This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5413	1	

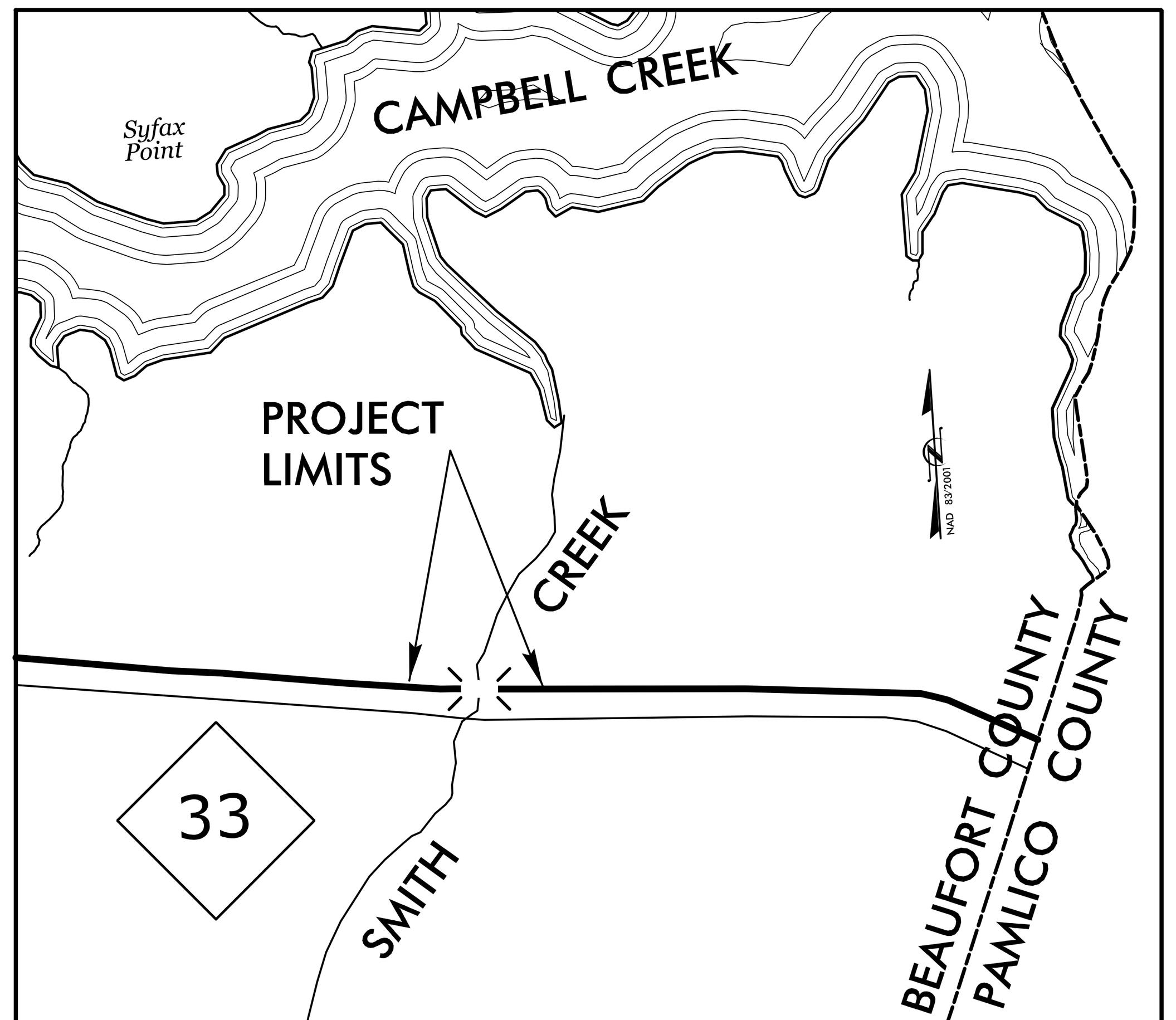
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
55043.1.1		PE
55043.2.1		ROW/UTIL.
55043.3.1		CONST.

LOCATION: REPLACE BRIDGE NO. 20 OVER SMITH CREEK ON NC 33

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

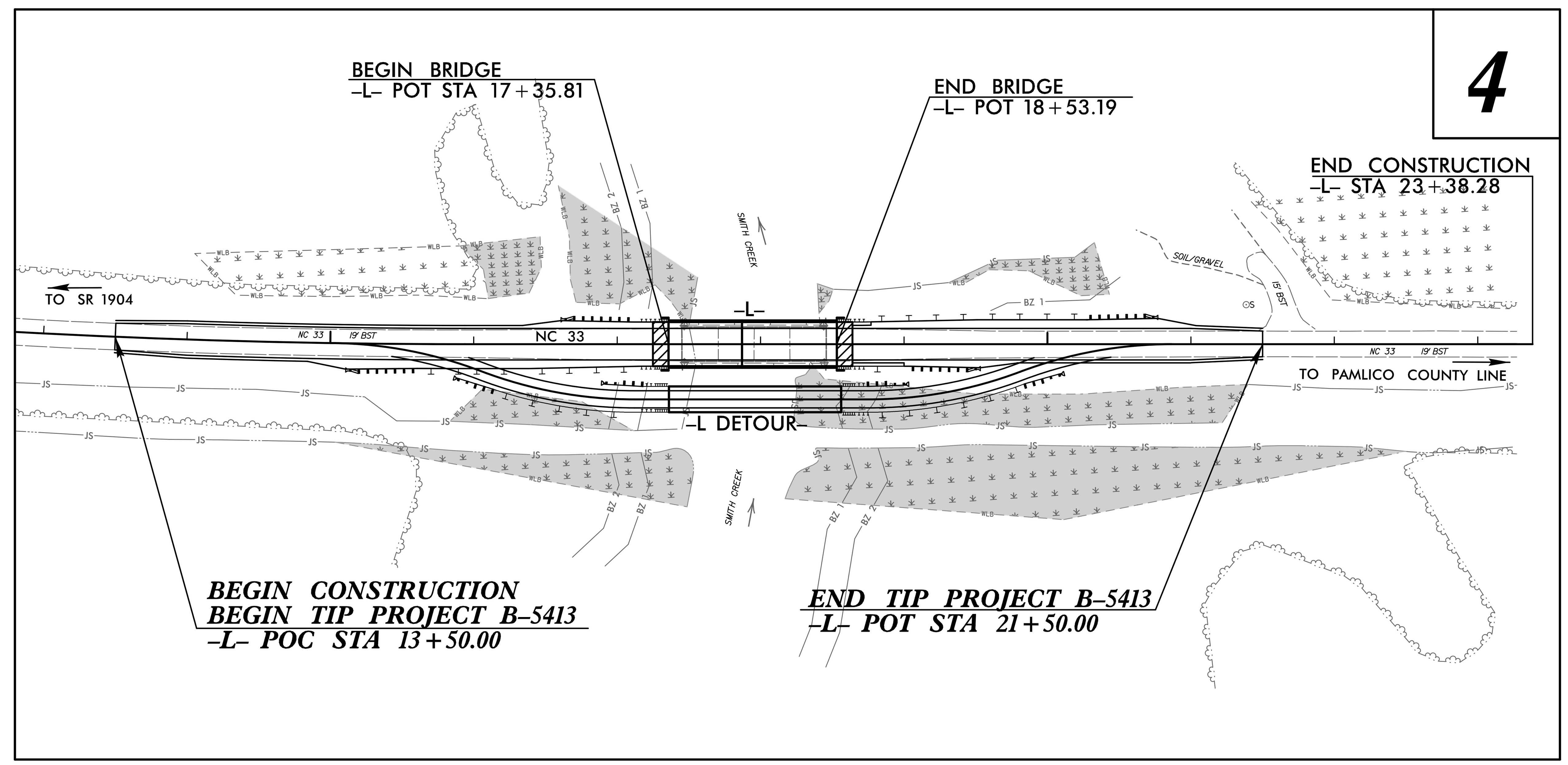
TIP PROJECT: B-5413

CONTRACT: DB00446



VICINITY MAP
ON-SITE DETOUR

NAD 83/2001



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2013 = 250
ADT 2033 = 500
K = 10 %
D = 60 %
T = 7 % *
V = 60 MPH
* TTST = 2% DUAL 5%
FUNC CLASS = MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5413 = 0.130 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5413 = 0.022 MILES
TOTAL LENGTH OF TIP PROJECT B-5413 = 0.152 MILES

HNTB

Prepared In the Office of:
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 29, 2017

LETTING DATE:
JULY 25, 2018

DOUGLAS M. WHEATLEY, PE
PROJECT ENGINEER

MONICA J. DUVAL
PROJECT DESIGN ENGINEER

HEATHER C. LANE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by: James A. Byrd 7/9/2018
SIGNATURE: P.E.

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

ROADWAY DESIGN ENGINEER

DocuSigned by: Douglas M. Wheatley 7/9/2018
SIGNATURE: P.E.

NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS M. WHEATLEY

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/99

09-JUL-2018 13:21
\Roadway\Proj\b5413_rdy_tsh.dgn
HNTB

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS M. WHEATLEY

DocuSigned by: Douglas M. Wheatley
AB7893E9DB124DA...
4/4/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

INDEX OF SHEETS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01–16–2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 II.

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. 560.02

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

POWER – TIDELAND EMC

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT–OF–WAY MARKERS:

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

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01–16–2018
REV.

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	
200.02	Method of Clearing – Method II
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
422.02	Bridge Approach Fills – Type II Modified Approach Fill
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction – High Side of Superelevated Curve – Method II
DIVISION 8 – INCIDENTALS	
815.02	Subsurface Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
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 (Special Detail for Sheet 6 of 8)
862.03	Structure Anchor Units (Special Detail for Type III Anchor Units Sheets 1 of 7 and 2 of 7)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5413	1B-1

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

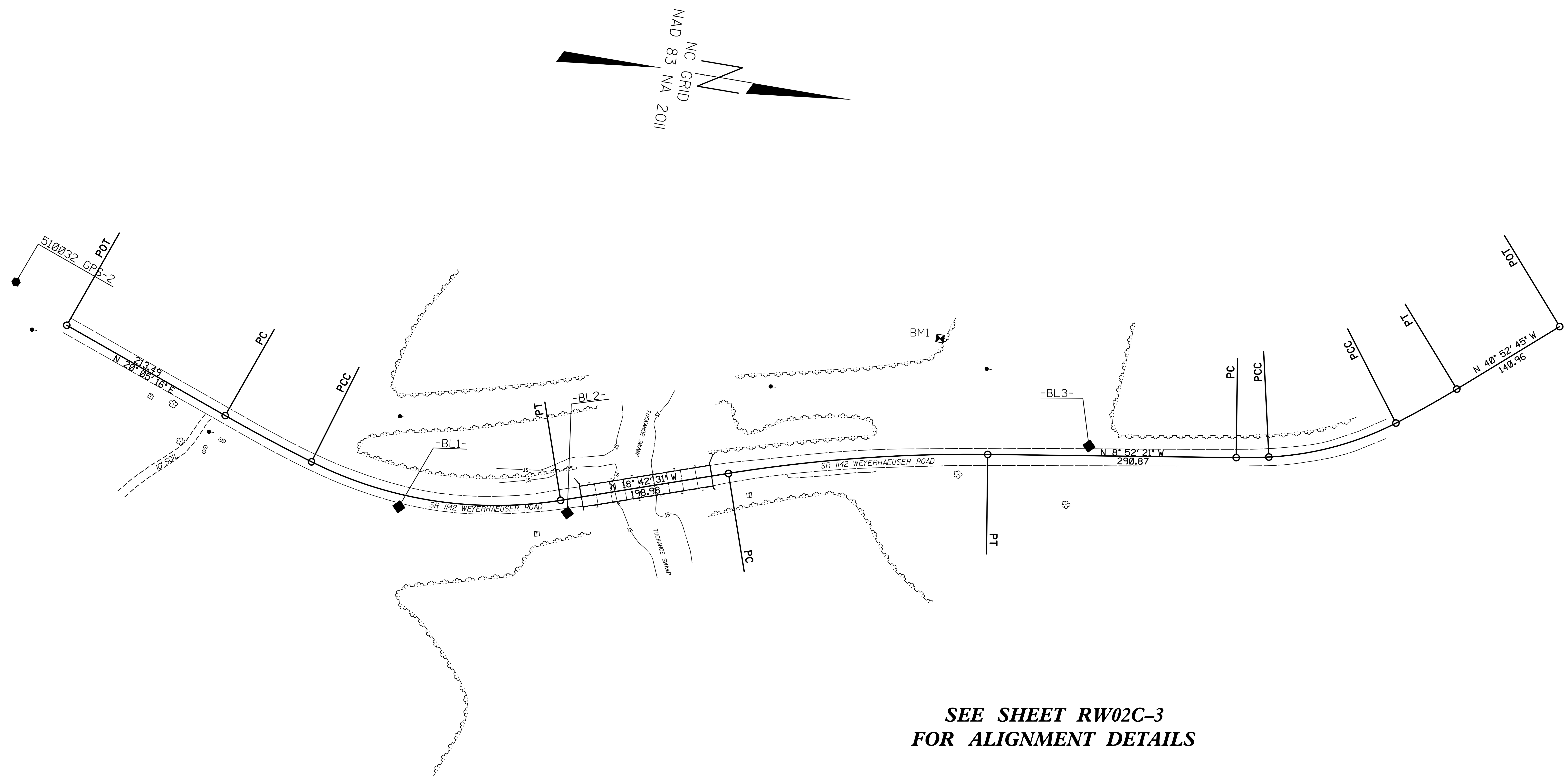
MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
51-0032	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SEE SHEET RW02C-3
FOR ALIGNMENT DETAILS

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
51-0032	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
GPS2	NCDOT GPS 51003	468907.9540	2425103.4460	54.41
1	BL-1	469393.7990	2425288.1300	51.90
2	BL-2	469589.4710	2425262.3470	51.83
3	BL-3	470178.6650	2425083.3050	49.68

BENCHMARK

****

BM1 ELEVATION = 51.23

N 469986 E 2424988

RR SPIKE SET IN 24" HARDWOOD

****

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
51-0032	RW02C-3
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EXISTING ALIGNMENT

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	468975.020	2425143.481							
LINE			N 20°05'16.2" E	213.49					
PC	469175.518	2425216.805							
CURVE			N 18°34'27.7" E	114.71	03°01'37.0"(LT)	02°38'18.4"	114.73	57.38	2171.58
PCC	469284.255	2425253.344							
CURVE			N 00°49'26.0" W	295.11	35°46'10.2"(LT)	11°55'29.8"	299.96	155.05	480.47
PT	469579.332	2425249.101							
LINE			N 18°42'31.1" W	198.98					
PC	469767.801	2425185.276							
CURVE			N 13°47'26.2" W	304.42	09°50'09.8"(RT)	03°13'37.7"	304.79	152.77	1775.44
PT	470063.444	2425112.711							
LINE			N 08°52'21.3" W	290.87					
PC	470350.829	2425067.848							
CURVE			N 10°38'38.8" W	38.26	03°32'35.1"(LT)	09°15'35.8"	38.26	19.14	618.75
PCC	470388.427	2425060.782							
CURVE			N 24°33'52.9" W	154.00	24°17'53.1"(LT)	15°39'36.5"	155.16	78.76	365.87
PCC	470528.487	2424996.762							
CURVE			N 38°47'47.3" W	81.63	04°09'55.7"(LT)	05°06'07.3"	81.64	40.84	1123.00
PT	470592.104	2424945.619							
LINE			N 40°52'45.1" W	140.96					
POT	470698.680	2424853.368							

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

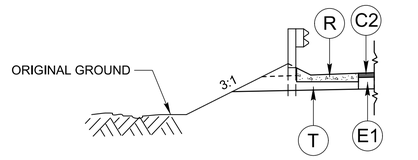
03-APR-2018 22:16
\TBP 2.R.7.Jones BR032\Final Survey\51-0032_LS_rw2c-3.dgn
HNTB

6/2/99

FINAL PAVEMENT SCHEDULE

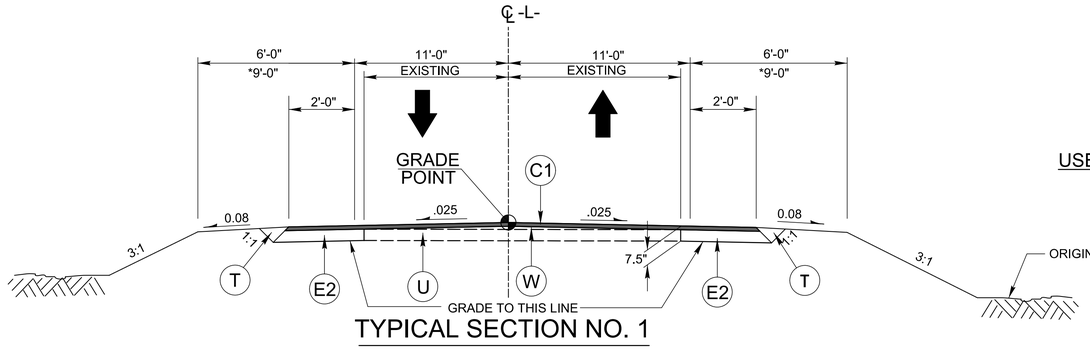
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER INCH. DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YARD.
E2	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
E3	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH. DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



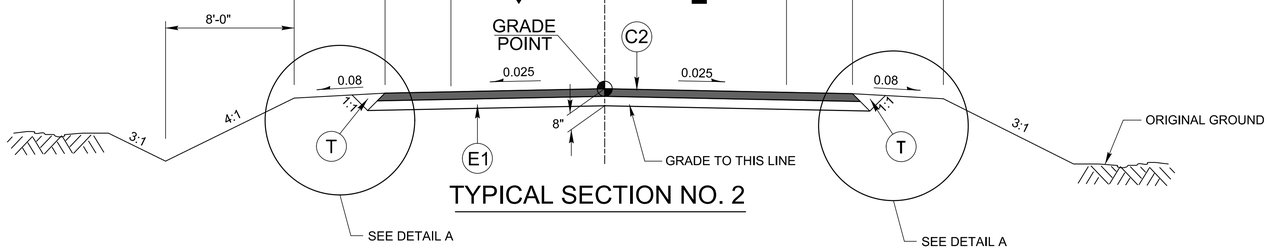
DETAIL A

SHOULDER BERM GUTTER LOCATIONS
-L- STA 18+64+/- TO STA 18+77+/- (LT)
-L- STA 18+64+/- TO STA 19+00.00(RT)



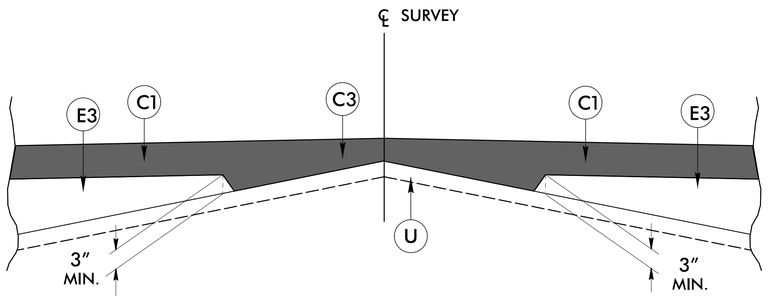
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FROM:
-L- STA 13+50.00 TO STA 16+25.00
-L- STA 19+75.00 TO STA 21+50.00

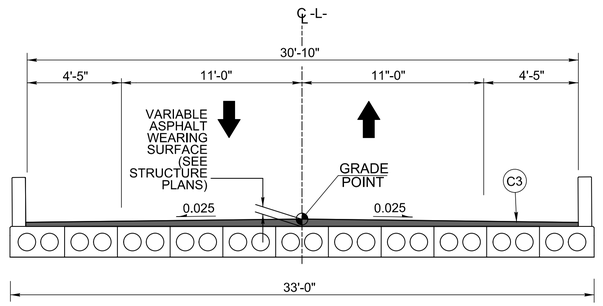


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FROM:
-L- STA 16+25.00 TO STA 17+35.81 (BEGIN BRIDGE)
-L- STA 18+53.19 (END BRIDGE) TO STA 19+75.00



Detail Showing Method of Wedging



TYPICAL SECTION NO. 3
CORED SLAB BRIDGE OVERLAY

USE TYPICAL SECTION NO. 3 FROM:
-L- STA 17+35.81 TO STA 18+53.19

NOTES: * SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B-5413	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER

4/4/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER INCH. DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YARD.
E2	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
E3	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH. DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

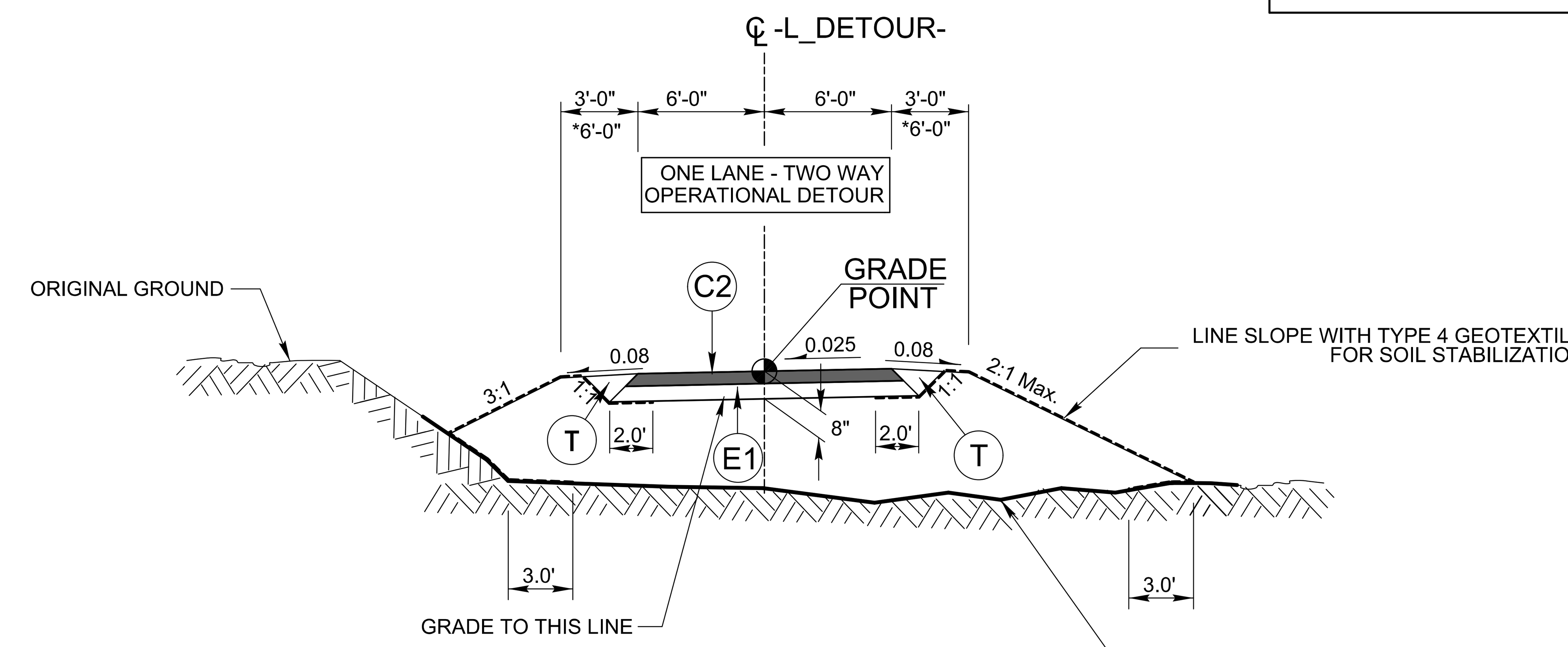
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B-5413	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 36786 DOUGLAS M. WHEATLEY
4/4/2018

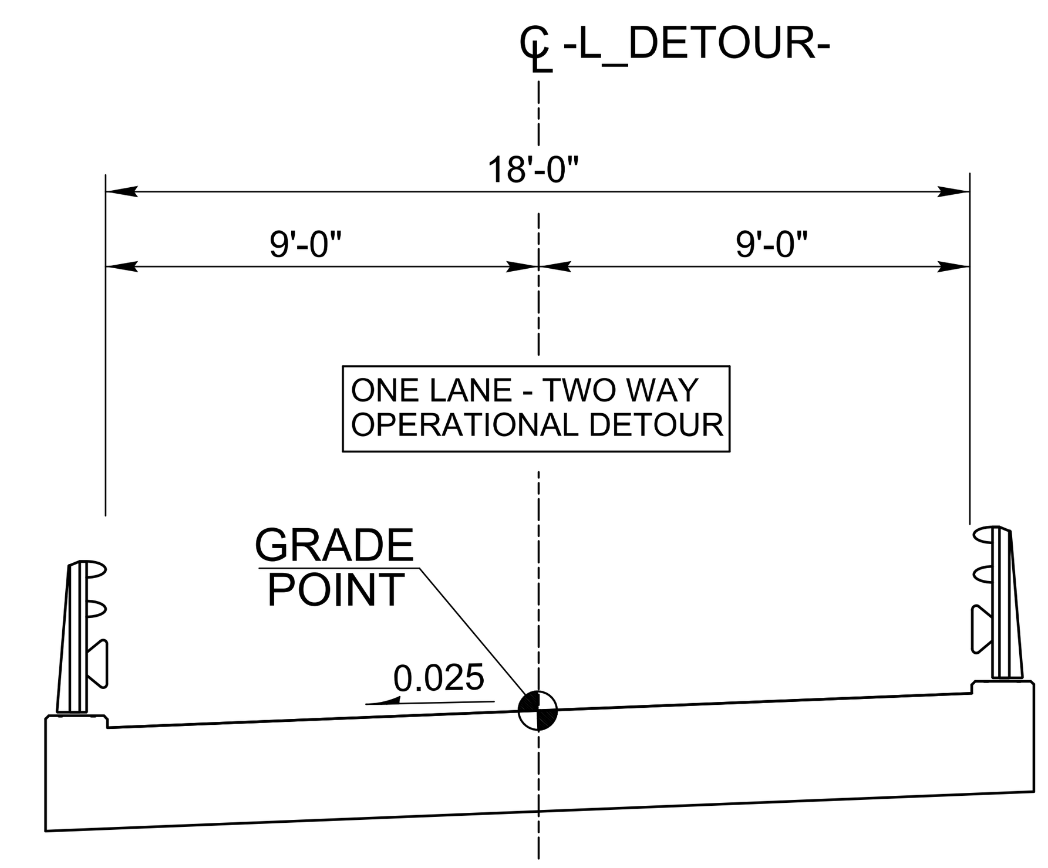
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 4 FROM:

-L_DETOUR- STA 15+75.24 TO STA 17+40.90(BEGIN BRIDGE)
-L_DETOUR- STA 18+60.90 (END BRIDGE) TO STA 20+21.23



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5 FROM:

-L_DETOUR- STA 17+40.90 TO STA 18+60.90

NOTES: * SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL

03-APR-2018 22:16
R:\Roadway\Proj\B5413_rdy_typ.dgn
HNTB

8/17/99

HNTB HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B-5413	2B-1

R/W SHEET NO.

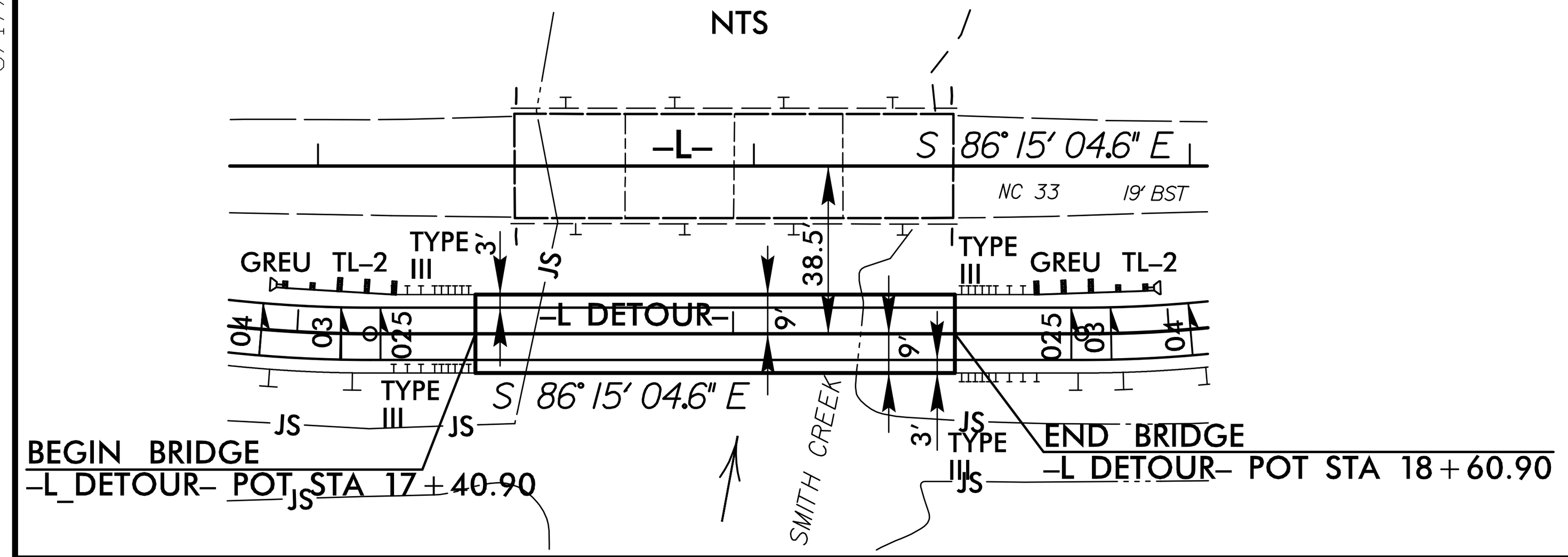
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER 4/4/2018	NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER 4/4/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/2001

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

NTS

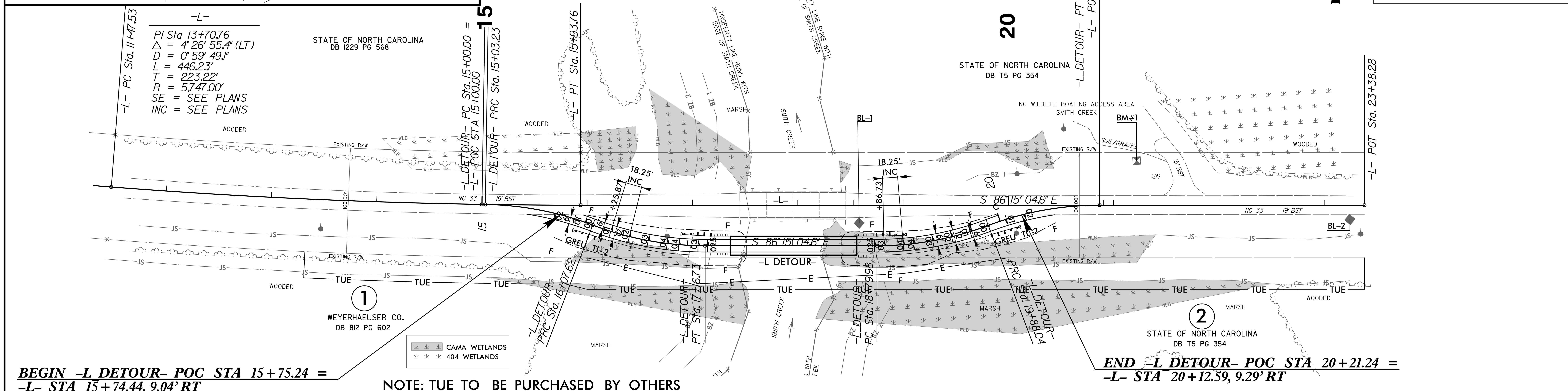


-L DETOUR-

PI Sta 15+01.62	PI Sta 15+55.96	PI Sta 16+62.79	PI Sta 19+34.60	PI Sta 20+42.66
Δ = 0° 01' 56.0" (LT)	Δ = 19° 56' 11.8" (RT)	Δ = 20° 50' 20.8" (LT)	Δ = 20° 38' 12.5" (LT)	Δ = 20° 38' 12.5" (RT)
D = 0° 59' 49.1"	D = 19° 05' 54.9"	D = 19° 05' 54.9"	D = 19° 05' 54.9"	D = 19° 05' 54.9"
L = 3.23'	L = 104.39'	L = 109.11'	L = 108.05'	L = 108.05'
T = 1.62'	T = 52.73'	T = 55.17'	T = 54.62'	T = 54.62'
R = 5,747.00'	R = 300.00'	R = 300.00'	R = 300.00'	R = 300.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS
INC = SEE PLANS	INC = SEE PLANS	INC = SEE PLANS	INC = SEE PLANS	INC = SEE PLANS
	V = 30 MPH	V = 30 MPH	V = 30 MPH	V = 30 MPH

-L-

PI Sta 13+70.76
Δ = 4° 26' 55.4" (LT)
D = 0° 59' 49.1"
L = 446.23'
T = 223.22'
R = 5,747.00'
SE = SEE PLANS
INC = SEE PLANS



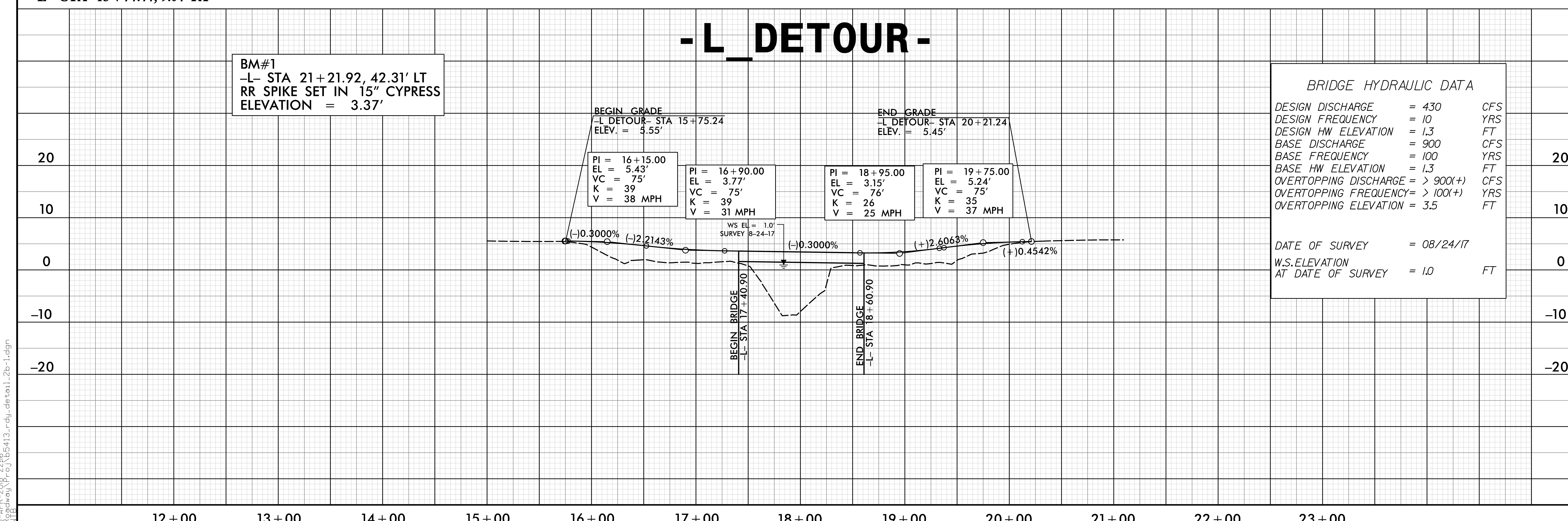
BEGIN -L_DETOUR- POC STA 15+75.24 =
-L- STA 15+74.44, 9.04' RT

NOTE: TUE TO BE PURCHASED BY OTHERS

END -L_DETOUR- POC STA 20+21.24 =
-L- STA 20+12.59, 9.29' RT

-L_DETOUR-

BM#1
-L- STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 430	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 1.3	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.3	FT
OVERTOPPING DISCHARGE	= > 900(+)	CFS
OVERTOPPING FREQUENCY	= > 100(+)	YRS
OVERTOPPING ELEVATION	= 3.5	FT
DATE OF SURVEY	= 08/24/17	
W.S. ELEVATION AT DATE OF SURVEY	= 1.0	FT

03-APR-2018 22:16
\Roadway\Proj\b5413_rdy_detail_2b-1.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
B-5413	2G-1

GEOTECHNICAL ENGINEER

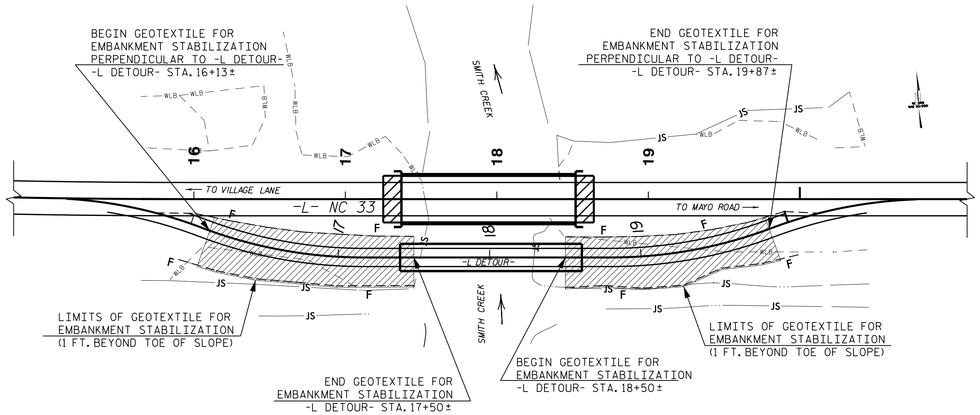
NORTH CAROLINA PROFESSIONAL SEAL 032171 ENGINEER JINYOUNG PARK

DocuSigned by: A713D8FC... SIGNATURE 2/9/2018 DATE

ENGINEER

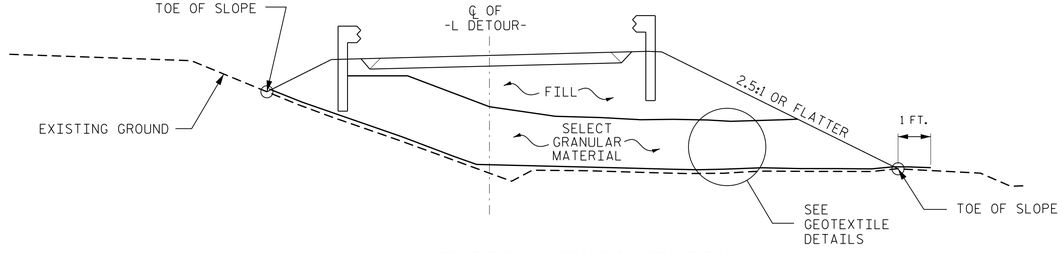
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN VIEW
N.T.S.

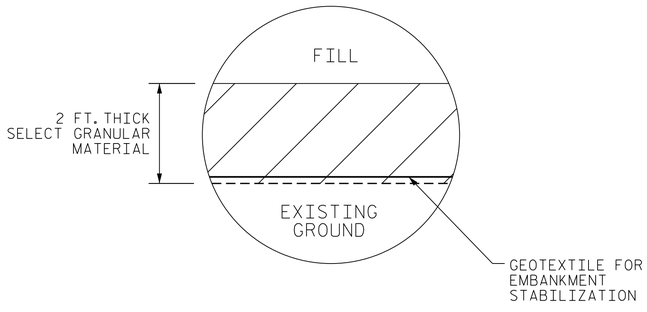
AREA OF GEOTEXTILE FOR EMBANKMENT STABILIZATION MACHINE OR ROLL DIRECTION PERPENDICULAR TO EMBANKMENT CENTERLINE



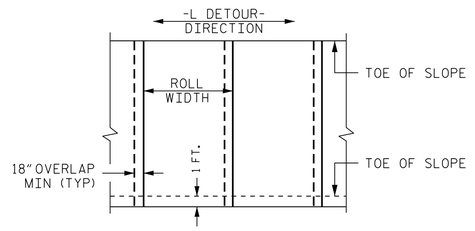
TYPICAL CROSS SECTION
N.T.S.

NOTES

1. DO NOT GRUB, ONLY CLEAR THE AREA WITHIN THE LIMITS OF THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
2. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION PERPENDICULAR TO EMBANKMENT CENTERLINE ON THE EXISTING GROUND AS SHOWN IN THE PLAN OR AS DIRECTED BY THE ENGINEER.
3. PLACE THE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
4. PLACE 2 FT. OF SELECT GRANULAR MATERIAL ON THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
5. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
6. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
7. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINMUM OF 18 INCHES.
8. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION , SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.



GEOTEXTILE DETAILS
N.T.S.



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW, N.T.S.)

QUANTITIES

GEOTEXTILE FOR EMBANKMENT STABILIZATION	950 SY#
SELECT GRANULAR MATERIAL	550 CY

GEOTEXTILE FOR EMBANKMENT STABILIZATION ESTIMATED QUANTITY DOES NOT INCLUDE OVERLAPS OR WASTE.

PREPARED BY: J. PARK	DATE: 02/2018
REVIEWED BY: J. BATTS	DATE: 02/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

COMPUTED BY: MONICA DUVAL	DATE: 11/01/2017
CHECKED BY: DOUGLAS M. WHEATLEY, PE	DATE: 11/29/2017

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5413	3B-1

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
-L_DETOUR- STA 15+75.24	STA 17+40.90(BRIDGE)	3		452	449	
-L_DETOUR STA 18+60.90 (BRIDGE)	STA 20+21.24	5		356	351	
SUBTOTALS:		8		808	800	
-L- STA 13+50.00	STA 17+35.81(BRIDGE)	4		1130	1126	
-L- STA 18+53.19(BRIDGE)	STA 21+50.00	11		420	409	
SUBTOTALS:		15		1550	1535	
DETOUR REMOVAL						
-L_DETOUR- STA 15+75.24	STA 17+40.90(BRIDGE)	255				255
-L_DETOUR STA 18+60.90 (BRIDGE)	STA 20+21.24	281				281
SUBTOTALS:		536		2358	2335	536
PROJECT TOTALS:		559		2358	2335	536
5% TO REPLACE BORROW					117	
LOSS DUE TO CLEARING & GRUBBING						-100
BY CONTINGENCY			700			
GRAND TOTALS:		559	700	2358	2452	436
SAY:		590	700		2575	
EST. SHALLOW UNDERCUT = 100 CY (PER GEOTECH RECOMMENDATION)						
EST. SELECT GRANULAR MATERIAL = 1750 CY (PER GEOTECH RECOMMENDATION)						
EST. CLASS IV SUBGRADE STABILIZATION = 190 TONS (PER GEOTECH RECOMMENDATION)						

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

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	16+25.00	17+44.37	CL	283.67
	18+46.82	19+75.00	CL	293.22
-L_DETOUR- REMOVAL	15+75.23	17+40.90	CL	222.81
	18+60.90	20+21.24	CL	215.73
			TOTAL:	1015.43
			SAY:	1050

ROW AREA DATA SUMMARY

PARCEL NO.	PROPERTY OWNERS NAMES	PROP. R/W	TEMP. UTILTIY EASE.	PERM. DRAIN. EASE.	PERM. DRAINAGE UTILITY EASE.	CONST. EASE.
1	WEYERHAEUSER CO.					2,328.58 S.F.
2	STATE OF NORTH CAROLINA					1,996.75 S.F.

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH (FT)
-L-	18+64.06(LT)	18+77.00(LT)	13
	18+64.06(RT)	19+00.00(RT)	36
		TOTAL:	49
		SAY:	55

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	CAAP 12"	CAAP 15"	CAAP 18"	CAAP 24" .064	CAAP 30" .079	CAAP 36"	CAAP 42" .109	CAAP 48"	BIT. COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"
-L- 18+73.00	LT	0401		6.20																											
		0401	0402		3.00	2.91																			28						
-L- 18+73.00	RT	0402		6.21																											
		0402	0403		2.80	2.73																			20						
-L- 18+96.00	RT	0403		6.14																											
		0403	OUT		0.61	0.59																			20						
TOTAL																									68						

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" 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')	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			D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	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	J.B. STD. 840.31 OR 840.32	TB GRATED D.I., TYPE 'B' STD. 840.35	T.B.D.I. (N.S.) FRAME AND TWO GRATES STD. 840.29					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
-L- 18+73.00						1																			1	1										
-L- 18+73.00						1																			1	1										
-L- 18+96.00						1	0.5																		1	1										
TOTAL						3	0.5																		3	3										

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

COMPUTED BY: MONICA DUVAL	DATE: 03/02/17
CHECKED BY: DOUGLAS M. WHEATLEY, PE	DATE: 10/19/17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5413	3B-2

"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 SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TL-3			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TEMP. GREU TL-2	TEMP. TYPE III	TYPE III	GREU TL-3						EA	G	NG				
-L-	16+61.00	17+36(BRIDGE)	LT	75'				17+37(BRIDGE)	4.42'	9'		50'		1'			1	1												
	15+11.00	17+36(BRIDGE)	RT	225'			17+37(BRIDGE)		4.42'	9'	50'		1'				1	1												
	18+53(BRIDGE)	20+78.00	LT	225'			18+52(BRIDGE)		4.42'	9'	50'		1'				1	1												
	18+53(BRIDGE)	19+53.00	RT	100'				18+52(BRIDGE)	4.42'	9'		50'		1'			1	1												
			SUBTOTAL:	625'																										
			ANCHOR DEDUCTIONS:																											
			GREU TL-3: 4@50'	-200'																										
			TYPE III: 4@18.75'	-75'																										
			TOTAL:	350'													4	4												
			SAY:	362.50'																										
			ADDITIONAL POST:	5																										
	TEMPORARY GUARDRAIL FOR DETOUR																													
-L_DETOUR-	16+90.90	17+40.90(BRIDGE)	LT	50'				17+40.90(BRIDGE)	3'	6'		31.25'		0.62'	1	1														REMOVE WHEN DETOUR IS REMOVED
	15+90.90	17+40.90(BRIDGE)	RT	150'			17+40.90(BRIDGE)		3'	6'	31.25'		0.62'		1	1														REMOVE WHEN DETOUR IS REMOVED
	18+60.90(BRIDGE)	19+10.90	LT	50'			18+60.90(BRIDGE)		3'	6'	31.25'		0.62'		1	1														REMOVE WHEN DETOUR IS REMOVED
	18+60.90(BRIDGE)	20+10.90	RT	150'				18+60.90(BRIDGE)	3'	6'		31.25'		0.62'	1	1														REMOVE WHEN DETOUR IS REMOVED
			SUBTOTAL:	400'																										
			ANCHOR DEDUCTIONS:																											
			TEMP. GREU TL-2: 4@31.25'	-125'																										
			TYPE III: 4@18.75'	-75																										
			TOTAL:	200'											4	4														

12/06/07

16-APR-2018 14:57
\Roadway\Proj\B5413_rdy_sum.dgn
HNTB

HNTB

HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B-5413	4
R/W SHEET NO.	

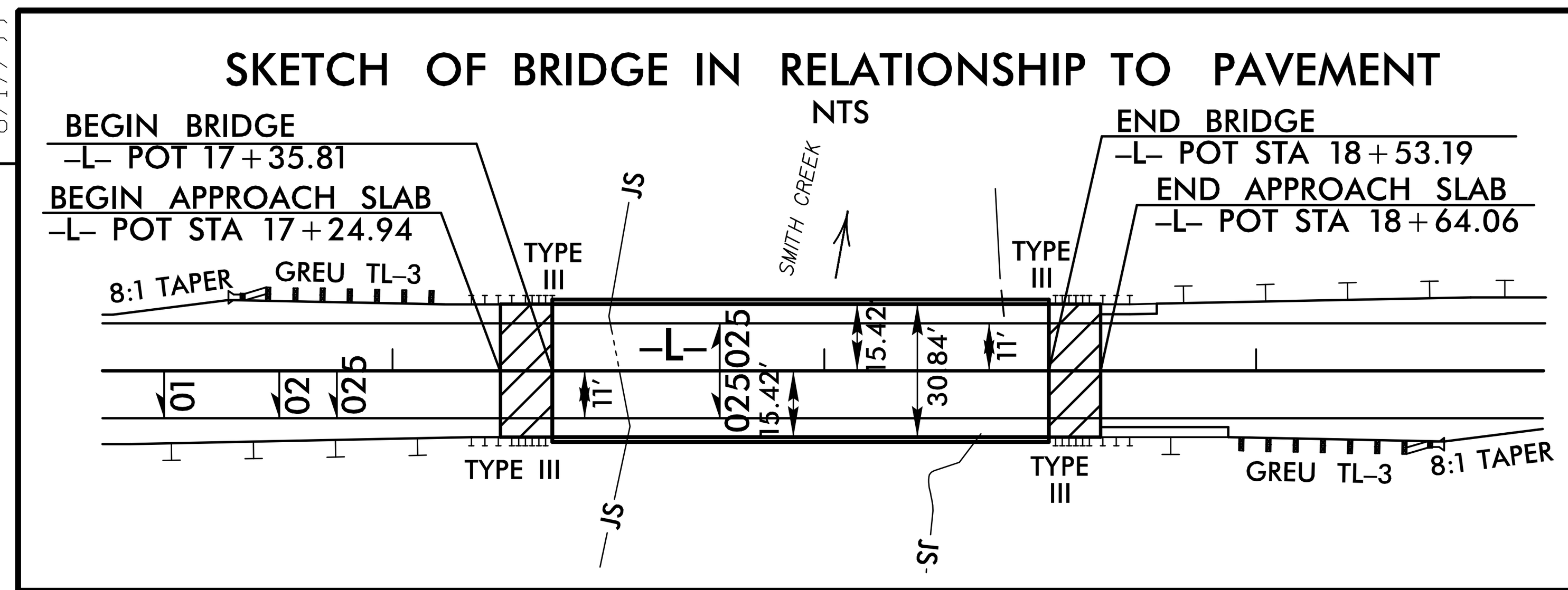
ROADWAY DESIGN ENGINEER — SEAL 36786 — 4/4/2018

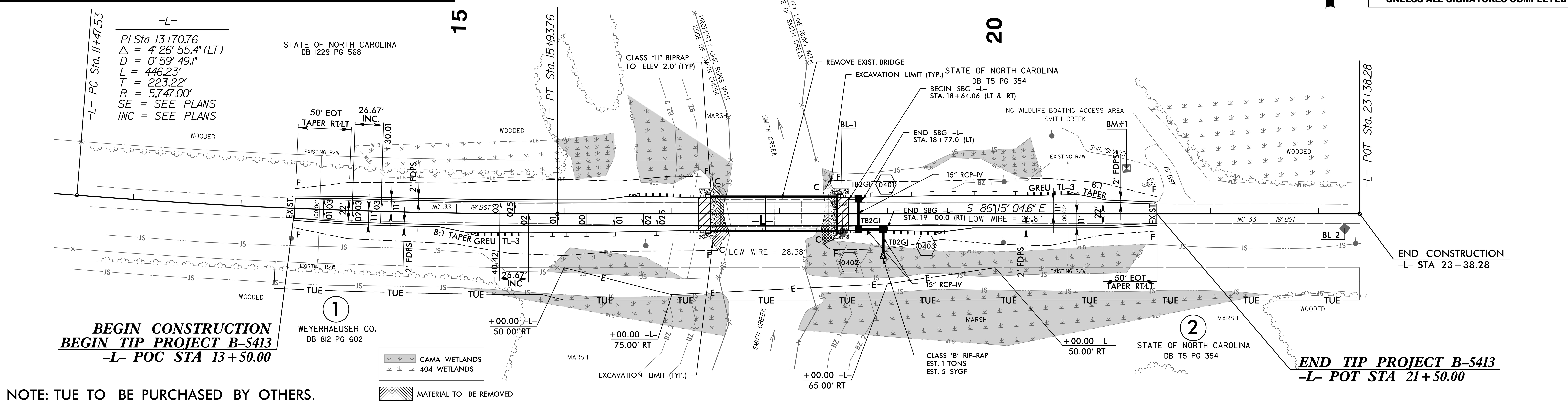
HYDRAULICS ENGINEER — SEAL 15764 — 4/4/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

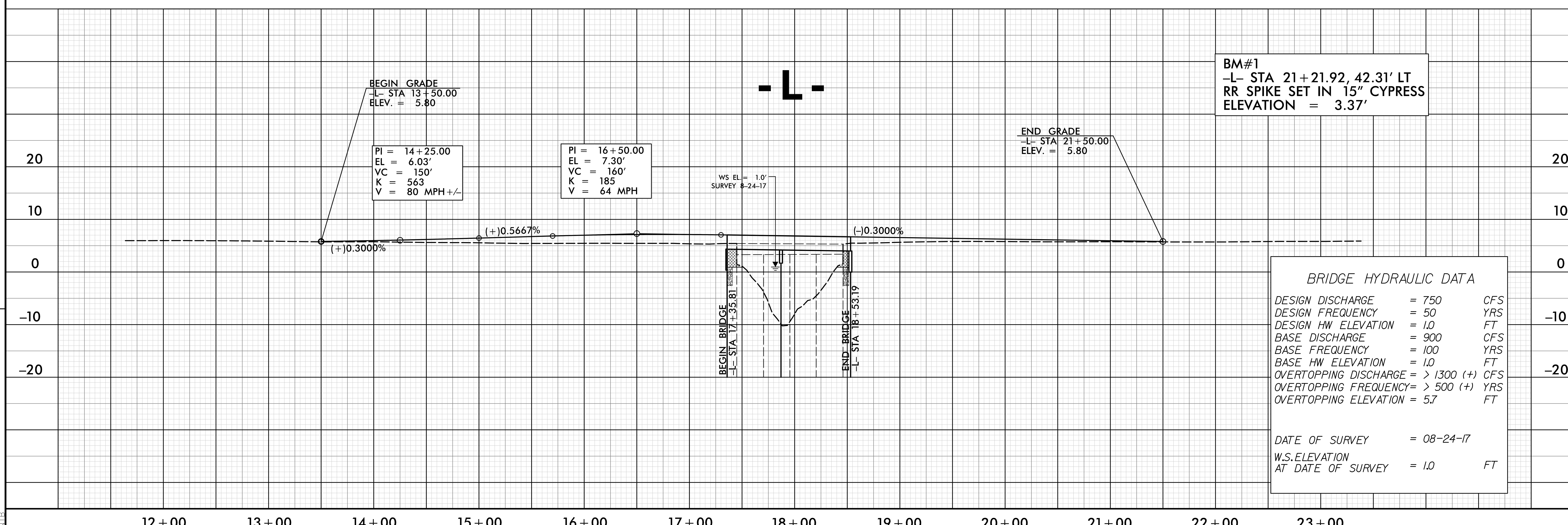
NTS





NOTE: TUE TO BE PURCHASED BY OTHERS.

-L-



BM#1
-L- STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 750	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1.0	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.0	FT
OVERTOPPING DISCHARGE	= > 1300 (+)	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 5.7	FT
DATE OF SURVEY	= 08-24-17	
W.S.ELEVATION AT DATE OF SURVEY	= 1.0	FT

REVISIONS

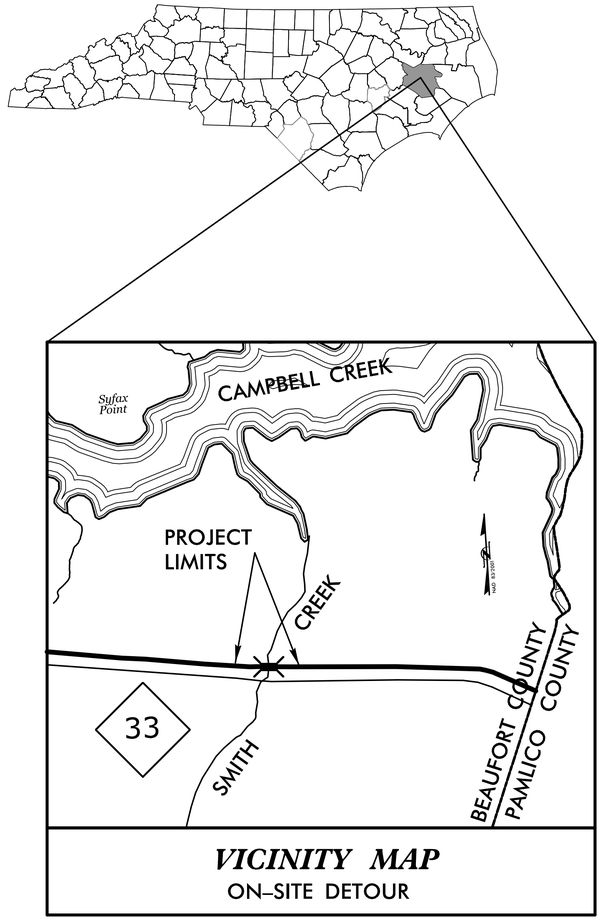
8/17/99

03-APR-2018 22:17
\Roadway\Proj\b5413_rdy_psh4.dgn
HNTB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BEAUFORT COUNTY



VICINITY MAP
ON–SITE DETOUR

LOCATION: REPLACE BRIDGE NO. 20 OVER SMITH CREEK ON NC 33

INDEX OF SHEETS

SHEET NO.
TMP–1

B–5413

TIP PROJECT:

L. D. STOUCHKO, PE — *TRAFFIC CONTROL PROJECT ENGINEER*
J. A. PHILLIPS — *TRAFFIC CONTROL DESIGN ENGINEER*
S. J. HAMILTON, PE, CPM — *NCDOT CONTACT*

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Ste 200
Raleigh, North Carolina 27609
NC License No: C-1554

APPROVED DocuSigned by: Lori D. Stouchko, P.E. A11E0A9B32E...
DATE: 4/4/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034437 ENGINEER LORI D STOUCHKO

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/4/2018
...\TCP\B-5413_tc_TCP_01_title.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
B-5413	TMP-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY-DRUM
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

LEGEND

GENERAL

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

SIGNALS

EXISTING PROPOSED TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM
- TEMPORARY CRASH CUSHION
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION	PAY ITEM
	PAVEMENT MARKING LINES	
		PAINT (4")
PA	WHITE EDGELINE	
PI	DOUBLE YELLOW	
		PAINT (24")
P2	WHITE STOP BAR	
	PAVEMENT MARKERS	
		TEMPORARY RAISED
MM	CRYSTAL/CRYSTAL	

NOTE: FOR EACH PAINT PAVEMENT MARKING ITEM, REFER TO GENERAL NOTES FOR NUMBER OF APPLICATIONS.

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED
Digitally signed by: Lori D. Stouchko, P.E.
A11E0AB632E84E9...
DATE: 4/4/2018

NORTH CAROLINA PROFESSIONAL SEAL 034437 ENGINEER LORI D. STOUCHKO
SEAL

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

TRANSPORTATION MANAGEMENT PLAN
ROADWAY STANDARD DRAWINGS, LEGEND & TEMPORARY PAVEMENT MARKING SCHEDULE

4/4/2018
...\TCP\B-5413_tc_TCP_01_title.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
B-5413	TMP-2

MANAGEMENT STRATEGIES

MAINTENANCE OF TRAFFIC FOR THIS PROJECT HAS BEEN DIVIDED INTO TWO PHASES USING TEMPORARY SIGNALS AND ONE-LANE, TWO-WAY TRAFFIC PATTERNS.

DURING PHASE I, USING FLAGGERS AS NEEDED, CONSTRUCT TEMPORARY BRIDGE PROVIDING SMOOTH TIE FROM EXISTING TO PROPOSED. SHIFT TRAFFIC TO TEMPORARY PATTERN. TRAFFIC WILL BE IN A ONE-LANE, TWO-WAY PATTERN ON THE ONSITE DETOUR WITH THE USE OF TEMPORARY PORTABLE SIGNALS WHILE THE PROPOSED BRIDGE AND ROADWAY IS CONSTRUCTED.

DURING PHASE II, USING FLAGGERS, TRAFFIC IS RETURNED TO ORIGINAL PATTERN WHILE TEMPORARY DETOUR IS REMOVED AND COMPLETED BY PLACING FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS & MARKERS AND PLACE TRAFFIC IN FINAL PATTERN.

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) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) 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.

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

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

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

GENERAL NOTES

F) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 350 IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

H) NOTIFY THE OVERSIZE/OVERWEIGHT PERMIT GROUP FOURTEEN (14) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

TRAFFIC CONTROL DEVICES

K) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

PAVEMENT MARKINGS AND MARKERS

M) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

	ROAD NAME	MARKING	MARKER
1.	NC 33	PAINT	TEMPORARY RAISED

N) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

P) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

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

MISCELLANEOUS

R) ENSURE THE OVERSIZE/OVERWEIGHT PERMIT UNIT (919) 733-4740 HAS BEEN ADVISED OF THE ONGOING TRAFFIC OPERATIONS THROUGH THE DIVISION OFFICE. SEE ALSO GENERAL NOTE "H".

S) STATE FORCES WILL INSTALL MARKINGS AND MARKERS ON THE FINISHED PROJECT. CONTACT JEFF DUNNING AT 252-830-3493 TWO WEEKS PRIOR PLACING FINAL SURFACE COURSE.

PHASING

NOTES:
COMPLETE ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE. THIS MAY REQUIRE TEMPORARY DITCHES.

THE TERM "RSD" REFERS TO ROADWAY STANDARD DRAWINGS.

ALL REFERENCES TO CONSTRUCTION INCLUDE PAVING UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE UNLESS SPECIFICALLY CALLED FOR.

PHASE I

STEP 1:
INSTALL ADVANCED WORK ZONE WARNING SIGNS. USING INSET "TYPICAL FOR SIGN PLACEMENT" ON SHEET TMP-4, INSTALL ALL SIGNS AND COVER ALL EXCEPT THE ADVANCED WORK ZONE WARNING SIGNS.

STEP 2:
AWAY FROM TRAFFIC, CONSTRUCT DETOUR BRIDGE AND ROADWAY FROM -L_DETOUR- STA 16+50+/- TO STA 19+50+/-.

STEP 3:
USING RSD 1101.02, (SHEET 1 OF 14) AND FLAGGERS, CONSTRUCT DETOUR TIE-INS FROM -L_DETOUR- STA 15+75+/- TO STA 16+50+/- AND FROM -L_DETOUR- STA 19+50+/- TO STA 20+21+/-. (SEE SHEET TMP-3.)

STEP 4:
INSTALL TEMPORARY SIGNALS, PAVEMENT MARKING, MARKERS, DEVICES, UNCOVER SIGNS AS SHOWN ON TMP-4 AND SHIFT TRAFFIC TO ONE LANE-TWO WAY TRAFFIC PATTERN. (SEE SPECIAL PROVISION FOR TEMPORARY PORTABLE SIGNAL.)

STEP 5:
AWAY FROM TRAFFIC, REMOVE EXISTING STRUCTURE (REFER TO STRUCTURE PLANS) AND CONSTRUCT PROPOSED BRIDGE. (SEE TMP-4)

AWAY FROM TRAFFIC CONSTRUCT THE FOLLOWING:
* -L- FROM STA 16+50+/- TO BRIDGE
* -L- FROM BRIDGE TO STA 19+50+/-

PHASE II (NOT SHOWN)

STEP 1:
USING RSD 1101.02 (SHEET 1 OF 14), CONSTRUCT -L- FROM STA 13+50+/- TO STA 16+50+/- AND FROM STA 19+50+/- TO STA 21+50+/- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE. PLACE PAINT PAVEMENT MARKING IN PROPOSED PATTERN. REMOVE TEMPORARY SIGNALS, CLOSE DETOUR AND SHIFT TRAFFIC TO -L-.

STEP 2:
USING RSD 1101.02 (SHEET 1 OF 14) AND FLAGGERS AS NEEDED, REMOVE DETOUR BRIDGE AND TEMPORARY PAVEMENT.

STEP 3:
USING RSD 1101.02 (SHEET 1 OF 14), PLACE FINAL LAYER OF SURFACE COURSE ON -L- FROM STA 13+50/- TO STA 21+50+/-. STATE FORCES WILL PLACE FINAL (THERMOPLASTIC) PAVEMENT MARKINGS IN FINAL PATTERN.

HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: Digitally signed by: Lori D. Stouchko, P.E.
DocuSigned by: A11E0A9B32E84E9...
DATE: 4/4/2018

NORTH CAROLINA PROFESSIONAL SEAL 034437 ENGINEER LORI D. STOUCHKO
SEAL

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

TRANSPORTATION MANAGEMENT PLAN

TRANSPORTATION OPERATIONS PLAN, NOTES AND PHASING

4/4/2018
...\TCP\B-5413_tc_TCP_02_notes.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
B-5413	TMP-3

NAD 83/2001

15

20

USING RSD 1101.02, (SHEET 1 OF 14)
CONSTRUCT ONSITE DETOUR FROM
STA 15+75+/- TO STA 20+21+/-

-L-
NC 33

Ⓒ

Ⓑ

-L_DETOUR-

-L_DETOUR- STA 16+50+/-

-L_DETOUR- STA 19+50+/-

Ⓑ

R11-2
48″ x 30″

ROAD
CLOSED

W1-6R
48″ x 24″

TYPE III BARRICADE

Ⓒ

R11-2
48″ x 30″

ROAD
CLOSED

W1-6L
48″ x 24″

TYPE III BARRICADE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

APPROVED:
Digitally signed by:
Lori D. Stouchko, P.E.
A11E0A9B32E84E9...

DATE:
4/4/2018

NORTH CAROLINA PROFESSIONAL SEAL 034437 ENGINEER LORI D. STOUCHKO

SEAL

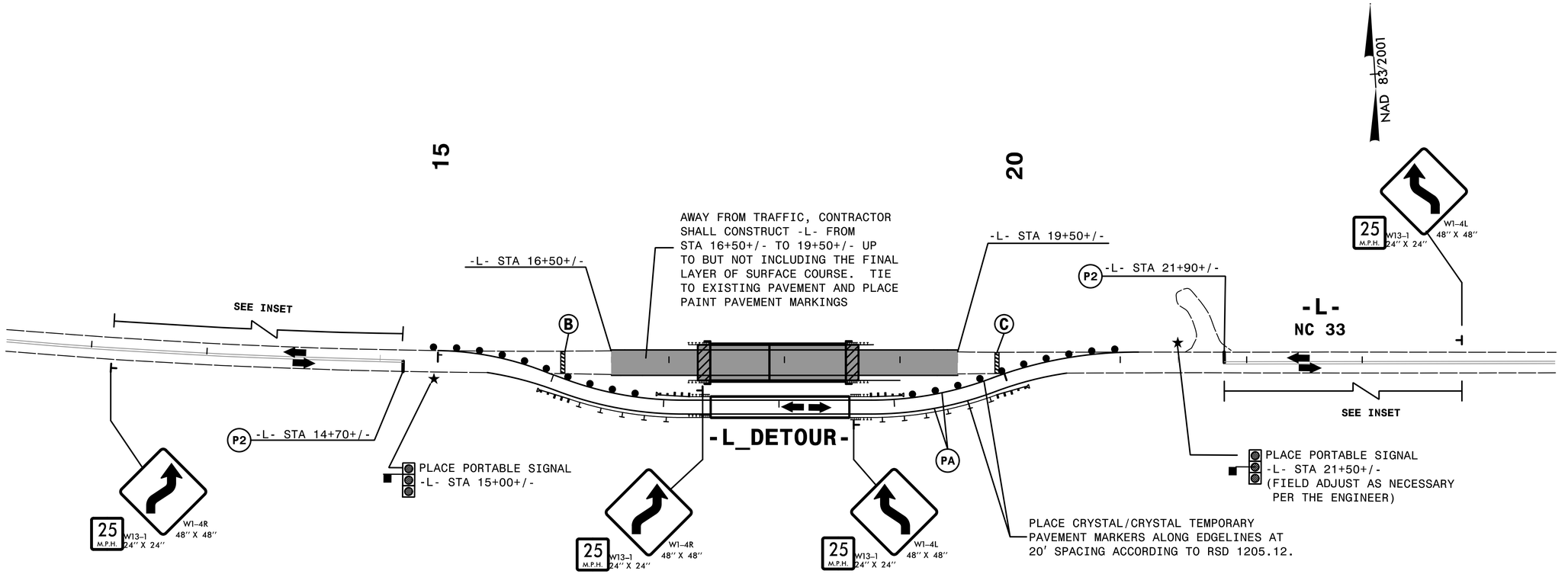
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • MOUNT

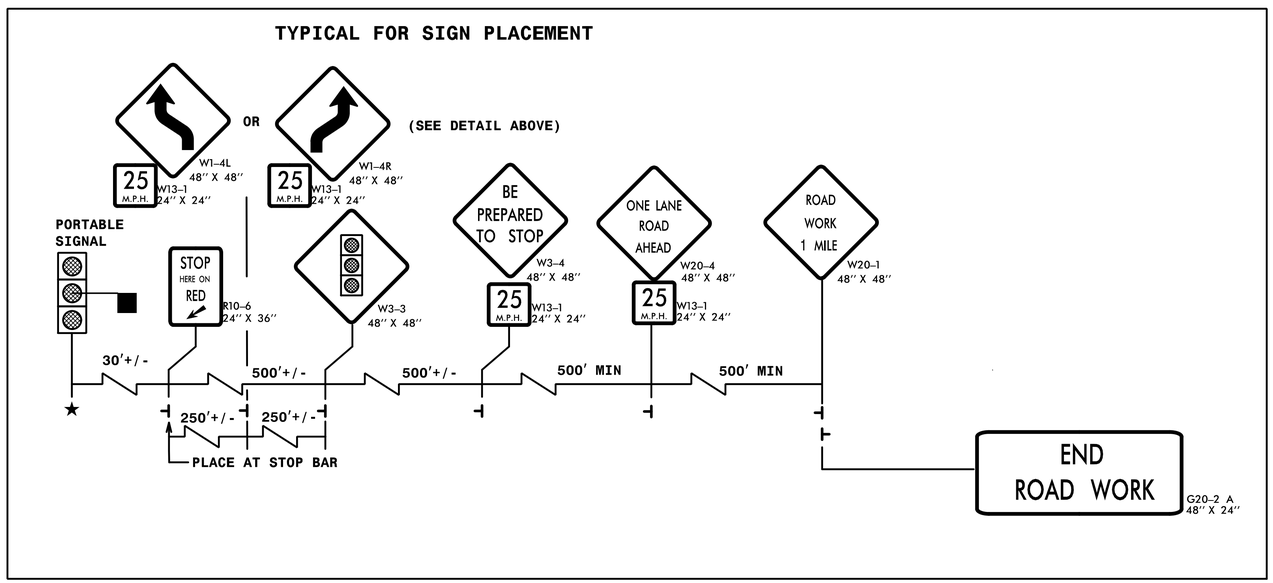
TRANSPORTATION
MANAGEMENT PLAN

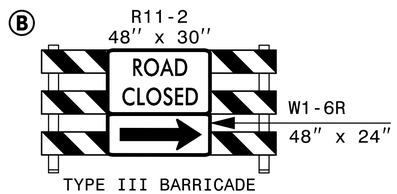
PHASE I
STEPS 2 AND 3

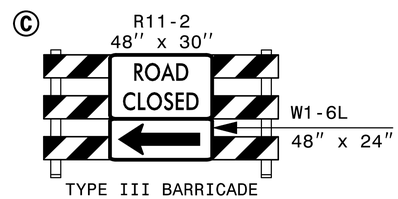
4/4/2018
...\B_5413_tc_TCP_03_PISteps2and3.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
B-5413	TMP-4









DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED
Digitally signed by: Lori D. Stouchko, P.E.
A11E0A9B32E84E9...
DATE: 4/4/2018

NORTH CAROLINA PROFESSIONAL SEAL 034437 ENGINEER LORI D STOUCHKO

SEAL

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

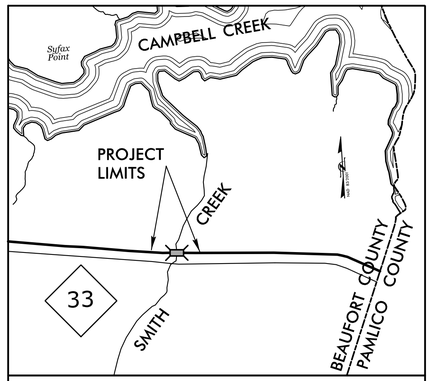
TRANSPORTATION MANAGEMENT PLAN

PHASE I
STEPS 4 AND 5

4/4/2018
...\B-5413_tc_TCP_04_PIStep4and5REV.dgn
HNTB

PROJECT: B-5413

TIP No.



VICINITY MAP
ON-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

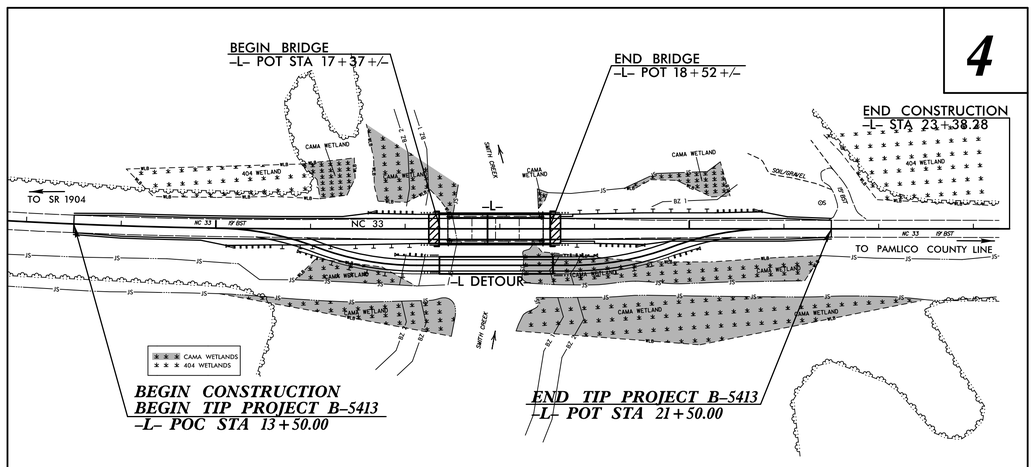
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

BEAUFORT COUNTY

LOCATION: REPLACE BRIDGE NO. 20 OVER SMITH CREEK ON NC 33

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NAD 83/2001



BEGIN CONSTRUCTION
BEGIN TIP PROJECT B-5413
-L- POC STA 13+50.00

END TIP PROJECT B-5413
-L- POT STA 21+50.00

4

FOR -L DETOUR- ALIGNMENT, SEE SHEET 2B-1

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5413	EC-1	

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

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	
1630.05	Temporary Diversion	
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	
	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	

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

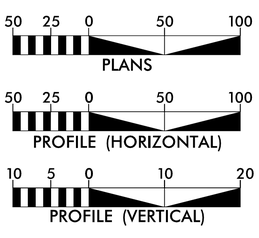
HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. Beginning
to Sta. End
Refer To E. C. Special Provisions for Special Considerations.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

GRAPHIC SCALES



ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

ALLEN HODGES E.I.
EROSION CONTROL
LEVEL III
CERTIFICATION #3633

Roadway Standard Drawings

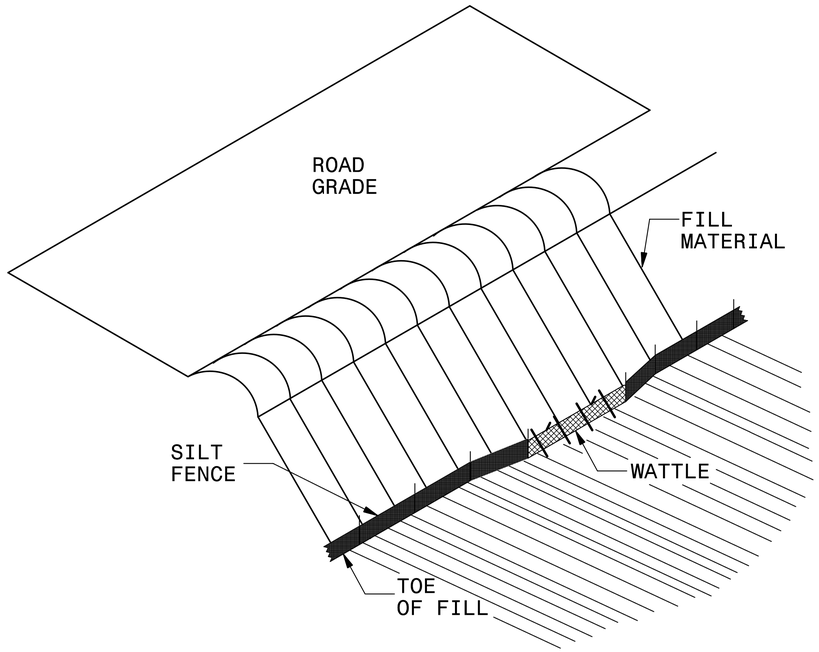
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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*		

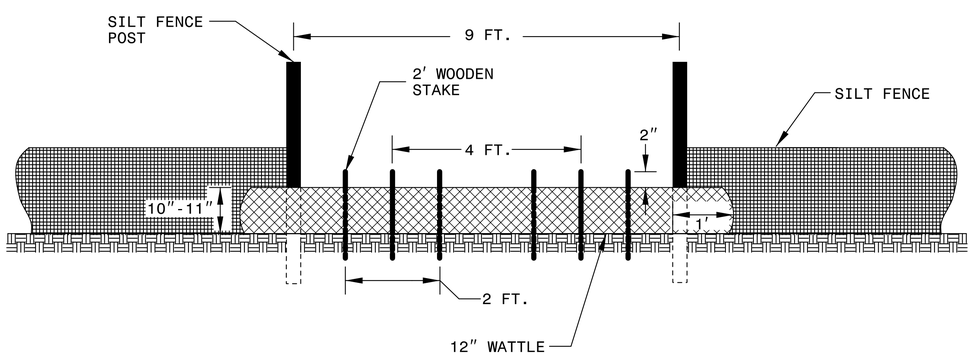
4/4/2018
HNTB
b5413_EC_tsh.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-5413	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

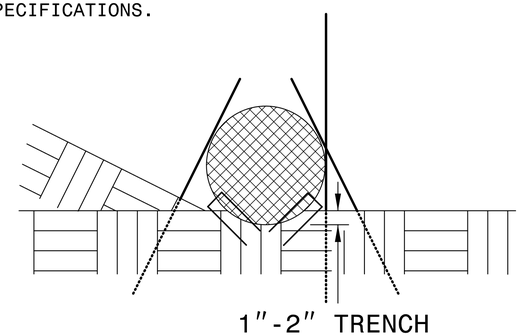
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

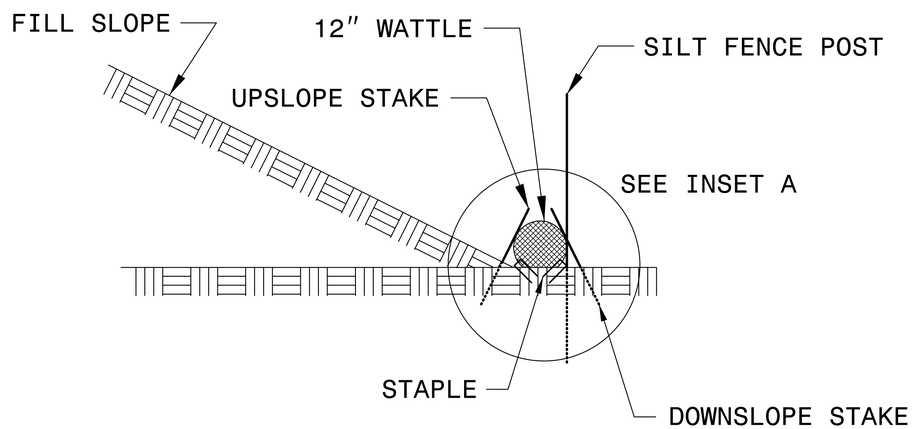
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

INSET A

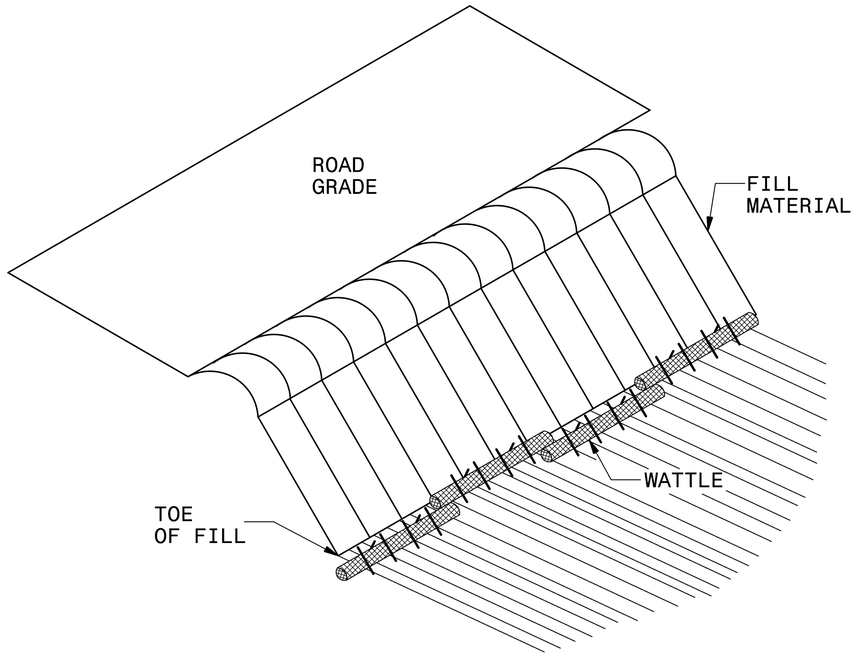




SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-5413	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

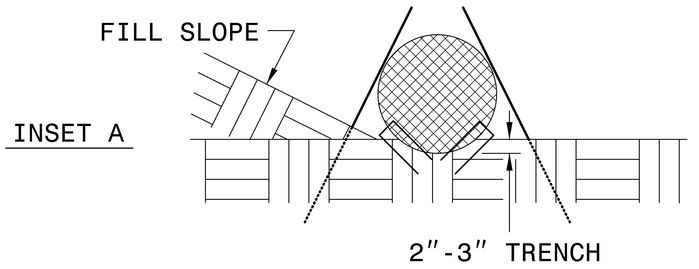
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

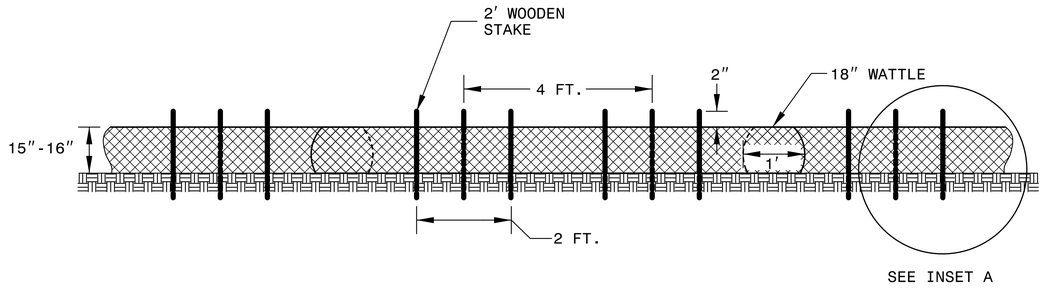
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

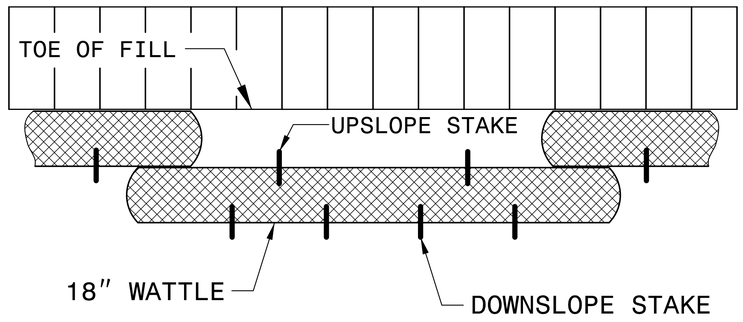
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.





FRONT VIEW



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-5413	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

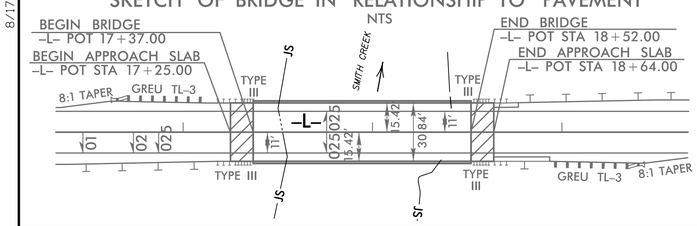
SOIL STABILIZATION TIMEFRAMES

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

8/17/99

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

NTS



HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B–5413	EC–4
R/W SHEET NO.	

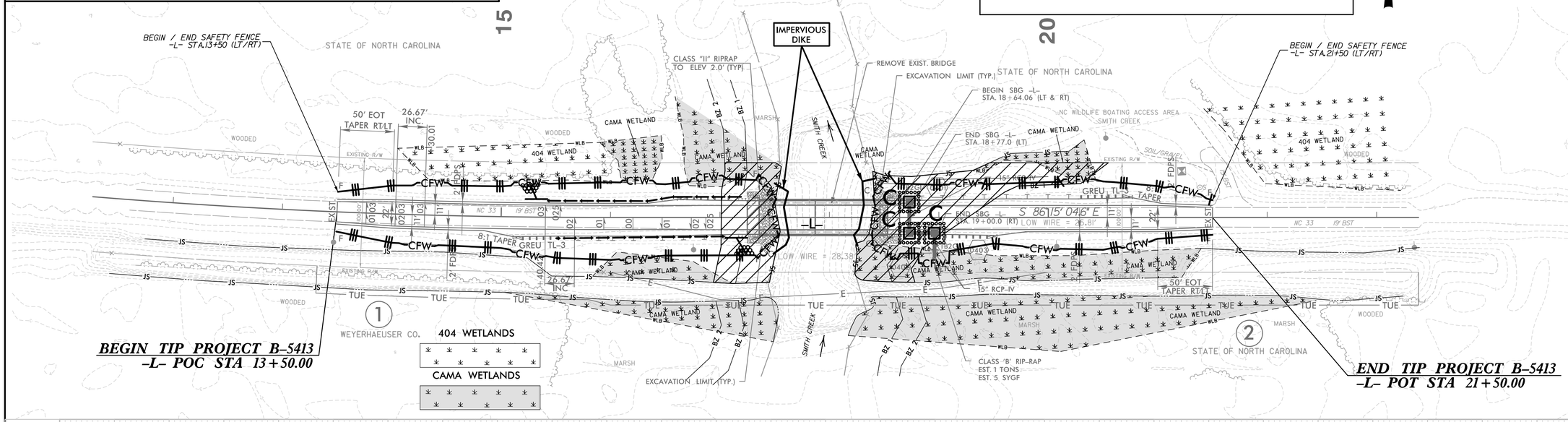
ALLEN HODGES E.I.
EROSION CONTROL
LEVEL III
CERTIFICATION #3633

NOTES: 1. THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTROL FENCE OR WATTLES IN LOW AREAS OF SILT FENCE AND UNDER THE BRIDGE, AS NEEDED OR DIRECTED BY THE ENGINEER.
2. THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

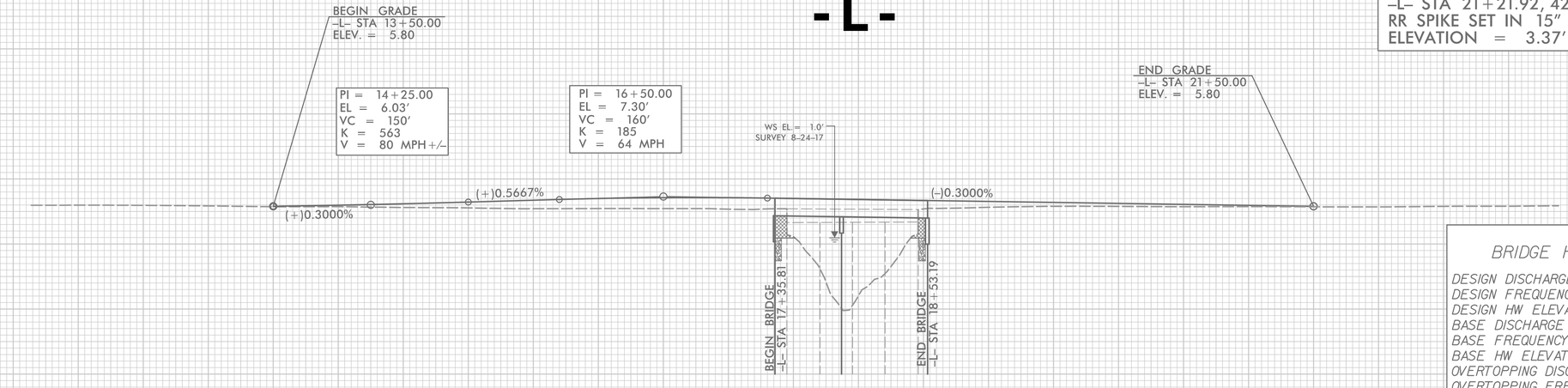
Place Matting for Erosion Control on Slope as Work Allows.
Sta. 15+50 to Sta. 17+35 LT&RT
Sta. 18+52 to Sta. 19+00 RT

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NAD 83/2001



MATERIAL TO BE REMOVED



BM#1
–L– STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 750	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1.0	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.0	FT
OVERTOPPING DISCHARGE	= > 1300 (+)	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 5.7	FT
DATE OF SURVEY	= 08-24-17	
W.S. ELEVATION AT DATE OF SURVEY	= 1.0	FT

20 10 0 –10 –20

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

4/4/2018
B-5413_hyd_EC_psh4.dgn
HNTB

8/17/99

DETOUR

HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

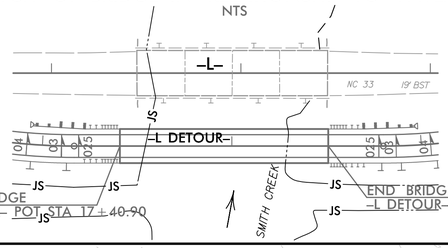
PROJECT REFERENCE NO.	SHEET NO.
B-5413	EC-2B-1
R/W SHEET NO.	

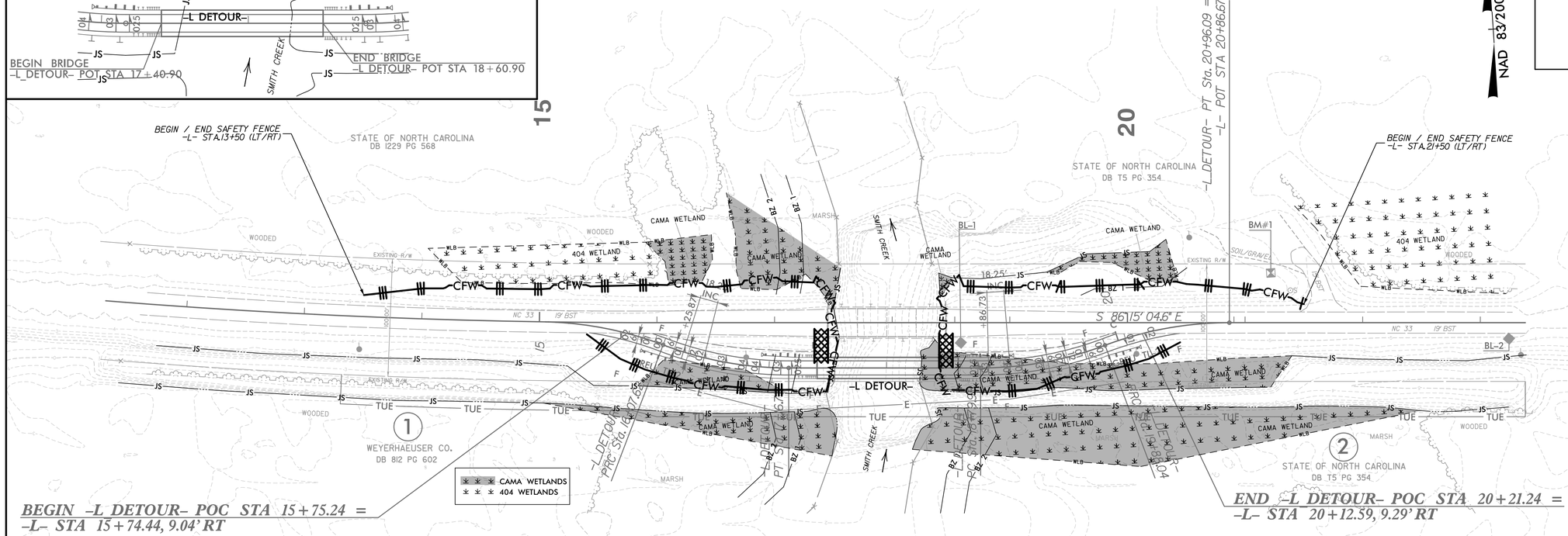
ALLEN HODGES E.I.
EROSION CONTROL
LEVEL III
CERTIFICATION #3633

NAD 83/2001

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

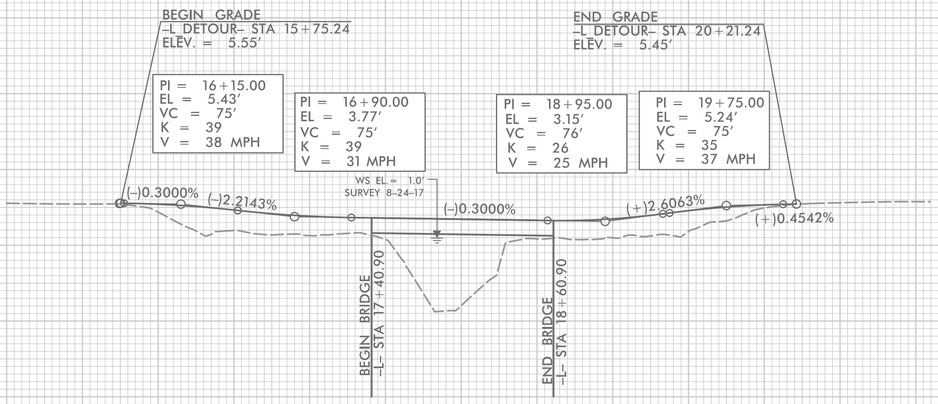
NTS





BM#1
–L– STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'

- DET1 -



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 430	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 1.3	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.3	FT
OVERTOPPING DISCHARGE	= > 900(+)	CFS
OVERTOPPING FREQUENCY	= > 100(+)	YRS
OVERTOPPING ELEVATION	= 3.5	FT
DATE OF SURVEY	= 08/24/17	
W.S. ELEVATION AT DATE OF SURVEY	= 1.0	FT

20 10 0 –10 –20

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

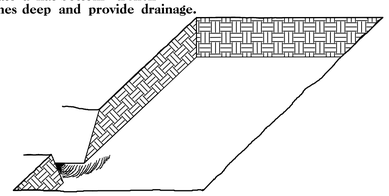
4/4/2018
15413_hyd_EC_psh2b-1.dgn
HNTB

PLANTING DETAILS

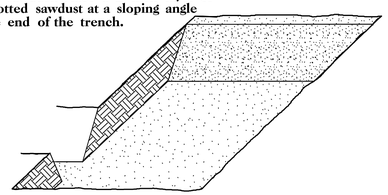
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

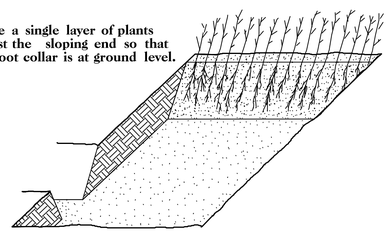
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



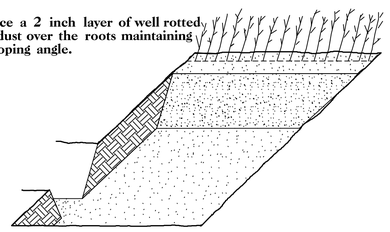
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

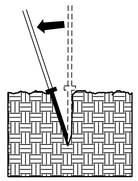


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

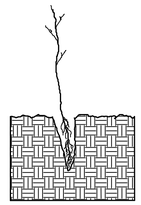


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

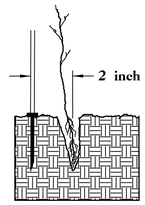
DI33LE PLANTING METHOD USING THE K3C PLANTING 3AR



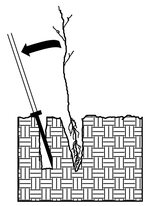
1. Insert planting bar as shown and pull handle toward planter.



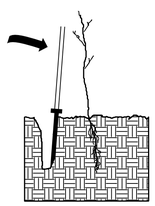
2. Remove planting bar and place seedling at correct depth.



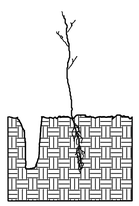
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5413	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

REFORESTATION

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

REFORESTATION

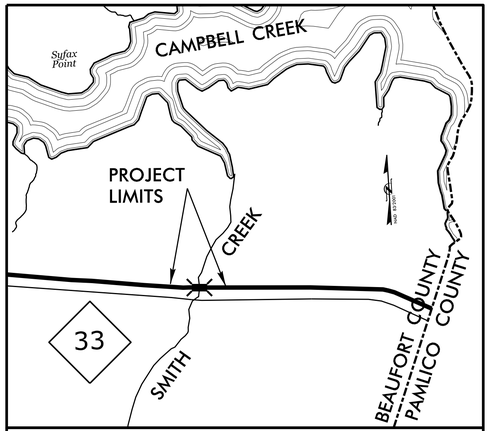
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

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

REFORESTATION DETAIL SHEET

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

TIP PROJECT: B–5413



VICINITY MAP
ON–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
BEAUFORT COUNTY

T.I.P. NO.	SHEET NO.
B–5413	UO–1

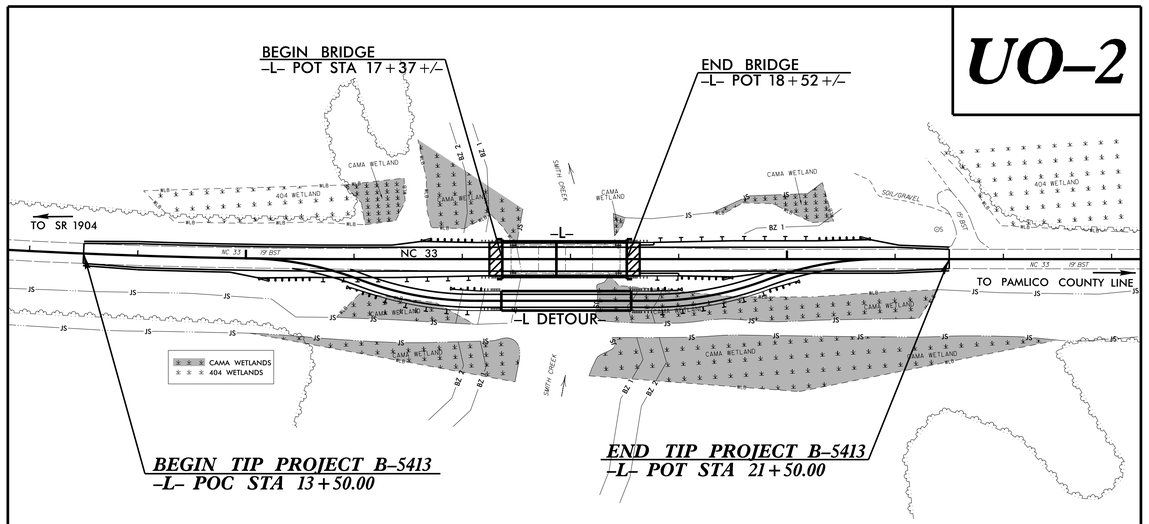
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: REPLACE BRIDGE NO. 20 OVER SMITH CREEK ON NC 33

TYPE OF WORK: TEMPORARY RELOCATION OF AERIAL POWER

NAD 83'2001

UO–2



BEGIN TIP PROJECT B–5413
–L– POC STA 13+50.00

END TIP PROJECT B–5413
–L– POT STA 21+50.00

FOR –L DETOUR– ALIGNMENT, SEE SHEET 2B–1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2	*UBO PLAN SHEET*
UO–3	*DETAIL SHEET*
UO–4	*DETAIL SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) POWER – TIDELAND EMC

PREPARED IN THE OFFICE OF:

M A Engineering Consultants, Inc.
598 East Chatham Street - Suite 137
Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221
NC License: F-0160

WEBB WHITE — *UTILITY PROJECT MANAGER*
DWAYNE SMITH — *PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
DIVISION 2
DIV ADDRESS
1037 W.H. SMITH BLVD
PO BOX 1587
GREENVILLE NC 27835

HEATHER LANE, P.E.
DIVISION 2
PROJECT DEVELOPMENT UNIT
DIVISION BRIDGE PROGRAM MANAGER

PROJECT REFERENCE NO.	SHEET NO.
B-5413	UO-2

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

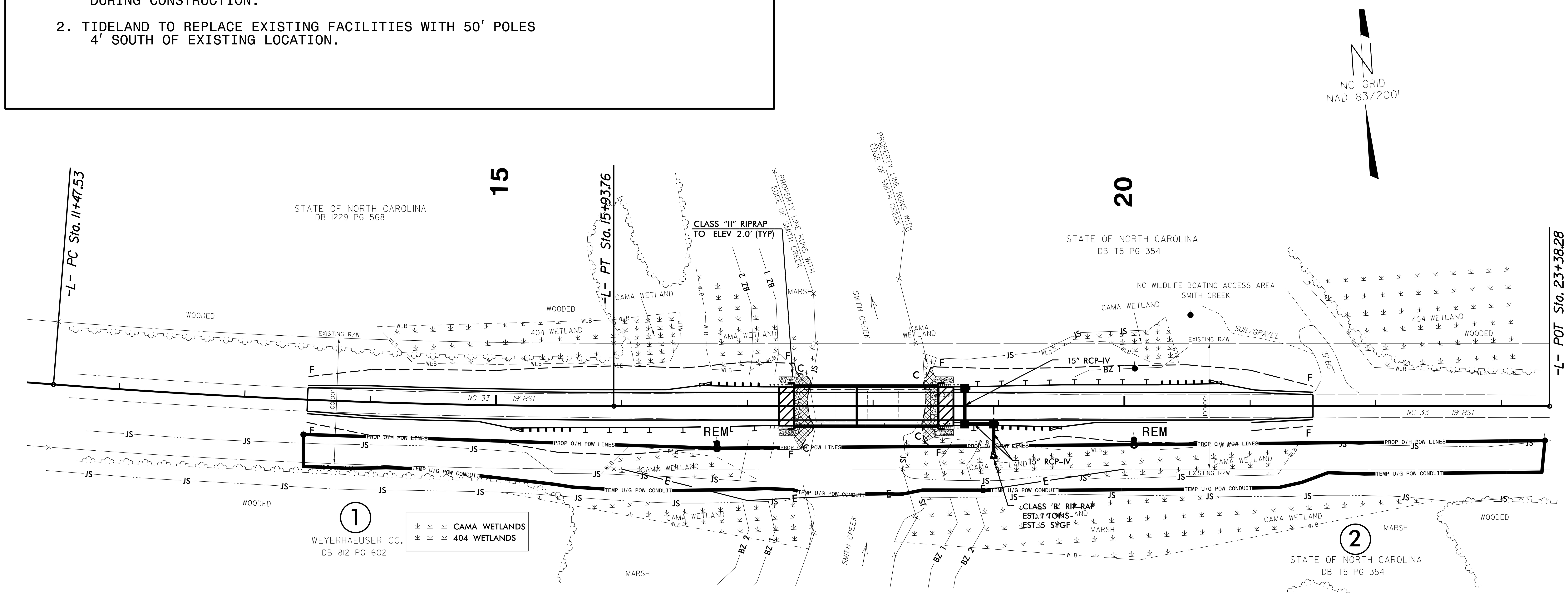
POWER: TIDELAND EMC
CONTACT: JOHN MARSH
1-800-637-1079 x4324

PRE CONSTRUCTION NOTES:

1. TIDELAND EMC TO LAY A TEMPORARY CONDUIT IN THE DITCH FROM STA # 13+45 TO STA# 23+38.
2. TIDELAND EMC TO PLACE TEMPORARY CABLE IN SCHEDULE 40 HDPE CONDUIT.
3. TIDELAND EMC TO USE WEIGHTED ANCHORS TO BE USED TO KEEP CONDUIT FROM FLOATING AND STABILIZE CONDUIT ON DITCH AND CREEK BOTTOM.
4. ANY REQUIRED EASEMENTS NEEDED TO PERFORM WORK WILL BE OBTAINED BY TIDELAND EMC.

POST CONSTRUCTION NOTES:

1. TIDELAND TO REMOVE POLES AT STA # 16+75 AND 19+90 DURING CONSTRUCTION.
2. TIDELAND TO REPLACE EXISTING FACILITIES WITH 50' POLES 4' SOUTH OF EXISTING LOCATION.



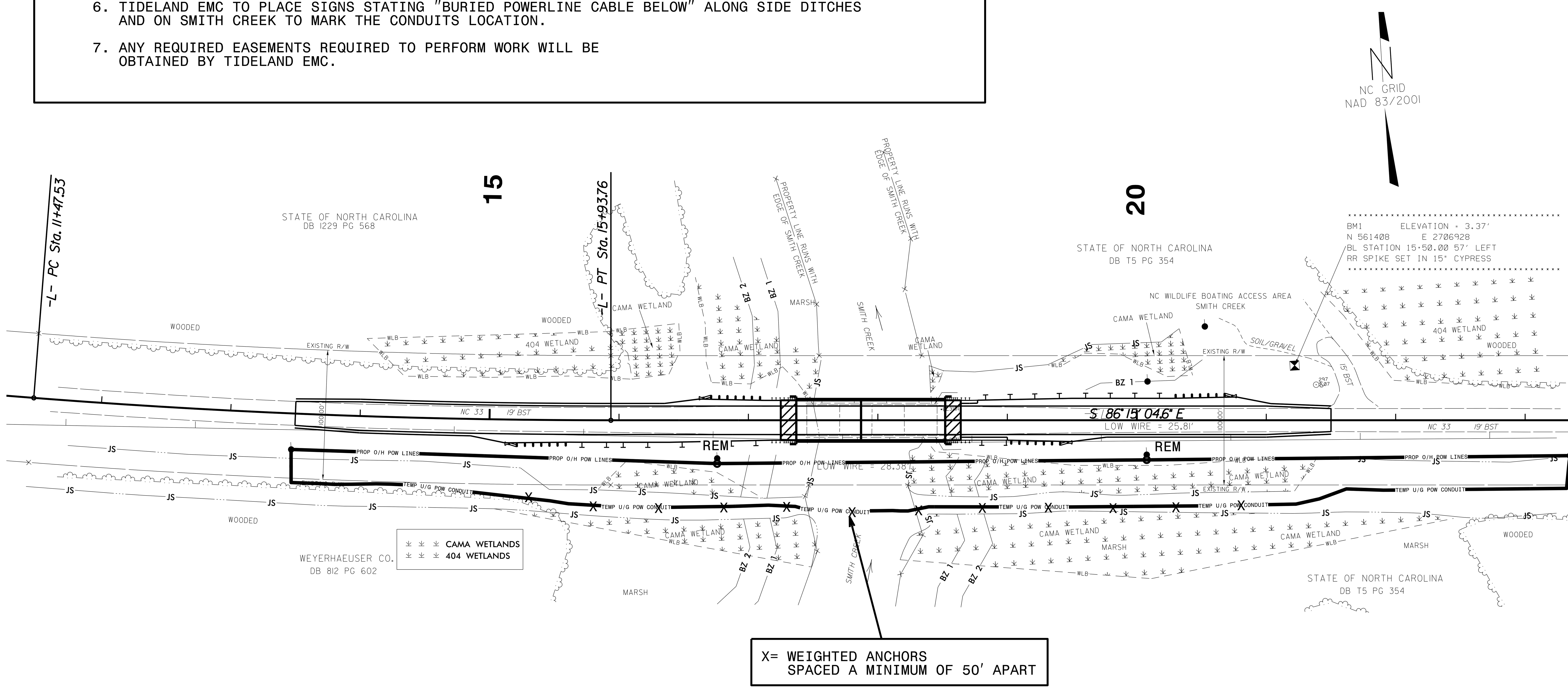
PROJECT REFERENCE NO.	SHEET NO.
B-5413	UO-3

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

POWER: TIDELAND EMC
CONTACT: JOHN MARSH
1-800-637-1079 x4324
NOTES:

1. TIDELAND EMC TO LAY A TEMPORARY CONDUIT IN THE DITCH FROM POLE AT STA # 13+45 TO POLE AT STA# 23+38.
2. TIDELAND EMC TO PLACE TEMPORARY CABLE IN SCHEDULE 40 HDPE CONDUIT. CONDUIT WILL BE OPEN ON BOTH ENDS AND FILLED WITH WATER TO MINIMIZE BOUYANCY.
3. TIDELAND EMC TO USE EPR (ETHYLENE PROPYLENE RUBBER) RUBBER COATED CABLE.
4. A MINIMUM OF 8# WEIGHTED ANCHORS TO BE USED TO KEEP CONDUIT FROM FLOATING. ANCHORS WILL BE ATTACHED TO CONDUIT WITH WRAP LOCK TIES.
5. ANCHORS TO BE PLACED AT APPROX 50′ INTERVALS ALONG SMITH CREEK STREAM BED AND SIDE DITCHES AS NEEDED TO STABILIZE CONDUIT ON CREEK BOTTOM. DISTANCES MAY BE SHORTER DEPENDING ON STABILIZATION NEEDS DEEMED NECESSARY AT TIME OF INSTALLATION.
6. TIDELAND EMC TO PLACE SIGNS STATING "BURIED POWERLINE CABLE BELOW" ALONG SIDE DITCHES AND ON SMITH CREEK TO MARK THE CONDUITS LOCATION.
7. ANY REQUIRED EASEMENTS REQUIRED TO PERFORM WORK WILL BE OBTAINED BY TIDELAND EMC.



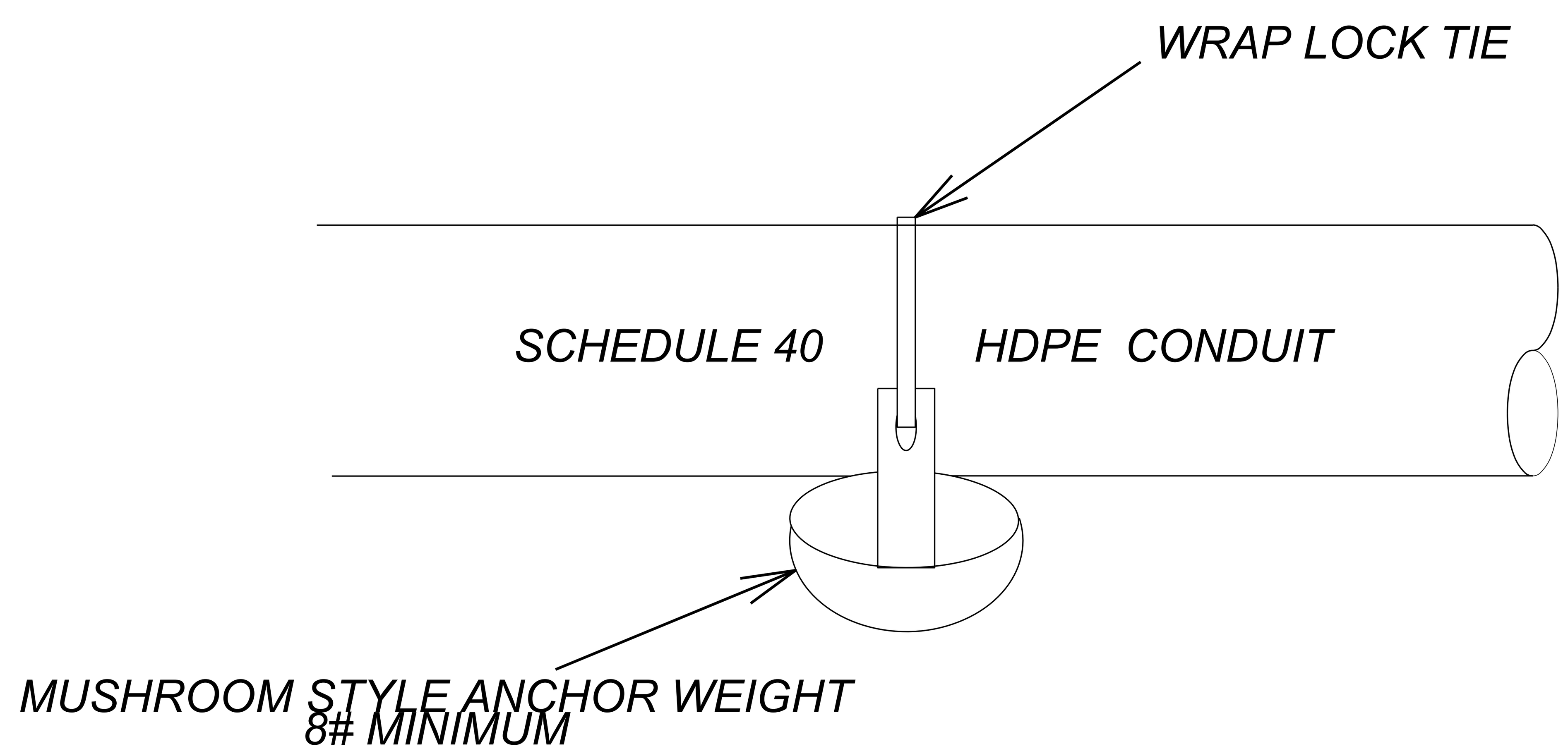
4/4/2018
R:\085\0696\026\11500 Beaufort 20\Roadway\Proj\UBO\b5413_uo_psh3 - DETAIL_20180403.dgn
8/17/99

8/17/99

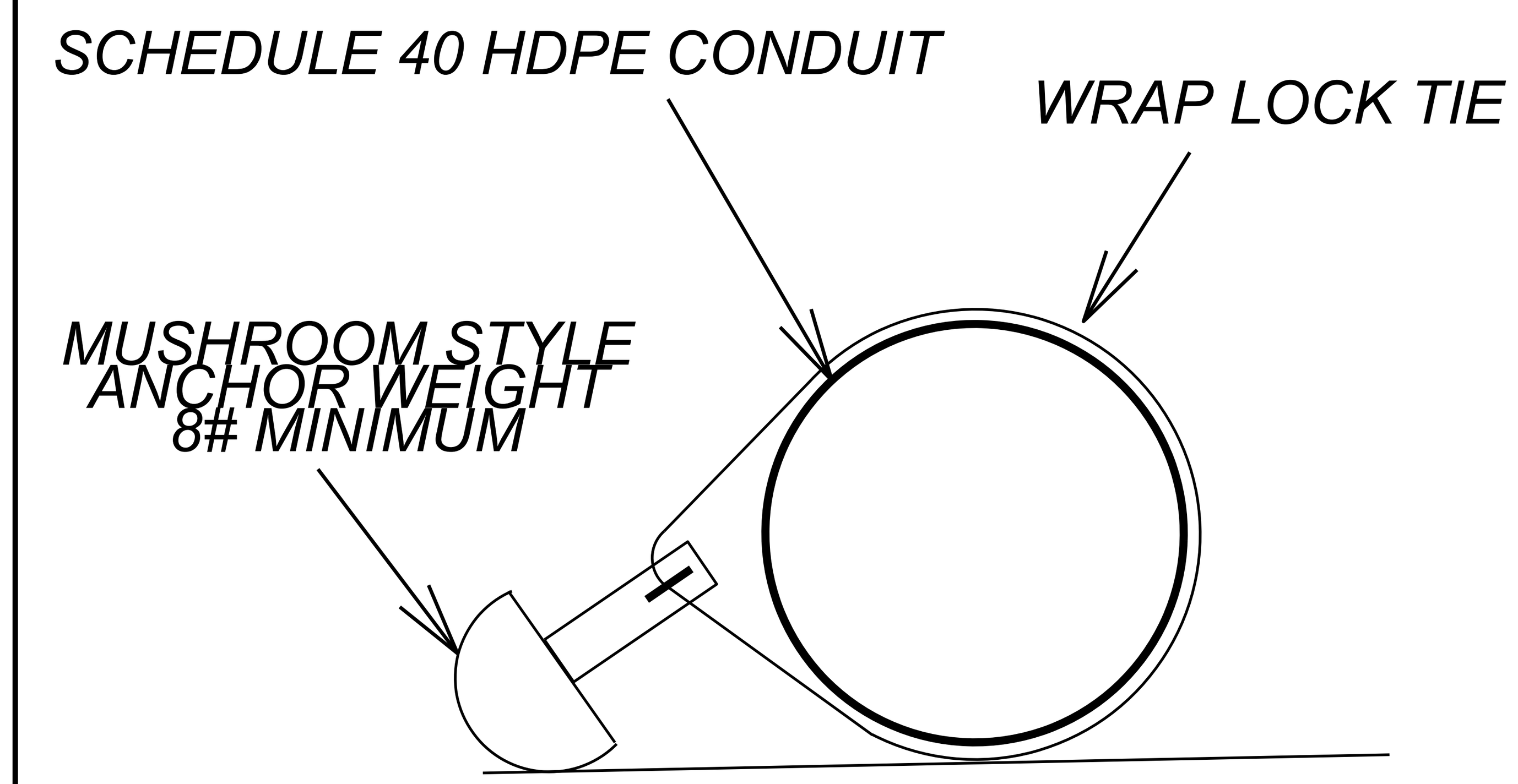
PROJECT REFERENCE NO.	SHEET NO.
B-5413	UO-4

UTILITIES BY OTHERS

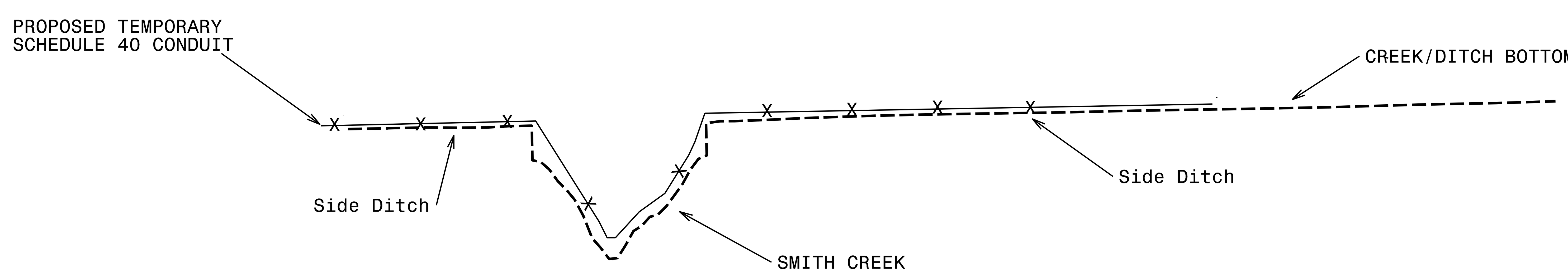
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.



SECTION VIEW
NTS



ANCHOR DETAIL
NTS

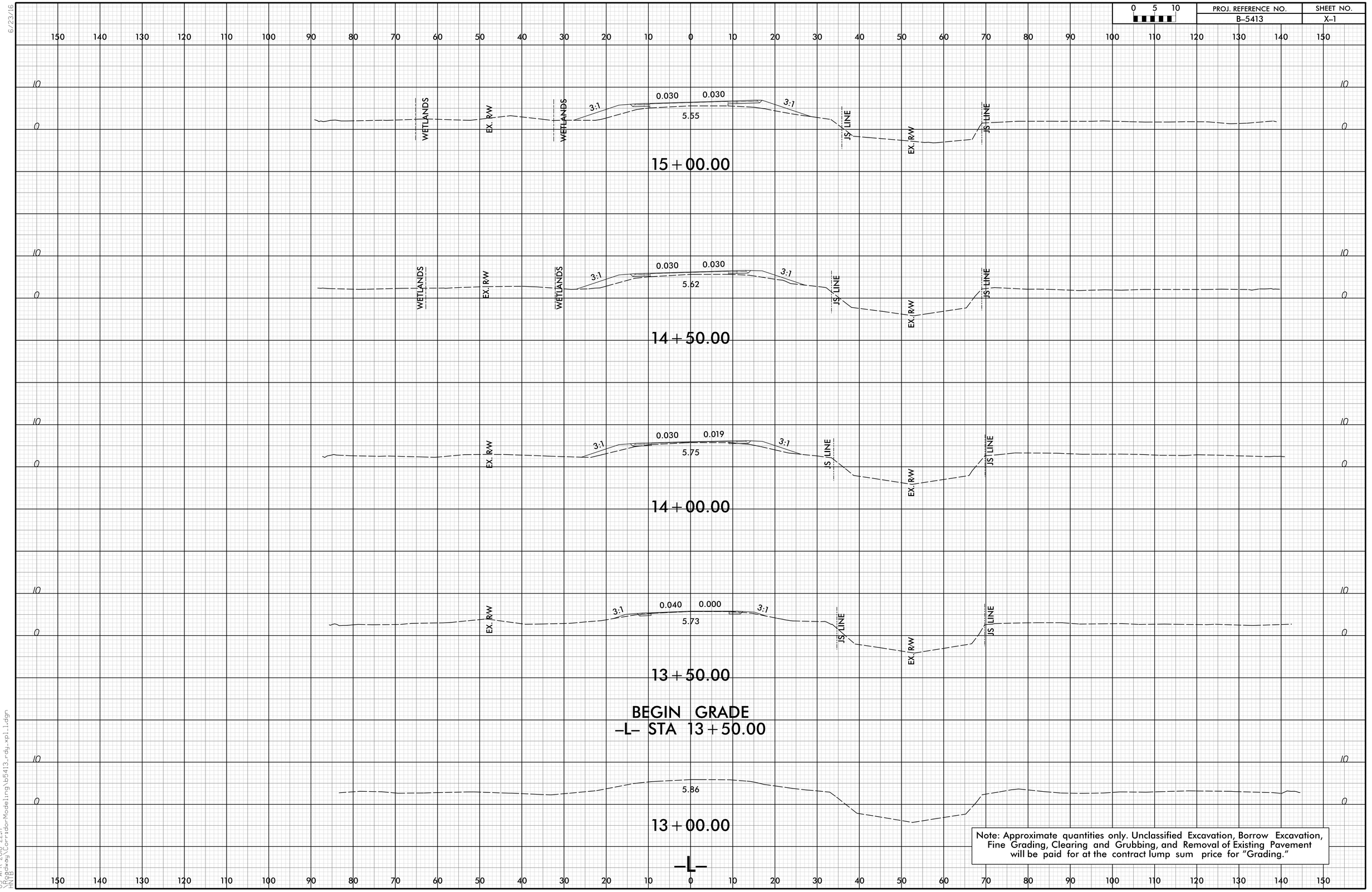


SECTION VIEW
NTS

2/15/2018
P:\JOBS\0696\026\11500 Beaufort 20\Roadway\Proj\UBO\b5413_uo-psh4 - DETAIL.dgn
11:06:08 AM

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-1



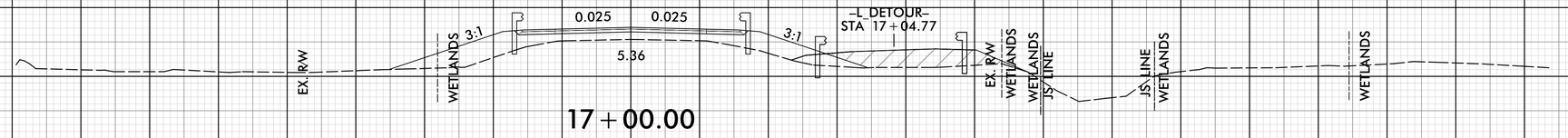
Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl1.dgn
HNTB

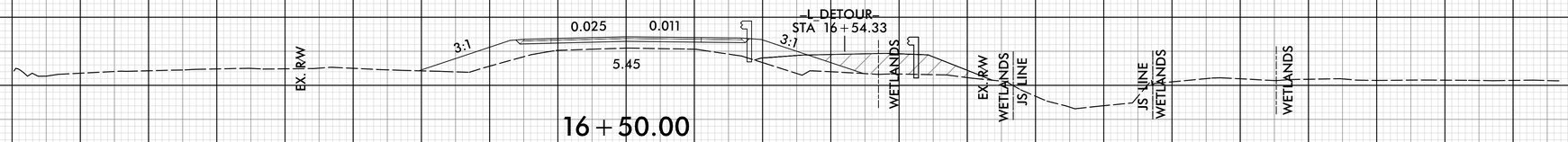
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-2

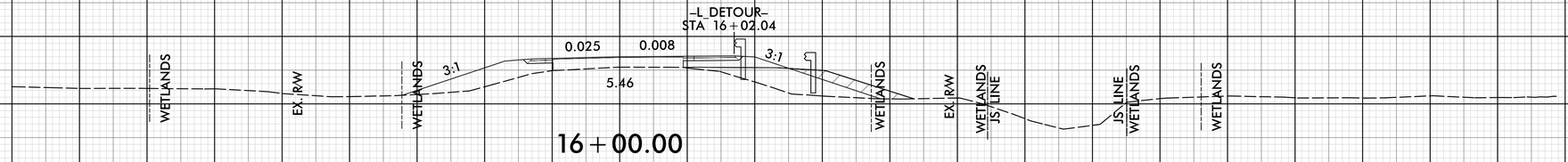
DETOUR REMOVAL EXCAVATION



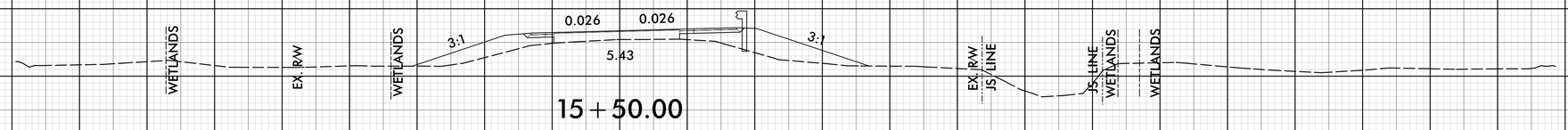
17+00.00



16+50.00



16+00.00



15+50.00

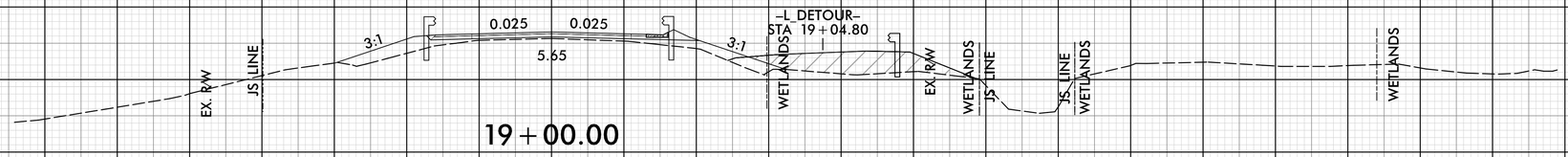
-L-

03-APR-2018 22:17
V:\Roadway\Corridor Modeling\b5413_rdy_xpl1.dgn
HNTB

6/23/16

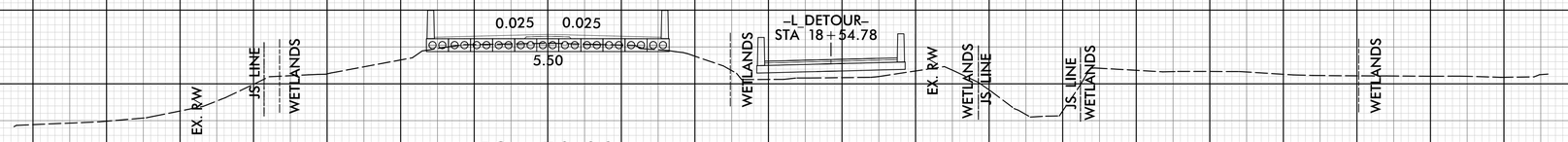
PROJ. REFERENCE NO.	SHEET NO.
B-5413	X-3

DETOUR REMOVAL EXCAVATION

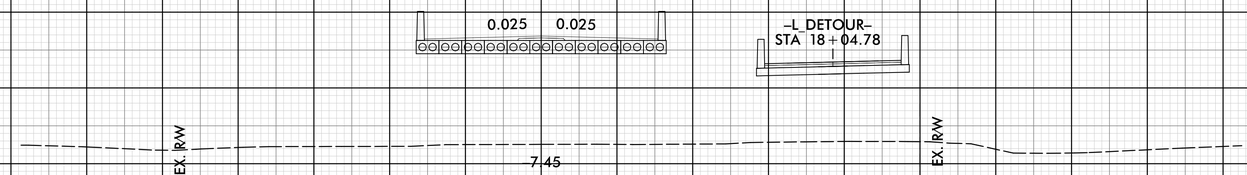


19+00.00

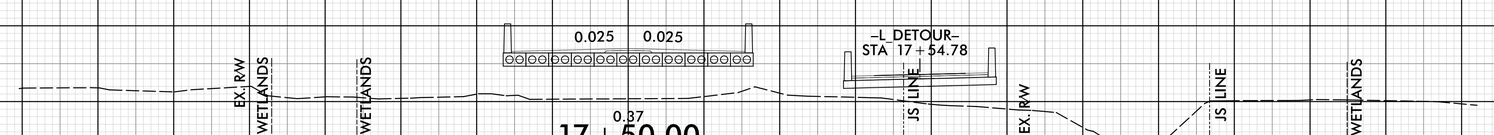
END BRIDGE
–L– STA 18+53.19



18+50.00



18+00.00



17+50.00
BEGIN BRIDGE
–L– STA 17+35.81
–L–

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl1.dgn
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	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

DETOUR REMOVAL EXCAVATION

END GRADE –L– STA 21+50.00

10 / 0

EX. R/W | 3:1 | 0.025 | 0.025 | 3:1 | 5.72 | JS LINE | EX. R/W | JS LINE WETLANDS | WETLANDS

21+50.00

10 / 0

EX. R/W | 3:1 | 0.025 | 0.025 | 3:1 | 5.76 | WETLANDS | EX. R/W WETLANDS JS LINE | JS LINE | WETLANDS

21+00.00

10 / 0

EX. R/W | 3:1 | 0.025 | 0.025 | 3:1 | 5.74 | WETLANDS | EX. R/W WETLANDS JS LINE | JS LINE WETLANDS | WETLANDS | WETLANDS

20+50.00

10 / 0

JS LINE WETLANDS | EX. R/W WETLANDS | 3:1 | –L DETOUR– STA 20+08.16 | 0.025 | 0.025 | 5.79 | 3:1 | WETLANDS | EX. R/W | WETLANDS JS LINE | JS LINE WETLANDS | WETLANDS

20+00.00

10 / 0

JS LINE WETLANDS | EX. R/W WETLANDS | 3:1 | 0.025 | 0.025 | –L DETOUR– STA 19+55.57 | 3:1 | 5.79 | WETLANDS | EX. R/W WETLANDS JS LINE | JS LINE WETLANDS | WETLANDS

19+50.00

–L–

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

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl1.dgn
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–5

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

10

0

–10

EX. R/W

WETLANDS

5.71

EX. R/W

WETLANDS

22+00.00

–L–

10

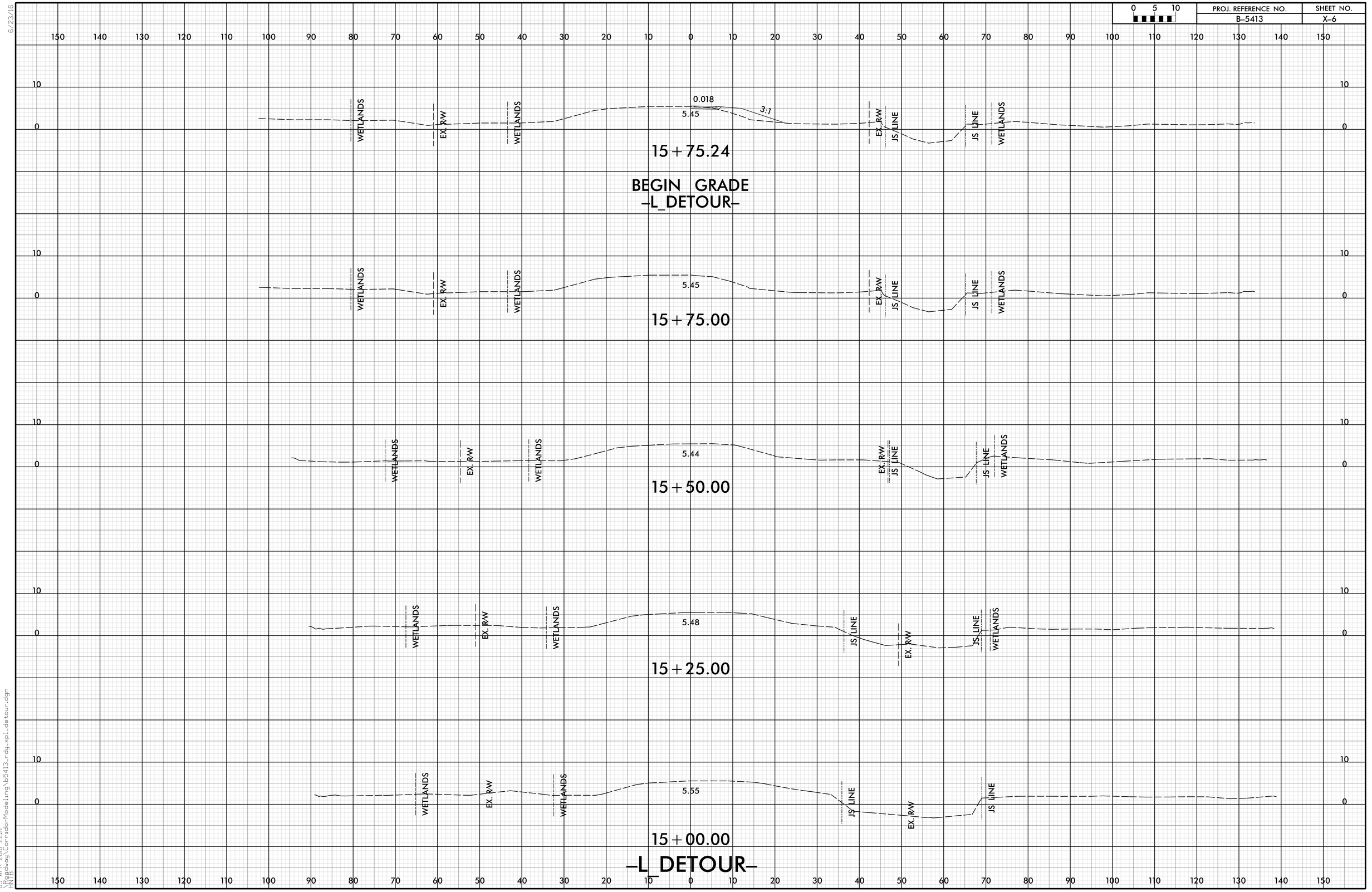
0

–10

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

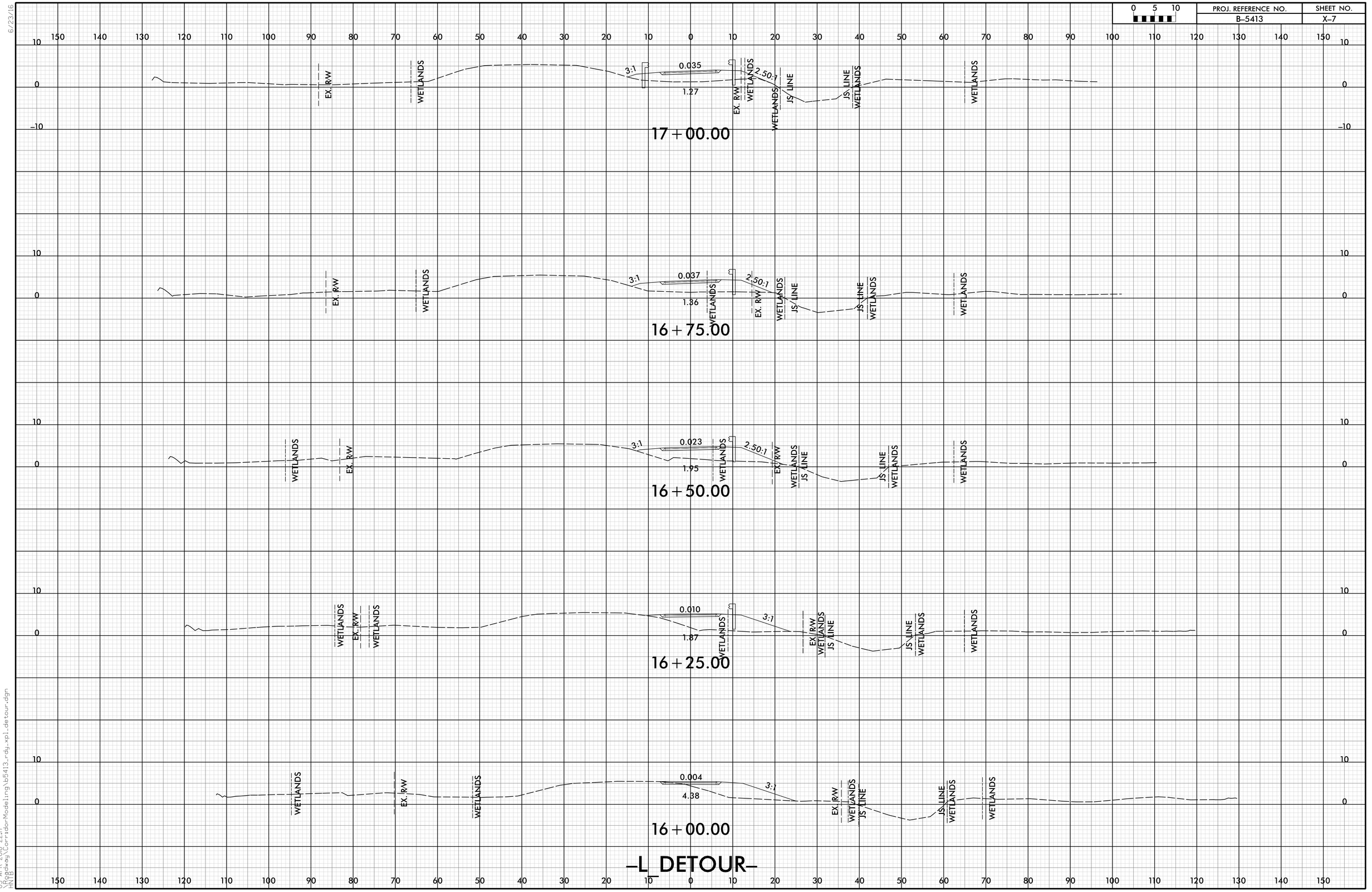
03-APR-2018 22:17
\Roadway\CorridorModeling\b5413_rdy_xpl1.dgn
HNTB

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-6



6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–7



03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl_detour.dgn
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–8

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

10
0
–10

0.025

EX. R/W

–7.96

EX. R/W

18 + 00.00

10
0
–10

0.025

EX. R/W

–6.35

EX. R/W

17 + 75.00

10
0

WETLANDS

EX. R/W

0.025

0.76

EX. R/W

JS LINE

JS LINE

WETLANDS

WETLANDS

17 + 50.00

BEGIN BRIDGE
–L_DETOUR– STA 17 + 40.90

10
0

WETLANDS

EX. R/W

WETLANDS

3:1

0.025

1.56

EX. R/W

VAR.

JS LINE

JS LINE

WETLANDS

WETLANDS

17 + 25.00

–L_DETOUR–

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

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl_detour.dgn
HNTB

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-9

6/23/16

03-APR-2018 22:17
\Roadway\Corridor-Modeling\b5413_rdy_xpl_detour.dgn

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-10

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

10 / 0

JS LINE · WETLANDS · EX. R/W · WETLANDS · 5.46 · WETLANDS · EX. R/W · WETLANDS · JS LINE · JS LINE · WETLANDS

20+25.00

END GRADE
–L_DETOUR– STA 20+21.24

0.018 · 3:1 · 5.44

20+21.24

0.007 · 3:1 · 4.91

JS LINE · WETLANDS · EX. R/W · WETLANDS · EX. R/W · WETLANDS · JS LINE · JS LINE · WETLANDS · WETLANDS

20+00.00

0.007 · 3:1 · 3.22

EX. R/W · JS LINE · WETLANDS · WETLANDS · EX. R/W · WETLANDS · JS LINE · JS LINE · WETLANDS · WETLANDS

19+75.00

0.021 · 2.50:1 · 1.84

EX. R/W · JS LINE · WETLANDS · WETLANDS · EX. R/W · WETLANDS · JS LINE · JS LINE · WETLANDS · WETLANDS

19+50.00

–L_DETOUR–

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

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl_detour.dgn
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–11

21+00.00

5.76

EX. R/W
WETLANDS
EX. R/W
JS LINE
JS LINE
WETLANDS
WETLANDS

20+75.00

5.72

EX. R/W
WETLANDS
EX. R/W
JS LINE
JS LINE
WETLANDS

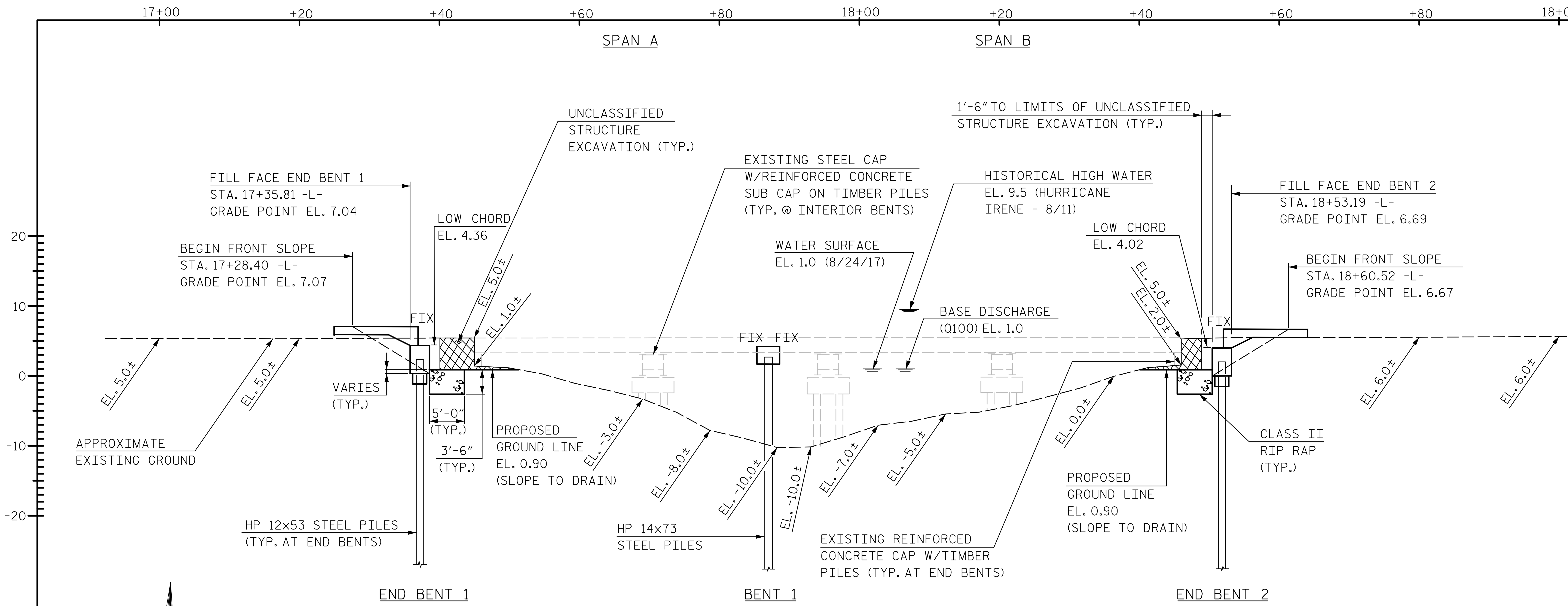
20+50.00

5.61

JS LINE
EX. R/W
WETLANDS
WETLANDS
EX. R/W
JS LINE
JS LINE
WETLANDS

–L_DETOUR–

03-APR-2018 22:17
X:\Roadway\CorridorModeling\b5413_rdy_xpl_detour.dgn
HNTB



SECTION ALONG ℄ -L-

FOR GENERAL NOTES, SEE SHEET 2.

BRIDGE HYDRAULIC DATA

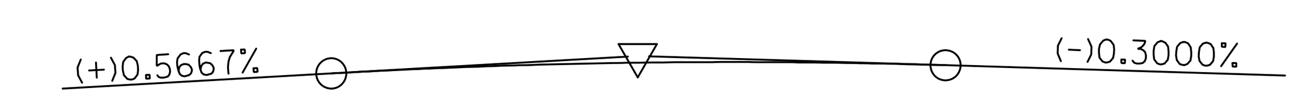
DESIGN DISCHARGE	=	750 CFS
FREQUENCY OF DESIGN FLOOD	=	50 YR
DESIGN HIGH WATER ELEVATION	=	1.0 FT.
DRAINAGE AREA	=	4.4 SQ. MI.
BASE DISCHARGE (Q100)	=	900 CFS
BASE HIGH WATER ELEVATION	=	1.0 FT.

OVERTOPPING FLOOD DATA

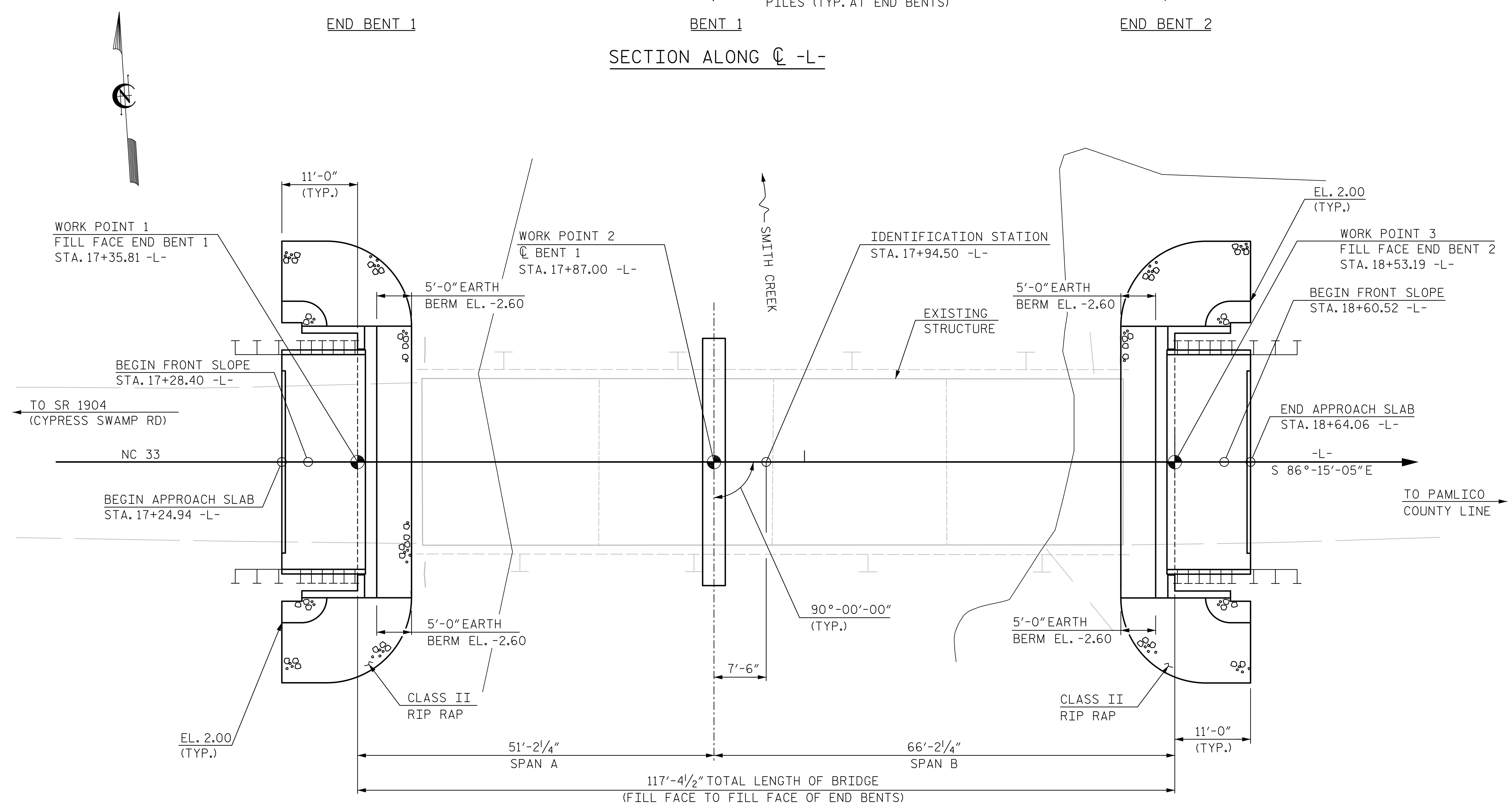
OVERTOPPING DISCHARGE	=	> 1300 (+) CFS
FREQUENCY OF OVERTOPPING FLOOD	=	> 500-YR (+)
OVERTOPPING FLOOD ELEVATION	=	5.7 FT.

NOTE: OVERTOPPING OCCURS AT ROADWAY STA. 22+00.00

PI STA. = 16+50.00
EL. = 7.30
V.C. = 160'



GRADE DATA -L-



PLAN

PILES NOT SHOWN FOR CLARITY.

CENTERLINE BRIDGE IS ON CENTERLINE SURVEY.

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 20

Paul J Barber

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON NC 33 OVER SMITH CREEK BETWEEN SR 1904 AND PAMLICO CO. LINE

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

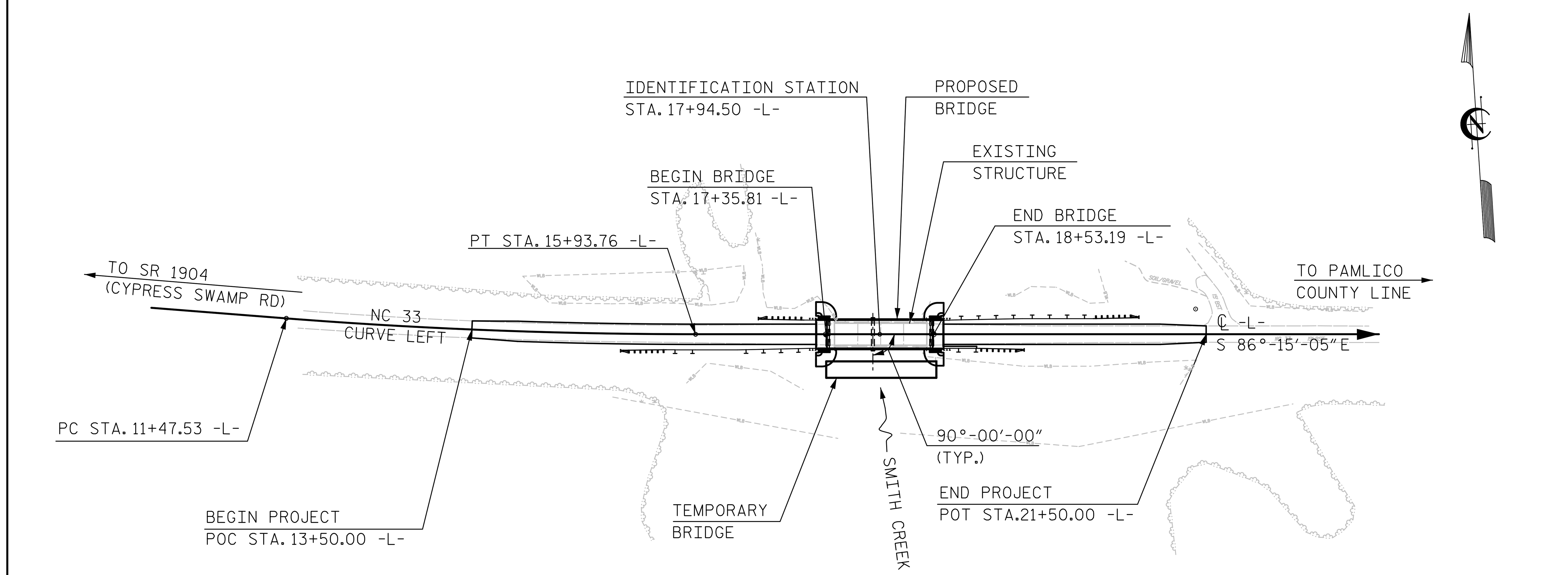
DRAWN BY J. BAYNE DATE 12/17
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 1

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-1
TOTAL SHEETS 17

BM: "BM1" - RAILROAD SPIKE IN BASE OF 15" CYPRESS, 42.31' LT. OF STA. 21+21.92 -L-, EL. 3.37



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 115 TONS PER PILE.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN -47.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION -20.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING TWO PRODUCTION PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 1, BENT NO. 1 OR END BENT NO. 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. STRUCTURE AT STATION 17+94.50	REMOVAL OF EXISTING STRUCTURE AT STATION 17+94.50 -L-	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 17+94.50 -L-	CLASS AA CONCRETE	BRIDGE APPROACH SLABS AT STATION 17+94.50 -L-	EPOXY COATED REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES	HP 12x53 STEEL PILES		HP 14x73 STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0"x2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE	—	LUMP SUM	—	—	—	—	LUMP SUM	—	—	—	—	—	—	—	—	230.50	—	—	LUMP SUM	22	1,265
END BENT 1	—	—	—	—	LUMP SUM	21.8	—	2,603	7	—	7	490	—	—	4	—	120	120	—	—	—
BENT 1	—	—	—	—	—	10.7	—	2,102	—	8	—	—	8	720	4	—	—	—	—	—	—
END BENT 2	—	—	—	—	LUMP SUM	21.8	—	2,603	7	—	7	560	—	—	4	—	115	115	—	—	—
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	LUMP SUM	54.3	LUMP SUM	7,308	14	8	14	1,050	8	720	12	230.50	235	235	LUMP SUM	22	1,265

GENERAL 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.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED. CONTRACTOR SHALL NOT PLACE A CRANE ON SPAN B.

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

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.

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 17+94.50 -L-.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 19.5 FT. ON EACH SIDE OF CENTERLINE BRIDGE 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 CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 17+94.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE EXISTING FOUR SPAN STRUCTURE WITH SPAN LENGTHS OF 25'-5", 2 SPANS @ 25'-0", AND 25'-5" WITH REINFORCED CONCRETE (RC) DECK AND 4.5" ASPHALT WEARING SURFACE ON 6 LINES OF CONTINUOUS W16X40 STEEL I BEAMS AT 4'-8" CENTERS WITH A 28.0' OUT TO OUT DECK WIDTH ON RC CAP AND TIMBER PILE END BENTS AND STEEL CAP AND RC SUB CAP AND TIMBER PILE INTERIOR BENTS SHALL BE REMOVED. IN ADDITION, ANY PILES REMAINING FROM PREVIOUS BRIDGE CONSTRUCTION OR MAINTENANCE OPERATIONS SHALL BE REMOVED AND INCLUDED IN THE LUMP SUM PAY ITEM FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 17+94.50 -L-"

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.

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.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND END BENT CAPS, AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE SPECIAL PROVISIONS.

ALL BAR SUPPORTS USED IN THE BARRIER RAIL, BENT CAPS, END BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE BENT CAPS AND PILES IN END BENT NO. 1, BENT NO. 1 AND END BENT NO. 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

THICKNESS OF THE THERMAL SPRAY COATING AND SEAL THICKNESS FOR STEEL PILES SHALL BE PER TABLE 2 OF THE THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM.

PROJECT NO. B-5413

BEAUFORT **COUNTY**

STATION: 17+94.50 -L-

SHEET 2 OF 2

DocuSigned by:
Paul J Barber
8DF1B5768741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

5/15/2018 5:30 PM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON NC 33
OVER SMITH CREEK
BETWEEN SR 1904
AND PAMLICO CO. LINE

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 12/17
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 2

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.	S-2
1			3			TOTAL SHEETS	17
2			4				

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	2.053	--	1.75	0.276	2.26	50′	EL	29.5	0.52	**2.05**	50′	EL	**5.9**	0.80	0.276	2.22	50′	EL	29.5	
		HL-93(Opr)	N/A	--	2.661	--	1.35	0.276	2.93	50′	EL	29.5	0.52	2.66	50′	EL	5.9	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	2.47	88.93	1.75	0.276	2.86	50′	EL	29.5	0.52	**2.47**	50′	EL	**5.9**	0.80	0.276	2.81	50′	EL	29.5	
		HS-20(Opr)	36.000	--	3.202	115.279	1.35	0.276	3.71	50′	EL	29.5	0.52	3.2	50′	EL	5.9	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.053	81.711	1.4	0.276	7.7	50′	EL	29.5	0.52	7.14	50′	EL	5.9	0.80	0.276	6.05	50′	EL	29.5	
		SNGARBS2	20.000	--	4.634	92.672	1.4	0.276	5.89	50′	EL	29.5	0.52	5.14	50′	EL	5.9	0.80	0.276	4.63	50′	EL	29.5	
		SNAGRIS2	22.000	--	4.43	97.466	1.4	0.276	5.65	50′	EL	29.5	0.52	4.8	50′	EL	5.9	0.80	0.276	4.43	50′	EL	29.5	
		SNCOTTS3	27.250	--	3.015	82.171	1.4	0.276	3.84	50′	EL	29.5	0.52	3.57	50′	EL	5.9	0.80	0.276	3.02	50′	EL	29.5	
		SNAGGRS4	34.925	--	2.567	89.643	1.4	0.276	3.27	50′	EL	29.5	0.52	3.01	50′	EL	5.9	0.80	0.276	2.57	50′	EL	29.5	
		SNS5A	35.550	--	2.507	89.116	1.4	0.276	3.19	50′	EL	29.5	0.52	3.07	50′	EL	5.9	0.80	0.276	2.51	50′	EL	29.5	
		SNS6A	39.950	--	2.32	92.685	1.4	0.276	2.95	50′	EL	29.5	0.52	2.82	50′	EL	5.9	0.80	0.276	2.32	50′	EL	29.5	
		SNS7B	42.000	--	2.21	92.825	1.4	0.276	2.81	50′	EL	29.5	0.52	2.8	50′	EL	5.9	0.80	0.276	2.21	50′	EL	29.5	
	TTST	TNAGRIT3	33.000	--	2.835	93.559	1.4	0.276	3.61	50′	EL	29.5	0.52	3.34	50′	EL	5.9	0.80	0.276	2.84	50′	EL	29.5	
		TNT4A	33.075	--	2.853	94.369	1.4	0.276	3.63	50′	EL	29.5	0.52	3.24	50′	EL	5.9	0.80	0.276	2.85	50′	EL	29.5	
		TNT6A	41.600	--	2.352	97.863	1.4	0.276	2.99	50′	EL	29.5	0.52	3.03	50′	EL	5.9	0.80	0.276	2.35	50′	EL	29.5	
		TNT7A	42.000	--	2.375	99.744	1.4	0.276	3.02	50′	EL	29.5	0.52	2.89	50′	EL	5.9	0.80	0.276	2.37	50′	EL	29.5	
		TNT7B	42.000	--	2.475	103.971	1.4	0.276	3.16	50′	EL	29.5	0.52	2.71	50′	EL	5.9	0.80	0.276	2.48	50′	EL	29.5	
		TNAGRIT4	43.000	--	2.343	100.737	1.4	0.276	2.98	50′	EL	29.5	0.52	2.62	50′	EL	5.9	0.80	0.276	2.34	50′	EL	29.5	
		TNAGT5A	45.000	--	2.2	98.988	1.4	0.276	2.8	50′	EL	29.5	0.52	2.63	50′	EL	5.9	0.80	0.276	2.20	50′	EL	29.5	
		TNAGT5B	45.000	3	**2.165**	97.428	1.4	0.276	2.75	50′	EL	29.5	0.52	2.49	50′	EL	5.9	0.80	0.276	**2.17**	50′	EL	**29.5**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

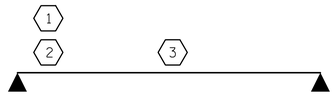
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'A'

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

DocuSigned by: Paul J Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 50′ CORED SLAB UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : CVC 6/10	
CHECKED BY : DNS 6/10	

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 1/18
CHECKED BY P. BARBER DATE 2/18

DWG. NO. 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			17

STD. NO. 24LRFR1_90S_50L (TOP DOWN)

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	1.018	--	1.75	0.274	1.05	65′	EL	32	0.513	1.2	65′	EL	6.4	0.80	0.274	**1.02**	65′	EL	**32**	
		HL-93(Opr)	N/A	--	1.358	--	1.35	0.274	1.36	65′	EL	32	0.513	1.56	65′	EL	6.4	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.306	47.014	1.75	0.274	1.34	65′	EL	32	0.513	1.48	65′	EL	6.4	0.80	0.274	**1.31**	65′	EL	**32**	
		HS-20(Opr)	36.000	--	1.742	62.706	1.35	0.274	1.74	65′	EL	32	0.513	1.92	65′	EL	6.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.868	38.725	1.4	0.274	3.69	65′	EL	32	0.513	4.33	65′	EL	6.4	0.80	0.274	2.87	65′	EL	32	
		SNGARBS2	20.000	--	2.171	43.424	1.4	0.274	2.79	65′	EL	32	0.513	3.11	65′	EL	6.4	0.80	0.274	2.17	65′	EL	32	
		SNAGRIS2	22.000	--	2.071	45.552	1.4	0.274	2.66	65′	EL	32	0.513	2.89	65′	EL	6.4	0.80	0.274	2.07	65′	EL	32	
		SNCOTTS3	27.250	--	1.428	38.924	1.4	0.274	1.84	65′	EL	32	0.513	2.17	65′	EL	6.4	0.80	0.274	1.43	65′	EL	32	
		SNAGGRS4	34.925	--	1.206	42.136	1.4	0.274	1.55	65′	EL	32	0.513	1.81	65′	EL	6.4	0.80	0.274	1.21	65′	EL	32	
		SNS5A	35.550	--	1.179	41.911	1.4	0.274	1.52	65′	EL	32	0.513	1.85	65′	EL	6.4	0.80	0.274	1.18	65′	EL	32	
		SNS6A	39.950	--	1.087	43.43	1.4	0.274	1.4	65′	EL	32	0.513	1.69	65′	EL	6.4	0.80	0.274	1.09	65′	EL	32	
		SNS7B	42.000	--	1.035	43.489	1.4	0.274	1.33	65′	EL	32	0.513	1.67	65′	EL	6.4	0.80	0.274	1.04	65′	EL	32	
	TTST	TNAGRIT3	33.000	--	1.327	43.8	1.4	0.274	1.71	65′	EL	32	0.513	2.01	65′	EL	6.4	0.80	0.274	1.33	65′	EL	32	
		TNT4A	33.075	--	1.335	44.142	1.4	0.274	1.72	65′	EL	32	0.513	1.95	65′	EL	6.4	0.80	0.274	1.33	65′	EL	32	
		TNT6A	41.600	--	1.096	45.613	1.4	0.274	1.41	65′	EL	32	0.513	1.8	65′	EL	6.4	0.80	0.274	1.10	65′	EL	32	
		TNT7A	42.000	--	1.105	46.4	1.4	0.274	1.42	65′	EL	32	0.513	1.74	65′	EL	6.4	0.80	0.274	1.10	65′	EL	32	
		TNT7B	42.000	--	1.15	48.298	1.4	0.274	1.48	65′	EL	32	0.513	1.62	65′	EL	6.4	0.80	0.274	1.15	65′	EL	32	
		TNAGRIT4	43.000	--	1.089	46.815	1.4	0.274	1.4	65′	EL	32	0.513	1.57	65′	EL	6.4	0.80	0.274	1.09	65′	EL	32	
		TNAGT5A	45.000	--	1.024	46.084	1.4	0.274	1.32	65′	EL	32	0.513	1.57	65′	EL	6.4	0.80	0.274	1.02	65′	EL	32	
		TNAGT5B	45.000	3	1.01	45.431	1.4	0.274	1.3	65′	EL	32	0.513	1.49	65′	EL	6.4	0.80	0.274	**1.01**	65′	EL	**32**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

(1)
(2)
(3)

LRFR SUMMARY
FOR SPAN 'B'

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

DocuSigned by: Paul J Barber 3BDF1B57368741E...
3/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR 65′ CORED SLAB UNIT 90° SKEW
(NON-INTERSTATE TRAFFIC)

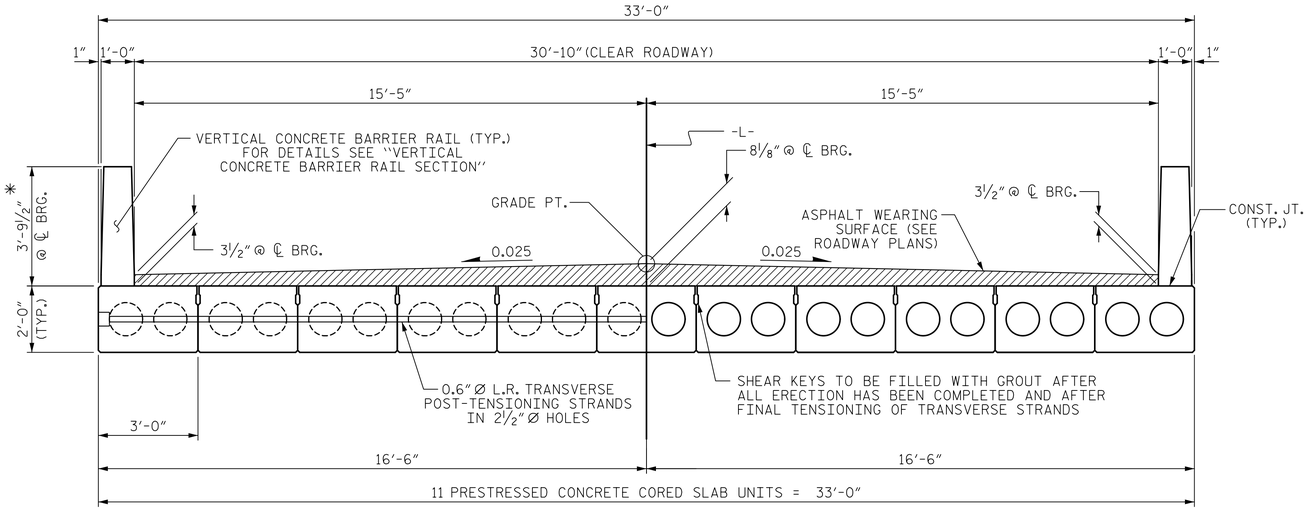
ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : CVC 6/10	
CHECKED BY : DNS 6/10	

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 1/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			17

STD. NO. 24LRFR1_90S_65L



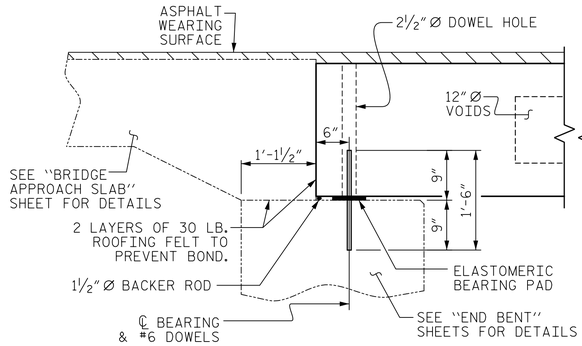
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

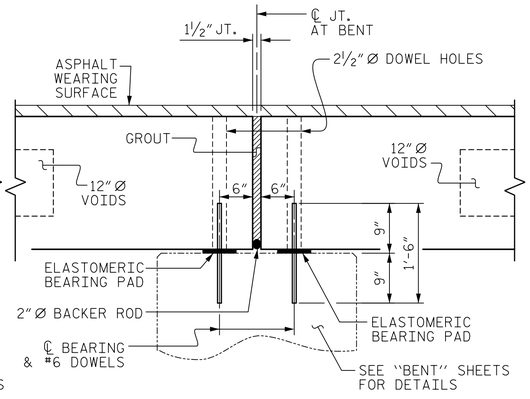
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE ''VERTICAL CONCRETE BARRIER RAIL SECTION'' DETAIL.

FIXED END

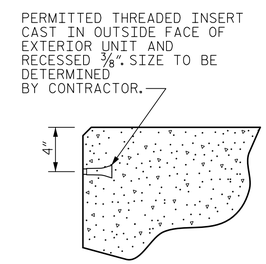


SECTION AT END BENT

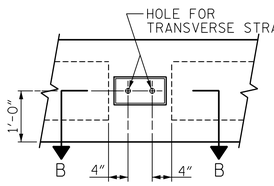
FIXED END FIXED END



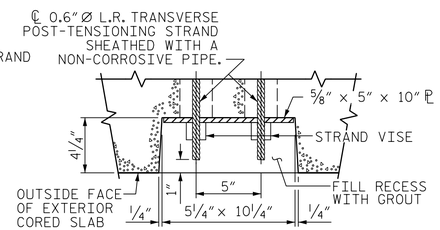
SECTION AT BENT



THREADED INSERT DETAIL

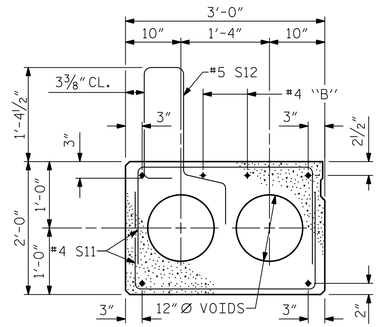


ELEVATION VIEW



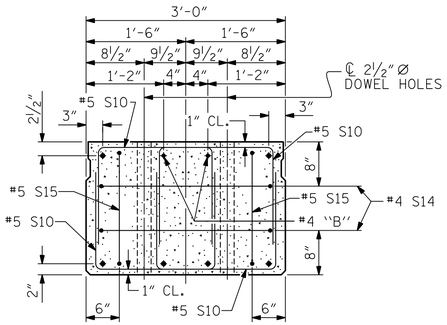
SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



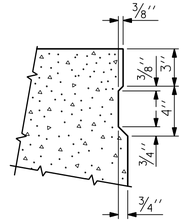
EXTERIOR SLAB SECTION

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



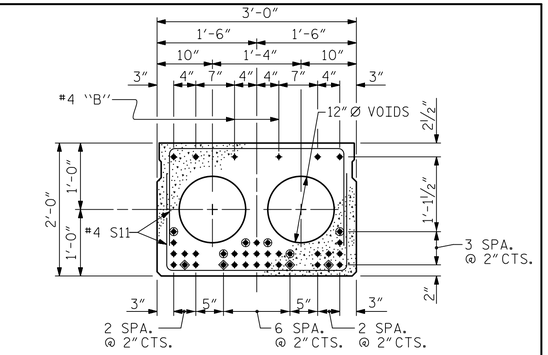
END ELEVATION

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.



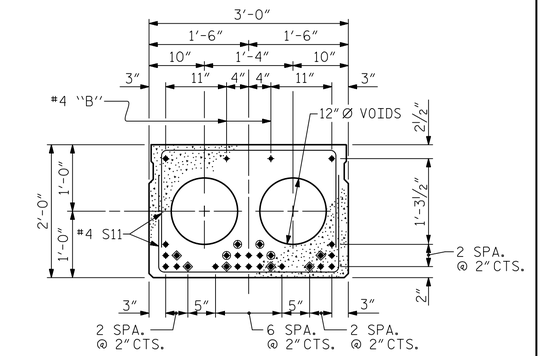
SHEAR KEY DETAIL

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



INTERIOR SLAB SECTION (50′)(TOP DOWN)

(31 STRANDS REQUIRED)



INTERIOR SLAB SECTION (65′ UNIT)

(24 STRANDS REQUIRED)

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.

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 1 OF 4

DocuSigned by: Paul J Barber
18DF1B57368741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3′-0′′ X 2′-0′′ PRESTRESSED CONCRETE CORED SLAB UNIT

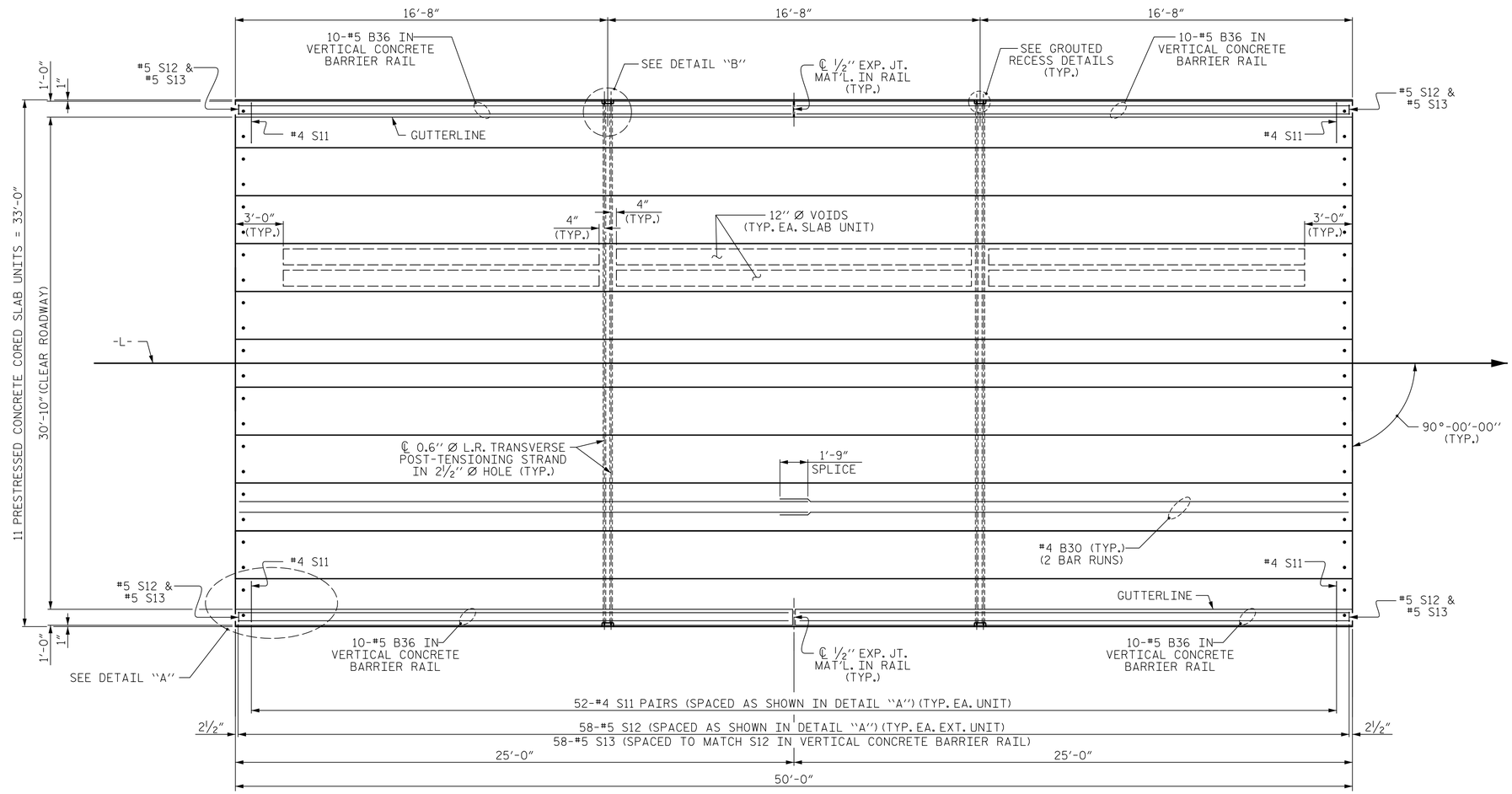
ASSEMBLED BY : J. BAYNE	DATE : 2/18		
CHECKED BY : P. BARBER	DATE : 2/18		
DRAWN BY : MAA 6/10	REV. 9/14 MAA/TMG		
CHECKED BY : MKT 7/10			

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

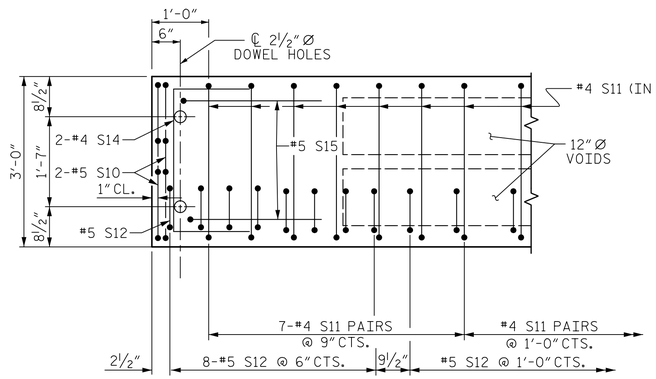
DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			17

STD. NO. 24PCS4_33_90S

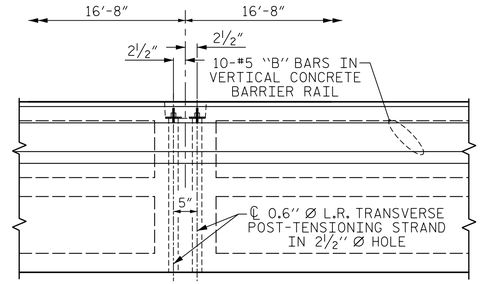


PLAN OF UNIT



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 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

DocuSigned by: Paul J Barber
3/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : J. BAYNE	DATE : 2/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : MAA 7/10	REV. 12/5/11 MAA/AAC
CHECKED BY : MKT 8/10	REV. 8/14 MAA/TMG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 6

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

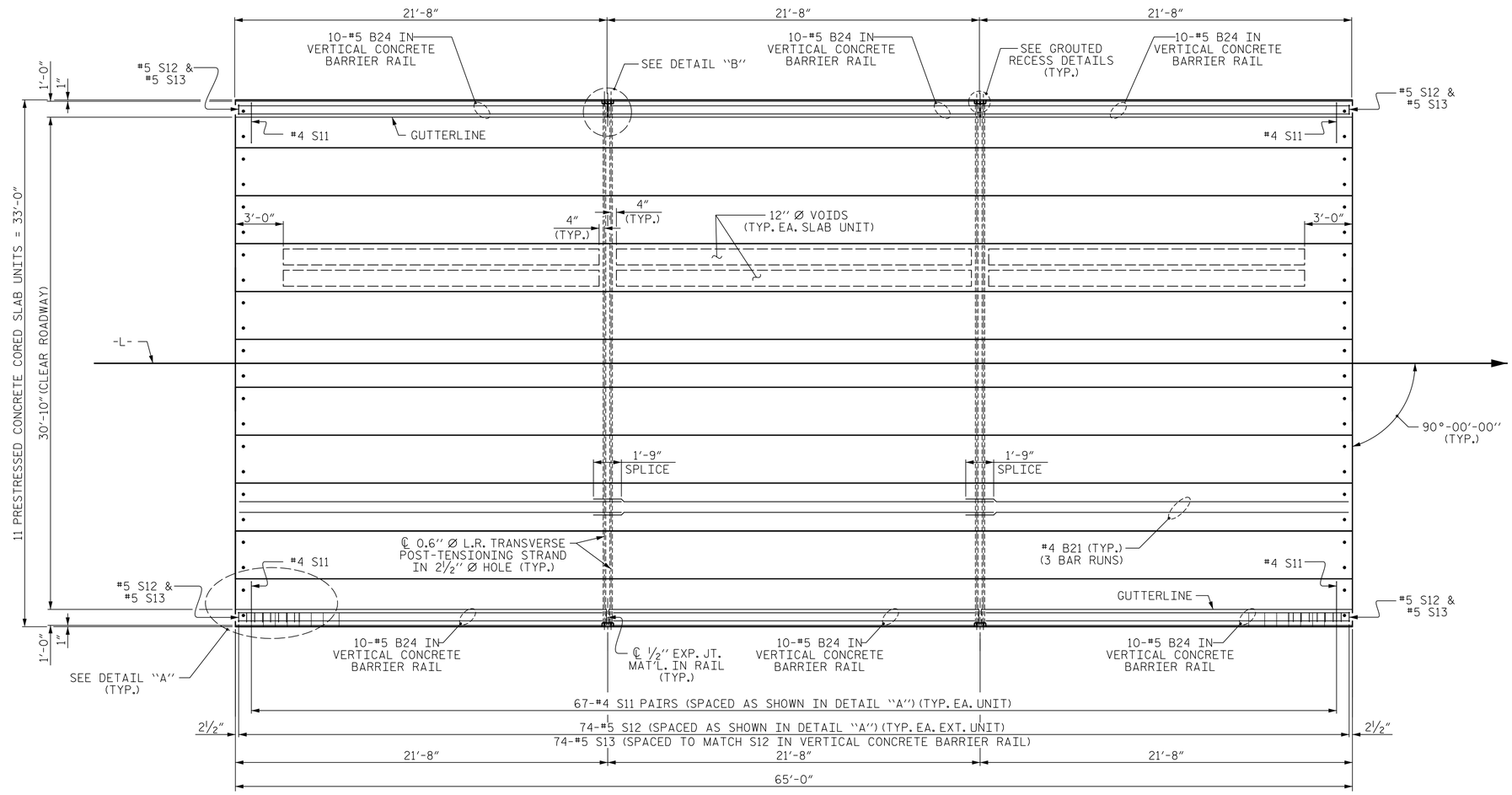
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

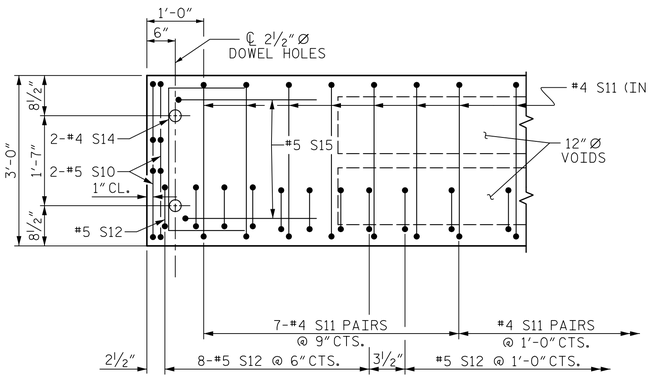
PLAN OF 50′ UNIT 30′-10″ CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			17

STD. NO. 24PCS_33_90S_50L (TOP DOWN)

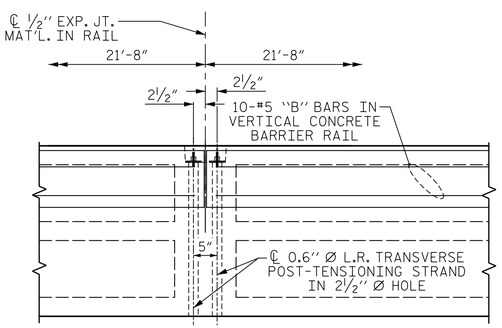


PLAN OF UNIT



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 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

ASSEMBLED BY : J. BAYNE	DATE : 1/18		
CHECKED BY : P. BARBER	DATE : 2/18		
DRAWN BY : MAA	6/10	REV. 12/5/11	MAA/AAC
CHECKED BY : MKT	7/10	REV. 8/14	MAA/TMG

DocuSigned by: Paul J Barber
3/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 1/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 7

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			17

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 65′ UNIT 30′-10″ CLEAR ROADWAY 90° SKEW

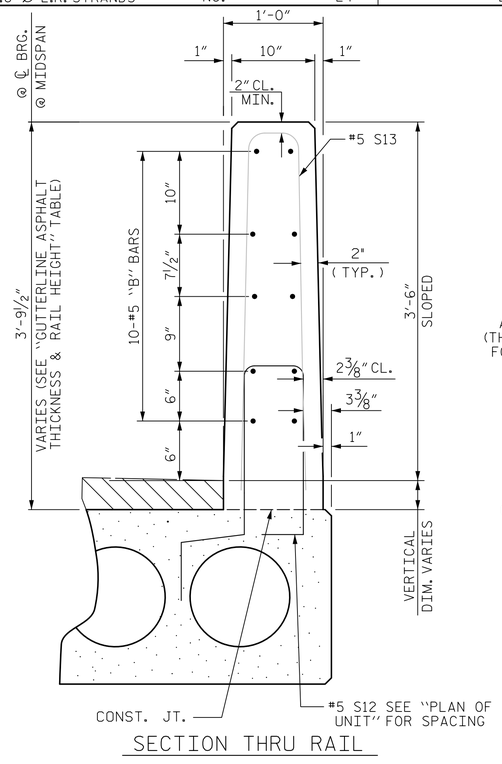
STD. NO. 24PCS_33_90S_65L

BILL OF MATERIAL FOR ONE 50′ CORED SLAB UNIT

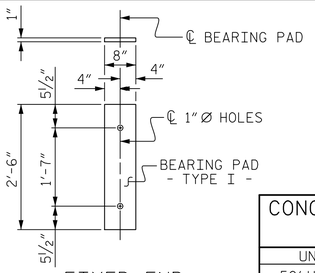
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B30	4	#4	STR	25′-9″	69	25′-9″	69
S10	8	#5	3	4′-9″	40	4′-9″	40
S11	104	#4	3	5′-10″	405	5′-10″	405
✳S12	58	#5	1	5′-7″	338		
S14	4	#4	3	5′-7″	15	5′-7″	15
S15	4	#5	3	7′-1″	30	7′-1″	30
REINFORCING STEEL			LBS.		559		559
✳EPOXY COATED REINFORCING STEEL			LBS.		338		
8500 P.S.I. CONCRETE			CU. YDS.		8.6		8.6
0.6″Ø L.R. STRANDS			No.		31		31

BILL OF MATERIAL FOR ONE 65′ CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B21	6	#4	STR	22′-10″	92	22′-10″	92
S10	8	#5	3	4′-9″	40	4′-9″	40
S11	134	#4	3	5′-10″	522	5′-10″	522
✳S12	74	#5	1	5′-7″	431		
S14	4	#4	3	5′-7″	15	5′-7″	15
S15	4	#5	3	7′-1″	30	7′-1″	30
REINFORCING STEEL			LBS.		699		699
✳EPOXY COATED REINFORCING STEEL			LBS.		431		
6000 P.S.I. CONCRETE			CU. YDS.		11.0		11.0
0.6″Ø L.R. STRANDS			No.		24		24



SECTION THRU RAIL



FIXED END
(TYPE I - 44 REQ′D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

CONCRETE RELEASE STRENGTH

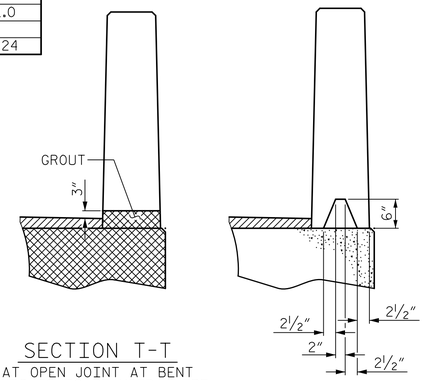
UNIT	PSI
50′ UNITS	6200
65′ UNITS	4800

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
50′ UNIT			
EXTERIOR C.S.	9	50′-0″	450′-0″
INTERIOR C.S.	2	50′-0″	100′-0″
TOTAL	11		550′-0″

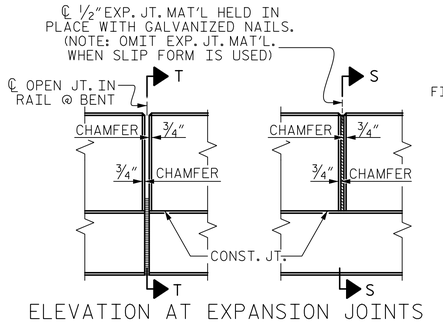
CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
65′ UNIT			
EXTERIOR C.S.	9	65′-0″	585′-0″
INTERIOR C.S.	2	65′-0″	130′-0″
TOTAL	11		715′-0″



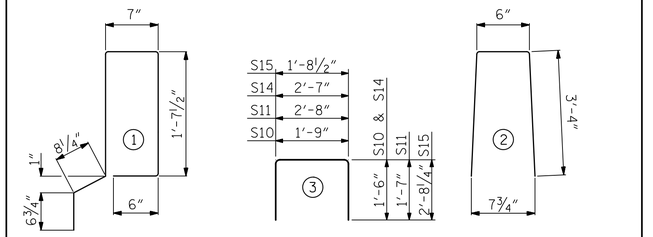
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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



ELEVATION AT EXPANSION JOINTS

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
	50′ UNIT					
✳B36	40	40	#5	STR	24′-7″	1026
✳S13	116	116	#5	2	7′-2″	867
✳EPOXY COATED REINFORCING STEEL				LBS.		1893
CLASS AA CONCRETE				CU.YDS.		13.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		100.25

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	65′ UNIT					
✳B24	60	60	#5	STR	21′-3″	1330
✳S13	148	148	#5	2	7′-2″	1106
✳EPOXY COATED REINFORCING STEEL				LBS.		2436
CLASS AA CONCRETE				CU.YDS.		16.9
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		130.25

DEAD LOAD DEFLECTION AND CAMBER

	3′-0″ x 2′-0″
50′ CORED SLAB UNIT	0.6″Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½″ ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	⅛″ ↓
FINAL CAMBER	1⅜″ ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

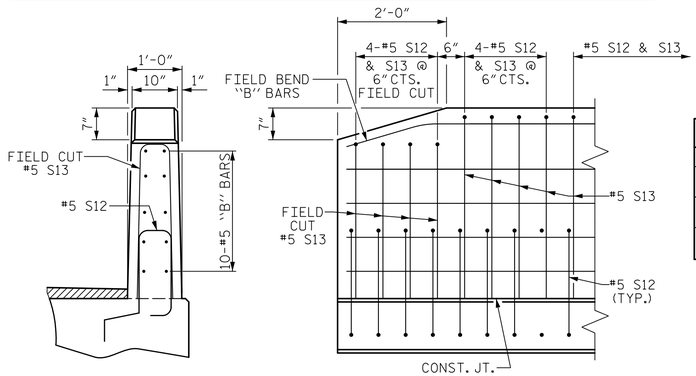
DEAD LOAD DEFLECTION AND CAMBER

	3′-0″ x 2′-0″
65′ CORED SLAB UNIT	0.6″Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1⅞″ ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	½″ ↓
FINAL CAMBER	1⅜″ ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
50′ UNITS	2⅛″	3′-8⅛″
65′ UNITS	2⅛″	3′-8⅛″



END VIEW

SIDE VIEW

END OF RAIL DETAILS

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 2½″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.

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.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS 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, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A 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.

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.

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.

PRESTRESSED CONCRETE CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3′-0″X 2′-0″
PRESTRESSED CONCRETE CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
DocuSigned by: Paul J Barber 1BDF1B57368741E...
3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

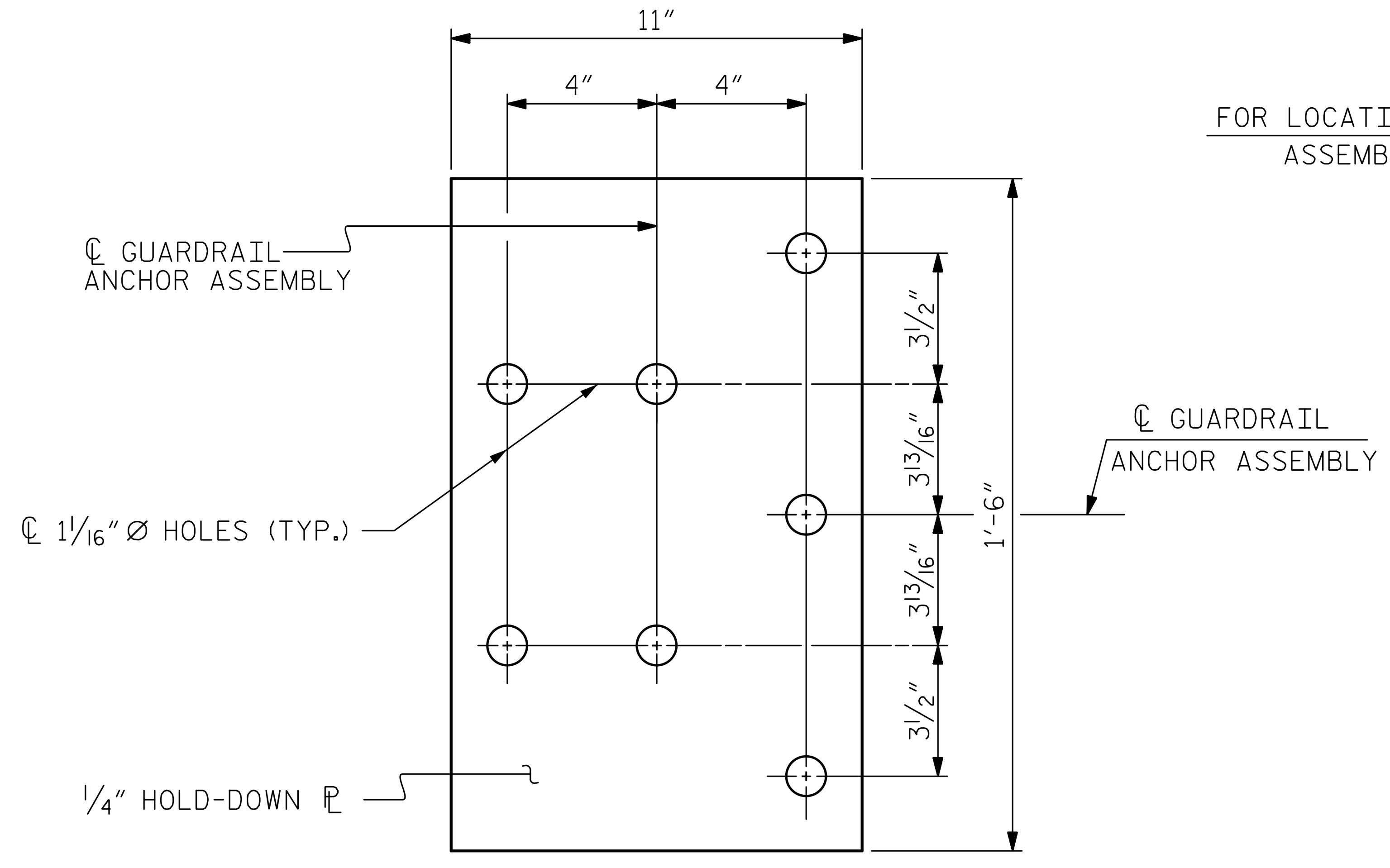
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 8

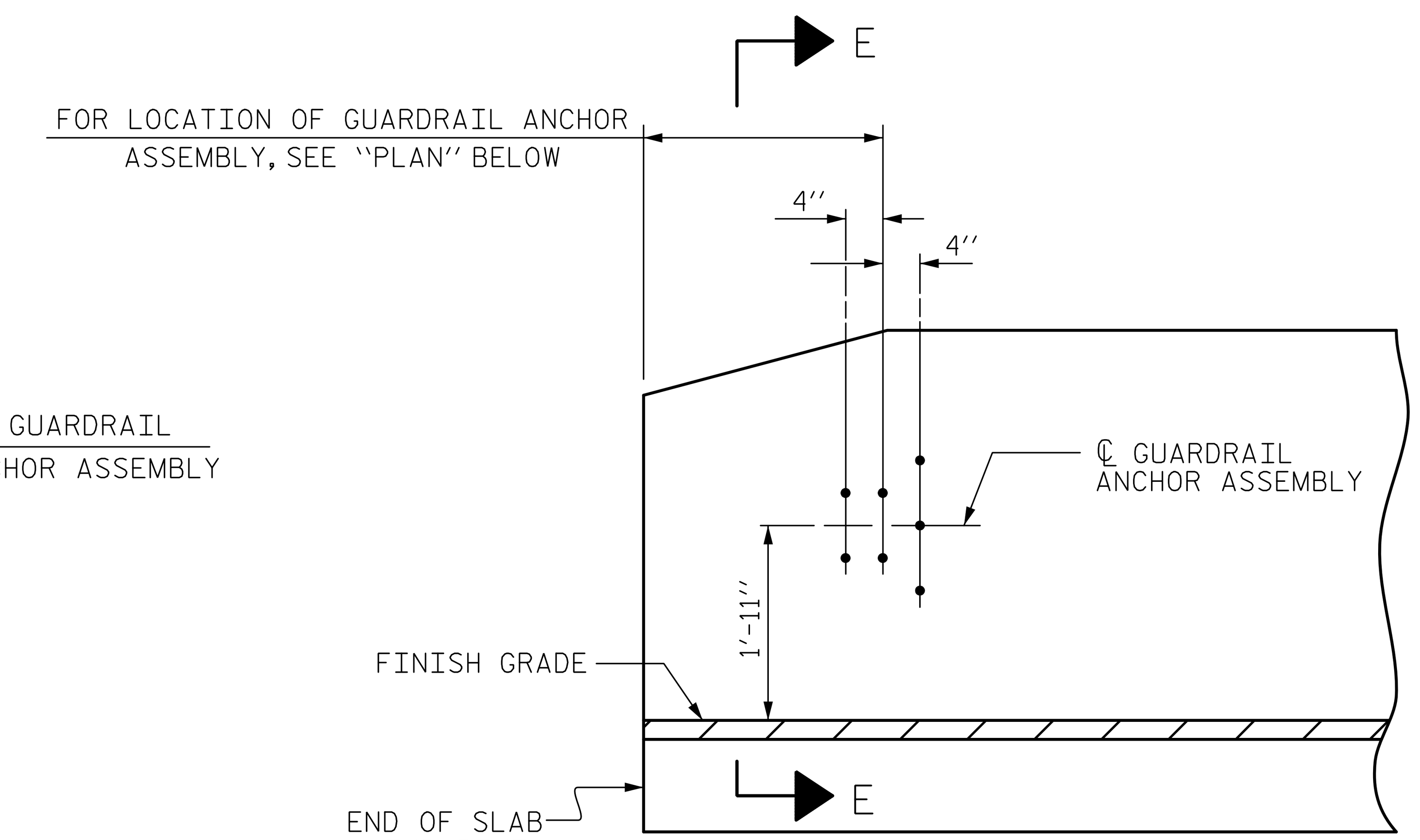
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			17

ASSEMBLED BY : J. BAYNE		DATE : 2/18	
CHECKED BY : P. BARBER		DATE : 2/18	
DRAWN BY : MAA	6/10	REV. 11/14	MAA/TMG
CHECKED BY : MKT	7/10		

STD. NO. 24PCS3_33_90S



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 7 - ⅞" 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 ⅞" 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.)

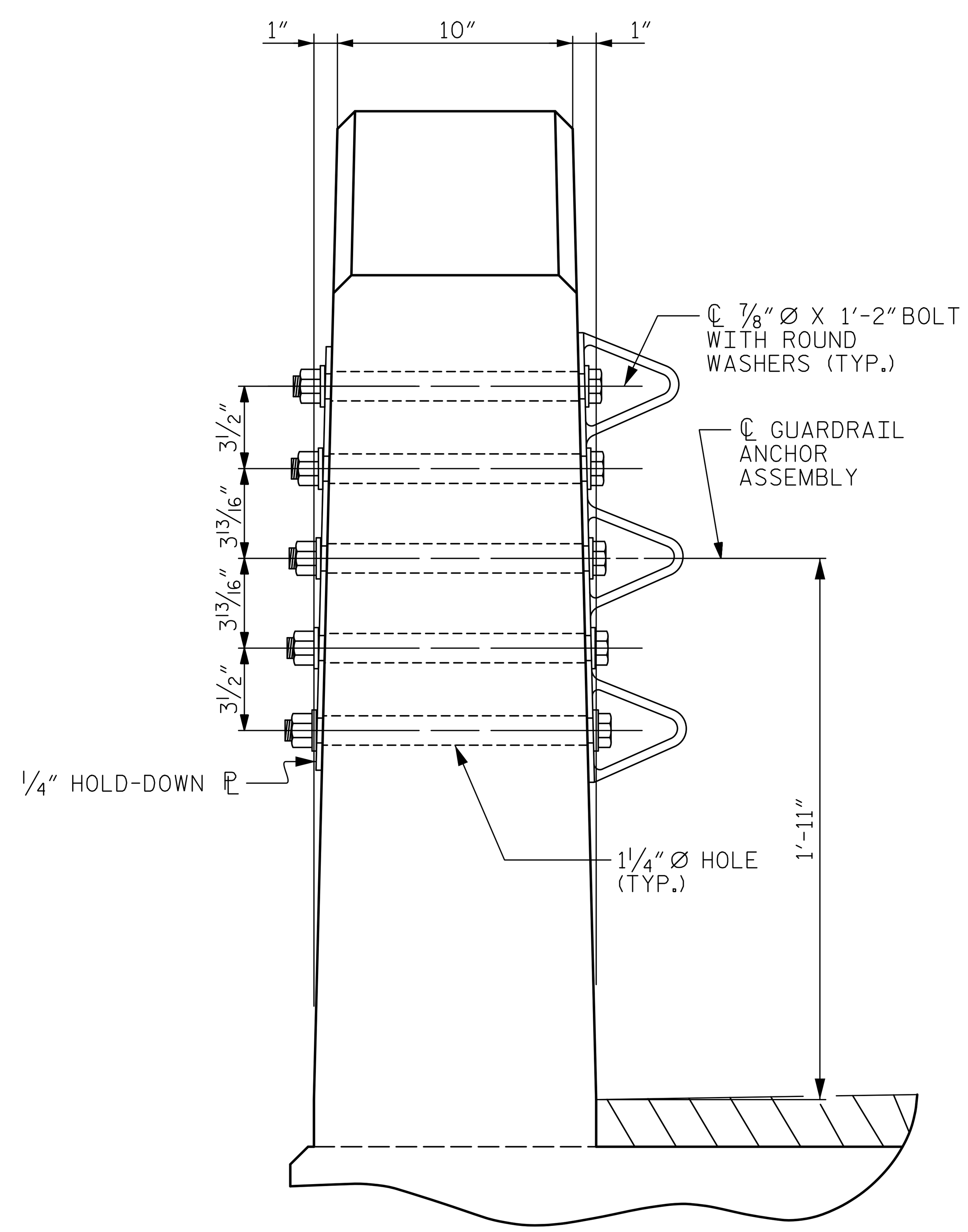
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

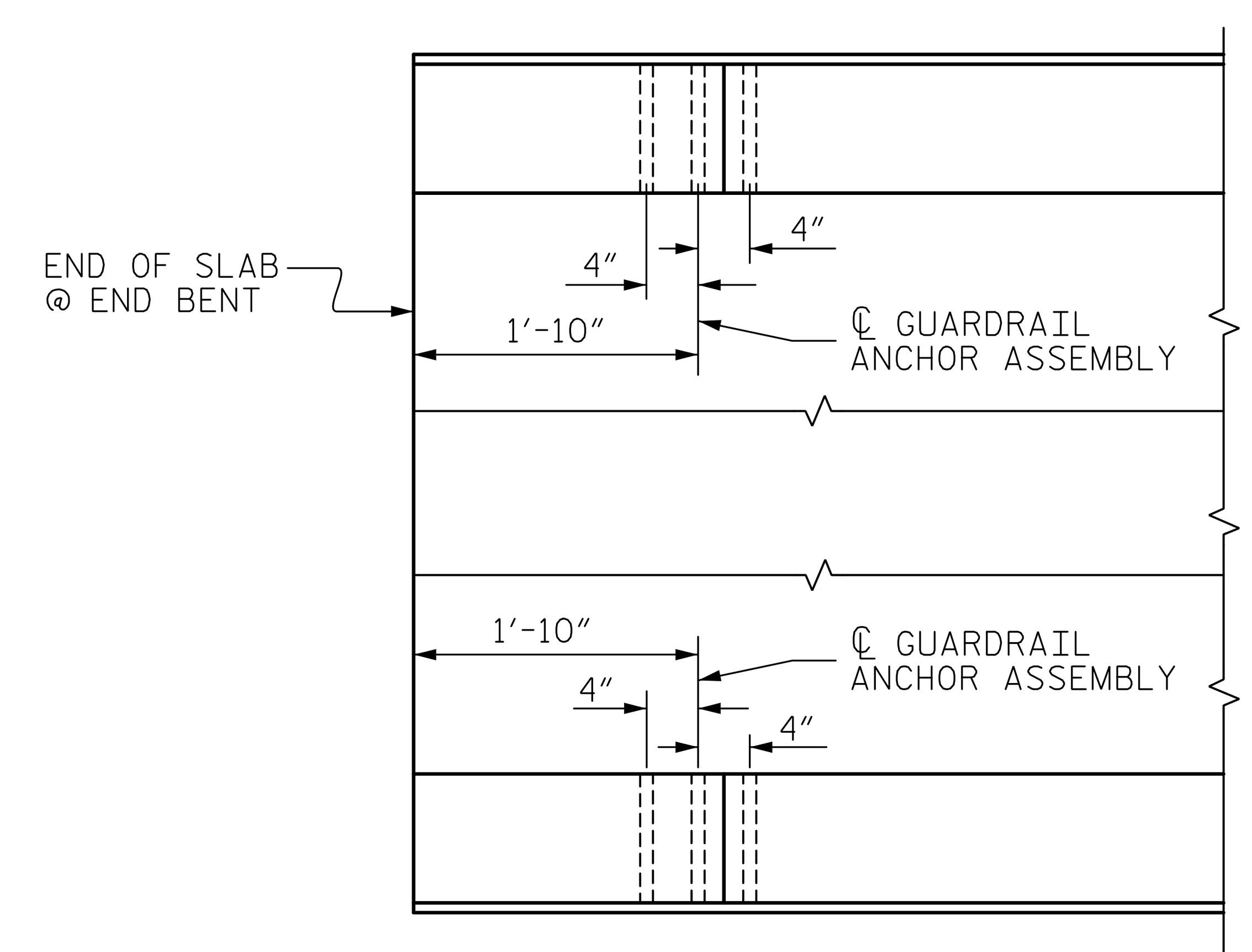
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1¼" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SECTION E-E

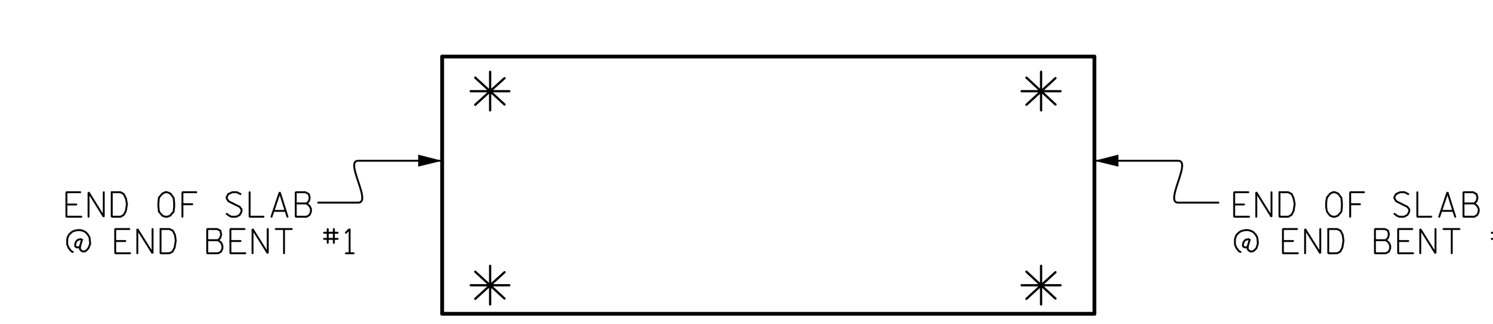
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

DocuSigned by: Paul J Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

ASSEMBLED BY : J. BAYNE		DATE : 1/18	
CHECKED BY : P. BARBER		DATE : 2/18	
DRAWN BY : MAA 5/10	REV. 6/13		MAA/GM
CHECKED BY : GM 5/10	REV. 1/15		MAA/TMG
	REV. 12/17		MAA/THC

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

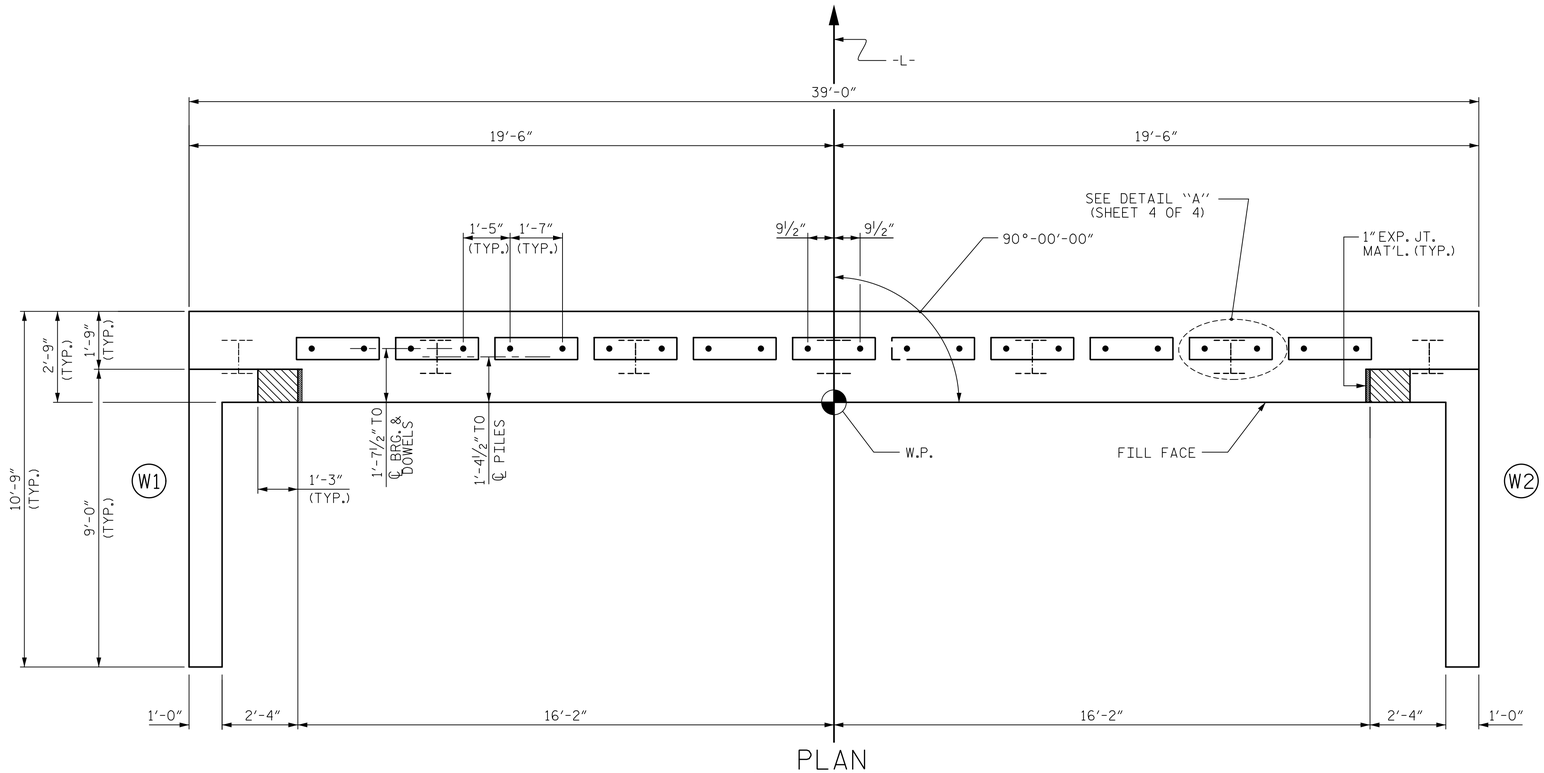
DRAWN BY J. BAYNE DATE 1/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 9

REVISIONS

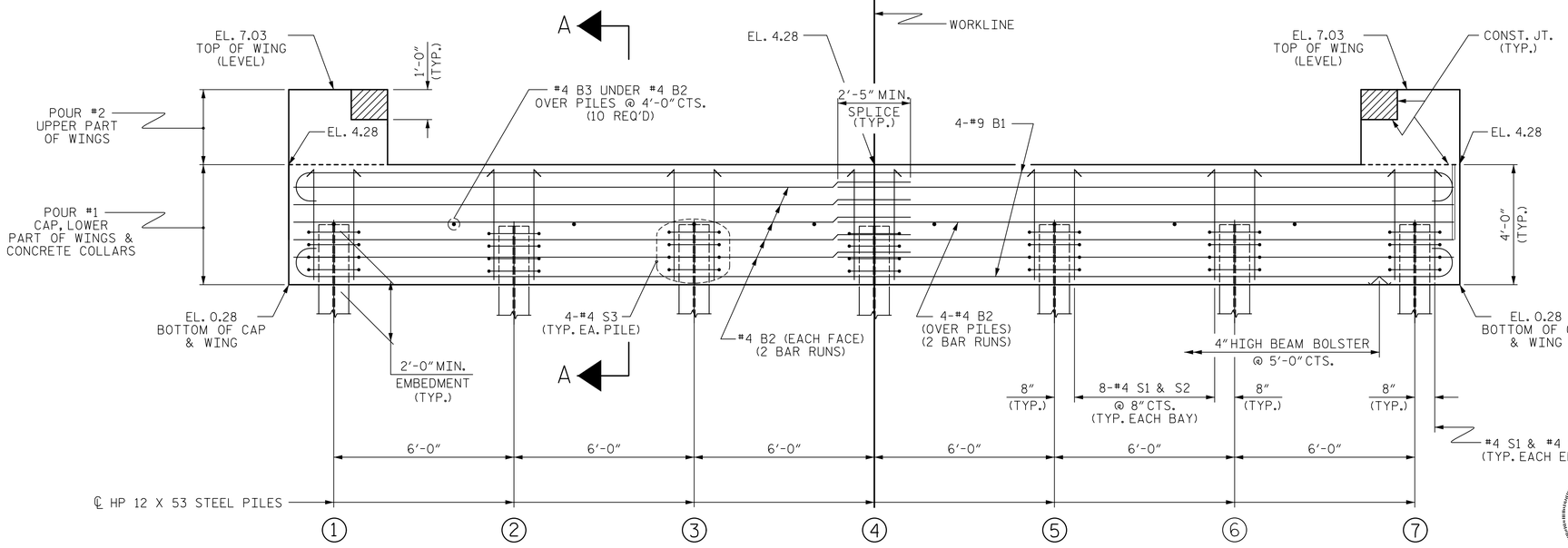
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-9
TOTAL SHEETS 17

STD. NO. GRA3



PLAN



ELEVATION

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

NOTES

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE END BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE COROSSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BAR SUPPORTS USED IN THE END BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN END BENT NO. 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

DocuSigned by: Paul J Barber 1BDF1B573687418...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

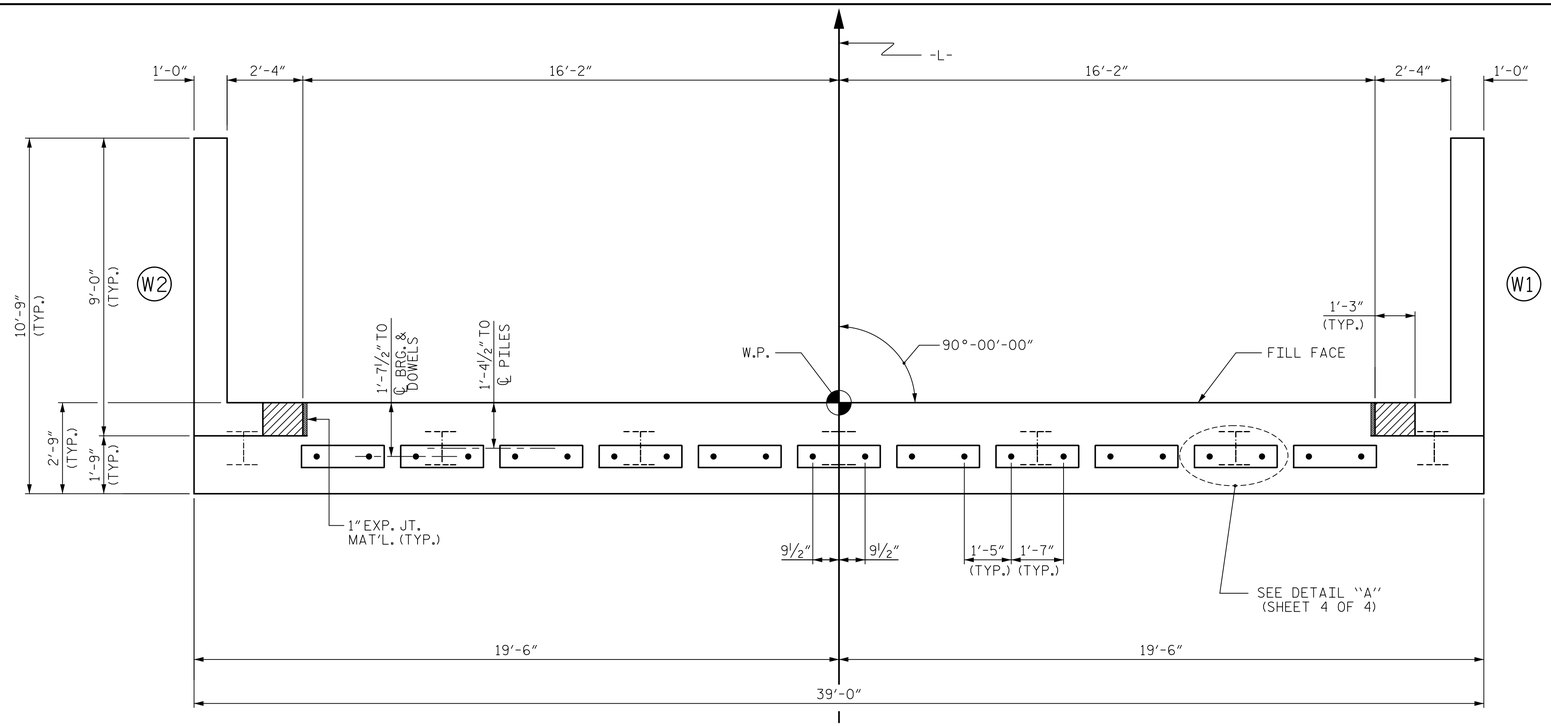
ASSEMBLED BY : J. BAYNE	DATE : 2/18		
CHECKED BY : P. BARBER	DATE : 2/18		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

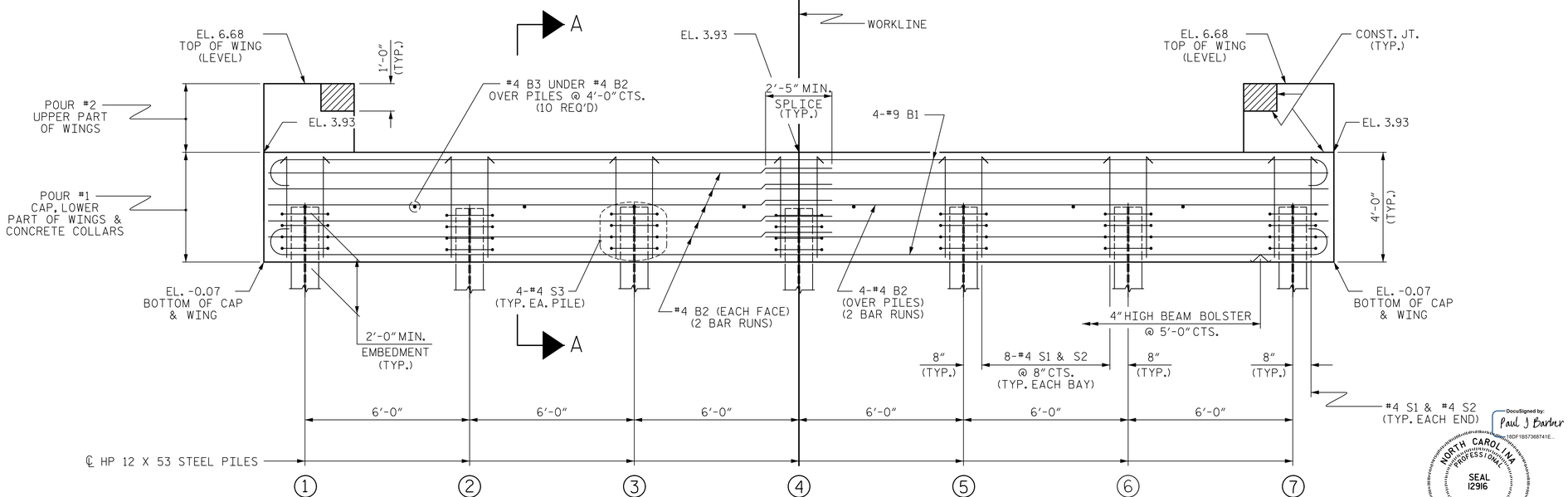
DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			17

STD. NO. EB_33_90S4



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.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE END BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE COROSSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BAR SUPPORTS USED IN THE END BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN END BENT NO. 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

DocuSigned by: Paul J Barber 1BDF1B573687 41E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : J. BAYNE	DATE : 2/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 11

PROJECT NO. B-5413
BEAUFORT COUNTY
STATION: 17+94.50 -L-

SHEET 2 OF 4

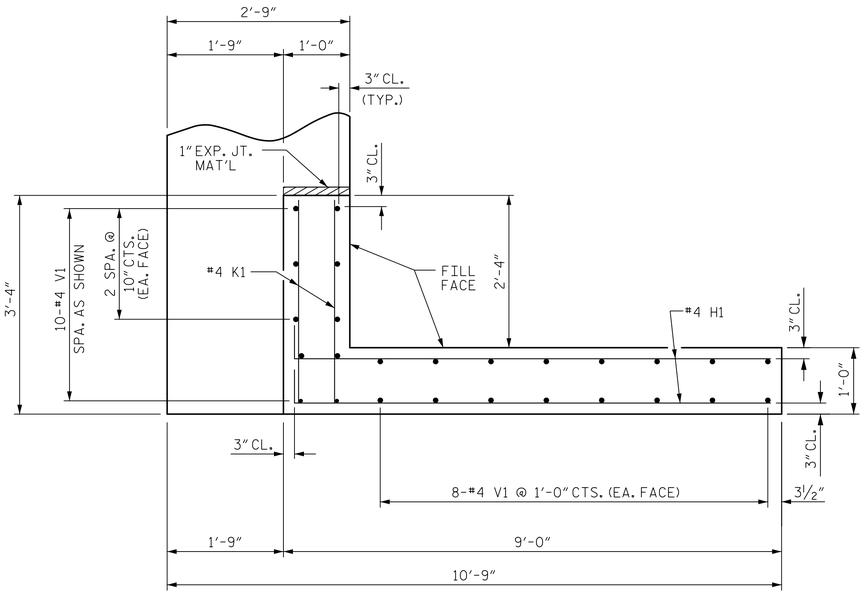
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

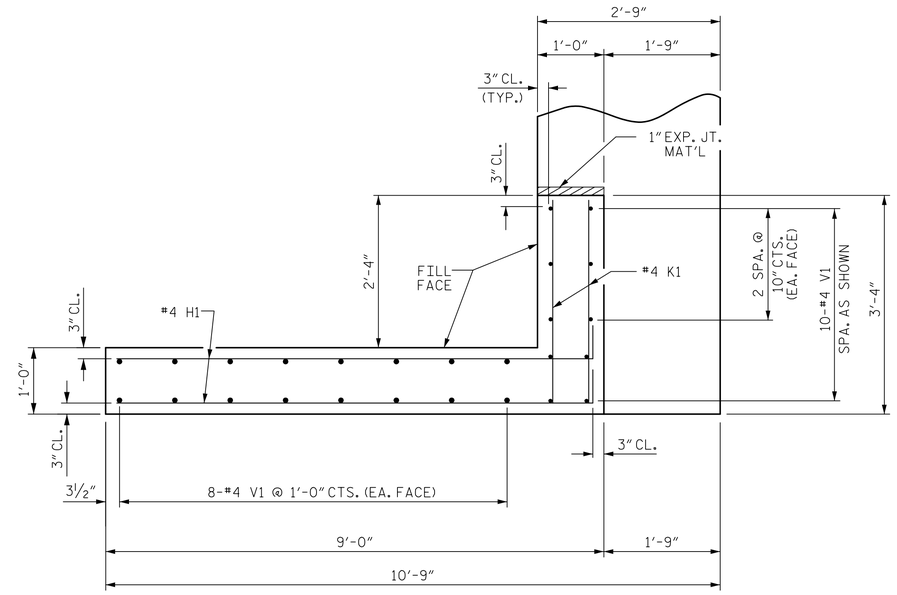
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			17

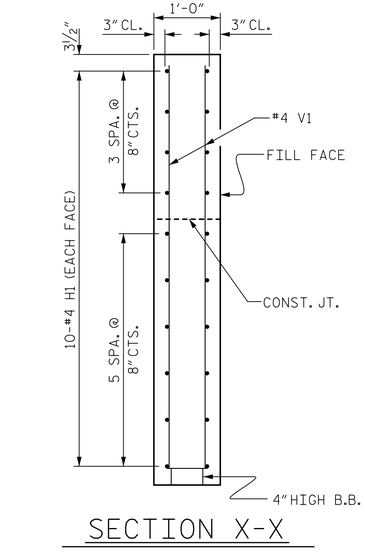
STD. NO. EB_33_90S4



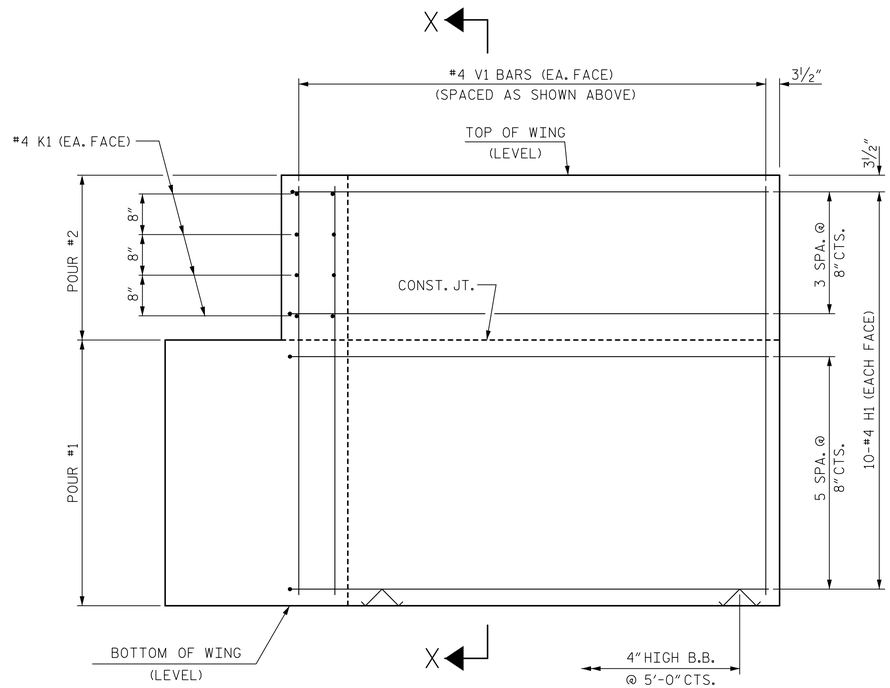
PLAN OF WING (W1)



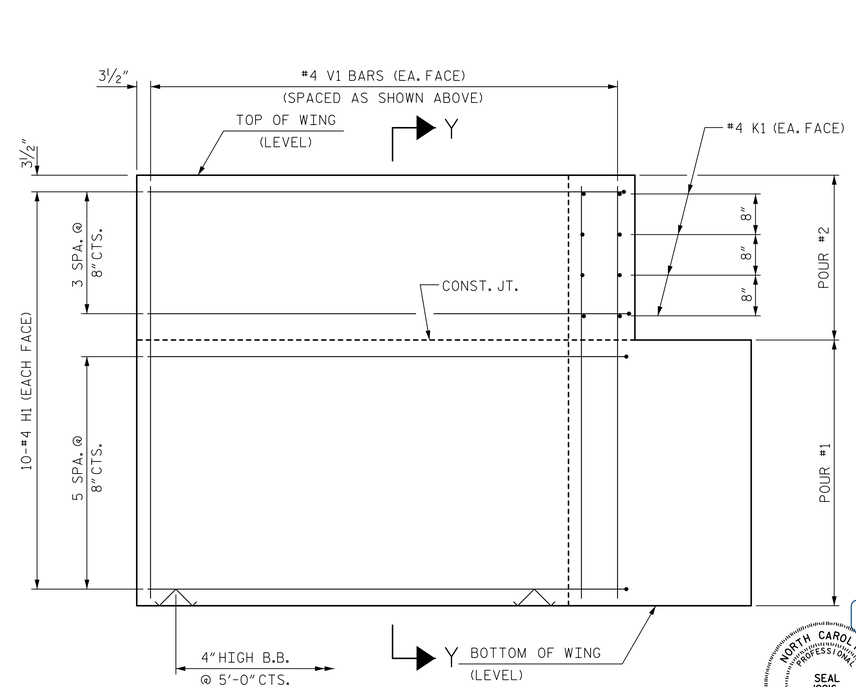
PLAN OF WING (W2)



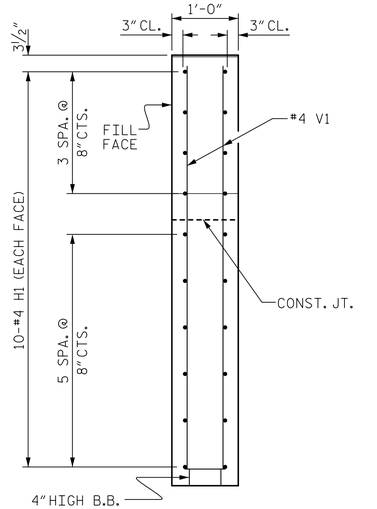
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 3 OF 4

DocuSigned by: Paul J Barber 18DF1B5736B741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WING DETAILS

ASSEMBLED BY : J. BAYNE	DATE : 2/18		
CHECKED BY : P. BARBER	DATE : 2/18		
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG		
CHECKED BY : AAC 12/11			

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18

DWG. NO. 12

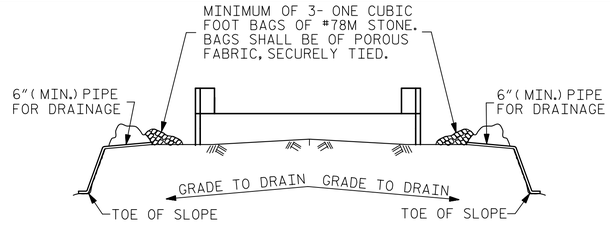
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT WING DETAILS

STD. NO. EB_33_90S4

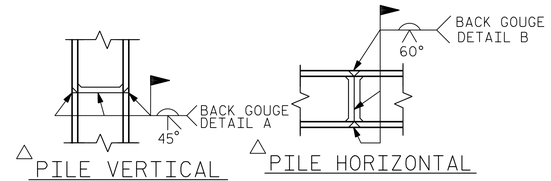


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

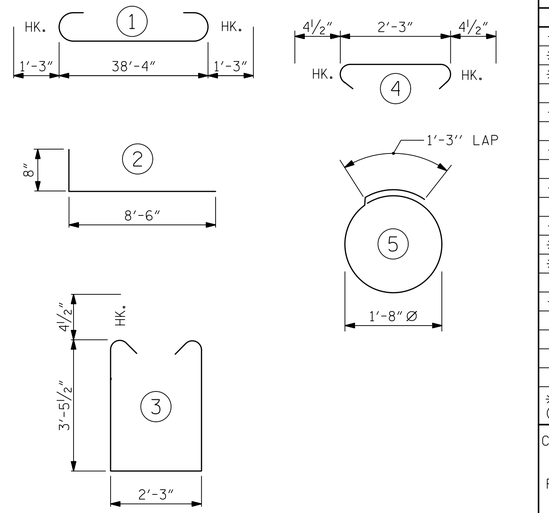
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 490	HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 560
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7
PILE REDRIVES NO: 4	PILE REDRIVES NO: 4

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	8	#9	1	40'-10"	1,111
✳B2	28	#4	STR	20'-6"	383
✳B3	10	#4	STR	2'-3"	15
✳D1	22	#6	STR	1'-6"	50
✳H1	40	#4	2	9'-2"	245
✳K1	16	#4	STR	2'-9"	29
✳S1	50	#4	3	9'-11"	331
✳S2	50	#4	4	3'-0"	100
✳S3	28	#4	5	6'-6"	122
✳V1	52	#4	STR	6'-3"	217

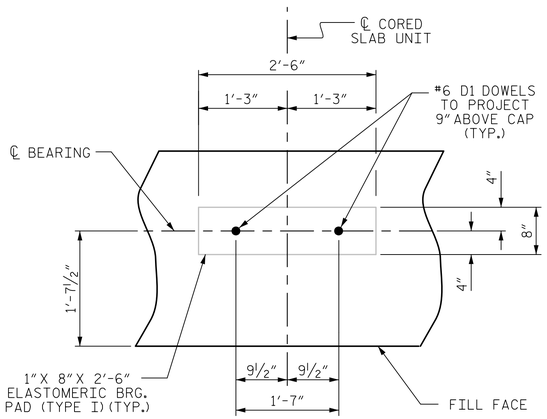
✳EPOXY COATED REINFORCING STEEL (FOR ONE END BENT) 2,603 LBS.

CLASS AA CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 19.5 C.Y.

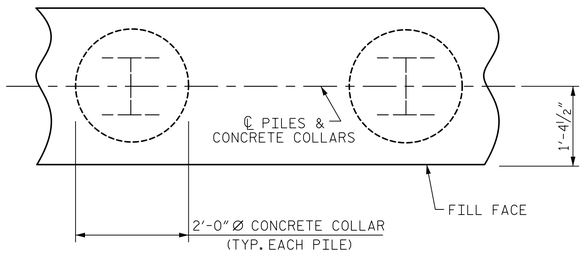
POUR #2 UPPER PART OF WINGS 2.3 C.Y.

TOTAL CLASS AA CONCRETE 21.8 C.Y.

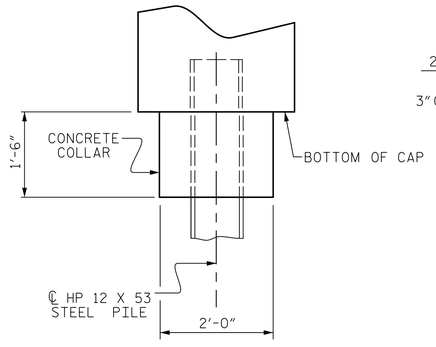


DETAIL "A"

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



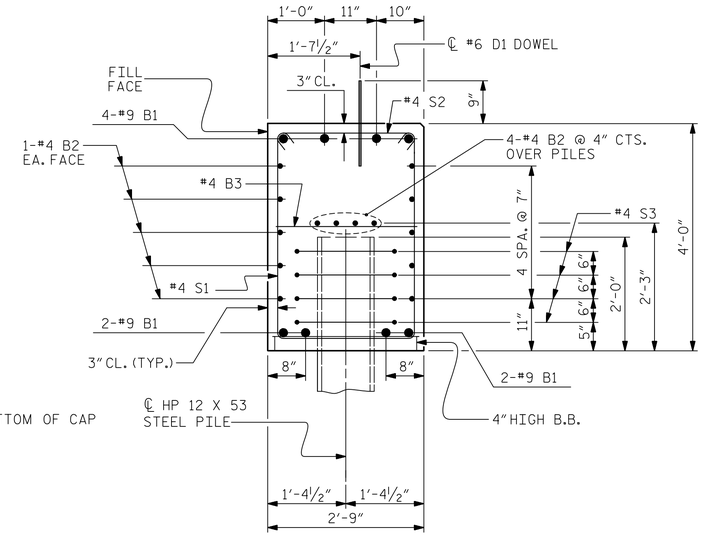
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

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



SECTION A-A

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

DocuSigned by: Paul J Barber 8DF1B57368741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

ASSEMBLED BY : J. BAYNE	DATE : 2/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : WJH 12/11	REV. 4/17 MAA/THC
CHECKED BY : AAC 12/11	

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY J. BARBER DATE 2/18

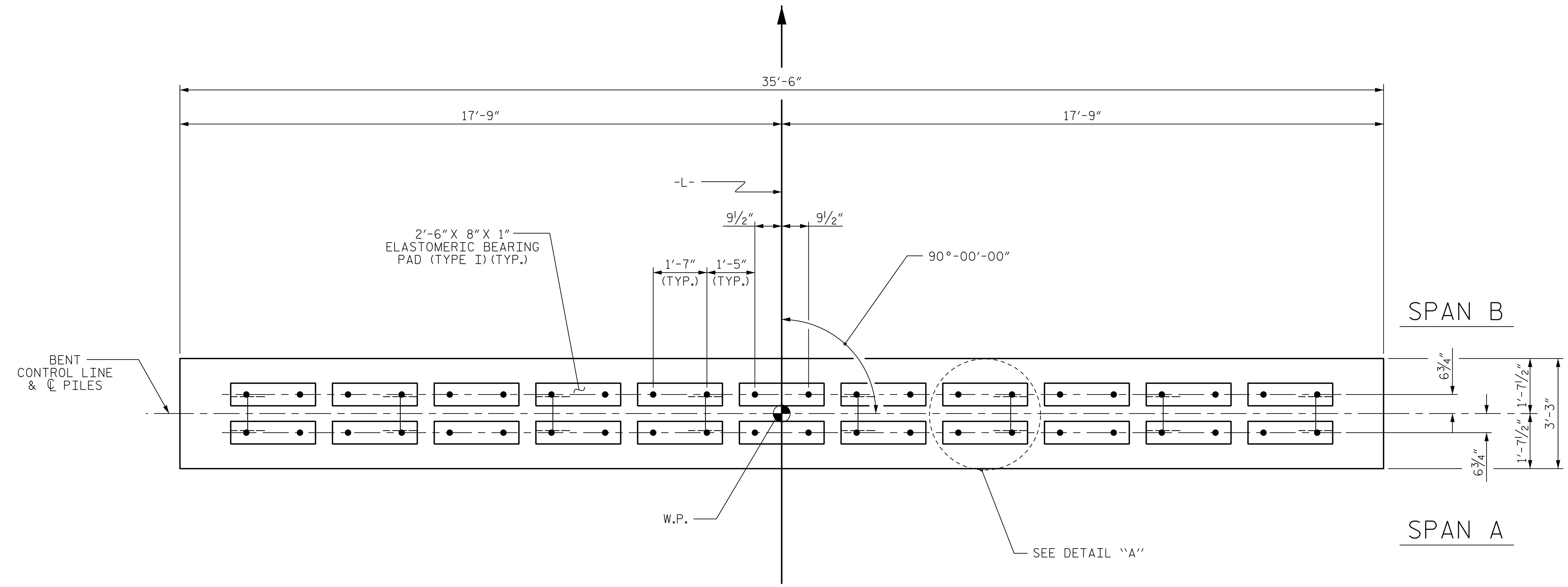
DWG. NO. 13

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

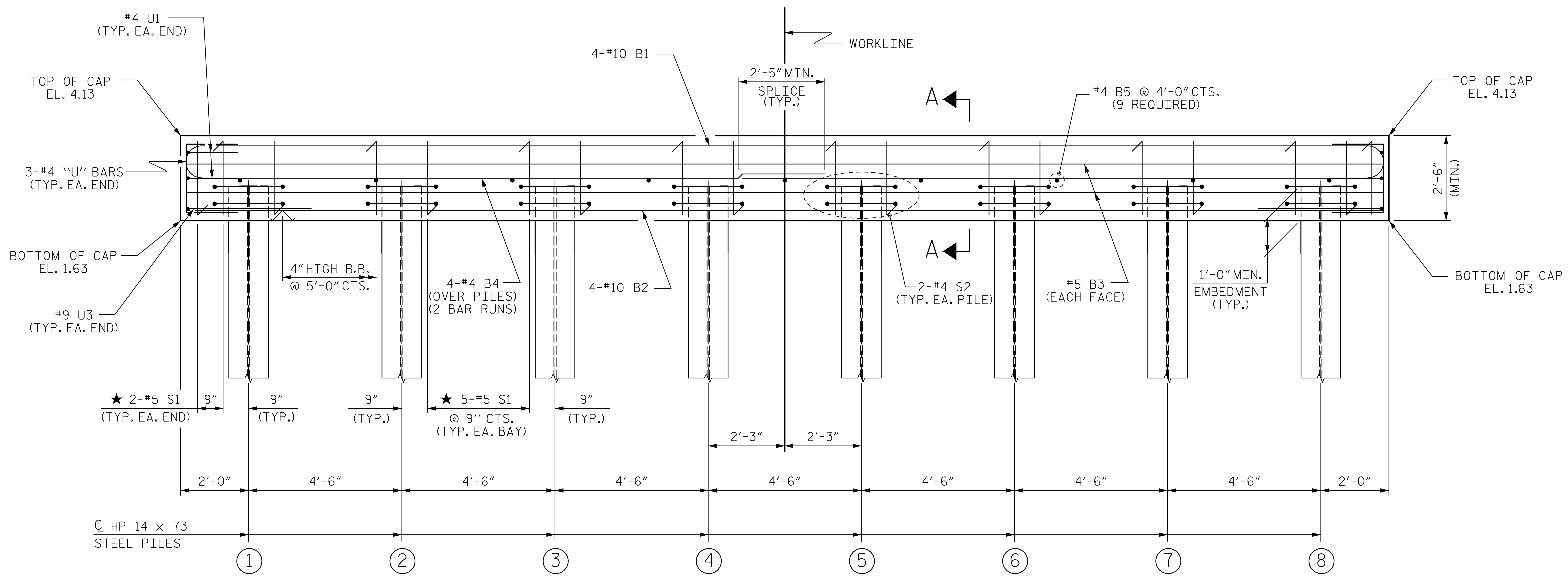
SHEET NO. S-13

TOTAL SHEETS 17

STD. NO. EB_33_90S4



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2

NOTES

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

★ INVERT ALTERNATE STIRRUPS.

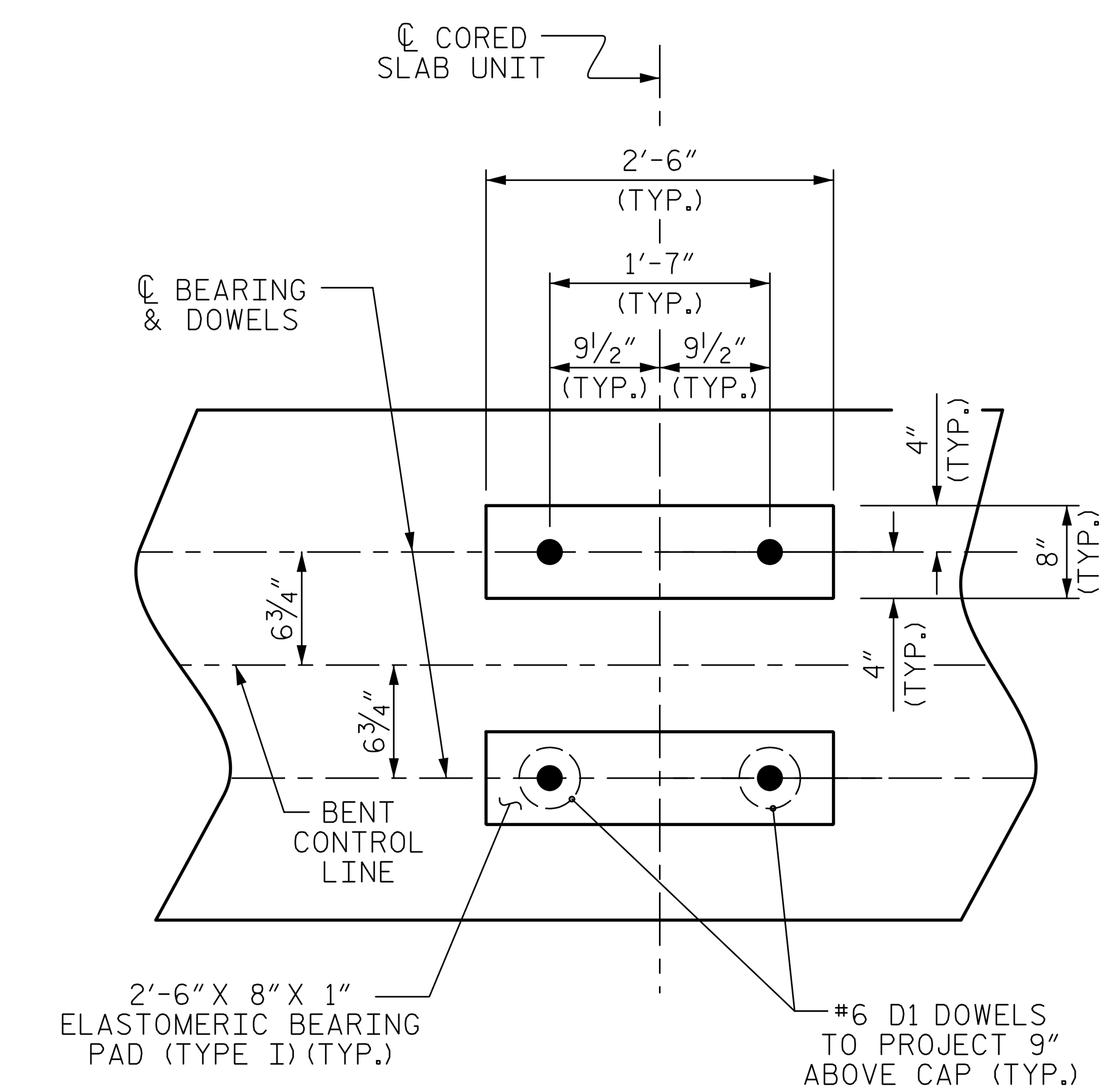
CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE COROSSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BAR SUPPORTS USED IN THE BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE BENT CAP OF BENT NO. 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

METALIZE PILES IN ACCORDANCE WITH TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-09 BROWN AND 1080-09 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

DocuSigned by: Paul J Barber

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB — HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18

DWG. NO. 14

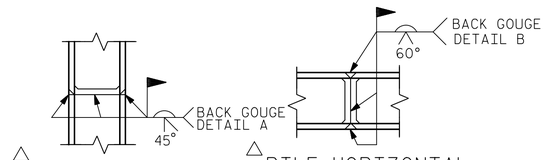
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S-14
TOTAL SHEETS 17

ASSEMBLED BY : J. BAYNE DATE : 2/18
CHECKED BY : P. BARBER DATE : 2/18

DRAWN BY : DGE 05/10
CHECKED BY : MKT 05/10
REV. 6/17 MAA/THC

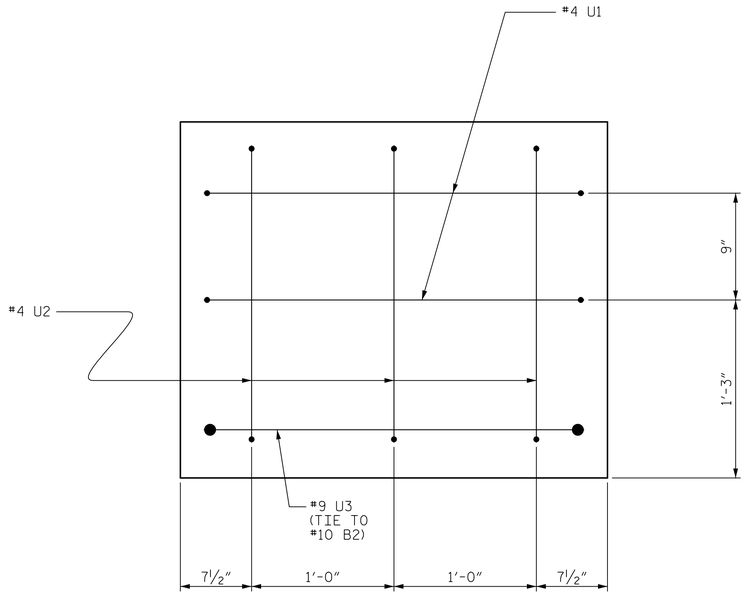
STD. NO. 14" HP_BT_33_90S_<60'



△ POSITION OF PILE DURING WELDING.

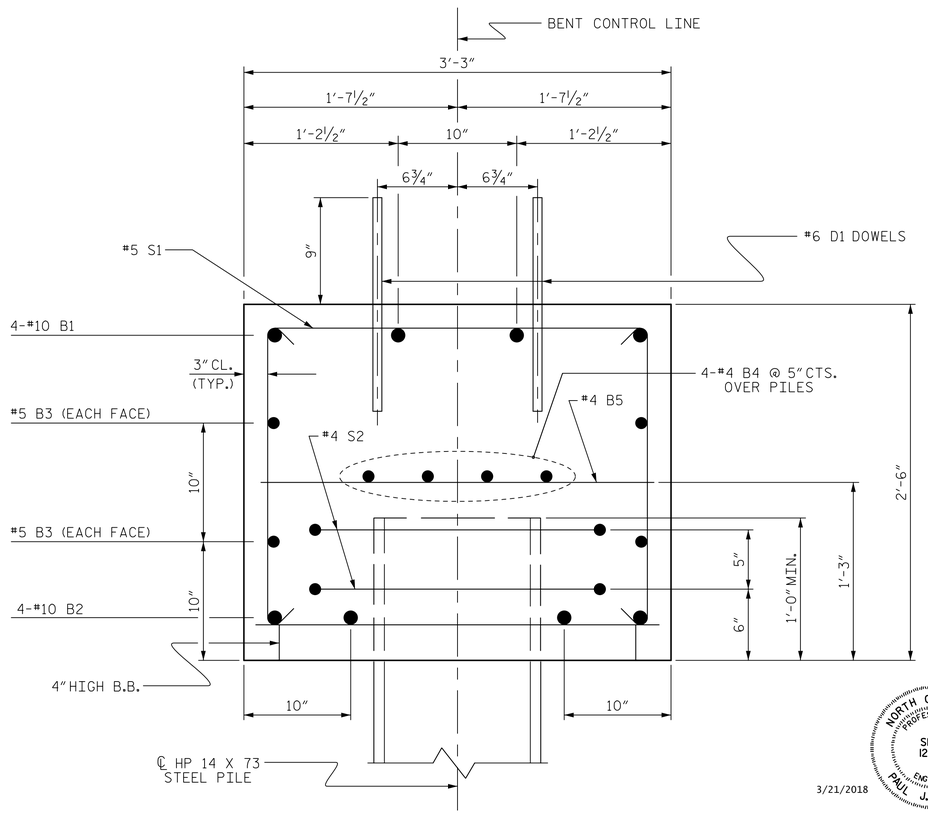
PILE SPLICE DETAILS

SCALE- 3/4" = 1'-0"



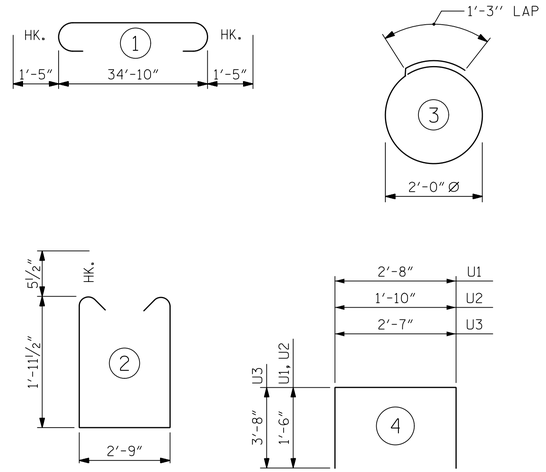
END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	4	#10	1	37'-8"	648
✳ B2	4	#10	STR	35'-0"	602
✳ B3	4	#5	STR	35'-0"	146
✳ B4	8	#4	STR	18'-9"	100
✳ B5	9	#4	STR	2'-9"	17
✳ D1	44	#6	STR	1'-6"	99
✳ S1	39	#5	2	7'-7"	308
✳ S2	16	#4	3	7'-7"	81
✳ U1	4	#4	4	5'-8"	15
✳ U2	6	#4	4	4'-10"	19
✳ U3	2	#9	4	9'-11"	67

✳EPOXY COATED REINFORCING STEEL (FOR ONE BENT) 2102 LBS

CLASS AA CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS AA CONCRETE 10.7 C.Y.

HP 14 X 73 STEEL PILES (FOR ONE BENT)

No. 8 720

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES (FOR ONE BENT) NO: 8

PILE REDRIVES NO: 4

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

DocuSigned by: Paul J Barber 18DF1B57368741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

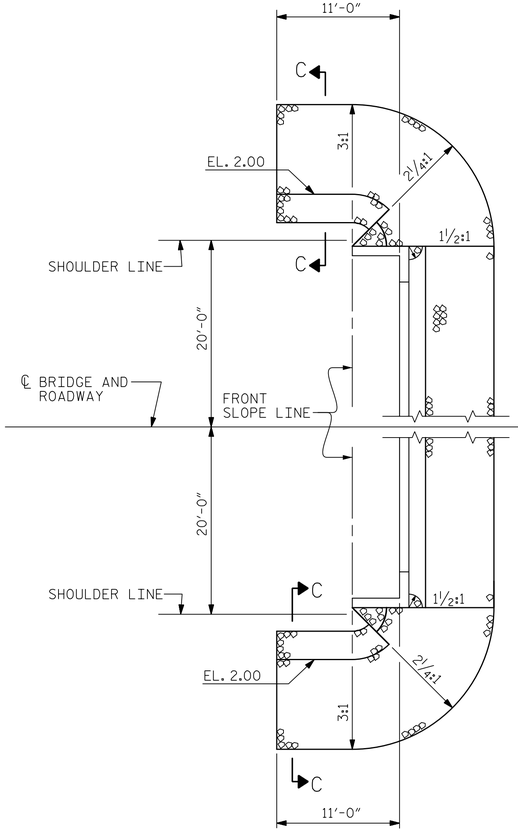
DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 15

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			17

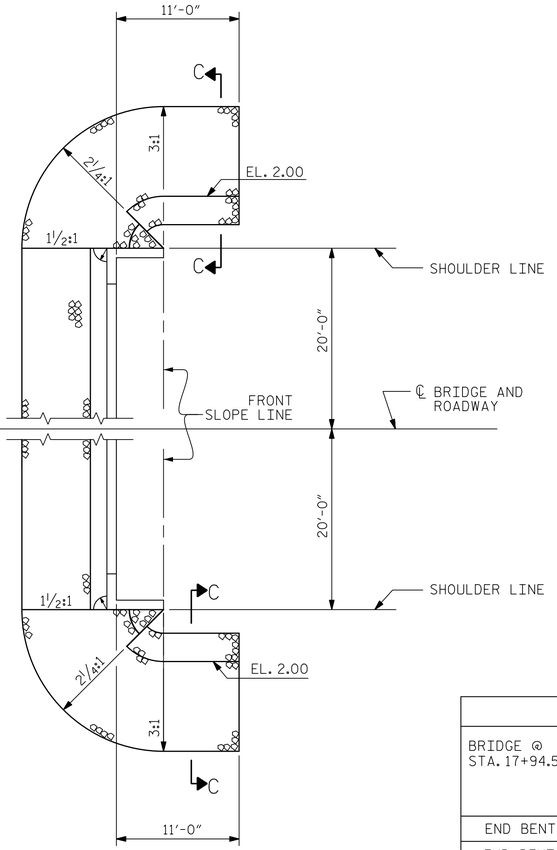
ASSEMBLED BY : J. BAYNE DATE : 2/18
CHECKED BY : P. BARBER DATE : 2/18

DRAWN BY : DGE 05/10
CHECKED BY : MKT 05/10
REV. 6/17 MAA/THC

STD. NO. 14"HP_BT_33_90S_<60'



END BENT 1

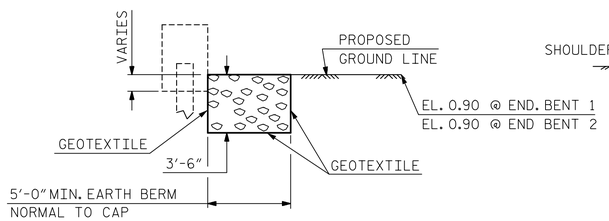


END BENT 2

NOTES :

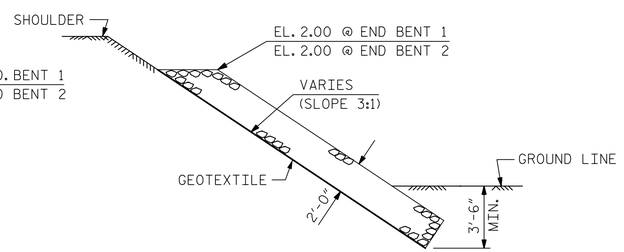
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+94.50 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	120
END BENT 2	115	115



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

DocuSigned by: Paul J Barber 380F1B57368741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

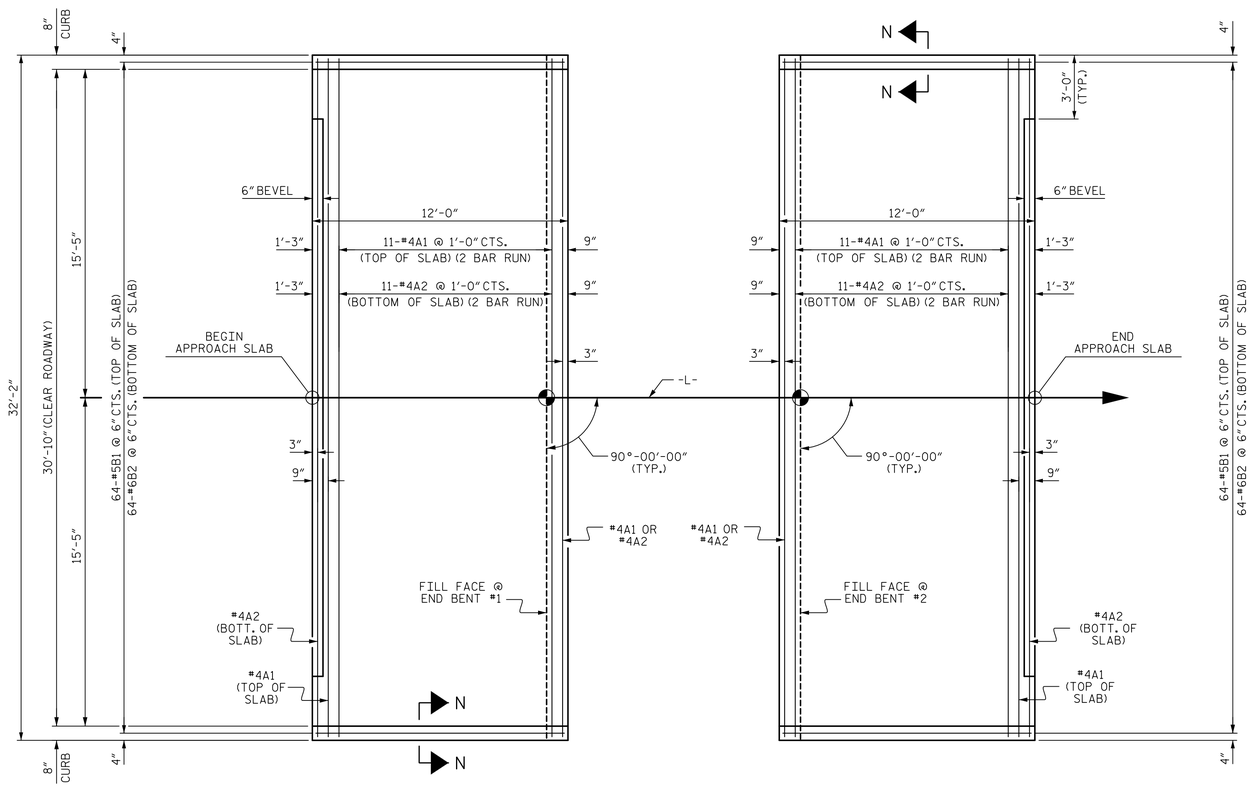
ASSEMBLED BY : J. BAYNE	DATE : 2/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 2/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 16

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			17

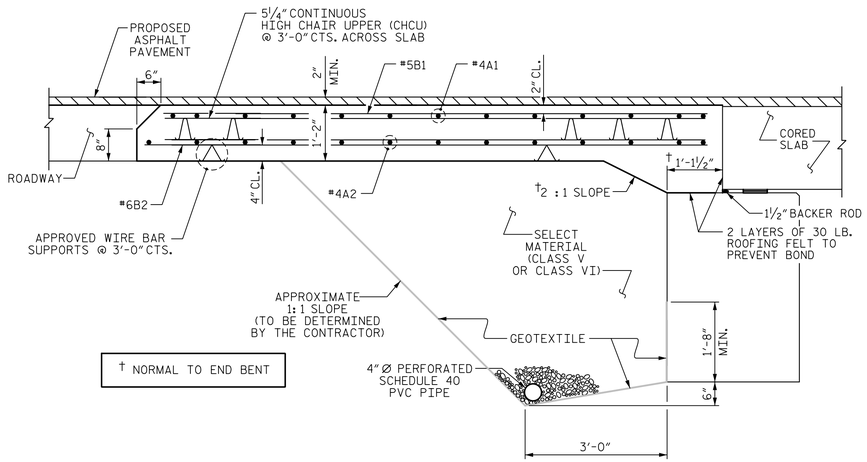
STD. NO. RR1



PLAN @ END BENT #1

PLAN @ END BENT #2

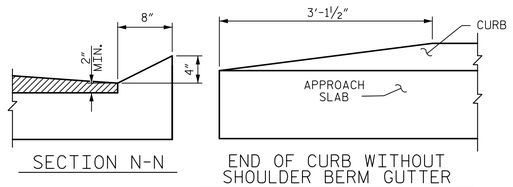
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : P. BARBER	DATE : 2/18
DRAWN BY : SHS/MAA 5-09	REV. 12-17 MAA/THC
CHECKED BY : BCH 5-09	

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.

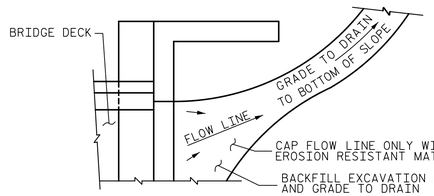
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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.

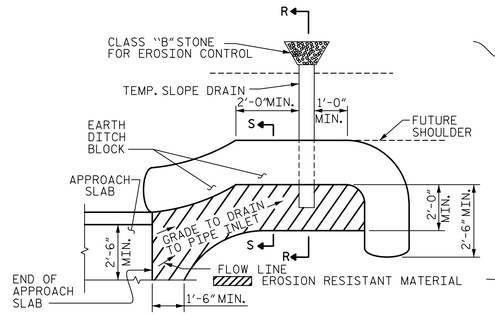
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



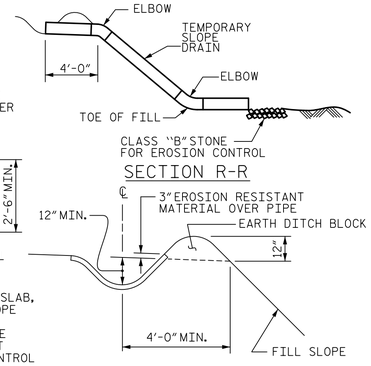
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



PLAN VIEW

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



SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
✳ EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C. Y.	19.5

APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
✳ B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
✳ EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C. Y.	19.5

PROJECT NO. B-5413

BEAUFORT COUNTY

STATION: 17+94.50 -L-

DocuSigned by: Paul J Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

3/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 1/18
CHECKED BY P. BARBER DATE 2/18
DWG. NO. 17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			17

STD. NO. BAS_33_90S

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990