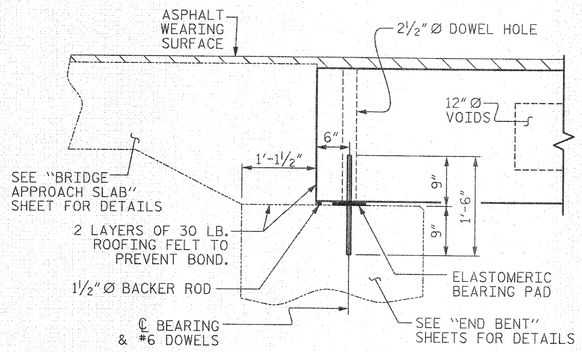


EXTERIOR SLAB SECTION

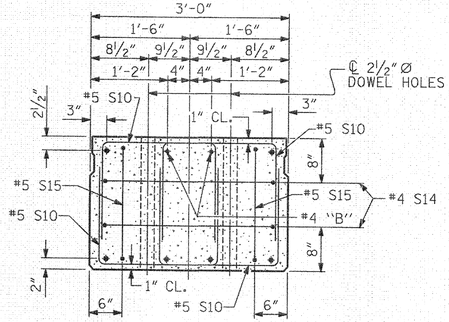
TYPE I & V
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II, III & IV.)



THREADED INSERT DETAIL



SECTION AT END BENT



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-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

DRAWN BY :	MAA	6/10	REV.	12/11	MAA/AAC
CHECKED BY :	MKT	7/10	REV.	8/14	MAA/TMC

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

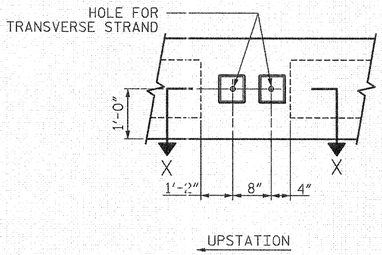
NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JOHN P. SHERMAN
1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

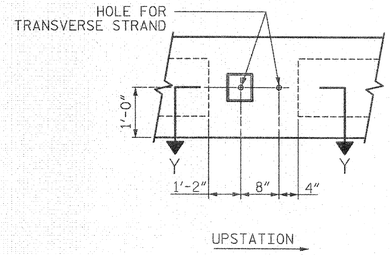
1/11/2016
BD-5109AC_SD_PC_05.dgn

STD. NO. 24PCS4_27_75S



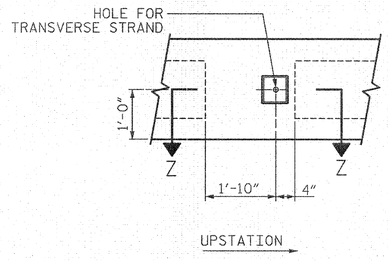
VIEW A-A

SEE SHEET 1 OF 5



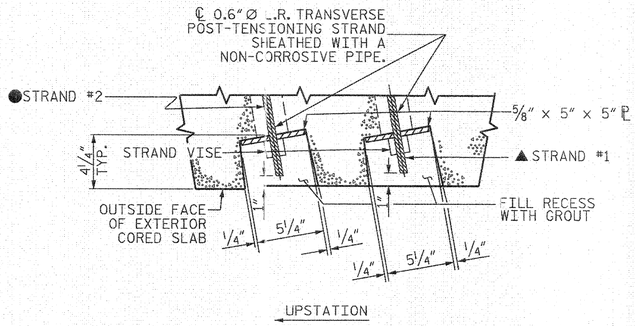
VIEW B-B

SEE SHEET 1 OF 5



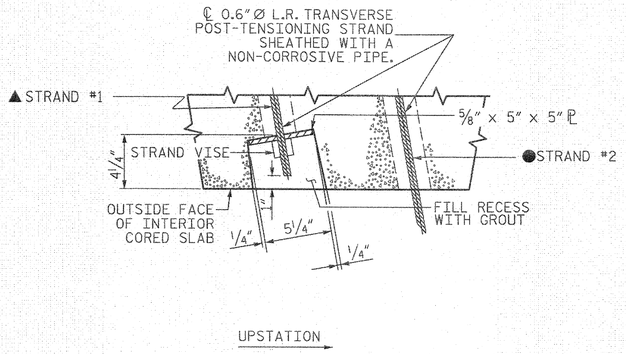
VIEW C-C

SEE SHEET 1 OF 5



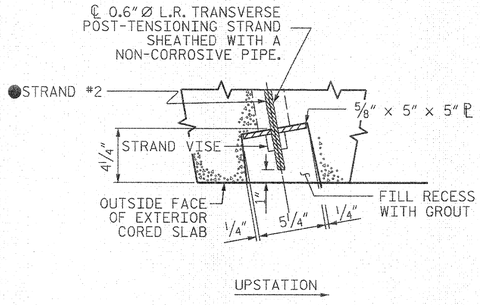
SECTION X-X

(TYPE I UNIT)



SECTION Y-Y

(TYPE III UNIT)



SECTION Z-Z

(TYPE V UNIT)

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

▲ STRAND #1 GOES THROUGH 5 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)

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

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

DRAWN BY : MAA	6/10	REV. 12/11	MAA/AAC
CHECKED BY : MKT	7/10	REV. 8/14	MAA/TMG

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER MARK A. ANDERSON P. SHERMAN 1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

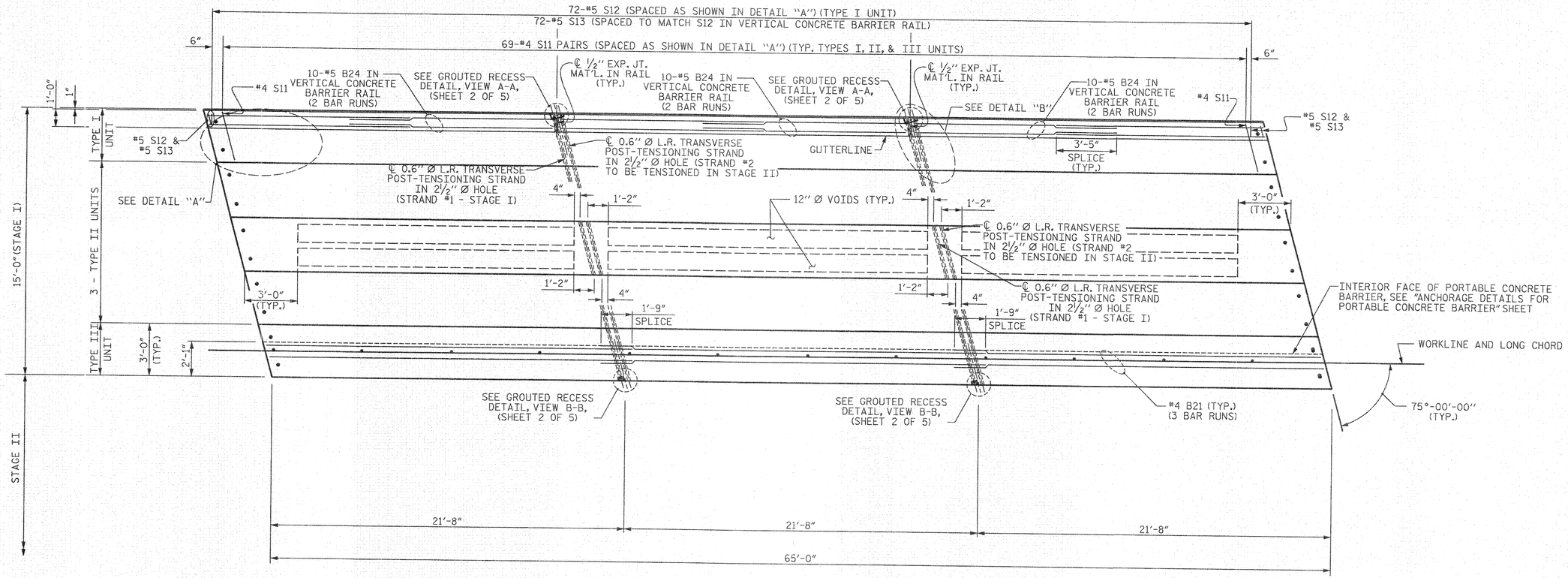
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

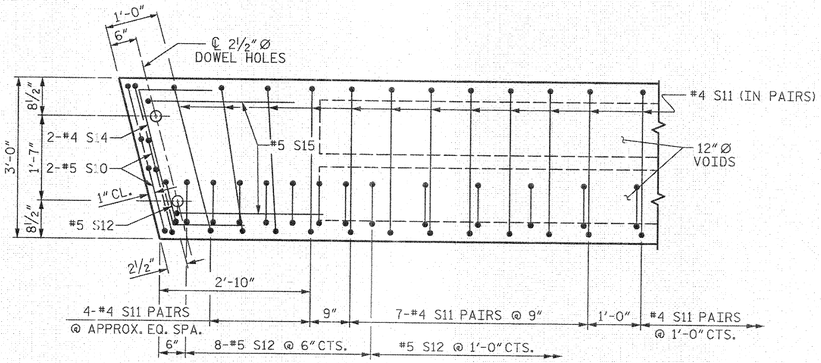
STD. NO. 24PCS4_27_75S

1/11/2016
BD-5109AC_SD_PC_06.dgn



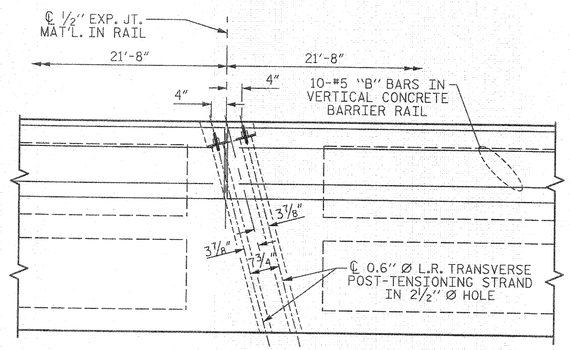
PLAN OF SPAN A

STAGE I CONSTRUCTION



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES (TYPE I UNIT SHOWN, TYPE V SIMILAR.)

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

DRAWN BY :	MAA	6/10	
CHECKED BY :	MKT	7/10	
REV.	12/5/11		MAA/AAC
REV.	8/14		MAA/TMG

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PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031988 JAMES A. SHERMAN 1-13-16

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PROJECT NO. BD-5109AC
FORSYTH COUNTY
STATION: 13+04.51 -L-
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

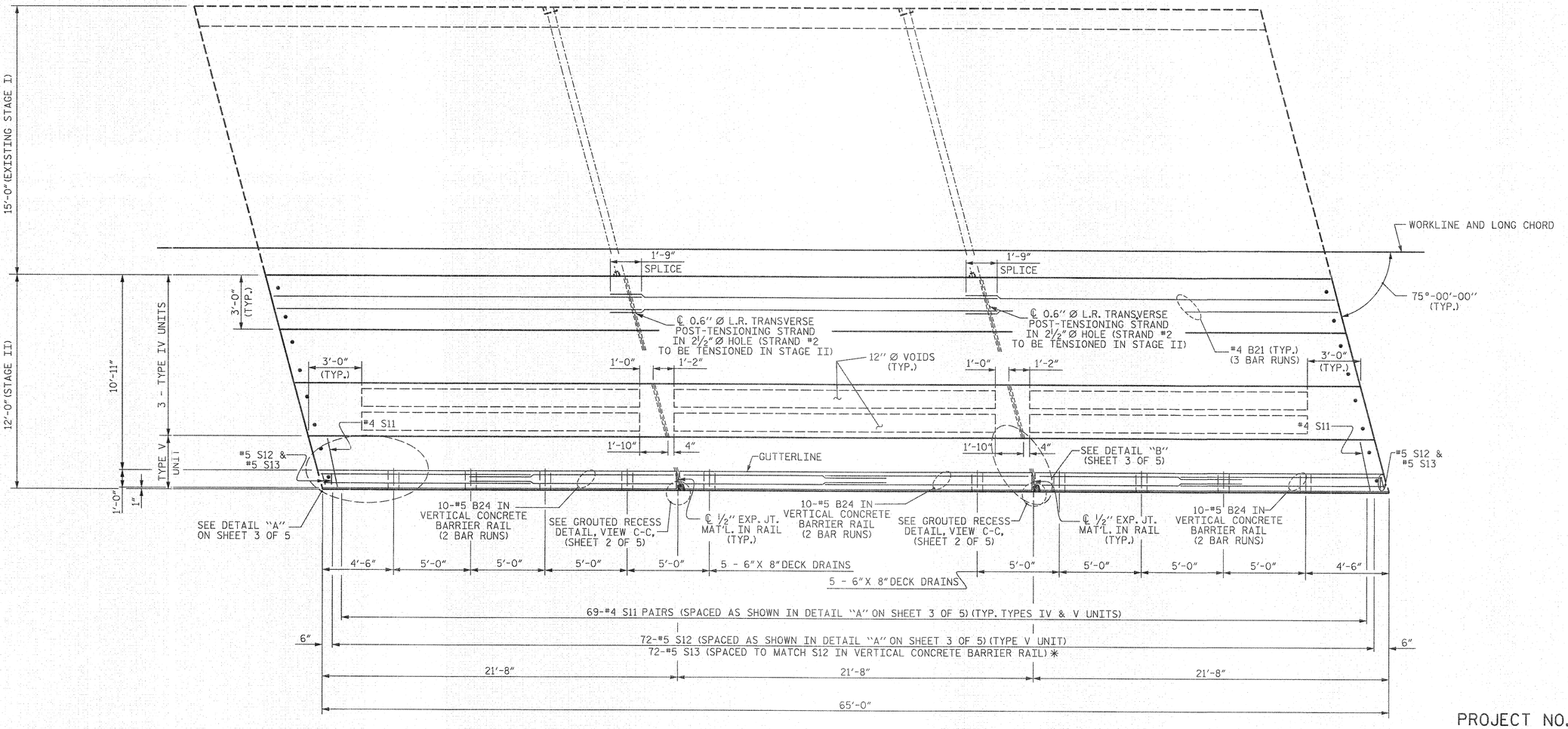
STANDARD SUPERSTRUCTURE

PLAN OF SPAN A

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

STD. NO. 24PCS_27_75S_65L



PLAN OF SPAN A

STAGE II CONSTRUCTION

✱ MATCH #5 S13 BARS TO #5 S12 BARS. PLACE SUCH THAT CONCRETE COVER TO DECK DRAINS IS MAXIMIZED

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

SHEET 4 OF 5

DESIGNED BY:	E. DAVIS	DATE:	NOV. 2014
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REV.	8/14	MAA/TMC

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NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JOHN P. SHERMAN
1-13-16

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE

PLAN OF SPAN A

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

STD. NO. 24PCS_27_75S_65L

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
65' UNITS	2⅛"	3'-8⅛"

DEAD LOAD DEFLECTION AND CAMBER

TYPES I, II, III, IV & V UNITS

	3'-0" x 2'-0"
65' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1⅞" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	½" ↓
FINAL CAMBER	1⅜" ↑

** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED

		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	1	65'-0"	65'-0"
	TYPE II	3	65'-0"	195'-0"
	TYPE III	1	65'-0"	65'-0"
STAGE II	TYPE IV	3	65'-0"	195'-0"
	TYPE V	1	65'-0"	65'-0"
	TOTAL	9		585'-0"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	65' UNIT					
*B24	120	120	#5	STR	12'-10"	1606
*S13	148	148	#5	2	7'-2"	1106
*EPOXY COATED REINFORCING STEEL				LBS.		2712
CLASS AA CONCRETE				CU.YDS.		16.9
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		130.26

CONCRETE RELEASE STRENGTH

UNIT	PSI
65' UNITS	4800

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

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.

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.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS 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.

FLAME CUTTING OF THE TRANSVERSE POST TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

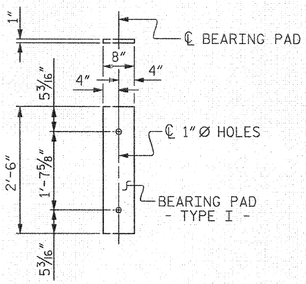
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

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.

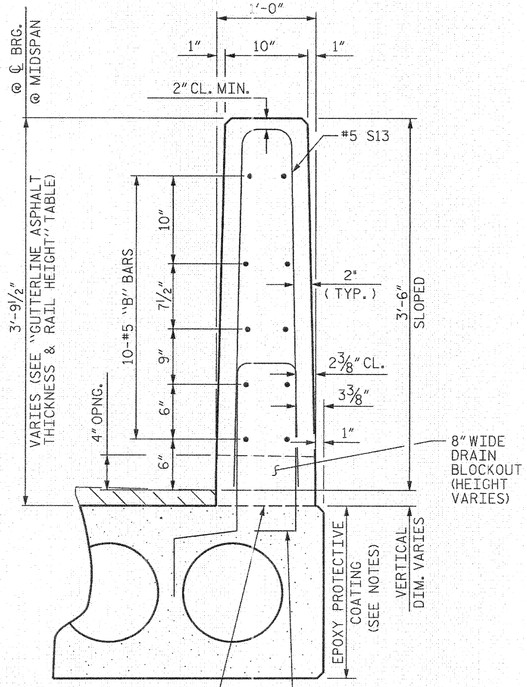
APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.



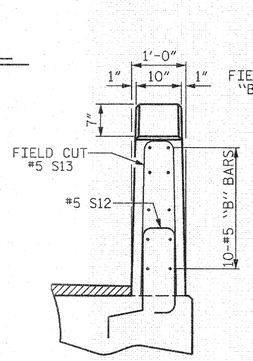
FIXED END
(TYPE I - 18 REQ'D)

ELASTOMERIC BEARING DETAILS

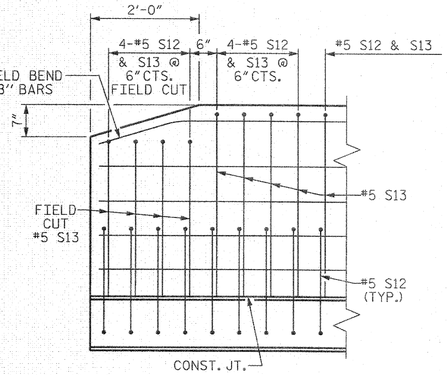
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



SECTION THRU RAIL

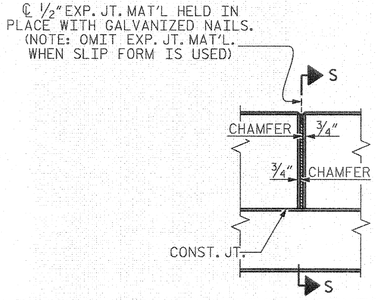


END VIEW

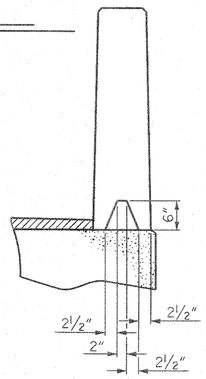


SIDE VIEW

END OF RAIL DETAILS



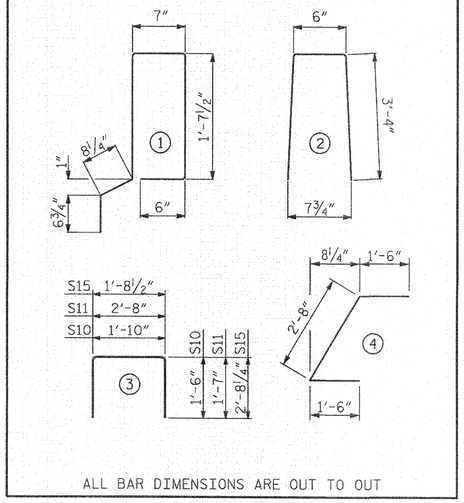
ELEVATION AT EXPANSION JOINTS



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

VERTICAL CONCRETE BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 65' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B21	6	#4	STR	22'-10"	92	22'-10"	92
S10	8	#5	3	4'-10"	40	4'-10"	40
S11	138	#4	3	5'-10"	538	5'-10"	538
*S12	74	#5	1	5'-7"	431		
S14	4	#4	4	5'-8"	15	5'-8"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		715		715
*EPOXY COATED REINFORCING STEEL			LBS.		431		
6000 P.S.I. CONCRETE			CU. YDS.		11.2		11.2
0.6" Ø L.R. STRANDS			No.		24		24

PROJECT NO. BD-5109AC

FORSYTH COUNTY

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SHEET 5 OF 5

DESIGNED BY:	E. DAVIS	DATE:	NOV. 2014
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DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE:	JAN. 2016

DRAWN BY:	MAA	6/10	REV.	12/11	MAA/AAC
CHECKED BY:	MKT	7/10	REV.	8/14	MAA/TMG
			REV.	11/14	MAA/TMG

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PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 081988 ENGINEER P. SHERMAN
1-13-16

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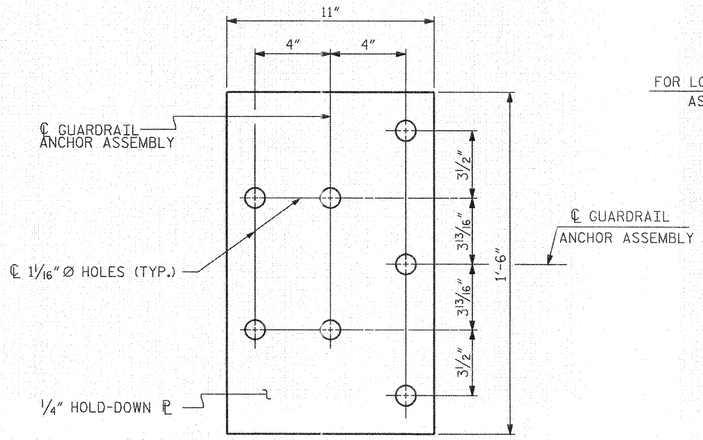
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

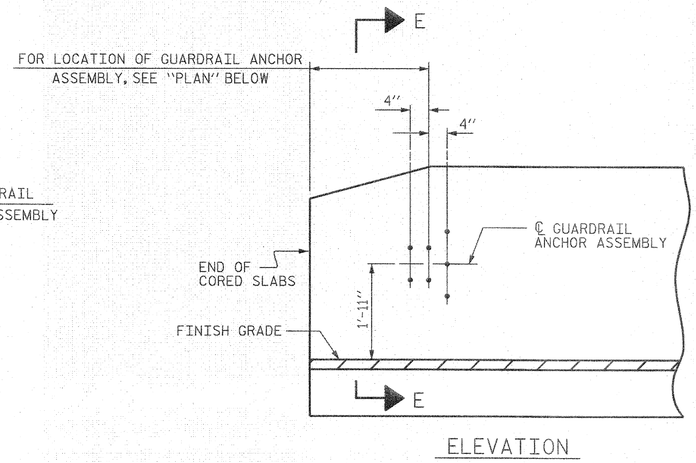
STANDARD
SUPERSTRUCTURE
3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

STD. NO. 24PCS3_27_75&105S



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" ℄ 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.)

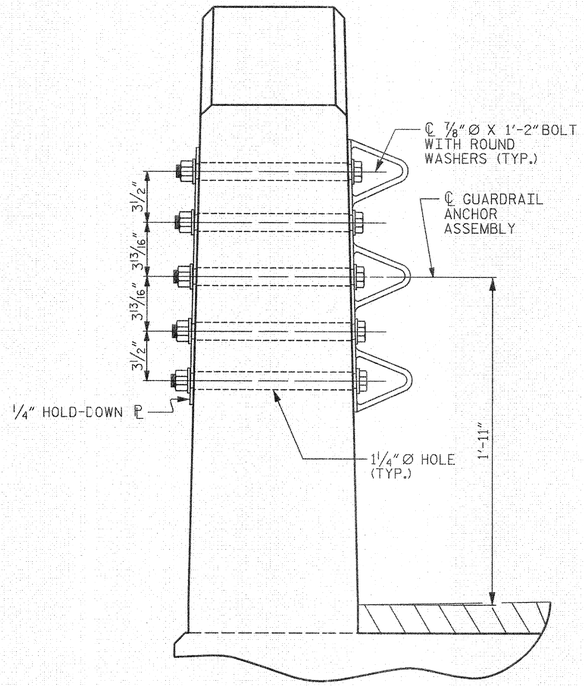
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

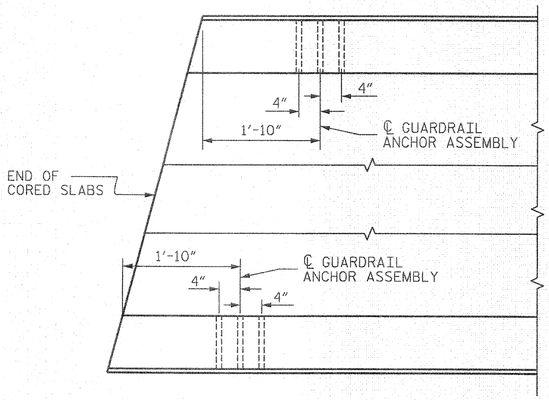
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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.

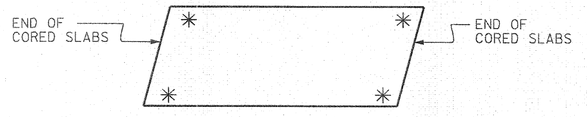


SECTION E-E



PLAN

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

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

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FORSYTH COUNTY

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DRAWN BY : WJH 4/89	REV. 10/1/11	MAA/GW
CHECKED BY : FCJ 5/89	REV. 10/12	MAA/GW
	REV. 6/13	MAA/GW

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1-13-16

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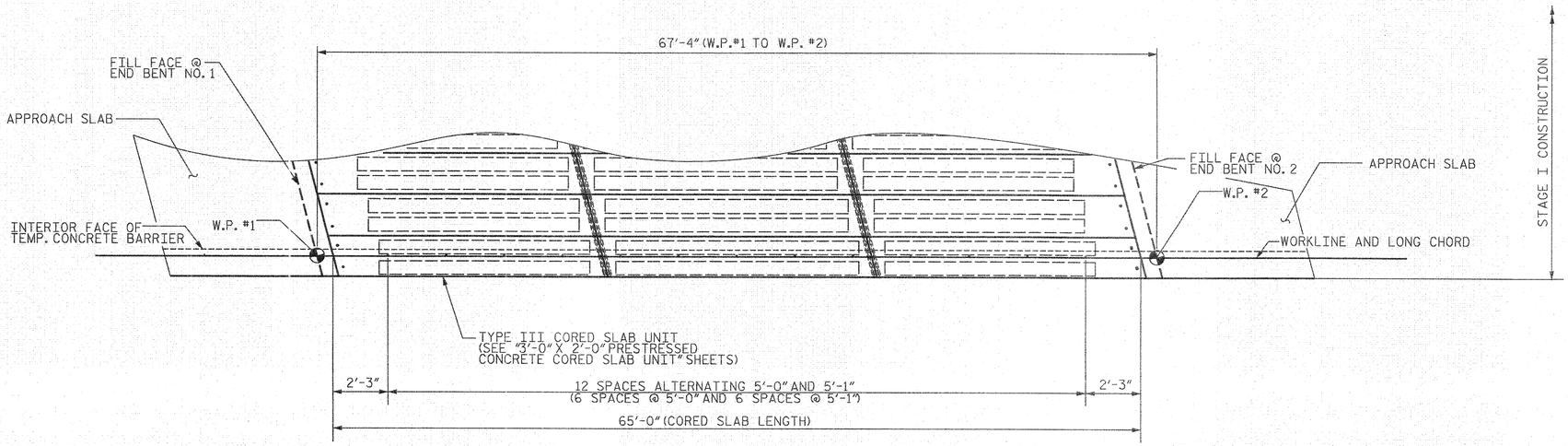
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

STD. NO. GRA3



ANCHORAGE SPACING FOR PORTABLE CONCRETE BARRIER - STAGE I

NOTES

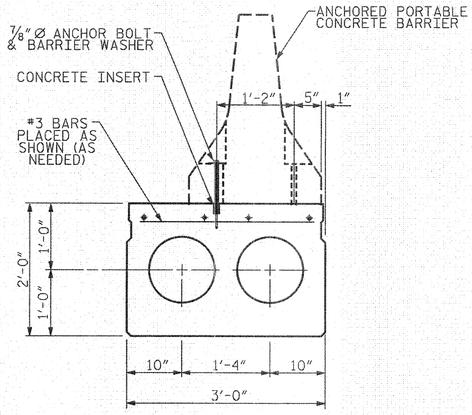
THE CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE CONCRETE INSERTS.

USE ASTM A325 HIGH STRENGTH GALVANIZED ANCHOR BOLTS.

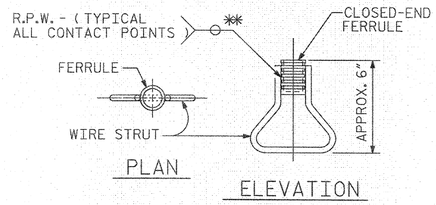
INSTALL ANCHORED PORTABLE CONCRETE BARRIER IN ACCORDANCE WITH SECTION 1170 OF THE STANDARD SPECIFICATIONS. PORTABLE CONCRETE BARRIER RAIL ON THE APPROACH SLABS SHALL BE INSTALLED WITH AN APPROVED METHOD SHOWN IN THE ROADWAY STANDARD DRAWINGS.

THE CONCRETE INSERTS SHALL BE GROUTED IMMEDIATELY FOLLOWING THE REMOVAL OF THE PORTABLE CONCRETE BARRIER.



SECTION OF ANCHOR ASSEMBLY LOCATION

(TYPE III UNIT OF STAGE I)
THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.



CONCRETE INSERT

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

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NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JACK P. SHERMAN
1-13-16

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RALEIGH

ANCHORAGE DETAILS FOR PORTABLE CONCRETE BARRIER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			16

1/11/2016
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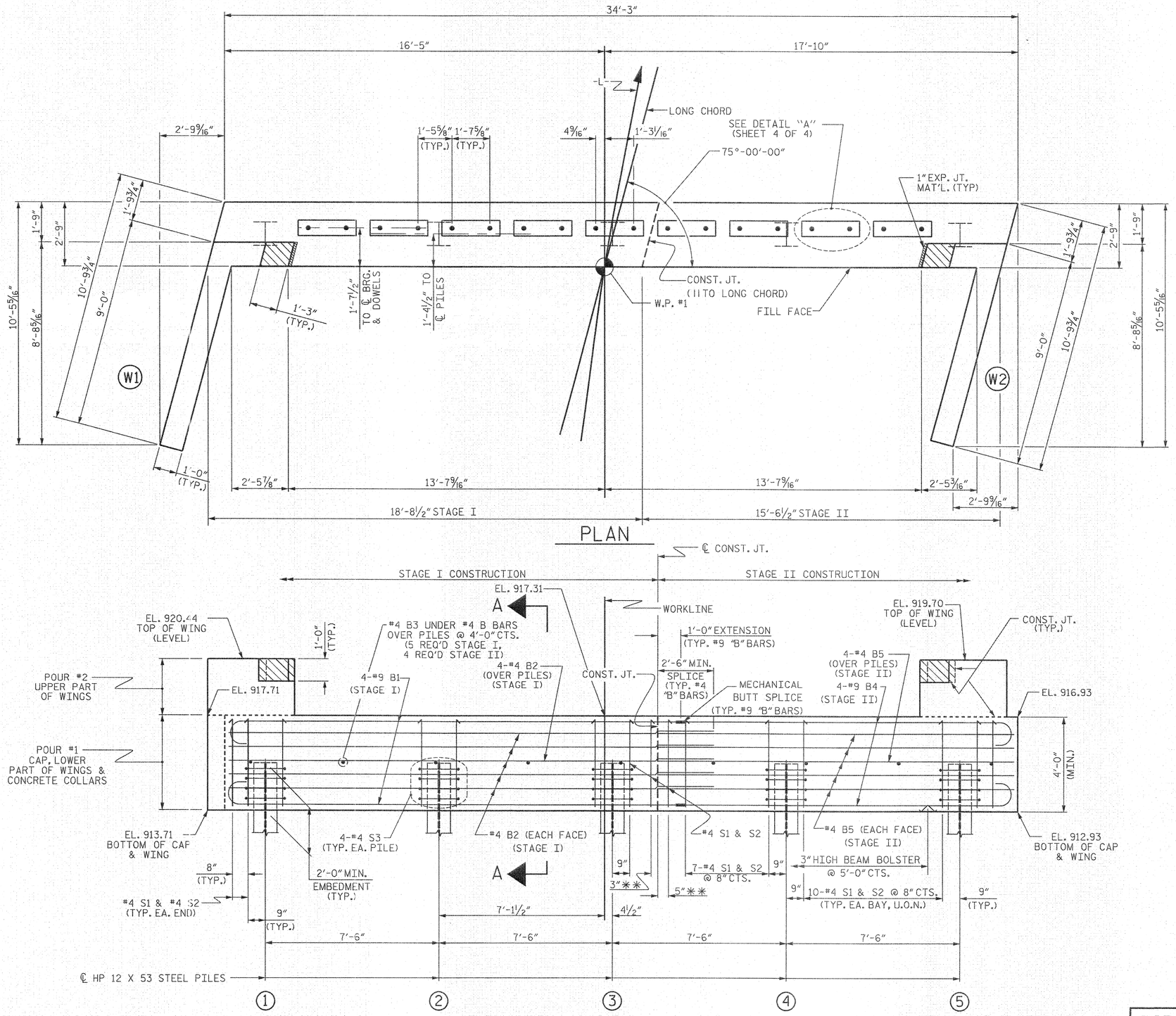

PLAN

ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.
** ROTATE STIRRUPS ⊥ TO CONST. JT., DIMENSIONS ARE MEASURED ⊥ TO CONST. JT.

NOTES

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

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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE BARS REQUIRING MECHANICAL COUPLERS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL COUPLER CHOSEN BY THE CONTRACTOR.

TOP OF PILE ELEVATIONS

①	915.64
②	915.47
③	915.31
④	915.14
⑤	914.98

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DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG		
CHECKED BY : AAC 12/11			

1/11/2016
BD-5109AC_SD_EB_12.dgn

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031688 ENGINEER JACOB A. SHERMAN
1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

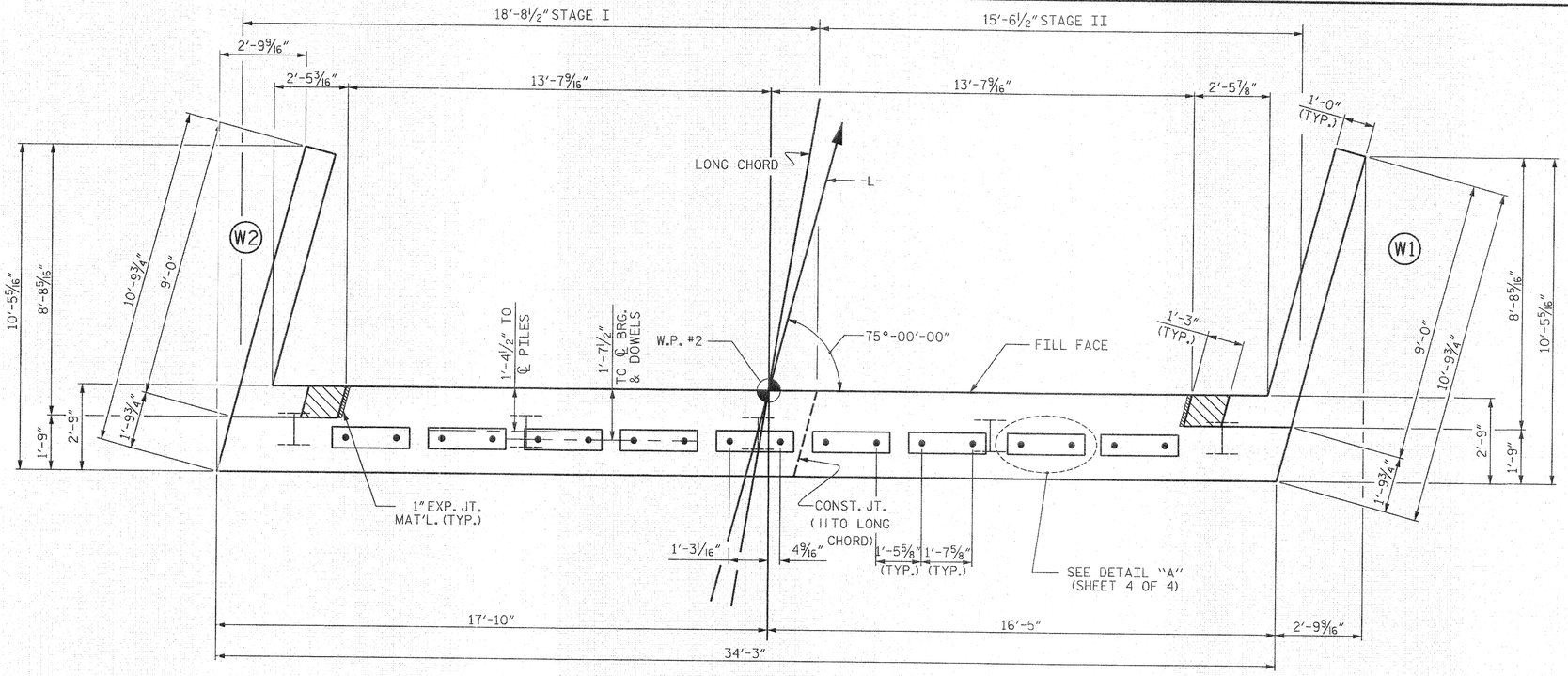
PROJECT NO. BD-5109AC
FORSYTH COUNTY
STATION: 13+04.51 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

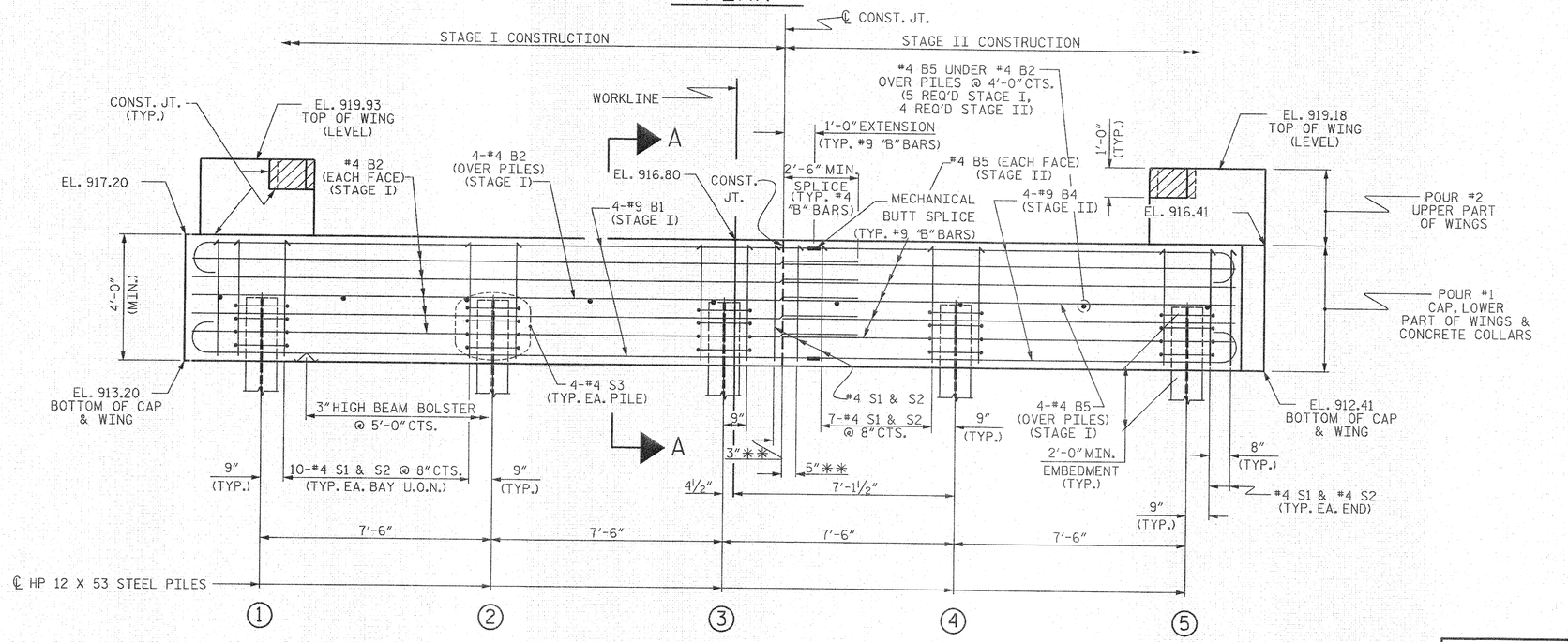
STANDARD SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

STD. NO. EB_27_75S4



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.
**ROTATE STIRRUPS ⊥TO CONST. JT., DIMENSIONS ARE MEASURED ⊥ TO CONST. JT.

NOTES

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

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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE BARS REQUIRING MECHANICAL COUPLERS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL COUPLER CHOSEN BY THE CONTRACTOR.

TOP OF PILE ELEVATIONS	
①	915.13
②	914.96
③	914.80
④	914.63
⑤	914.47

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

DRAWN BY :	WJH	12/11	REV. 4/15 MAA/TMG
CHECKED BY :	AAC	12/11	

1/11/2016
BD-5109AC_SD_EB_13.dgn

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER WILLIAM P SHERMAN
1-13-16

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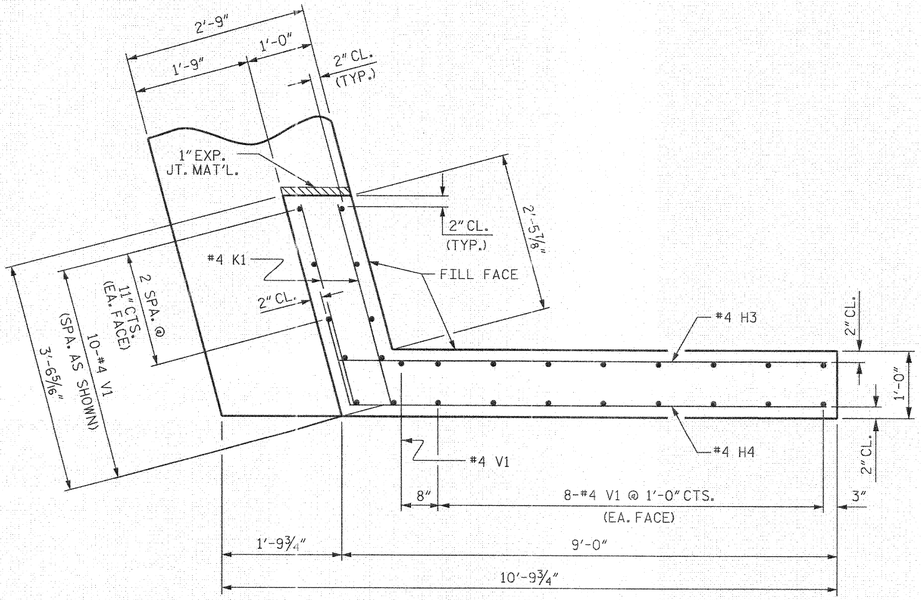
PROJECT NO. BD-5109AC
FORSYTH COUNTY
STATION: 13+04.51 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

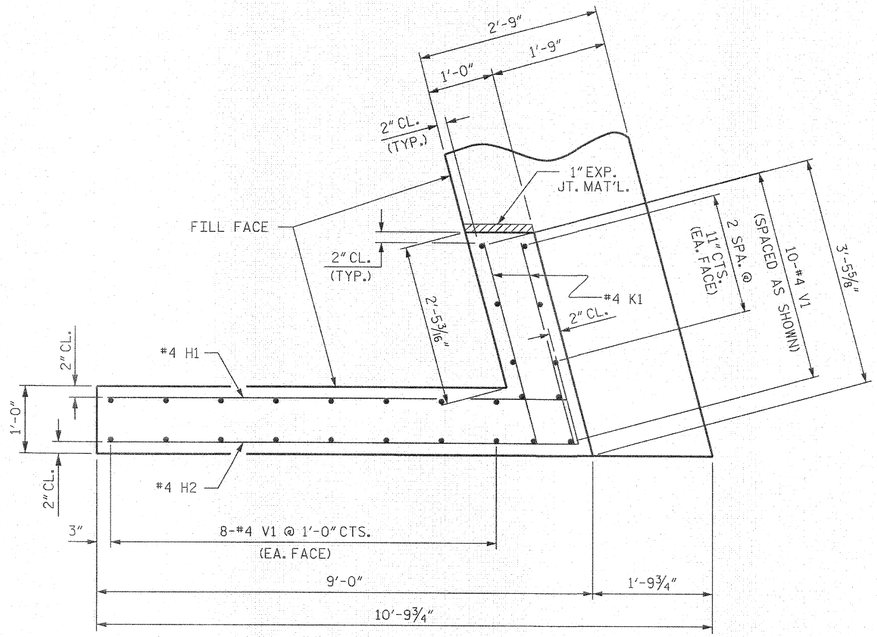
STANDARD SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			16

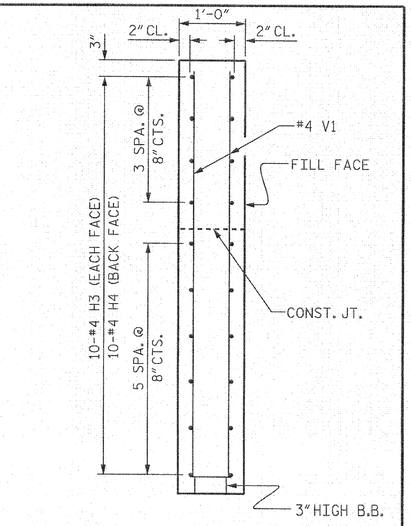
STD. NO. EB_27_75S4



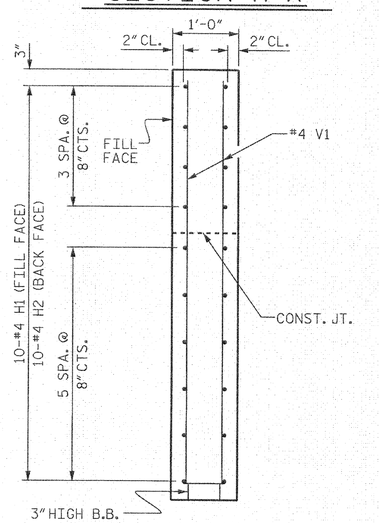
PLAN OF WING (W1)



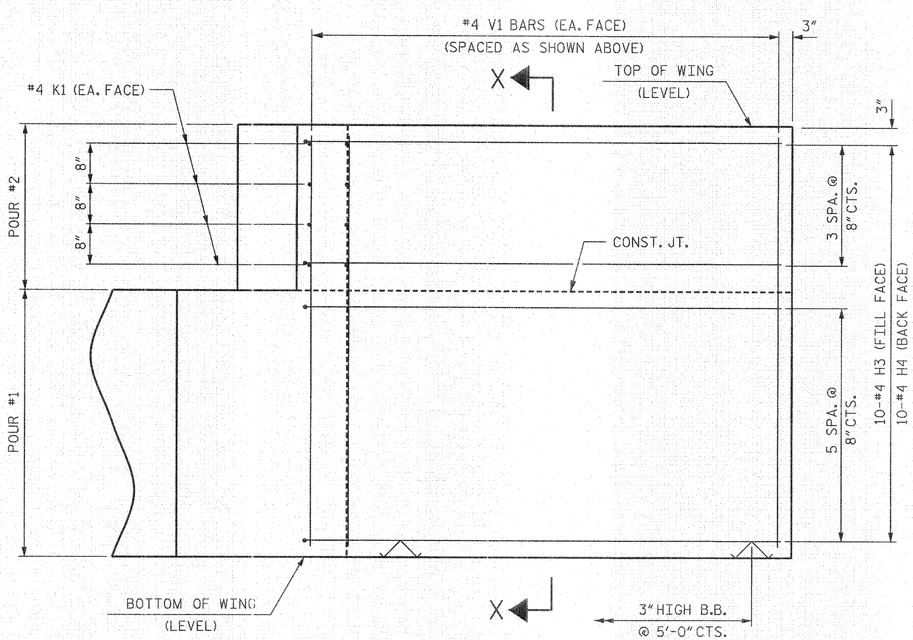
PLAN OF WING (W2)



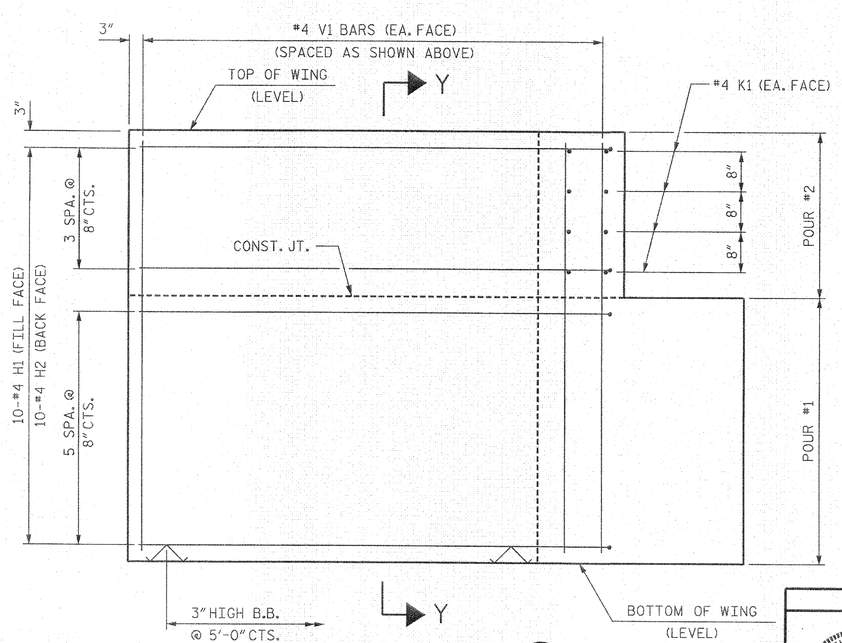
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016
DRAWN BY : WJH 12/11	REV. 4/15		MAA/TMG
CHECKED BY : AAC 12/11			

1/11/2016
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PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER JOSEPH A. SHERMAN 1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

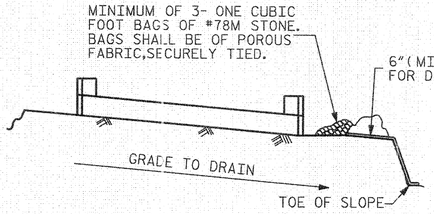
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUBSTRUCTURE
END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

STD. NO. EB_27_75S4

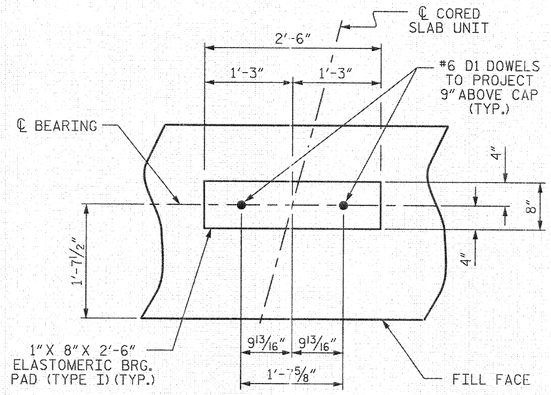


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

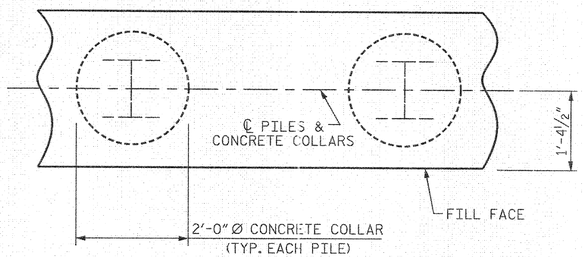
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

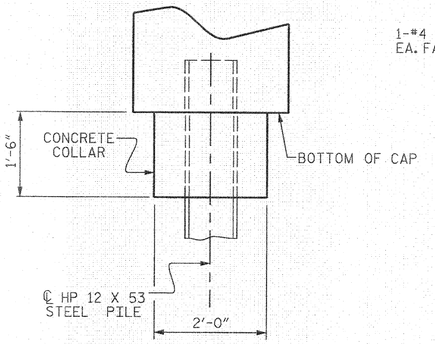


DETAIL "A"

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



PLAN

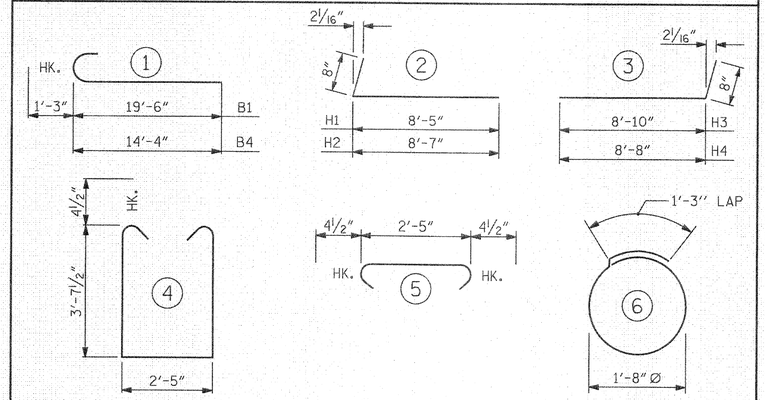


ELEVATION

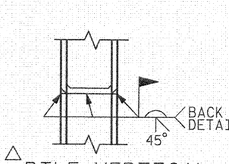
CORROSION PROTECTION FOR STEEL PILES DETAIL

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

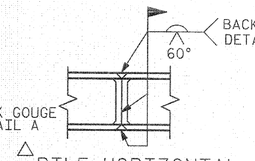
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

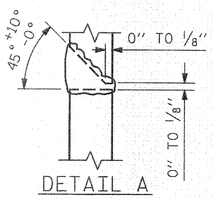


△ PILE VERTICAL

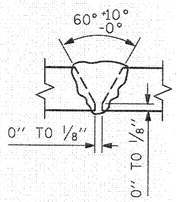


△ PILE HORIZONTAL OR VERTICAL

△ POSITION OF PILE DURING WELDING.

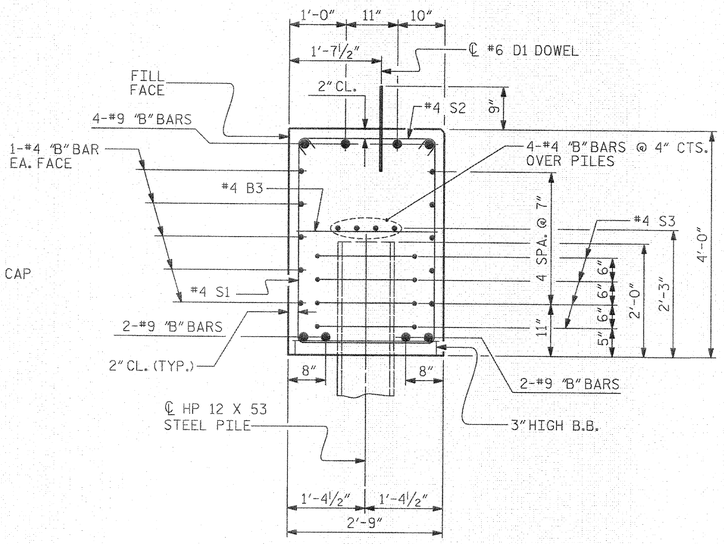


DETAIL A



DETAIL B

PILE SPLICE DETAILS



SECTION A-A

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

BILL OF MATERIAL FOR ONE END BENT

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	20'-9"	564
B2	14	#4	STR	21'-0"	196
B3	5	#4	STR	2'-5"	8
D1	10	#6	STR	1'-6"	23
✳H3	10	#4	3	9'-6"	63
✳H4	10	#4	3	9'-4"	62
K1	8	#4	STR	3'-1"	16
S1	24	#4	4	10'-5"	167
S2	24	#4	5	3'-2"	51
S3	12	#4	6	6'-6"	52
V1	27	#4	STR	6'-2"	111

REINFORCING STEEL (FOR STAGE I) 1313 LBS.

CLASS A CONCRETE BREAKDOWN (FOR STAGE I)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 9.3 C.Y.

POUR #2 UPPER PART OF WINGS 1.2 C.Y.

TOTAL CLASS A CONCRETE 10.5 C.Y.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	4	#4	STR	2'-5"	6
B4	8	#9	1	15'-7"	424
B5	14	#4	STR	15'-4"	143
D1	8	#6	STR	1'-6"	18
✳H1	10	#4	2	9'-1"	61
✳H2	10	#4	2	9'-3"	62
K1	8	#4	STR	3'-1"	16
S1	20	#4	4	10'-5"	139
S2	20	#4	5	3'-2"	42
S3	8	#4	6	6'-6"	35
V1	26	#4	STR	6'-2"	107

REINFORCING STEEL (FOR STAGE II) 1053 LBS.

CLASS A CONCRETE BREAKDOWN (FOR STAGE II)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 7.9 C.Y.

POUR #2 UPPER PART OF WINGS 1.2 C.Y.

TOTAL CLASS A CONCRETE 9.1 C.Y.

END BENT NO. 1	END BENT NO. 2	END BENT NO. 1	END BENT NO. 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 3 LIN. FT.= 45	NO: 3 LIN. FT.= 45	NO: 2 LIN. FT.= 30	NO: 2 LIN. FT.= 30
STEEL PILE POINTS EA. = 3	STEEL PILE POINTS EA. = 3	STEEL PILE POINTS EA. = 2	STEEL PILE POINTS EA. = 2

✳BARS SHOWN AS REQ'D FOR EB #1, INTERCHANGE FOR EB #2. SEE END BENT WING DETAILS, SHEET 3 OF 4.

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016
DRAWN BY :	WJH 12/11		
CHECKED BY :	AAC 12/11		

1/11/2016
BD-5109AC_SD_EB_15.dgn

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL SEAL 031988 ENGINEER AARON A. CLARK
1-13-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

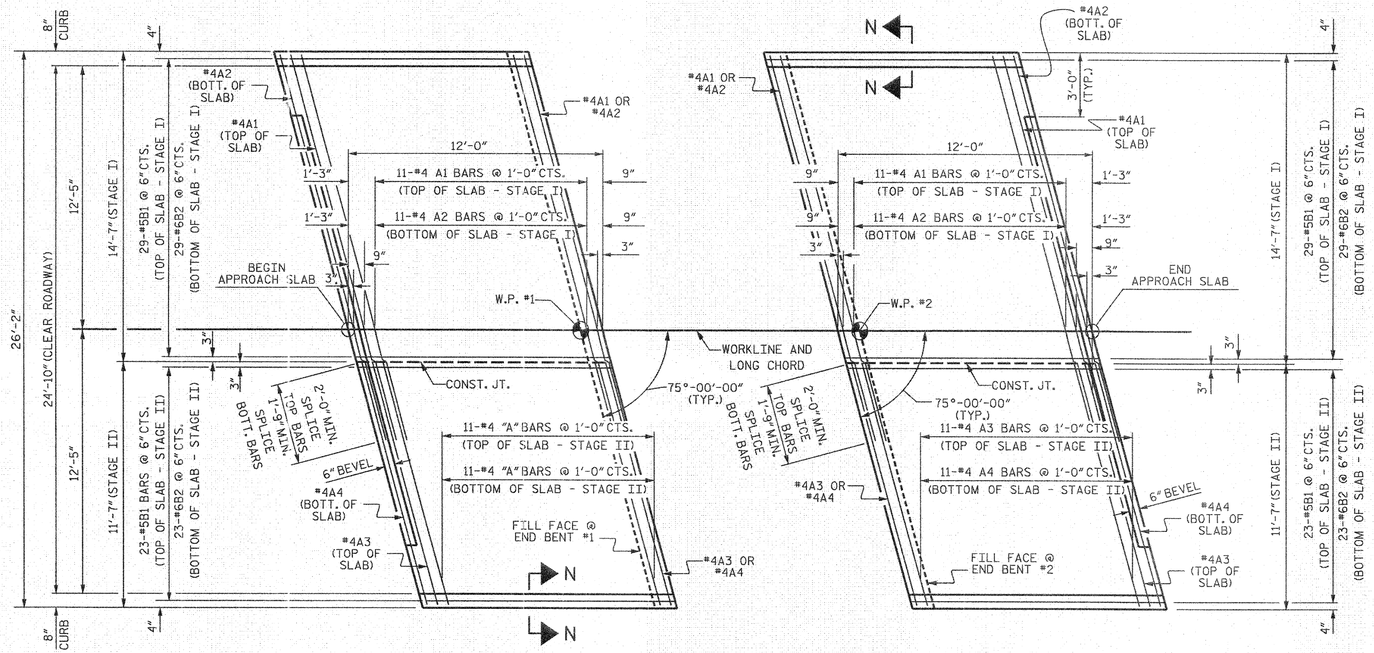
PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51 -L-

SHEET 4 OF 4

STD. NO. EB_27_75S4



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

GEOTEXTILE SHALL BE TYPE I 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.

BILL OF MATERIAL

APPROACH SLAB AT EB #1 STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	17'-0"	147
A2	13	#4	STR	16'-9"	145
* B1	29	#5	STR	11'-1"	335
B2	29	#6	STR	11'-7"	505
REINFORCING STEEL				LBS.	650
* EPOXY COATED REINFORCING STEEL				LBS.	482
CLASS AA CONCRETE				C.Y.	8.9

APPROACH SLAB AT EB #1 STAGE II

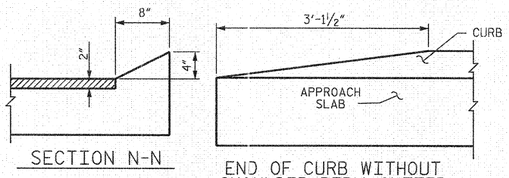
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	13	#4	STR	11'-9"	102
A4	13	#4	STR	11'-9"	102
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
REINFORCING STEEL				LBS.	502
* EPOXY COATED REINFORCING STEEL				LBS.	368
CLASS AA CONCRETE				C.Y.	7.0

APPROACH SLAB AT EB #2 STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	17'-0"	147
A2	13	#4	STR	16'-9"	145
* B1	29	#5	STR	11'-1"	335
B2	29	#6	STR	11'-7"	505
REINFORCING STEEL				LBS.	650
* EPOXY COATED REINFORCING STEEL				LBS.	482
CLASS AA CONCRETE				C.Y.	8.9

APPROACH SLAB AT EB #2 STAGE II

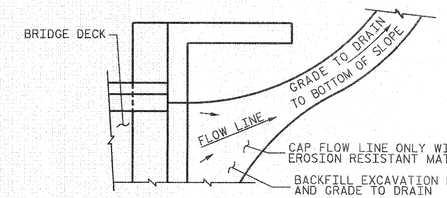
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	13	#4	STR	11'-9"	102
A4	13	#4	STR	11'-9"	102
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
REINFORCING STEEL				LBS.	502
* EPOXY COATED REINFORCING STEEL				LBS.	368
CLASS AA CONCRETE				C.Y.	7.0



SECTION N-N

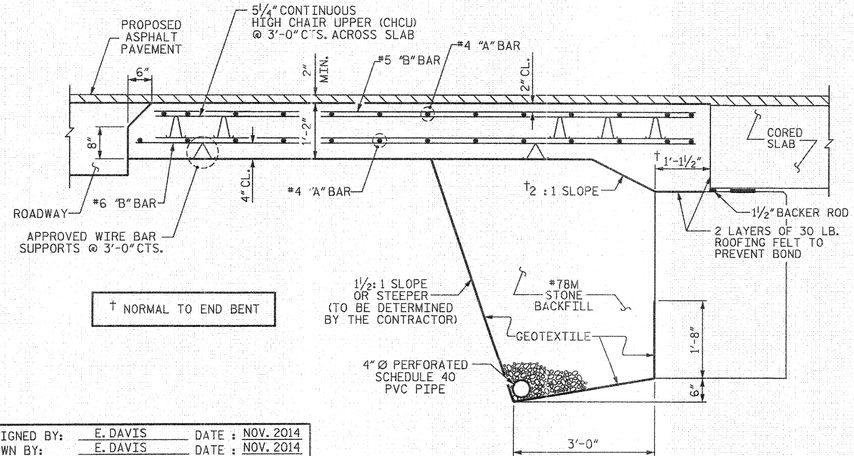
END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

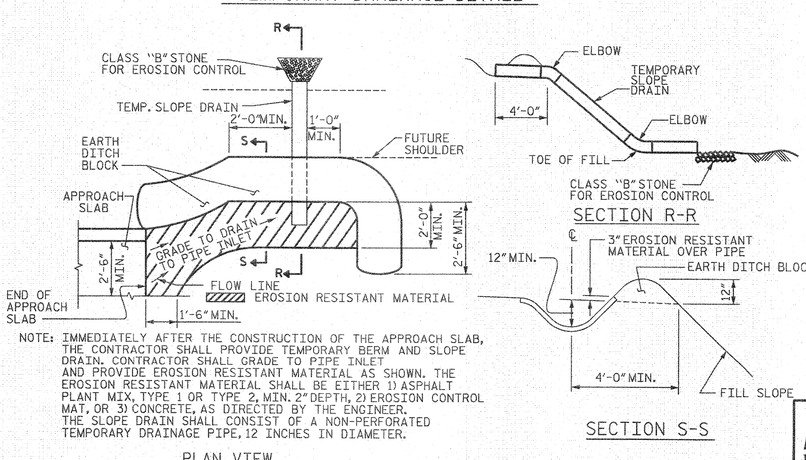


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



SECTION 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"

PROJECT NO. BD-5109AC

FORSYTH COUNTY

STATION: 13+04.51-L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
75° SKEW

DESIGNED BY:	E. DAVIS	DATE :	NOV. 2014
DRAWN BY:	E. DAVIS	DATE :	NOV. 2014
CHECKED BY:	J. SHERMAN	DATE :	NOV. 2014
DESIGN ENGINEER OF RECORD:	J. SHERMAN	DATE :	JAN. 2016

DRAWN BY : SHS/MAA 5-09	REV. 12-11	MAA/AAC
CHECKED BY : BCH 5-09	REV. 8-14	MAA/TMG
	REV. 9-15	MAA/TMG

PARSONS BRINCKERHOFF
121 WEST TRADE ST.
SUITE 1950
CHARLOTTE, NC 28202
LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037286 JOSEPH C. SHERMAN
1-13-16

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

STD. NO. BAS_27_75S

1/13/2016
BD-5109AC_SD_AS_16.dgn

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.

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