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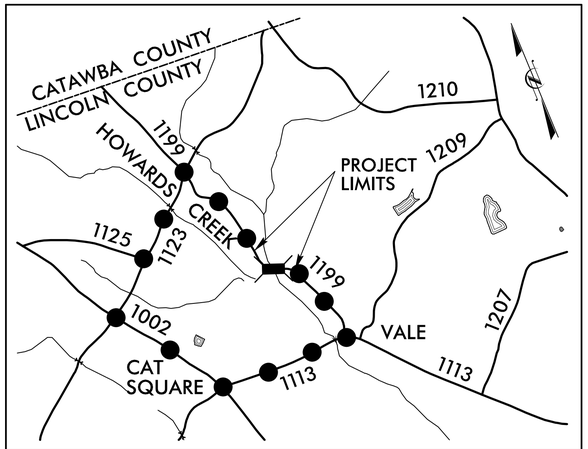
09/08/99

TIP PROJECT: 17BP.12.R.19

CONTRACT: DL00170

See Sheet 1A-1 For Index of Sheets
See Sheet 1B-1 for Symbology Sheet



VICINITY MAP

OFFSITE DETOUR

100% SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LINCOLN COUNTY

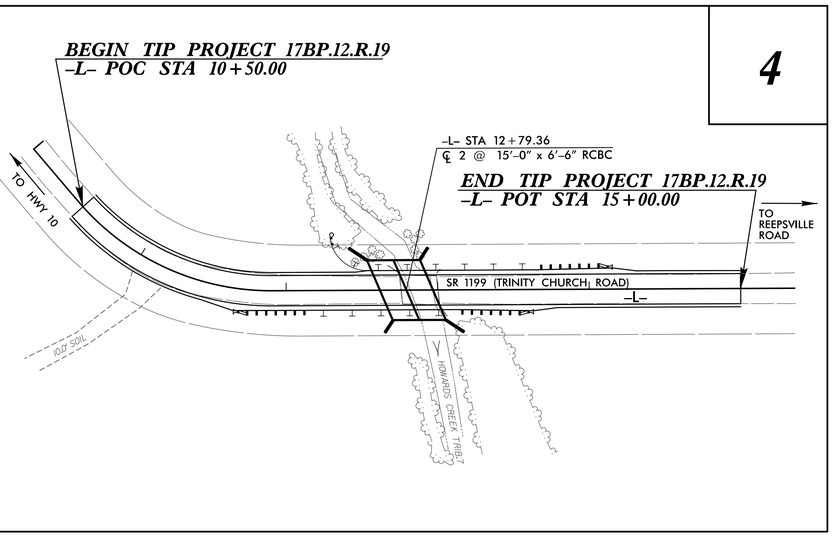
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.19	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.12.R.19		PE
17BP.12.R.19		ROW/UTIL
17BP.12.R.19		CONST.

LOCATION: REPLACE BRIDGE NO. 127 OVER HOWARDS CREEK ON SR 1199 (TRINITY CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT

NAD 83/ NSRS 2007

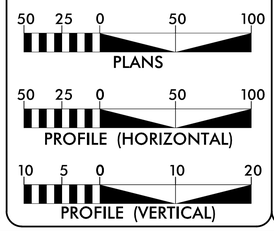


NOTES:

** DESIGN EXCEPTION APPROVED FOR HORIZONTAL CURVE (167.15'), HORIZONTAL SSD (200'), VERTICAL SAG (K = 40) AND VERTICAL SSD (305')

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2013 = 190
ADT 2033 = 360
K = 10 %
D = 60 %
T = 6 % *
** V = 60 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT 17BP.12.R.19	= 0.079 MILES
LENGTH OF STRUCTURE PROJECT 17BP.12.R.19	= 0.006 MILES
TOTAL LENGTH OF PROJECT 17BP.12.R.19	= 0.085 MILES

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:
JUNE 22, 2017

LETTING DATE:
MARCH 13, 2018

DOUGLAS M. WHEATLEY, PE
PROJECT ENGINEER

MONICA J. DUVAL
PROJECT DESIGN ENGINEER

STEVE RACKLEY, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A BYRD

DocuSigned by: James A. Byrd 1/8/2018
SIGNATURE

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS M. WHEATLEY

DocuSigned by: Douglas M. Wheatley 1/8/2018
SIGNATURE

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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HNTB

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS W. WHEATLEY
2/9/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS
1B	SYMBOLOGY SHEET
1C–1	EXISTING CENTERLINE ALIGNMENT
1D–1	PROPOSED ALIGNMENT CONTROL SHEET
1E–1	RIGHT OF WAY CONTROL SHEET
RW–1	RIGHT OF WAY EASEMENTS AND PROPERTY TITLE SHEET
RW–4	RIGHT OF WAY EASEMENTS AND PROPERTY
2A–1	TYPICAL SECTION SHEET
3B–1	EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARY, ROW SUMMARY, & DRAINAGE SUMMARY SHEET
4	PLAN & PROFILE SHEET
TMP–1 THRU TMP–2	TRAFFIC CONTROL PLANS
EC–1 THRU EC–6	EROSION CONTROL PLANS
U0–1 THRU UO–2	UTILITIES BY OTHER PLANS
X–1 THRU X–3	CROSS SECTION SHEETS
S1–1 THRU S1–8	CULVERT PLANS

GENERAL NOTES: 2018 SPECIFICATIONS

EFFECTIVE: 01–16–2018
REVISED:

GRADE LINE:
GRADING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED OR FUTRUE SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 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. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

GUARDRAIL:

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

SUBSURFACE PLANS:

STRUCTURE SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

PHONE – AT&T
WATER – LINCOLN COUNTY

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.

EFF. 01–16–2018

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 8 – INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent 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:

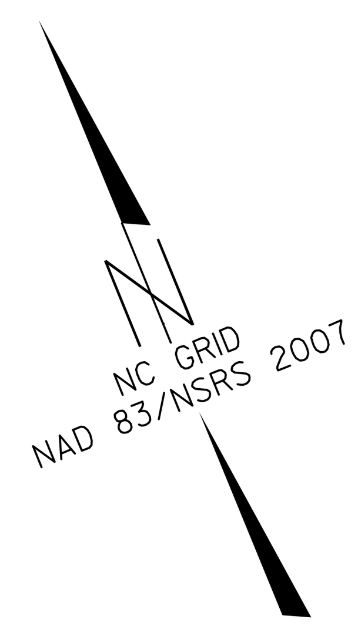
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

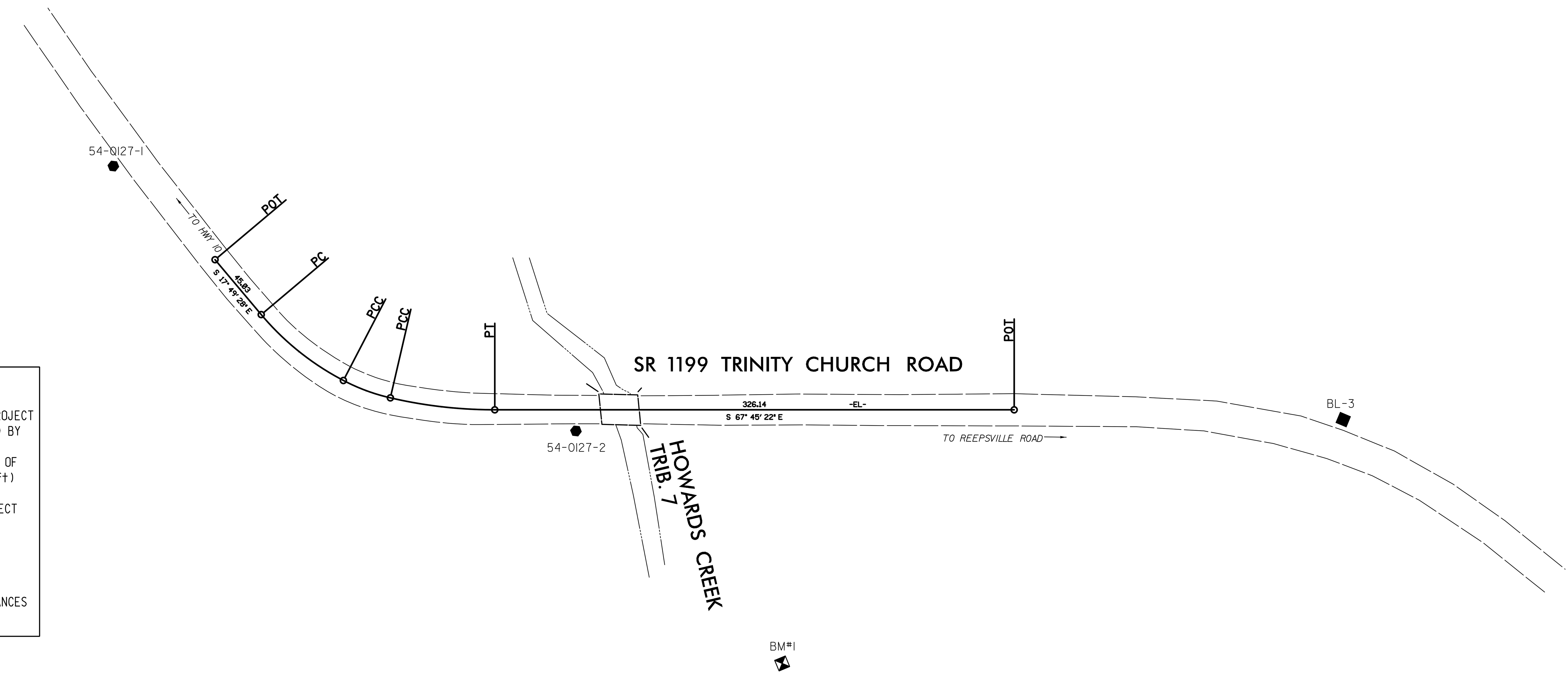
MISCELLANEOUS:

- 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.

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION





DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "54-0127-1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 662925.178(ft) EASTING: 1285234.796(ft)
ELEVATION: 940.60(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999845995
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "54-0127-1" TO -L- STATION 10+00.00 IS
S 25°08'29.6" E 86.79'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	54-0127-1	662925.1780	1285234.7960	940.60
2	54-0127-2	662661.3220	1285440.7430	928.72
3	BL-3	662485.5359	1285889.3367	936.13

****
BM1 ELEVATION = 928.24
N 662477 E 1285505
R/R SPIKE SET IN BASE OF 18" BLACKWALNUT TREE ON THE EAST BANK OF CREEK
****

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	662846.608	1285271.670							
LINE			S 17°49'27.7" E	45.03					
PC	662803.741	1285285.454							
CURVE			S 29°02'09.4" E	66.11	22°25'23.5"(LT)	33°42'12.2"	66.53	33.70	170.00
PCC	662745.942	1285317.539							
CURVE			S 47°28'30.6" E	31.45	14°27'18.9"(LT)	45°50'11.8"	31.54	15.85	125.00
PCC	662724.683	1285340.720							
CURVE			S 61°13'45.8" E	66.00	13°03'11.5"(LT)	19°44'03.4"	66.14	33.22	290.34
PT	662692.916	1285398.574							
LINE			S 67°45'21.5" E	326.14					
POT	662569.455	1285700.443							

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.

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1/10/18

REVISIONS

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UNITS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	1D-1
Location and Surveys	

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	662846.6082	1285271.6703
PC	10+45.29	662803.4922	1285285.5336
PT	11+90.96	662699.9461	1285381.3853
POT	15+35.67	662569.4552	1285700.4425

NOTES:

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

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

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	1E-1

Location and Surveys

PROJECT SURVEYOR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMANENT EASEMENT MARKER IRON PIN & CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+90.96	29.46	662672.6773	1285370.2327
L	12+35.00	-50.00	662729.5523	1285441.0788
L	12+35.00	-30.00	662711.0407	1285433.5078
L	12+75.00	60.00	662612.5964	1285436.4613
L	12+95.00	-50.00	662706.8391	1285496.6136
L	13+20.00	60.00	662595.5615	1285478.1124
L	13+50.00	30.00	662611.9724	1285517.2364
L	14+00.00	-30.00	662648.5796	1285586.2285

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

REVISIONS

1/10/18

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UNITS

09/08/99

TIP PROJECT: 17BP.12.R.19

CONTRACT: DL00170

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.19	RW-1	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

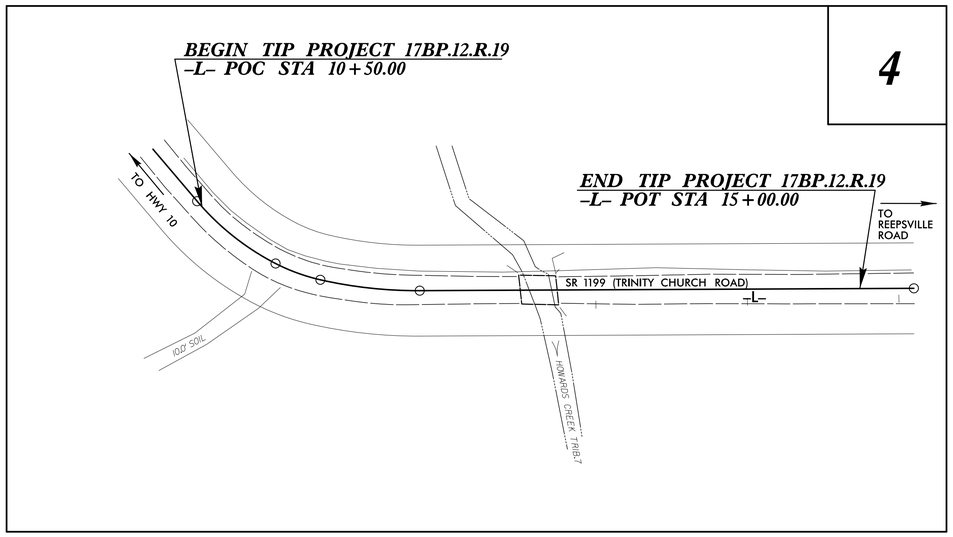
RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

LINCOLN COUNTY

LOCATION: ***REPLACE BRIDGE NO. 127 OVER HOWARDS CREEK ON SR 1199 (TRINITY CHURCH ROAD)***

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

NAD 83/ NSRS 2007



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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 190
ADT 2033 = 360
K = 10 %
D = 60 %
T = 6 % *
** V = 60 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT 17BP.12.R.19	= 0.079 MILES
LENGTH OF STRUCTURE PROJECT 17BP.12.R.19	= 0.006 MILES
TOTAL LENGTH OF PROJECT 17BP.12.R.19	= 0.085 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 22, 2017

LETTING DATE:
MARCH 13, 2018

PROFESSIONAL LAND SURVEYOR

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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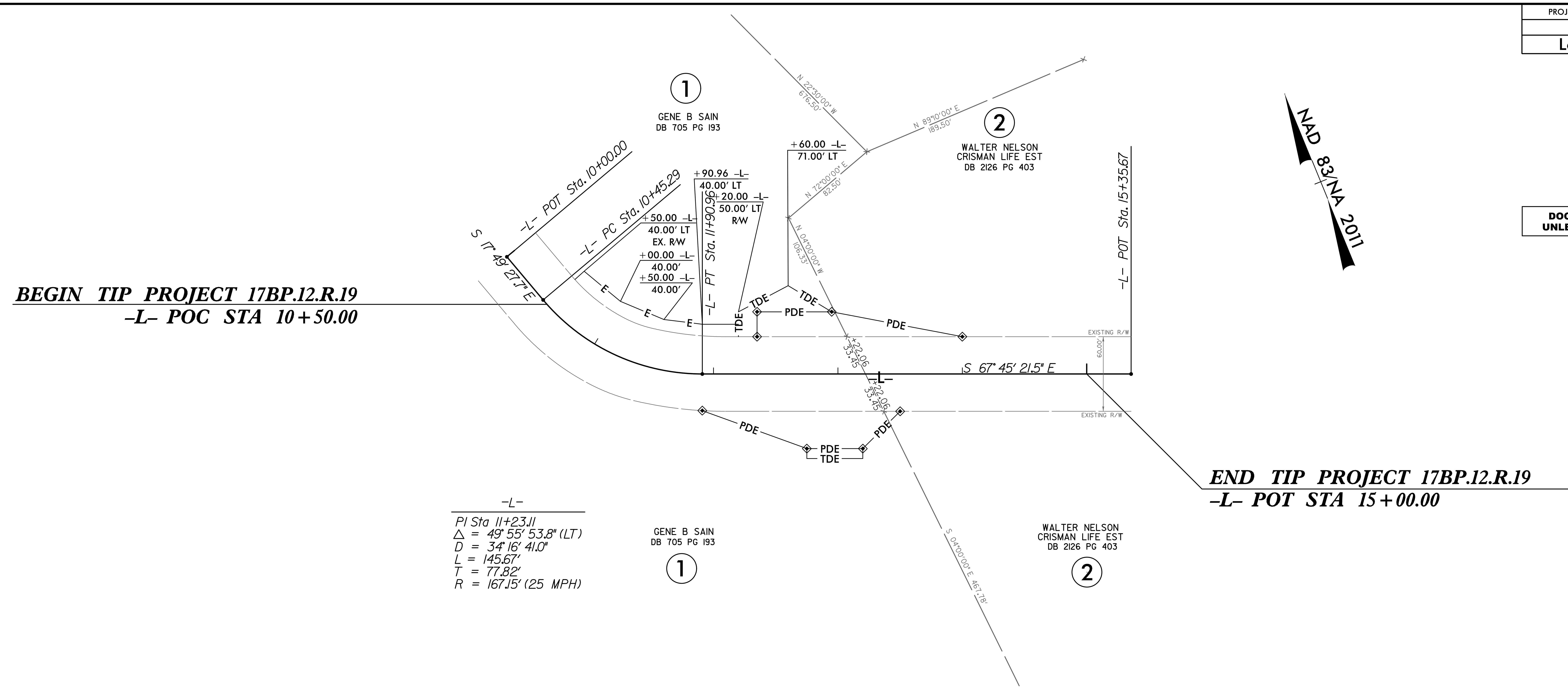
PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	RW-4

Location and Surveys

PROJECT SURVEYOR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

REVISIONS

1/10/18

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6/2/99

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.
17BP.12.R.19	2A-1

ROADWAY DESIGN ENGINEER

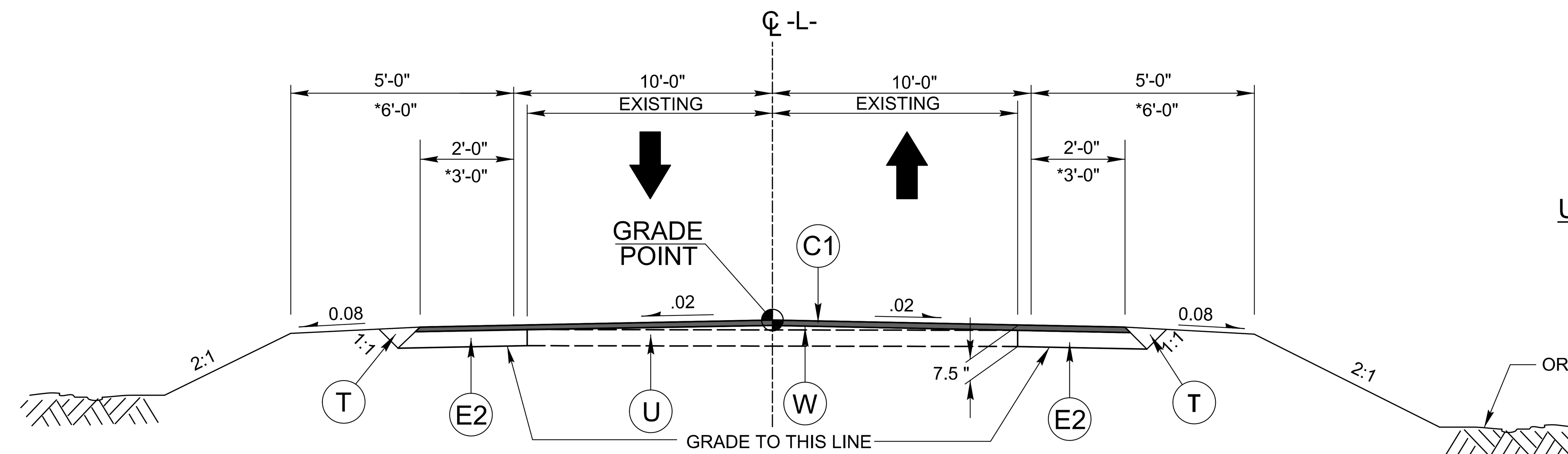
NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS M. WHEATLEY
AB7893E9DB1243A...
1/8/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE (FINAL)

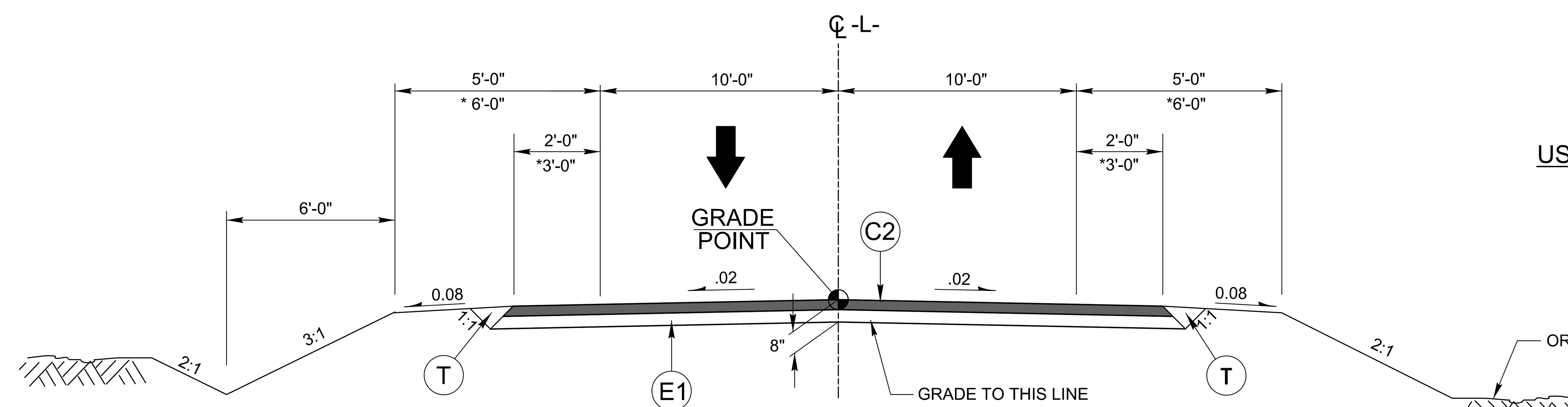
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE,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

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



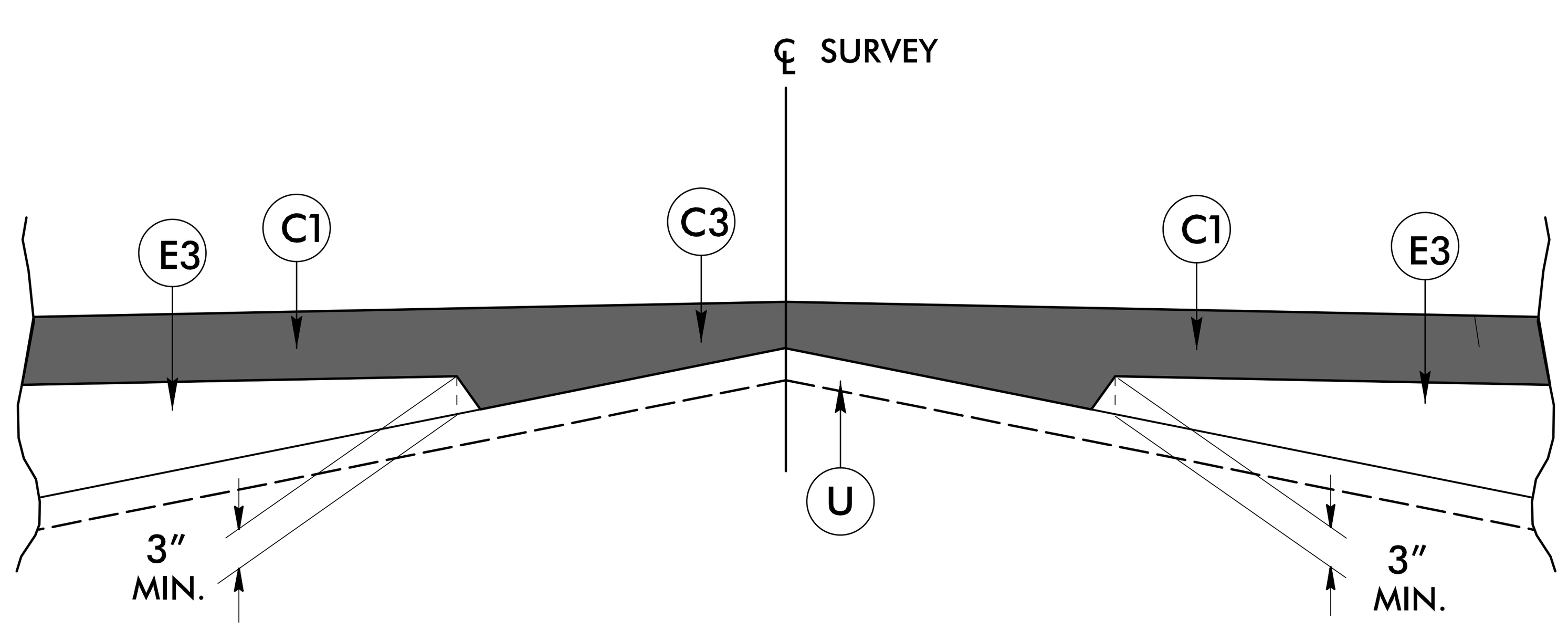
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FROM:
-L- STA 10+50.00 TO STA 12+00.00
-L- STA 13+50.00 TO STA 15+00.00

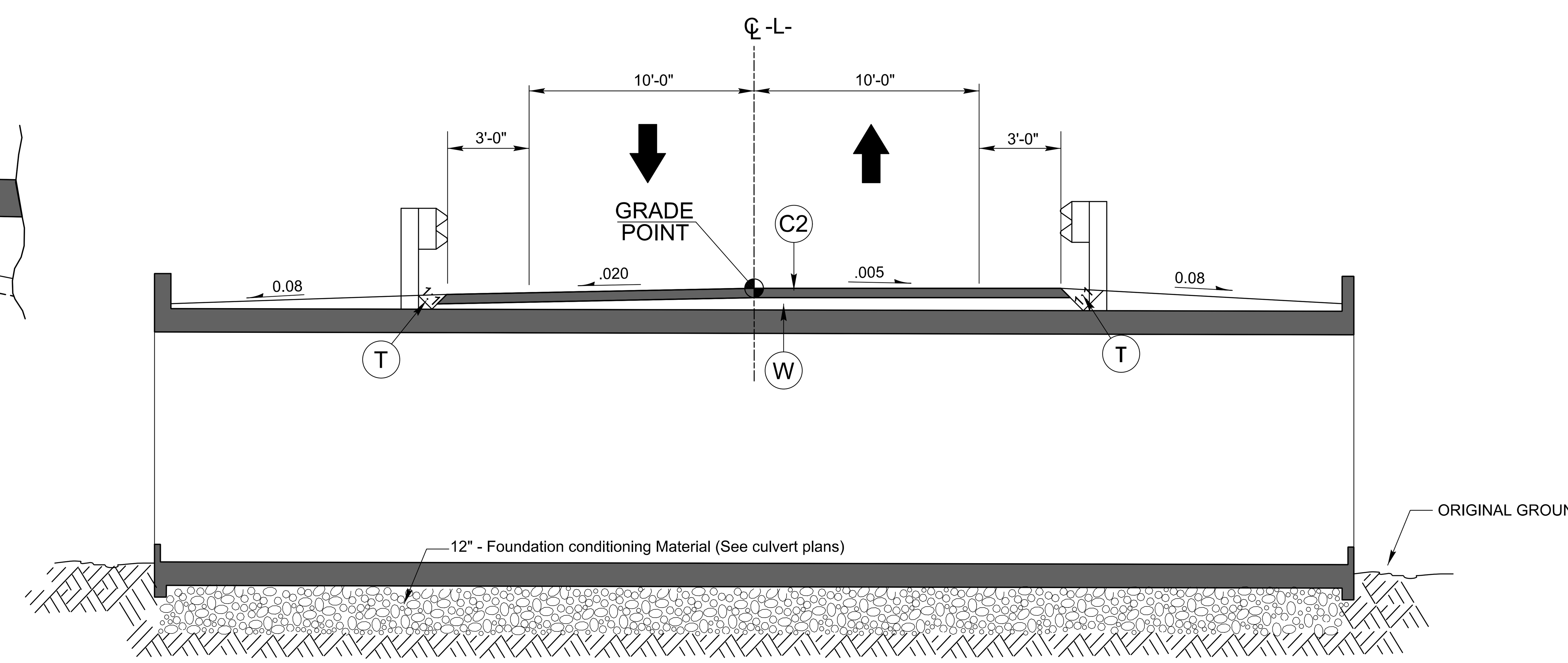


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FROM:
-L- STA 12+00.00 TO STA 13+50.00



Detail Showing Method of Wedging
(USE WITH TYPICAL SECTION NO. 1)



CULVERT DETAIL

CENTERLINE CULVERT -L- STA 12+79.36 (SEE CULVERT PLANS)

NOTES: * INCREASED PAVED AND GRASS SHOULDERS TO ACCOMMODATE GUARDRAIL PLACEMENT.

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HNTB

12/06/07

COMPUTED BY: MONICA DUVAL	DATE: 05/25/17
CHECKED BY: DOUGLAS M. WHEATLEY, PE	DATE: 11/29/17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.R.12.19	3B–1

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– STA 10+50.00	–L– STA 12+61.84 BEGIN CULVERT	214	45		169
–L– STA 12+79.36 END CULVERT	–L– STA 15+00.00	238	411	173	
SUBTOTALS:		452	456	173	169
PROJECT TOTALS:		452	456	173	169
WASTE IN LIEU OF BORROW				–169	–169
GRAND TOTALS:		452	456	4	0
SAY:		462		10	

Note: Approximate quantities only. Unclassified Excavation, Borrow, 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–	12+00.00	12+75.87	CL	156
–L–	13+00.22	13+50.00	CL	101
			TOTAL:	257
			SAY:	270

ROW AREA DATA SUMMARY

PARCEL NO.	PROPERTY OWNERS NAMES	PERM. UTILTIY EASE.	PERM. DRAIN. EASE.	PERM. DRAINAGE UTILITY EASE.	CONST. EASE.	TEMPORARY DRAIN. EASE.
1	GENE B. SAIN		3999.88 S.F.		1436.32 S.F.	1363.63 S.F.
2	WALTER NELSON CRISMAN LIFE EST		1325.92 S.F.			83.87 S.F.

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CAAP 12"	CAAP 15"	CAAP 18"	CAAP 24" .064	CAAP 30" .079	CAAP 36"	CAAP 42" .109	CAAP 48"	BITUMINOUS 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– 12+47.48	LT																														
TOTAL																															

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')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	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	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
–L– 12+47.48		40																									21	REMOVE 21' OF 18" RCP
TOTAL		40																									21	

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

"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 STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	TYPE III	GREU TL–3	M–350	XIII	CAT–1	VI MOD	BIC	AT–1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	STA 11+62.50	STA 13+62.50	RT	200.00'			STA 12+70 CULVERT		3'	6'	50'		1'				2													
–L–	STA 12+29.30	STA 14+15.38	LT	162.50'	37.50'			STA 12+88 CULVERT	3'	6'		50'		1'			1						1							
			SUBTOTAL:	362.50'	37.50'												3						1							
			ANCHOR DEDUCTIONS:																											
			GRAU 350: 3@50'	–150'																										
			TYPE AT–1:1@6.25'	–6.25'																										
			TOTAL:	206.25'	37.50'																									
			SAY:	212.50'	50'												3						1							
			5 ADDITIONAL POST																											

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8/17/99

**NOTE: 1. DESIGN EXCEPTION APPROVED FOR HORIZONTAL CURVE (167.15'), HORIZONTAL SSD VERTICAL SSD AND VERTICAL SAG (K = 40)

2. ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED ON PLAN

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.
17BP.12.R.19	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 36786 DOUGLAS M. WHEATLEY — 1/4/2018	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15764 JAMES A. BYRD — 1/4/2018

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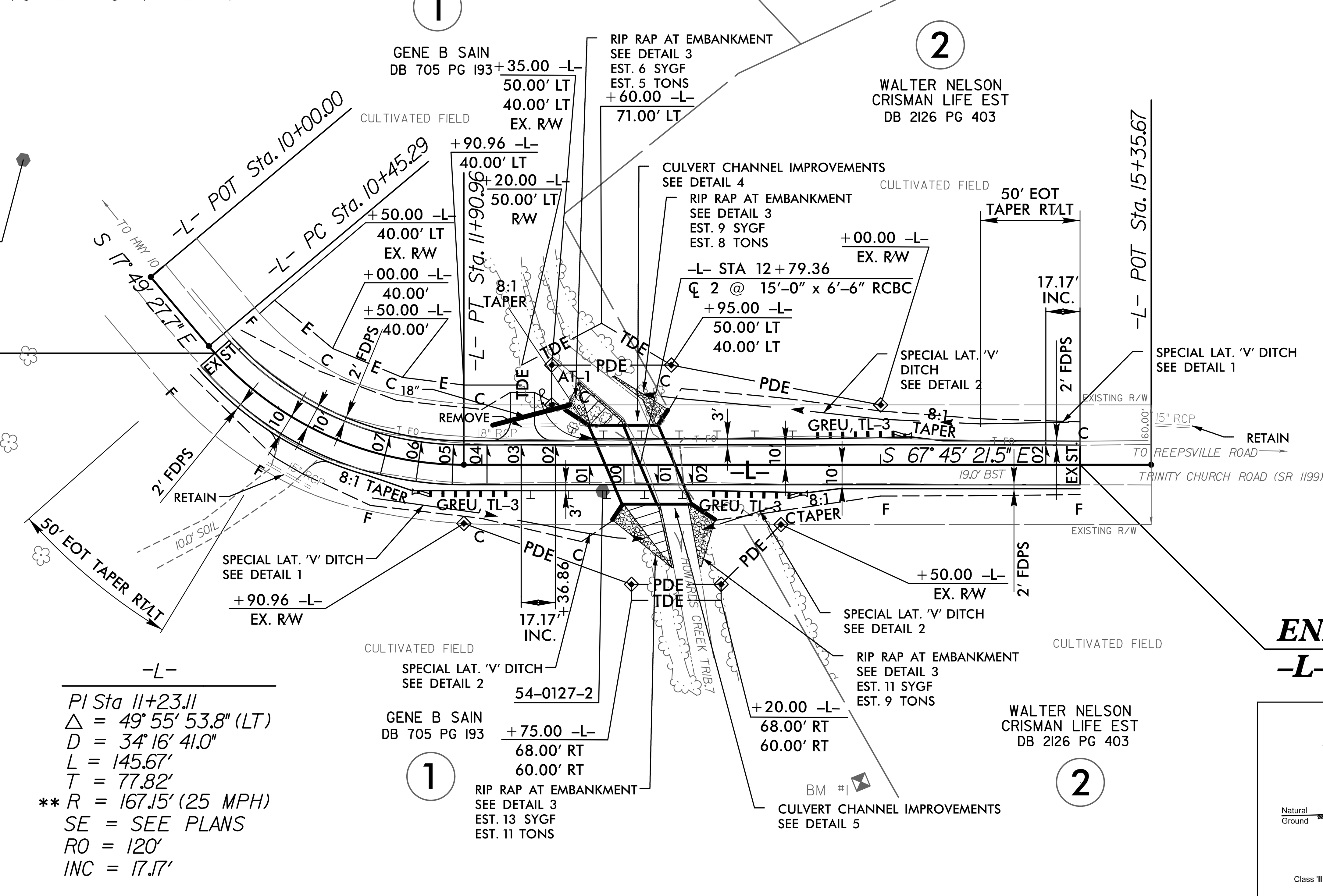
BEGIN TIP PROJECT 17BP.12.R.19
-L- POC STA 10+50.00



END TIP PROJECT 17BP.12.R.19
-L- POT STA 15+00.00

-L-
PI Sta 11+23.11
Δ = 49° 55' 53.8" (LT)
D = 34° 16' 41.0"
L = 145.67'
T = 77.82'
** R = 167.15' (25 MPH)
SE = SEE PLANS
RO = 120'
INC = 17.17'

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground; 2:1; D; 3:1; Fill Slope; Min. D = 1.0 Ft.

FROM -L- STA. 11+50 TO STA. 12+00 RT
FROM -L- STA. 14+50 TO STA. 15+00 LT

DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground; 2:1; D; VAR; Fill Slope; Min. D = 1.0 Ft.

FROM -L- STA. 12+00 TO STA. 12+85 RT
FROM -L- STA. 12+80 TO STA. 14+50 LT
FROM -L- STA. 13+10 TO STA. 13+50 RT

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)
10' min.; 1.0' min.; Ditch Grade; GEOTEXTILE
Type of Liner = Class 'II' Rip-Rap

-L- STA. 12+50 LT
-L- STA. 12+75 RT
-L- STA. 12+85 LT
-L- STA. 13+10 RT

DETAIL 4 (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)
EST. 20 CY EXCAVATION
EST. 45 SY MATTING
EST. 30 TONS CLASS 'II' RIP-RAP
D = Varies (To Top of Bank)
-L- STA. 12+78 LT

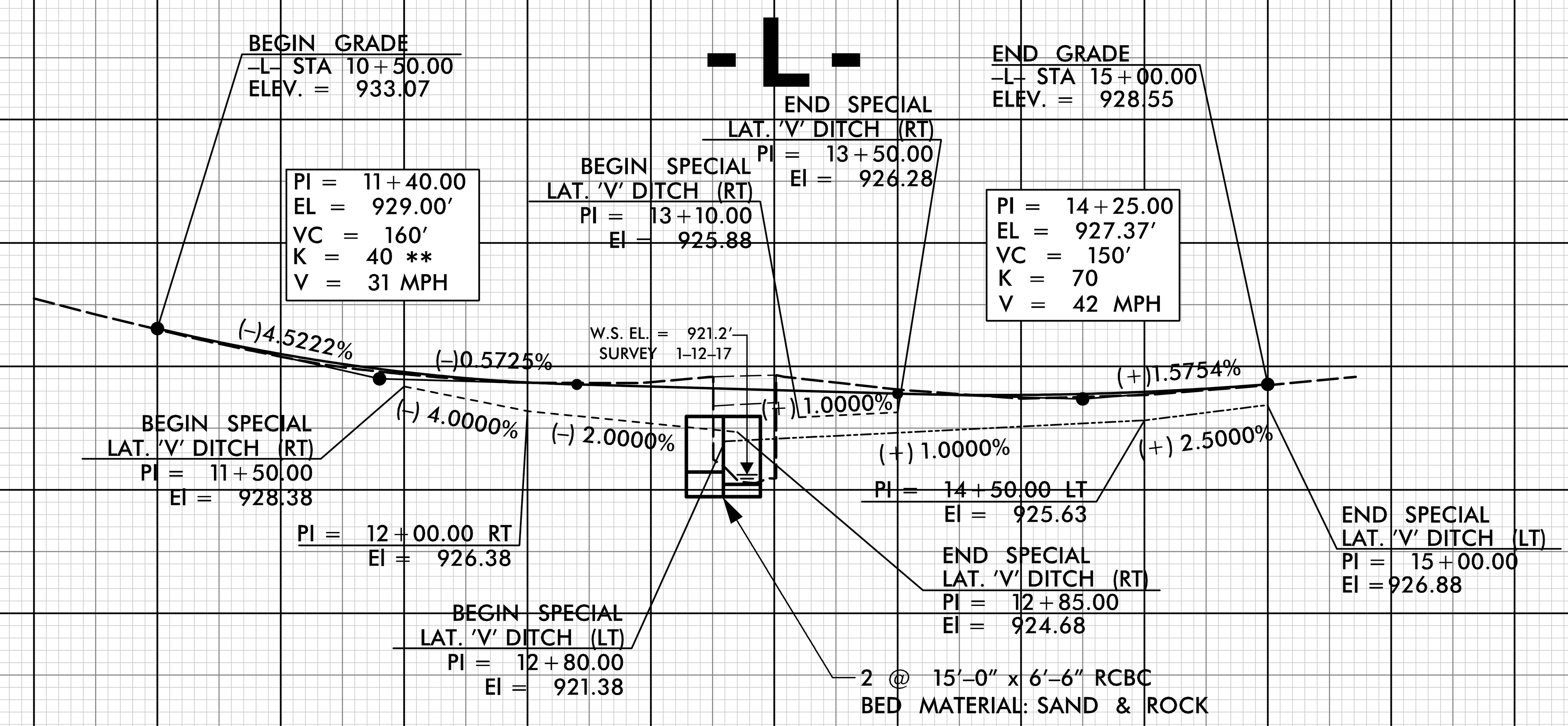
DETAIL 5 (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)
EST. 25 CY EXCAVATION
EST. 55 SY MATTING
EST. 40 TONS CLASS 'II' RIP-RAP
D = Varies (To Top of Bank)
-L- STA. 12+96 RT

REVISIONS

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 928.6	FT
BASE DISCHARGE	= 2265	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 929.2	FT
OVERTOPPING DISCHARGE	= 900	CFS
OVERTOPPING FREQUENCY	= <10-YR(-)	YRS
OVERTOPPING ELEVATION	= 927.69	FT

LEFT DITCH
RIGHT DITCH



BM #1
RR SPIKE IN BASE OF 18" BLACK WALNUT TREE
ELEV. = 928.24

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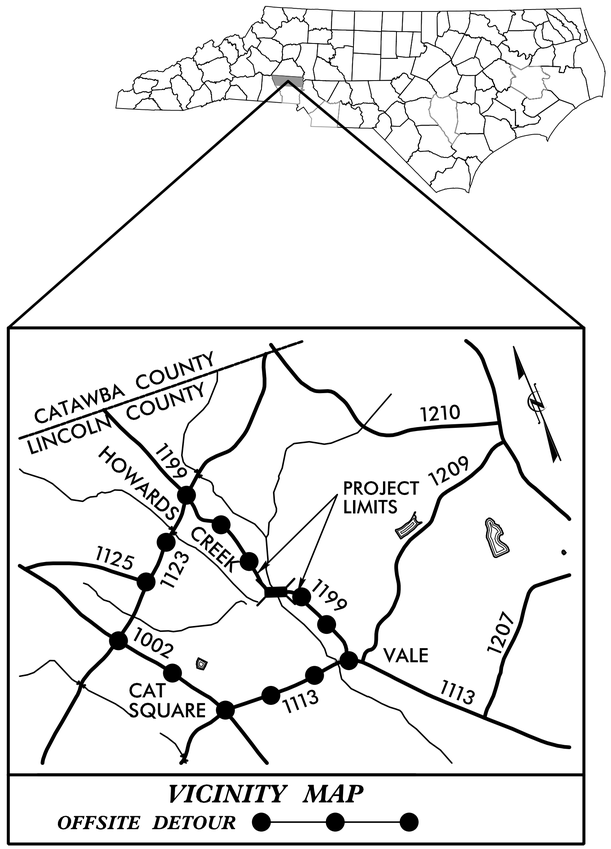
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

LINCOLN COUNTY



VICINITY MAP

OFFSITE DETOUR

LOCATION: REPLACE BRIDGE NO. 127 OVER HOWARDS CREEK ON SR 1199 (TRINITY CHURCH ROAD)

INDEX OF SHEETS

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 JAN 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

R. B. EARLY, PE — *TRAFFIC CONTROL PROJECT ENGINEER*

J. A. PHILLIPS — *TRAFFIC CONTROL DESIGN ENGINEER*

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NCDOT CONTACTS:

Byron Engle, PE	DIVISION 12 - DIVISION TRAFFIC ENGINEER
Jimmy Hamrick, PE	DIVISION 12 - REGIONAL TRAFFIC ENGINEER

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

APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 1/5/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

SHEET NO. TMP-1

17BP.12.R.19

TIP PROJECT:

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PROJ. REFERENCE NO.	SHEET NO.
17BP.12.R.19	TMP-2

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 THE DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATIONS MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL THE 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.

TRAFFIC PATTERN ALTERATIONS

B) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN ON THIS SHEET.

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

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

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKING AND MARKERS

G) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKERS
SR 1199 (TRINITY CHURCH RD)	PAINT	SNOWPLOWABLE

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

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

J) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

K) STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND TYPE III BARRICADES AT THE PROJECT LIMITS. STATE FORCES WILL INSTALL MARKINGS AND MARKERS ON THE FINISHED PROJECT. CONTACT PHIL EAKER AT 980-552-4122 TWO WEEKS PRIOR TO CLOSING THE ROAD FOR DETOUR INSTALLATION.

PHASING

PHASE I

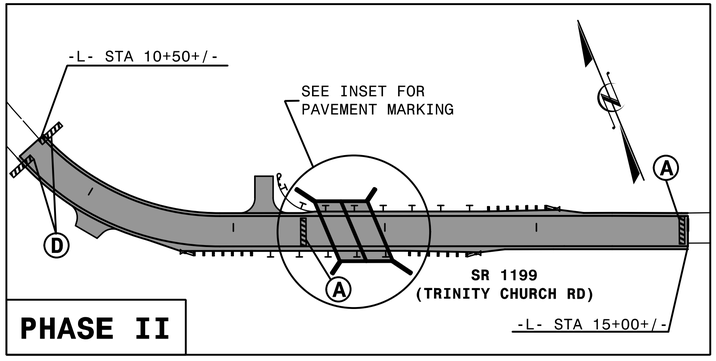
PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE AND COVER OFF-SITE DETOUR SIGNS AS SHOWN AND IN ACCORDANCE WITH RSD 1101.03 (SHEET 1 OF 9).

PHASE II

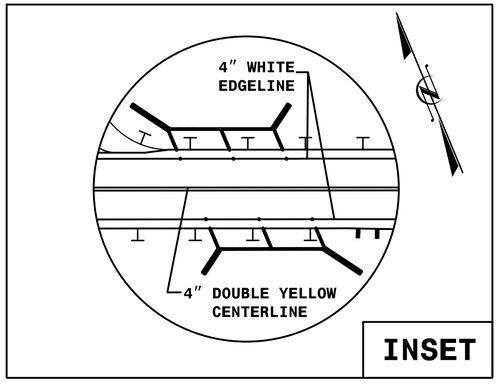
USING OFF-SITE DETOUR, UNCOVER DETOUR SIGNS, CLOSE -L- (SR 1199 /TRINITY CHURCH RD) TO TRAFFIC AND CONSTRUCT CULVERT AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE. MAINTAIN ACCESS TO DRIVEWAYS WITHIN THE PROJECT LIMITS.

PHASE III

UPON COMPLETION OF CULVERT AND ROADWAY, PLACE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH RSD 1205.01, 1205.02, 1205.12, 1250.01 AND 1251.01. REMOVE BARRICADES AND DETOUR SIGNS AND OPEN -L- (SR 1199 / TRINITY CHURCH RD) TO TRAFFIC.



PHASE II



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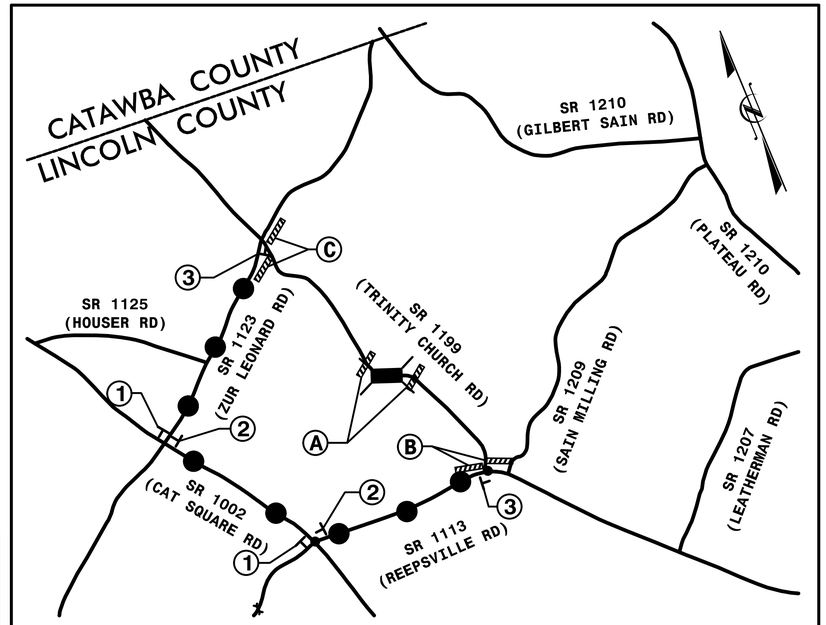
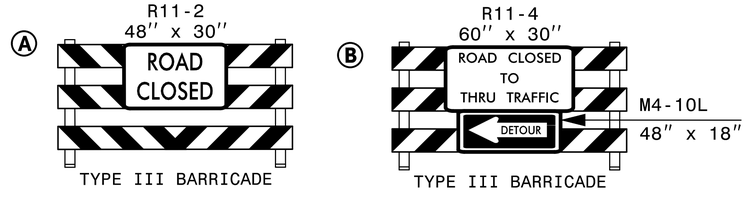


VICINITY MAP

OFFSITE DETOUR



APPROVED: DocuSigned by: Rhonda B. Early F34CAF5AC6BF48A...

DATE: 1/5/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 023521 ENGINEER RHONDA B. EARLY

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TRANSPORTATION MANAGEMENT PLAN

GENERAL NOTES, PHASING AND DETOUR SIGNING

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

1/5/2018
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HNTB

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TIP PROJECT: 17BP.12.R.19

CONTRACT:

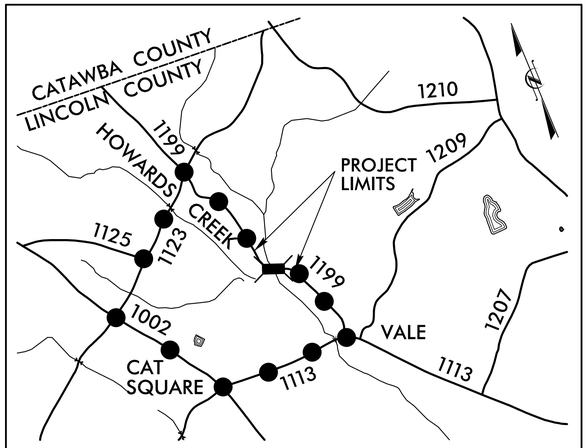
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LINCOLN COUNTY

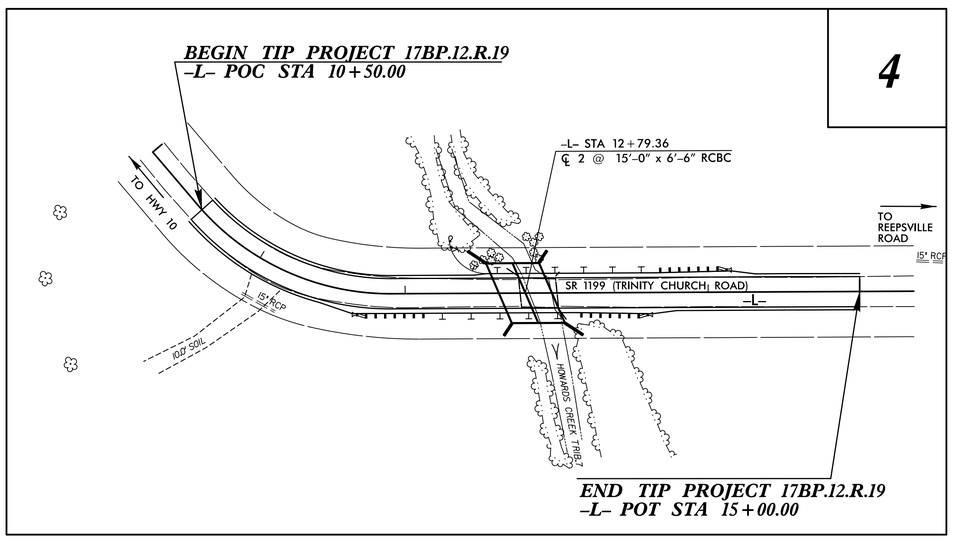
LOCATION: REPLACE BRIDGE NO. 127 OVER HOWARDS CREEK ON SR 1199 (TRINITY CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT



VICINITY MAP

OFFSITE DETOUR



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NAD 83/ NSRS 2007

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.19	EC-1	

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

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
	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	
	Tiered Skimmer Basin	
	Infiltration Basin	

NOTES:

1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
**3. DESIGN EXCEPTION NEEDED FOR HORIZONTAL CURVE (167.15') AND VERTICAL SAG (K = 40)

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

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 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:
HNTB
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

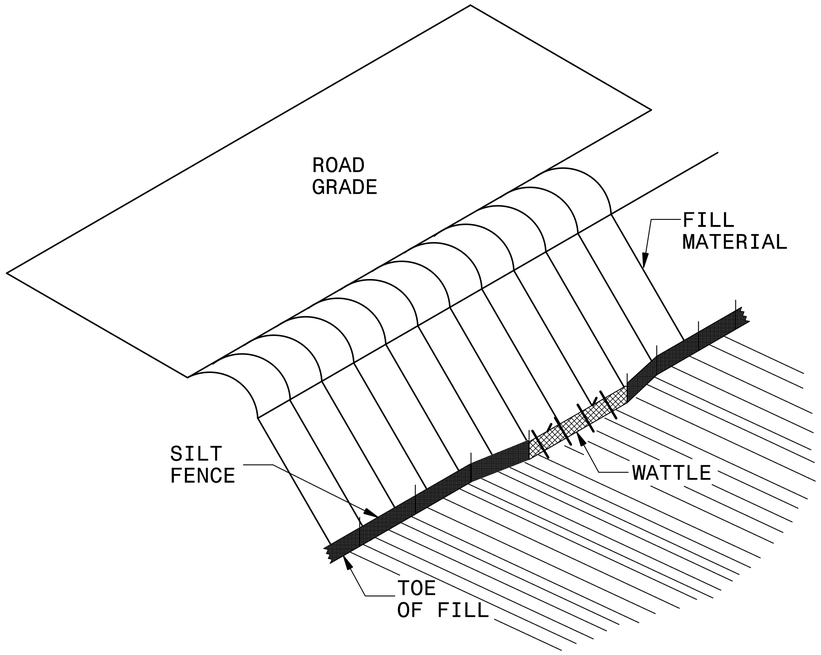
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	*Railroad Erosion Control Detail*	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*		

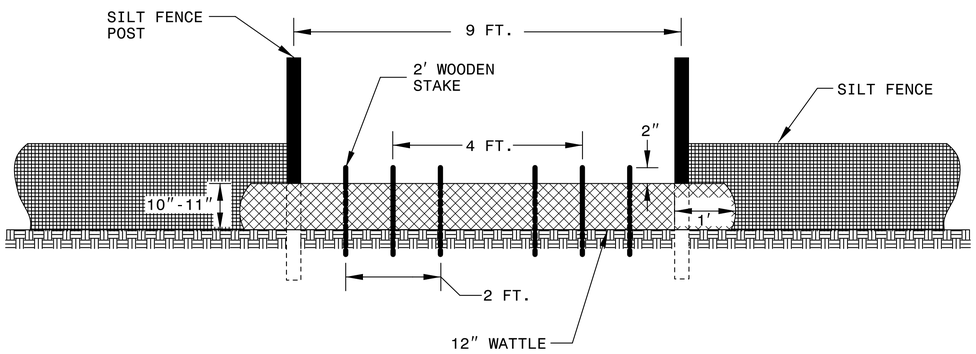
11/30/2017
...\540027_hyd_EC_tsh.dgn
HNTB

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.RJ9	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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.

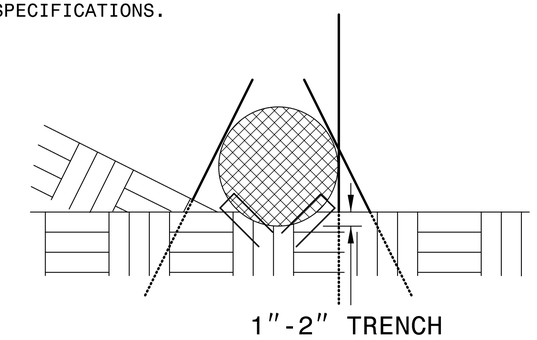
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

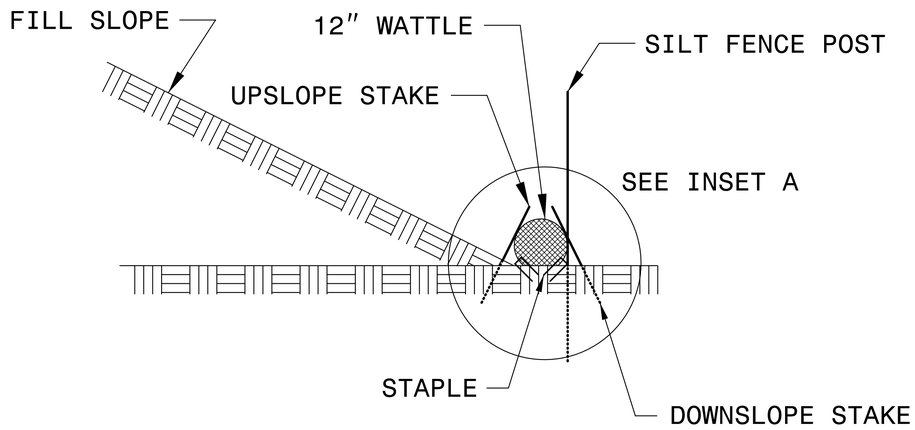
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

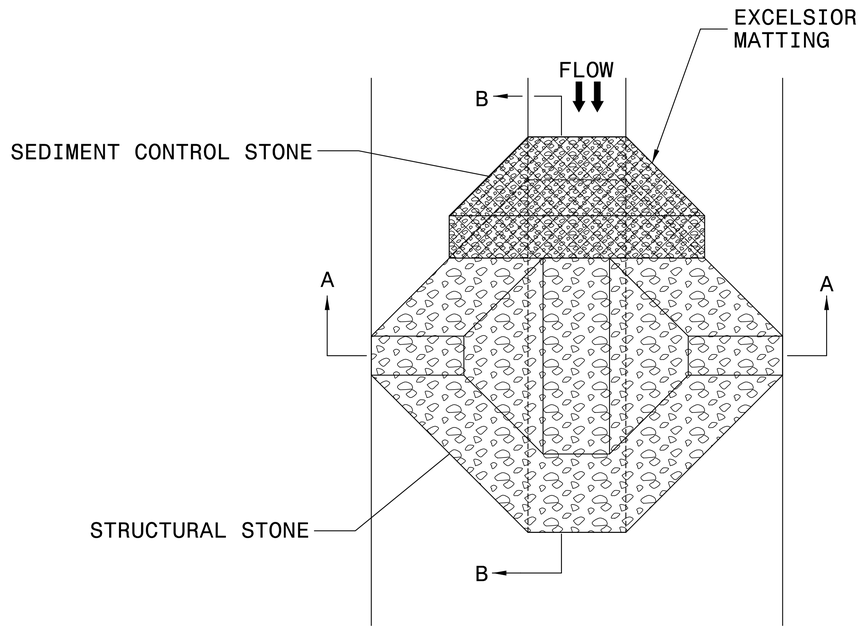




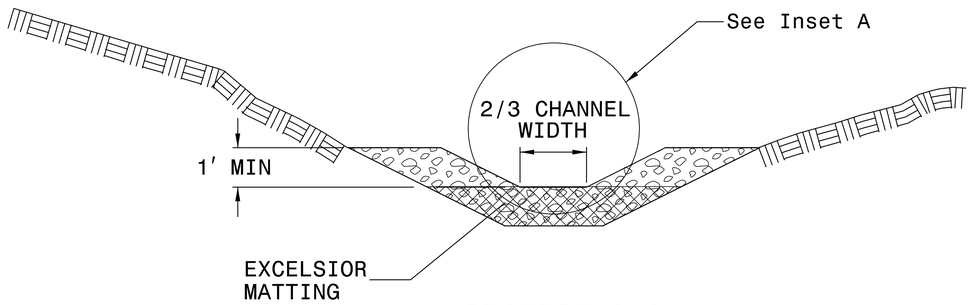
SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.RJ9	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

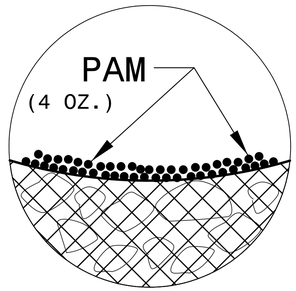
NOTES:

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

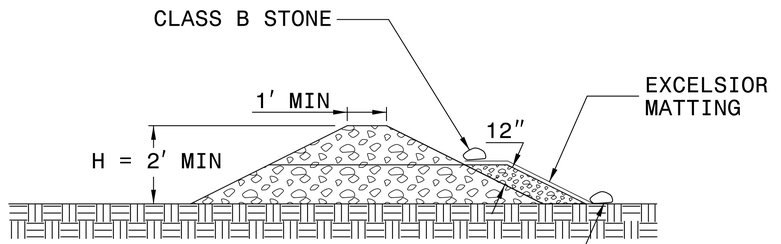
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A

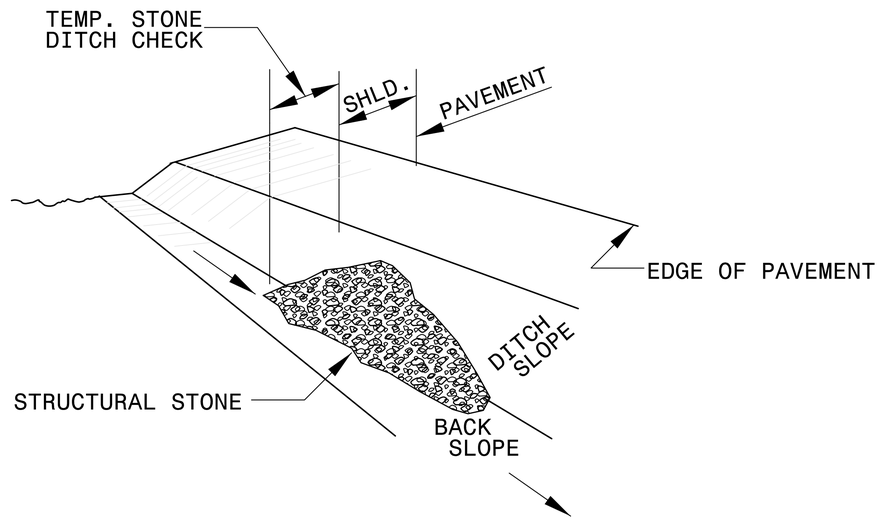


SECTION B-B

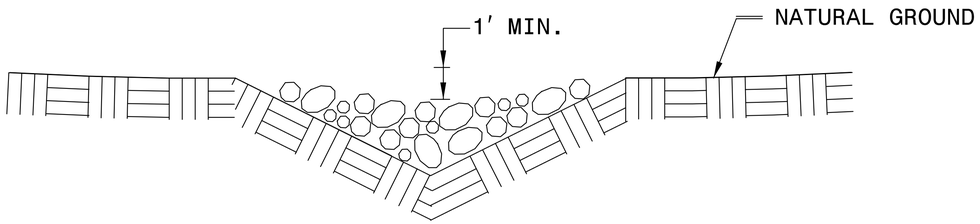
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP12.RJ9	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

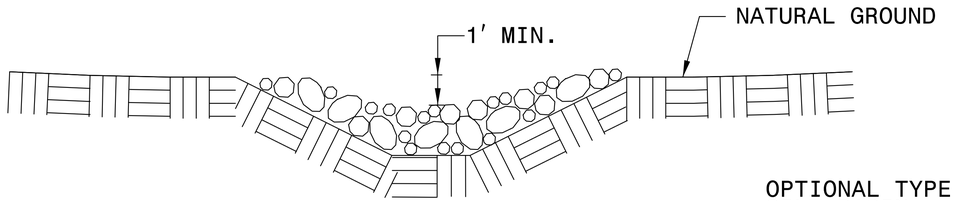
TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH

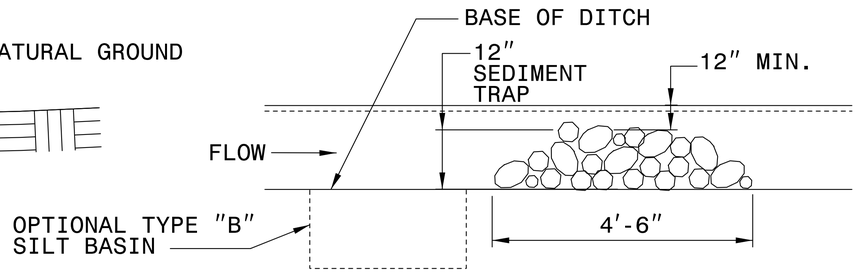


CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

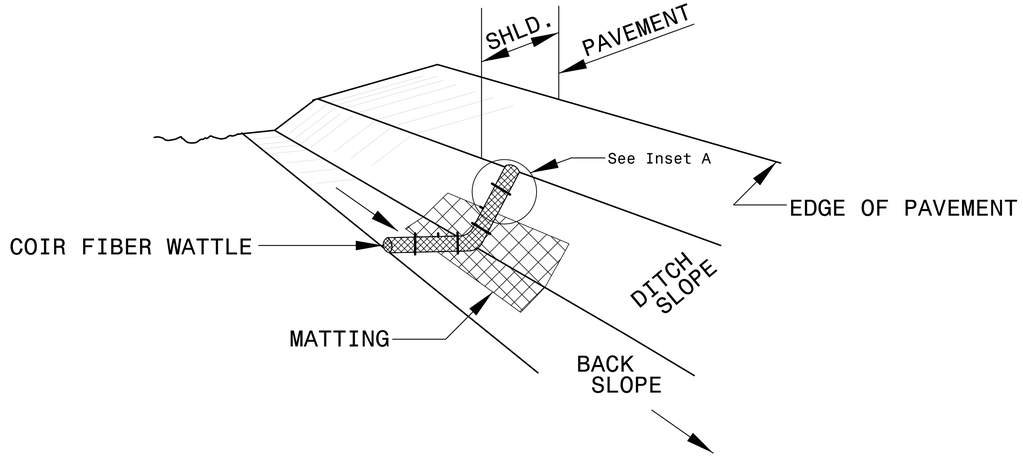
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



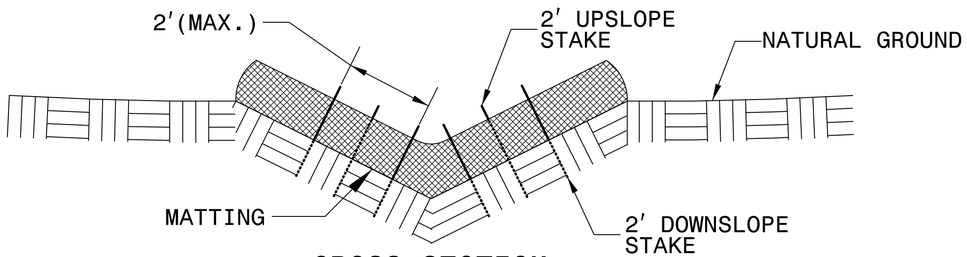
ELEVATION VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R19	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

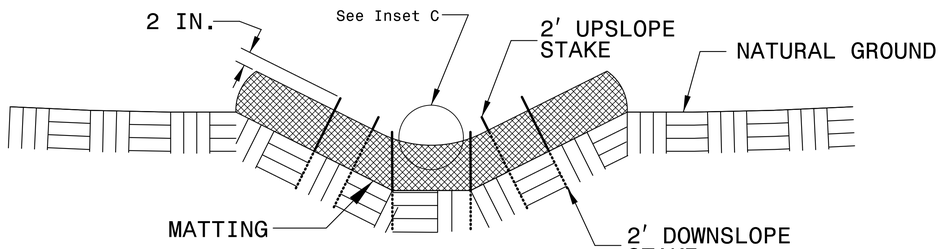
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

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

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

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

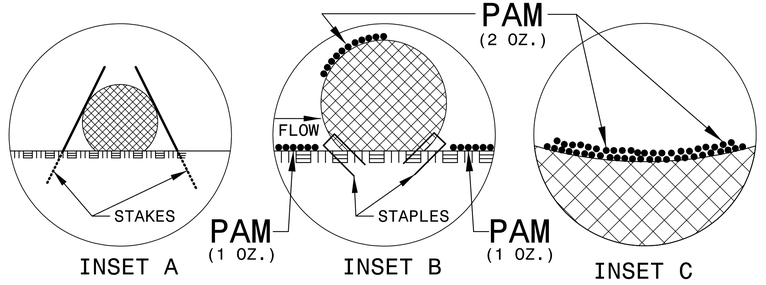
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

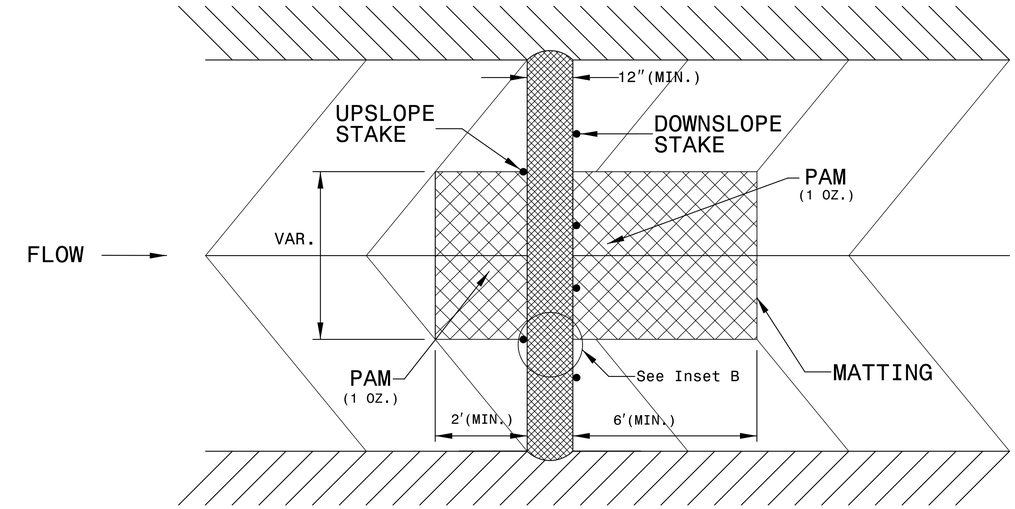
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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

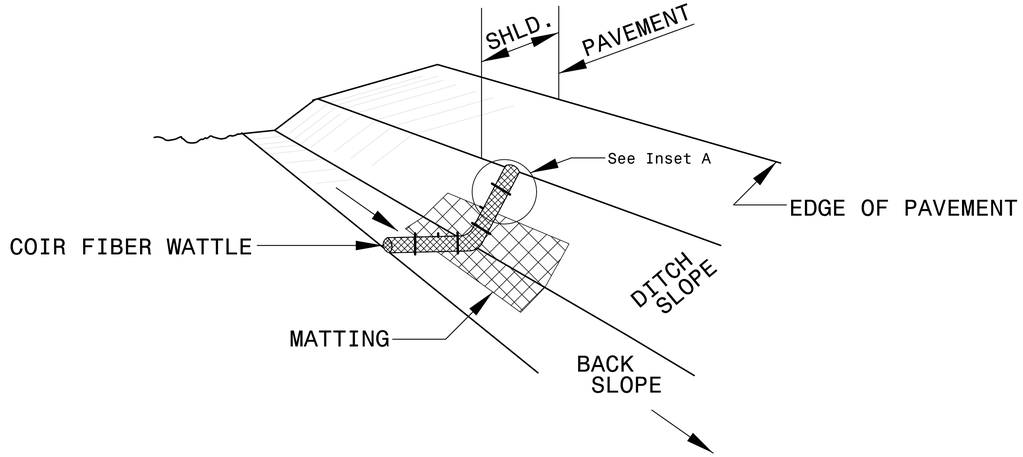




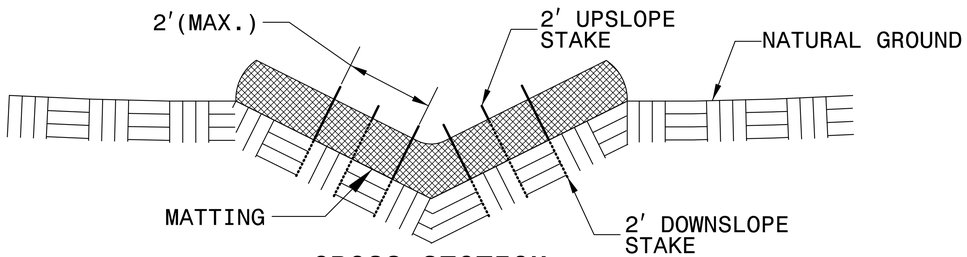
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.RJ9	EC-2D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

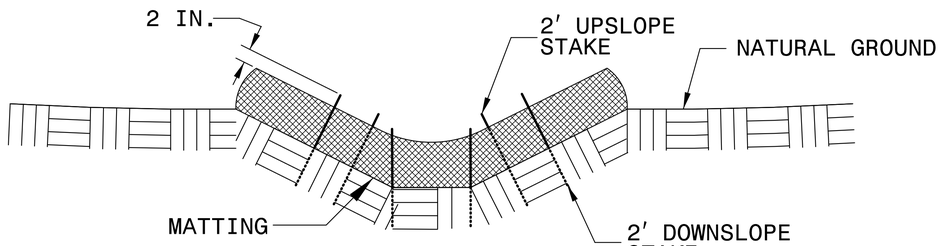
COIR FIBER WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

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

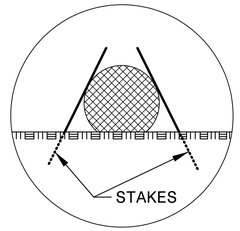
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

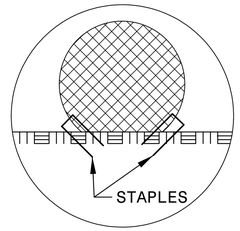
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

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

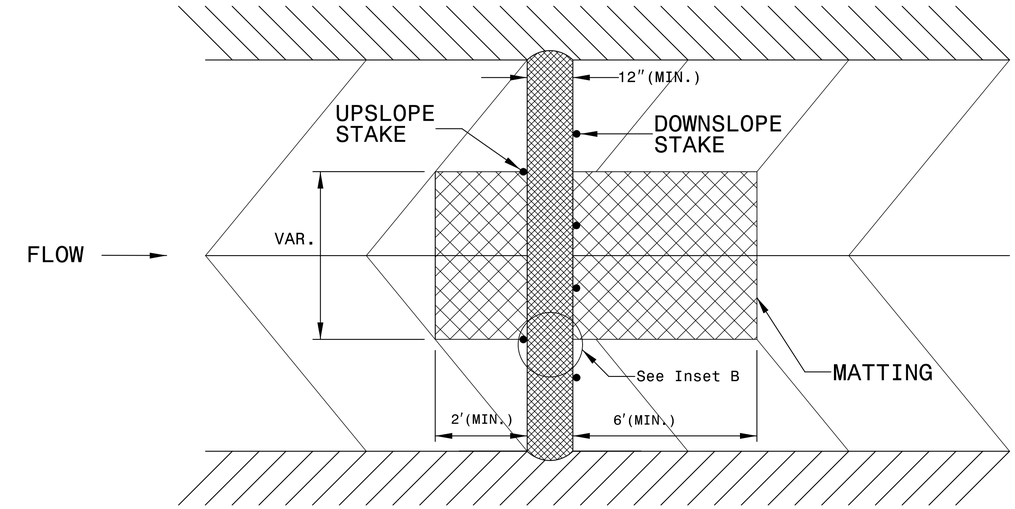
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



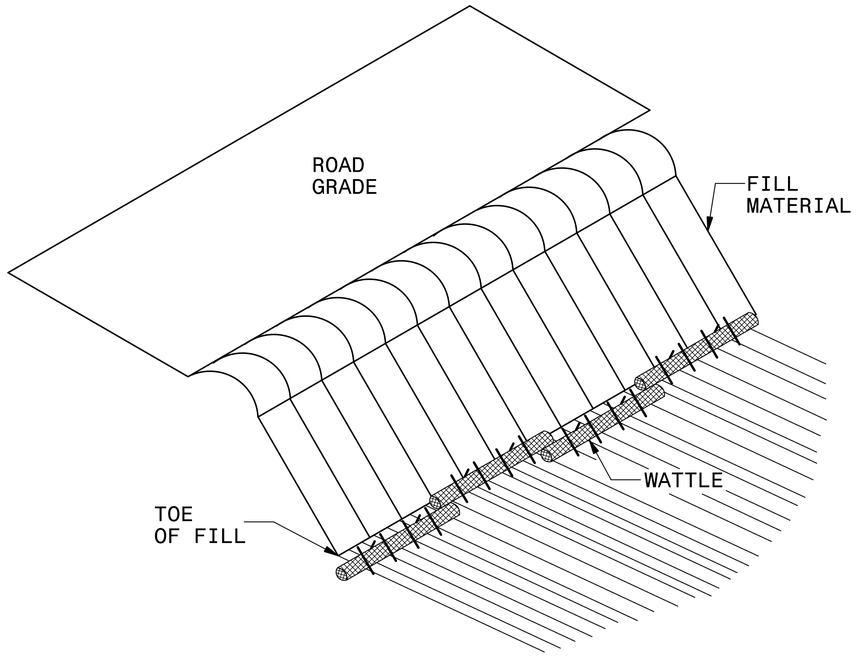
INSET B



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.RJ9	EC-2E
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.

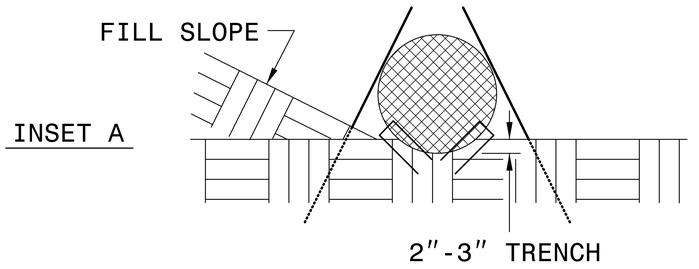
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

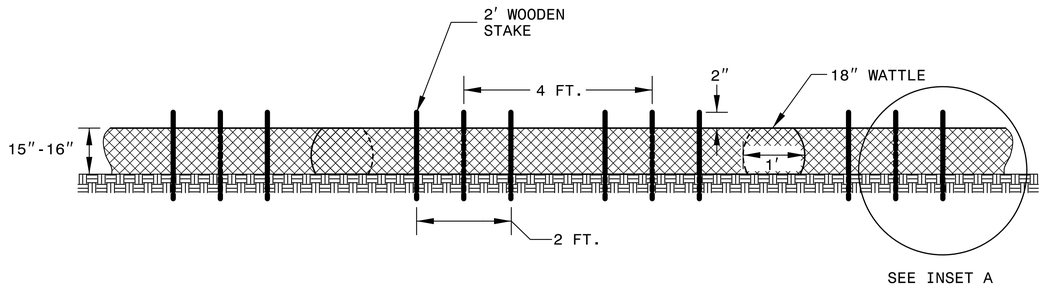
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

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

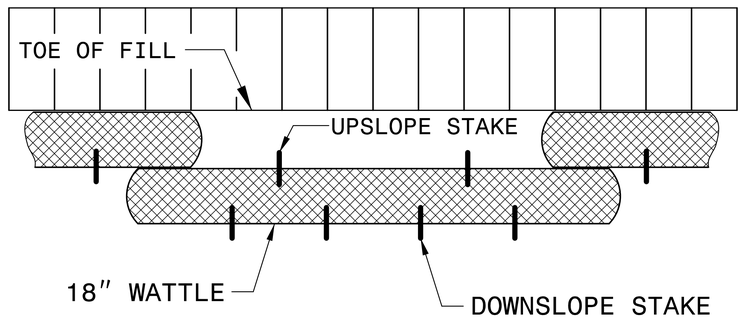
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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





FRONT VIEW



TOP VIEW

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+50	12+85	RT	85
4	-L-	12+80	15+00	RT	155
				SUBTOTAL	240
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					1560
				TOTAL	1800
				SAY	1800

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	EC-3A

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

REVISIONS

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

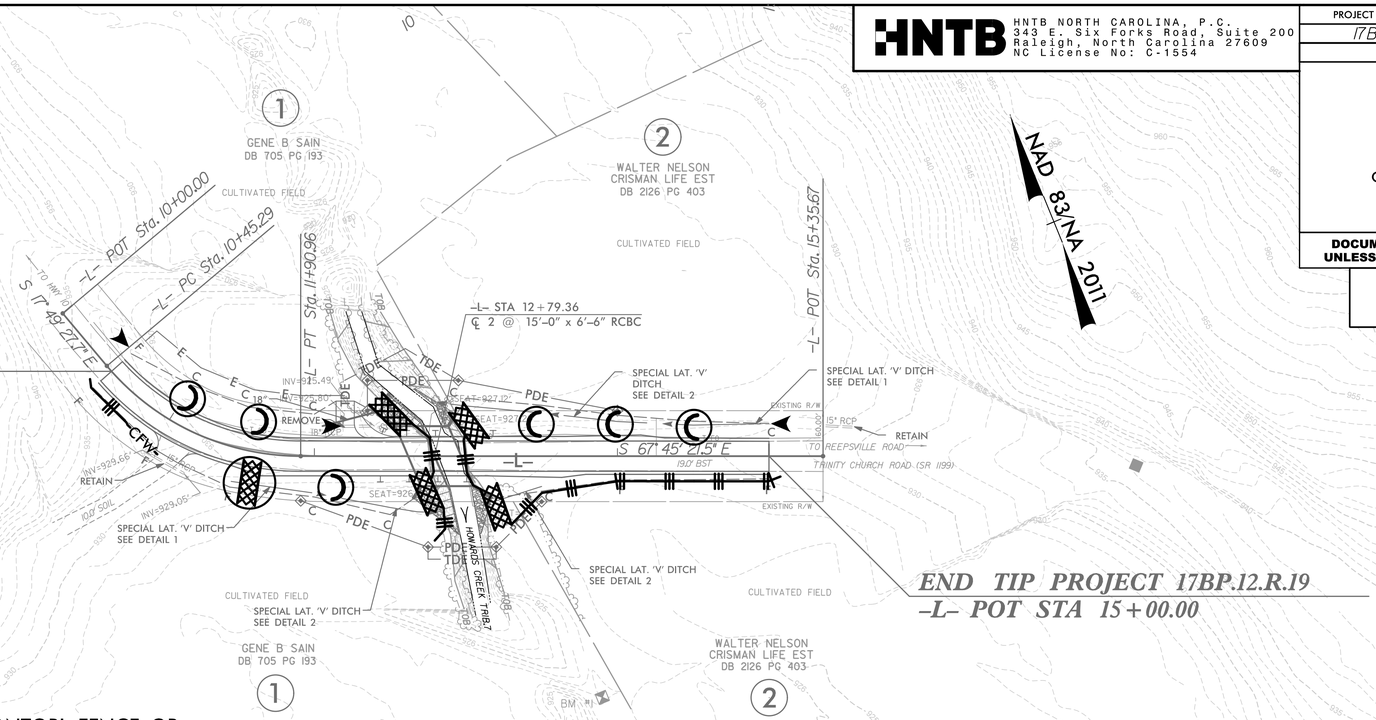
PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	EC-4/CONST.4
R/W SHEET NO.	

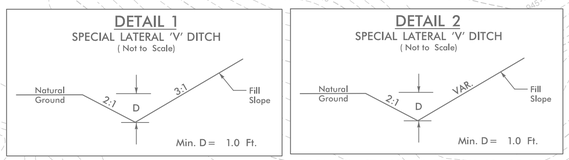
ALLEN HODGES, E.I.
EROSION CONTROL
LEVEL III
CERTIFICATION #3633

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NAD 83/NA 2011





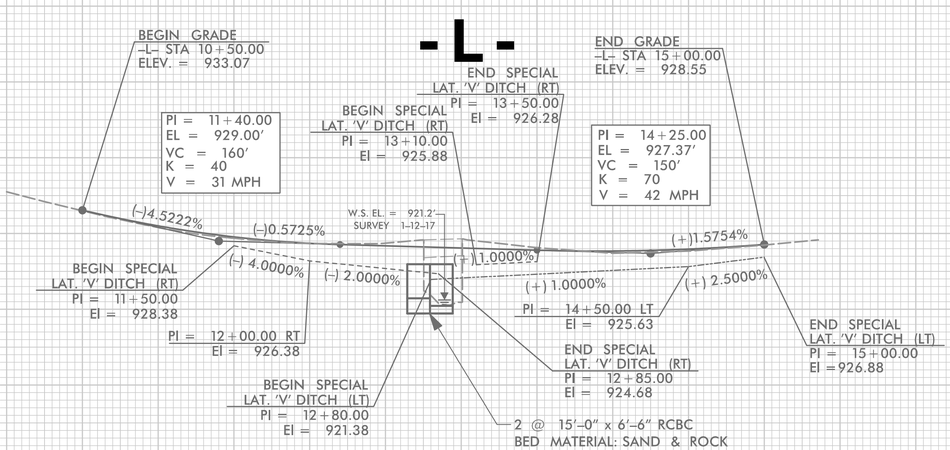
FROM -L- STA. 11+50 TO STA. 12+00 RT
FROM -L- STA. 14+50 TO STA. 15+00 LT

FROM -L- STA. 12+00 TO STA. 12+85 RT
FROM -L- STA. 12+80 TO STA. 14+50 LT
FROM -L- STA. 13+10 TO STA. 13+50 RT

NOTES: 1. THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTORL 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).

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 928.6	FT
BASE DISCHARGE	= 2265	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 929.2	FT
OVERTOPPING DISCHARGE	= 900	CFS
OVERTOPPING FREQUENCY	= <10-YR(-)	YRS
OVERTOPPING ELEVATION	= 927.69	FT



LEFT DITCH ----------

RIGHT DITCH - - - - - -

BM #1
RR SPIKE IN BASE OF 18" BLACK WALNUT TREE
ELEV. = 928.24

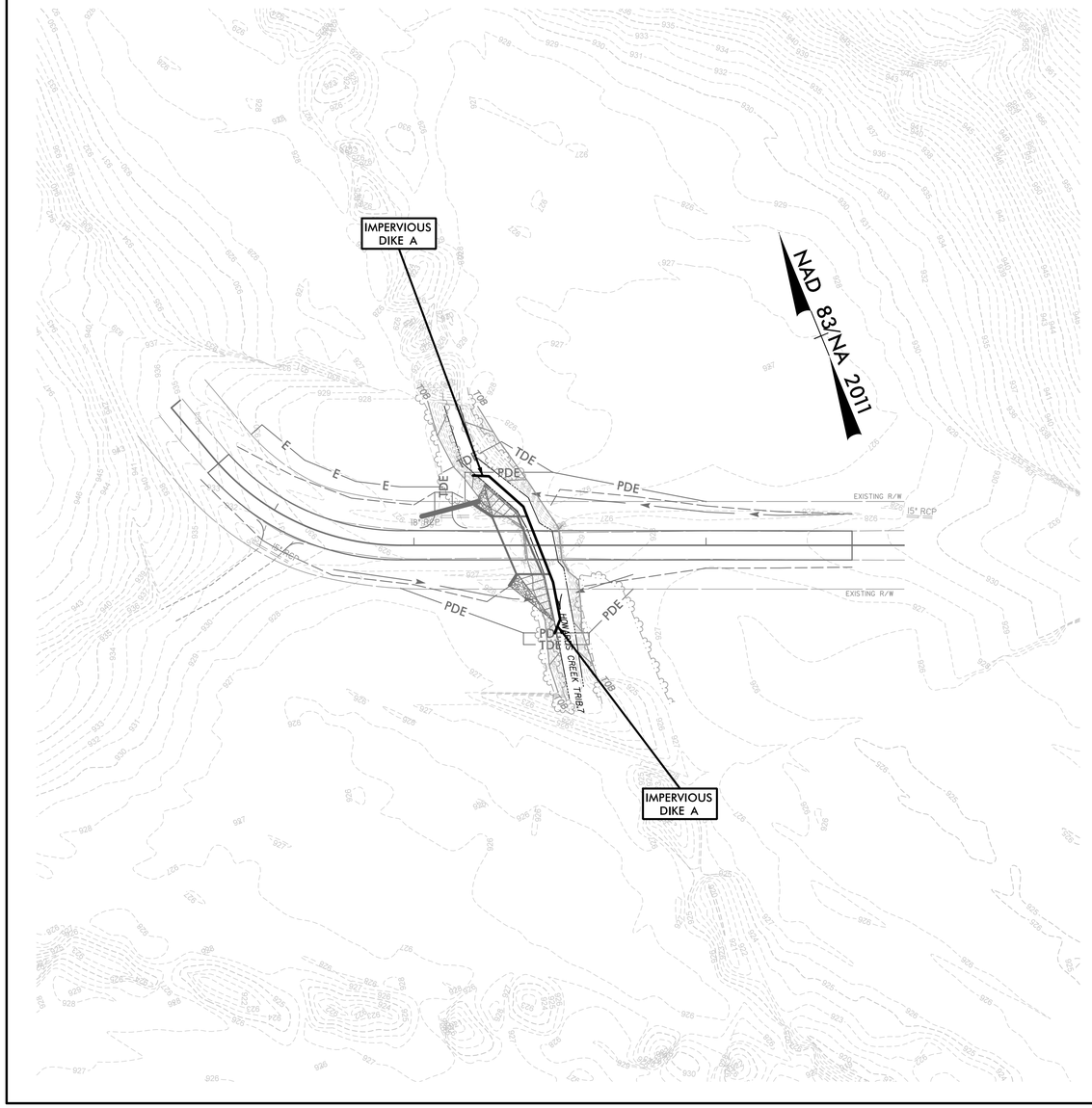
11/30/2017
S:\480127_hyd_EC_psh4.dgn
HNTB

CULVERT CONSTRUCTION SEQUENCE STA. 12+79.36 –L–

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

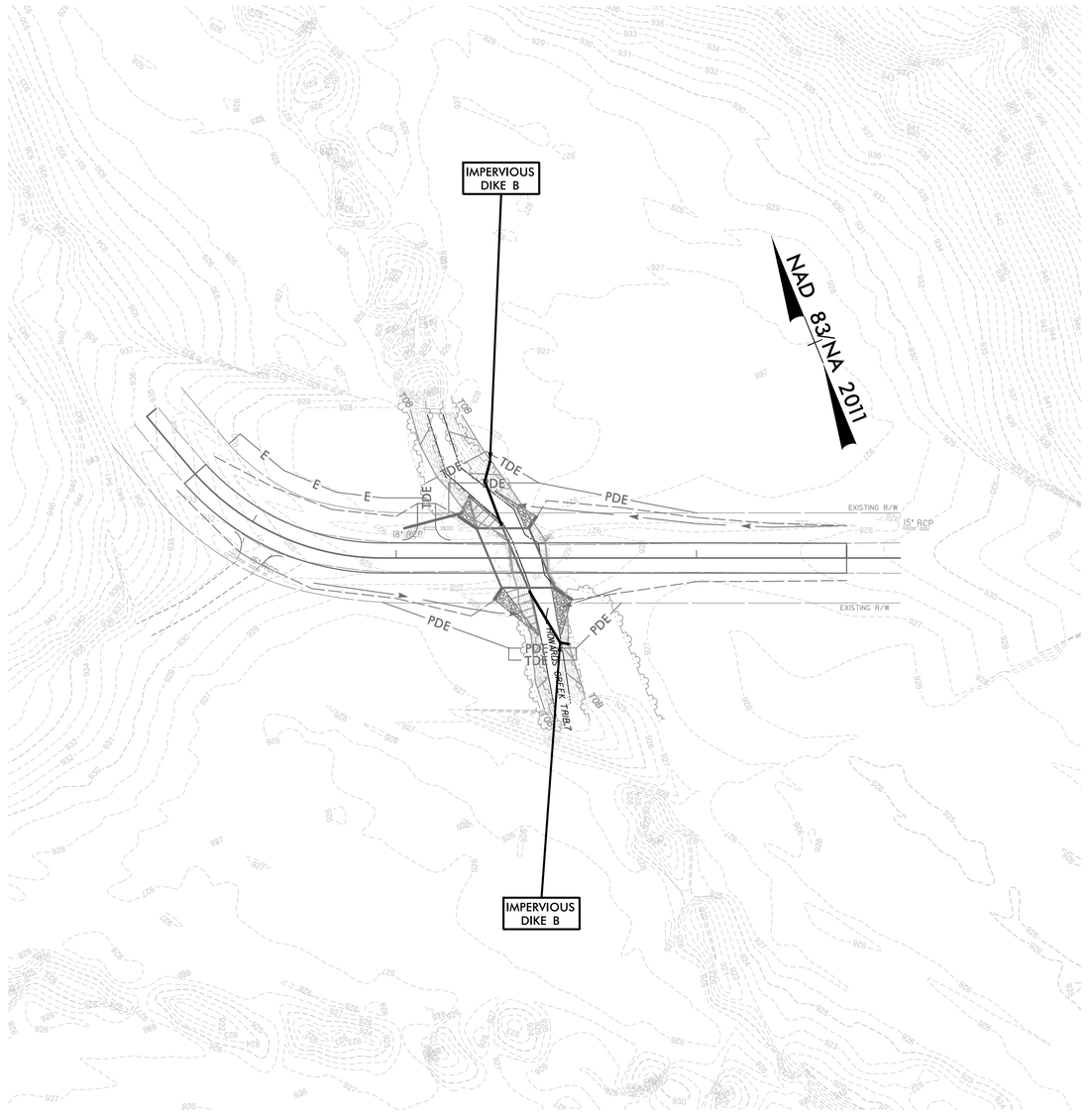
PHASE I

1. INSTALL IMPERVIOUS DIKE A AND DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S) AS NEEDED.
2. CONSTRUCT WESTERN BARREL OF THE PROPOSED CULVERT.
3. CONSTRUCT PORTION OF UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS FOR THE WESTERN BARREL.



PHASE II

1. REMOVE IMPERVIOUS DIKE A AND INSTALL IMPERVIOUS DIKE B. DIVERT FLOW TO NEWLY CONSTRUCTED WESTERN BARREL.
2. CONSTRUCT THE EASTERN BARREL OF THE PROPOSED CULVERT.
3. CONSTRUCT THE REMAINDER OF THE UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS.
4. REMOVE IMPERVIOUS DIKE B AND ALLOW FLOW THROUGH CULVERT.

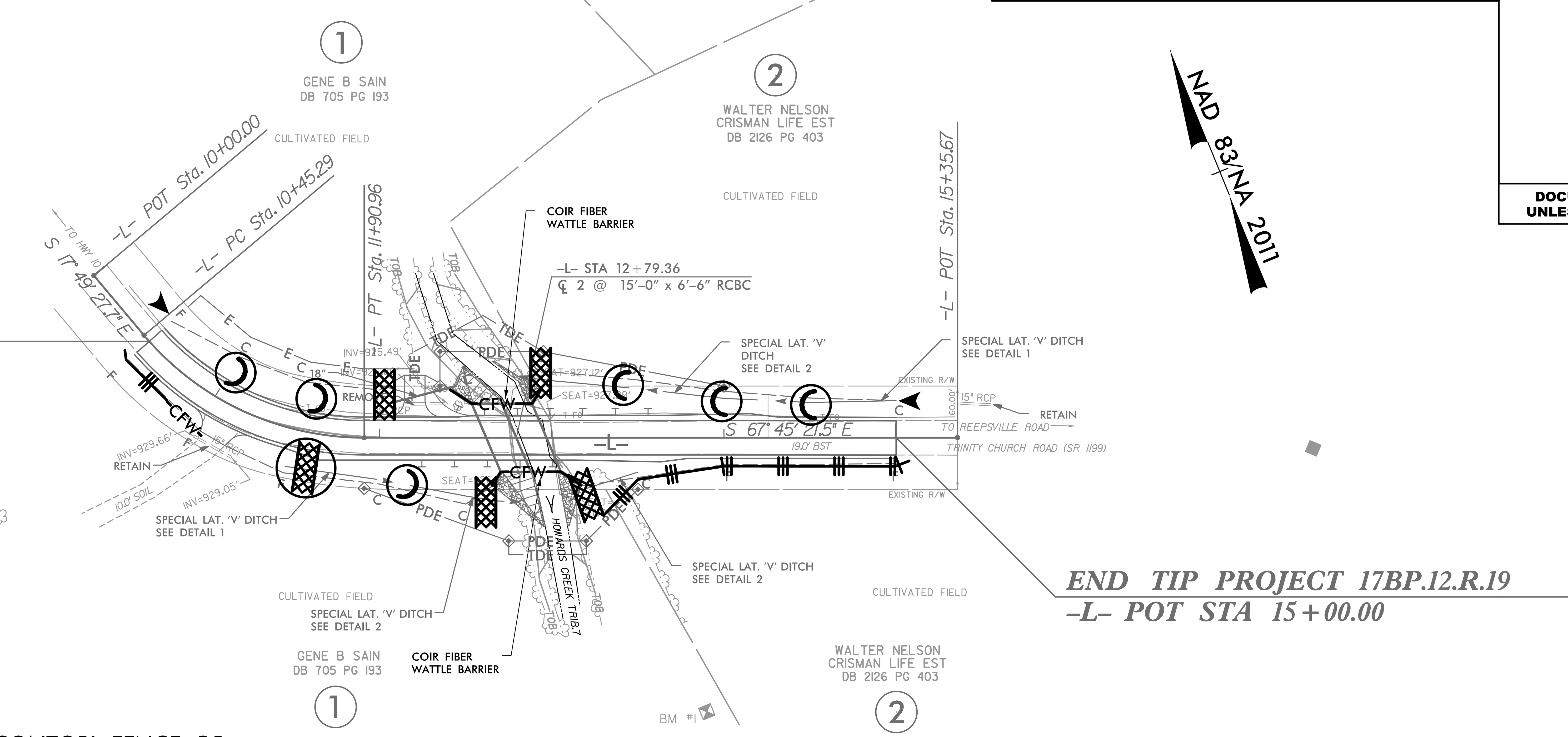


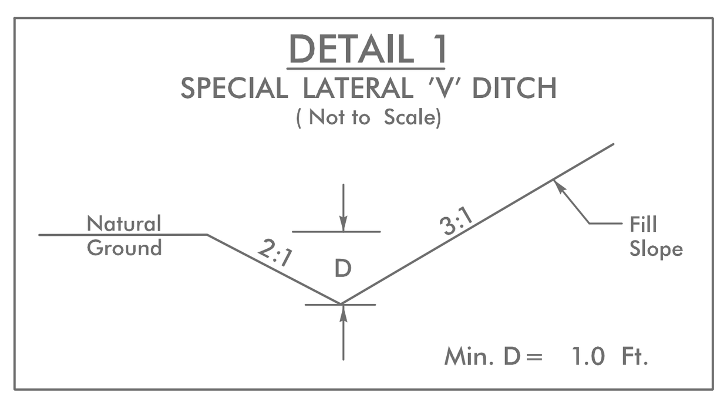
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	EC-6/CONST.4
R/W SHEET NO.	

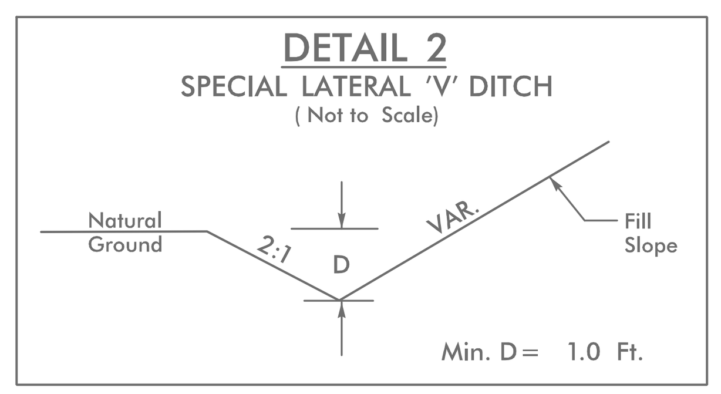
ALLEN HODGES, E.I.
EROSION CONTROL
LEVEL III
CERTIFICATION #3633

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





FROM -L- STA. 11+50 TO STA. 12+00 RT
FROM -L- STA. 14+50 TO STA. 15+00 LT

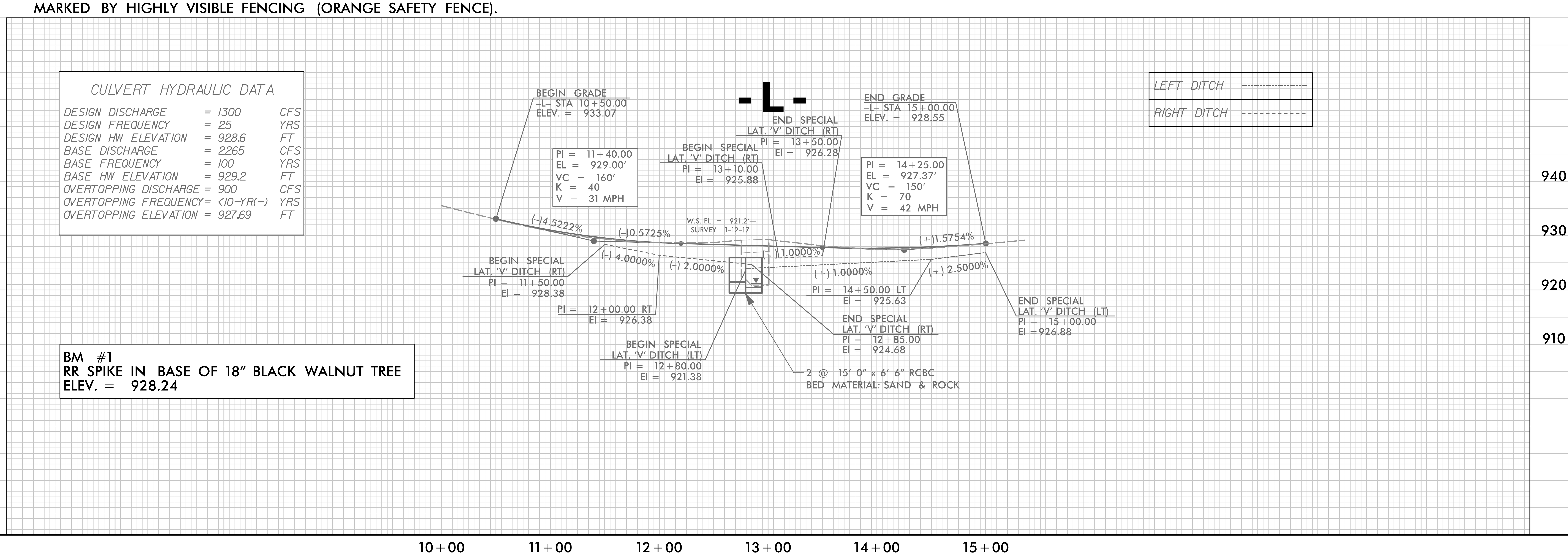


FROM -L- STA. 12+00 TO STA. 12+85 RT
FROM -L- STA. 12+80 TO STA. 14+50 LT
FROM -L- STA. 13+10 TO STA. 13+50 RT

NOTES:
1. THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTORL 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).

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 928.6	FT
BASE DISCHARGE	= 2265	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 929.2	FT
OVERTOPPING DISCHARGE	= 900	CFS
OVERTOPPING FREQUENCY	= <10-YR(-)	YRS
OVERTOPPING ELEVATION	= 927.69	FT



BM #1
RR SPIKE IN BASE OF 18" BLACK WALNUT TREE
ELEV. = 928.24

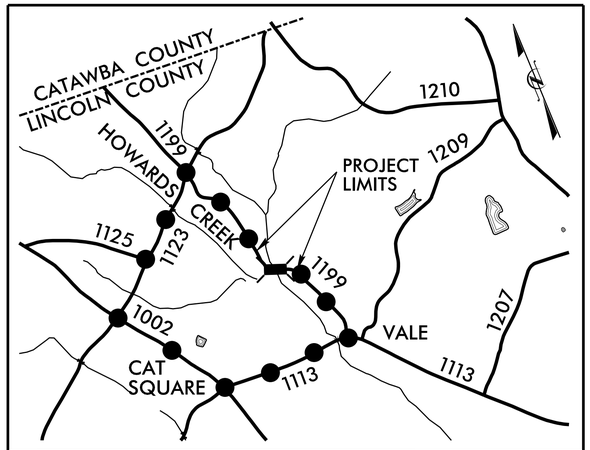
REVISIONS

8/17/99

11/30/2017
5400127_hyd_EC_psh4.dgn
HNTB

09/08/99

TIP PROJECT: 17BP.12.R.19



VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
LINCOLN COUNTY

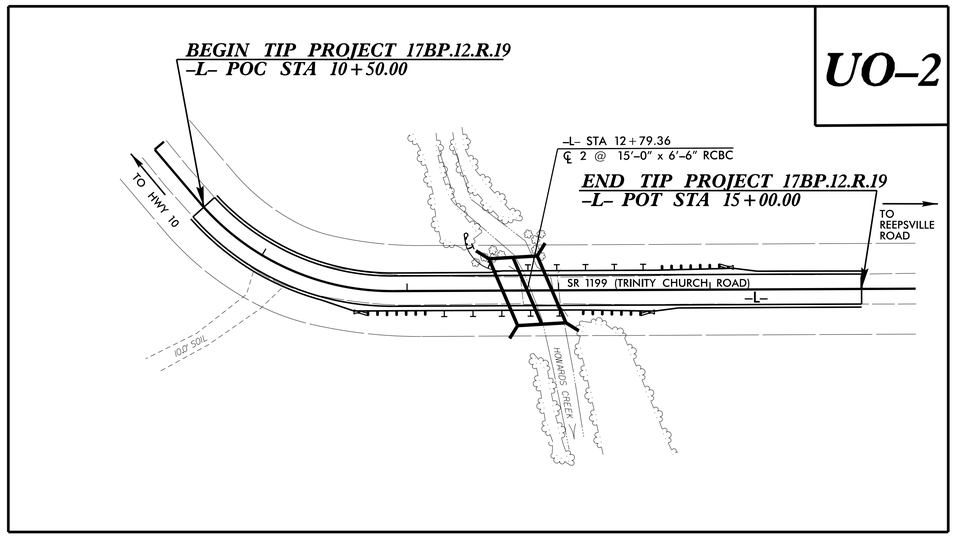
T.I.P. NO.	SHEET NO.
17BP.12.R.19	UO–1

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

LOCATION: REPLACE BRIDGE NO. 127 OVER HOWARDS CREEK ON SR 1199 (TRINITY CHURCH ROAD)

TYPE OF WORK: UTILITY RELOCATION

NAD 83/ NSRS 2007



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) FIBER OPTIC – AT&T

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

WEBB WHITE — UTILITY PROJECT MANAGER
WARREN ANDERSON — PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 12
DIV ADDRESS
PO BOX 47
1710 E. MARION ST
SHELBY NC 28151–0047

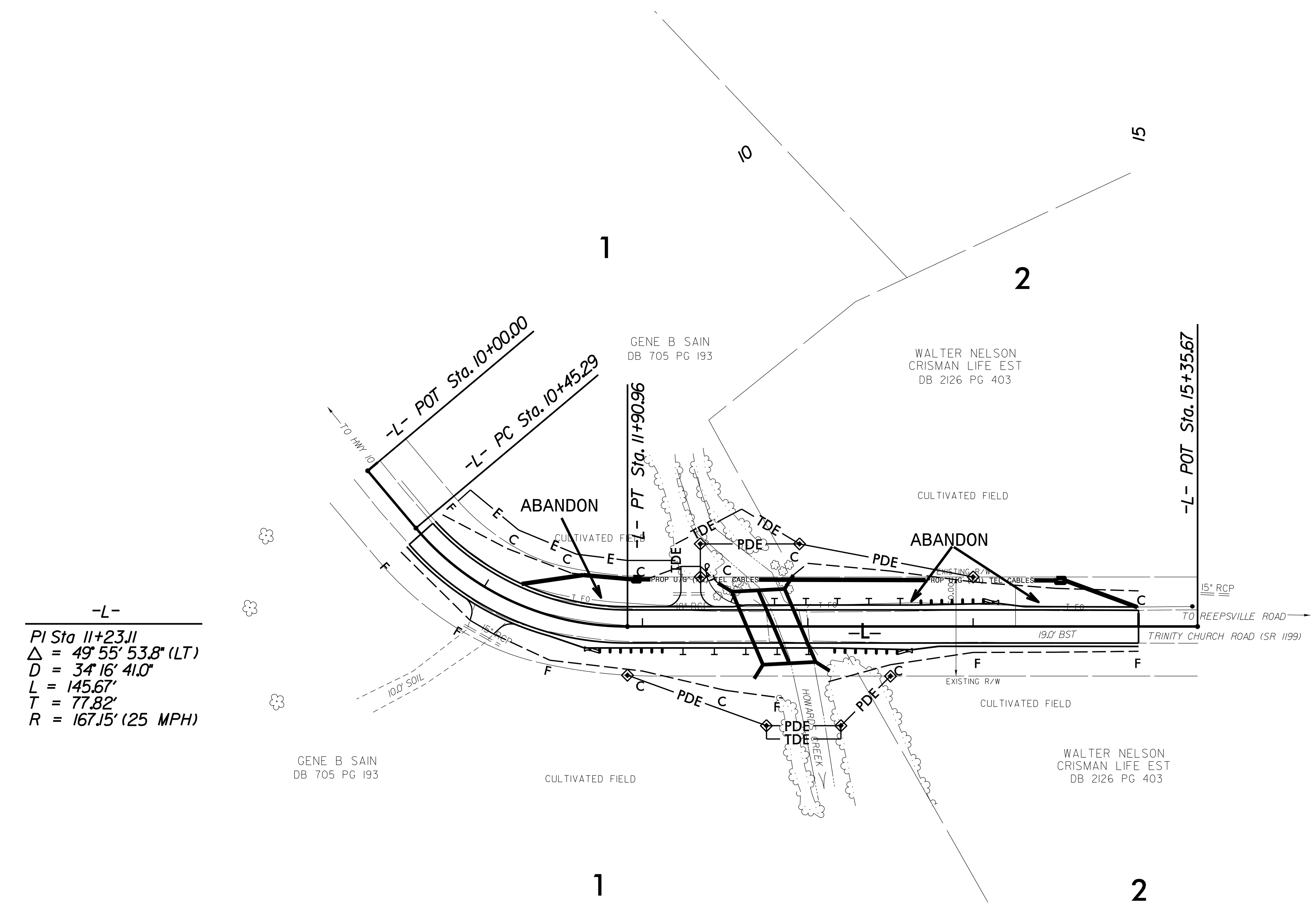
STEVE RACKLEY, P.E. — DIVISION 12 BRIDGE MANAGER

12/12/2017
P:\JOBS\0696\025\0800_Lincoln BR-127\Roadway\UB01\5400127_uo_tsh.dgn
7:52:24 AM

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.19	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.



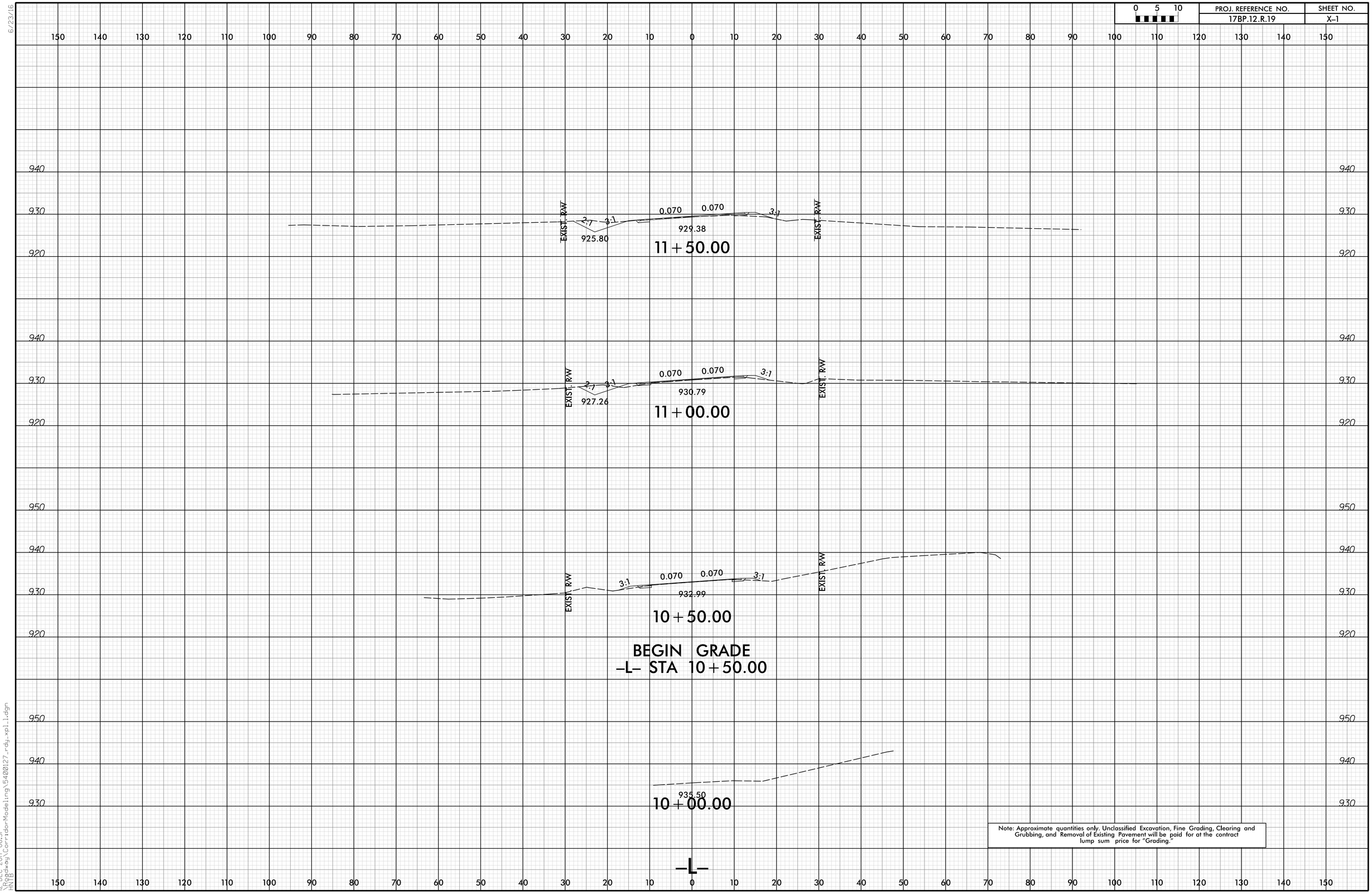
AT&T TO PERFORM HDD ACROSS HOWARDS CREEK
STEVE MODE
704.617.6525

8/17/99

9/15/2017
P:\JOBS\0696\025\10800_Lincoln BR-127\Roadway\UBO\5400127_uo_psh2.dgn

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.12.R.19	X-1



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

12-DEC-2017 08:31
N:\Highway\CorridorModeling\5400127_rdy_xpl_1.dgn
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.12.R.19	X-2

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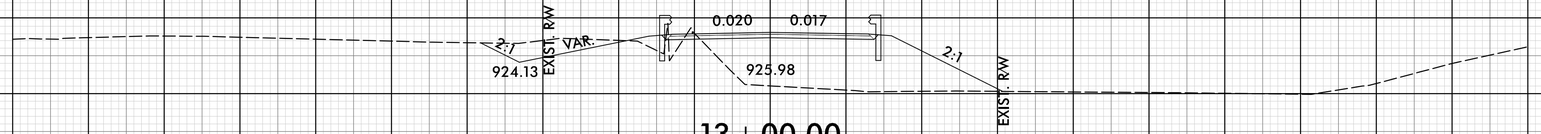
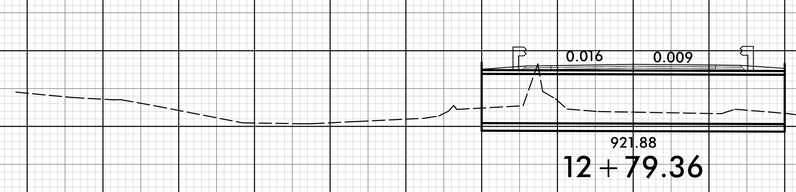
940 930 920 910



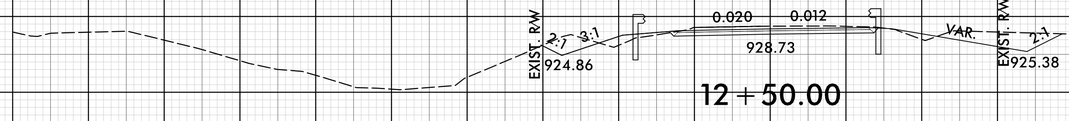
13+00.00

END CULVERT
–L– STA 12+96.88

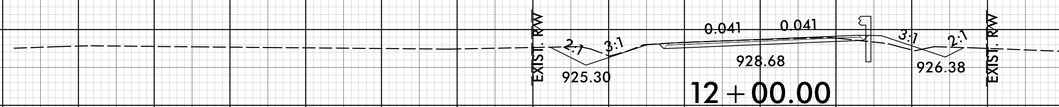


12+79.36

BEGIN CULVERT
–L– STA 12+61.84



12+50.00



12+00.00

–L–

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HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	17BP.12.R.19	X-3

940 930 920

EXIST. R/W

928.95

15+25.00

EXIST. R/W

END GRADE

–L– STA 15+00.00

EXIST. R/W

VAR. 0.010 0.020

928.47

15+00.00

EXIST. R/W

EXIST. R/W

2:1 3:1 0.020 0.020 3:1

925.63

927.68

14+50.00

EXIST. R/W

EXIST. R/W

2:1 3:1 0.020 0.020 3:1

925.13

927.39

14+00.00

EXIST. R/W

EXIST. R/W

2:1 VAR. 0.020 0.020 3:1 2:1

924.63

928.13

926.28

13+50.00

EXIST. R/W

–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

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HNTB

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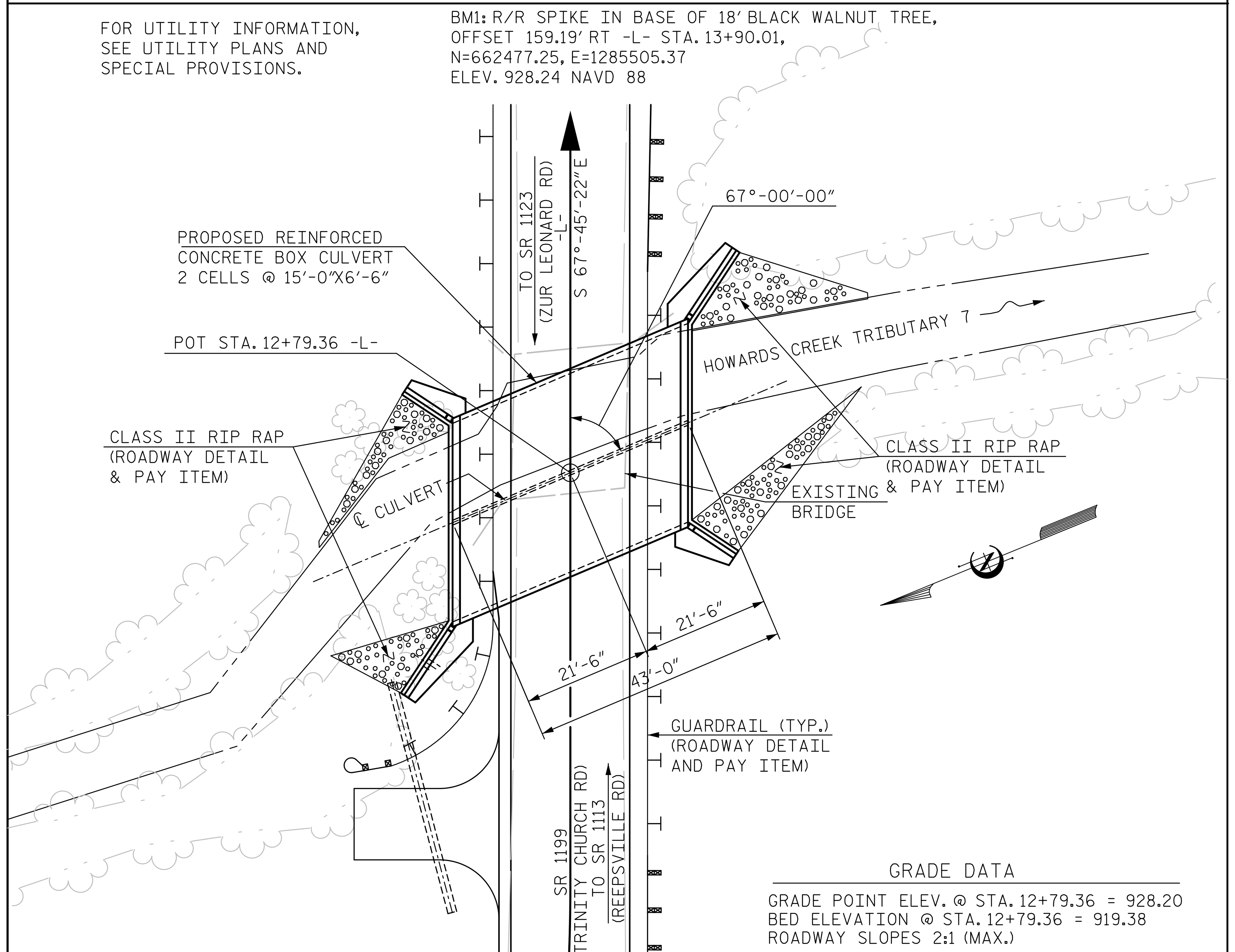
LOCATION SKETCH



GRADE DATA

GRADE POINT ELEV. @ STA. 12+79.36 = 928.20
BED ELEVATION @ STA. 12+79.36 = 919.38
ROADWAY SLOPES 2:1 (MAX.)

HYDRAULIC DATA

DESIGN DISCHARGE	1,300 CFS
FREQUENCY OF DESIGN FLOOD	25 YR.
DESIGN HIGH WATER ELEV.	928.6
DRAINAGE AREA	4.1 SQ. MI.
BASIC DISCHARGE (Q100)	2,265 CFS
BASIC HIGH WATER ELEV.	929.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	900 CFS
FREQUENCY OF OVERTOPPING FLOOD	<10 YR.
OVERTOPPING FLOOD ELEV.	927.69 (OCCURS AT ROADWAY SAG -L- 14+00.00)

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

DESIGN FILL - 2.4' (ROADWAY SURFACE TO BOTTOM OF TOP CULVERT SLAB)

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR OTHER DESIGN DATA AND NOTES SEE STRUCTURE STANDARD NOTES SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS. THE ENTIRE COST OF WORK TO REPLACE EXCAVATED OR SUPPLEMENTAL MATERIAL SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE EXISTING STRUCTURE CONSISTING OF A SINGLE SPAN OF 25'-6" WITH A CLEAR ROADWAY WIDTH OF 19.2' ON AN ASPHALT WEARING SURFACE AND TIMBER DECK SUPPORTED BY 10 LINES OF W14x34 STEEL I-BEAMS ON TIMBER SUBSTRUCTURE UNITS SHALL BE REMOVED.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS BOX CULVERT SHALL BE SUBMITTED. SEE STRUCTURE STANDARD NOTES SHEET.

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 12+79.36 -L-".

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

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

NO BACKFILLING OF EXTERIOR WALLS SHALL BE PERMITTED UNTIL TOP SLAB HAS BEEN PLACED AND CURED. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARILY BRACING WALLS UNTIL TOP SLAB IS COMPLETED.

NO WORK SHALL BE DONE ON THE CULVERT AT STA. 12+79.36 -L- UNTIL THE AREA OF THE BOX CULVERT HAS BEEN UNDERCUT AND UNSUITABLE MATERIAL REPLACED WITH SUITABLE MATERIAL, PROPERLY COMPACTED TO THE ELEVATION OF THE BOTTOM OF THE PROPOSED FLOOR SLAB. THE LIMITS OF THIS UNDERCUT EXCAVATION SHALL BE AT LEAST THE LIMITS OF THE BOX CULVERT INCLUDING THE WINGS. NO SEPARATE PAYMENT WILL BE MADE FOR ANY TEMPORARY SHEETING, UNDERCUT, OR UNSUITABLE MATERIAL REPLACEMENT AS REQUIRED TO CONSTRUCT THE PROPOSED CULVERT. PAYMENT IS INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

EXCAVATE AT LEAST 1 FOOT BELOW BOTTOM OF CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414-4 OF THE STANDARD SPECIFICATIONS.

UNDERCUTTING SHOULD BE ANTICIPATED. UNDERCUT TO ELEVATIONS OF 915.0 ON THE INLET END AND 913.0 ON THE OUTLET END, APPROXIMATELY 180 CUBIC YARDS OF UNDERCUT MAY BE REQUIRED. THE UNDERCUT MAY BE BACKFILLED WITH FOUNDATION CONDITIONING MATERIAL.

SUBGRADE SHOULD BE VERIFIED BY ENGINEER OR THEIR REPRESENTATIVE PRIOR TO PLACING FOUNDATION CONDITIONING MATERIAL.

SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR STAGING DETAILS AND NOTES, SEE BILL OF MATERIAL SHEET.

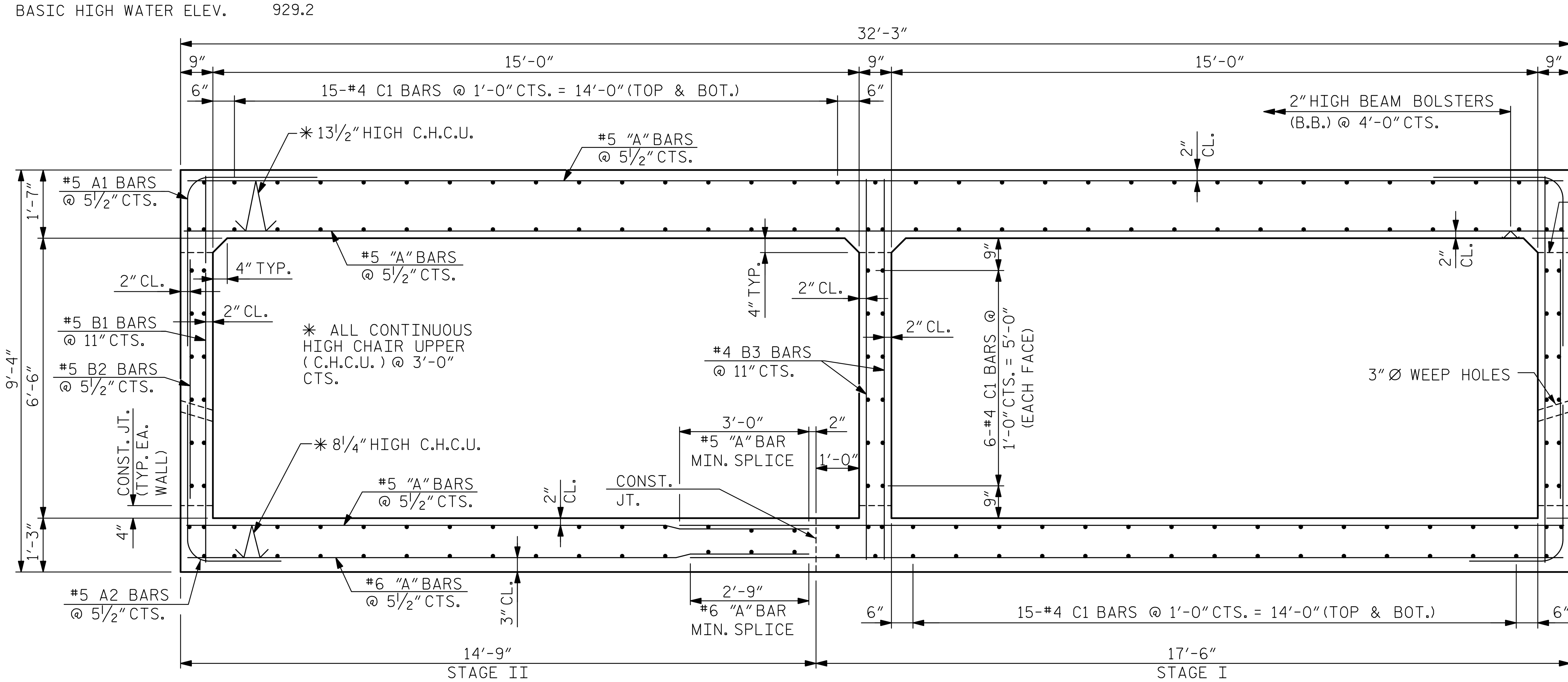
NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

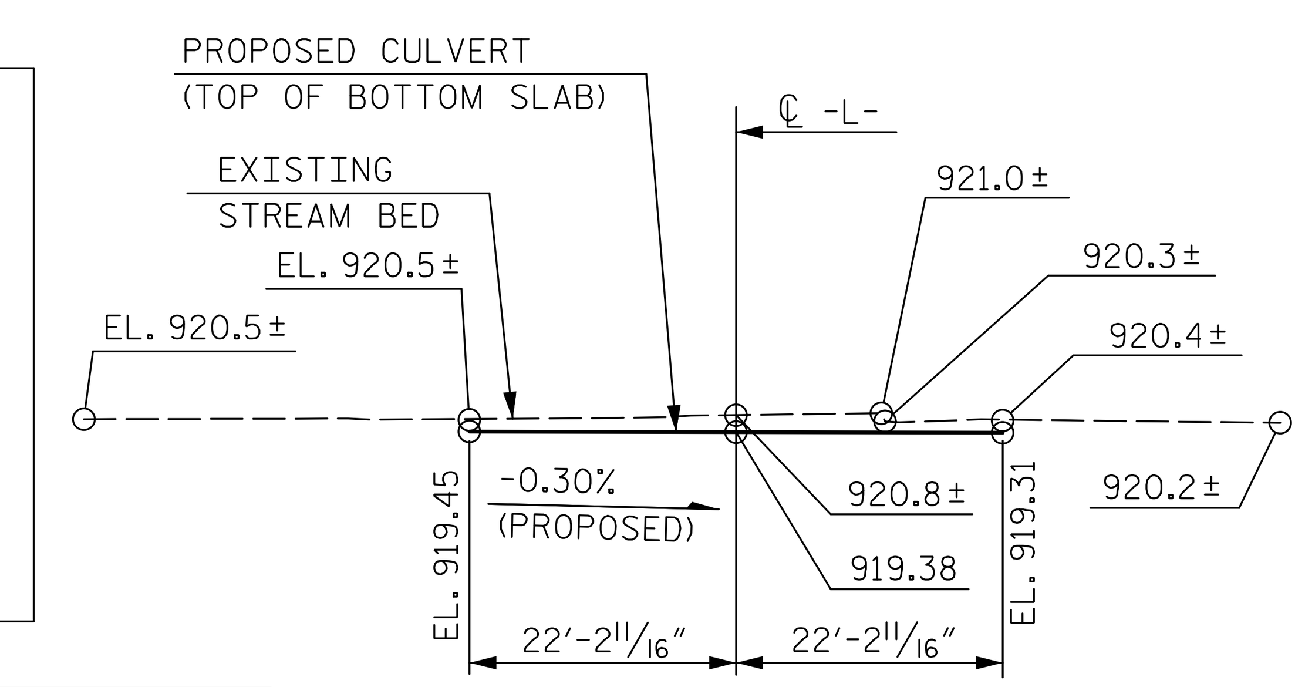
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 174 "C" BARS IN SECTION OF BARREL.
(LOOKING DOWNSTREAM)

I HEREBY CERTIFY THESE PLANS ARE AS-BUILT PLANS

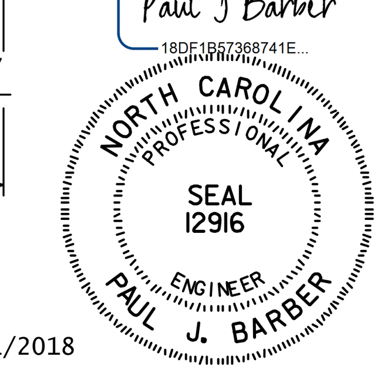


PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES		
REMOVAL OF EXISTING STRUCTURE AT STATION 12+79.36 -L-	LUMP SUM	
ASBESTOS ASSESSMENT	LUMP SUM	
CULVERT EXCAVATION AT STATION 12+79.36 -L-	LUMP SUM	
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	108	TONS
CLASS A CONCRETE		
BARREL @ 3.93 CY/FT	169.0	C.Y.
WING ETC.	30.7	C.Y.
TOTAL	199.7	C.Y.
REINFORCING STEEL		
BARREL	26,805	LBS.
WINGS ETC.	1,411	LBS.
TOTAL	28,216	LBS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: Paul J Barber



2/1/2018

PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

REPLACES BRIDGE NO. 127

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LOCATION SKETCH/BARREL SECT. FOR DOUBLE 15'-0" FT. × 6'-6" FT. CONCRETE BOX CULVERT SR 1199 OVER HOWARDS CREEK TRIB. 7

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

DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17
DWG. NO. 1

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

SHEET NO. C-1
TOTAL SHEETS 8

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.131	--	1.75	1.506	1	TOP SLAB	6.0	1.131	2	BOTTOM SLAB	14.10	1 , 2
		HL-93 (OPERATING)	N/A	--	1.466	--	1.35	1.722	1	TOP SLAB	14.67	1.466	2	BOTTOM SLAB	14.10	1 , 2
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.336	48.09	1.75	1.953	1	TOP SLAB	6.0	1.336	2	BOTTOM SLAB	14.10	1 , 2
		HS-20 (OPERATING)	36.000	--	1.732	62.34	1.35	2.233	1	TOP SLAB	14.67	1.732	2	BOTTOM SLAB	14.10	1 , 2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.166	42.73	1.40	4.017	1	TOP SLAB	6.0	3.166	2	BOTTOM SLAB	14.10	1 , 2
		SNGARBS2	20.000	--	2.798	55.97	1.40	3.761	1	TOP SLAB	6.0	2.798	2	BOTTOM SLAB	14.10	1 , 2
		SNAGRIS2	22.000	--	2.880	63.36	1.40	4.017	1	TOP SLAB	6.0	2.880	2	BOTTOM SLAB	14.10	1 , 2
		SNCOTTS3	27.250	--	1.675	45.69	1.40	2.259	1	TOP SLAB	6.0	1.675	2	BOTTOM SLAB	14.10	1 , 2
		SNAGGRS4	34.925	--	1.797	62.77	1.40	4.484	1	EXTERIOR WALL	0	1.797	2	BOTTOM SLAB	14.10	1 , 2
		SNS5A	35.550	--	1.799	63.95	1.40	2.403	1	TOP SLAB	6.0	1.799	2	BOTTOM SLAB	14.10	1 , 2
		SNS6A	39.950	--	1.731	69.14	1.40	2.397	1	TOP SLAB	6.0	1.731	2	BOTTOM SLAB	14.10	1 , 2
		SNS7B	42.000	--	1.662	69.81	1.40	4.215	1	EXTERIOR WALL	0	1.662	1	BOTTOM SLAB	14.10	1 , 2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	2.034	67.11	1.40	12.037	1	INTERIOR WALL	0	2.034	1	BOTTOM SLAB	14.10	2
		TNT4A	33.075	--	1.896	62.70	1.40	9.309	1	INTERIOR WALL	0	1.896	2	BOTTOM SLAB	14.10	2
		TNT6A	41.600	--	1.805	75.09	1.40	4.221	1	EXTERIOR WALL	0	1.805	2	BOTTOM SLAB	14.10	1 , 2
		TNT7A	42.000	--	1.824	76.60	1.40	4.282	1	EXTERIOR WALL	0	1.824	1	BOTTOM SLAB	14.10	1 , 2
		TNT7B	42.000	--	1.735	72.86	1.40	9.181	1	INTERIOR WALL	0	1.735	2	BOTTOM SLAB	14.10	2
		TNAGRIT4	43.000	--	1.673	71.93	1.40	10.155	1	INTERIOR WALL	0	1.673	1	BOTTOM SLAB	14.10	2
		TNAGT5A	45.000	--	1.668	75.05	1.40	10.155	1	INTERIOR WALL	0	1.668	1	BOTTOM SLAB	14.10	2
		TNAGT5B	45.000	⟨3⟩	1.535	69.06	1.40	10.113	1	INTERIOR WALL	0	1.535	1	BOTTOM SLAB	14.10	2

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1. MOMENT LOCATION MIRRORED IN BOX 2
2. SHEAR SAME LOCATION FOR BOTH BOX 1 AND 2

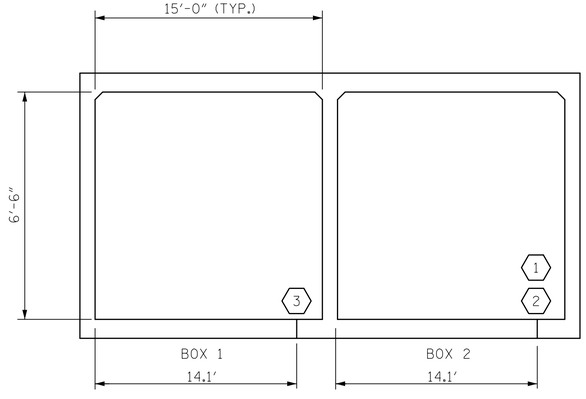
⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

DocuSigned by: Paul J. Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

1/8/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : M. WRIGHT	DATE : 12/17		
CHECKED BY : J. WHEATLEY	DATE : 12/17		
DRAWN BY : WMC 7/11	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 7/11	REV. 12/17	MAA/THC	

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DRAWN BY M. WRIGHT DATE 12/17
CHECKED BY J. WHEATLEY DATE 12/17
DWG. NO. 2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	C-2
1			3			TOTAL SHEETS
2			4			8

STD. NO. LRFR5

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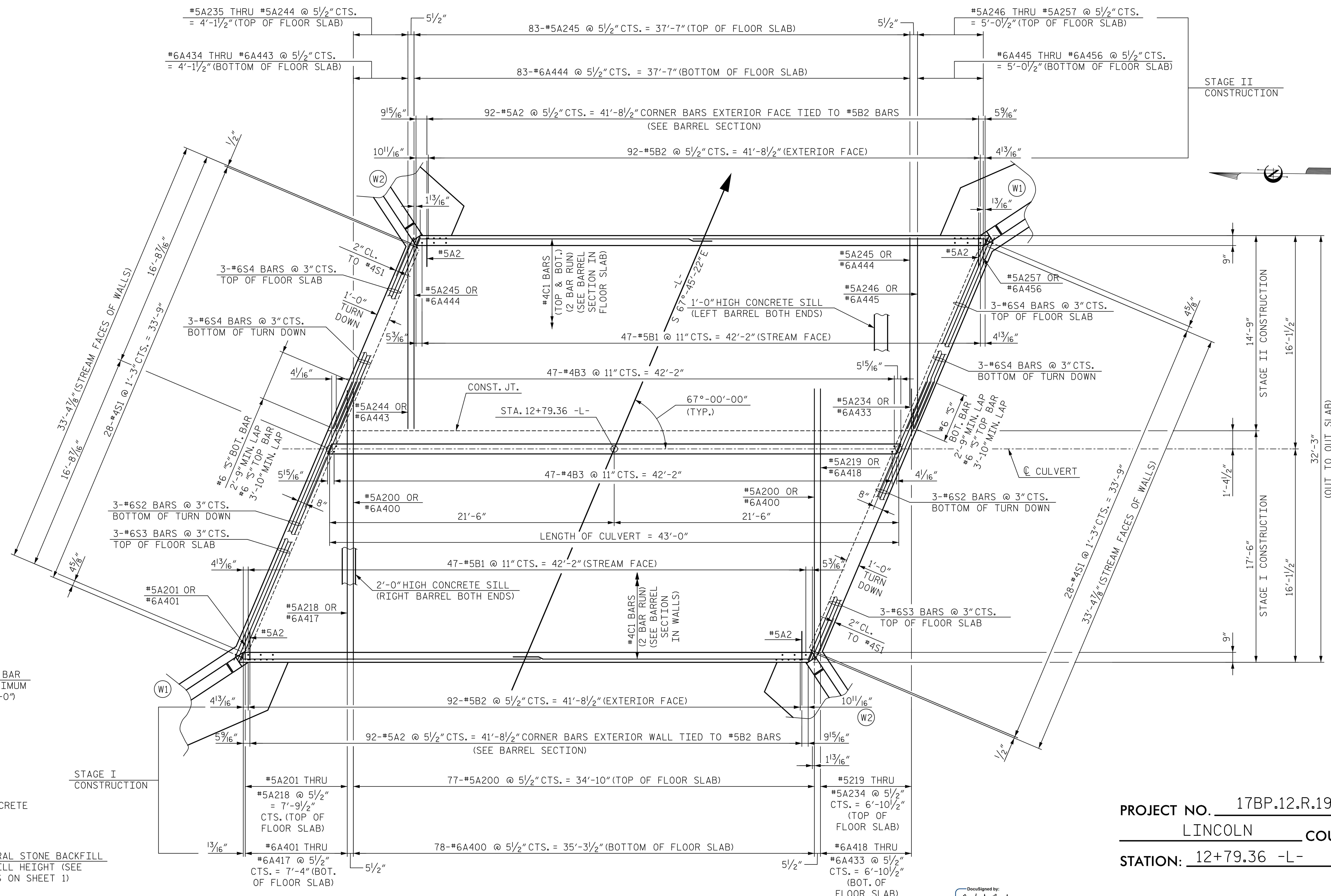
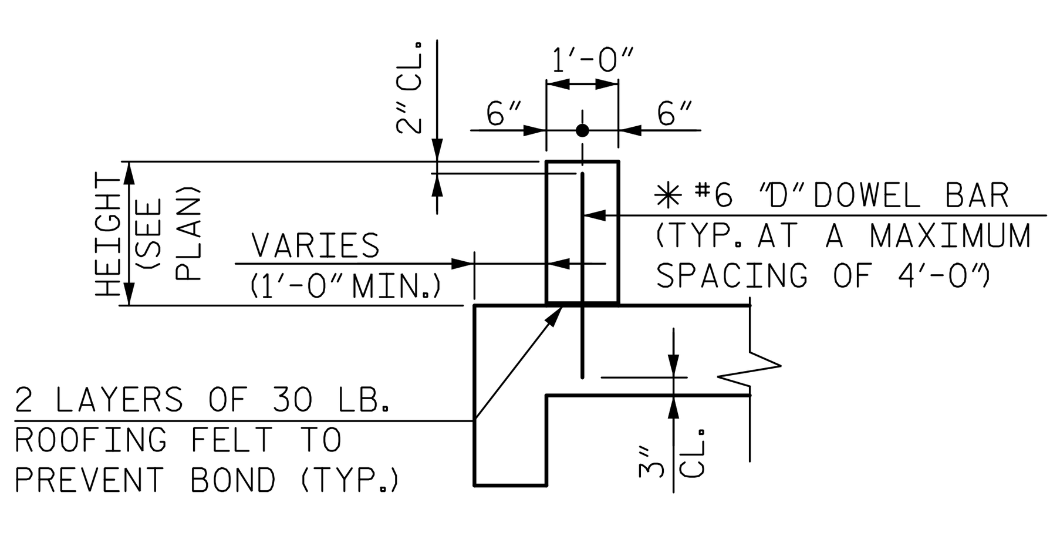
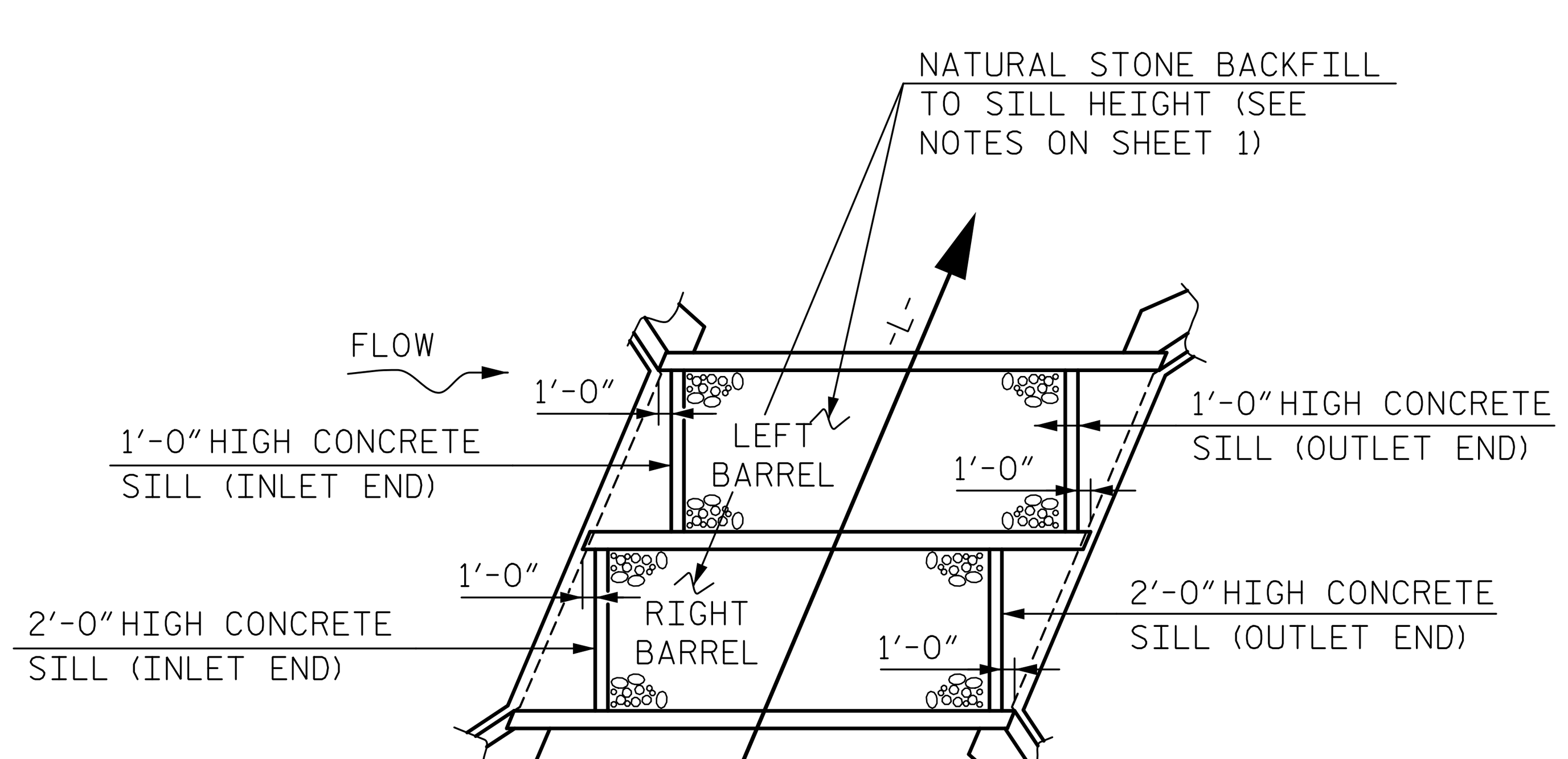


PLAN - FLOOR SLAB

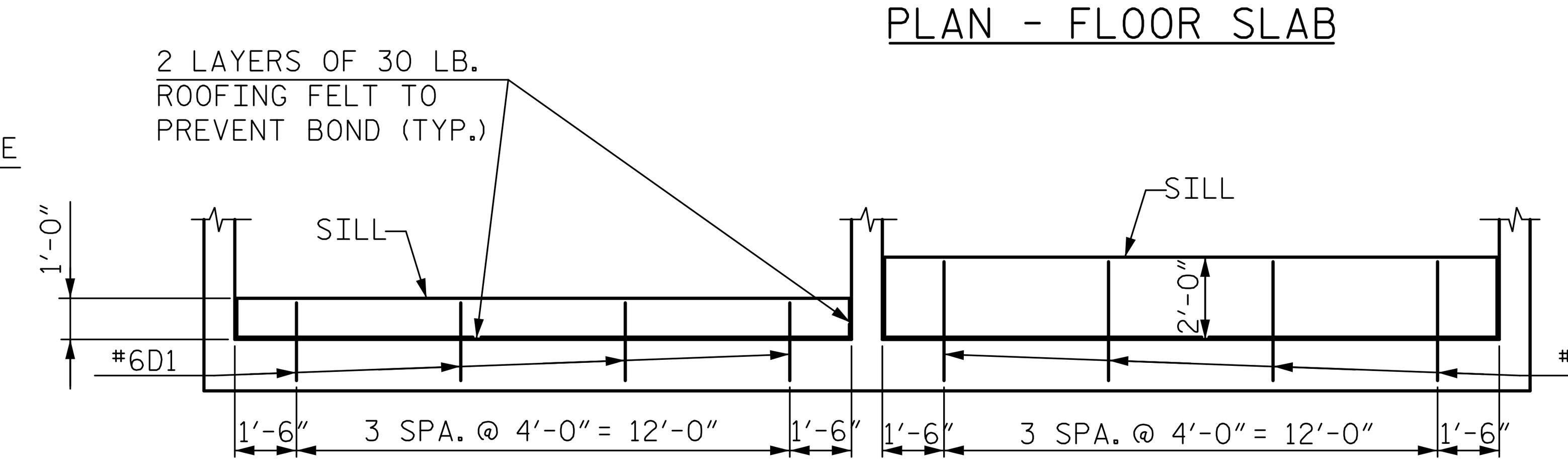


SECTION THROUGH SILL

✱ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.



SILL LAYOUT PLAN



SILL ELEVATION
(LOOKING DOWN STREAM)

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

1/8/2018

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PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL PLAN FOR DOUBLE 15'-0" FT. × 6'-6" FT. CONCRETE BOX CULVERT 67° SKEW

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DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17

DWG. NO. 3

REVISIONS						
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1			3			
2			4			

SHEET NO. C-3

TOTAL SHEETS 8

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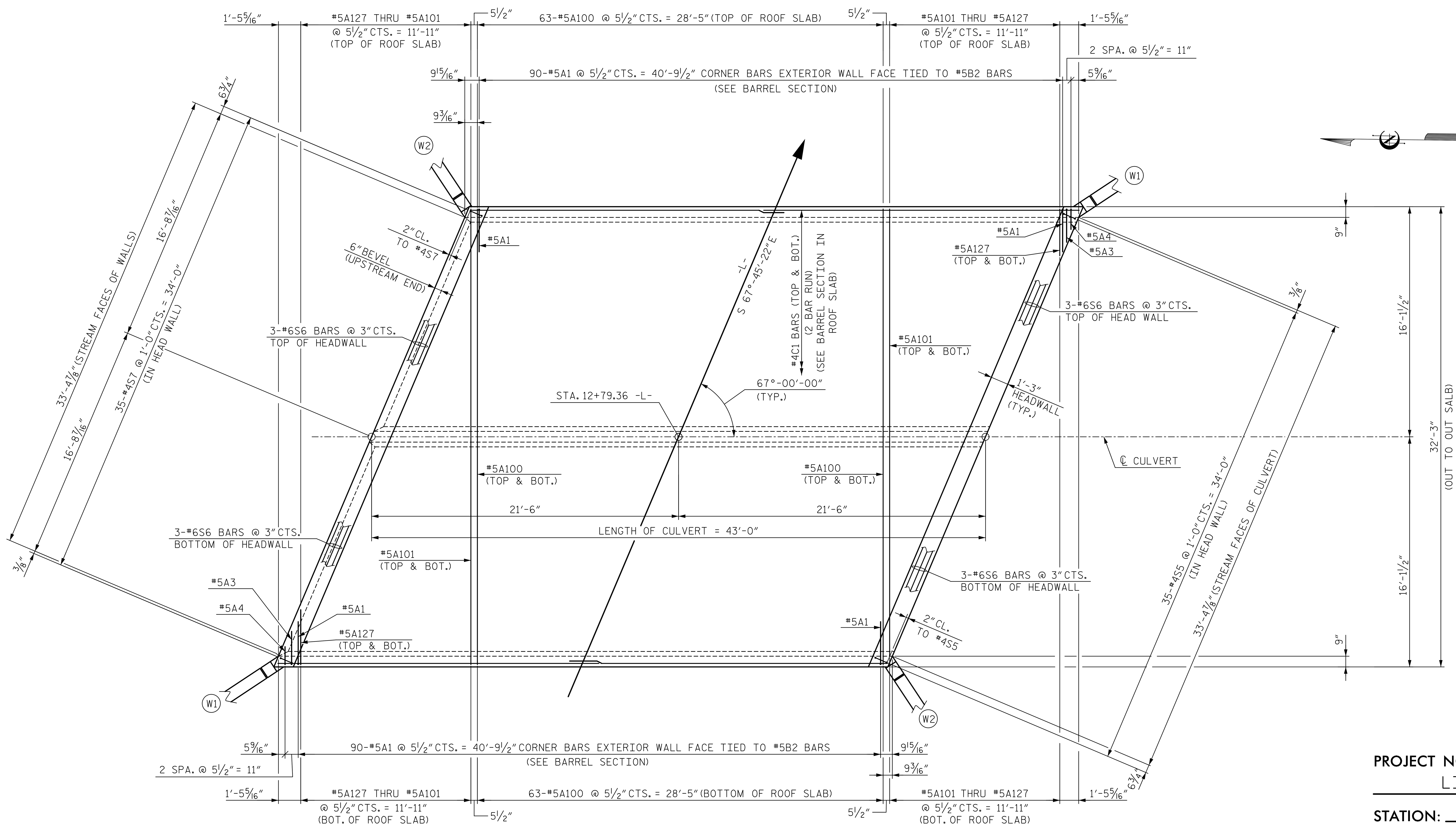

PLAN - ROOF SLAB
(STAGE II CONSTRUCTION)

PROJECT NO. 17BP.12.R.19
LINCOLN COUNTY
STATION: 12+79.36 -L-

DocuSigned by: Paul J. Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

1/8/2018

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL PLAN FOR DOUBLE 15'-0" FT. × 6'-6" FT. CONCRETE BOX CULVERT 67° SKEW

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DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17
DWG. NO. 4

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2			4			8

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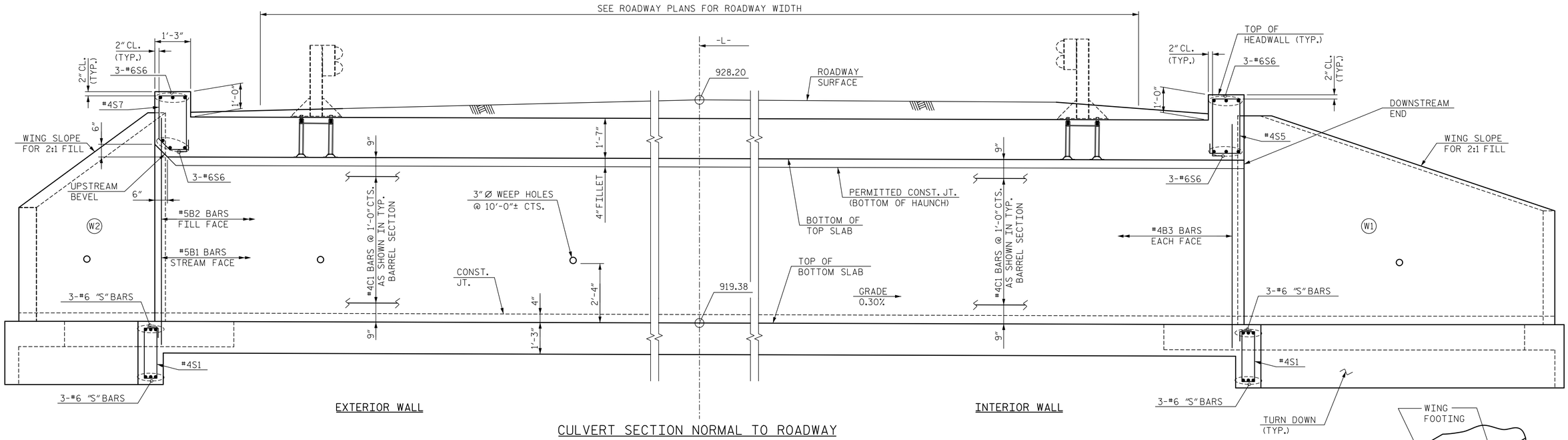
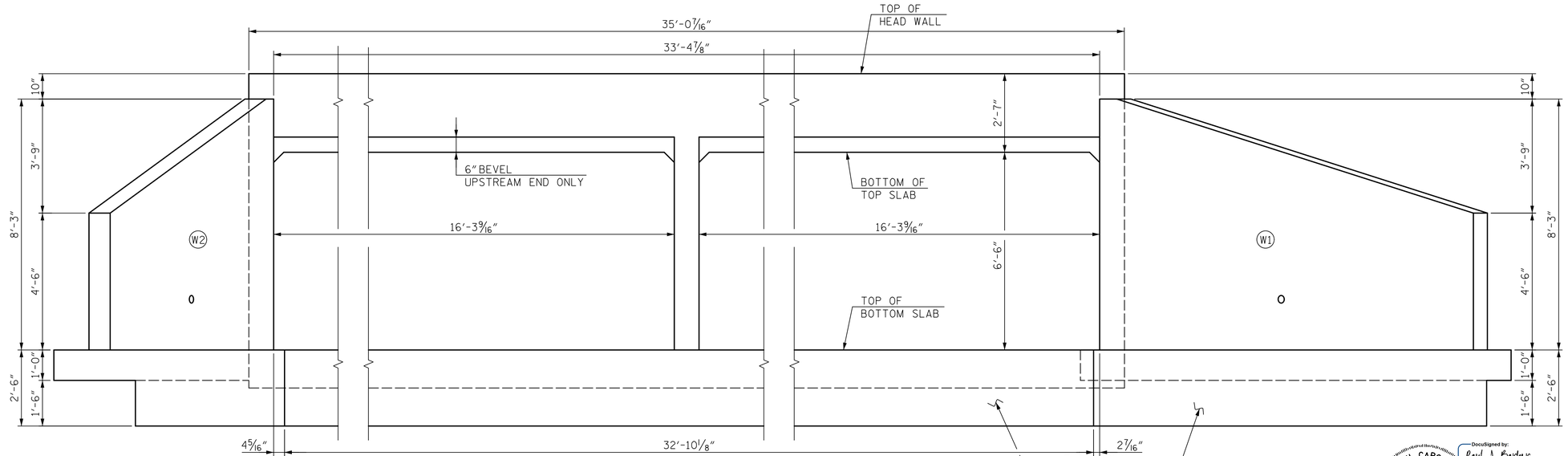
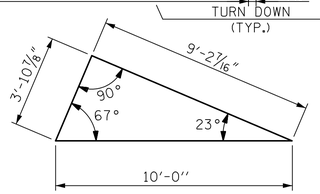


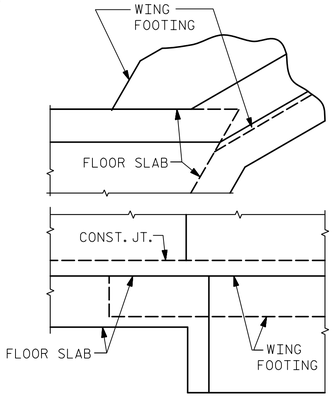
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW



SKEW TRIANGLE



DETAIL
CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

I HEREBY CERTIFY THESE PLANS ARE AS-BUILT PLANS

DocuSigned by: Paul J. Barber 18DF1B57368741E...

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

1/8/2018

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PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL DETAILS FOR DOUBLE 15'-0"FT. x 6'-6"FT. CONCRETE BOX CULVERT 67° SKEW

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DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17
DWG. NO. 5

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			8

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CULVERT REINFORCING

BILL OF MATERIAL

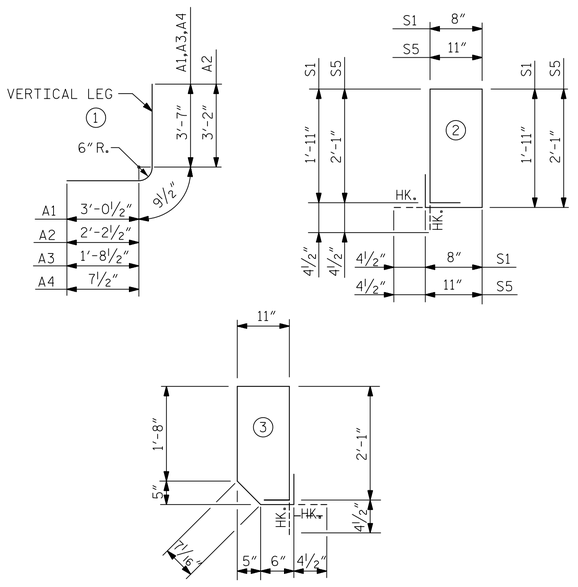
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	180	5	1	7′-5″	1,392
A2	184	5	1	6′-2″	1,183
A3	2	5	1	6′-1″	13
A4	2	5	1	5′-0″	10
A100	126	5	STR	31′-11″	4,194
A101	4	5	STR	31′-6″	131
A102	4	5	STR	30′-5″	127
A103	4	5	STR	29′-4″	122
A104	4	5	STR	28′-3″	118
A105	4	5	STR	27′-2″	113
A106	4	5	STR	26′-1″	109
A107	4	5	STR	25′-0″	104
A108	4	5	STR	23′-11″	100
A109	4	5	STR	22′-10″	95
A110	4	5	STR	21′-9″	91
A111	4	5	STR	20′-8″	86
A112	4	5	STR	19′-8″	82
A113	4	5	STR	18′-7″	78
A114	4	5	STR	17′-6″	73
A115	4	5	STR	16′-5″	68
A116	4	5	STR	15′-4″	64
A117	4	5	STR	14′-3″	59
A118	4	5	STR	13′-2″	55
A119	4	5	STR	12′-1″	50
A120	4	5	STR	11′-0″	46
A121	4	5	STR	9′-11″	41
A122	4	5	STR	8′-10″	37
A123	4	5	STR	7′-9″	32
A124	4	5	STR	6′-8″	28
A125	4	5	STR	5′-7″	23
A126	4	5	STR	4′-6″	19
A127	4	5	STR	3′-5″	14

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A200	77	5	STR	20′-6″	1,646
A201	1	5	STR	1′-11″	2
A202	1	5	STR	3′-0″	3
A203	1	5	STR	4′-1″	4
A204	1	5	STR	5′-2″	5
A205	1	5	STR	6′-3″	7
A206	1	5	STR	7′-4″	8
A207	1	5	STR	8′-4″	9
A208	1	5	STR	9′-5″	10
A209	1	5	STR	10′-6″	11
A210	1	5	STR	11′-7″	12
A211	1	5	STR	12′-8″	13
A212	1	5	STR	13′-9″	14
A213	1	5	STR	14′-10″	15
A214	1	5	STR	15′-11″	17
A215	1	5	STR	17′-0″	18
A216	1	5	STR	18′-1″	19
A217	1	5	STR	19′-2″	20
A218	1	5	STR	20′-3″	21
A219	1	5	STR	19′-8″	21
A220	1	5	STR	18′-7″	19
A221	1	5	STR	17′-6″	18
A222	1	5	STR	16′-5″	17
A223	1	5	STR	15′-4″	16
A224	1	5	STR	14′-3″	15
A225	1	5	STR	13′-2″	14
A226	1	5	STR	12′-1″	13
A227	1	5	STR	11′-0″	11
A228	1	5	STR	9′-11″	10
A229	1	5	STR	8′-10″	9
A230	1	5	STR	7′-9″	8
A231	1	5	STR	6′-8″	7
A232	1	5	STR	5′-7″	6
A233	1	5	STR	4′-6″	5
A234	1	5	STR	3′-5″	4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A235	1	5	STR	3′-10″	4
A236	1	5	STR	4′-11″	5
A237	1	5	STR	6′-0″	6
A238	1	5	STR	7′-1″	7
A239	1	5	STR	8′-2″	9
A240	1	5	STR	9′-3″	10
A241	1	5	STR	10′-4″	11
A242	1	5	STR	11′-5″	12
A243	1	5	STR	12′-6″	13
A244	1	5	STR	13′-7″	14
A245	83	5	STR	14′-5″	1,248
A246	1	5	STR	13′-9″	14
A247	1	5	STR	12′-8″	13
A248	1	5	STR	11′-7″	12
A249	1	5	STR	10′-6″	11
A250	1	5	STR	9′-5″	10
A251	1	5	STR	8′-4″	9
A252	1	5	STR	7′-4″	8
A253	1	5	STR	6′-3″	7
A254	1	5	STR	5′-2″	5
A255	1	5	STR	4′-1″	4
A256	1	5	STR	3′-0″	3
A257	1	5	STR	1′-11″	2
A400	78	6	STR	20′-3″	2,372
A401	1	6	STR	1′-11″	3
A402	1	6	STR	3′-0″	5
A403	1	6	STR	4′-1″	6
A404	1	6	STR	5′-2″	8
A405	1	6	STR	6′-3″	9
A406	1	6	STR	7′-4″	11
A407	1	6	STR	8′-4″	13
A408	1	6	STR	9′-5″	14
A409	1	6	STR	10′-6″	16
A410	1	6	STR	11′-7″	17
A411	1	6	STR	12′-8″	19
A412	1	6	STR	13′-9″	21
A413	1	6	STR	14′-10″	22
A414	1	6	STR	15′-11″	24
A415	1	6	STR	17′-0″	26
A416	1	6	STR	18′-1″	27
A417	1	6	STR	19′-2″	29
A418	1	6	STR	19′-5″	29
A419	1	6	STR	18′-4″	28
A420	1	6	STR	17′-3″	26
A421	1	6	STR	16′-2″	24
A422	1	6	STR	15′-1″	23
A423	1	6	STR	14′-0″	21
A424	1	6	STR	12′-11″	19
A425	1	6	STR	11′-10″	18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A426	1	6	STR	10′-9″	16
A427	1	6	STR	9′-8″	15
A428	1	6	STR	8′-7″	13
A429	1	6	STR	7′-6″	11
A430	1	6	STR	6′-5″	10
A431	1	6	STR	5′-4″	8
A432	1	6	STR	4′-3″	6
A433	1	6	STR	3′-2″	5
A434	1	6	STR	3′-10″	6
A435	1	6	STR	4′-11″	7
A436	1	6	STR	6′-0″	9
A437	1	6	STR	7′-1″	11
A438	1	6	STR	8′-2″	12
A439	1	6	STR	9′-3″	14
A440	1	6	STR	10′-4″	16
A441	1	6	STR	11′-5″	17
A442	1	6	STR	12′-6″	19
A443	1	6	STR	13′-7″	20
A444	83	6	STR	14′-5″	1,797
A445	1	6	STR	13′-9″	21
A446	1	6	STR	12′-8″	19
A447	1	6	STR	11′-7″	17
A448	1	6	STR	10′-6″	16
A449	1	6	STR	9′-5″	14
A450	1	6	STR	8′-4″	13
A451	1	6	STR	7′-4″	11
A452	1	6	STR	6′-3″	9
A453	1	6	STR	5′-2″	8
A454	1	6	STR	4′-1″	6
A455	1	6	STR	3′-0″	5
A456	1	6	STR	1′-11″	3
B1	94	5	STR	8′-11″	874
B2	184	5	STR	5′-6″	1,056
B3	94	4	STR	8′-11″	560
C1	348	4	STR	22′-4″	5,192
D1	8	6	STR	1′-10″	22
D2	8	6	STR	2′-10″	34
S1	56	4	2	5′-11″	221
S2	6	6	STR	21′-10″	197
S3	6	6	STR	22′-11″	207
S4	12	6	STR	15′-8″	282
S5	35	4	2	6′-9″	158
S6	12	6	STR	34′-8″	625
S7	35	4	3	6′-6″	152
REINFORCING STEEL				LBS.	26,805

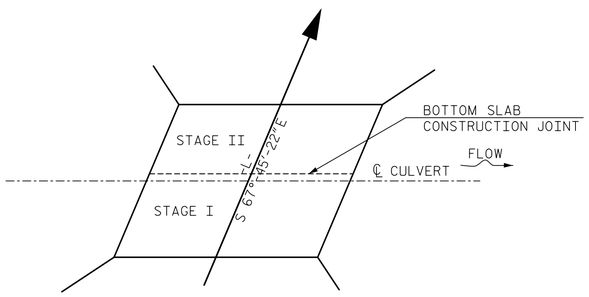
BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A1	#5	3′-0″ HORIZ. LEG
A1	#5	2′-2″ VERT. LEG
A2	#5	2′-2″
A200	#5	3′-0″
A400	#6	2′-9″
B1,B2	#5	2′-2″
C BARS	#4	1′-11″



CONSTRUCTION SEQUENCE

PHASING REQUIRES OFFSITE TRAFFIC DETOUR - SEE TRAFFIC CONTROL PLANS.
STAGING REQUIRES CREEK FLOW DIVERSION - SEE EROSION CONTROL PLANS.

STAGING NOTES

CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:

STAGE I: AFTER SHIFTING TRAFFIC TO OFFSITE DETOUR.
1. REMOVE EXISTING BRIDGE.
2. INSTALL IMPERVIOUS DIKE TO SHIFT STREAM FLOW FROM STAGE I AND DEWATER CONSTRUCTION AREA.
3. CONSTRUCT STAGE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4″ OF VERTICAL WALLS.
4. CONSTRUCT REMAINING STAGE I PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.

STAGE II: AFTER RECONFIGURING IMPERVIOUS DIKE AND SHIFTING STREAM FLOW THROUGH STAGE I CELL.
1. CONSTRUCT STAGE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4″ OF REMAINING VERTICAL WALL.
2. CONSTRUCT REMAINING STAGE II PORTION OF WALL AND WINGS FULL HEIGHT.
3. CONSTRUCT ENTIRE ROOF SLAB AND HEADWALLS.

PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

DocuSigned by: Paul J. Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

1/8/2018

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DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17

DWG. NO. 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
15′-0″FT. x 6′-6″FT.
CONCRETE BOX CULVERT
67° SKEW

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	C-6
1			3			TOTAL SHEETS
2			4			8

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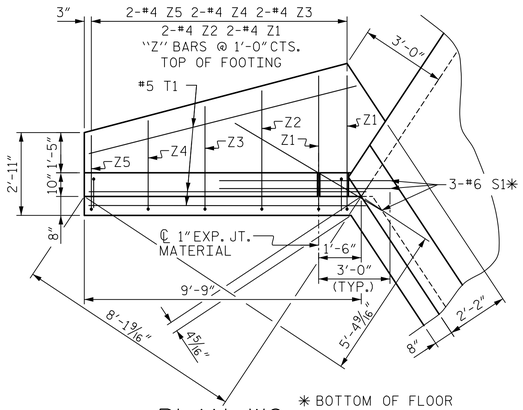
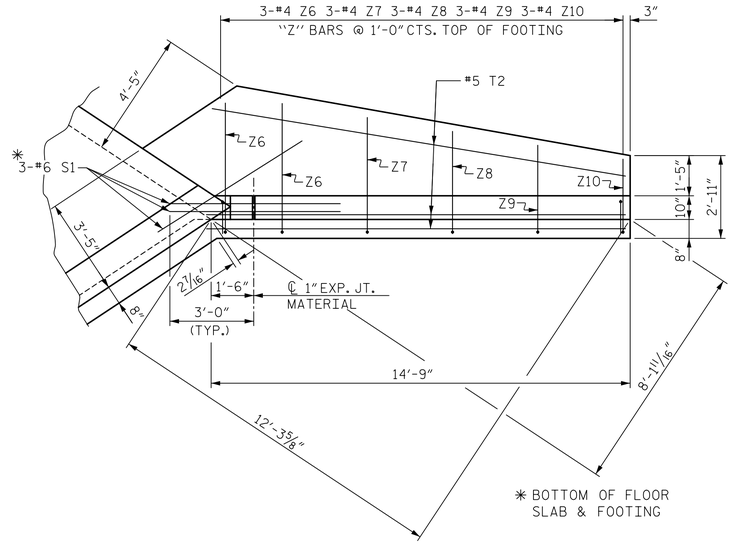


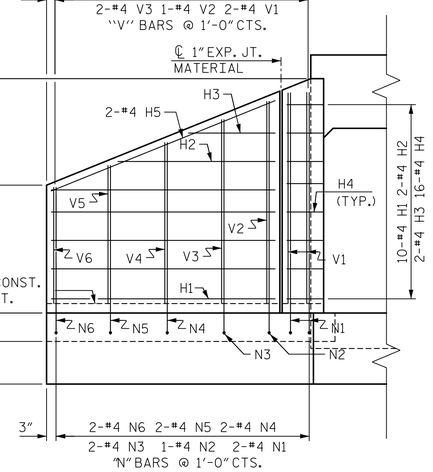
PLAN W2

* BOTTOM OF FLOOR SLAB & FOOTING

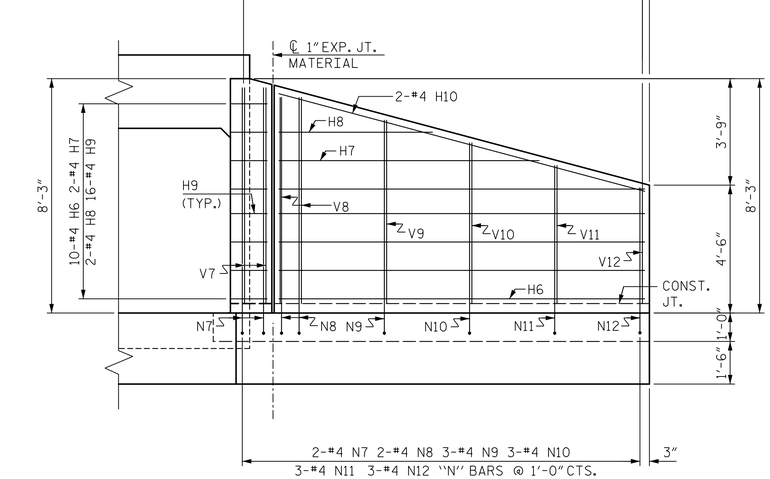


* BOTTOM OF FLOOR SLAB & FOOTING

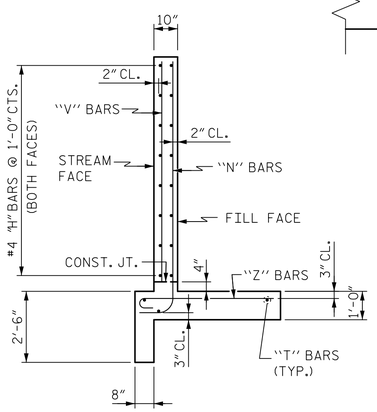
PLAN W1



ELEVATION W2



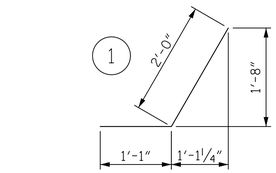
ELEVATION W1

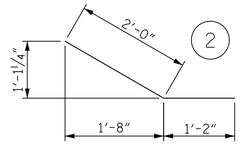


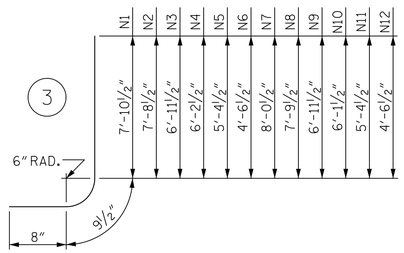
TYPICAL WING SECTION

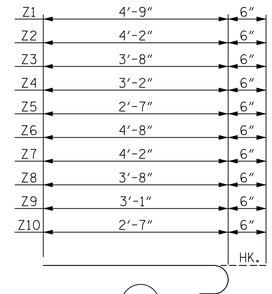
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.









BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	20	#4	STR	7'-10"	105
H2	4	#4	STR	5'-5"	14
H3	4	#4	STR	2'-11"	8
H4	32	#4	1	3'-1"	66
H5	4	#4	STR	8'-5"	22
H6	20	#4	STR	12'-10"	171
H7	4	#4	STR	9'-0"	24
H8	4	#4	STR	5'-3"	14
H9	32	#4	2	3'-2"	68
H10	4	#4	STR	13'-3"	35
N1	4	#4	3	9'-4"	25
N2	2	#4	3	9'-2"	12
N3	4	#4	3	8'-5"	22
N4	4	#4	3	7'-8"	20
N5	4	#4	3	6'-10"	18
N6	4	#4	3	6'-0"	16
N7	4	#4	3	9'-6"	25
N8	4	#4	3	9'-3"	25
N9	6	#4	3	8'-5"	34
N10	6	#4	3	7'-7"	30
N11	6	#4	3	6'-10"	27
N12	6	#4	3	6'-0"	24
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	9'-8"	60
T2	6	#5	STR	14'-8"	92
V1	4	#4	STR	7'-4"	20
V2	2	#4	STR	7'-2"	10
V3	4	#4	STR	6'-5"	17
V4	4	#4	STR	5'-8"	15
V5	4	#4	STR	4'-10"	13
V6	4	#4	STR	4'-0"	11
V7	4	#4	STR	7'-6"	20
V8	4	#4	STR	7'-3"	19
V9	6	#4	STR	6'-5"	26
V10	6	#4	STR	5'-7"	22
V11	6	#4	STR	4'-10"	19
V12	6	#4	STR	4'-0"	16
Z1	4	#4	4	5'-3"	14
Z2	4	#4	4	4'-8"	12
Z3	4	#4	4	4'-2"	11
Z4	4	#4	4	3'-8"	10
Z5	4	#4	4	3'-1"	8
Z6	6	#4	4	5'-2"	21
Z7	6	#4	4	4'-8"	19
Z8	6	#4	4	4'-2"	17
Z9	6	#4	4	3'-7"	14
Z10	6	#4	4	3'-1"	12

REINFORCING STEEL FOR 4 WINGS	1,411 LBS
CLASS A CONCRETE	
4 WINGS	17.3 CY
2 HEADWALLS	3.2 CY
2 END CURTAIN WALLS	6.9 CY
4 SILLS	3.3 CY
TOTAL	30.7 CY

PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

DocuSigned by: Paul J. Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

1/8/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR DOUBLE 15'-0"FT. x 6'-6"FT. CONCRETE BOX CULVERT 67° SKEW

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

DRAWN BY M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17
DWG. NO. 7

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	C-7
1			3			TOTAL SHEETS
2			4			8

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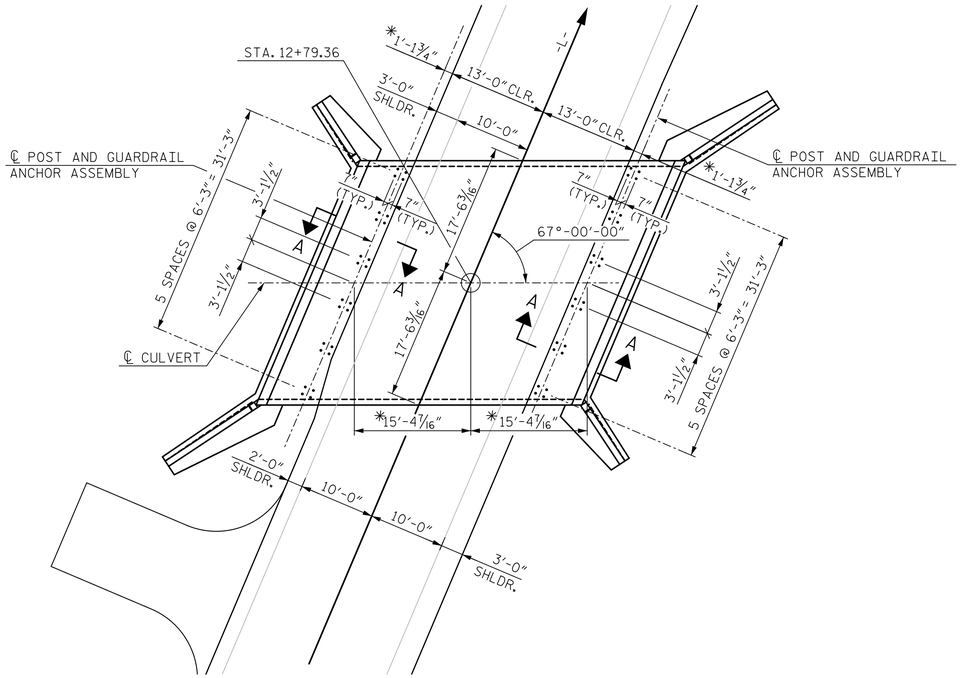
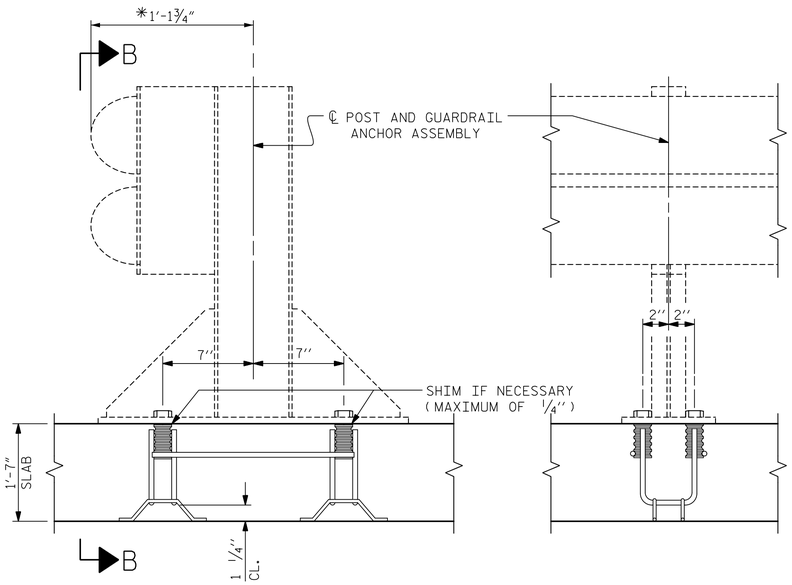


PLAN

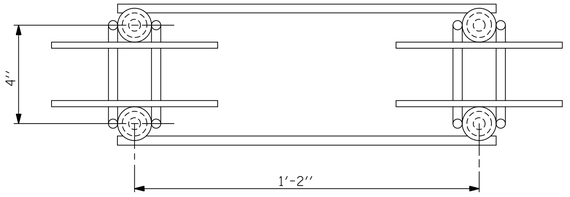
SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

* GUARDRAIL DIMENSION SHALL BE VERIFIED BY ROADWAY ENGINEER PRIOR TO CONSTRUCTION.

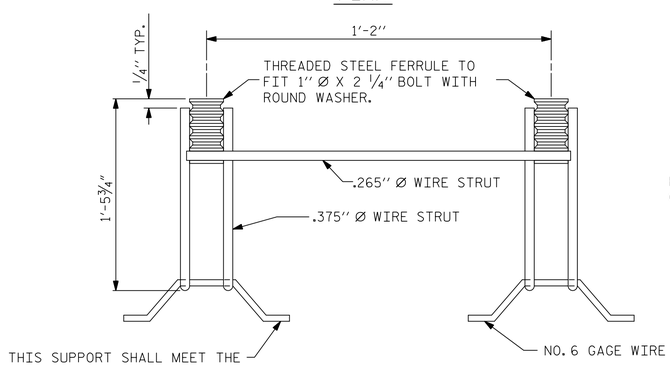


SECTION A-A

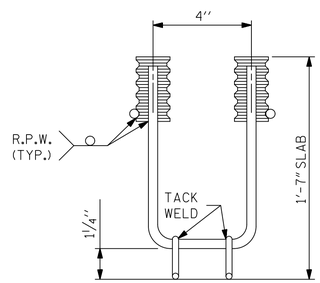
SECTION B-B



PLAN



SIDE VIEW



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1" Ø X 2 ¼" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2¼" GALVANIZED BOLTS 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.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1"Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.12.R.19

LINCOLN COUNTY

STATION: 12+79.36 -L-

DocuSigned by: Paul J. Barber

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

1/8/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

ASSEMBLED BY : M. WRIGHT	DATE : 11/17
CHECKED BY : P. BARBER	DATE : 11/17
DRAWN BY : FCJ 6/88	REV. 5/1/06R KMM/GM.
CHECKED BY : ARB 6/88	REV. 10/1/11 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 M. WRIGHT DATE 11/17
CHECKED BY P. BARBER DATE 11/17
DWG. NO. 8

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	C-8
1			3			TOTAL SHEETS
2			4			8

STD. NO. GRA1