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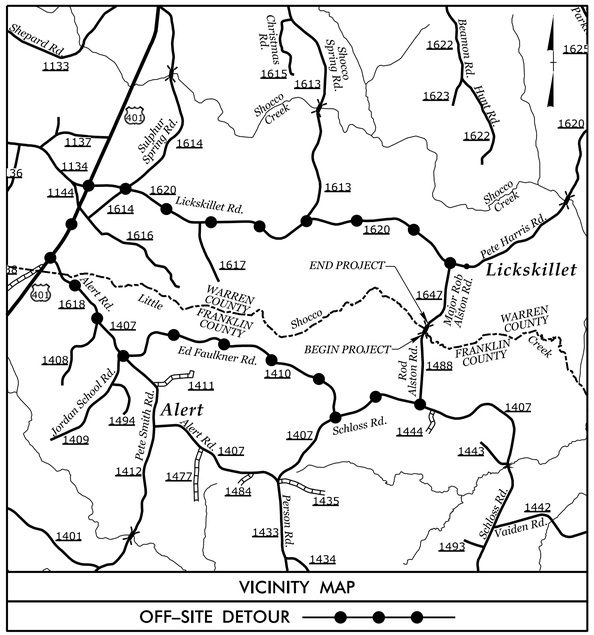
09/08/99

TIP PROJECT: 17BP.5.R.78

CONTRACT: DE00359



VICINITY MAP

OFF–SITE DETOUR

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FRANKLIN & WARREN COUNTIES

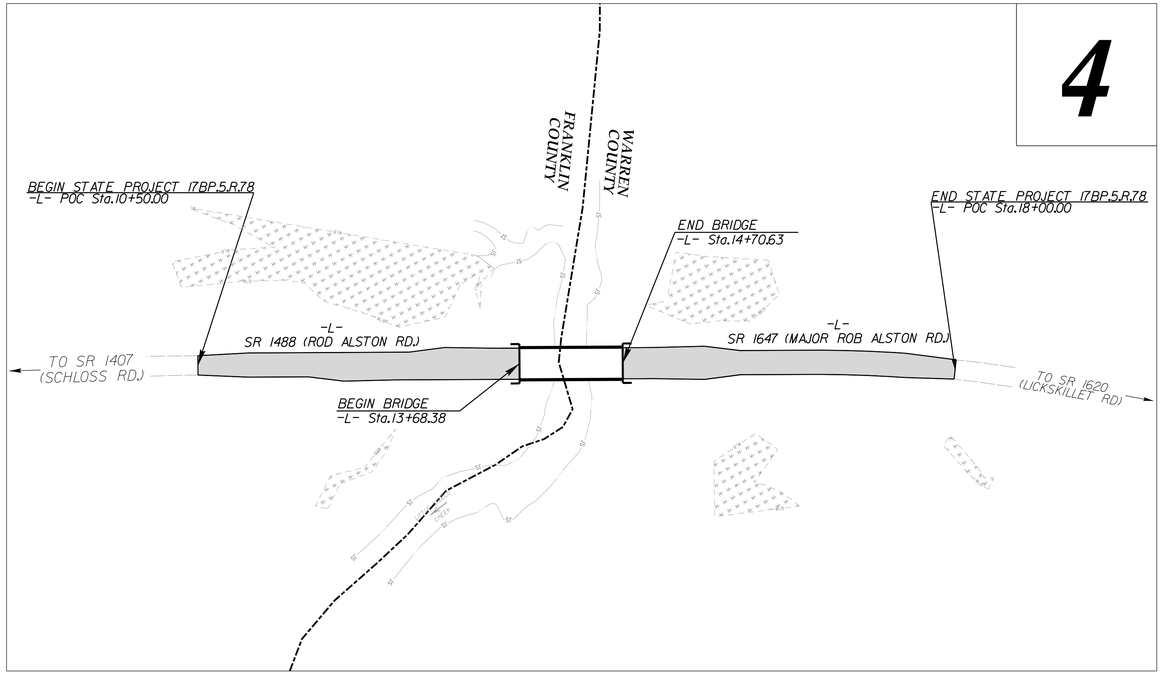
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.78	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.5.R.78	N/A	PE
17BP.5.R.78	N/A	RIGHT–OF–WAY
17BP.5.R.78	N/A	UTILITIES
17BP.5.R.78	N/A	CONSTRUCTION

LOCATION: BRIDGE NO. 140 OVER LITTLE SHOCCO CREEK ON SR 1488 (ROD ALSTON RD.) /SR 1647 (MAJOR ROB ALSTON RD.)

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

NAD 83/NA 2011



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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 = 120
V = 60 MPH
CLASS = RURAL LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 17BP.5.R.78 = 0.123 mi.
LENGTH STRUCTURES STATE PROJECT 17BP.5.R.78 = 0.019 mi.
TOTAL LENGTH STATE PROJECT 17BP.5.R.78 = 0.142 mi.

Prepared in the Offices of:

STEWART
223 S. WEST ST, STE 1100
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vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 12, 2017

RIGHT OF WAY COMPLETE:
JANUARY 22, 2019

LETTING DATE:
JANUARY 18, 2022

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER

LISA GILCHRIST, EI
NCDOT CONTACT

HYDRAULICS ENGINEER

1/5/2023

DocuSigned by:
Reid B. Robol
9E3E5A39E6894F4...

SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 043870 ENGINEER REID B. ROBOL

P.E.

ROADWAY DESIGN ENGINEER

1/5/2023

DocuSigned by:
Michael S. Burns, Jr.
D425C8CC006F437...

SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.

P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

1/4/2023
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USER:mburns

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	1A

ROADWAY DESIGN ENGINEER
1/5/2023

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S BURNS

DocuSigned by:
Michael S. Burns, Jr.
DA26C8CCD05E437...

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Raleigh, NC 27603
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INDEX OF SHEETS

EFF. 01-16-2018
REV.

2018 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, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modiefied Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation (Use Detail Sheet 2C-1 in leiu of Sheet 6 of 8)
862.03	Structure Anchor Units (Use Detail Sheet 2C-2 in leiu of Sheets 1 of 7 & 2 of 7)

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

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

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.

TEMPORARY SHORING:

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

END BENTS:

THE 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.

RIGHT-OF-WAY MARKERS:

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

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW 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

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:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

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 — HH
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)* — T
- U/G Telephone Cable (SUE – LOS C)* — T
- U/G Telephone Cable (SUE – LOS D)* — T
- U/G Telephone Conduit (SUE – LOS B)* — TC
- U/G Telephone Conduit (SUE – LOS C)* — TC
- U/G Telephone Conduit (SUE – LOS D)* — TC
- U/G Fiber Optics Cable (SUE – LOS B)* — T FO
- U/G Fiber Optics Cable (SUE – LOS C)* — T FO
- U/G Fiber Optics Cable (SUE – LOS D)* — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)* — TV
- U/G TV Cable (SUE – LOS C)* — TV
- U/G TV Cable (SUE – LOS D)* — TV
- U/G Fiber Optic Cable (SUE – LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)* — G
- U/G Gas Line (SUE – LOS C)* — G
- U/G Gas Line (SUE – LOS D)* — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)* — FSS
- SS Force Main Line (SUE – LOS C)* — FSS
- SS Force Main Line (SUE – LOS D)* — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS

DocuSigned by: 11/24/2019
Michael S. Burns, Jr.

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER MARK C. MORRISON

DocuSigned by: 11/25/2019
Clark Morrison

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REVISIONS

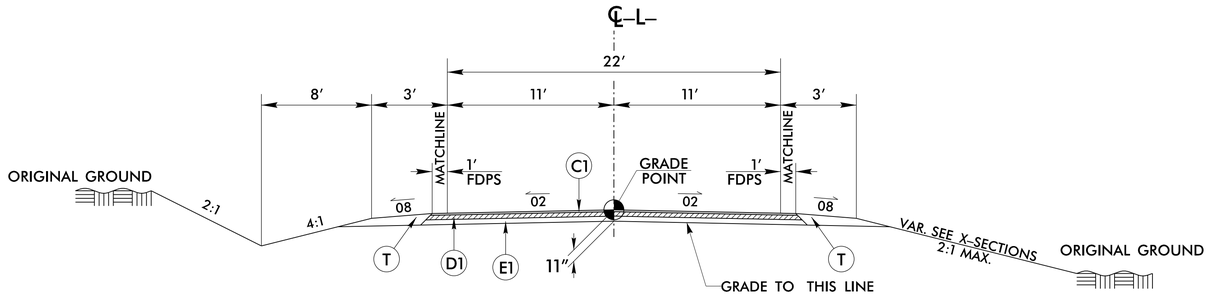
5/14/99

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

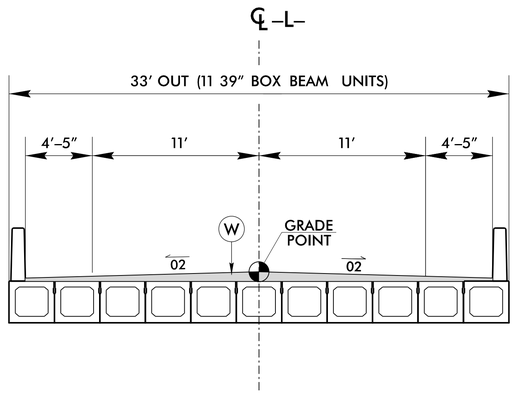
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, 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 B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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



TYPICAL SECTION NO. 1

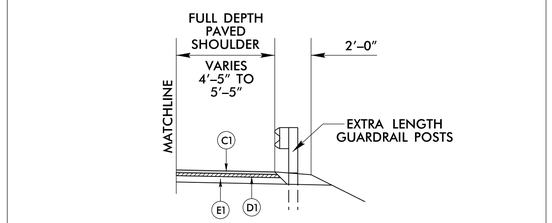
–L– STA. 10+50.00 TO –L– STA. 13+68.38 (BEGIN BRIDGE)
–L– STA. 14+70.63 (END BRIDGE) TO –L– STA. 18+00.00



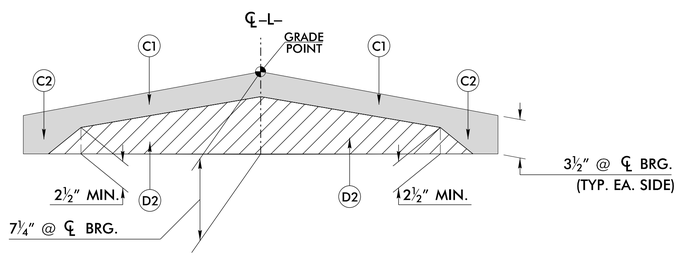
NOTE:
FOR ASPHALT DEPTHS, SEE STRUCTURE PLANS

TYPICAL SECTION NO. 2

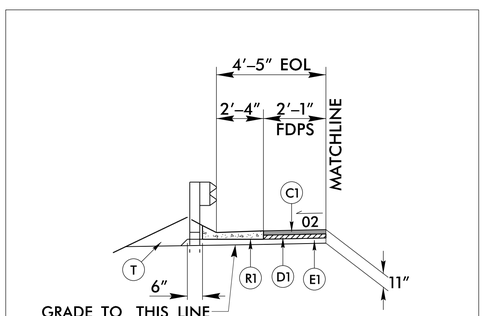
–L– STA. 13+68.38 (BEGIN BRIDGE) TO –L– STA. 14+70.63 (END BRIDGE)



DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL ON –L–



DETAIL SHOWING METHOD OF WEDGING ON BRIDGE
USE IN CONJUNCTION WITH BRIDGE TYPICAL SECTION



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

USE SHOULDER BERM GUTTER AT THE FOLLOWING LOCATIONS:
–L– STA. 14+81.50 (END APPROACH SLAB) TO –L– STA. 14+98.00 (LEFT)
–L– STA. 14+81.50 (END APPROACH SLAB) TO –L– STA. 14+98.00 (RIGHT)

11/24/2019
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USER:mburns

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.87	2C-1
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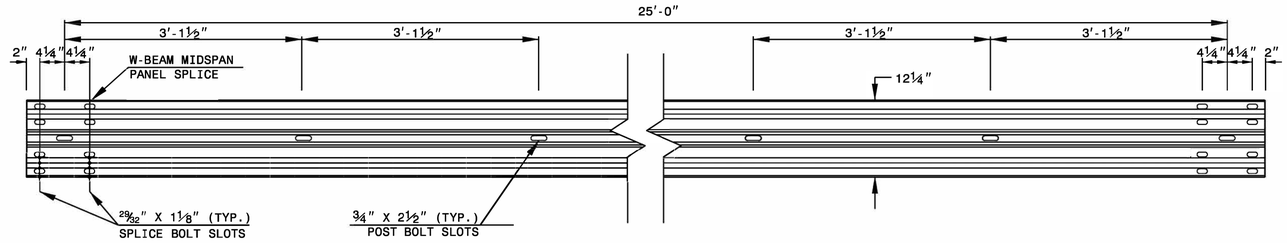
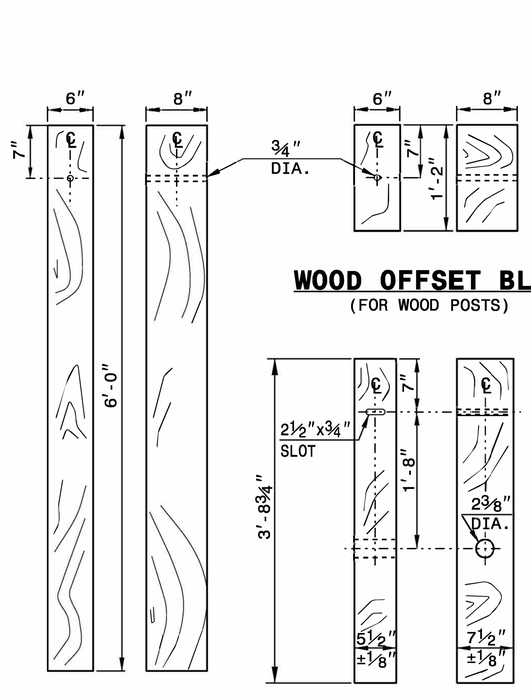
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



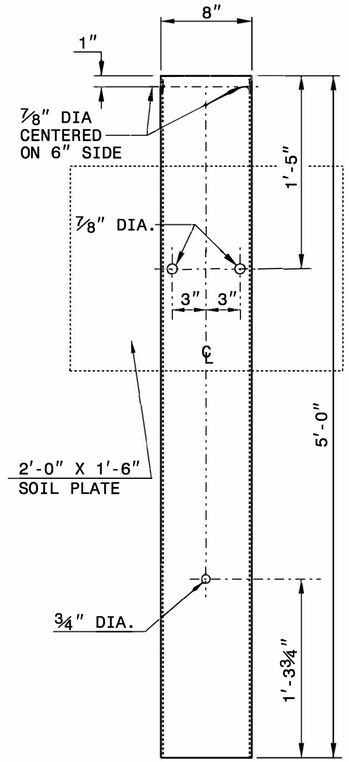
STANDARD W-BEAM GUARDRAIL



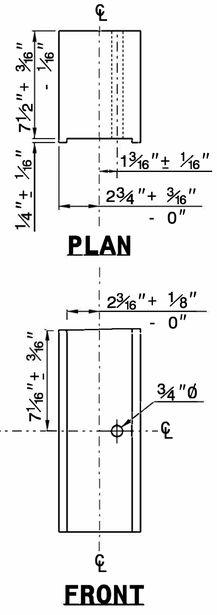
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"

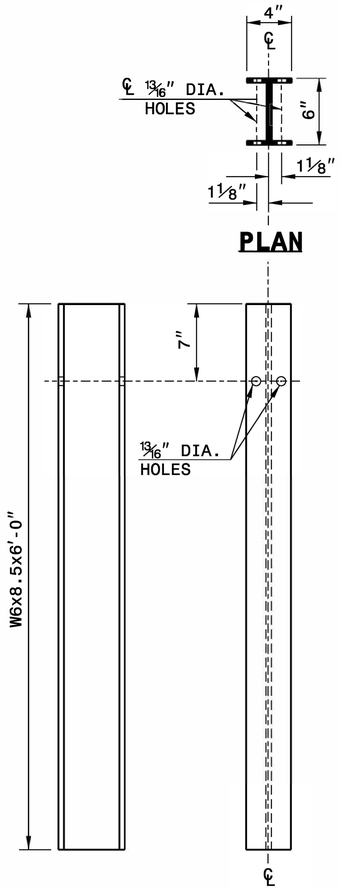


PLAN

SIDE

FRONT

ROUTED OFFSET BLOCK



PLAN

SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

1/5/2023

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144

DocuSigned by:
Nicole M. Huckler
5884323D34164C5...

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

SEE TITLE BLOCK

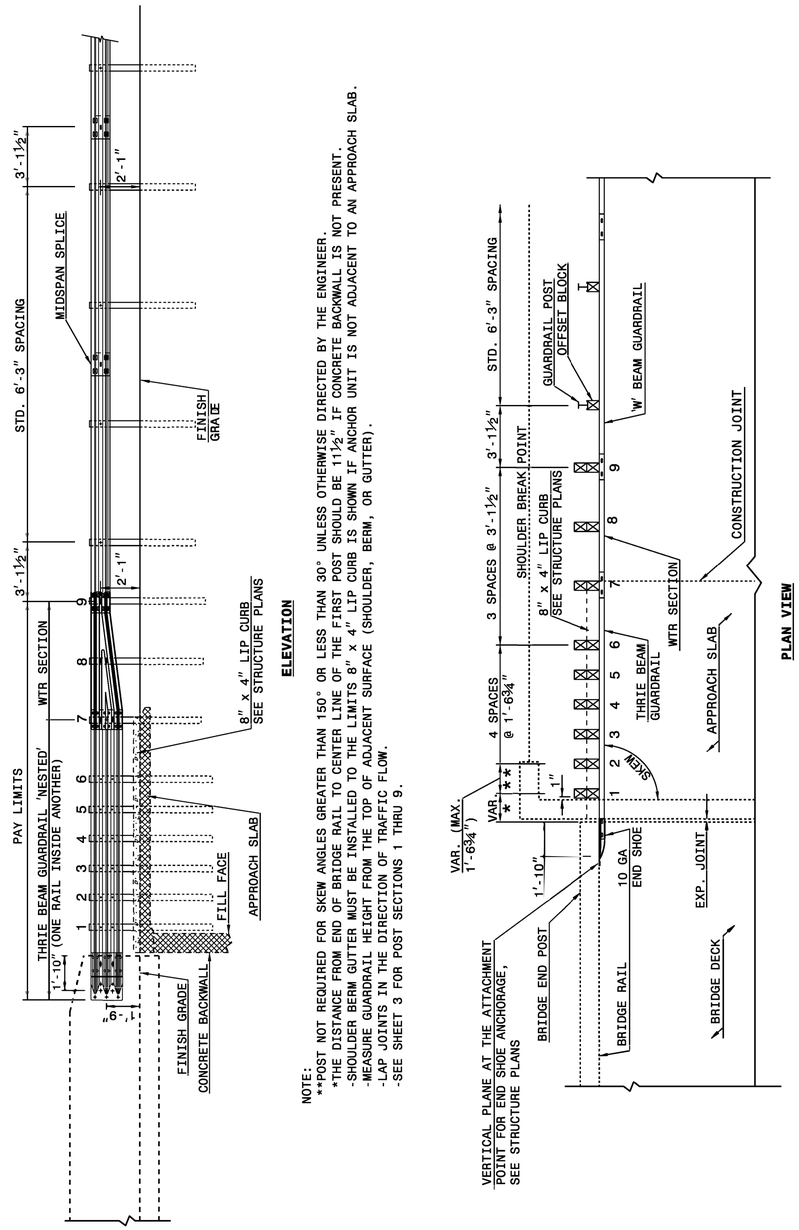
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	2C-2

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

ROADWAY 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



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.

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

1/5/2023

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE MARIE HUCKLE

DocuSigned by:
Nicole M. Huckle
588432303416405...

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

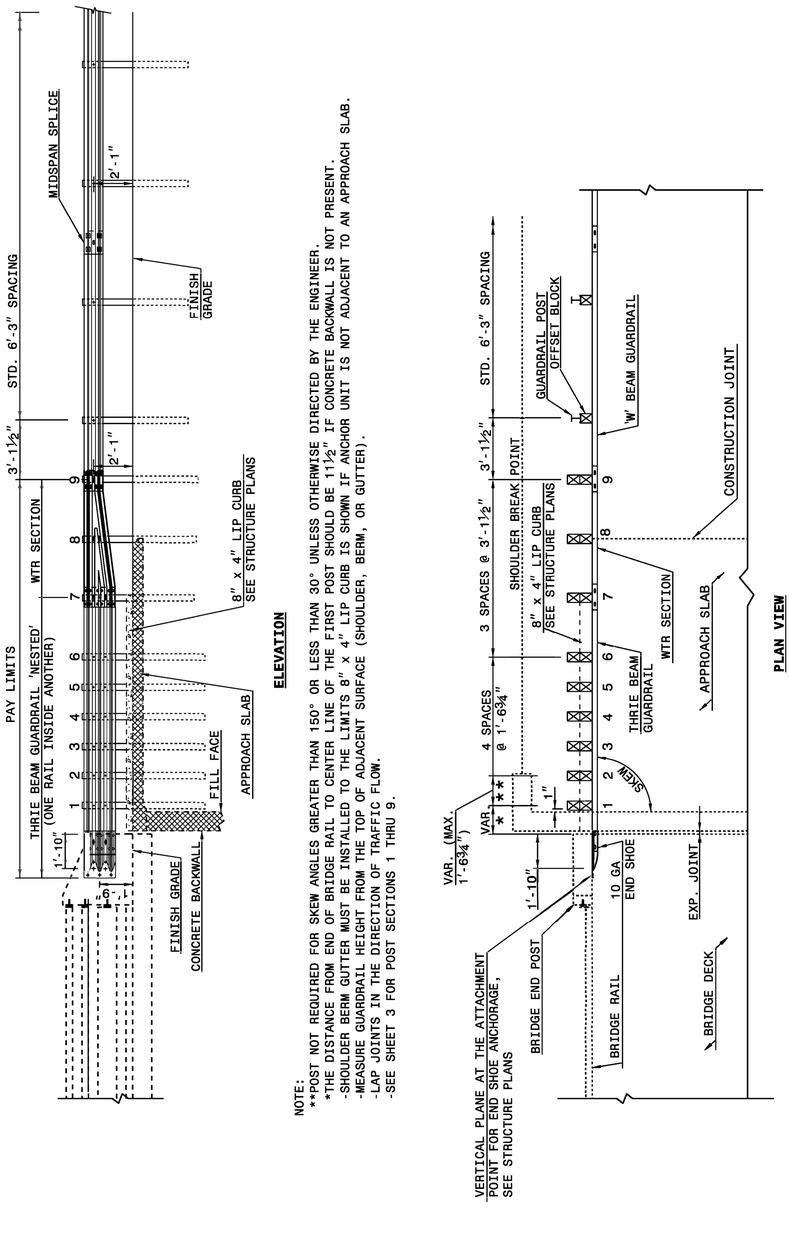
SEE TITLE BLOCK

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

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



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.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03

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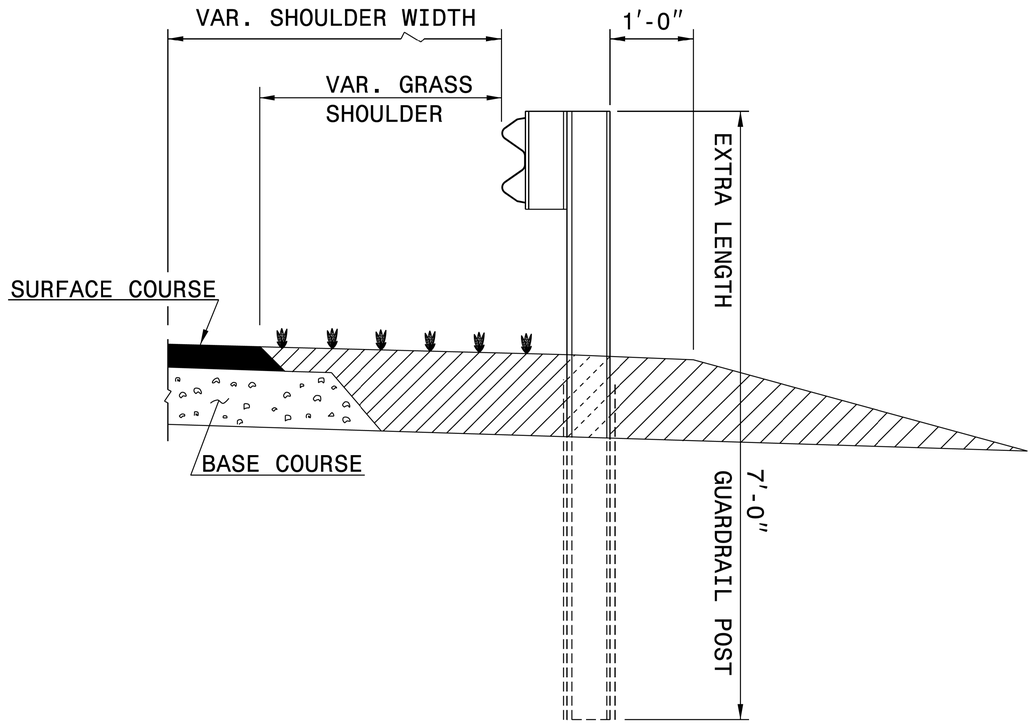
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\8862d0301.dgn
jhowerton AT CSD-2425595

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	2C-3



REFER TO NCDOT STANDARDS 862.01 AND 862.02 FOR PLACEMENT AND INSTALLATION.

1/5/2023

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE M. HACKLER

DocuSigned by:
Nicole M. Hackler
588432303416405...

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

7' GUARDRAIL POST

ORIGINAL BY: L. Robinson DATE: 1995
MODIFIED BY: L. Robinson DATE: Feb. 1996
CHECKED BY: DATE:
FILE SPEC.: s:7'postguardrail.dgn

17-MAR-2017 13:19
S:\Contracts\Special Details\jhowerton\7'postguardrail.dgn
jhowerton AT CSD-292595

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- Sta. 10+50.00	-L- Sta. 13+68.38	53	421	368	
-L- Sta. 14+70.63	-L- Sta. 18+00.00	41	597	556	
SUBTOTAL:		94	1,018	924	
PROJECT TOTALS:		94	1,018	924	
EST. 5% REPLACE TOPSOIL ON BORROW PIT				46	
GRAND TOTAL:		94	1,018	970	
SAY:		**100**		**1,020**	

UNDERCUT EXCAVATION= 400 CY(Contingency)
SELECT GRANULAR MATERIAL= 400 CY(Contingency)
GEOTEXTILE FOR SOIL STABILIZATION= 400 CY(Contingency)

(Total square yards of Geotextile for Soil Stabilization is only the contingent quantity and may only represent a portion of the geotextile quantity shown in the item Sheets of Proposal.)

Note: 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.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	10+50.00	13+74.45	CL	698.90			
-L-	14+64.44	18+00.00	CL	723.33			
		TOTAL:		1,422.23			
		SAY:		**1,500**			

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L- (LT)	14+81.50	14+98.00	16.50
-L- (RT)	14+81.50	14+98.00	16.50
		TOTAL:	33.00
		SAY:	35

"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 STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	ANCHORS XI	ANCHORS GREU, TL-3	ANCHORS M-350	ANCHORS XIII	ANCHORS CAT-1	ANCHORS VI MOD	ANCHORS BIC	ANCHORS TYPE III	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	11+93.38	13+68.38	RT	175.00'			11+93.38		4'-5"	6'-5"	50'		1'				1						1						USE EXTRA LENGTH G/R POSTS, SEE DETAIL SHEET 2C-3
-L-	12+93.38	13+68.38	LT	75.00'				13+68.38	4'-5"	6'-5"		50'		1'			1						1						USE EXTRA LENGTH G/R POSTS, SEE DETAIL SHEET 2C-3
-L-	14+70.63	15+51.88	RT	81.25'				14+70.63	4'-5"	6'-5"		50'		1'			1						1						USE EXTRA LENGTH G/R POSTS, SEE DETAIL SHEET 2C-3
-L-	14+70.63	15+51.88	LT	81.25'			14+70.63		4'-5"	6'-5"	50'		1'				1						1						USE EXTRA LENGTH G/R POSTS, SEE DETAIL SHEET 2C-3
																													DO NOT MODIFY THE POSTS WITHIN THE PAY ITEM LIMITS OF THE GREU, TL-3
			SUBTOTAL:	406.25'													4						4						
		LESS ANCHOR DEDUCTIONS:																											
		TYPE III(4@18.75')		-75'																									
		GREU, TL-3(4@50')		-200																									
			TOTAL:	137.5'													4						4						
			SAY:	137.5'													4						4						
	EXTRA LENGTH GUARDRAIL POSTS:			16 EA																									

REVISIONS

8/17/99

10/25/2022 ...\Proj\920140_RDY_SUM_3B-1.dgn

COMPUTED BY: EAB DATE: 8/11/2017

CHECKED BY: ECOLOGICAL ENGINEERING, LLP DATE: 8/11/2017

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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"
14+93 -L-	LT	0401		232.73	229.98																																						
	LT	0401	0402		229.98	222.53			24						X	X			X																								
14+93 -L-	RT	0403		232.73	229.98																																						
	RT	0403	0404		229.98	222.6			24						X	X			X																								
SHEET TOTALS									48																																		

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 OR 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')" LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.D.I. STD. 840.35			DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
14+93 -L-								1																			1	1								
																															2@15"				
14+93 -L-								1																			1	1								
																															2@15"				
SHEET TOTALS								2																			2	2			4@15"				

ABBREVIATIONS

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

REVISIONS

8/17/99

12/3/2018 ...\Proj\920140_RDY_SUM_3D-1.dgn

8/17/99

REVISIONS

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		100	200	300		
			TOTAL CY/TONS/SY:		100	200	300*		

ASU = Aggregate Subgrade, AST = Aggregate Stabilization

***Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.**

12/3/2018
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PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	4

ROADWAY DESIGN ENGINEER — 1/5/2023 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045230 MICHAEL S. BURNS, JR. — DocuSigned by: Michael S. Burns, Jr.

HYDRAULICS ENGINEER — 1/5/2023 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043870 REID B. ROBOL — DocuSigned by: Reid B. Robol

STEWART — Firm License No. C-1051, 223 S. West St., Suite 1100, Raleigh, NC 27603, T 919.380.8750, www.stewartinc.com

VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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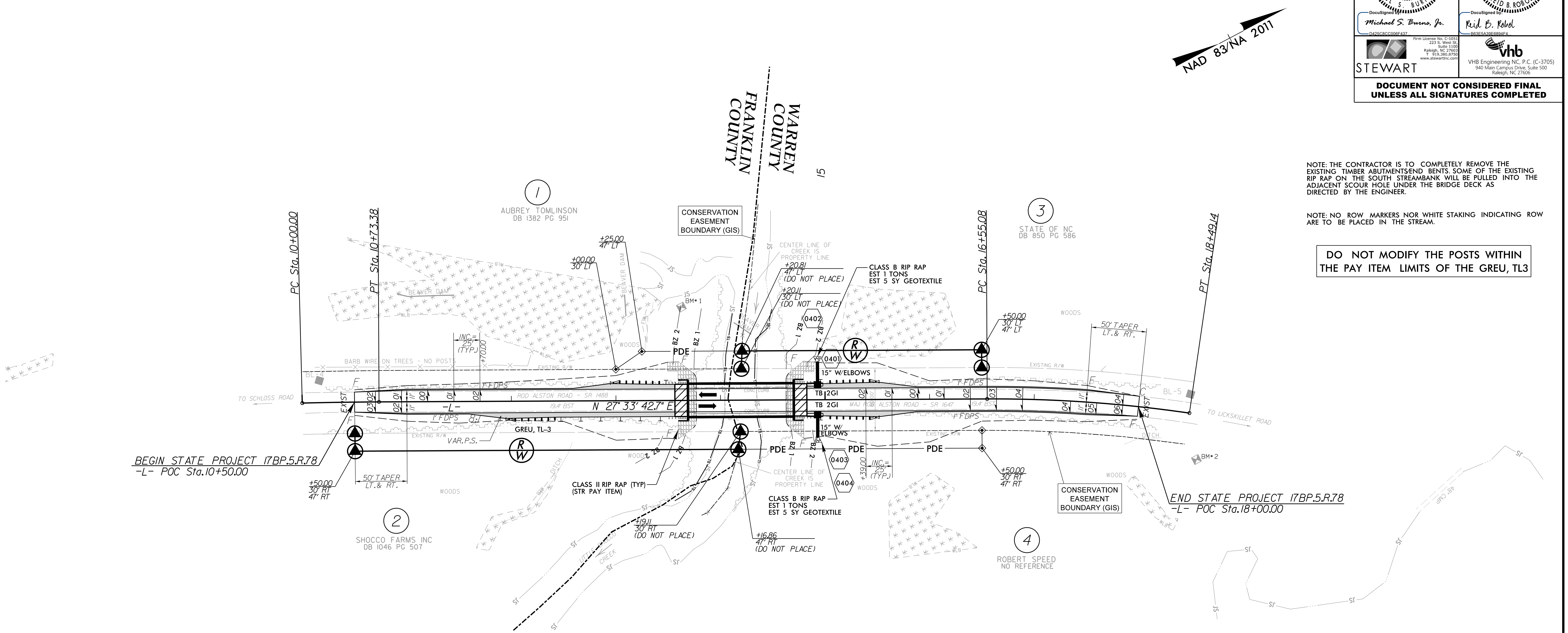
-L-

PI Sta 10+36.69	PI Sta 17+52.29
Δ = 1° 14' 11.5" (RT)	Δ = 8° 33' 09.3" (RT)
D = 1° 41' 06.6"	D = 4° 24' 26.5"
L = 73.38'	L = 194.05'
T = 36.69'	T = 97.21'
R = 3,400.00'	R = 1,300.00'
S_e = Exist.	S_e = Exist.



NOTE: THE CONTRACTOR IS TO COMPLETELY REMOVE THE EXISTING TIMBER ABUTMENTS/END BENTS. SOME OF THE EXISTING RIP RAP ON THE SOUTH STREAMBANK WILL BE PULLED INTO THE ADJACENT SCOUR HOLE UNDER THE BRIDGE DECK AS DIRECTED BY THE ENGINEER.

NOTE: NO ROW MARKERS NOR WHITE STAKING INDICATING ROW ARE TO BE PLACED IN THE STREAM.

DO NOT MODIFY THE POSTS WITHIN THE PAY ITEM LIMITS OF THE GREU, TL3

REVISIONS

8/17/99

FOR -L- PROFILE.SEE SHEET 5

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

10/25/2022 R:\Proj\920140_RDY_PSH04.dgn

5/28/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS

DocuSigned by: Michael S. Burns, Jr. 1/25/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043870 ENGINEER REID B. ROBOL

DocuSigned by: Reid B. Robol 1/29/2019

STEWART

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www.stewartinc.com

vhb

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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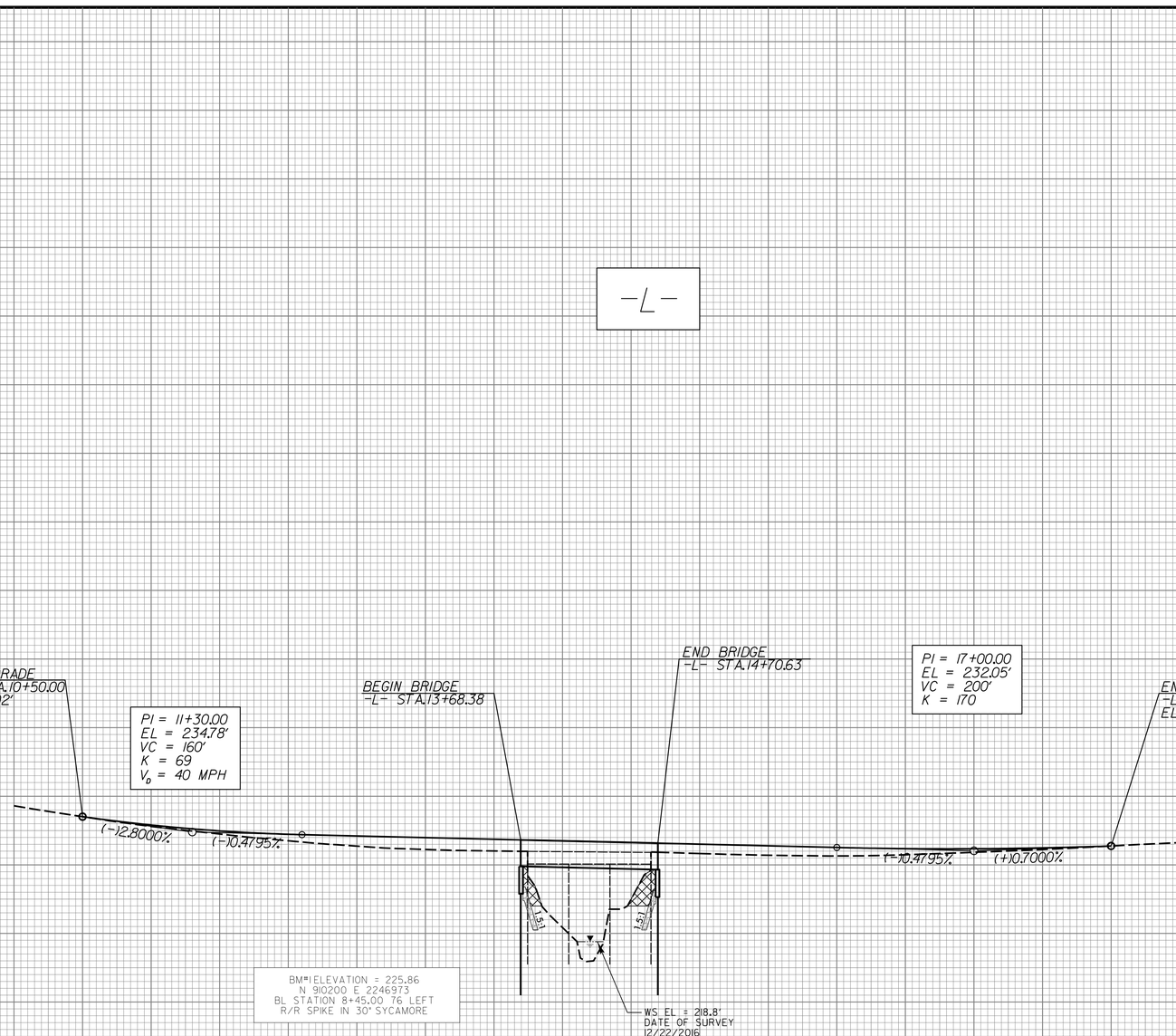

260 250 240 230 220 210 200

10 11 12 13 14 15 16 17 18 19

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 226.9	FT
BASE DISCHARGE	= 3601	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 228.9	FT
OVERTOPPING DISCHARGE	= 7236	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 232.6	FT
DATE OF SURVEY	= 12/22/2016	
W.S.ELEVATION AT DATE OF SURVEY	= 218.8	FT

FOR -L- PLAN VIEW SEE SHEET 4

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

1/25/2019
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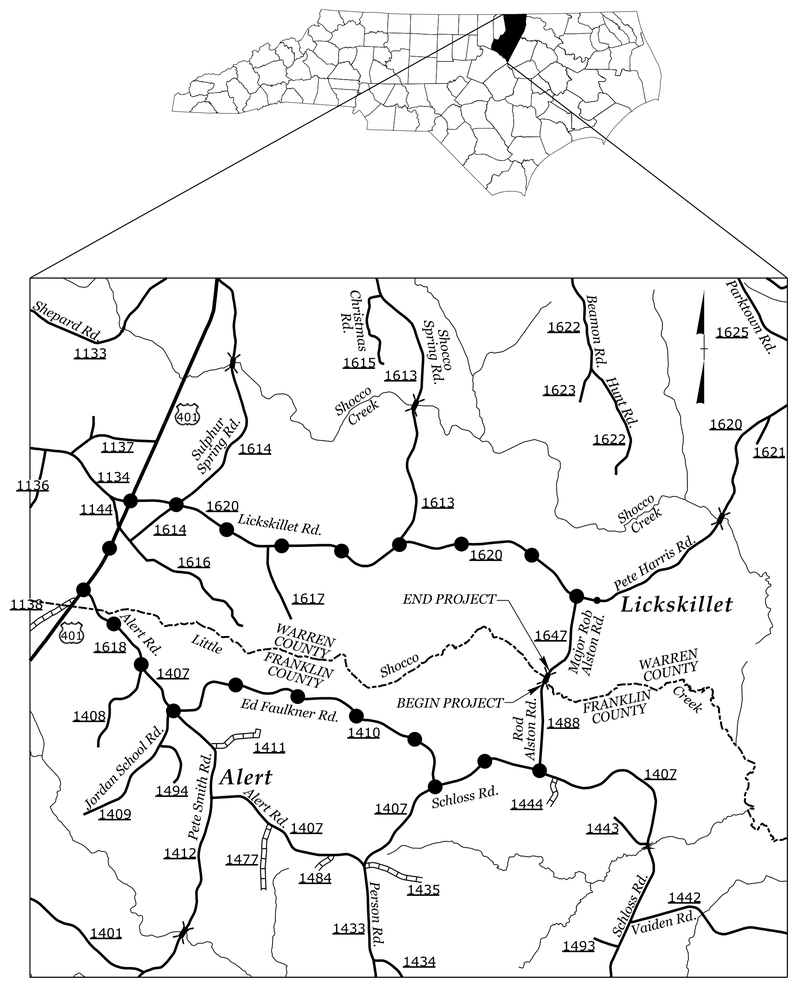
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

FRANKLIN & WARREN COUNTIES



OFF-SITE DETOUR

INDEX OF SHEETS

SHEET NO.
TMP-1

17BP.5.R.78

TIP PROJECT:

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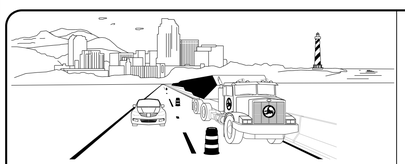
APPROVED: DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...

DATE: 1/25/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.



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

PLANS PREPARED BY:

STEWART
223 S. WEST ST, STE 1100
RALEIGH, NC 27603
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER

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

1/25/2019
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USER:jroemer

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUM
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

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Raleigh, NC 27603
T 919.380.8750
www.stewartinc.com

APPROVED: DocuSigned by: Michael S. Burns, Jr. D425CBCC006F437...

DATE: 1/25/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.

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

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ROADWAY STANDARD DRAWINGS & LEGEND

1/25/2019
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PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-1B

MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED STRUCTURE BRIDGE No. 140 OVER LITTLE SHOCCO CREEK, SR 1488 (ROD ALSTON RD.) / SR 1647 (MAJ. ROB ALSTON RD.) WILL BE CLOSED TO THROUGH TRAFFIC. THROUGH TRAFFIC ON SR 1488 (ROD ALSTON RD.)/ SR 1647 (MAJ. ROB ALSTON RD.) WILL BE MAINTAINED USING AN OFF-SITE DETOUR.

THE OFF-SITE DETOUR WILL INCLUDE SR 1407, SR 1410, US 401, AND SR 1620 (SEE SHEETS TMP-3 AND TMP-4).

LOCAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
2. NOTIFY THE FRANKLIN & WARREN COUNTY SCHOOLS TRANSPORTATION DIRECTORS OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.
3. NOTIFY THE FRANKLIN & WARREN COUNTY EMERGENCY MANAGEMENT SERVICES DIRECTORS OF BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

GENERAL NOTES

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

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

SIGNING

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

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

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

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

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

PHASING

STEP 1:

PROVIDE AND MAINTAIN CHANGEABLE MESSAGE SIGNS AT EACH END OF SR 1488 (ROD ALSTON RD.) / SR 1647 (MAJ. ROB ALSTON RD.) FOR FOURTEEN (14) CALENDAR DAYS PRIOR TO ROAD CLOSURE, AS SHOWN ON SHEET TMP-3.

STEP 2:

USING RSD 1101.03, SHEET 1 OF 9, SHEETS TMP-2A THRU TMP-4 INSTALL ROAD CLOSURE AND DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE SR 1488 (ROD ALSTON RD.) / SR 1647 (MAJ. ROB ALSTON RD.) TO THROUGH TRAFFIC, AND DETOUR TRAFFIC OFF-SITE. REMOVE CHANGEABLE MESSAGE SIGNS ONCE DETOUR IS IN PLACE.

STEP 3:

REMOVE THE EXISTING STRUCTURE.

STEP 4:

CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY.

STEP 5:

PLACE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

STEP 6:

OPEN SR 1488 (ROD ALSTON RD.) / SR 1647 (MAJ. ROB ALSTON RD.) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

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APPROVED: DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...

DATE: 1/25/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.

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

TRANSPORTATION OPERATIONS PLAN

1/25/2019
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USER:jroemer

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-2

SIGN NUMBER: SP-1
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 2′-0″
HEIGHT: 2′-0″
TOTAL AREA: 4.0 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

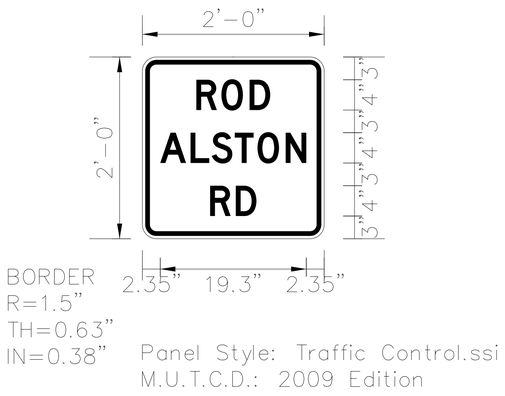
USE NOTES: 1,2

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

DESIGN BY: Michael Burns, PE
PROJECT ID: 17BP.5.R.78

CHECKED BY: Andy Young, PE
LOCATION: Franklin County

Jun 19, 2018
DIV: DIV 5



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																											Series/Size Text Length
	R	O	D																								D 2000
	7.1	10.4	14.2																								9.8
	A	L	S	T	O	N																					D 2000
	2.4	6.4	9.2	12.2	15.2	18.9																					19.3
	R	D																									D 2000
	8.9	12.3																									6.1

FILENAME: 920140_TC_TMP-02A

NORTH CAROLINA D.O.T. SIGN DETAIL

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Raleigh, NC 27603
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APPROVED: DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...
DATE: 1/25/2019
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS JR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SPECIAL SIGN DESIGN

1/25/2019
...\TCP\920140_TC_TMP-02.dgn
USER:jroemer

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-2A

SIGN NUMBER: SP-2
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-6″
HEIGHT: 1′-6″
TOTAL AREA: 5.3 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

USE NOTES: 1,2

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

DESIGN BY: Michael Burns, PE
PROJECT ID: 17BP.5.R.78

CHECKED BY: Andy Young, PE
LOCATION: Warren County

Jun 19, 2018
DIV: DIV 5

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																									Series/Size Text Length
	M	A	J	O	R		R	O	B																D 2000
	5.5	9.2	12.9	16.3	20	22.7	26.7	30.1	33.8																31
	A	L	S	T	O	N		R	D																D 2000
	6.3	10.3	13.1	16.1	19.1	22.9	25.6	29.6	33																29.4

FILENAME: 920140_TC_TMP-02B

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DATE: 1/25/2019
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS JR.

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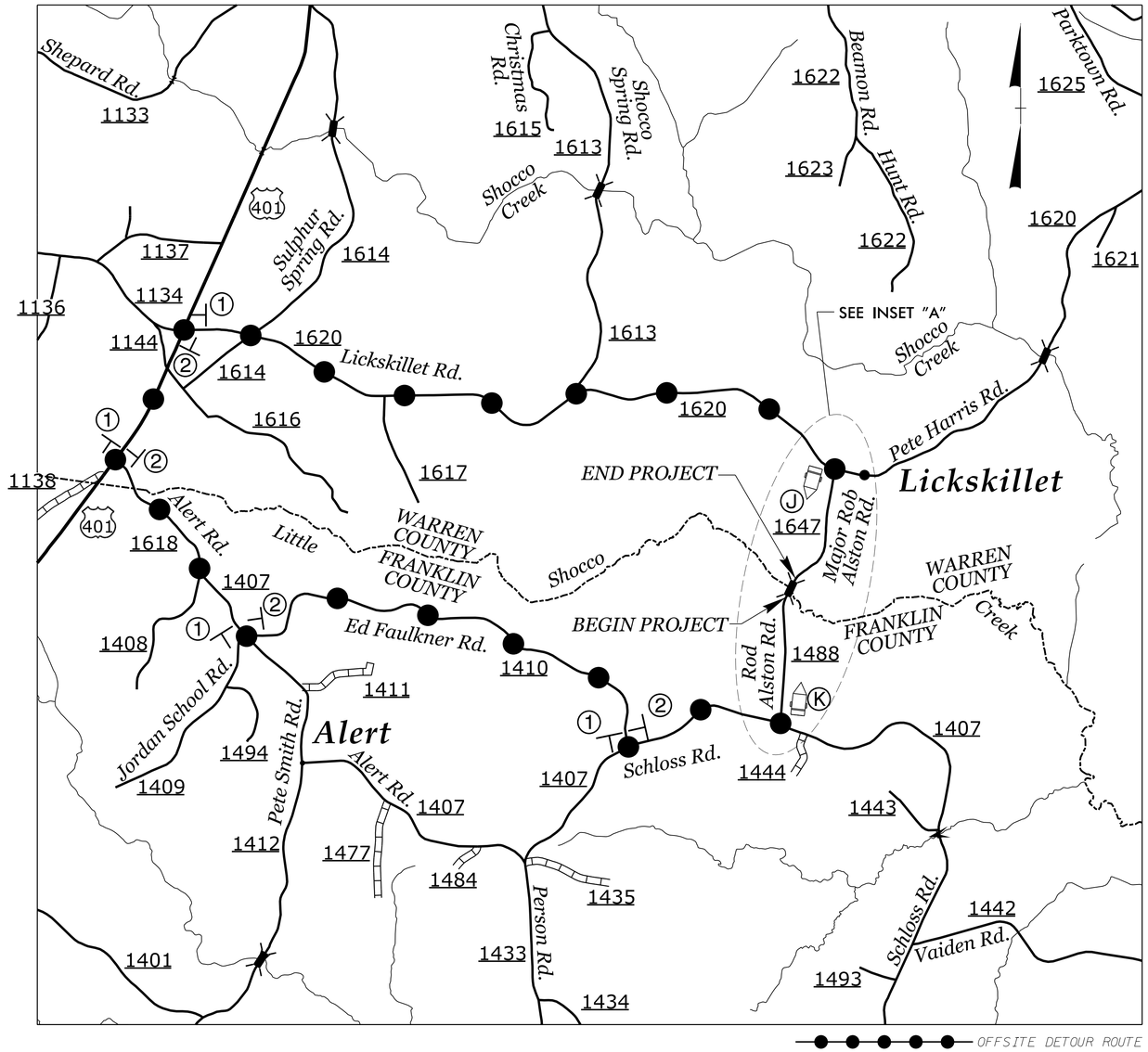
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

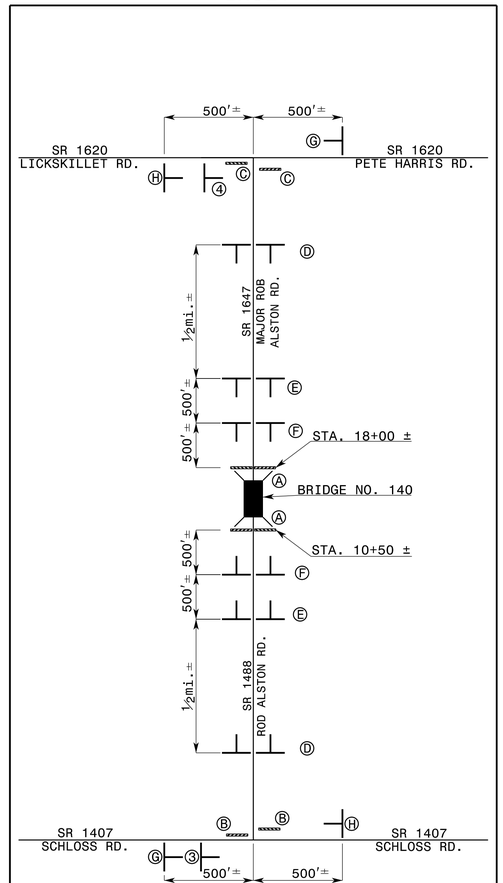
SPECIAL SIGN DESIGN

1/25/2019
...\TCP\920140_TC_TMP-02A.dgn
USER:jroemer

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-3



INSET A



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

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DATE: 1/25/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.

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

OFF-SITE DETOUR

1/25/2019
...\TCP\920140_TC_TMP-03.dgn
USER:jroemer

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	TMP-4

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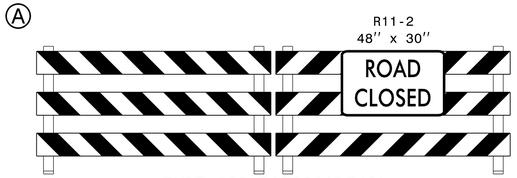

TYPE III BARRICADE(S)

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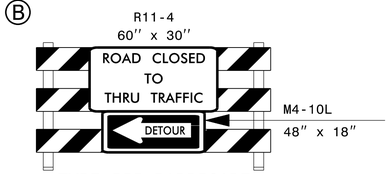

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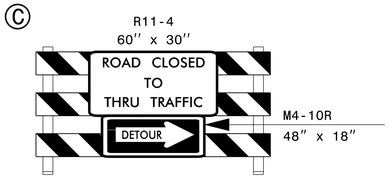

TYPE III BARRICADE

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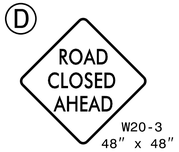

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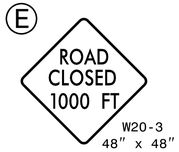

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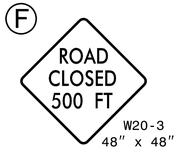

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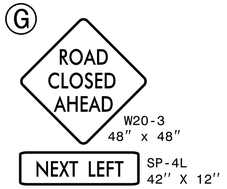

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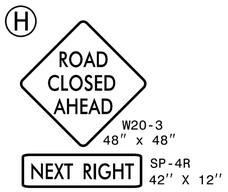


Ⓙ

MESSAGE NO. 1	MESSAGE NO. 2
ROD ALSTON RD	CLOSED STARTING XX-XX-XX

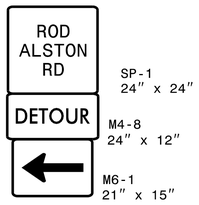
CHANGEABLE MESSAGE SIGN

Ⓚ

MESSAGE NO. 1	MESSAGE NO. 2
MAJ. ROB ALSTON RD	CLOSED STARTING XX-XX-XX

CHANGEABLE MESSAGE SIGN

①



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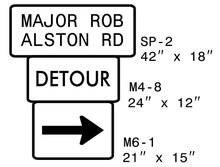

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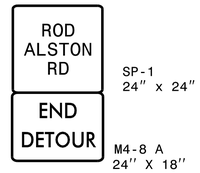

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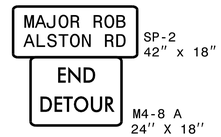

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STEWART

APPROVED: DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...

DATE: 1/25/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS, JR.

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

OFF-SITE DETOUR SIGNS

1/25/2019
...\TCP\920140_TC_TMP-04.dgn
USER:jroemer

CONTRACT: DE00359 T.I.P.: 17BP.5.R.78

TIP NO.	SHEET NO.
17BP.5.R.78	PMP-1

APPROVED: DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...

DATE: 1/5/2023

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 045230 ENGINEER MICHAEL S. BURNS

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
FRANKLIN & WARREN COUNTIES

LOCATION: BRIDGE NO. 140 OVER LITTLE SHOCCO CREEK ON SR 1488 (ROD ALSTON RD.) / SR 1647 (MAJOR ROB ALSTON RD.)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - CONTRACT STANDARDS AND DEVELOPMENT UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 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
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
PA	PAINT WHITE EDGELINE (4") X2
PI	PAINT YELLOW DOUBLE CENTER (4") X2

NAD 83/NA 2011

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:

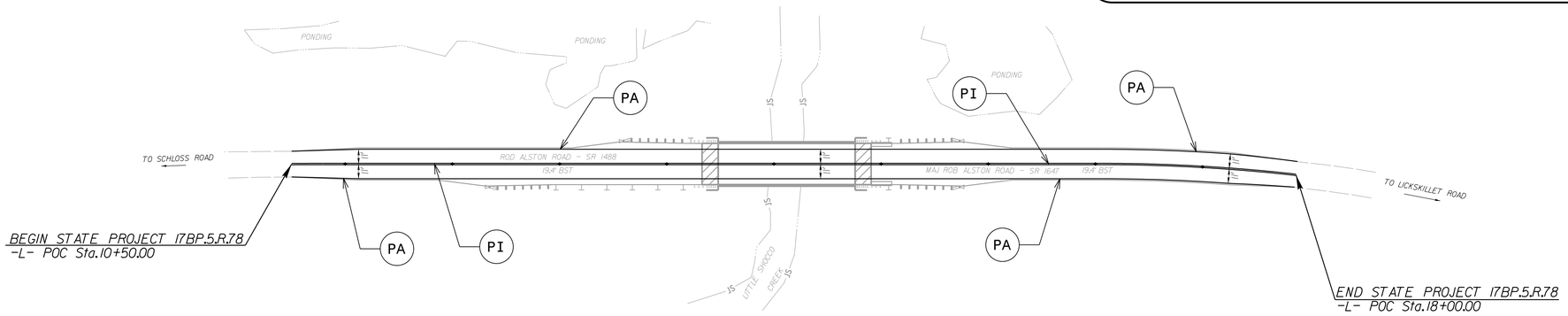
ROAD NAME	MARKING	MARKER
ROD ALSTON RD./ MAJOR ROB ALSTON RD.	PAINT	NONE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

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

D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

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



INDEX

PLAN PREPARED BY: STEWART

ANDY YOUNG, PE — PROJECT ENGINEER

MICHAEL BURNS, PE — PROJECT DESIGN ENGINEER

STEWART
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1/4/2023
...\CPS\20140_TC_PMP01.dgn
USER:mburns

TIP NO.	SHEET NO.
17BP.5.R.78	PMP-2

APPROVED: Matthew V. Springer
DATE: 8/30/2019
DocuSigned by: DC60F0E8B584403...

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

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

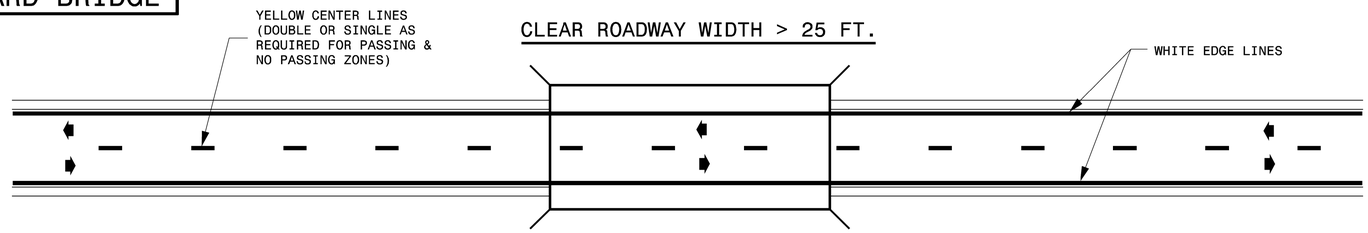
8-19

ENGLISH DETAIL DRAWING FOR PAVEMENT MARKINGS

BRIDGES

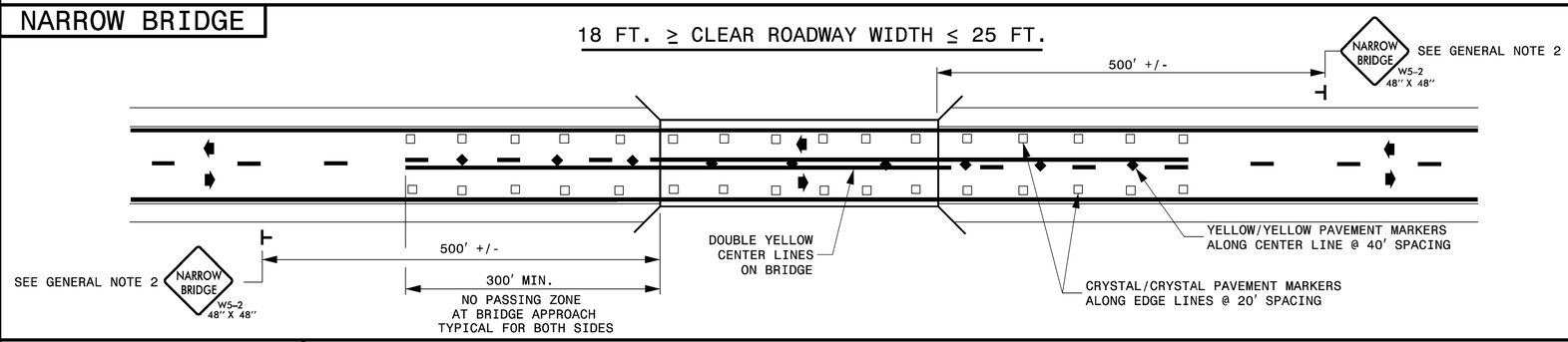
STANDARD BRIDGE

CLEAR ROADWAY WIDTH > 25 FT.



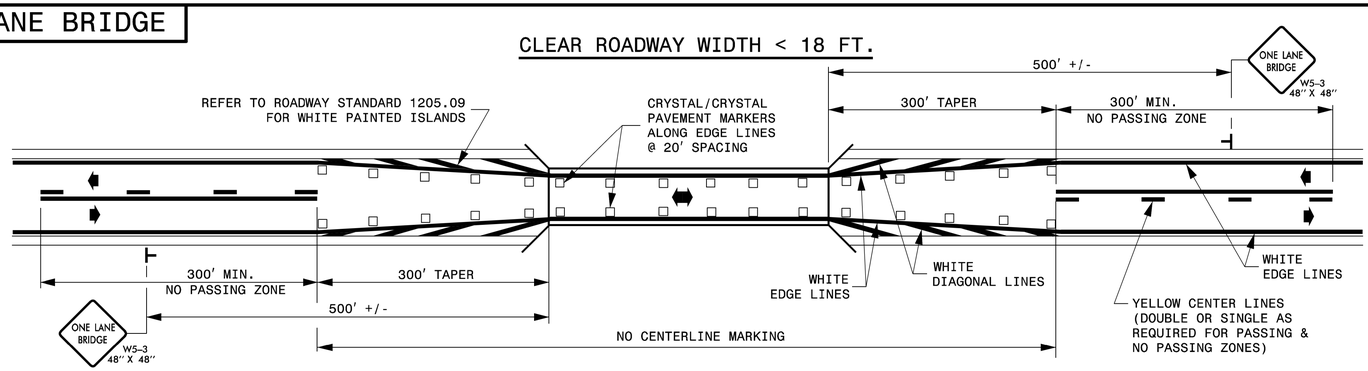
NARROW BRIDGE

18 FT. ≥ CLEAR ROADWAY WIDTH ≤ 25 FT.



ONE-LANE BRIDGE

CLEAR ROADWAY WIDTH < 18 FT.



GENERAL NOTES:

1- NO PASSING ZONES SHOWN ARE MINIMUMS. APPLY MINIMUM PASSING AND STOPPING SIGHT DISTANCES AS DETERMINED BY THE ENGINEER.

2- FOR BRIDGES WITH 18 TO 25 FEET CLEAR ROADWAY WIDTH, SIGNS MUST BE USED WHEN THE APPROACH PAVEMENT WIDTH IS 2 FOOT OR GREATER THAN THE CLEAR ROADWAY WIDTH.

LEGEND

DIRECTION OF TRAFFIC FLOW	YELLOW/YELLOW PAVEMENT MARKER
STATIONARY SIGN	CRYSTAL/CRYSTAL PAVEMENT MARKER

SHEET 1 OF 1
1205D12

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

8-19

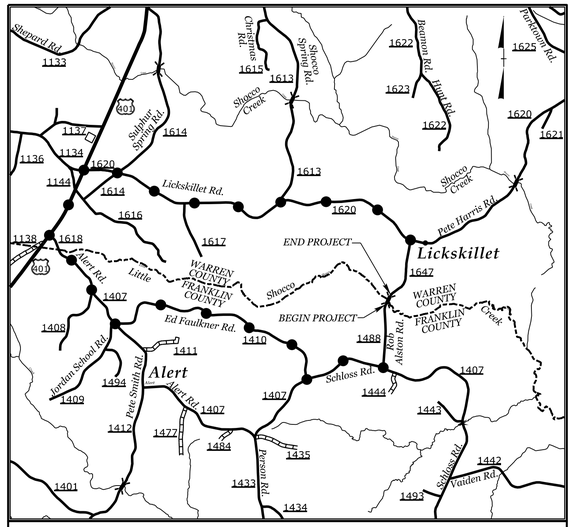
ENGLISH DETAIL DRAWING FOR PAVEMENT MARKINGS
BRIDGES

SHEET 1 OF 1
1205D12

REVISED PAVEMENT MARKING ROADWAY STANDARD DRAWING

8-29-19

TIP PROJECT: 17BP.5.R.78



VICINITY MAP

OFF-SITE DETOUR

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

FRANKLIN & WARREN COUNTIES

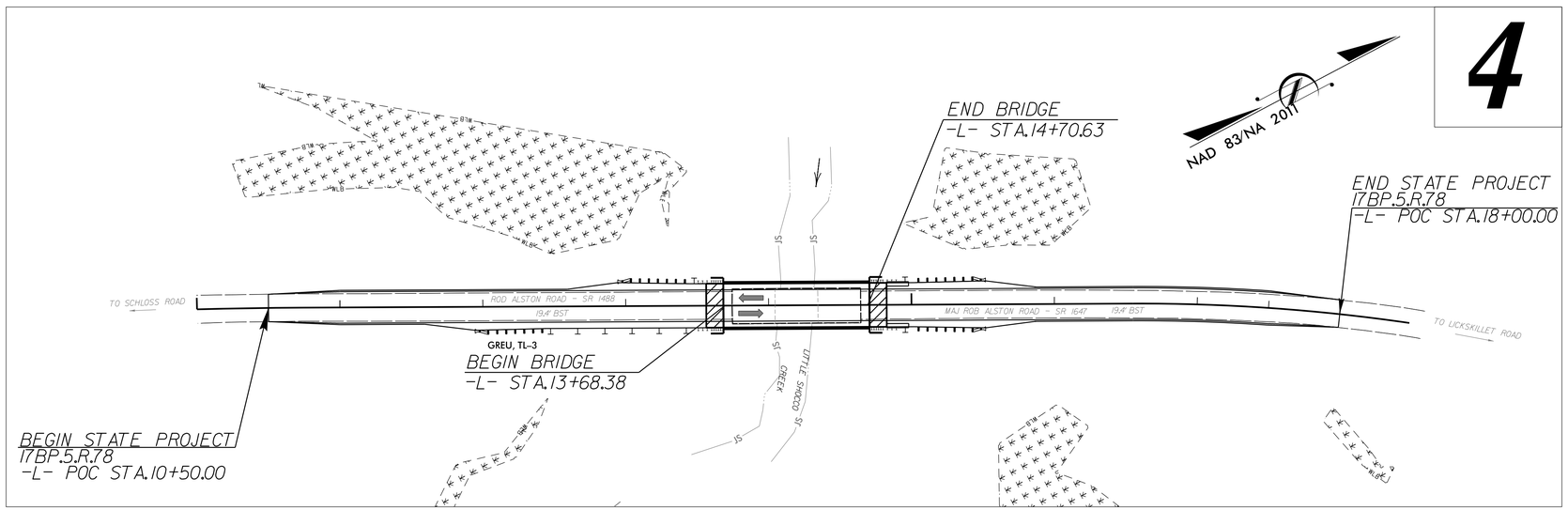
LOCATION: BRIDGE NO. 140 OVER LITTLE SHOCCO CREEK ON SR 1647 (ROB ALSTON RD.)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.78	EC-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
17BP.5.R.78	N/A	PE	

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	



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

GRAPHIC SCALE

25 0 50
PLANS

25 0 50
PROFILE (HORIZONTAL)

5 0 10
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 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

Designed by:

REID ROBOL, PE — ***3409***

NAME — *LEVEL III CERTIFICATION NO.*

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

DONALD PEARSON

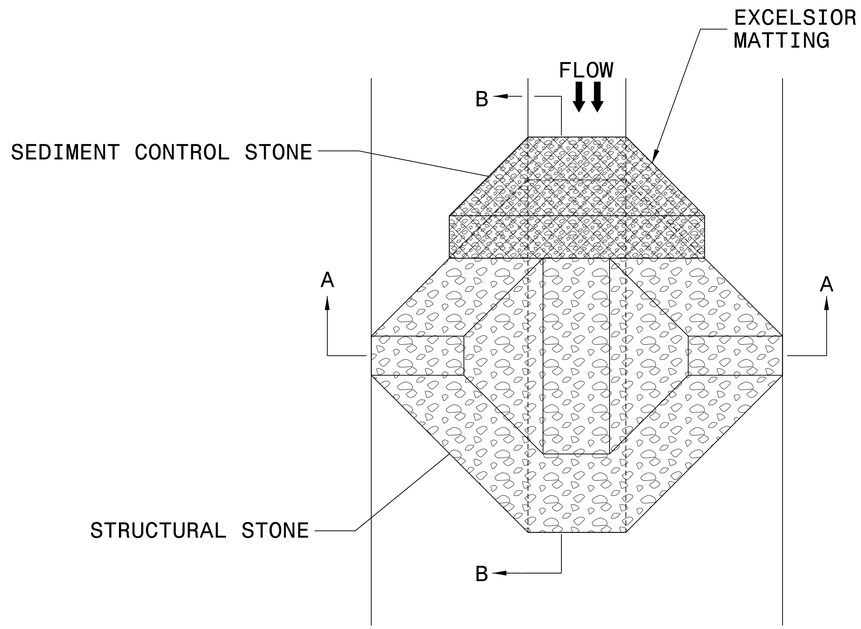
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

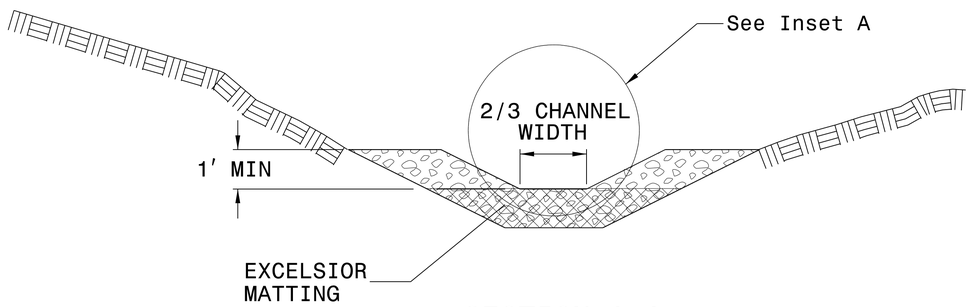
1604.01	*Railroad Erosion Control Detail*	1632.01	*Rock Inlet Sediment Trap Type A*
1605.01	*Temporary Silt Fence*	1632.02	*Rock Inlet Sediment Trap Type B*
1606.01	*Special Sediment Control Fence*	1632.03	*Rock Inlet Sediment Trap Type C*
1607.01	*Gravel Construction Entrance*	1633.01	*Temporary Rock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

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	EC-02
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

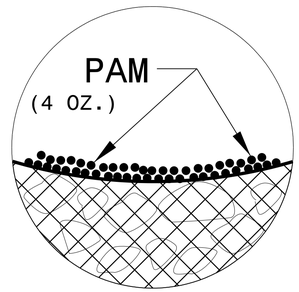
NOTES:

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

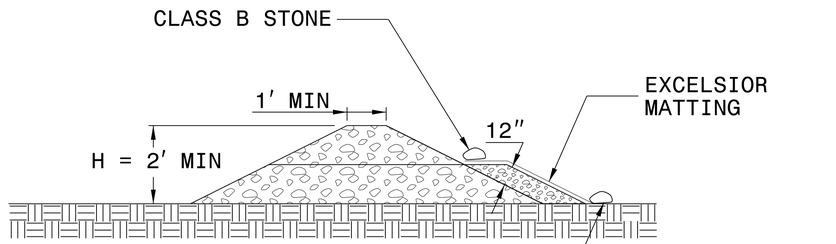
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.
17BP.5.R.78	EC-03

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	7 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	7 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

8/17/99

REVISIONS

-L-	
PI Sta 10+36.69	PI Sta 17+52.29
△ = 1° 14' 11.5" (RT)	△ = 8° 33' 09.3" (RT)
D = 1° 41' 06.6"	D = 4° 24' 26.5"
L = 733.38'	L = 194.05'
T = 366.91'	T = 97.21'
R = 3,400.00'	R = 1,300.00'

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS

DESIGN STANDARDS IN SENSITIVE WATERSHEDS (15A NCAC 04B.0124 (b)-(e)) ARE INCORPORATED INTO NCDOT PROJECTS THAT OCCUR WITHIN OR UPSTREAM OF WATER BODIES THAT CONTAIN FEDERALLY PROTECTED AQUATIC SPECIES. WITHIN THE ENVIRONMENTALLY SENSITIVE AREAS, THE FOLLOWING SHAT APPLY:

- THE CONTRACTOR MAY PERFORM CLEARING OPERATIONS BUT NOT GRUBBING OPERATIONS UNTIL IMMEDIATELY PRIOR TO BEGINNING GRADING OPERATIONS.

- ONCE GRADING OPERATIONS BEGIN, WORK SHALL PROGRESS IN A CONTINUOUS MANNER UNTIL COMPLETE.

- EROSION CONTROL DEVICES SHALL BE INSTALLED IMMEDIATELY FOLLOWING THE CLEARING OPERATION.

- SEEDING MULCHING SHALL BE PERFORMED ON THE AREAS DISTURBED BY CONSTRUCTION IMMEDIATELY FOLLOWING FINAL GRADE ESTABLISHMENT.

- SEEDING MULCHING SHALL BE DONE IN STAGES ON CUT AND FILL SLOPES THAT ARE GREATER THAN 20 FEET IN HEIGHT MEASURE ALONG THE SLOPE OR GREATER THAN TWO ACRES IN AREA, WHICHEVER IS LESS

SPECIAL SEDIMENT CONTROL FENCE AS INDICATED BY NCDOT STANDARD NO. 1606.01 (APPENDIX C) WILL BE INSTALLED ALONG THE TOP OF THE STREAM BANK. STANDARD SILT FENCE WILL BE INSTALLED ALONG THE TOE OF SLOPE PARALLEL TO THE STREAM. ONCE THE DISTURBED AREAS OF THE PROJECT DRAINING TO THE SPECIAL SEDIMENT CONTROL FENCE HAVE BEEN STABILIZED, THE SPECIAL SEDIMENT CONTROL FENCE AND ALL BUILT UP SEDIMENT ADJACENT TO THE FENCE WILL BE REMOVED TO NATURAL GROUND AND STABILIZED WITH APPROPRIATE SEED MIX. NATIVE GRASS MIX WILL BE USED ON THE FLOODPLAIN.

ALL APPROPRIATE SEDIMENTATION AND EROSION CONTROL MEASURES THROUGHOUT THE PROJECT LIMITS WILL BE CLEANED OUT WHEN HALF FULL WITH SEDIMENT, TO ENSURE PROPER FUNCTION OF THE MEASURES.

COIR FIBER MATTING WILL BE INSTALLED ON THE FOOTPRINT OF UNCLASSIFIED STRUCTURE EXCAVATION NEAR THE STREAMBANKS.

EMBANKMENT CONSTRUCTION AND GRADING SHALL BE MANAGED IN SUCH A MANNER AS TO PREVENT SURFACE RUNOFF/DRAINAGE FROM DISCHARGING UNTREATED INTO THE RIPARIAN BUFFER. INSTEAD ALL INTERIM SURFACES WILL BE GRADED TO DRAIN TO TEMPORARY EROSION CONTROL DEVICES. TEMPORARY BERMS DITCHES, ETC WILL BE INCORPORATED, AS NECESSARY, TO TREAT TEMPORARY RUNOFF BEFORE DISCHARGING INTO THE RIPARIAN BUFFER (AS SPECIFIED IN THE NCDOT BMP MANUAL).

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INSTALL +/- 200 SY COIR FIBER MATTING ON EXCAVATED BENCH UNDER BRIDGE

NAD 83/NA 2011

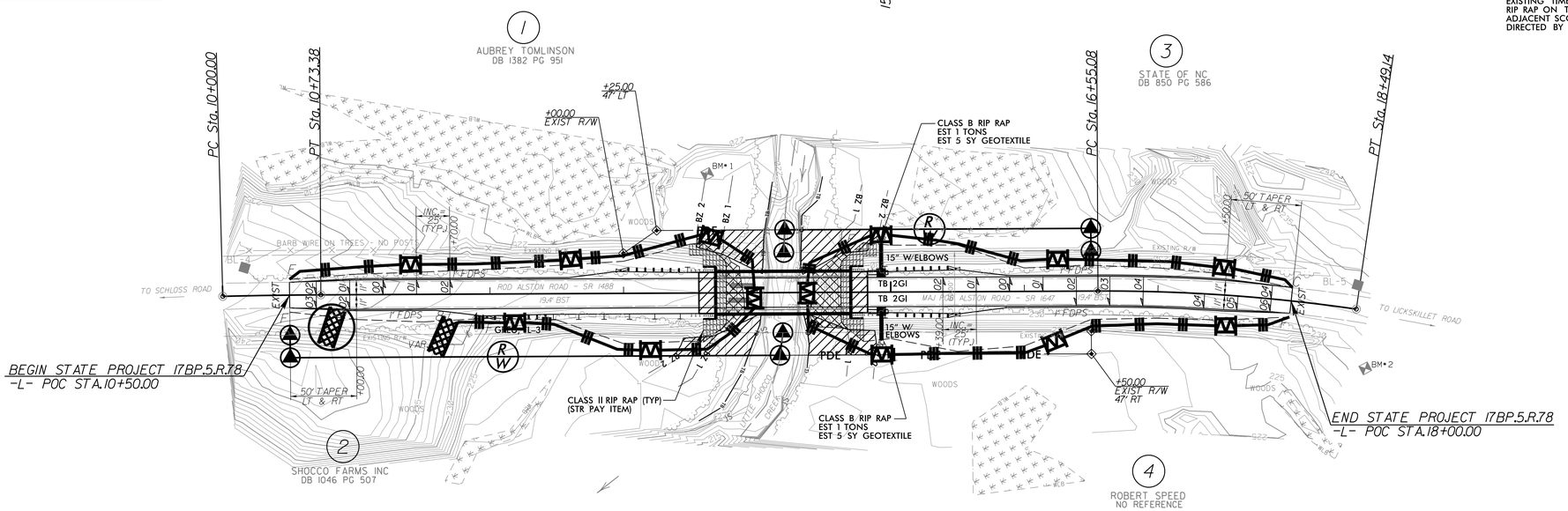
PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	EC-04/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8796
www.stewartinc.com

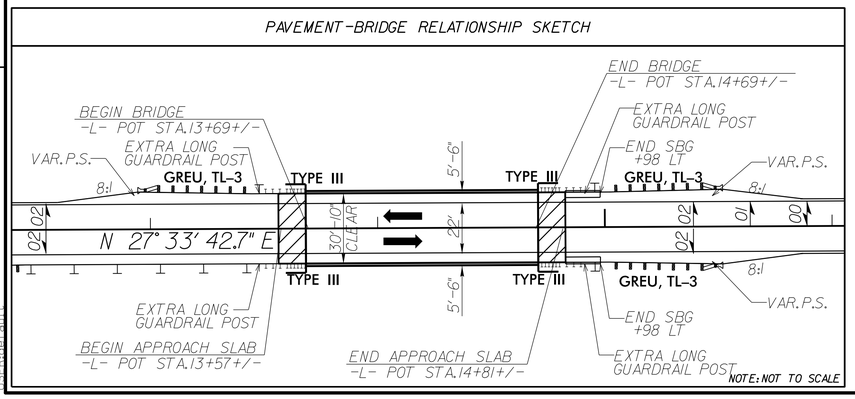
NC FIRM LICENSE No: P-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 567-0955
ECOLOGICAL ENGINEERING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: THE CONTRACTOR IS TO COMPLETELY REMOVE THE EXISTING TIMBER ABUTMENTS/END BENTS. SOME OF THE EXISTING RIP RAP ON THE SOUTH STREAMBANK WILL BE PULLED INTO THE ADJACENT SCOUR HOLE UNDER THE BRIDGE DECK AS DIRECTED BY THE ENGINEER.



PAVEMENT-BRIDGE RELATIONSHIP SKETCH



FOR -L- PROFILE, SEE SHEET 5

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-15

12/4/2018
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USER: cgault

8/17/99

REVISIONS

-L-	
PI Sta 10+36.69	PI Sta 17+52.29
△ = 1° 14' 11.5" (RT)	△ = 8° 33' 09.3" (RT)
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INSTALL +/- 200 SY COIR FIBER MATTING ON EXCAVATED BENCH UNDER BRIDGE

NAD 83/NA 2011

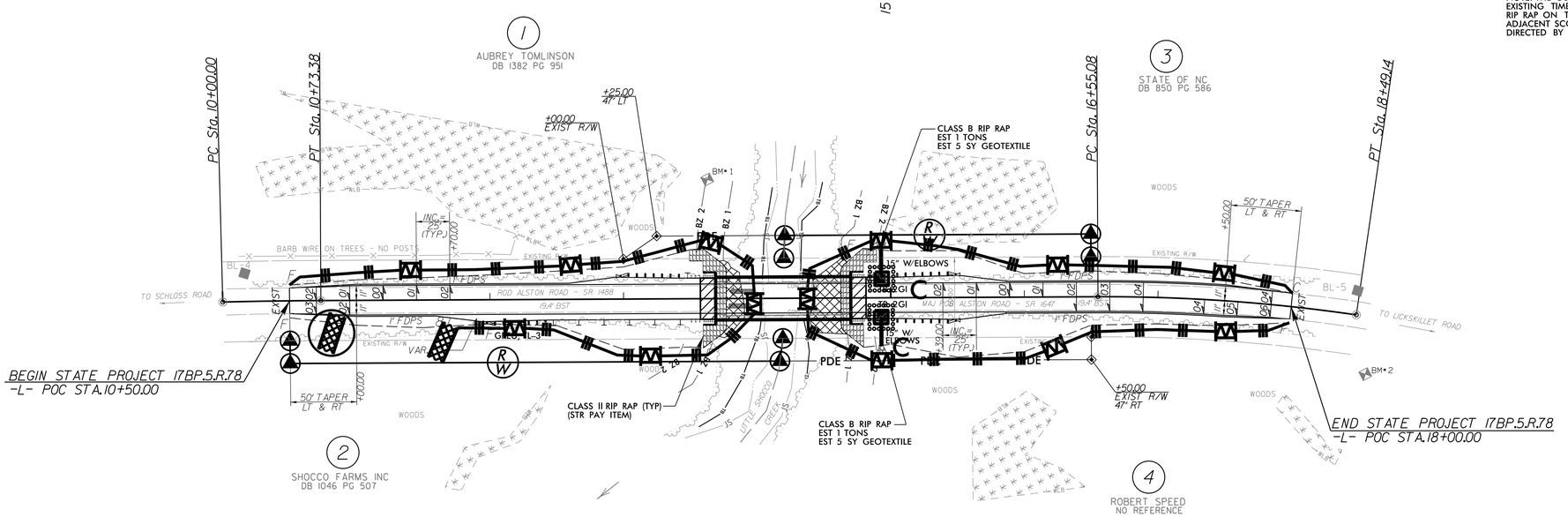
PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.78	EC-05/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NC FIRM LICENSE No:P-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 567-0055
ECOLOGICAL ENGINEERING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

15



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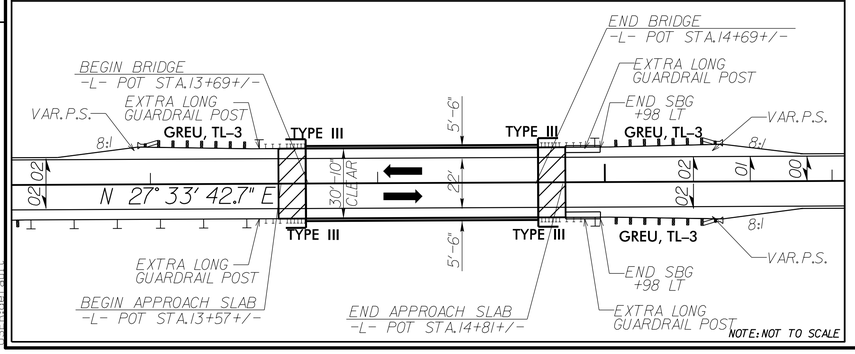
PAVEMENT-BRIDGE RELATIONSHIP SKETCH



FOR -L- PROFILE, SEE SHEET 5

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-15

12/4/2018
I:\Projects\928140_EC_Rev_FINAL.dgn
USER: Paul

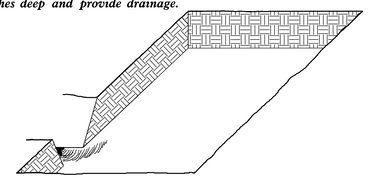
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.78	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

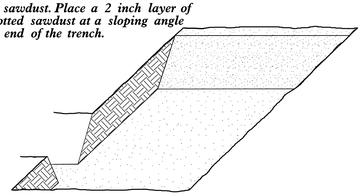
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

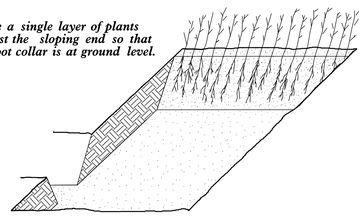
1. Locate a healing–in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



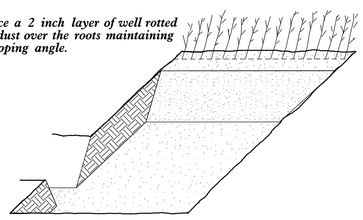
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

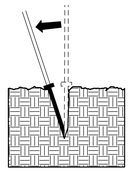


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

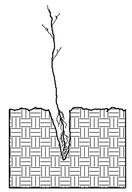


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

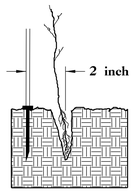
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



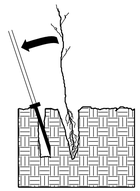
1. Insert planting bar as shown and pull handle toward planter.



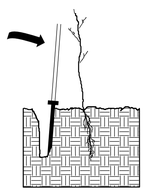
2. Remove planting bar and place seedling at correct depth.



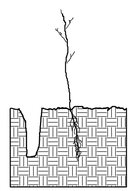
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

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

REFORESTATION

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

REFORESTATION

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

33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in BR
34%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Station -L-	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	28	1
11+50.00	19	5
12+00.00	6	14
12+50.00	0	39
13+00.00	0	100
13+50.00	0	130
13+68.38	0	62

Station -L-	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
14+70.63	0	0
15+00.00	0	88
15+50.00	0	169
16+00.00	0	150
16+50.00	0	64
17+00.00	3	19
17+50.00	13	6
18+00.00	25	1

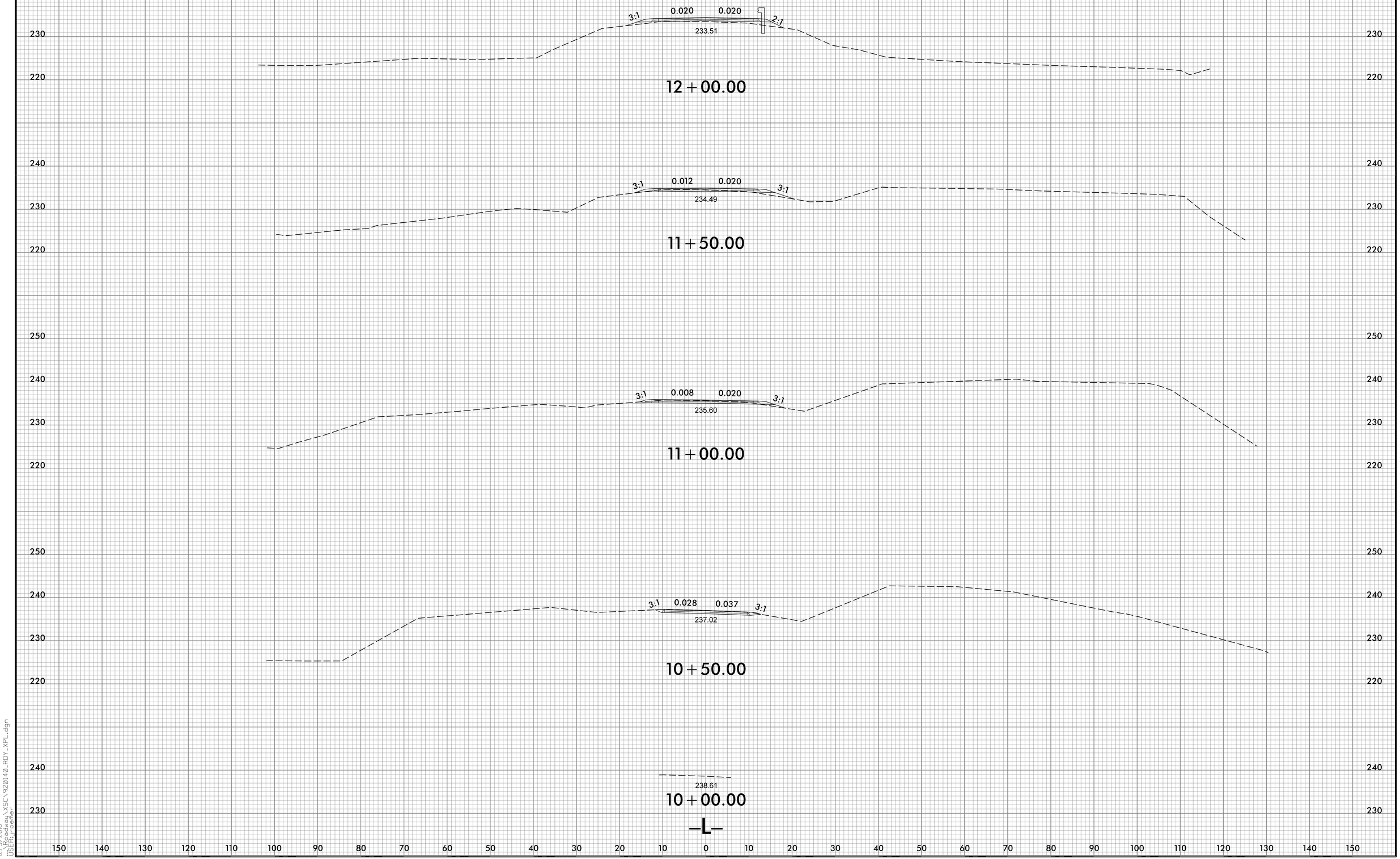
Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

REVISIONS

8/17/99

12/3/2018 ...\92014_RDY_XPL_X-1A.dgn

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.5.R.78	X-1



0 5 10

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	X-2

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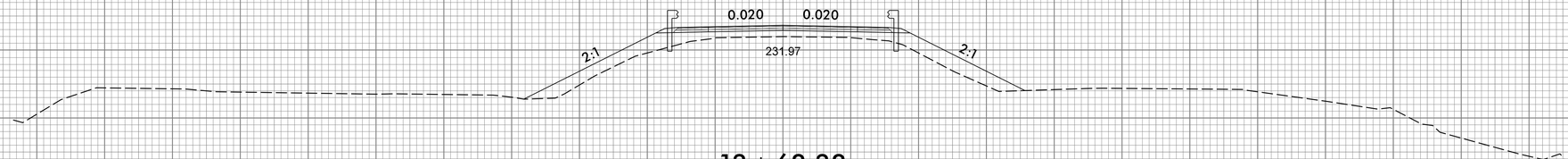
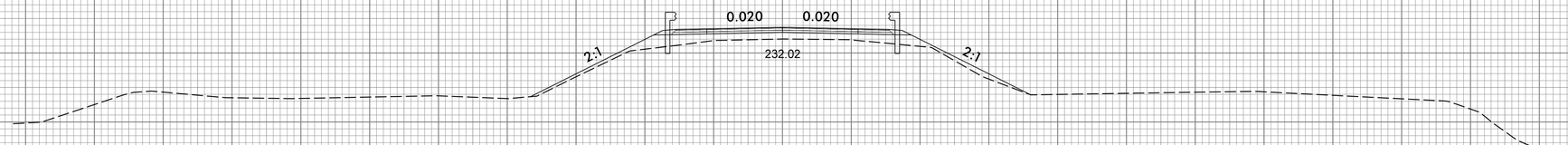
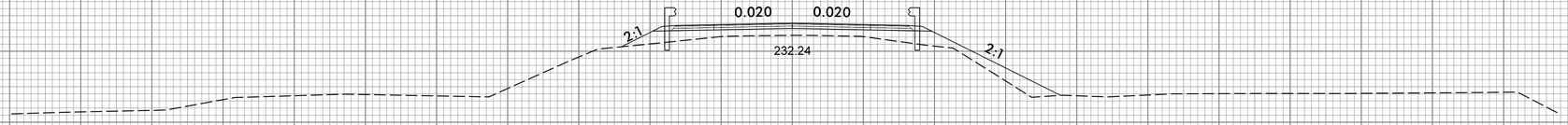
240 230 220 210



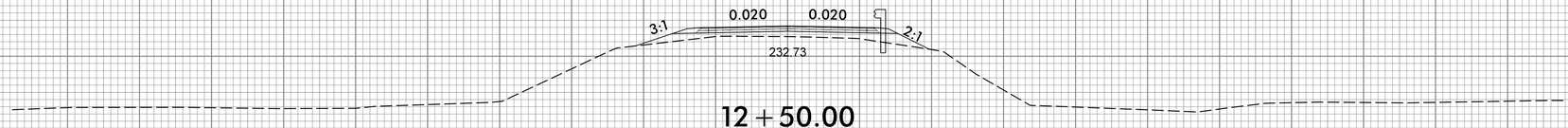
13+68.38
(BEGIN BRIDGE)



13+50.00



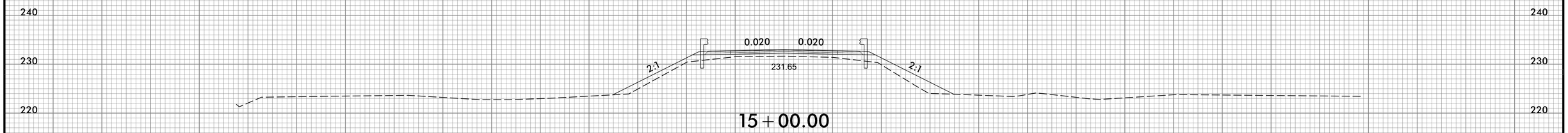
13+00.00



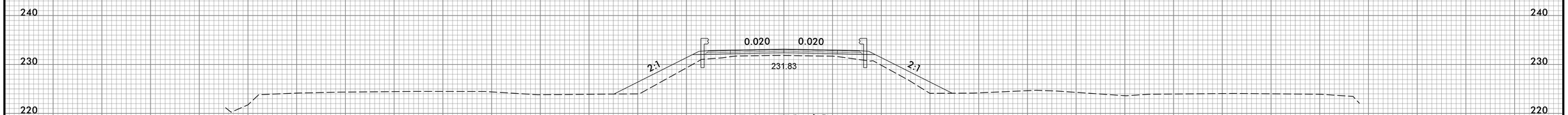
12+50.00
–L–

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.R.78	X-3

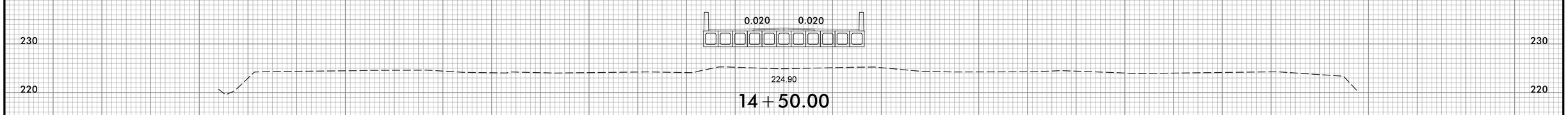


15 + 00.00

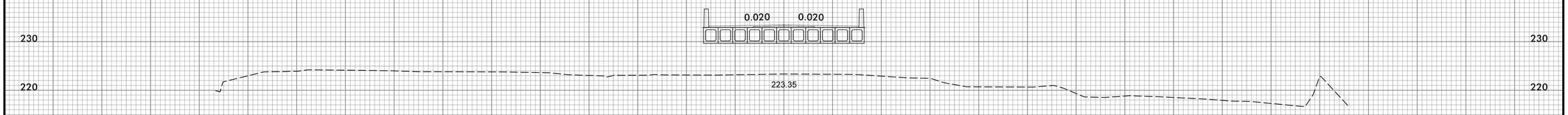


14 + 70.63

(END BRIDGE)



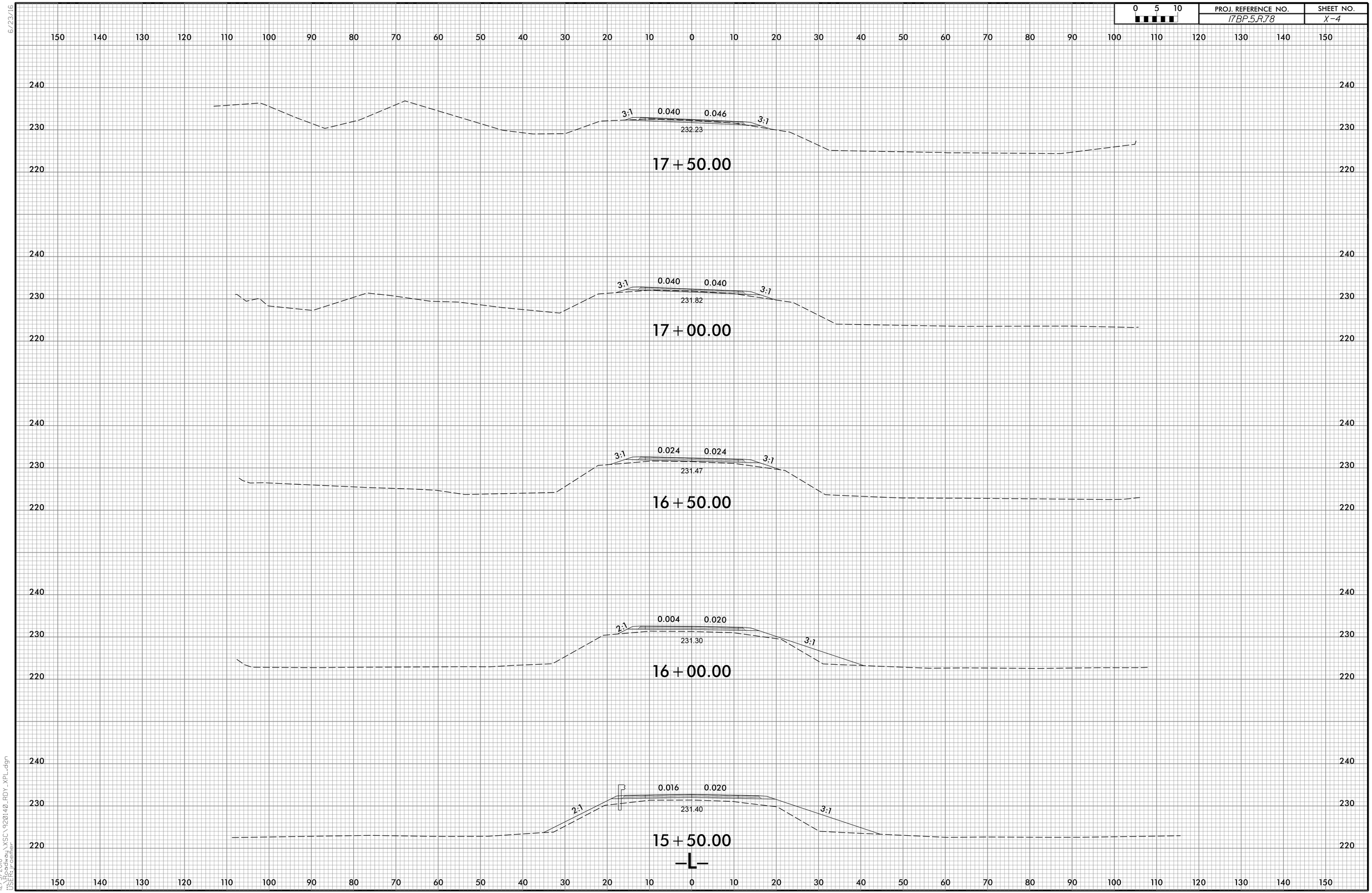
14 + 50.00



14 + 00.00

–L–

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.5.R.78	X-4



6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.5.R.78	X-5

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

240
230
220

233.18

18+45.00

250
240
230
220

0.039 0.065 3:1

232.75

18+00.00

-L-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

12/3/2018
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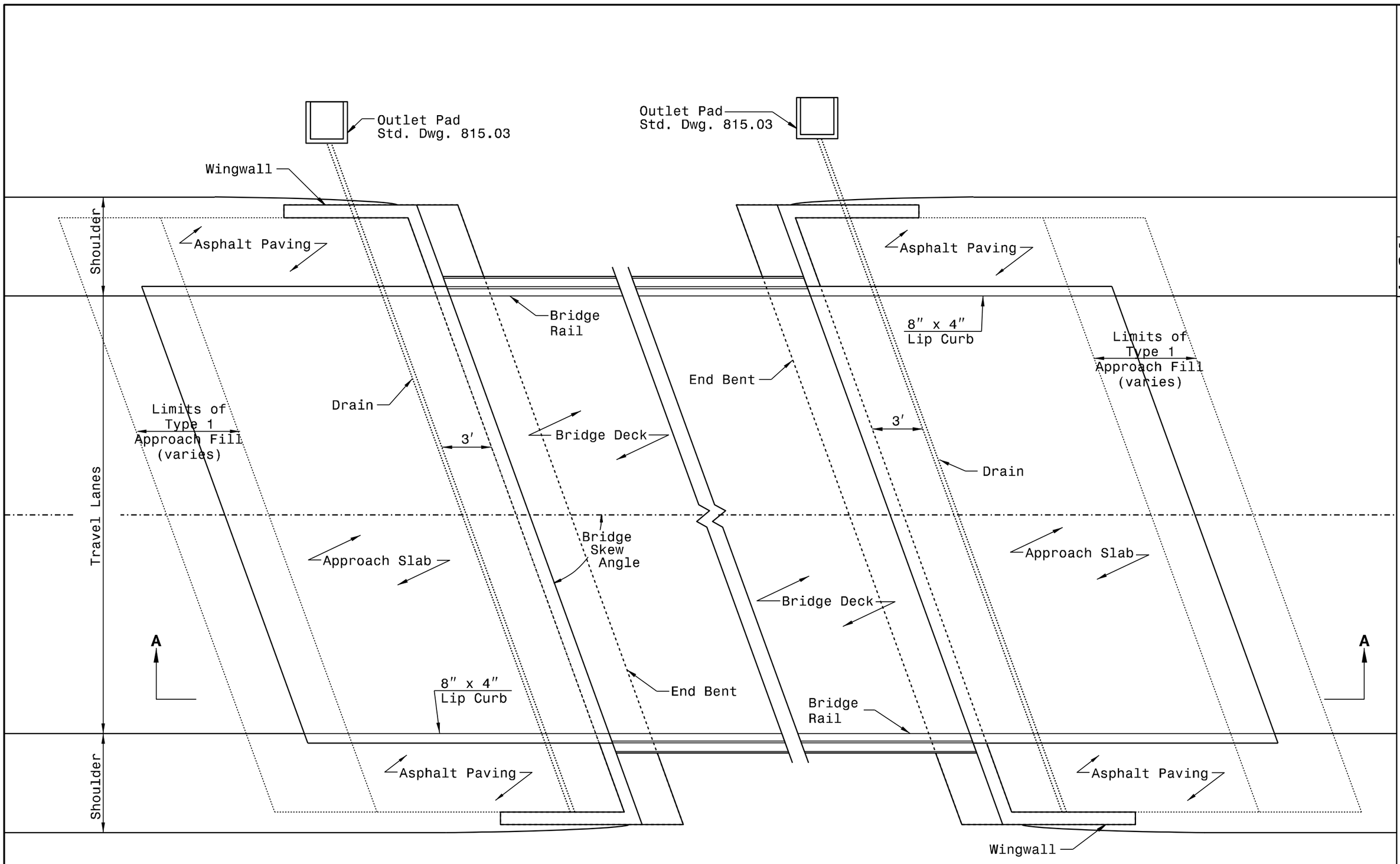
USER: jroemer



PLAN VIEW
APPROACH SLAB

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

1-24

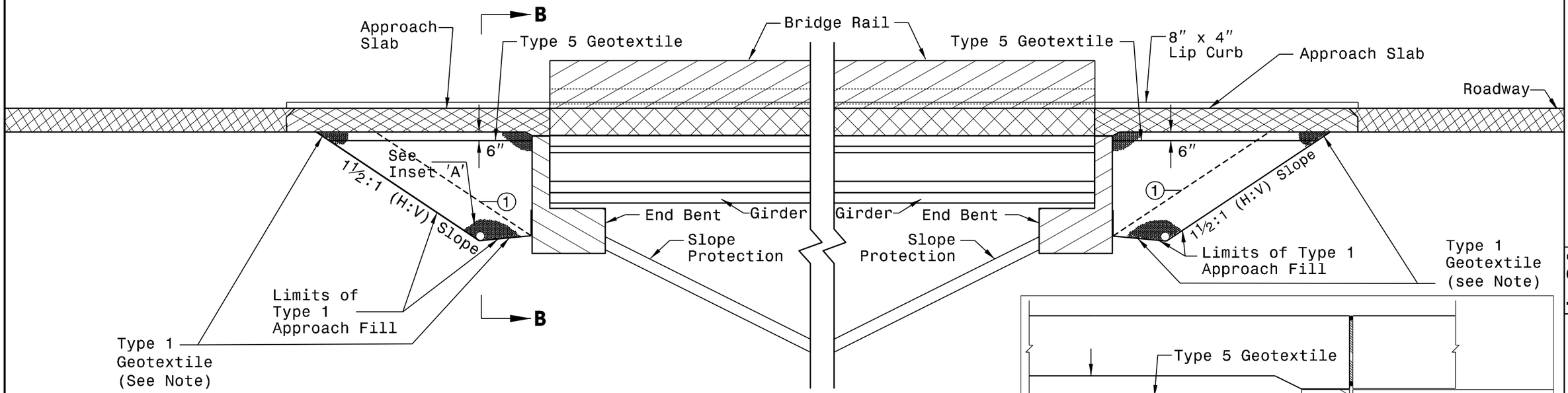
ROADWAY STANDARD DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 1 APPROACH FILL

SHEET 1 OF 2

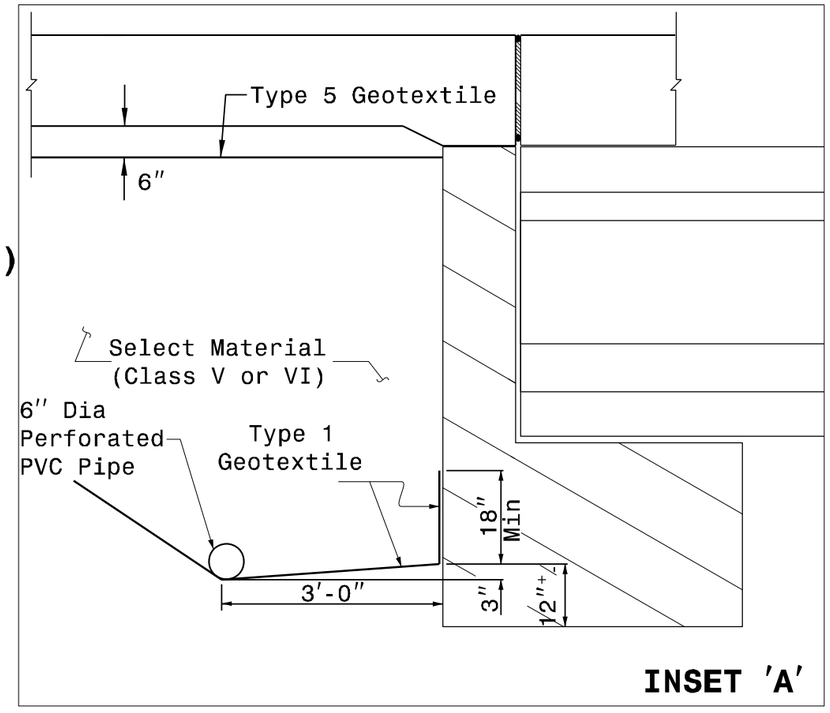
423.01



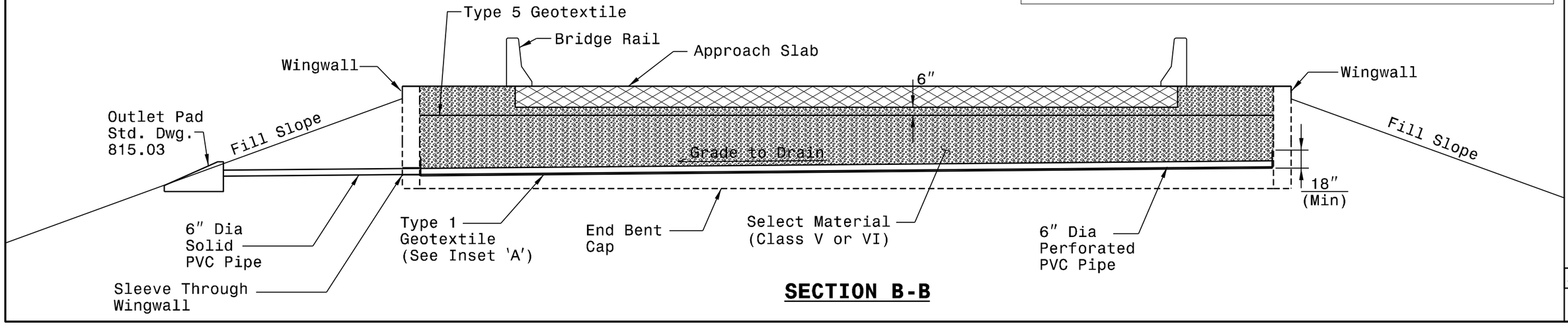
SECTION A-A
(Girder bridge shown, Cored Slabs and Box Beams similar)

① 1½:1 Compacted Temporary Fill Slope (Not necessary for cuts)

Note: If 1½:1 slope intersects subgrade beyond the end of the approach slab, wrap type 1 geotextile back over the approach fill to 18″ under approach slab as shown on sheet 2 of 2 on Std. Dwg. 423.02.



INSET 'A'



SECTION B-B

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

1-24

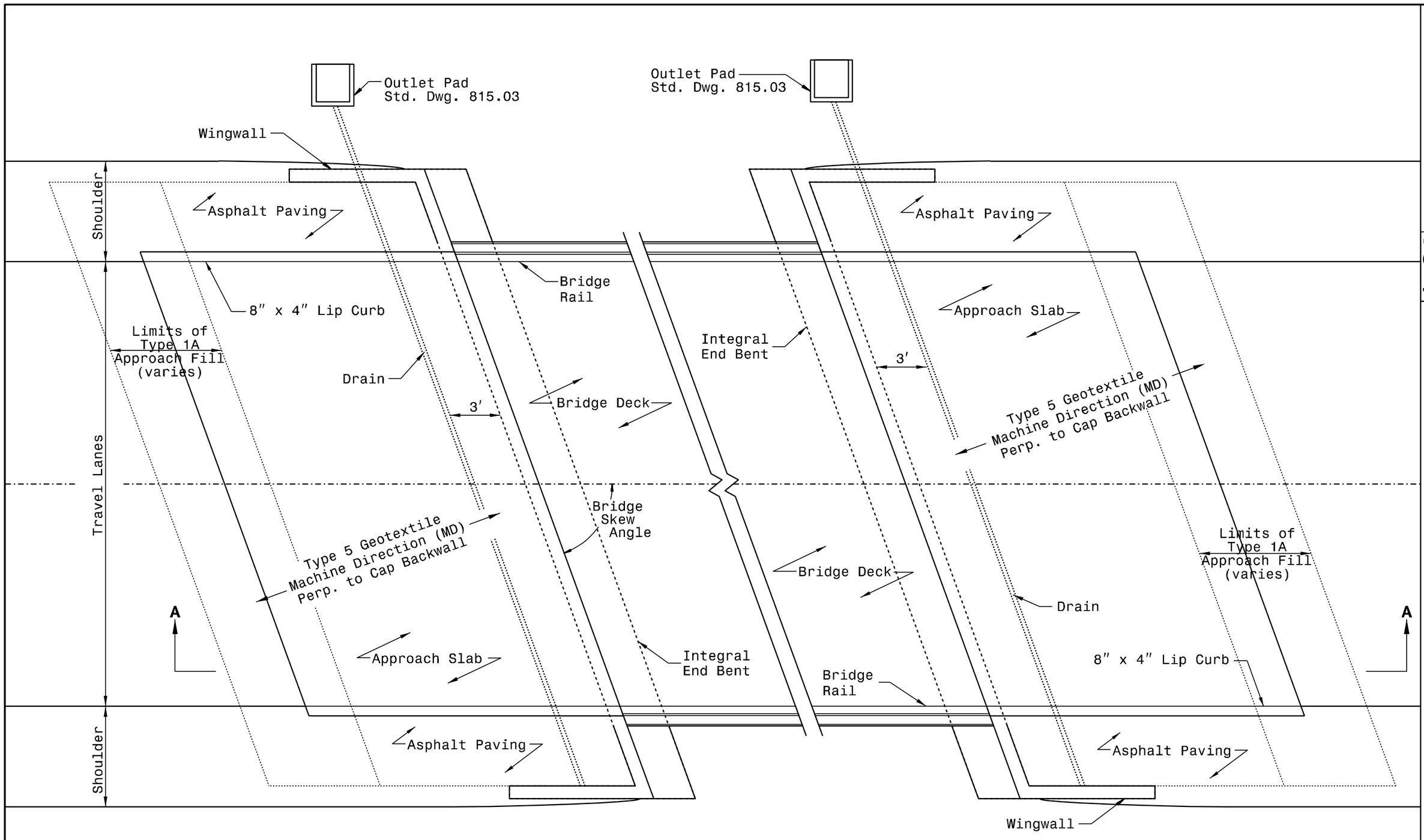
ROADWAY STANDARD DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 1 APPROACH FILL

SHEET 2 OF 2

423.01



PLAN VIEW
APPROACH SLAB

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

1-24

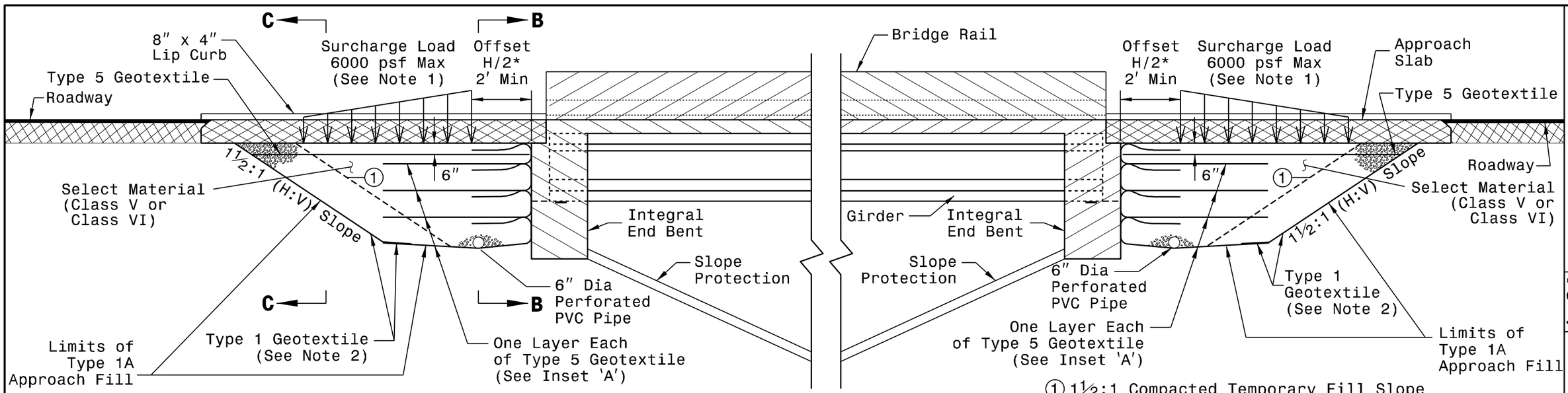
ROADWAY STANDARD DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 1A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

SHEET 1 OF 3

423.02

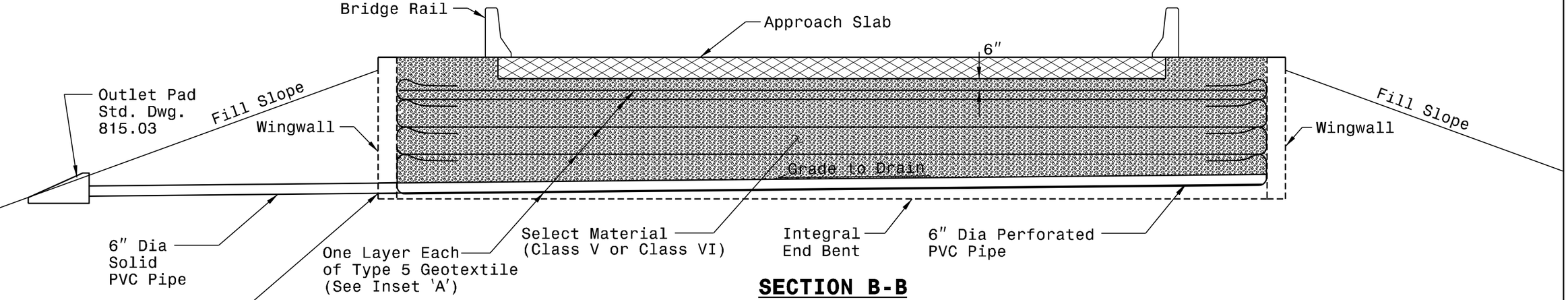


① 1½:1 Compacted Temporary Fill Slope
(Not necessary for cuts)

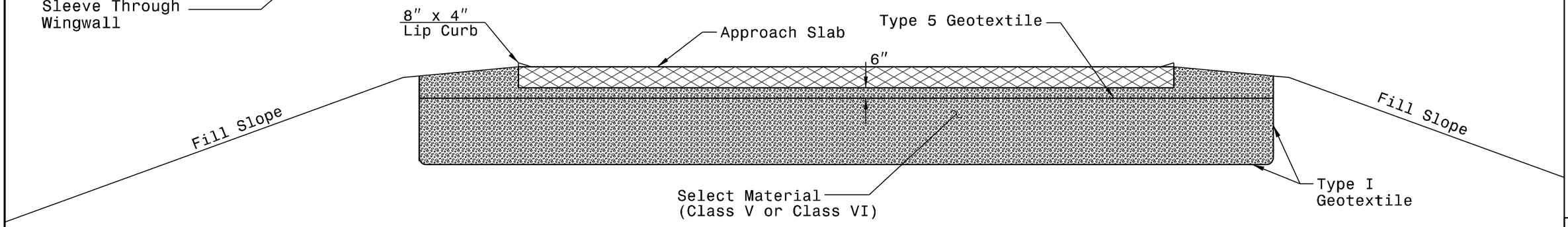
NOTE 1: Temporary geotextile walls are designed for a maximum eccentric surcharge pressure of 6000 psf for the offest shown. Surcharge loads from construction equipment, e.g., cranes that exceed 6000 psf are the Contractor's responsibility.

SECTION A-A
(*H As Shown on Sheet 3 of 3)

Note 2: If 1½:1 slope intersects subgrade beyond the end of the approach slab, wrap type 1 geotextile back over the approach fill to 18″ under approach slab as shown on sheet 2 of 3 on Std. Dwg. 423.04.



SECTION B-B



SECTION C-C

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

1-24

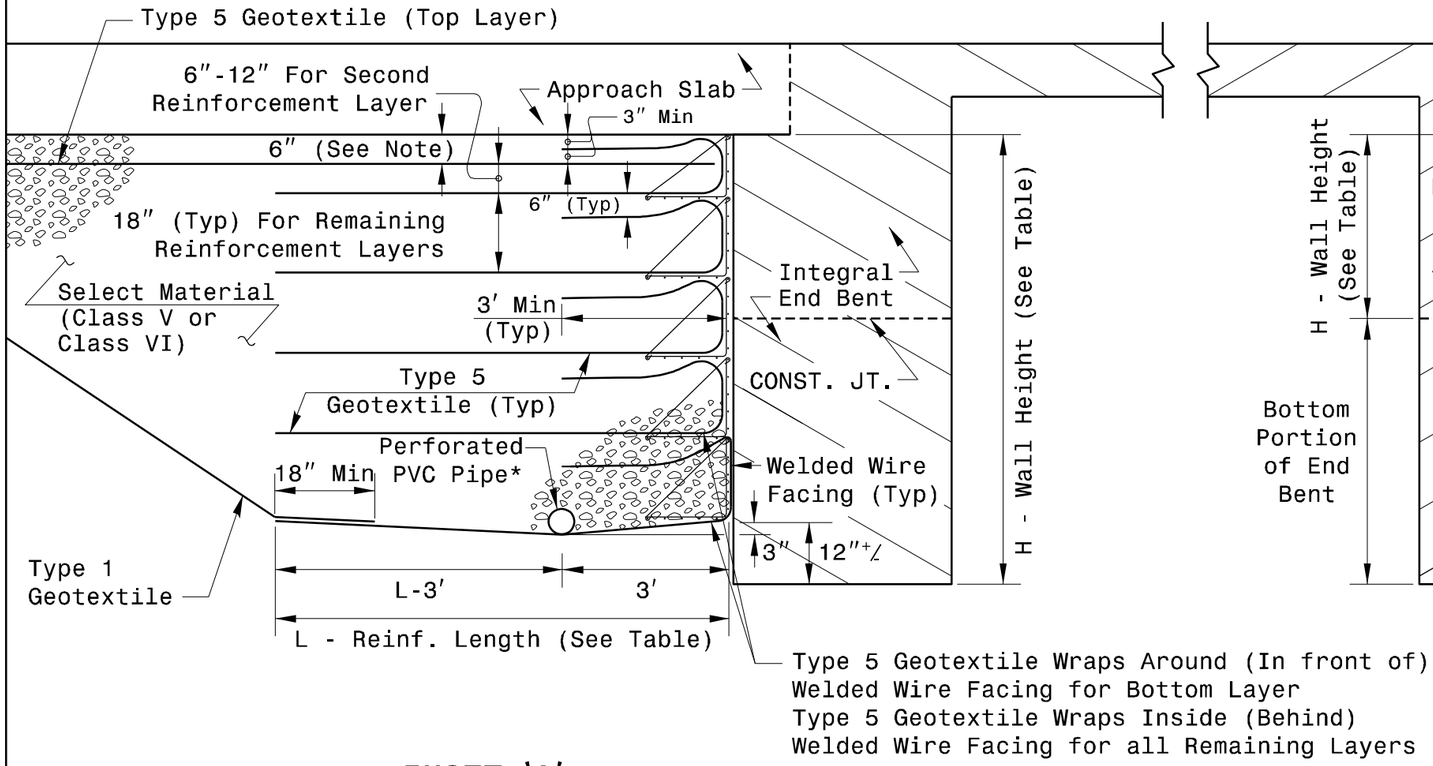
ROADWAY STANDARD DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 1A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

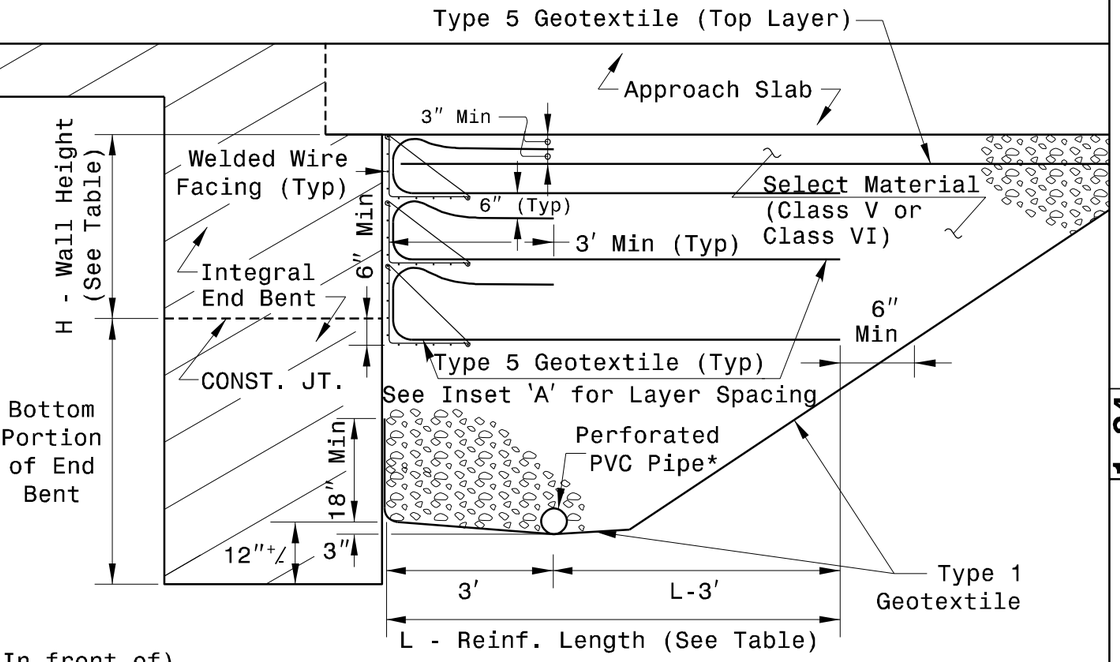
SHEET 2 OF 3

423.02



INSET 'A'

NOTE: Place top (first) reinforcement layer 6" below top of wall regardless of vertical spacing for underlying reinforcement layers. As shown in insets above, it is not necessesary to wrap the top layer of geotextile reinforcement at the wall face.



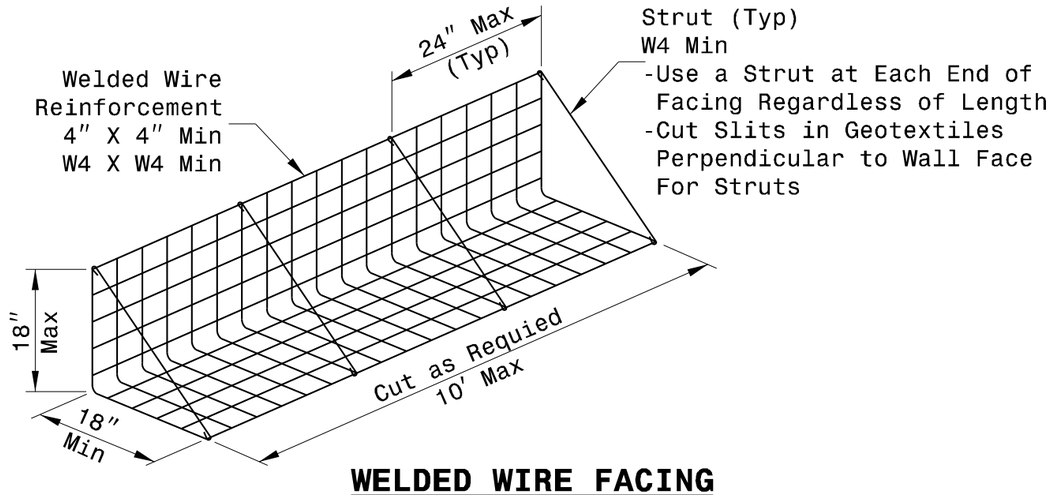
ALTERNATE INSET 'A'

(Allowed When Bottom Portion of Integral End Bent is Constructed Before Temporary Wall and End Bent Piles are at Least 25' Long or Drilled In)

TEMPORARY GEOTEXTILE WALL DETAILS

(*Perforations Pointing Down and Pipes Sloped to Drain)

TYPE 5 GEOTEXTILE REINFORCEMENT LENGTH (except for top layer)	
WALL HEIGHT H (ft)	REINFORCEMENT LENGTH L (ft)
< 8	8
8 TO 12	= H



WELDED WIRE FACING

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

1-24

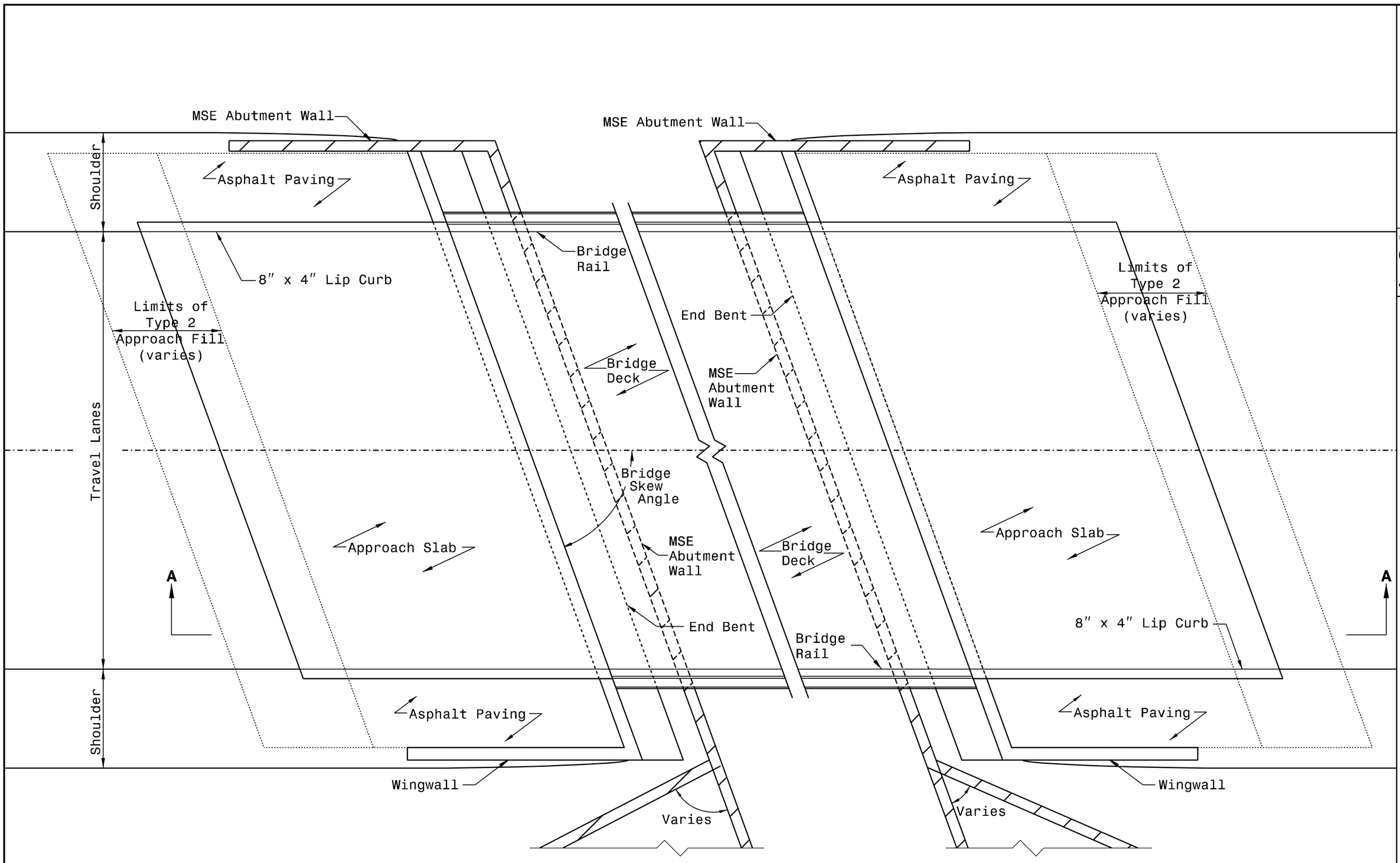
ROADWAY STANDARD DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 1A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

SHEET 3 OF 3

423.02



PLAN VIEW
APPROACH SLAB

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

1-24

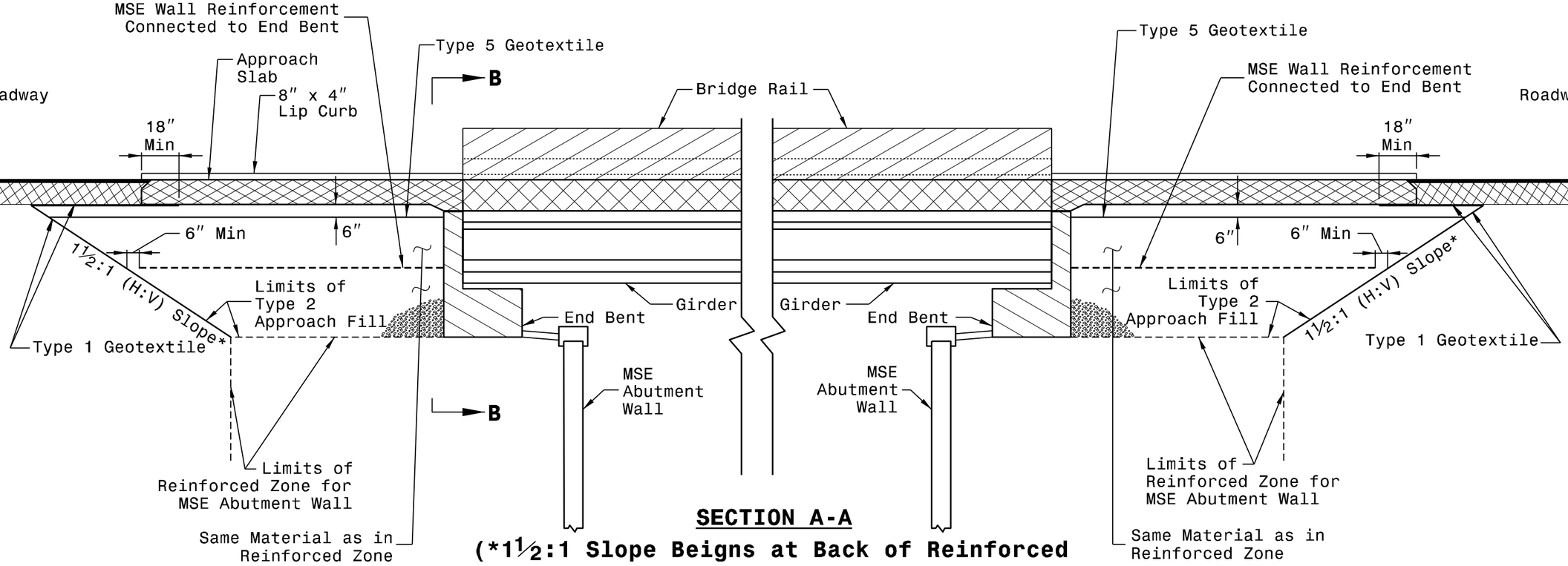
ROADWAY DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 2 APPROACH FILL
FOR MSE WALLS

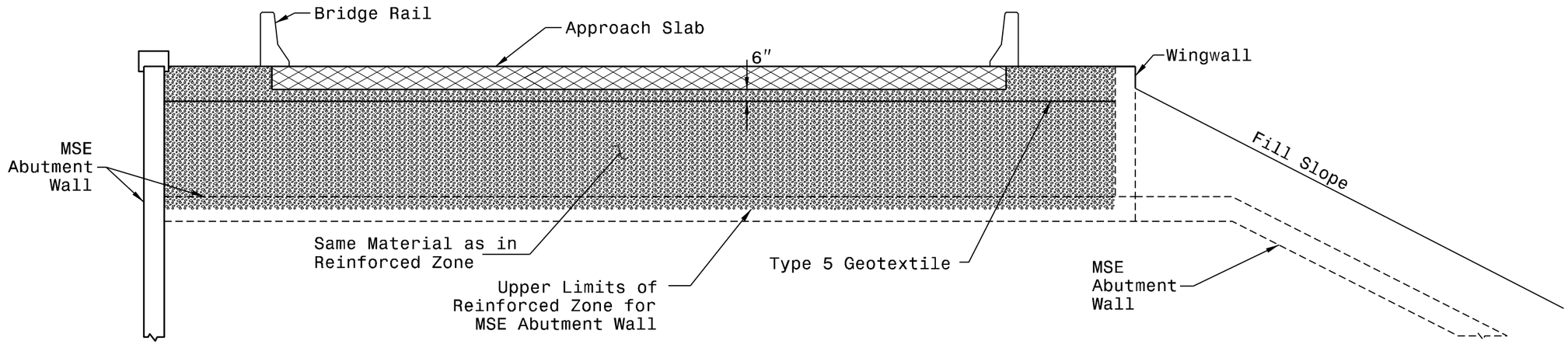
SHEET 1 OF 2

423.03



SECTION A-A

(*1½:1 Slope Beigns at Back of Reinforced Zone for MSE Abutment Wall as Shown)



SECTION B-B

(MSE Wall Reinforcement Not Shown for Clarity)

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

1-24

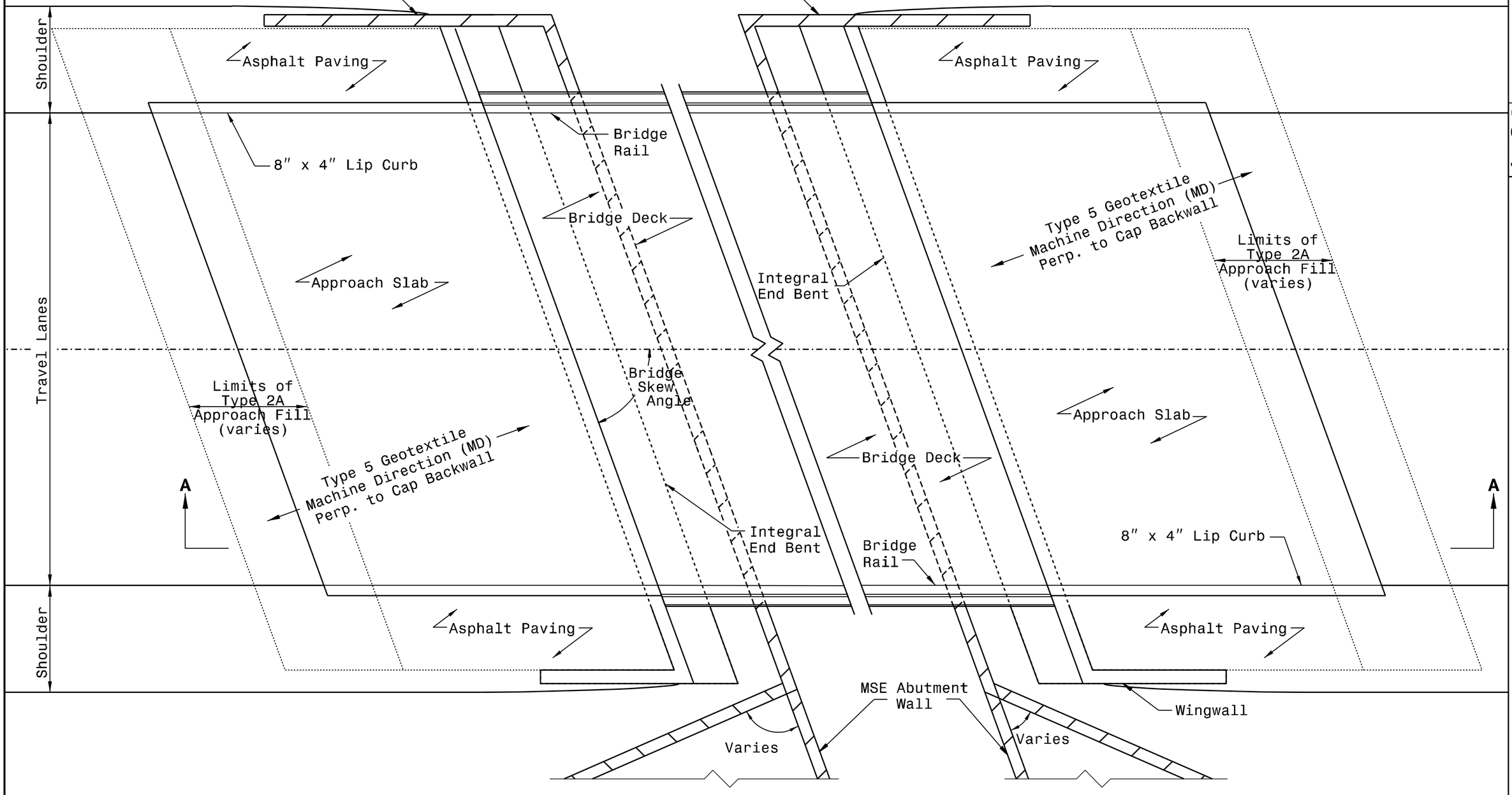
ROADWAY DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 2 APPROACH FILL
FOR MSE WALLS

SHEET 2 OF 2

423.03



PLAN VIEW
APPROACH SLAB

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

1-24

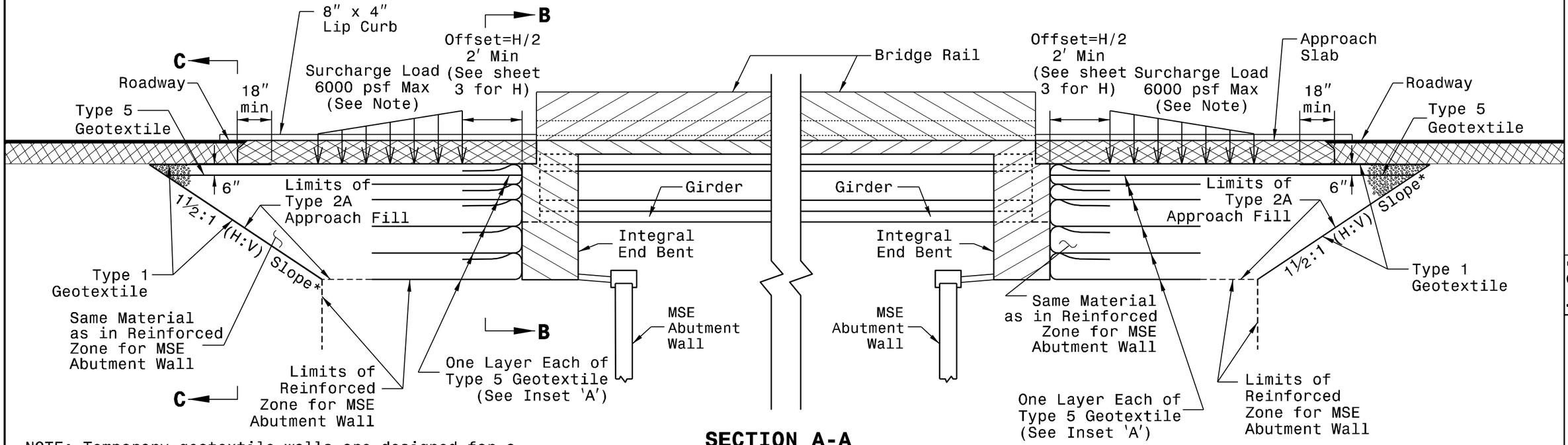
ROADWAY DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 2A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

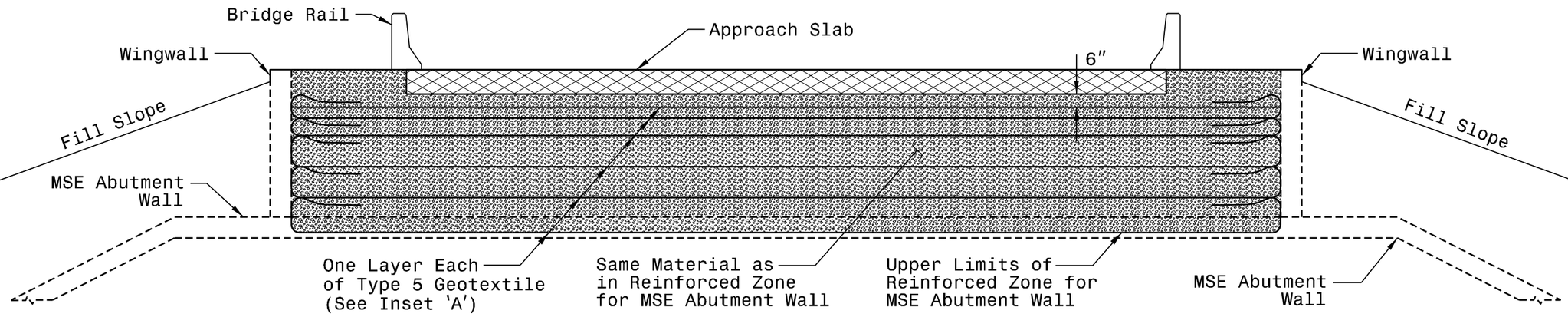
SHEET 1 OF 3

423.04

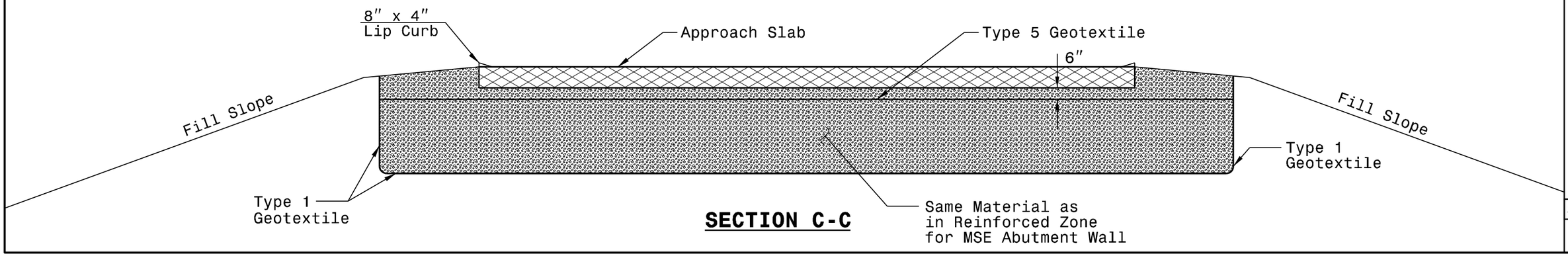


SECTION A-A
(*1½:1 Slope Begins at Back of Reinforced Zone for MSE Abutment Wall as Shown)

NOTE: Temporary geotextile walls are designed for a maximum eccentric surcharge pressure of 6000 psf for the offest shown. Surcharge loads from construction equipment, e.g., cranes that exceed 6000 psf are the Contractor's responsibility.



SECTION B-B



SECTION C-C

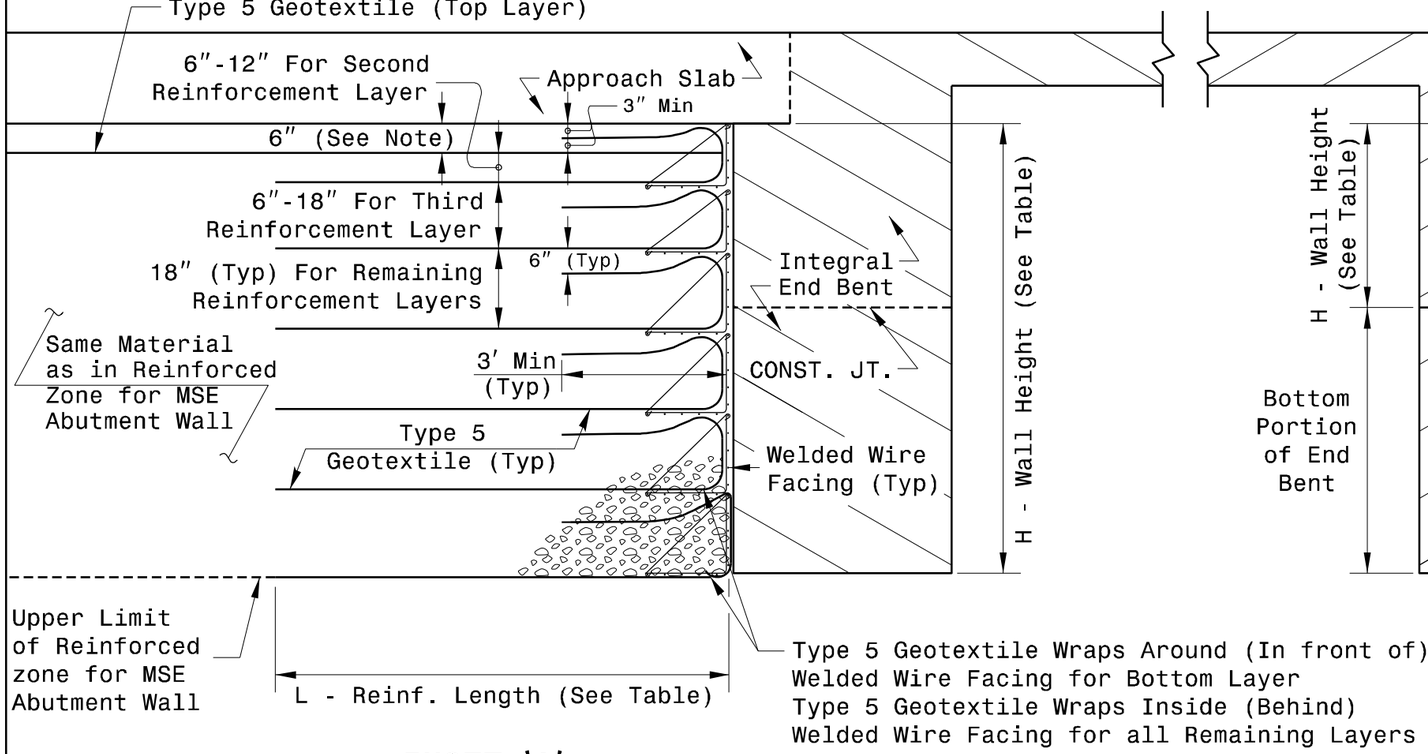
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE 2A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

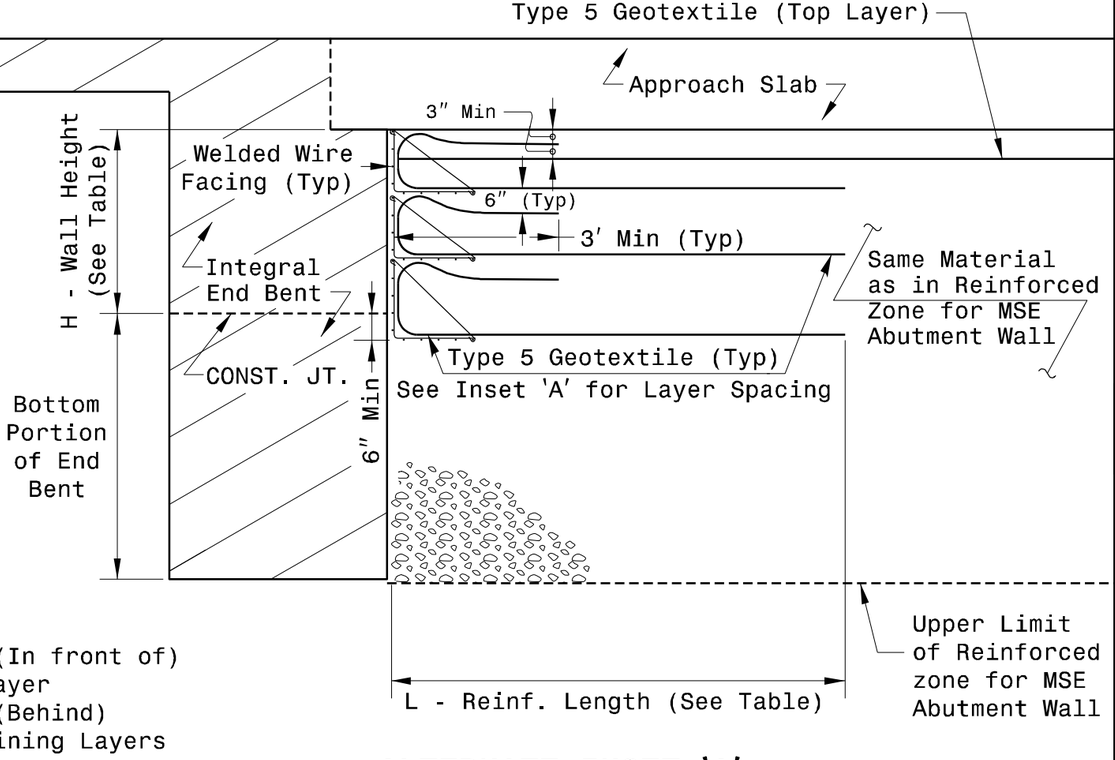
SHEET 2 OF 3

423.04



INSET 'A'

NOTE: Place top (first) reinforcement layer 6″ below top of wall regardless of vertical spacing for underlying reinforcement layers. As shown in insets above, it is not necessesary to wrap the top layer of geotextile reinforcement at the wall face.

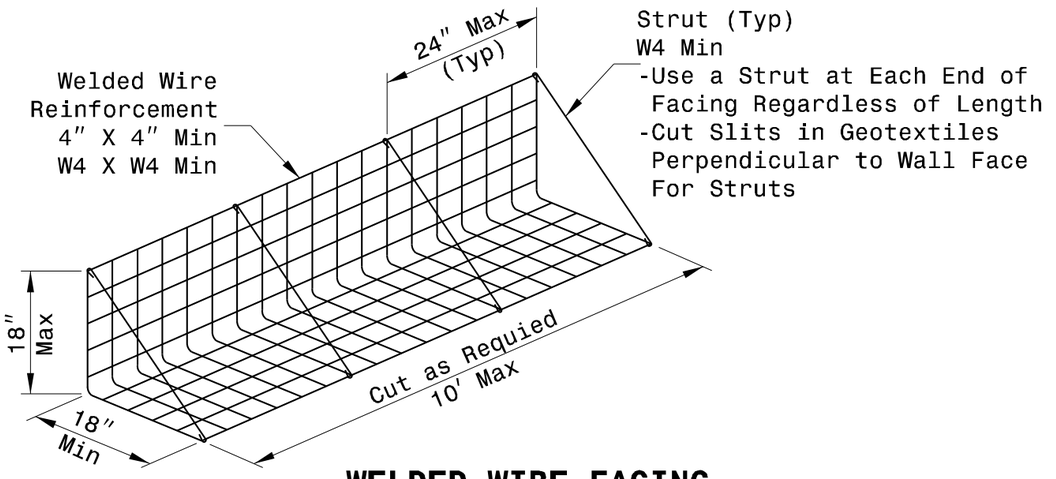


ALTERNATE INSET 'A'

(Allowed When Bottom Portion of Integral End Bent is Constructed Before Temporary Wall and End Bent Piles are at Least 25′ Long or Drilled In)

TEMPORARY GEOTEXTILE WALL DETAILS

TYPE 5 GEOTEXTILE REINFORCEMENT LENGTH (except for top layer)	
WALL HEIGHT H (ft)	REINFORCEMENT LENGTH L (ft)
< 8	8
8 TO 12	= H



WELDED WIRE FACING

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

1-24

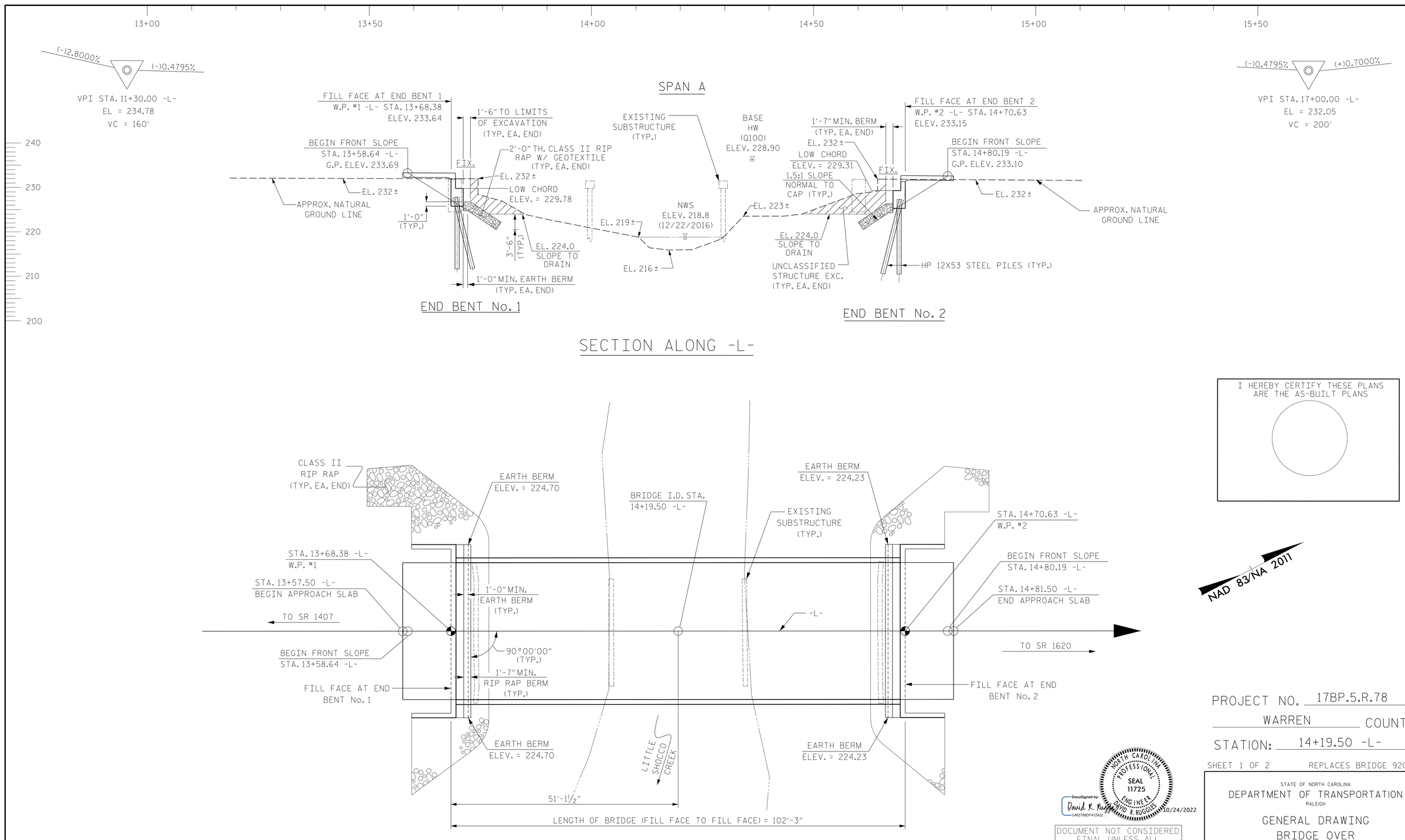
ROADWAY DETAIL DRAWING FOR

BRIDGE APPROACH FILLS

TYPE 2A APPROACH FILL
ALTERNATE FOR INTEGRAL ABUTMENT

SHEET 3 OF 3

423.04



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

NAD 83/NA 2011

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

SHEET 1 OF 2 REPLACES BRIDGE 920140

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DocuSigned by: David R. Ruggles C4627B0F413422... 10/24/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STEWART

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
LITTLE SHOCCO CREEK
ON SR 1647 (MAJ ROB ALSTON RD.)
BETWEEN SR 1407 AND SR 1620

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

DRAWN BY:	E. PHELPS	DATE : 12/17
CHECKED BY:	J. LOFTUS	DATE : 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 01/18

WARREN 140

2/13/2019
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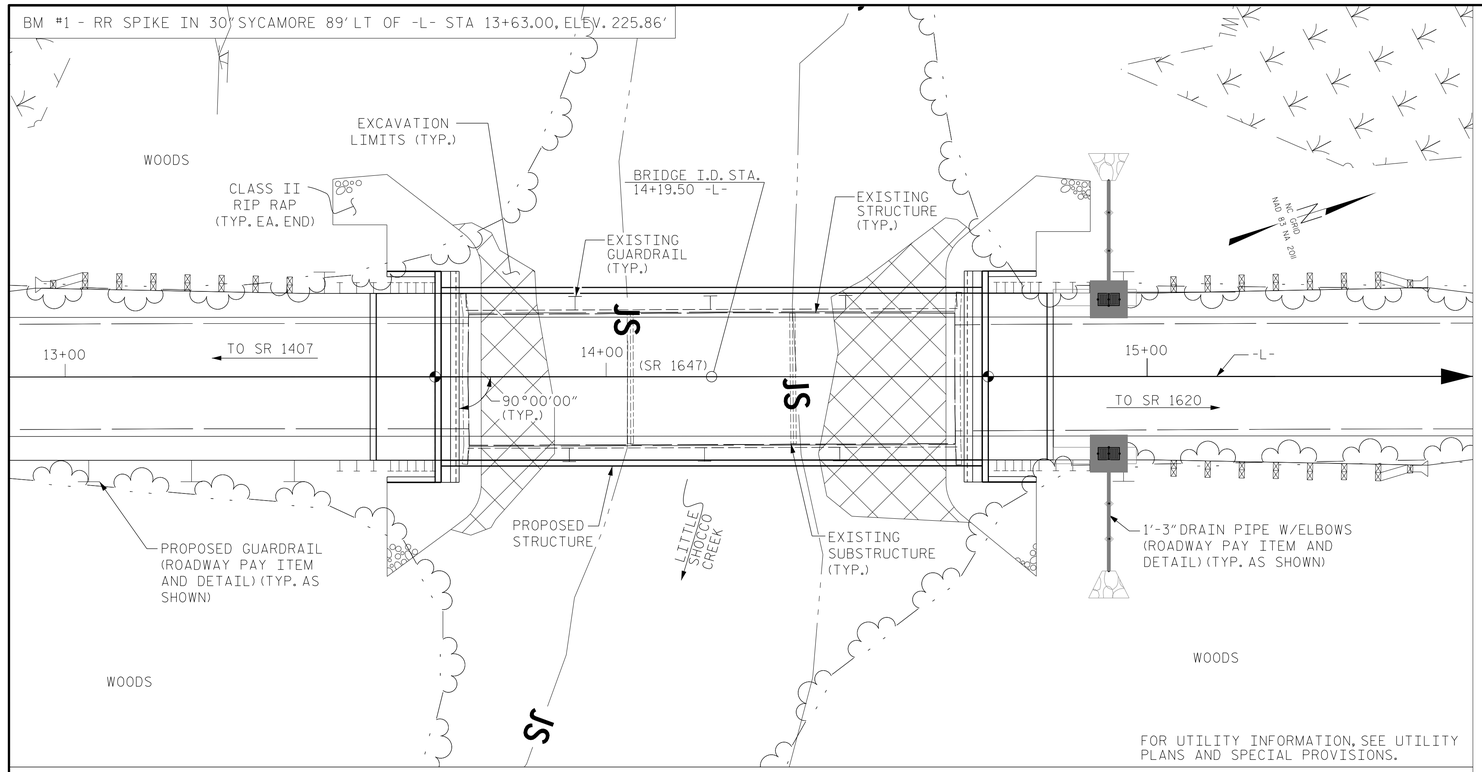
USER:vchung



LOCATION SKETCH

FOUNDATION NOTES:

1. FOR PILES, SEE 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 115 TONS PER PILE.
3. DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
4. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

HYDRAULIC DATA	
DESIGN DISCHARGE	2300 CFS
FREQUENCY OF DESIGN FLOOD	25 YR.
DESIGN HIGHWATER ELEV.	226.9 FT.
DRAINAGE AREA	11.0 SQ. MI.
BASE DISCHARGE (Q100)	3601 CFS
BASE HIGHWATER ELEV.	228.9 FT.

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	7236 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD ELEV.	✳232.6 FT.

✳SAG LOCATED AT STA. 15+89.00 -L-

GENERAL NOTES:

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH 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. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCE BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
6. REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
7. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
8. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
9. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
10. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
11. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
12. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
13. ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
14. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30'± FT LEFT SIDE AND 30'± RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE END OF THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
15. THE EXISTING STRUCTURE #920140 CONSISTING OF THREE (3) PRESTRESSED CONCRETE CHANNEL SECTION SPANS @ 30'-0" (90'-0" TOTAL LENGTH), 24'-4" CLEAR ROADWAY WIDTH AND CONCRETE DECK ON CONCRETE CAPS & TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED IN THEIR ENTIRETY (INCLUDING PILES AND TIMBER PILE BRACING IN THEIR ENTIRETY).
16. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
17. NO HEAVY EQUIPMENT WILL BE PLACED IN LITTLE SHOCCO CREEK.
18. BEST MANAGEMENT PRACTICES FOR BRIDGE DEMOLITION AND REMOVAL WILL BE IMPLEMENTED DURING THE REMOVAL OF THE EXISTING BRIDGE.
19. THE BRIDGE WILL BE REMOVED FROM THE TOP DOWN, FIRST REMOVING THE ASPHALT WITH CONTAINMENT MEASURES IN PLACE TO PREVENT ASPHALT FROM DROPPING INTO THE STREAM. THE METHOD OF CONTAINMENT WILL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THIS WILL BE FOLLOWED BY REMOVAL OF THE DECKING, GIRDERS, ETC., AND FINALLY THE WOODEN PILES. AN ATTEMPT WILL BE MADE TO COMPLETELY REMOVE THE PILES; HOWEVER, IF THIS CANNOT BE ACCOMPLISHED WITH MINIMAL SUBSTRATE DISTURBANCE, THE PILES WILL BE PINCHED OFF ONE FOOT BELOW THE MUD LINE BELOW THE RIP RAP OR CUT FLUSH WITH EXISTING RIP RAP AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL NOT BE ALLOWED TO DRAG REMOVED TIMBER PILES ON OR ACROSS THE STREAMBED. SOME AMOUNT OF EXISTING RIP RAP ON THE SOUTH STREAMBANK WILL BE PULLED INTO THE ADJACENT SCOUR HOLE UNDER THE BRIDGE DECK AS DIRECTED BY THE ENGINEER.
20. DECK DRAINS WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO THE STREAM.
21. A TEMPORARY WORK PAD MAY BE REQUIRED TO SET THE GIRDERS. THE WORK PAD WILL BE SET ON HIGH GROUND ON THE EAST SIDE OF THE STREAM RESTRICTED TO 10+50 TO 13+90 RT AND WILL NOT BE PLACED IN THE STREAM.
22. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LUMP SUM	CY	LUMP SUM	LBS	EACH	No.	LF	EACH	LF	TON	SY	LUMP SUM	No.	LF
SUPERSTRUCTURE					LUMP SUM						200.0			LUMP SUM	11	1100.0
END BENT No. 1			LUMP SUM	29.0		4,610	7	7	105	7		95	105			
END BENT No. 2			LUMP SUM	29.0		4,610	7	7	105	7		85	95			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	58.0	LUMP SUM	9,220	14	14	210	14	200.0	180	200	LUMP SUM	11	1100.0

DRAWN BY: E. PHELPS DATE: 12/17
CHECKED BY: J. LOFTUS DATE: 01/18
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/18

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
DocuSigned by: David R. Ruggles C4627B0DF413422...
10/24/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STEWART
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Suite 400
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PROJECT NO. 17BP.5.R.78
WARREN COUNTY
STATION: 14+19.50 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
LITTLE SHOCCO CREEK
ON SR 1647 (MAJ ROB ALSTON RD.)
BETWEEN SR 1407 AND SR 1620

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

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	1.035	--	1.75	0.272	1.26	A	EL	49.25	0.489	1.34	A	EL	4.925	0.80	0.272	**1.04**	A	EL	**49.25**	
		HL-93(Opr)	N/A	--	1.633	--	1.35	0.272	1.63	A	EL	49.25	0.489	1.73	A	EL	4.925	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.44	51.84	1.75	0.272	1.75	A	EL	49.25	0.489	1.81	A	EL	4.925	0.80	0.272	**1.44**	A	EL	**49.25**	
		HS-20(Opr)	36.000	--	2.271	81.756	1.35	0.272	2.27	A	EL	49.25	0.489	2.35	A	EL	4.925	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.413	46.079	1.4	0.272	5.19	A	EL	49.25	0.489	5.59	A	EL	4.925	0.80	0.272	3.41	A	EL	49.25	
		SNGARBS2	20.000	--	2.473	49.452	1.4	0.272	3.76	A	EL	49.25	0.489	3.91	A	EL	4.925	0.80	0.272	2.47	A	EL	49.25	
		SNAGRIS2	22.000	--	2.313	50.885	1.4	0.272	3.52	A	EL	49.25	0.489	3.6	A	EL	4.925	0.80	0.272	2.31	A	EL	49.25	
		SNCOTTS3	27.250	--	1.696	46.228	1.4	0.272	2.58	A	EL	49.25	0.489	2.78	A	EL	4.925	0.80	0.272	1.70	A	EL	49.25	
		SNAGGRS4	34.925	--	1.39	48.556	1.4	0.272	2.11	A	EL	49.25	0.489	2.26	A	EL	4.925	0.80	0.272	1.39	A	EL	49.25	
		SNS5A	35.550	--	1.361	48.398	1.4	0.272	2.07	A	EL	49.25	0.489	2.27	A	EL	4.925	0.80	0.272	1.36	A	EL	49.25	
		SNS6A	39.950	--	1.238	49.456	1.4	0.272	1.88	A	EL	49.25	0.489	2.05	A	EL	4.925	0.80	0.272	1.24	A	EL	49.25	
		SNS7B	42.000	--	1.178	49.496	1.4	0.272	1.79	A	EL	49.25	0.489	2	A	EL	4.925	0.80	0.272	1.18	A	EL	49.25	
	TTST	TNAGRIT3	33.000	--	1.506	49.709	1.4	0.272	2.29	A	EL	49.25	0.489	2.46	A	EL	4.925	0.80	0.272	1.51	A	EL	49.25	
		TNT4A	33.075	--	1.51	49.942	1.4	0.272	2.3	A	EL	49.25	0.489	2.41	A	EL	4.925	0.80	0.272	1.51	A	EL	49.25	
		TNT6A	41.600	--	1.224	50.926	1.4	0.272	1.86	A	EL	49.25	0.489	2.09	A	EL	4.925	0.80	0.272	1.22	A	EL	49.25	
		TNT7A	42.000	--	1.225	51.442	1.4	0.272	1.86	A	EL	49.25	0.489	2.05	A	EL	4.925	0.80	0.272	1.22	A	EL	49.25	
		TNT7B	42.000	--	1.254	52.657	1.4	0.272	1.91	A	EL	49.25	0.489	1.96	A	EL	4.925	0.80	0.272	1.25	A	EL	49.25	
		TNAGRIT4	43.000	--	1.203	51.711	1.4	0.272	1.83	A	EL	49.25	0.489	1.91	A	EL	4.925	0.80	0.272	1.20	A	EL	49.25	
		TNAGT5A	45.000	--	1.139	51.236	1.4	0.272	1.73	A	EL	49.25	0.489	1.87	A	EL	4.925	0.80	0.272	1.14	A	EL	49.25	
		TNAGT5B	45.000	3	1.129	50.805	1.4	0.272	1.72	A	EL	49.25	0.489	1.82	A	EL	4.925	0.80	0.272	**1.13**	A	EL	**49.25**	

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)

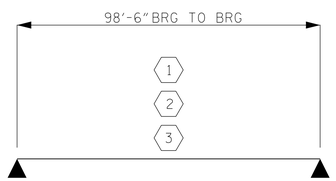
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

DocuSigned by: David R. Ruggles C462768DF412422... 10/24/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 100' 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

DRAWN BY: E. PHELPS DATE: 12/17
CHECKED BY: J. LOFTUS DATE: 01/18
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/18

2/13/2019
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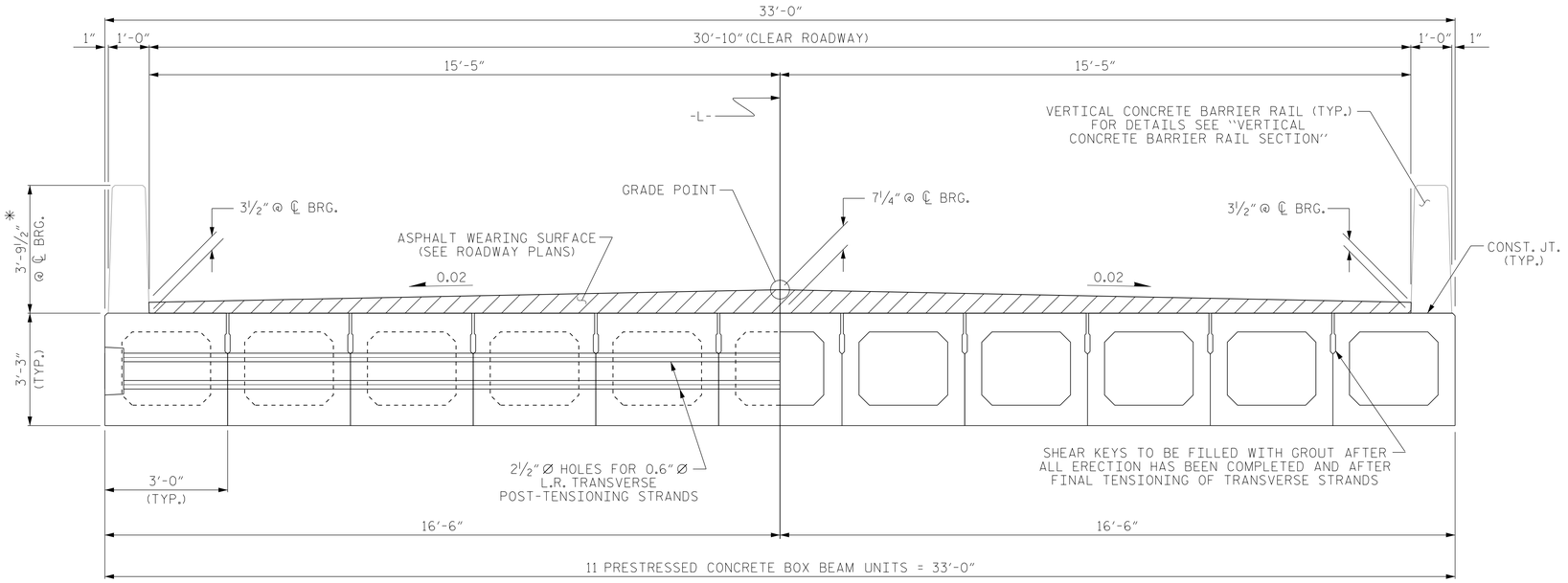
USER:vchung

WARREN 140

STD. NO. 39LRFR1_90S_100L



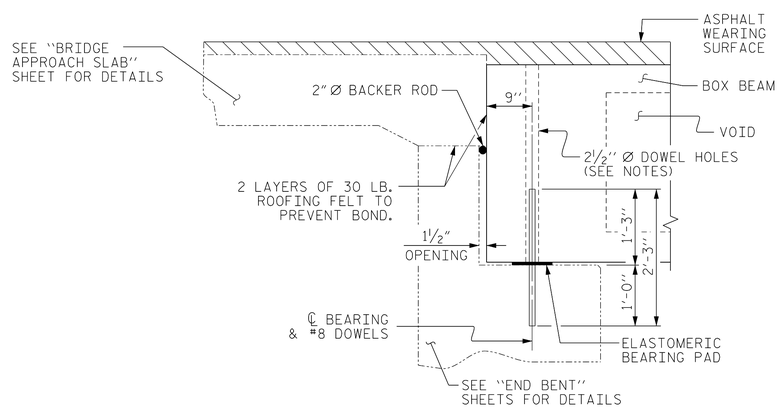
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

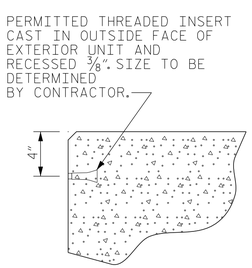
TYPICAL SECTION

* - 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 5,500 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.

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

DRAWN BY:	E. PHELPS	DATE : 12/17
CHECKED BY:	J. LOFTUS	DATE : 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 01/18

STD. NO. 39PCBB1_33

WARREN 140

2/13/2019
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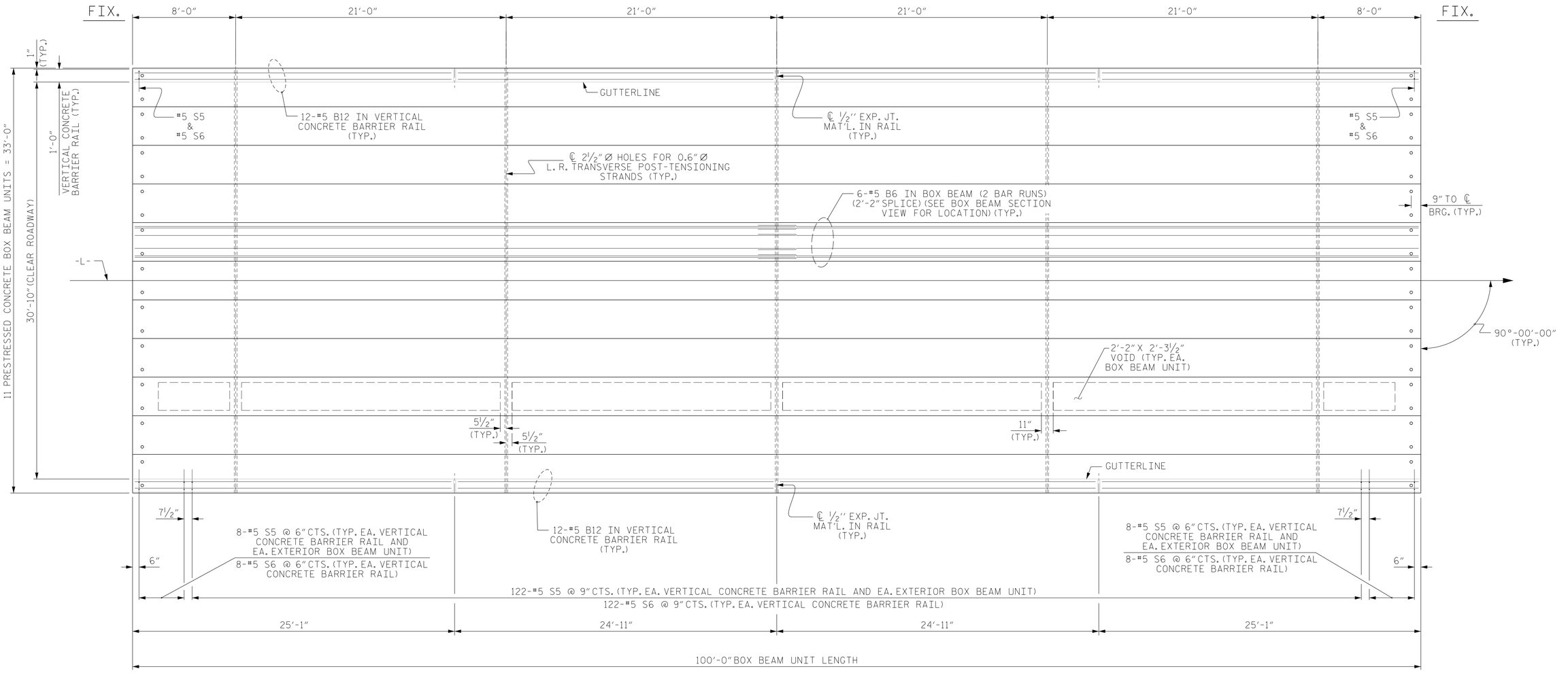
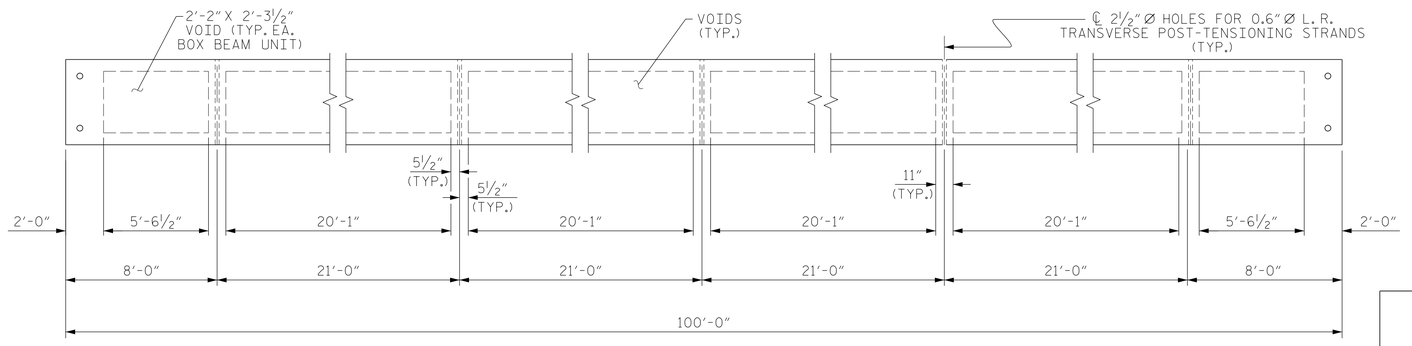
USER:vchung



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 100' UNIT 30'-10" CLEAR ROADWAY 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGIES

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

DRAWN BY:	E. PHELPS	DATE : 12/17
CHECKED BY:	J. LOFTUS	DATE : 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 01/18

STD.NO.39PCBB_33_90S_100L

WARREN 140

2/13/2019
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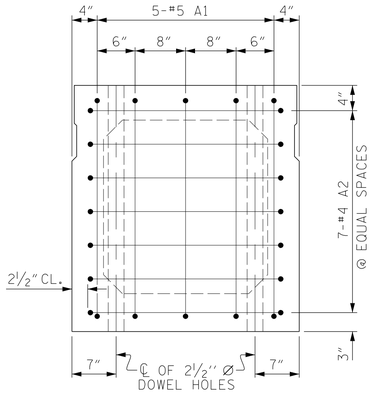
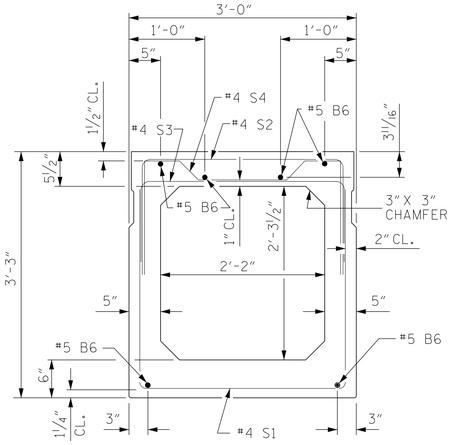


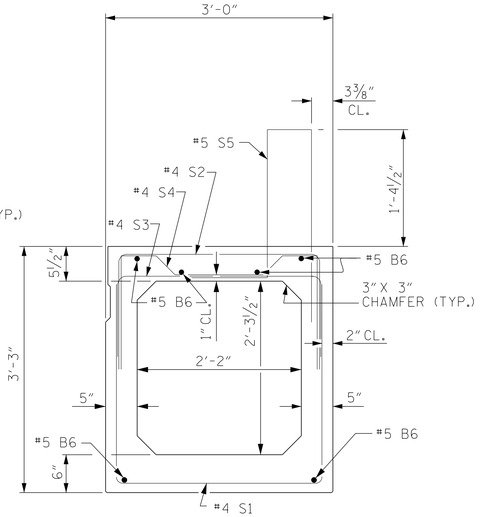
END ELEVATION

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

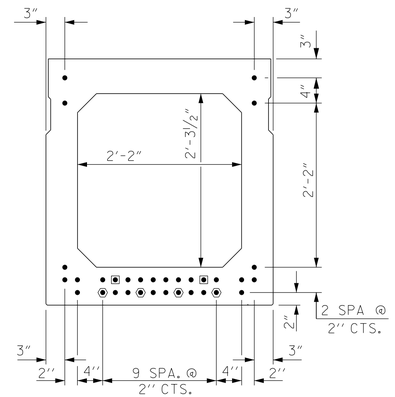
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

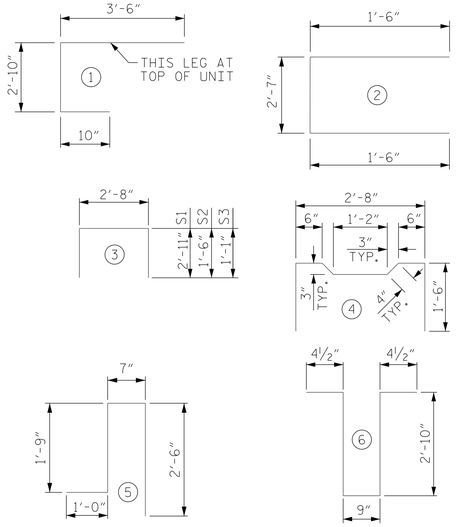
(32 STRANDS REQUIRED)

DEBONDING LEGEND

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

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

BAR TYPES



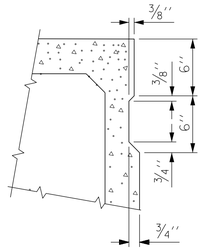
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	81	#4	3	8'-6"	460	8'-6"	460
S2	81	#4	3	5'-8"	307	5'-8"	307
S3	141	#4	3	4'-10"	455	4'-10"	455
S4	60	#4	4	5'-10"	234	5'-10"	234
✳ S5	138	#5	5	5'-10"	840	--	--
REINFORCING STEEL					2421 LBS.		2421 LBS.
✳ EPOXY COATED REINF. STEEL					840 LBS.		
7500 P.S.I. CONCRETE					19.6 CU. YDS.		19.4 CU. YDS.
0.6" Ø L.R. STRANDS					No. 32		No. 32

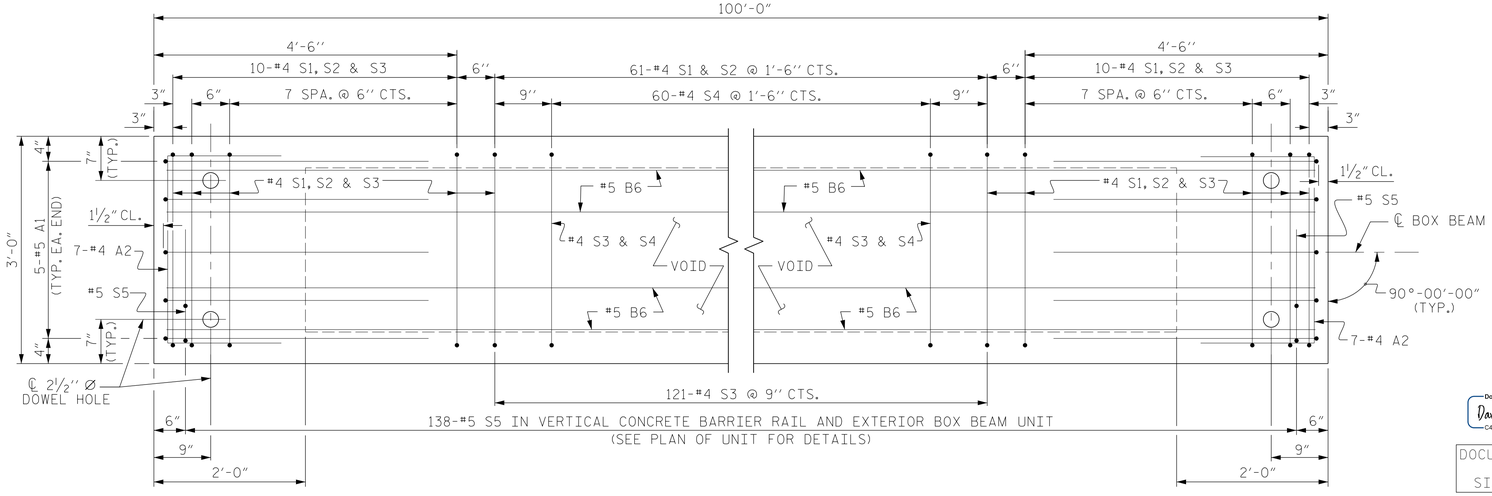
GRADE 270 STRANDS

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



SHEAR KEY DETAIL

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



PLAN OF BOX BEAM

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

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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RALEIGH
STANDARD

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

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

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DRAWN BY:	E. PHELPS	DATE : 12/17
CHECKED BY:	J. LOFTUS	DATE : 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 01/18

STD. NO. 39PCBB6_90S_100L

WARREN 140

2/13/2019
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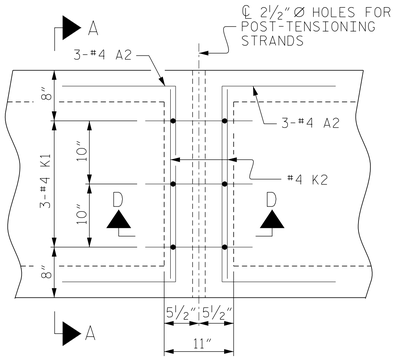
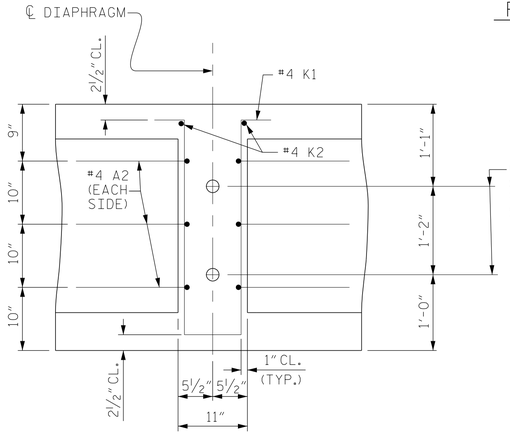
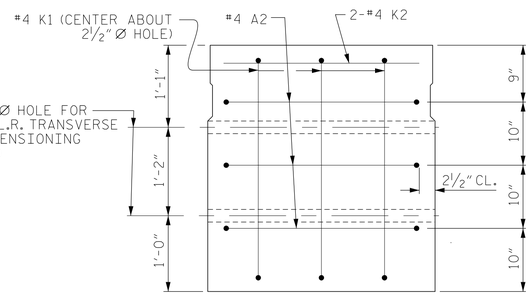
USER:vchung



PLAN



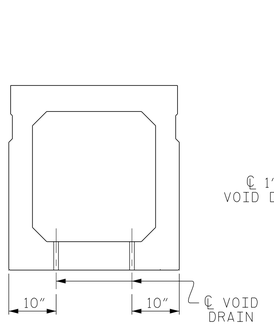
SECTION D-D



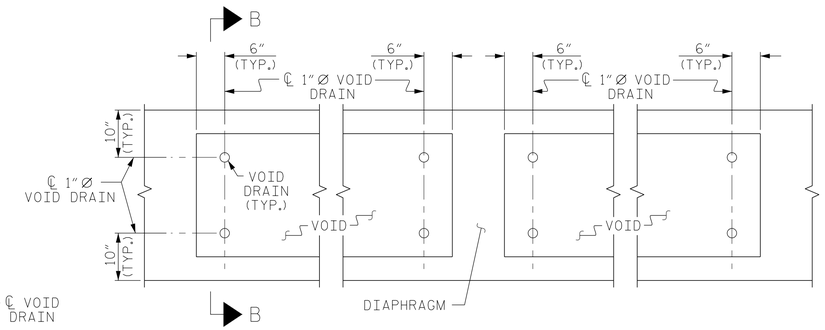
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

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



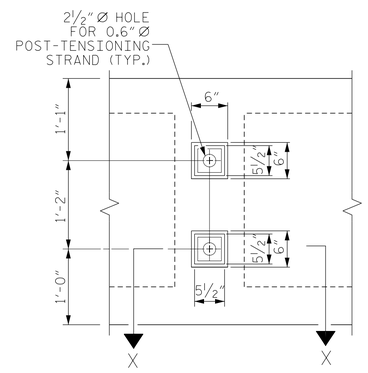
SECTION B-B



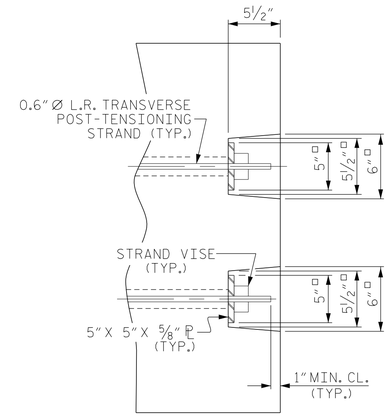
PART PLAN

VOID DRAIN DETAILS

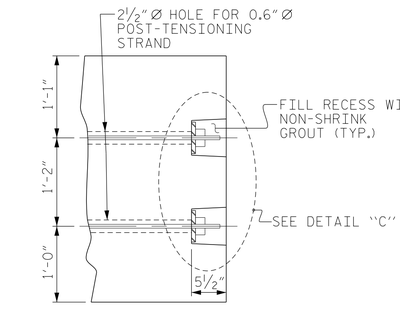
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



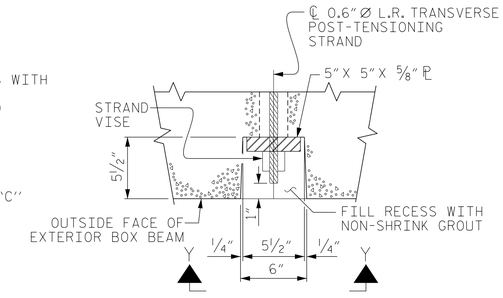
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



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

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
100'-0" BOX BEAM UNIT (NC & SE)	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅞" ↓
FINAL CAMBER	1⅛" ↑

** INCLUDES FUTURE WEARING SURFACE

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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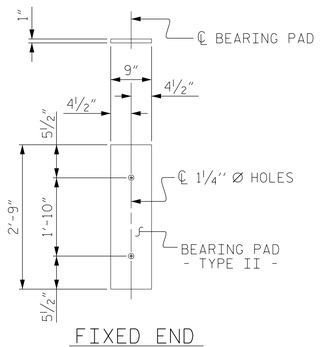
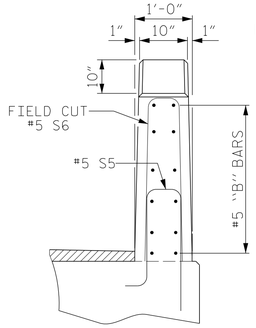
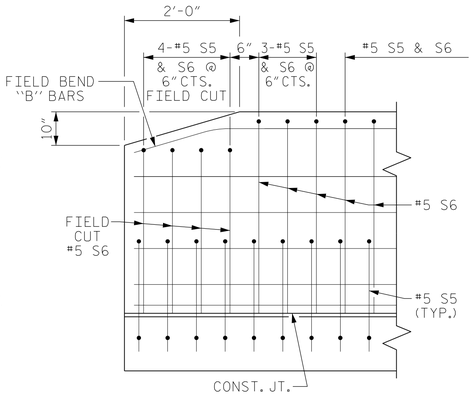


FIXED END

(TYPE II - 22 REQ'D)



END VIEW

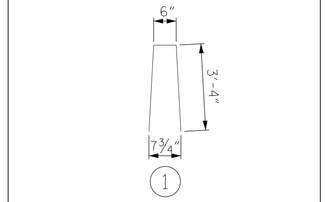


SIDE VIEW

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS

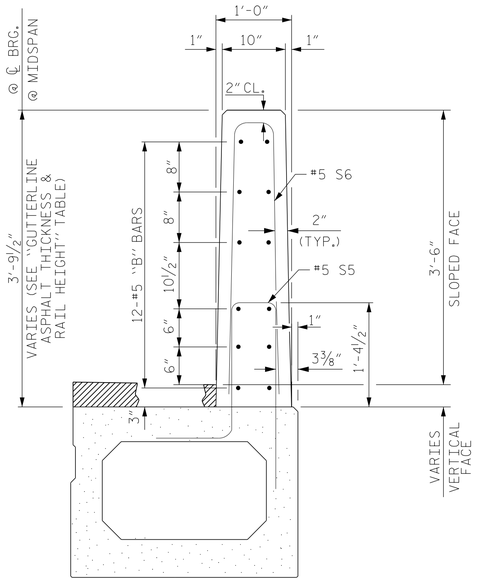


BAR TYPE

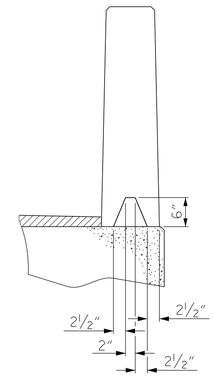
BAR DIMENSIONS ARE OUT TO OUT

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11	———	1100'-0"

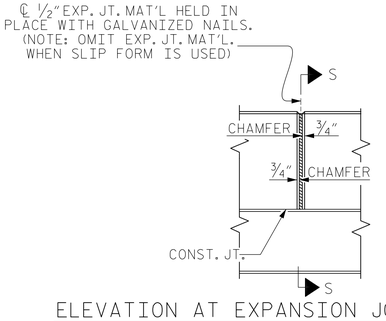


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	100' UNIT				
✳B12	96	#5	STR	24'-7"	2461
✳S6	276	#5	1	7'-2"	2063
✳EPOXY COATED REINFORCING STEEL			LBS.		4524
CLASS AA CONCRETE			CU.YDS.		25.9
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN.FT.		200.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2⅜"	3'-8⅜"

PROJECT NO. 17BP.5.R.78

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SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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STANDARD

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

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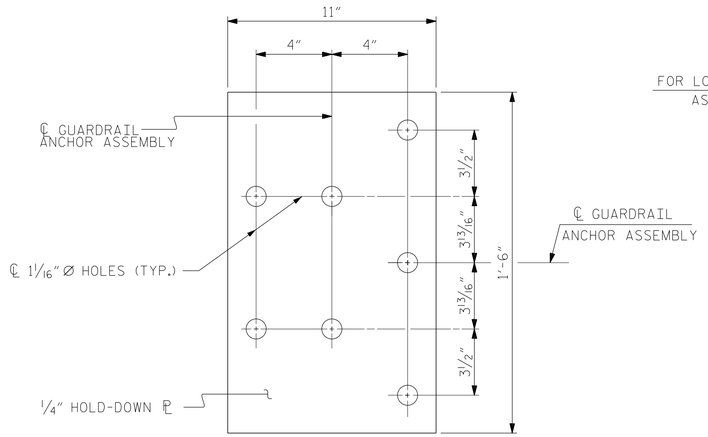
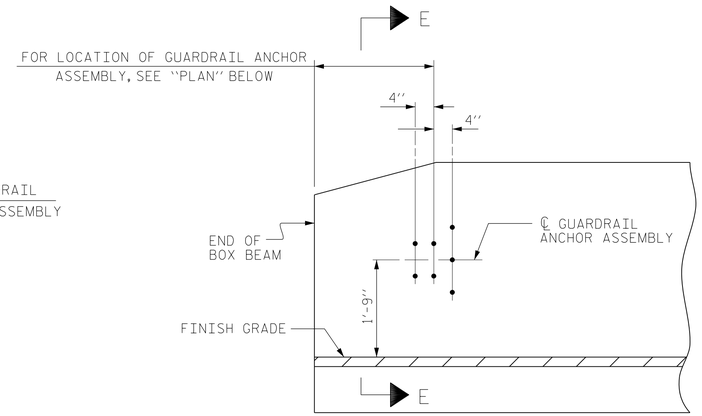


PLAN



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.)

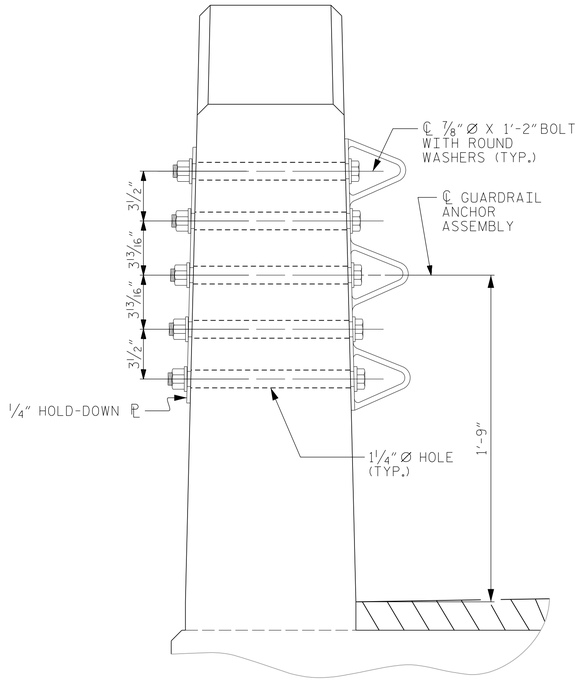
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

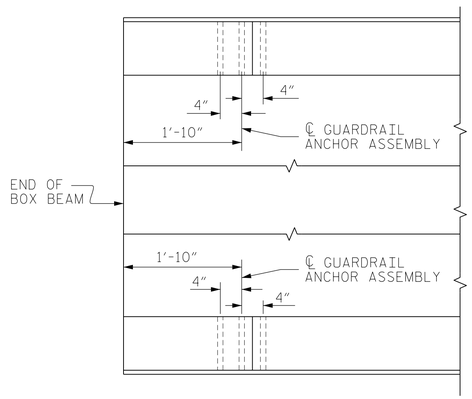
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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 DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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(SHT 1) STD. NO. GRA3

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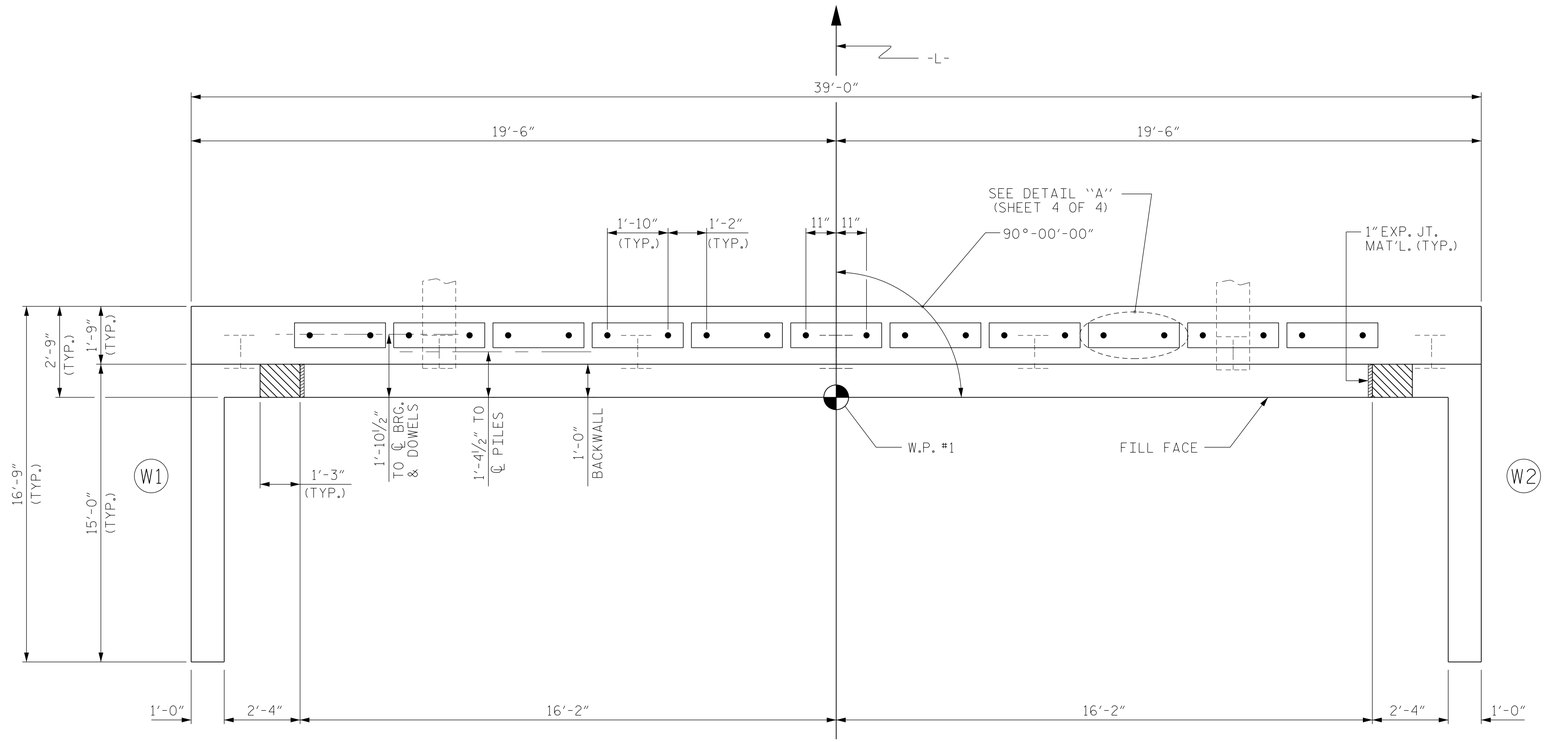
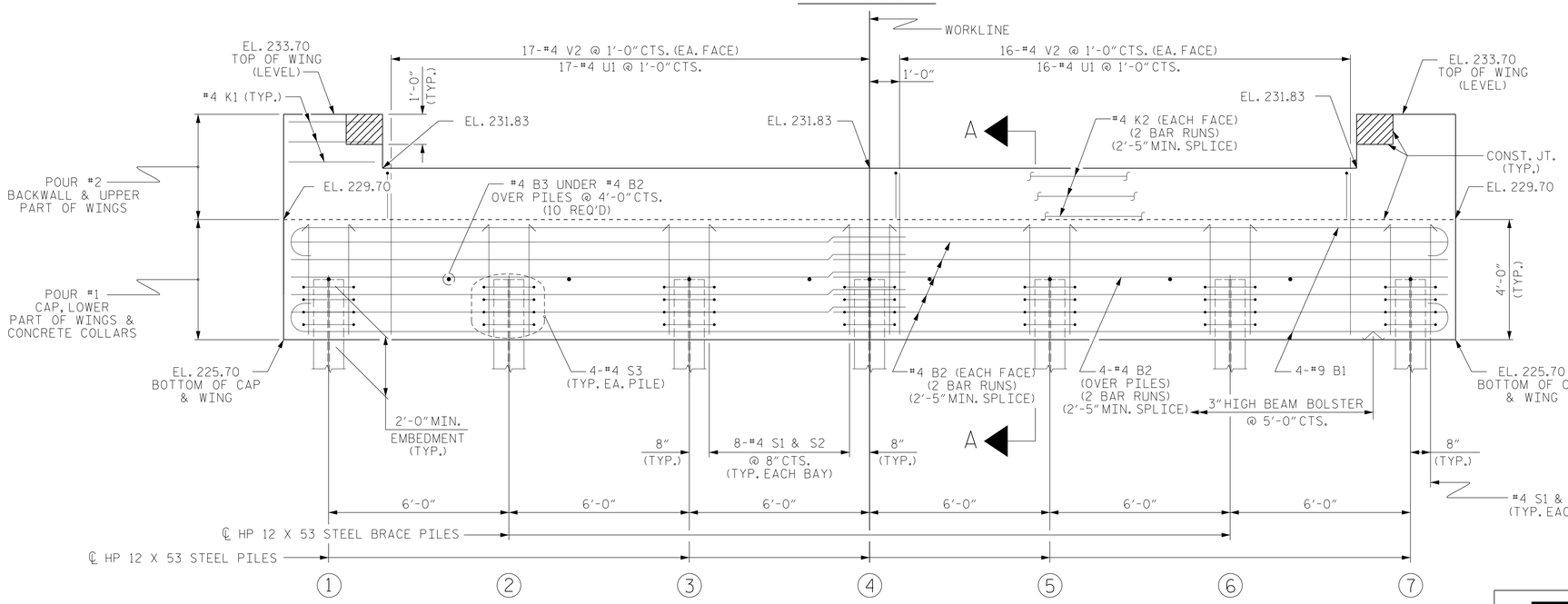


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE 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.

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SHEET 1 OF 4

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SUBSTRUCTURE

END BENT No. 1

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1			3			TOTAL SHEETS
2			4			16

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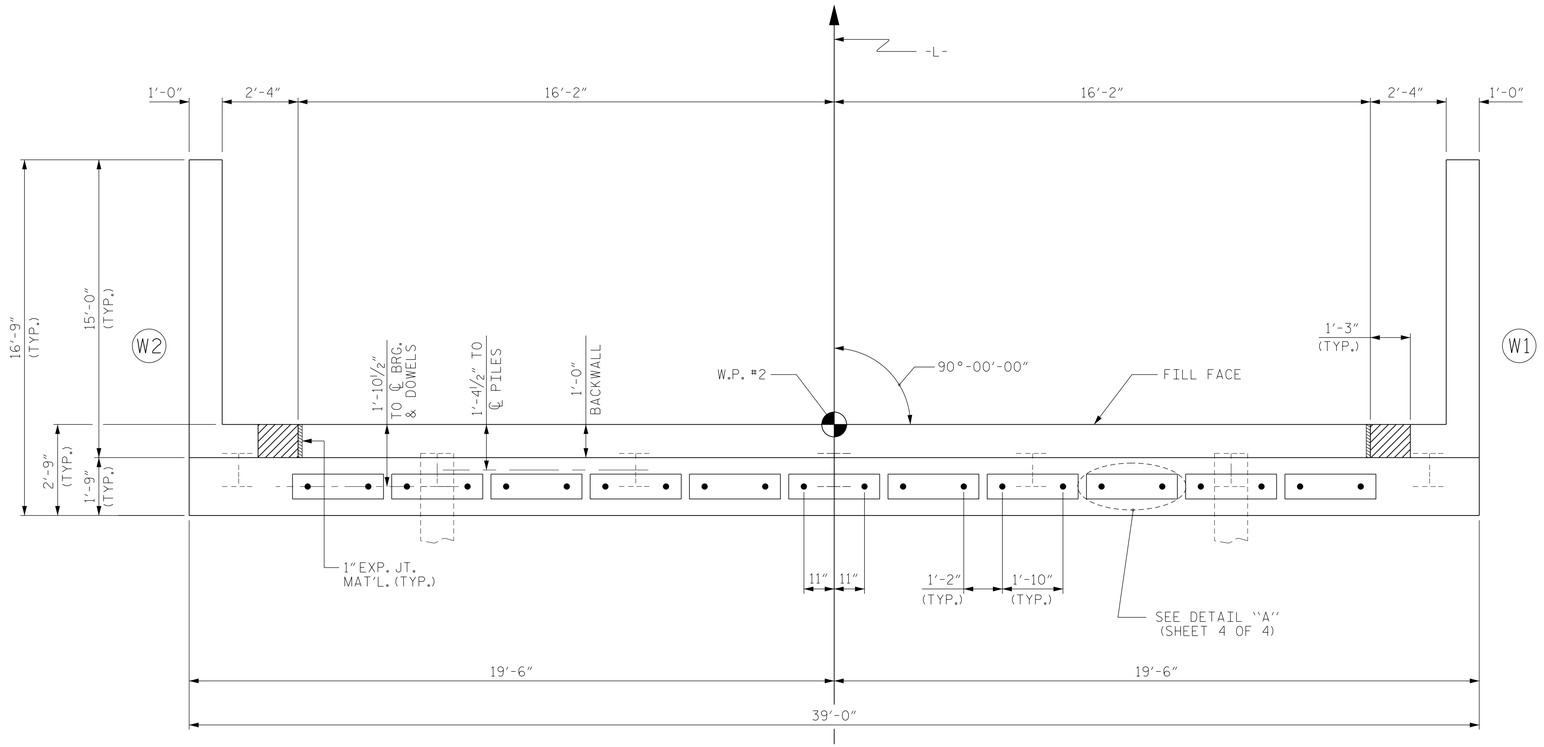
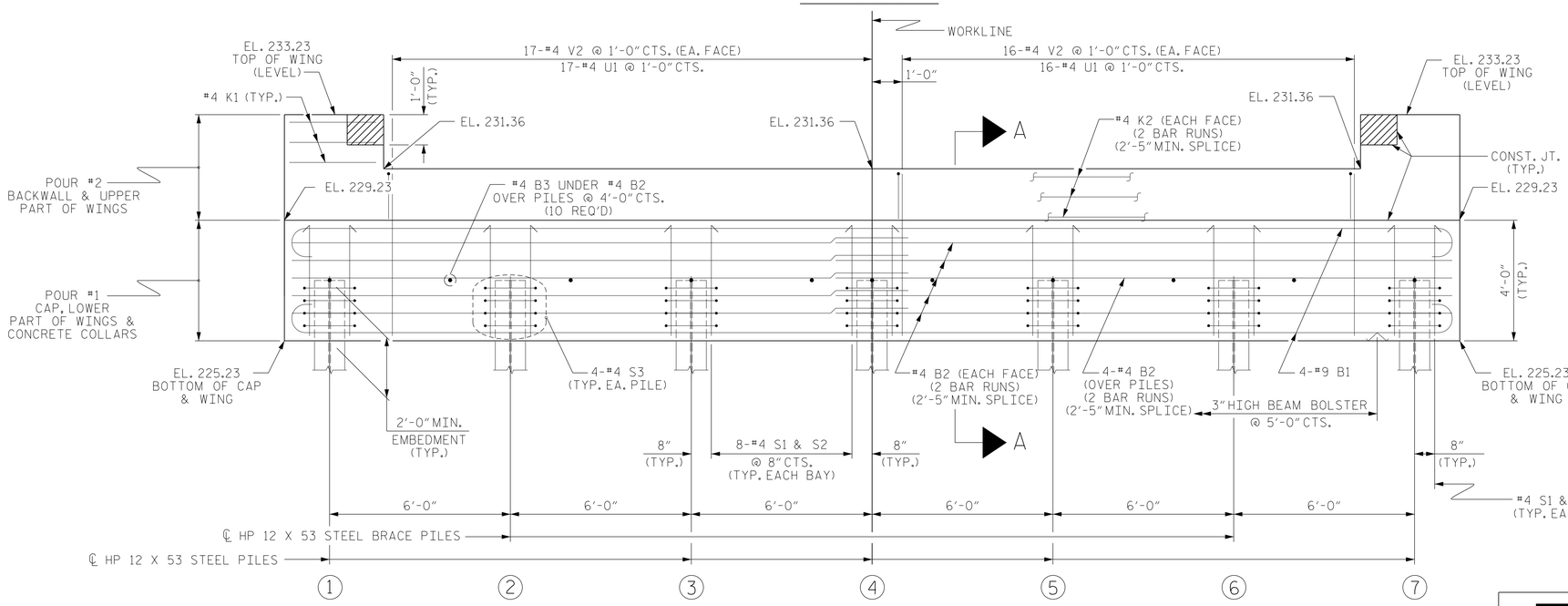


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

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FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

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SHEET 2 OF 4

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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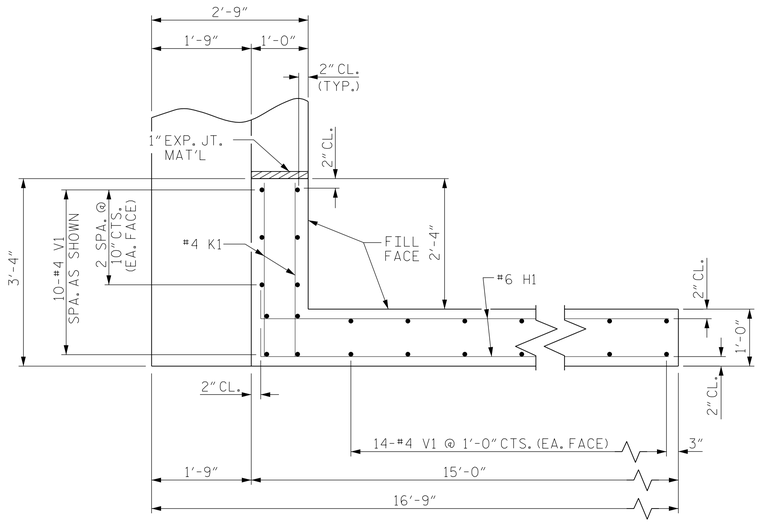
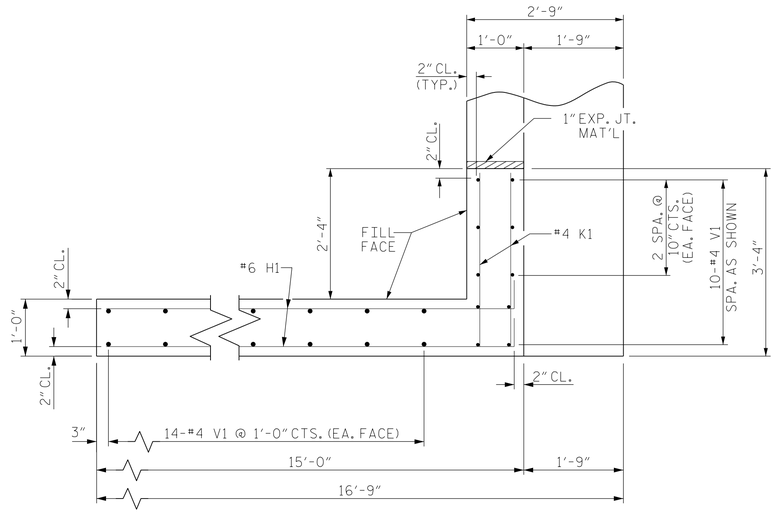
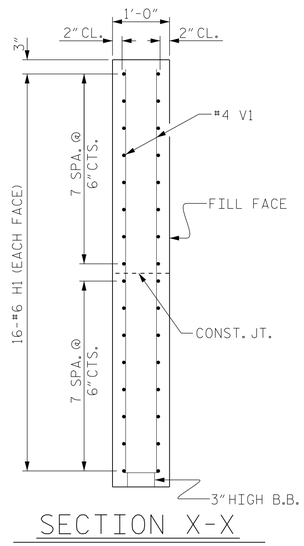


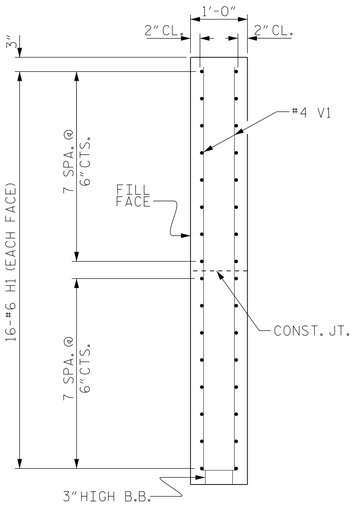
PLAN OF WING (W1)



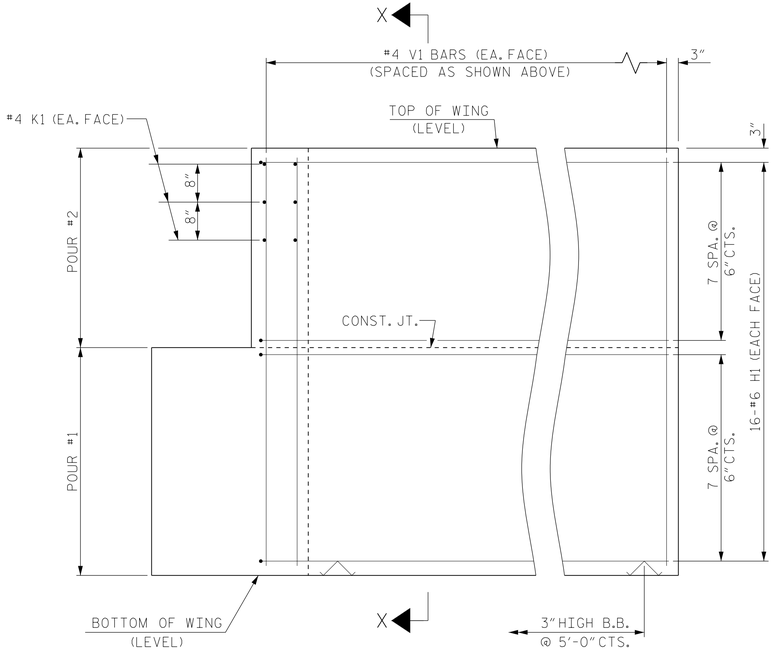
PLAN OF WING (W2)



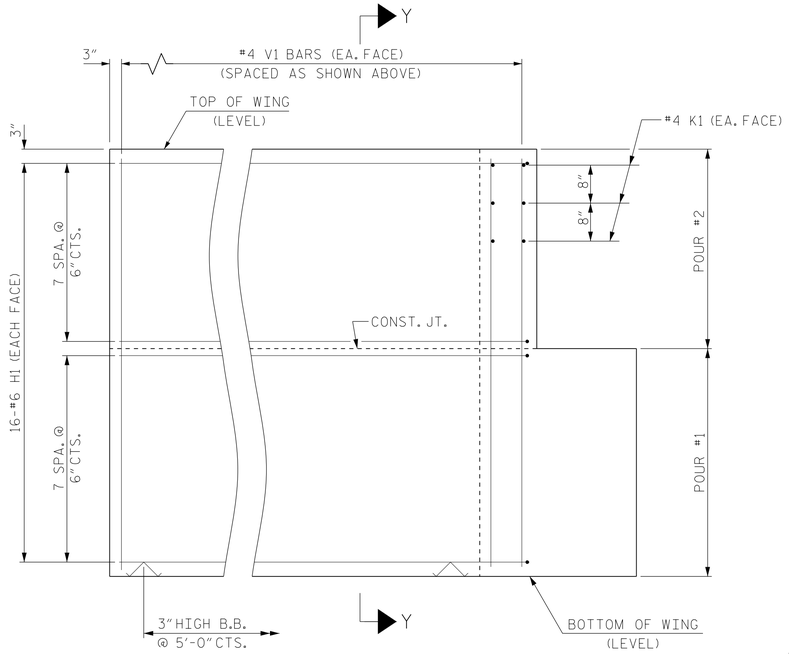
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

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END BENT WING DETAILS

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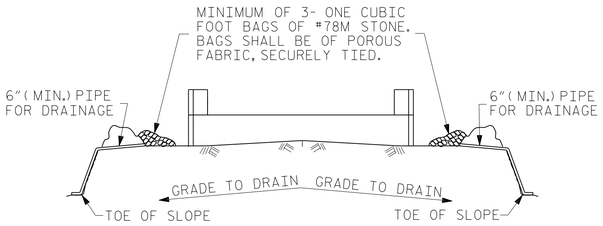
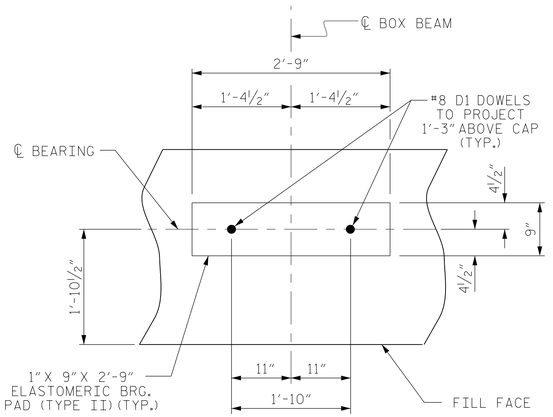


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

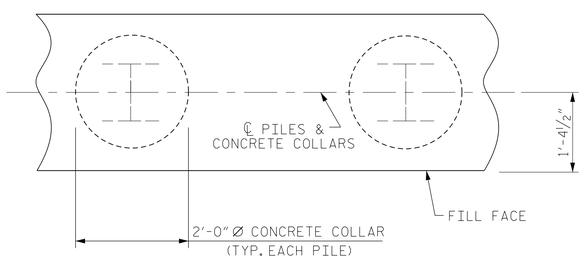
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

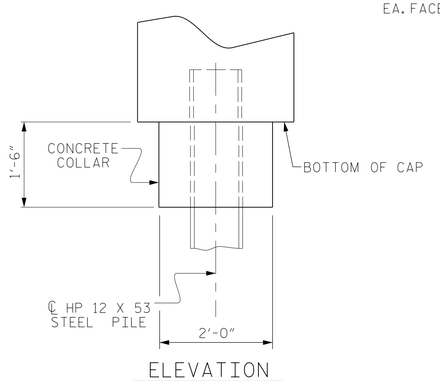


DETAIL ''A''

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



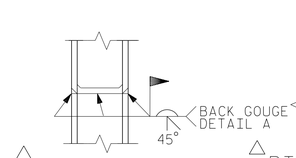
PLAN



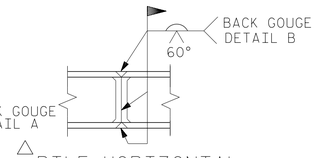
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

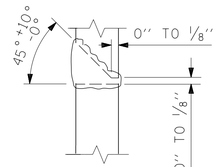
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



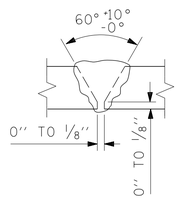
△ PILE VERTICAL



△ PILE HORIZONTAL OR VERTICAL



DETAIL A

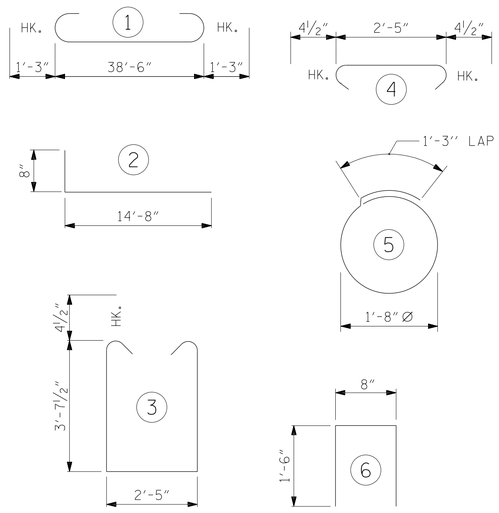


DETAIL B

△ 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 NO: 7 LIN. FT.= 105	HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 105
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7
STEEL PILE POINTS NO: 7	STEEL PILE POINTS NO: 7

BILL OF MATERIAL FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-8"	81
V1	76	#4	STR	7'-8"	389
V2	66	#4	STR	5'-9"	254

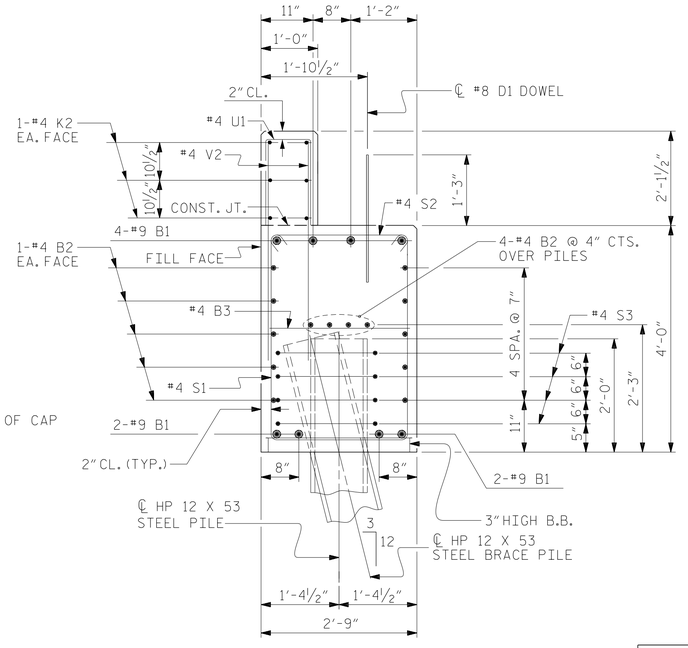
REINFORCING STEEL (FOR ONE END BENT) 4610 LBS.

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 7.7 C.Y.

TOTAL CLASS A CONCRETE 29.0 C.Y.



SECTION A-A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -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

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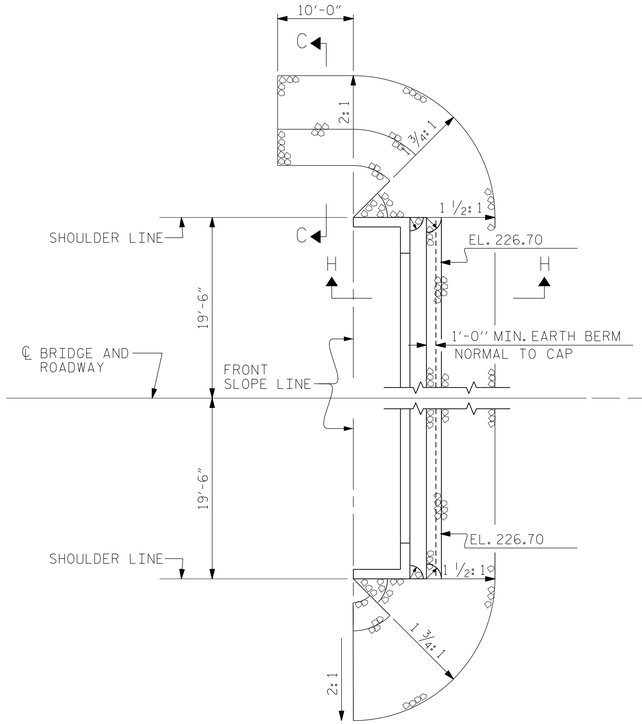
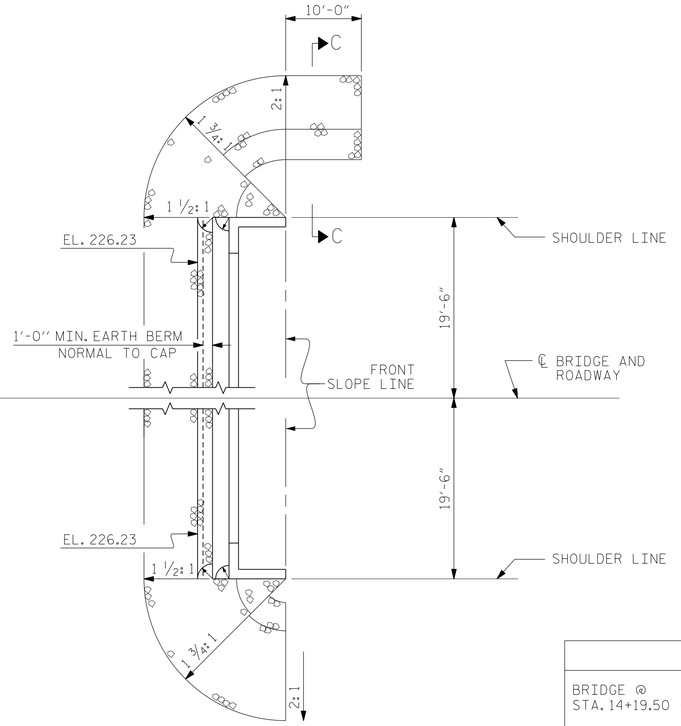
DRAWN BY:	E. PHELPS	DATE :	12/17
CHECKED BY:	J. LOFTUS	DATE :	01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE :	01/18

STD. NO. EB_33_90S4_39BB



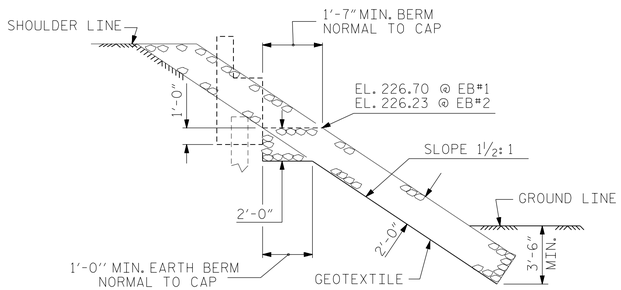


NOTES :

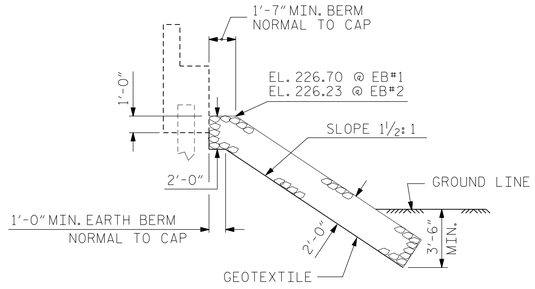
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+19.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	95	105
END BENT 2	85	95

SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP



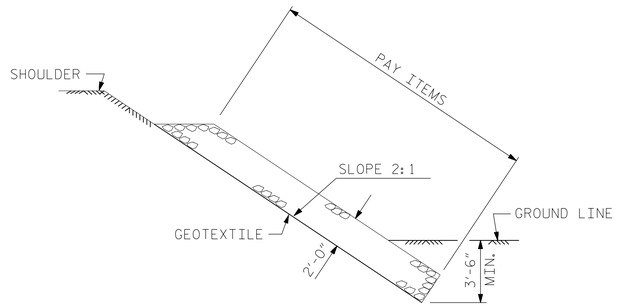
SECTION H-H



℄ SECTION

BERM RIP RAPPED

BERM RIP RAPPED



SECTION C-C

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGIES

DocuSigned by: David R. Ruggies C462769DF412422... 10/24/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

DRAWN BY:	E. PHELPS	DATE : 12/17
CHECKED BY:	J. LOFTUS	DATE : 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE : 01/18

2/13/2019
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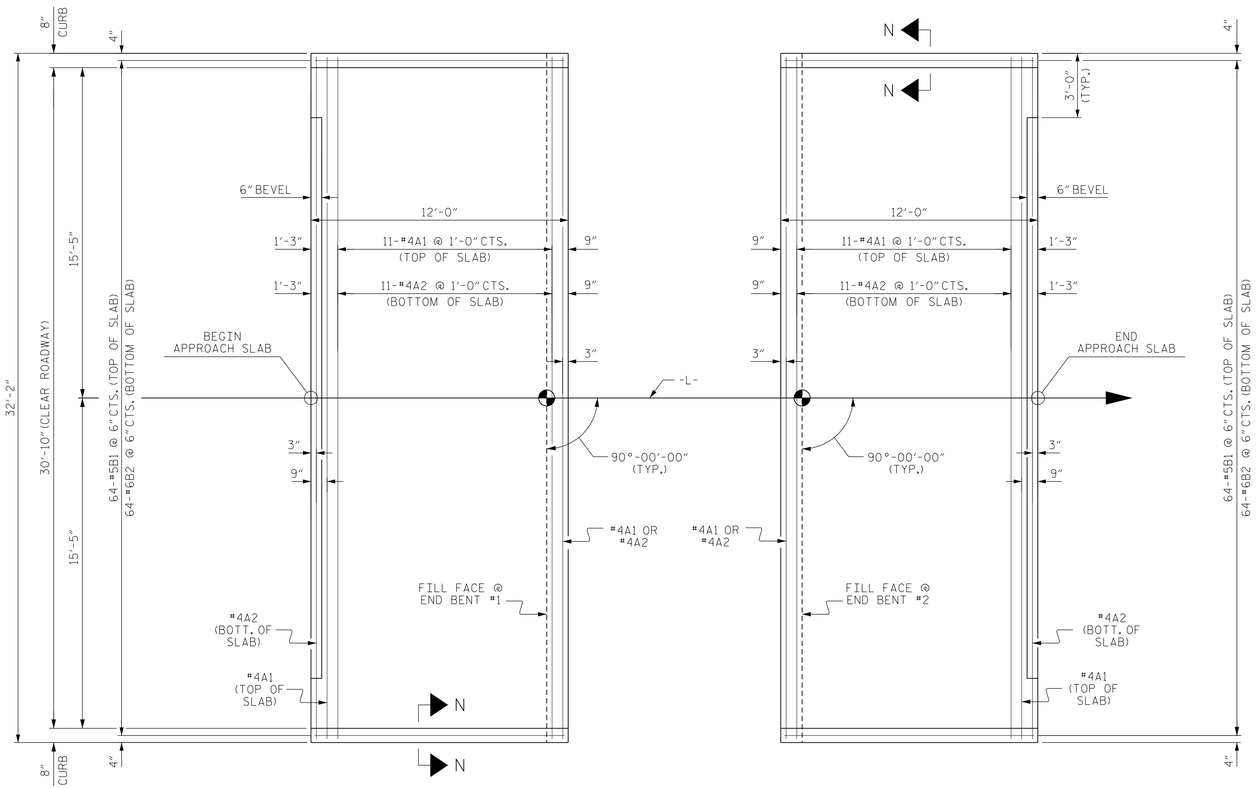
USER:vchung

WARREN 140

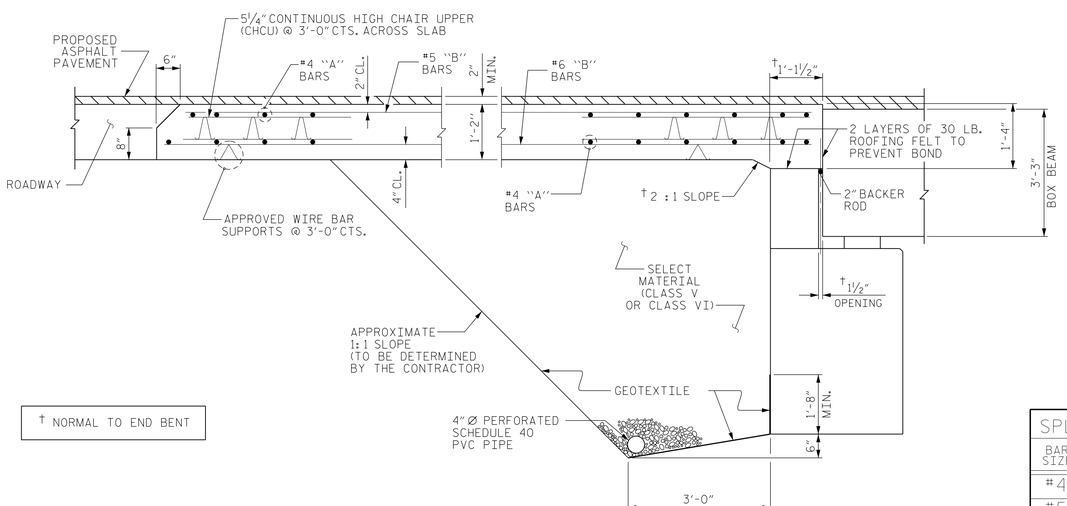
STD. NO. RR1 (Sht 2)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

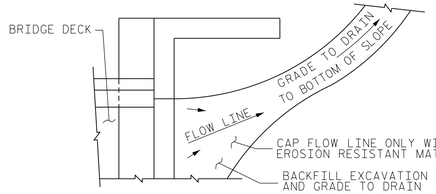
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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.

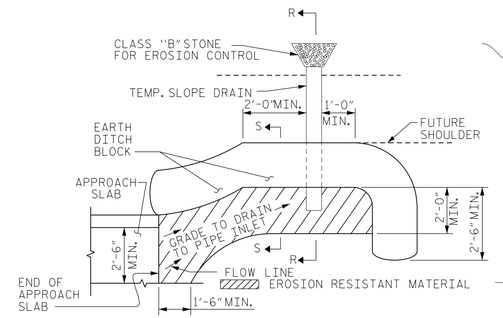
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



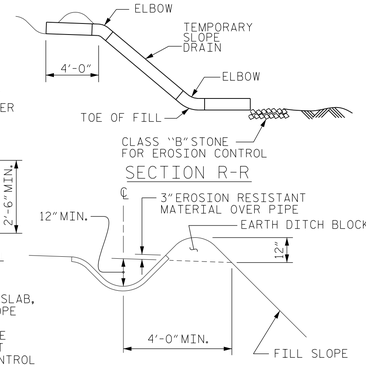
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

PLAN VIEW

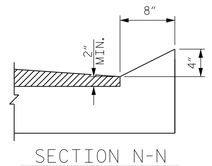


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
✳ EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	17.0

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
✳ EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C.Y.	17.0

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

DocuSigned by: David R. Ruggles C462768DF412422... 10/24/2022

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

90° SKEW

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

DRAWN BY:	E. PHELPS	DATE: 12/17
CHECKED BY:	J. LOFTUS	DATE: 01/18
DESIGN ENGINEER OF RECORD:	J. LOFTUS	DATE: 01/18

STD. NO. BAS_BB_33_90S

10/24/2022
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USER:grambouli

WARREN 140

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 2018 "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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

PROJECT NO. 17BP.5.R.78

WARREN COUNTY

STATION: 14+19.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

ENGLISH

JANUARY, 1990

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

STD. NO. SN

WARREN 140

2/13/2019
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USER:vchung

REV. 6-16-95 EEM (-) RGW REV. 5-7-03 RWW (-) JTE REV. 10-1-11 MAA (-) GM
REV. 8-16-99 RWW (-) LES REV. 5-1-06 TLA (-) GM REV. 12-17 MAA (-) THC