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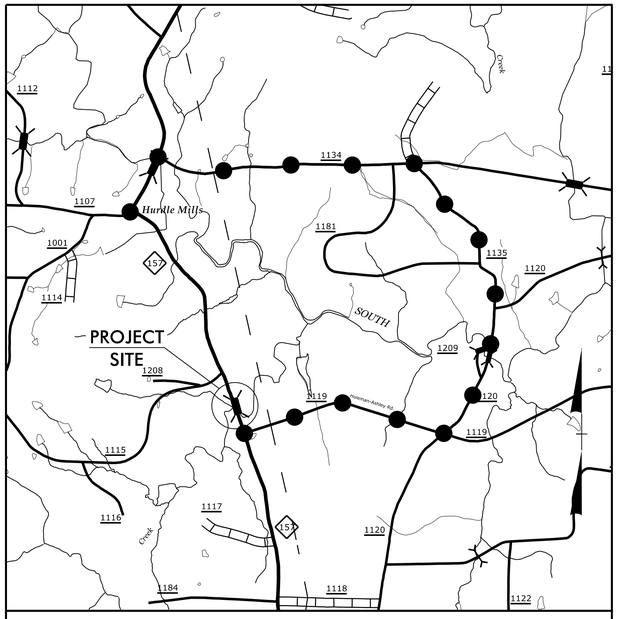
09/08/99

PROJECT: 41665.3E

CONTRACT:



VICINITY MAP FOR 41665.3E

OFFSITE DETOUR ROUTE

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41665.3E	1	

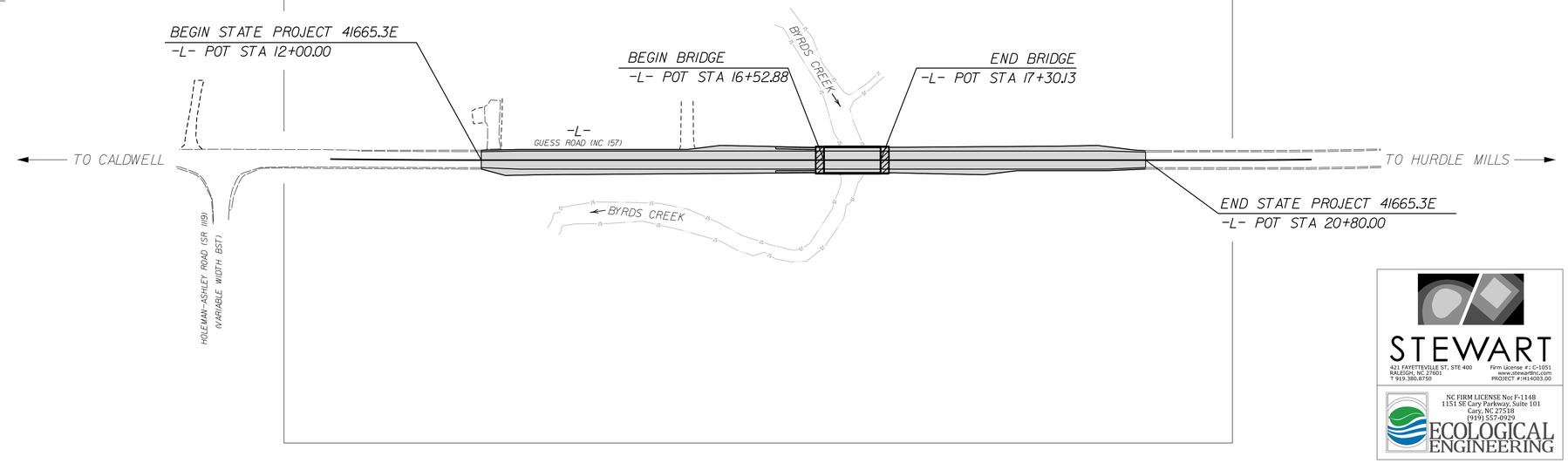
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41665.3E	N/A	PE
41665.3E	N/A	ROW & UTILITY
41665.3E	N/A	CONSTRUCTION

LOCATION: ***BRIDGE NO. 14 OVER BYRDS CREEK ON NC 157 (GUESS ROAD)***

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

4

NAD 83/ NA 2011



STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:H14003.00

NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 557-0929
ECOLOGICAL ENGINEERING

DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K AND VERTICAL SSD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT = 1600
V = 55 MPH
CLASS = MAJOR COLLECTOR

REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 41665.3E	=	0.152 mi.
LENGTH STRUCTURES STATE PROJECT 41665.3E	=	0.015 mi.
TOTAL LENGTH STATE PROJECT 41665.3E	=	0.167 mi.

Prepared in the Office of:
STEWART
For
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 7, 2015

RIGHT OF WAY COMPLETE: DECEMBER 7, 2015

LETTING DATE: MARCH 23, 2016

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, EI
PROJECT DESIGN ENGINEER

LISA GILCHRIST, EI
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by: Frank F Fleming 2/10/2016
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING

ROADWAY DESIGN ENGINEER

DocuSigned by: Andrew P. Young 2/9/2016
SIGNATURE: *P.E.*

NORTH CAROLINA PROFESSIONAL SEAL 34407 ENGINEER ANDREW P. YOUNG

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/9/2016
I:\Proj\T20014_RDY_PSH01.dgn
USER:ayoung

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34407 ENGINEER ANDREW P. YOUNG

DocuSigned by: Andrew P. Young 2/9/2016

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STEWART
Firm License No. C-1051
421 Fayetteville St, Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

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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. 10-30-2012

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
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
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
840.29	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
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
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 OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

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 SURVEYOR 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

DUKE ENERGY PROGRESS - POWER

CENTURYLINK - TELEPHONE/FIBEROPTICS

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.

2/9/2016 ...\Proj\72014_RDY_PSH01A.dgn

02/03/15

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	1-B

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
- Existing Historic Property Boundary — HPB
- 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

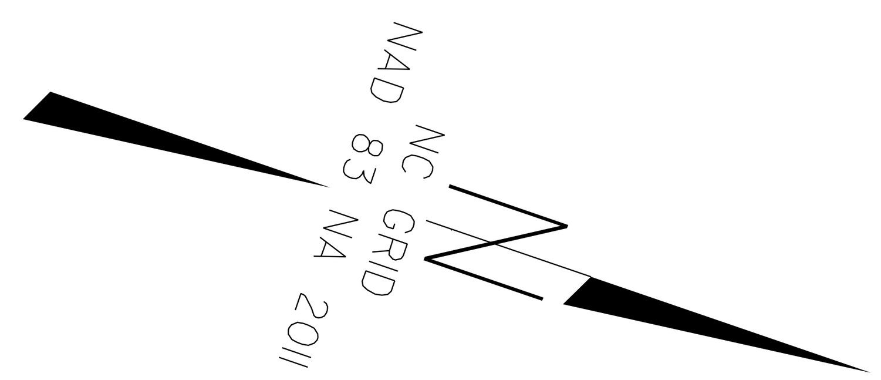
SANITARY SEWER:

- 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 B–0014–72

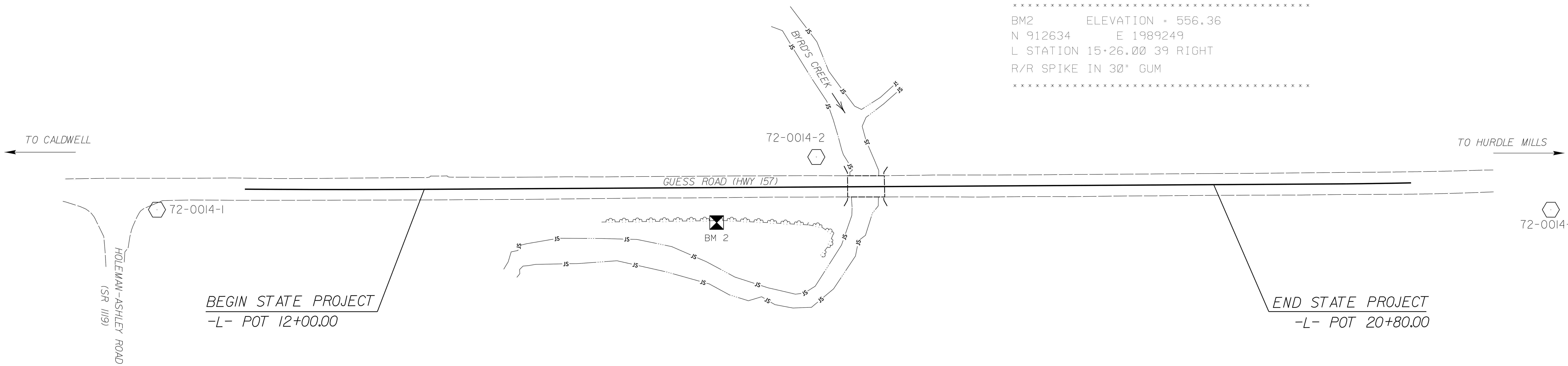


BASE LINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	72-0014-1	912039.3240	1989437.4750	590.48′	OUTSIDE PROJECT LIMITS	
2	72-0014-2	912736.0200	1989150.7650	559.84′	16+54.19	20.20 LT
3	72-0014-3	913794.3510	1988787.0820	598.24′	OUTSIDE PROJECT LIMITS	

BENCH MARK DATA

BM2 ELEVATION = 556.36
N 912634 E 1989249
L STATION 15+26.00 39 RIGHT
R/R SPIKE IN 30" GUM



L

TYPE	STATION	NORTH	EAST
PC	10+00.00	912124.5750	1989384.0967
PT	11+99.01	912312.9067	1989319.7855
PC	22+27.56	913284.0421	1988980.9537
PT	23+00.00	913352.2083	1988956.4373

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+00.00	45.00	912328.6648	1989361.9478
L	12+00.00	30.00	912323.7233	1989347.7851
L	12+60.00	45.00	912385.3156	1989342.1822
L	13+00.00	60.00	912428.0243	1989343.1678
L	13+91.00	45.00	912509.0033	1989299.0272
L	21+00.00	45.00	913178.4276	1989065.4633
L	21+00.00	30.00	913173.4862	1989051.3006
L	21+00.00	-30.00	913153.7206	1988994.6497
L	21+00.00	-45.00	913148.7792	1988980.4870
L	12+00.00	-45.00	912299.0163	1989276.9715
L	12+00.00	-30.00	912303.9577	1989291.1342

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "72-0014-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 912736.020(ft) EASTING: 1989150.765(ft)
ELEVATION: 559.84(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00000379
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "72-0014-2" TO -L- STATION 12+00.00 IS
S 21°46′50″ E 454.64
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GEOID G12NC

NOTE: DRAWING NOT TO SCALE

NOTES:

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.

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034407 ANDREW P. YOUNG
DocuSigned by: Andrew P. Young 2/9/2016

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON
DocuSigned by: Clark Morrison 2/10/2016

STEWART

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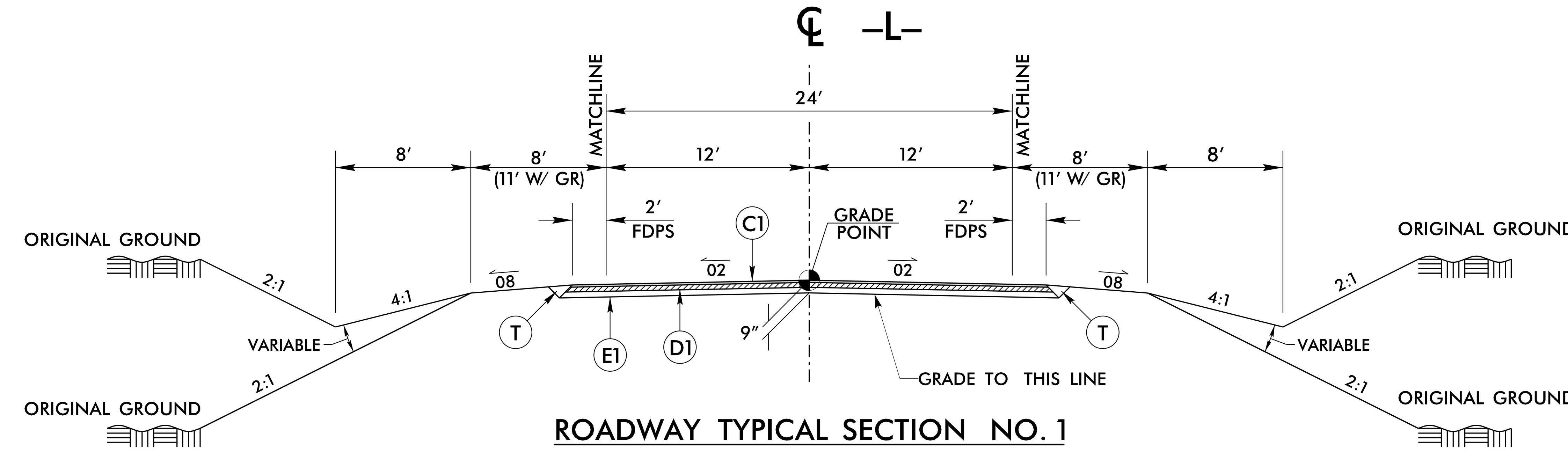
PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

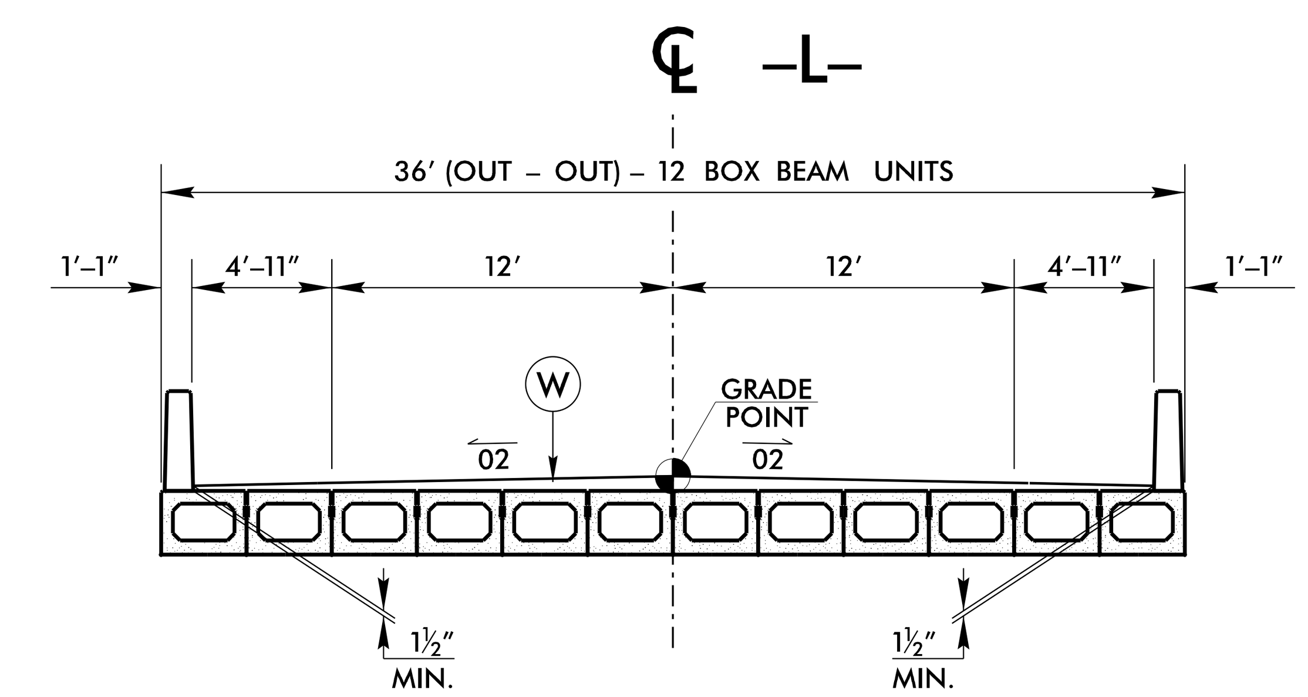
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3½" 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.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
W	WEDGING (SEE THIS SHEET FOR WEDGING DETAIL)

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



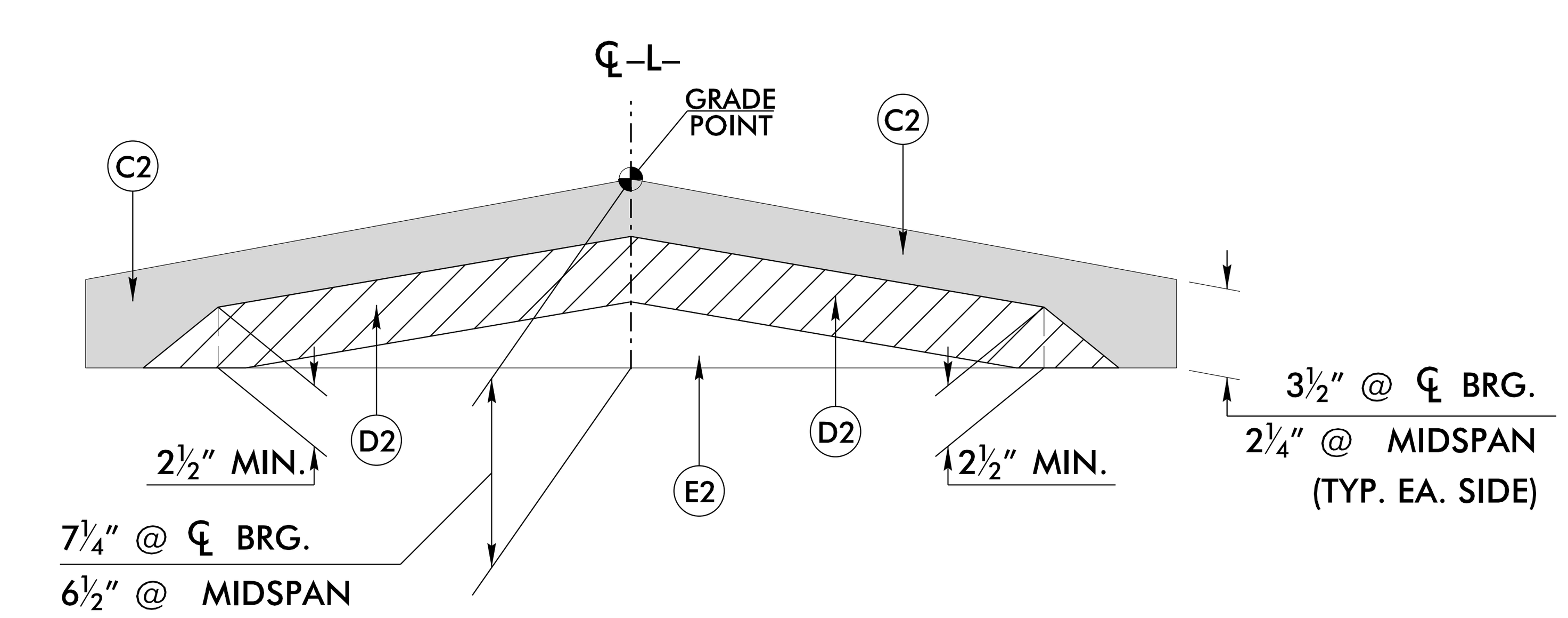
ROADWAY TYPICAL SECTION NO. 1

-L- STA. 12+00.00 TO -L- STA. 16+52.88 (BEGIN BRIDGE)
-L- STA. 17+30.13 (END BRIDGE) TO -L- STA. 20+80.00



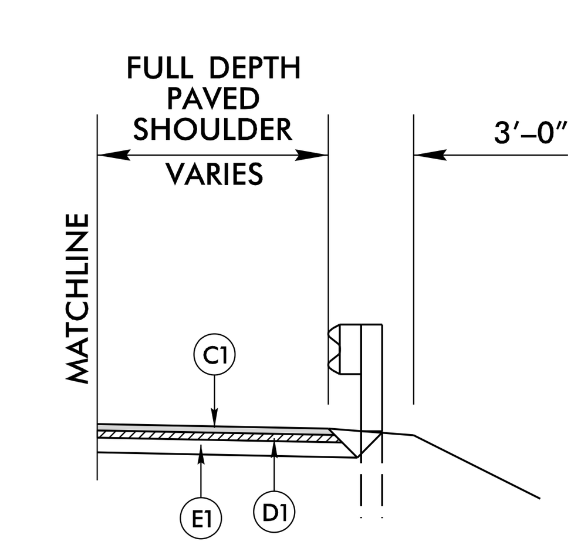
BRIDGE TYPICAL SECTION

-L- STA. 16+52.88 TO -L- STA. 17+30.13
NOTE: SEE STRUCTURE PLANS FOR ASPHALT WEARING SURFACE

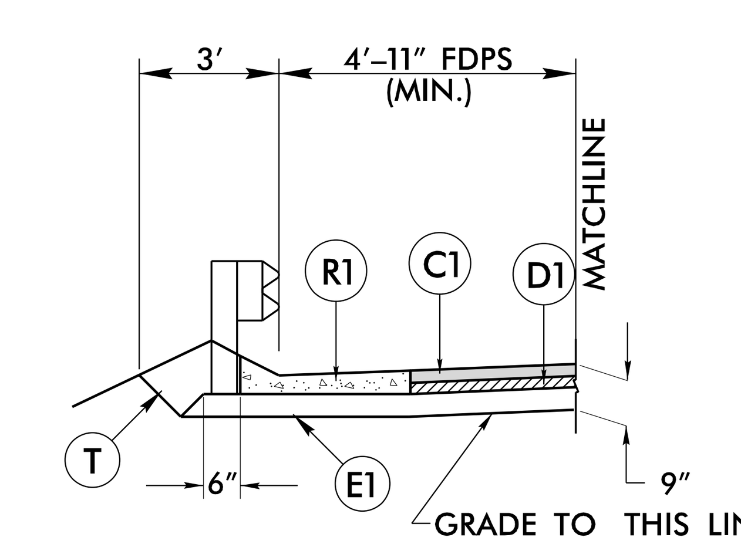


DETAIL SHOWING METHOD OF WEDGING ON BRIDGE

USE IN CONJUNCTION WITH BRIDGE TYPICAL SECTION



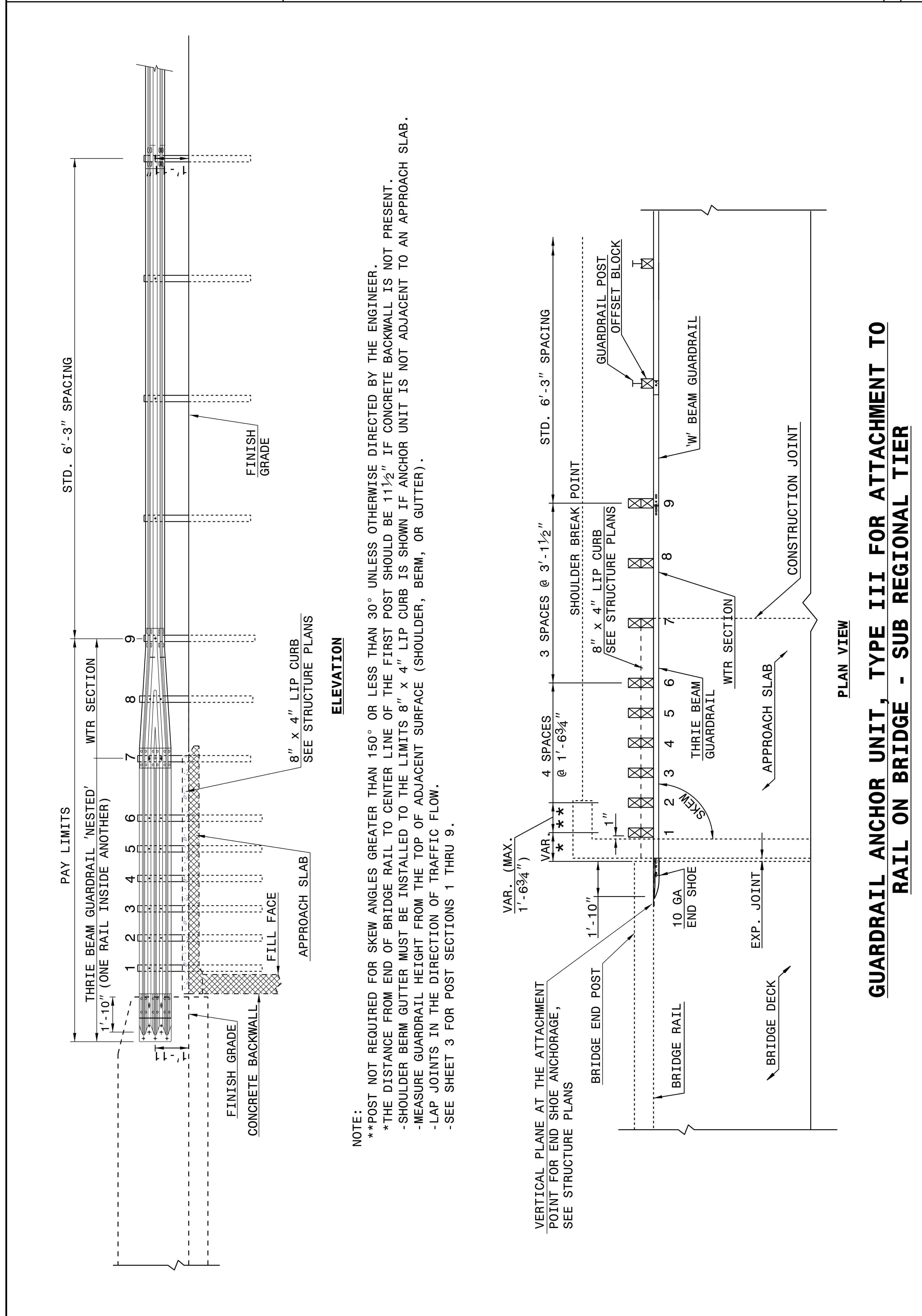
DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

-L- STA. 14+65.00 TO -L- STA. 14+77.00 (RT)
-L- STA. 14+55.00 TO -L- STA. 14+68.00 (LT)

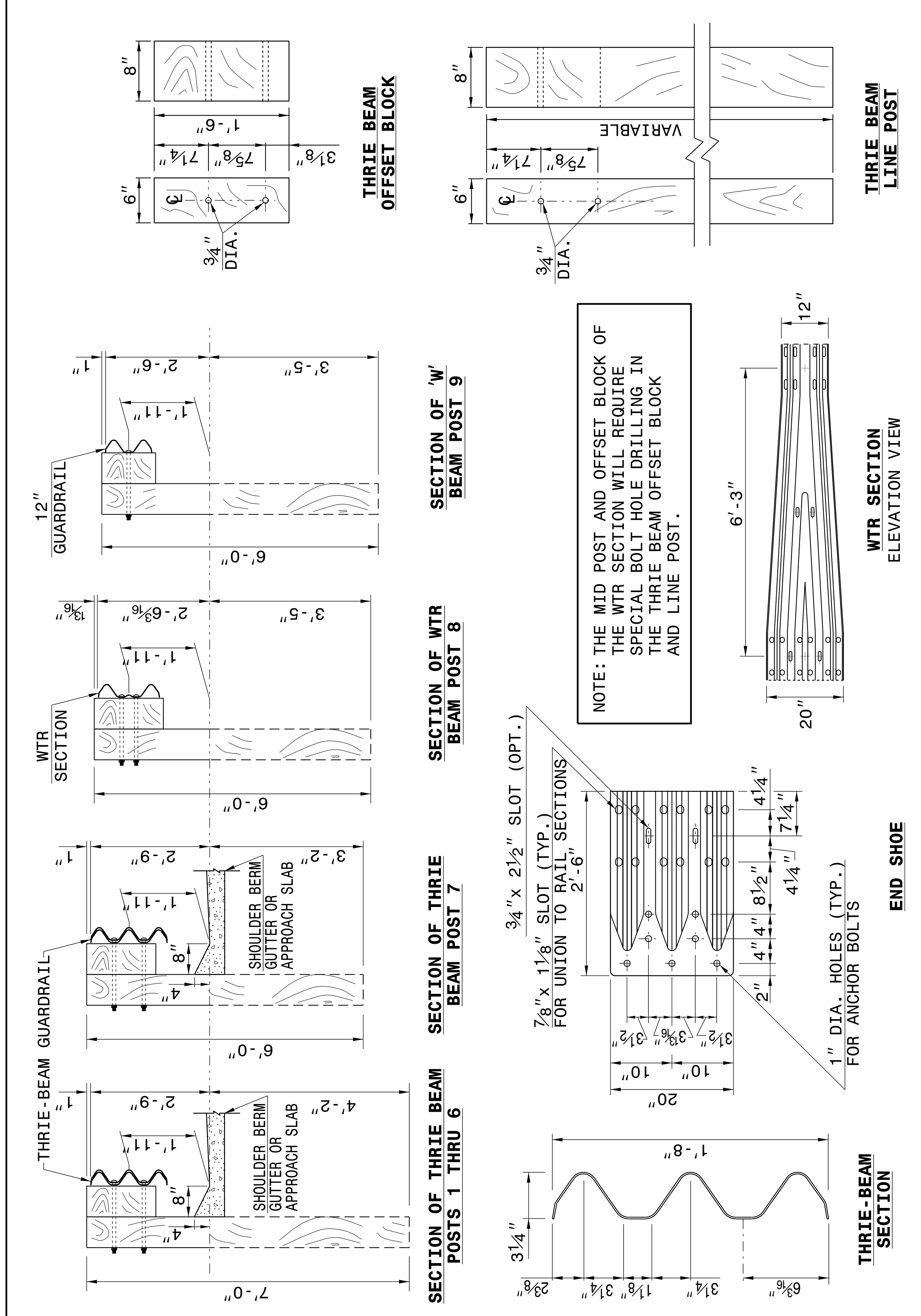
PROJECT REFERENCE NO.	SHEET NO.
41665.3E	2C-1


GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER
ELEVATION
PLAN VIEW
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 3 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


THRIE BEAM OFFSET BLOCK
THRIE BEAM LINE POST
SECTION OF 'W' BEAM POST 9
SECTION OF WTR BEAM POST 8
SECTION OF THRIE BEAM POST 7
SECTION OF THRIE BEAM POSTS 1 THRU 6
WTR SECTION ELEVATION VIEW
END SHOE
THRIE-BEAM SECTION
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 SEAL 022966 ENGINEER Joel S. Howerton
DocuSigned by: Joel Howerton
2/10/2016

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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.:

PROJECT REFERENCE NO.	SHEET NO.
SF-720014	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 2/9/2016
F760CAEB96FC4D3... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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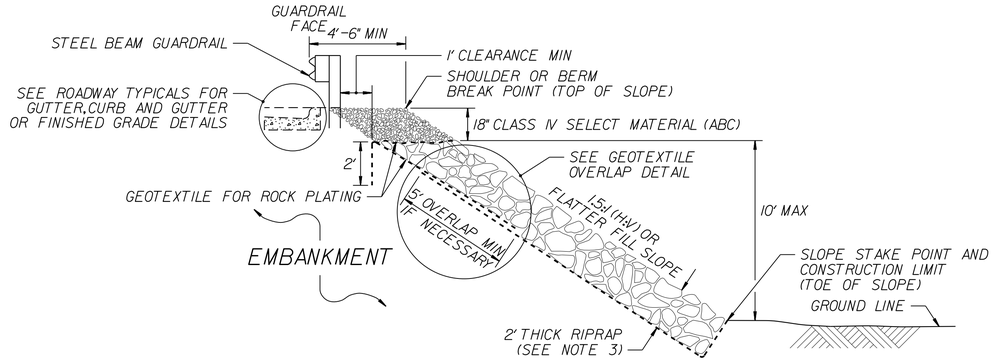
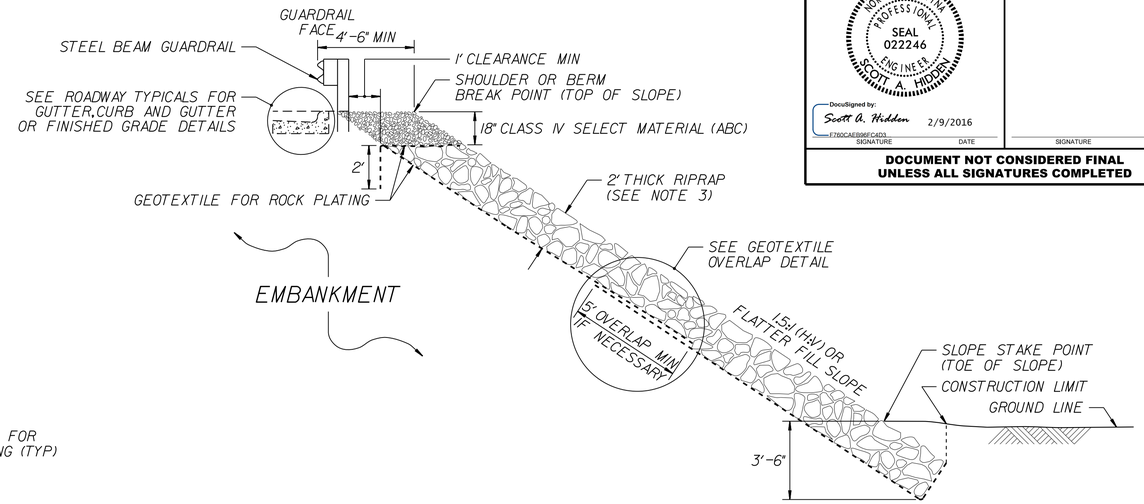


ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



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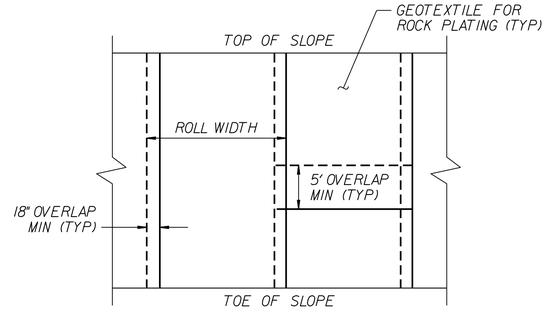
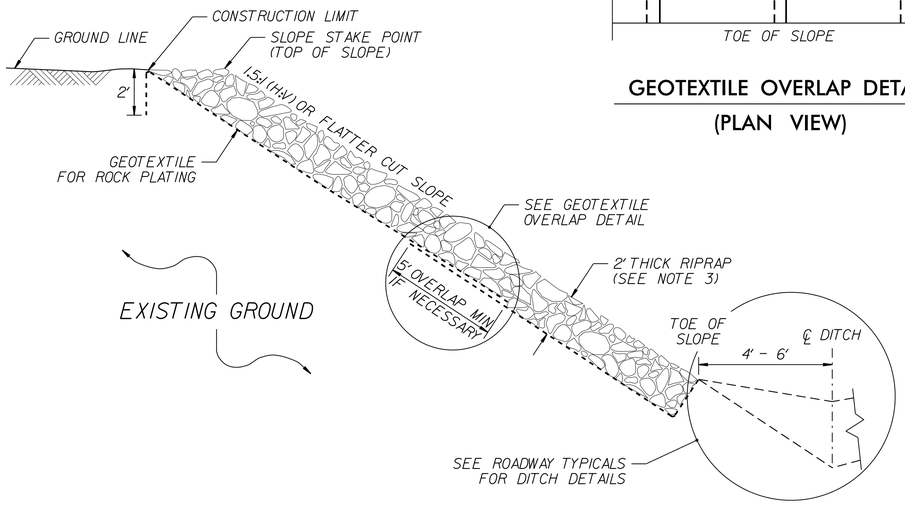
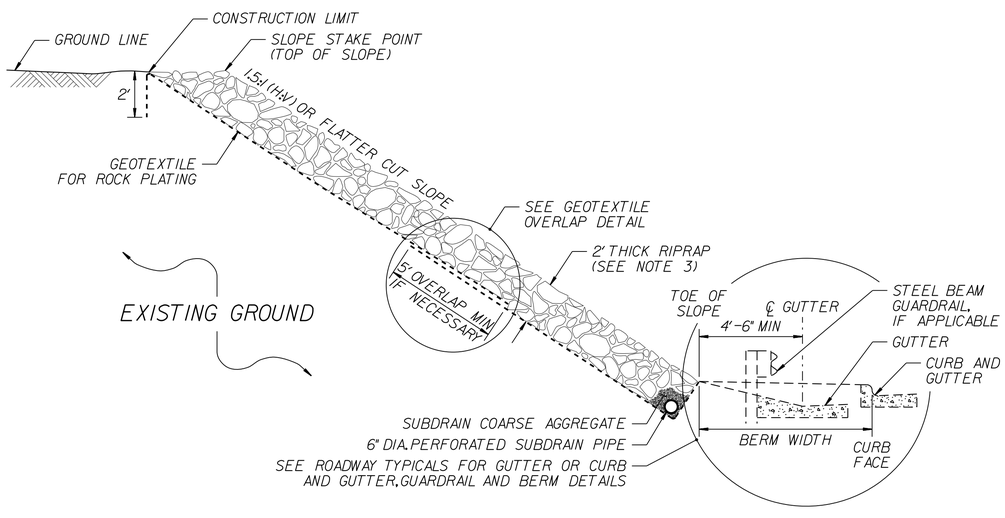


GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



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.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD ROCK PLATING

DATE: 2-19-13

REVISIONS

8/17/99

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
12+00.00	16+52.88 Beg. Bridge)	368	611	243	
17+30.13 (End Bridge)	20+80.00	357	146		211
Project Total:		725	757	243	211
Waste in Lieu of Borrow				-211	
Project Total:		725	757	32	
5% for Borrow Pit				2	
GRAND TOTALS:		725		34	
SAY:		**750**		**40**	

Contingency Undercut = 200 CY
Select Granular Material, Class III = 200 CY
Geotextile for Soil Stabilization = 200 SY

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL
-L-	12+00.00	16+71.50	CL	1279
-L-	17+12.95	20+80.00	CL	995
		TOTAL:		2274
		SAY:		2275

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LENGTH
-L- (Left)	15+90.00	16+41.88	51.88
-L- (Right)	15+90.00	16+41.88	51.88
		TOTAL:	103.76
		SAY:	105

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"

"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

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END
-L-	12+27.88	16+52.88	RT	425			16+54		4'-11"	7'-11"	406.25		3'-1"	
-L-	15+15.38	16+52.88	LT	137.5				16+54	4'-11"	7'-11"		87.5		2'-6"
-L-	17+30.13	18+67.63	RT	137.5				17+29	4'-11"	7'-11"		87.5		2'-6"
-L-	17+30.13	20+17.63	LT	287.5			17+29		4'-11"	7'-11"	237.5		2'-5"	
		SUBTOTALS		987.5										
	DEDUCITONS FOR ANCHOR UNITS													
		GRAU-350 TL-3	4 @ 50'	-200										
		TYPE III	4 @ 18.75'	-75										
		PROJECT TOTALS		712.5										
	ADDITIONAL GUARDRAIL POSTS = 5 EA													

SURVEY LINE	BEG. STA.	ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
		XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	TYPE III	G	NG				
-L-	12+27.88			1						1						
-L-	15+15.38			1						1						
-L-	17+30.13			1						1						
-L-	17+30.13			1						1						
SUBTOTALS				4						4						

2/9/2016 ...\Proj\720014_RDY_SUM_03B-1.dgn

REVISIONS

8/17/99

COMPUTED BY:	RBR	DATE:	8/26/2015
CHECKED BY:	ECOLOGICAL ENGINEERING LLP	DATE:	8/26/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	3D-1

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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	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
15+95 -L-	LT	0401		560.51	557.76														
		0401	OUT1		557.76	557.63			16									X	X
15+95 -L-	RT	0402		560.52	557.36														
		0402	OUT2		557.36	555.96			16							X		X	X
14+73 -L-	LT	0403																	
SHEET TOTALS									32										

SIZE / THICKNESS OR GAUGE:

STATION	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"
15+95 -L- (0401)																								
0401 OUT1																								
15+95 -L- (0402)																								
0402 OUT2																								
14+73 -L- (0403)																								
SHEET TOTALS																								

STATION	** " 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
15+95 -L- (0401)								1						
0401 OUT1														
15+95 -L- (0402)								1						
0402 OUT2														
14+73 -L- (0403)				24										
SHEET TOTALS				24				2						

STATION	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	15" DRAINAGE PIPE ELBOW		SIDE DRAIN 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
15+95 -L- (0401)													1	1							
0401 OUT1																					
15+95 -L- (0402)													1	1							
0402 OUT2															2						
14+73 -L- (0403)																					
SHEET TOTALS													2	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.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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COMPUTED BY: _MSB_____________ DATE: 8-19-2015__
CHECKED BY: ______________ DATE: _________

(4-21-15)

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	3G-1

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

REVISIONS

SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No.	Riprap Class	SY
-L-	1.5:1 (H:V)	12+00	2:1 (H:V)	14+50	RT	2	II	450
							TOTAL SY:	450

*Use Class I, II or B riprap if riprap class is not shown for rock plating location.

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
41665.3E	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 34407 ANDREW P. YOUNG — Andrew P. Young 2/9/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20147 FRANK F. FLEMING — Frank F. Fleming 2/10/2016

STEWART — Firm License No. C-1051, 421 Fayetteville St., Suite 400, Raleigh, NC 27601, T 919.380.8750, www.stewartinc.com

ECOLOGICAL ENGINEERING — NC FIRM LICENSE No. F-1146, 1151 SE Cary Parkway, Suite 101, Cary, NC 27518, (919) 557-0929

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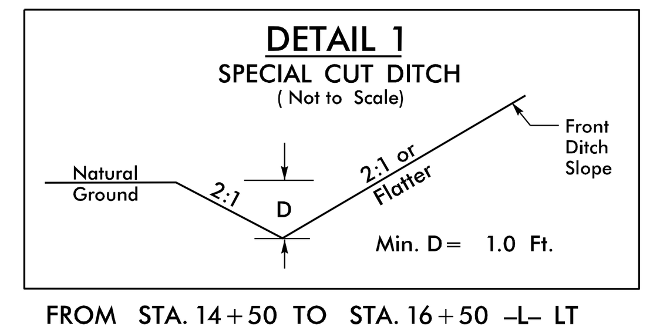
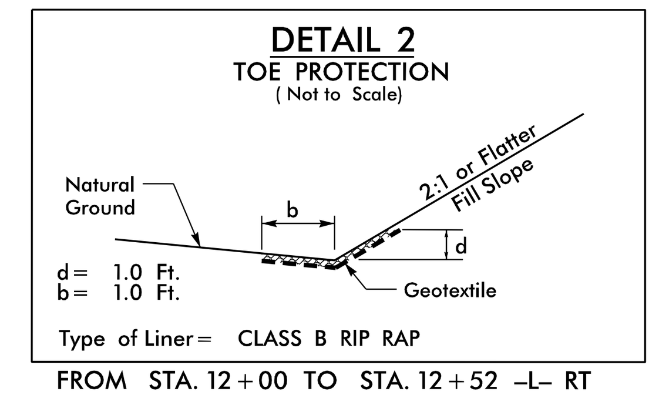
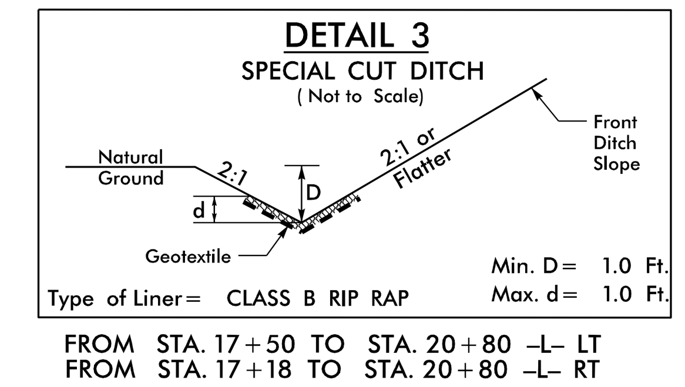
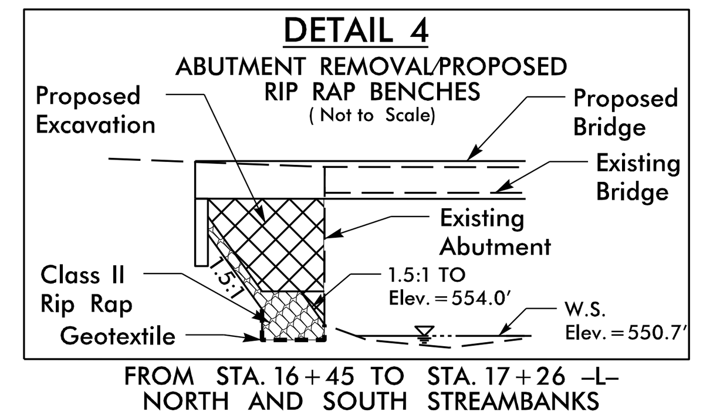
-L- CURVE DATA

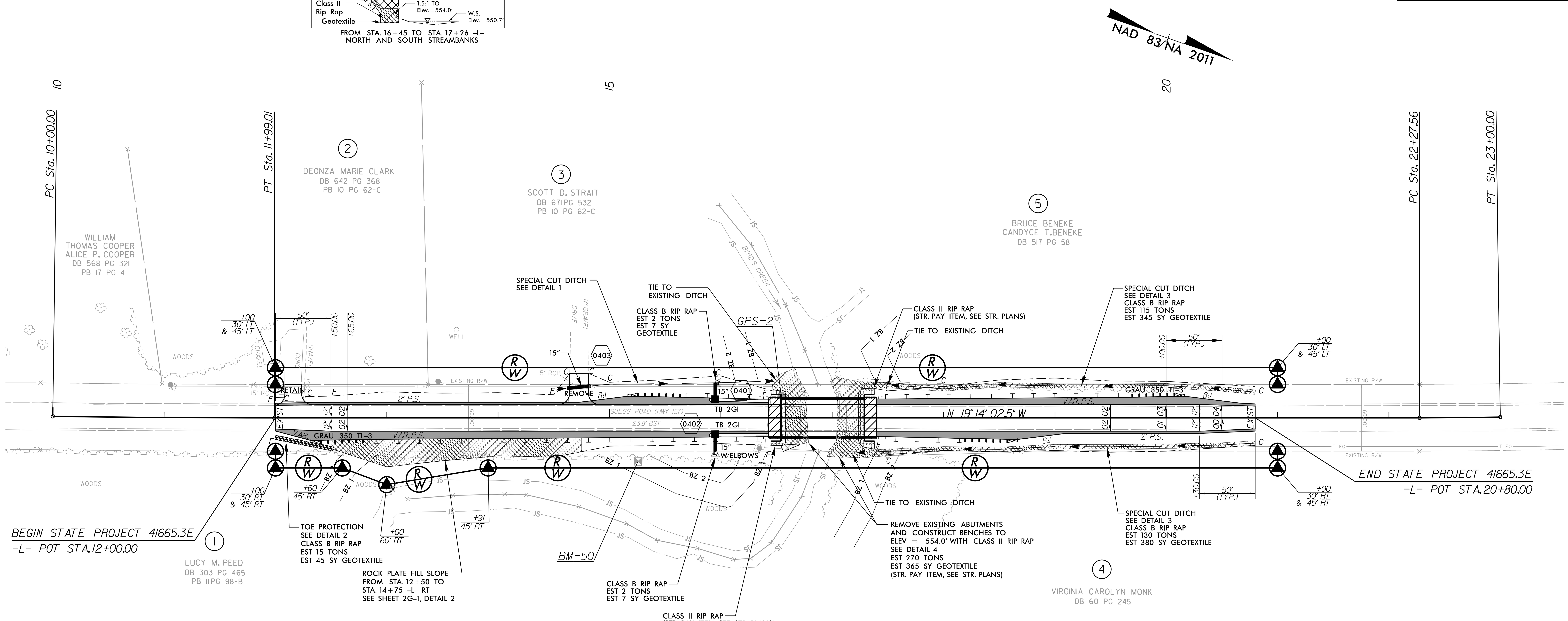
PI Sta 10+99.51	PI Sta 22+63.78
Δ = 0° 45' 36.6" (LT)	Δ = 0° 27' 40.2" (LT)
D = 0° 22' 55.1"	D = 0° 38' 11.8"
L = 199.01'	L = 72.44'
T = 99.51'	T = 36.22'
R = 15,000.00'	R = 9,000.00'

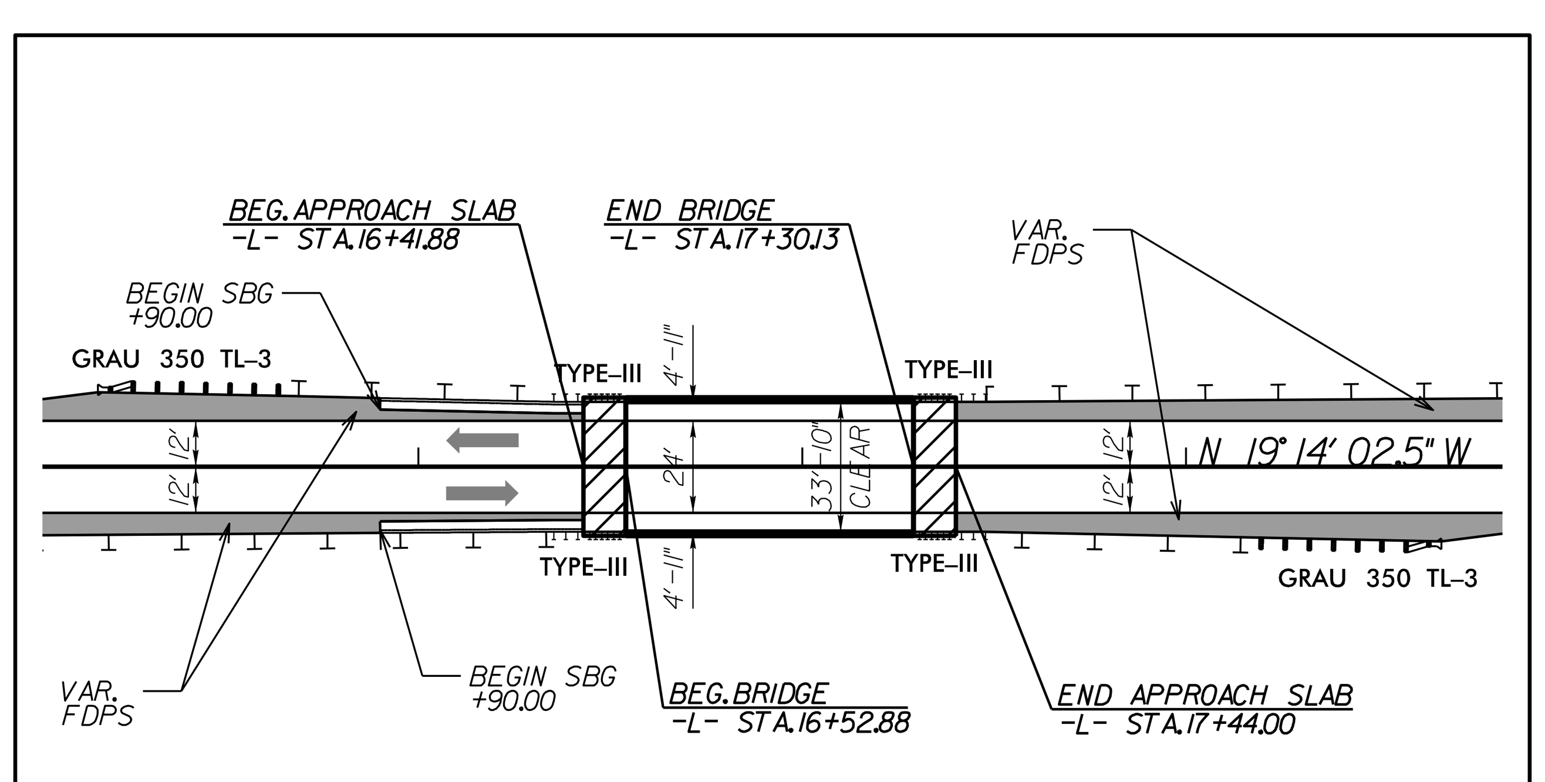












DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP (NTS)

FOR -L- PROFILE SEE SHEET 5

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

REVISIONS

8/17/99

2/9/2016 ...\Proj\720014_RDY_PSH04.dgn

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG	NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
DocuSigned by: Andrew P. Young 2/9/2016 EF21D93DD62F4EF...	DocuSigned by: Frank F Fleming 2/10/2016 B1DD721AA9FA4A6...
STEWART Firm License No. C-1051 421 Fayetteville St, Suite 400 Raleigh, NC 27601 T 919.380.8750 www.stewartinc.com	ECOLOGICAL ENGINEERING NC FIRM LICENSE No: F-1148 1151 SE Cary Parkway, Suite 101 Cary, NC 27518 (919) 557-0929

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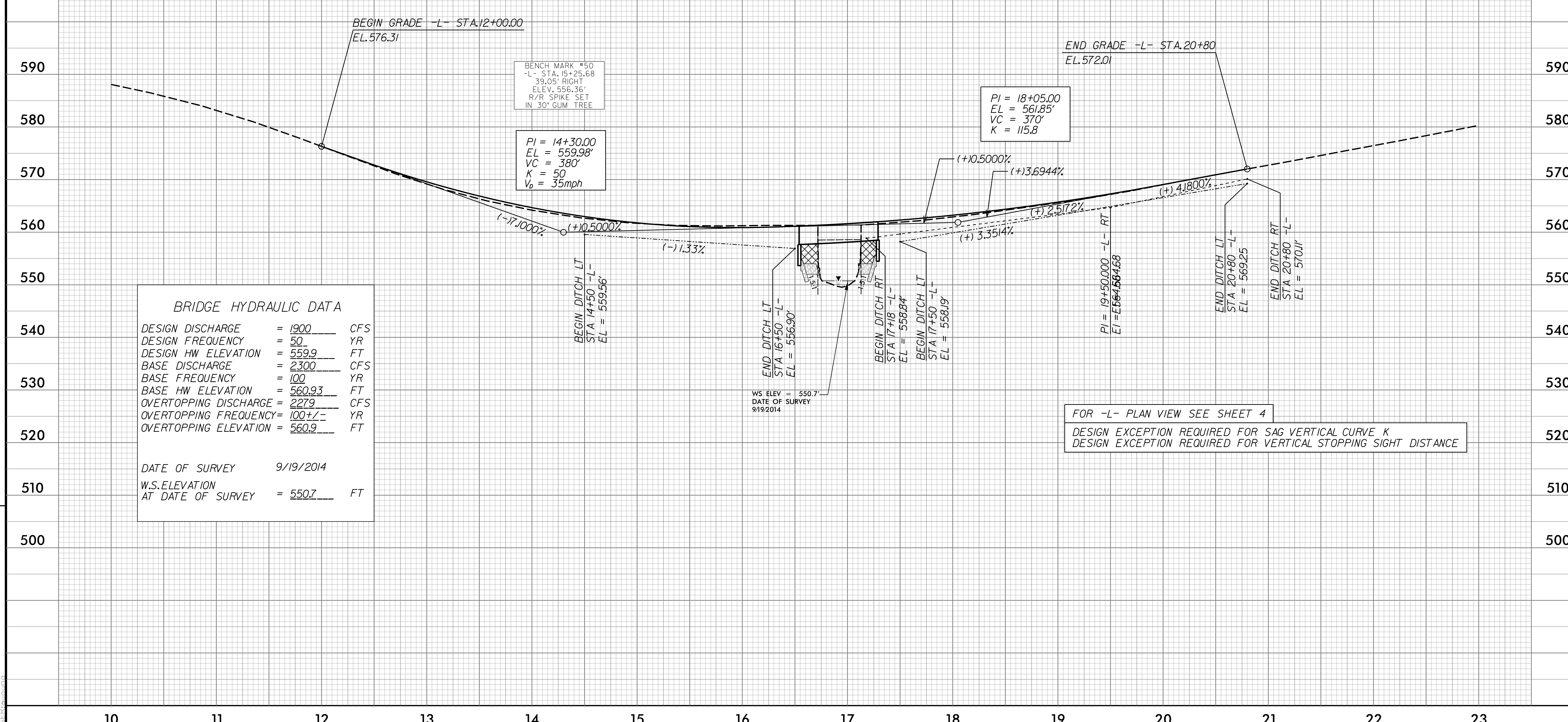
5/28/99



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1900	CFS
DESIGN FREQUENCY	=	50	YR
DESIGN HW ELEVATION	=	559.9	FT
BASE DISCHARGE	=	2300	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	560.93	FT
OVERTOPPING DISCHARGE	=	2279	CFS
OVERTOPPING FREQUENCY	=	100+/-	YR
OVERTOPPING ELEVATION	=	560.9	FT
DATE OF SURVEY		9/19/2014	
W.S.ELEVATION AT DATE OF SURVEY	=	550.7	FT

FOR -L- PLAN VIEW SEE SHEET 4

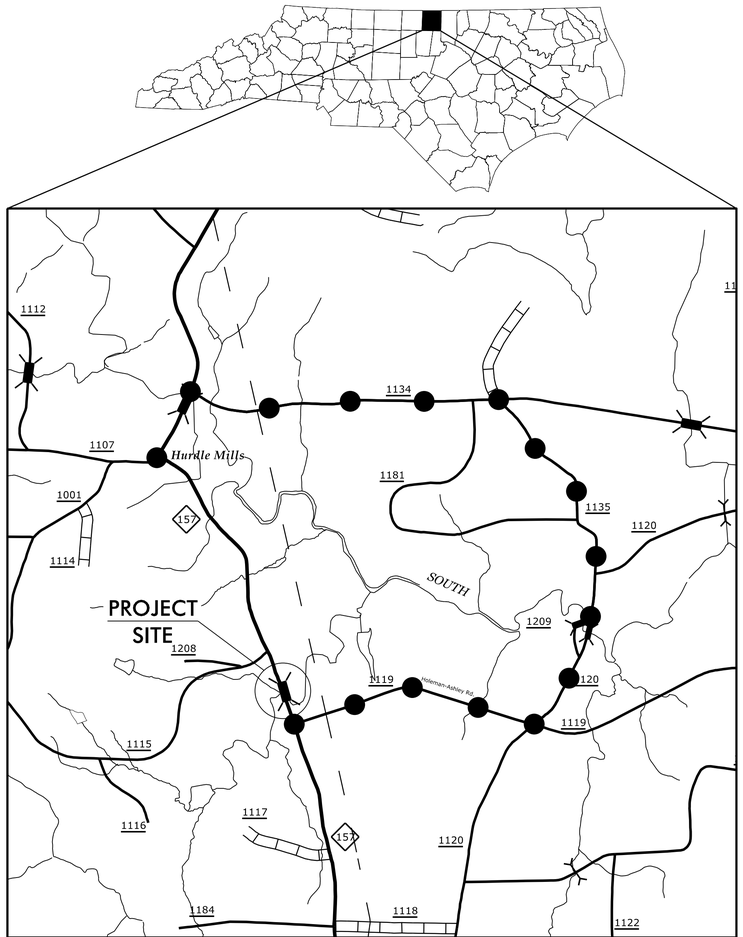
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K
DESIGN EXCEPTION REQUIRED FOR VERTICAL STOPPING SIGHT DISTANCE

2/9/2016 \Proj\720014_RDY_PSH05.dgn USER:ayoung

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

PERSON COUNTY



VICINITY MAP

OFFSITE DETOUR ROUTE

INDEX OF SHEETS

SHEET NO.
TMP-1

41665.3E

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

DAVID RUGGLES, PE — TRAFFIC CONTROL PROJECT ENGINEER

HANAN ASSFOURA, EI — TRAFFIC CONTROL DESIGN ENGINEER

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

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PLANS PREPARED BY:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License # : C-1051
www.stewartinc.com
PROJECT # :B11001

APPROVED: DocuSigned by: David Ruggles 2/18/2016
DATE: 2/18/2016

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

2/18/2016
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USER:hassfoura

PROJ. REFERENCE NO.	SHEET NO.
41665.3E	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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

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

SIGNALS

EXISTING PROPOSED TEMPORARY (TEMP)

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

2/18/2016
...\TCP\T2014_TC_TCP_01A.dgn
USER:nassfourg

STEWART
Firm License No. C-1051
421 Fayetteville St,
Suite 400
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T 919.380.8750
www.stewartinc.com

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APPROVED: David Ruggles DATE: 2/18/2016

SEAL — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

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

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
41665.3E	TMP-1B

MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED STRUCTURE BRIDGE No. 14 OVER BYRD'S CREEK, NC 157 (GUESS ROAD) WILL BE CLOSED TO THROUGH TRAFFIC. LOCAL TRAFFIC ON GUESS ROAD WILL BE MAINTAINED USING AN OFFSITE DETOUR.

ACCESS TO ALL RESIDENCES AND BUSINESSES WITHIN THE PROJECT LIMITS MUST BE MAINTAINED AT ALL TIMES.

NOTIFY THE ENGINEER, PERSON COUNTY EMERGENCY SERVICES, AND PERSON COUNTY SCHOOLS OF BRIDGE REMOVAL THIRTY (30) CALENDAR DAYS PRIOR TO ROAD CLOSURE.

PHASING

STEP 1:

PROVIDE CHANGEABLE MESSAGE SIGN WITH COUNTDOWN FOURTEEN (14) DAYS PRIOR TO CLOSURE OF NC 157 (GUESS ROAD) AT BOTH POINTS OF ROAD CLOSURE.

STEP 2:

USING RSD 1101.03, SHEET 1 OF 9, SHEETS TMP-2 AND TMP-3, INSTALL DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE NC 157 (GUESS ROAD) TO THROUGH TRAFFIC, AND DETOUR TRAFFIC OFFSITE.

STEP 3:

BEFORE BEGINNING WORK, LOCATE LIMITS OF PAVEMENT MARKING SKIP LINES AT NORTH AND SOUTH ENDS OF PROJECT.

STEP 4:

AWAY FROM TRAFFIC, COMPLETE THE FOLLOWING:
(SEE ROADWAY AND STRUCTURE PLANS).

1) REMOVE EXISTING STRUCTURE No. 14 AND CONSTRUCT THE PROPOSED STRUCTURE FROM -L- STA. 16+52.88 TO -L- STA 17+30.13.

2) CONSTRUCT THE PROPOSED ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -L- 12+00.00 TO -L- 16+52.88 AND -L- STA 17+30.13 TO -L- STA 20+80.00.

3) USING THE FINAL PAVEMENT MARKING PLAN, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, FROM -L- STA. 12+00.00 TO -L- STA. 20+80.00 AND TIE TO EXISTING PAVEMENT MARKINGS.

STEP 5:

OPEN ROADWAY TO TRAFFIC AND REMOVE ALL WORK ZONE SIGNAGE.

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

TRAFFIC PATTERN ALTERATIONS

E) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

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

H) 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.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

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

STEWART
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421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: David Ruggles DATE: 2/18/2016

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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

TRANSPORTATION OPERATIONS PLAN

2/18/2016
...\TCP\T20014_TC_TCP_01B.dgn
USER:rhasstoura

PROJ. REFERENCE NO.	SHEET NO.
41665.3E	TMP-2

SIGN NUMBER: GUESS RD
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-0″
HEIGHT: 1′-6″
TOTAL AREA: 4.5 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.38″
WIDTH: 0.63″
RADII: 1.5″

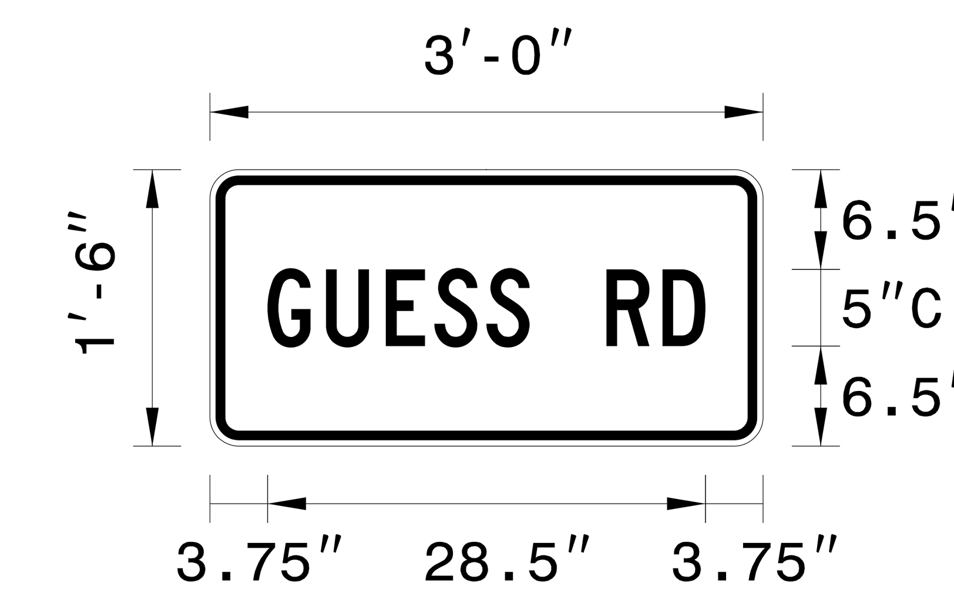
NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT′L: 0.080″ (2.0 mm) ALUMINUM

DESIGN BY: MSB
PROJECT ID: 41665.3E
CHECKED BY: DRR
DIV: 5
DATE: Feb 17, 2015



BORDER
R=1.5″
TH=0.63″
IN=0.38″

Panel Style: Traffic Control.ssi
M.U.T.C.D.: 2009 Edition

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

	G	U	E	S	S		R	D	Series/Size Text Length
									C 2000
	3.8	7.6	11.5	14.6	18	20.8	25.8	29.5	28.5

FILENAME: 720014_TC_TCP_02

NORTH CAROLINA D.O.T. SIGN DETAIL

2/18/2016
...\TCP\720014_TC_TCP_02.dgn
USER:hassfoura

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APPROVED: David Ruggles DATE: 2/18/2016

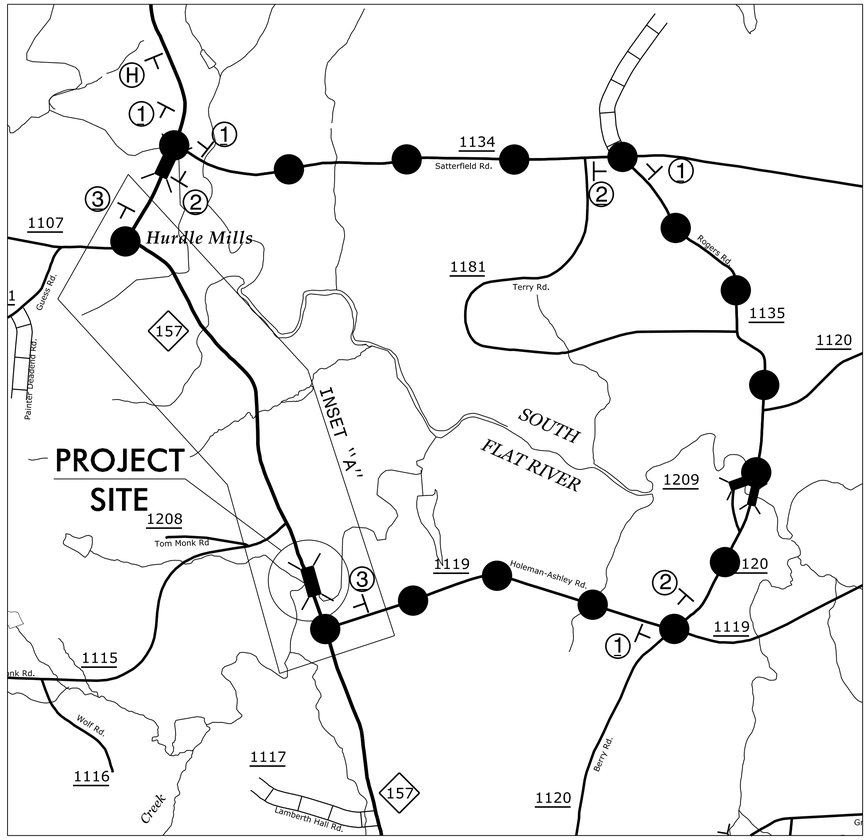
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

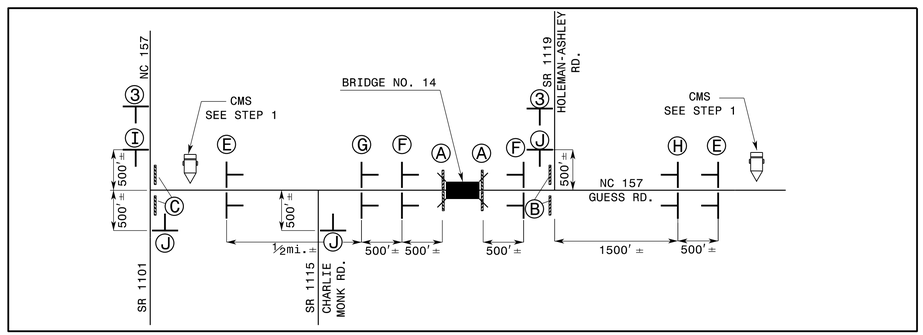
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN

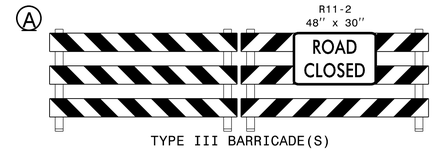
PROJ. REFERENCE NO.	SHEET NO.
41665.3E	TMP-3



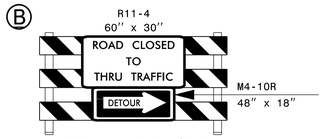
OFFSITE DETOUR SIGNING



INSET "A"

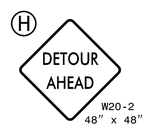


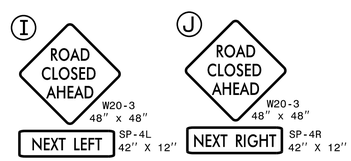
TYPE III BARRICADE(S)

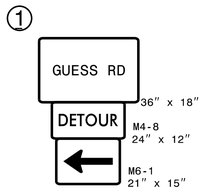


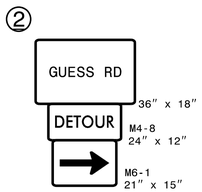
TYPE III BARRICADE

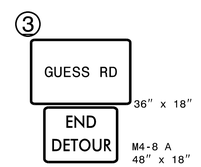
TYPE III BARRICADE











REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: David Ruggles DATE: 2/18/2016

C462768DE412422...

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T 919.380.8750
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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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

OFF-SITE DETOUR

2/18/2016
...\TCP\T200104_TC_TCP_03.dgn
USER:hasstoura

T.I.P.: 41665.3E

CONTRACT:

TIP NO.	SHEET NO.
41665.3E	PMP-1

APPROVED: DocuSigned by: David Ruggles C462768DF412422...

DATE: 2/18/2016

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

PERSON COUNTY

LOCATION: BRIDGE NO. 14 OVER BYRDS CREEK ON NC 157 (GUESS ROAD)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR 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
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
TA	THERMOPLASTIC WHITE EDGELINE (4")
TF	THERMOPLASTIC - 10 FT. YELLOW SKIP (4")
TH	THERMOPLASTIC - YELLOW SINGLE CENTER (4")
TI	THERMOPLASTIC YELLOW DOUBLE CENTER (4")
MA	YELLOW & YELLOW, PERMANENT RAISED PAVEMENT MARKERS

GENERAL NOTES

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.

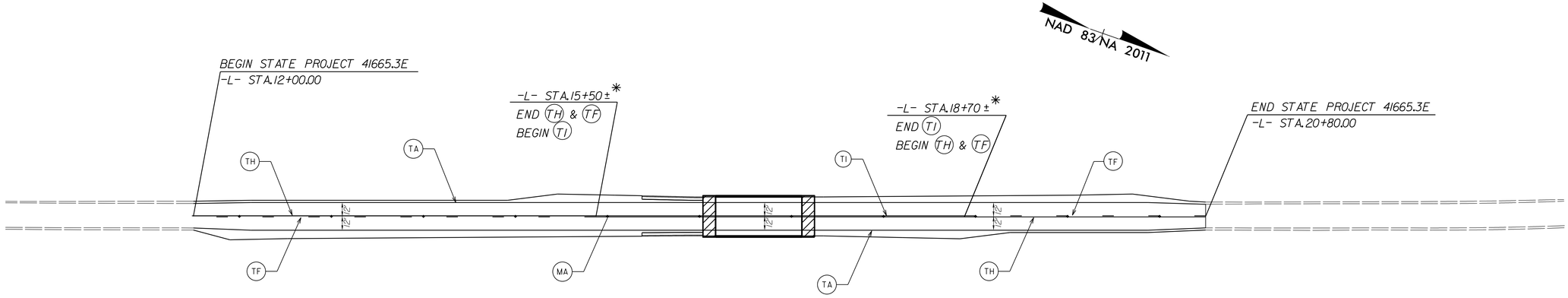
A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
GUESS ROAD	THERMOPLASTIC	SNOWPLOWABLE
BRIDGE	THERMOPLASTIC	SNOWPLOWABLE

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

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

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.



*NOTE: CONTRACTOR TO MATCH EXISTING PAVEMENT MARKING

PLAN PREPARED BY: STEWART

DAVID RUGGLES, PE — PROJECT ENGINEER

HANAN ASSFOURA, EI — PROJECT DESIGN ENGINEER

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2/1/2016
...\TIP\720014_TC_PMP_01.dgn
USER:hassfoura

TIP PROJECT: 41665.3E

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41665.3E	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41665.3E	N/A	PE
41665.3E	N/A	ROW & UTILITY
41665.3E	N/A	CONSTRUCTION

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

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

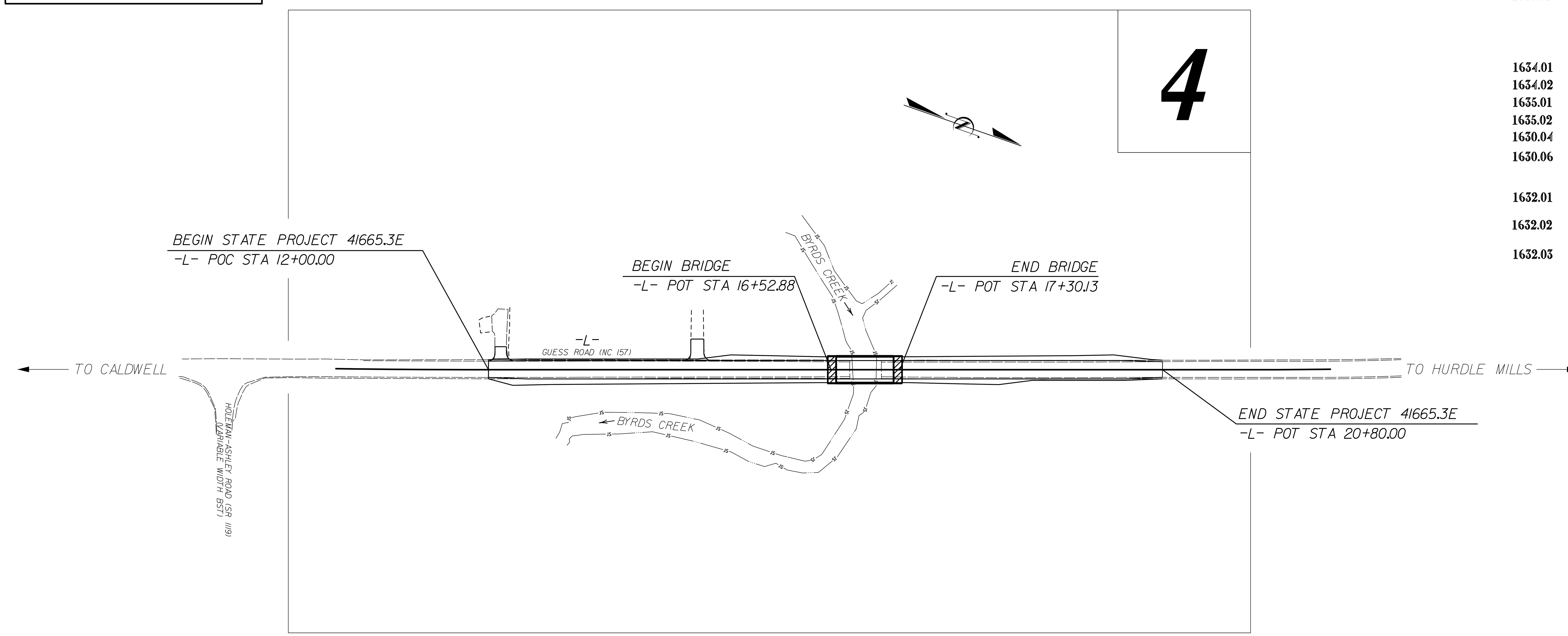
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

PERSON COUNTY

LOCATION: ***BRIDGE NO. 14 OVER BYRDS CREEK ON NC 157 (GUESS ROAD)***

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



CLEARING ON THIS PROJECT SHALL BE TO LIMITS ESTABLISHED USING METHOD III
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K AND VERTICAL SSD

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	EW / 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	

GRAPHIC SCALE

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

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

Prepared In the Office of:

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

2012 STANDARD SPECIFICATIONS

Designed by:

REID ROBOL, EI — *3409*
NAME — *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

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

2012 STANDARD SPECIFICATIONS

Reviewed by:

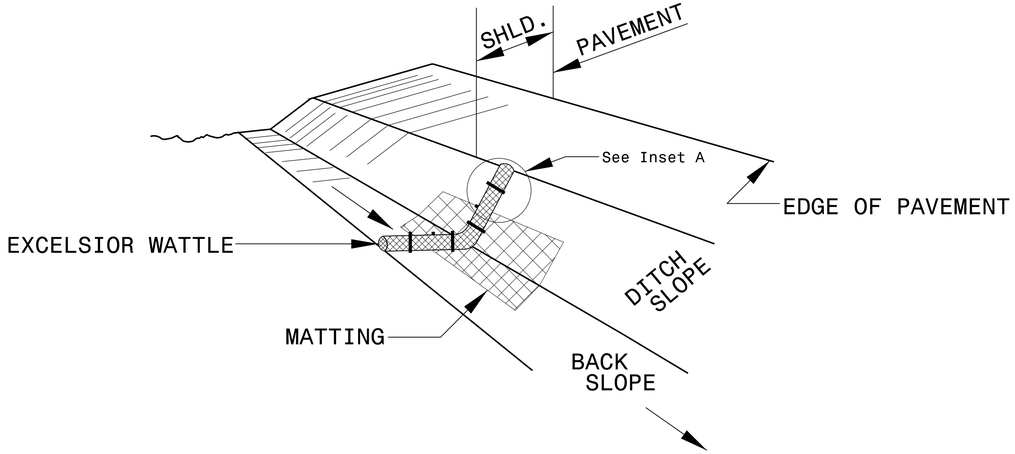
Roadway Standard Drawings

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.

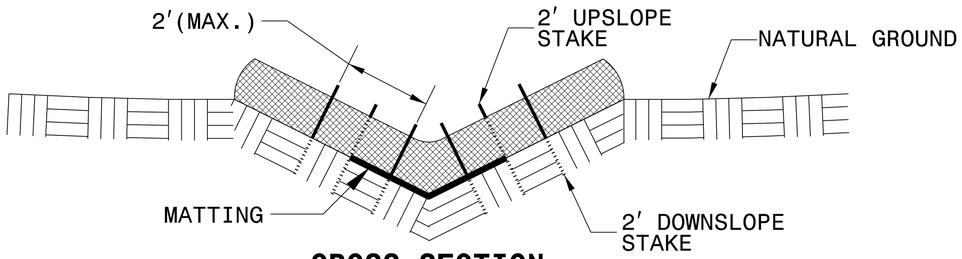
1604.01	Railroad Erosion Control Detail
1605.01	Temporary Silt Fence
1606.01	Special Sediment Control Fence
1607.01	Gravel Construction Entrance
1622.01	Temporary Berms and Slope Drains
1630.01	Riser Basin
1630.02	Silt Basin Type B
1630.03	Temporary Silt Ditch
1630.04	Stilling Basin
1630.05	Temporary 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.
41665.3E	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

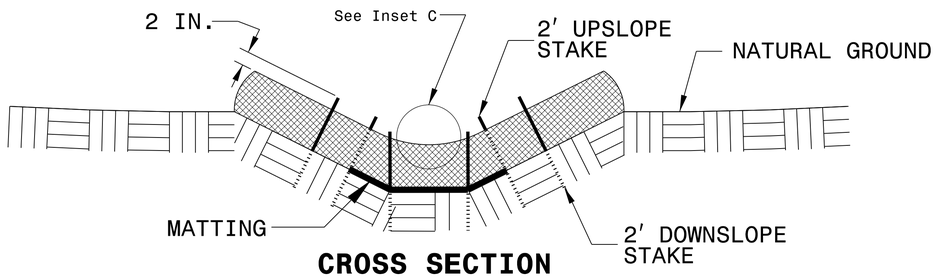
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

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

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

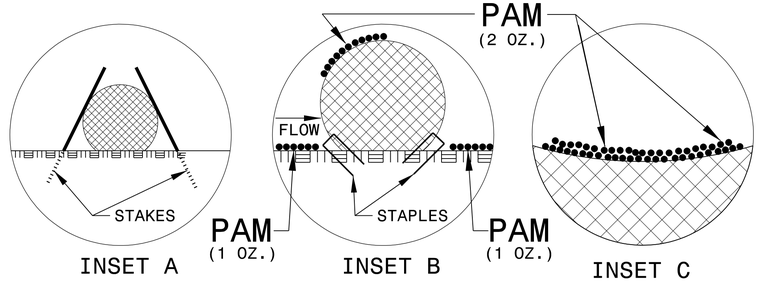
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

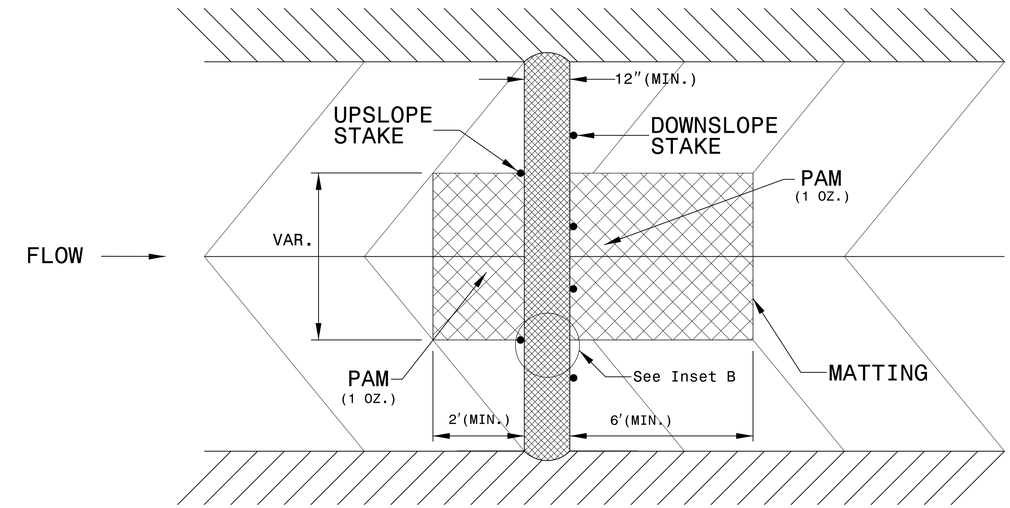
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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

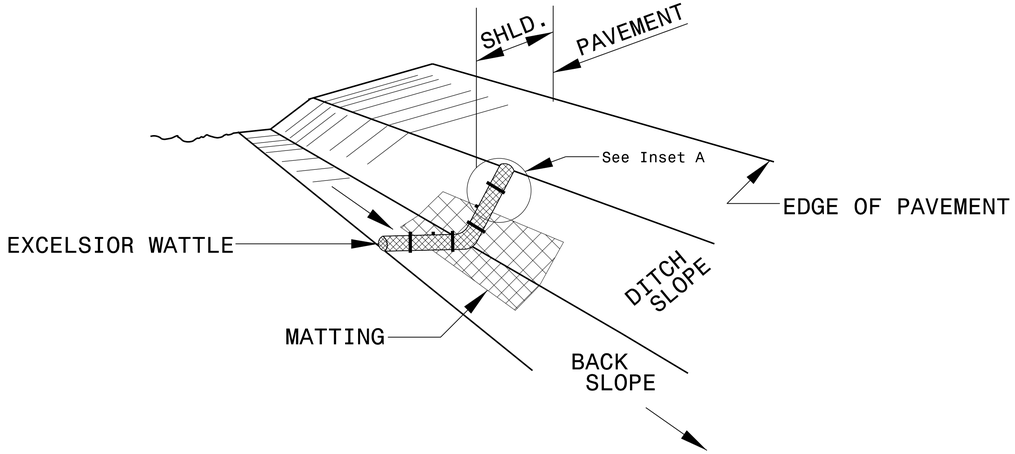




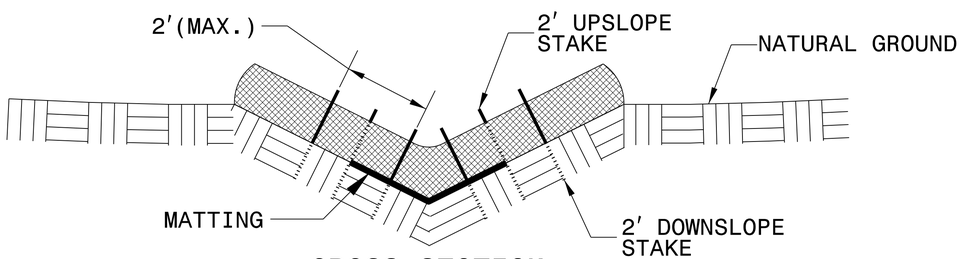
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

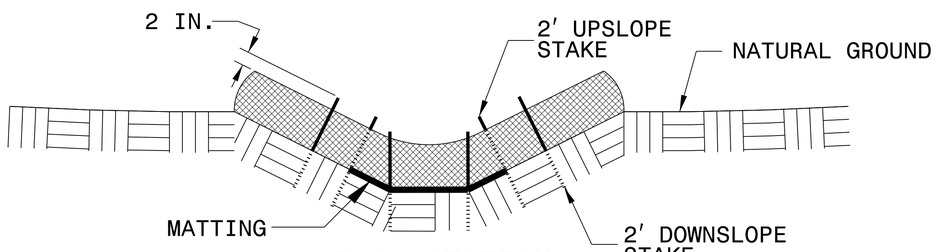
WATTLE DETAIL



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.

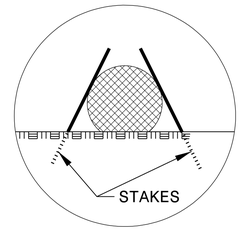
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

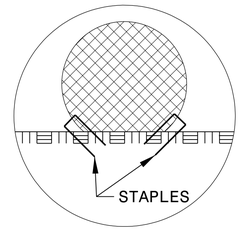
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

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

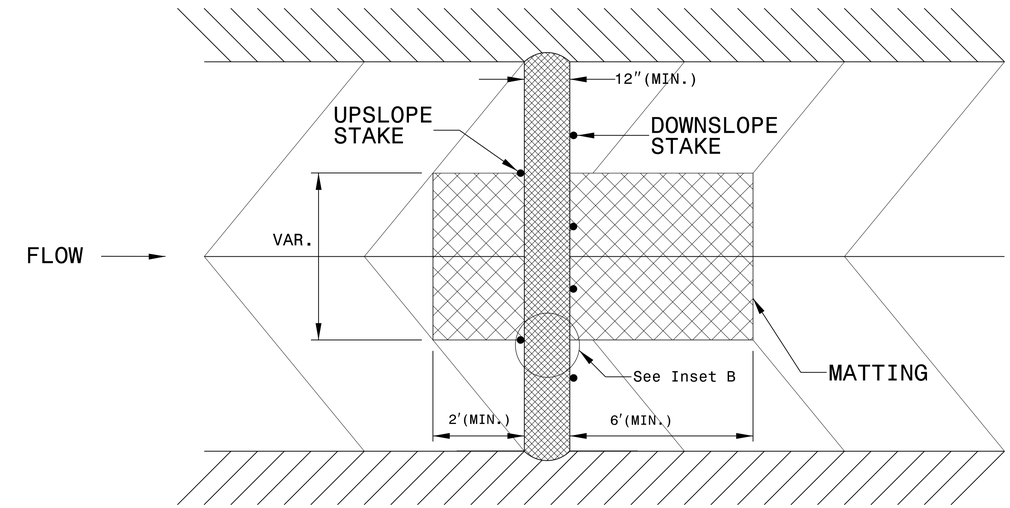
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



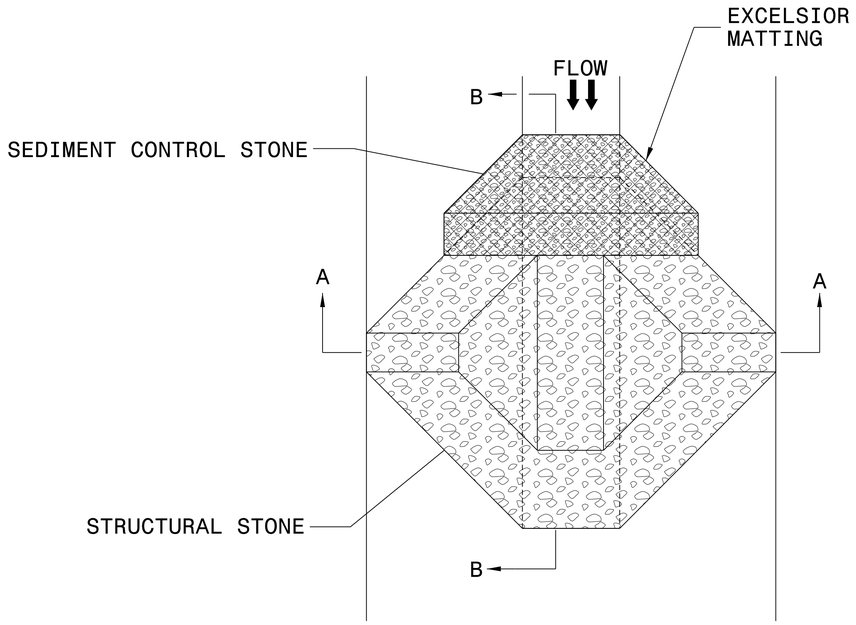
INSET B



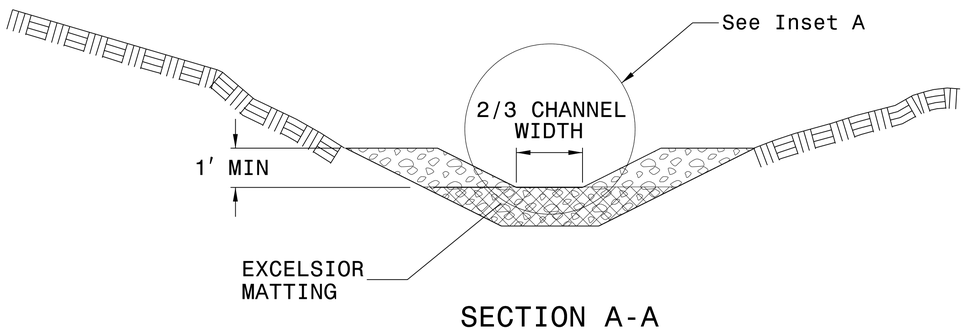
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

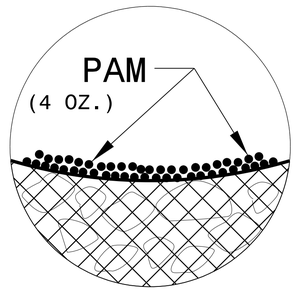
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

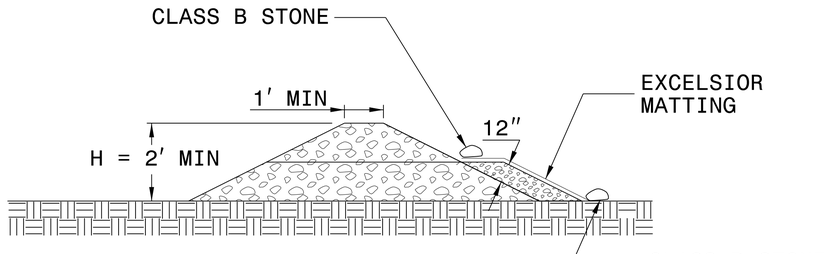
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	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.
41665.3E	EC-04/CONST.04

R/W SHEET NO.

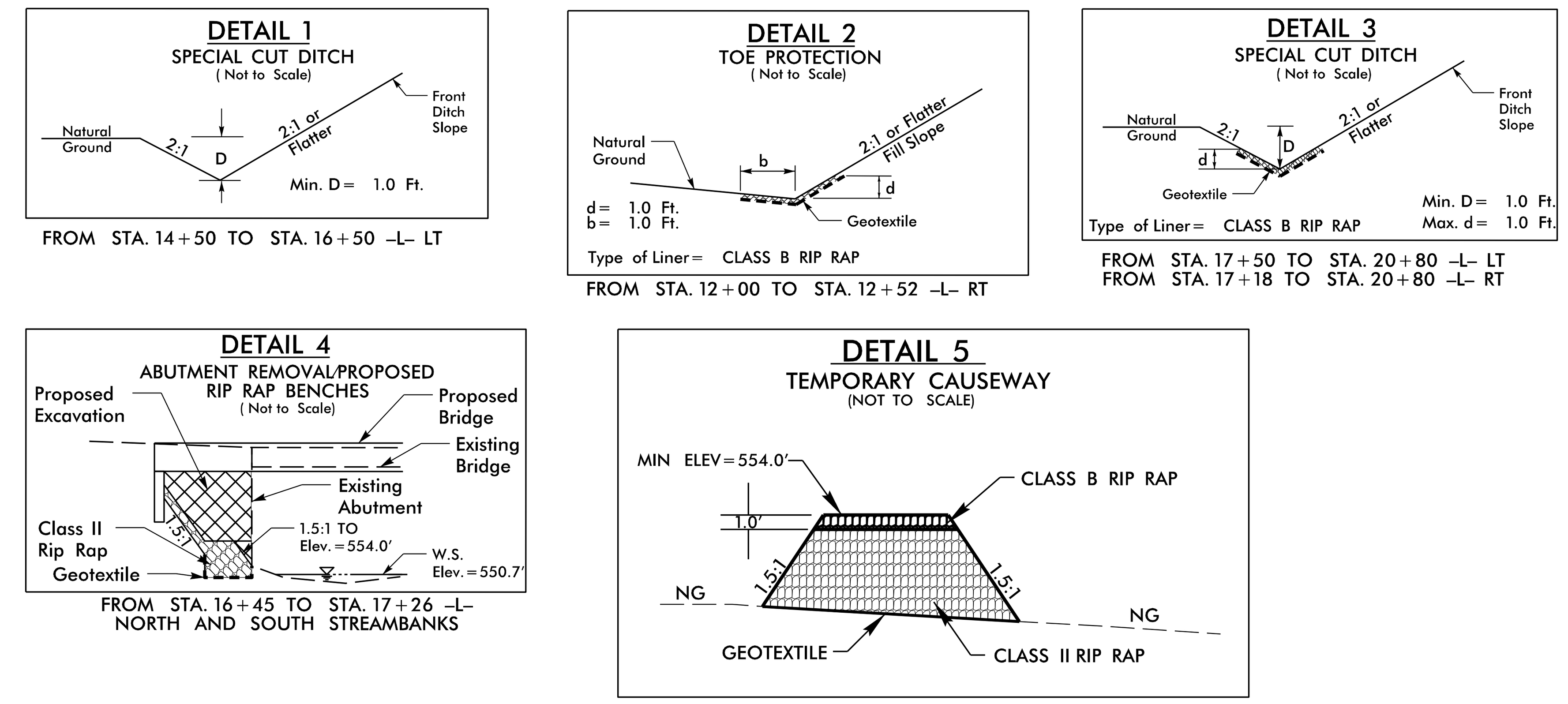
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

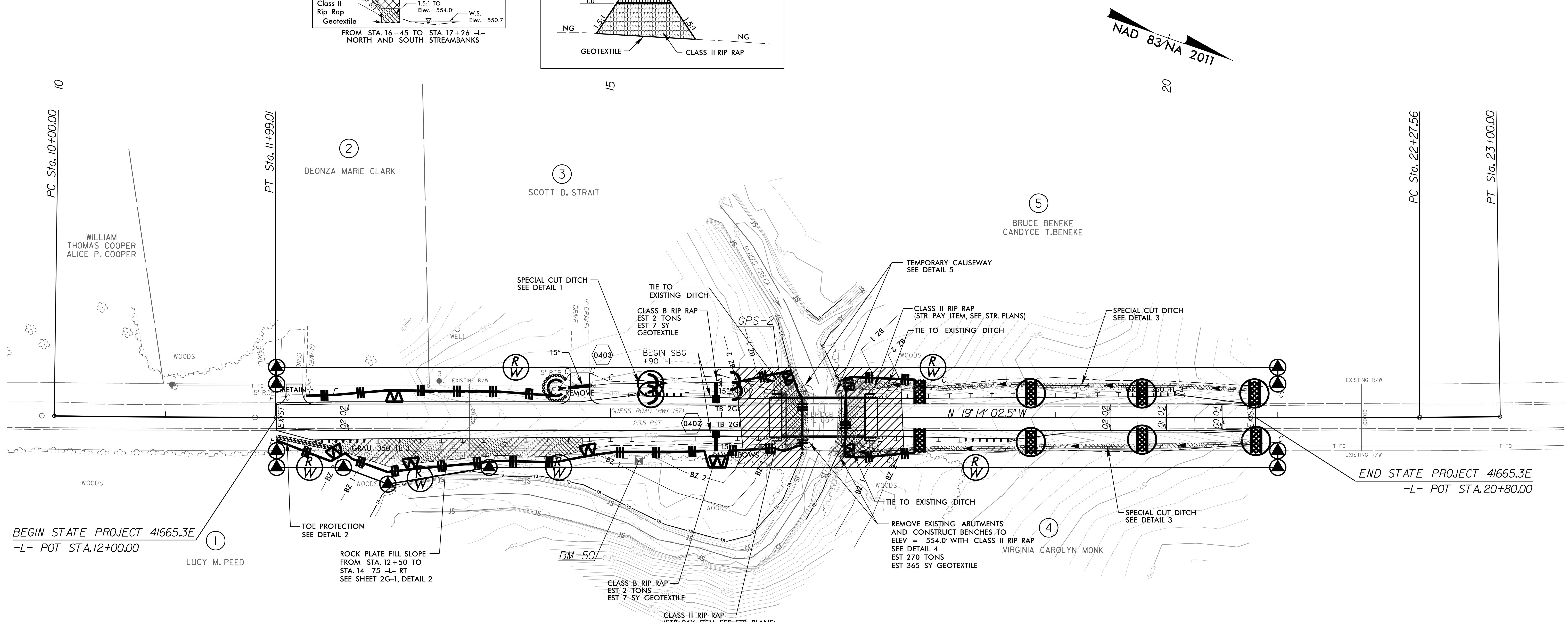
STEWART

ECOLOGICAL ENGINEERING

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4



DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1 or Flatter
Front Ditch Slope
Min. D = 1.0 Ft.
FROM STA. 14+50 TO STA. 16+50 -L- LT
DETAIL 2
TOE PROTECTION
(Not to Scale)
Natural Ground
2:1 or Flatter Fill Slope
Geotextile
d = 1.0 Ft.
b = 1.0 Ft.
Type of Liner = CLASS B RIP RAP
FROM STA. 12+00 TO STA. 12+52 -L- RT
DETAIL 3
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1 or Flatter
Front Ditch Slope
Geotextile
Type of Liner = CLASS B RIP RAP
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
FROM STA. 17+50 TO STA. 20+80 -L- LT
FROM STA. 17+18 TO STA. 20+80 -L- RT
DETAIL 4
ABUTMENT REMOVAL/PROPOSED RIP RAP BENCHES
(Not to Scale)
Proposed Excavation
Proposed Bridge
Existing Bridge
Existing Abutment
Class II Rip Rap
Geotextile
1.5:1 TO Elev. = 554.0'
W.S. Elev. = 550.7'
FROM STA. 16+45 TO STA. 17+26 -L- NORTH AND SOUTH STREAMBANKS
DETAIL 5
TEMPORARY CAUSEWAY
(NOT TO SCALE)
MIN ELEV = 554.0'
CLASS B RIP RAP
1.0'
1.5:1
NG
GEOTEXTILE
CLASS II RIP RAP



NAD 83/NA 2011
PC Sta. 10+00.00
PT Sta. 11+99.01
PC Sta. 22+27.56
PT Sta. 23+00.00
WILLIAM THOMAS COOPER
ALICE P. COOPER
DEONZA MARIE CLARK
SCOTT D. STRAIT
BRUCE BENEKE
CANDYCE T.BENEKE
LUCY M. PEED
VIRGINIA CAROLYN MONK
SPECIAL CUT DITCH SEE DETAIL 1
TIE TO EXISTING DITCH
CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE
BEGIN SBG +90 -L-
TEMPORARY CAUSEWAY SEE DETAIL 5
CLASS II RIP RAP (STR. PAY ITEM, SEE STR. PLANS)
TIE TO EXISTING DITCH
SPECIAL CUT DITCH SEE DETAIL 3
GUESS ROAD (HWY 157)
N 19° 14' 02.5" W
GRAU 350 TL-3
END STATE PROJECT 41665.3E
-L- POT STA.20+80.00
BEGIN STATE PROJECT 41665.3E
-L- POT STA.12+00.00
TOE PROTECTION SEE DETAIL 2
ROCK PLATE FILL SLOPE FROM STA. 12+50 TO STA. 14+75 -L- RT SEE SHEET 2G-1, DETAIL 2
BM-50
CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE
CLASS II RIP RAP (STR. PAY ITEM, SEE STR. PLANS)
TIE TO EXISTING DITCH
REMOVE EXISTING ABUTMENTS AND CONSTRUCT BENCHES TO ELEV = 554.0' WITH CLASS II RIP RAP SEE DETAIL 4 EST 270 TONS EST 365 SY GEOTEXTILE
SPECIAL CUT DITCH SEE DETAIL 3
WOODS
GPS-2

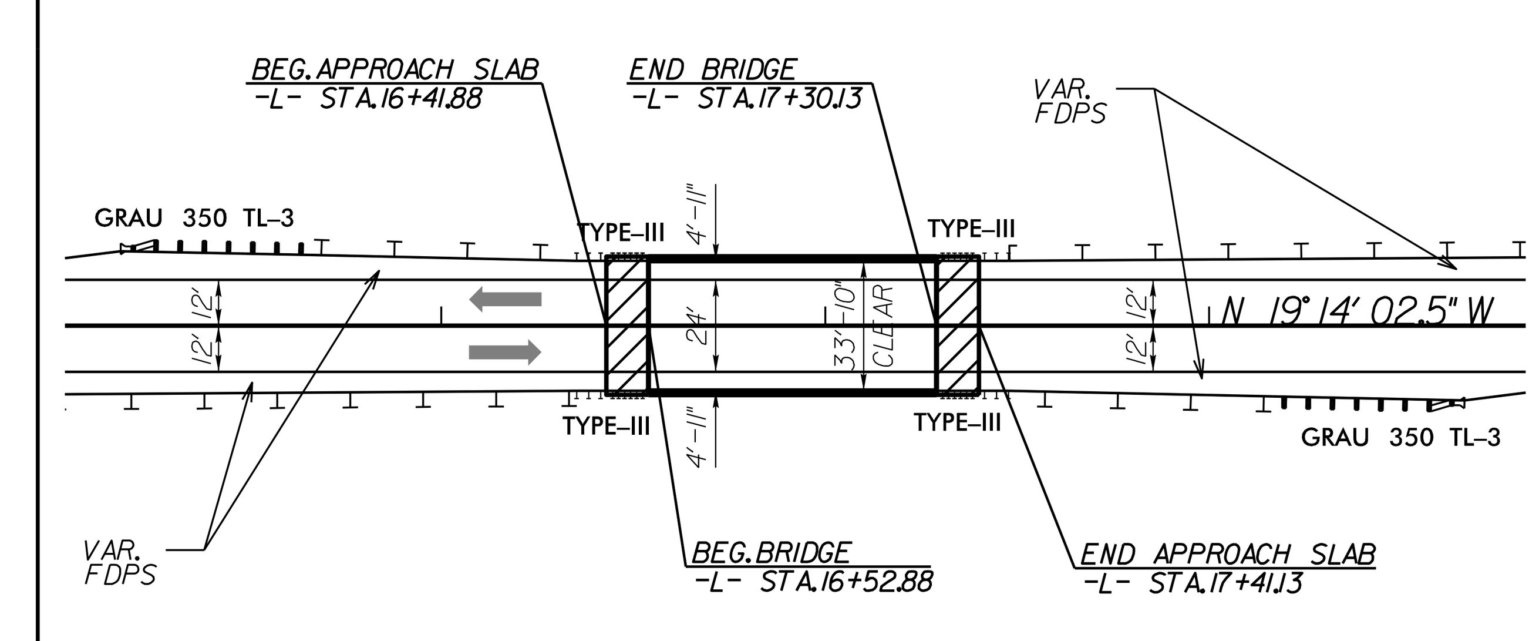
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

-L- CURVE DATA

PI Sta 10+99.51	PI Sta 22+63.78
Δ = 0° 45' 36.6" (LT)	Δ = 0° 27' 40.2" (RT)
D = 0° 22' 55.1"	D = 0° 38' 11.8"
L = 199.01'	L = 72.44'
T = 99.51'	T = 36.22'
R = 15,000.00'	R = 9,000.00'

FOR -L- PROFILE SEE SHEET 5

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



DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP (NTS)

REVISIONS

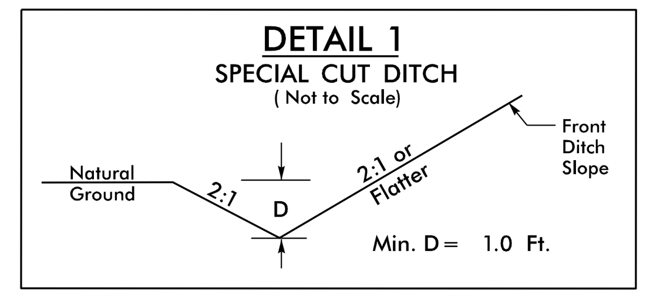
8/17/99

2/22/2016

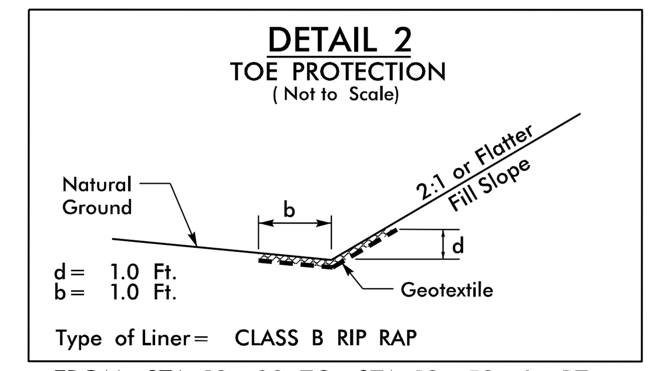
PROJECT REFERENCE NO.	SHEET NO.
41665.3E	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — Firm License No. C-1051, 421 Fayetteville St, Suite 400, Raleigh, NC 27601, T 919.380.8750, www.stewartinc.com

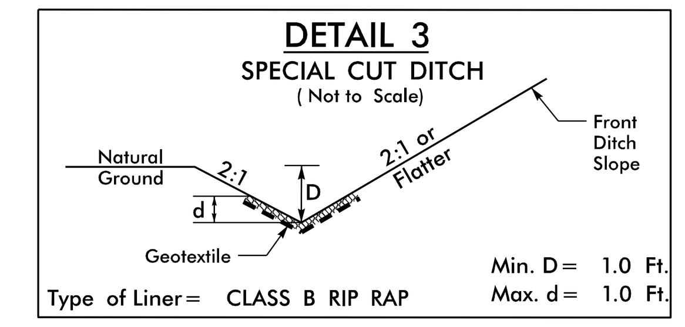
ECOLOGICAL ENGINEERING — NC FIRM LICENSE No: F-1148, 1151 SE Cary Parkway, Suite 101, Cary, NC 27518, (919) 557-0929



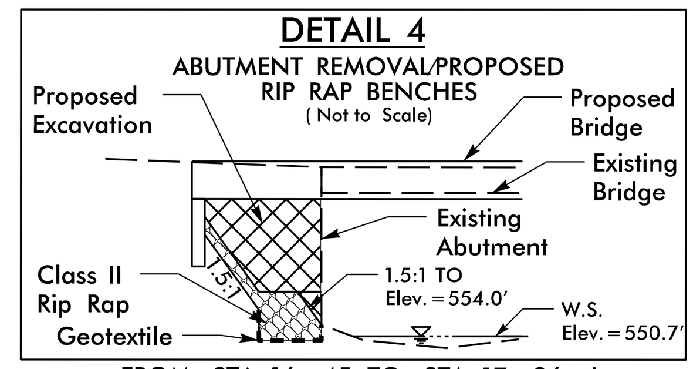
FROM STA. 14+50 TO STA. 16+50 -L- LT



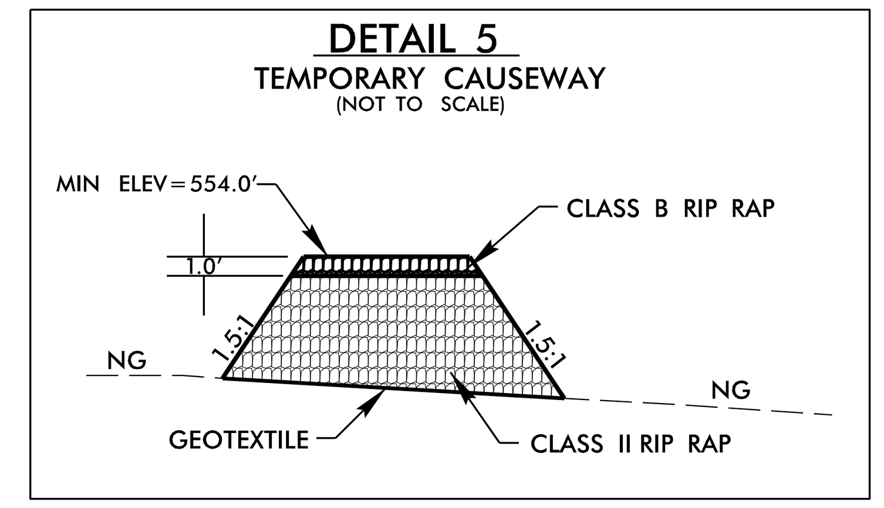
FROM STA. 12+00 TO STA. 12+52 -L- RT

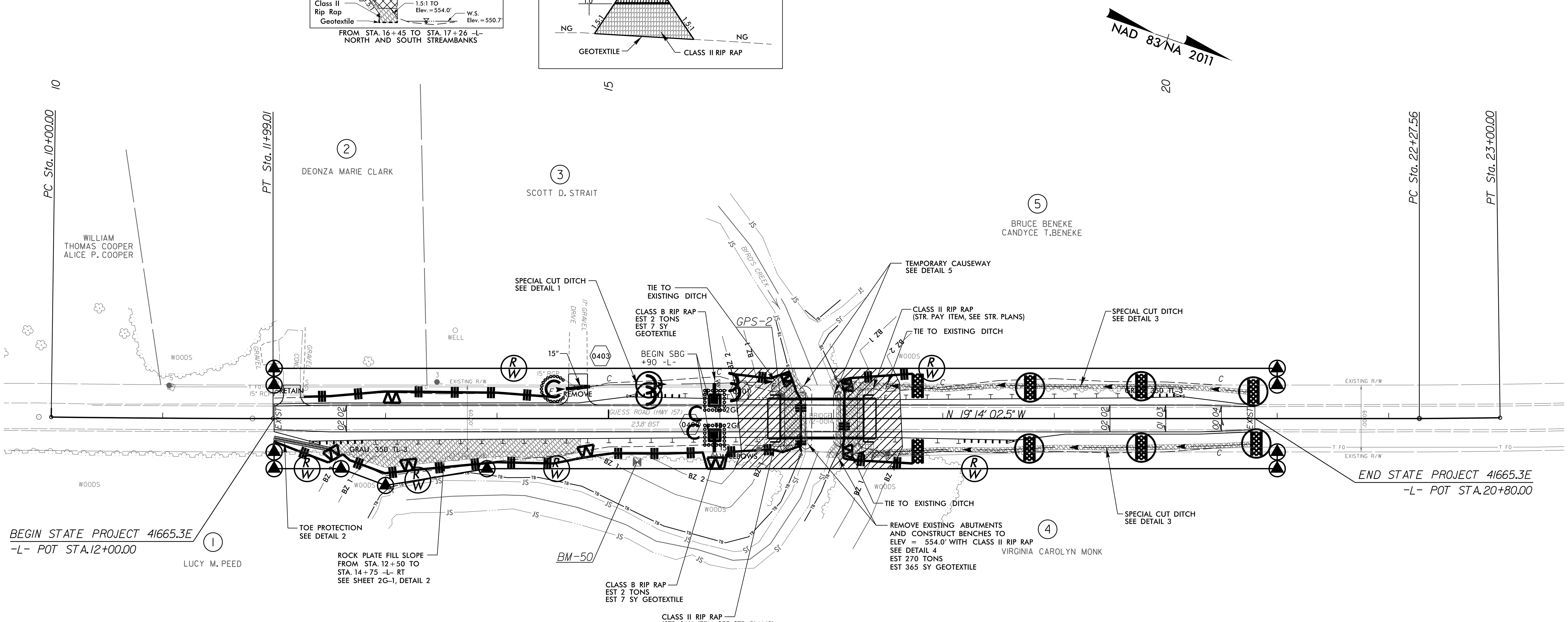


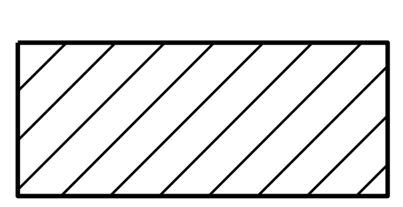
FROM STA. 17+50 TO STA. 20+80 -L- LT
FROM STA. 17+18 TO STA. 20+80 -L- RT



FROM STA. 16+45 TO STA. 17+26 -L- NORTH AND SOUTH STREAMBANKS







ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

-L- CURVE DATA

PI Sta 10+99.51	PI Sta 22+63.78
△ = 0° 45' 36.6" (LT)	△ = 0° 27' 40.2" (LT)
D = 0° 22' 55.1"	D = 0° 38' 11.8"
L = 199.01'	L = 72.44'
T = 99.51'	T = 36.22'
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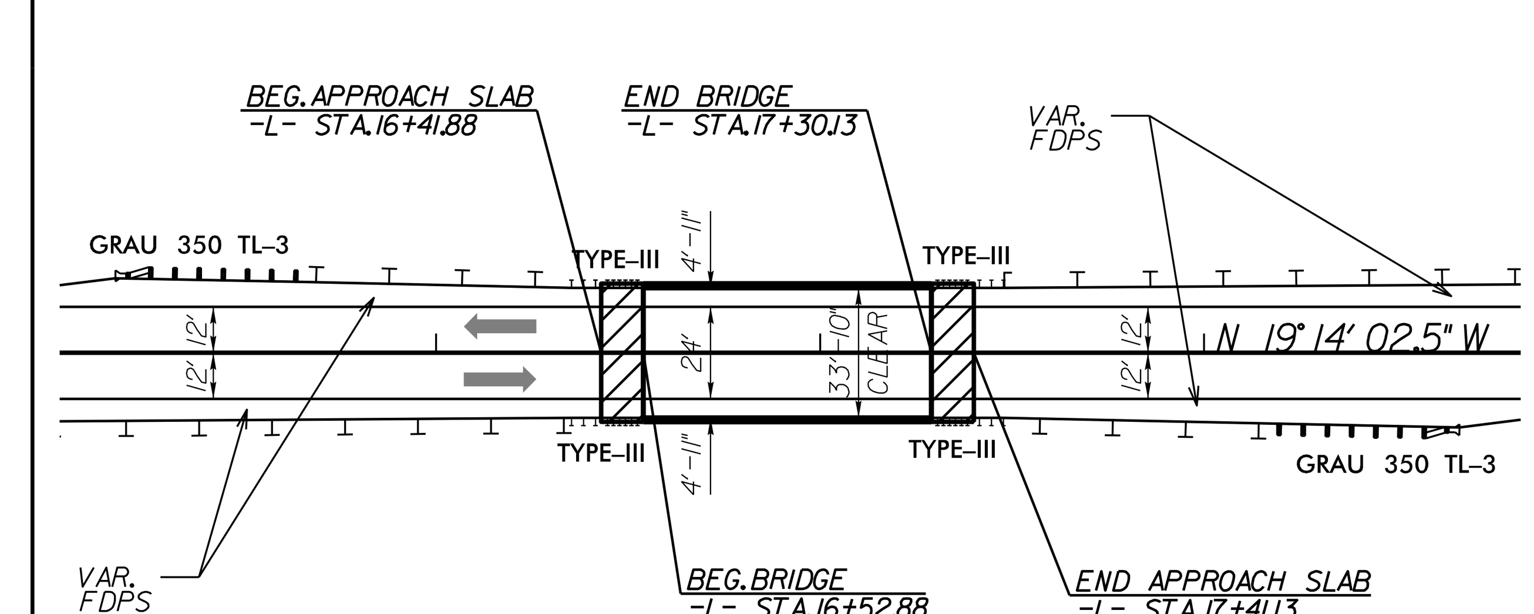
FOR -L- PROFILE SEE SHEET 5
SEE SHEETS S-1 THRU S-16 FOR STRUCTURE PLANS



DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP (NTS)

REVISIONS

8/17/99

2/22/2016
...\72001 4_REU_PSH_Final.dgn
USER:default

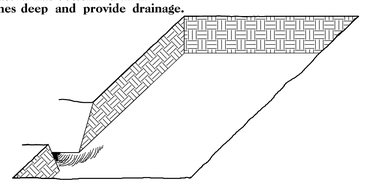
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41665.3E	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

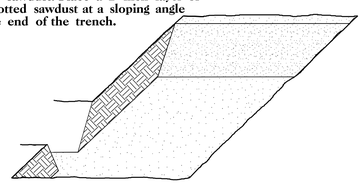
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

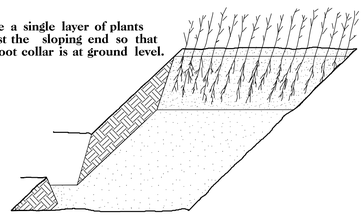
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



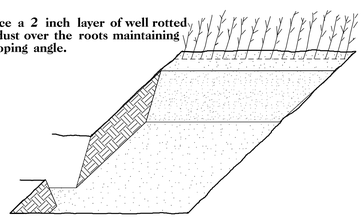
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

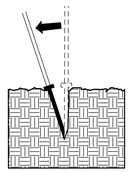


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

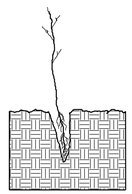


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

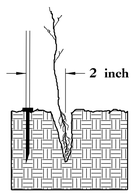
DI33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



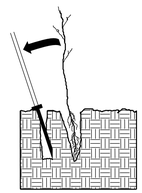
1. Insert planting bar as shown and pull handle toward planter.



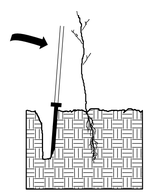
2. Remove planting bar and place seedling at correct depth.



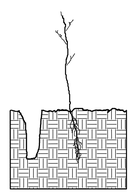
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

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

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

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

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in 3R
25% PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in 3R
25% 3ETULA NIGRA	RIVER 3IRCH	12 in – 18 in 3R

REFORESTATION DETAIL SHEET

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

09/08/95

TIP PROJECT: 41665.3E

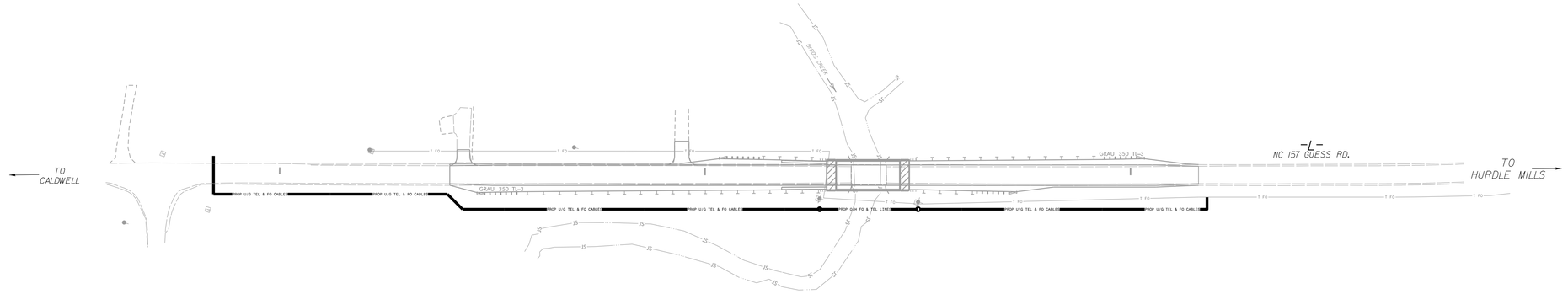
T.I.P. NO.	SHEET NO.
41665.3E	UO–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
PERSON COUNTY

LOCATION: BRIDGE NO. 14 OVER BYRDS CREEK ON NC 157 (GUESS ROAD)

TYPE OF WORK: PERMANENT FIBER OPTICS RELOCATION
PERMANENT TELEPHONE RELOCATION



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

UTILITY OWNERS ON PROJECT

(A) CENTURY LINK – FIBER OPTICS & TELEPHONE

PREPARED IN THE OFFICE OF:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:3811001

DAVID RUGGLES, PE *PROJECT ENGINEER*
MICHAEL BURNS, EI *PROJECT DESIGN ENGINEER*

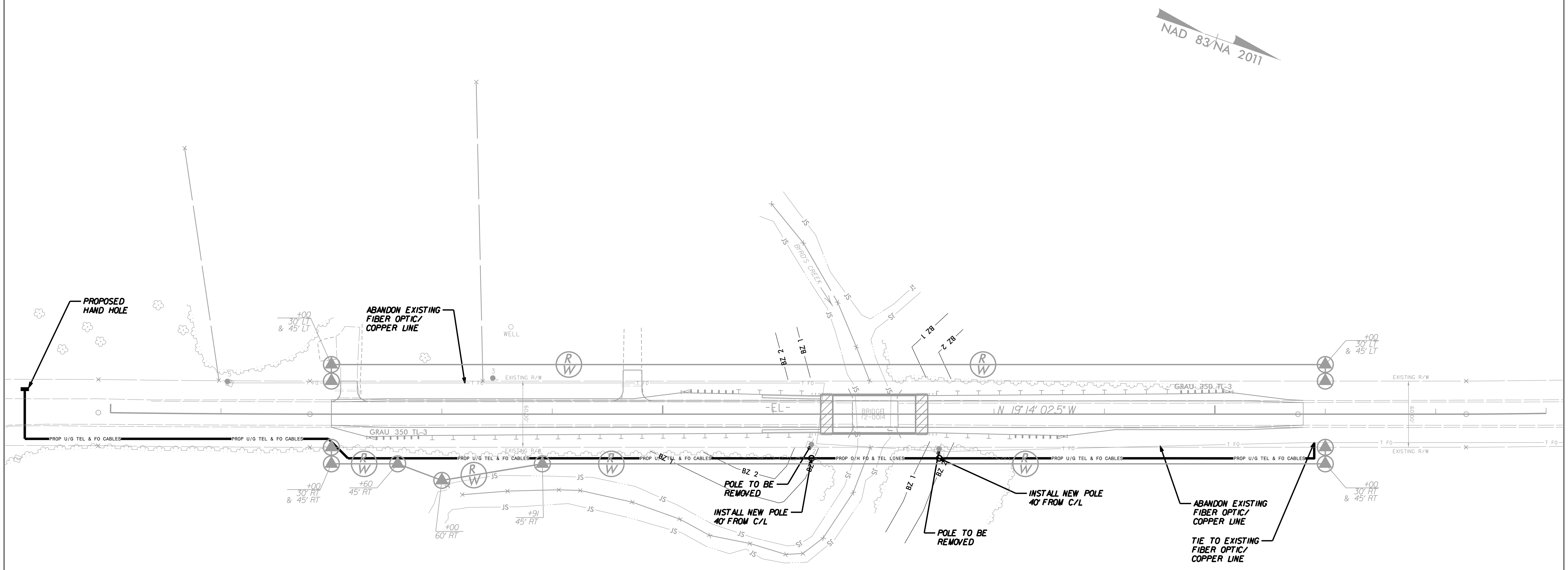
2/18/2016
i:\Rdy_Ut\Proj\72004_utl_tsh.dgn
USER:nasfourd

PROJECT REFERENCE NO.	SHEET NO.
41665.3E	UO-2

UTILITIES BY OTHERS

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

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com



8/17/99

2/18/2016

PROJ. REFERENCE NO.	SHEET NO.
41665.3E	X-1A
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+50.00	0	0
12+00.00	0	0
12+50.00	35	10
13+00.00	27	98
13+50.00	22	155
14+00.00	22	102
14+50.00	22	51
15+00.00	31	31
15+50.00	51	30
16+00.00	81	19
16+50.00	77	13

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
17+50.00	0	0
18+00.00	30	26
18+50.00	44	25
19+00.00	73	18
19+50.00	81	16
20+00.00	70	18
20+50.00	59	19
21+00.00	0	0


0 2.5 5
PROJ. REFERENCE NO.
41665.3E
SHEET NO.
X-1
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
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
3:1
0.017
0.023
572.61
1.5:1
570
565
12+50.00
3:1
0.007
0.032
4:1
576.31
575
570
12+00.00
585
580
575
579.92
11+50.00
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	41665.3E	X-2


0 2.5 5
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
0.020
0.020
4:1
2:1
2:1
561.69
558.90
15+00.00
0.020
0.020
2:1
2:1
562.65
14+50.00
0.020
0.020
2:1
1.5:1
564.19
14+00.00
-L-


0 2.5 5
PROJ. REFERENCE NO.
41665.3E
SHEET NO.
X-4
0.020
0.020
550.42
17 + 00.00
3:1
2:1
561.29
16 + 50.00
4:1
2:1
558.57
561.23
16 + 00.00
2:1
4:1
558.23
561.25
15 + 50.00
-L-

PROJ. REFERENCE NO.
41665.3E
SHEET NO.
X-5
0 2.5 5
19+00.00
0.020
0.020
565.61
563.20
563.44
18+50.00
564.19
561.52
562.20
18+00.00
562.89
559.84
560.96
17+50.00
561.91
559.72
-L-
8/23/99
2/18/2016

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	41665.3E	X-6

8/23/99

2/18/2016

16+50 17+00 17+50

580 570 560 550 540

(-)7.100% (+)0.5000%

PI STA. 14+30.00 -L-
EL = 559.98'
VC = 380'

(+)0.5000% (+)3.6944%

PI STA. 18+05.00 -L-
EL = 561.85'
VC = 370'

SPAN A

FILL FACE AT END BENT 1
W.P. #1 STA. 16+52.88 -L-
G.P. ELEV. 561.14

BEGIN FRONT SLOPE
STA. 16+44.06 -L-
G.P. ELEV. 561.08

1'-6" LIMITS OF EXCAVATION (TYP. EA. END)

CLASS II RIP RAP W/GEOTEXTILE (TYP. EA. END)

EL. 554.0 SLOPE TO DRAIN

FIX.

EL. 561±

APPROX. NATURAL GROUND LINE

LOW CHORD ELEV. = 557.78

EL. 553±

TEMPORARY CAUSEWAY SEE DETAIL

BASE HW (Q100) ELEV. 560.93

WS ELEV. 550.7 (09/19/2014)

1'-0" MIN.

3'-6" (TYP.)

EL. 551±

EL. 550±

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

BANK STABILIZATION 2'-0" TH. CLASS II RIP RAP W/ GEOTEXTILE

1'-7" MIN. BERM (TYP. EA. END)

1.5:1 SLOPE NORMAL TO CAP (TYP.)

EL. 561±

LOW CHORD ELEV. = 558.60

EL. 554.0 SLOPE TO DRAIN

FIX.

EL. 551± EL. 554±

BANK STABILIZATION 2'-0" TH. CLASS II RIP RAP W/ GEOTEXTILE

UNCLASSIFIED STRUCTURE EXCAVATION (TYP. EA. END)

FILL FACE AT END BENT 2
W.P. #2 STA. 17+30.13 -L-
G.P. ELEV. 562.00

END FRONT SLOPE
STA. 17+39.30 -L-
G.P. ELEV. 562.14

EL. 562±

APPROX. NATURAL GROUND LINE

1'-0" MIN.

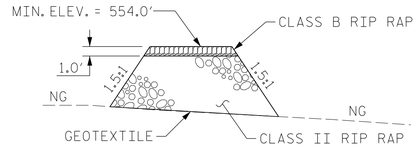
HP 12X53 STEEL PILES (TYP.)

END BENT No. 1

SECTION ALONG -L-

END BENT No. 2

TEMPORARY CAUSEWAY DETAIL
(NOT TO SCALE)



NAD 83/NA 2011

BANK STABILIZATION 2'-0" TH. CLASS II RIP RAP W/ GEOTEXTILE

TEMPORARY CAUSEWAY SEE DETAIL

BYRDS CREEK

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

1'-7" MIN. RIP RAP BERM (TYP.)

BRIDGE ID
STA 16+91.50 -L-

EXISTING SUBSTRUCTURE (TYP.)

CLASS II RIP RAP (TYP. EA. END)

STA 16+44.06 -L-
BEGIN FRONT SLOPE

STA 16+41.88 -L-
BEGIN APPROACH SLOPE

STA 16+52.88 -L-
W.P. #1

TO SR 1119

-L-

STA 17+30.13 -L-
W.P. #2

STA 17+39.30 -L-
END FRONT SLOPE

STA 17+44.00 -L-
END APPROACH SLOPE

TO SR 1115

90°00'00" (TYP.)

FILL FACE @ END BENT #1

FILL FACE @ END BENT #2

EARTH BERM EL. 552.70 (LEVEL)

EARTH BERM EL. 553.52 (LEVEL)

38'-7½"

LENGTH OF BRIDGE (FILL FACE TO FILL FACE) = 77'-3"

PLAN

PILES NOT SHOWN FOR CLARITY

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NORTH CAROLINA PROFESSIONAL SEAL 041425 ENGINEER JEFFREY M. LOFTUS

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PROJECT NO. 41665.3E

PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE 720014

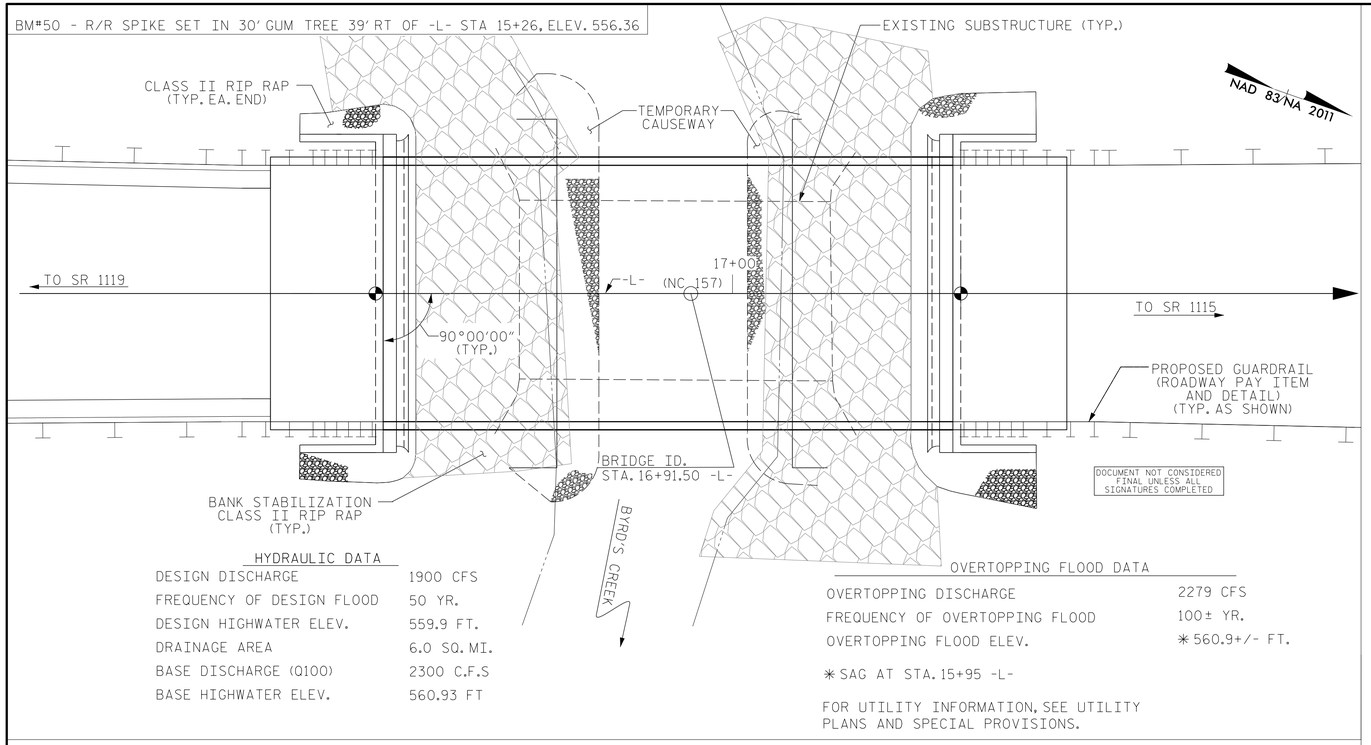
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER BYRDS CREEK
ON NC 157 BETWEEN
SR 1119 AND SR 1115

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

DRAWN BY: H.ASSFOURA DATE : 02/15
CHECKED BY: J.LOFTUS DATE : 02/15
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE : 12/15

BRIDGE NO: 720014
2/3/2016
...\400_001_416653E_SMU_GD01.dgn
USER:jloftus



HYDRAULIC DATA

DESIGN DISCHARGE	1900 CFS
FREQUENCY OF DESIGN FLOOD	50 YR.
DESIGN HIGHWATER ELEV.	559.9 FT.
DRAINAGE AREA	6.0 SQ. MI.
BASE DISCHARGE (Q100)	2300 C.F.S
BASE HIGHWATER ELEV.	560.93 FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	2279 CFS
FREQUENCY OF OVERTOPPING FLOOD	100± YR.
OVERTOPPING FLOOD ELEV.	✳ 560.9+/- FT.

✳ SAG AT STA. 15+95 -L-

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

FOUNDATION NOTES

1. FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
3. PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1 AND END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATIONS 543.7 FT AND 544.5 FT, RESPECTIVELY. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
4. CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 AND END BENT NO. 2.
5. DO NOT DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 AFTER PLACING PILES IN HOLES. VERIFY PILES ARE SEATED ON HARD ROCK BEFORE FILLING WITH CONCRETE OR GROUT.

NOTES

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
4. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."
5. THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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 DIFFERENCE BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
6. THE EXISTING STRUCTURE CONSISTING OF ONE SPAN @ 40'-4"; STEEL PLANK FLOOR ON I-BEAMS; 24.2 CLEAR ROADWAY WIDTH SUPPORTED ON TIMBER CAPS AND TIMBER POST AND CONCRETE SILLS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED IN ITS ENTIRETY, WHICH INCLUDES EXISTING CONCRETE FOOTINGS. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
7. REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
8. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
9. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
10. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
11. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
12. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
13. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
14. ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
15. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 35 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS
16. 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 16+91.50 -L-."
17. AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 16+91.50 -L-.
18. FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINF. STEEL	HP 12X53 STEEL PILES		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		ASBESTOS ASSESSMENT
	LUMP SUM	LUMP SUM	EACH	EACH	LUMP SUM	CY. YDS.	LUMP SUM	LBS	No.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	No.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE	LUMP SUM						LUMP SUM				150.25			LUMP SUM	12	900	
END BENT No. 1			35	35	LUMP SUM	26.9		3795	7	70		195	248				
END BENT No. 2			34	36	LUMP SUM	26.9		3795	7	70		242	303				
TOTAL	LUMP SUM	LUMP SUM	69	71	LUMP SUM	53.8	LUMP SUM	7590	14	140	150.25	437	551	LUMP SUM	12	900	LUMP SUM

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NORTH CAROLINA PROFESSIONAL SEAL 041425 ENGINEER JEFFREY M. LOFTUS

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STEWART

PROJECT NO. 41665.3E

PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER BYRDS CREEK
ON NC 157 BETWEEN
SR 1119 AND SR 1115

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

DRAWN BY: H.ASSFOURA DATE: 02/15
CHECKED BY: J.LOFTUS DATE: 02/15
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 12/15

BRIDGE NO: 720014
2/3/2016
...\400_002_416653E_SMU_GD02.dgn
USER:jloftus

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.484	--	1.75	0.273	2.04	A	EL	36.75	0.507	1.56	A	EL	7.35	0.80	0.273	**1.48**	A	EL	**36.75**	
		HL-93(Opr)	N/A	--	2.028	--	1.35	0.273	2.64	A	EL	36.75	0.507	2.03	A	EL	7.35	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.947	70.08	1.75	0.273	2.67	A	EL	36.75	0.507	1.98	A	EL	7.35	0.80	0.273	**1.95**	A	EL	**36.75**	
		HS-20(Opr)	36.000	--	2.561	92.205	1.35	0.273	3.46	A	EL	36.75	0.507	2.56	A	EL	7.35	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	4.403	59.442	1.4	0.273	7.55	A	EL	36.75	0.507	5.89	A	EL	7.35	0.80	0.273	4.40	A	EL	36.75	
		SNGARBS2	20.000	--	3.277	65.549	1.4	0.273	5.62	A	EL	36.75	0.507	4.18	A	EL	7.35	0.80	0.273	3.28	A	EL	36.75	
		SNAGRIS2	22.000	--	3.102	68.248	1.4	0.273	5.32	A	EL	36.75	0.507	3.88	A	EL	7.35	0.80	0.273	3.10	A	EL	36.75	
		SNCOTTS3	27.250	--	2.191	59.705	1.4	0.273	3.76	A	EL	36.75	0.507	2.94	A	EL	7.35	0.80	0.273	2.19	A	EL	36.75	
		SNAGGRS4	34.925	--	1.83	63.896	1.4	0.273	3.14	A	EL	36.75	0.507	2.44	A	EL	7.35	0.80	0.273	1.83	A	EL	36.75	
		SNS5A	35.550	--	1.789	63.605	1.4	0.273	3.07	A	EL	36.75	0.507	2.47	A	EL	7.35	0.80	0.273	1.79	A	EL	36.75	
		SNS6A	39.950	--	1.641	65.556	1.4	0.273	2.81	A	EL	36.75	0.507	2.25	A	EL	7.35	0.80	0.273	1.64	A	EL	36.75	
		SNS7B	42.000	--	1.563	65.632	1.4	0.273	2.68	A	EL	36.75	0.507	2.21	A	EL	7.35	0.80	0.273	1.56	A	EL	36.75	
	TTST	TNAGRIT3	33.000	--	2.001	66.029	1.4	0.273	3.43	A	EL	36.75	0.507	2.68	A	EL	7.35	0.80	0.273	2.00	A	EL	36.75	
		TNT4A	33.075	--	2.01	66.465	1.4	0.273	3.45	A	EL	36.75	0.507	2.61	A	EL	7.35	0.80	0.273	2.01	A	EL	36.75	
		TNT6A	41.600	--	1.642	68.325	1.4	0.273	2.82	A	EL	36.75	0.507	2.35	A	EL	7.35	0.80	0.273	1.64	A	EL	36.75	
		TNT7A	42.000	--	1.65	69.313	1.4	0.273	2.83	A	EL	36.75	0.507	2.3	A	EL	7.35	0.80	0.273	1.65	A	EL	36.75	
		TNT7B	42.000	--	1.706	71.672	1.4	0.273	2.93	A	EL	36.75	0.507	2.16	A	EL	7.35	0.80	0.273	1.71	A	EL	36.75	
		TNAGRIT4	43.000	--	1.624	69.831	1.4	0.273	2.78	A	EL	36.75	0.507	2.09	A	EL	7.35	0.80	0.273	1.62	A	EL	36.75	
		TNAGT5A	45.000	--	1.531	68.917	1.4	0.273	2.63	A	EL	36.75	0.507	2.08	A	EL	7.35	0.80	0.273	1.53	A	EL	36.75	
		TNAGT5B	45.000	3	1.513	68.095	1.4	0.273	2.59	A	EL	36.75	0.507	1.99	A	EL	7.35	0.80	0.273	**1.51**	A	EL	**36.75**	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

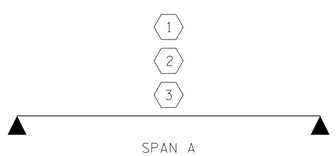
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

DocuSigned by: Jeff Loftus FE51DC02E6794A0...
2/3/2016

NORTH CAROLINA PROFESSIONAL SEAL 041425 ENGINEER JEFFREY M. LOFTUS

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PROJECT NO. 41665.3E

PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

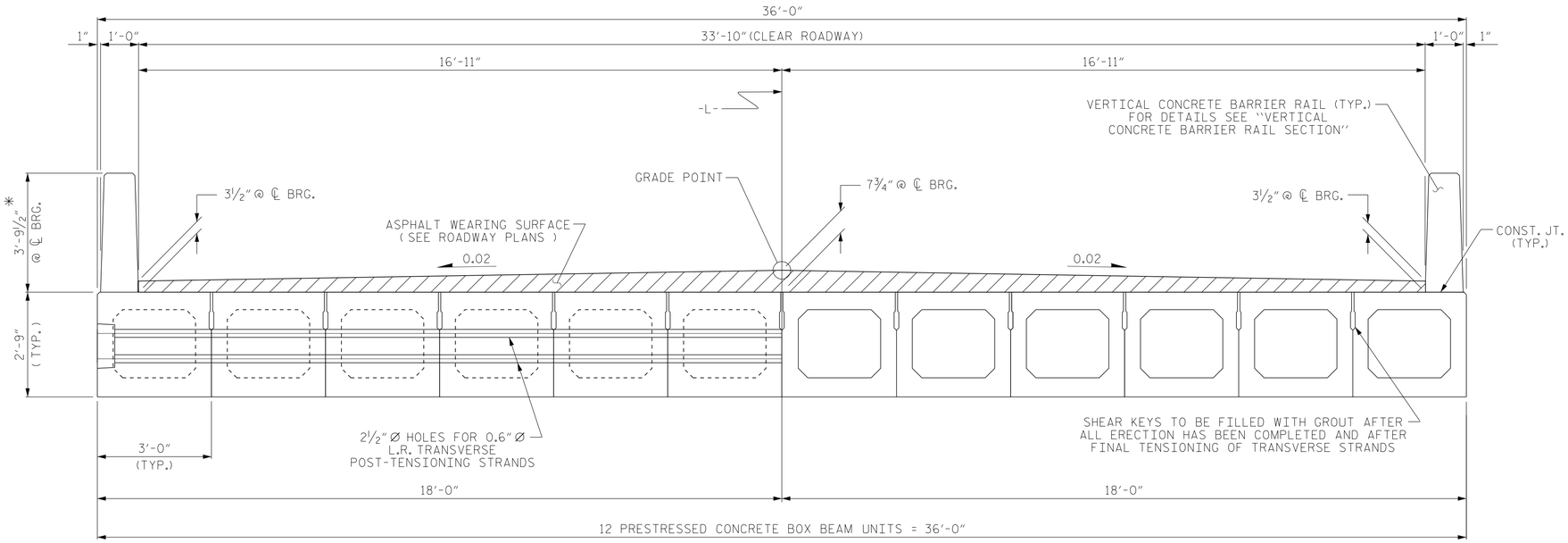
STANDARD

LRFR SUMMARY FOR 75' BOX BEAM UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY :	H.ASSFOURA	DATE :	02/15
CHECKED BY :	J.LOFTUS	DATE :	02/15
DRAWN BY :	TMG		11/11
CHECKED BY :	AAC		11/11

BRIDGE NO: 720014
2/3/2016
...\400_003_41665E_SMU_LRFR03.dgn
USER:jloftus



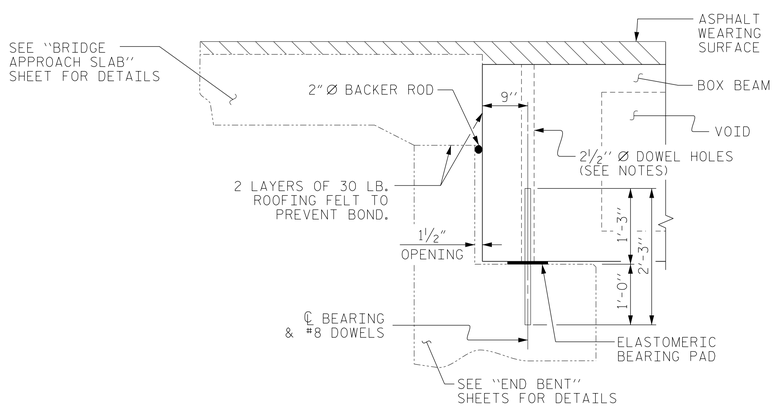
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

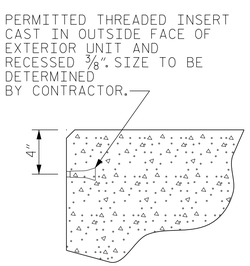
TYPICAL SECTION

*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



THREADED INSERT DETAIL

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.

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

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.

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

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

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

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

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NORTH CAROLINA PROFESSIONAL SEAL 041425 ENGINEER JEFFREY M. LOFTUS

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PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

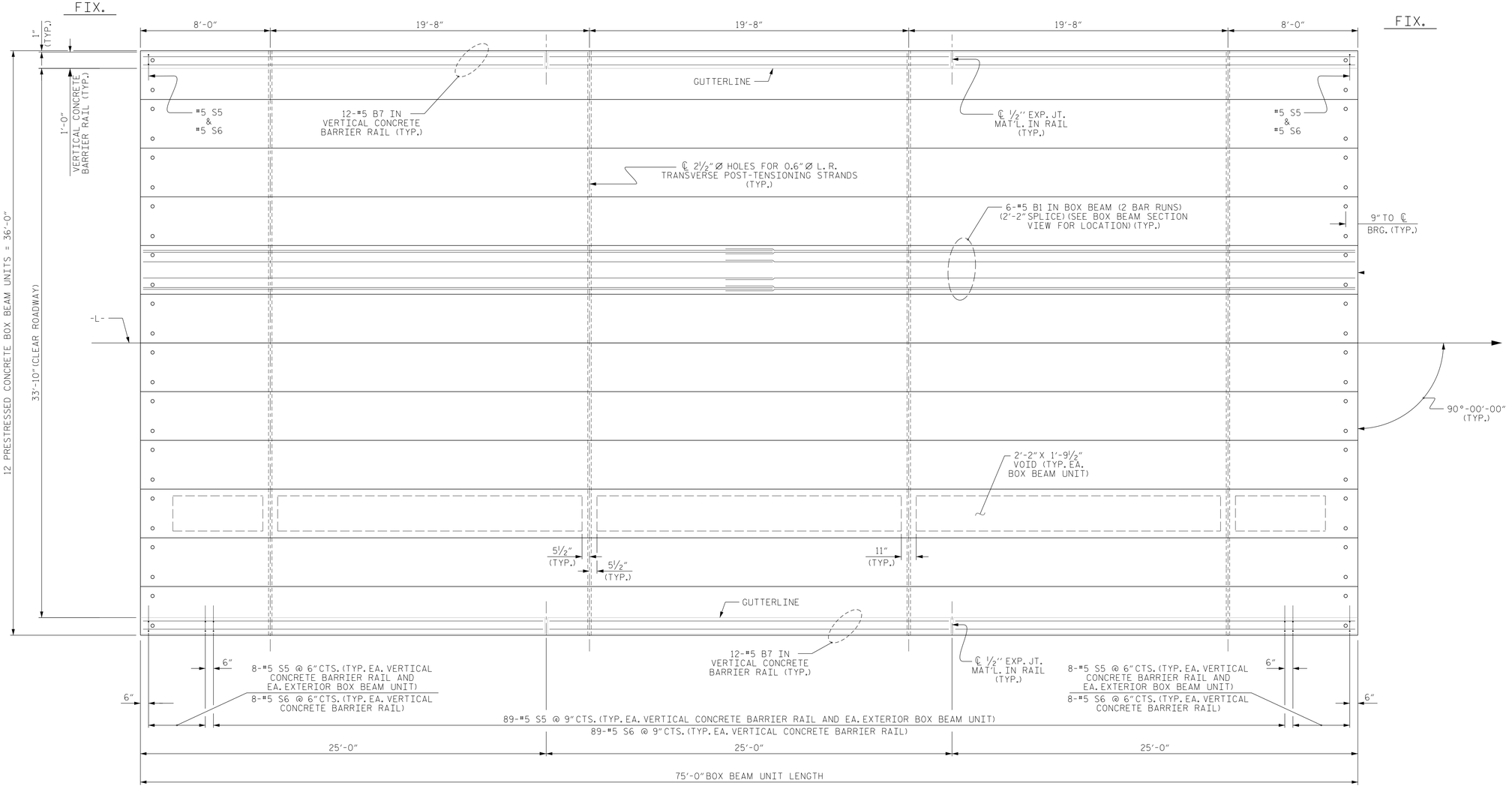
3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

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

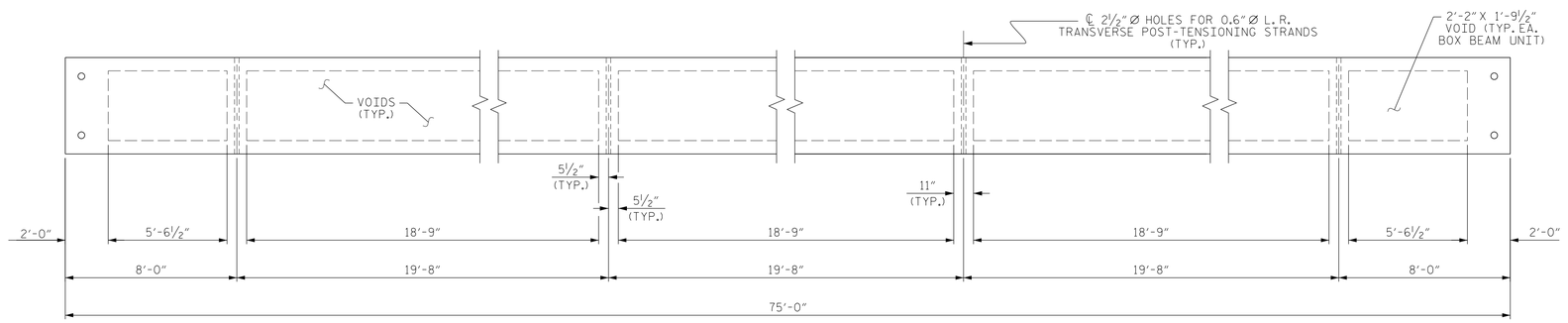
ASSEMBLED BY : H.ASSFOURA	DATE : 02/15		
CHECKED BY : J.LOFTUS	DATE : 02/15		
DRAWN BY : DGE 8/11	REV. 8/14	MAA/TMG	
CHECKED BY : TMG 11/11			

BRIDGE NO: 720014

2/3/2016
...\400.004_416653E_SMU_TS01.dgn
USER:jloftus



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

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SHEET 2 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF 75' UNIT 33'-10" CLEAR ROADWAY 90° SKEW

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

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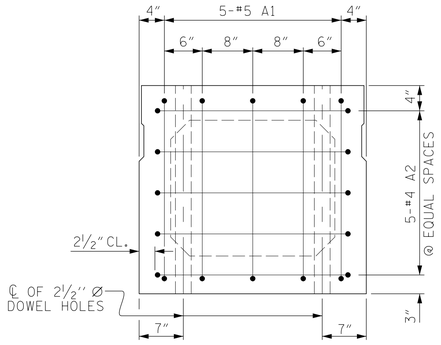
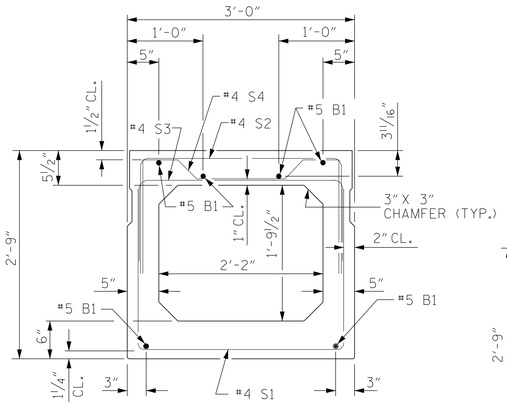


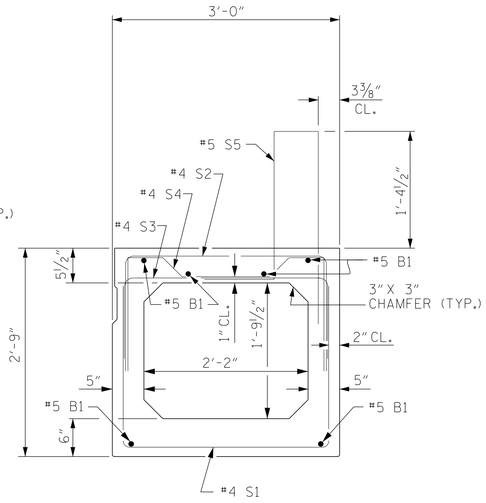
END ELEVATION

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

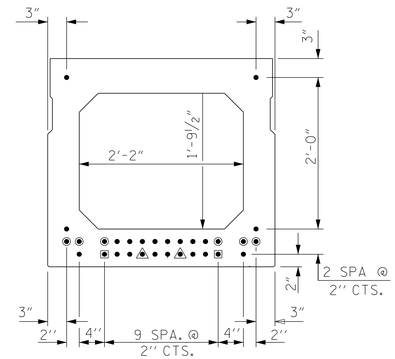
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

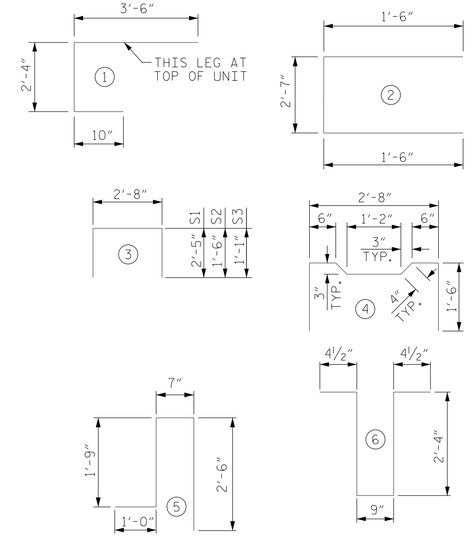
(24 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ⊙ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST.

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.

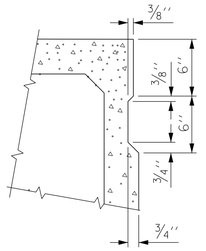
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-7"	127	5'-7"	127
B1	12	#5	STR	38'-5"	481	38'-5"	481
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-7"	14	2'-7"	14
S1	63	#4	3	7'-6"	316	7'-6"	316
S2	63	#4	3	5'-8"	238	5'-8"	238
S3	107	#4	3	4'-10"	345	4'-10"	345
S4	44	#4	4	5'-10"	171	5'-10"	171
✳ S5	105	#5	5	5'-10"	639	--	--
REINFORCING STEEL					1811 LBS.		1811 LBS.
✳ EPOXY COATED REINF. STEEL					639 LBS.		
8000 P.S.I. CONCRETE					13.4 CU. YDS.		13.3 CU. YDS.
0.6" Ø L.R. STRANDS					No. 24		No. 24

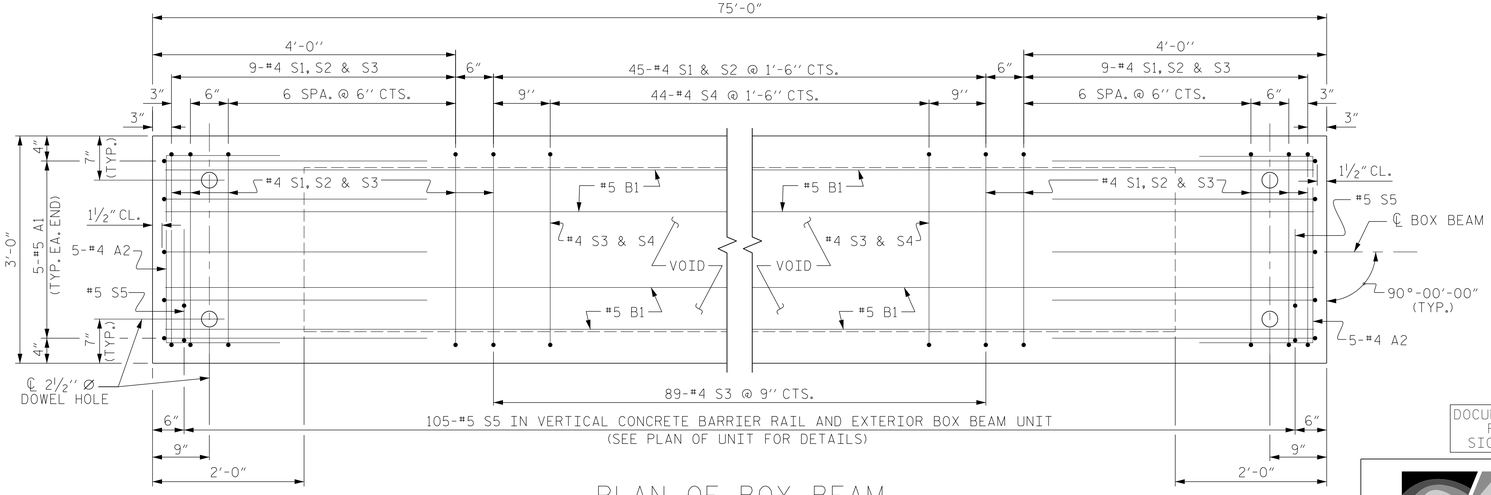


SHEAR KEY DETAIL

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

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



PLAN OF BOX BEAM

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

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STATE OF NORTH CAROLINA
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RALEIGH
STANDARD

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

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2			4			16

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CHECKED BY : J.LOFTUS	DATE : 02/15		
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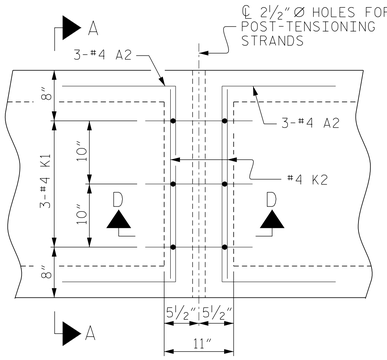
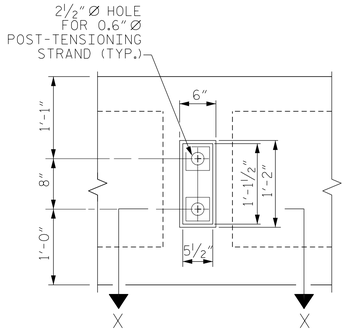
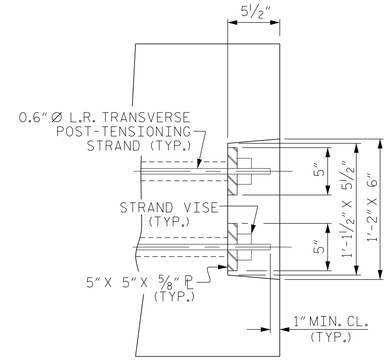


PLAN

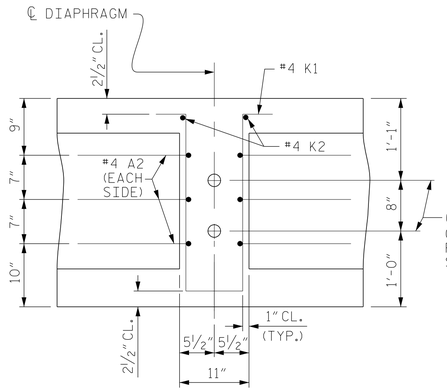


VIEW Y-Y

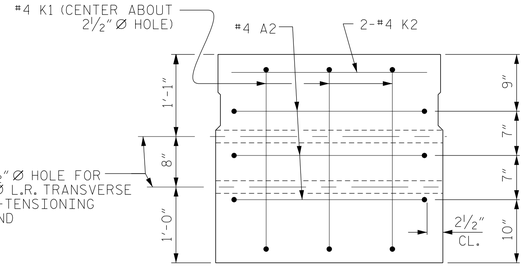
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

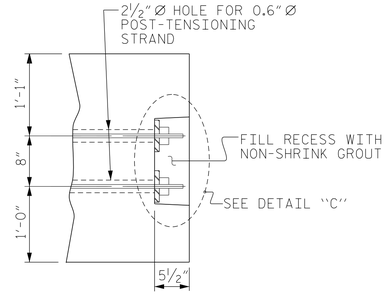


SECTION D-D

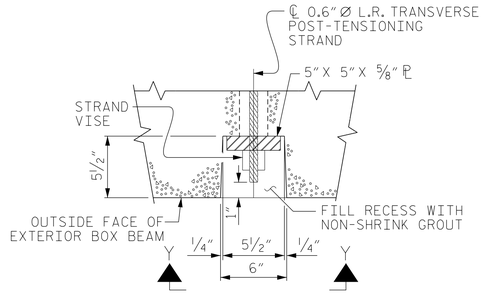


SECTION A-A

VOIDS NOT SHOWN



PART SECTION AT RECESS



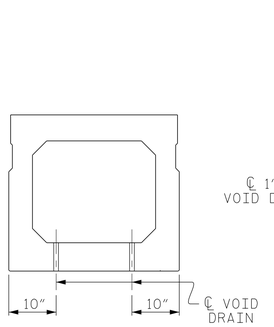
SECTION X-X

SHOWING PLAN VIEW OF GROUTED RECESS

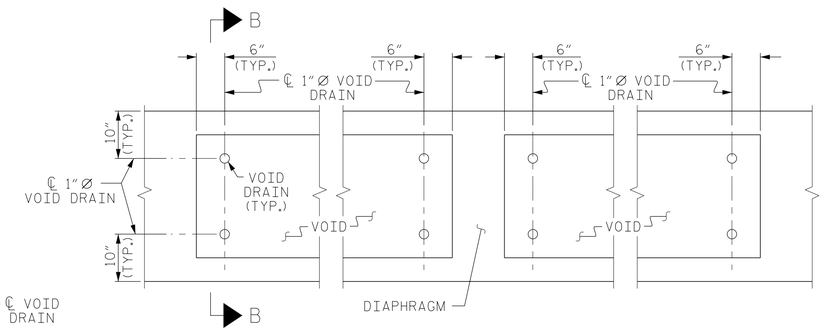
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

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"
75' BOX BEAM UNIT (NC & SE)	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1¾" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	½" ↓
FINAL CAMBER	1¼" ↑

** INCLUDES FUTURE WEARING SURFACE

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY : H.ASSFOURA	DATE : 02/15		
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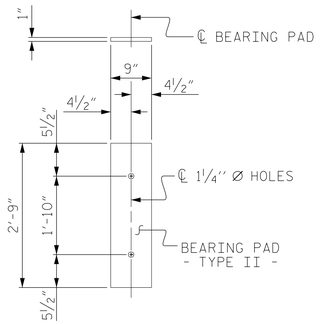
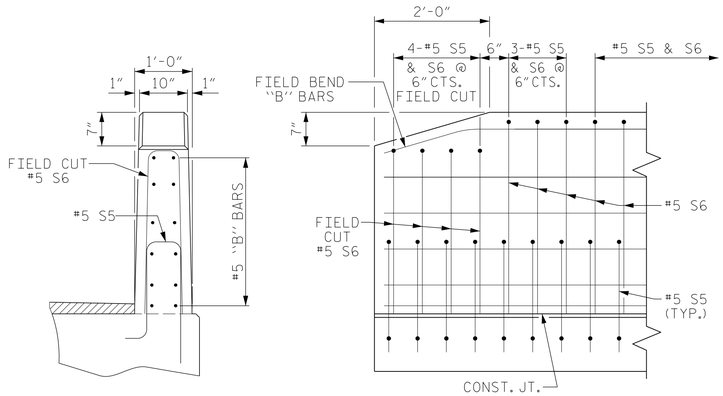


FIXED END

(TYPE II - 24 REQ'D)

ELASTOMERIC BEARING DETAILS

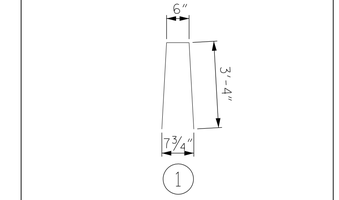
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



END VIEW

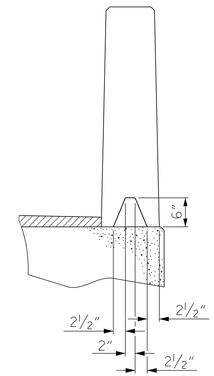
SIDE VIEW

END OF RAIL DETAILS



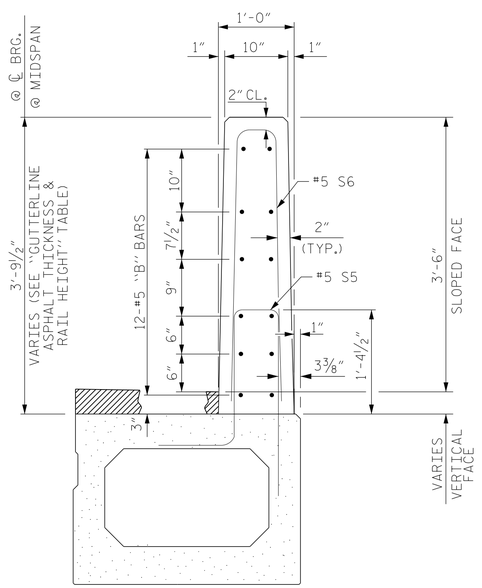
BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

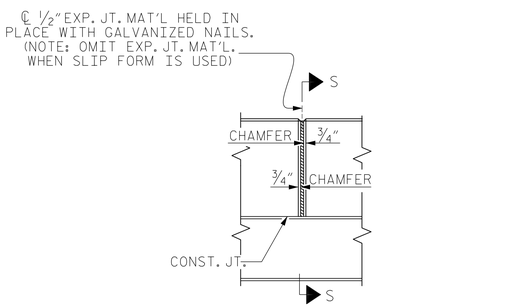


SECTION S-S

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



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
75' UNITS	2¼"	3'-8¼"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	75' UNIT				
✳ B7	72	#5	STR	24'-7"	1846
✳ S6	210	#5	1	7'-2"	1570
✳ EPOXY COATED REINFORCING STEEL			LBS.		3416
CLASS AA CONCRETE			CU.YDS.		19.4
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		150.25

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	75'-0"	150'-0"
INTERIOR B.B.	10	75'-0"	750'-0"
TOTAL	12	———	900'-0"

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SHEET 5 OF 5

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RALEIGH

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

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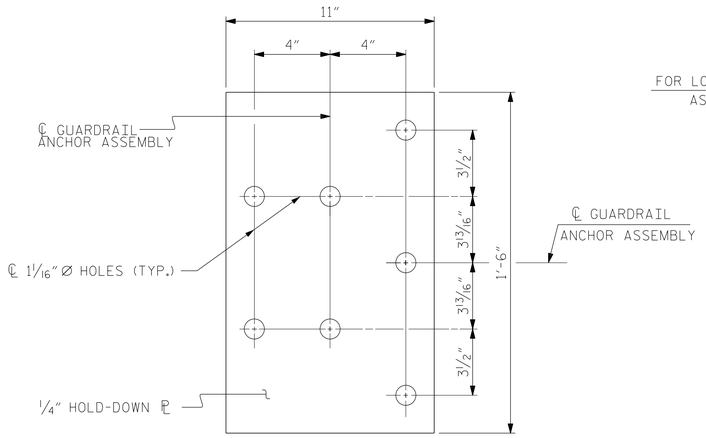
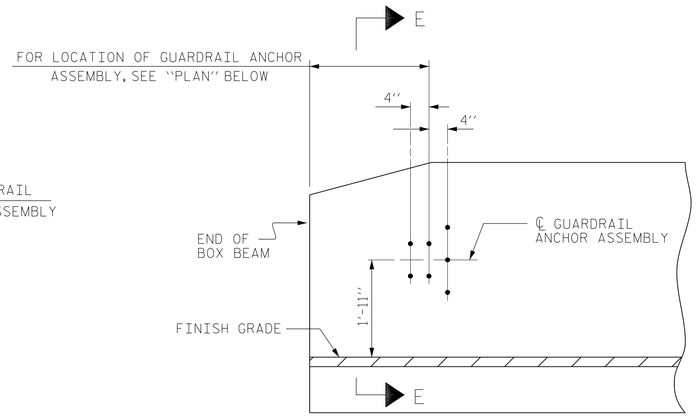


PLAN



ELEVATION

NOTES

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

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

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

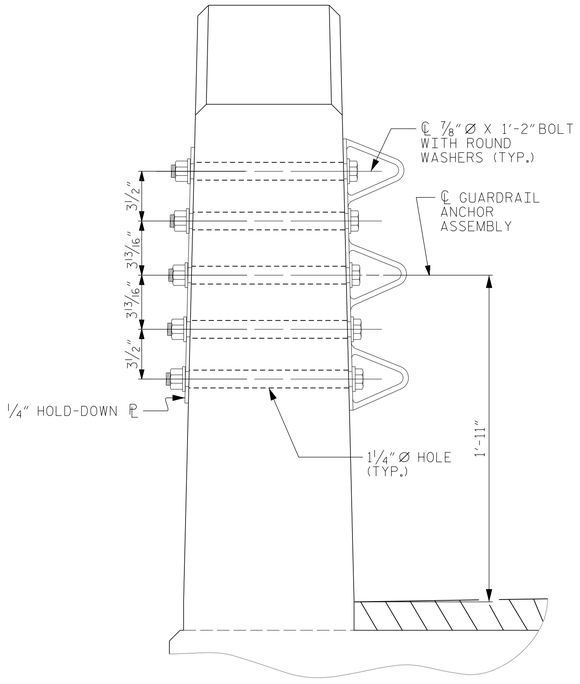
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

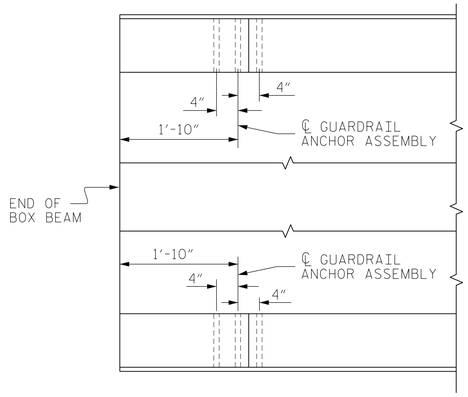
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

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STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

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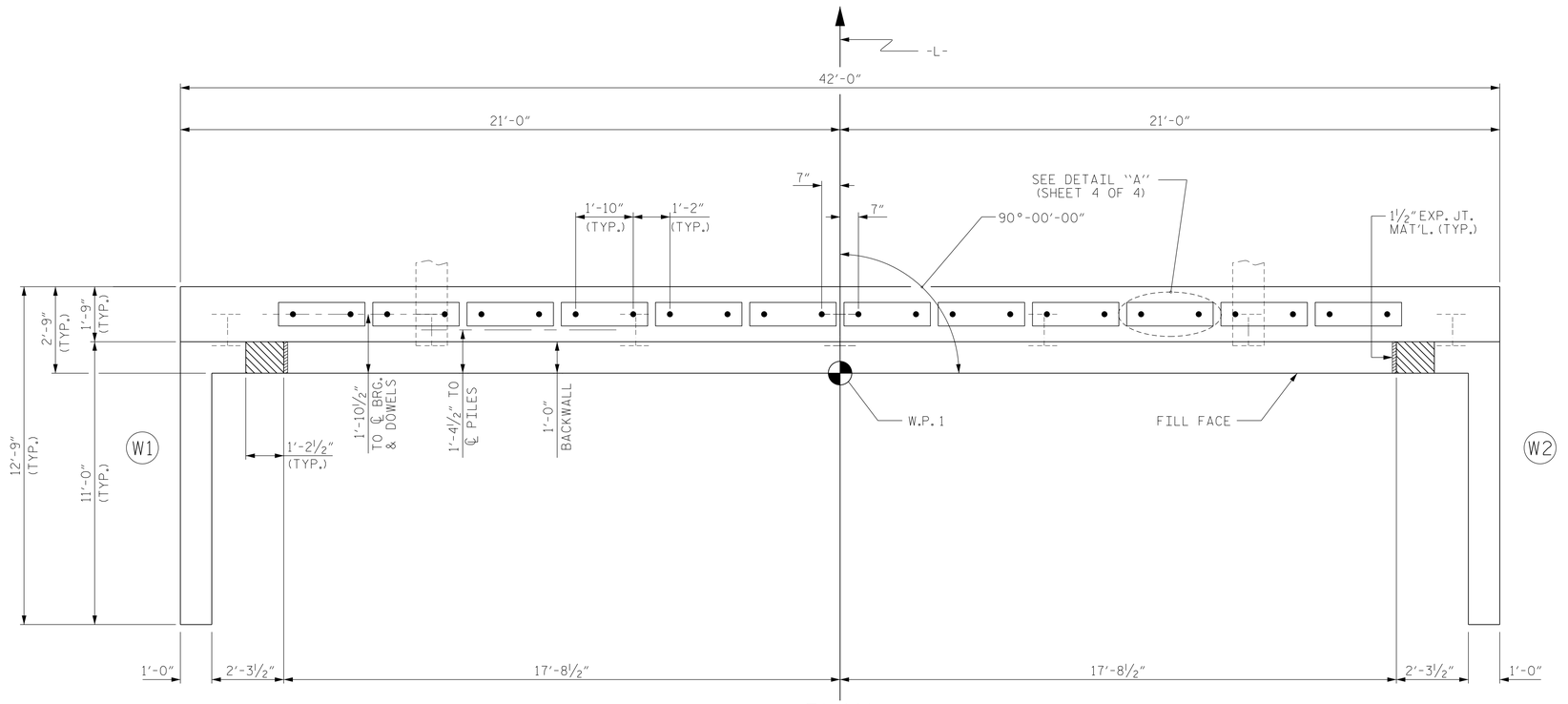
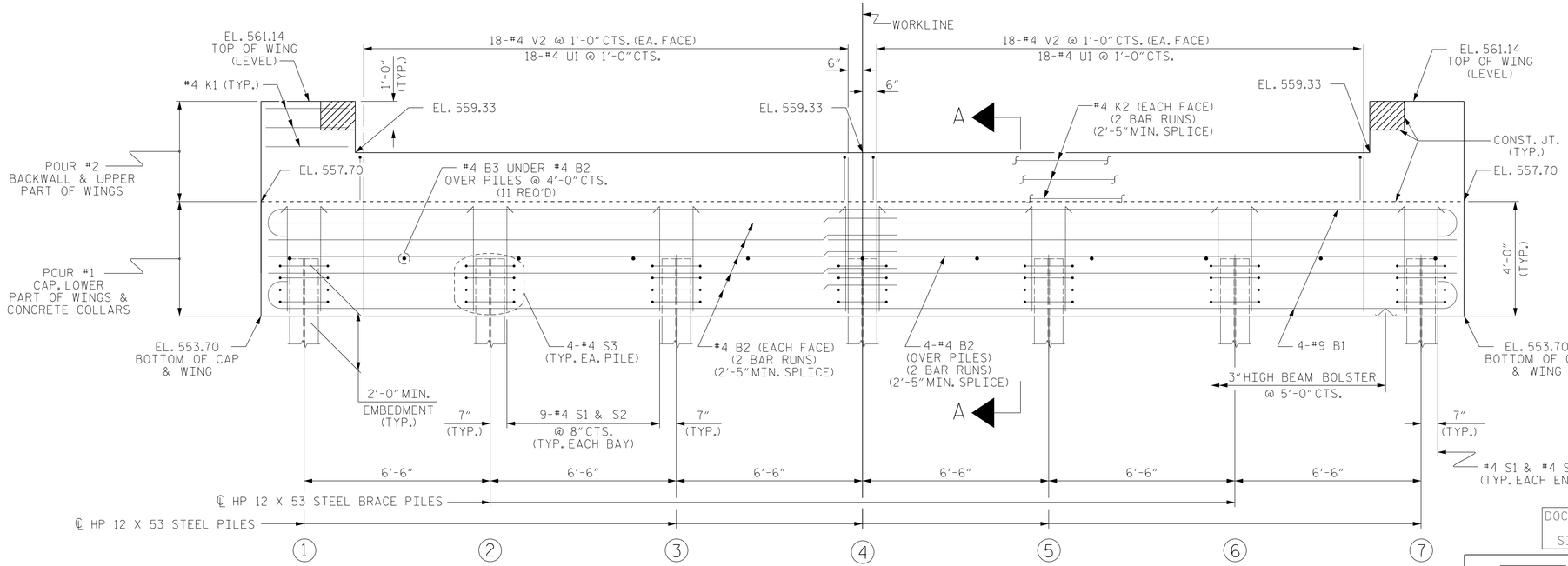
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY :	H.ASSFOURA	DATE :	02/15
CHECKED BY :	J.LOFTUS	DATE :	02/15
DRAWN BY :	MAA 5/10	REV. 10/1/11	MAA/GM
CHECKED BY :	GM 5/10	REV. 12/5/11	MAA/GM
		REV. 6/13	MAA/GM

BRIDGE NO: 720014
2/3/2016
...\400_009_416653E_SMU_GRA01.dgn
USER:jloftus



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 VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4"DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

DocuSigned by: Jeff Loftus FE51DC02E6794A9... 2/3/2016

NORTH CAROLINA PROFESSIONAL SEAL 041425 ENGINEER JEFFREY M. LOFTUS

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PERSON COUNTY
STATION: 16+91.50 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

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

ASSEMBLED BY :	H.ASSFOURA	DATE :	02/15
CHECKED BY :	J.LOFTUS	DATE :	02/15
DRAWN BY : WJH	12/11	REV. 8/14	MAA/TMG
CHECKED BY : AAC	12/11		

BRIDGE NO: 7200141
2/3/2016
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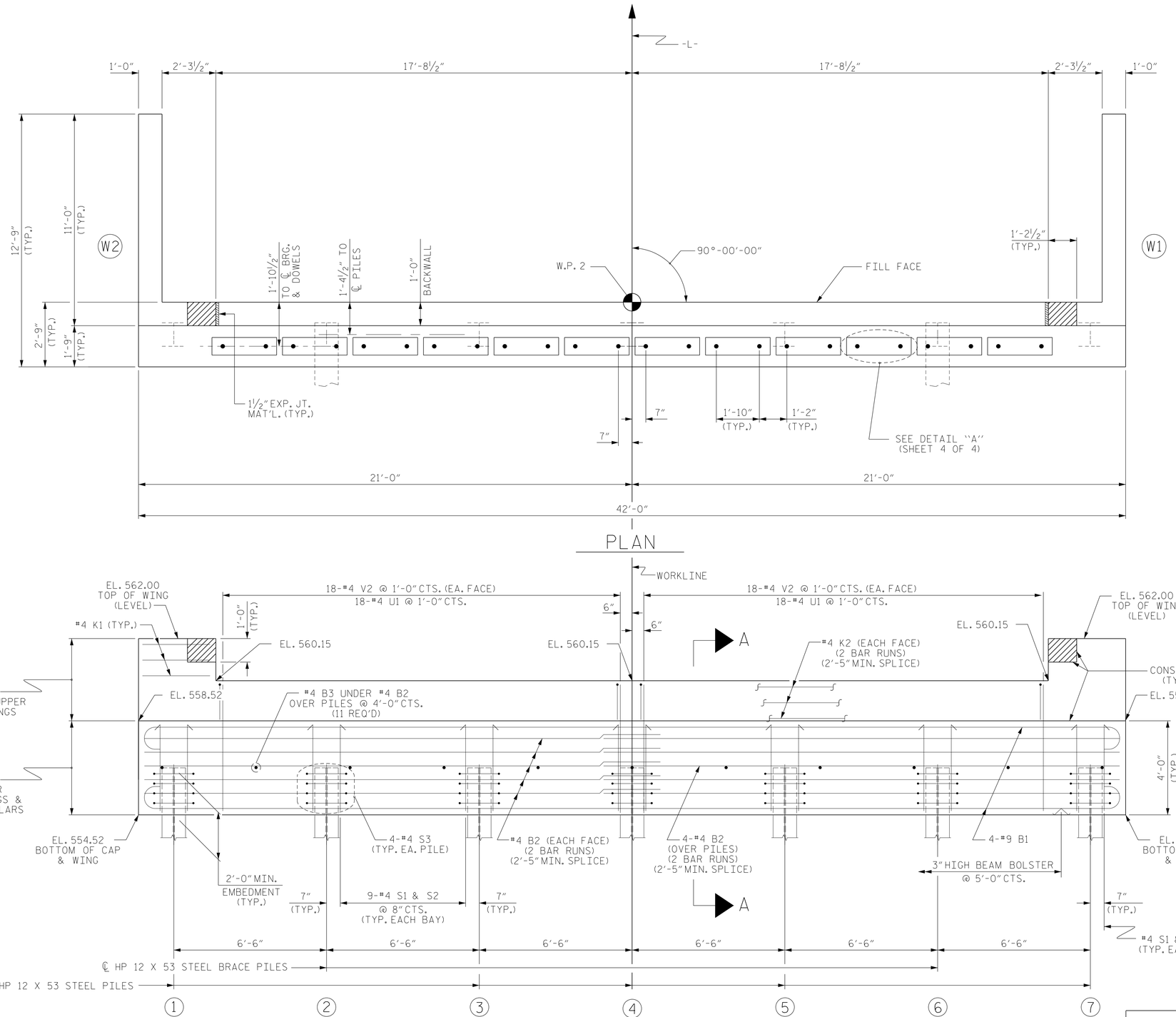
USER:jloftus

STD. NO. EB_36_90S4_33BB



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 VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

DocuSigned by: Jeff Loftus FE51DC02E6794A9... 2/3/2016

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SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

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

ASSEMBLED BY :	H.ASSFOURA	DATE :	02/15
CHECKED BY :	J.LOFTUS	DATE :	02/15
DRAWN BY : WJH	12/11	REV. 8/14	MAA/TMG
CHECKED BY : AAC	12/11		

2/3/2016
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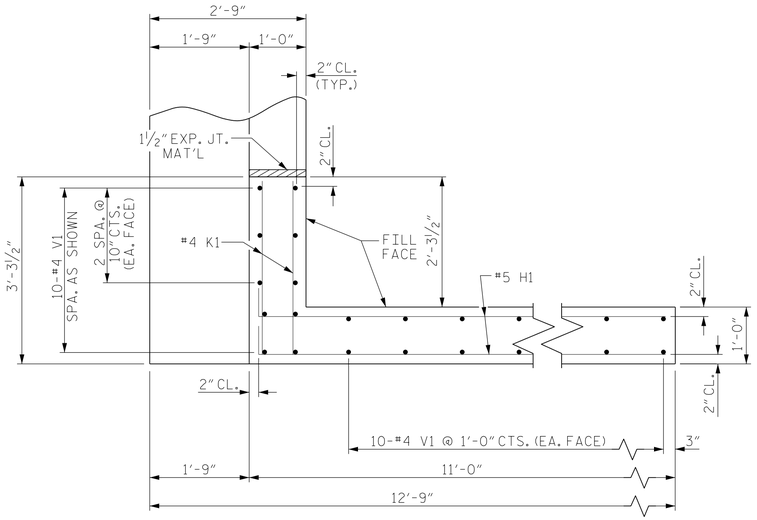
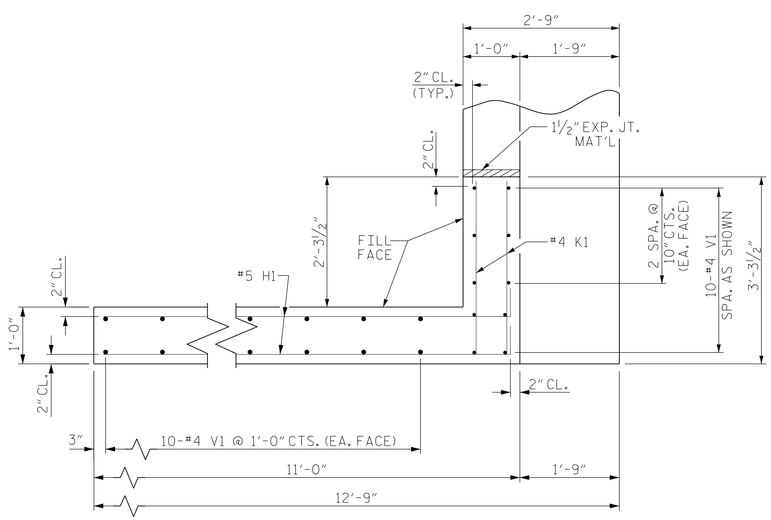
USER:jloftus

BRIDGE NO: 720014

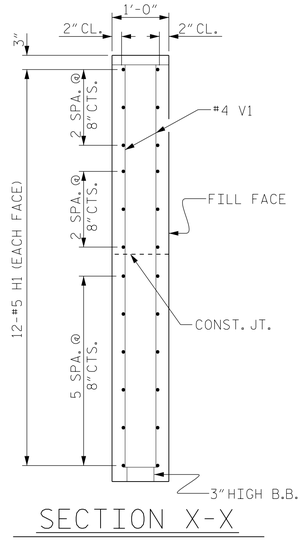
STD. NO. EB_36_90S4_33BB



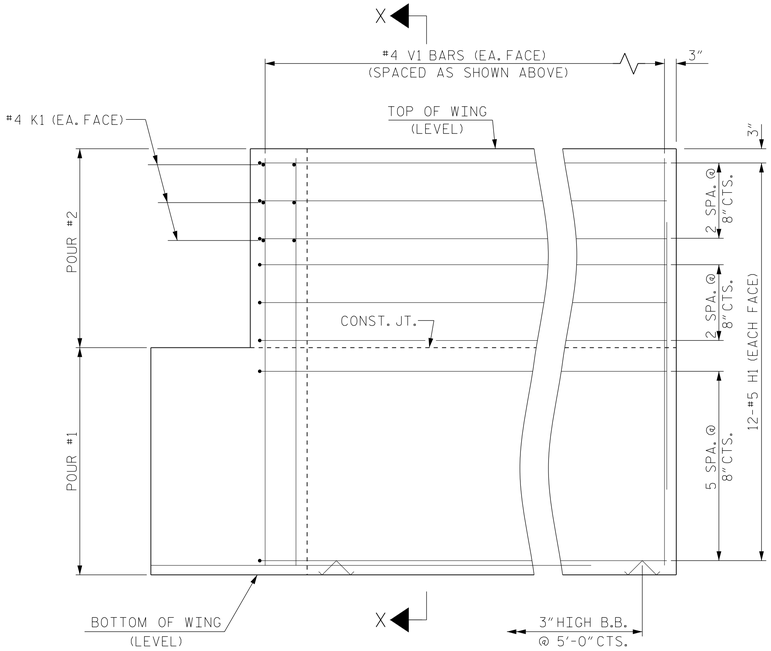
PLAN OF WING (W1)



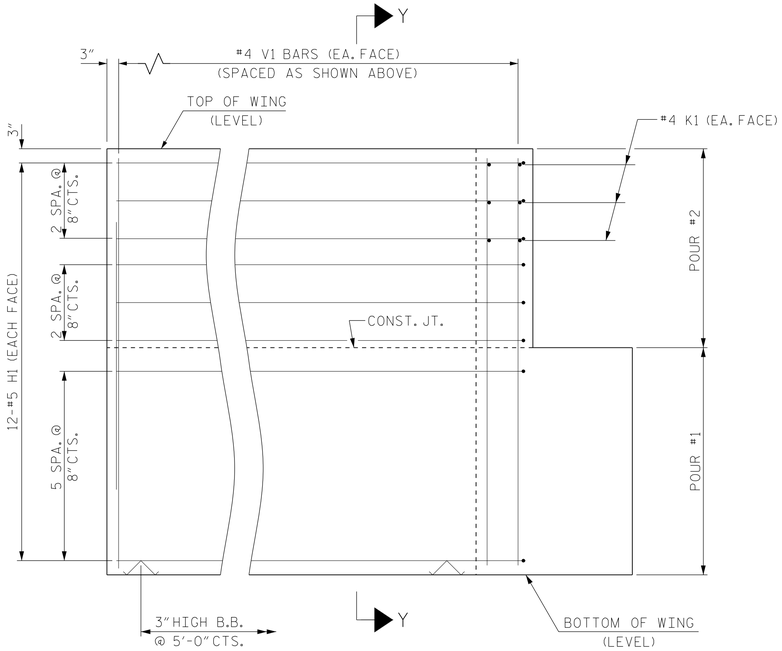
PLAN OF WING (W2)



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

SECTION Y-Y

WING DETAILS

PROJECT NO. 41665.3E

PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 3 OF 4

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2/3/2016

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SUBSTRUCTURE

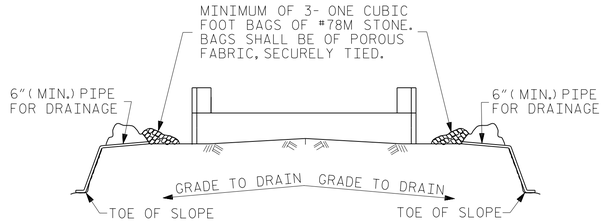
END BENT
WING DETAILS

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

ASSEMBLED BY : H.ASSFOURA		DATE : 02/15	
CHECKED BY : J.LOFTUS		DATE : 02/15	
DRAWN BY : WJH 12/11	REV. 8/14		MAA/TMC
CHECKED BY : AAC 12/11			

BRIDGE NO: 720014

2/3/2016
...\400_012_416653E_SMU_EB03.dgn
USER:jloftus

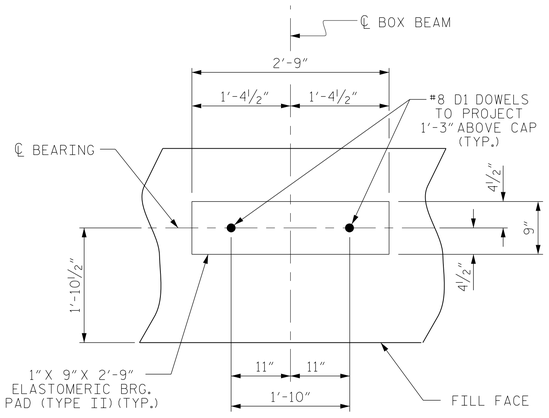


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

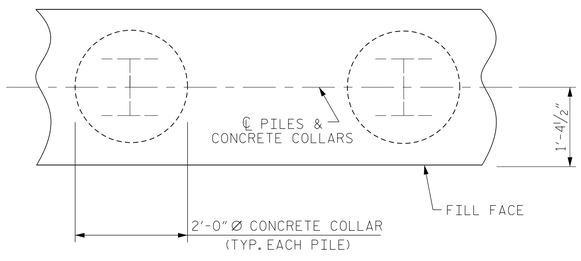
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

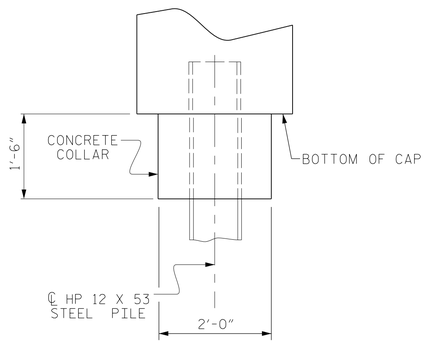


DETAIL ''A''

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



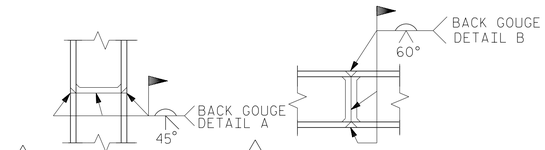
PLAN



ELEVATION

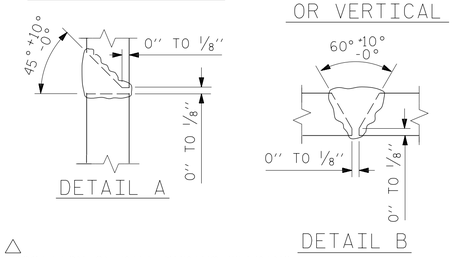
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



△ PILE VERTICAL

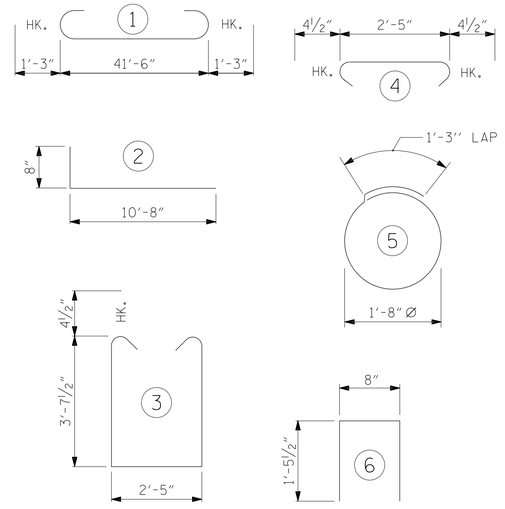
△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 70	NO: 7 LIN. FT.= 70

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	44'-0"	1197
B2	28	#4	STR	22'-1"	413
B3	11	#4	STR	2'-5"	18
D1	24	#8	STR	2'-3"	144
H1	48	#5	2	11'-4"	567
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	22'-1"	177
S1	56	#4	3	10'-5"	390
S2	56	#4	4	3'-2"	118
S3	28	#4	5	6'-6"	122
U1	36	#4	6	3'-7"	86
V1	60	#4	STR	7'-2"	287
V2	72	#4	STR	5'-3"	253

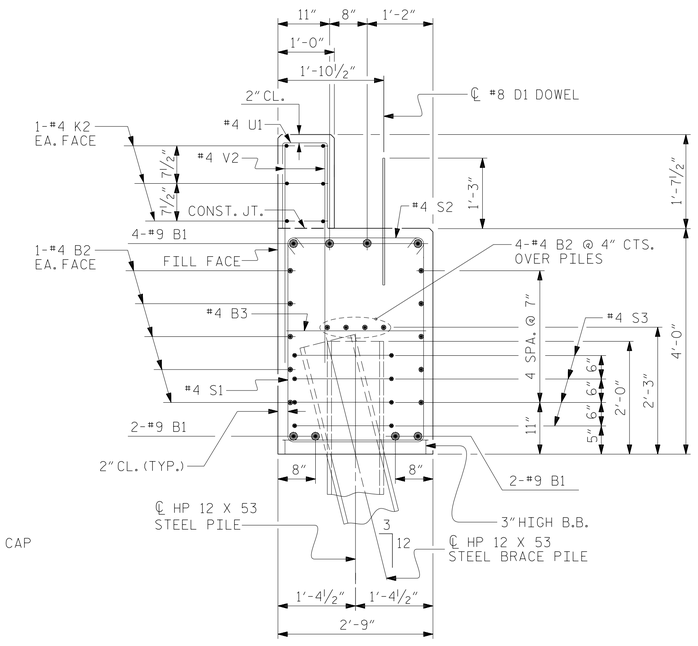
REINFORCING STEEL (FOR ONE END BENT) 3795 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 21.3 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 5.5 C.Y.

TOTAL CLASS A CONCRETE 26.9 C.Y.



1-#4 K2 EA. FACE

1-#4 B2 EA. FACE

℄ #8 D1 DOWEL

SECTION A-A

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

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PERSON COUNTY

STATION: 16+91.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

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

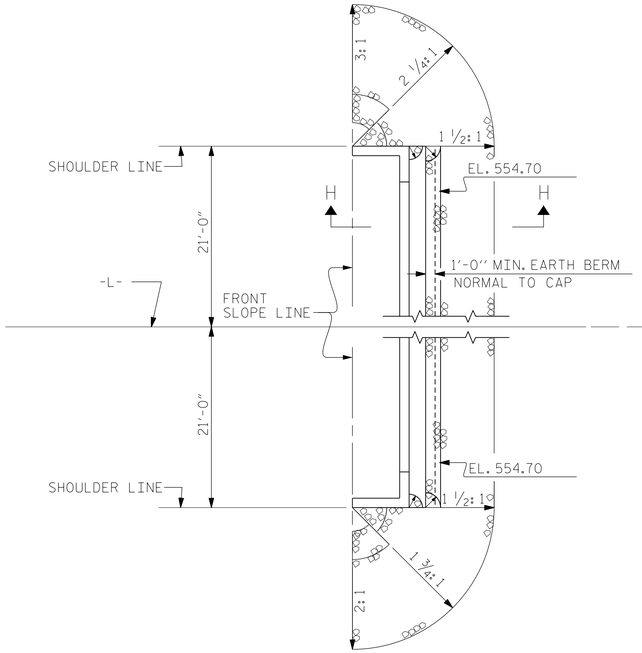
ASSEMBLED BY : H.ASSFOURA	DATE : 02/15	
CHECKED BY : J.LOFTUS	DATE : 02/15	
DRAWN BY : WJH 12/11	REV. 8/14	MAA/TMG
CHECKED BY : AAC 12/11		

BRIDGE NO: 720014

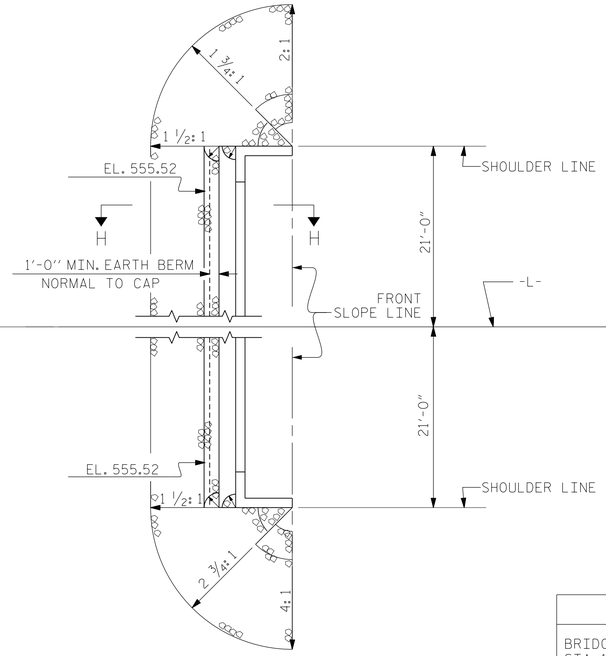
2/3/2016
...\400_013_416653E_SMU_EB04.dgn
USER:jloftus

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



@ END BENT NO. 1

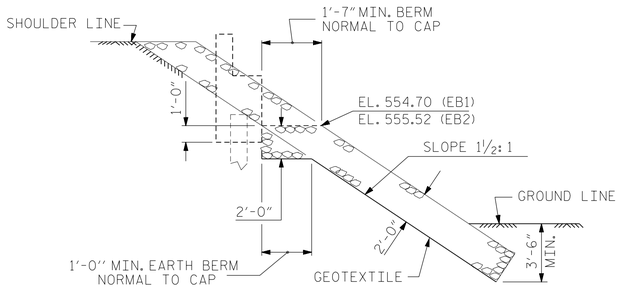


@ END BENT NO. 2

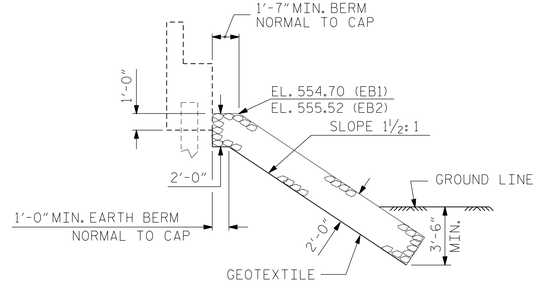
PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+91.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	69	77
END BENT 2	98	109
BANK STAB. - END BENT 1	*126	*171
BANK STAB. - END BENT 2	*144	*194

* SEE GENERAL DWG FOR LIMITS OF BANK STABILIZATION CLASS II RIP RAP



SECTION H-H



℄ SECTION
BERM RIP RAPPED

DocuSigned by:
Jeff Loftus
FE51DC02E6794A9...
2/3/2016

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041425
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STANDARD

RIP RAP DETAILS

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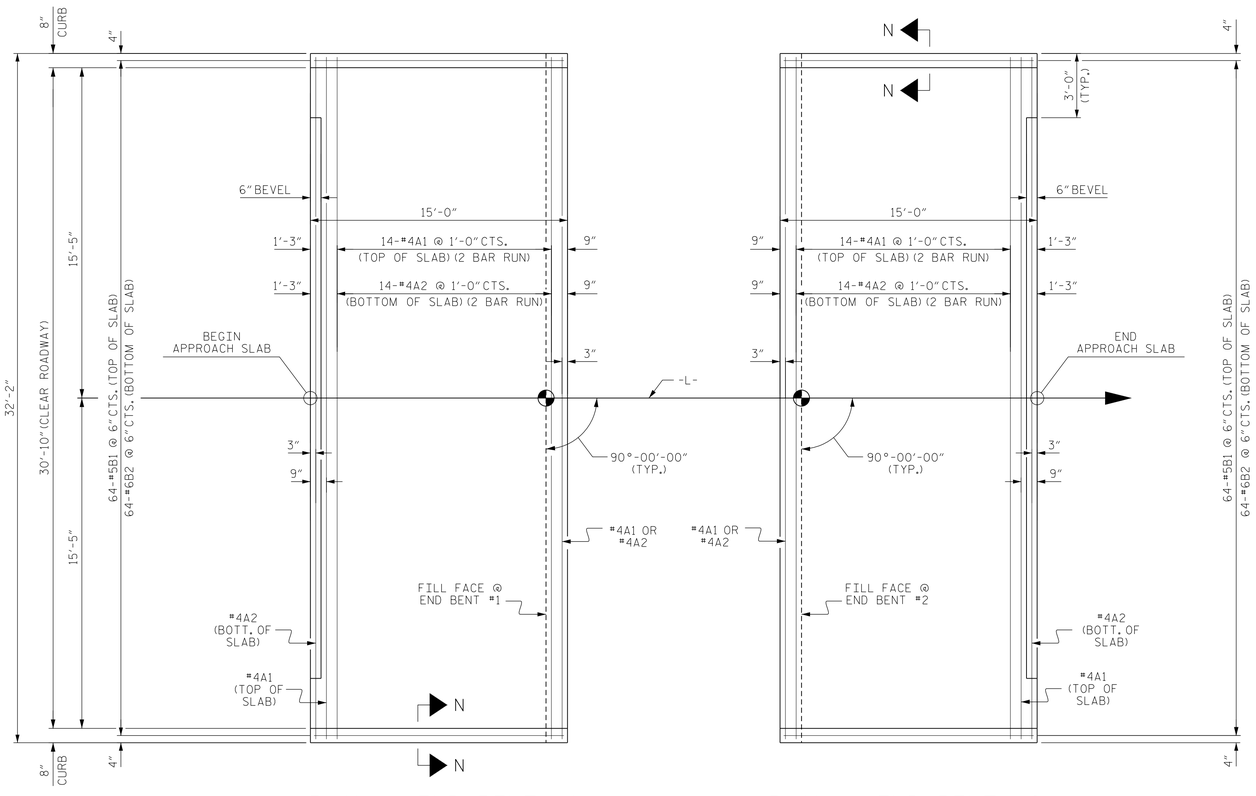
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

DRAWN BY:	H.ASSFOURA	DATE : 02/15
CHECKED BY:	J.LOFTUS	DATE : 02/15
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 12/15

BRIDGE NO: 720014

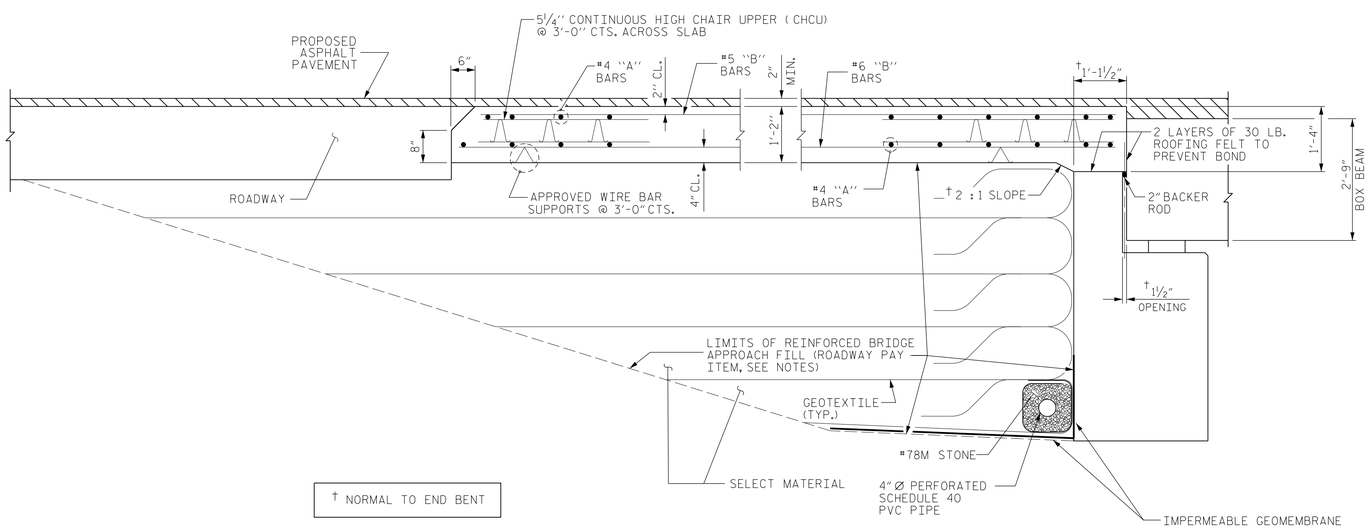
2/3/2016
...\400_014_416653E_SMU_RR01.dgn
USER:jloftus



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

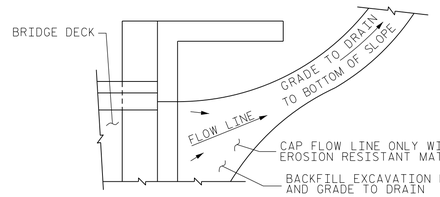
SECTION THRU SLAB

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

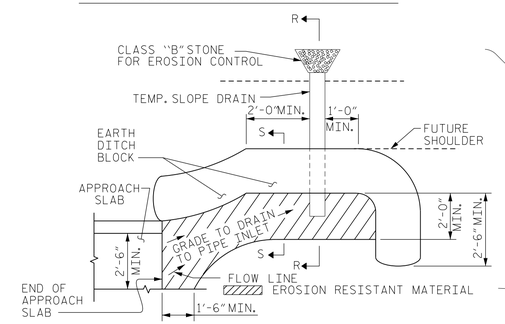
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

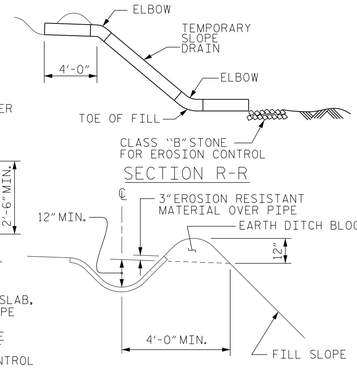


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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



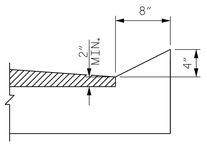
SECTION R-R

SECTION S-S

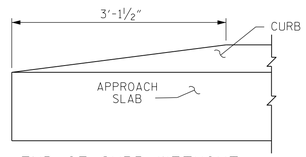
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

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2/3/2016

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Raleigh, NC 27601
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www.stewartinc.com
STEWART

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	16'-11"	362
A2	32	#4	STR	16'-9"	358
.	.	.	.	.	.
* B1	64	#5	STR	14'-2"	946
B2	64	#6	STR	14'-8"	1410
REINFORCING STEEL				LBS.	1768
* EPOXY COATED REINFORCING STEEL				LBS.	1308
CLASS AA CONCRETE				C. Y.	21.2

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	16'-11"	362
A2	32	#4	STR	16'-9"	358
.	.	.	.	.	.
* B1	64	#5	STR	14'-2"	946
B2	64	#6	STR	14'-8"	1410
REINFORCING STEEL				LBS.	1768
* EPOXY COATED REINFORCING STEEL				LBS.	1308
CLASS AA CONCRETE				C. Y.	21.2

PROJECT NO. 41665.3E

PERSON COUNTY

STATION: 16+91.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

DRAWN BY: J. LOFTUS DATE: 12/15
CHECKED BY: D. RUGGLES DATE: 12/15
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 12/15

BRIDGE NO: 720014

2/3/2016
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USER:jloftus

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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STATION: 16+91.50 -L-

BRIDGE NO: 720014

2/3/2016
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USER:jloftus

ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (J) RGW REV. 5-7-03 RWW (J) JTE REV. 10-1-11 MAA (J) GM
REV. 8-16-99 RWW (J) LES REV. 5-1-06 TLA (J) GM

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