

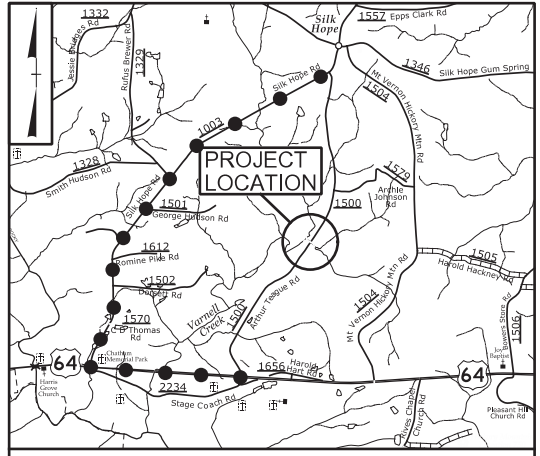
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09/08/19

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



VICINITY MAP

● ● ● DETOUR ROUTE

FINAL PLANS

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS CHATHAM COUNTY

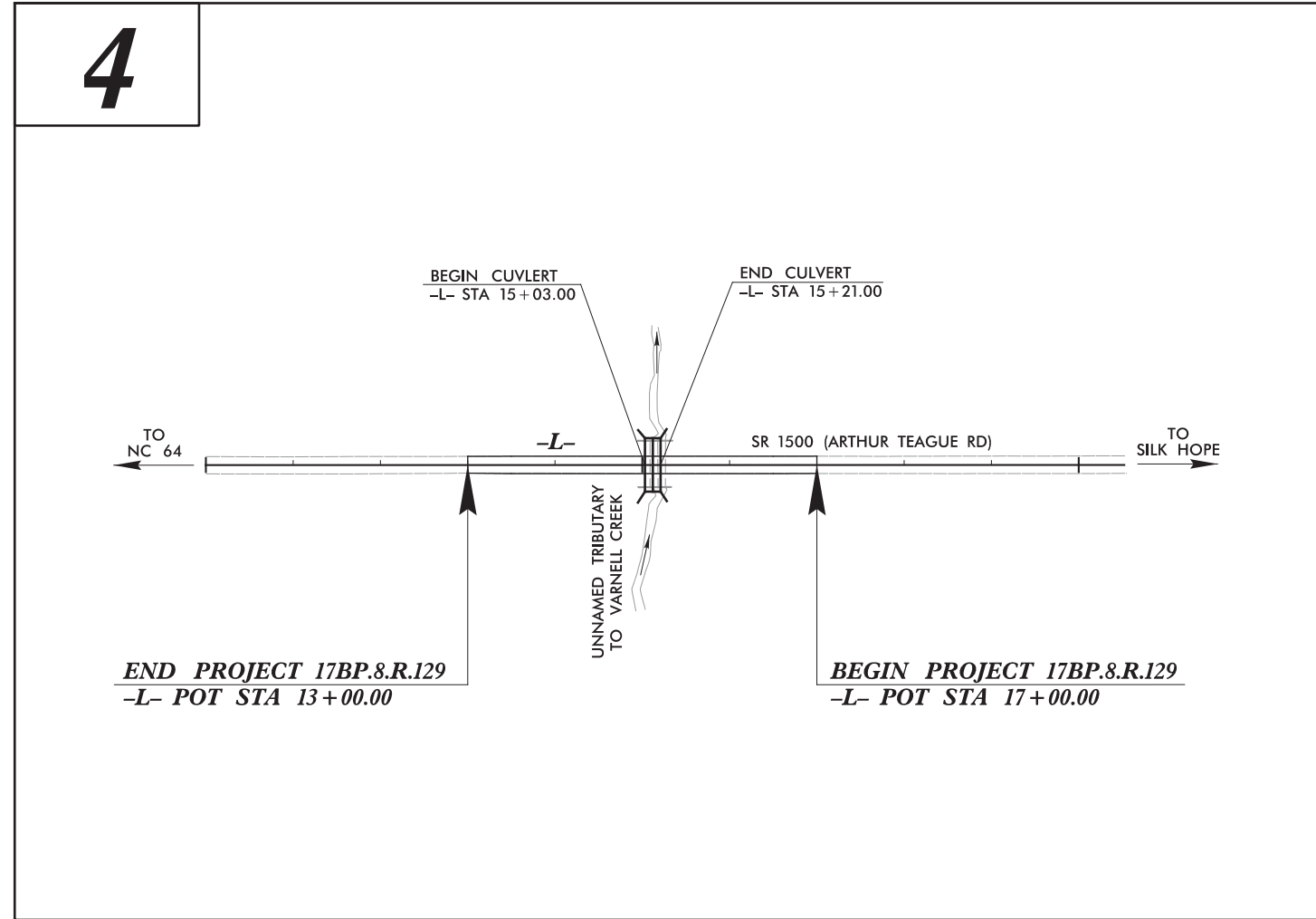
LOCATION: REPLACE CULVERT NO. 490 OVER UNNAMED TRIBUTARY TO VARNELL CREEK ON SR 1500 (ARTHUR TEAGUE ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.8.R.129	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.8.R.129		P.E.	
17BP.8.R.129		CONSTRUCTION	

PROJECT: 17BP.8.R.129

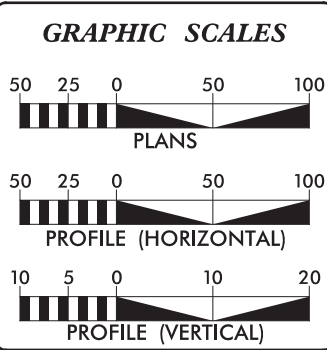
CONTRACT:



NOTES:

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT (2018) =	245
K =	%
D =	%
T =	%
V =	60 MPH
TTST =	% DUAL %
FUNC CLASS =	LOCAL RURAL
SUB-REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT 17BP.8.R.129 =	0.076 MILES
TOTAL LENGTH PROJECT 17BP.8.R.129 =	0.076 MILES

Prepared for the North Carolina Department of Transportation  
In the office of:

**ICA** Engineering, Inc.  
555 Fayetteville St., Suite 900  
Raleigh, NC 27601  
NC License No: F-0258

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
AUGUST 24, 2017

**LETTING DATE:**  
FEBRUARY 27, 2018

**DENA C. SNEAD, PE**  
PROJECT ENGINEER

**ALEXANDER D. SNIDER, PE**  
PROJECT DESIGN ENGINEER

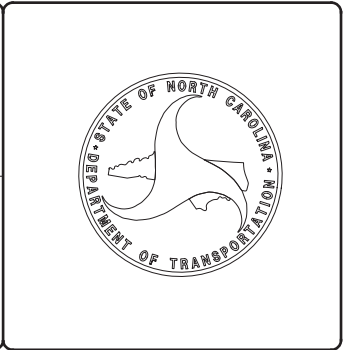
**TIM WELCH, PE**  
NCDOT CONTACT  
DIV 8 BRIDGE PROGRAM MANAGER

**HYDRAULICS ENGINEER**

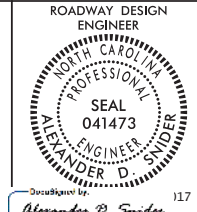
**TRENTON J. CORMIER**  
12/20/2017  
P.E.

**ROADWAY DESIGN ENGINEER**

**ALEXANDER D. SNIDER**  
12/20/2017  
P.E.



12/20/2017  
C:\P\PROJECTS\17BP.8.R.129\17BP.8.R.129\CHATHAM\_490\_P.DY\_TSH.dgn  
ICA ENGINEERING, INC.



DOCUMENT NOT VALID UNLESS ALL SIGNATURES COMPLETED

SHEET NUMBER	INDEX OF SHEETS SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B-1	ROADWAY SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-3	CROSS-SECTIONS
C-1 THRU C-5	CULVERT PLANS

**GENERAL NOTES:**

2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

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

**CLEARING:**  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

**SUPERELEVATION:**  
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

**SHOULDER CONSTRUCTION:**  
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

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

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

**END BENTS:**  
THE 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 Duke Energy Progress, TWC/Charter Communication/Spectrum, Aqua America, PSNC  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class "B" Rip Rap

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

## BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EP
Computed Property Corner	✕
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-X-X-X-
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-S-
Potential Contamination Area: Soil	-S-S-
Known Contamination Area: Water	-W-W-
Potential Contamination Area: Water	-W-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	_____
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	— (R/W) —
New Right of Way Line with Pin and Cap	— (R/W) — ▲
New Right of Way Line with Concrete or Granite RW Marker	— (R/W) — ▲
New Control of Access Line with Concrete C/A Marker	— (C/A) —
Existing Control of Access	— (C/A) —
New Control of Access	— (C/A) —
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	●

Note: Not to Scale

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

Hedge	_____
Woods Line	_____
Orchard	_____
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	—
Telephone Cell Tower	—
U/G Telephone Cable Hand Hole	—
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.*)	—
U/G Water Line LOS C (S.U.E.*)	—
U/G Water Line LOS D (S.U.E.*)	—
Above Ground Water Line	— A/G Water —

## TV:

TV Pedestal	—
TV Tower	—
U/G TV Cable Hand Hole	—
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 —

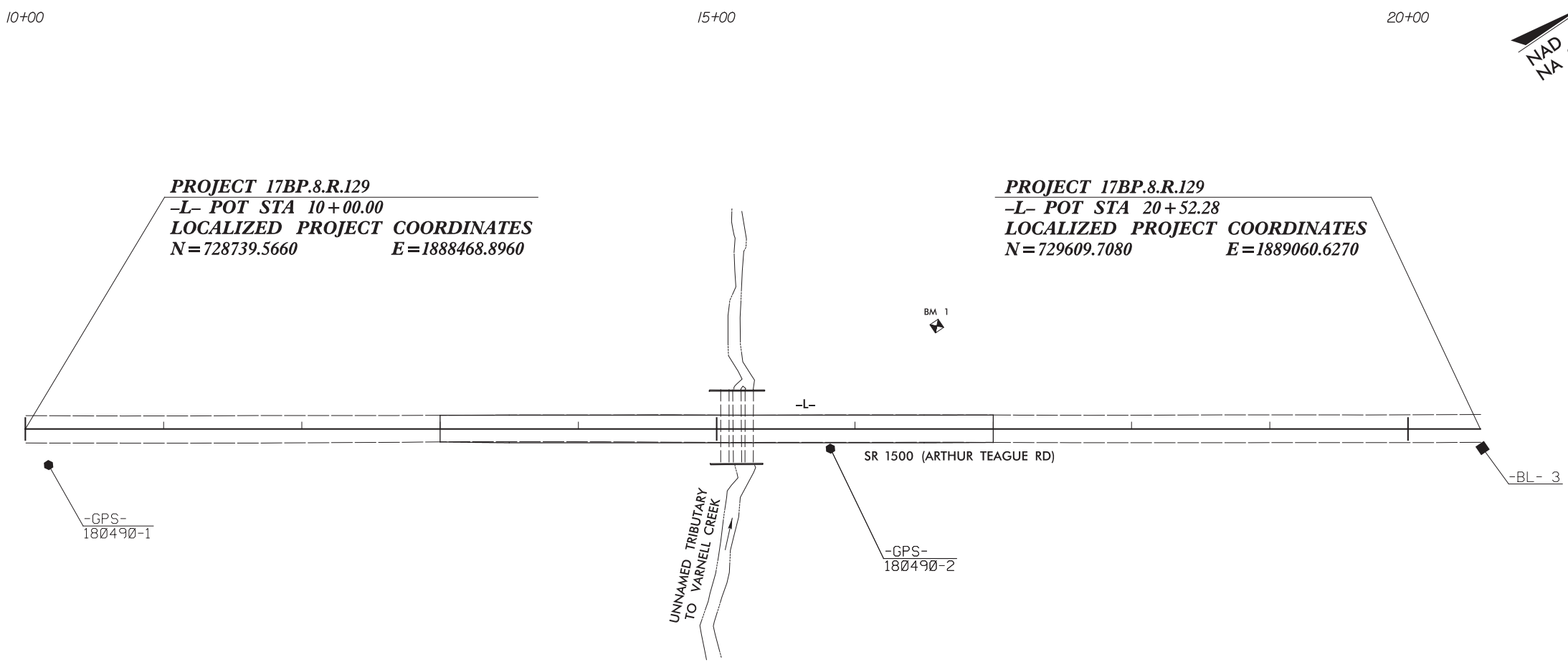
## SANITARY SEWER:

Sanitary Sewer Manhole	— SS —
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	—
Utility Unknown U/G Line LOS B (S.U.E.*)	—
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.

# 17BP.8.R.129 SURVEY CONTROL SHEET



**PROJECT 17BP.8.R.129**  
**-L- POT STA 10+00.00**  
**LOCALIZED PROJECT COORDINATES**  
**N=728739.5660      E=1888468.8960**

**PROJECT 17BP.8.R.129**  
**-L- POT STA 20+52.28**  
**LOCALIZED PROJECT COORDINATES**  
**N=729609.7080      E=1889060.6270**

BENCHMARK DATA	
BM1	ELEVATION = 543.62
N 729327	E 1888778
L STATION 16+59.19 75 LEFT	
BENCH TIE SPIKE IN 18" SWEET GUM	

BASELINE DATA							
BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET	
1	GPS 180490-1	728738.7716	1888499.9356	559.02	10+16.80	26.11 RT	
2	GPS 180490-2	729213.0490	1888808.1040	541.70	15+82.28	14.24 RT	
3	BL-3	729603.2400	1889072.9340	546.18		OUTSIDE PROJECT LIMITS	

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "180490-2"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 729213.049(ft)    EASTING: 1888808.104(ft)  
 ELEVATION: 541.696(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999889083

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "180490-2" TO -L- STATION 10+00.00 IS  
 S 35°37'05.50" W 582.45'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

### NOTES

- THE CONTROL DATA FOR THIS PROJECT WAS PROVIDED BY NCDOT.  
 CONTROL POINTS PROVIDED ARE AS FOLLOWS:  

180490-1	N=728738.7716	E=1888499.9356	ELEV.=559.02
180490-2	N=729213.0490	E=1888808.1040	ELEV.=541.70

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

  - INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY NCDOT.
  - ◆ INDICATES CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY NCDOT.

NOTE: DRAWING NOT TO SCALE

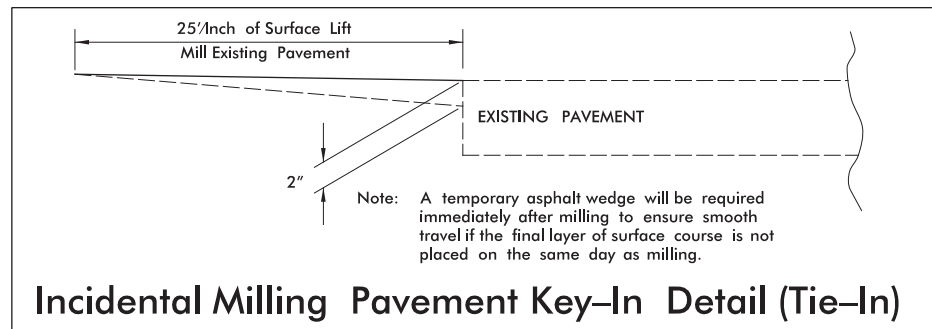
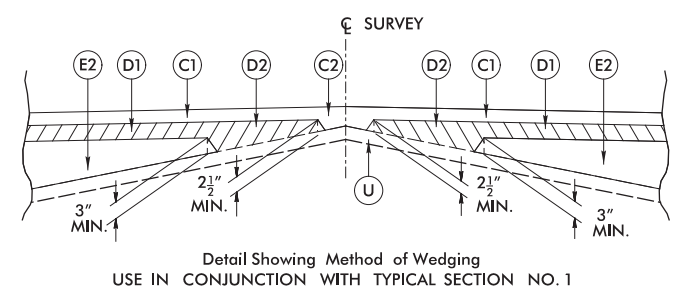
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 11/29/2017  
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 T&A ENGINEERING, INC.

6/2/99

PAVEMENT SCHEDULE

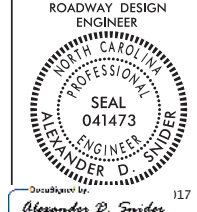
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0X, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING)

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

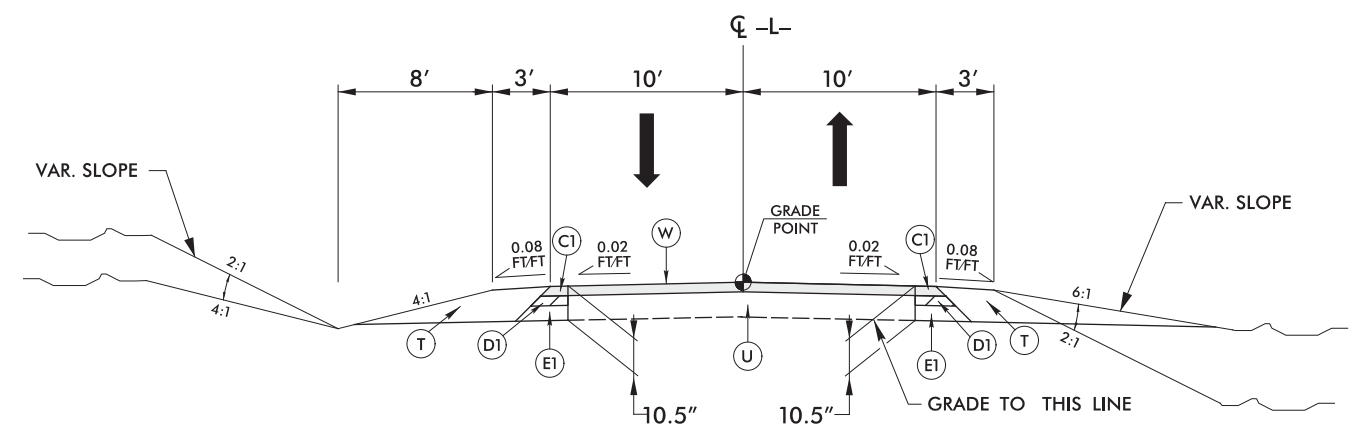


ICA Engineering, Inc.  
555 Fayetteville St.  
Suite 900  
Raleigh, NC 27601  
NC License No: F-0258

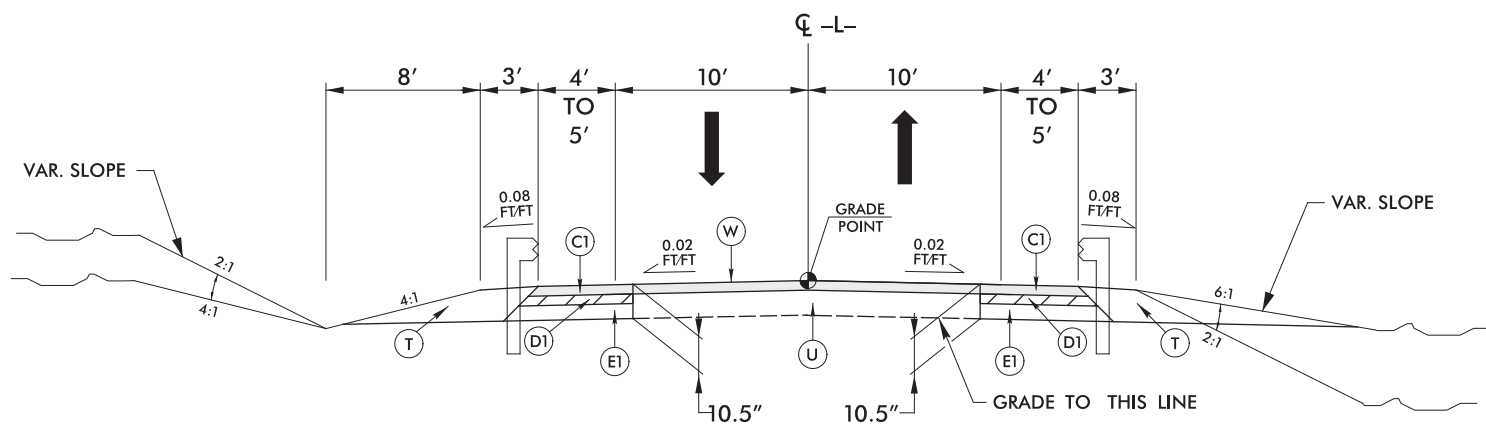
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SHEET NO. 2A-1



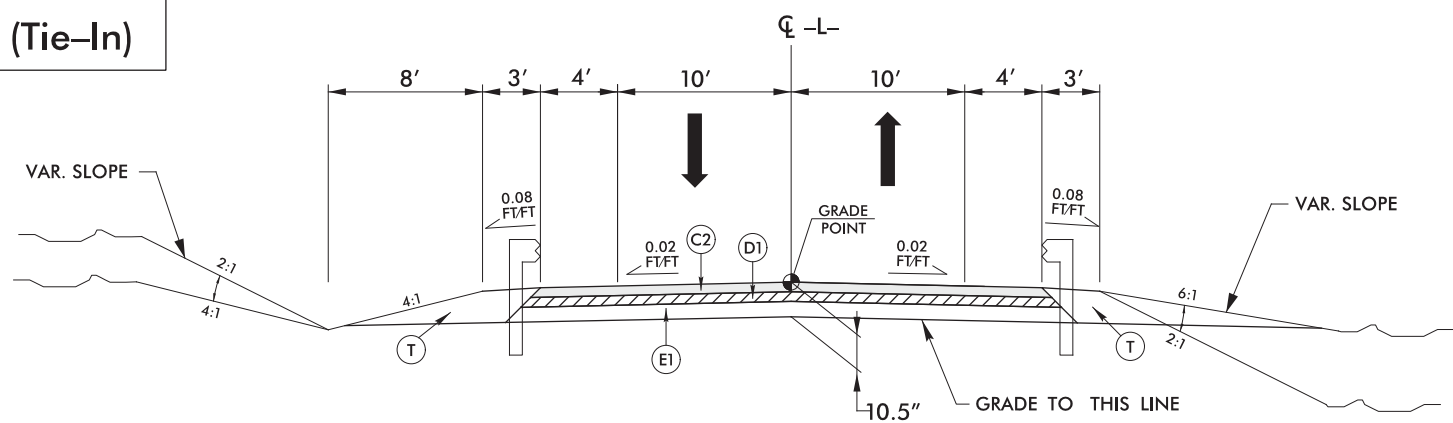
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USE TYPICAL SECTION NO. 1 FROM:  
-L- STA 13+00.00 TO -L- STA 14+30.00  
-L- STA 16+05.00 TO -L- STA 17+00.00



USE TYPICAL SECTION NO. 2 FROM:  
-L- STA 14+30.00 TO -L- STA 14+75.00  
-L- STA 15+50.00 TO -L- STA 16+05.00



USE TYPICAL SECTION NO. 3 FROM:  
-L- STA 14+75.00 TO -L- STA 15+50.00

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COMPUTED BY: ADS DATE: 11/30/2017  
CHECKED BY: DCS DATE: 11/30/2017

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS



ICA Engineering, Inc.  
555 Fayetteville St.  
Suite 900  
Raleigh, NC 27601  
NC License No: F-0258

PROJECT REFERENCE NO. SHEET NO.  
17BP.8.R.129 3B-1

SUMMARY OF EARTHWORK  
IN CUBIC YARDS

Table with 6 columns: STATION, STATION, UNCL. EXCAV., EMBANK. +%, BORROW, WASTE. Rows include station ranges, subtotals, and material breakdowns like SHOULDER MATERIAL and UNDERCUT (GEOTECH).

PAVEMENT REMOVAL SUMMARY

Table with 5 columns: SURVEY LINE, STATION, STATION, LOCATION LT/RT/CL, YD^2. Shows a single entry for station 14+75.00 to 15+50.00 at CL location with 165 YD^2.

GEOTEXTILE FOR SOIL STABILIZATION (SY) = 100  
SHALLOW UNDERCUT (CY) = 100  
CLASS IV SUBGRADE STABILIZATION (TON) = 200

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

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

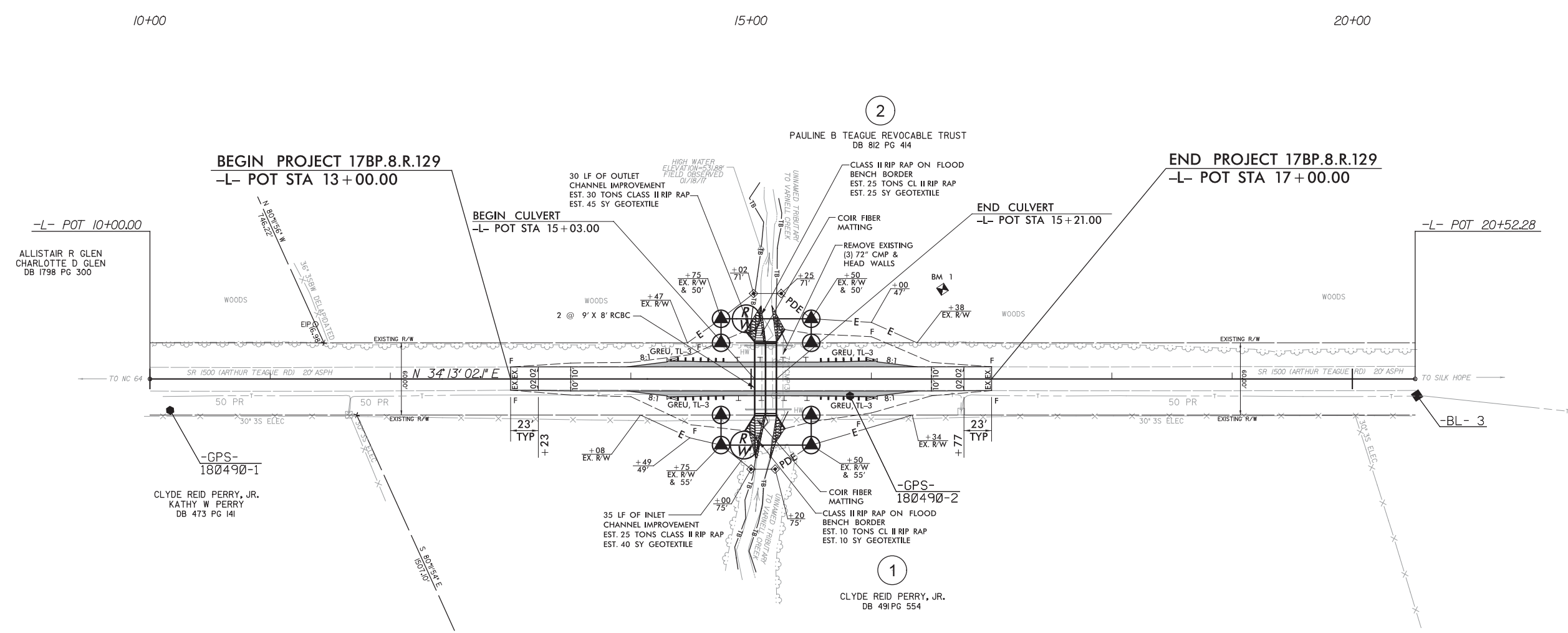
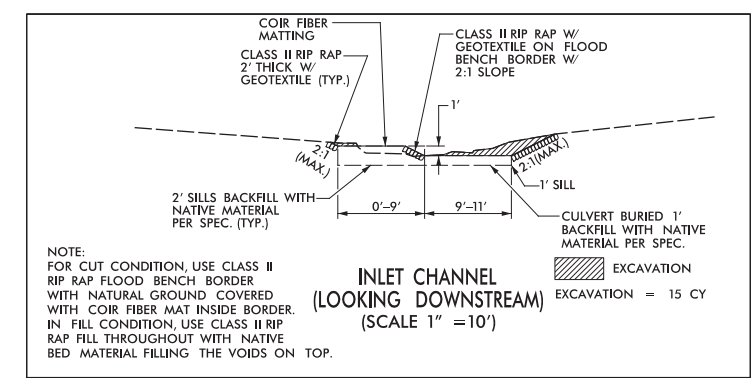
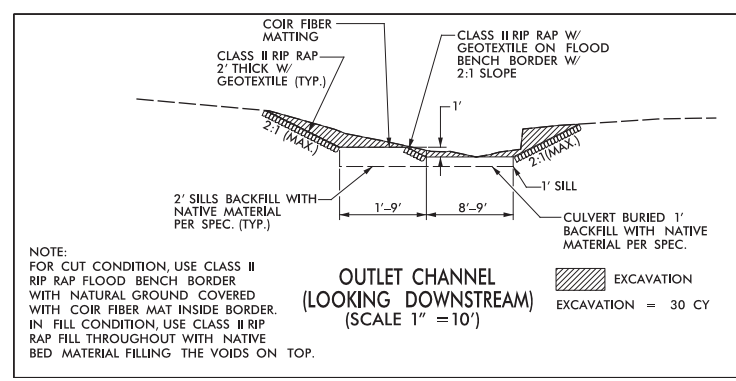
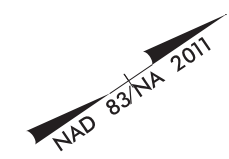
GUARDRAIL SUMMARY

Table with columns for SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH, WARRANT POINT, TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, IMPACT ATTENUATOR, SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, and REMARKS.

11/30/2017 1:40:24 PM 9554\CHATHAM\_490\_RDY\_PSH\_03B-1.dgn

8/17/19

PROJECT REFERENCE NO. <b>17BP.8.R.129</b>	SHEET NO. <b>4</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>ALEXANDER D. SWIDER</b> NORTH CAROLINA PROFESSIONAL SEAL 041473	HYDRAULICS ENGINEER <b>TRANTON J. COMBER</b> NORTH CAROLINA PROFESSIONAL SEAL 034364
Designed by: 12/20/2017 <b>Alexander D. Swider</b>	Designed by: 12/20/2017 <b>Tranton J. Comber</b>
UNLESS ALL SIGNATURES COMPLETED	



12/20/2017  
 9:15 PM  
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 ICA ENGINEERING, INC.

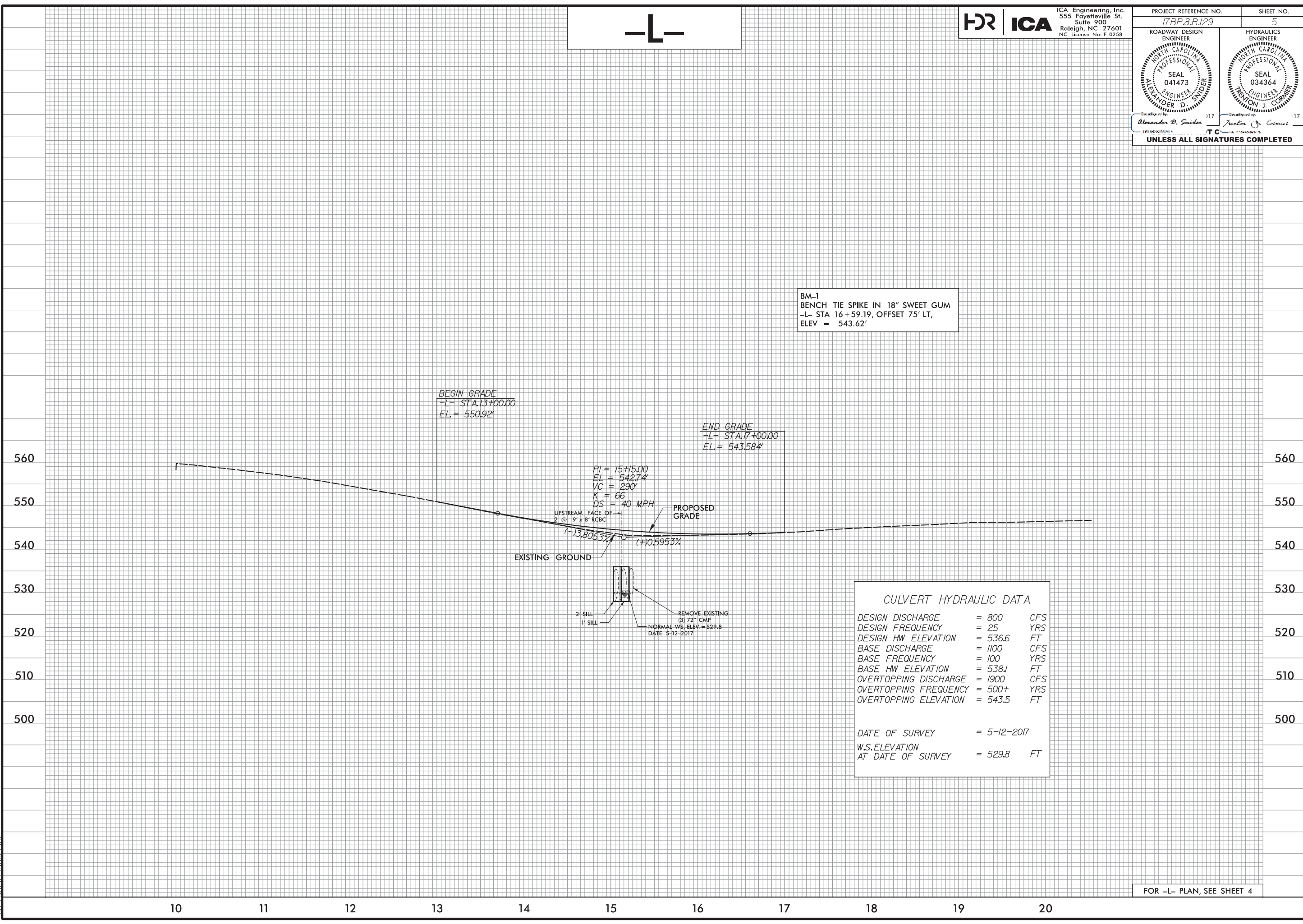


5/28/09



ICA Engineering, Inc.  
555 Fayetteville St,  
Suite 900  
Raleigh, NC 27601  
NC License No: F-0258

PROJECT REFERENCE NO. <b>17BP&amp;R129</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER <b>ALEXANDER D. SWIDER</b>	HYDRAULICS ENGINEER <b>TREVON J. CORNBOR</b>
Drawn by: <b>Alexander D. Swider</b>	Checked by: <b>Trevon J. Cornbor</b>
<b>UNLESS ALL SIGNATURES COMPLETED</b>	



**BM-1**  
BENCH TIE SPIKE IN 18" SWEET GUM  
-L- STA 16+59.19, OFFSET 75' LT,  
ELEV = 543.62'

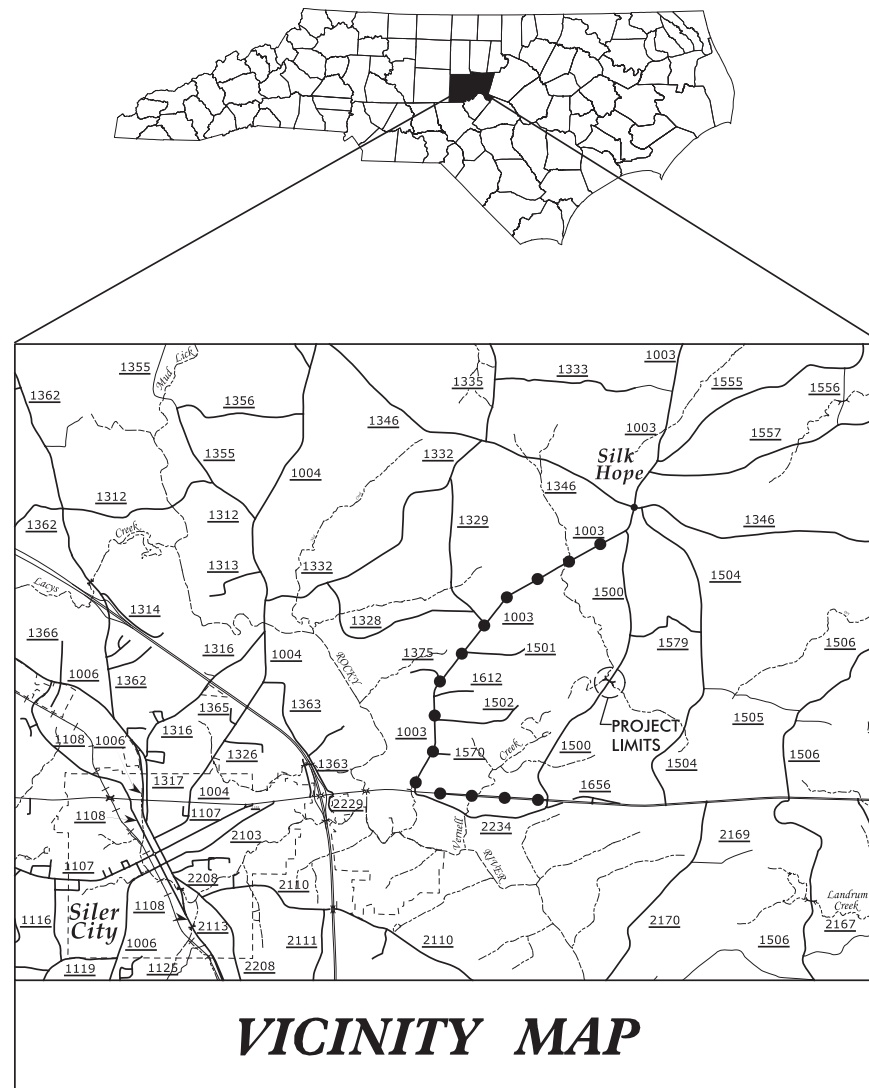
CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 536.6	FT
BASE DISCHARGE	= 1100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 538.1	FT
OVERTOPPING DISCHARGE	= 1900	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 543.5	FT
DATE OF SURVEY	= 5-12-2017	
W.S. ELEVATION AT DATE OF SURVEY	= 529.8	FT

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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**CHATHAM COUNTY**



**LOCATION: CULVERT NO. 490 OVER UT TO VARNELL CREEK ON SR 1500 (ARTHUR TEAGUE ROAD)**

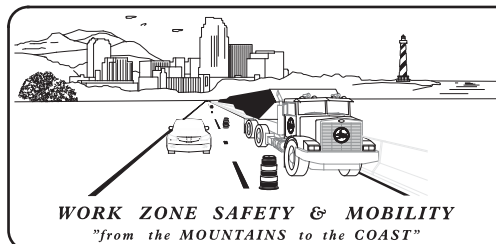
**TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE**

<b>INDEX OF SHEETS</b>	
<u>SHEET NO.</u>	<u>TITLE</u>
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGY GENERAL NOTES, LOCAL NOTES AND PHASING)
TMP-3	DETOUR FOR ARTHUR TEAGUE ROAD CLOSURE
TMP-4	ROAD CLOSURE SIGNS, DETOUR SIGNS AND SIGN DESIGN

SHEET NO.  
TMP-1

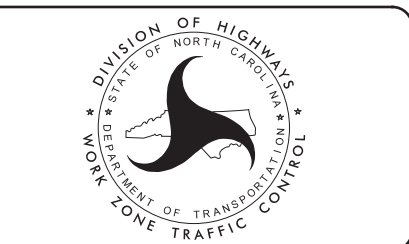
**17BP.8.R.129**

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



**PLANS PREPARED BY:**  
  
M. RZEPKA, P.E.  
PROJECT ENGINEER  
  
Y. MARIOTTE  
PROJECT DESIGN ENGINEER

**NCDOT CONTACTS:**  
  
T. WELCH, P.E.  
DIV. 8 BRIDGE PROGRAM MANAGER  
  
PROJECT DESIGN ENGINEER



PLAN PREPARED BY:  
**ICA**  
ICA Engineering, Inc.  
555 Fayetteville St.,  
Suite 900  
Raleigh, NC 27601  
NC License No. F-0258

APPROVED: *Michael T. Rzepka*  
DATE: 12/20/2017  
  
SEAL  
MICHAEL T. RZEPKA  
ENGINEER  
15876  
NORTH CAROLINA  
PROFESSIONAL

**PROJECT:**

12/20/2017  
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ICA Engineering


## 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:

<u>STD. NO.</u>	<u>TITLE</u>
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

## LEGEND

### GENERAL

 NORTH ARROW

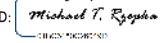
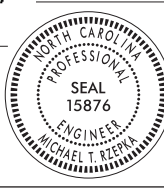

### TRAFFIC CONTROL DEVICES

 BARRICADE (TYPE III)

### TEMPORARY SIGNING

 STATIONARY SIGN

I:\29\2017  
 ca\powerking\east01\40249605\chart490\_tmp\_title\_la.dgn  
 ICA Engineering

APPROVED:  DATE: 12/20/2017  SEAL			<h3>ROADWAY STANDARD DRAWINGS &amp; LEGEND</h3>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

## MANAGEMENT STRATEGY

THIS PROJECT CONSISTS OF REPLACING CULVERT NO. 94 OVER UT TO VARNELL CREEK ON SR 1500 (ARTHUR TEAGUE RD). DURING CONSTRUCTION, SR 1500 (ARTHUR TEAGUE RD) WILL BE CLOSED AT THE CONSTRUCTION LIMITS AND TRAFFIC WILL BE PLACED ON AN OFF-SITE DETOUR ALONG SR 1003 (SILK HOPE RD) AND US 64.

SR 1500 (ARTHUR TEAGUE RD) WILL BE REOPENED TO 2-LANE/2-WAY TRAFFIC UPON COMPLETION OF CONSTRUCTION.

## 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.

### TRAFFIC PATTERN ALTERATIONS

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

### SIGNING

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

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

- C) 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.

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

## LOCAL NOTES

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

## PHASING

### STEP 1

USING ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9), INSTALL ROAD CLOSURE AND DETOUR SIGNS. CLOSE SR 1500 (ARTHUR TEAGUE RD) AND DETOUR TRAFFIC (SEE LOCAL NOTE 1).

### STEP 2

REMOVE EXISTING BRIDGE.

### STEP 3

CONSTRUCT PROPOSED STRUCTURE AND ROADWAY.

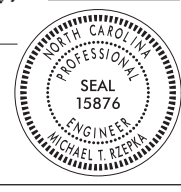

### STEP 4

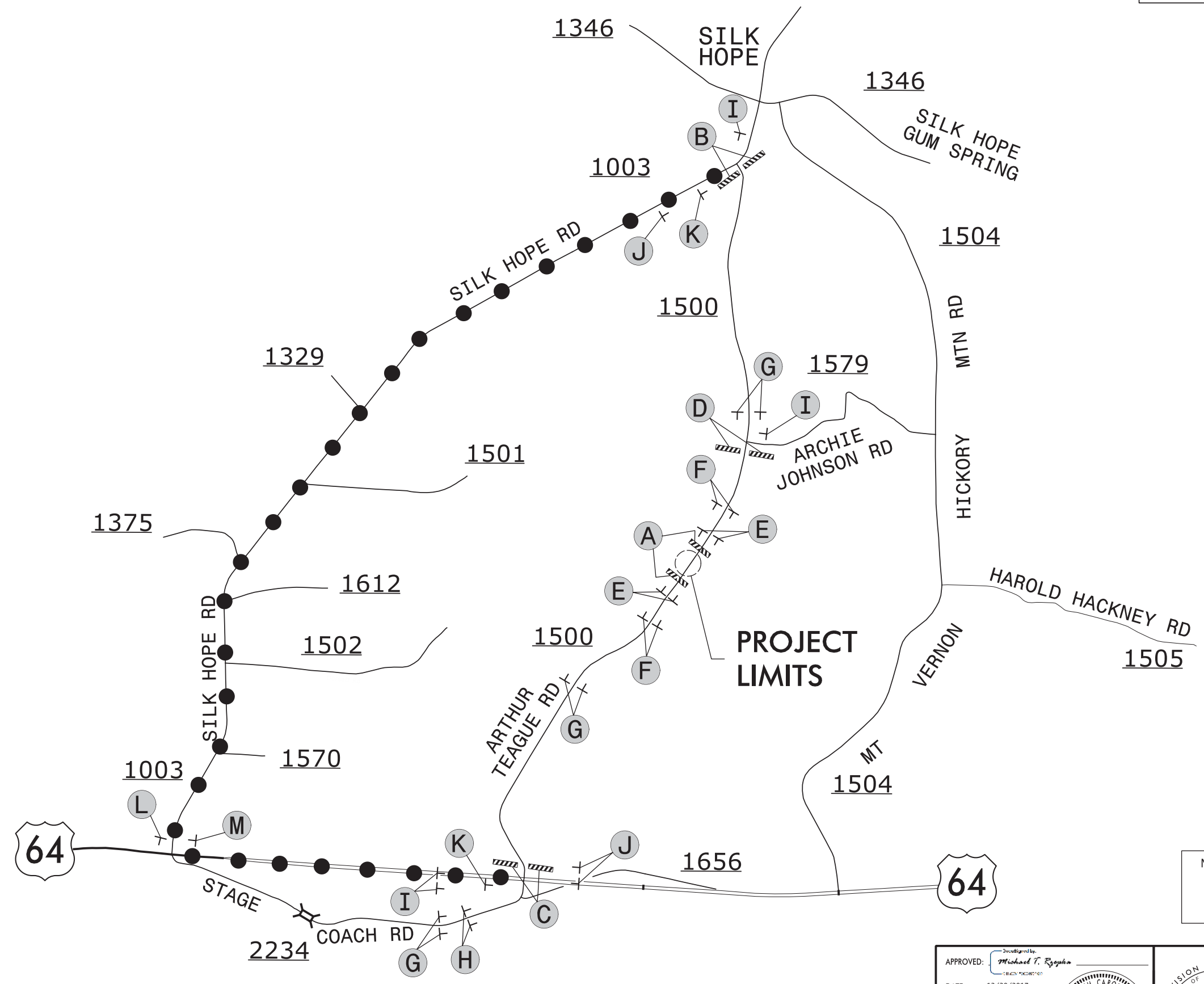
PLACE FINAL PAVEMENT MARKINGS AND MARKERS ON SR 1500 (ARTHUR TEAGUE RD) AND OPEN ROAD TO TRAFFIC.

### STEP 5

REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

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 cs\powerking\boost01\40249605\chat490\_tmp\_title.lib.dgn  
 ICA\_Engineering

APPROVED: <u>Michael T. Reppin</u> <small>DESIGNED BY</small> DATE: <u>12/20/2017</u> <div style="text-align: center;">             SEAL         </div>		<h1 style="margin: 0;">TRANSPORTATION OPERATIONS PLAN</h1>
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		



NOTES: SEE SHEET TMP-4 FOR ROAD CLOSURE SIGNS AND DETOUR SIGNS  
REFER TO RSD 1101.03, (SHEET 1 OF 9) FOR APPLICABLE NOTES

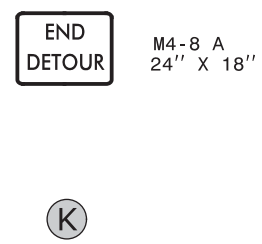
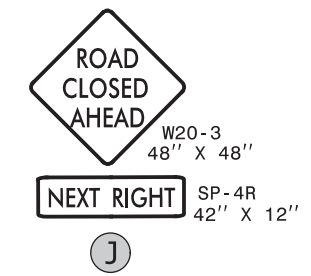
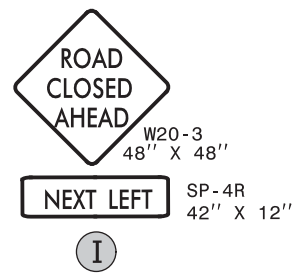
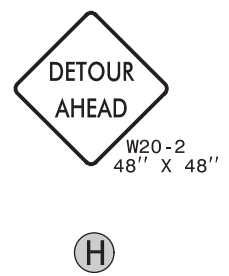
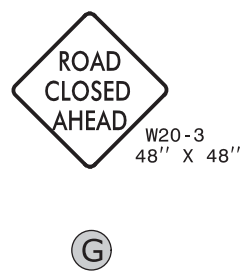
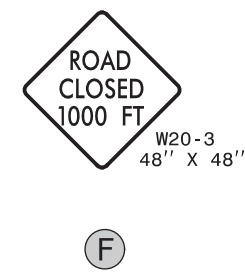
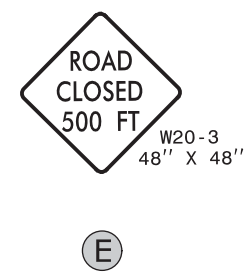
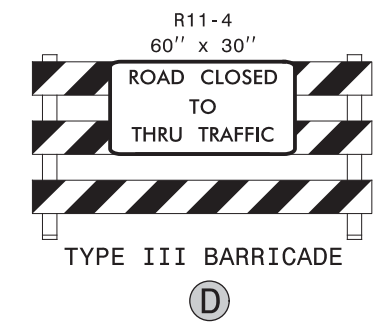
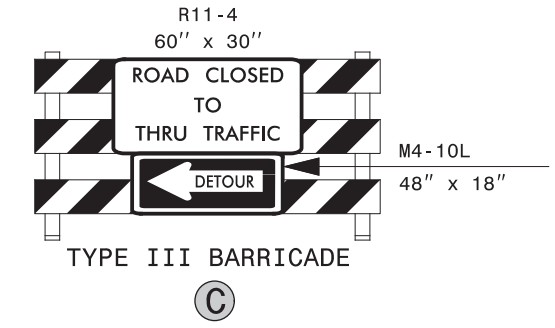
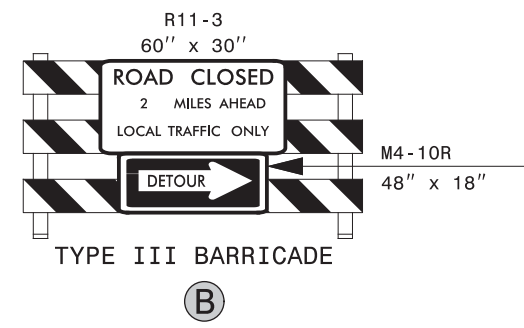
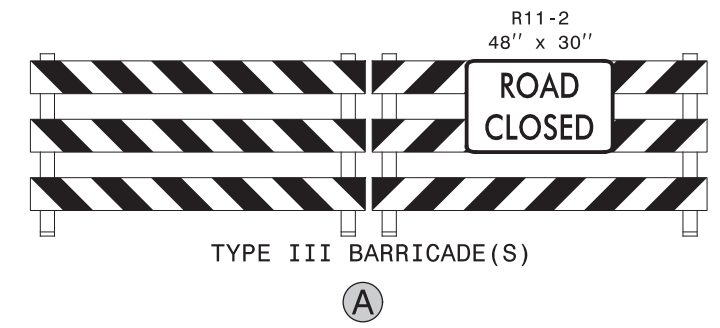
11/29/2017  
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ICA Engineering, Inc.

APPROVED: *Michael T. Rygoza*  
DATE: 12/20/2017  
SEAL  
MICHAEL T. RYGOZA  
ENGINEER  
15876



DETOUR FOR  
ARTHUR TEAGUE ROAD  
CLOSURE

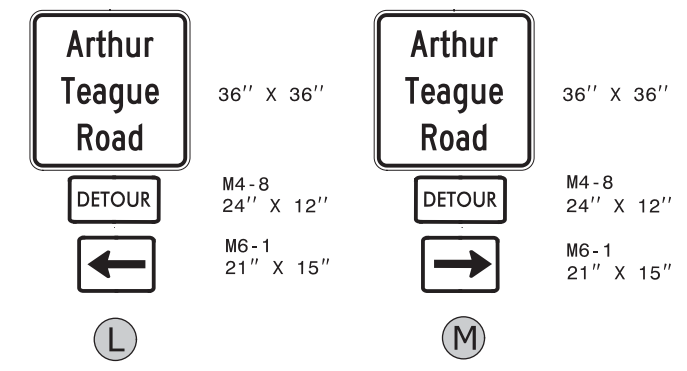
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



SIGN NUMBER: Arthur Teague TYPE: STATIONARY QUANTITY: SEE PLANS SIGN WIDTH: 3'-0" HEIGHT: 3'-0" TOTAL AREA: 9.0 Sq.Ft. BORDER TYPE: INSET RECESS: 0.63" WIDTH: 0.88" RADII: 2.25" NO. Z BARS: LENGTH:	BACKG COLOR: Fluorescent Orange COPY COLOR: Black SYMBOLOGY TABLE: MAT'L: 0.080" (2.0 mm) ALUMINUM	DESIGN BY: mtr PROJECT ID: 17BP.8.R.129 CHECKED BY: LOCATION: Oct 24, 2017 DIV: 8
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BORDER  
R=2.25"  
TH=0.88"  
IN=0.63"

Spacing Factor is 1 unless specified otherwise



LETTER POSITIONS

Letter spacings are to start of next letter

Series/Size	Text Length																			
C 2000	8.2	4.6	2.2	2.8	4	4.1	2	8.2												
C 2000	7	3.6	3.5	3.7	4.1	4	3.1	7												
C 2000	10.7	4.1	3.7	3.7	3.1	10.7														

FILENAME: misc sign designs

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: <i>Michael T. Rzepka</i> DATE: 12/20/2017 SEAL DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			ROAD CLOSURE SIGNS, DETOUR SIGNS AND SIGN DESIGN
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11/29/2017 c:\pwworking\ncdot\04249605\chat490\_tmpl\_detour\_4.dgn ICA Engineering

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.8.R.129	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



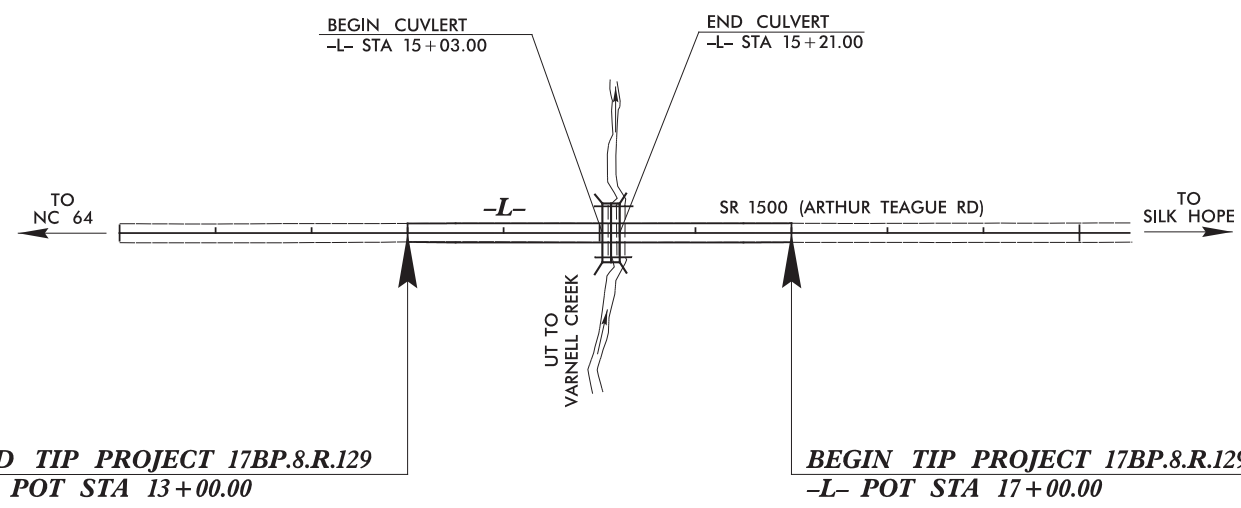
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL

**CHATHAM COUNTY**

CULVERT NO. 490 OVER UT TO VARNELL CREEK  
ON SR 1500 (ARTHUR TEAGUE ROAD)

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



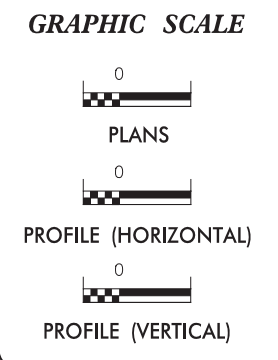
**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	— m —
1630.05	Temporary Diversion	— m —
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	▲▲▲▲▲▲▲▲
1622.01	Temporary Berms and Slope Drains	— m —
1630.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▨
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▨
1633.02	Temporary Rock Silt Check Type-B	▨
	Wattle / Coir Fiber Wattle	— m —
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	— m —
1634.01	Temporary Rock Sediment Dam Type-A	▨
1634.02	Temporary Rock Sediment Dam Type-B	▨
1635.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭

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

**TIP PROJECT: 17BP.8.R.129**

ALEXANDER D. SNIDER, PE  
ROADSIDE ENVIRONMENTAL ENGINEER  
3064  
LEVEL III CERTIFICATION NUMBER  
TRENTON J. CORMIER, PE  
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER  
3377  
LEVEL III CERTIFICATION NUMBER



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

Prepared In the Office of:  
**ICA**  
ICA Engineering, Inc.  
555 Fayetteville St., Suite 900  
Raleigh, NC 27601  
NC License No: F-0258  
Designed by:  
**ALEXANDER D. SNIDER, PE** 3064  
NAME LEVEL III CERTIFICATION NO.

Reviewed In the Office of:  
**ROADSIDE ENVIRONMENTAL UNIT**  
1 South Wilmington St.  
Raleigh, NC 27611  
2018 STANDARD SPECIFICATIONS  
Reviewed by:  
**AARON HARPER, EI**

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 revision 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 Silt 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	

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DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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## ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
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.



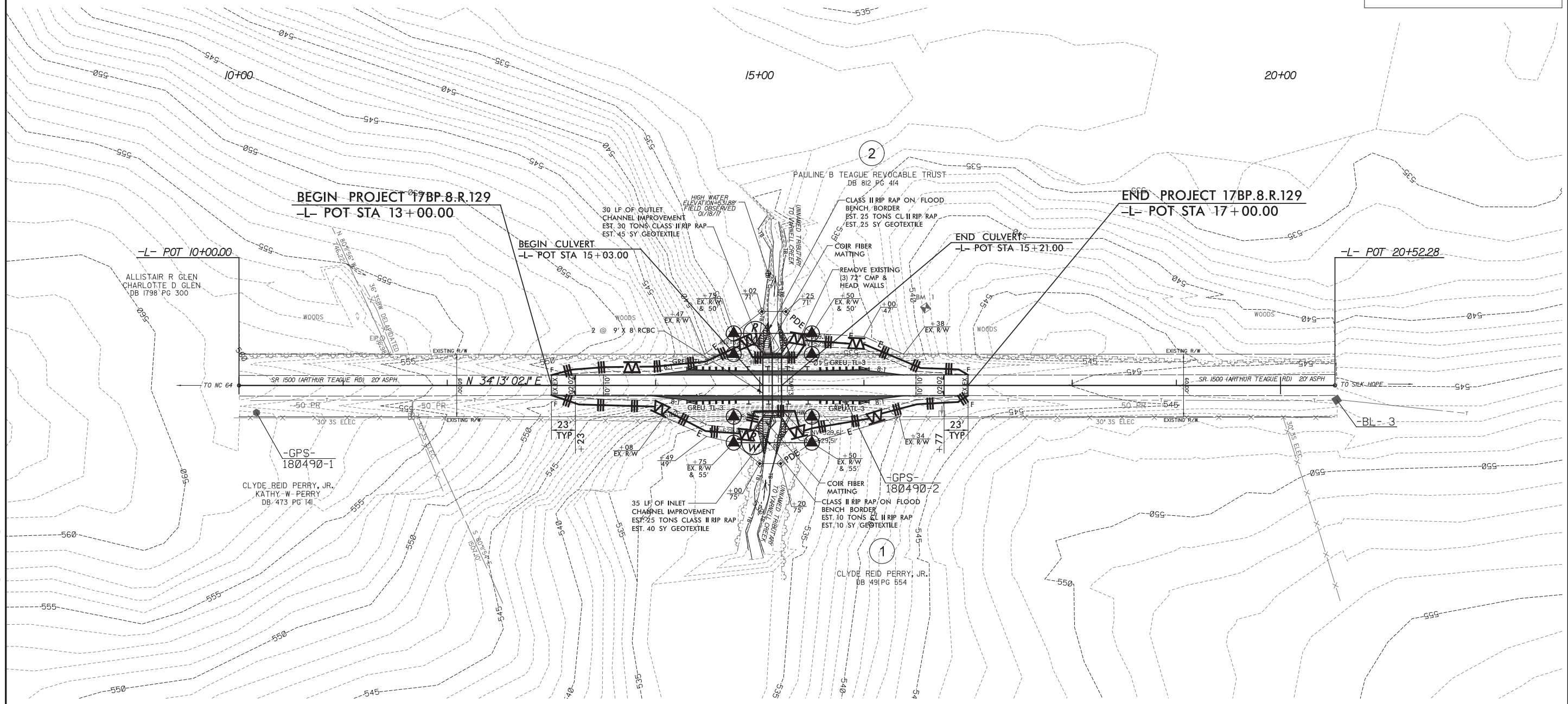
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11/28/2017  
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ICA ENGINEERING, INC.



LEVEL III CERTIFIED BY:  
ALEXANDER D SNIDER, PE  
CERTIFICATION NUMBER: 3064  
ISSUED: AUGUST 11, 2017

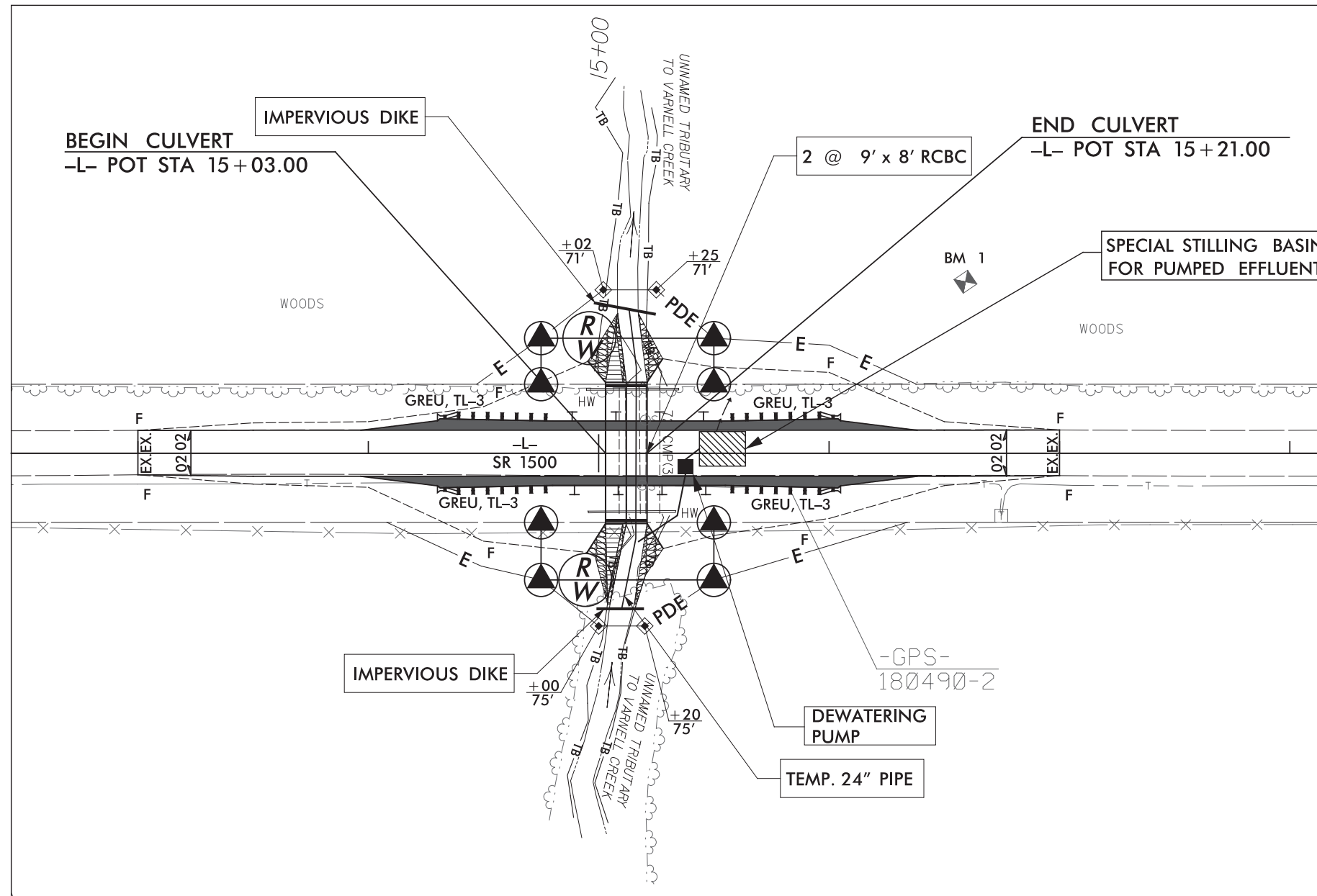
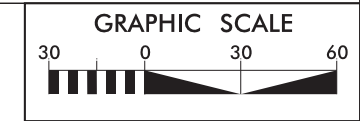
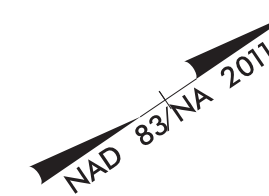
CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 04

NOTE:  
ALL EROSION CONTROL DEVICES SHOWN ARE  
LOCATED WITHIN RW OR EASEMENT.



FOR -L- PROFILE, SEE SHEET 5

# CONSTRUCTION SEQUENCE



### CULVERT CONSTRUCTION SEQUENCE:

- 1.) INSTALL ALL TEMPORARY SEDIMENT CONTROL DEVICES NECESSARY FOR CULVERT CONSTRUCTION.
- 2.) INSTALL SPECIAL STILLING BASIN WITHIN PROJECT RIGHT-OF-WAY. PUMP ALL EFFLUENT INTO SPECIAL STILLING BASIN (15' X 20').
- 4.) INSTALL IMPERVIOUS DIKES AND INSTALL 24" TEMP. PIPE (131 LF).
- 5.) DE-WATER EFFLUENT FROM WORK SITE INTO SPECIAL STILLING BASIN.
- 6.) CONSTRUCT PROPOSED 2 @ 9' X 8' RCBC AND CHANNEL IMPROVEMENTS.
- 7.) REMOVE 24" TEMPORARY PIPE AND IMPERVIOUS DIKES TO ALLOW FLOW THROUGH NEWLY CONSTRUCTED CULVERT. REMOVE SPECIAL STILLING BASINS.
- 8.) COMPLETE PROPOSED ROADWAY.
- 9.) UPON STABILIZATION OF ALL DISTURBED AREAS, REMOVE ALL TEMPORARY SEDIMENT CONTROL DEVICES.

### NOTES:

1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
5. PUMPS AND HOSES SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA.
6. THE CONTRACTOR SHALL NOT PUMP SEDIMENT-LADEN WATER DIRECTLY INTO STREAM. FOR DE-WATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT-LADEN WATER THROUGH SPECIAL STILLING BASIN.

8/17/99

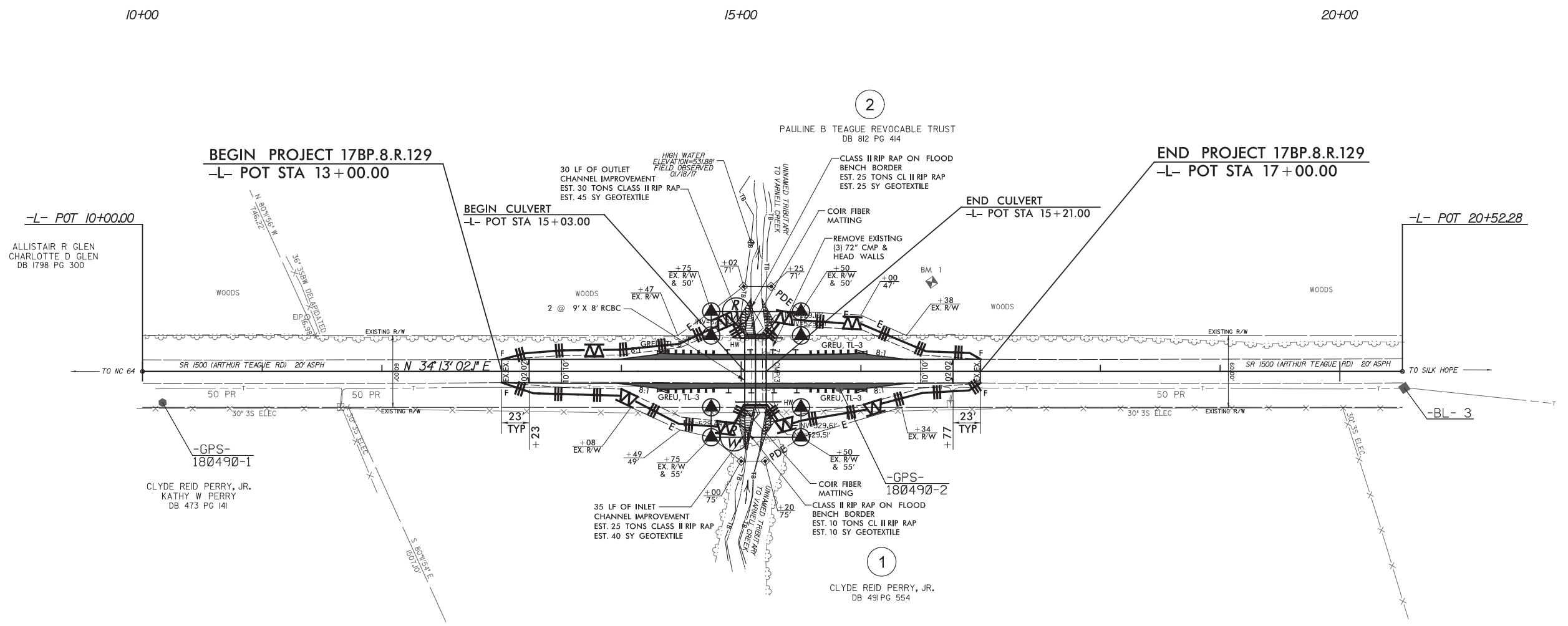
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:  
 ALEXANDER D SNIDER, PE  
 CERTIFICATION NUMBER: 3064  
 ISSUED: AUGUST 11, 2017



FINAL EROSION CONTROL  
 FOR CONSTRUCTION SHEET 04

NOTE:  
 ALL EROSION CONTROL DEVICES SHOWN ARE  
 LOCATED WITHIN RW OR EASEMENT.



ALLISTAIR R GLEN  
 CHARLOTTE D GLEN  
 DB 1798 PG 300

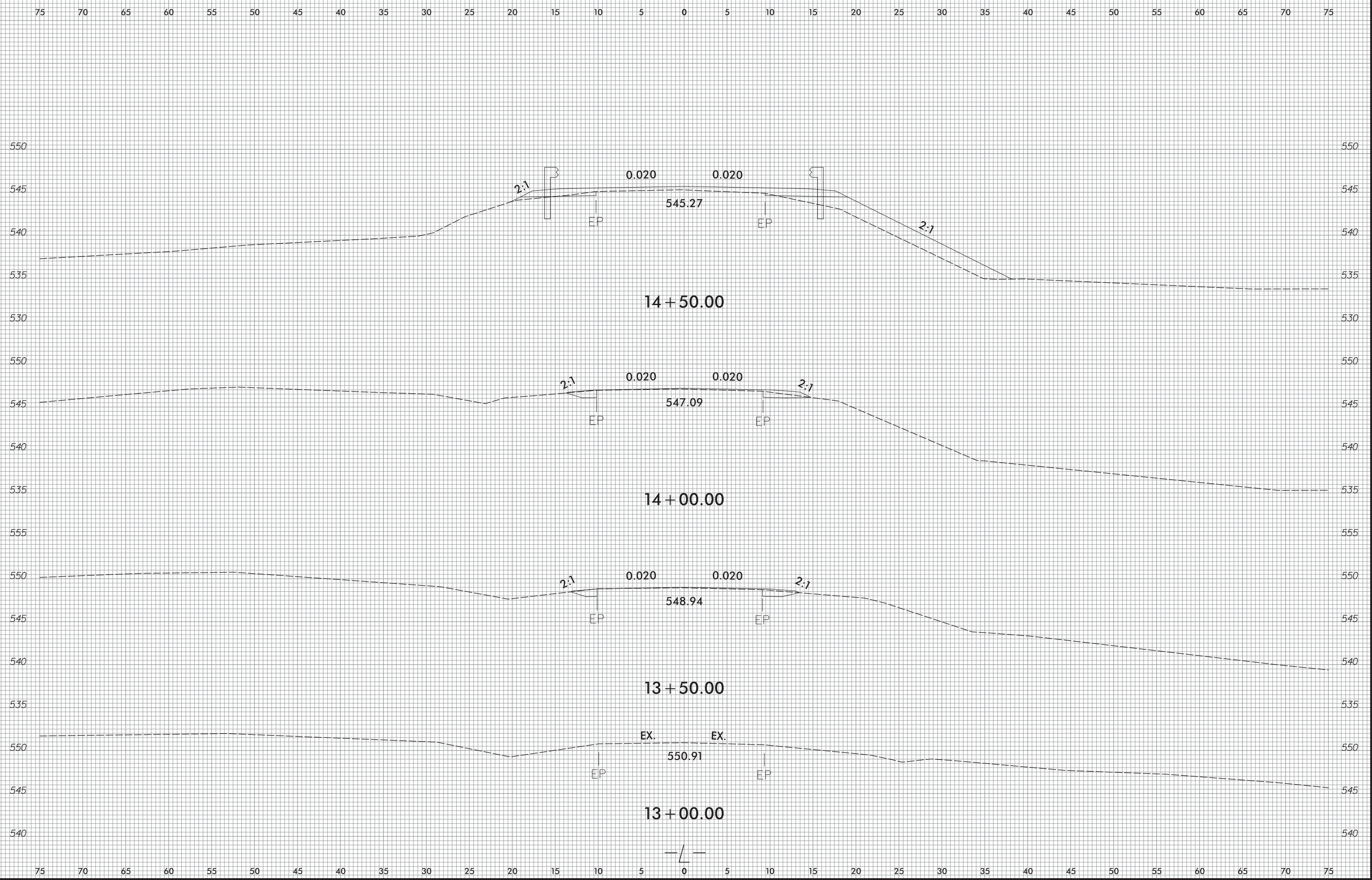
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 180490-1  
 CLYDE REID PERRY, JR.  
 KATHY W PERRY  
 DB 473 PG 141

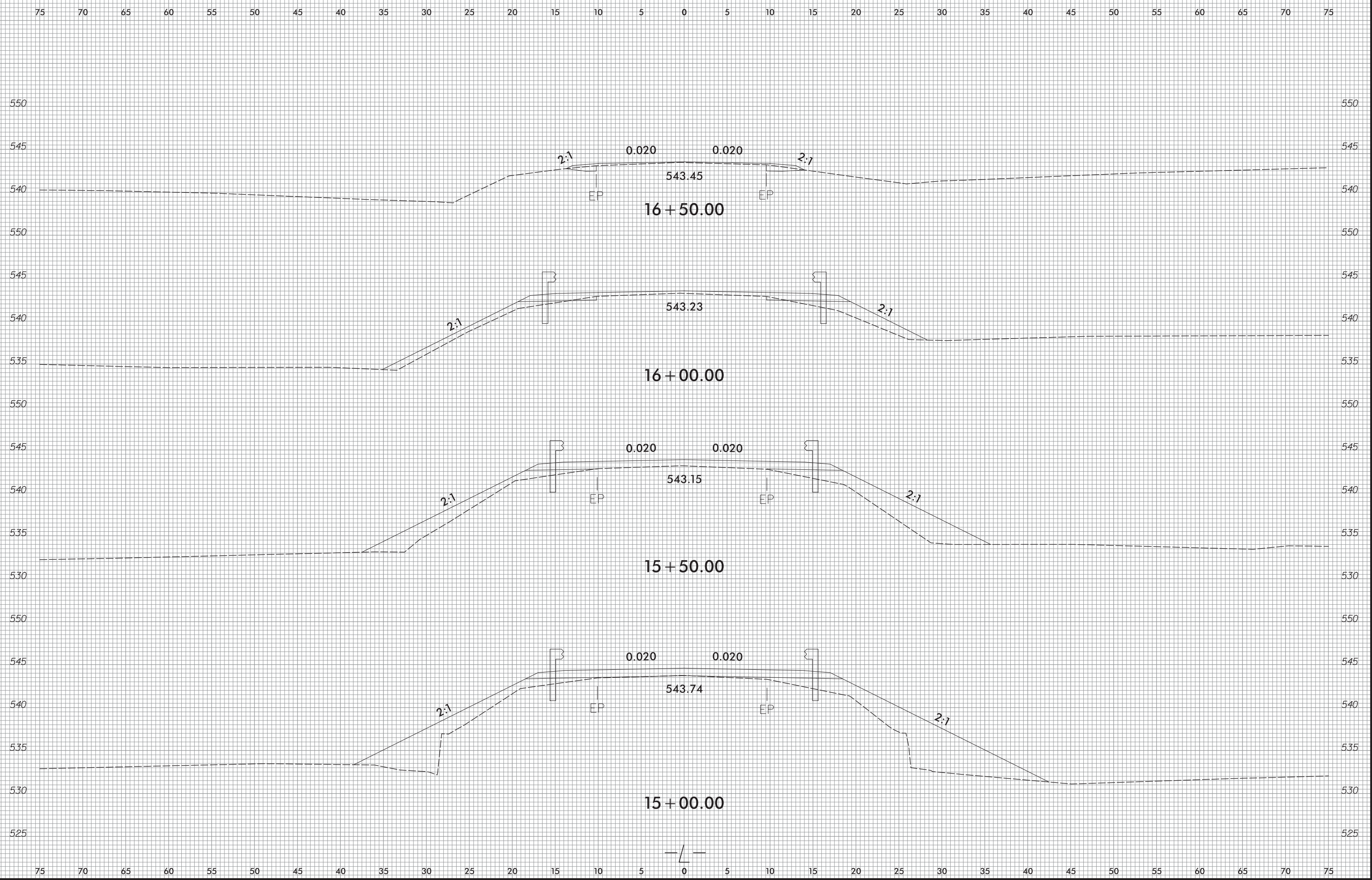
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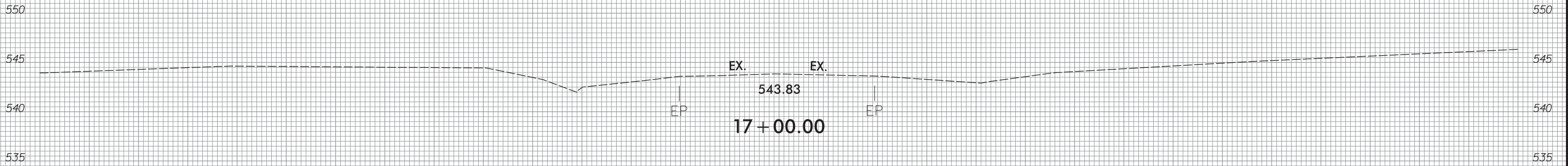
FOR -L- PROFILE, SEE SHEET 5

11/28/2017  
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 ICA ENGINEERING, INC.

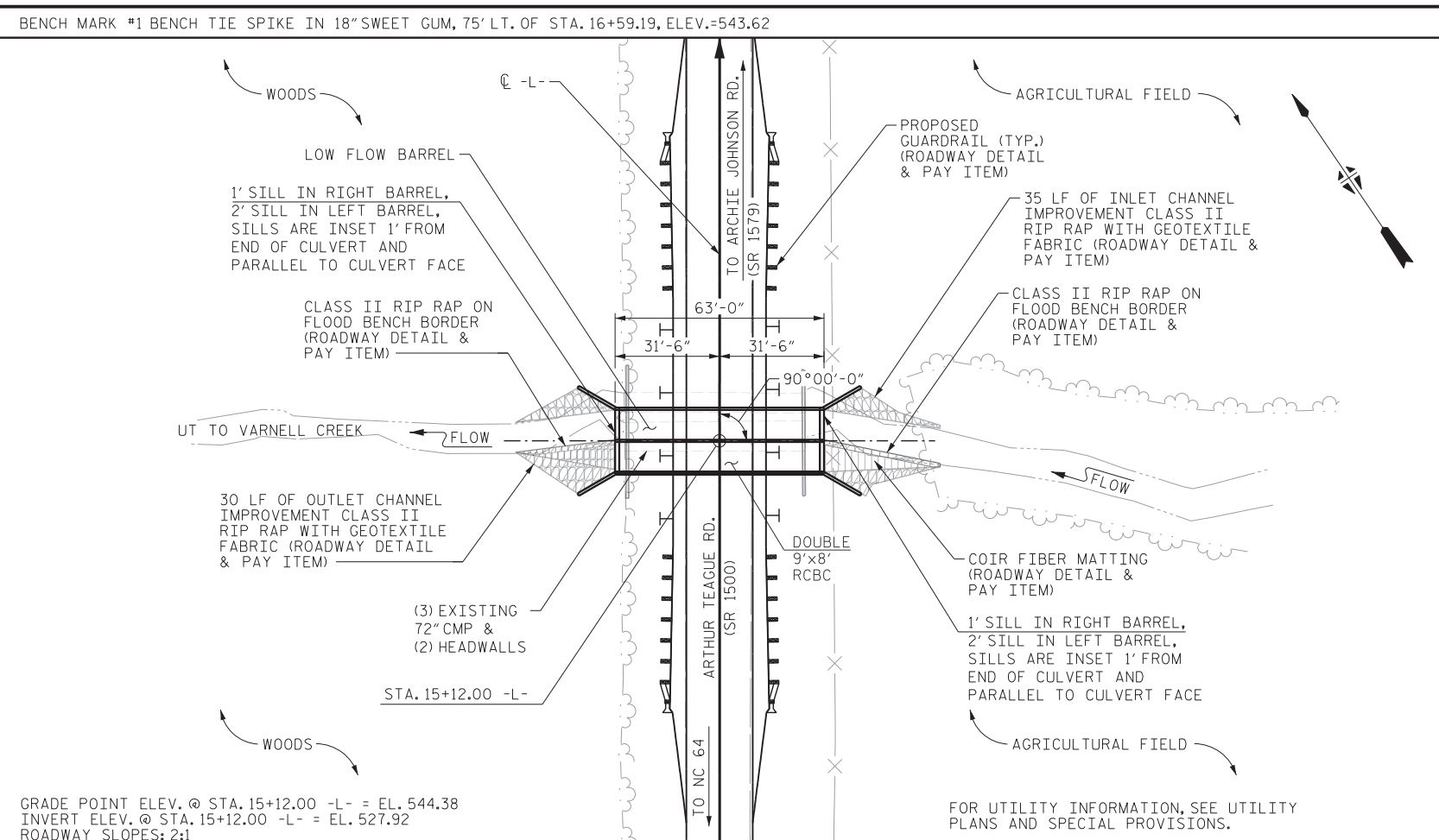




75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



GRADE POINT ELEV. @ STA. 15+12.00 -L- = EL. 544.38  
 INVERT ELEV. @ STA. 15+12.00 -L- = EL. 527.92  
 ROADWAY SLOPES: 2:1

**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 DESIGN FILL = MAX. 8.7', MIN. 7.7'.

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

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTING AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION, EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

**TOTAL STRUCTURE QUANTITIES**

<b>CLASS A CONCRETE</b>	
BARREL @ 2.081 CY/FT	131.1 C.Y.
WINGS, ETC.	29.4 C.Y.
SILLS	2.0 C.Y.
TOTAL	162.5 C.Y.
<b>REINFORCING STEEL</b>	
BARREL, SILLS	16,191 LBS.
WINGS, ETC.	1,874 LBS.
TOTAL	18,065 LBS.
FOUNDATION CONDITIONING MATERIAL	107 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
PLACEMENT OF NATIVE STREAM BED MATERIAL	LUMP SUM

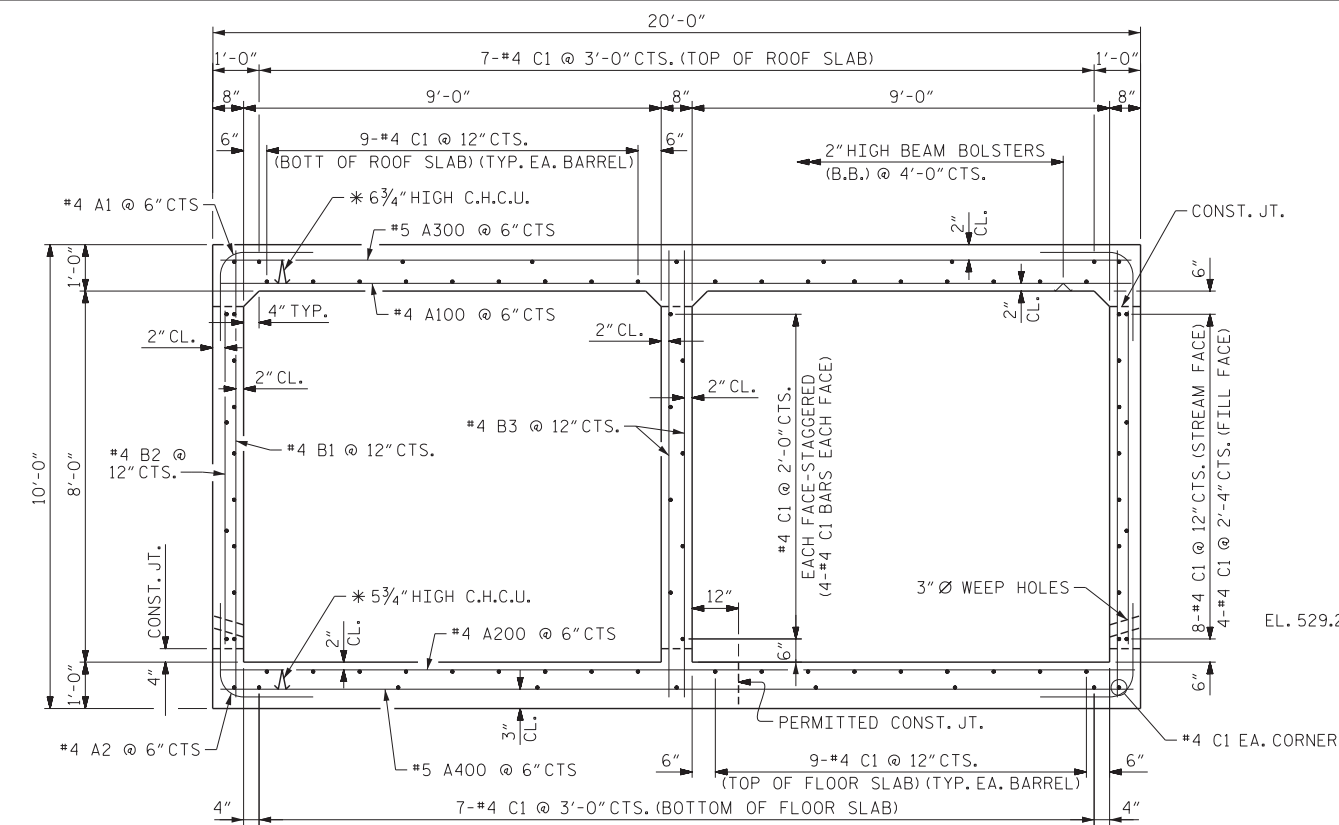
**HYDRAULIC DATA**

DESIGN DISCHARGE	= 800 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 536.6
DRAINAGE AREA	= 1.9 SQ MI
BASE DISCHARGE (Q 100)	= 1,100 CFS
BASE HIGH WATER ELEVATION	= 538.1

**OVERTOPPING FLOOD DATA \***

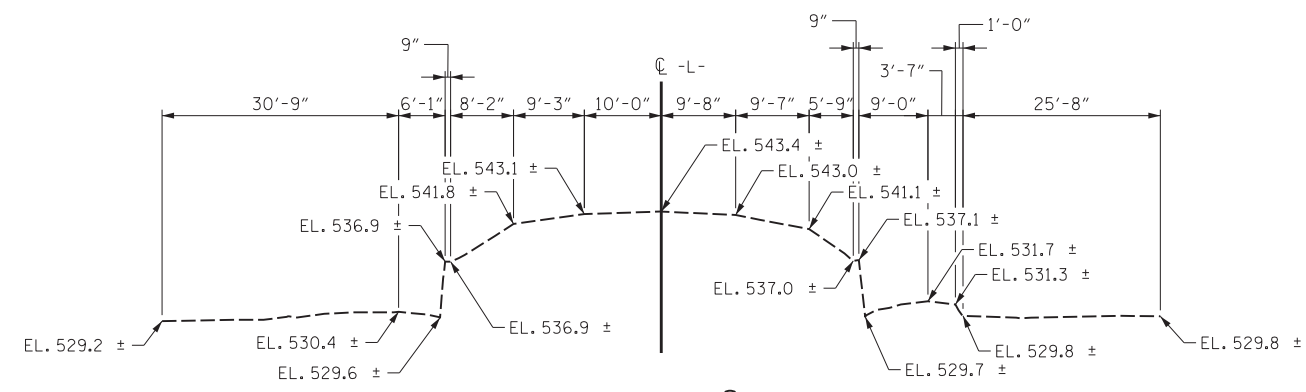
OVERTOPPING DISCHARGE	= 1,900 CFS
FREQUENCY OF OVERTOPPING FLOOD	= > 500 YR
OVERTOPPING FLOOD ELEVATION	= 543.5 *

\* OVERTOPPING OCCURS @ ROADWAY STATION 16+21.00 AT ROADWAY GRADE POINT.



**RIGHT ANGLE SECTION OF BARREL**

THERE ARE 86 "C" BARS IN SECTION OF BARREL.  
 \* ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.



**PROFILE ALONG CULVERT**

PROJECT NO. 17BP.8.R.129  
 CHATHAM COUNTY  
 STATION: 15+12.00 -L-  
 SHEET 1 OF 4 REPLACES CULVERT NO. 490



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE BARREL  
 9 FT. X 8 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

<b>REVISIONS</b>				<b>SHEET NO.</b>	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 5

DRAWN BY: D. H. CARTER DATE: NOV 2017  
 CHECKED BY: M. T. NEIHEISEL DATE: NOV 2017  
 DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE: NOV 2017

**ICA Engineering, Inc.**  
 5121 Kingdom Way, Suite 100  
 Raleigh, NC 27607  
 NC License No: F-0258

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.PHT  
 PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl  
 USER: dcarter DATE: 11/30/2017 TIME: 9:52:33 AM  
 FILE: \\410.001.17BP.8.R.129.SMU.CU.001.180490.dgn

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 x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ <sub>L</sub> )	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	1.27	--	1.75	1.27	1	TOP SLAB	5.17	1.68	1	TOP SLAB	9.33	1	
	HL-93 (OPERATING)	N/A	---	1.65	--	1.35	1.65	1	TOP SLAB	5.17	2.18	1	TOP SLAB	9.33	1	
	HS-20 (INVENTORY)	36.000	②	1.33	47.8	1.75	1.33	1	TOP SLAB	5.17	1.74	1	TOP SLAB	9.33	1	
	HS-20 (OPERATING)	36.000	---	1.72	61.9	1.35	1.72	1	TOP SLAB	5.17	2.25	1	TOP SLAB	9.33	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.49	33.6	1.40	2.49	1	TOP SLAB	5.17	3.35	1	TOP SLAB	9.33	1
		SNGARBS2	20.000		2.33	46.6	1.40	2.33	1	TOP SLAB	5.17	3.03	1	TOP SLAB	9.33	1
		SNAGRIS2	22.000		2.49	54.7	1.40	2.49	1	TOP SLAB	5.17	3.16	1	TOP SLAB	9.33	1
		SNCOTTS3	27.250		1.59	43.3	1.40	1.59	1	TOP SLAB	5.17	2.13	1	TOP SLAB	9.33	1
		SNAGGRS4	34.925	③	1.46	50.9	1.40	1.46	1	TOP SLAB	5.17	1.89	1	TOP SLAB	9.33	1
		SNS5A	35.550		1.63	57.9	1.40	1.63	1	TOP SLAB	5.17	1.99	1	TOP SLAB	9.33	1
		SNS6A	39.950		1.62	64.7	1.40	1.62	1	TOP SLAB	5.17	1.94	1	TOP SLAB	9.33	1
		SNS7B	42.000		1.59	66.7	1.40	1.59	1	TOP SLAB	5.17	1.91	1	TOP SLAB	9.33	1
	TRUCK TRACTOR SEMI-TRAILER (TTS)	TNAGRIT3	33.000		2.49	82.1	1.40	2.49	1	TOP SLAB	5.17	2.90	1	TOP SLAB	9.33	1
		TNT4A	33.075		1.89	62.5	1.40	1.89	1	TOP SLAB	5.17	2.46	1	TOP SLAB	9.33	1
		TNT6A	41.600		1.64	68.2	1.40	1.64	1	TOP SLAB	5.17	1.99	1	TOP SLAB	9.33	1
		TNT7A	42.000		1.78	74.7	1.40	1.78	1	TOP SLAB	5.17	2.13	1	TOP SLAB	9.33	1
		TNT7B	42.000		1.58	66.3	1.40	1.58	1	TOP SLAB	5.17	1.94	1	TOP SLAB	9.33	1
		TNAGRIT4	43.000		1.89	81.2	1.40	1.89	1	TOP SLAB	5.17	2.31	1	TOP SLAB	9.33	1
TNAGT5A	45.000		2.15	96.7	1.40	2.15	1	TOP SLAB	5.17	2.33	1	TOP SLAB	9.33	1		
TNAGT5B	45.000		1.89	85.0	1.40	1.89	1	TOP SLAB	5.17	2.19	1	TOP SLAB	9.33	1		

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	--

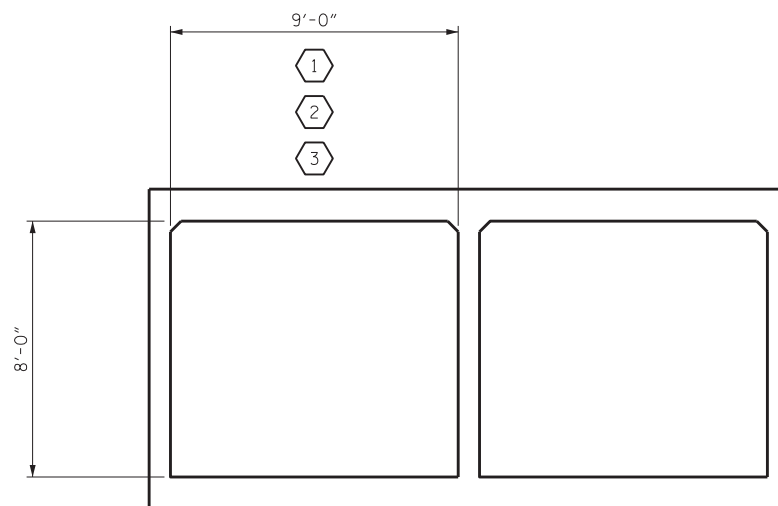
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.  
LL SURCHARGE DEPTH = 3.40 FT.  
RATINGS ARE FOR NON-INTERSTATE TRAFFIC.

COMMENTS:

1. MINIMUM RATING IS BASED ON THE MINIMUM 6.7' OF FILL OVER THE BOX.

①	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



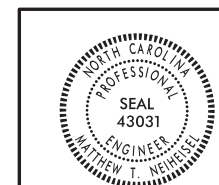
LRFR SUMMARY

PROJECT NO. 17BP.8.R.129  
CHATHAM COUNTY  
STATION: 15+12.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

DOUBLE BARREL  
9 FT. X 8 FT.  
CONCRETE BOX CULVERT  
90° SKEW



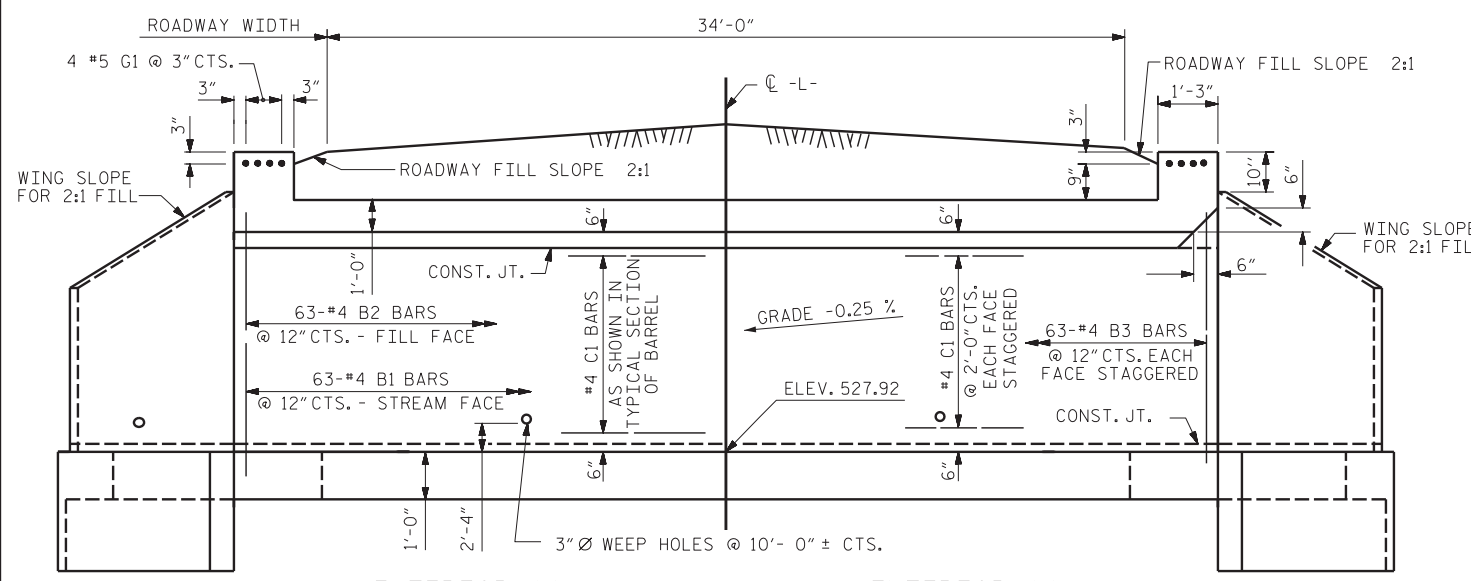
Sealed by  
Matthew T. Neiheisel  
11/30/2017  
43031

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

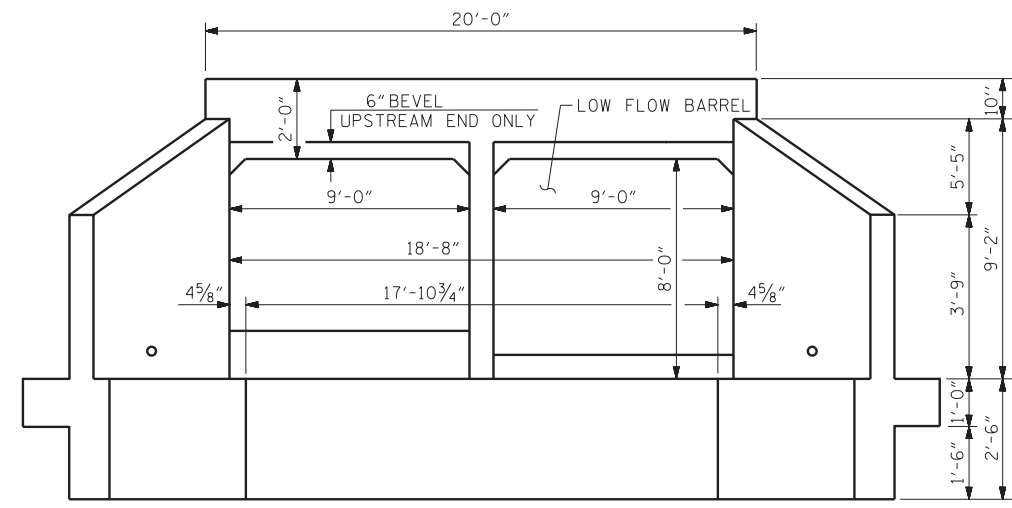
ICA Engineering, Inc.  
5121 Kingdom Way,  
Suite 100  
Raleigh, NC 27607  
NC License No: F-0258

DRAWN BY: D. H. CARTER DATE: NOV 2017  
CHECKED BY: M. T. NEIHEISEL DATE: NOV 2017  
DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE: NOV 2017

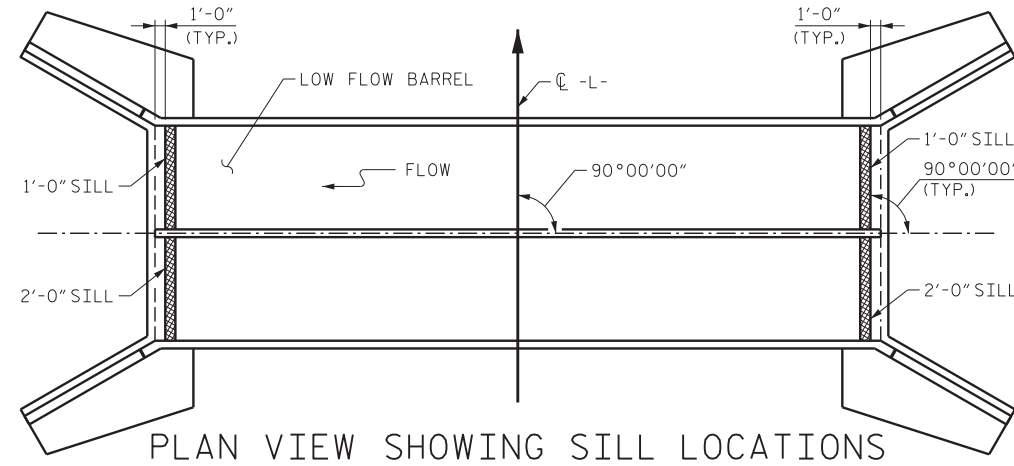




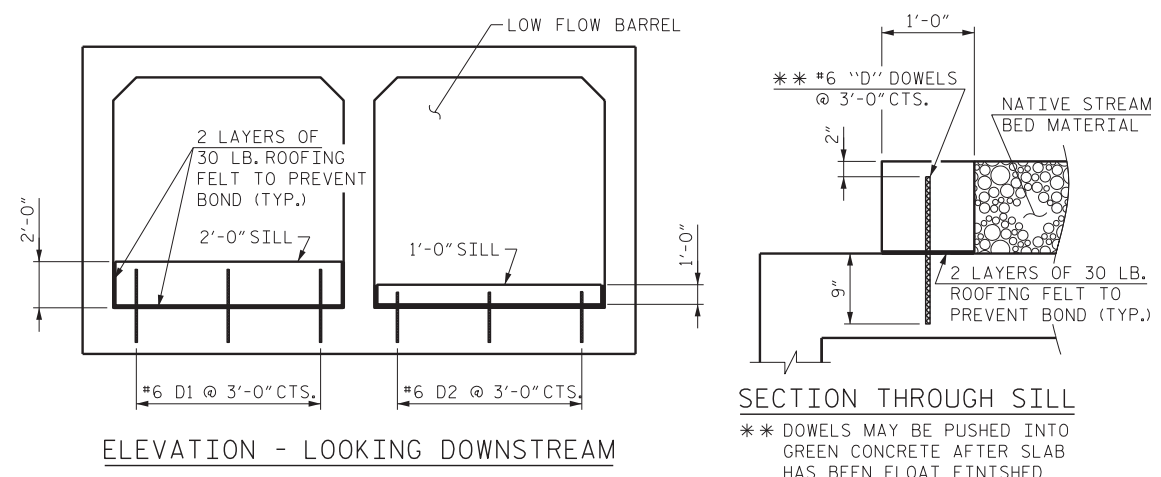
EXTERIOR WALL INTERIOR WALL  
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION  
(LOOKING DOWNSTREAM)



PLAN VIEW SHOWING SILL LOCATIONS



ELEVATION - LOOKING DOWNSTREAM

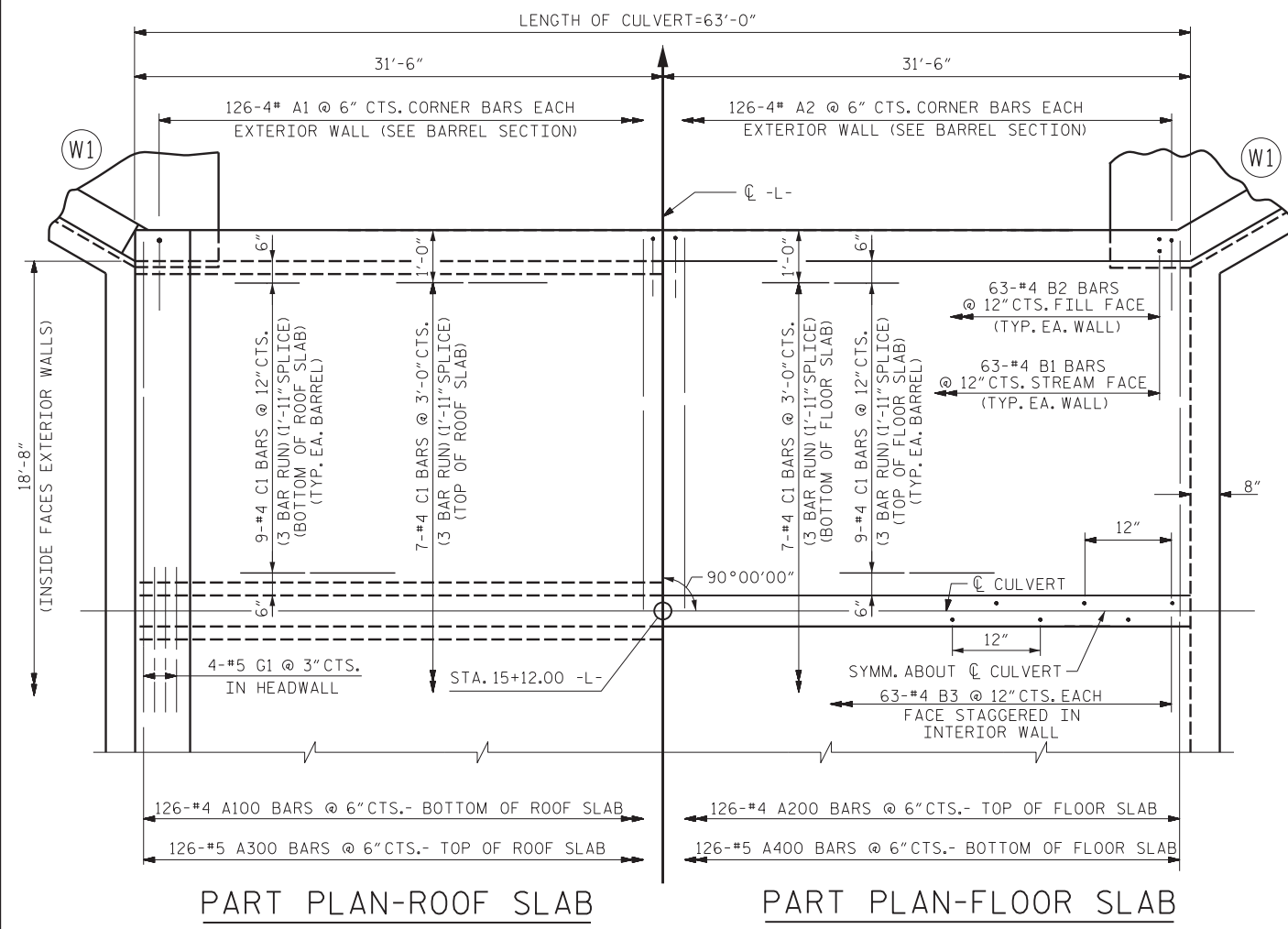
CULVERT SILL DETAILS

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT 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 MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), 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.

REINFORCING STEEL BAR SCHEDULE - BARREL						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	252	#4	1	4'-7"	772	
A2	252	#4	1	4'-3"	715	
A100	126	#4	STR	19'-8"	1655	
A200	126	#4	STR	19'-8"	1655	
A300	126	#5	STR	19'-8"	2585	
A400	126	#5	STR	19'-8"	2585	
B1	126	#4	STR	9'-7"	807	
B2	126	#4	STR	7'-0"	589	
B3	126	#4	STR	9'-7"	807	
C1	258	#4	STR	22'-2"	3820	
D1	6	#6	STR	2'-7"	23	
D2	6	#6	STR	1'-7"	14	
G1	8	#5	STR	19'-8"	164	
REINFORCING STEEL					LBS.	16,191

BAR TYPES		
ALL BAR DIMENSIONS ARE OUT TO OUT		
CLASS A CONCRETE		
TOTAL	CULVERT	131.1 CY
	SILLS	2.0 CY
	TOTAL	133.1 CY

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
B1, B3	#4	1'-5"
C1	#4	1'-11"
A200	#4	1'-5"
A400	#5	1'-9"



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

DRAWN BY: D. H. CARTER DATE: NOV 2017  
 CHECKED BY: M. T. NEIHEISEL DATE: NOV 2017  
 DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE: NOV 2017

ICA Engineering, Inc.  
 5121 Kingdom Way, Suite 100  
 Raleigh, NC 27607  
 NC License No: F-0258



PROJECT NO. 17BP.8.R.129  
 CHATHAM COUNTY  
 STATION: 15+12.00 -L-  
 SHEET 3 OF 4

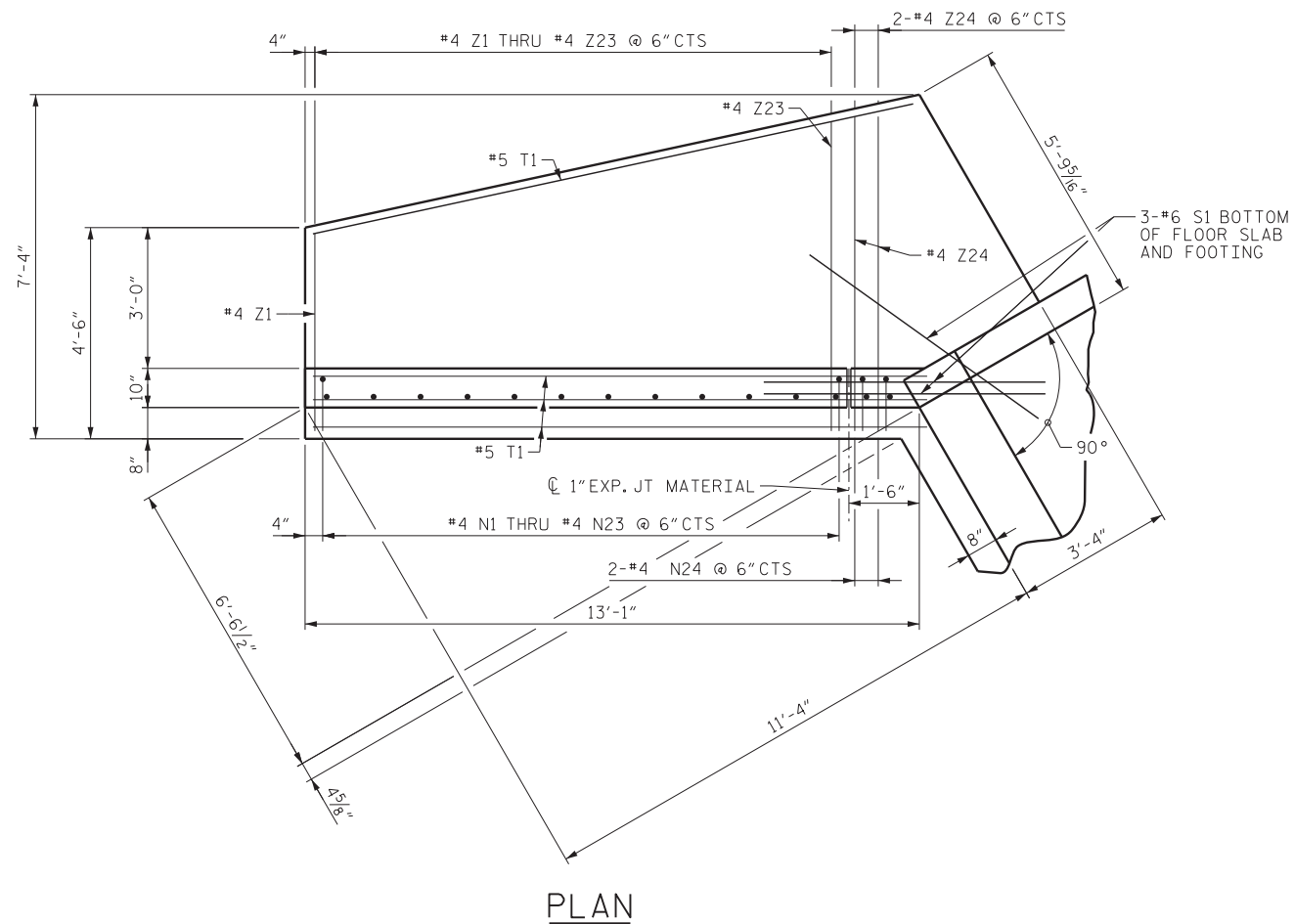
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DEPARTMENT OF TRANSPORTATION  
 RALEIGH

DOUBLE BARREL  
 9 FT. X 8 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW

SHEET NO. C-3  
 TOTAL SHEETS 5

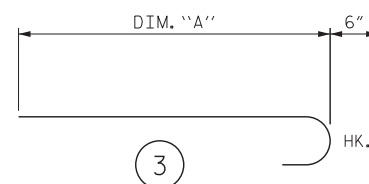
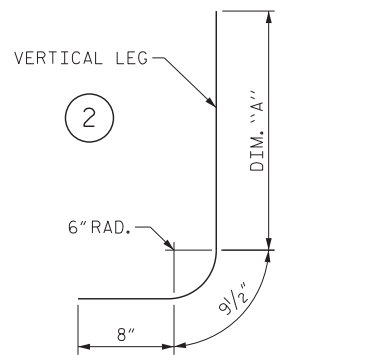
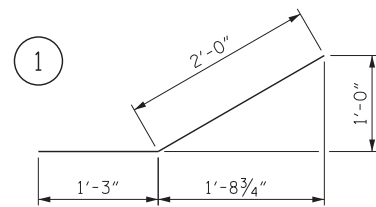
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PLAN

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

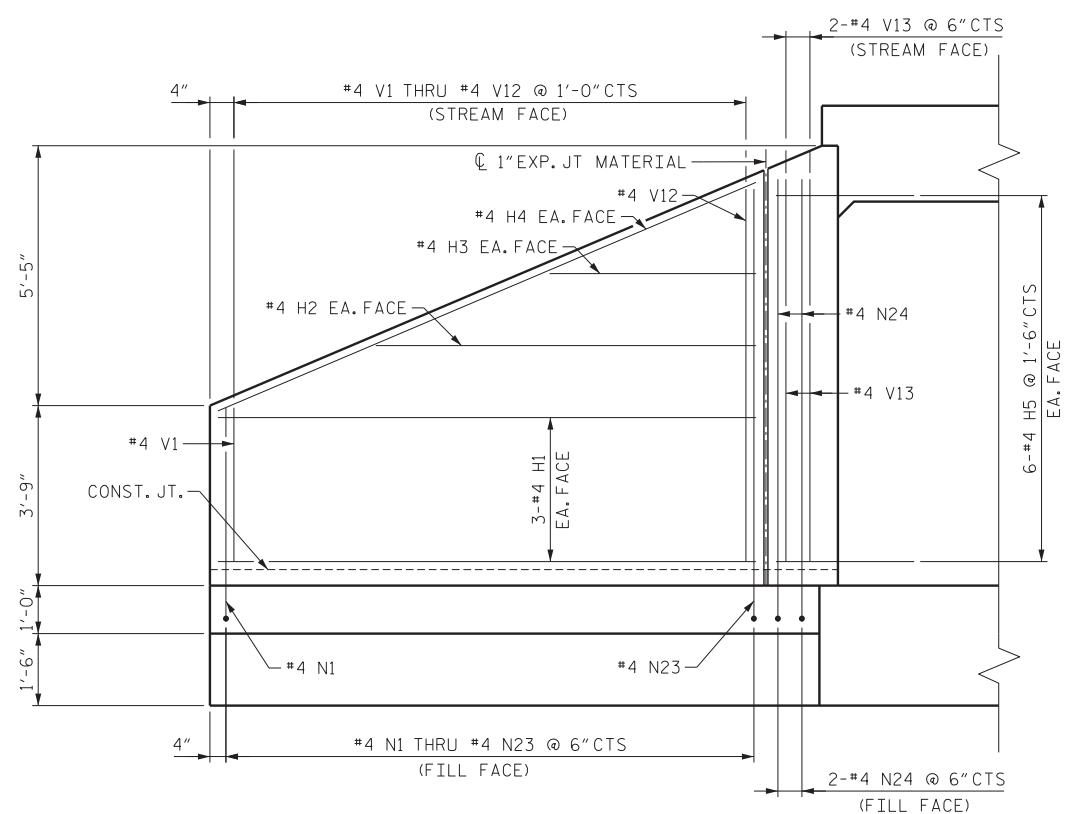


REINFORCING STEEL BAR SCHEDULE (4 WINGS)

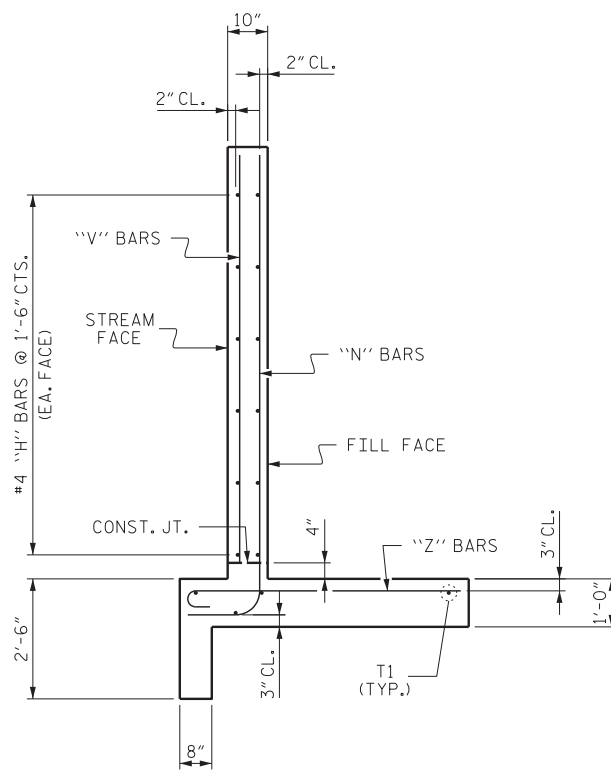
BAR	NO.	SIZE	TYPE	DIM. \"A\"	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	DIM. \"A\"	LENGTH	WEIGHT
H1	24	#4	STR		11'-2"	179	V2	4	#4	STR		3'-7"	10
H2	8	#4	STR		7'-10"	42	V3	4	#4	STR		4'-0"	11
H3	8	#4	STR		4'-2"	22	V4	4	#4	STR		4'-5"	12
H4	8	#4	STR		12'-1"	65	V5	4	#4	STR		4'-10"	13
H5	48	#4	1		3'-3"	104	V6	4	#4	STR		5'-3"	14
							V7	4	#4	STR		5'-8"	15
N1	4	#4	2	3'-10 1/2"	5'-4"	14	V8	4	#4	STR		6'-1"	16
N2	4	#4	2	4'-1 1/2"	5'-7"	15	V9	4	#4	STR		6'-6"	17
N3	4	#4	2	4'-3 1/2"	5'-9"	15	V10	4	#4	STR		6'-11"	18
N4	4	#4	2	4'-6 1/2"	6'-0"	16	V11	4	#4	STR		7'-4"	20
N5	4	#4	2	4'-8 1/2"	6'-2"	16	V12	4	#4	STR		7'-9"	21
N6	4	#4	2	4'-11 1/2"	6'-5"	17	V13	8	#4	STR		7'-11"	42
N7	4	#4	2	5'-1 1/2"	6'-7"	18	Z1		#4	3	4'-2"	4'-8"	12
N8	4	#4	2	5'-4 1/2"	6'-10"	18	Z2	4	#4	3	4'-4"	4'-10"	13
N9	4	#4	2	5'-6 1/2"	7'-0"	19	Z3	4	#4	3	4'-5"	4'-11"	13
N10	4	#4	2	5'-9 1/2"	7'-3"	19	Z4	4	#4	3	4'-6"	5'-0"	13
N11	4	#4	2	5'-11 1/2"	7'-5"	20	Z5	4	#4	3	4'-7"	5'-1"	14
N12	4	#4	2	6'-2 1/2"	7'-8"	20	Z6	4	#4	3	4'-9"	5'-3"	14
N13	4	#4	2	6'-4 1/2"	7'-10"	21	Z7	4	#4	3	4'-10"	5'-4"	14
N14	4	#4	2	6'-7 1/2"	8'-1"	22	Z8	4	#4	3	4'-11"	5'-5"	14
N15	4	#4	2	6'-9 1/2"	8'-3"	22	Z9	4	#4	3	5'-1"	5'-7"	15
N16	4	#4	2	7'-0 1/2"	8'-6"	23	Z10	4	#4	3	5'-2"	5'-8"	15
N17	4	#4	2	7'-2 1/2"	8'-8"	23	Z11	4	#4	3	5'-3"	5'-9"	15
N18	4	#4	2	7'-5 1/2"	8'-11"	24	Z12	4	#4	3	5'-5"	5'-11"	16
N19	4	#4	2	7'-7 1/2"	9'-1"	24	Z13	4	#4	3	5'-6"	6'-0"	16
N20	4	#4	2	7'-10 1/2"	9'-4"	25	Z14	4	#4	3	5'-7"	6'-1"	16
N21	4	#4	2	8'-0 1/2"	9'-6"	25	Z15	4	#4	3	5'-8"	6'-2"	16
N22	4	#4	2	8'-3 1/2"	9'-9"	26	Z16	4	#4	3	5'-10"	6'-4"	17
N23	4	#4	2	8'-5 1/2"	9'-11"	26	Z17	4	#4	3	5'-11"	6'-5"	17
N24	8	#4	2	8'-8 1/2"	10'-2"	54	Z18	4	#4	3	6'-0"	6'-6"	17
							Z19	4	#4	3	6'-2"	6'-8"	18
S1	12	#6	STR		6'-0"	108	Z20	4	#4	3	6'-3"	6'-9"	18
							T1	16	#5	STR		13'-1"	218
							Z21	4	#4	3	6'-4"	6'-10"	18
							Z22	4	#4	3	6'-6"	7'-0"	19
							V1	4	#4	STR		3'-2"	8
							Z23	4	#4	3	6'-7"	7'-1"	19
							Z24	8	#4	3	6'-8"	7'-2"	38

REINFORCING STEEL FOR 4 WINGS 1,874 LBS

CLASS A CONCRETE  
 4 WINGS 25.2 CY  
 2 HEADWALLS 1.9 CY  
 2 END CURTAIN WALLS 2.3 CY  
 TOTAL 29.4 CY



ELEVATION



TYPICAL WING SECTION

PROJECT NO. 17BP.8.R.129

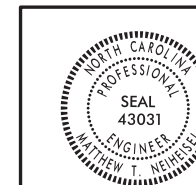
CHATHAM COUNTY

STATION: 15+12.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

DOUBLE BARREL  
 9 FT. X 8 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW



REVISIONS

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

SHEET NO. C-4

TOTAL SHEETS 5

DRAWN BY: D. H. CARTER DATE: NOV 2017  
 CHECKED BY: M. T. NEIHEISEL DATE: NOV 2017  
 DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE: NOV 2017

ICA Engineering, Inc.  
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 Raleigh, NC 27607  
 NC License No: F-0258

11/30/2017  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl  
 USER: dcarter DATE: 11/30/2017 TIME: 9:53:06 AM  
 FILE: \\410.015.17BP.8.R.129.SMU.CU.004.180490.dgn

### STANDARD NOTES

#### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	HL 93
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	--	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	--	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

#### MATERIAL AND WORKMANSHIP:

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

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

#### CONCRETE:

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

#### CONCRETE CHAMFERS:

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

#### DOWELS:

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

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

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

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

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

#### REINFORCING STEEL:

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

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

#### STRUCTURAL STEEL:

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

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

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" 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. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

#### SPECIAL NOTES:

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

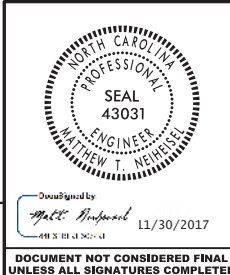
PROJECT NO. 17BP.8.R.129  
CHATHAM COUNTY  
STATION: 15+12.00 -L-

STATE OF NORTH CAROLINA  
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RALEIGH

### STANDARD NOTES

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

SHEET NO. C-5  
TOTAL SHEETS 5



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PLOT DRIVER: NCDOT\_STRUCTURE\_SHEET\_PLOTTER.plt DATE: 11/30/2017 TIME: 9:53:13 AM  
USER: dcorfer  
FILE: \\410.020.17BP.8.R.129.SMU.CU.005.180490.dgn

DRAWN BY : D. H. CARTER DATE : NOV 2017  
CHECKED BY : M. T. NEIHEISEL DATE : NOV 2017  
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