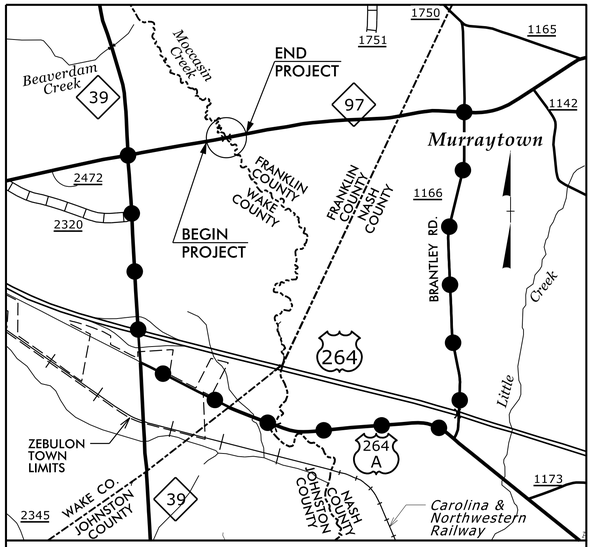
09/08/99

T.I.P PROJECT: B-4830

CONTRACT: C203806



VICINITY MAP

OFF-SITE DETOUR

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE & FRANKLIN COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4830	1	

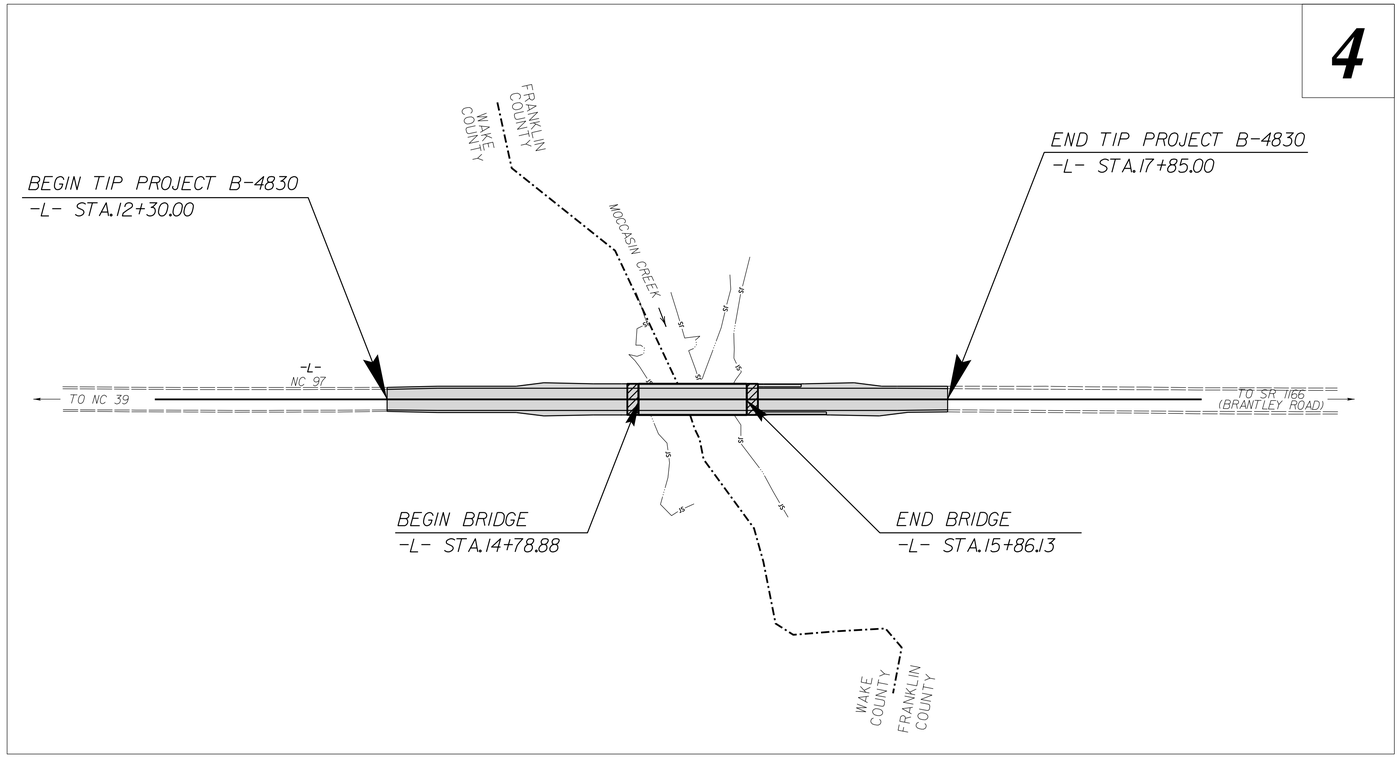
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38600.1.1	BRSTP-0097(34)	PE
38600.2.2	N/A	ROW & UTILITY
38600.3.2	N/A	CONSTRUCTION

LOCATION: ***BRIDGE NO. 20 OVER MOCCASIN CREEK ON NC 97***

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

NAD 83/
NSRS 2007

4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

2016 ADT = 2,922 VPD
2036 ADT = 3,530 VPD
DHV = 12%
D = 60%
T = 4% *
V = 60 MPH
* (TTST 1% + DUAL 3%)
FUNC. CLASS. = RURAL MAJOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4830	=	0.085 mi.
LENGTH STRUCTURES TIP PROJECT B-4830	=	0.020 mi.
TOTAL LENGTH TIP PROJECT B-4830	=	0.105 mi.

Prepared in the Offices of:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750

NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 557-0929
Firm License #: C-1051
www.stewartbc.com
PROJECT #:IM14017
ECOLOGICAL ENGINEERING

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 22, 2015

LETTING DATE:
MAY 16, 2017

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, EI
PROJECT DESIGN ENGINEER

GARY R. LOVERING, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

DocuSigned by: Frank Fleming 2/8/2017
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG

DocuSigned by: Andrew P. Young 2/8/2017
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/8/2017
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USER:FKeys

PROJECT REFERENCE NO.	SHEET NO.
B-4830	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG

DocuSigned by: 2/8/2017
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STEWART

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS

INDEX OF SHEETS

EFF. 01-17-2012
REV. 02-29-2016

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 January, 2012 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	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.11	Bridge Approach Fills - Sub Regional Tier
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

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.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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 OFSUPERELEVATED 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 CONSULTWITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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:

UTILITY OWNERS ON THIS PROJECT ARE

AT&T

VERIZON BUSINESS

MCI COMMUNICATIONS SERVICES

DUKE

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.

2/8/2017
...\B4830_RDY_PSH_1A.dgn

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-4830	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed 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)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

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 & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line (RW)
- New Right of Way Line with Pin and Cap (RW)
- New Right of Way Line with Concrete or Granite R/W Marker (RW)
- New Control of Access Line with Concrete C/A Marker (CA)
- Existing Control of Access (CA)
- New Control of Access (CA)
- Existing Easement Line (E)
- New Temporary Construction Easement (E)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

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
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (T HH)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E.*) (W)
- U/G Water Line LOS C (S.U.E.*) (W)
- U/G Water Line LOS D (S.U.E.*) (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (C)
- TV Tower
- U/G TV Cable Hand Hole (H HH)
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (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)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

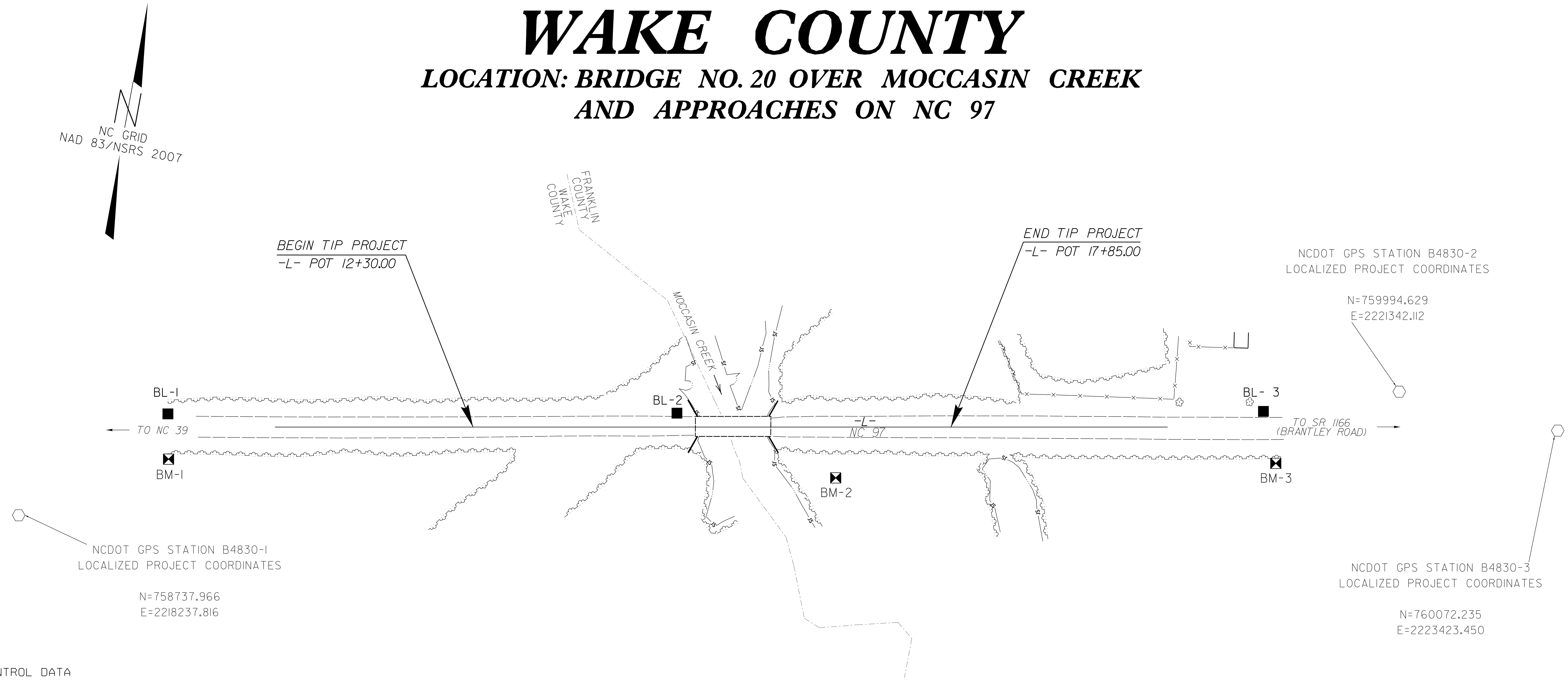
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?UTL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO. B-4830 | SHEET NO. 1C-1
Location and Surveys

SURVEY CONTROL SHEET B-4830

WAKE COUNTY

LOCATION: BRIDGE NO. 20 OVER MOCCASIN CREEK AND APPROACHES ON NC 97



CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	BL-1	759454.6037	2218420.8155	225.46	OUTSIDE PROJECT LIMITS	
BL2	BL-2	759562.7968	2219001.8838	224.77	14+66.78	16.18 LT
BL3	BL-3	759688.4014	2219671.0935	230.47	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

BM1 ELEVATION = 220.64'
N 759403 E 2218431
L STATION 12+30.00
S 73°31'05" W DIST 355.39'
BENCH TIE SPIKE IN 20" OAK

BM2 ELEVATION = 218.56'
N 759522 E 2219197
L STATION 16+51.00 59' RIGHT
BENCH TIE SPIKE IN 24" OAK

BM3 ELEVATION = 231.24'
N 759632 E 2219696
L STATION 12+30.00
N 82°07'47" E DIST 933.07'
BENCH TIE SPIKE IN 12" SWEETGUM

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4830-1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 758737.966(ft) EASTING: 2218237.816(ft)
ELEVATION: 239.318(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991638
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4830-1" TO -L- STATION 12+30.00 IS
N 34°53'31" E 933.80'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4830_ls_control.txt

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

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

6/2/99
2/8/2017 ...Roadway\Proj\B4830_ls_1c.dgn

STEWART
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421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
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PROJECT REFERENCE NO.	SHEET NO.
B-4830	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034407 ANDREW P. YOUNG	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON
DocuSigned by: Andrew P. Young 2/13/2017	DocuSigned by: Clark Morrison 2/13/2017

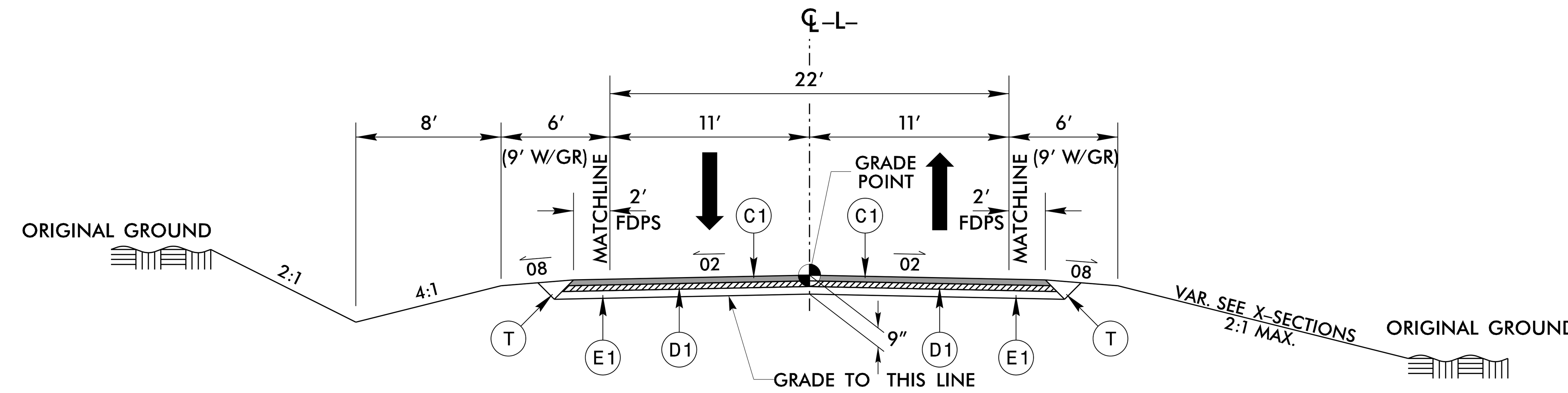
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

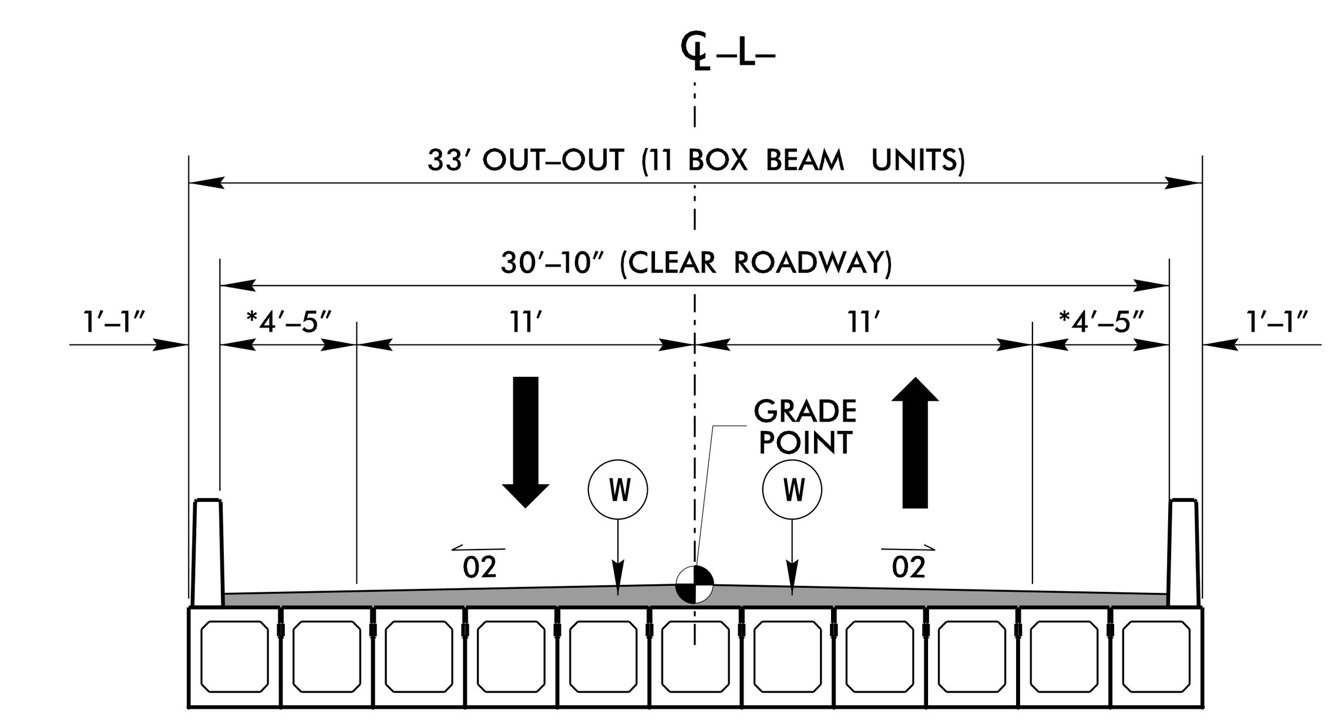
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 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" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
W	ASPHALT WEDGING (SEE DETAIL)

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



TYPICAL SECTION NO. 1

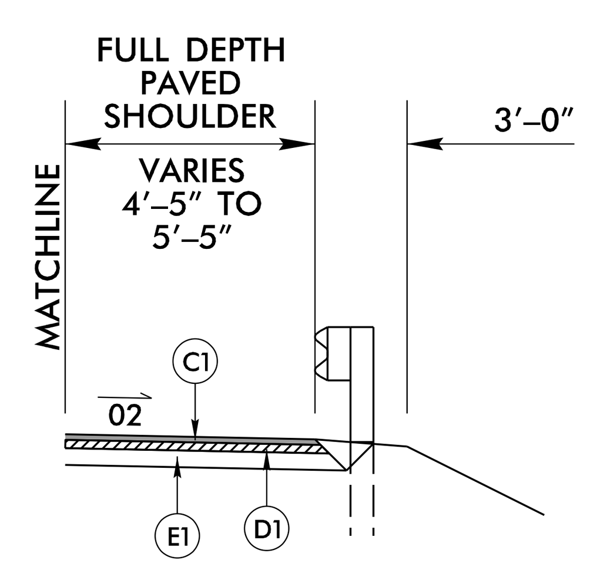
-L- STA. 12+30.00 TO -L- STA. 14+78.88 (BEGIN BRIDGE)
-L- STA. 15+86.13 (END BRIDGE) TO -L- STA. 17+85.00



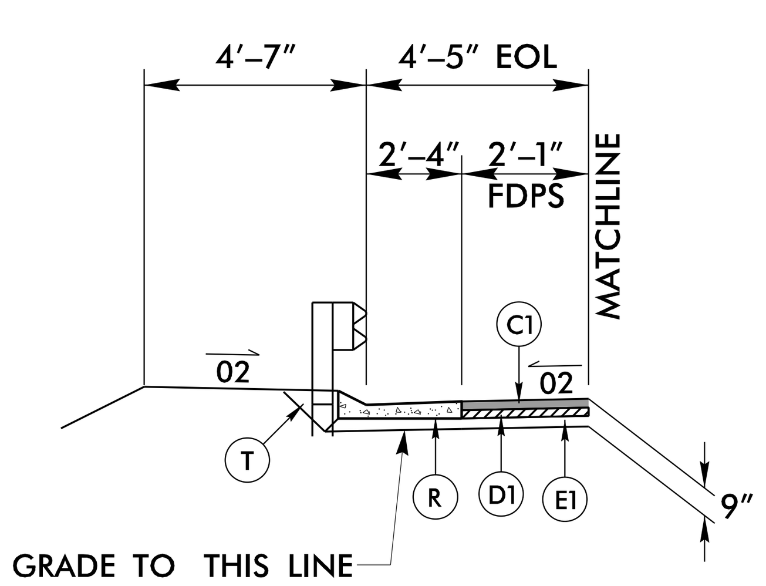
TYPICAL SECTION NO. 2
BOX BEAM BRIDGE

-L- STA. 14+78.88 (BEGIN BRIDGE) TO -L- STA. 15+86.13 (END BRIDGE)

* ADDITIONAL BRIDGE OFFSET WIDTH REQUIRED FOR HYDRAULIC DESIGN

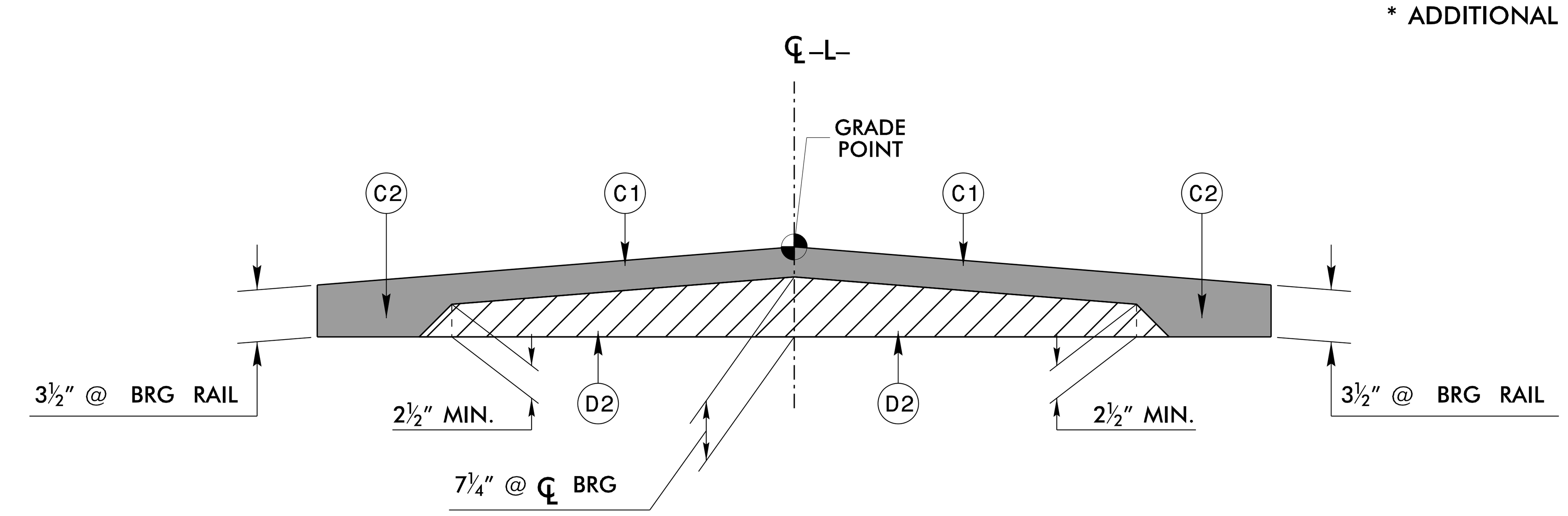


DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

USE SHOULDER BERM GUTTER AT THE FOLLOWING LOCATIONS:
-L- STA. 15+97.00 (END APPROACH SLAB) TO -L- STA. 16+40.00 (LEFT)
-L- STA. 15+97.00 (END APPROACH SLAB) TO -L- STA. 16+65.00 (RIGHT)



DETAIL SHOWING METHOD OF WEDGING ON BRIDGE

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

8/17/99
2/8/2017
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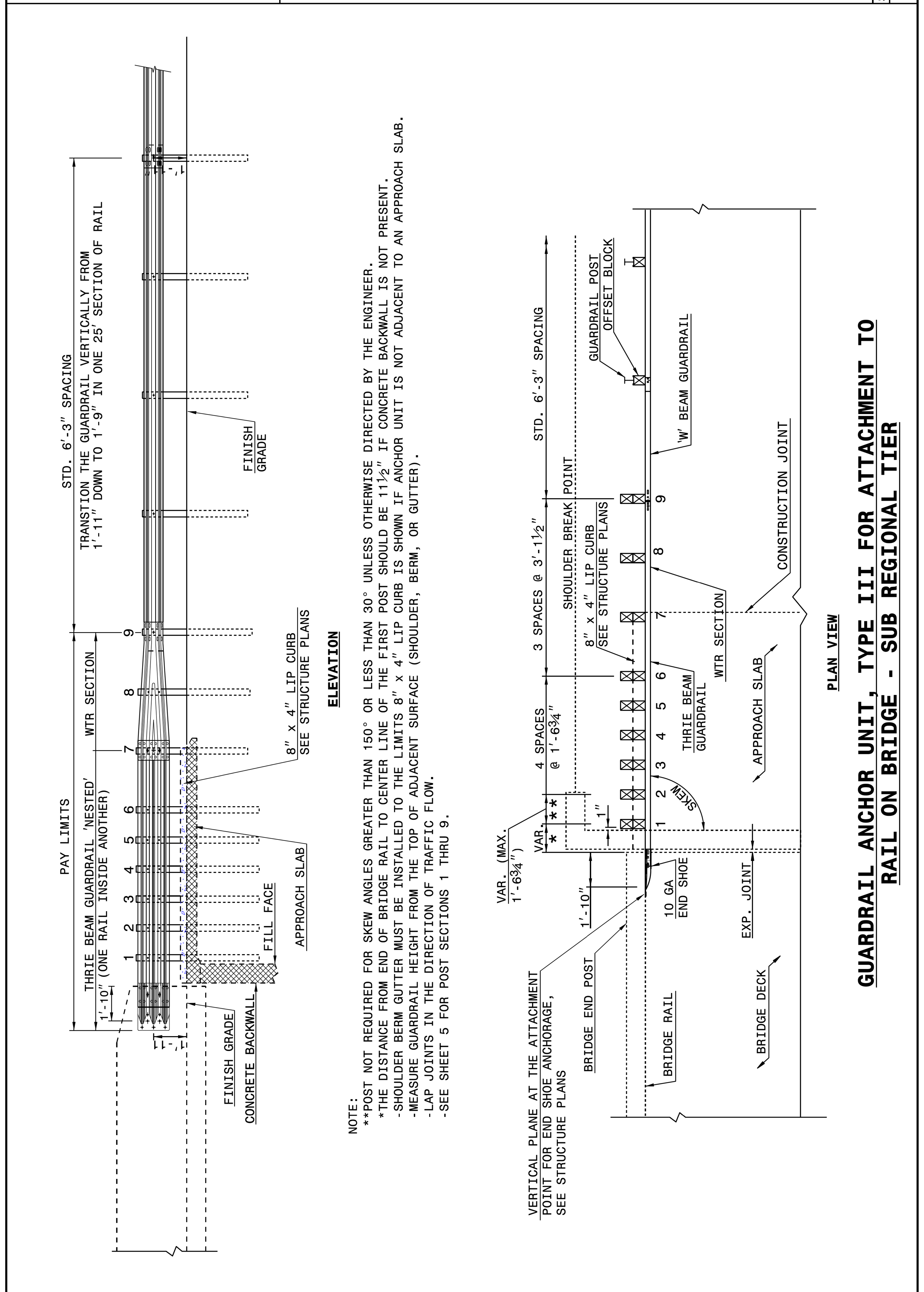
PROJECT REFERENCE NO.	SHEET NO.
B-4830	2C-1

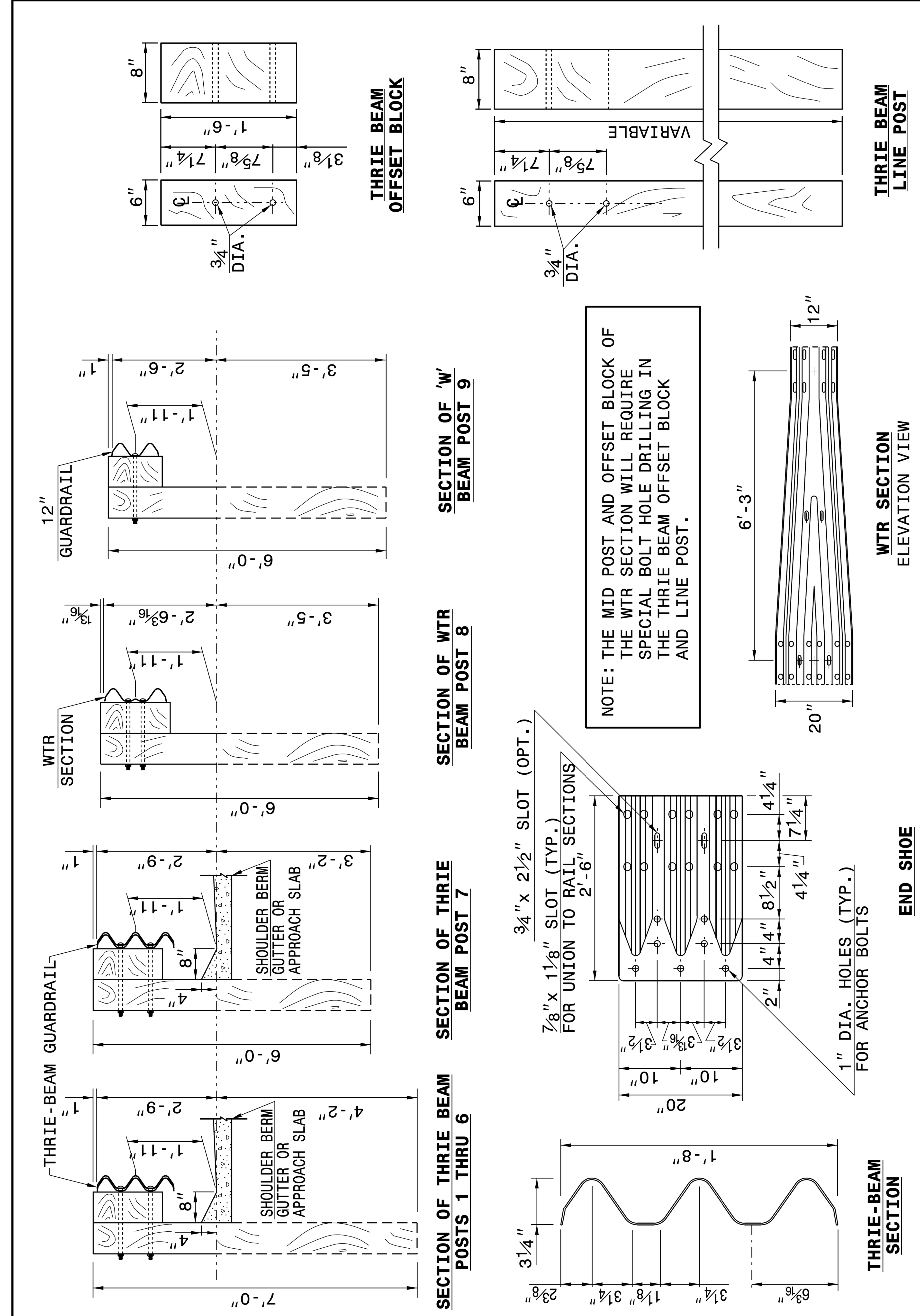
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER — SHEET 2 OF 7 862d03



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

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

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



NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton 2/8/2017
DocuSigned by: Joel Howerton

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

SEE TITLE BLOCK

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

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

PROJECT REFERENCE NO.	SHEET NO.
B-4830	2G-1

GEOTECHNICAL ENGINEER

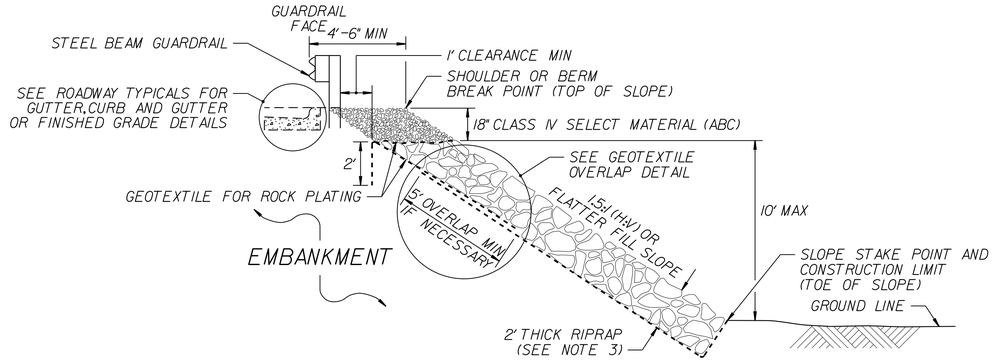
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 7/12/2016
F760CAE89BFC4D3... SIGNATURE DATE

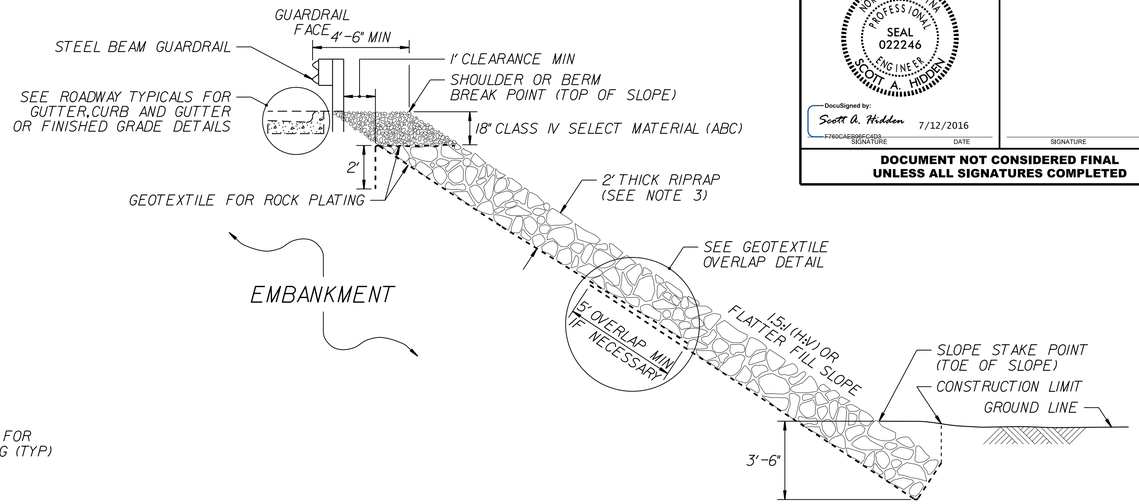
ENGINEER

SIGNATURE DATE

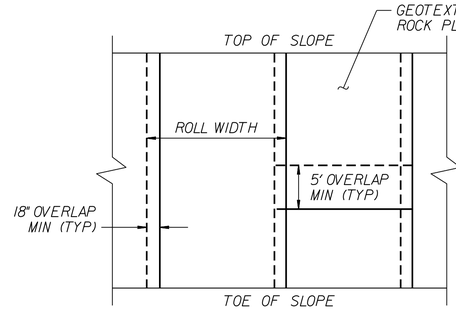
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



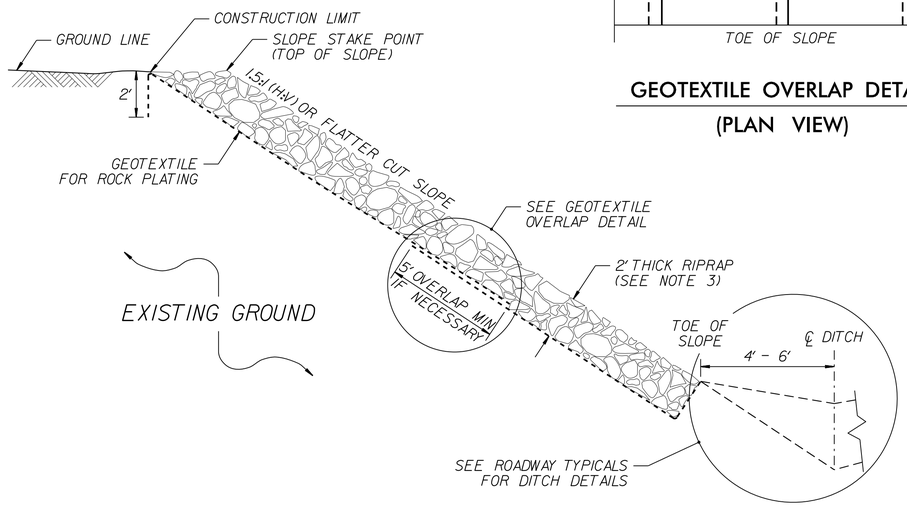
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



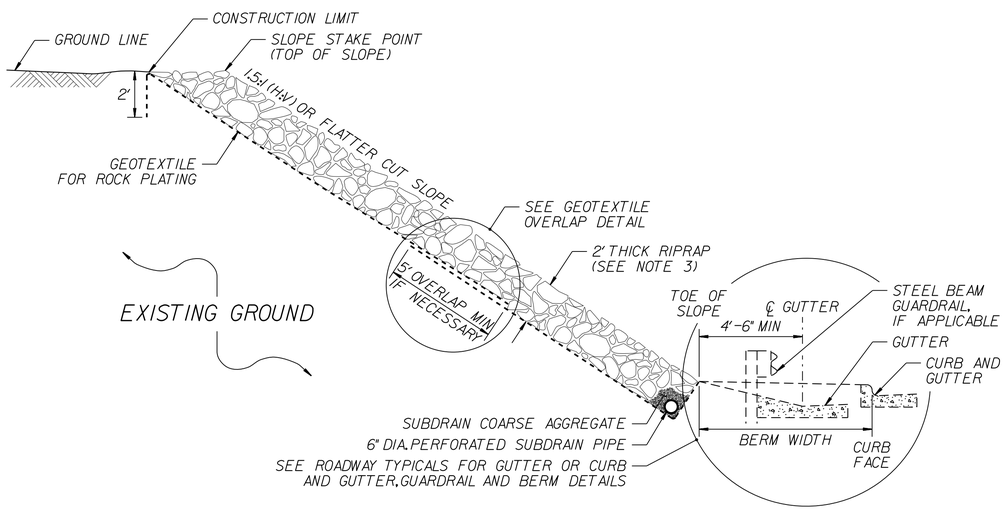
ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD
ROCK PLATING

DATE: 2-19-13

★ SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- STA. 12+30.00	-L- STA. 14+78.88 (BR)	157	1090	933	
SUBTOTAL:		157	1090	933	
-L- STA. 15+86.13 (BR)	-L- STA. 17+85.00	216	192		24
SUBTOTAL:		216	192		
WASTE IN LIEU OF BORROW				-24	-24
PROJECT TOTALS:		373	1282	909	0
EST 5% TO REPLACE TOP SOIL ON BORROW PIT				45	
GRAND TOTALS:		373		954	
SAY:		390		1000	

ESTIMATED UNDERCUT EXCAVATION = 400 CY (CONTINGENCY)
ESTIMATED SELECT GRANULAR MATERIAL = 400 CY (CONTINGENCY)
ESTIMATED GEOTEXTILE FOR SOIL STABILIZATION = 400 SY (CONTINGENCY)

EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

★ PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	12+30.00	14+88.23	EXIST. ROAD	662			
-L-	15+75.81	17+85.00	EXIST. ROAD	567			
		TOTAL:		1,229			
		SAY:		1,250			

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L- (LT)	15+97.00	16+40.00	43
-L- (RT)	15+97.00	16+65.00	68
		TOTAL:	111
		SAY:	115

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

GUARDRAIL SUMMARY

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	ANCHORS TYPE III	ANCHORS GRAU 350	ANCHORS M-350	ANCHORS XIII	ANCHORS CAT-1	ANCHORS VI MOD	ANCHORS BIC		IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+85.13	14+78.88 (BR)	LT	93.75				14+78.88	4'-5"	9'		50		1		1	1												TL-3
-L-	13+85.13	14+78.88 (BR)	RT	93.75			14+78.88		4'-5"	9'	50		1			1	1												TL-3
-L-	15+86.13 (BR)	16+92.38	LT	106.25			15+86.13		4'-5"	9'	50		1			1	1												TL-3
-L-	15+86.13 (BR)	17+17.38	RT	131.25				15+86.13	4'-5"	9'		50		1		1	1												TL-3
			SUBTOTAL:	425																									
			LESS ANCHOR DEDUCTIONS:																										
			TYPE III (4 @ 18.75')	-75																									
			GRAU-350 TL-3 (4 @ 50')	-200																									
			TOTAL:	150												4	4												
			SAY:	175																									
			ADDITIONAL GUARDRAIL POSTS = 5 EA																										

REVISIONS

8/17/99

2/8/2017 ...B4830_RDY_SUM_3B-1.dgn

COMPUTED BY: RBR DATE: 5/7/2015

CHECKED BY: ECOLOGICAL ENG., LLP DATE: 5/7/2015

PROJECT REFERENCE NO.	SHEET NO.
B-4830	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
SUBREGIONAL

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
16+05 -L-	LT	0401		226.01	223.26															
		0401	0402		223.26	223.12														
16+35 -L-	LT	0402		225.87	223.12															
		0402	0403		223.12	214.00			28							x			x	x
16+05 -L-	RT	0404		226.01	223.26															
		0404	0405		223.26	223.00														
16+60 -L-	RT	0405		225.75	223.00															
		0405	0406		223.00	215.39			28							x			x	x
SHEET TOTALS									56											

STATION	LOCATION	FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
16+05 -L-	LT	0401																									
		0401	0402																		28						
16+35 -L-	LT	0402																									
		0402	0403																								
16+05 -L-	RT	0404																									
		0404	0405																		52						
16+60 -L-	RT	0405																									
		0405	0406																								
SHEET TOTALS																					80						

STATION	LOCATION	FROM	TO	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES 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	J.B. STD. 840.31 OR 840.32	G.D.I. FRAME (N.S. FLAT) W/2 GRATES STD. 840.29	T.B.D.I. STD. 840.35			DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
16+05 -L-	LT	0401									1																			1	1							
		0401	0402																																			
16+35 -L-	LT	0402									1																			1	1							
		0402	0403																															2@15"				
16+05 -L-	RT	0404									1																			1	1							
		0404	0405																																			
16+60 -L-	RT	0405									1																			1	1							
		0405	0406																															2@15"				
SHEET TOTALS											4																			4	4			4@15"				

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.)	(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

REVISIONS

8/17/99

2/8/2017 ..\Proj\B4830_RDY_SUM_3D-1.dgn USER:Fkeys

PROJECT REFERENCE NO.	SHEET NO.
B-4830	3G-1

COMPUTED BY: _TTZ_____________ DATE: 6-15-2015_
CHECKED BY: _______________ DATE: _________

REVISIONS

(4-21-15)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No.	Riprap Class	SY
-L-	2:1 (H:V)	14+00	1.5:1 (H:V)	14+64.88	LT & RT	2	II	380
-L-	1.5:1 (H:V)	16+00.13	2:1 (H:V)	16+50	LT & RT	2	II	270
							TOTAL SY:	650

See Sheet 2G-1 for Rock Plating Detail

8/17/99

2/8/2017
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PROJECT REFERENCE NO.	SHEET NO.
B-4830	4

ROADWAY DESIGN ENGINEER — SEAL 034407 — Andrew P. Young — 2/8/2017

HYDRAULICS ENGINEER — SEAL 20147 — Frank F. Fleming — 2/8/2017

STEWART

ECOLOGICAL ENGINEERING

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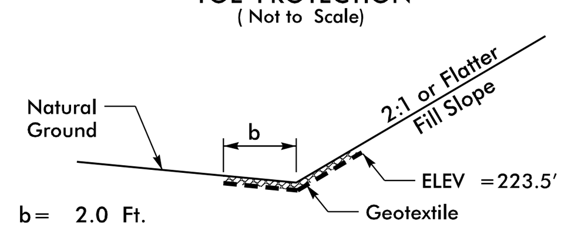
REVISIONS

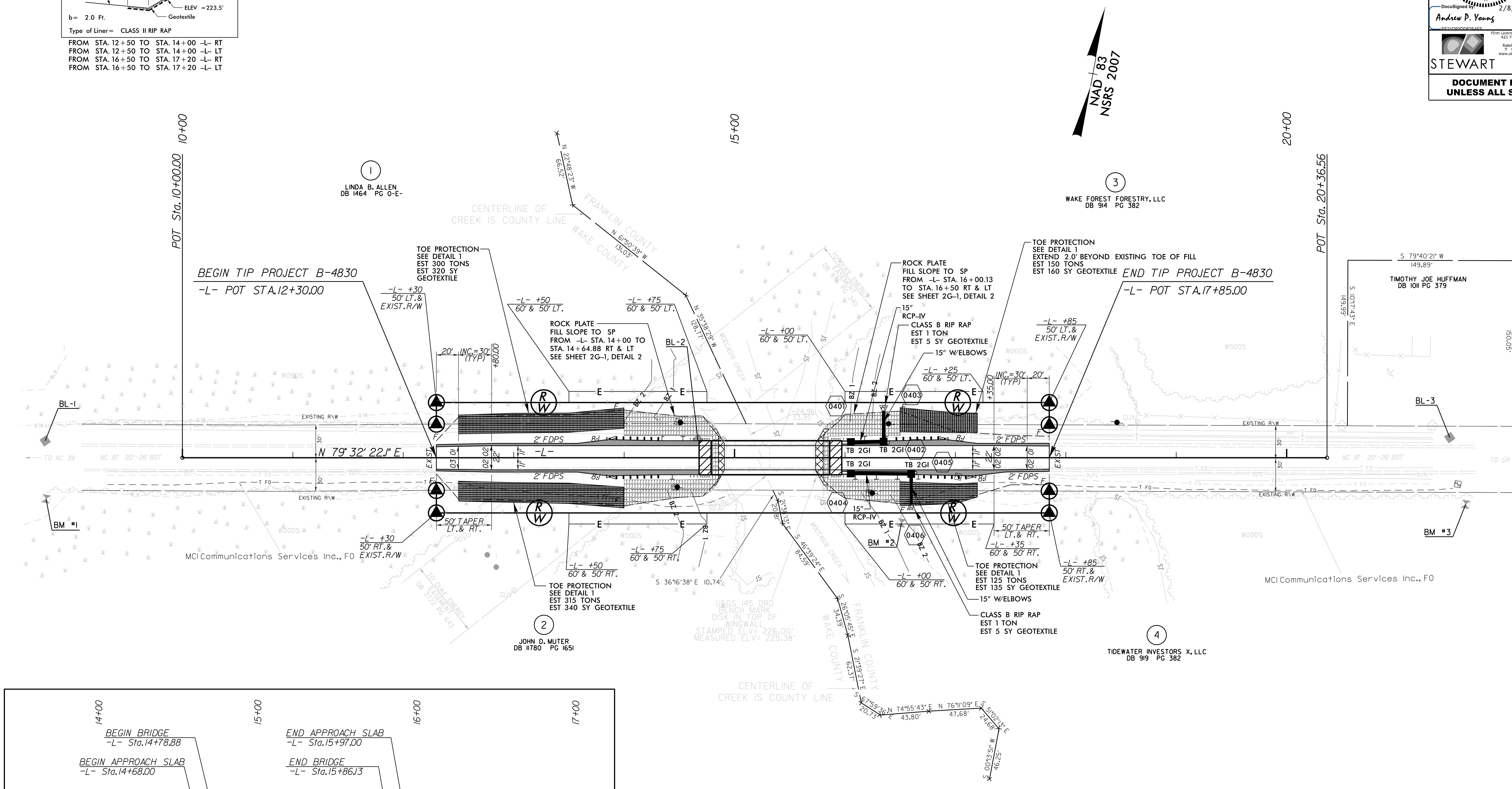
DETAIL 1
TOE PROTECTION
(Not to Scale)



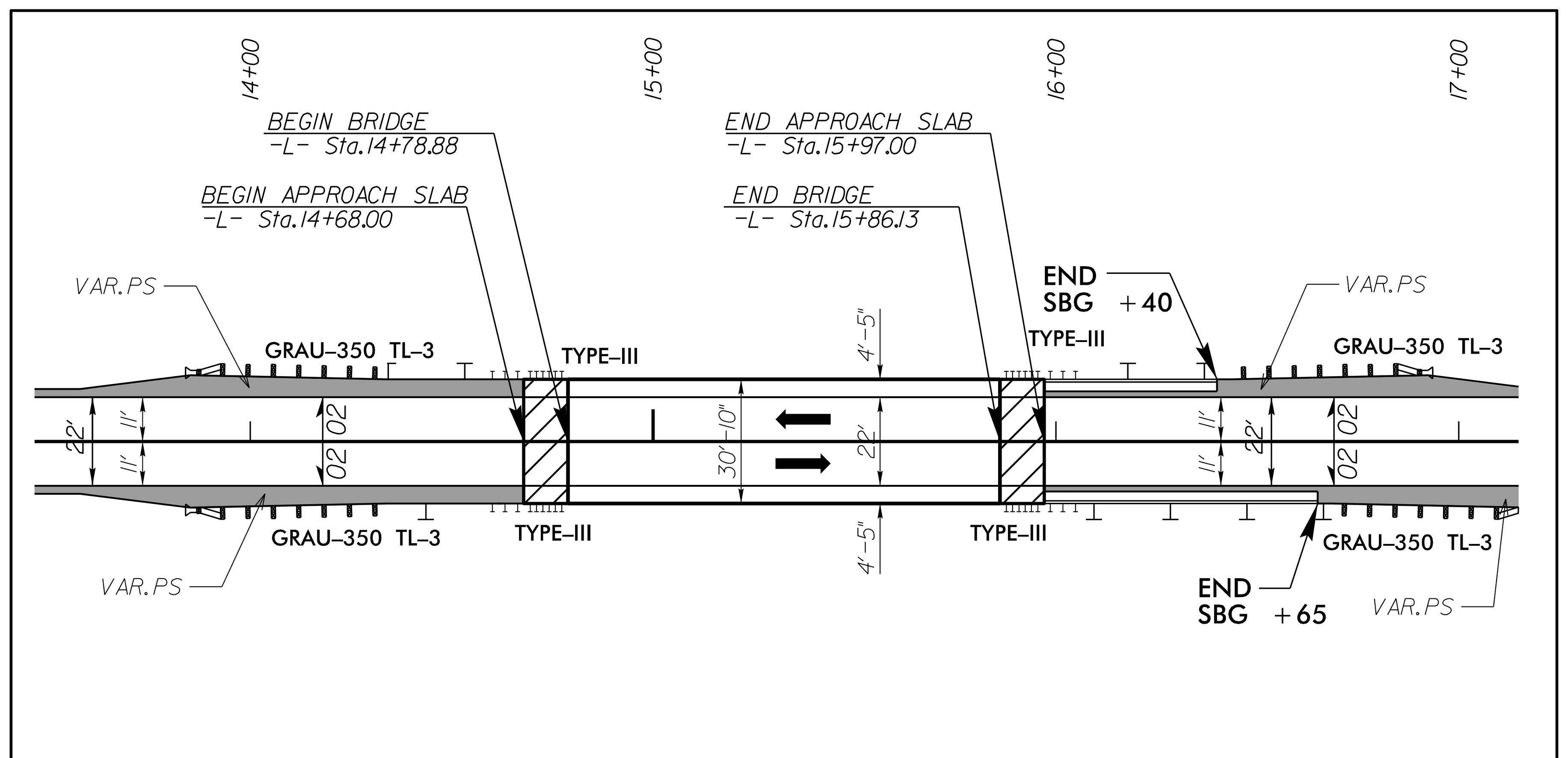
b= 2.0 Ft.

Type of Liner= CLASS II RIP RAP

FROM STA. 12+50 TO STA. 14+00 -L- RT
FROM STA. 12+50 TO STA. 14+00 -L- LT
FROM STA. 16+50 TO STA. 17+20 -L- RT
FROM STA. 16+50 TO STA. 17+20 -L- LT



NAD 83
NSRS 2007
10+00
15+00
20+00
POT Sta. 10+00.00
POT Sta. 20+36.56
BEGIN TIP PROJECT B-4830
-L- POT STA.12+30.00
END TIP PROJECT B-4830
-L- POT STA.17+85.00
LINDA B. ALLEN
DB 1464 PG 0-E-
JOHN D. MUTER
DB 11780 PG 1651
WAKE FOREST FORESTRY, LLC
DB 914 PG 382
TIDEWATER INVESTORS X, LLC
DB 919 PG 382
TIMOTHY JOE HUFFMAN
DB 1011 PG 379
CENTERLINE OF CREEK IS COUNTY LINE
FRANKLIN COUNTY
WAKE COUNTY
N 79° 32' 22.1" E
BL-1
BL-2
BL-3
BM #1
BM #2
BM #3
TOE PROTECTION
SEE DETAIL 1
EST 300 TONS
EST 320 SY GEOTEXTILE
ROCK PLATE
FILL SLOPE TO SP
FROM -L- STA. 14+00 TO
STA. 14+64.88 RT & LT
SEE SHEET 2G-1, DETAIL 2
ROCK PLATE
FILL SLOPE TO SP
FROM -L- STA. 16+00.13
TO STA. 16+50 RT & LT
SEE SHEET 2G-1, DETAIL 2
15" RCP-IV
CLASS B RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
15" W/ELBOWS
TOE PROTECTION
SEE DETAIL 1
EXTEND 2.0' BEYOND EXISTING TOE OF FILL
EST 150 TONS
EST 160 SY GEOTEXTILE
TOE PROTECTION
SEE DETAIL 1
EST 315 TONS
EST 340 SY GEOTEXTILE
TOE PROTECTION
SEE DETAIL 1
EST 125 TONS
EST 135 SY GEOTEXTILE
-L- +30 50' LT.& EXIST.R/W
-L- +30 50' RT.& EXIST.R/W
-L- +50 60' & 50' LT.
-L- +50 60' & 50' RT.
-L- +75 60' & 50' LT.
-L- +75 60' & 50' RT.
-L- +00 60' & 50' LT.
-L- +00 60' & 50' RT.
-L- +25 60' & 50' LT.
-L- +35 60' & 50' RT.
-L- +85 50' LT.& EXIST.R/W
-L- +85 50' RT.& EXIST.R/W
20' INC.=30' (TYP)
INC.=30' 20' (TYP)
50' TAPER LT.& RT.
2' FDPS
EXISTING R/W
TB 2GI
MCI Communications Services Inc., FO
USGS 145 ORD BENCH MARK DISK IN TOP OF WINGWALL STAMPED ELV= 226.00' MEASURED ELV= 225.38'
S 36°16'38" E 10.74'
S 79°40'21" W 149.89'
WOODS
TO NC 39
TO SR 1166 (BRANTLEY RD)



PAVEMENT-BRIDGE RELATIONSHIP SKETCH
(NOT TO SCALE)

END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PAY ITEM)

FOR -L- PROFILE,SEE SHEET 5

PROPOSED PAVED SHOULDER

FOR STRUCTURE PLANS,SEE SHEETS S-1 THRU S-16

2/8/2017
B4830_RDY_PSH_04.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4830	5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG
DocuSigned by: Andrew P. Young 2/8/2017
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HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
DocuSigned by: Frank Fleming 2/8/2017
B1DD721AA9FA4A6...

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ECOLOGICAL ENGINEERING
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(919) 557-0929

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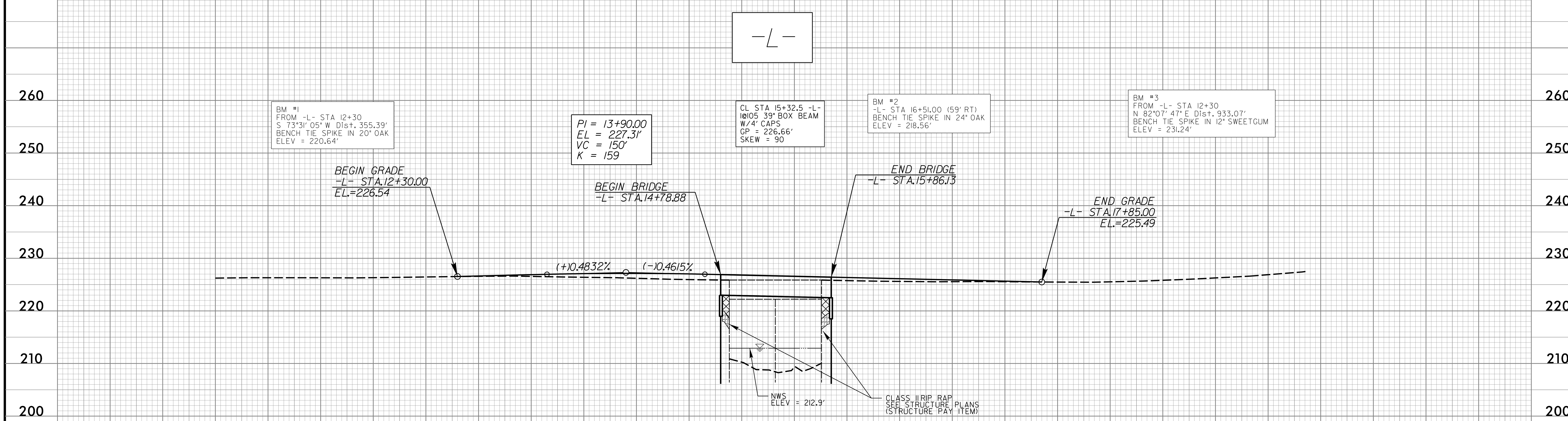

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	5560	CFS
DESIGN FREQUENCY	=	50	YR
DESIGN HW ELEVATION	=	221.0	FT
BASE DISCHARGE	=	7230	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	222.59	FT
OVERTOPPING DISCHARGE	=	10224	CFS
OVERTOPPING FREQUENCY	=	500-	YR
OVERTOPPING ELEVATION	=	225.5	FT
ESTIMATED NORMAL WATER SURFACE ELEV.	=	212.9	FT
DATE OF SURVEY	=	12/09/2014	
W.S.ELEVATION AT DATE OF SURVEY	=	212.9	FT

END BENT EXCAVATION
SEE STRUCTURE PLANS
(STRUCTURE PAY ITEM)

FOR -L- PLAN VIEW,SEE SHEET 4

FOR STRUCTURE PLANS,SEE SHEETS S-1 THRU S-16

5/28/99

2/8/2017
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