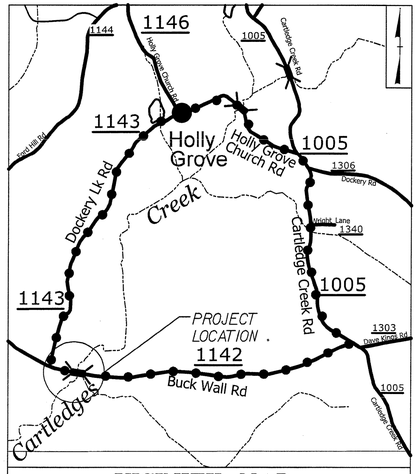
09/08/99

PROJECT: BD-5108AC

CONTRACT:

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

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional symbols
See Sheet 1-C For Survey Control Sheet



VICINITY MAP

OFF-SITE DETOUR ROUTE =

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RICHMOND COUNTY

LOCATION: BRIDGE NO. 113 ON SR 1142 (BUCK WALL ROAD) OVER CARTLEDGE CREEK

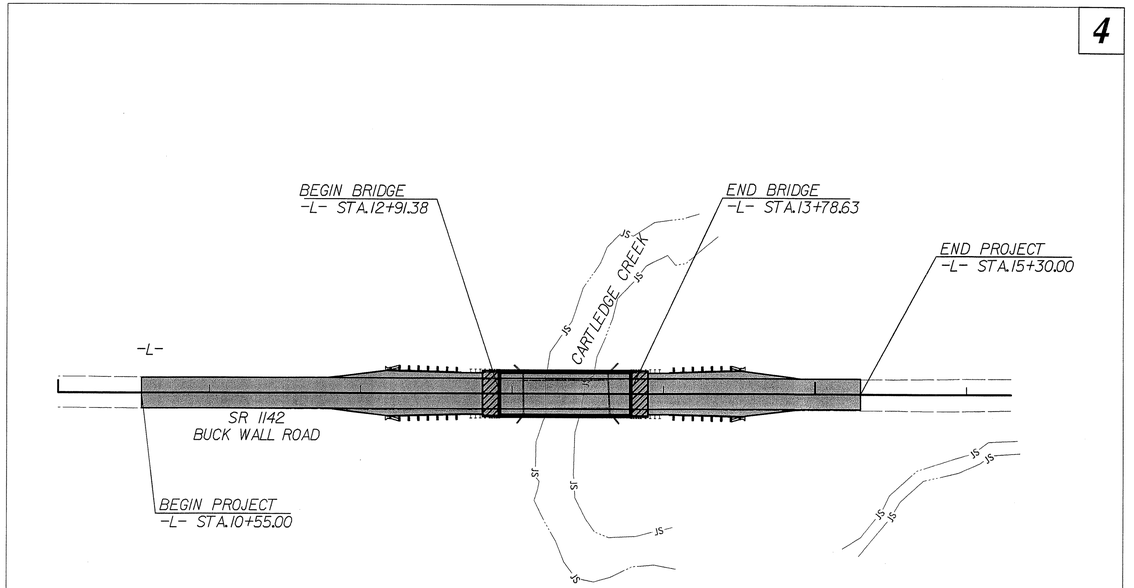
TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5108AC	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45354.1.30		PE
45354.2.FD30		R/W & UTIL.
45354.3.FD30		CONST

NC GRID
NAD 83 NA 2011

4



GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2013 = 153
D = 50%
T = 6% *
V = 55 MPH

* TTST =3 DUAL 3
FUNC CLASS = LOCAL

SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT BD-5108AC = 0.073 MI
LENGTH OF STRUCTURE PROJECT BD-5108AC = 0.017 MI
TOTAL LENGTH OF PROJECT BD-5108AC = 0.090 MI

Prepared in the Office of:
SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-8977
Fax:919-789-8591
License: C-2197

FOR THE NORTH CAROLINA DEPT. OF TRANSPORATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY, 2014

LETTING DATE:
JULY 22, 2014

STEVE SCOTT, PE
PROJECT ENGINEER

AGNIESZKA NAU, PE
PROJECT DESIGN ENGINEER

TIM WELCH, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

SIGNATURE: W. Galen Cail 4/4/14 P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029712 ENGINEER AGNIESZKA J. NAU

SIGNATURE: 04-04-14 P.E.

DEPARTMENT OF TRANSPORTATION • STATE OF NORTH CAROLINA •

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	1-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS

INDEX OF SHEETS

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11-01-11

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

EFF. 01-17-12
REV. 11-01-11

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	1B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — VIneyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

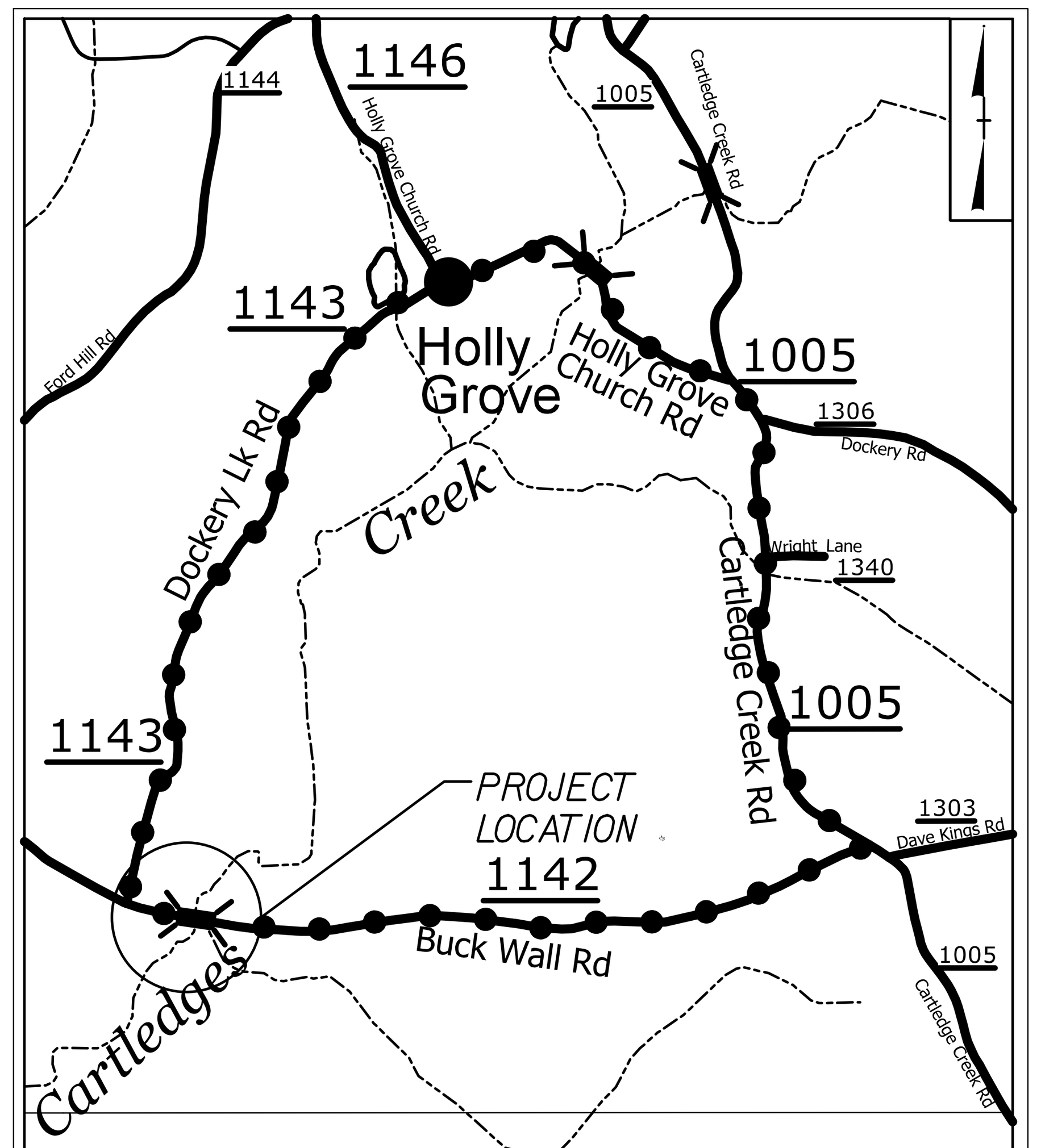
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

SURVEY CONTROL SHEET BD-5108AC

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

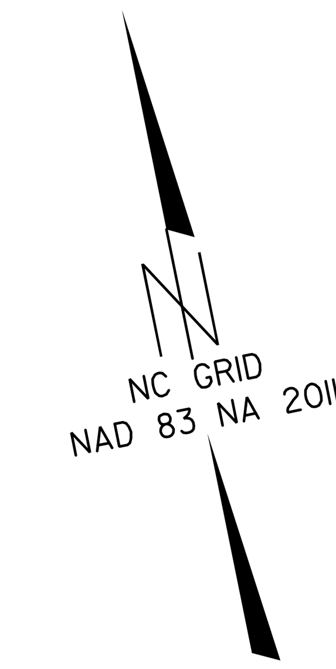
PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	1-C
R/W SHEET NO.	

-L- ALIGNMENT						
Point	BL Point	North	East	Elevation	Station	Offset
BL-101	BL-101	451,453.13'	1,746,564.11'	150.28'	10+10.10	15.26'
BL-102	BL-102	451,425.15'	1,746,856.84'	148.73'	13+02.88	-12.25'
BL-103	BL-103	451,337.85'	1,747,172.29'	147.71'	16+29.11	14.24'



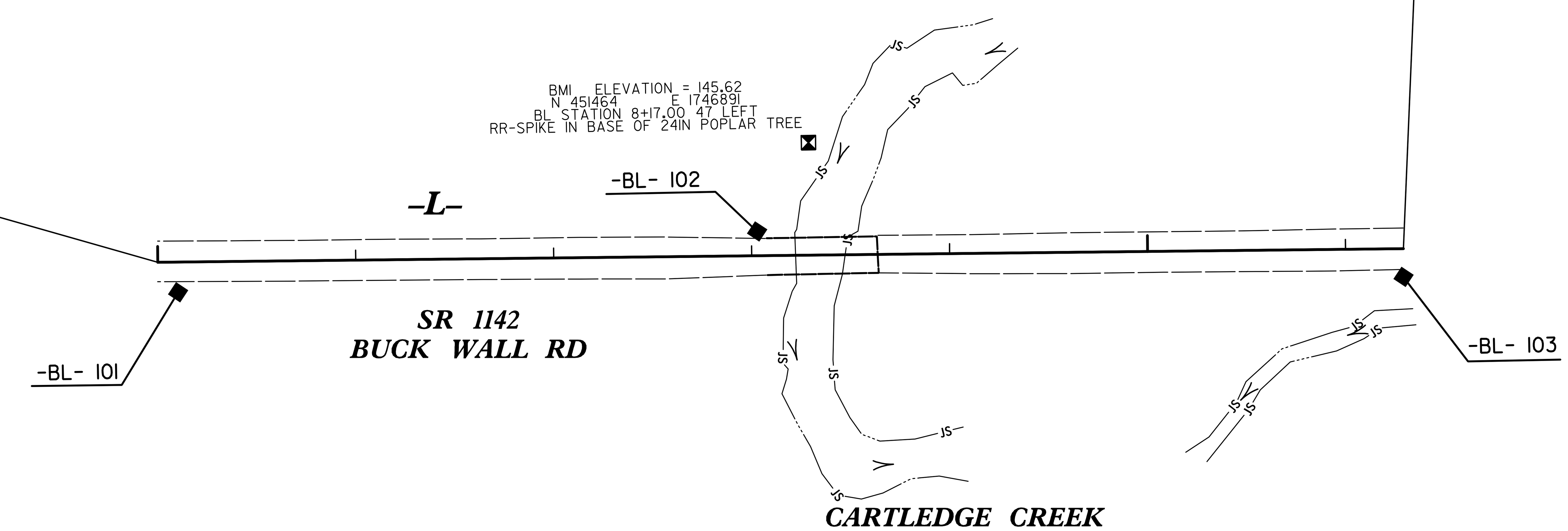
VICINITY MAP

OFF-SITE DETOUR ROUTE =



-L- STA. 16+29.26 END STATE PROJECT BD-5108AC
LOCALIZED PROJECT COORDINATES
N = 451,351.81' E = 1,747,175.12'

-L- STA. 10+00.00 BEGIN STATE PROJECT BD-5108AC
LOCALIZED PROJECT COORDINATES
N = 451,470.01' E = 1,746,557.06'



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5108AC-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 452070.372(ft) EASTING: 1745097.610(ft)
ELEVATION: 199.037(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987837
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5108AC-2" TO -L- STATION 10+00.00 IS 1578.1051' S67°38'22.52"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT WAS PROVIDED BY NCDOT.*
   CONTROL POINTS PROVIDED ARE AS FOLLOWS:
   BD5108AC-2 N=452,070.372 E=1,745,097.610 ELEV=199.037'

   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.*

◆ *INDICATES CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY NCDOT.*

NOTE: DRAWING NOT TO SCALE

REVISIONS

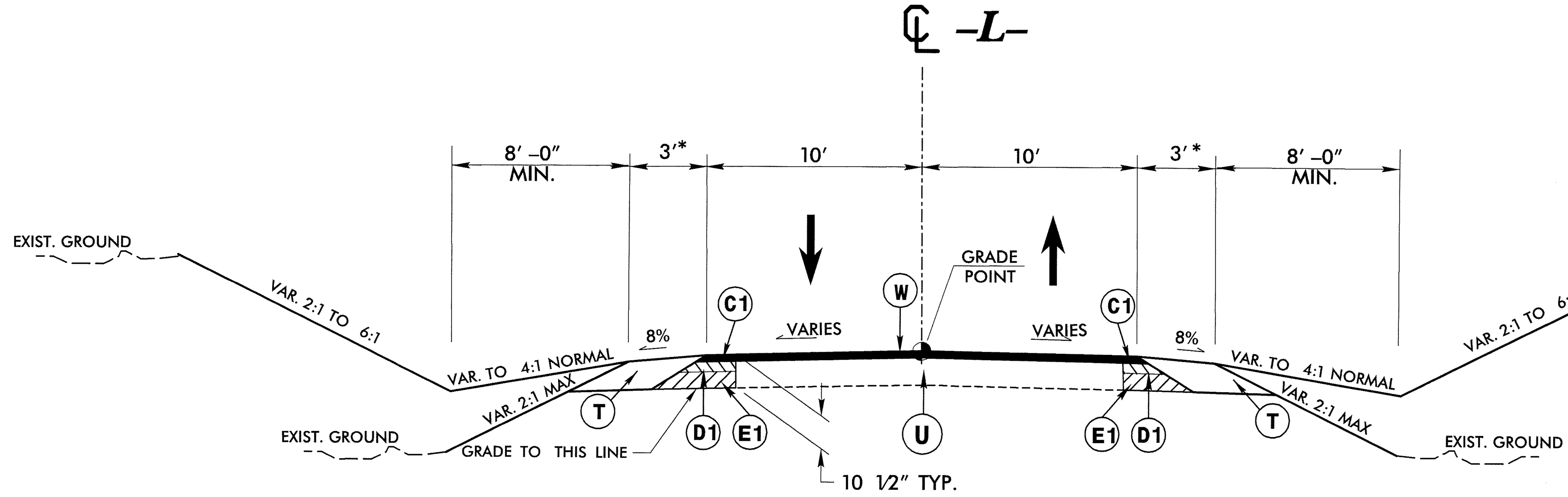
8/17/99

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

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	2
R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029712 ENGINEER AGNIESZKA J. NAU 06-04-14



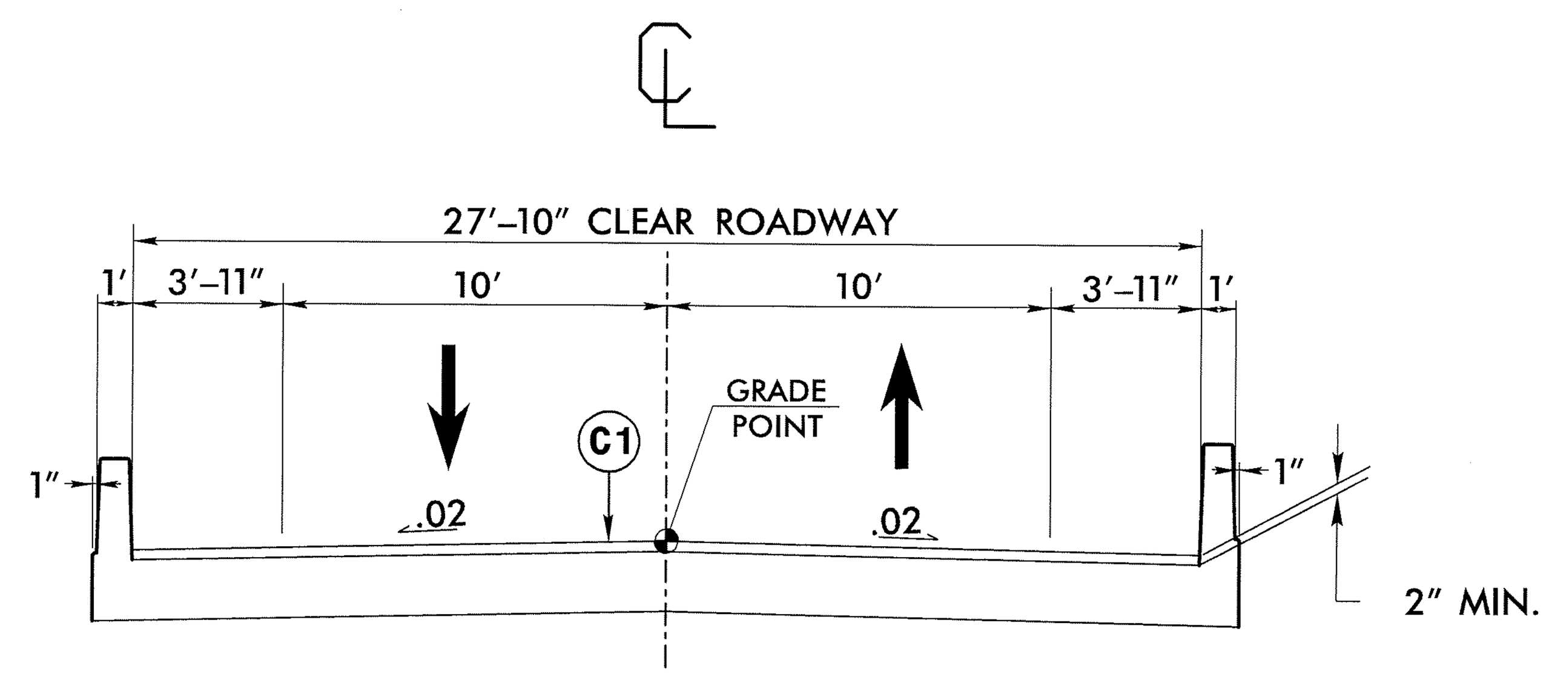
* PAVE SHOULDER TO FACE OF GUARDRAIL
ADD 3′ TO SHOULDERS FOR GUARDRAIL

TYPICAL SECTION NO. 1

-L- STA. 10+55.00 TO -L- STA. 12+91.38 (BEGIN BRIDGE)
-L- STA. 13+78.63 (END BRIDGE) TO -L- STA. 15+30.00

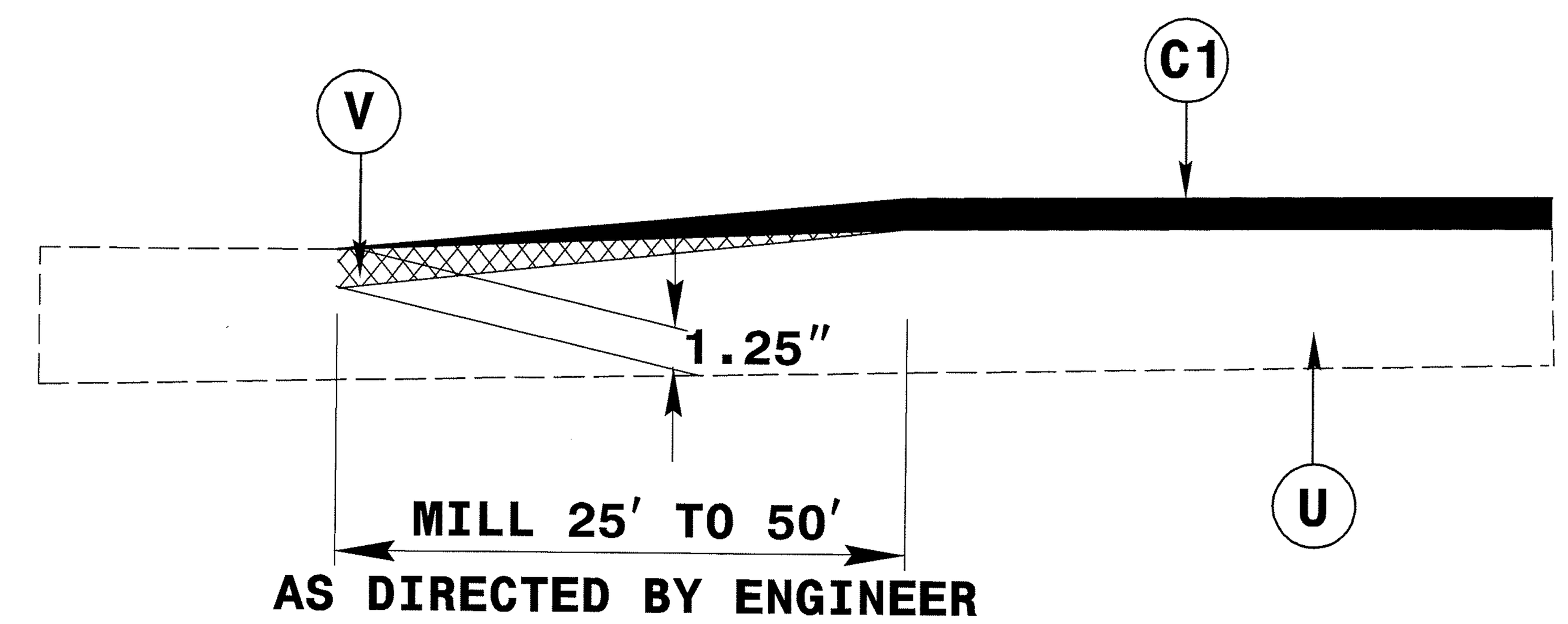
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
D1	PROP. APPROX. 3″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL)
V	MILLING

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



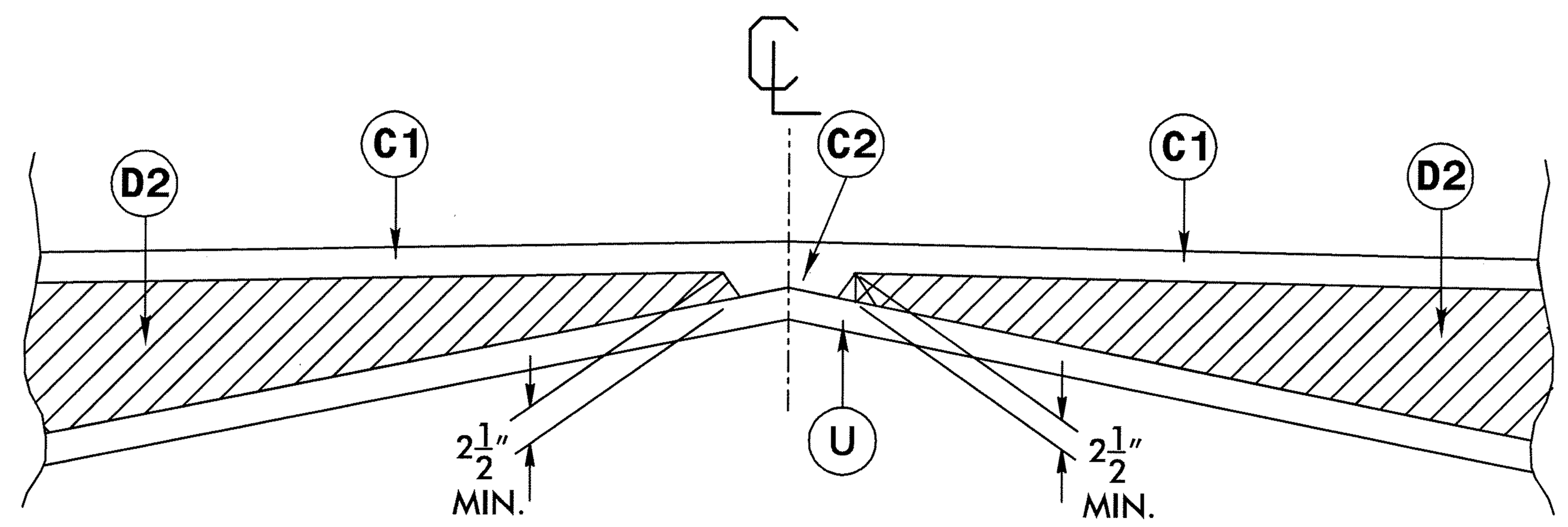
TYPICAL SECTION NO. 2

-L- STA. 12+91.38 (BEGIN BRIDGE)
TO -L- STA. 13+78.63 (END BRIDGE)



MILLING DETAIL

-L- 10+55.00
-L- 15+30.00



Detail Showing Method of Wedging

6/21/00

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	3

ITEM NUMBER	SECTION NUMBER	DESCRIPTION	QUANTITY	UNIT
0000100000-N	800	MOBILIZATION	1	LS
0030000000-N	SP	BRIDGE APPROACH FILL-SUB REGIONAL TIER, STATION -L- STA. 13+35.00	1	LS
0043000000-N	226	GRADING	1	LS
0050000000-E	226	SUPPLEMENTARY CLEARING & GRUBBING	1	ACR
0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	40	SY
0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	4	TON
0343000000-E	310	15" SIDE DRAIN PIPE	36	LF
1220000000-E	545	INCIDENTAL STONE	100	TON
1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	50	TON
1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	30	TON
1525000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	190	TON
1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	20	TON
2286000000-N	840	MASONARY DRAINAGE STRUCTURE	2	EA
2364200000-N	840	WIDE SLOT FLAT GRATE, 840.20	2	EA
2556000000-E	846	SHOULDER BERM GUTTER	16	LF
3030000000-E	862	STEEL BM GUARDRAIL	25	LF
3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	5	EA
3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	4	EA
3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	4	EA
3649000000-E	876	RIP RAP, CLASS B	2	TON
3656000000-E	876	GEOTEXTILE FOR DRAINAGE	595	SY
4457000000-N	SP	TEMPORARY TRAFFIC CONTROL	1	LS
4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	1,900	LF
6000000000-E	1605	TEMPORARY SILT FENCE	775	LF
6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	150	TON
6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	55	TON
6012000000-E	1610	SEDIMENT CONTROL STONE	75	TON
6015000000-E	1615	TEMPORARY MULCHING	0.5	ACR
6018000000-E	1620	SEED FOR TEMPORARY SEEDING	100	LB
6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	0.5	TON
6024000000-E	1622	TEMPORARY SLOPE DRAINS	100	LF
6029000000-E	SP	SAFETY FENCE	100	LF
6030000000-E	1630	SILT EXCAVATION	80	CY
6036000000-E	1631	MATTING FOR EROSION CONTROL	500	SY
6037000000-E	SP	COIR FIBER MAT	100	SY
6042000000-E	1632	1/4" HARDWARE CLOTH	60	LF
6069000000-E	1638	SPECIAL STILLING BASINS	2	EA
6071010000-E	SP	WATTLE	200	LF
6071020000-E	SP	POLYACRYLAMIDE (PAM)	40	LB
6084000000-E	1660	SEEDING AND MULCHING	0.5	ACR
6087000000-E	1660	MOWING	0.15	ACR
6090000000-E	1661	SEED FOR REPAIR SEEDING	50	LB
6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25	TON
6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	50	LB
6108000000-E	1665	FERTILIZER TOPDRESSING	0.25	TON
6114500000-N	1667	SPECIALIZED HAND MOWING	10	MHR
6117000000-N	SP	RESPONSE FOR EROSION CONTROL	12	EA

ITEM NUMBER	SECTION NUMBER	DESCRIPTION	QUANTITY	UNIT
8035000000-N	402	REM OF EX STRUCTURE AT STATION 13+35.00 -L-	1	LS
8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 13+35.00 -L-	1	LS
8182000000-E	420	CLASS A CONCRETE (BRIDGE)	33.8	CY
8210000000-N	422	BRIDGE APPROACH SLABS, STATION -L- 13+35.00	1	LS
8217000000-E	425	REINFORCING STEEL (BRIDGE)	5384	LB
8364000000-E	450	HP 12X53 STEEL PILES	175	LF
8505000000-E	460	VERTICAL CONCRETE BARRIER RAIL	170	LF
8606000000-E	876	RIP RAP CLASS II (2'-0" THICK)	180	TON
8622000000-E	876	GEOTEXTILE FOR DRAINAGE	195	SY
8657000000-N	430	ELASTOMERIC BEARINGS, Type II	1	LS
8753100000-E	430	3'-0" X 2'-9" PRESTRESSED CONC BOX BEAMS	850.00	LF

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$SCENAME$$$$

4/04/06

COMPUTED BY: AJN DATE: 11/27/13
CHECKED BY: DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUB-REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	3-A

STATION	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"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12"	15"	18"	24"	36"	42"	48"
THICKNESS OR GAUGE																				.064	.064	.064	.064	.079	.109	.109
13+92 -L-	RT	0402		150.2																						
		0402	0403		147.4	143.4																				
13+92 -L-	LT	0404		150.2																						
		0404	0405		147.4	142.2																				
TOTAL																										

STATION	FROM	TO	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" 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'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02
13+92 -L-	0402																								1			
	0402	0403																			16							
13+92 -L-	0404																								1			
	0404	0405																			20							
TOTAL																					36				2			

STATION	FROM	TO	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET		G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	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+92 -L-	0402									1				1					
	0402	0403																	
13+92 -L-	0404									1				1					
	0404	0405																	
TOTAL										2				2					

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

5/14/99

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
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License: C-2197

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- STA. 10+55.00 TO BRIDGE	16		64	48	
SUBTOTAL	16		64	48	
BRIDGE TO -L- STA. 15+30.00	1		196	195	
SUBTOTAL	1		196	195	
TOTAL	17		259	242	
LOSS DUE TO CLEAR & GRUB.					
WASTE IN LEU OF BORROW					
PROJECT TOTAL	17		259	242	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				12	
GRAND TOTAL	17		259	254	
SAY	20				

NOTE: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

"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	BEGINNING STATION	END STATION	LOCATION	LENGTH			WARRENT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU-350	AT-1	TYPE III	
-L-	12+12	12+87	RT	75.00'			12+87		4'-0"	7'-0"					1		1	
-L-	13+82	14+57	RT	75.00'				13+82	4'-0"	7'-0"					1		1	
-L-	14+57	13+82	LT	75.00'			13+82		4'-0"	7'-0"					1		1	
-L-	12+87	12+12	LT	75.00'				12+87	4'-0"	7'-0"					1		1	
SUBTOTAL				300.00'														
LESS ANCHOR DEDUCTIONS																		
GRAU-350 4 @ 50' =				-200.00'														
TYPE III 4 @ 18.75' =				-75.00'														
			TOTAL	25.00'			ADDITIONAL GUARDRAIL POSTS – 5 EA											
			SAY	25.00'											4		4	

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

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029712 ENGINEER AGNIESZKA J. NAU 04-04-14	NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 4/4/14

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
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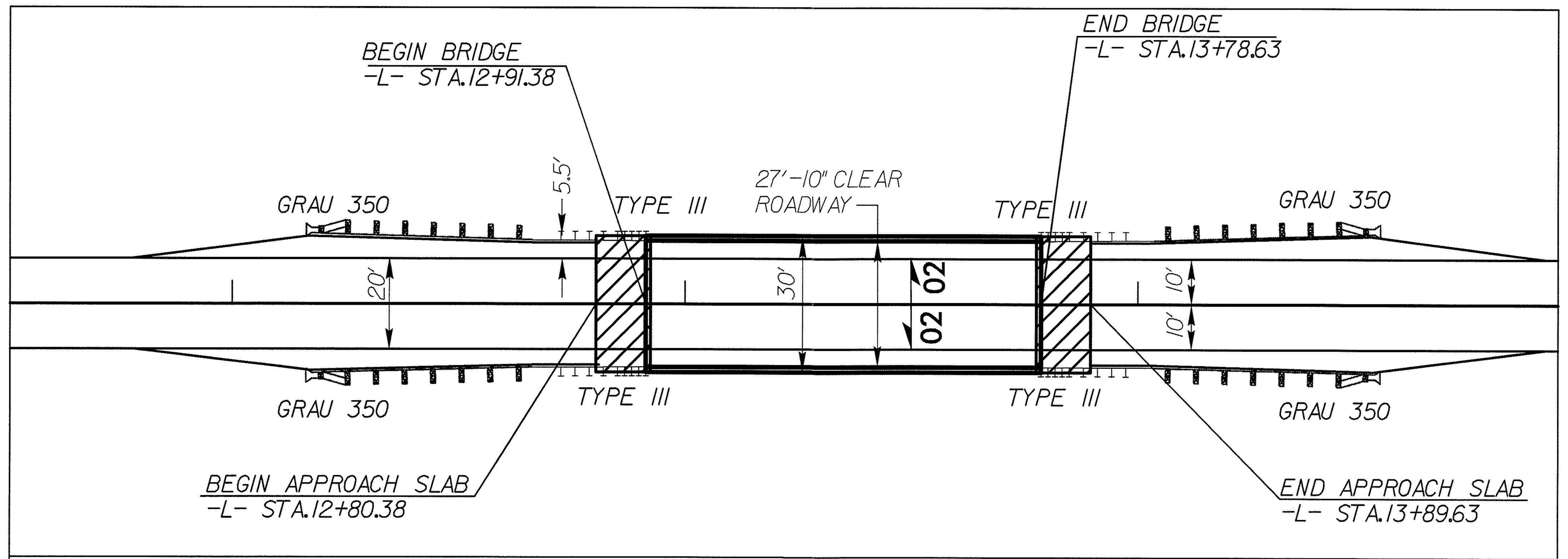
Fax:919-789-9591
License: C-2197



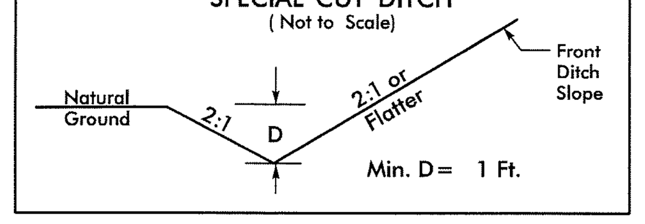
Sketch showing Dimensions of Pavement and Shoulder in Relation to Proposed Bridge Width

NC GRID
NAD 83 NA 2011

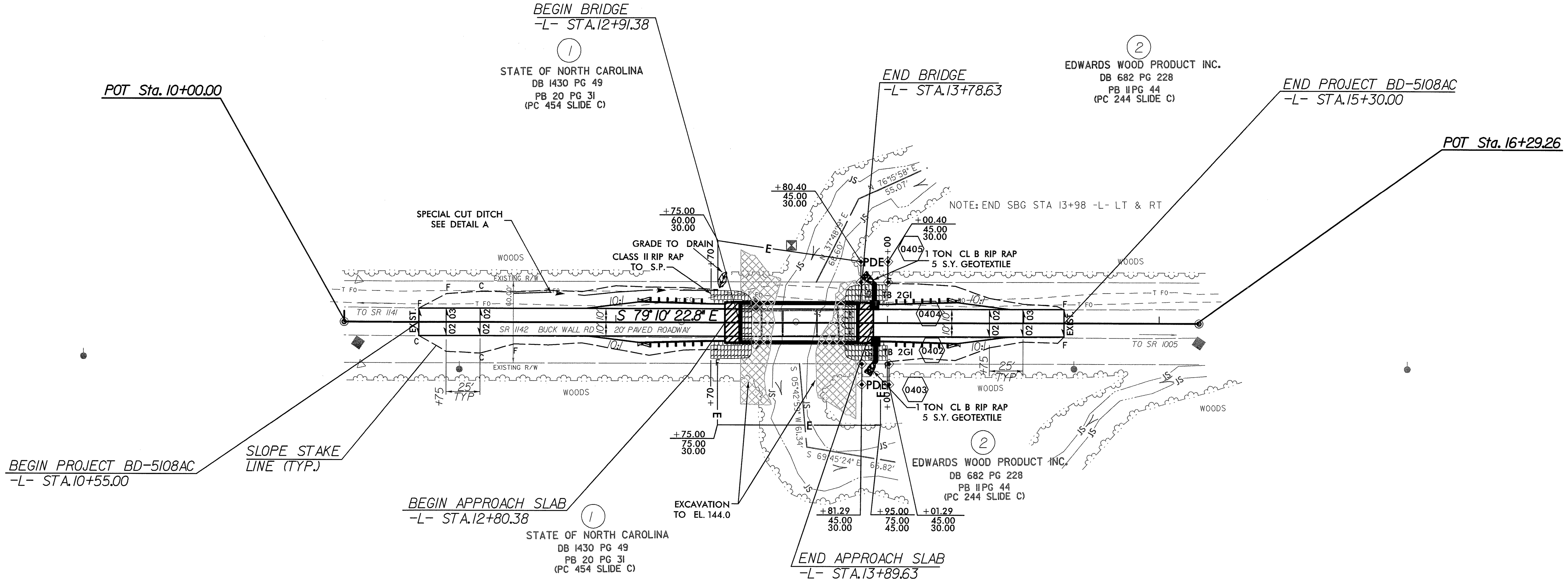
10

15

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 11+25 TO STA. 12+75 -L- LT



NOTE: SEE PLAN SHEET 5 FOR PROFILE

NOTE: SEE SHEETS S-1 THRU S-14 FOR STRUCTURE PLANS

REVISIONS

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029712 ENGINEER AGNIESZKA J. NAU 04-04-14	NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 4/4/14

SEPI
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
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License: C-2197

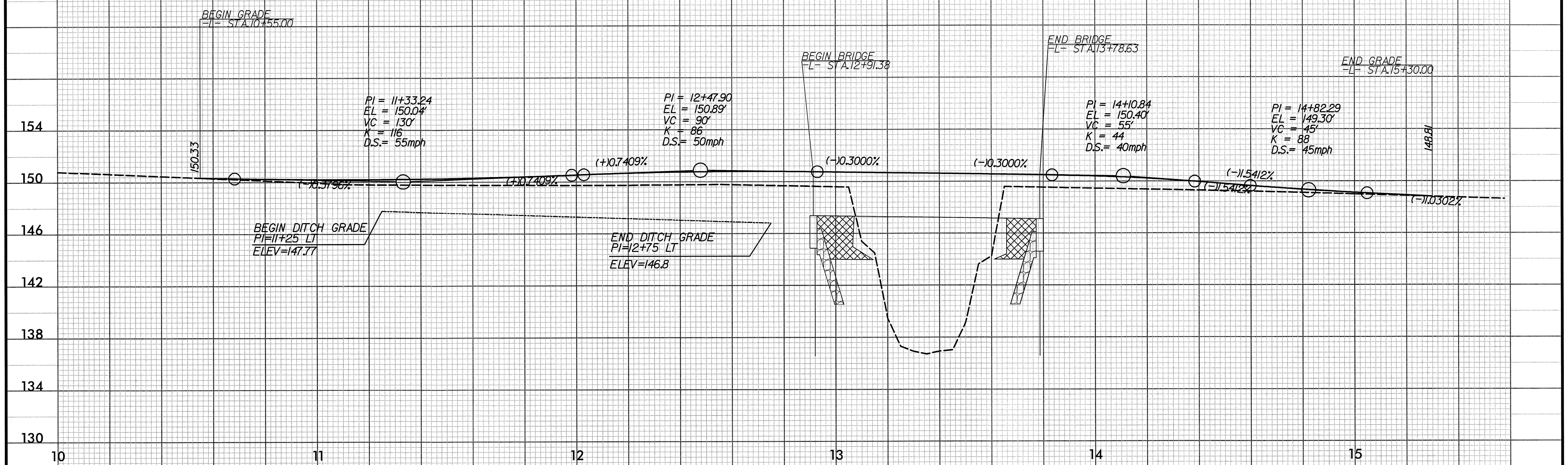
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2,200	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	147.5	FT
BASE DISCHARGE	=	5,509	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	151.01	FT
OVERTOPPING DISCHARGE	=	2,200	CFS
OVERTOPPING FREQUENCY	=	5	YRS
OVERTOPPING ELEVATION	=	147.5	FT
DATE OF SURVEY	=	7-31-13	
W.S.ELEVATION AT DATE OF SURVEY	=	138.9	FT

BM 1
Sta.-BL- 8+17.00
OFF 47' LT
ELEV.145.62'
RR SPIKE IN BASE
OF 24IN POPLAR

-L-
Sta.13+29.31
OFF 56.76' LT

-L-

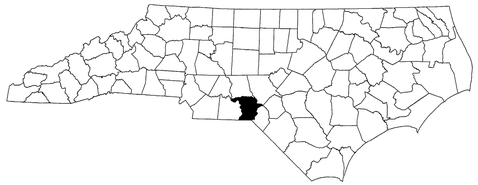


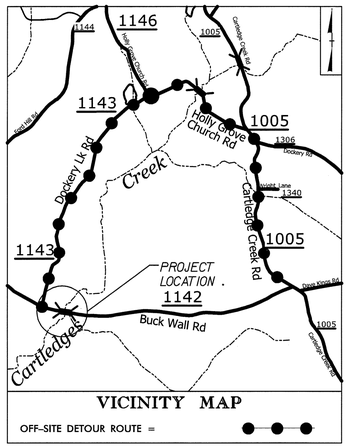
NOTE: SEE PLAN SHEET 4 FOR PLAN
NOTE: SEE SHEETS S-1 THRU S-14 FOR STRUCTURE PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

RICHMOND COUNTY





VICINITY MAP

OFF-SITE DETOUR ROUTE =

LOCATION: ***BRIDGE NO. 113 ON SR 1142 (BUCK WALL ROAD) OVER CARTLEDGE CREEK***

TYPE OF WORK: ***GRADING, PAVING, DRAINAGE, & STRUCTURE***

INDEX OF SHEETS

SHEET NO.
TMP-1

BD-5108AC

TIP PROJECT:

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. S. BOURNE, P.E. ***STATE TRAFFIC MANAGEMENT ENGINEER***

J. ISHAK, P.E. ***TRAFFIC CONTROL PROJECT ENGINEER***

_____ ***TRAFFIC CONTROL PROJECT DESIGN ENGINEER***

_____ ***TRAFFIC CONTROL DESIGN ENGINEER***

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

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

APPROVED: Steven D. Miller
DATE: 4-3-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	TMP-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES-TYPE III

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- USER DEFINED (IF NEEDED)
- USER DEFINED (IF NEEDED)

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

APPROVED: _____ DATE: 9-3-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

ROADWAY STANDARD DRAWINGS & LEGEND

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

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	TMP-1B

MANAGEMENT STRATEGIES

-CLOSE SR 1142 (BUCK WALL RD) AND DETOUR TRAFFIC OFF-SITE

-LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION

LOCAL NOTES

1. NOTIFY THE ENGINEER AT LEAST ONE MONTH PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
2. NOTIFY RICHMOND COUNTY SCHOOLS AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE.
3. NOTIFY RICHMOND COUNTY EMERGENCY SERVICES AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE.

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.

SIGNING

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

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC MANAGEMENT PLANS.

B) 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.

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

PHASING

STEP 1 USING RSD 1101.03 SHEET 1 OF 9, CLOSE BUCK WALL ROAD (SR 1142) AND DETOUR TRAFFIC OFF-SITE AS SHOWN ON TMP-3. MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN CLOSURE POINTS.

STEP 2 REMOVE THE EXISTING STRUCTURE.

STEP 3 CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY.

STEP 4 PLACE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

STEP 5 OPEN BUCK WALL ROAD (SR 1142) TO TRAFFIC AND REMOVE ALL TRAFFIC CONTROL DEVICES.

APPROVED: _____ DATE: 4-3-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

TRANSPORTATION OPERATIONS PLAN

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

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
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Fax:919-789-9591
License: C-2197

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	TMP-2

SIGN NUMBER: SP-1 BACKG COLOR:Fluorescent Orange
TYPE: STATIONARY COPY COLOR: Black
QUANTITY: SEE PLANS

SIGN WIDTH: 42″
HEIGHT: 24″
TOTAL AREA: 7.0 Sq. Ft.

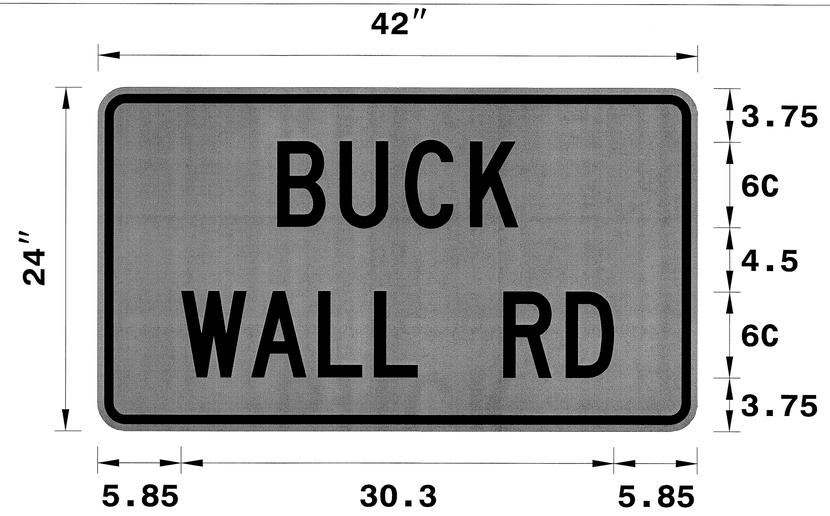
BORDER TYPE: RECESSED
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

MAT'L: 0.125″ (3.2 mm) ALUMINUM
0.079″ COMPOSITE

USE NOTES

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be Type VII, VIII, or IX (prismatic) fluorescent orange retroreflective sheeting.

DESIGN BY: R. DRAYTON CHECKED BY: S. MILLER
PROJECT ID: BD-5108AC DIV: 8 DATE: Sep 06, 2013



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																										Series/Size Text Length
	B	U	C	K																						C 2000
	12.57	16.95	21.51	26.07																						16.86
	W	A	L	L		R	D																			C 2000
	5.85	10.77	15.45	19.35	22.41	28.41	32.79																			30.3

FILENAME: BD-5108AC Sign Design

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: [signature] DATE: 4-3-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

SPECIAL
SIGN DESIGN

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

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	TMP-3

1145

Parson Lake Rd

1146

Holly Grove Church Rd

1005

Pleasant Hill Church Rd

1307

Cartledge Creek Rd

1144

Ford Hill Rd

I

H

1143

Holly Grove Church Rd

1005

I

H

1306

Dockery Rd

1306

Dockery Rd

Dockery Lk Rd

Creek

Wright Lane

1340

Cartledge Creek Rd

1304

Harrington Rd

1141

1144

Blewitt Falls Rd

1143

1005

INSET A

(SEE TMP-4)

1142

G

Buck Wall Rd

1142

G

Dave Kings Rd

1303

1302

Crestview Dr

220

1141

Buck Wall Rd

Cartledge Creek Rd

1005

PEE DEE RIVER

Blewitt Falls Rd

Cartledges

DETOUR ROUTE

(SEE TMP-4 FOR SIGN LEGEND)

APPROVED: _____ DATE: 4-3-14

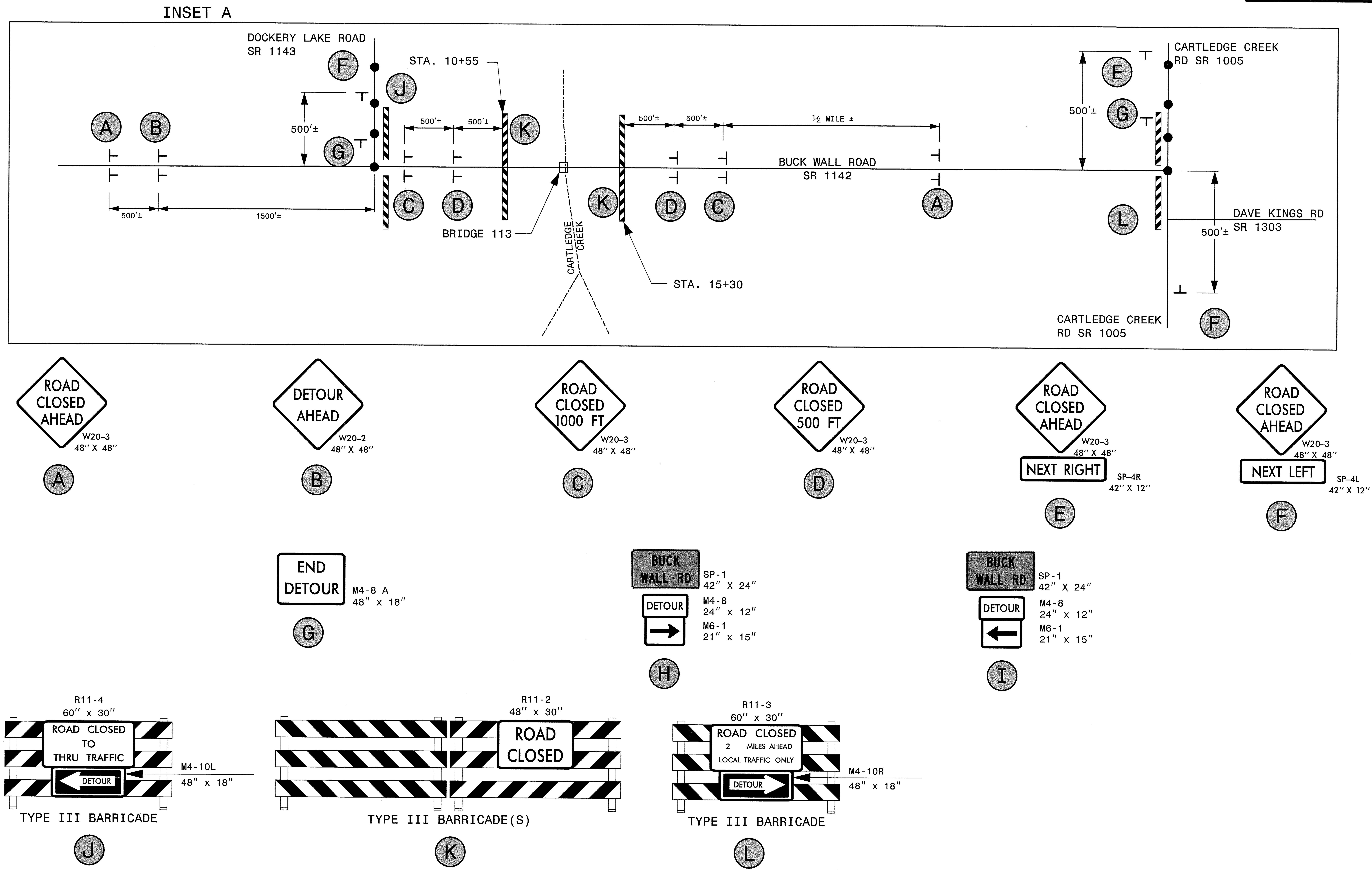
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

OFF–SITE DETOUR

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	TMP-4



APPROVED: [signature] DATE: 4-2-14

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037026 STEVEN D. MILES

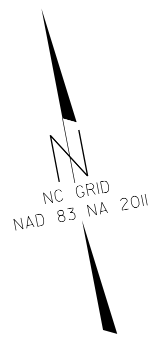
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

ROAD CLOSURE

TIP PROJECT: BD-5108AC

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5108AC	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION



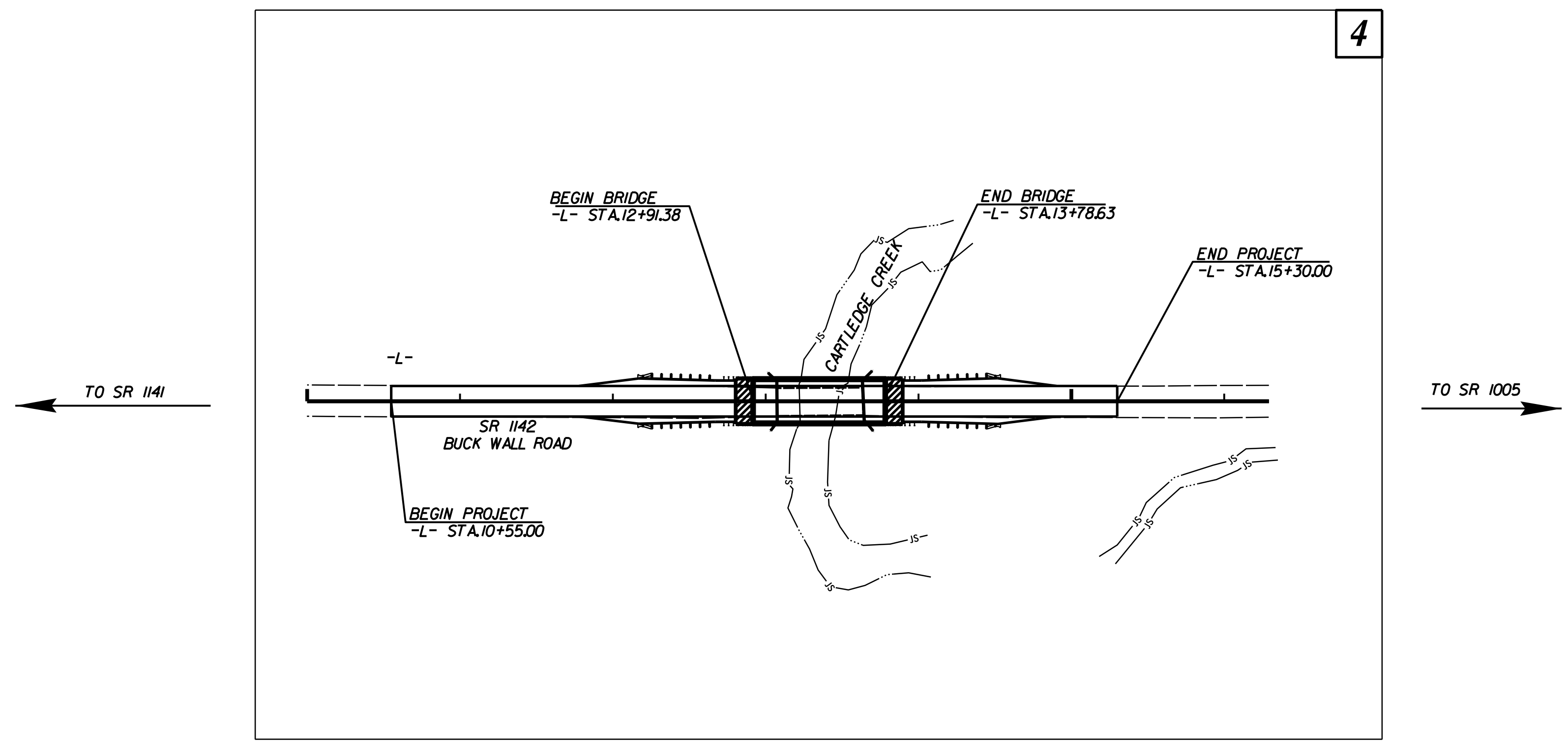
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

RICHMOND COUNTY

LOCATION: BRIDGE NO. 113 ON SR 1142 (BUCK WALL ROAD) OVER CARTLEDGE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURE



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	RW / 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	

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

GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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.

Prepared In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

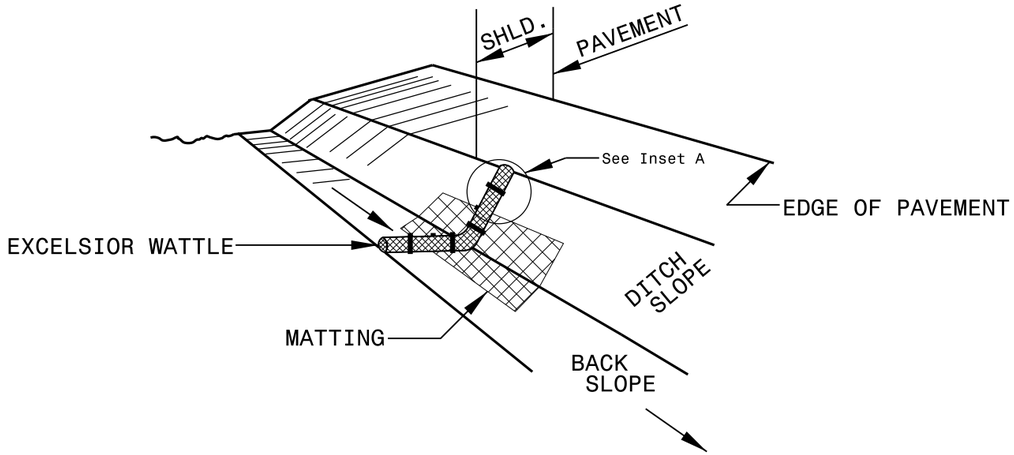
Roadway Standard Drawings

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.

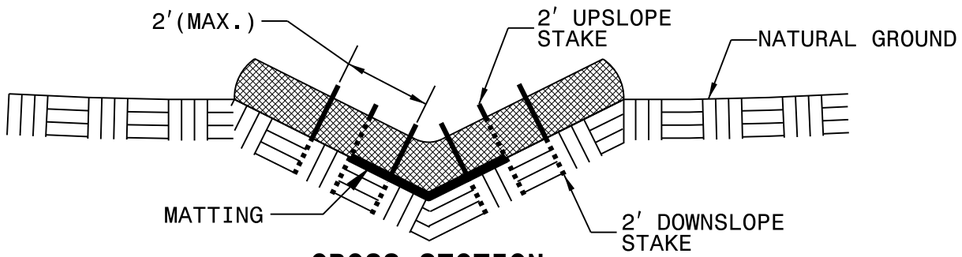
- 1604.01 Railroad Erosion Control Detail
- 1605.01 Temporary Silt Fence
- 1606.01 Special Sediment Control Fence
- 1607.01 Gravel Construction Entrance
- 1622.01 Temporary Berms and Slope Drains
- 1630.01 Riser Basin
- 1630.02 Silt Basin Type B
- 1630.03 Temporary Silt Ditch
- 1630.04 Stilling Basin
- 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-5108AC	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

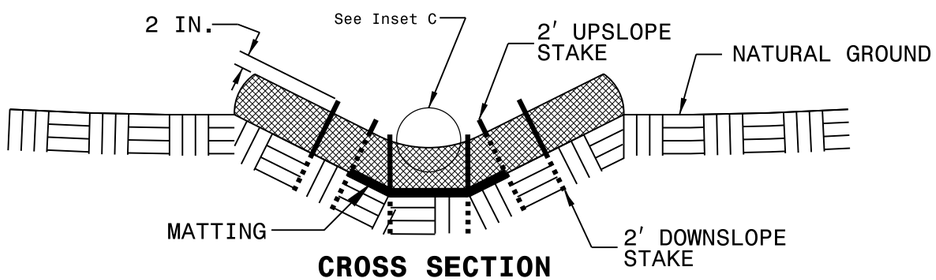
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



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.

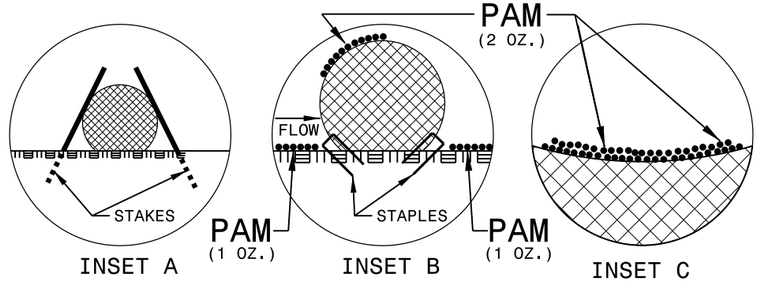
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

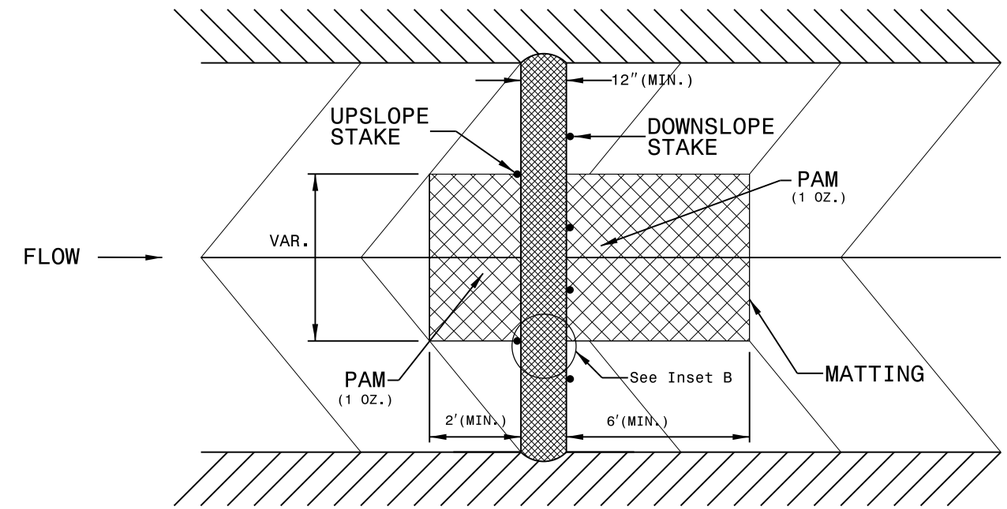
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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.

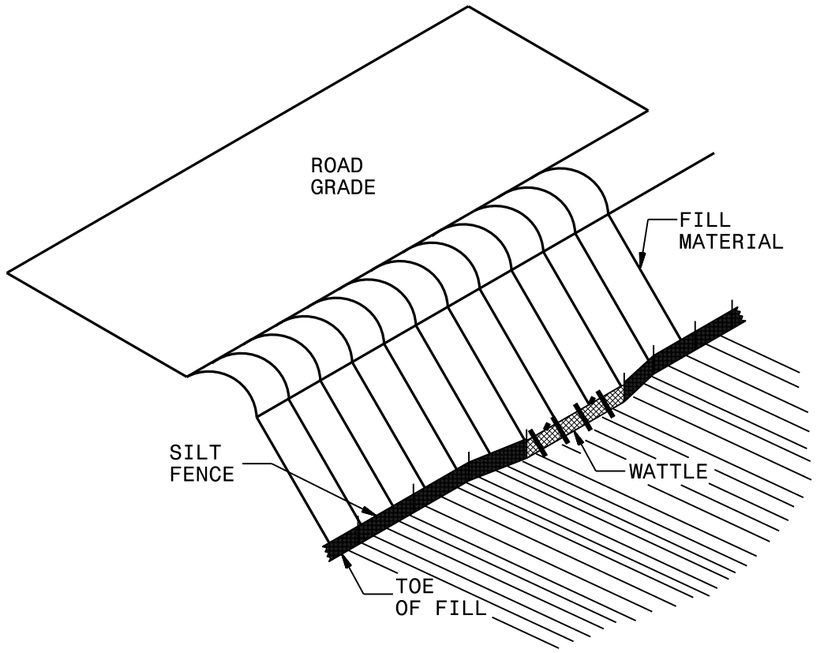




TOP VIEW

SILT FENCE WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

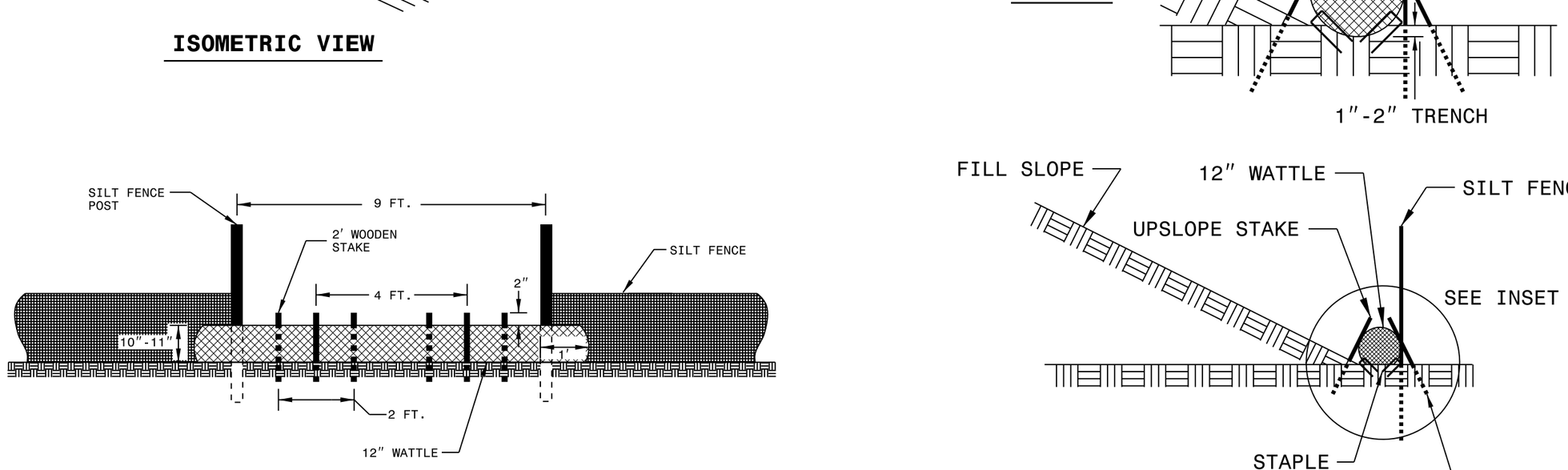
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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.

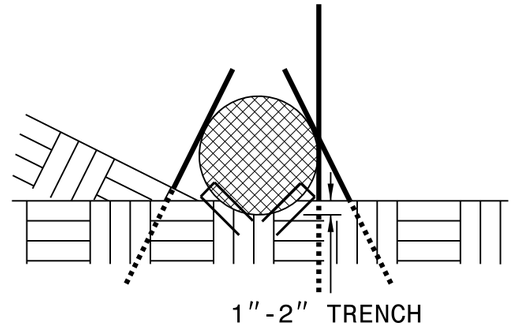
WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.



VIEW FROM SLOPE

INSET A



SIDE VIEW

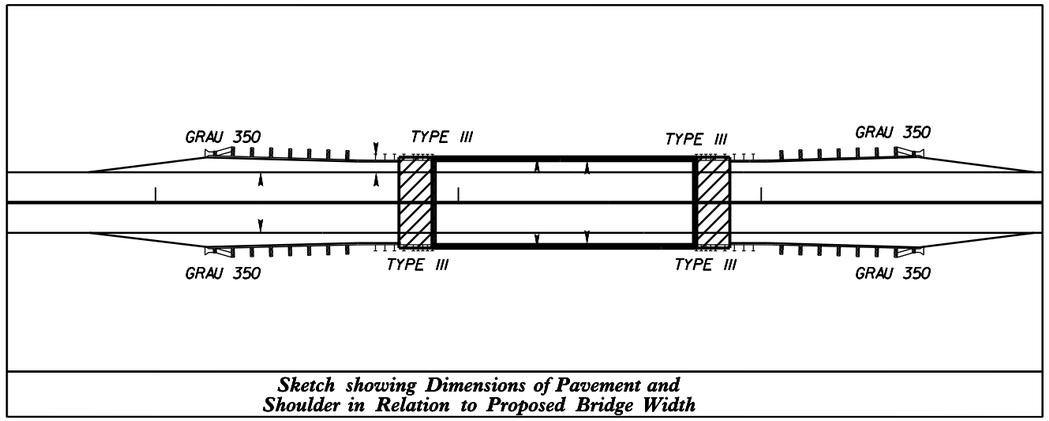
PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



Sketch showing Dimensions of Pavement and Shoulder in Relation to Proposed Bridge Width

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

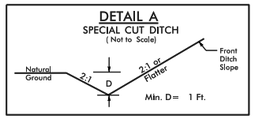
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NC GRID
NAD 83 NA 2011

10

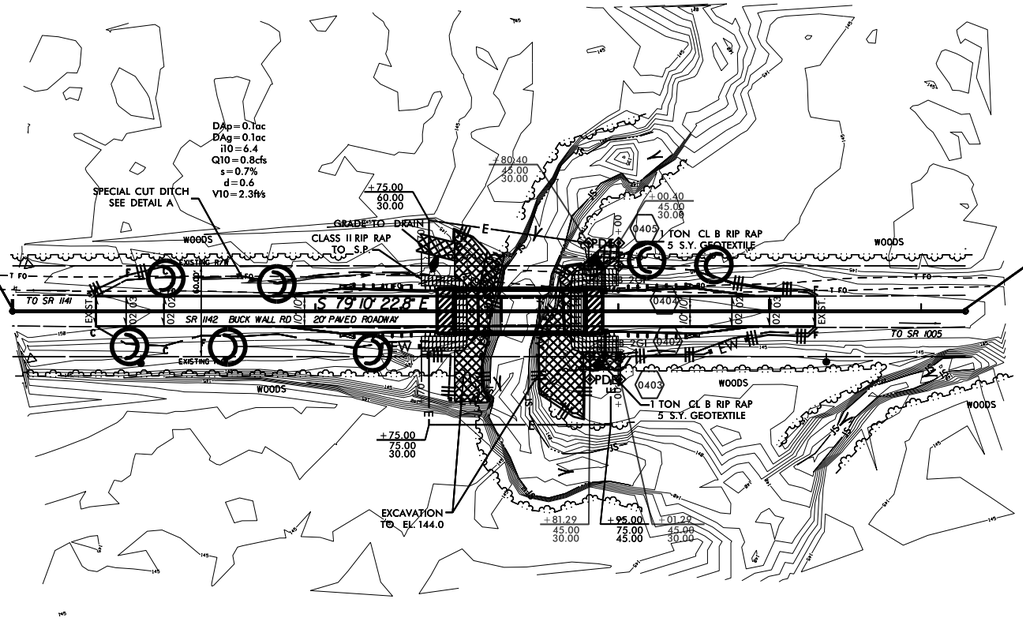
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 11+25 TO STA. 12+75 –L– LT

15

POT Sta. 10+00.00



POT Sta. 16+29.26

REVISIONS

8/17/99

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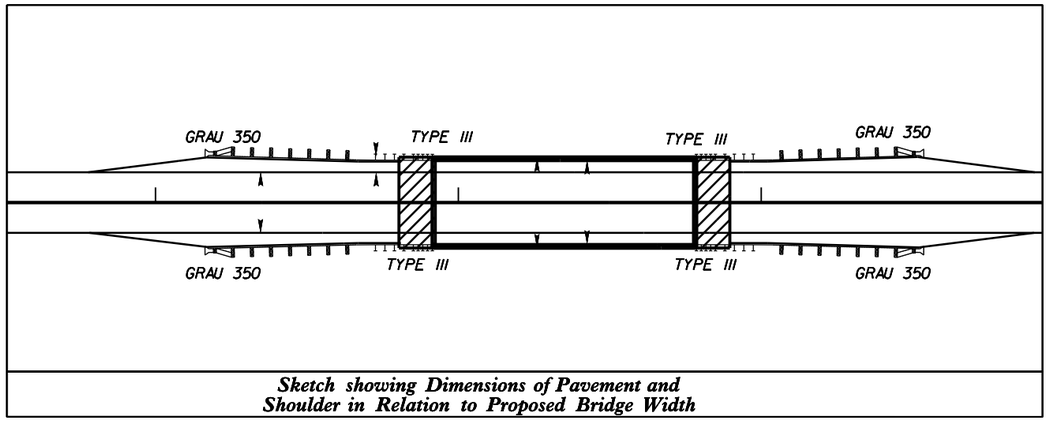
awagner

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



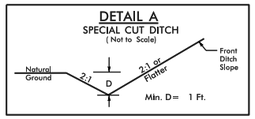
Sketch showing Dimensions of Pavement and Shoulder in Relation to Proposed Bridge Width

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NC GRID
NAD 83 NA 2011

10

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

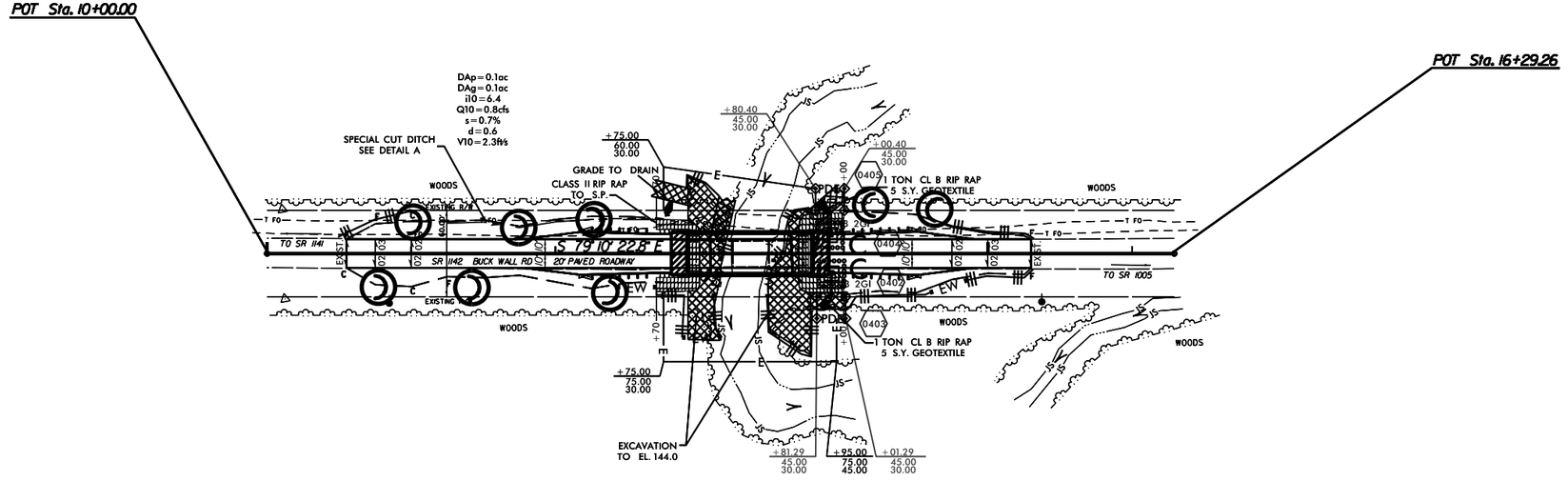


FROM STA. 11+25 TO STA. 12+75 –L– LT

15

POT Sta. 10+00.00

POT Sta. 16+29.26



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awagner

REVISIONS

8/17/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	X-1

CROSS SECTION INDEX

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$FILENAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	X-2

SEPI
ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

8/23/99

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

0 2.5 5
PROJ. REFERENCE NO.
BD-5108AC
SHEET NO.
X-3
8/23/99
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
160
155
150
145
140
3:1
0.020
0.020
2:1
147.45
149.75
11+75.00
2:1
4:1
0.020
0.020
4:1
147.61
149.77
11+50.00
2:1
4:1
0.020
0.020
4:1
147.77
149.80
11+25.00
-L-
$$$$$$SYSTIME$$$$$
$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BD-5108AC	X-4

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	X-5

8/23/99

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

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	X-7

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
BD-5108AC	X-8

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

F.A. PROJ. NO. BRZ-1142(10)

13+00 13+50 14+00

0.7409% -0.3000%

GRADE DATA
P.I. STA. = 12+47.90 -L-
EL.= 150.89
V.C. = 90'

-0.3000% -1.5412%

GRADE DATA
P.I. STA. = 14+10.84 -L-
EL.= 150.40
V.C. = 55'

160 150 140

FILL FACE @ END BENT 1
STA. 12+91.38 -L-
G. P. EL. 150.76

BEGIN FRONT SLOPE
STA. 12+86.35 -L-
GRADE POINT EL. 150.78

1'-7" BERM (TYP.)

EL. 150.0±

FIX

APPROXIMATE EXISTING GROUND LINE

LOW CHORD EL. 147.34

1'-6" (TYP.)

BOT. OF CAP EL. 144.76

1½:1 SLOPE NORMAL TO CAP (TYP.)

EL. 145.0±

EL. 144.0±

EXCAVATE TO EL. 144.0 (GRADE TO DRAIN)

EXISTING SUBSTRUCTURE (TYP.)

EL. 137.0±

SPAN A

Q100 EL. 151.01

Q5 EL. 147.5

NWS EL. 138.9

EL. 137.0±

EXCAVATE TO EL. 144.0 (GRADE TO DRAIN)

EL. 144.0±

EL. 144.0±

EL. 150.0±

3'-6" (MIN.) (TYP.)

CLASS II RIP RAP (TYP.)

HP 12 X 53 STEEL PILES (TYP.)

FIX

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

BEGIN FRONT SLOPE
STA. 13+84.59 -L-
G. P. EL. 150.48

FILL FACE @ END BENT 2
STA. 13+78.63 -L-
G. P. EL. 150.50

EL. 150.0±

LOW CHORD EL. 147.08

BOT. OF CAP EL. 144.50

UNCLASSIFIED STRUCTURE EXCAVATION

END BENT 1

END BENT 2

SECTION ALONG -L-

RIP RAP ESTIMATED QUANTITIES

	RIP RAP CLASS II (TONS)	GEOTEXTILE FOR DRAINAGE (SQ. YARDS)
END BENT 1	85	90
END BENT 2	95	105
TOTAL	180	195

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG
3/21/14

STA. 12+70.00 -L-

1'-7" BERM (TYP.)

2:1

1¾:1 (TYP.)

BEGIN FRONT SLOPE
STA. 12+86.35 -L-

BEGIN APPROACH SLAB
STA. 12+80.38-L-

TO SR 1143

W.P. #1
STA. 12+91.38 -L-

1½:1

90°-00'-00" (TYP.)

FILL FACE @ END BENT 1

STA. 12+70.00 -L-

EARTH BERM EL. 144.26 (LEVEL)

RIP RAP CLASS II (TYP.)

℄ BRIDGE
STA. 13+35.00 -L-

EXISTING SUBSTRUCTURE

CARTLEDGE CREEK

-L-

43'-7½" 43'-7½"

TOTAL LENGTH OF BRIDGE (W.P. #1 TO W.P. #2) = 87'-3"

RIP RAP CLASS II (TYP.)

EARTH BERM EL. 144.0 (LEVEL)

1¾:1 (TYP.)

2:1

1½:1

BEGIN FRONT SLOPE
STA. 13+84.59 -L-

END APPROACH SLAB
STA. 13+89.63 -L-

TO SR 1005

W.P. #2
STA. 13+78.63 -L-

FILL FACE @ END BENT 2

1'-7" MIN. EARTH BERM (TYP.)

2:1

STA. 14+00.00 -L-

STA. 14+00.00 -L-

PLAN

END BENT PILES NOT SHOWN FOR CLARITY, FOR PILE LOCATIONS, SEE "END BENT" SHEETS

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE #113

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CARTLEDGE CREEK ON SR 1142 BETWEEN SR 1143 AND SR 1005

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

DRAWN BY : C. YOKELEY DATE : 03/14
CHECKED BY : T. H. FANG DATE : 3-18-14

21-MAR-2014 13:07
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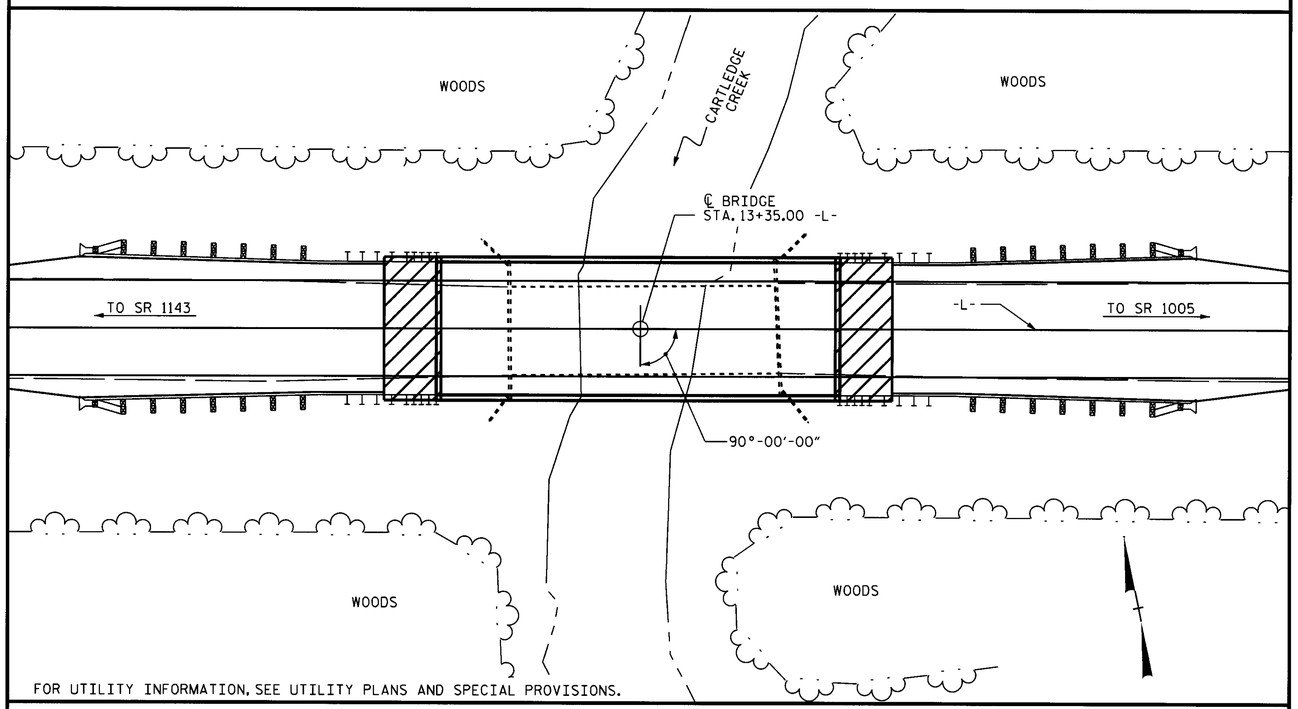
clyokeley

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 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'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				LUMP SUM					170.0			LUMP SUM	10	850.0
END BENT 1		LUMP SUM	16.9		2,692	5	75	5		85	90			
END BENT 2		LUMP SUM	16.9		2,692	5	100	5		95	105			
TOTAL	LUMP SUM	LUMP SUM	33.8	LUMP SUM	5,384	10	175	10	170.0	180	195	LUMP SUM	10	850.0

BM #1: RR SPIKE IN BASE OF 24" POPLAR TREE LOCATED AT STA. 13+29.3 -L-, 57' LT. EL.=145.62'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

FOUNDATION NOTES

FOR PILES SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 & 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 122 TONS PER PILE.

DRIVE PILES AT END BENTS 1 & 2 TO REQUIRED DRIVING RESISTANCE OF 205 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENTS 1 & 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF STANDARD SPECIFICATIONS.

HYDRAULIC DATA

DESIGN DISCHARGE	= 2200 CFS
FREQUENCY OF DESIGN FLOOD	= 5 YR.
DESIGN HIGH WATER ELEVATION	= 147.5
DRAINAGE AREA	= 24.6 SQ.MI.
BASE DISCHARGE (Q100)	= 5509 CFS
BASE HIGH WATER ELEVATION	= 151.01

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	2200 CFS
FREQUENCY OF OVERTOPPING FLOOD	5 YR.
OVERTOPPING FLOOD ELEVATION	= 147.5

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 PERFORMANCE ZONE 2.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

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 SAME 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.

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 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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 53 FT. LEFT SIDE, 60 FT. RIGHT SIDE AT END BENT 1 AND 30 FT. LEFT SIDE, 70 FT. RIGHT SIDE AT END BENT 2 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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+35.00 -L-."

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 16'-0", 1 @ 25'-1", AND 1 @ 16'-2" WITH A CLEAR ROADWAY WIDTH OF 18.8' WITH TIMBER DECK ON STEEL I-BEAMS; END AND INTERIOR BENTS CONSISTING OF TIMBER CAPS ON TIMBER PILES WITH TIMBER BULKHEADS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW LEGAL LOAD LIMIT.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

3/21/14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CARTLEDGE CREEK ON SR 1142 BETWEEN SR 1143 AND SR 1005

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

DRAWN BY : C. YOKELEY DATE : 03/14
CHECKED BY : T. H. FANG DATE : 3-18-14

21-MAR-2014 13:17
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clyokeley

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR 33" PRESTRESSED CONCRETE BOX BEAMS

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
							LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
								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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.401	--	1.75	0.273	1.73	A	EL	41.75	0.497	1.54	A	EL	8.35	0.80	0.273	**1.40**	A	EL	**41.75**	
		HL-93(Opr)	N/A	--	1.994	--	1.35	0.273	2.25	A	EL	41.75	0.497	1.99	A	EL	8.35	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.882	67.762	1.75	0.273	2.33	A	EL	41.75	0.497	1.99	A	EL	8.35	0.80	0.273	**1.88**	A	EL	**41.75**	
		HS-20(Opr)	36.000	--	2.584	93.027	1.35	0.273	3.02	A	EL	41.75	0.497	2.58	A	EL	8.35	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	4.355	58.789	1.40	0.273	6.74	A	EL	41.75	0.497	6.03	A	EL	8.35	0.80	0.273	4.35	A	EL	41.75	
		SNGARBS2	20.000	--	3.199	63.989	1.40	0.273	4.95	A	EL	41.75	0.497	4.26	A	EL	8.35	0.80	0.273	3.20	A	EL	41.75	
		SNAGRIS2	22.000	--	3.011	66.245	1.40	0.273	4.66	A	EL	41.75	0.497	3.94	A	EL	8.35	0.80	0.273	3.01	A	EL	41.75	
		SNCOTTS3	27.250	--	2.166	59.016	1.40	0.273	3.35	A	EL	41.75	0.497	3.01	A	EL	8.35	0.80	0.273	2.17	A	EL	41.75	
		SNAGGRS4	34.925	--	1.792	62.595	1.40	0.273	2.77	A	EL	41.75	0.497	2.47	A	EL	8.35	0.80	0.273	1.79	A	EL	41.75	
		SNS5A	35.550	--	1.754	62.349	1.40	0.273	2.71	A	EL	41.75	0.497	2.49	A	EL	8.35	0.80	0.273	1.75	A	EL	41.75	
		SNS6A	39.950	--	1.602	63.995	1.40	0.273	2.48	A	EL	41.75	0.497	2.27	A	EL	8.35	0.80	0.273	1.60	A	EL	41.75	
		SNS7B	42.000	--	1.525	64.059	1.40	0.273	2.36	A	EL	41.75	0.497	2.22	A	EL	8.35	0.80	0.273	1.53	A	EL	41.75	
	TTST	TNAGRIT3	33.000	--	1.951	64.392	1.40	0.273	3.02	A	EL	41.75	0.497	2.70	A	EL	8.35	0.80	0.273	1.95	A	EL	41.75	
		TNT4A	33.075	--	1.958	64.758	1.40	0.273	3.03	A	EL	41.75	0.497	2.64	A	EL	8.35	0.80	0.273	1.96	A	EL	41.75	
		TNT6A	41.600	--	1.594	66.309	1.40	0.273	2.47	A	EL	41.75	0.497	2.34	A	EL	8.35	0.80	0.273	1.59	A	EL	41.75	
		TNT7A	42.000	--	1.598	67.128	1.40	0.273	2.47	A	EL	41.75	0.497	2.30	A	EL	8.35	0.80	0.273	1.60	A	EL	41.75	
		TNT7B	42.000	--	1.645	69.07	1.40	0.273	2.54	A	EL	41.75	0.497	2.17	A	EL	8.35	0.80	0.273	1.64	A	EL	41.75	
		TNAGRIT4	43.000	--	1.571	67.556	1.40	0.273	2.43	A	EL	41.75	0.497	2.11	A	EL	8.35	0.80	0.273	1.57	A	EL	41.75	
		TNAGT5A	45.000	--	1.484	66.800	1.40	0.273	2.30	A	EL	41.75	0.497	2.08	A	EL	8.35	0.80	0.273	1.48	A	EL	41.75	
		TNAGT5B	45.000	3	1.469	66.118	1.40	0.273	2.27	A	EL	41.75	0.497	2.00	A	EL	8.35	0.80	0.273	**1.47**	A	EL	**41.75**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

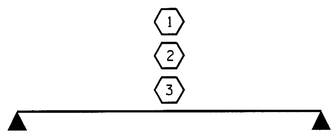
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 85' BOX BEAM UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING MING FANG

3/21/14

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

ASSEMBLED BY : S. B. WILLIAMS DATE : 12-13
CHECKED BY : E. I. OMILE DATE : 1-14

DRAWN BY : TMG 11/11
CHECKED BY : AAC 11/11

21-MAR-2014 13:17
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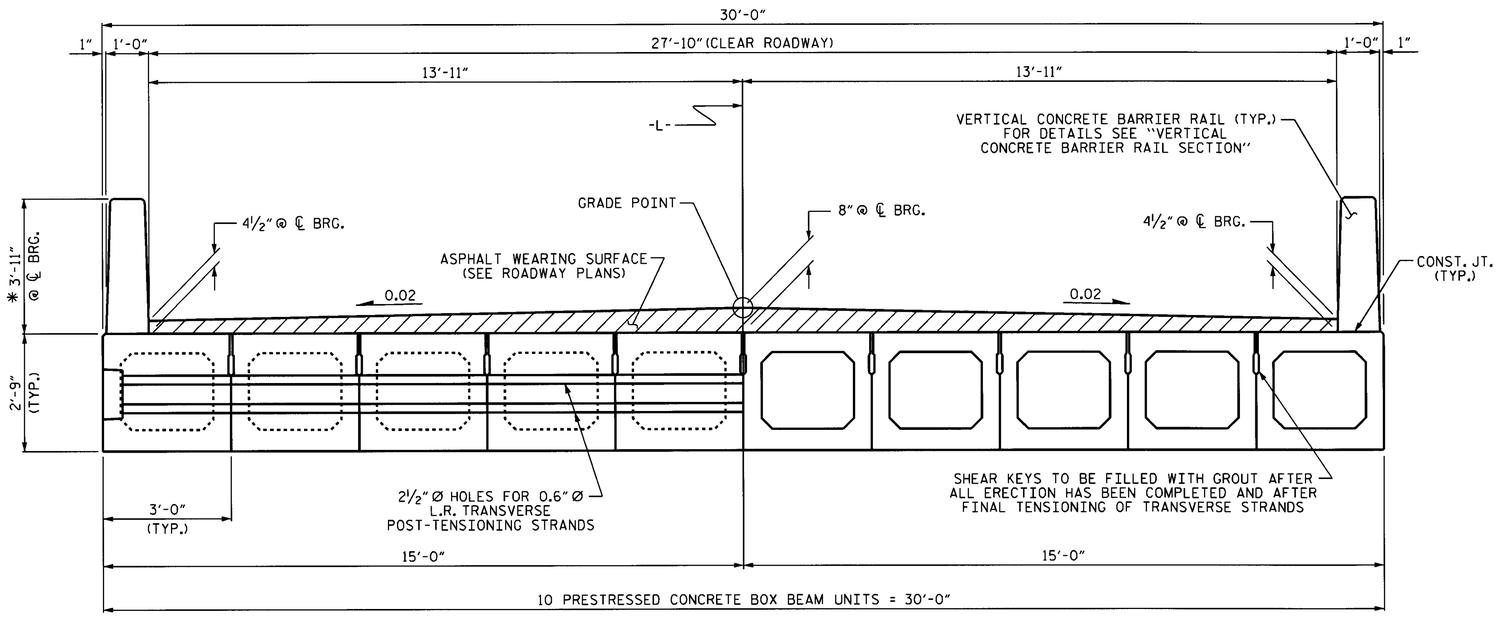
ciyokeley

STD. NO. 33LRFR1_90S_85L



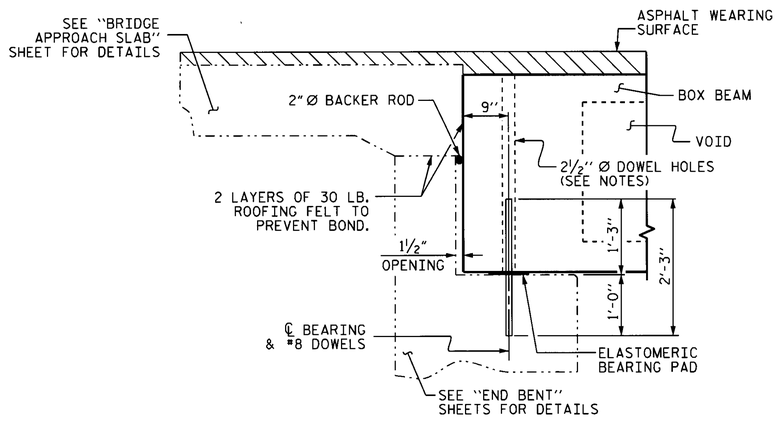
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

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

FIXED END



SECTION AT END BENT

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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM 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.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL 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 VERTICAL 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.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG
3/21/14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

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

STD. NO. STD.33PCBB1_30

ASSEMBLED BY : S. B. WILLIAMS DATE : 12-13	
CHECKED BY : E. I. OMILE DATE : 12-13	
DRAWN BY : DGE 8/11	
CHECKED BY : TMG 11/11	

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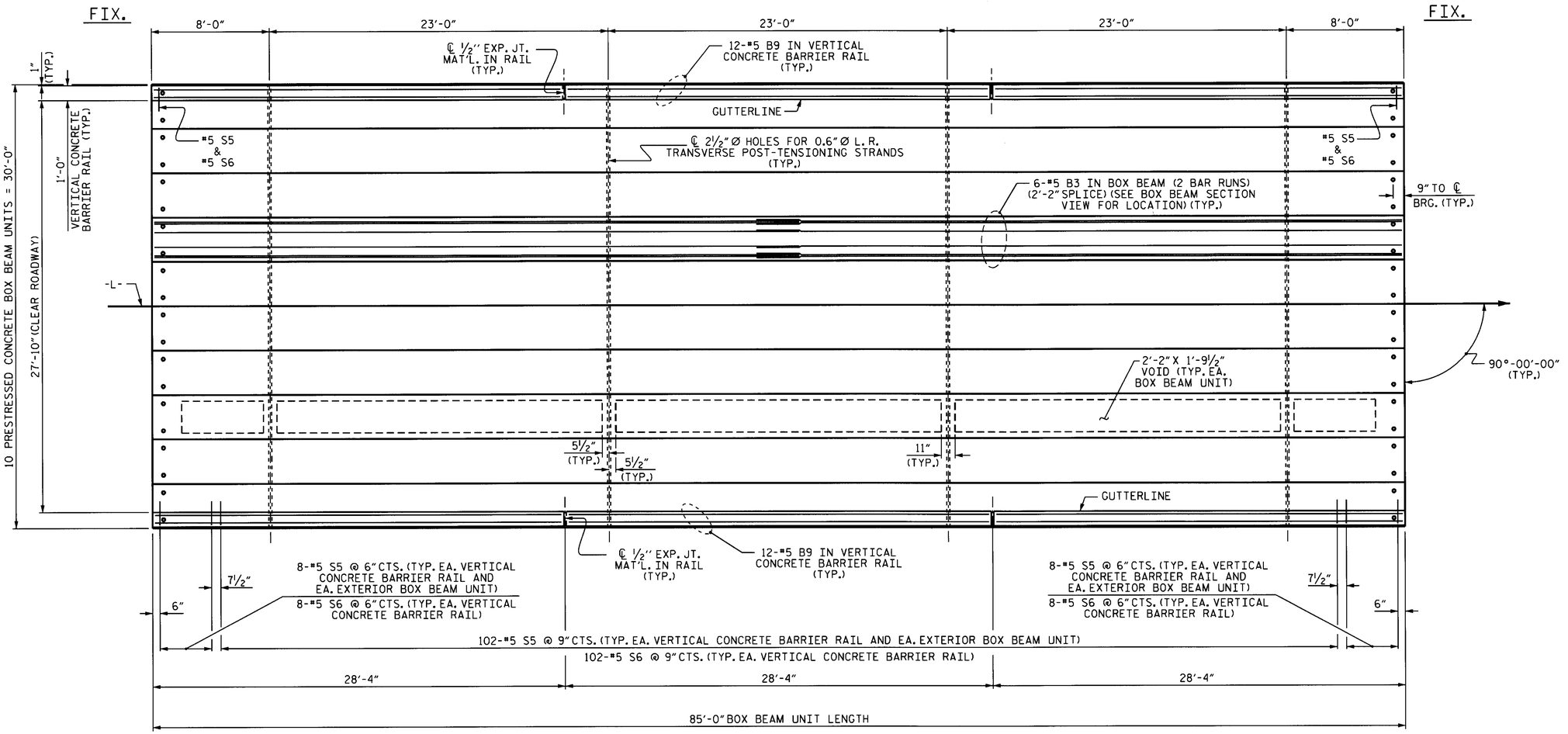
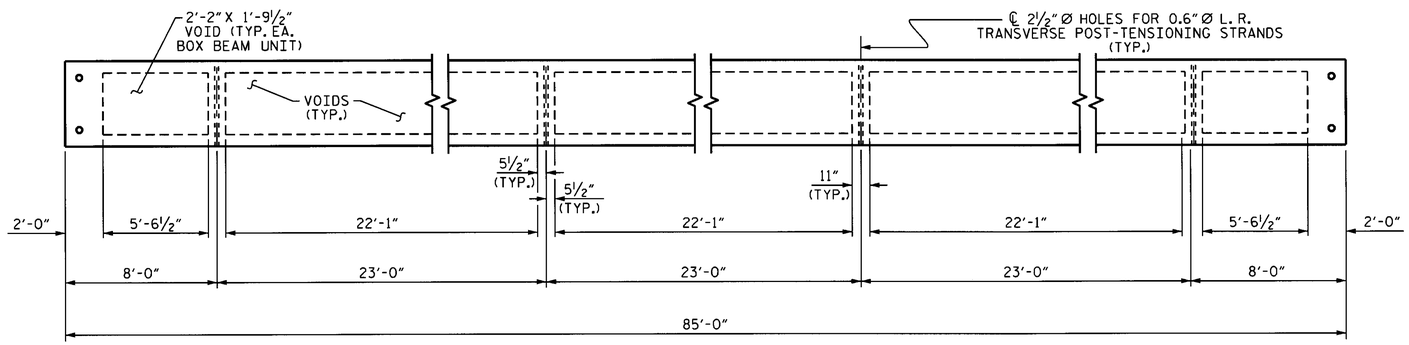
clyokeley



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING FENG
3/21/14

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 85' UNIT 27'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS DATE : 12-13	
CHECKED BY : E. I. OMILE DATE : 12-13	
DRAWN BY : DGE 8/11	
CHECKED BY : TMG 11/11	

STD.NO.33PCBB_30_90S_85L

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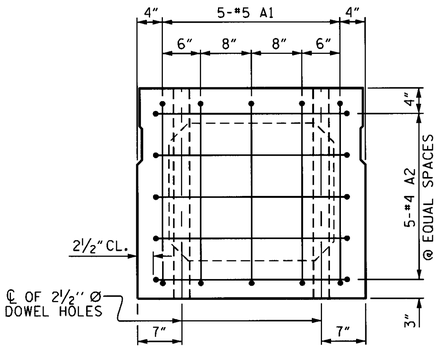
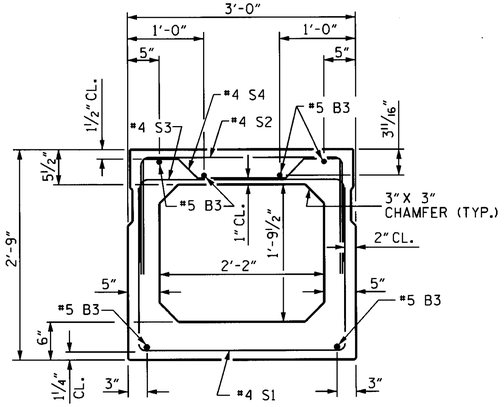


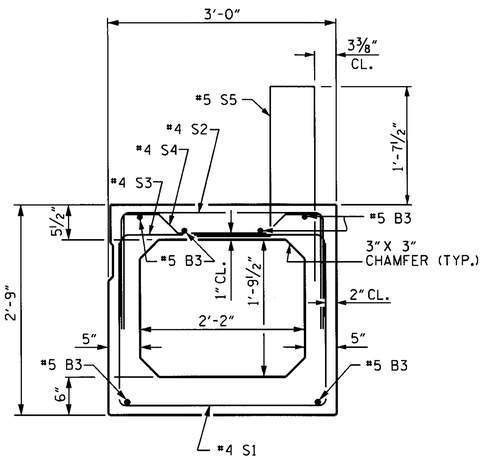
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES.
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

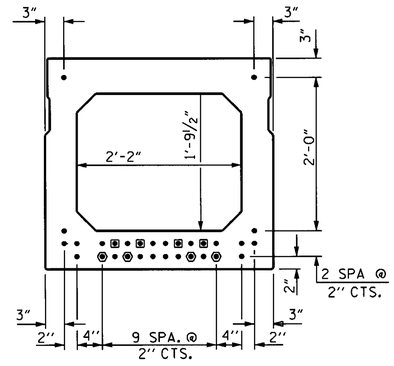
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(30 STRANDS REQUIRED)

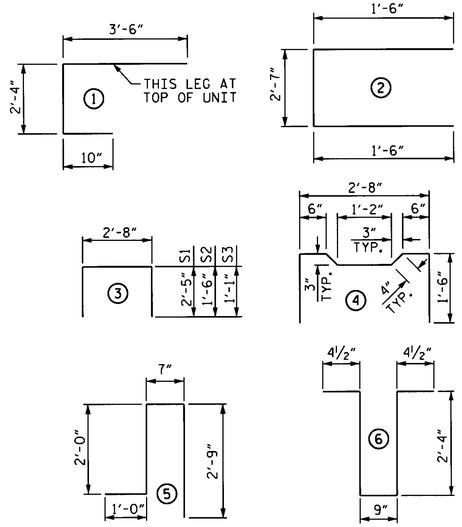
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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

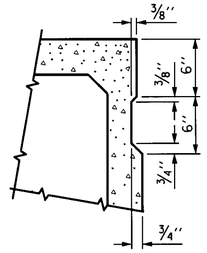
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

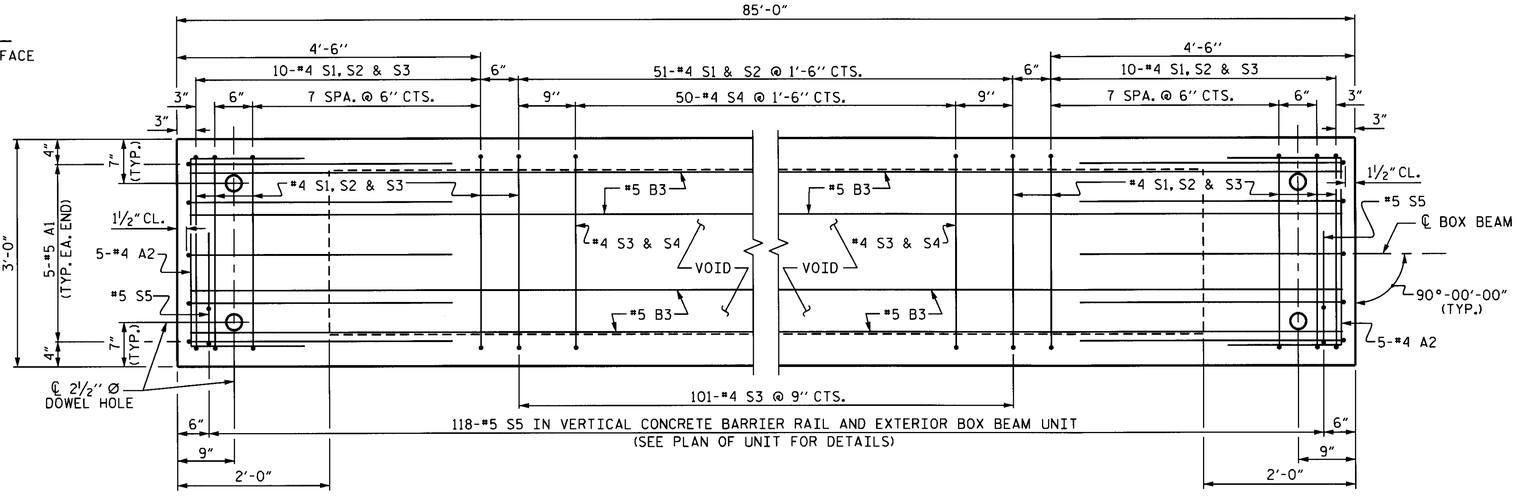
BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-7"	127	5'-7"	127
B3	12	#5	STR	43'-5"	543	43'-5"	543
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-7"	14	2'-7"	14
S1	71	#4	3	7'-6"	356	7'-6"	356
S2	71	#4	3	5'-8"	269	5'-8"	269
S3	121	#4	3	4'-10"	391	4'-10"	391
S4	50	#4	4	5'-10"	195	5'-10"	195
✱ S5	118	#5	5	6'-4"	779	--	--
REINFORCING STEEL					2014 LBS.		2014 LBS.
✱ EPOXY COATED REINF. STEEL					779 LBS.		
8000 P.S.I. CONCRETE					15.1 CU. YDS.		15.0 CU. YDS.
0.6" Ø L.R. STRANDS					No. 30		No. 30



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF UNIT.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIANG FANG
3/21/14

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 12-13
CHECKED BY : E. I. OMILE	DATE : 12-13
DRAWN BY : DGE 10/11	
CHECKED BY : TMC 11/11	

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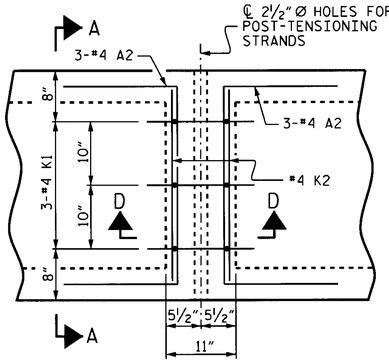
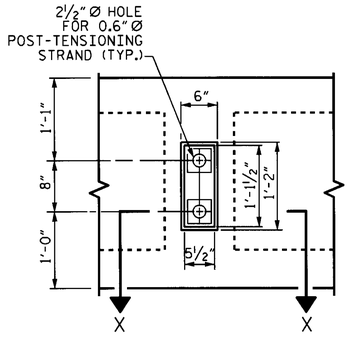
ciyokeley

STD. NO. 33PCBB4_90S_85L

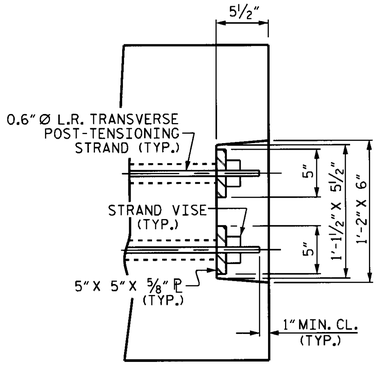


PLAN

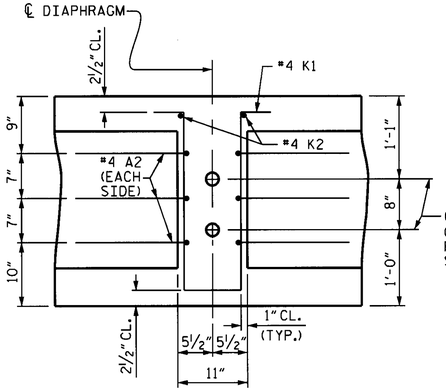


VIEW Y-Y

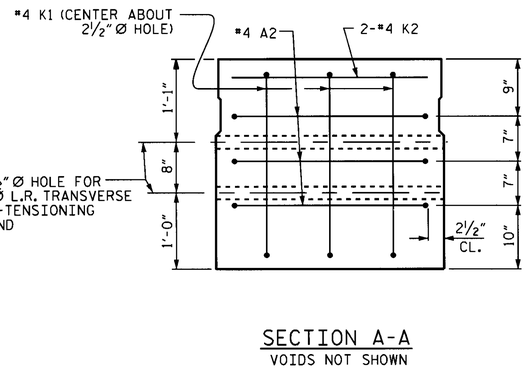
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

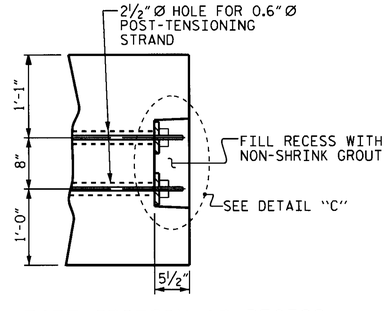


SECTION D-D

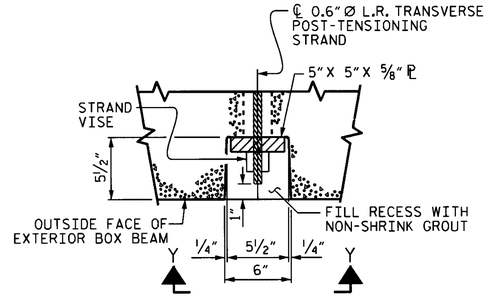


SECTION A-A

VOIDS NOT SHOWN



PART SECTION AT RECESS



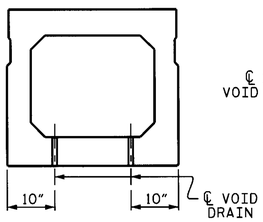
SECTION X-X

SHOWING PLAN VIEW OF GROUTED RECESS

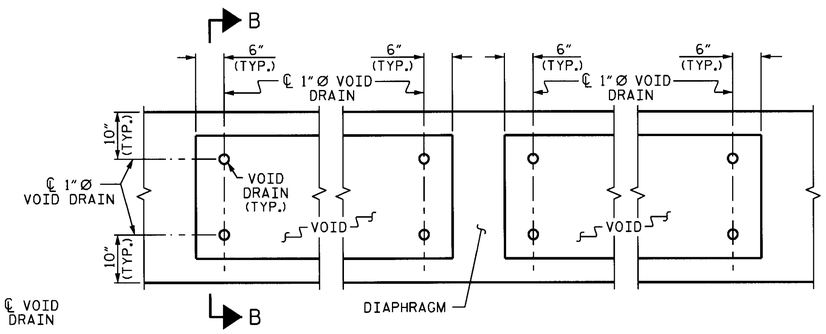
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
85' BOX BEAM UNIT (NC & SE)	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3¾" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	¾" ↓
FINAL CAMBER	3" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

3/21/14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS DATE : 12-13
CHECKED BY : E. I. OMILE DATE : 12-13

DRAWN BY : DGE 10/11
CHECKED BY : TMC 11/11

21-MAR-2014 13:17
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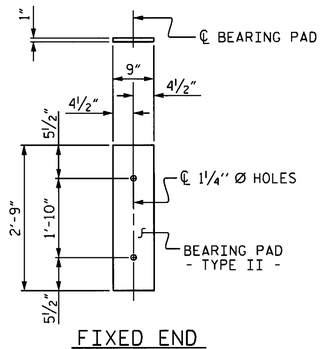
ciyoke@ey

STD.NO.33PCBB5_90S

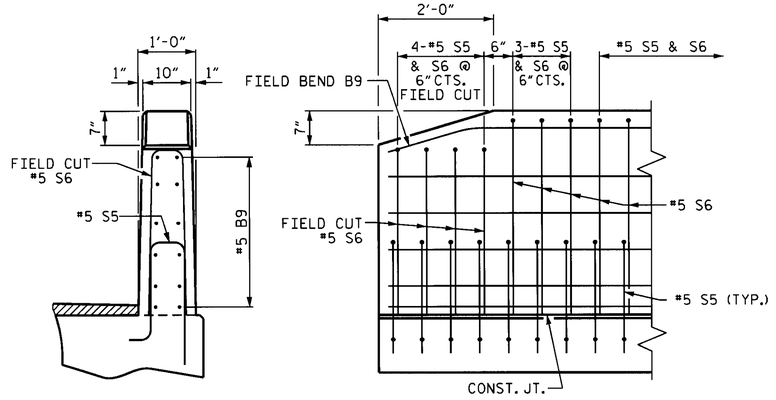


FIXED END

(TYPE II - 20 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

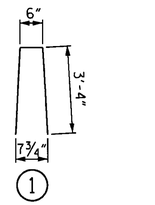


END VIEW

SIDE VIEW

END OF RAIL DETAILS

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-0"	170'-0"
INTERIOR B.B.	8	85'-0"	680'-0"
TOTAL	10		850'-0"



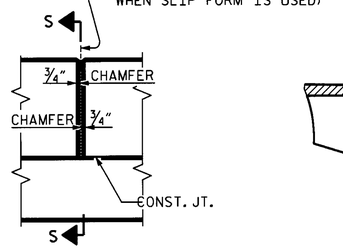
BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

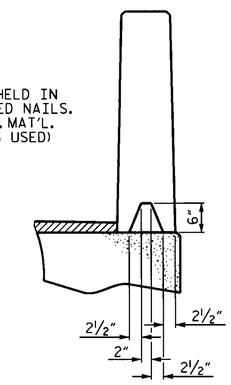
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	85' UNIT				
✳ B9	72	#5	STR	27'-11"	2096
✳ S6	236	#5	1	7'-2"	1764
✳ EPOXY COATED REINFORCING STEEL			LBS.		3860
CLASS AA CONCRETE			CU.YDS.		22.8
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		170.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
85' UNITS	1½"	3'-8"

SECTION THRU RAIL



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

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			14

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

3/21/14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 12-13
CHECKED BY : E. I. OMILE	DATE : 12-13
DRAWN BY : DGE 10/11	
CHECKED BY : TMG 11/11	

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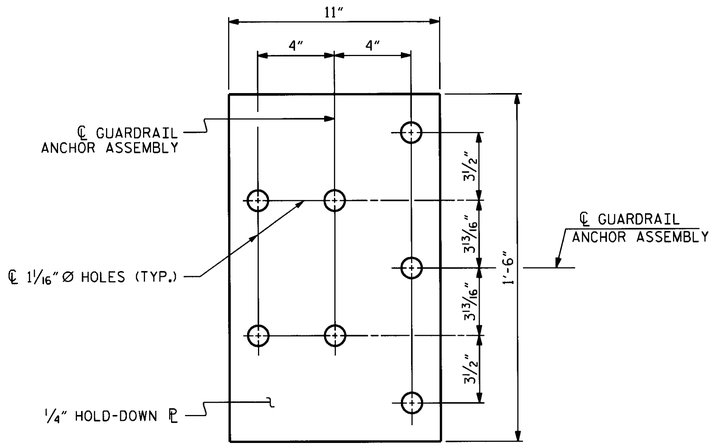
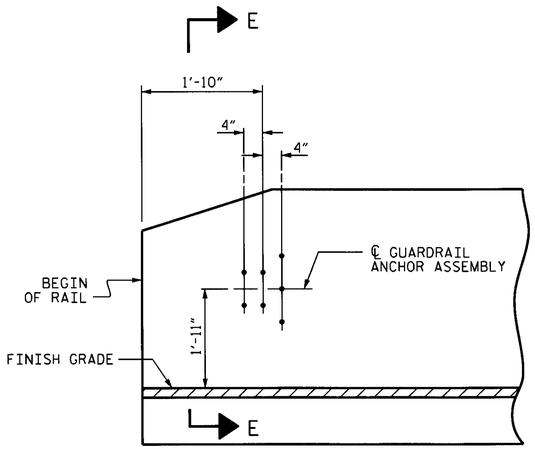
clyokeley

STD. NO. 33PCBB8_90S



PLAN



ELEVATION

NOTES

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

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

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

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

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

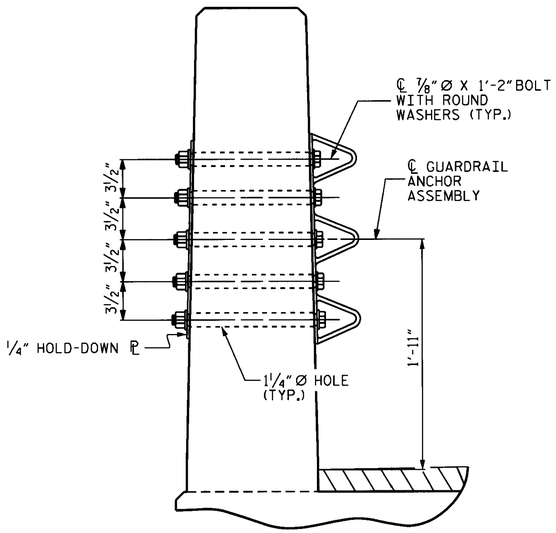
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

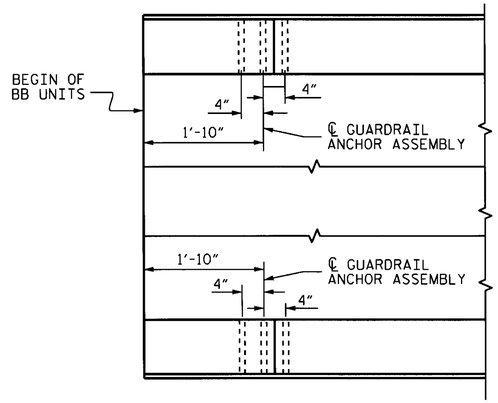
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY



SECTION E-E



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN. END BENT 2 SIMILAR.

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
3/21/14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS DATE : 12-13
CHECKED BY : E. I. OMILE DATE : 12-13

DRAWN BY : MAA 5/10
CHECKED BY : GM 5/10

REV. 10/1/11 MAA/GM
REV. 12/5/11 MAA/GM
REV. 6/13 MAA/GM

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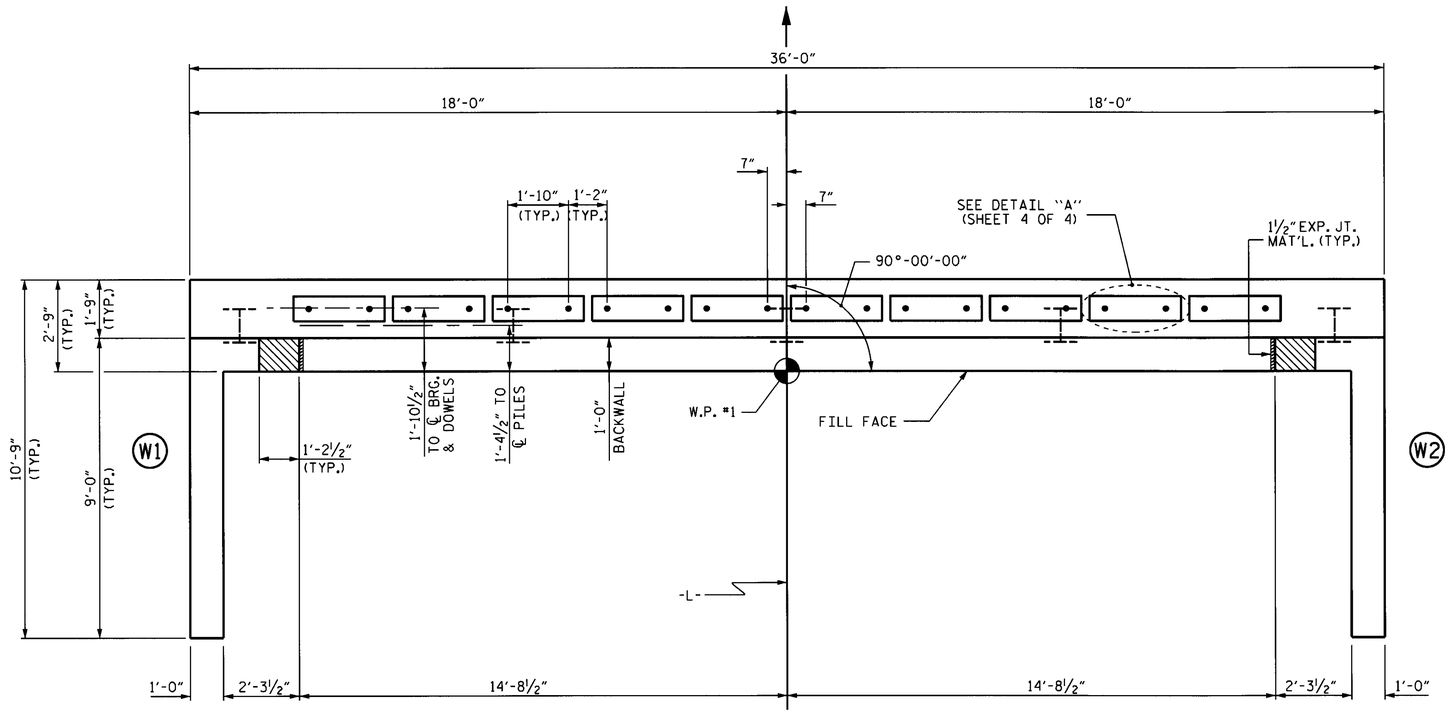
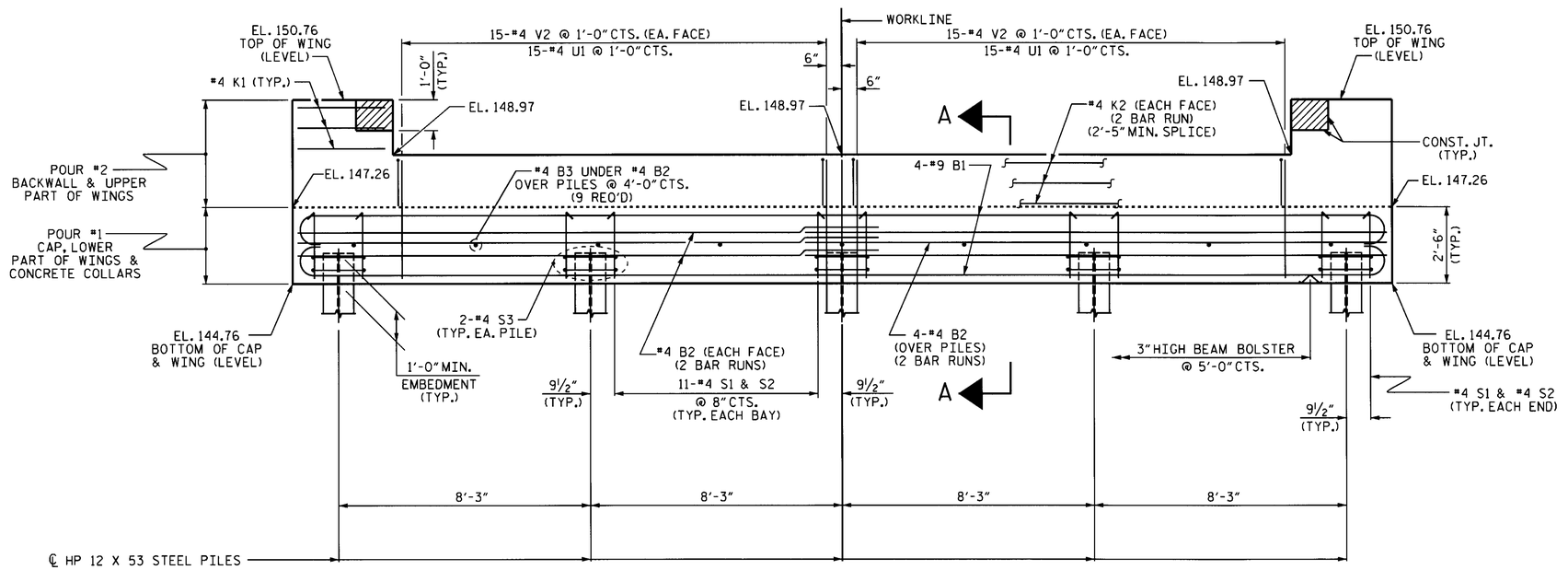
(SHT 1) STD. NO. GRA3



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.

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 CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG JIANG
3/21/14

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00-L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 1-14
CHECKED BY : E. I. OMILE	DATE : 1-14
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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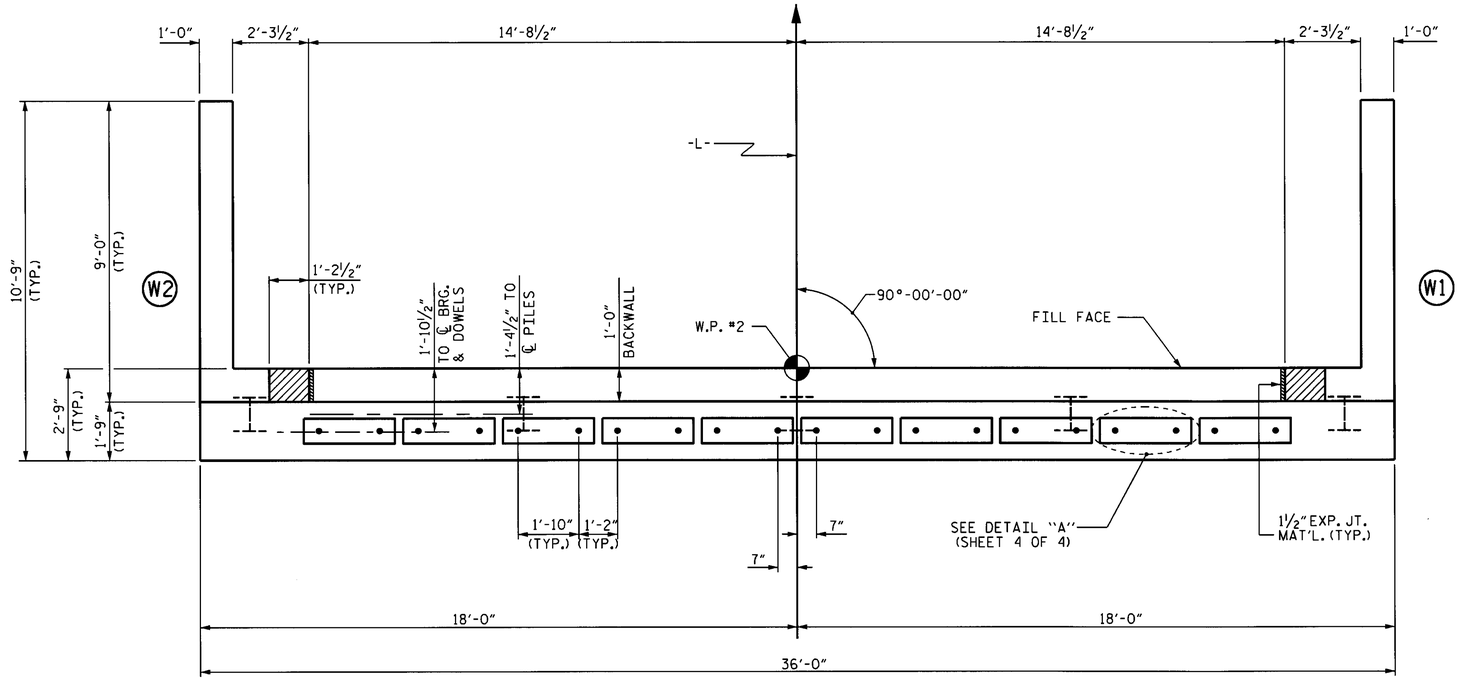
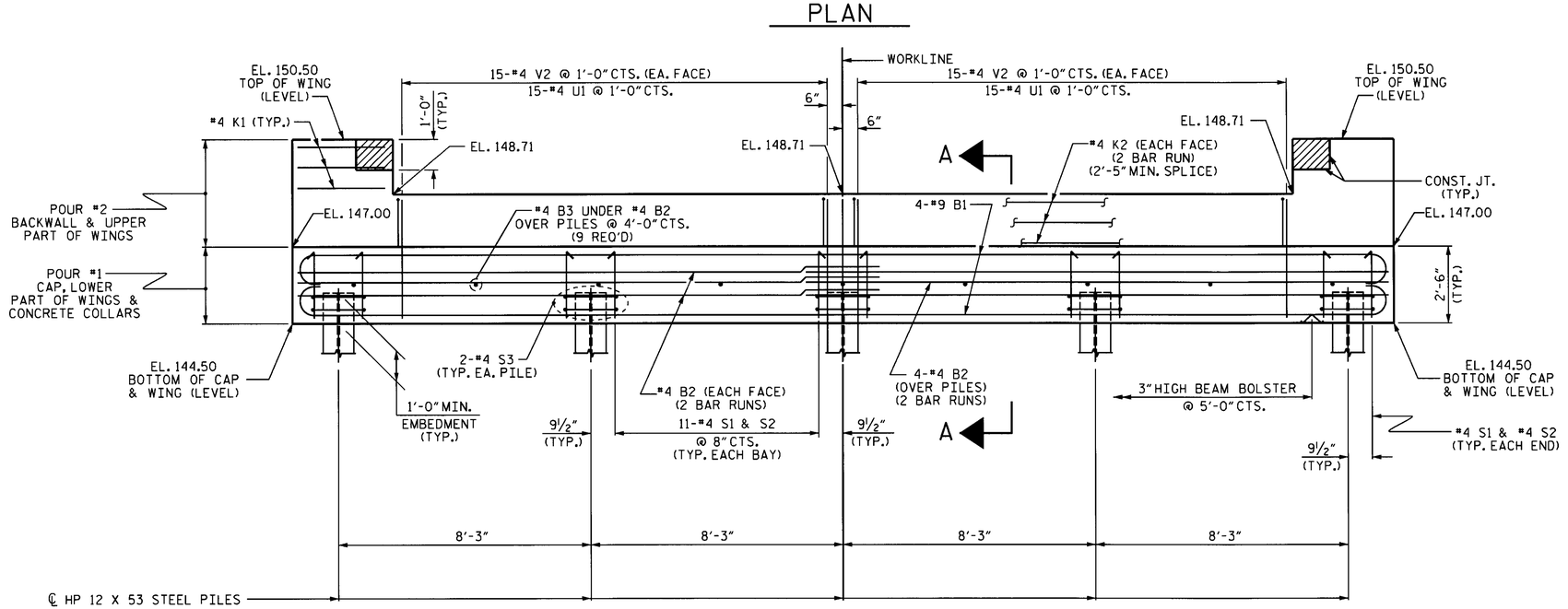


PLAN



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.

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 CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER YING HSIUNG FANG
3/21/14

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00-L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 1-14
CHECKED BY : E. I OMILE	DATE : 1-14
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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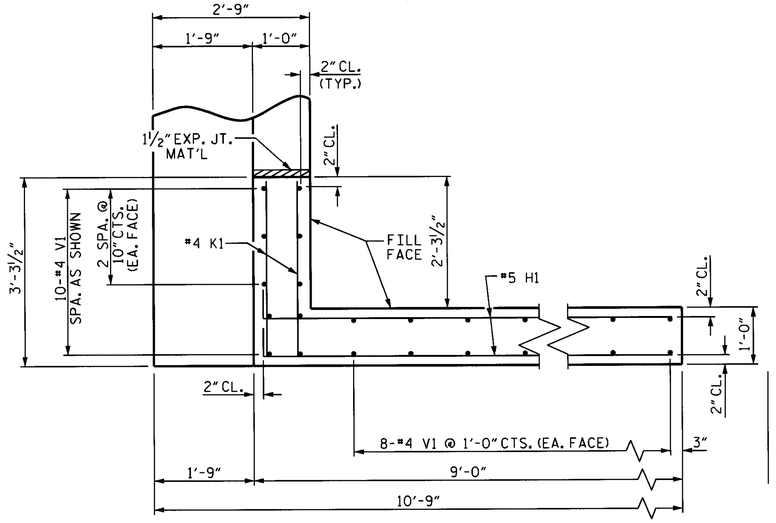
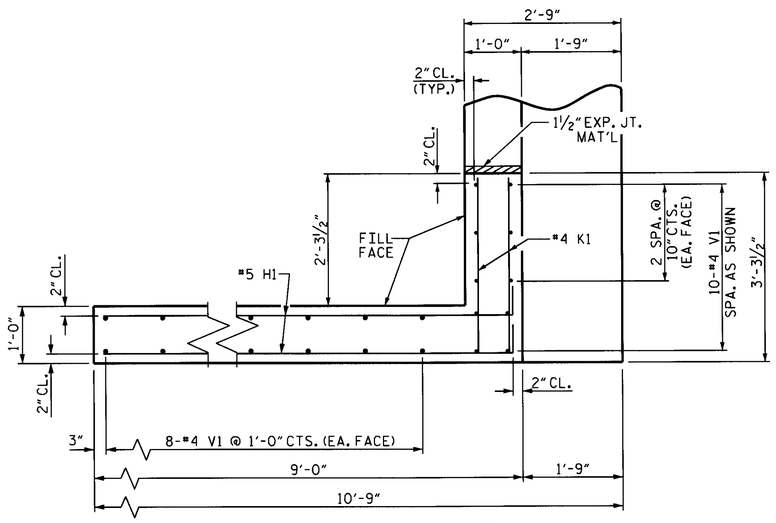
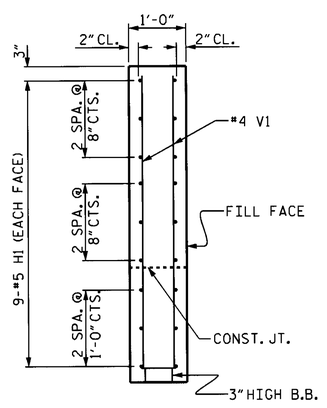


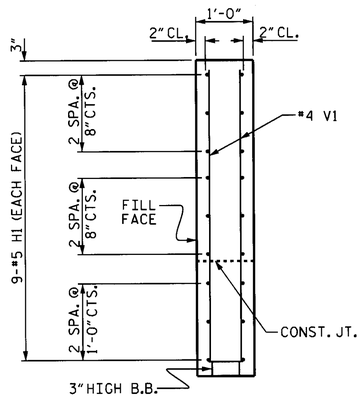
PLAN OF WING (W1)



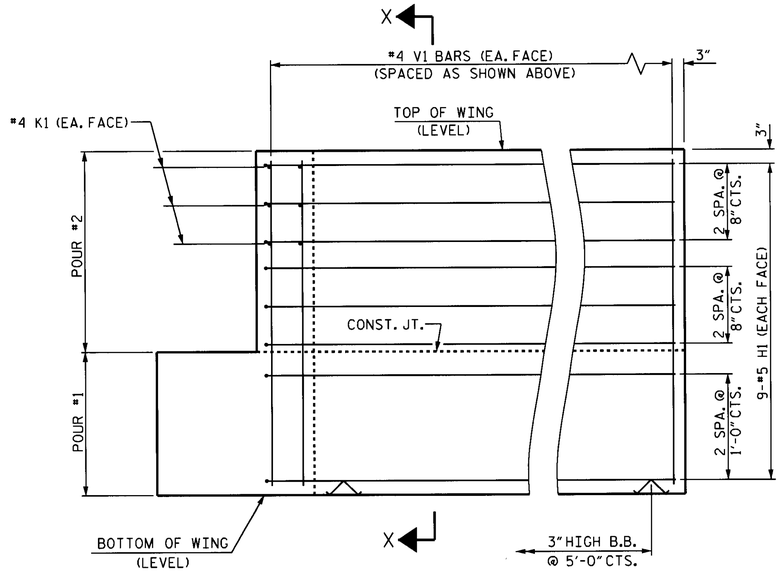
PLAN OF WING (W2)



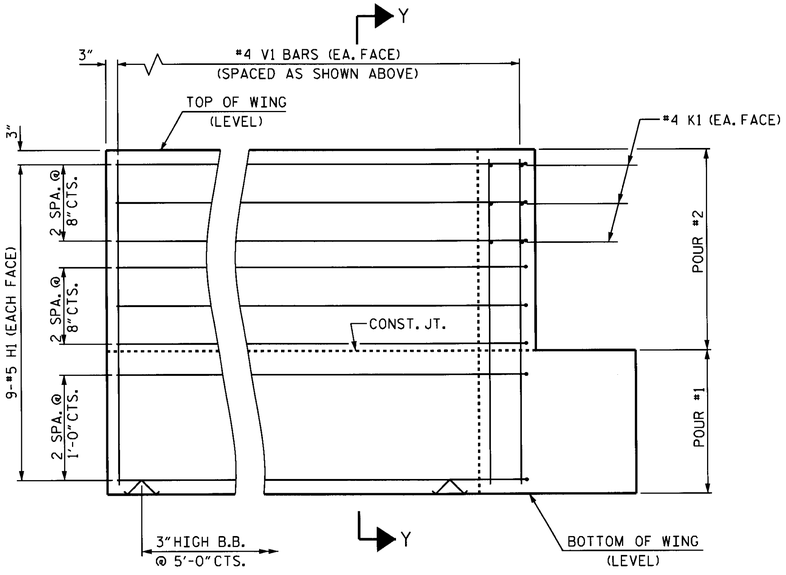
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG YANG
3/21/14

PROJECT NO. BD-5108AC
RICHMOND COUNTY
STATION: 13+35.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			14

DRAWN BY : S. B. WILLIAMS DATE : 1-14
CHECKED BY : E. I. OMILE DATE : 2-14

21-MAR-2014 13:18
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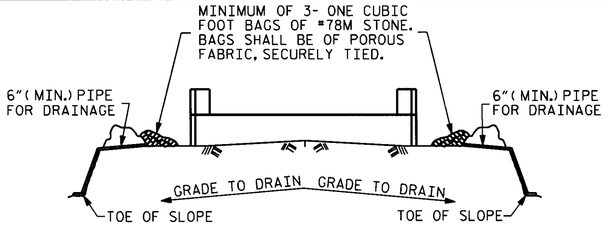
clyokeley

STD. NO. EB_33_90S4_33BB

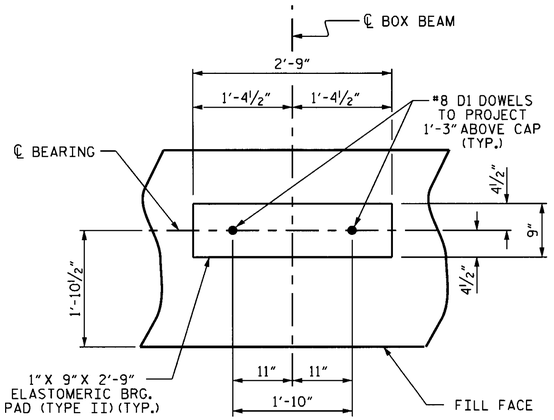


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

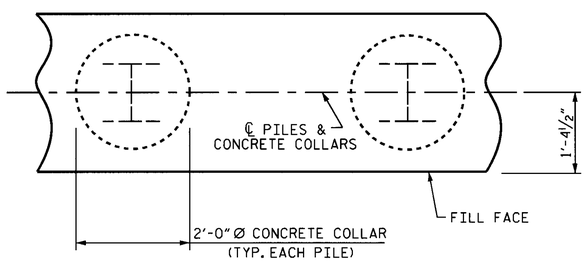
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

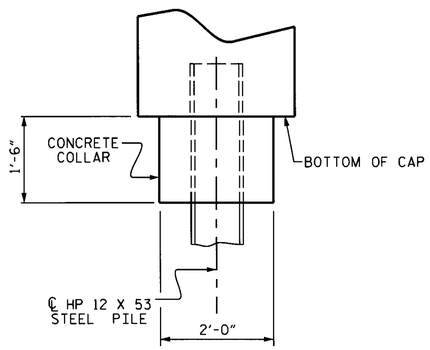


DETAIL "A"

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



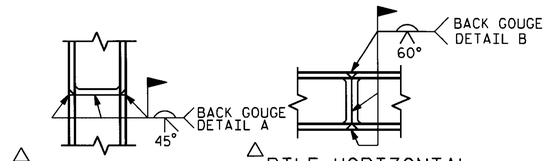
PLAN



ELEVATION

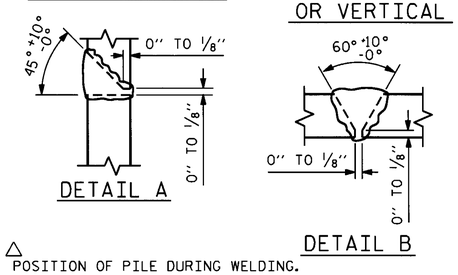
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



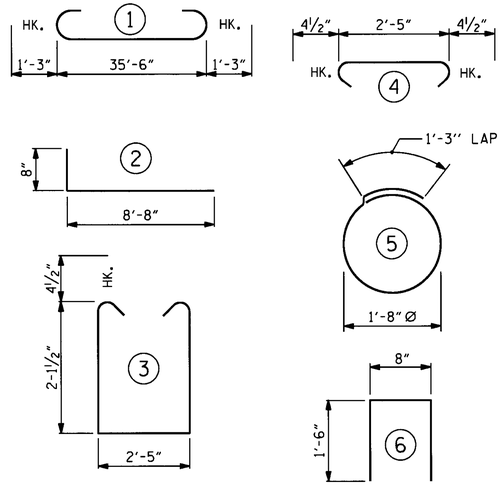
DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 1		END BENT 2	
HP 12 X 53 STEEL PILES		HP 12 X 53 STEEL PILES	
NO: 5	LIN. FT.= 75	NO: 5	LIN. FT.= 100
STEEL PILE POINTS	5 EACH	STEEL PILE POINTS	5 EACH

BILL OF MATERIAL

FOR ONE END BENT (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	16	#4	STR	19'-1"	204
B3	9	#4	STR	2'-5"	15
D1	20	#8	STR	2'-3"	120
H1	36	#5	2	9'-4"	350
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	19'-1"	153
S1	46	#4	3	7'-5"	228
S2	46	#4	4	3'-2"	97
S3	10	#4	5	6'-6"	43
U1	30	#4	6	3'-8"	73
V1	52	#4	STR	5'-8"	197
V2	60	#4	STR	3'-10"	154

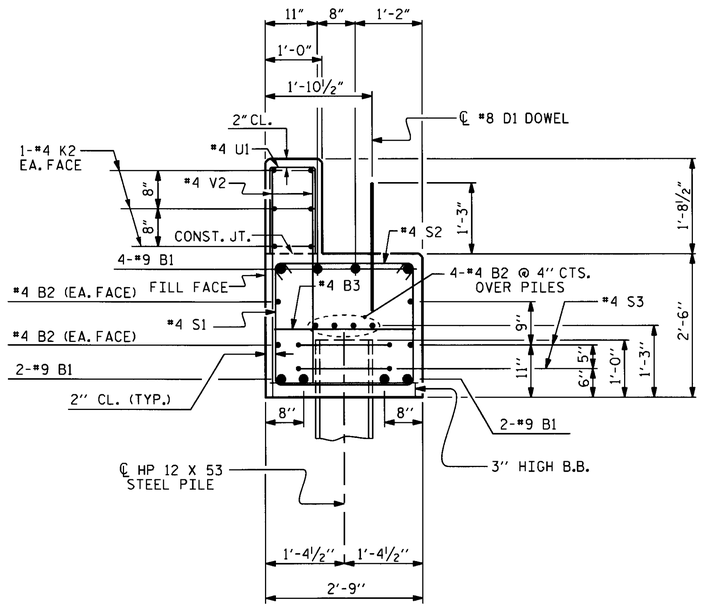
REINFORCING STEEL (FOR ONE END BENT) 2692 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 11.7 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 5.2 C.Y.

TOTAL CLASS A CONCRETE 16.9 C.Y.



SECTION A-A

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER ING HSIUNG FANG

3/21/14

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 1-14
CHECKED BY : E. I. OMILE	DATE : 2-14
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

21-MAR-2014 13:18
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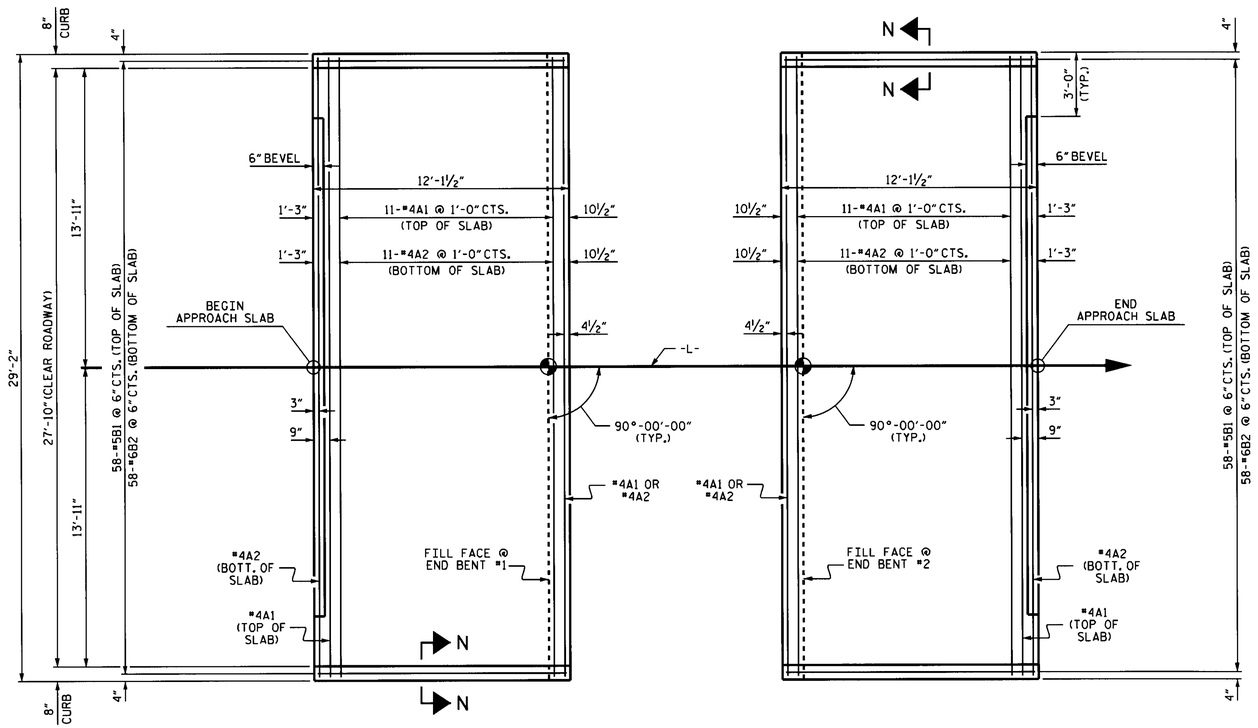
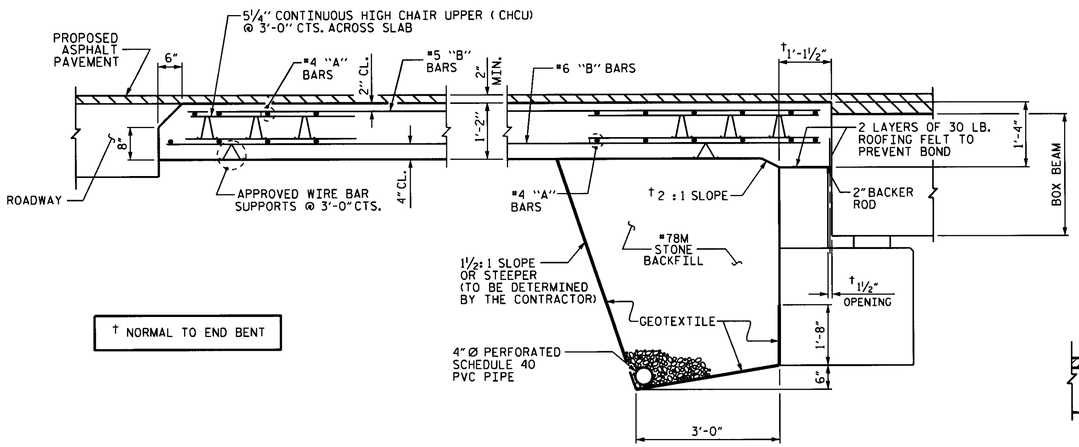
ciyokeley



PLAN @ END BENT 1

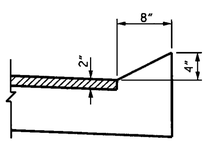
PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

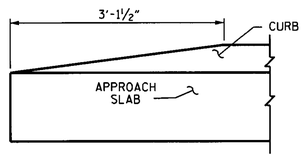


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

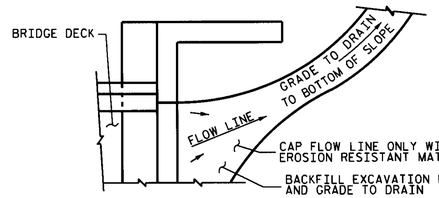
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

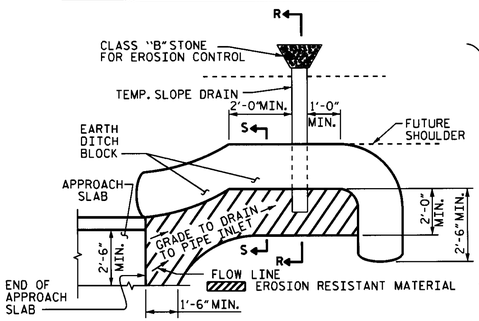
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



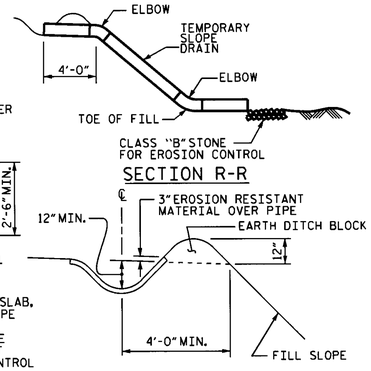
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

PLAN VIEW



SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
* B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
* EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C. Y.	15.6

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
* B1	58	#5	STR	11'-2"	676
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1266
* EPOXY COATED REINFORCING STEEL				LBS.	926
CLASS AA CONCRETE				C. Y.	15.6

PROJECT NO. BD-5108AC

RICHMOND COUNTY

STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIANG CHANG

3/21/14

ASSEMBLED BY : S. B. WILLIAMS	DATE : 12-13
CHECKED BY : E. I. OMILE	DATE : 12-13
DRAWN BY : MAA	11/11
CHECKED BY : AAC	11/11

21-MAR-2014 13:18
S:\DPG2\Ting\DIV8BD\BD-5108AC Richmond 113\Final_plans\BD5108AC_bb_fplan.dgn
clyokeley

STD. NO. BAS_BB_30_90S

09/08/99

TIP PROJECT: BD-5108AC

CONTRACT:

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

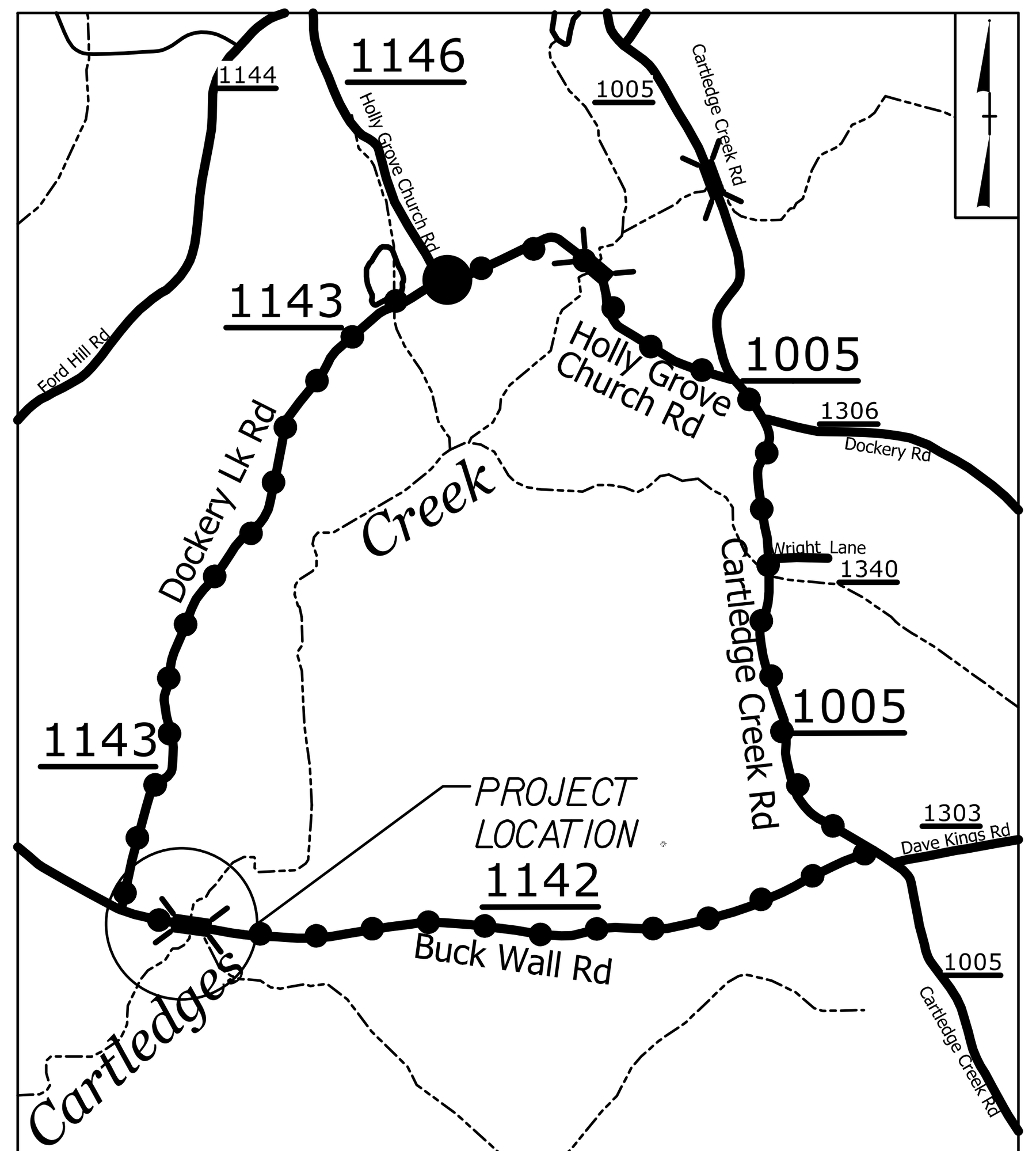
T.I.P. NO.	SHEET NO.
BD-5108AC	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RICHMOND COUNTY

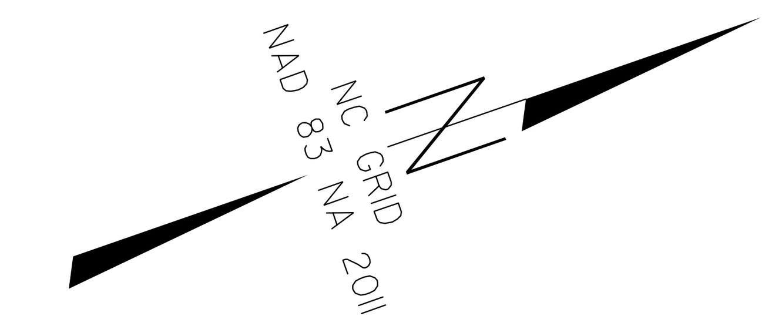
LOCATION: BRIDGE NO. 113 ON SR 1142 (BUCK WALL ROAD) OVER CARTLEDGE CREEK

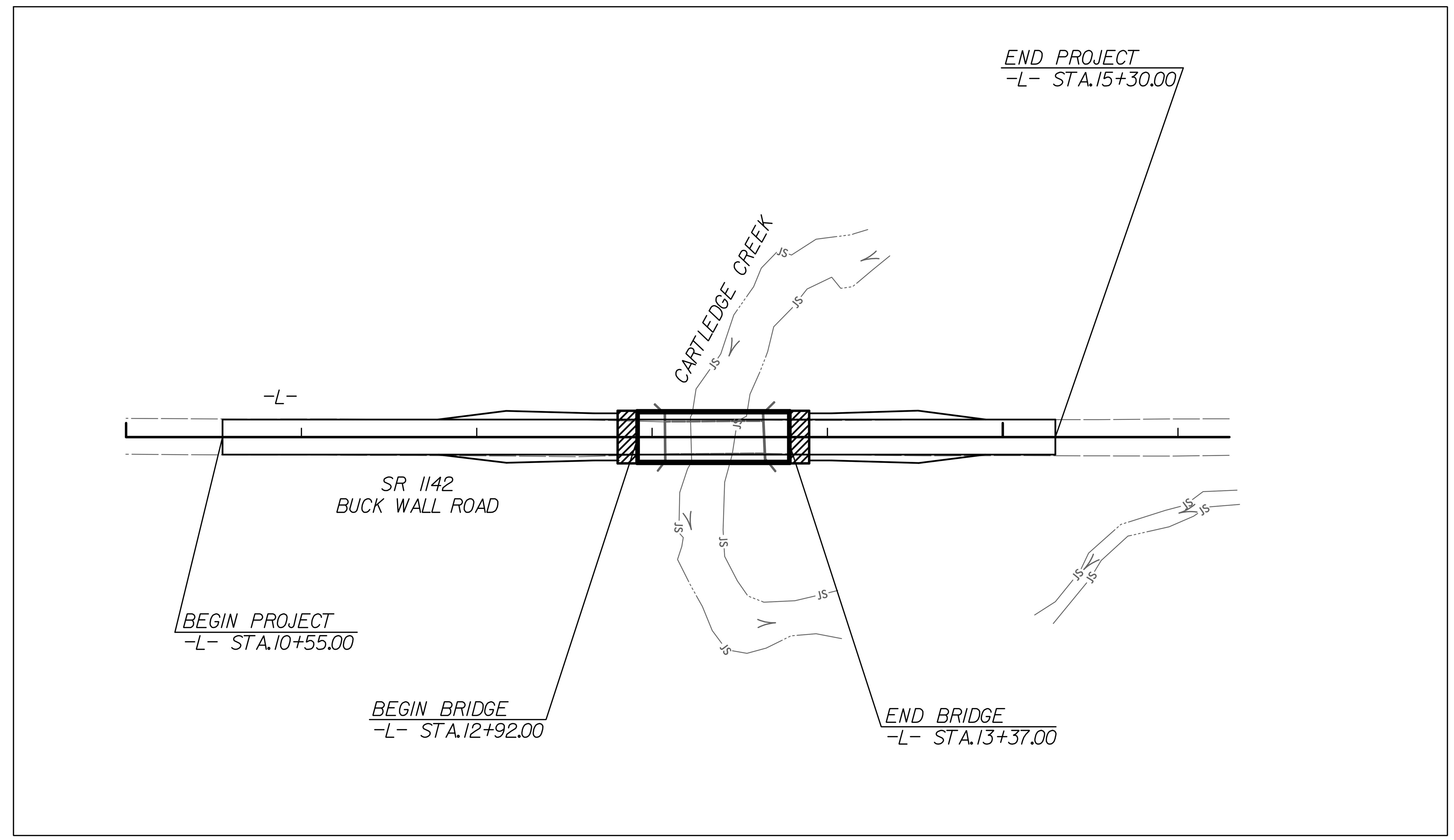
TYPE OF WORK: POWER RELOCATION



VICINITY MAP

OFF-SITE DETOUR ROUTE = ●—●—●—●—●





INDEX OF SHEETS

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

UTILITY OWNERS ON PROJECT

1) AT&T TELEPHONE CO.

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

UTILITIES COORDINATION CONSULTANT
Lavon Tyson

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS UTILITIES ENGINEERING SECTION
1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 707-6690
FAX (919) 250-4151

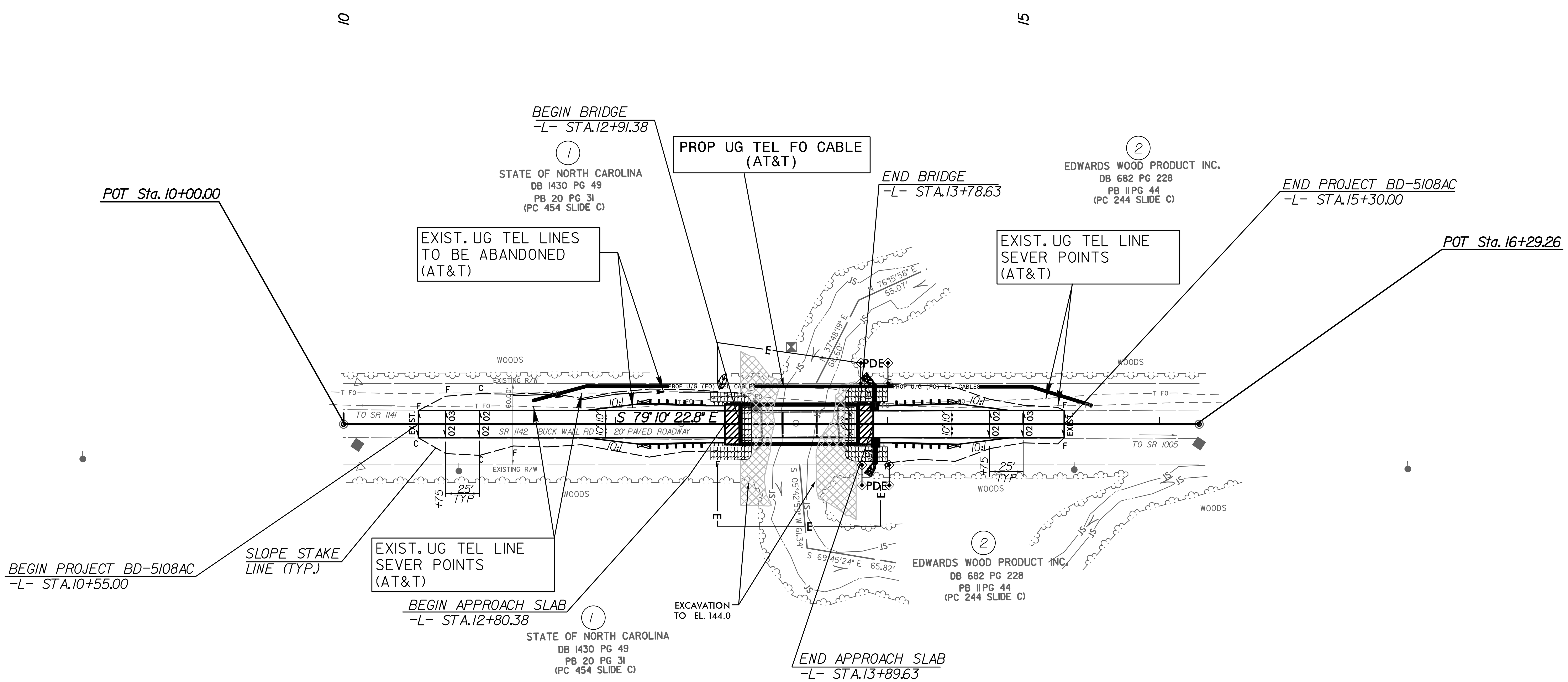
Roger Worthington, P.E. — *UTILITIES SECTION ENGINEER*
Ron Wilkins, PE — *UTILITIES SQUAD LEADER PROJECT ENGINEER*

PROJECT REFERENCE NO.	SHEET NO.
BD-5108AC	UO-2
R/W SHEET NO.	

SEPI
ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

UTILITIES BY OTHERS

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



UTILITY POLE OWNERS
1- PEE DEE ELECTRIC MEM CORP - 131
2 - PEE DEE ELECTRIC MEM CORP - 131X
3 - PEE DEE ELECTRIC MEM CORP - 132
4 - PEE DEE ELECTRIC MEM CORP - 133
5 - PEE DEE ELECTRIC MEM CORP - 133X
6 - PEE DEE ELECTRIC MEM CORP - 134

REVISIONS

8/17/99

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