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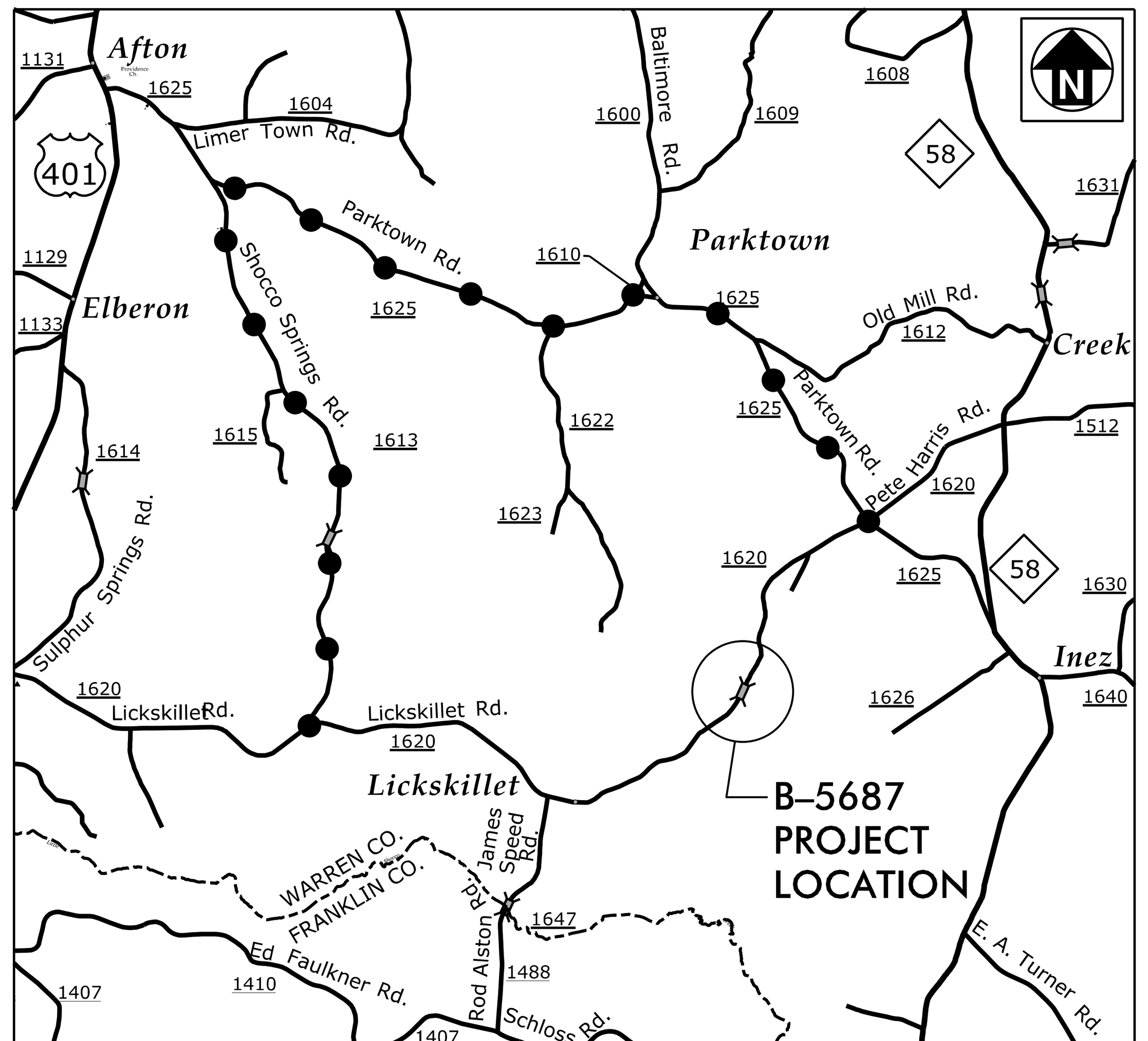
TIP PROJECT: B-5687

CONTRACT: DE000209



VICINITY MAP
(NOT TO SCALE)

●—●—●—●—● OFF–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

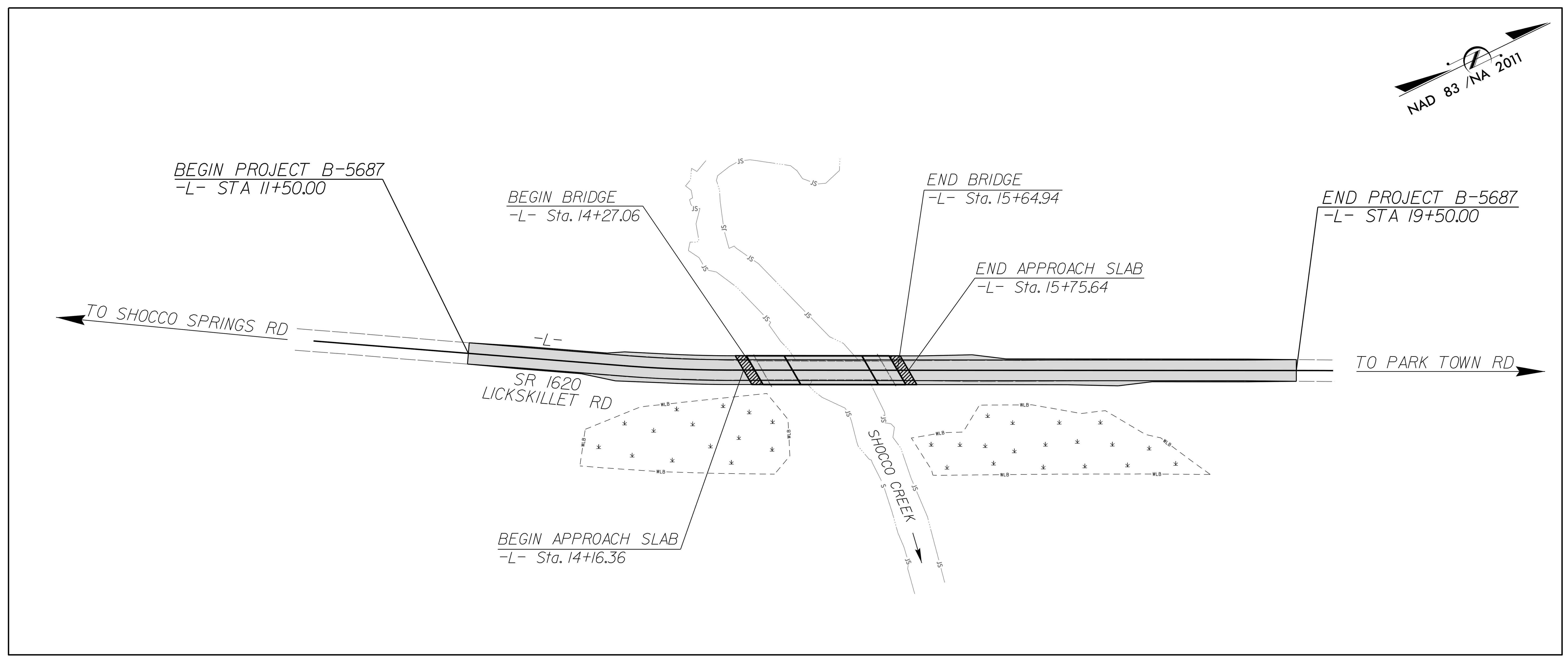
WARREN COUNTY

LOCATION: BRIDGE NO. 43 OVER SHOCCO CREEK ON SR 1620 (LICKSKILLET ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5687	1	

STATE PROJECT NO.	F. A. PROJ. NO.	DESCRIPTION
45641.1.1		PE
45641.2.1		RW
45641.3.1		CONST



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2011) = 380

ADT (2025) = 760

V = 55 MPH

CLASS = LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.126 MILES

LENGTH STRUCTURE TIP PROJECT = 0.026 MILES

TOTAL LENGTH TIP PROJECT = 0.152 MILES

Prepared in the Office of Mott MacDonald for

DIVISION 5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 12, 2017

LETTING DATE:
MAY 23, 2018

TIM JORDAN, PE
PROJECT ENGINEER

TRENT CORMIER, PE
HYDRAULICS ENGINEER

NCDOT CONTACT: LISA GILCHRIST, EI

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

DocuSigned by:
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SIGNATURE: 4/23/2018 P.E.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER TRENTON J. CORMIER

DocuSigned by:
[illegible]
BAE073AA58A4428...
SIGNATURE: 4/23/2018 P.E.

PLANS PREPARED BY:

MOTT MACDONALD
PO Box 700
Fuquay–Varina, NC 27526
(919) 552–2253
(919) 552–2254 (Fax)
www.mottmac.com/americas

LICENSE NO. F–0669

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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PROJECT REFERENCE	SHEET NO.
B–5687 – WARREN 43	1–A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JOHNSON

DocuSigned by: James Timothy Johnson
4/4/2018

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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Prepared in the Office of:

MOTT MACDONALD
PO Box 700
Fuquay–Varina, NC 27526
www.mottmac.com

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01–16–18

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.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE HALIFAX ELECTRIC AND CENTURY LINK.

RIGHT–OF–WAY MARKERS:

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

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01–16–2018

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 Modified 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
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
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

INDEX OF SHEETS

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PhilSmith

PROJECT REFERENCE	SHEET NO.
B-5687 – WARREN 43	1–B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth — 3
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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06/20/17

PROJECT REFERENCE NO.	SHEET NO.
B-5687 – WARREN 43	1C-1
Location and Surveys	

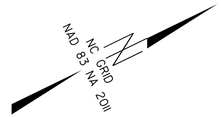
SURVEY CONTROL SHEET B–5687

B5687-1 ⬡
N=917136.691
E=2254855.368

⬡ B5687-2
N=917498.262
E=2255392.129

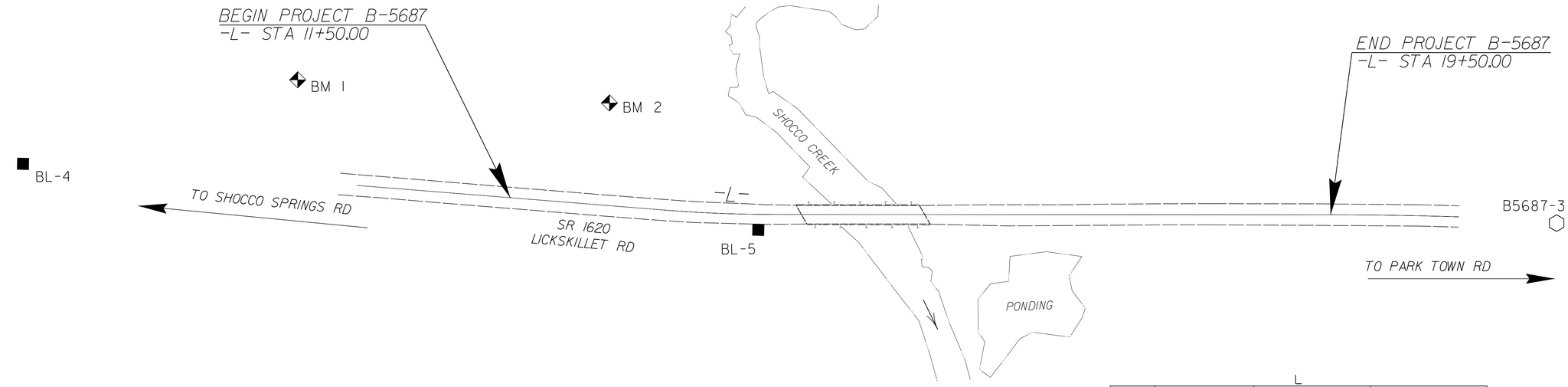
ROW CONCRETE OR GRANITE -E-

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+50.00	30.05	918328.59309	2256145.12224
L	11+50.00	45.00	918320.99678	2256158.00355
L	11+50.00	-29.95	918359.07111	2256093.43960
L	11+50.00	-40.00	918364.17395	2256084.78653
L	13+00.00	45.00	918450.20332	2256234.19857
L	13+00.00	-40.00	918493.38048	2256160.98155
L	14+05.39	45.00	918546.14972	2256285.77054
L	14+05.39	55.00	918541.76785	2256294.75938
L	14+05.39	-55.00	918589.96847	2256195.88218
L	14+05.39	-40.00	918583.39566	2256209.36543
L	15+90.00	-55.00	918755.91047	2256276.77553
L	15+90.00	55.00	918707.70985	2256375.65273
L	15+90.00	45.00	918712.09172	2256366.66389
L	15+90.00	-40.00	918749.33766	2256290.25879
L	19+50.00	-30.00	919068.55388	2256456.99511
L	19+50.00	-40.00	919072.93576	2256448.00628
L	19+50.00	30.00	919042.26263	2256510.92813
L	19+50.00	45.00	919035.68982	2256524.41138



ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+20.00	-30.10	918247.16632	2256027.27813
L	10+20.00	-55.00	918259.81448	2256005.83021
L	17+10.00	-75.00	918872.54025	2256311.38036
L	20+65.00	-50.00	919181.22400	2256491.49695
L	20+65.00	-30.10	919172.00340	2256509.13040



BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
4	BL-4	917931.3580	2255881.7350	250.13	OUTSIDE PROJECT LIMITS	
5	BL-5	918547.5060	2256253.0190	220.54	13+92.41	15.03 RT
3	B5687-3	919546.1760	2256732.9600	250.59	OUTSIDE PROJECT LIMITS	

BM 1 ELEVATION = 238.28
N 918208 E 2255925
L STATION 10+00.00
S 86°40'55.7" W DIST 117.85
BM1-R/R SPIKE IN 24" PINE

BM 2 ELEVATION = 220.71
N 918471 E 2256079
L STATION 12+39.00 100 LEFT
BM2-R/R SPIKE IN 23" PINE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5687-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 917,498.262(ft) EASTING: 2,255,392.129(ft) ELEVATION: 296.92'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999781940
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5687-2" TO -L- STATION 11+50 IS N 40°41'30.2" E 1,115.22'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GEOID G12NC

NOTE: DRAWING NOT TO SCALE

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	918214.6488	2256043.0466
PC	13+00.00	918473.0618	2256195.4366
PT	14+05.39	918565.8682	2256245.3208
PC	19+50.00	919055.4083	2256483.9616
PT	20+75.00	919166.9111	2256540.4497

NOTES:

⬡ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

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

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PROJECT REFERENCE	SHEET NO.
B–5687 – WARREN 43	2A–1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JOHNSON

Docusigned by: James Timothy Johnson 4/24/2018

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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MOTT MACDONALD
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Fuquay–Varina, NC 27526
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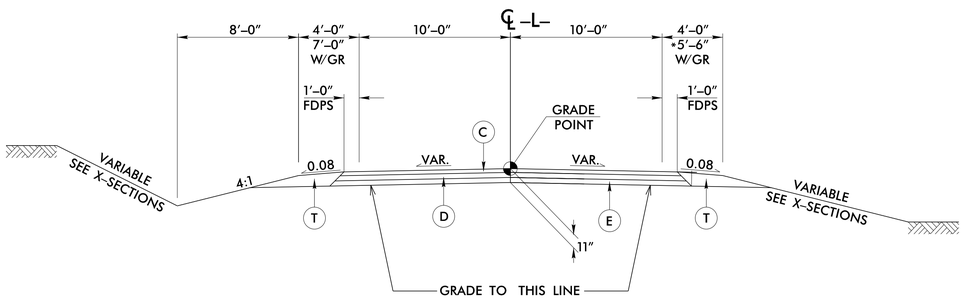


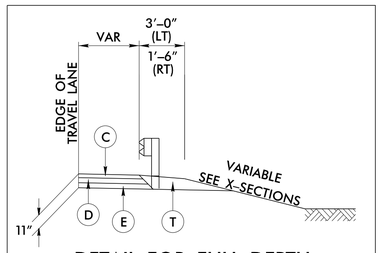
TYPICAL SECTION NO. 1

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
–L– STA 11+50.00 TO 12+00.00

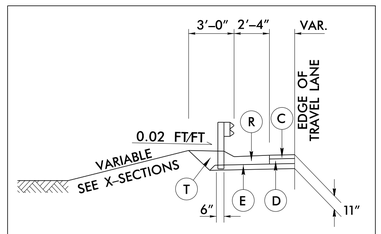
USE TYPICAL SECTION NO. 1:
–L– STA 12+00.00 TO 14+27.06 (BEGIN BRIDGE)
–L– STA 15+64.94 (END BRIDGE) TO 19+00.00

TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
–L– STA 19+00.00 TO 19+50.00

*USE 8′ GUARDRAIL POST (SEE SHEETS 2C–1 & 3B–1)

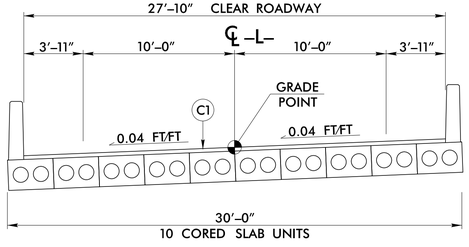


DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH GUARDRAIL



DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL

–L– STA 13+61.00 TO 14+08.47 LT



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:
–L– STA 14+27.06 (BEGIN BRIDGE) TO 15+64.94 (END BRIDGE)

NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTHS ON STRUCTURE

PAVEMENT SCHEDULE	
C	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C1	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.
D	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.

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

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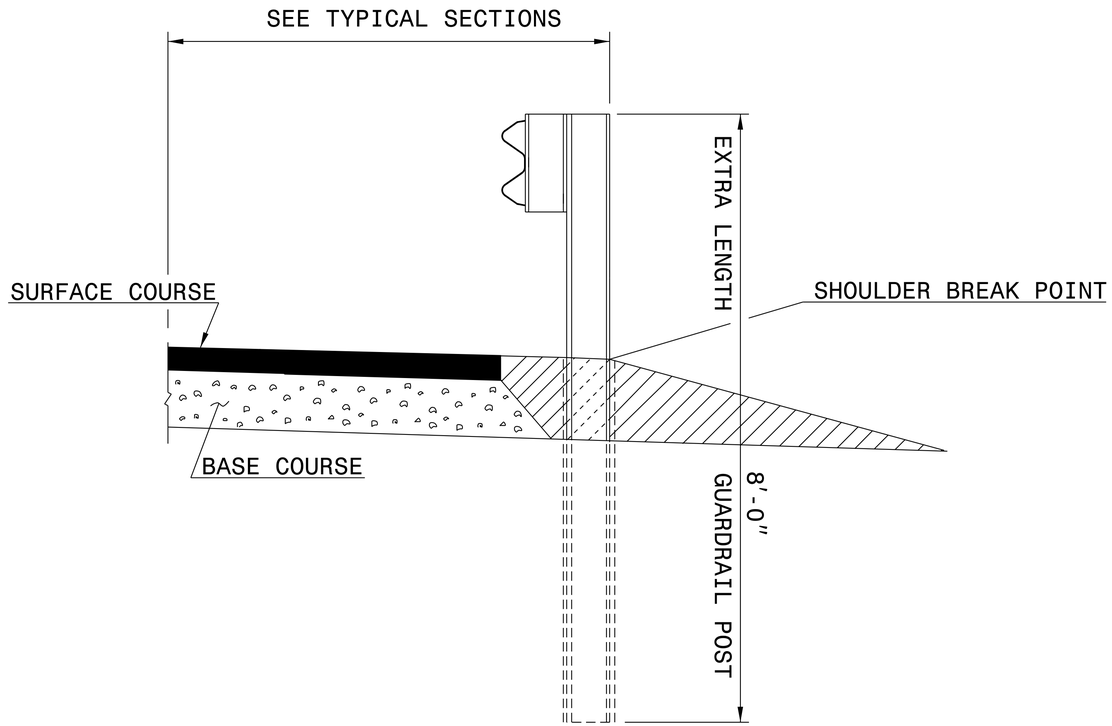
PROJECT REFERENCE NO.	SHEET NO.
B-5687 - WARREN 43	2C-1



NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel Burkhardt

Joel Burkhardt
4/9/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

8′ GUARDRAIL POST

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

10-MAY-2017 12:03
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jhowerton AT CSD-232595

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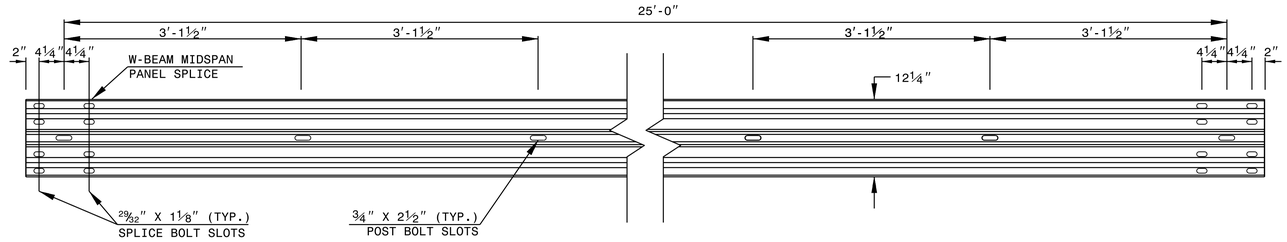
PROJECT REFERENCE NO.	SHEET NO.
B-5687 - WARREN 43	2C-2
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

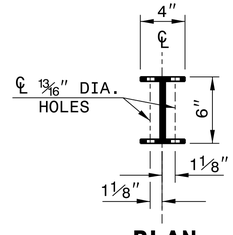
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

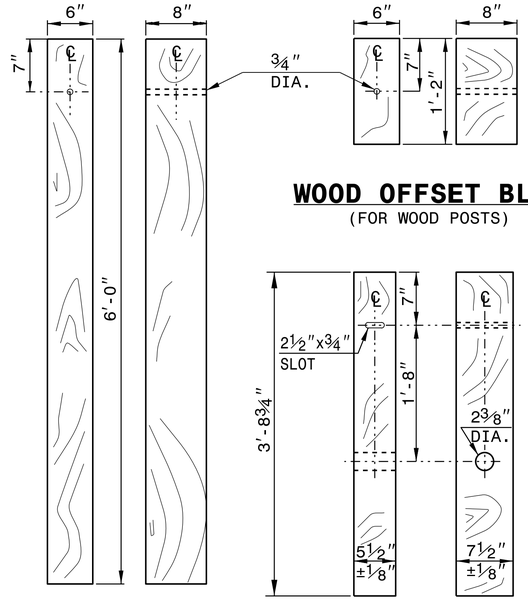
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



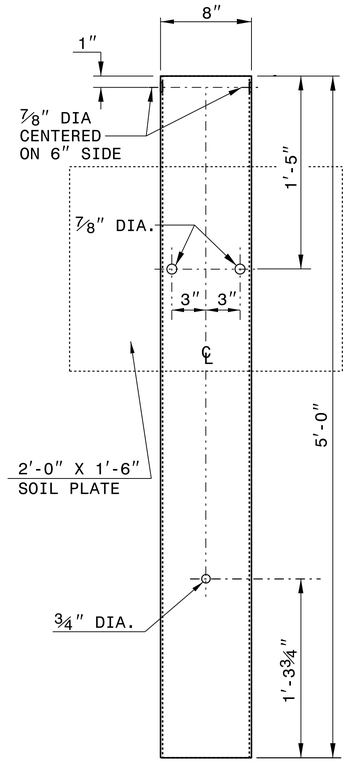
PLAN



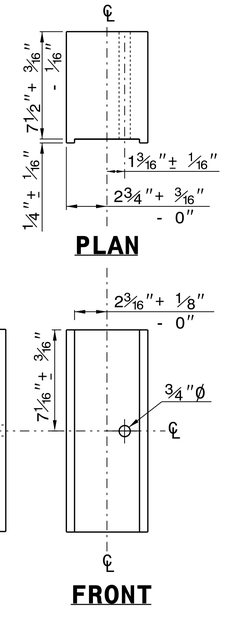
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST

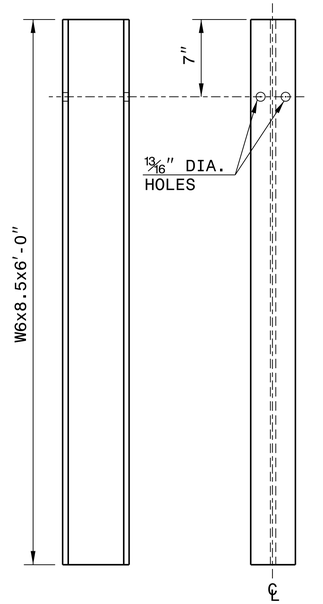


STEEL TUBE
TS 6"x8"x0.1875"



SIDE **FRONT**

ROUTED OFFSET BLOCK



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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
DocuSigned by: Joel S. Howerton 4/6/2018
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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.: _____

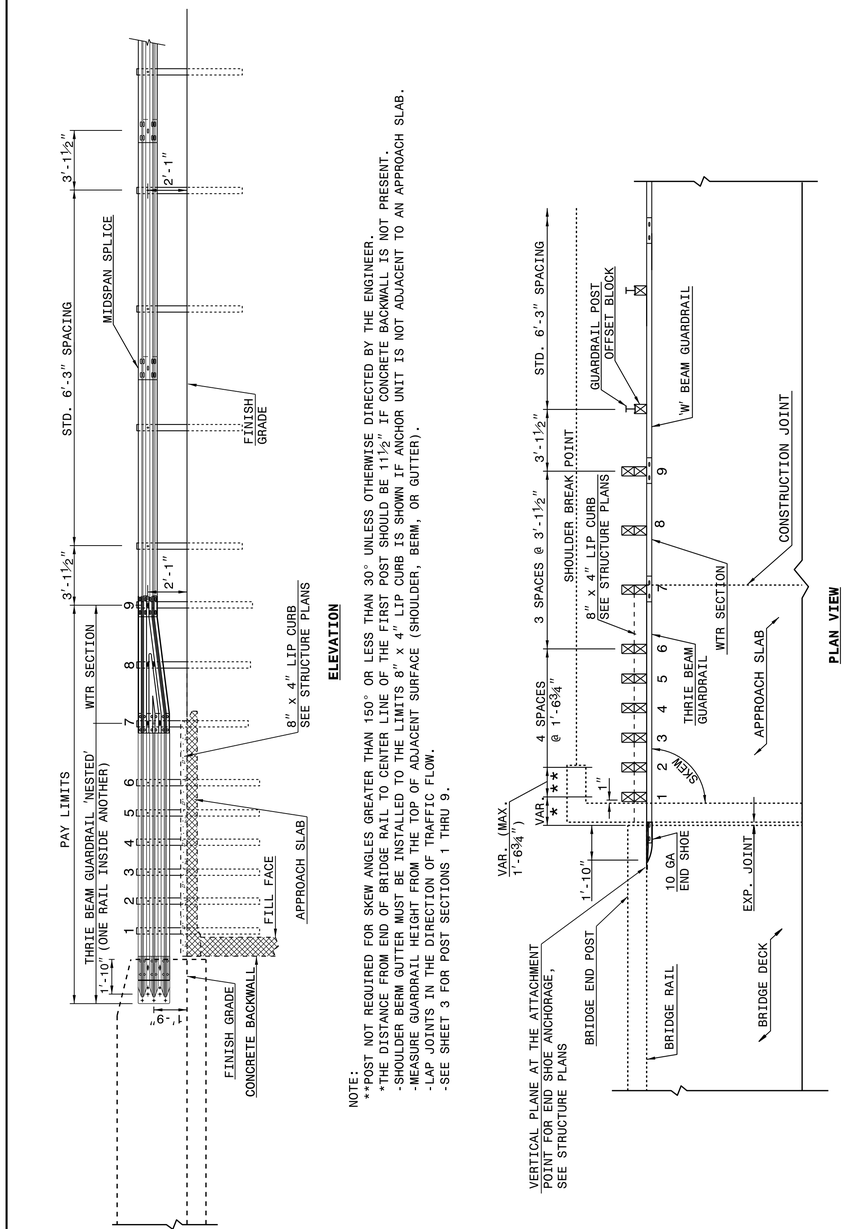
DocuSign Envelope ID: 989A4F13-5092-4276-BA0A-E7803156DE95

PROJECT REFERENCE NO.	SHEET NO.
B-5687 - WARREN 43	2C-3

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

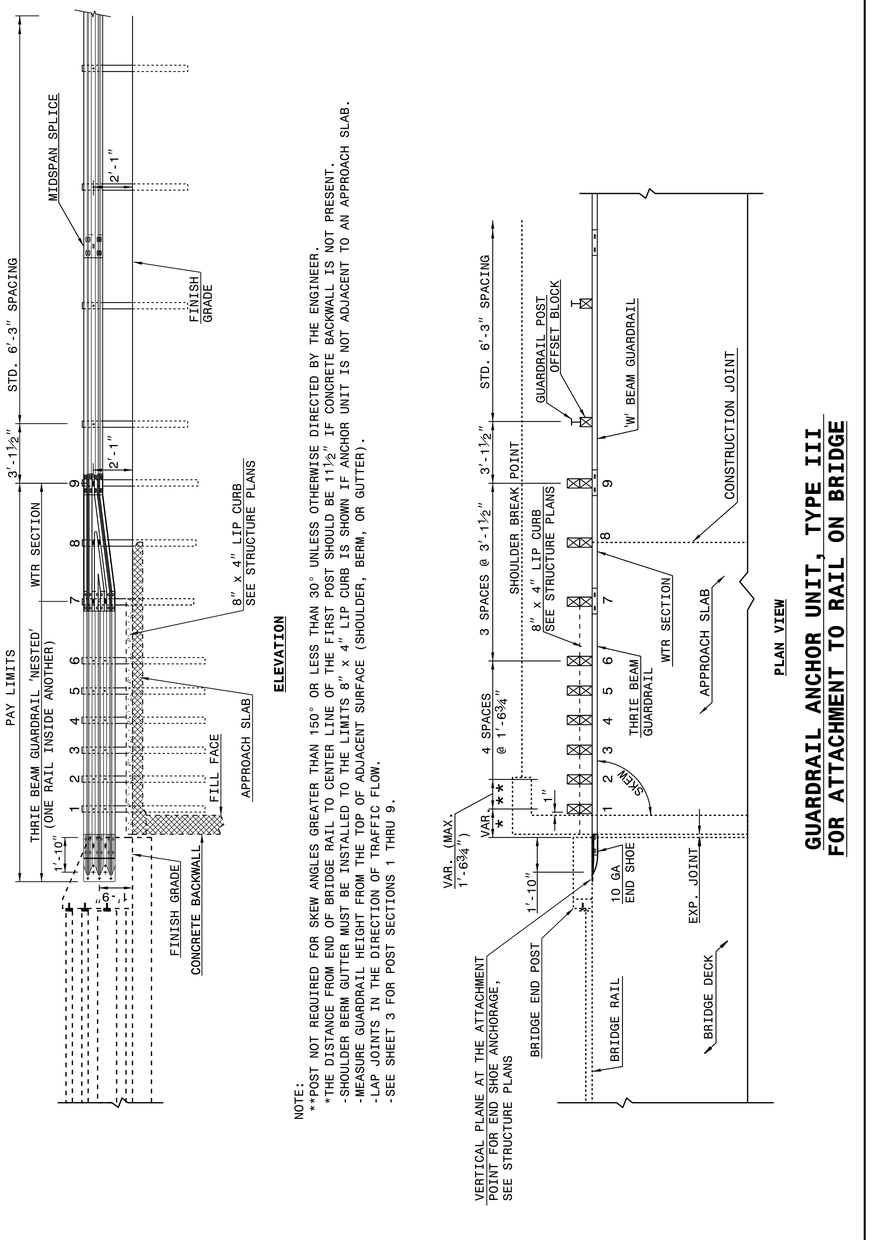
NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 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

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:
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*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

STATE OF
NORTH CAROLINA
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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

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jhowerton AT CSD-2425965

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 4/6/2018
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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.: _____

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT-1	GREU TL-3	TYPE III						NO.	PERMITTED G	PERMITTED NG	
-L-	12+91.34	14+35.09	RT	143.75'				14+35.09	4'	5.5'		50'		1'		1	1									USE 8' GUARDRAIL POSTS (SEE SHEET 2C-1)
-L-	13+00.28	14+19.03	LT	118.75'			14+19.03		4'	7'	50'		1'			1	1									
-L-	15+72.97	17+79.22	RT	206.25'			15+72.97		4'	5.5'	50'		1'			1	1									USE 8' GUARDRAIL POSTS (SEE SHEET 2C-1)
-L-	15+56.91	16+38.16	LT	81.25'				15+56.91	4'	7'		50'		1'		1	1									
		SUBTOTAL		550.00'																						
		LESS ANCHOR DEDUCTIONS																								
		GREU-TL3 4 x 50.00' =		-200.00'																						
		TYPE III 4 x 18.75' =		-75.00'																						
		TOTAL		275'												4	4									ADDITIONAL GUARDRAIL POSTS = 5 EA

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LENGTH
-L- LT	13+61.00	14+08.47	47.47'
		TOTAL	47.47'
		SAY	50'

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 11+50.00 TO 14+27.06 (BEGIN BRIDGE)	127		286	159	
-L- 15+64.94 (END BRIDGE) TO 19+50.00	100		548	448	
SUBTOTAL	227		834	607	
WASTE IN LIEU OF BORROW					
PROJECT TOTAL	227		834	607	
5% TO REPLACE BORROW				31	
GRAND TOTAL	227		834	638	
SAY	240			670	

EST. 200 CY UNDERCUT (CONTINGENCY)

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

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SUB–REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48” & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP or HDPE) 12″	15″	18″	24″	30″	36″	42″	48″	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE HDPE	
14+02	LT	401	402	221.7	218.9		X												
13+66	LT	402	403	221.5	218.5	216.4													
TOTAL																			

STATION	C.S. PIPE 12″ .064	15″ .064	18″ .064	24″ .064	36″ .079	42″ .109	48″ .109	R.C. PIPE (CLASS III) 15″	18″	24″	30″	36″	42″	48″	R.C. PIPE (CLASS IV) 12″	15″	18″	24″	30″	36″	42″	48″
14+02																36′						
13+66		12′																				
TOTAL		12′														36′						

STATION	**″ R. C. PIPE (CLASS V)	**″ R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**″ R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15″ SIDE DRAIN PIPE	18″ SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES 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 CATCH BASIN	DROP INLET	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. ″B″ C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
14+02								1														1	1					
13+66								1														1	1	2 @ 15″				
TOTAL								2														2	2	2 @ 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.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout.
See ″Standard Specifications For Roads and Structures, Section 300–5″.

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PROJECT REFERENCE	SHEET NO.
B-5687 – WARREN 43	4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JONES

DocuSigned by: 4/4/2018

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER BRENNON J CORMIER

DocuSigned by: 4/4/2018

HDR ENGINEERING
LICENSE NO. F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

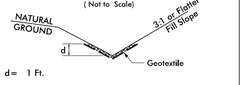
Prepared in the Office of:

MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

HORIZONTAL SCALE
25' 0 25' 50'

DETAIL A
TOE PROTECTION
(Not to Scale)

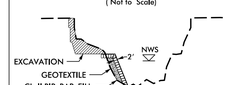


d = 1 Ft.

Type of Liner = Class B Rip-Rap

–L– STA. 11+70 TO 12+20 RT
–L– STA. 17+10 TO 18+50 LT

DETAIL B
BANK STABILIZATION
(Not to Scale)



Type of Liner = CLASS II RIP RAP

–L– STA. 14+70
–L– STA. 15+35

NAD 83/NA 2011

15+00

QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION

1
E B HARRIS &
ANNE T HARRIS
DB 899 PG 83

2
P G SEAMAN JR & OTHERS
NO REFERENCE

3
CLEMON KEARNEY
DB 888 PG 837

BEGIN PROJECT B-5687
–L– POT Sta. 11+50.00

END PROJECT B-5687
–L– PC Sta. 19+50.00

–L– POT Sta. 10+00.00

–L– PT Sta. 20+75.00

BM-1

BM-2

+20 –L– 30.10' LT 55' LT

+05.39 –L– 40' LT 55' LT

CLASS B RIP RAP
EST. 1 TON
EST. 5 SY GEOTEXTILE

15" CSP W/2 ELBOWS

BEGIN SBG +61 LT

+00 –L– 40' LT

+50 –L– 29.95' LT 40' LT

50' TAPER LT & RT

2% (TYP.)

EXCAVATION LIMITS

CLASS II RIP RAP (STRUCTURE PAY ITEM)

+90 –L– 40' LT 55' LT

+10 –L– 75' LT

TOE PROTECTION
SEE DETAIL A
EST. 65 TONS RIP RAP
EST. 150 SY GEOTEXTILE

+50 –L– 30' LT 40' LT

+65 –L– 30.10' LT 50' LT

TO SHOCCO SPRINGS ROAD

N 30° 31' 42.6" E

LICKSKILLET RD - SR 1620

206' BST

205' BST

N 25° 59' 17.9" E

TO PARK TOWN ROAD

N 27° 44' 45.0" E

EXISTING R/W

48" SS ELEC W/ FIBERGLASS AND WOOD POSTS

48" MTR

4SBW ON TREES - RUINS

GREU-TL3

15" RCP-IV

TB 2GI

30' DR

GATE

+50 –L– 30.05' RT 45' RT

+00 –L– 45' RT

BL-5

+05.39 –L– 45' RT 55' RT

+24

+90 –L– 45' RT 55' RT

+50 –L– 30' RT 45' RT

TOE PROTECTION
SEE DETAIL A
EST. 25 TONS RIP RAP
EST. 60 SY GEOTEXTILE

–L– PC Sta. 13+00.00

–L– PT Sta. 14+05.39

WOODS

WLB

CENTER LINE OF CREEK IS PROPERTY LINE

CLASS II RIP RAP (STRUCTURE PAY ITEM)

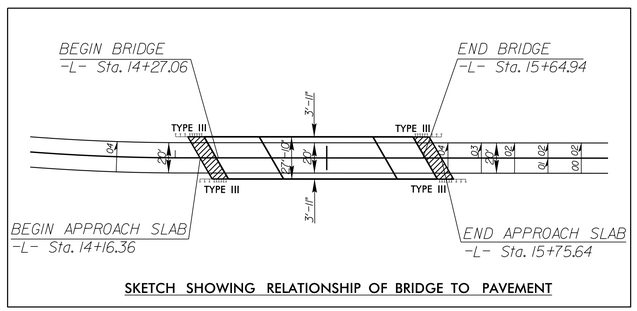
USE IMPERVIOUS DIKE
NCDOT STANDARD BMP
ALONG STREAM BANK TO
DEWATER AND ISOLATE
ADJACENT WORK AREA
TO INSTALL PROPOSED
INT. BENT IN THE DRY.
INSTALL BANK STABLIZATION
SEE DETAIL B
EST. 355 TONS RIP RAP
EST. 175 SY GEOTEXTILE

USE IMPERVIOUS DIKE
NCDOT STANDARD BMP
ALONG STREAM BANK TO
DEWATER AND ISOLATE
ADJACENT WORK AREA
TO INSTALL PROPOSED
INT. BENT IN THE DRY.
INSTALL BANK STABLIZATION
SEE DETAIL B
EST. 75 TONS RIP RAP
EST. 140 SY GEOTEXTILE

SHOCCO CREEK

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

DECK DRAINS NOT REQUIRED



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-24

ENVIRONMENTAL COMMITMENTS:

- BEST MANAGEMENT PRACTICES FOR BRIDGE DEMOLITION AND REMOVAL WILL BE IMPLEMENTED DURING THE REMOVAL OF THE EXISTING BRIDGE.
- 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 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 AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL NOT BE ALLOWED TO DRAG REMOVED TIMBER PILES ON OR ACROSS THE STREAMBED.
- IF STILL PRESENT AT THE TIME OF CONSTRUCTION, A FALLEN TREE CROSSING THE STREAM BELOW THE EXISTING BRIDGE WILL BE REMOVED TO PREVENT POTENTIAL BANK EROSION CAUSED BY THE TREE. THE ENGINEER WILL EVALUATE IF THE ROOT BALL CAN REMAIN IN PLACE. THE REMOVAL OF THE TREE IS CONSIDERED INCIDENTAL TO CLEARING AND GRUBBING.
- EXISTING TIMBER ABUTMENTS WILL BE COMPLETELY REMOVED.

–L–

PI Sta 13+52.72	PI Sta 20+12.50
Δ = 4° 32' 24.7" (LT)	Δ = 1° 45' 27.1" (RT)
D = 4° 18' 28.6"	D = 1° 24' 21.7"
L = 105.39'	L = 125.00'
T = 52.72'	T = 62.50'
R = 1,330.00'	R = 4,075.00'

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PROJECT REFERENCE	SHEET NO.
B-5687 – WARREN 43	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JOHNSON

DocuSigned by: James Timothy Johnson
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4/4/2018

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER TRENTON J CORNER

DocuSigned by: Trenton J Corner
DA5E0B...
4/4/2018

HDR ENGINEERING
LICENSE NO. F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:

MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

VERTICAL SCALE 5′ 0 5′ 10′

HORIZONTAL SCALE 25′ 0 25′ 50′

-L-

BEGIN GRADE
STA. 11+50.00
EL = 226.33′

PI = 12+65.00
EL = 221.66′
VC = 230′
K = 51
DS = 36 MPH

BRIDGE ℄ STA. 14+96 –L–
THREE SPANS: 1@35′ (21″ PCCS), 1@75′ (24″ PCCS), 1@25′ (21″ PCCS)
W/4.0° DEEP CAPS, SKEW 60
GP ELEV. = 222.63′

OVERTOPPING AT SAG STA. 13+58

REMOVE EXISTING BRIDGE

PI = 18+50.00
EL = 224.12′
VC = 200′
K = 57
DS = 37 MPH

END GRADE
STA. 19+50.00
EL = 228.04′

(–)4.0609%

(+)0.4205%

(+)3.9200%

EXCAVATION ELEV. = 214.2′ (TYP.)

3.5′ KEY DEPTH (TYP.)

CLASS II RIP RAP SLOPE 1.5:1 (2 FT. THICK) (NORMAL TO CAP) (TYP.) (STRUCTURE PAY ITEM)

BANK STABILIZATION SLOPE 1.5:1 (NORMAL TO TOP OF BANK w/CLASS II RIP RAP (TYP.) (BANK RE-ESTABLISHMENT)

NORMAL WS ELEV. = 212.5′ DATE: 12-9-2016

UNCLASSIFIED STRUCTURE EXCAVATION = 170 CY (STRUCTURE PAY ITEM)

BM #1 ELEVATION = 238.28′
R/R SPIKE IN 24 INCH PINE
–L– STATION 10+00.00
N 86 40′ 55″ E 117.85′ LT
(SEE SHEET 1C–1)

BM #2 ELEVATION = 220.71′
R/R SPIKE IN 23 INCH PINE
–L– STATION 12+39.00 100′ LT
(SEE SHEET 1C–1)

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 220.8	FT
BASE DISCHARGE	= 7207	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 221.5	FT
OVERTOPPING DISCHARGE	= 8700	CFS
OVERTOPPING FREQUENCY	= 500+/-	YRS
OVERTOPPING ELEVATION	= 222.7	FT
DATE OF SURVEY	= 12-9-16	
W.S.ELEVATION AT DATE OF SURVEY	= 212.5	FT

240 230 220 210 200 190 180 170 160 150 140 130 120

10 11 12 13 14 15 16 17 18 19 20

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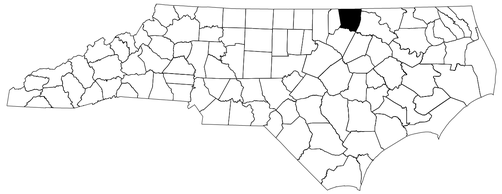
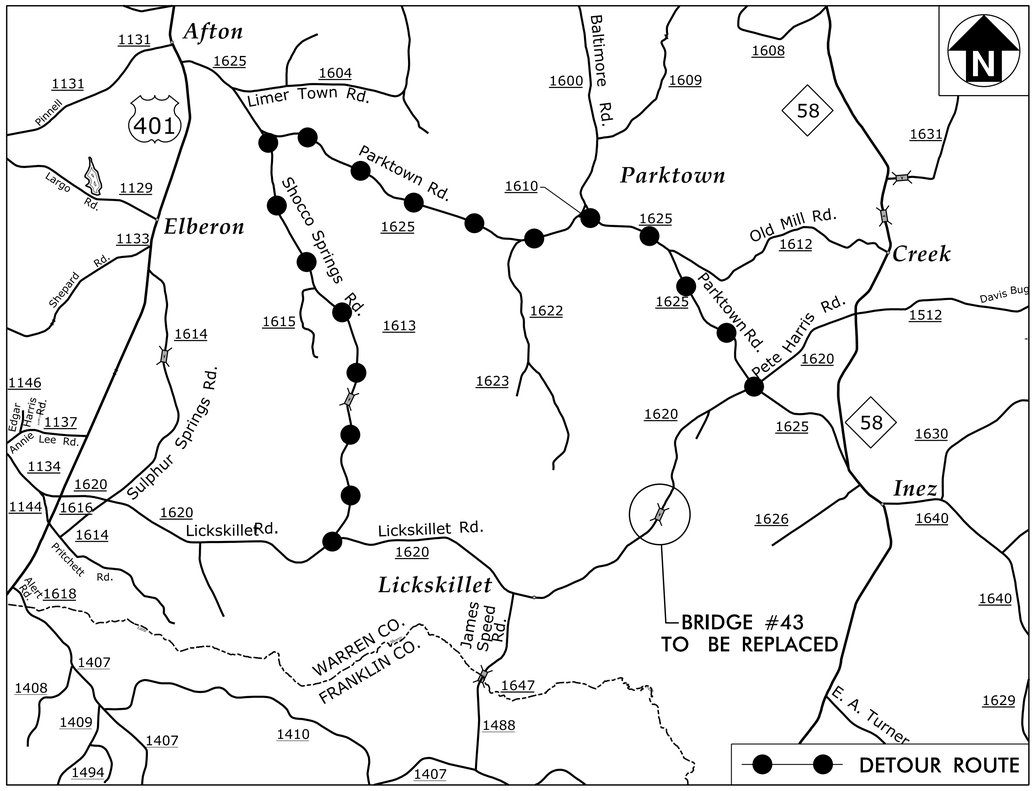
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WARREN COUNTY

BRIDGE NO. 43 OVER SHOCCO CREEK ON SR 1620 (LICKSKILLET ROAD)





INDEX OF SHEETS

B-5687

TIP PROJECT:

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

PREPARED IN THE OFFICE OF MOTT MACDONALD
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIM JORDAN, PE — TRAFFIC CONTROL PROJECT ENGINEER

BRIAN PHILLIPS — TRAFFIC CONTROL DESIGN ENGINEER

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

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(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas

LICENSE NO. F-0669

APPROVED: _____
DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN

DocuSigned by: James Timothy Jordan 3A8529B19D27444...

4/4/2018

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PROJECT REFERENCE NUMBER	SHEET NO.
B-5687 WARREN 43	TMP-2

TRAFFIC MANAGEMENT PLAN

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

TRAFFIC PATTERN ALTERATIONS

B) NOTIFY THE ENGINEER AND LOCAL SCHOOLS & EMS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

C) 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.

D) 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.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

G) INSTALL PAVEMENT MARKINGS AND MARKERS ON THE FINAL SURFACE ACCORDING TO THE ROADWAY STANDARD DRAWINGS.

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

MISCELLANEOUS

I) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

NCDOT ROADWAY 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
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1135.01	CONES
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

PHASING

STEP 1: PLACE MESSAGE SIGNS USING ROADWAY STANDARD DRAWING NUMBERS 1101.04, SHEET 1 OF 1, 1101.11, SHEET 1 OF 4, 1101.03, SHEET 1 OF 9, AND SHEET TMP-3, INSTALL AND COVER DETOUR SIGNING.

STEP 2: USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, UNCOVER OFF-SITE DETOUR SIGNING AND INSTALL TYPE III BARRICADES TO CLOSE SR 1620 (LICKSKILLET ROAD) TO THRU TRAFFIC.

STEP 3: PLACE TRAFFIC ONTO OFF-SITE DETOUR. PERFORM PROPOSED BRIDGE AND ROADWAY CONSTRUCTION. PLACE FINAL PAVEMENT MARKINGS AND MARKERS.

STEP 4: REMOVE TYPE III BARRICADES FROM SR 1620 (LICKSKILLET ROAD) AND REOPEN ROADWAY TO TRAFFIC. REMOVE ALL DETOUR SIGNING.

FINAL PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
THERMOPLASTIC WHITE EDGELINE (4")	1600 LF
THERMOPLASTIC YELLOW DOUBLE CENTER (4")	1600 LF
PERMANENT RAISED PAVEMENT MARKERS (YELLOW & YELLOW)	10 EA

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APPROVED:_____ DATE:_____

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JORDAN

SEAL Designed by: James Timothy Jordan 4/4/2018

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

GENERAL NOTES
ROADWAY STANDARD DRAWINGS
PHASING
PAVEMENT MARKING SCHEDULE

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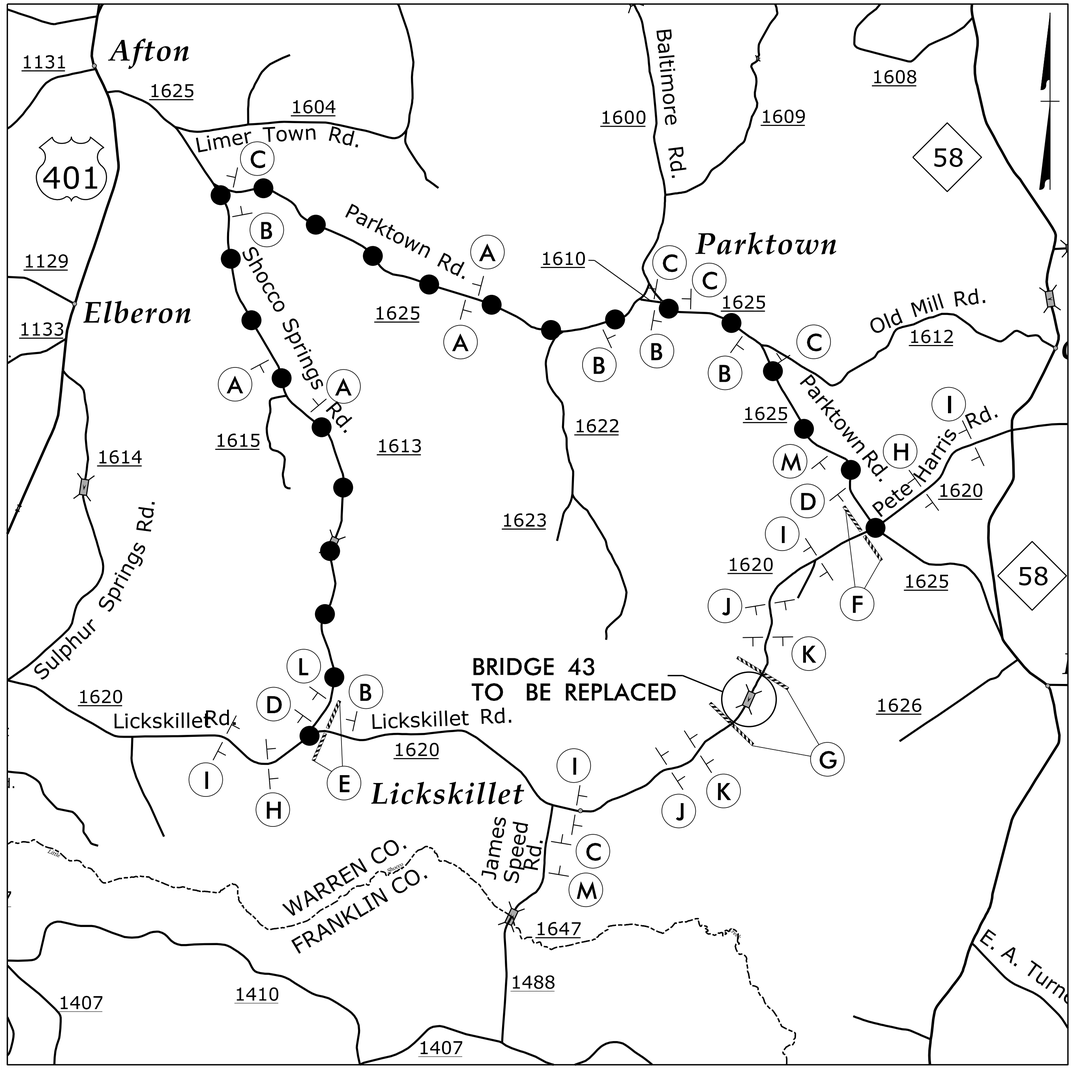
PROJECT REFERENCE NUMBER	SHEET NO.
B-5687 WARREN 43	TMP-3



NOTES: REFER TO ROADWAY STANDARD DRAWING NO. 1101.03, SHEETS 1 AND 2 OF 9, FOR ADDITIONAL SIGN SPACING REQUIREMENTS APPROACHING PROJECT SITE CLOSURE POINT.

✱ SEE SHEET TMP-4 FOR SPECIAL SIGN DESIGNS

TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES

✱ LICKSKILLET ROAD / DETOUR — M4-8 24″ x 12″ — M6-3 21″ x 15″ — (A)

✱ LICKSKILLET ROAD / DETOUR — M4-8 24″ x 12″ — M6-1 21″ x 15″ — (B)

✱ LICKSKILLET ROAD / DETOUR — M4-8 24″ x 12″ — M6-1 21″ x 15″ — (C)

END DETOUR — M4-8 A 24″ X 18″ — (D)

R11-4 60″ x 30″ — ROAD CLOSED TO THRU TRAFFIC / DETOUR — M4-10L 48″ x 18″

TYPE III BARRICADE (E)

R11-4 60″ x 30″ — ROAD CLOSED TO THRU TRAFFIC / DETOUR — M4-10R 48″ x 18″

TYPE III BARRICADE (F)

R11-2 48″ x 30″ — ROAD CLOSED

TYPE III BARRICADE(S) (G)

DETOUR AHEAD — W20-2 48″ x 48″ (H)

ROAD CLOSED AHEAD — W20-3 48″ X 48″ (I)

ROAD CLOSED 1000 FT — W20-3 48″ X 48″ (J)

ROAD CLOSED 500 FT — W20-3 48″ X 48″ (K)

ROAD CLOSED AHEAD — W20-3 48″ X 48″ / NEXT LEFT — SP-4L 42″ X 12″ (L)

ROAD CLOSED AHEAD — W20-3 48″ X 48″ / NEXT RIGHT — SP-4R 42″ X 12″ (M)

LEGEND
DETOUR ROUTE
STATIONARY SIGN
TYPE III BARRICADE

MESSAGE NO. 1	MESSAGE NO. 2
ROAD CLOSURE	IN 14 DAYS

CHANGEABLE MESSAGE SIGN

USE CHANGEABLE MESSAGE SIGNS FOR A 14-DAY COUNTDOWN ROAD CLOSURE NOTICE PRIOR TO CLOSING BUTNER ROAD TO THRU TRAFFIC.

INSTALL CHANGEABLE MESSAGE SIGNS AT THE DETOUR POINTS AND AS DIRECTED BY THE ENGINEER.

M MOTT MACDONALD
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(919) 552-2254 (Fax)
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LICENSE NO. F-0669

APPROVED:_____ DATE:_____

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER KENNETH TIMOTHY JORDAN

SEAL
Digitally signed by: James Timothy
3A652981902744A
4/4/2018

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

OLD NC 75 OFF-SITE DETOUR TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES

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PROJECT REFERENCE NUMBER	SHEET NO.
B-5687 WARREN 43	TMP-4

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

SIGN WIDTH: 4′-6″
HEIGHT: 2′-6″
TOTAL AREA: 11.3 Sq.Ft.

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

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT′L: 0.125″ (3.2 mm) ALUMINUM

DESIGN BY: BLP
PROJECT ID: B-5687
CHECKED BY: RWT
DIV: 5
DATE: Feb 13, 2017

USE NOTES: 1,2

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

BORDER
R=1.5″
TH=0.63″
IN=0.47″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

Series/Size
Text Length

	L	I	C	K	S	K	I	L	L	E	T																C 2000
	7	10.9	13	17.5	21.6	26	30.4	32.5	36.4	40.3	43.9																40
	R	O	A	D																							C 2000
	18.7	23	27.2	31.9																							16.6

FILENAME: B-5687_TC_TMP_SD1

NORTH CAROLINA D.O.T. SIGN DETAIL

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APPROVED: _____ DATE: _____

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER WILLIAM R. THOMPSON

SEAL
Docusigned by:
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4/4/2018

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

SIGN DESIGN

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TIP PROJECT: B–5687

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5687	EC-1	

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

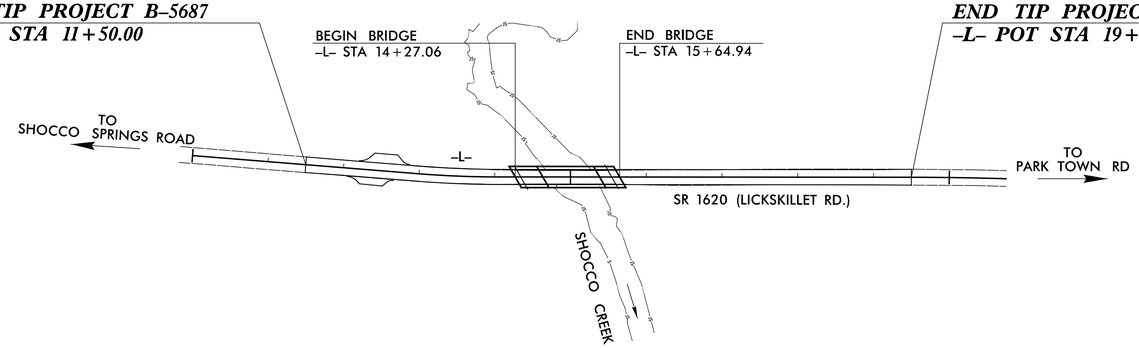
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WARREN COUNTY

BRIDGE NO. 43 ON SR 1620
OVER SHOCCO CREEK

BEGIN TIP PROJECT B–5687
–L– POC STA 11+50.00

END TIP PROJECT B–5687
–L– POT STA 19+50.00



NAD 83 /NA 2011

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	SW 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	SK
	Tiered Skimmer Basin	SK
	Infiltration Basin	SK

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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Designed by:

ALEXANDER D. SNIDER, PE 3064
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, EI CPESC

Roadway Standard Drawings

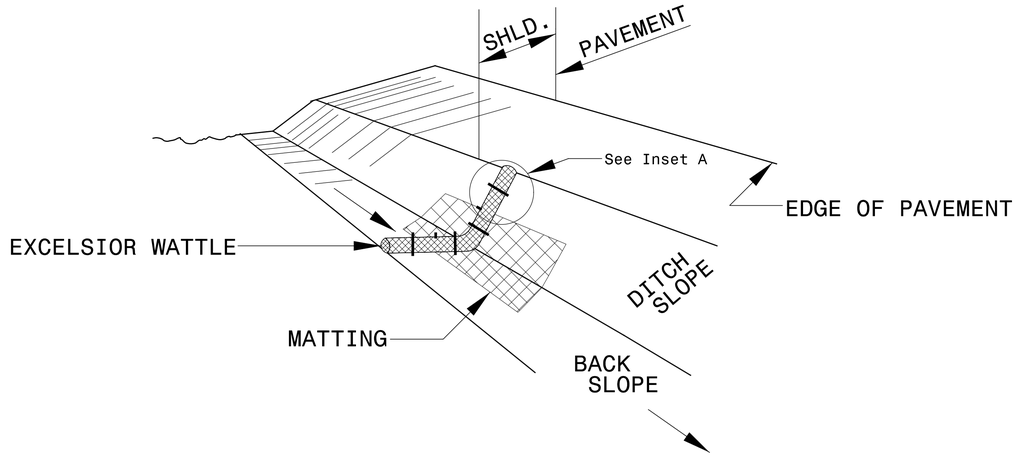
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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		

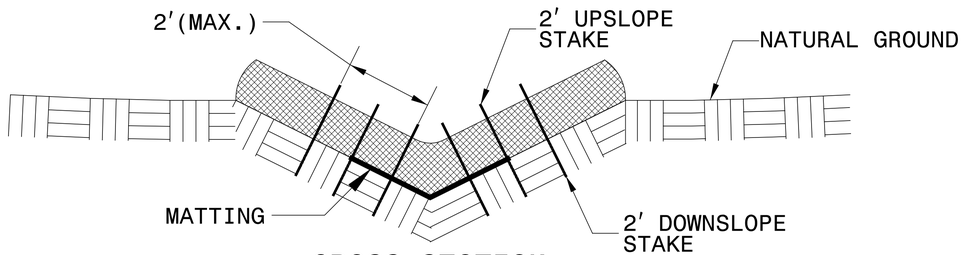
SYSTIMESTAMP
DESIGNFILENAME

PROJECT REFERENCE NO.	SHEET NO.
B-5687	EC-2

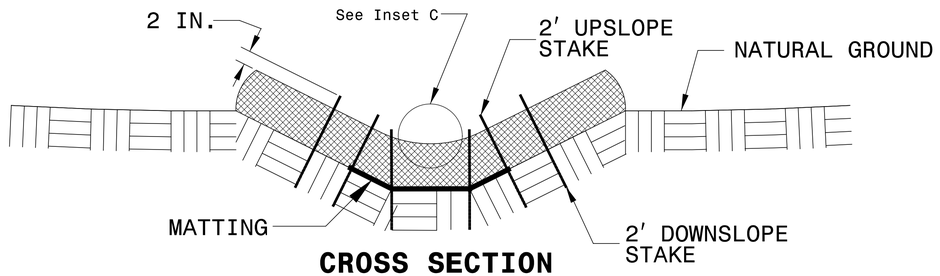
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

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

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

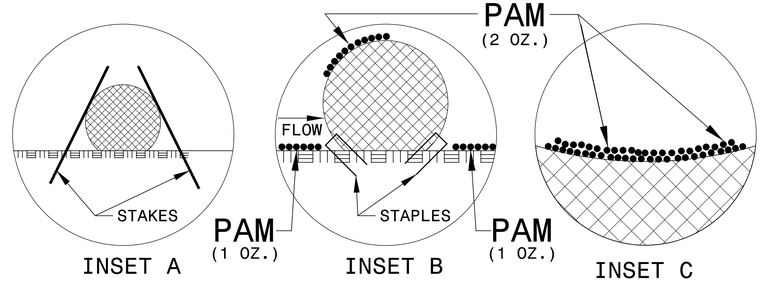
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

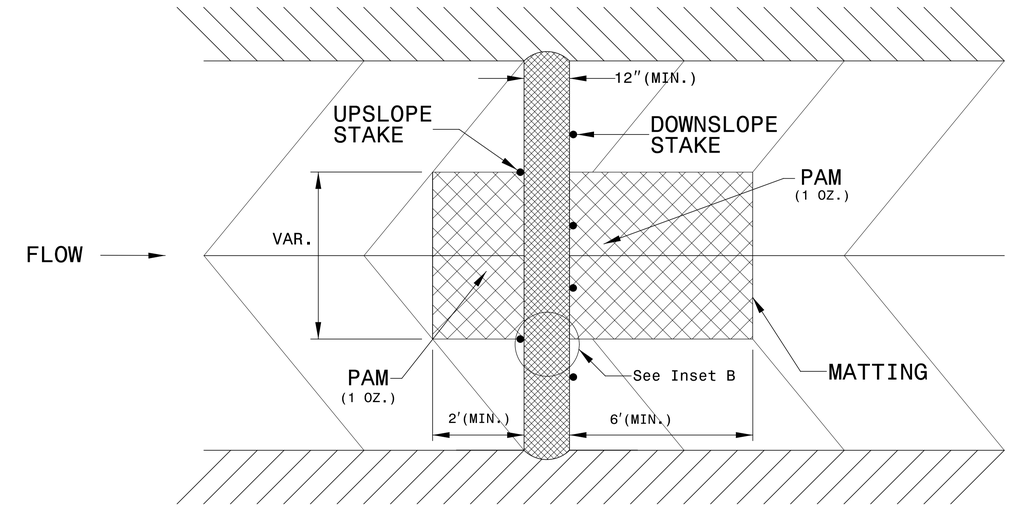
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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

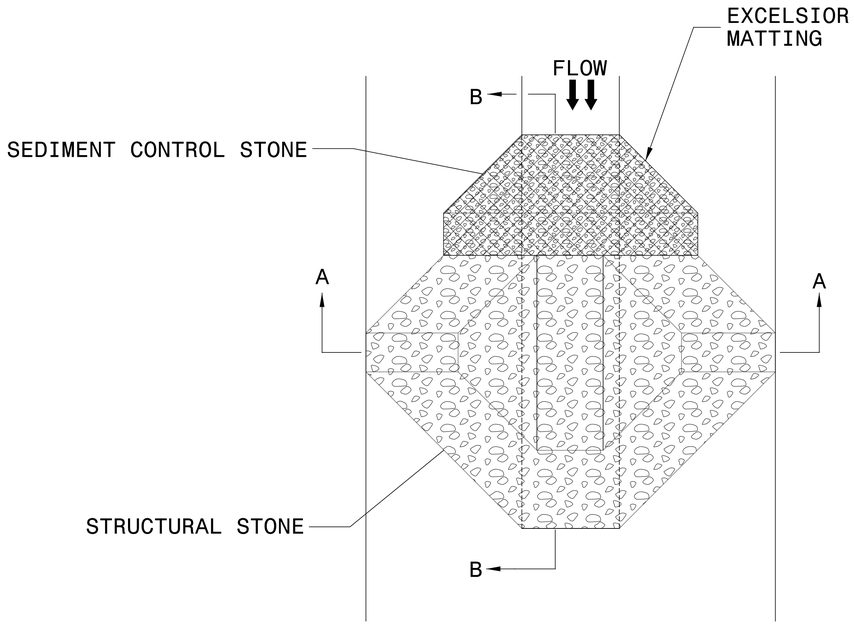




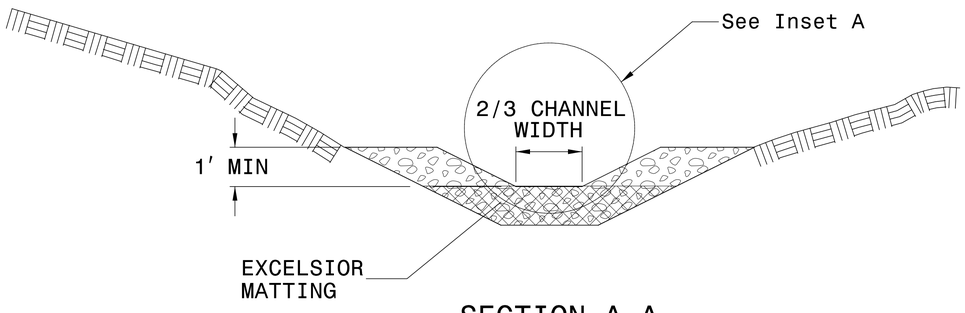
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-5687	EC-2A

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



PLAN



SECTION A-A

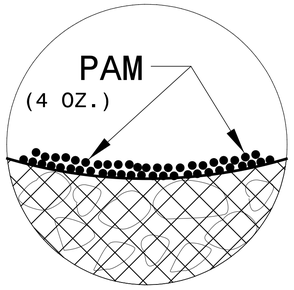
NOTES:

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

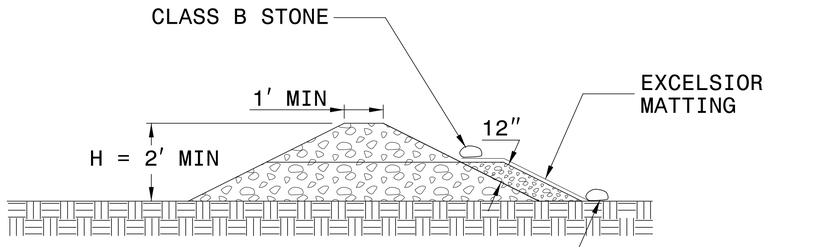
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.
B-5687	EC-3

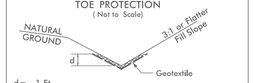
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

5/14/99

DETAIL A
TOE PROTECTION
(Not to Scale)

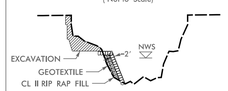


d = 1 Ft.

Type of Liner = Class B Rip-Rap

-L- STA. 11+70 TO 12+20 RT
-L- STA. 17+10 TO 18+50 LT

DETAIL B
BANK STABILIZATION
(Not to Scale)



Type of Liner = CLASS II RIP RAP

-L- STA. 14+70
-L- STA. 15+35

EROSION CONTROL COMMITMENTS:

- IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, THE CONTRACTOR MAY PERFORM CLEARING OPERATIONS BUT NOT GRUBBING OPERATION UNTIL IMMEDIATELY PRIOR TO BEGINNING GRADING OPERATIONS.
- ONCE GRADING OPERATIONS BEGIN IN IDENTIFIED ENVIRONMENTALLY SENSITIVE AREAS, WORK SHALL PROGRESS IN A CONTINUOIS MANNER UNTIL COMPLETE.
- IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, EROSION CONTROL DEVICES SHALL BE INSTALLEDIMMEDIATELY FOLLOWING THE CLEARING OPERATION.
- IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, "SEEDING MULCHING" SHALL BE PERFORMED ON THE AREAS DISTURBED BY CONSTRUCTION IMMEDIATELY FOLLOWING FINAL GRADE ESTABLISHMENT.
- IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, 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 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 A NATIVE GRASS MIX.
- ALL SEDIMENTATION AND EROSION CONTROL MEASURES, THROUGHOUT THE PROJECT LIMITS, WILL BE CLEANED OUT WITH 1/2 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 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, ECT. WILL INCORPORATED, AS NECESSARY, TO TREAT TEMPORARY RUNOFF BEFORE DISCHARGING IN TO THE RIPARIAN BUFFER (AS SPECIFIED IN THE NCDOT BMP MANUAL).

GRAPHIC SCALE
50 0 50 100

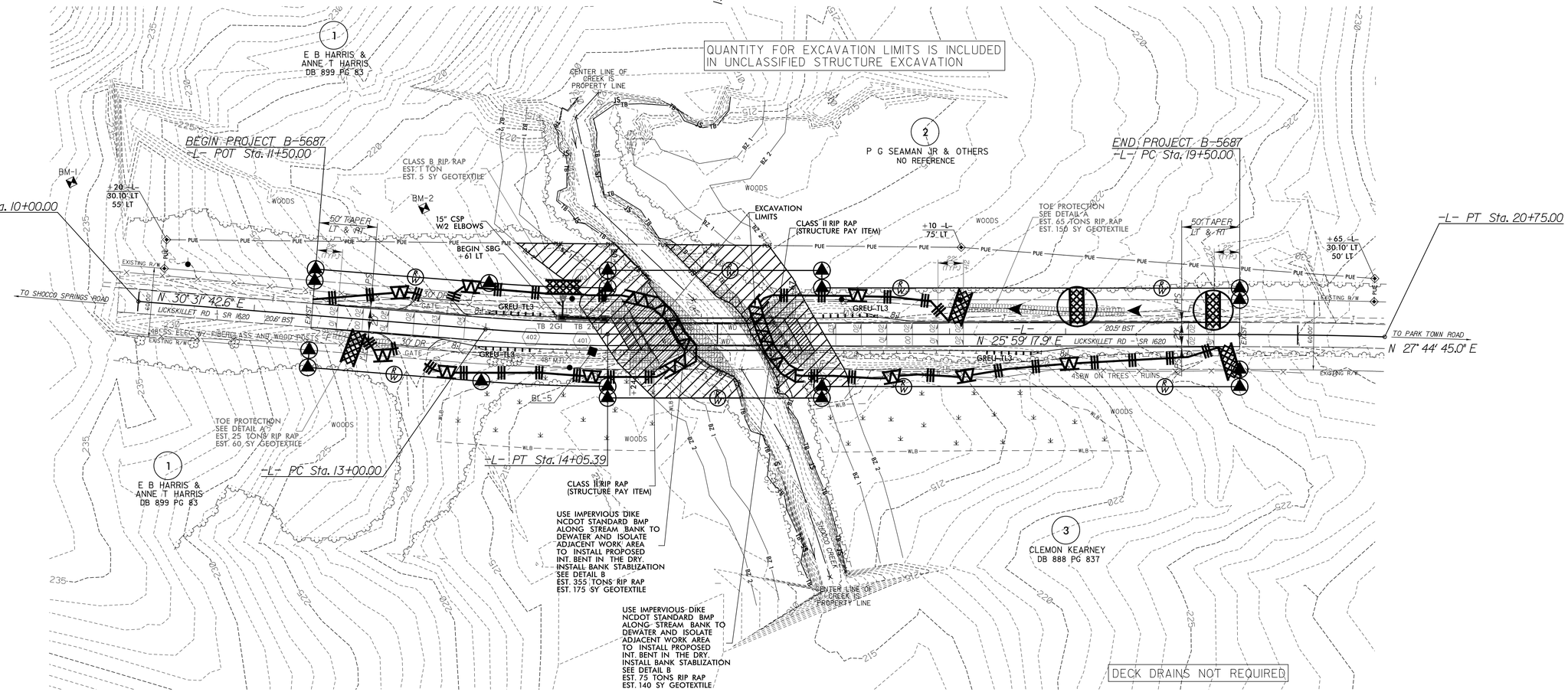
NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
B-5687	EC-4/CONST.4
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
ALEXANDER D SNIDER, PE
CERTIFICATION NUMBER: 3064
ISSUED: AUGUST 22, 2017

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4



IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING/PROPOSED R/W OR EASEMENT.

NOTE:
PLACE TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
UTILIZE SPECIAL STILLING BASINS FOR DRILLED PIERS

$$$$ENVSTIME $$$$
$$$$ENVDATE $$$$
$$$$ENVUNITS $$$$

PROJECT REFERENCE NO. B-5687 | SHEET NO. EC-5/CONST.4
R/W SHEET NO.
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

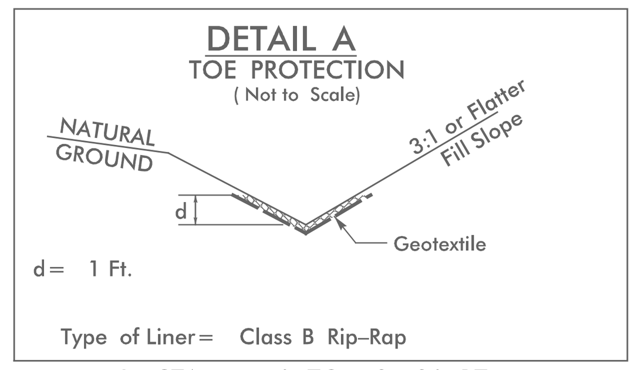
LEVEL III CERTIFIED BY:
ALEXANDER D SNIDER, PE
CERTIFICATION NUMBER: 3064
ISSUED: AUGUST 22, 2017

GRAPHIC SCALE
50 0 50 100

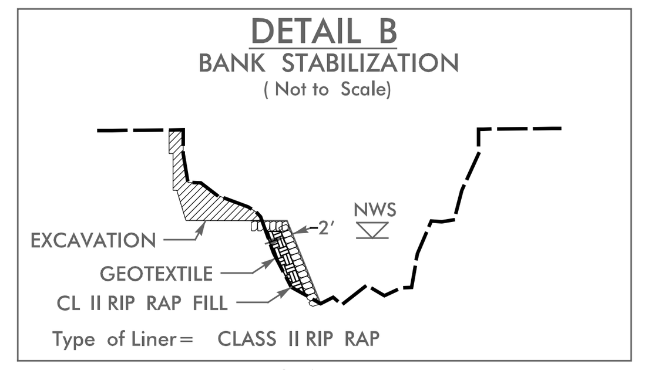
FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 4

NAD 83/NA 2011

5/14/99



–L– STA. 11+70 TO 12+20 RT
–L– STA. 17+10 TO 18+50 LT



–L– STA. 14+70
–L– STA. 15+35

EROSION CONTROL COMMITMENTS:

- IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, THE CONTRACTOR MAY PERFORM CLEARING OPERATIONS BUT NOT GRUBBING OPERATION UNTIL IMMEDIATELY PRIOR TO BEGINNING GRADING OPERATIONS.
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- COIR FIBER MATTING WILL BE INSTALLED ON THE FOOTPRINT OF UNCLASSIFIED STRUCTURE EXCAVATION NEAR THE STREAMBANKS.
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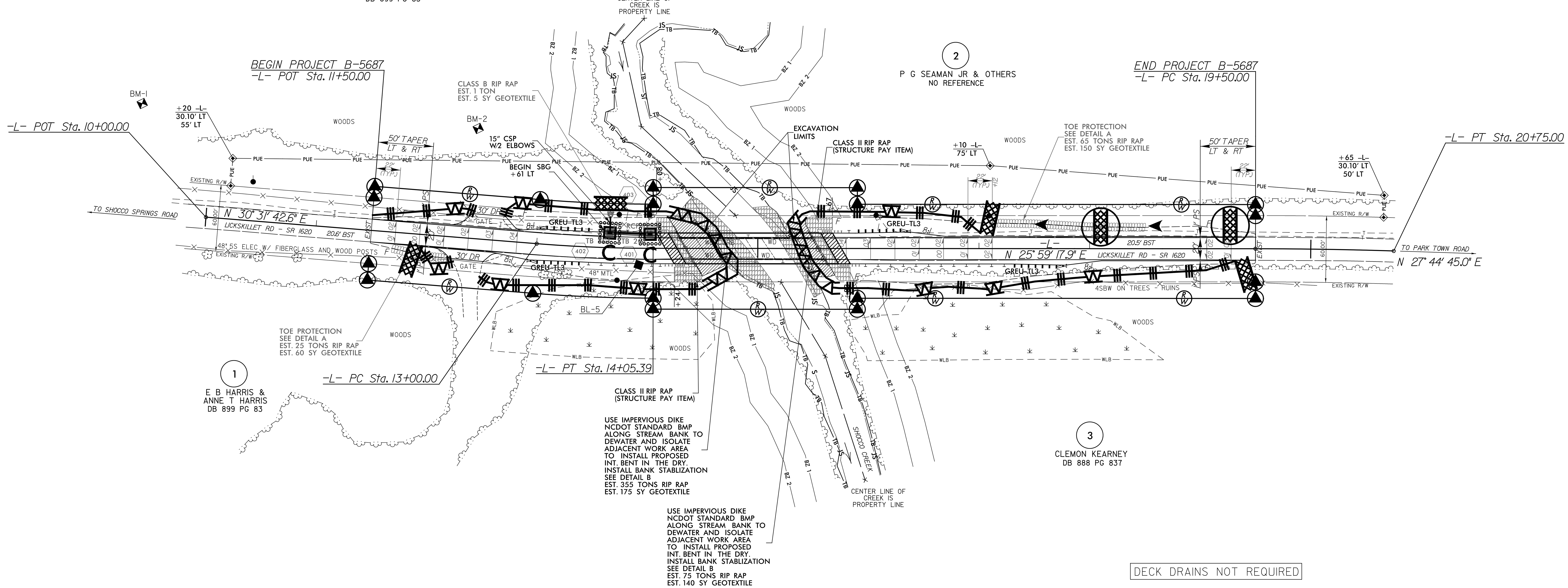
15+00

QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION



DECK DRAINS NOT REQUIRED

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING/PROPOSED R/W OR EASEMENT.

NOTE:
UTILIZE SPECIAL STILLING BASINS FOR DRILLED PIERS

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

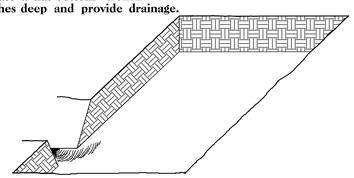
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5687	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

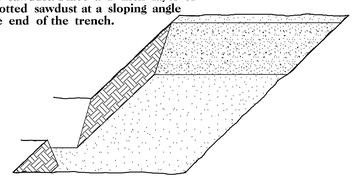
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

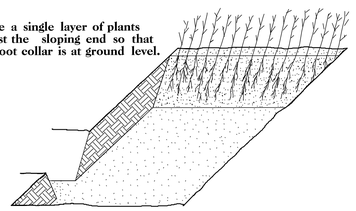
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



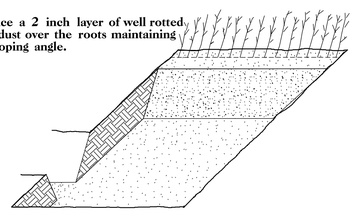
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

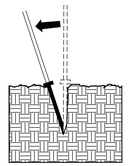


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

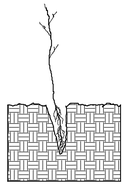


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

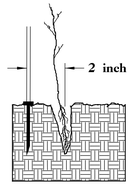
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



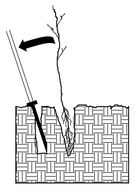
1. Insert planting bar as shown and pull handle toward planter.



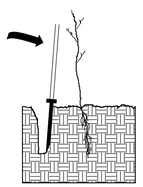
2. Remove planting bar and place seedling at correct depth.



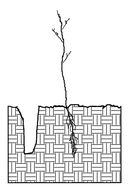
3. Insert planting bar 2 inches toward planter from seedling.



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

PROJECT REFERENCE	SHEET NO.
B-5687 – WARREN 43	UO-1

Prepared in the Office of:

THE WOOTEN COMPANY
120 North Boylan Avenue Raleigh NC 27603-1423
919.828.0531 fax 919.834.3589
License Number: F-0115

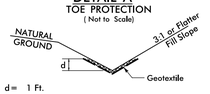
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
25' 0 25' 50'

UTILITIES BY OTHERS

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

DETAIL A
TOE PROTECTION
(Not to Scale)

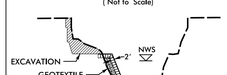


d = 1 Ft.

Type of Liner = Class B Rip-Rap

-L- STA. 11+70 TO 12+20 RT
-L- STA. 17+10 TO 18+50 LT

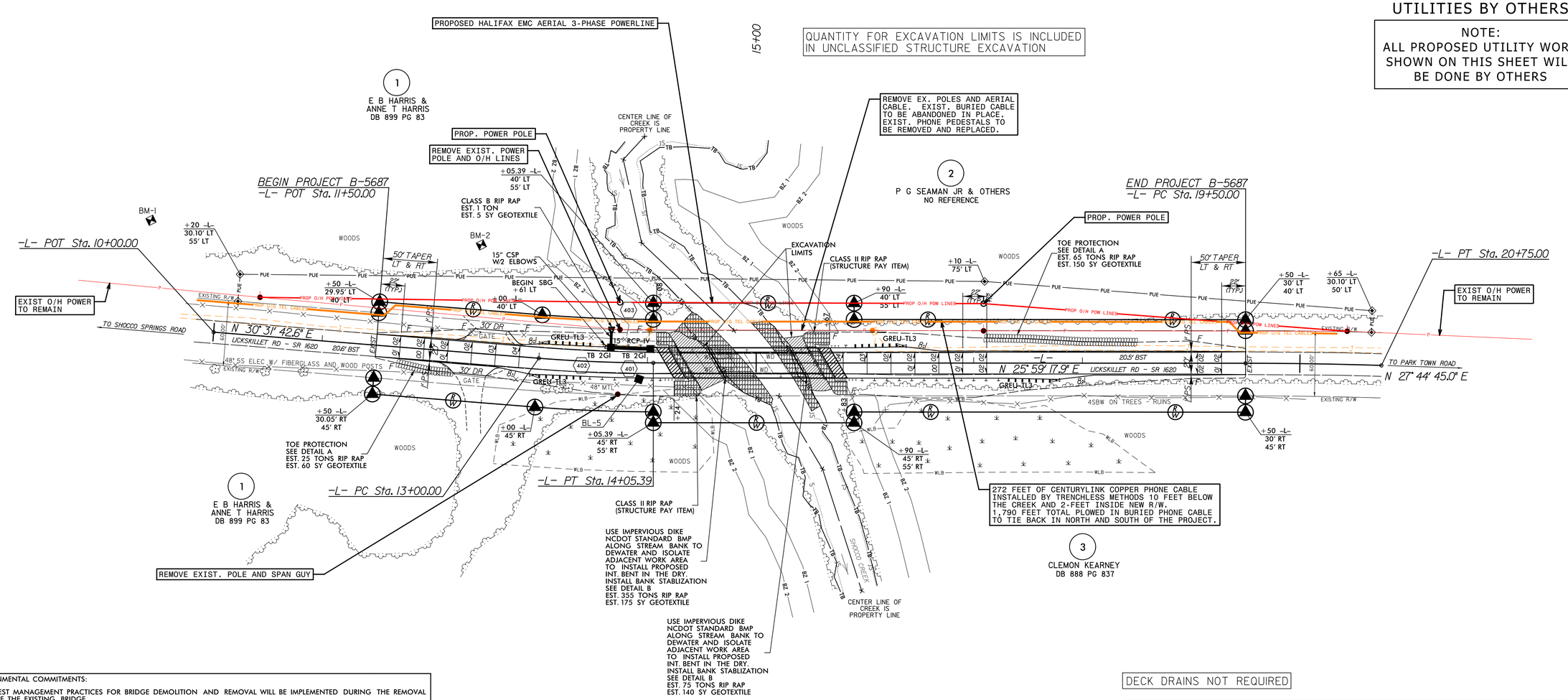
DETAIL B
BANK STABILIZATION
(Not to Scale)



Type of Liner = CLASS II RIP RAP

-L- STA. 14+70
-L- STA. 15+35

NAD 83/NA 2011



ENVIRONMENTAL COMMITMENTS:

- BEST MANAGEMENT PRACTICES FOR BRIDGE DEMOLITION AND REMOVAL WILL BE IMPLEMENTED DURING THE REMOVAL OF THE EXISTING BRIDGE.
- 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 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 AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL NOT BE ALLOWED TO DRAG REMOVED TIMBER PILES ON OR ACROSS THE STREAMBED.
- IF STILL PRESENT AT THE TIME OF CONSTRUCTION, A FALLEN TREE CROSSING THE STREAM BELOW THE EXISTING BRIDGE WILL BE REMOVED TO PREVENT POTENTIAL BANK EROSION CAUSED BY THE TREE. THE ENGINEER WILL EVALUATE IF THE ROOT BALL CAN REMAIN IN PLACE. THE REMOVAL OF THE TREE IS CONSIDERED INCIDENTAL TO CLEARING AND GRUBBING.
- EXISTING TIMBER ABUTMENTS WILL BE COMPLETELY REMOVED.

ENVIRONMENTAL COMMITMENTS:

-THERE SHALL BE NO IMPACTS TO THE STREAM CHANNEL OR CLEARING/GRUBBING OF TREES OR VEGETATION ALONG THE STREAMBANK FROM ANY UTILITY WORK.

- CONTRACTOR WILL USE NCDOT APPROVED EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES AND MAINTAIN THEM AS NECESSARY ON THE DEPARTMENT'S RIGHT OF WAY OR LEGALLY OBTAINED EASEMENTS. THE METHODS FOR EROSION CONTROL FOR THIS PROJECT MUST MEET EXPECTATIONS OF DESIGN STANDARDS IN SENSITIVE WATERSHEDS.

-IN AREAS IDENTIFIED AS ENVIRONMENTALLY SENSITIVE AREAS, EROSION CONTROL DEVICES SHALL BE INSTALLED IMMEDIATELY FOLLOWING LAND DISTURBING ACTIVITIES.

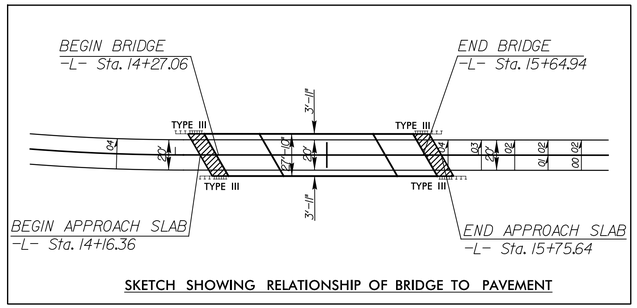
-CONTACT THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO ANY WORK CONDUCTED IN THE DEPARTMENT'S RIGHT OF WAY OR LEGALLY OBTAINED EASEMENTS.

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

-L-

PI Sta 13+52.72	PI Sta 20+12.50
Δ = 4° 32' 24.7" (LT)	Δ = 1° 45' 27.1" (RT)
D = 4° 18' 28.6"	D = 1° 24' 21.7"
L = 105.39'	L = 125.00'
T = 52.72'	T = 62.50'
R = 1,330.00'	R = 4,075.00'

DECK DRAINS NOT REQUIRED

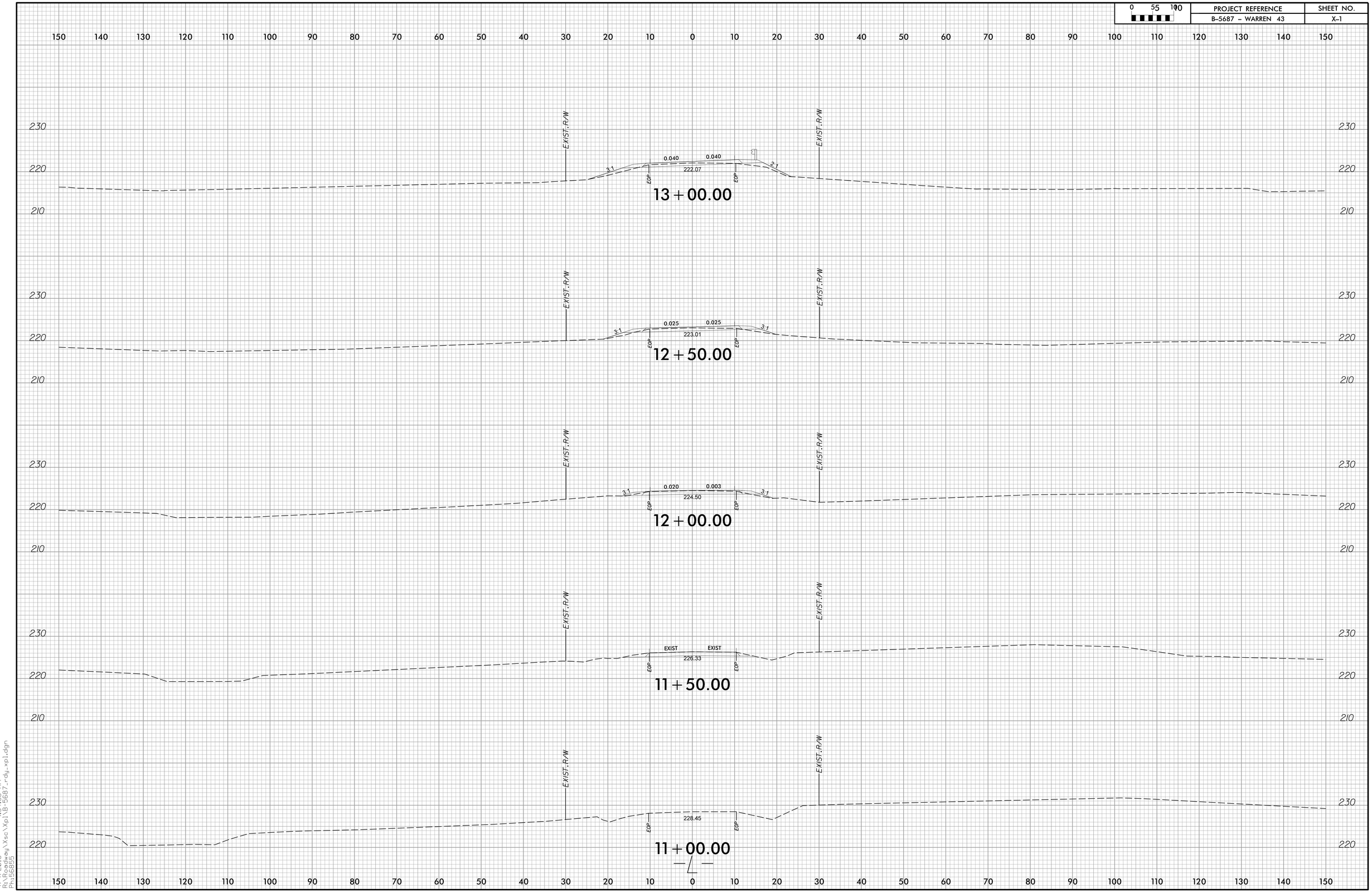


SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-24

3/29/2018
2:37:33 PM
T:\Projects\Hatch_Mott_MacDonald-3160\D\B-5687_Warren_43\B-5687_Revised_CFI_Plans\B-5687_Ub0.dgn
harris

0 55 100	PROJECT REFERENCE	SHEET NO.
	B-5687 – WARREN 43	X-1



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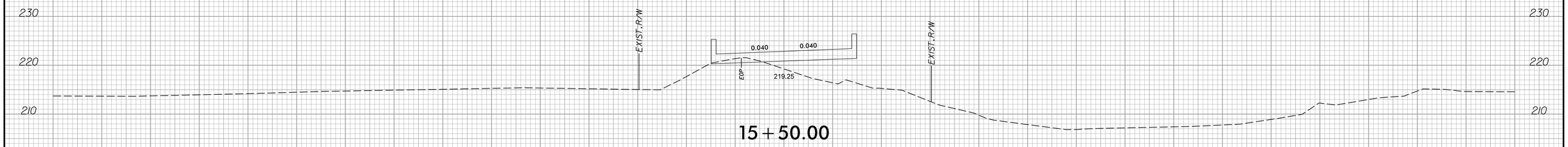
Ph:56855

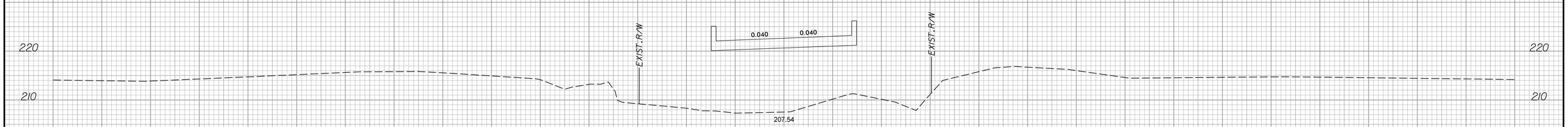
0 55 100	PROJECT REFERENCE	SHEET NO.
	B-5687 – WARREN 43	X–2

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

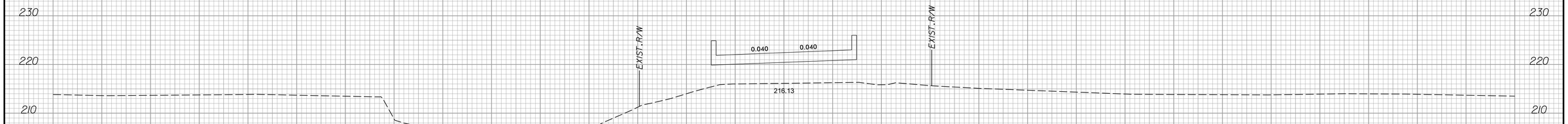
END BRIDGE 15+64.94



15+50.00

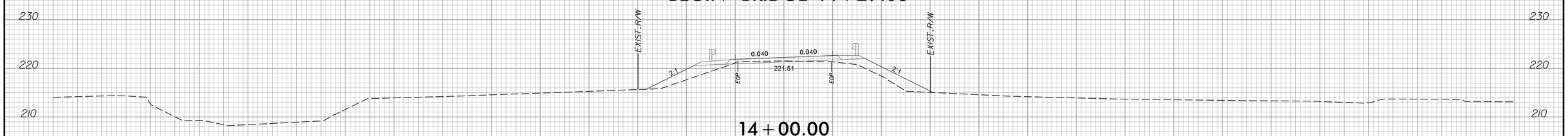


15+00.00

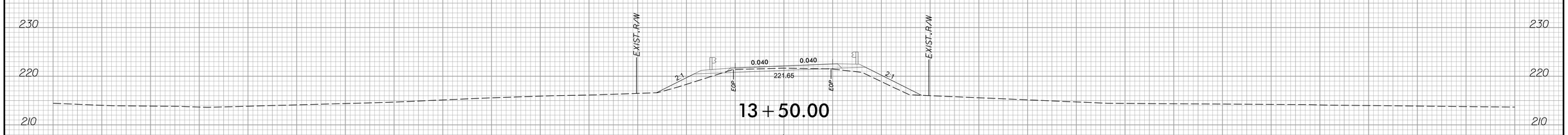


14+50.00

BEGIN BRIDGE 14+27.06



14+00.00



13+50.00

4/4/2018 9:54:37 AM
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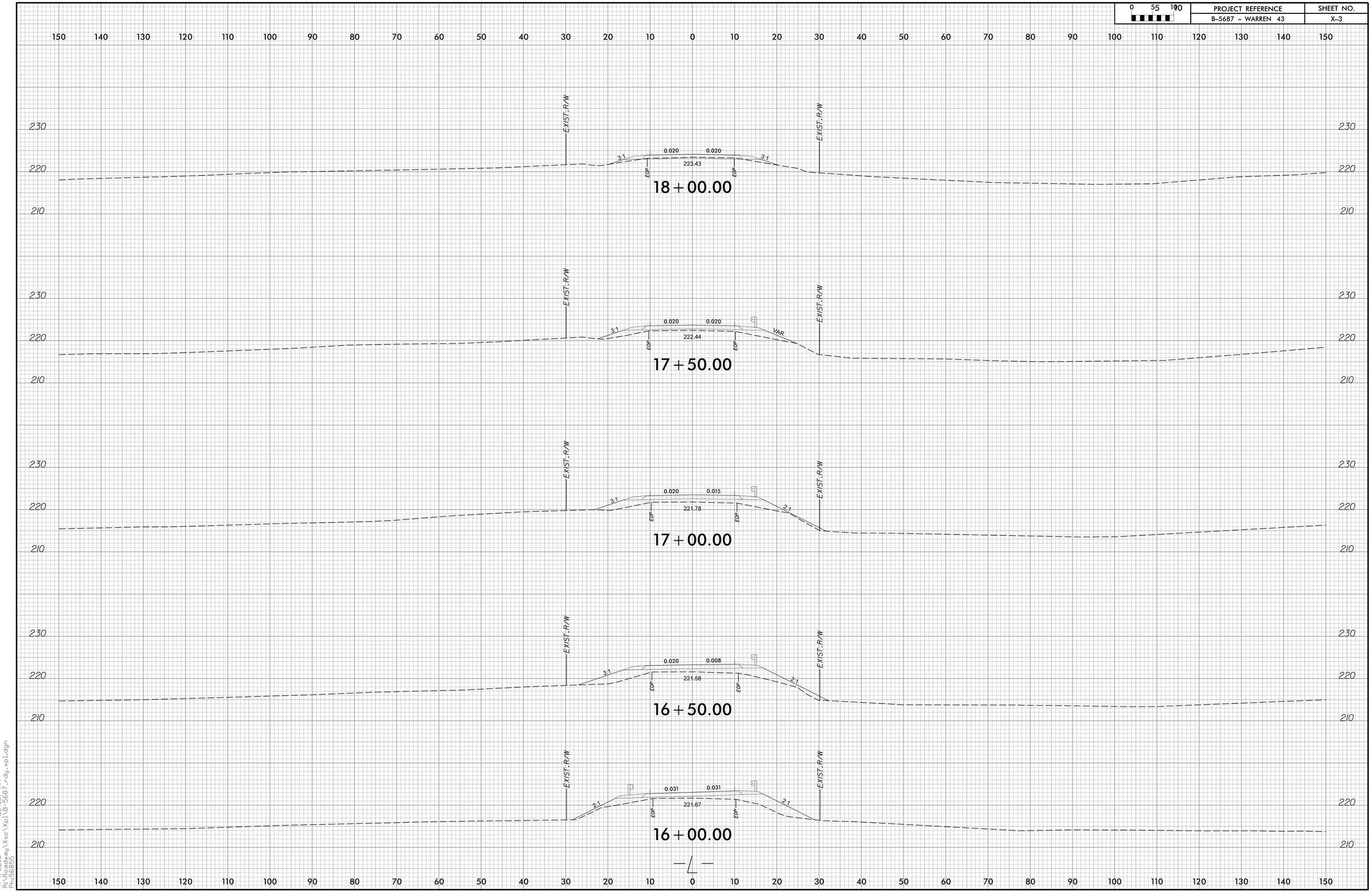
0 55 100	PROJECT REFERENCE	SHEET NO.
	B-5687 – WARREN 43	X–3



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	B-5687 – WARREN 43	X-4

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

EXIST. R/W
EOP
229.99
EOP
EXIST. R/W

20+00.00

230
220

EXIST. R/W
EXIST
EXIST
228.03
EOP
EOP
EXIST. R/W

19+50.00

230
220

EXIST. R/W
3:1
0.020
0.020
226.22
EOP
EOP
EXIST. R/W

19+00.00

230
220

EXIST. R/W
3:1
0.020
0.020
3:1
224.70
EOP
EOP
EXIST. R/W

18+50.00

210

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

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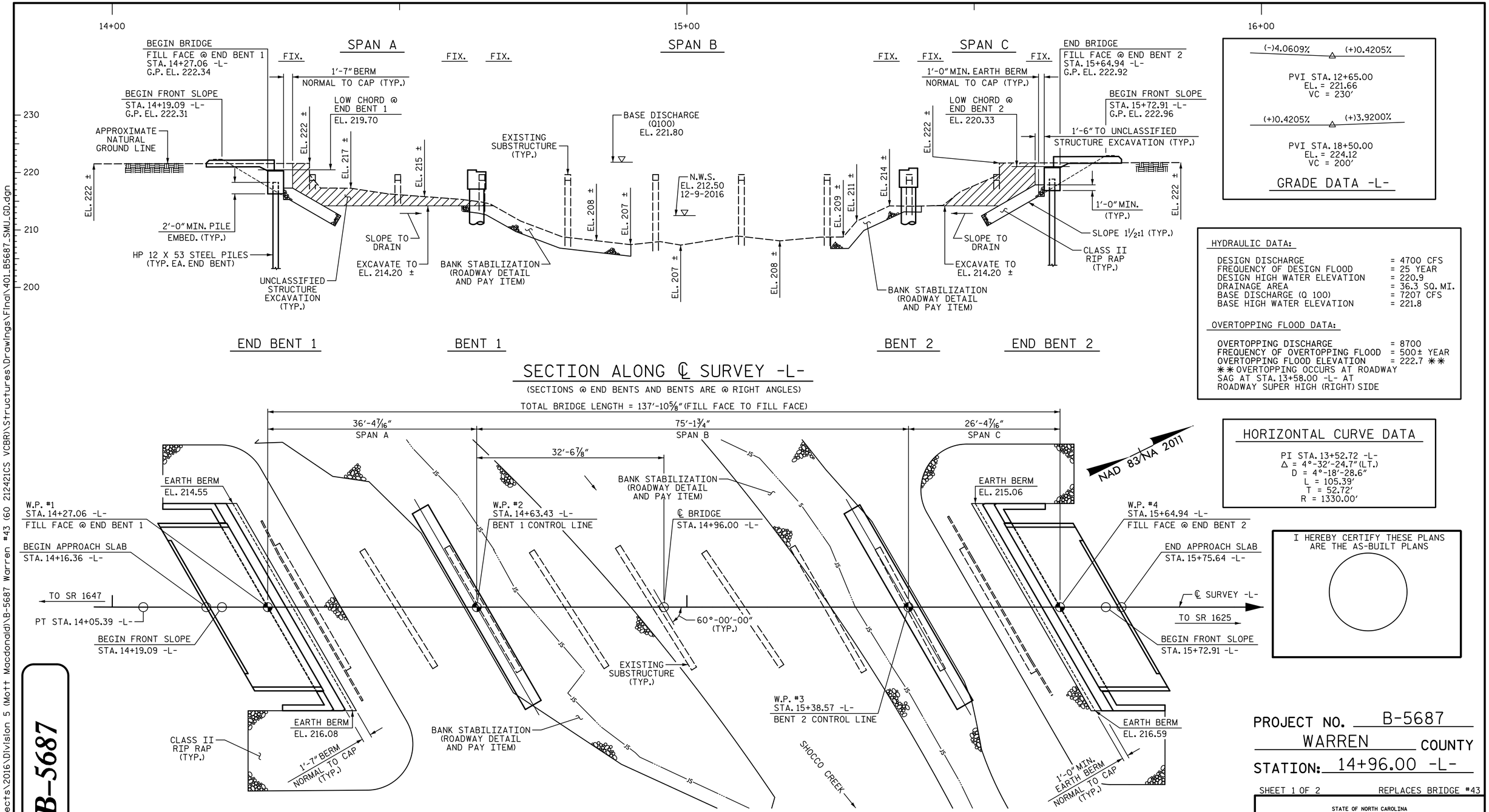

SECTION ALONG ℄ SURVEY -L-

(SECTIONS @ END BENTS AND BENTS ARE @ RIGHT ANGLES)

PLAN

(PILES AND DRILLED PIERS NOT SHOWN IN PLAN VIEW)

(-)4.0609% (+)0.4205%

PVI STA. 12+65.00
EL. = 221.66
VC = 230'

(+)0.4205% (+)3.9200%

PVI STA. 18+50.00
EL. = 224.12
VC = 200'

GRADE DATA -L-

HYDRAULIC DATA:

DESIGN DISCHARGE	= 4700 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YEAR
DESIGN HIGH WATER ELEVATION	= 220.9
DRAINAGE AREA	= 36.3 SQ. MI.
BASE DISCHARGE (Q 100)	= 7207 CFS
BASE HIGH WATER ELEVATION	= 221.8

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 8700
FREQUENCY OF OVERTOPPING FLOOD	= 500± YEAR
OVERTOPPING FLOOD ELEVATION	= 222.7 **

** OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 13+58.00 -L- AT ROADWAY SUPER HIGH (RIGHT) SIDE

HORIZONTAL CURVE DATA

PI STA. 13+52.72 -L-
Δ = 4°-32'-24.7" (LT.)
D = 4°-18'-28.6"
L = 105.39'
T = 52.72'
R = 1330.00'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

TIP: B-5687

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE #43

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1620
(LICKSKILLET RD)
OVER SHOCCO CREEK
BETWEEN SR 1647 AND SR 1625

27'-10" CLEAR ROADWAY - 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: T. BANKOVICH DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
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www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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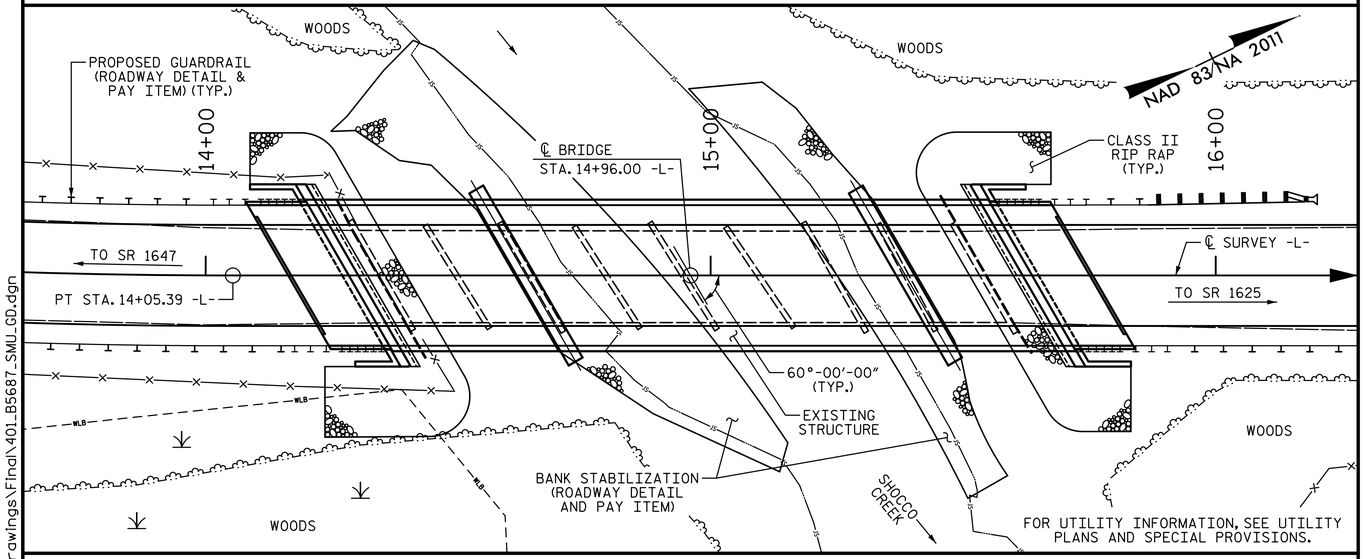

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	3'-0" DIA. DRILLED PIER IN SOIL	3'-0" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LS	LS	LF	LF	LF	EA	EA	LS	CY	LS	LB
SUPERSTRUCTURE										LS	
END BENT 1								LS	22.4		2,736
BENT 1			55.5	30.0	48.6				16.9		9,596
BENT 2			37.5	30.0	27.6				17.1		8,698
END BENT 2								LS	22.4		2,736
TOTAL	LS	LS	93.0	60.0	76.2	2	3	LS	78.8	LS	23,766

TOTAL BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0"X 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0"X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LB	EA	NO.	LF	LF	TON	SY	LS	NO.	LF	NO.	LF
SUPERSTRUCTURE					270.87			LS	20	600.00	10	750.00
END BENT 1		5	5	125		125	140					
BENT 1	1,692											
BENT 2	1,413											
END BENT 2		5	5	100		130	145					
TOTAL	3,105	10	10	225	270.87	255	285	LS	20	600.00	10	750.00

FOUNDATION NOTES:

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 197.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 185.0 FT. AND WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS 204.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 204.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 191.0 FT. AND WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS 201.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

USE IMPERVIOUS DIKE NCDOT STANDARD BMP ALONG STREAM BANKS TO DEWATER AND ISOLATE ADJACENT WORK AREAS TO INSTALL PROPOSED INTERIOR BENTS IN THE DRY. IMPERVIOUS DIKES SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM PAY ITEM FOR REMOVAL OF EXISTING STRUCTURE.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. LEFT AND 30 FT. RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTS OF 4 SPANS @ 15'-0", 2 @ 15'-1" AND 2 @ 15'-3½". THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 19'-3" WITH TIMBER FLOOR ON CONTINUOUS STEEL I-BEAMS. THE END BENTS AND INTERIOR BENTS CONSIST OF TIMBER CAPS ON TIMBER PILES. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 14+96.00 -L-."

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

BEST MANAGEMENT PRACTICES FOR BRIDGE DEMOLITION AND REMOVAL WILL BE IMPLEMENTED DURING THE REMOVAL OF THE EXISTING BRIDGE.

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, BEAMS, ETC., AND FINALLY THE WOODEN PILES. AN ATTEMPT WILL BE MADE TO 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 AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL NOT BE ALLOWED TO DRAG REMOVED TIMBER PILES ON OR ACROSS THE STREAMBED.

EXISTING TIMBER ABUTMENTS WILL BE COMPLETELY REMOVED.

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1620
(LICKSKILLET RD)
OVER SHOCCO CREEK
BETWEEN SR 1647 AND SR 1625

27'-10" CLEAR ROADWAY - 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			24

PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

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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**	1.142	--	1.75	0.254	1.5	35′	EL	16.923	0.653	**1.14**	35′	EL	**1.692**	0.80	0.254	1.16	35′	EL	16.923	
		HL-93(Opr)	N/A	--	1.48	--	1.35	0.254	1.95	35′	EL	16.923	0.653	1.48	35′	EL	1.692	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.318	47.43	1.75	0.254	1.99	35′	EL	13.538	0.653	**1.32**	35′	EL	**1.692**	0.80	0.254	1.54	35′	EL	16.923	
		HS-20(Opr)	36.000	--	1.708	61.484	1.35	0.254	2.57	35′	EL	13.538	0.653	1.71	35′	EL	1.692	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.649	35.758	1.4	0.254	4.3	35′	EL	16.923	0.653	3.39	35′	EL	1.692	0.80	0.254	2.65	35′	EL	16.923	
		SNGARBS2	20.000	--	2.276	45.521	1.4	0.254	3.64	35′	EL	13.538	0.653	2.56	35′	EL	1.692	0.80	0.254	2.28	35′	EL	13.538	
		SNAGRIS2	22.000	--	2.27	49.949	1.4	0.254	3.61	35′	EL	13.538	0.653	2.44	35′	EL	1.692	0.80	0.254	2.27	35′	EL	13.538	
		SNCOTTS3	27.250	--	1.326	36.138	1.4	0.254	2.15	35′	EL	16.923	0.653	1.71	35′	EL	1.692	0.80	0.254	1.33	35′	EL	16.923	
		SNAGGRS4	34.925	--	1.228	42.883	1.4	0.254	1.99	35′	EL	16.923	0.653	1.53	35′	EL	1.692	0.80	0.254	1.23	35′	EL	16.923	
		SNS5A	35.550	--	1.192	42.369	1.4	0.254	1.93	35′	EL	16.923	0.653	1.61	35′	EL	1.692	0.80	0.254	1.19	35′	EL	16.923	
		SNS6A	39.950	--	1.15	45.932	1.4	0.254	1.87	35′	EL	16.923	0.653	1.52	35′	EL	1.692	0.80	0.254	1.15	35′	EL	16.923	
		SNS7B	42.000	**3**	1.098	46.1	1.4	0.254	1.78	35′	EL	16.923	0.653	1.55	35′	EL	1.692	0.80	0.254	**1.10**	35′	EL	**16.923**	
	TTST	TNAGRIT3	33.000	--	1.422	46.913	1.4	0.254	2.31	35′	EL	16.923	0.653	1.77	35′	EL	1.692	0.80	0.254	1.42	35′	EL	16.923	
		TNT4A	33.075	--	1.419	46.934	1.4	0.254	2.3	35′	EL	16.923	0.653	1.67	35′	EL	1.692	0.80	0.254	1.42	35′	EL	16.923	
		TNT6A	41.600	--	1.244	51.758	1.4	0.254	2.02	35′	EL	16.923	0.653	1.64	35′	EL	1.692	0.80	0.254	1.24	35′	EL	16.923	
		TNT7A	42.000	--	1.286	54.015	1.4	0.254	2.09	35′	EL	16.923	0.653	1.52	35′	EL	1.692	0.80	0.254	1.29	35′	EL	16.923	
		TNT7B	42.000	--	1.263	53.051	1.4	0.254	2.05	35′	EL	16.923	0.653	1.48	35′	EL	1.692	0.80	0.254	1.26	35′	EL	16.923	
		TNAGRIT4	43.000	--	1.279	55.012	1.4	0.254	2.06	35′	EL	13.538	0.653	1.42	35′	EL	1.692	0.80	0.254	1.28	35′	EL	16.923	
		TNAGT5A	45.000	--	1.182	53.19	1.4	0.254	1.92	35′	EL	16.923	0.653	1.5	35′	EL	1.692	0.80	0.254	1.18	35′	EL	16.923	
		TNAGT5B	45.000	--	1.14	51.296	1.4	0.254	1.85	35′	EL	16.923	0.653	1.34	35′	EL	1.692	0.80	0.254	1.14	35′	EL	16.923	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM ℄ BEARING.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

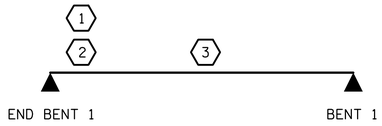
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

SPAN A

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

PLANS PREPARED BY:
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4/3/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 35′ CORED SLAB UNITS 60° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
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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**	1.06	--	1.75	0.248	1.14	75′	EL	36.923	0.655	**1.06**	75′	EL	**7.385**	0.80	0.248	1.11	75′	EL	36.923	
		HL-93(Opr)	N/A	--	1.374	--	1.35	0.248	1.48	75′	EL	36.923	0.655	1.37	75′	EL	7.385	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.32	47.508	1.75	0.248	1.48	75′	EL	36.923	0.655	**1.32**	75′	EL	**7.385**	0.80	0.248	1.44	75′	EL	36.923	
		HS-20(Opr)	36.000	--	1.711	61.585	1.35	0.248	1.91	75′	EL	36.923	0.655	1.71	75′	EL	7.385	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.204	43.258	1.4	0.248	4.12	75′	EL	36.923	0.655	3.9	75′	EL	7.385	0.80	0.248	3.20	75′	EL	36.923	
		SNGARBS2	20.000	--	2.403	48.063	1.4	0.248	3.09	75′	EL	36.923	0.655	2.78	75′	EL	7.385	0.80	0.248	2.40	75′	EL	36.923	
		SNAGRIS2	22.000	--	2.282	50.21	1.4	0.248	2.94	75′	EL	36.923	0.655	2.58	75′	EL	7.385	0.80	0.248	2.28	75′	EL	36.923	
		SNCOTTS3	27.250	--	1.595	43.463	1.4	0.248	2.05	75′	EL	36.923	0.655	1.95	75′	EL	7.385	0.80	0.248	1.59	75′	EL	36.923	
		SNAGGRS4	34.925	--	1.339	46.755	1.4	0.248	1.72	75′	EL	36.923	0.655	1.62	75′	EL	7.385	0.80	0.248	1.34	75′	EL	36.923	
		SNS5A	35.550	--	1.309	46.526	1.4	0.248	1.68	75′	EL	36.923	0.655	1.65	75′	EL	7.385	0.80	0.248	1.31	75′	EL	36.923	
		SNS6A	39.950	--	1.203	48.069	1.4	0.248	1.55	75′	EL	36.923	0.655	1.5	75′	EL	7.385	0.80	0.248	1.20	75′	EL	36.923	
		SNS7B	42.000	--	1.146	48.129	1.4	0.248	1.47	75′	EL	36.923	0.655	1.48	75′	EL	7.385	0.80	0.248	1.15	75′	EL	36.923	
	TTST	TNAGRIT3	33.000	--	1.468	48.444	1.4	0.248	1.89	75′	EL	36.923	0.655	1.79	75′	EL	7.385	0.80	0.248	1.47	75′	EL	36.923	
		TNT4A	33.075	--	1.475	48.79	1.4	0.248	1.9	75′	EL	36.923	0.655	1.74	75′	EL	7.385	0.80	0.248	1.48	75′	EL	36.923	
		TNT6A	41.600	--	1.208	50.272	1.4	0.248	1.55	75′	EL	36.923	0.655	1.58	75′	EL	7.385	0.80	0.248	1.21	75′	EL	36.923	
		TNT7A	42.000	--	1.216	51.061	1.4	0.248	1.56	75′	EL	36.923	0.655	1.55	75′	EL	7.385	0.80	0.248	1.22	75′	EL	36.923	
		TNT7B	42.000	--	1.261	52.955	1.4	0.248	1.62	75′	EL	36.923	0.655	1.44	75′	EL	7.385	0.80	0.248	1.26	75′	EL	36.923	
		TNAGRIT4	43.000	--	1.197	51.476	1.4	0.248	1.54	75′	EL	36.923	0.655	1.4	75′	EL	7.385	0.80	0.248	1.20	75′	EL	36.923	
		TNAGT5A	45.000	--	1.128	50.745	1.4	0.248	1.45	75′	EL	36.923	0.655	1.39	75′	EL	7.385	0.80	0.248	1.13	75′	EL	36.923	
		TNAGT5B	45.000	**3**	1.113	50.088	1.4	0.248	1.43	75′	EL	36.923	0.655	1.33	75′	EL	7.385	0.80	0.248	**1.11**	75′	EL	**36.923**	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM ℄ BEARING.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

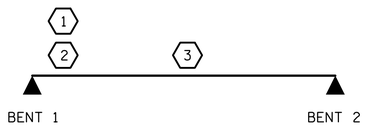
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

SPAN B

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11268 BETSY S. COX

4/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 75′ CORED SLAB UNITS 60° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			24

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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**	1.208	--	1.75	0.257	2.83	25'	EL	11.923	0.659	**1.21**	25'	EL	**1.192**	0.80	0.257	2.60	25'	EL	11.923	
		HL-93(Opr)	N/A	--	1.565	--	1.35	0.257	3.66	25'	EL	11.923	0.659	1.57	25'	EL	1.192	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.402	50.457	1.75	0.257	4.17	25'	EL	11.923	0.659	**1.4**	25'	EL	**1.192**	0.80	0.257	3.85	25'	EL	11.923	
		HS-20(Opr)	36.000	--	1.817	65.407	1.35	0.257	5.41	25'	EL	11.923	0.659	1.82	25'	EL	1.192	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.24	43.746	1.4	0.257	7.59	25'	EL	11.923	0.659	3.24	25'	EL	1.192	0.80	0.257	5.59	25'	EL	11.923	
		SNGARBS2	20.000	--	2.6	51.994	1.4	0.257	7.1	25'	EL	11.923	0.659	2.6	25'	EL	1.192	0.80	0.257	5.24	25'	EL	11.923	
		SNAGRIS2	22.000	--	2.548	56.063	1.4	0.257	7.59	25'	EL	11.923	0.659	2.55	25'	EL	1.192	0.80	0.257	5.59	25'	EL	11.923	
		SNCOTTS3	27.250	--	1.645	44.82	1.4	0.257	3.98	25'	EL	11.923	0.659	1.64	25'	EL	1.192	0.80	0.257	2.93	25'	EL	11.923	
		SNAGGRS4	34.925	--	1.585	55.347	1.4	0.257	3.96	25'	EL	11.923	0.659	1.58	25'	EL	1.192	0.80	0.257	2.92	25'	EL	11.923	
		SNS5A	35.550	--	1.655	58.841	1.4	0.257	3.85	25'	EL	11.923	0.659	1.66	25'	EL	1.192	0.80	0.257	2.82	25'	EL	11.923	
		SNS6A	39.950	--	1.588	63.45	1.4	0.257	3.6	25'	EL	11.923	0.659	1.59	25'	EL	1.192	0.80	0.257	2.66	25'	EL	11.923	
		SNS7B	42.000	--	1.599	67.158	1.4	0.257	3.6	25'	EL	11.923	0.659	1.6	25'	EL	1.192	0.80	0.257	2.64	25'	EL	11.923	
	TTST	TNAGRIT3	33.000	--	1.948	64.275	1.4	0.257	5.09	25'	EL	11.923	0.659	1.95	25'	EL	1.192	0.80	0.257	3.75	25'	EL	11.923	
		TNT4A	33.075	--	1.764	58.347	1.4	0.257	4.4	25'	EL	11.923	0.659	1.76	25'	EL	1.192	0.80	0.257	3.25	25'	EL	11.923	
		TNT6A	41.600	--	1.662	69.142	1.4	0.257	4.13	25'	EL	11.923	0.659	1.66	25'	EL	1.192	0.80	0.257	3.05	25'	EL	11.923	
		TNT7A	42.000	--	1.657	69.603	1.4	0.257	4.28	25'	EL	11.923	0.659	1.66	25'	EL	1.192	0.80	0.257	3.15	25'	EL	11.923	
		TNT7B	42.000	--	1.598	67.097	1.4	0.257	3.85	25'	EL	11.923	0.659	1.6	25'	EL	1.192	0.80	0.257	2.84	25'	EL	11.923	
		TNAGRIT4	43.000	--	1.595	68.603	1.4	0.257	4.14	25'	EL	11.923	0.659	1.6	25'	EL	1.192	0.80	0.257	3.04	25'	EL	11.923	
		TNAGT5A	45.000	--	1.625	73.143	1.4	0.257	4.14	25'	EL	11.923	0.659	1.63	25'	EL	1.192	0.80	0.257	3.04	25'	EL	11.923	
		TNAGT5B	45.000	**3**	1.476	66.434	1.4	0.257	4.08	25'	EL	9.538	0.659	**1.48**	25'	EL	**1.192**	0.80	0.257	3.02	25'	EL	9.538	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM ℄ BEARING.

(#) 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

SPAN C

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 25' CORED SLAB UNITS 60° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			24

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
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Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

4/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

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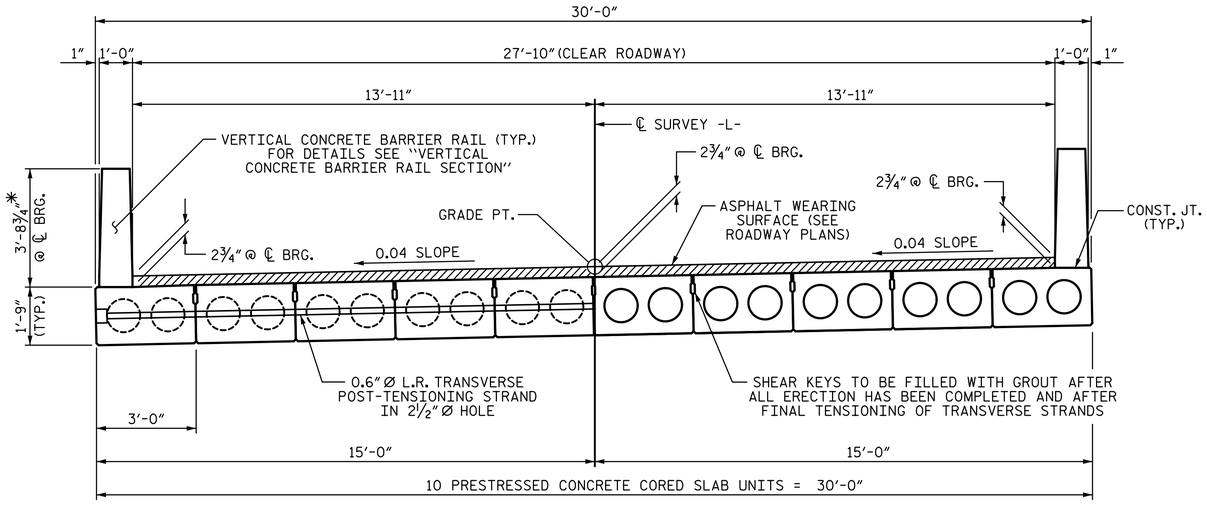


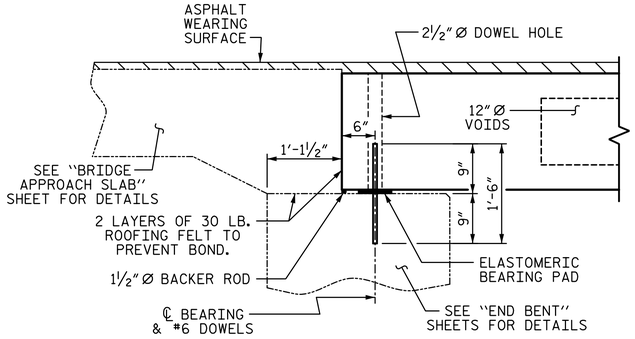
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

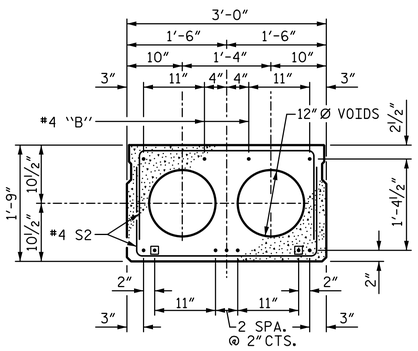
TYPICAL SECTION - SPANS A & C

* - 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

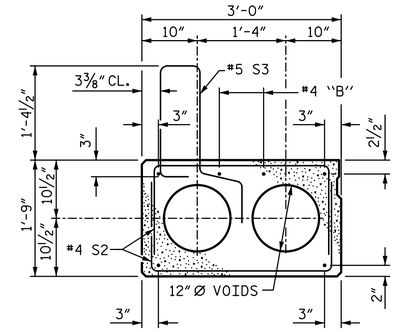


SECTION AT END BENT
FOR SECTION AT BENT, SEE SHEET 2 OF 7.



INTERIOR SLAB SECTION (25′-0″ AND 35′-0″ UNIT)

(9 STRANDS REQUIRED)



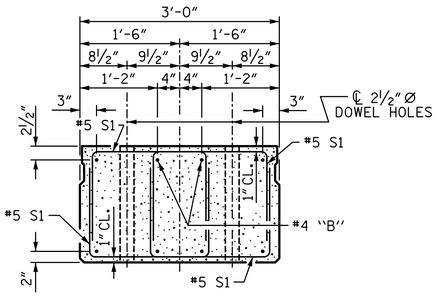
EXT. SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

0.6″Ø LOW RELAXATION STRAND LAYOUT

⊡ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

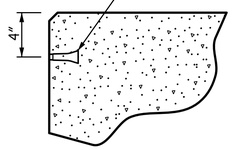
DEBONDING LEGEND



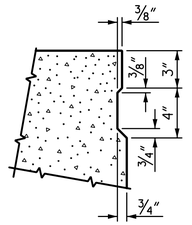
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED ⅜″, SIZE TO BE DETERMINED BY CONTRACTOR.

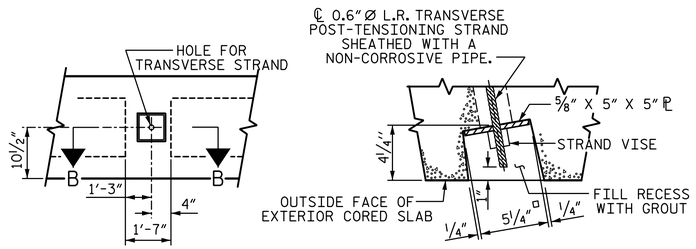


THREADED INSERT DETAIL



SHEAR KEY DETAIL

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



GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 1 OF 7

PLANS PREPARED BY:
SIMPSON ENGINEERING & ASSOCIATES
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(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
3′-0″ X 1′-9″ PRESTRESSED CONCRETE CORED SLAB UNIT SPANS A & C
60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

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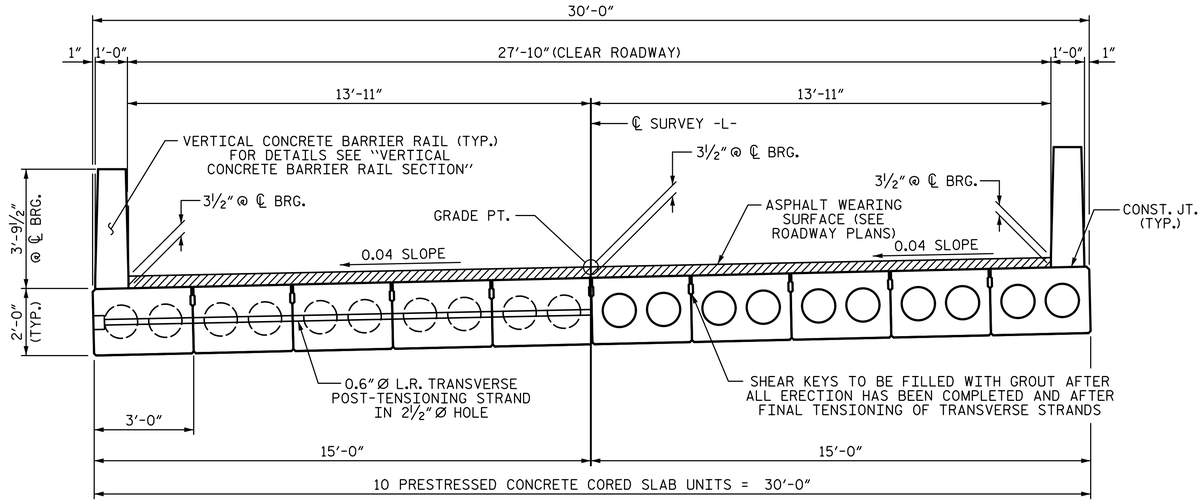
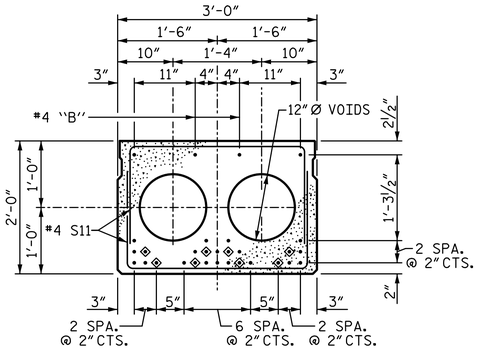


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

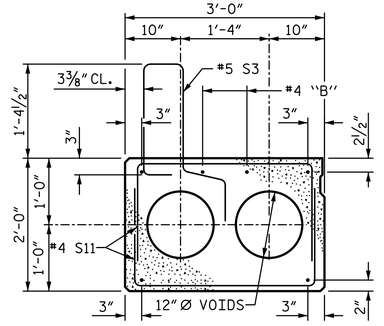
TYPICAL SECTION - SPAN B

✱ - 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.



INTERIOR SLAB SECTION (75'-0" UNIT)

(28 STRANDS REQUIRED)



EXT. SLAB SECTION

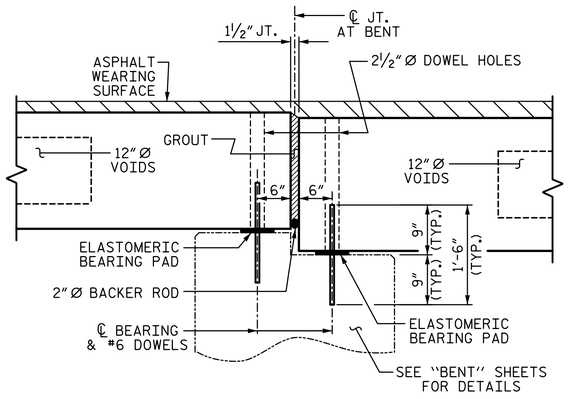
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

0.6" Ø LOW RELAXATION STRAND LAYOUT

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

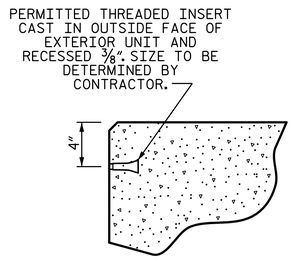
DEBONDING LEGEND

FIXED END FIXED END

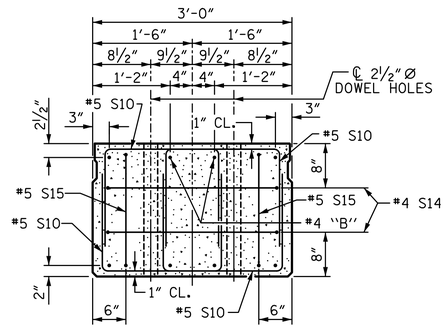


SECTION AT BENT 1

(BENT 2 SIMILAR)

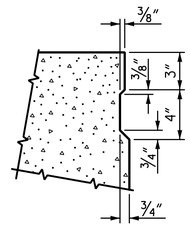


THREADED INSERT DETAIL



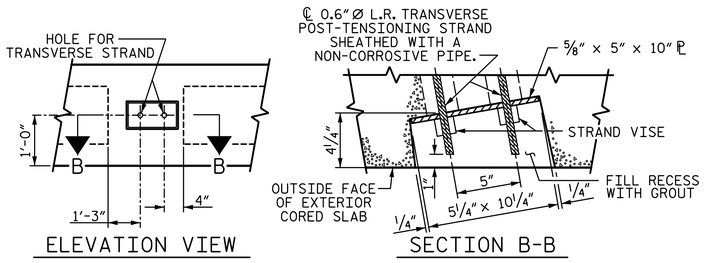
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

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



GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT SPAN B 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			24

PLANS PREPARED BY:
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LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

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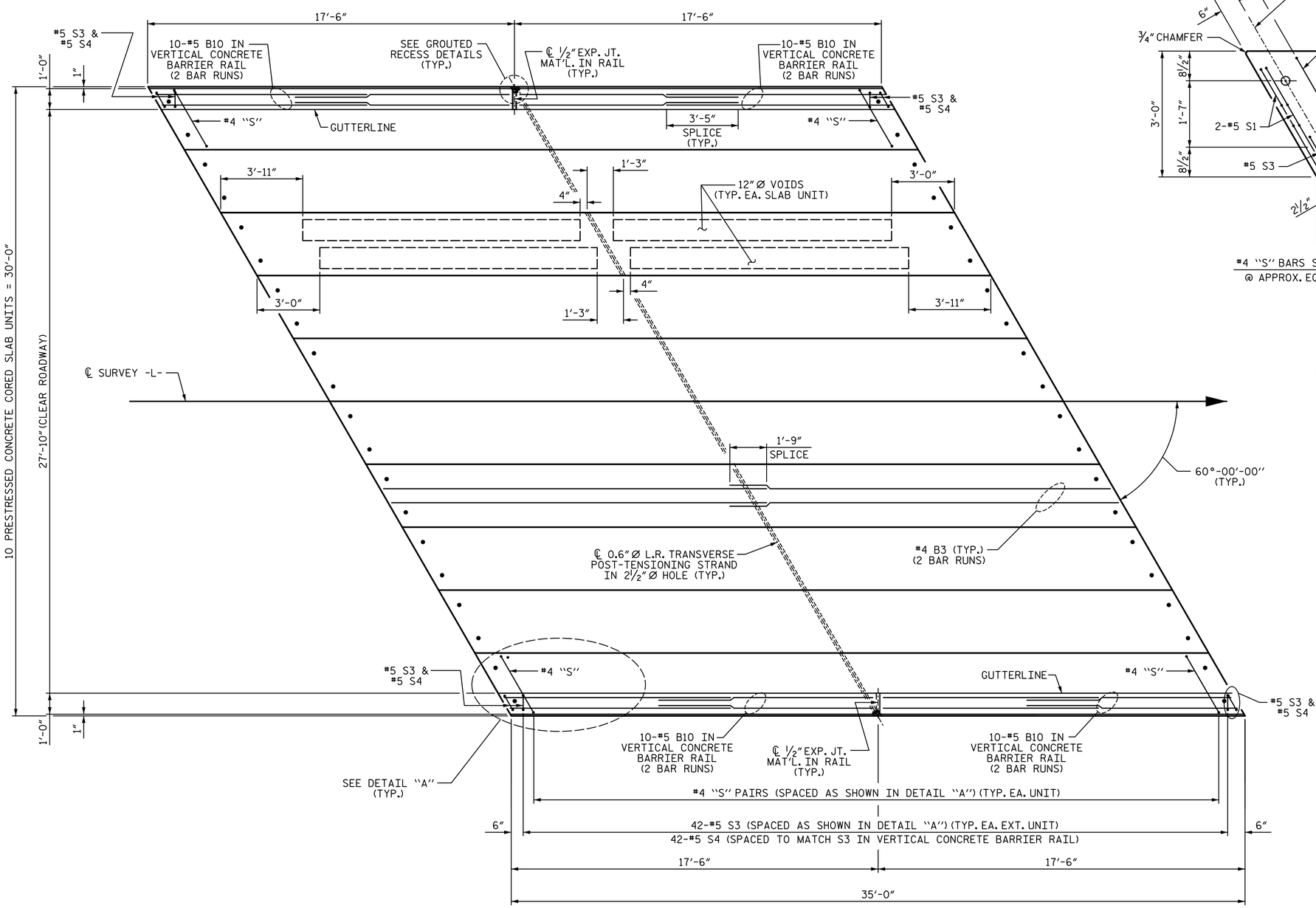
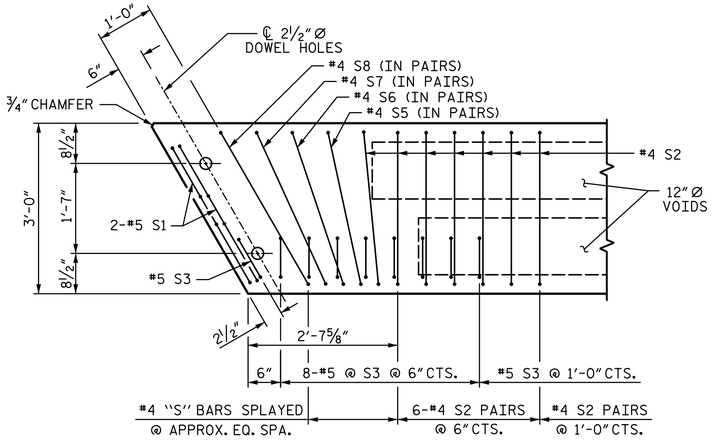


PLAN OF SPAN A



DETAIL ″A″

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN A (35′-0″ UNIT) 27′-10″ CLEAR ROADWAY 60° SKEW

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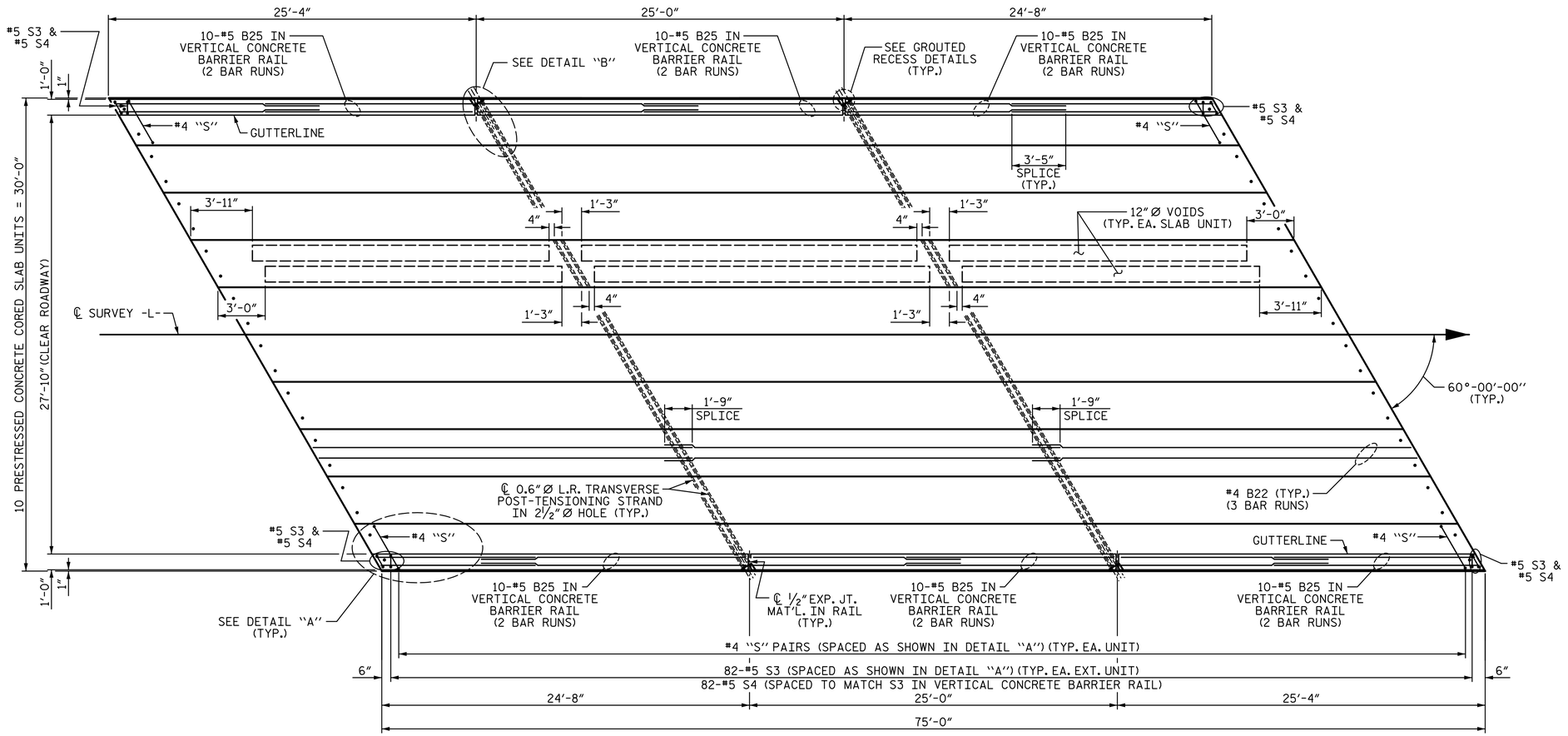
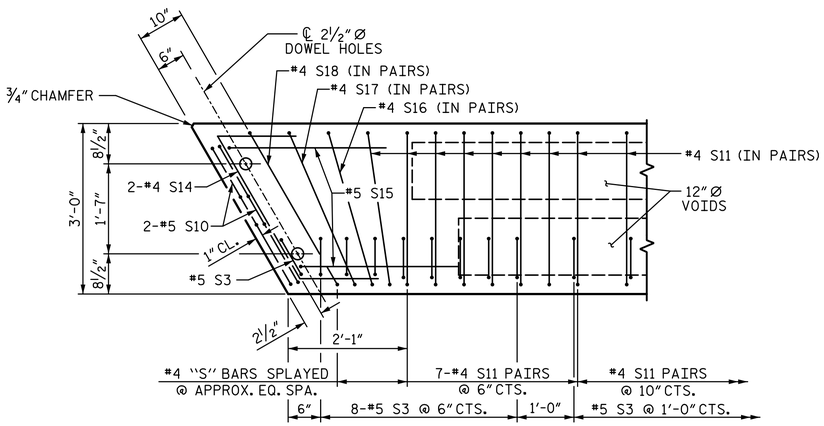
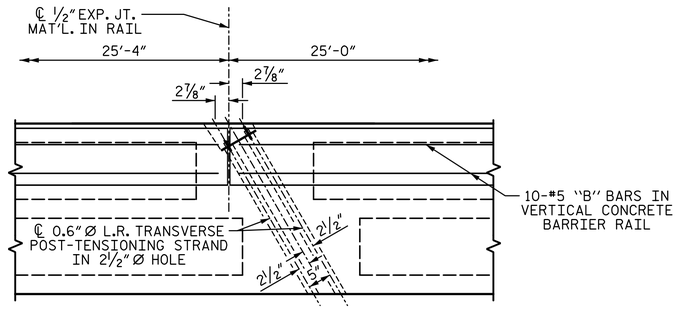


PLAN OF SPAN B



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

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4/3/2018

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PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN B (75'-0" UNIT) 27'-10" CLEAR ROADWAY 60° SKEW

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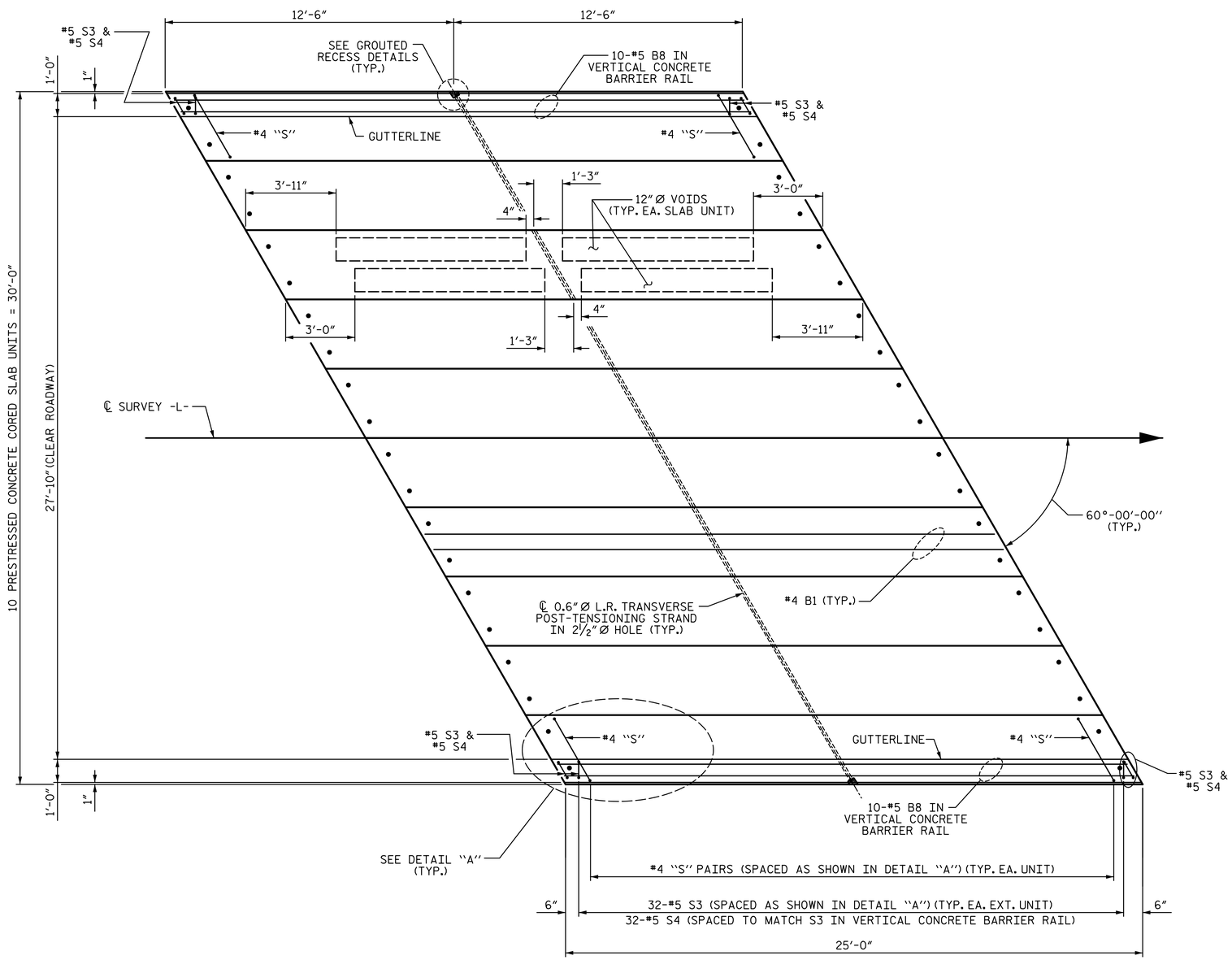
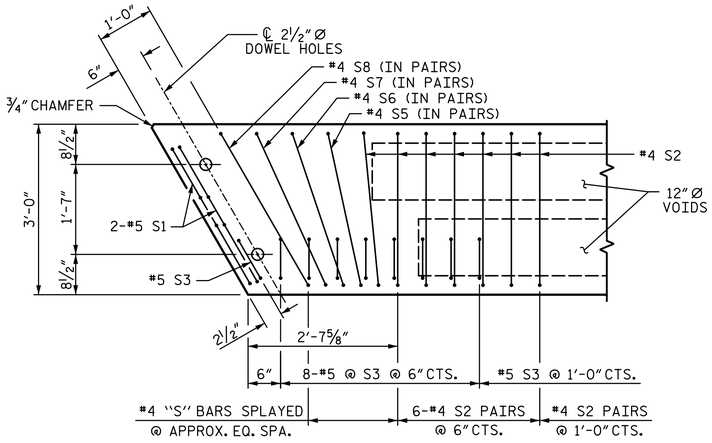


PLAN OF SPAN C



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN C
(25′-0″ UNIT)
27′-10″ CLEAR ROADWAY
60° SKEW

REVISIONS						SHEET NO.
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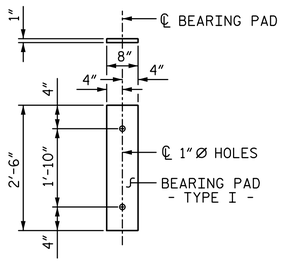


FIXED END
(TYPE I - 60 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
25' & 35' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

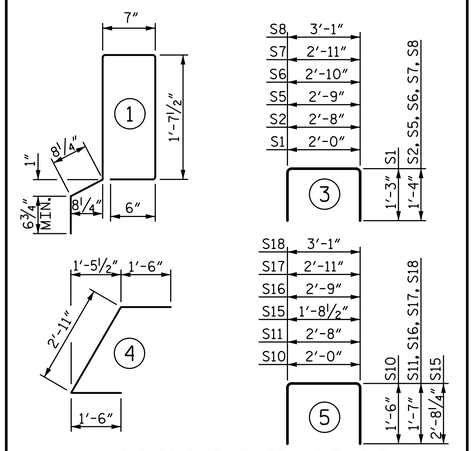
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
75' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↓
FINAL CAMBER	1 1/2" ↑

** INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
25' UNITS	2 5/8"	3'-8 5/8"
35' UNITS	2 5/8"	3'-8 5/8"
75' UNITS	2"	3'-8"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25' UNITS	4000
35' UNITS	4000
75' UNITS	6000

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

1'-9" CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
EXTERIOR C.S.	2	25'-0"	50'-0"
INTERIOR C.S.	8	25'-0"	200'-0"
TOTAL	10		250'-0"

1'-9" CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
35' UNIT			
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	8	35'-0"	280'-0"
TOTAL	10		350'-0"

2'-0" CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
75' UNIT			
EXTERIOR C.S.	2	75'-0"	150'-0"
INTERIOR C.S.	8	75'-0"	600'-0"
TOTAL	10		750'-0"

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT (1'-9" CSU)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-7"	33	24'-7"	33
S1	8	#5	3	4'-6"	38	4'-6"	38
S2	52	#4	3	5'-4"	185	5'-4"	185
✳ S3	34	#5	1	5'-7"	198		
S5	4	#4	3	5'-5"	14	5'-5"	14
S6	4	#4	3	5'-6"	15	5'-6"	15
S7	4	#4	3	5'-7"	15	5'-7"	15
S8	4	#4	3	5'-9"	15	5'-9"	15
REINFORCING STEEL			LB		315		315
✳ EPOXY COATED REINFORCING STEEL			LB		198		
5000 P.S.I. CONCRETE			CY		3.8		3.8
0.6" Ø L.R. STRANDS			No.		9		9

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT (1'-9" CSU)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-6"	38	4'-6"	38
S2	72	#4	3	5'-4"	257	5'-4"	257
✳ S3	44	#5	1	5'-7"	256		
S5	4	#4	3	5'-5"	14	5'-5"	14
S6	4	#4	3	5'-6"	15	5'-6"	15
S7	4	#4	3	5'-7"	15	5'-7"	15
S8	4	#4	3	5'-9"	15	5'-9"	15
REINFORCING STEEL			LB		403		403
✳ EPOXY COATED REINFORCING STEEL			LB		256		
5000 P.S.I. CONCRETE			CY		5.2		5.2
0.6" Ø L.R. STRANDS			No.		9		9

BILL OF MATERIAL FOR ONE 75' CORED SLAB UNIT (2'-0" CSU)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	26'-2"	105	26'-2"	105
✳ S3	84	#5	1	5'-7"	489		
S10	8	#5	5	5'-0"	42	5'-0"	42
S11	182	#4	5	5'-10"	709	5'-10"	709
S14	4	#4	4	5'-11"	16	5'-11"	16
S15	4	#5	5	7'-1"	30	7'-1"	30
S16	4	#4	5	5'-11"	16	5'-11"	16
S17	4	#4	5	6'-1"	16	6'-1"	16
S18	4	#4	5	6'-3"	17	6'-3"	17
REINFORCING STEEL			LB		951		951
✳ EPOXY COATED REINFORCING STEEL			LB		489		
8000 P.S.I. CONCRETE			CY		12.8		12.8
0.6" Ø L.R. STRANDS			No.		28		28

GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

NOTES:

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

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.

NOTES FOR 2'-0" CORED SLAB UNITS:

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

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

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE 3'-0" X 1'-9" & 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNITS 60° SKEW

REVISIONS						SHEET NO.
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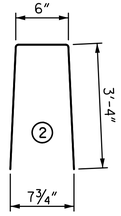
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

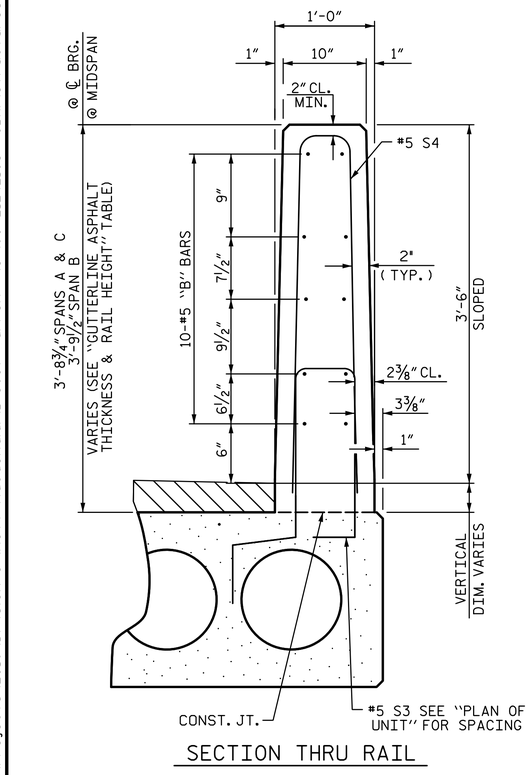
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	25′ UNIT					
✳ B8	20	20	#5	STR	24′-6″	511
✳ S4	68	68	#5	2	7′-2″	508
✳ EPOXY COATED REINFORCING STEEL				LB		1019
CLASS AA CONCRETE				CY		6.4
TOTAL VERTICAL CONCRETE BARRIER RAIL				LF		50.29

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

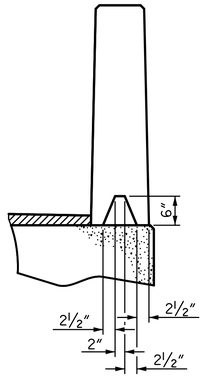
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	35′ UNIT					
✳ B10	80	80	#5	STR	10′-5″	869
✳ S4	88	88	#5	2	7′-2″	658
✳ EPOXY COATED REINFORCING STEEL				LB		1527
CLASS AA CONCRETE				CY		9.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LF		70.29

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	75′ UNIT					
✳ B25	120	120	#5	STR	14′-3″	1784
✳ S4	168	168	#5	2	7′-2″	1256
✳ EPOXY COATED REINFORCING STEEL				LB		3040
CLASS AA CONCRETE				CY		19.4
TOTAL VERTICAL CONCRETE BARRIER RAIL				LF		150.29

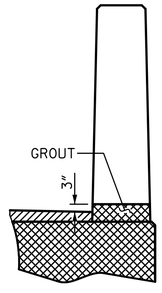


SECTION THRU RAIL



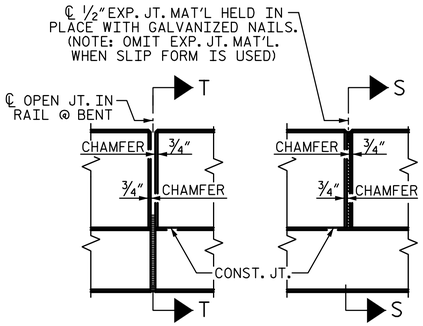
SECTION S-S

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

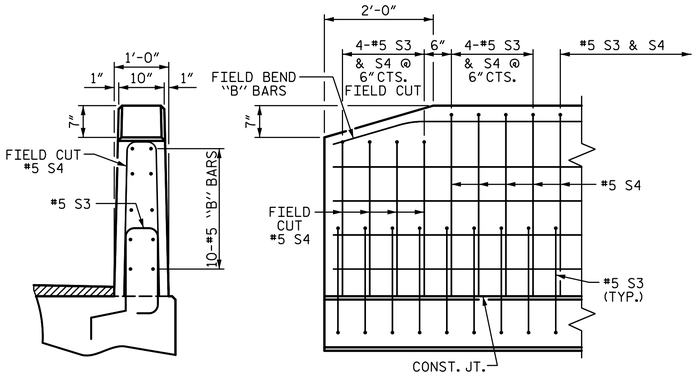


SECTION T-T

AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



ELEVATION AT EXPANSION JOINTS



END VIEW SIDE VIEW

END OF RAIL DETAILS

VERTICAL CONCRETE BARRIER RAIL DETAILS

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
3′-0″ X 1′-9″ &
3′-0″ X 2′-0″
PRESTRESSED CONCRETE
CORED SLAB UNITS
60° SKEW

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1			3			TOTAL SHEETS
2			4			24

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4/3/2018

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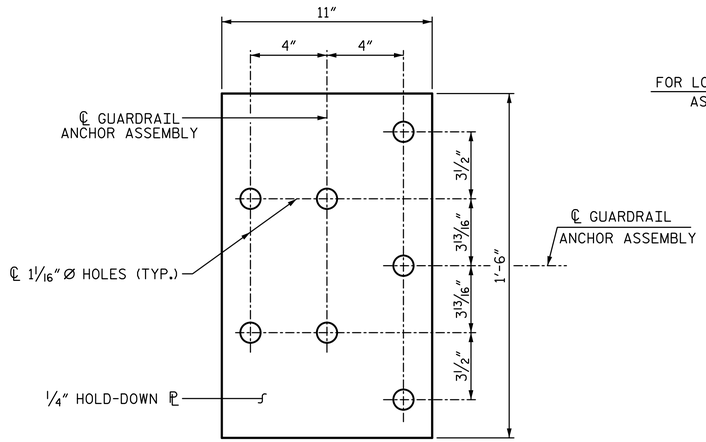
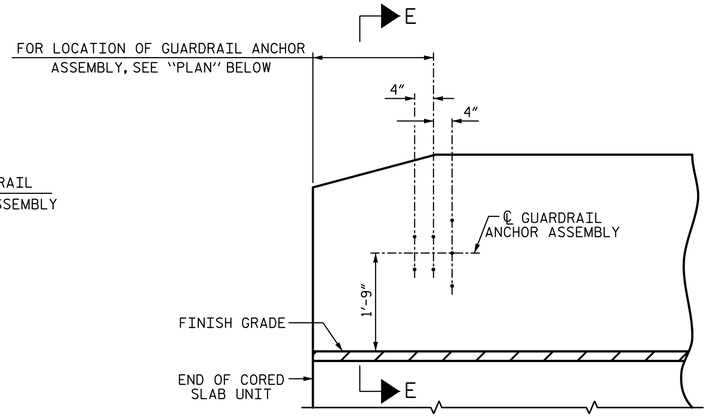
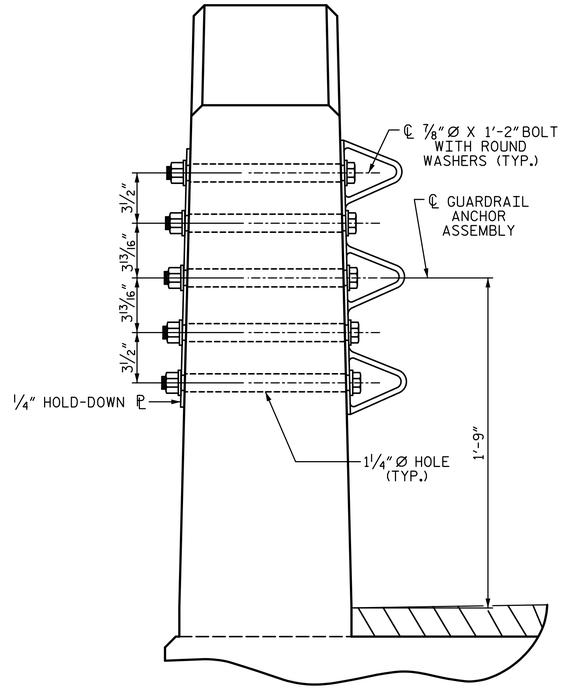


PLAN

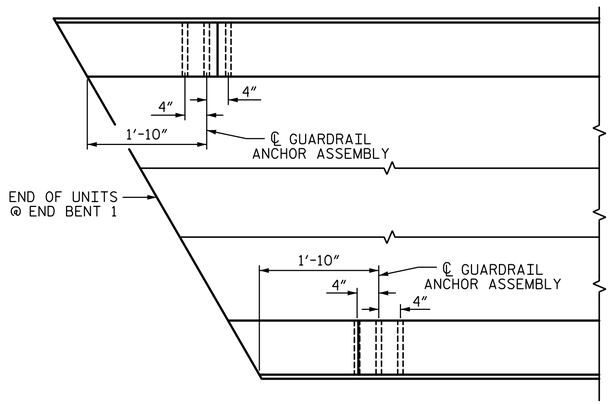


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

NOTES:

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

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

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

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

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

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

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

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

SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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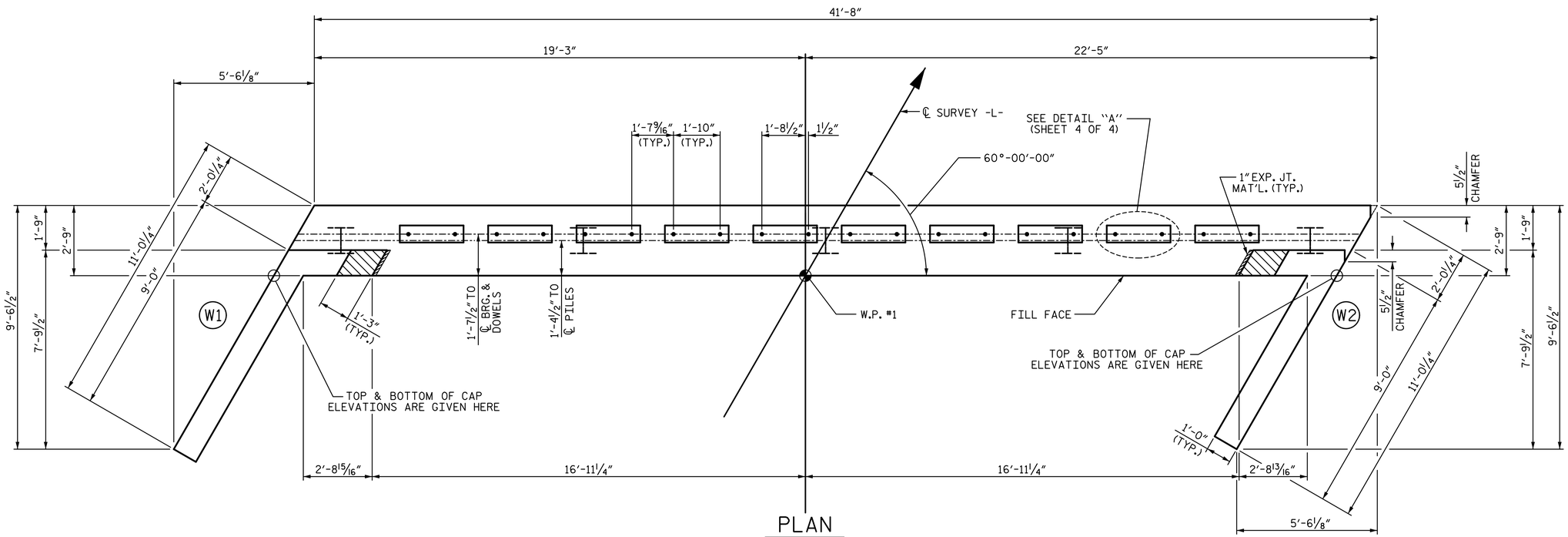
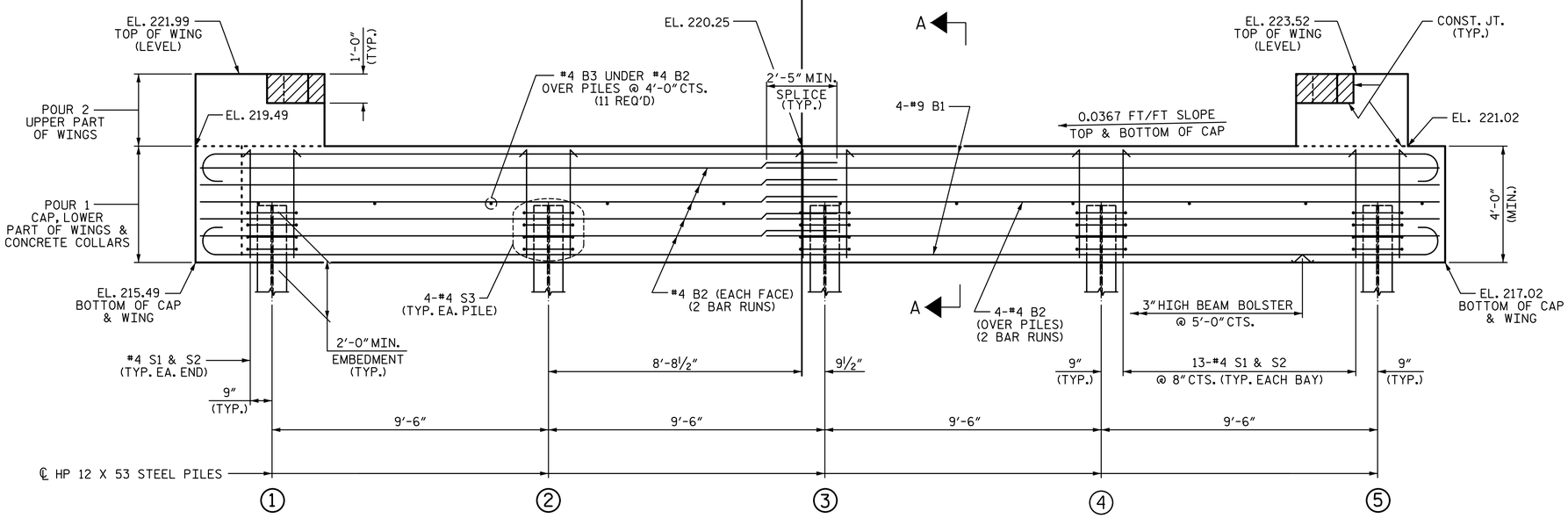


PLAN



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.

TOP OF PILE ELEVATIONS	
1	217.60
2	217.95
3	218.30
4	218.65
5	218.99

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

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1			3			TOTAL SHEETS
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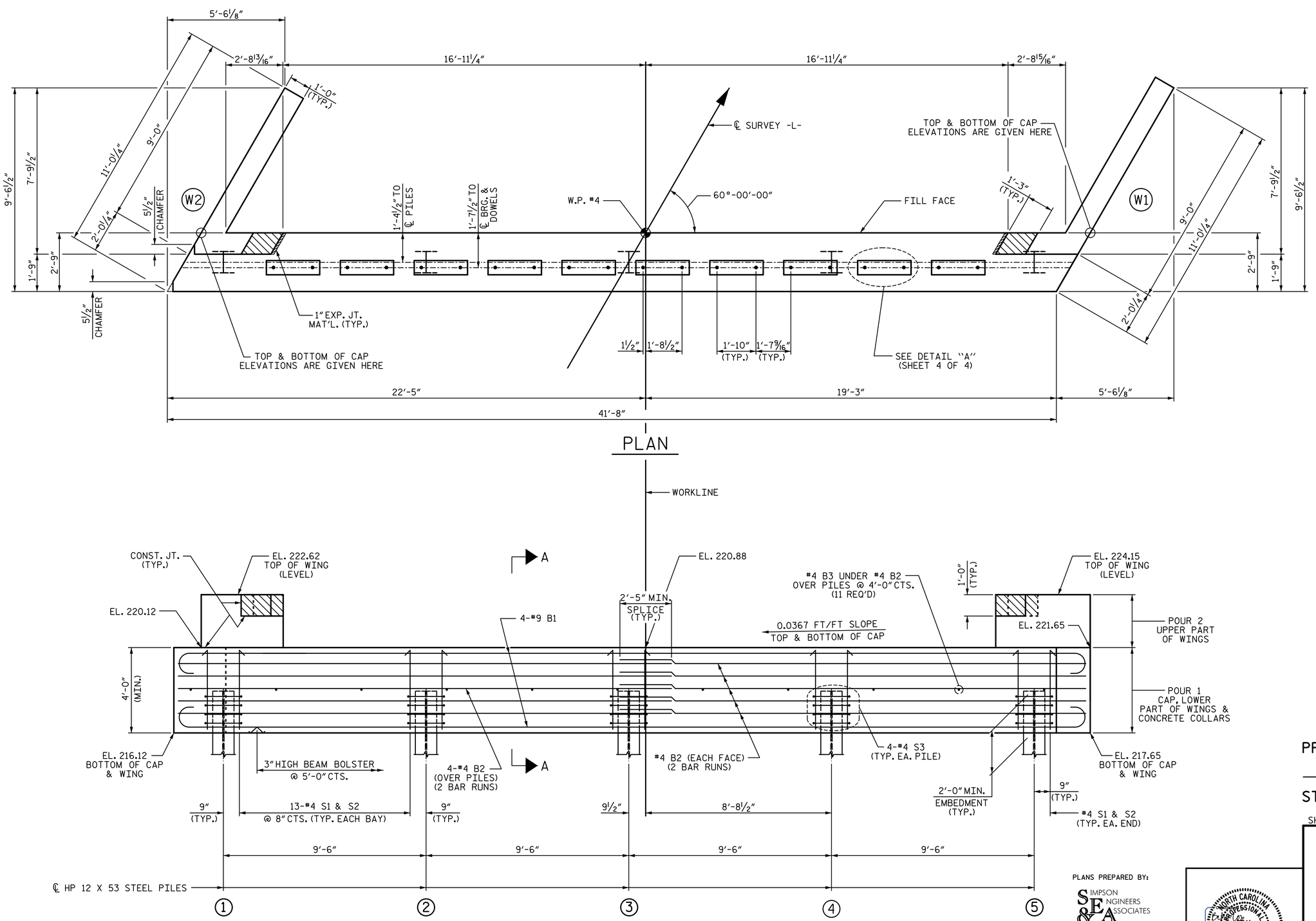

ELEVATION

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.

TOP OF PILE ELEVATIONS

①	218.17
②	218.52
③	218.87
④	219.22
⑤	219.57

PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-
SHEET 2 OF 4

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RALEIGH
SUBSTRUCTURE

END BENT 2

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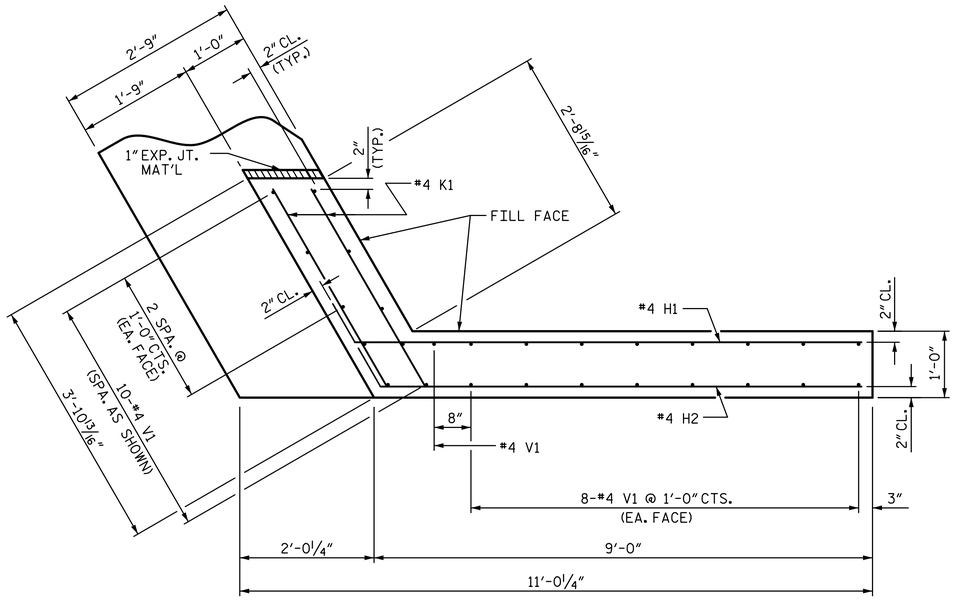
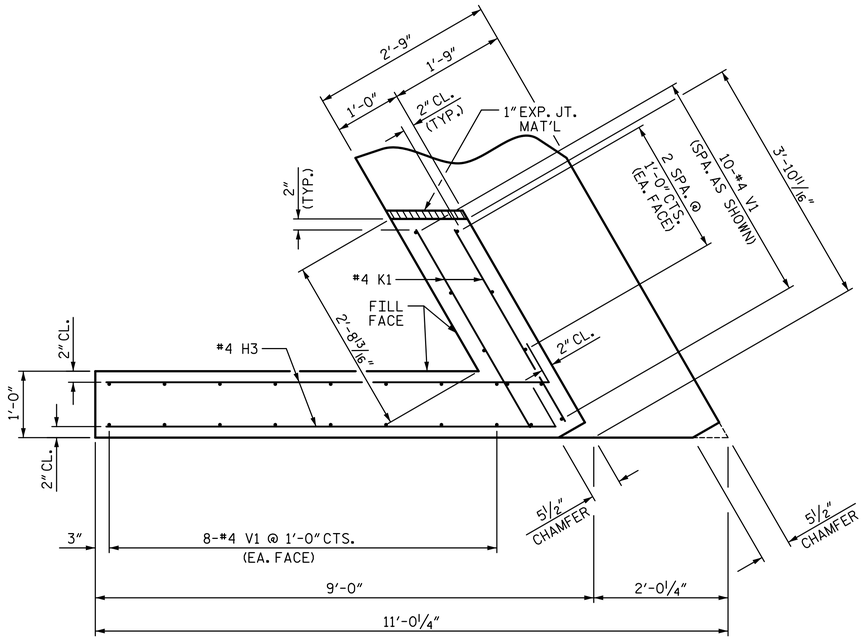
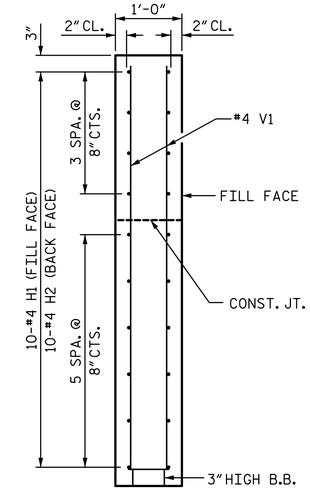


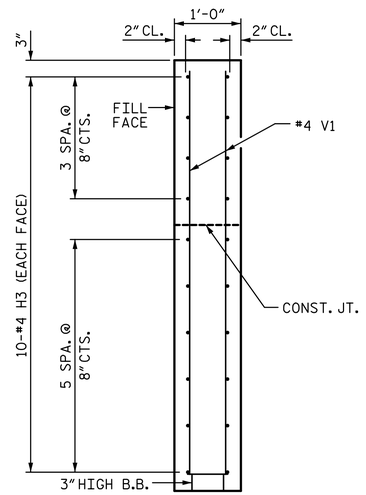
PLAN OF WING (W1)



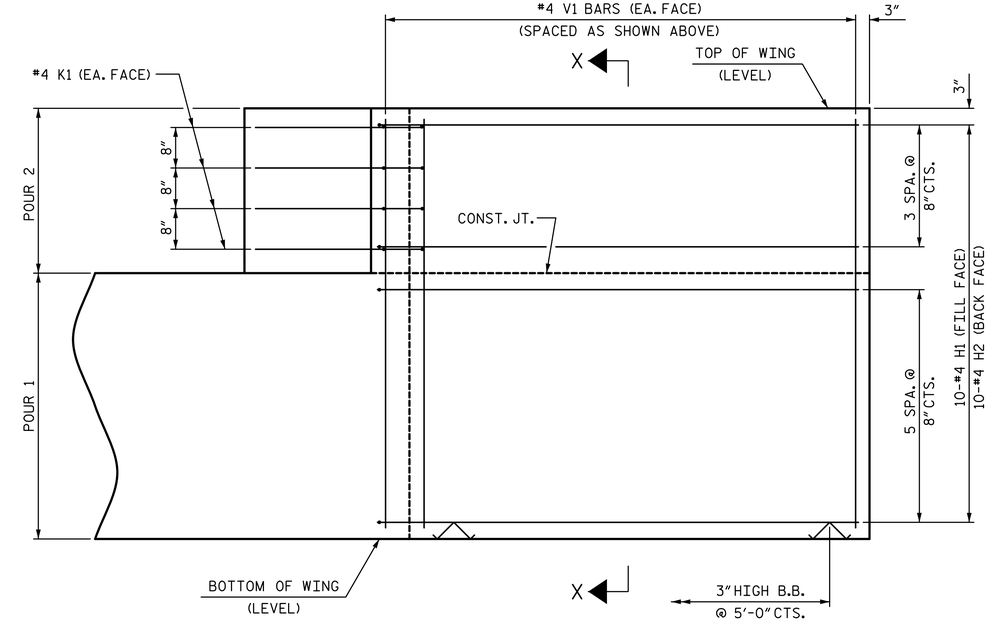
PLAN OF WING (W2)



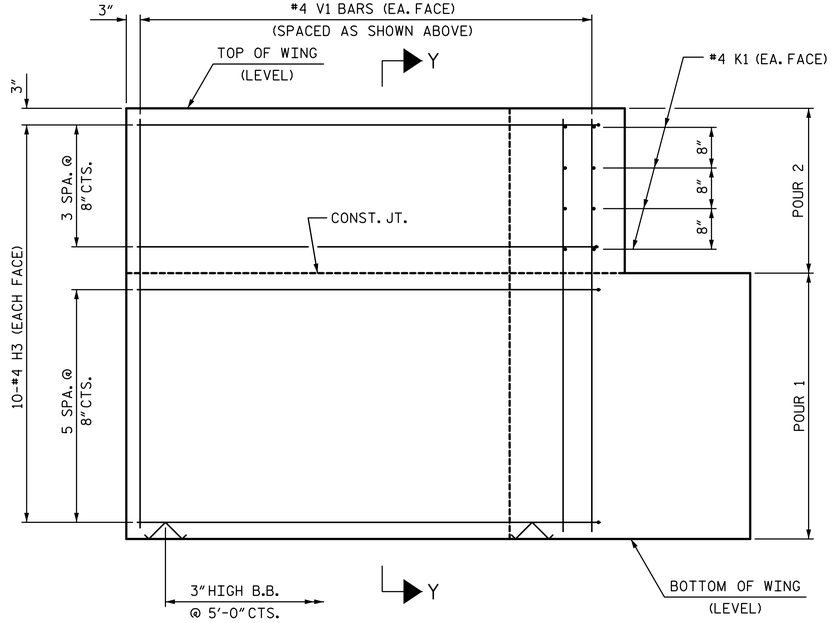
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

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END BENT WING DETAILS

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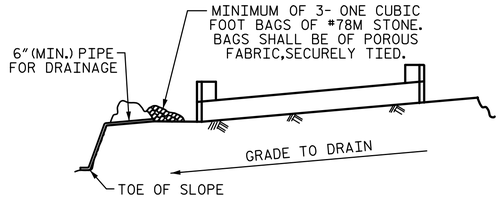
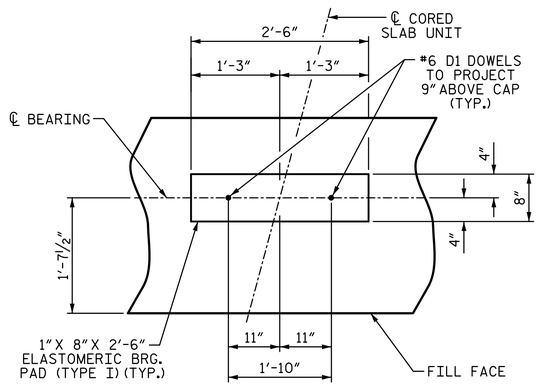


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

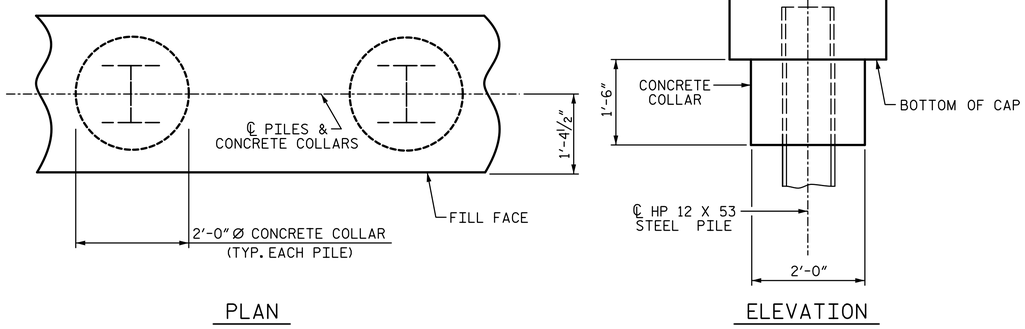
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

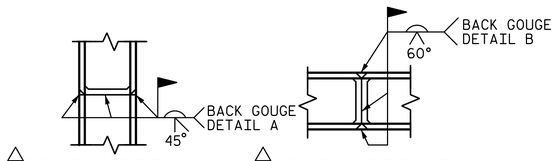
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



PLAN ELEVATION

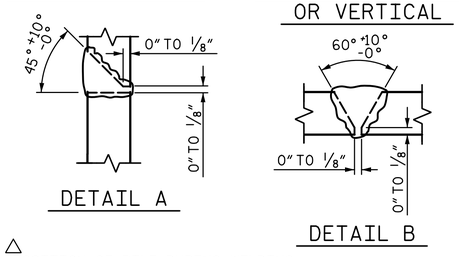
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



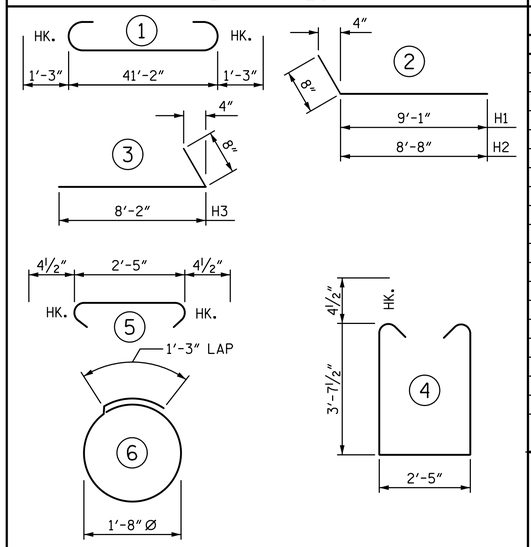
△PILE VERTICAL

△PILE HORIZONTAL OR VERTICAL



△POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	43'-8"	1188
B2	28	#4	STR	21'-11"	410
B3	11	#4	STR	2'-5"	18
D1	20	#6	STR	1'-6"	45
H1	10	#4	2	9'-9"	65
H2	10	#4	2	9'-4"	62
H3	20	#4	3	8'-10"	118
K1	16	#4	STR	3'-3"	35
S1	54	#4	4	10'-5"	376
S2	54	#4	5	3'-2"	114
S3	20	#4	6	6'-6"	87
V1	53	#4	STR	6'-2"	218

REINFORCING STEEL (FOR ONE END BENT) 2736 LB

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR 1 CAP, LOWER PART OF WINGS & COLLARS 20.2 CY

POUR 2 UPPER PART OF WINGS 2.2 CY

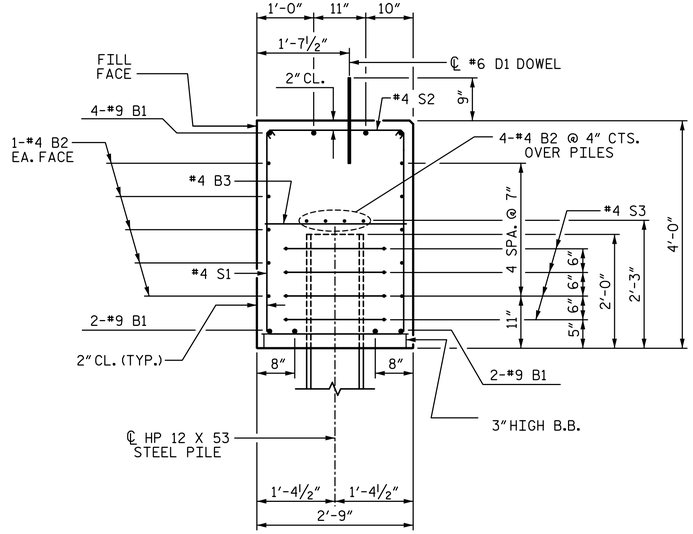
TOTAL CLASS A CONCRETE 22.4 CY

END BENT 1
HP 12 X 53 STEEL PILES
NO: 5 LF = 125

PILE DRIVING EQUIPMENT SETUP
HP 12 X 53 STEEL PILES EA: 5

END BENT 2
HP 12 X 53 STEEL PILES
NO: 5 LF = 100

PILE DRIVING EQUIPMENT SETUP
HP 12 X 53 STEEL PILES EA: 5



SECTION A-A

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

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2 DETAILS

PLANS PREPARED BY:

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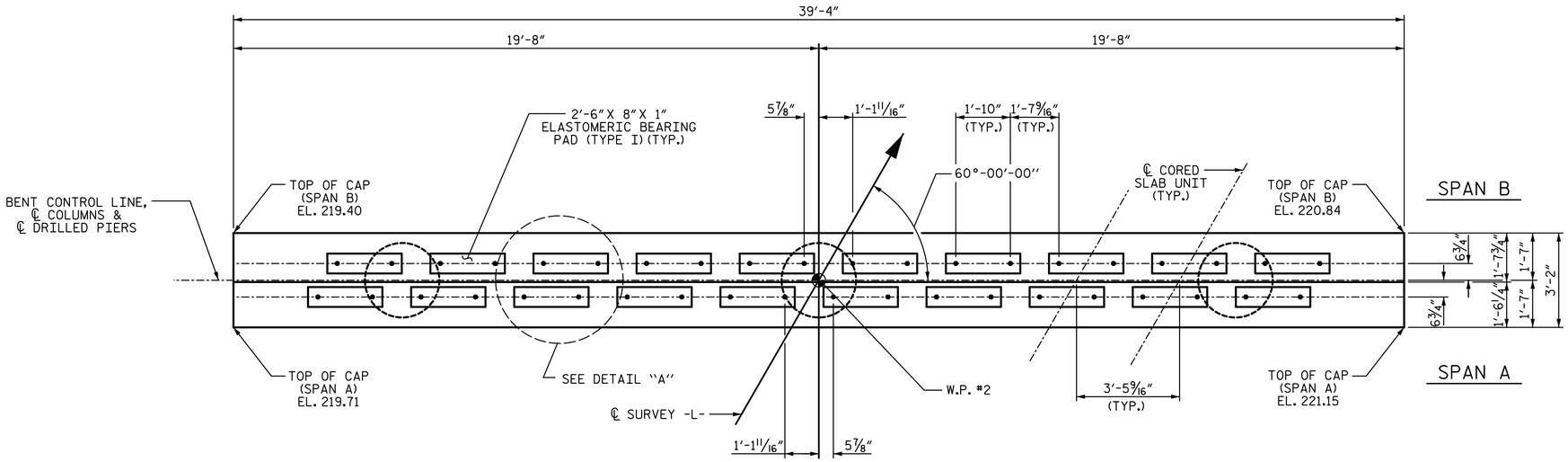
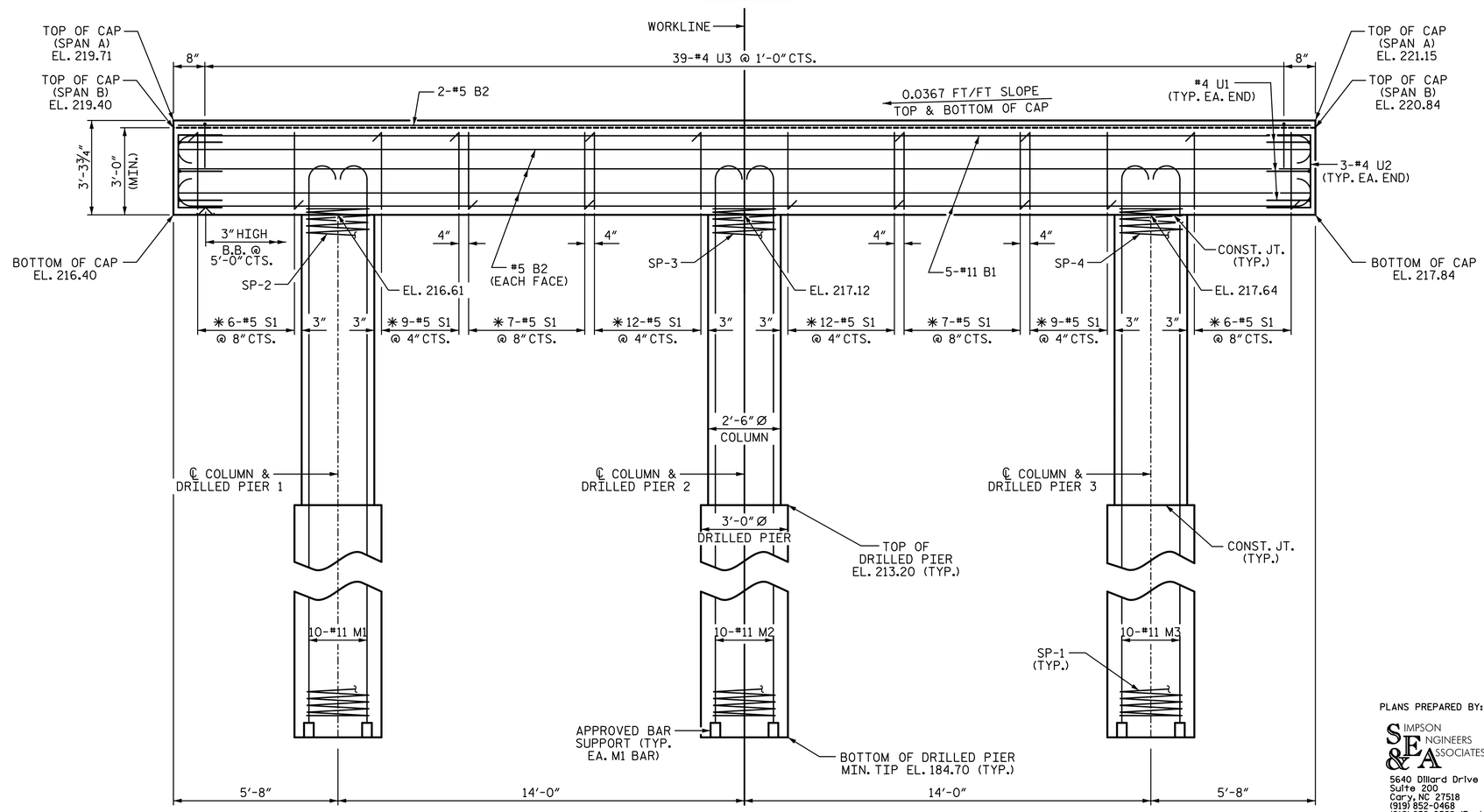


PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES:

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

HOOKS ON ″M″ BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

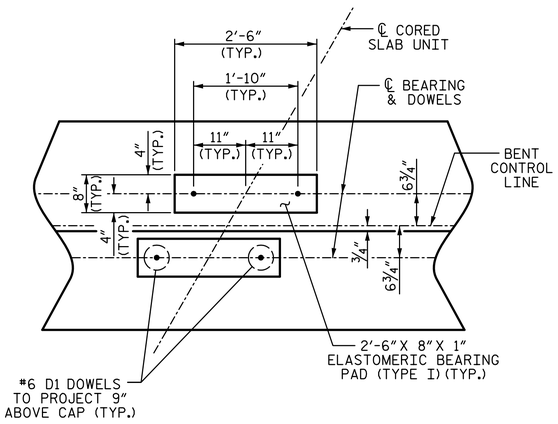
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL.″

✳ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

PLANS PREPARED BY:
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4/3/2018

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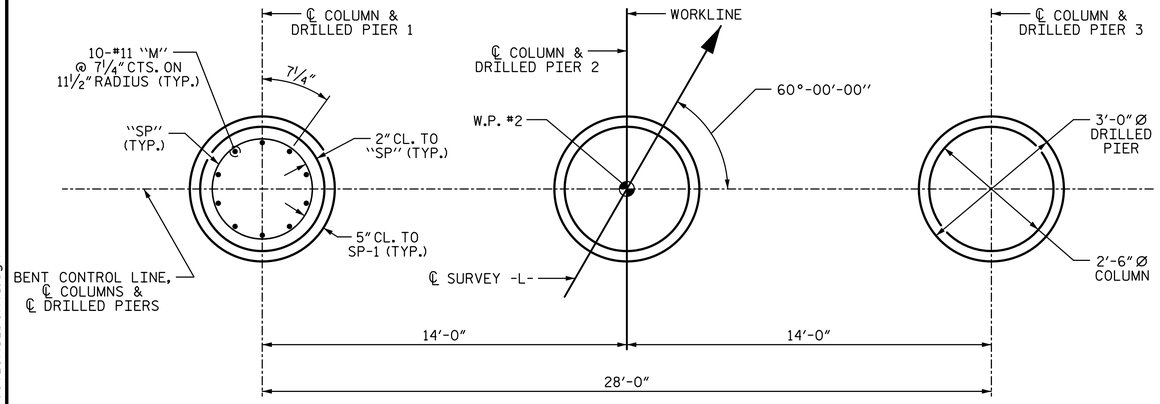
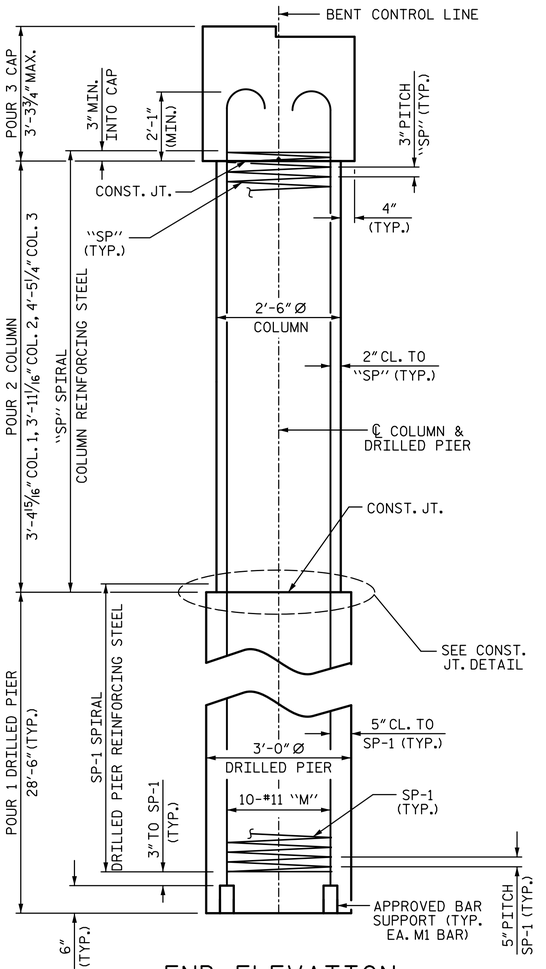
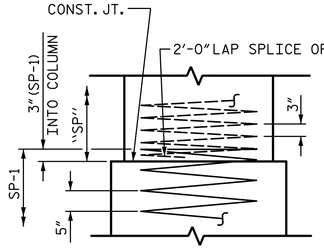


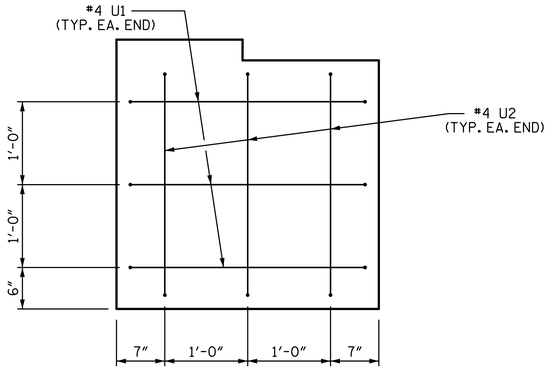
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



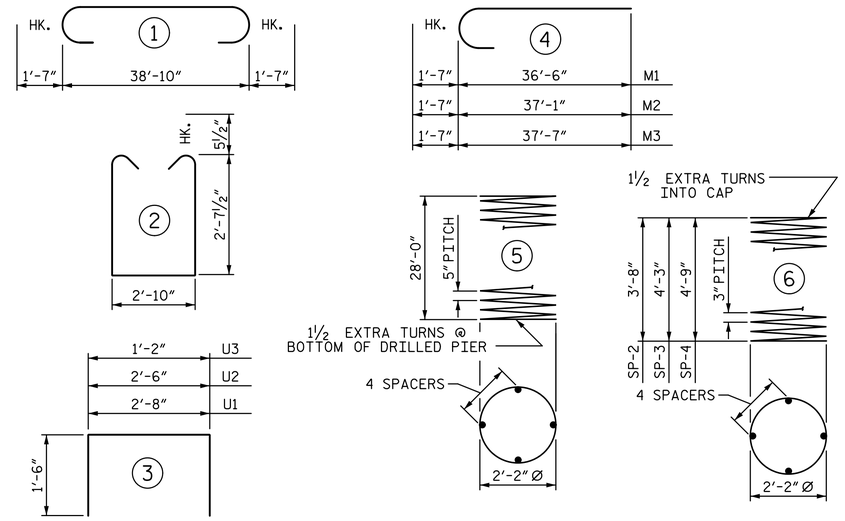
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW

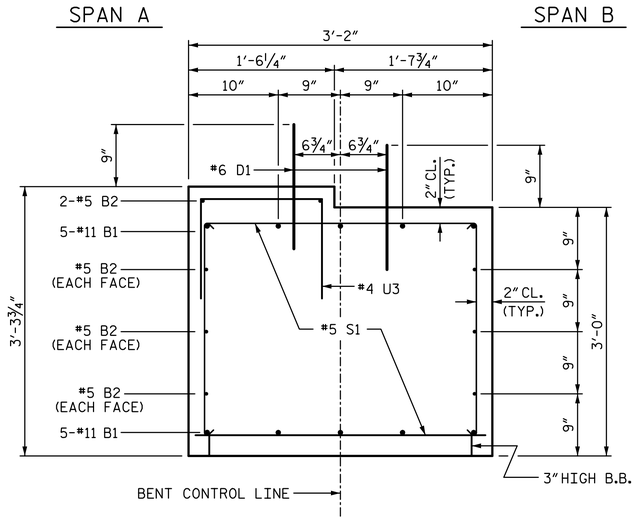
(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPAN A — SPAN B



SECTION THRU CAP

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	STR	42'-0"	2231
B2	8	#5	STR	39'-0"	325
D1	40	#6	STR	1'-6"	90
M1	10	#11	4	38'-1"	2023
M2	10	#11	4	38'-8"	2054
M3	10	#11	4	39'-2"	2081
S1	68	#5	2	9'-0"	638
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	39	#4	3	4'-2"	109

REINFORCING STEEL					9596 LB
SP-1	3	✳	5	459'-4"	1437
SP-2	1	✳✳	6	113'-7"	76
SP-3	1	✳✳	6	127'-0"	85
SP-4	1	✳✳	6	140'-4"	94

SPIRAL COLUMN REINFORCING STEEL 1692 LB

✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

✳✳ THE SP-2, SP-3, SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR 2 (COLUMNS)	2.1 CY
POUR 3 (CAP)	14.8 CY
TOTAL CLASS A CONCRETE	16.9 CY

DRILLED PIERS:

DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)	22.4 CY
3'-0" Ø DRILLED PIER NOT IN SOIL	30.0 LF
3'-0" Ø DRILLED PIER IN SOIL	55.5 LF
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	48.6 LF
CSL TUBES	360.0 LF

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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2			4			24

DRAWN BY: S.D. COOPER DATE: 4-18
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4/3/2018

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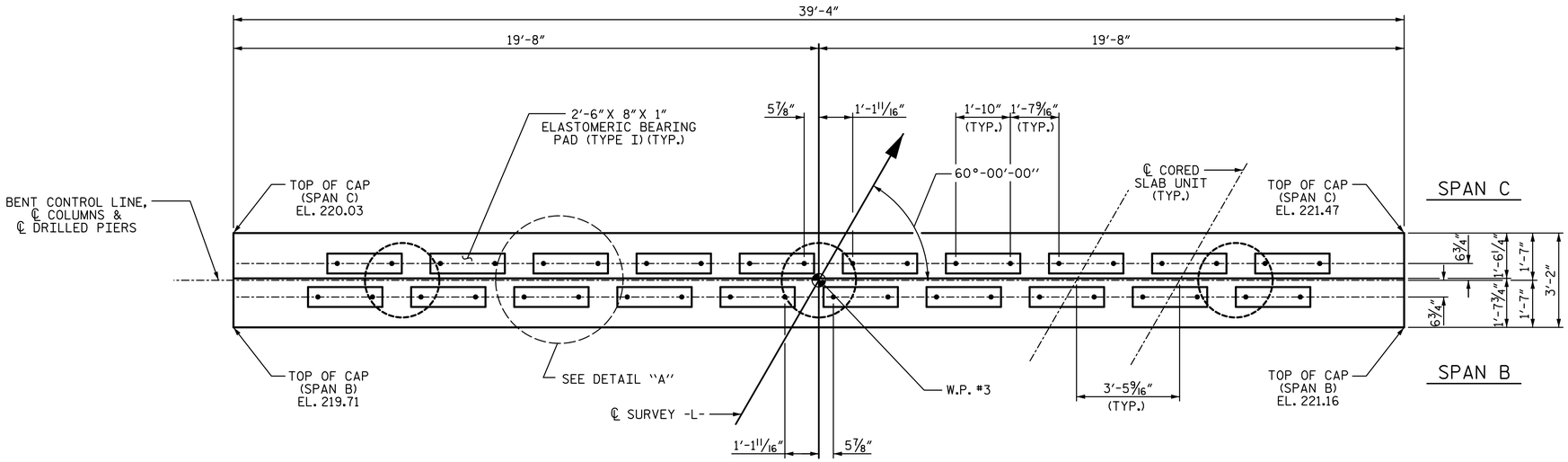
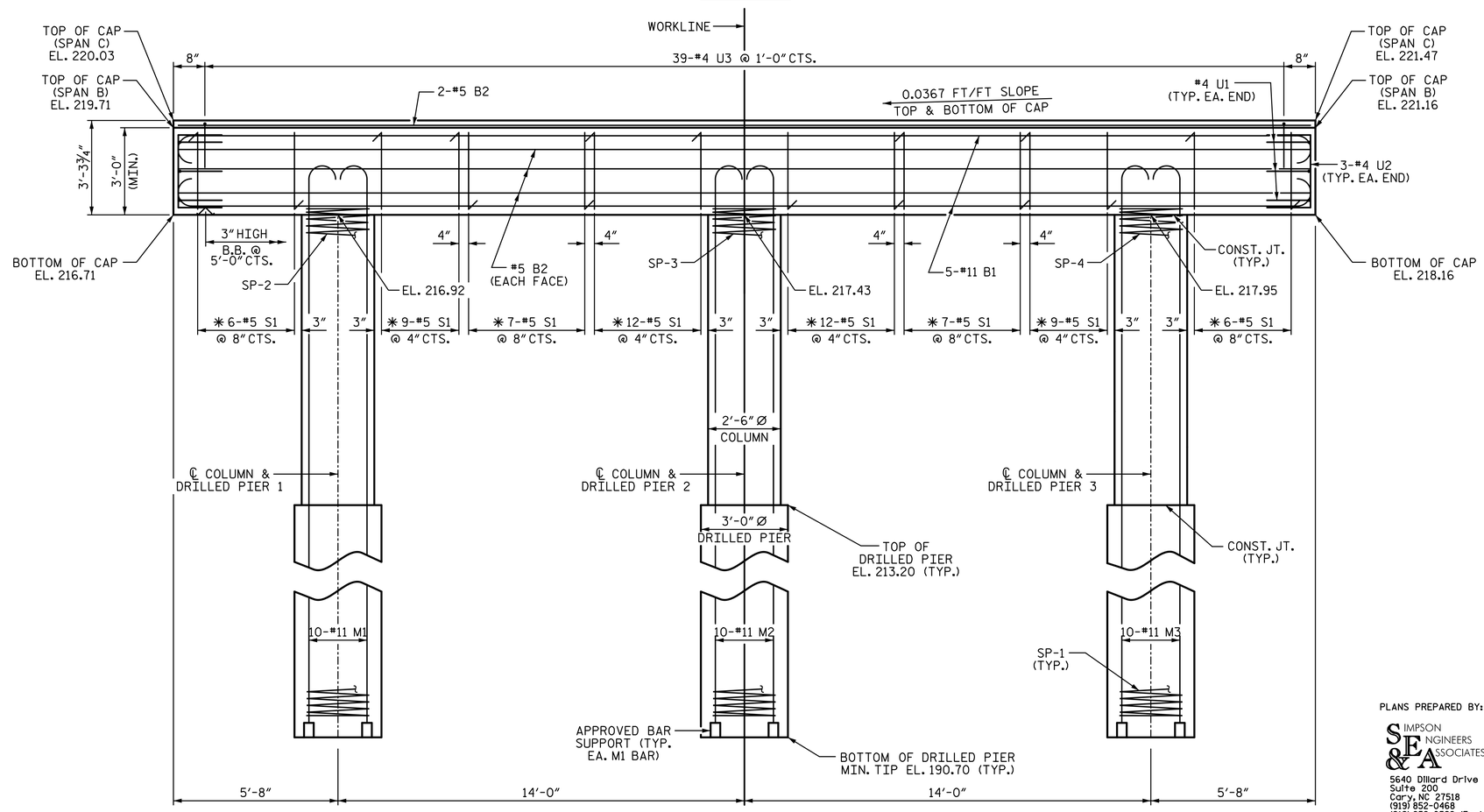


PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES:

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

HOOKS ON ″M″ BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

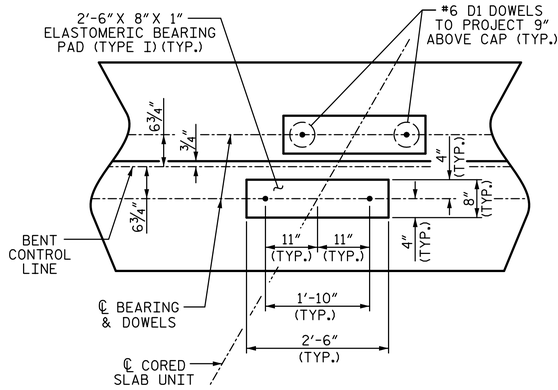
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL.″

✳ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

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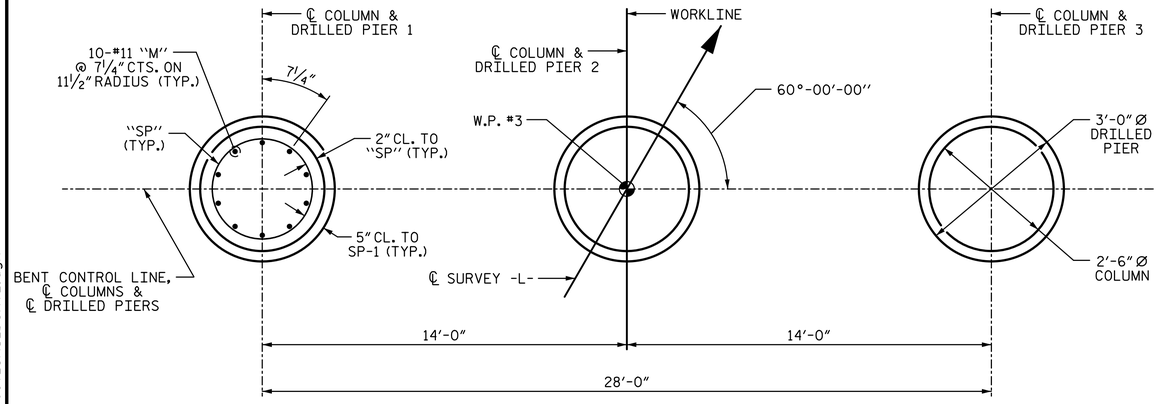
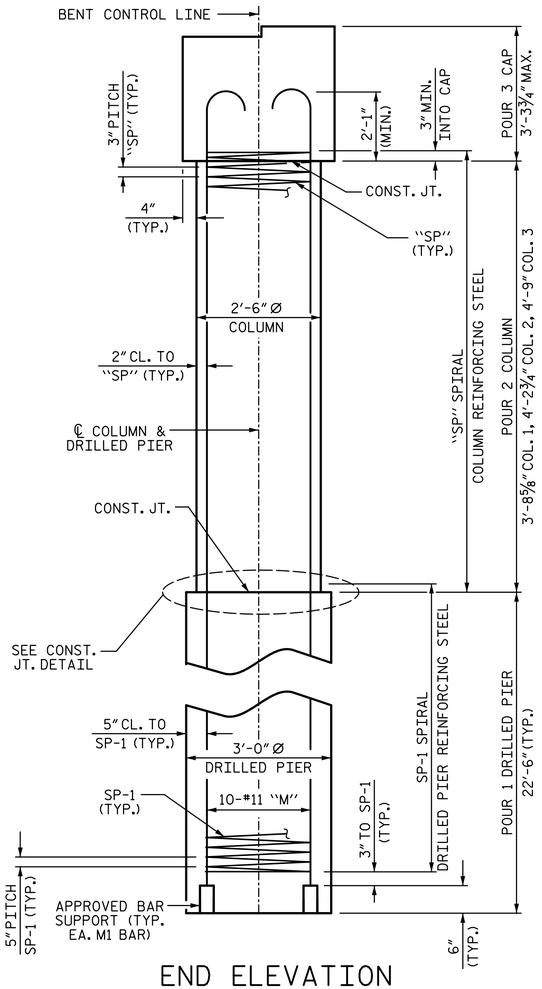
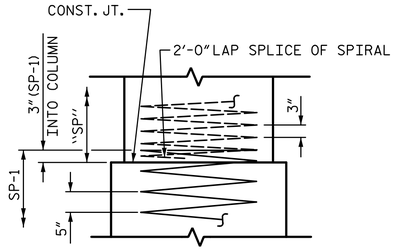


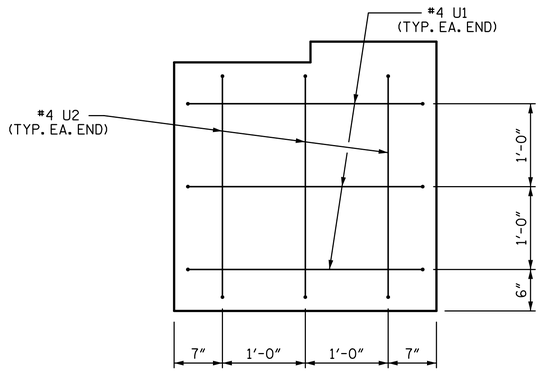
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



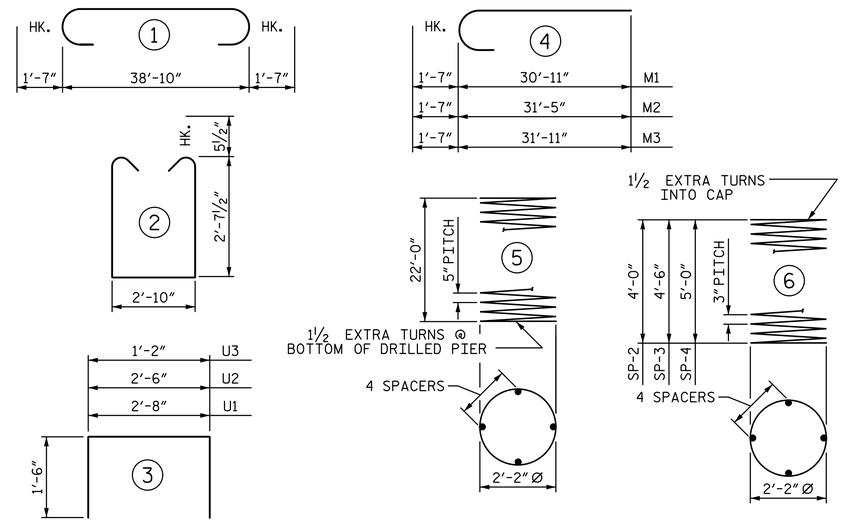
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	STR	42'-0"	2231
B2	8	#5	STR	39'-0"	325
D1	40	#6	STR	1'-6"	90
M1	10	#11	4	32'-6"	1727
M2	10	#11	4	33'-0"	1753
M3	10	#11	4	33'-6"	1780
S1	68	#5	2	9'-0"	638
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	39	#4	3	4'-2"	109

REINFORCING STEEL					8698 LB
SP-1	3	✳	5	366'-2"	1146
SP-2	1	✳✳	6	120'-3"	80
SP-3	1	✳✳	6	133'-8"	89
SP-4	1	✳✳	6	147'-0"	98

SPIRAL COLUMN REINFORCING STEEL 1413 LB

✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

✳✳ THE SP-2, SP-3, SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR 2 (COLUMNS)	2.3 CY
POUR 3 (CAP)	14.8 CY
TOTAL CLASS A CONCRETE	17.1 CY

DRILLED PIERS:

DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)	17.7 CY
3'-0" Ø DRILLED PIER NOT IN SOIL	30 LF
3'-0" Ø DRILLED PIER IN SOIL	37.5 LF
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	27.6 LF
CSL TUBES	288.0 LF

SPAN B SPAN C

SECTION THRU CAP

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 2

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1			3			TOTAL SHEETS
2			4			24

DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
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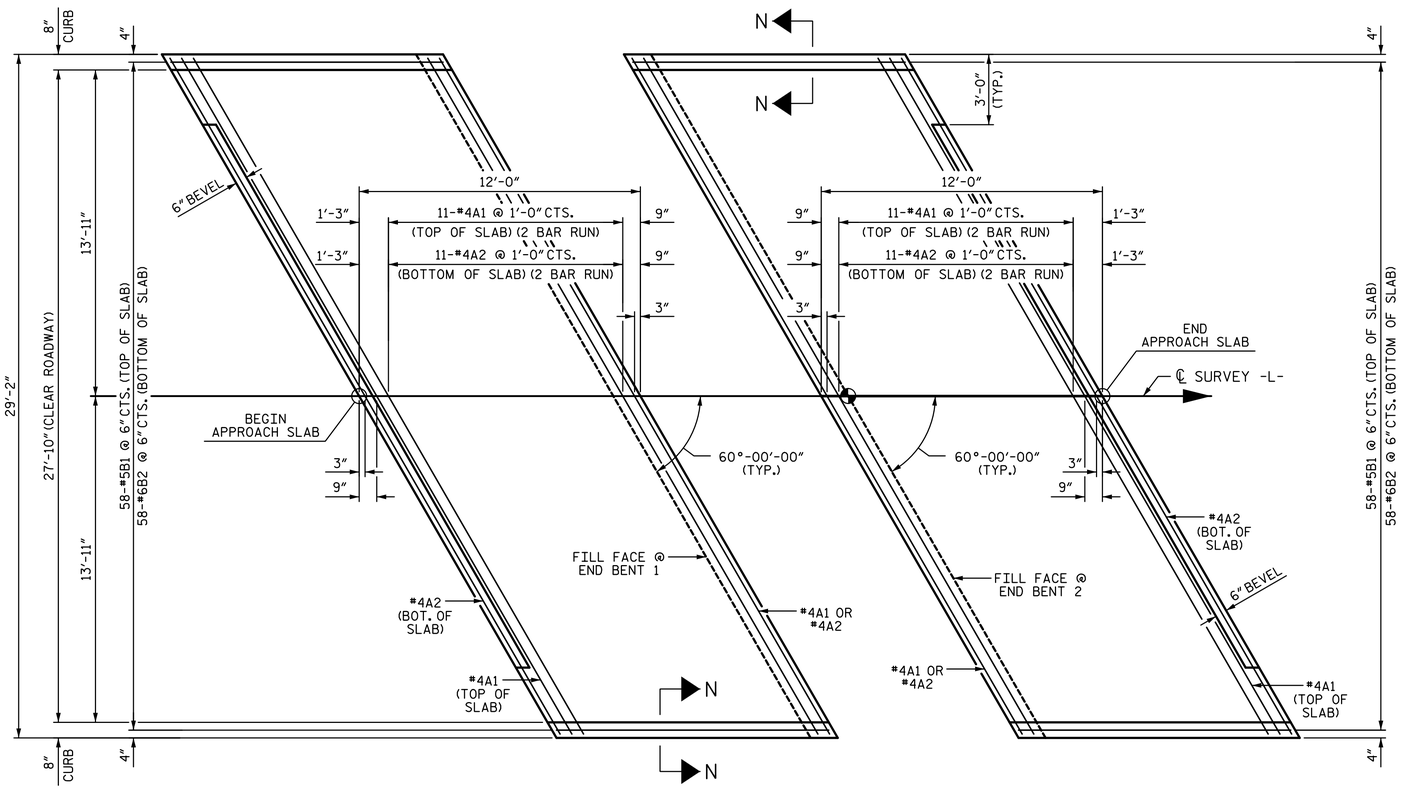
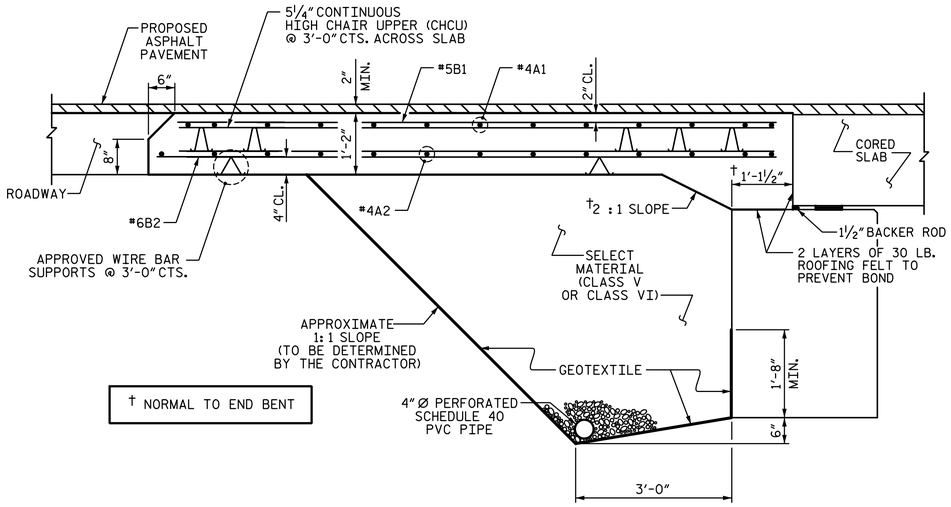


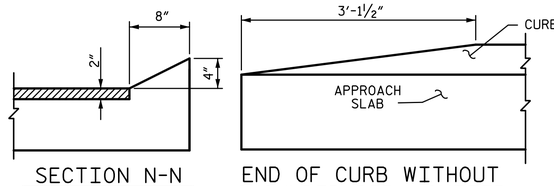
PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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.

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	17'-8"	307
A2	26	#4	STR	17'-7"	305
✳ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LB	1314
✳ EPOXY COATED REINFORCING STEEL				LB	977
CLASS AA CONCRETE				CY	16.9

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	17'-8"	307
A2	26	#4	STR	17'-7"	305
✳ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LB	1314
✳ EPOXY COATED REINFORCING STEEL				LB	977
CLASS AA CONCRETE				CY	16.9

SPLICE CHART

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

DRAWN BY: S.D. COOPER DATE: 4-18
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WARREN COUNTY
STATION: 14+96.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT

(SUB-REGIONAL TIER)-60° SKEW

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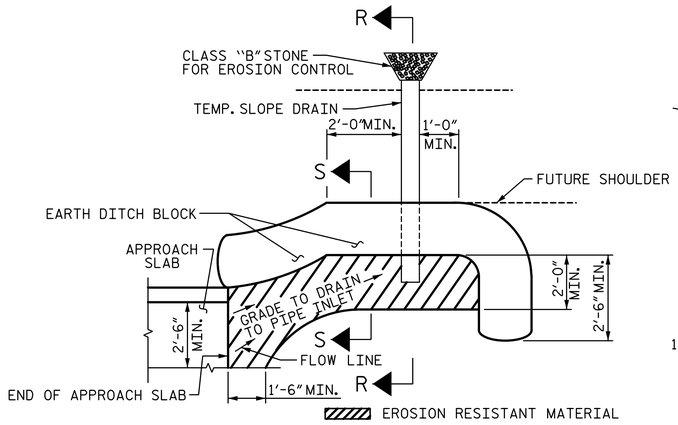
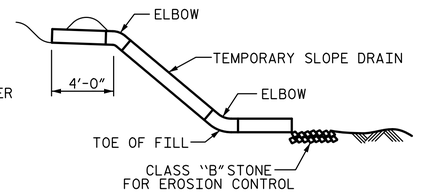
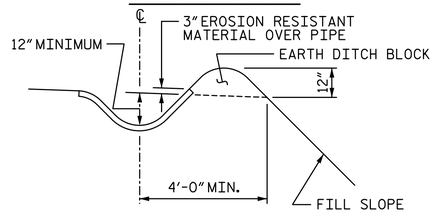


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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



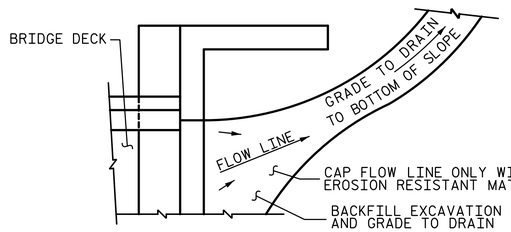
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

PROJECT NO. B-5687

WARREN COUNTY

STATION: 14+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
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NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

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DRAWN BY: S.D. COOPER DATE: 4-18
CHECKED BY: B.S. COX DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

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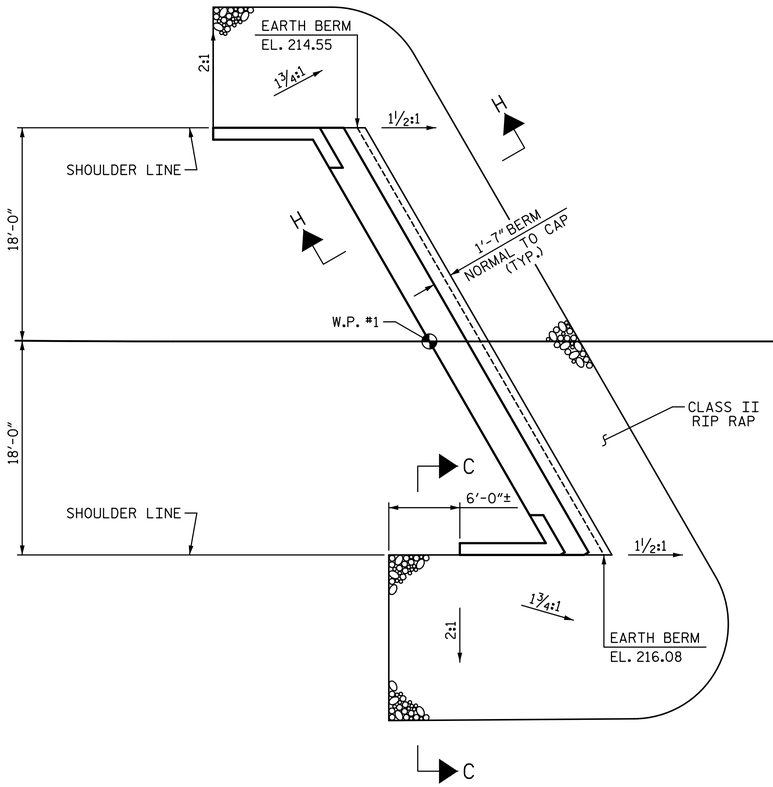

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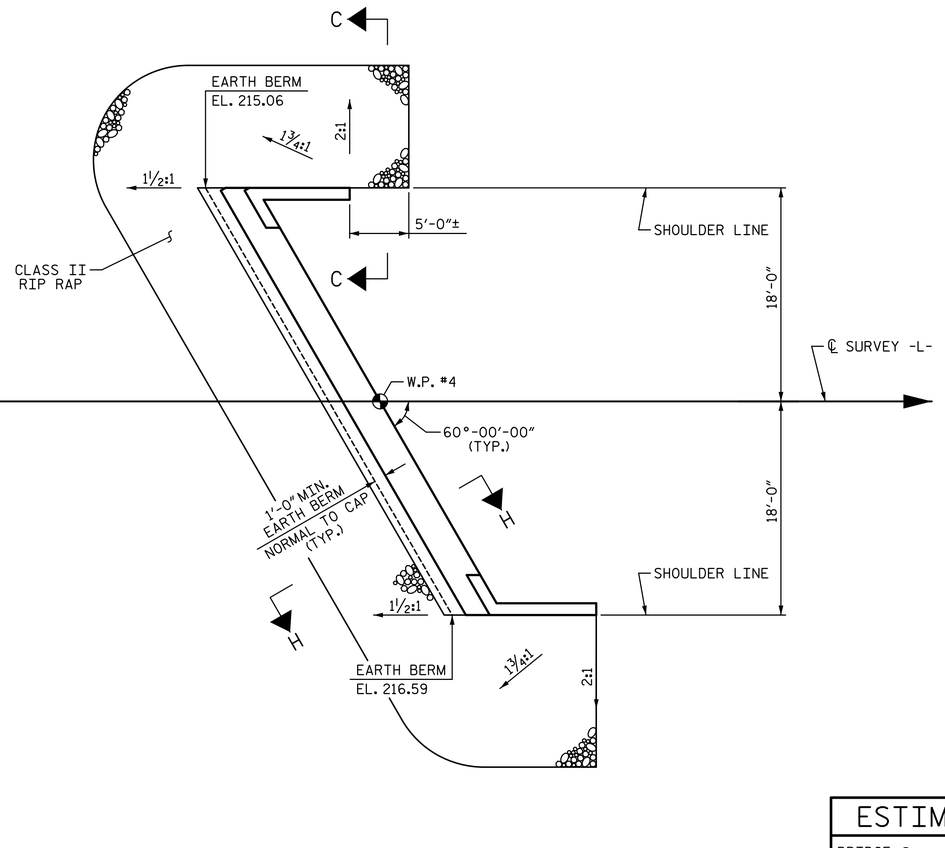
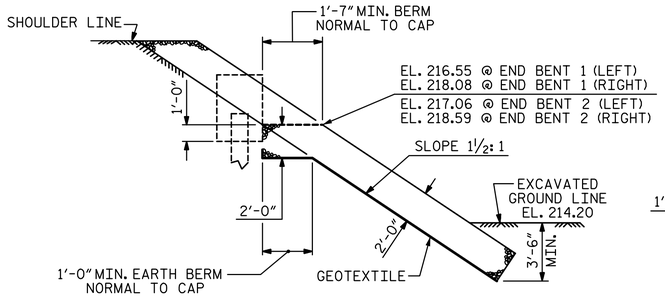


@ END BENT 2

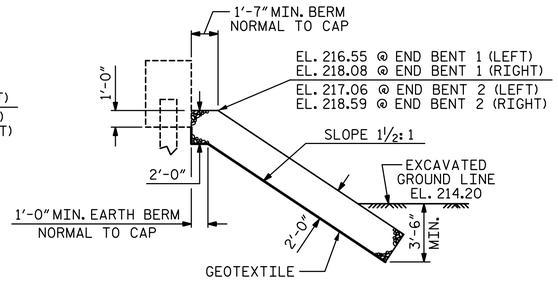
PLAN OF RIP RAP

ESTIMATED QUANTITIES

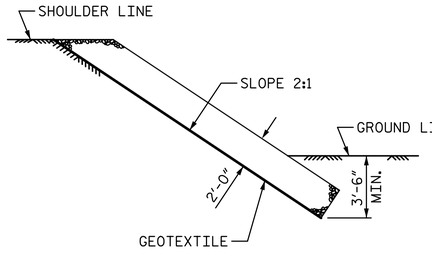
BRIDGE @ STA. 14+96.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	125	140
END BENT 2	130	145



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

DRAWN BY: S.D. COOPER DATE: 4-18
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PLANS PREPARED BY:
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LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
4/3/2018

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PROJECT NO. B-5687
WARREN COUNTY
STATION: 14+96.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			24

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990