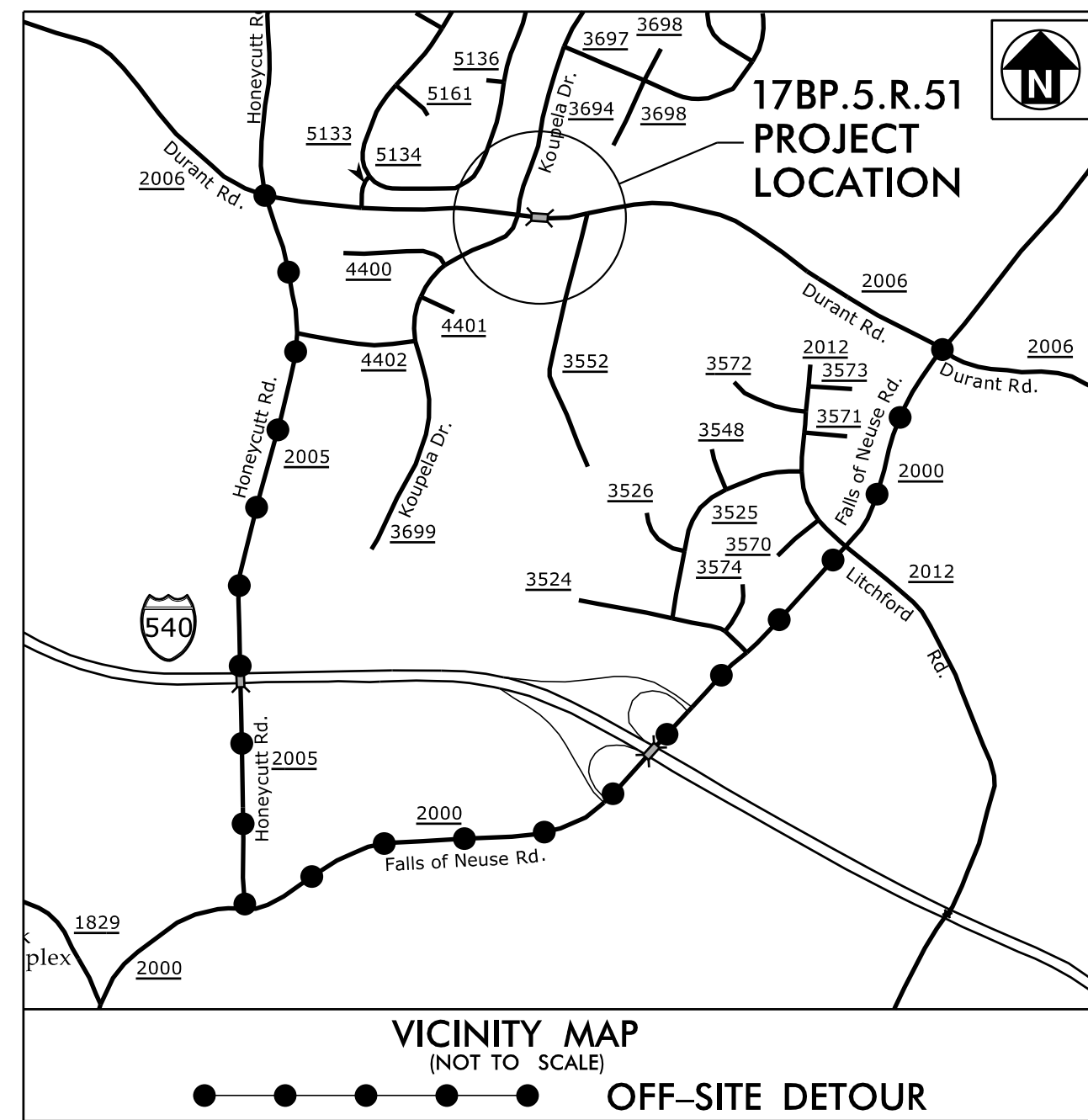


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with their signature on that page.**

**This file or an individual page
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CONTRACT: DE00203 TIP PROJECT: 17BP.5.R.51

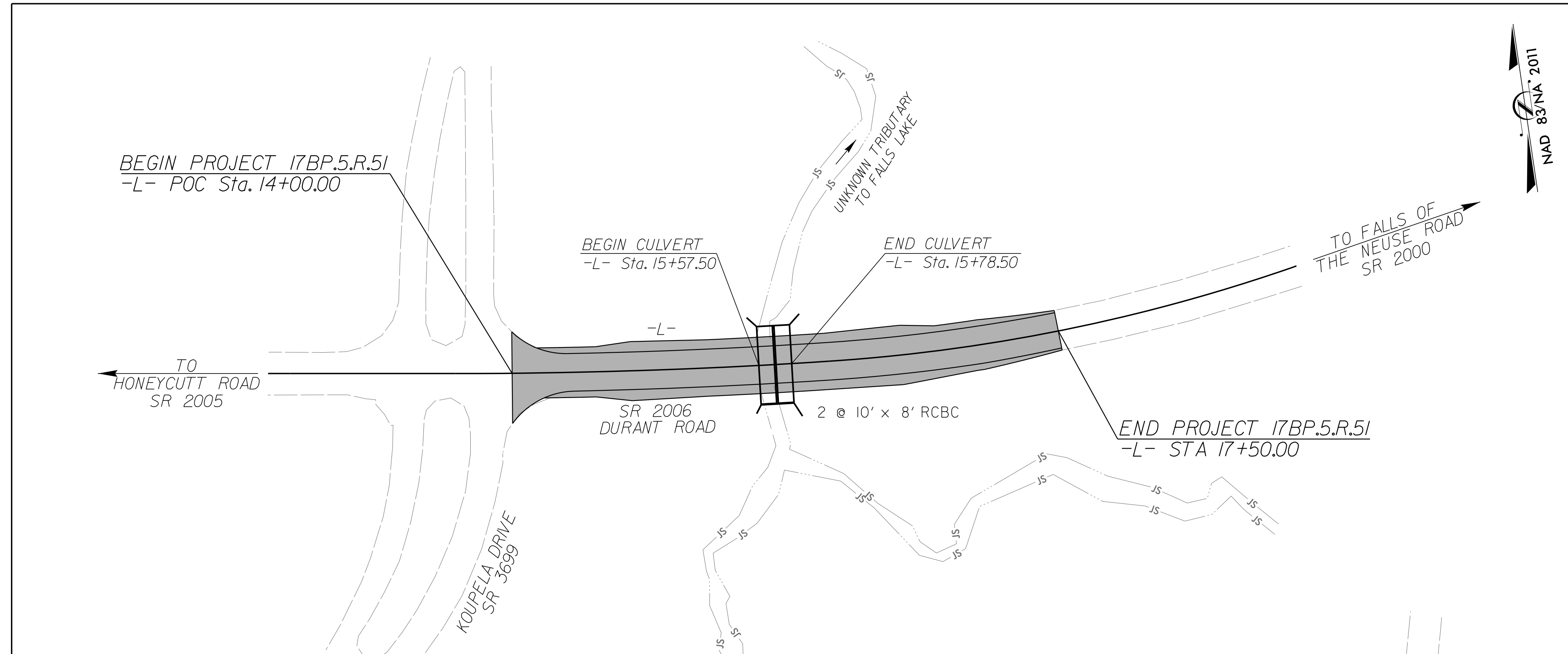


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

**LOCATION: BRIDGE NO. 27 OVER UNKNOWN TRIBUTARY TO FALLS LAKE
ON SR 2006 (DURANT ROAD)**

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

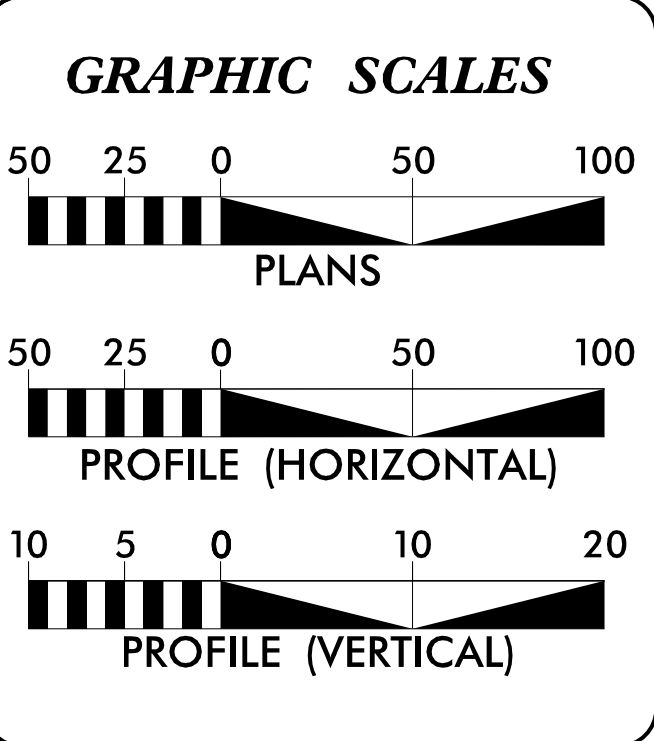
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.51	1	
STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.R.51			



***DESIGN EXCEPTION:**
SAG VERTICAL CURVE K
VERTICAL SSD

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF RALEIGH.
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 (2015) = 8200

ADT (2025) = 15000

V = 45 MPH

CLASS =
RURAL LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.062 MILES

LENGTH STRUCTURE TIP PROJECT = 0.004 MILES

TOTAL LENGTH TIP PROJECT = 0.066 MILES

Prepared in the Office of Matt MacDonald for
DIVISION 5
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 10, 2016

LETTING DATE:
APRIL 11, 2018

NCDOT CONTACT: LISA GILCHRIST, EI

TIM JORDAN, PE
PROJECT ENGINEER

TRENT CORMIER, PE
HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

Seal and signature of James Mott MacDonald, dated 3/8/2018.

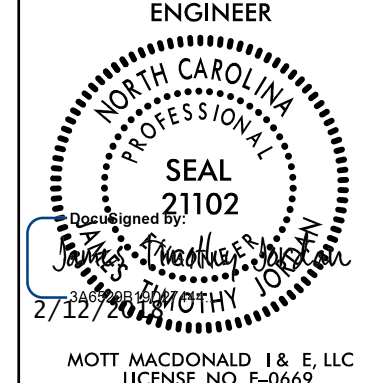
PLANS PREPARED BY:

M M
MOTT
MACDONALD

PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com

LICENSE NO. F-0669

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

PROJECT REFERENCE	SHEET NO.
17BP.5.R.51 - WAKE 27	1A
ROADWAY DESIGN ENGINEER  MOTT MACDONALD, I & E, LLC LICENSE NO. F-06697	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of:	M MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmcc.com

GENERAL NOTES

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

GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

GUARDRAIL:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE CITY OF RALEIGH, DUKE ENERGY, PSNC ENERGY, VERIZON BUSINESS, TIME WARNER CABLE AND AT&T.

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.

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01-16-2018

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B-1	GUARDRAIL SUMMARY AND EARTHWORK SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
UO-1	UTILITIES BY OTHERS PLAN
X-1 THRU X-3	CROSS-SECTIONS
C-1 THRU C-6	CULVERT PLANS
CN	STANDARD CULVERT NOTES

2/12/2018 1:35:08 PM
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 10-66165

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-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-

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
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	WLB
Proposed Lateral, Tail, Head Ditch	→
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
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	⊕
Storm Sewer	-----

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	⊕
H-Frame Pole	●
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	⊕
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	⊕
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

WATER:

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

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	⊕
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

SURVEY CONTROL SHEET 91-0027

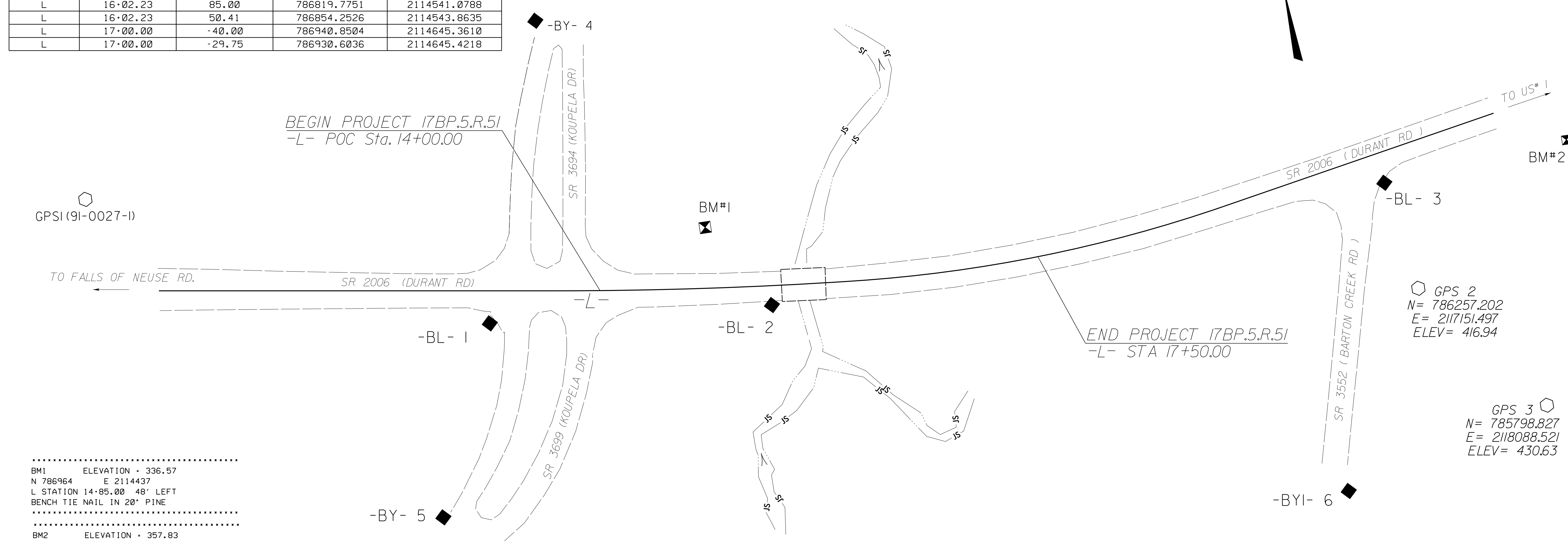
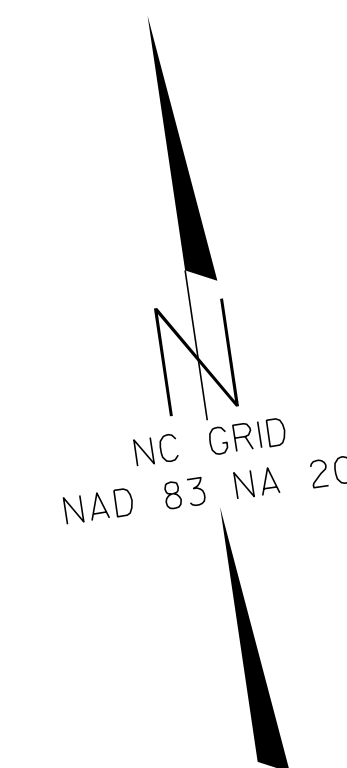
PROJECT REFERENCE	SHEET NO.
17BP.5.R.51 - WAKE 27	1C-1
Location and Surveys	

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+07.14	-40.00	786965.0753	2114359.3457
L	15+30.00	50.69	786860.5930	2114470.9055
L	15+30.00	85.00	786826.4610	2114467.4620
L	15+40.00	-80.00	786989.6595	2114493.7552
L	15+40.00	-40.00	786949.8506	2114489.8501
L	16+02.23	-80.00	786984.2395	2114554.3626
L	16+02.23	-40.00	786944.3694	2114551.1423
L	16+02.23	85.00	786819.7751	2114541.0788
L	16+02.23	50.41	786854.2526	2114543.8635
L	17+00.00	-40.00	786940.8504	2114645.3610
L	17+00.00	-29.75	786930.6036	2114645.4218

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+03.56	70.00	786856.5591	2114340.9848
L	16+02.23	70.00	786834.7264	2114542.2864
L	16+81.43	75.99	786824.9066	2114626.2328
L	16+94.16	48.30	786852.5296	2114639.7915
L	19+14.48	162.25	786762.9104	2114888.7089
L	19+26.95	134.97	786792.0336	2114895.9160



.....
 BM1 ELEVATION = 336.57
 N 786964 E 2114437
 L STATION 14+85.00 48' LEFT
 BENCH TIE NAIL IN 20' PINE

 BM2 ELEVATION = 357.83
 N 786933 E 2115125
 L STATION 10+00.00
 S 87°28'44" E DIST 1175'
 BENCH TIE NAIL IN 28' PINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS1	91-0027-1		787034.4862	2113774.7938	384.09	OUTSIDE PROJECT LIMITS	
BL1	-BL-1		786913.3558	2114256.2512	349.30	13+12.21	25.96 RT
BL2	-BL-2		786895.0176	2114480.5280	336.89	15+36.09	15.48 RT
BL3	-BL-3		786920.2285	2114976.8696	347.70	20+30.23	23.97 RT

BY	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY4	-BY-4		787146.4225	2114327.2683	346.90	13+48.45	214.98 LT
BYBL1			786913.3558	2114256.2512	349.30	13+12.21	25.96 RT
BY5	-BY-5		786765.9606	2114197.2056	353.99	12+75.31	180.39 RT

BY1	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BYBL3			786920.2285	2114976.8696	347.70	20+30.23	23.97 RT
BY16	BY1 6		786681.5900	2114913.0200	345.18	19+23.32	246.67 RT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "91-0027-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 786257.202 (ft) EASTING: 2117151.497 (ft) ELEVATION: 416.944 (ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .9999239858

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "91-0027-2" TO -L- STATION 14+00.00 IS N 76°34'46.8"W 2883.32 (ft)

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

TYPE	STATION	NORTH	EAST
POT	10+00.00	786984.6000	2113951.1700
PC	13+63.75	786931.5110	2114311.0258
PCC	16+02.23	786904.4992	2114547.9219
PT	19+03.66	786920.3560	2114848.0482
POT	21+30.52	786962.3450	2115070.9850

NOTES:

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

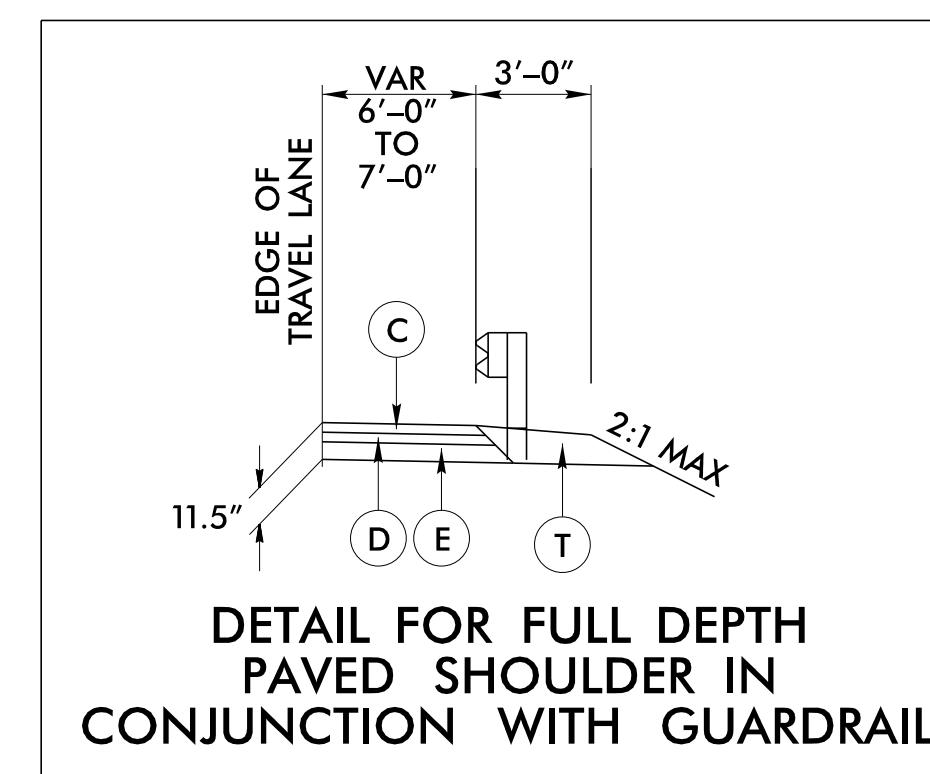
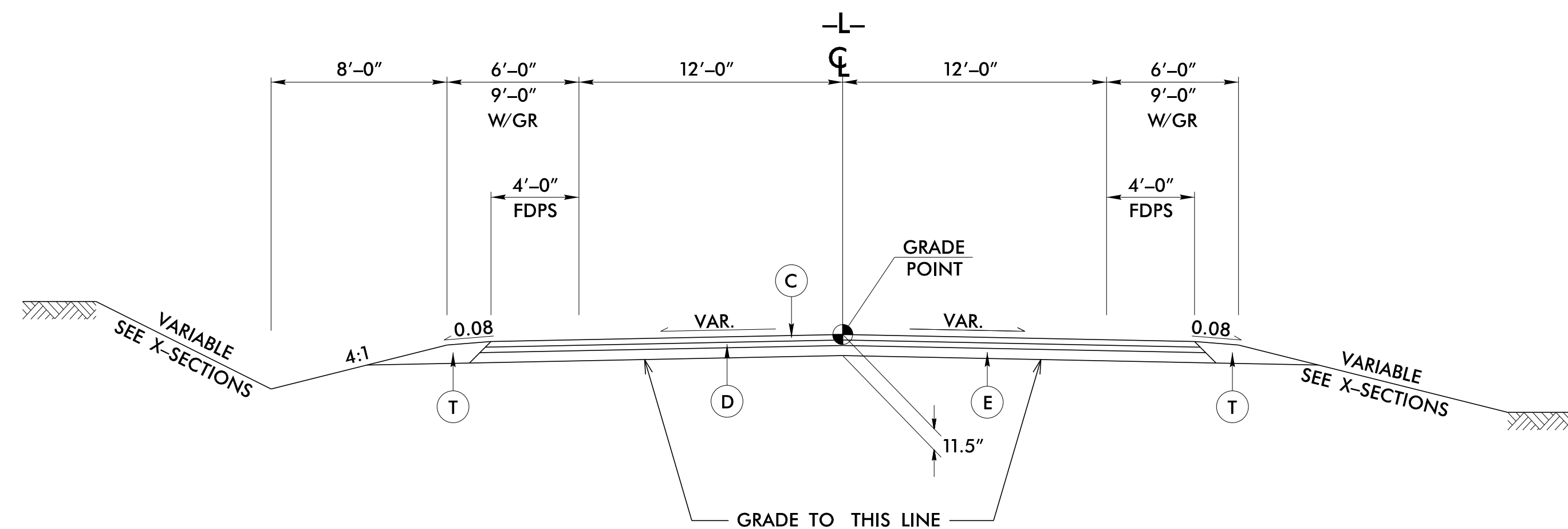
○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

GEOID G12NC
 NOTE: DRAWING NOT TO SCALE

5/24/16
 17BP.5.R.51 - WAKE 27 - 1C-1.dgn
 17BP.5.R.51 - WAKE 27 - 1C-1.dgn

PROJECT REFERENCE	SHEET NO.
17BP.5.R.51 - WAKE 27	2A-1
ROADWAY DESIGN ENGINEER	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	
Prepared in the Office of:	<p>M MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com</p>



TYPICAL SECTION NO. 1

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
 -L- STA 14+00.00 TO 14+50.00

USE TYPICAL SECTION NO. 1:
 -L- STA 14+50.00 TO 17+00.00

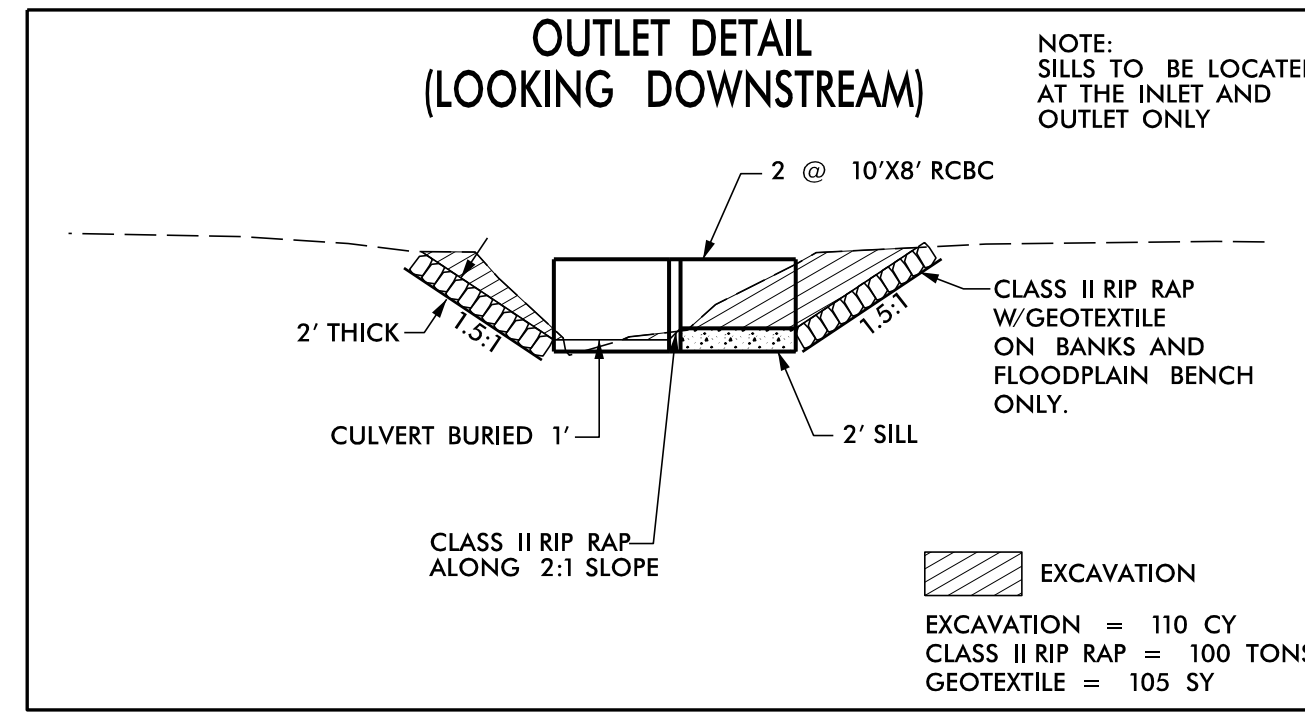
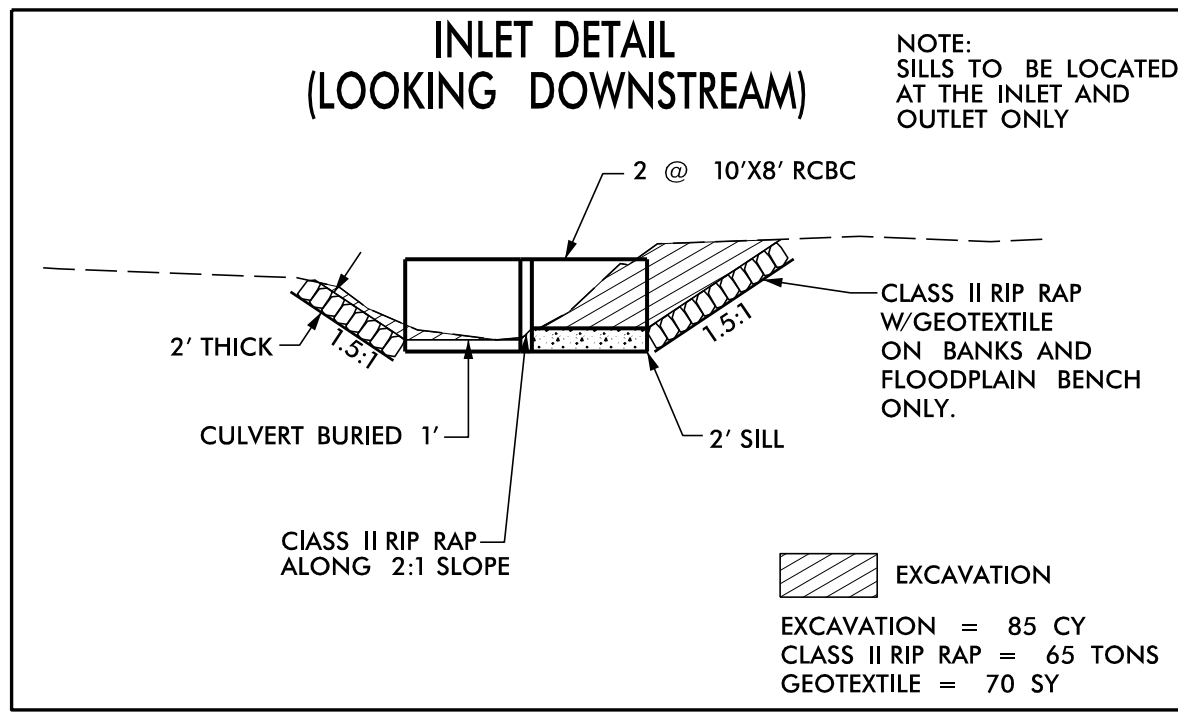
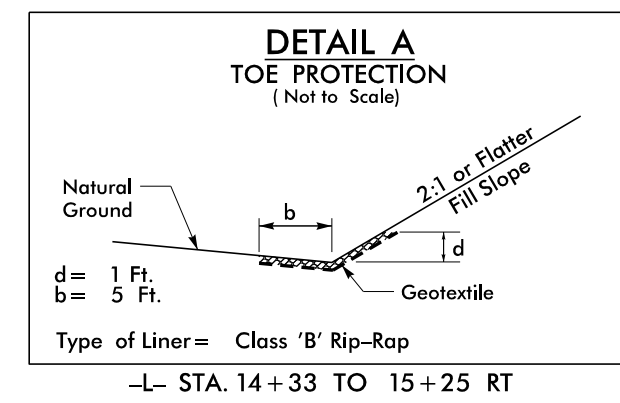
TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
 -L- STA 17+00.00 TO 17+50.00

PAVEMENT SCHEDULE

C	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
T	EARTH MATERIAL.

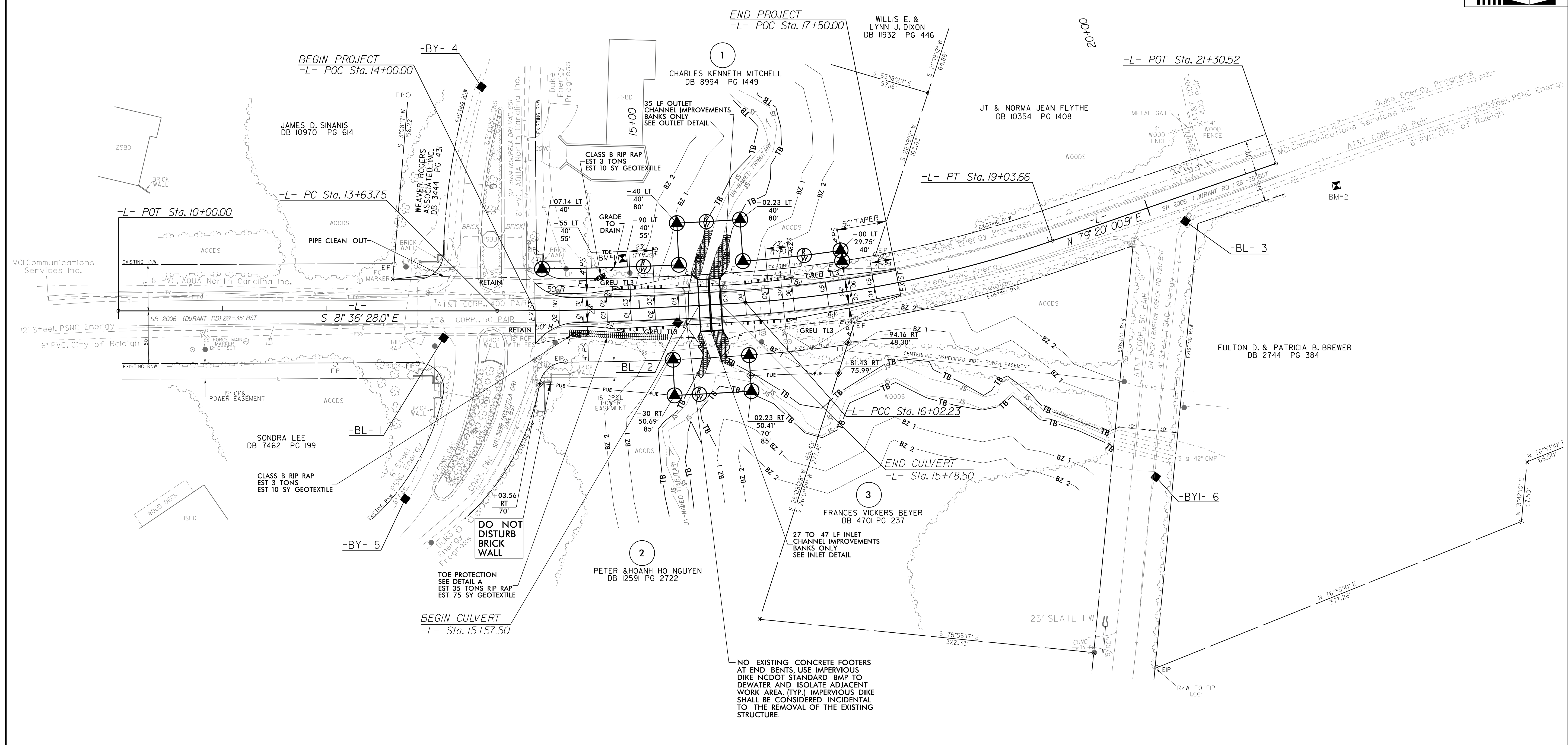
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

*DESIGN EXCEPTION:
SAG VERTICAL CURVE K
VERTICAL SSD



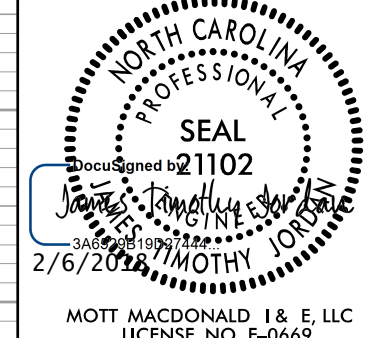
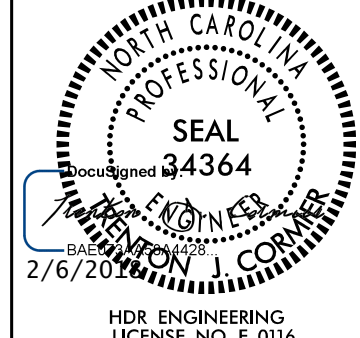

FOR CULVERT PLANS SEE SHEETS C-1 THRU C-6

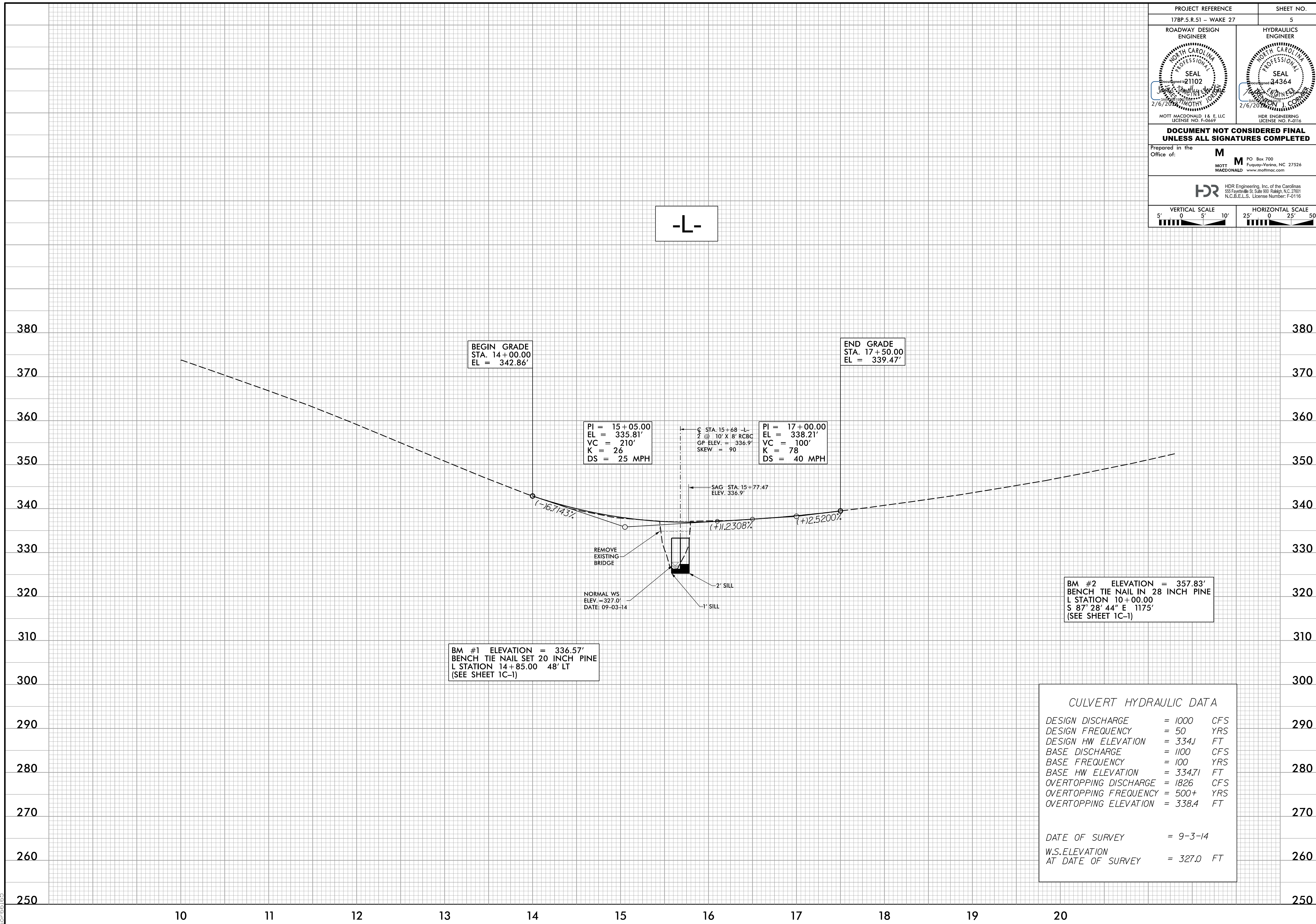
PROJECT REFERENCE 17BP.5.R.51 - WAKE 27	SHEET NO. 4
ROADWAY DESIGN ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0116
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	
<p>Prepared in the Office of: M MOTT MACDONALD</p>	
<p>MOTT MACDONALD 1 & E, LLC Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116</p>	
<p>HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116</p>	
<p>HORIZONTAL SCALE 25' 0 25' 50'</p>	



-L-	-L-
PI Sta 14+83.03	PI Sta 17+53.84
$\Delta = 3' 46' 28.1''$ (LT)	$\Delta = 15' 17' 03.0''$ (LT)
$D = 1' 34' 57.9''$	$D = 5' 04' 13.5''$
$L = 238.47'$	$L = 301.44'$
$T = 119.28'$	$T = 151.62'$
$R = 3,620.00'$	$R = 1,130.00'$

2/6/2018 11:33:45 AM
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ID: 66165

PROJECT REFERENCE 17BP.5.R.51 - WAKE 27	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of: M MOTT MACDONALD	
PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com	
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	
VERTICAL SCALE 5' 0' 5' 10'	HORIZONTAL SCALE 25' 0' 25' 50'



BEGIN GRADE
STA. 14+00.00
EL = 342.86'

END GRADE
STA. 17+50.00
EL = 339.47'

PI = 15+05.00
EL = 335.81'
VC = 210'
K = 26
DS = 25 MPH

STA. 15+68 -L-
2 @ 10' X 8' RCBC
GP ELEV. = 336.9'
SKEW = 90

PI = 17+00.00
EL = 338.21'
VC = 100'
K = 78
DS = 40 MPH

SAG STA. 15+77.47
ELEV. 336.9'

(-)-6.7143%

(+)-2.308%

(+)-2.5200%

REMOVE EXISTING BRIDGE

NORMAL WS
ELEV. = 327.0'
DATE: 09-03-14

2' SILL

1' SILL

BM #1 ELEVATION = 336.57'
BENCH TIE NAIL SET 20 INCH PINE
L STATION 14+85.00 48' LT
(SEE SHEET 1C-1)

BM #2 ELEVATION = 357.83'
BENCH TIE NAIL IN 28 INCH PINE
L STATION 10+00.00
S 87° 28' 44" E 1175'
(SEE SHEET 1C-1)

CULVERT HYDRAULIC DATA	
DESIGN DISCHARGE	= 1000 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 334.1 FT
BASE DISCHARGE	= 1100 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 334.71 FT
OVERTOPPING DISCHARGE	= 1826 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 338.4 FT
DATE OF SURVEY	= 9-3-14
W.S. ELEVATION AT DATE OF SURVEY	= 327.0 FT

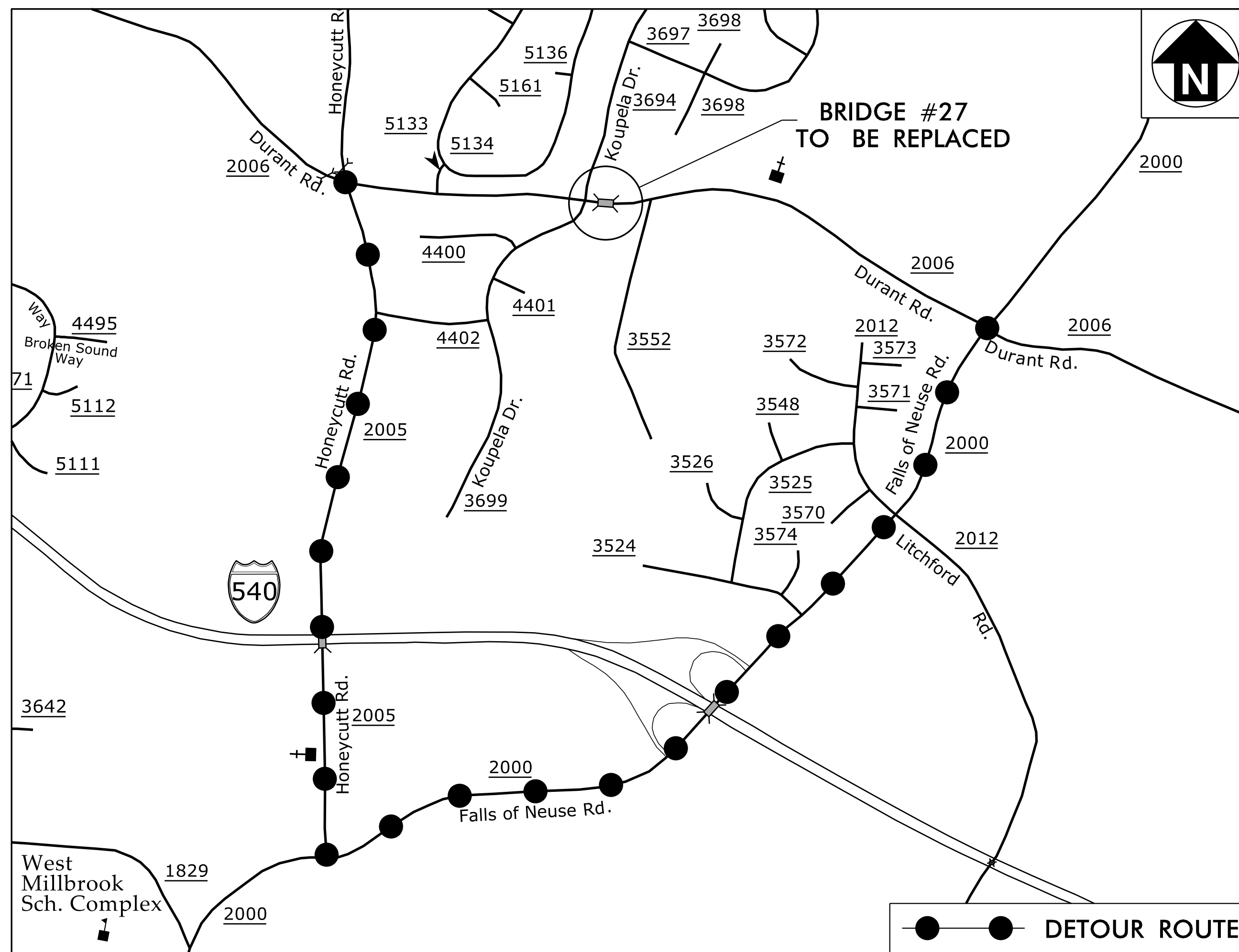
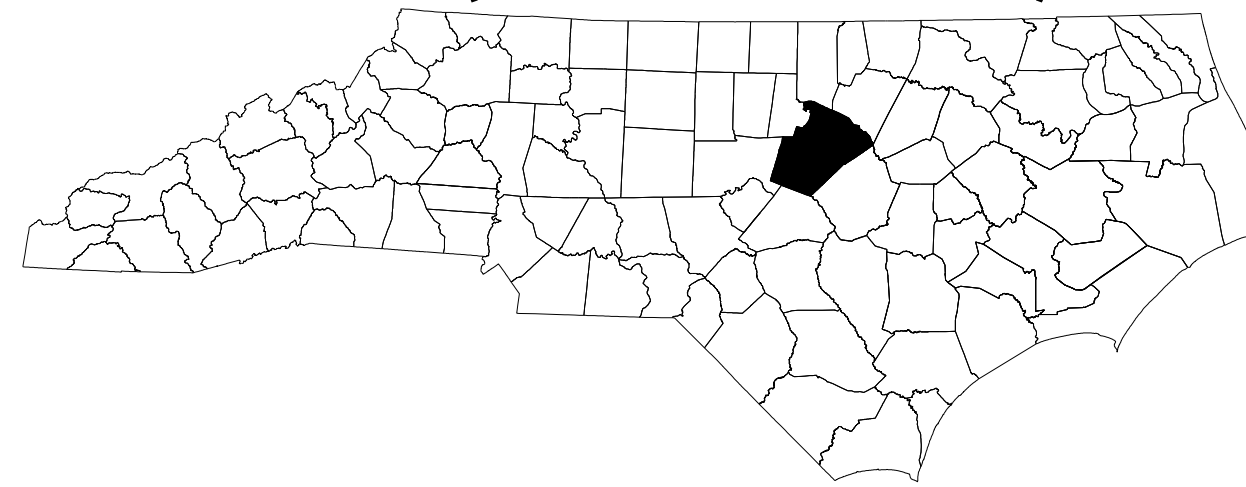
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY

BRIDGE NO. 27 OVER UNKNOWN TRIBUTARY TO FALLS LAKE
ON SR 2006 (DURANT ROAD)



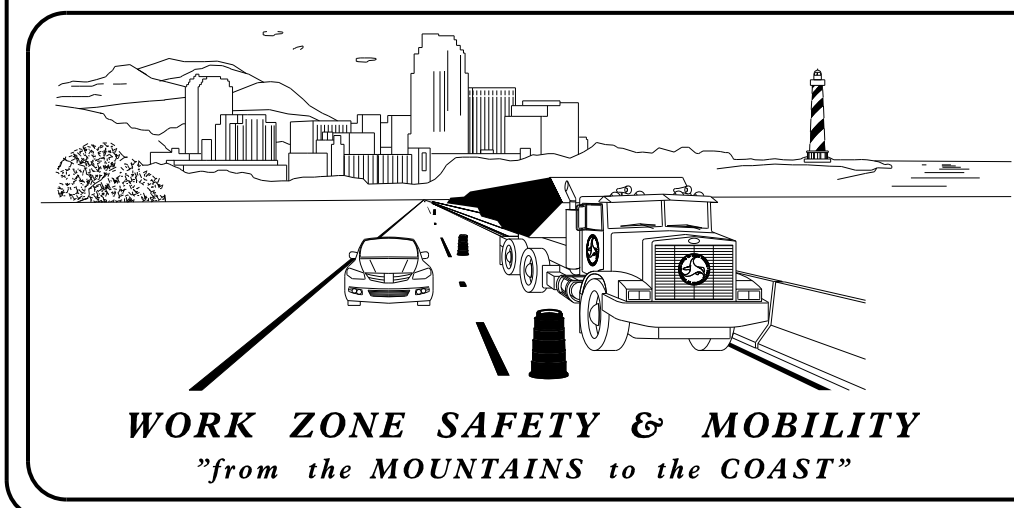
INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-2	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, GENERAL NOTES, PHASING AND FINAL PAVEMENT MARKING SCHEDULE
TMP-3	TEMPORARY TRAFFIC CONTROL PLAN
TMP-4	SPECIAL SIGN DESIGN

17BP.5.R.51

TIP PROJECT:

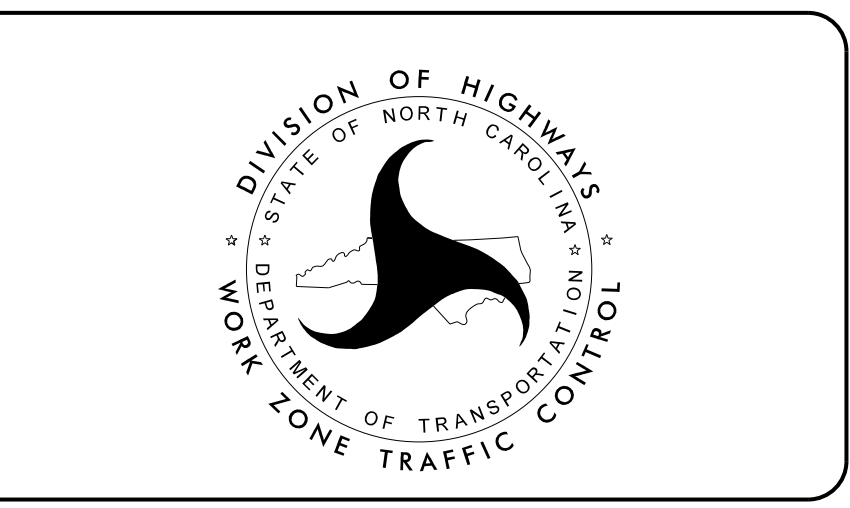
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



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

TIM JORDAN, PE TRAFFIC CONTROL PROJECT ENGINEER

BRIAN PHILLIPS TRAFFIC CONTROL DESIGN ENGINEER



M M
MOTT
MACDONALD

PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com

LICENSE NO. F-0669

APPROVED: James Timothy Jordan
DATE: 2/6/2018

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TRAFFIC MANAGEMENT PLAN

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

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

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

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

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

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

MISCELLANEOUS

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

NCDOT ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1135.01	CONES
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

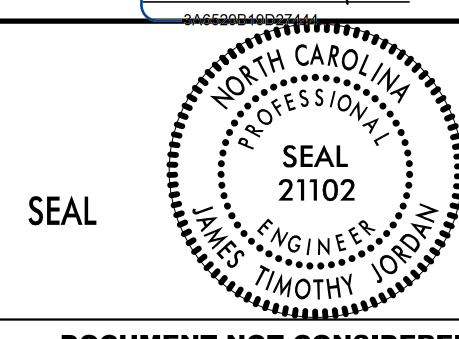
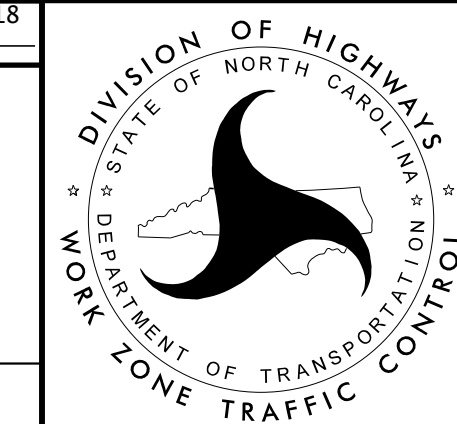
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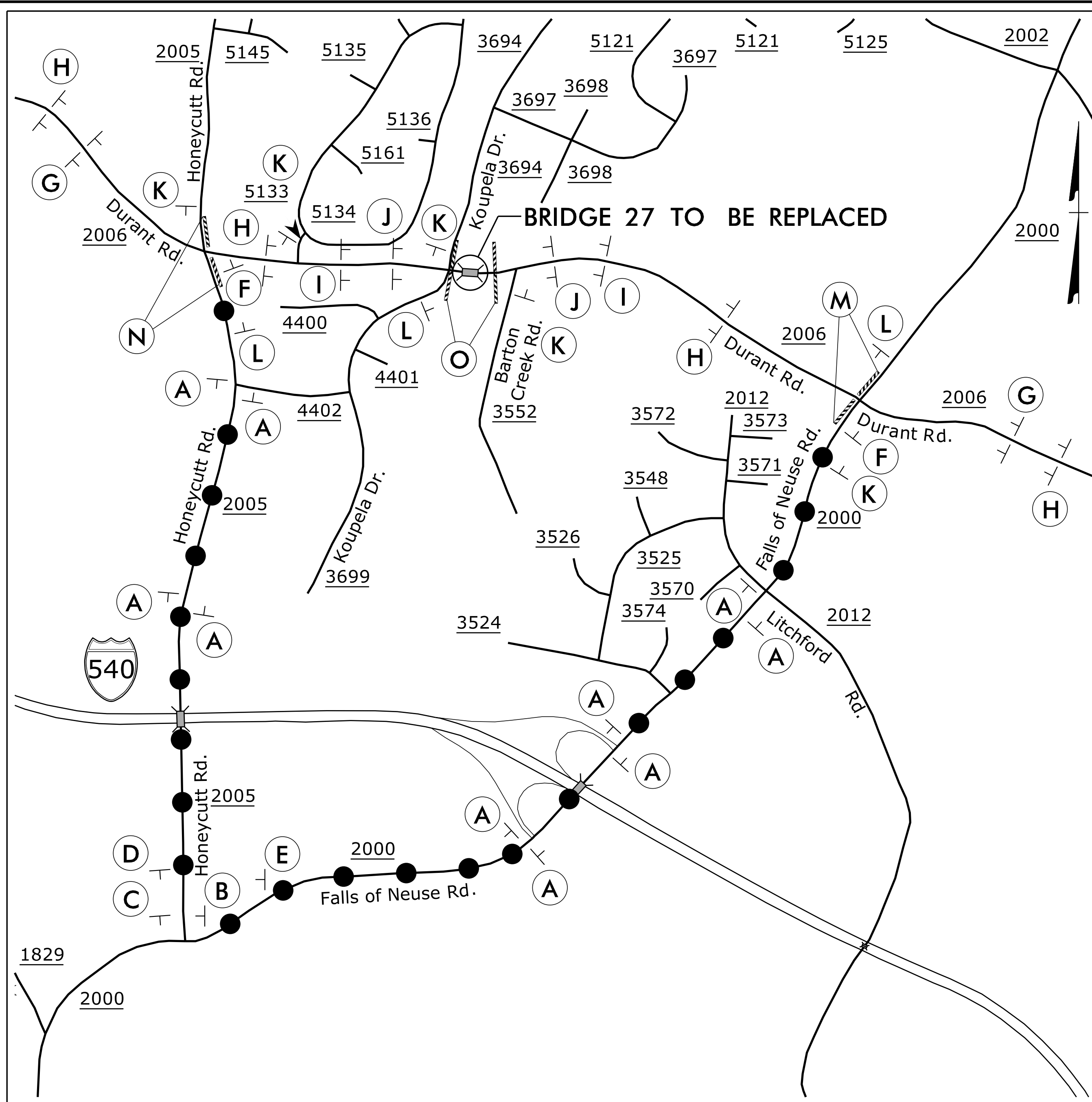
- STEP 1: PLACE MESSAGE SIGNS USING ROADWAY STANDARD DRAWING NUMBERS 1101.04, SHEET 1 OF 1, 1101.11, SHEET 1 OF 4, 1101.03, SHEET 1 OF 9, AND SHEET TMP-3, INSTALL AND COVER DETOUR SIGNING.
- STEP 2: USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, UNCOVER OFF-SITE DETOUR SIGNING AND INSTALL TYPE III BARRICADES TO CLOSE DURANT ROAD TO THRU TRAFFIC.
- STEP 3: PLACE TRAFFIC ONTO OFF-SITE DETOUR. PERFORM PROPOSED CULVERT AND ROADWAY CONSTRUCTION. PLACE FINAL PAVEMENT MARKINGS AND MARKERS.
- STEP 4: REMOVE TYPE III BARRICADES FROM DURANT ROAD AND REOPEN ROADWAY TO TRAFFIC. REMOVE ALL DETOUR SIGNING.

FINAL PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
THERMOPLASTIC WHITE EDGELINE (4")	700 LF
THERMOPLASTIC YELLOW DOUBLE CENTER (4")	700 LF
PERMANENT RAISED PAVEMENT MARKERS (YELLOW & YELLOW)	4 EA

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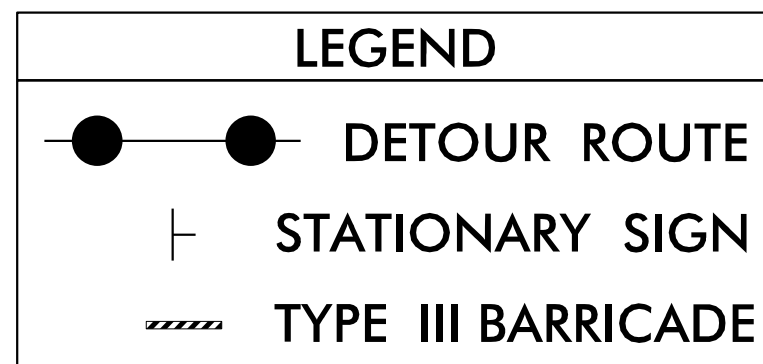
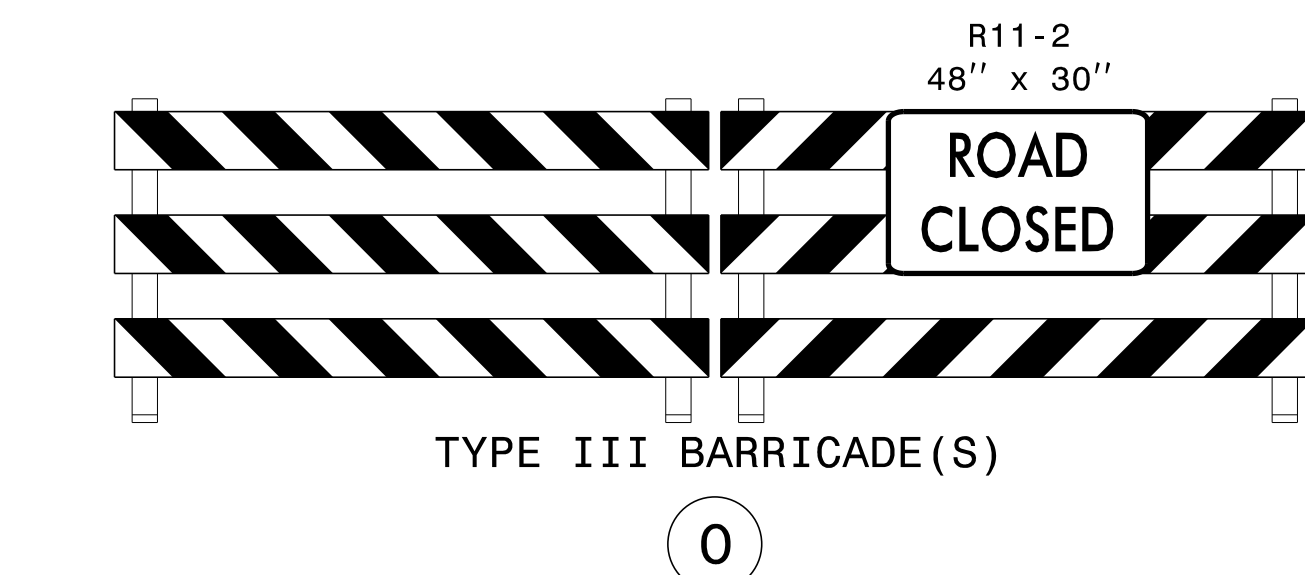
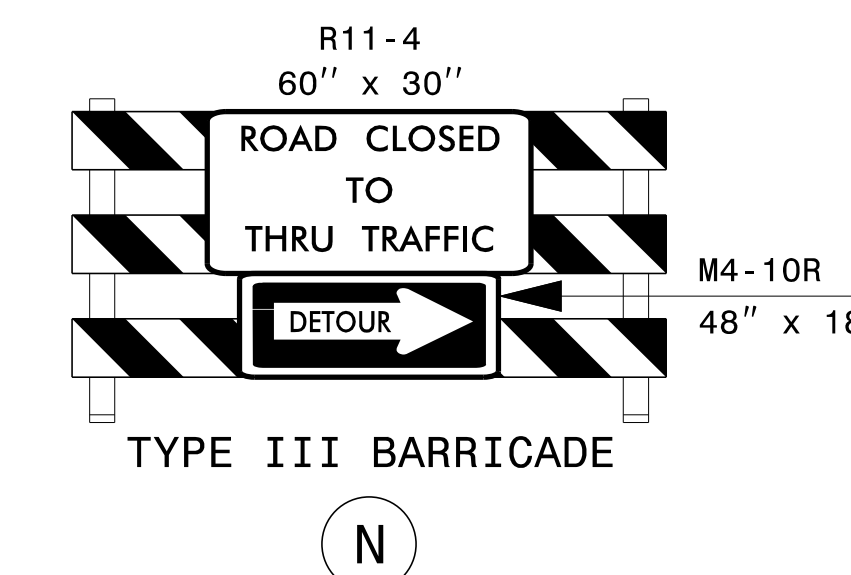
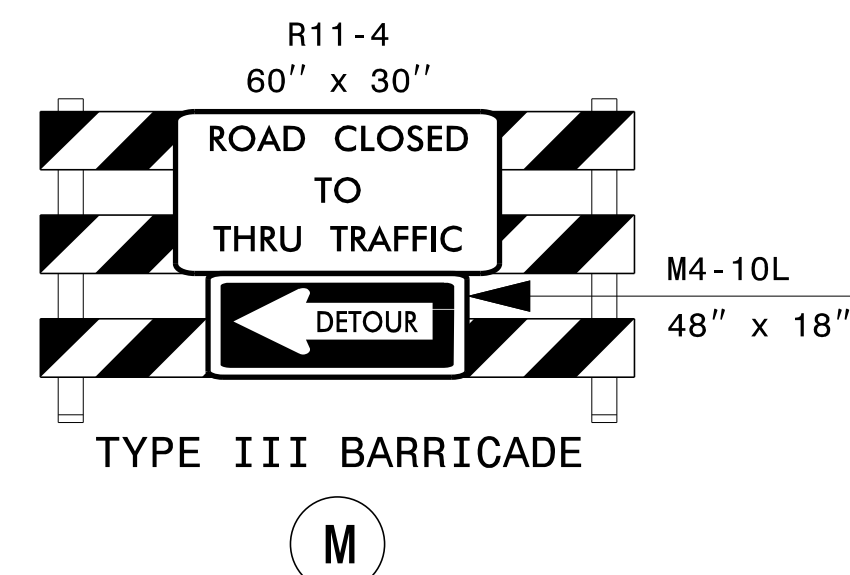
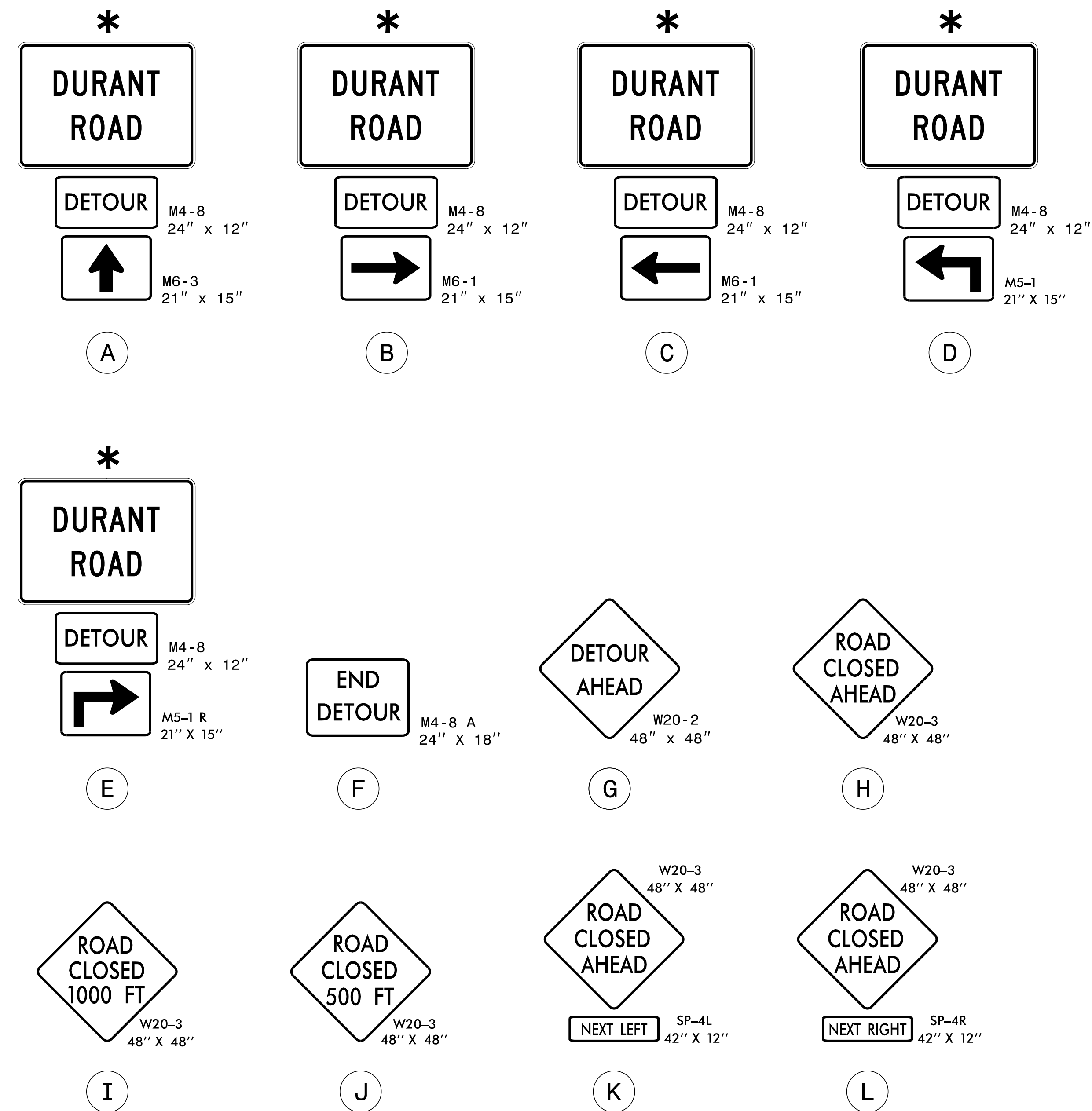
<p style="text-align: center;">M M</p> <p style="text-align: center;">MOTT MACDONALD</p> <p style="font-size: small;">PO Box 700 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.mottmac.com LICENSE NO. F-0669</p>	<p style="font-size: x-small;">APPROVED: <i>James Timothy Jordan</i> DATE: 2/6/2018</p> <div style="text-align: center;">  <p>SEAL</p> </div> <p style="font-size: x-small; text-align: center;">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	<div style="text-align: center;">  <p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL</p> </div>	<p>GENERAL NOTES ROADWAY STANDARD DRAWINGS PHASING PAVEMENT MARKING SCHEDULE</p>
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NOTES: REFER TO ROADWAY STANDARD DRAWING NO. 1101.03, SHEETS 1 AND 2 OF 9, FOR ADDITIONAL SIGN SPACING REQUIREMENTS APPROACHING PROJECT SITE CLOSURE POINT.

* SEE SHEET TMP-4 FOR SPECIAL SIGN DESIGNS

TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES



CHANGEABLE MESSAGE SIGN

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

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

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

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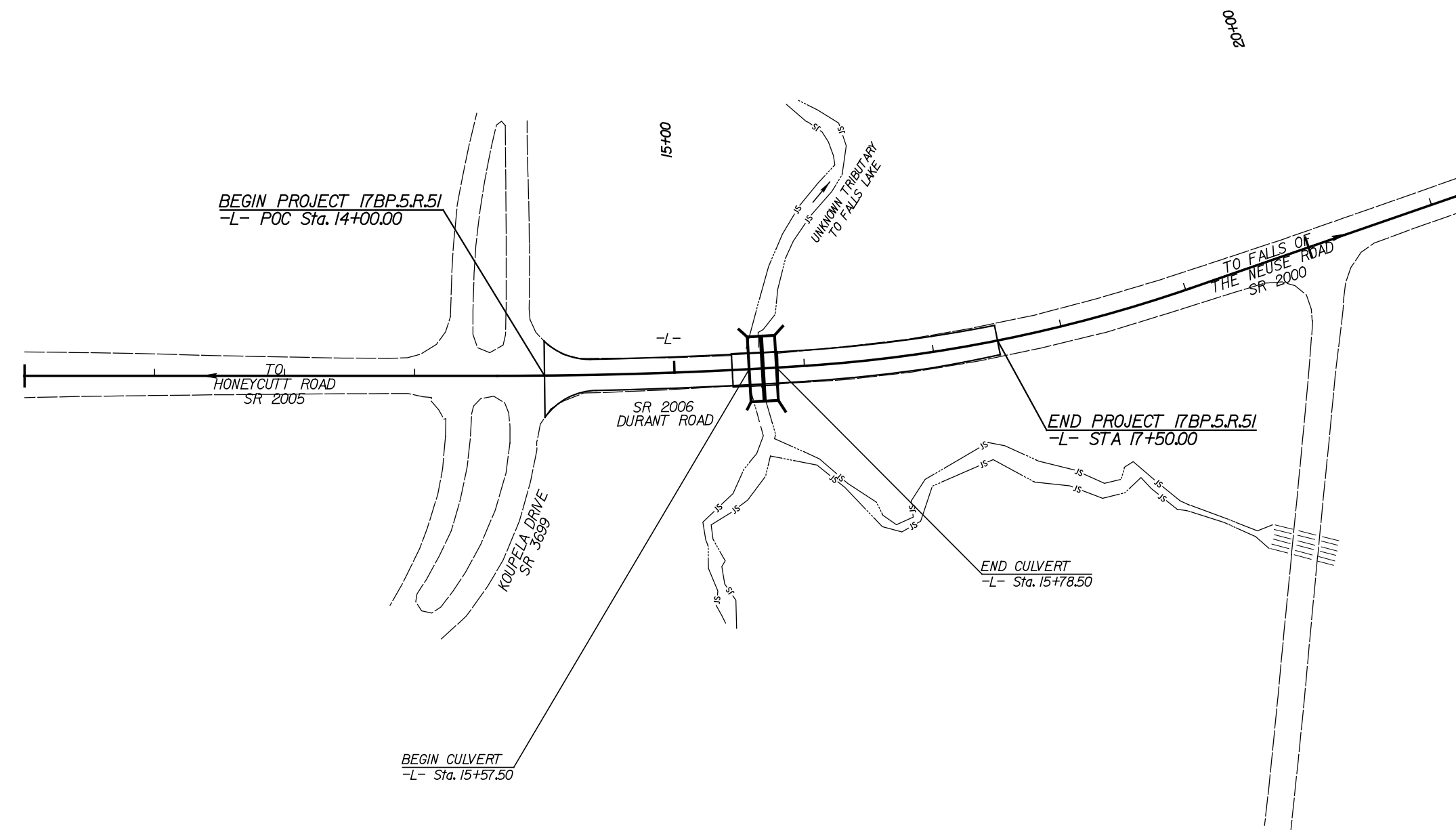
<p>M M</p> <p>MOTT MACDONALD</p> <p>PO Box 700 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.mottmac.com LICENSE NO. F-0669</p>	<p>APPROVED: James Timothy Jordan 2/6/2018</p>		<p>DURANT ROAD OFF-SITE DETOUR</p> <p>TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES</p>
	<p>SEAL</p> <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		

TIP PROJECT: 17BP.5.R.51

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY

**BRIDGE NO. 27 ON SR 2006
OVER UNKNOWN TRIBUTARY
TO FALLS LAKE**



STATE NO.	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.51	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

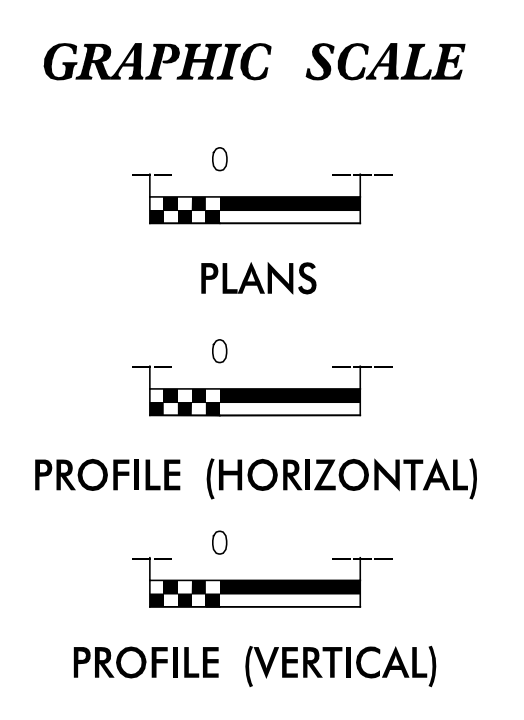
Std. #	Description	Symbol
1630.05	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	III III III
1622.01	Temporary Berms and Slope Drains	TD
1630.02	Silt Basin Type B	Silt Basin Symbol
1633.01	Temporary Rock Silt Check Type-A	Rock Silt Check Symbol
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	Rock Silt Check Symbol
1635.02	Temporary Rock Silt Check Type-B	Rock Silt Check Symbol
	Wattle/Coir Fiber Wattle	Wattle Symbol
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	Wattle Symbol
1634.01	Temporary Rock Sediment Dam Type-A	Rock Sediment Dam Symbol
1634.02	Temporary Rock Sediment Dam Type-B	Rock Sediment Dam Symbol
1655.01	Rock Pipe Inlet Sediment Trap Type-A	Rock Pipe Inlet Sediment Trap Symbol
1635.02	Rock Pipe Inlet Sediment Trap Type-B	Rock Pipe Inlet Sediment Trap Symbol
1630.04	Stilling Basin	Stilling Basin Symbol
1630.06	Special Stilling Basin	Stilling Basin Symbol
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	Skimmer Basin Symbol
	Tiered Skimmer Basin	Tiered Skimmer Basin Symbol
	Infiltration Basin	Infiltration Basin Symbol

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

**ENVIRONMENTALLY
SENSITIVE AREA(S) EXIST
ON THIS PROJECT**
*Refer To E. C. Special Provisions
for Special Considerations.*

**THIS PROJECT HAS
BEEN DESIGNED TO
SENSITIVE WATERSHED
STANDARDS.**

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:
HDR
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116
Designed by:
ALEXANDER D. SNIDER, PE 3064
NAME LEVEL III CERTIFICATION NO.

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

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest 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 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	

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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.

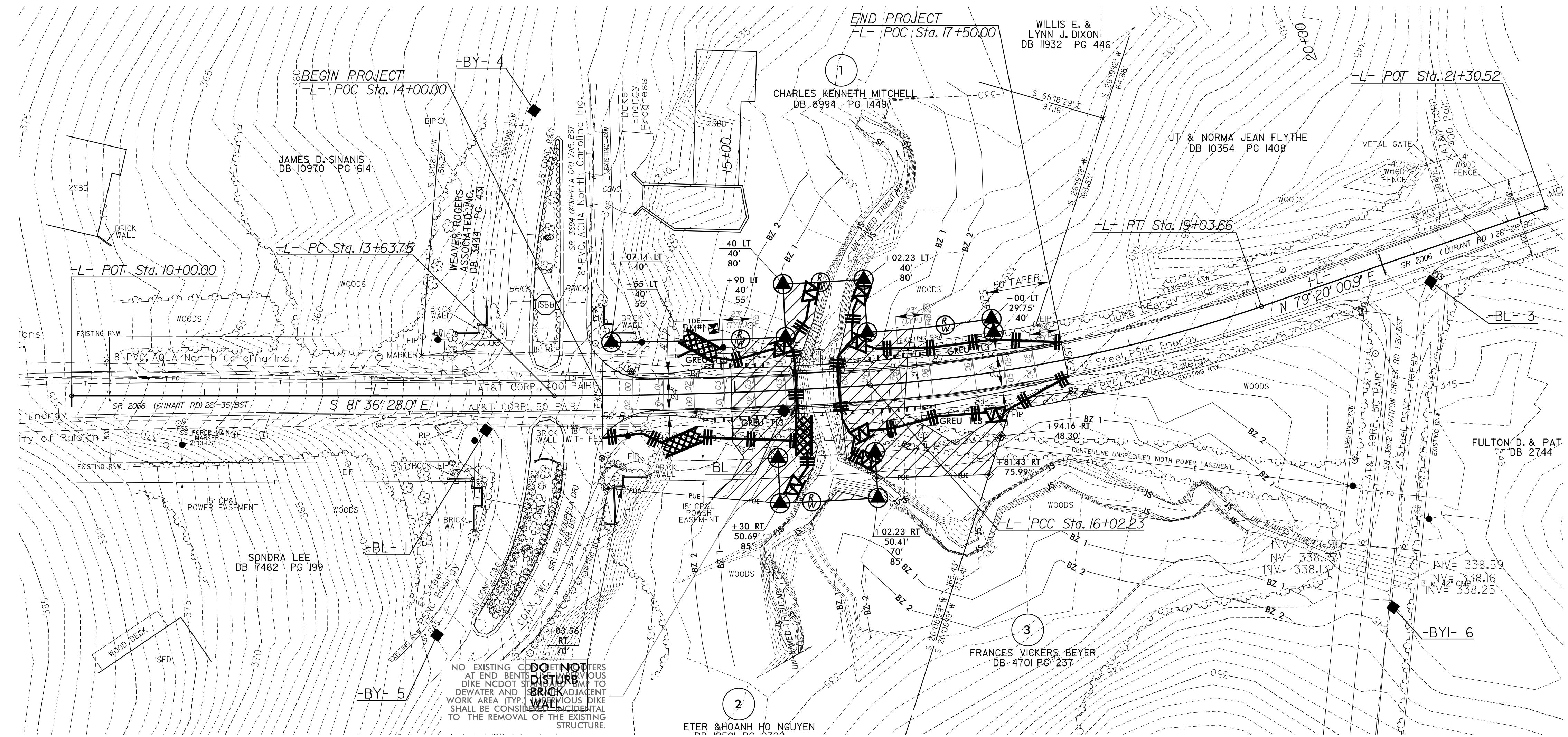
LEVEL III CERTIFIED BY:
ALEXANDER D. SNIDER, PE
CERTIFICATION NUMBER: 3064
ISSUED: FEBRUARY 17, 2017

Prepared in the Office of:
M MOTT MACDONALD
PO Box 700
Fayetteville, NC 27526
www.mottmac.com

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



FOR CULVERT PLANS SEE SHEETS C-1 THRU C-6



NO EXISTING STRUCTURES AT END BENEFIT. EXISTING DIKE NCDOT SHALL BE DEWATERED AND ADJACENT WORK AREA (TYP) SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE.

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
THIS PROJECT IS WITHIN THE FALLS LAKE WATERSHED AND HAS SPECIFIC STABILIZATION REQUIREMENTS.

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

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

\$\$\$DATE\$\$\$
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 ICA ENGINEERING, INC.

CULVERT CONSTRUCTION SEQUENCE STA. 15 + 68 -L-

PROJECT REFERENCE	SHEET NO.
17BP.5.R.51 - WAKE 27	EC-3A

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

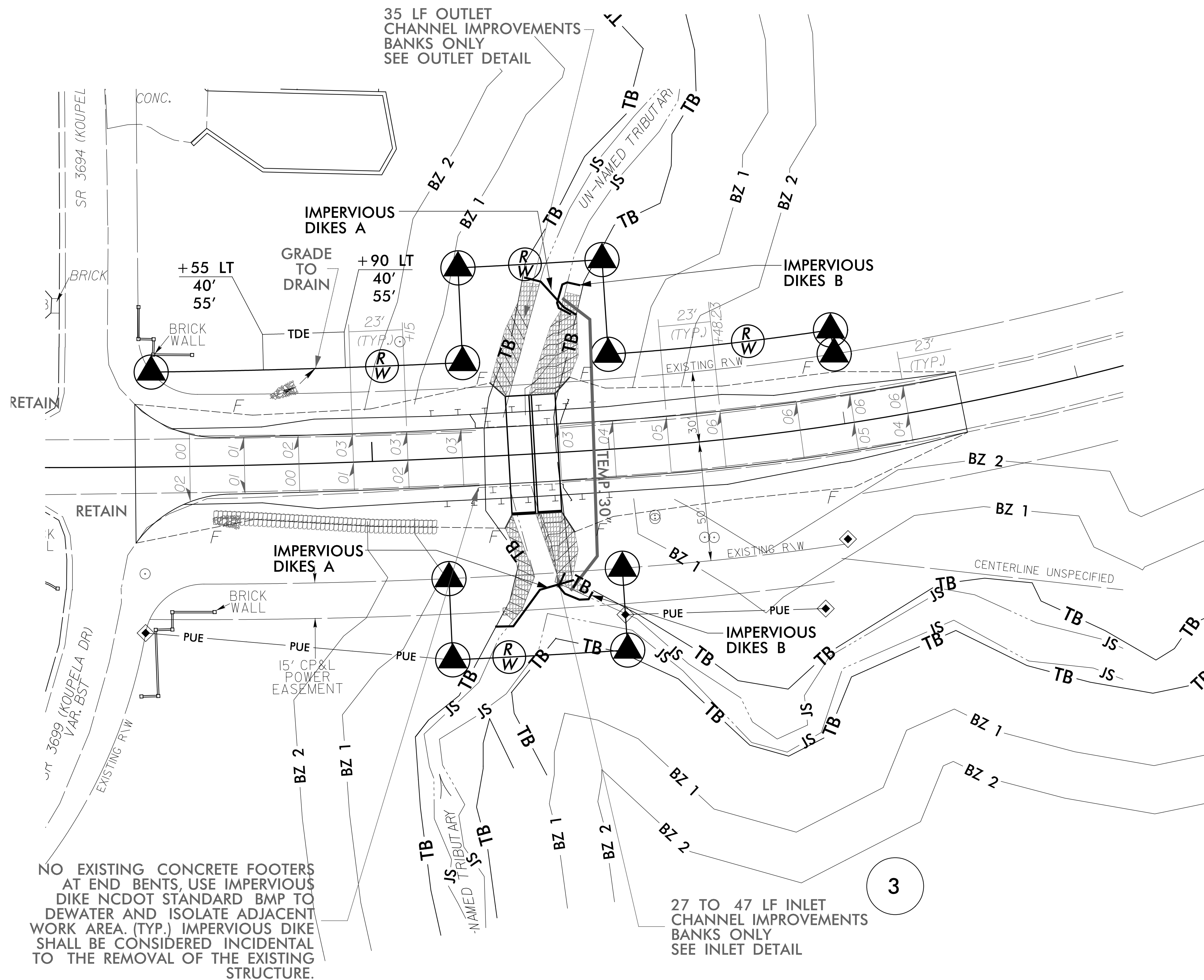
LEVEL III CERTIFIED BY:
ALEXANDER D. SNIDER, PE
CERTIFICATION NUMBER: 3064
ISSUED: FEBRUARY 17, 2017

Prepared in the Office of:
M MOTT MACDONALD
PO Box 700
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HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



1. INSTALL 30" TEMPORARY PIPE (132 LF) AND IMPERVIOUS DIKES A (68 LF) AS SHOWN. DIVERT CHANNEL FLOW THROUGH THE TEMPORARY PIPE.
2. INSTALL SPECIAL STILLING BASIN (NCDOT STD. DRAWING 1630.06).
3. CONSTRUCT 2 @ 10' x 8' RCBC w/SILLS AND BEVELED INLET. UTILIZE SPECIAL STILLING BASIN.
4. CONSTRUCT UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS. PLACE RIP RAP ON THE WEST SIDE UPSTREAM AND DOWNSTREAM CHANNEL IMPROVMENTS AND AS MUCH OF THE RIP RAP AS POSSIBLE ON THE EAST SIDE UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS.
5. REMOVE IMPERVIOUS DIKES A AND TEMPORARY PIPE. DIRECT FLOW THROUGH NEWLY CONSTRUCTED CULVERTS.
6. INSTALL IMPERVIOUS DIKES B (48 LF). COMPLETE PLACEMENT OF THE EAST SIDE UPSTREAM AND DOWNSTREAM RIP RAP. UTILIZE SPECIAL STILLING BASIN.
7. REMOVE IMPERVIOUS DIKES B AND SPECIAL STILLING BASIN. CONSTRUCT PROPOSED ROADWAY.



NO EXISTING CONCRETE FOOTERS AT END BENTS, USE IMPERVIOUS DIKE NCDOT STANDARD BMP TO DEWATER AND ISOLATE ADJACENT WORK AREA. (TYP.) IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE.

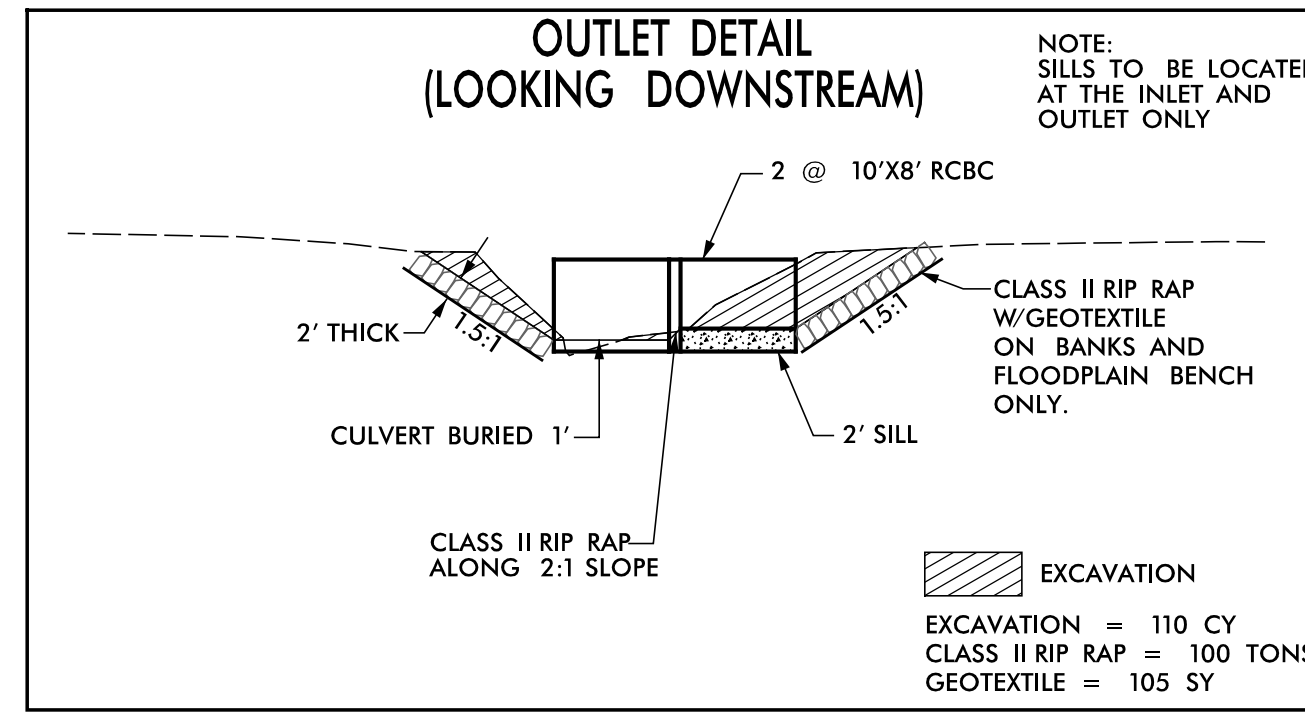
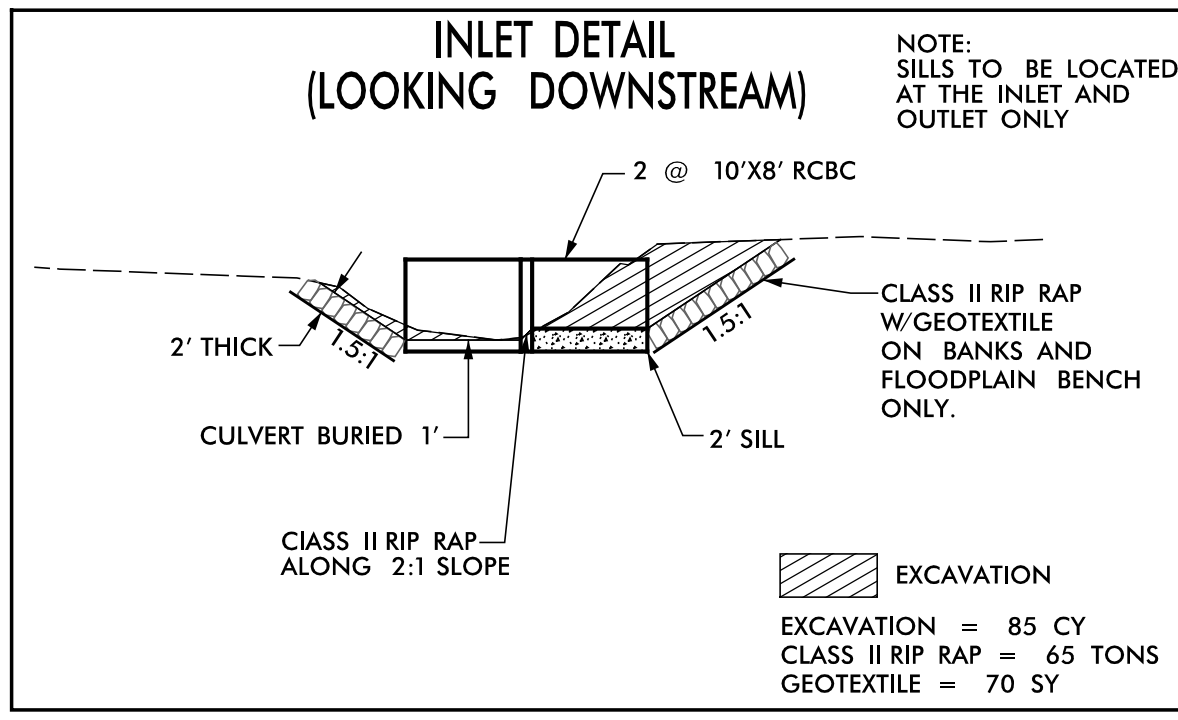
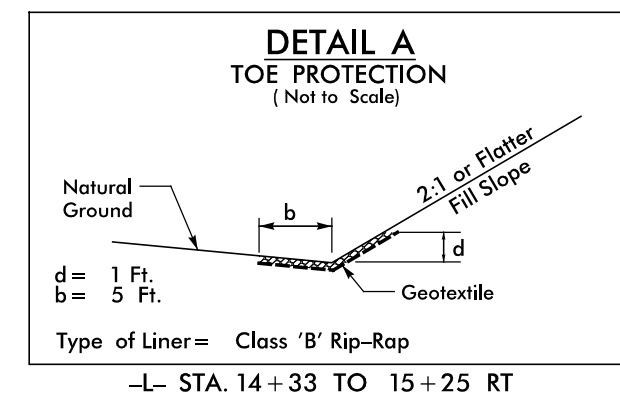
27 TO 47 LF INLET CHANNEL IMPROVEMENTS BANKS ONLY SEE INLET DETAIL

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ICA ENGINEERING, INC.

LEVEL III CERTIFIED BY:
 ALEXANDER D. SNIDER, PE
 CERTIFICATION NUMBER: 3064
 ISSUED: FEBRUARY 17, 2017

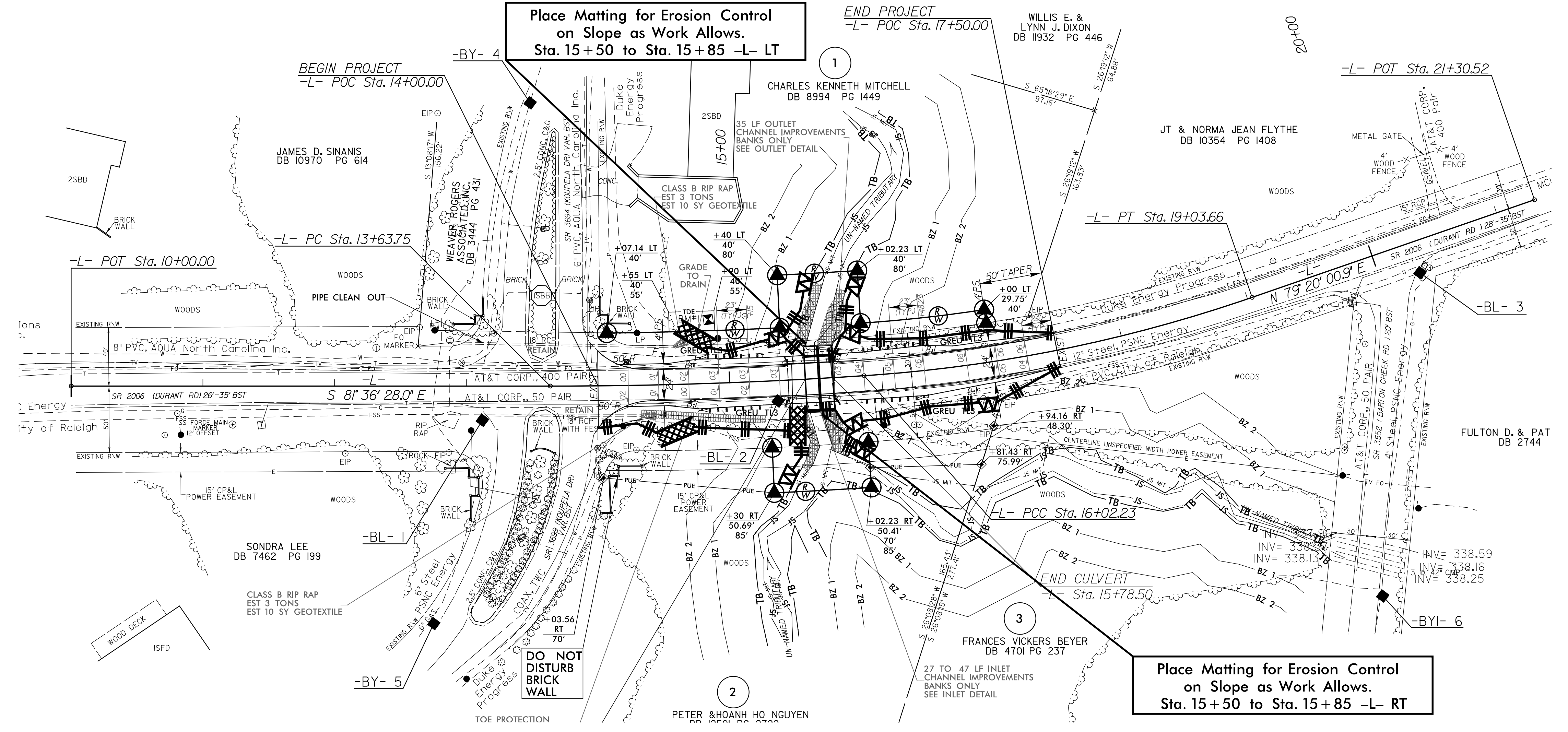
Prepared in the Office of:
M MOTT MACDONALD
 P.O. Box 700
 Fuquay-Varina, NC 27526
 www.mottmac.com

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



FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 4

FOR CULVERT PLANS SEE SHEETS C-1 THRU C-6



Place Matting for Erosion Control on Slope as Work Allows. Sta. 15+50 to Sta. 15+85 -L- LT

Place Matting for Erosion Control on Slope as Work Allows. Sta. 15+50 to Sta. 15+85 -L- RT

NOTE: THIS PROJECT IS WITHIN THE FALLS LAKE WATERSHED AND HAS SPECIFIC STABILIZATION REQUIREMENTS.

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

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

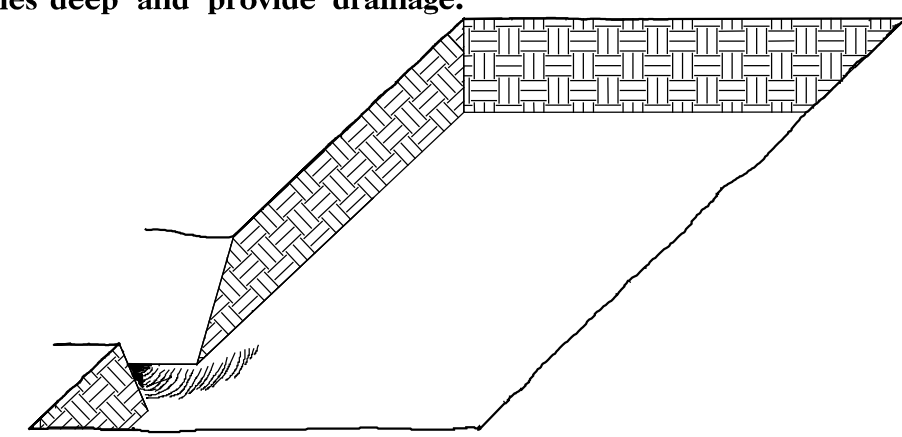
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 ICA ENGINEERING, INC.

PLANTING DETAILS

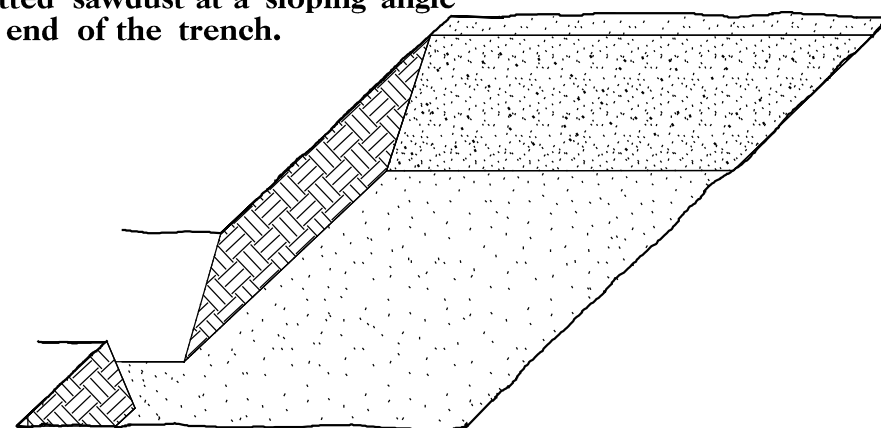
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

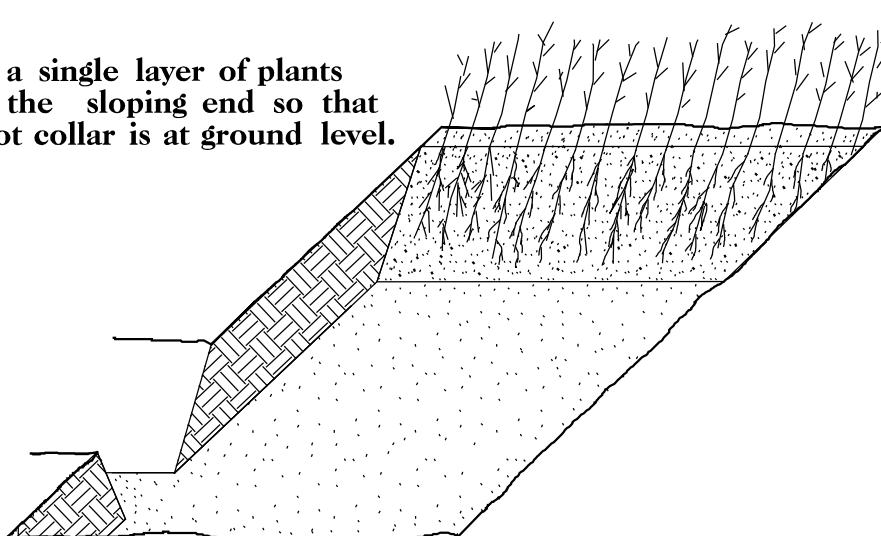
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



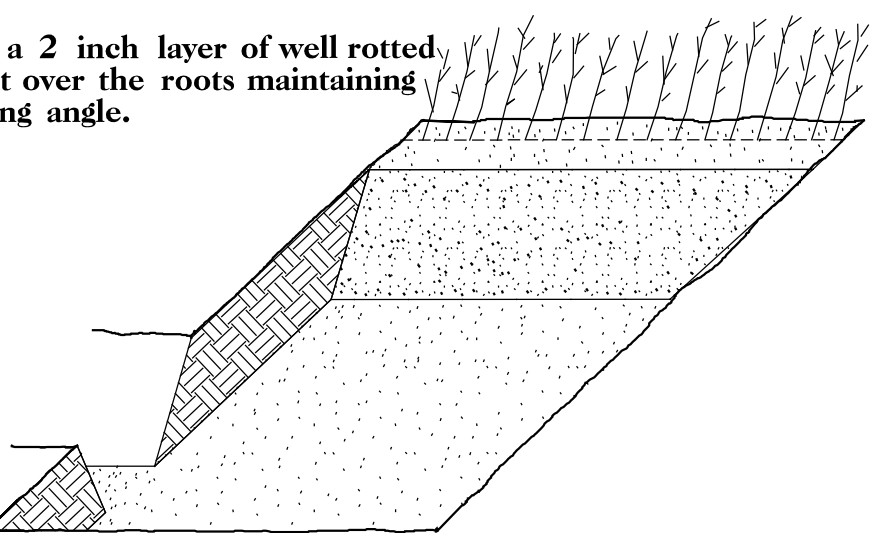
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

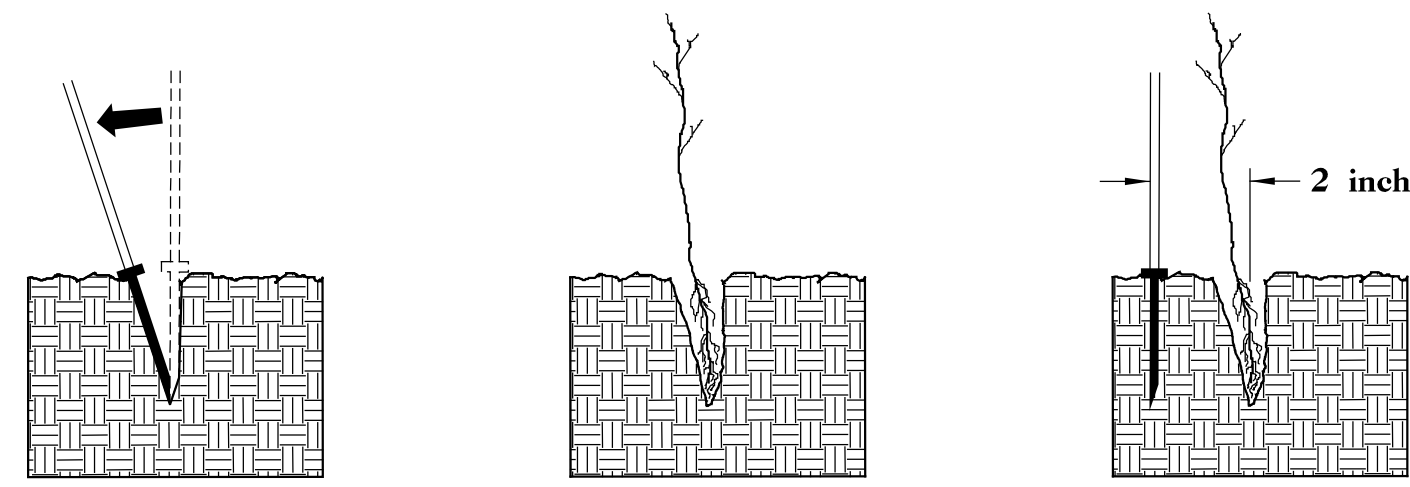


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.



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

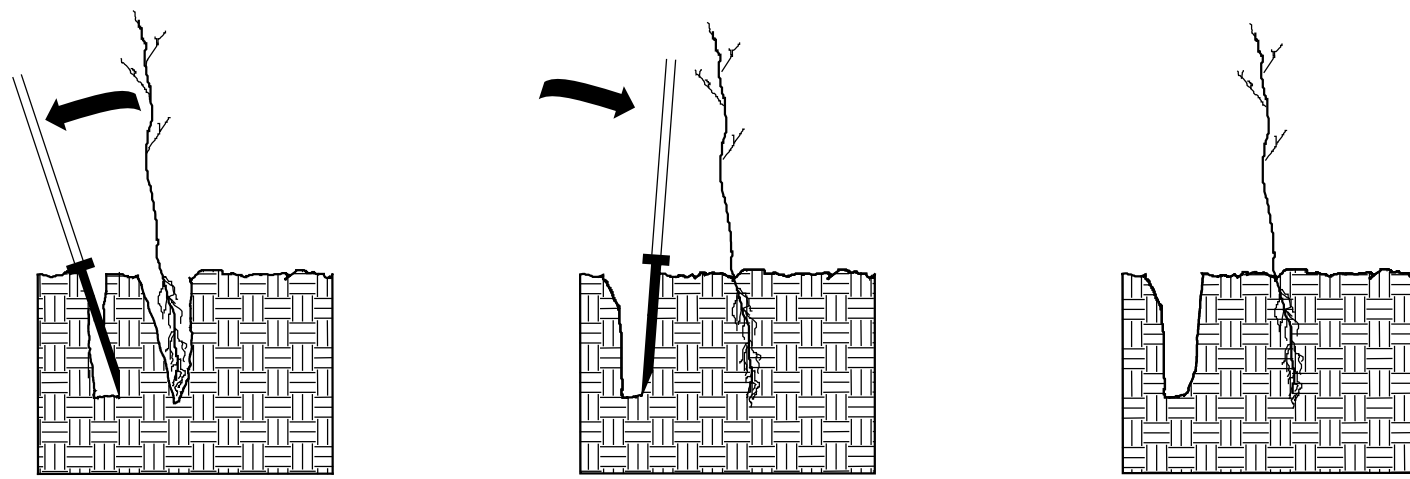
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



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

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

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



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

5. Push handle forward firming soil at top.

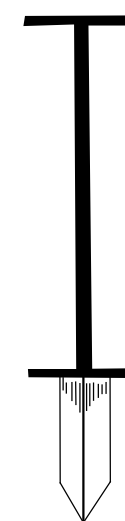
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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



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



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

REFORESTATION

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

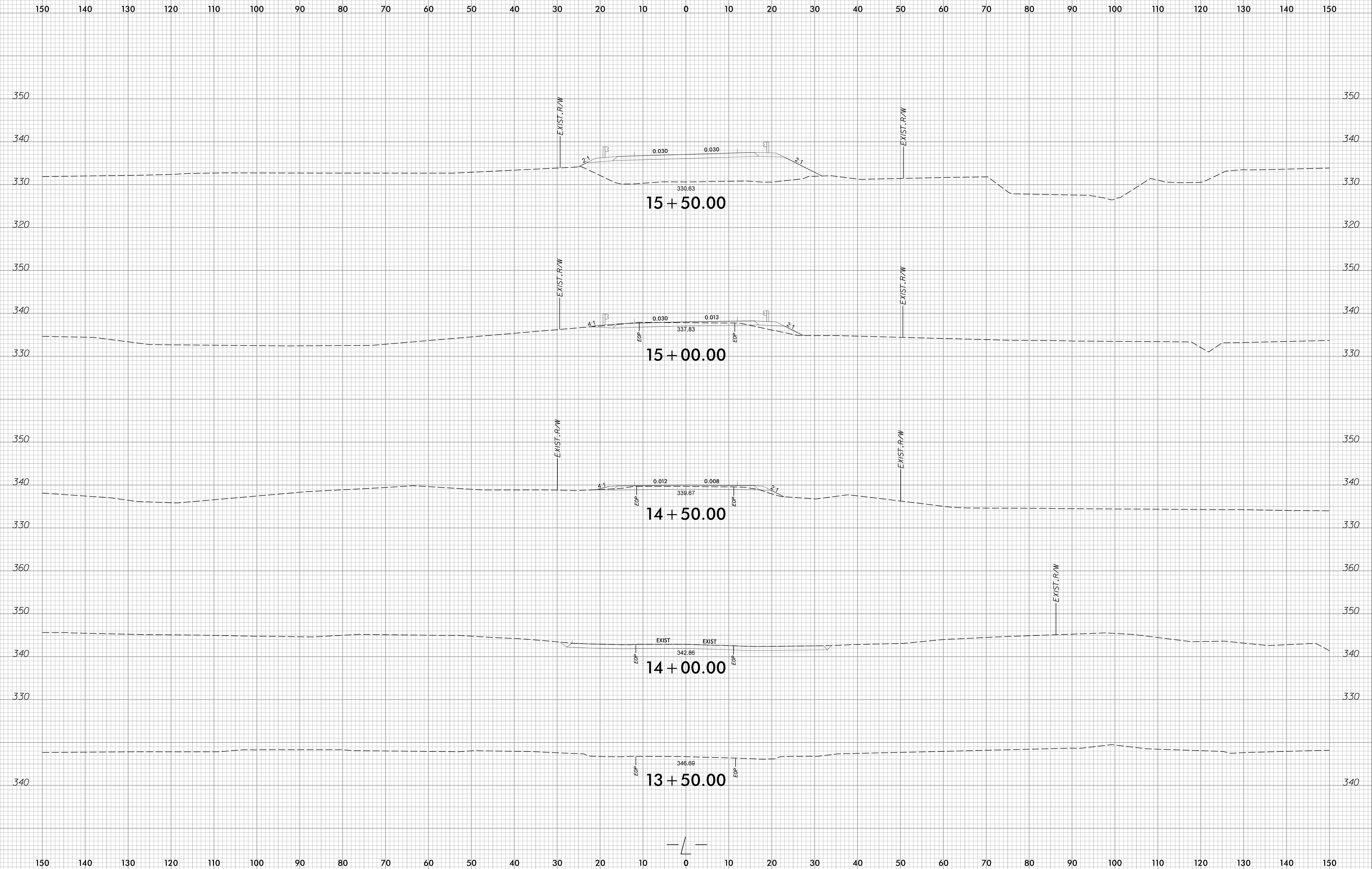
REFORESTATION

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

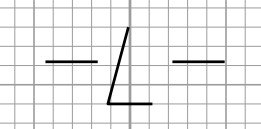
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

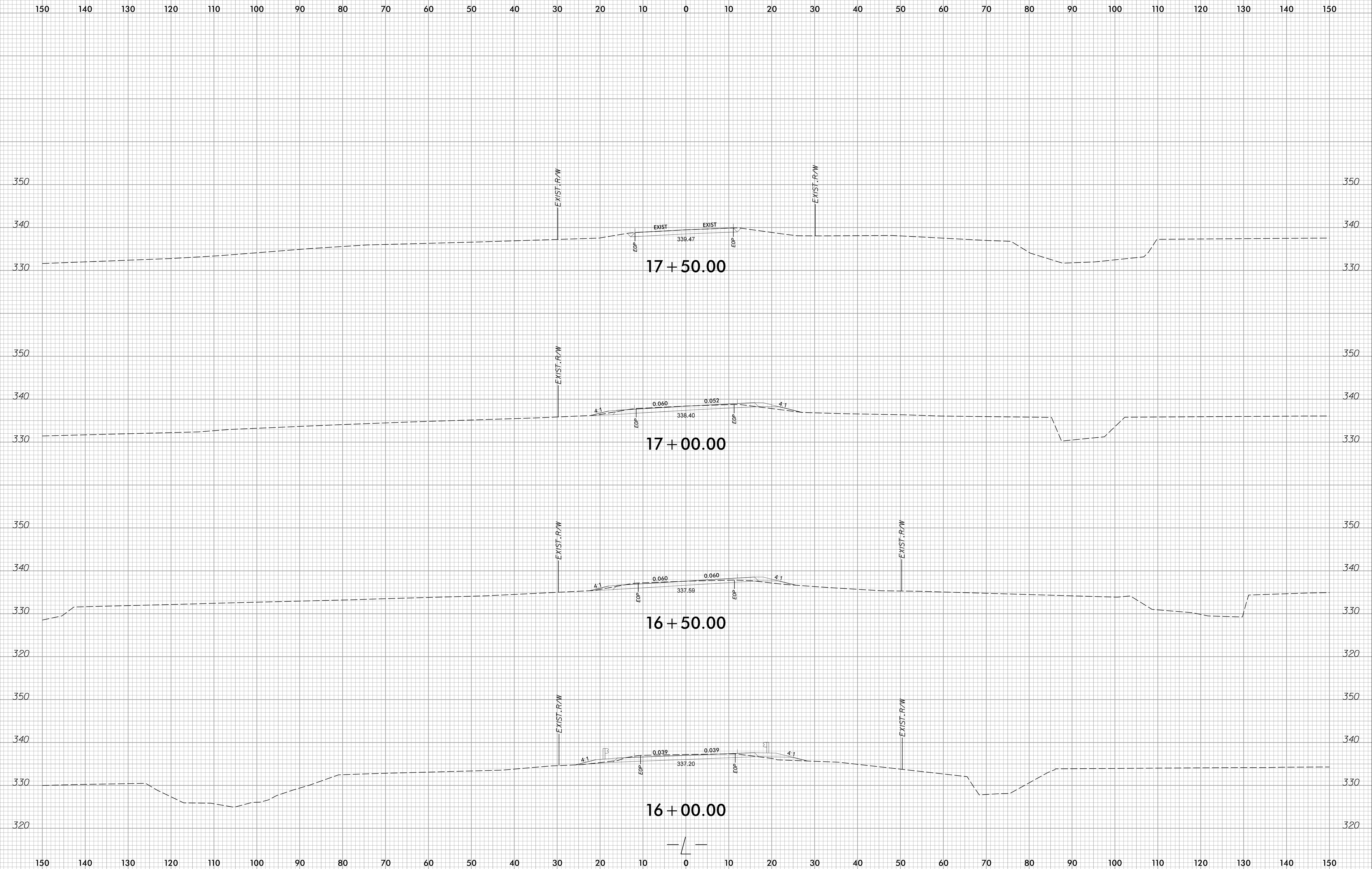
REFORESTATION DETAIL SHEET

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

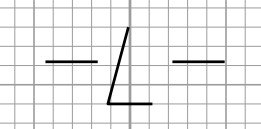


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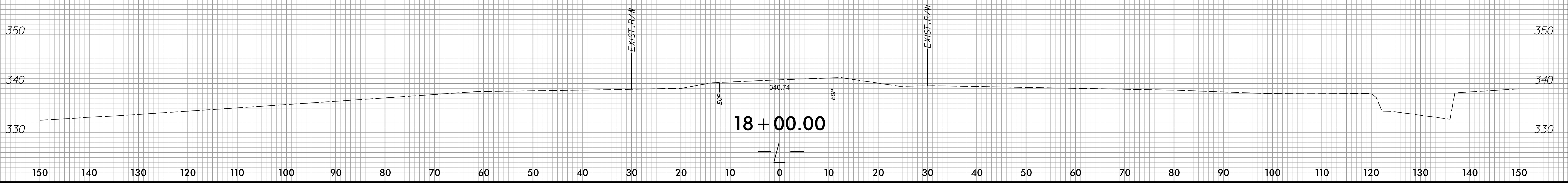




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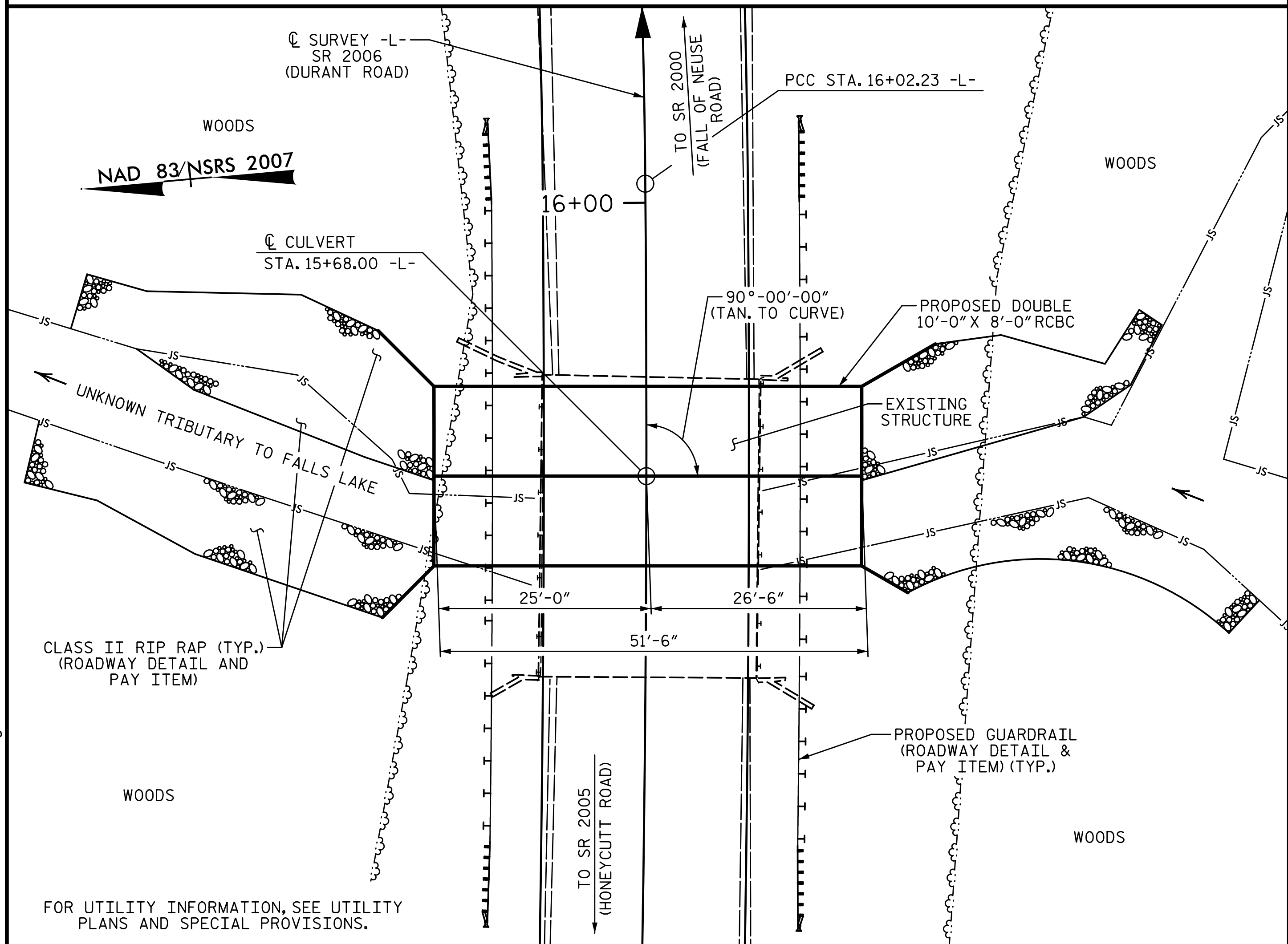


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BM #1 BENCH TIE SPIKE IN 20" PINE, STA. 14+85.29 -L-, 48.44' LT., EL. 336.57



LOCATION SKETCH

HYDRAULIC DATA:

DESIGN DISCHARGE	= 1000 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEAR
DESIGN HIGH WATER ELEVATION	= 334.10
DRAINAGE AREA	= 0.9 SQ. MI.
BASE DISCHARGE (Q 100)	= 1100 CFS
BASE HIGH WATER ELEVATION	= 334.71

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 1826 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEAR
OVERTOPPING FLOOD ELEVATION	= 338.40

** OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 15+77.47 -L- AT RIGHT ROADWAY SHOULDER

HORIZONTAL CURVE DATA

PI STA. 14+83.03 -L-
$\Delta = 3^{\circ}-46'-28.1"$ (LT.)
$D = 1^{\circ}-34'-57.9"$
$L = 238.47'$
$T = 119.28'$
$R = 3620.00'$

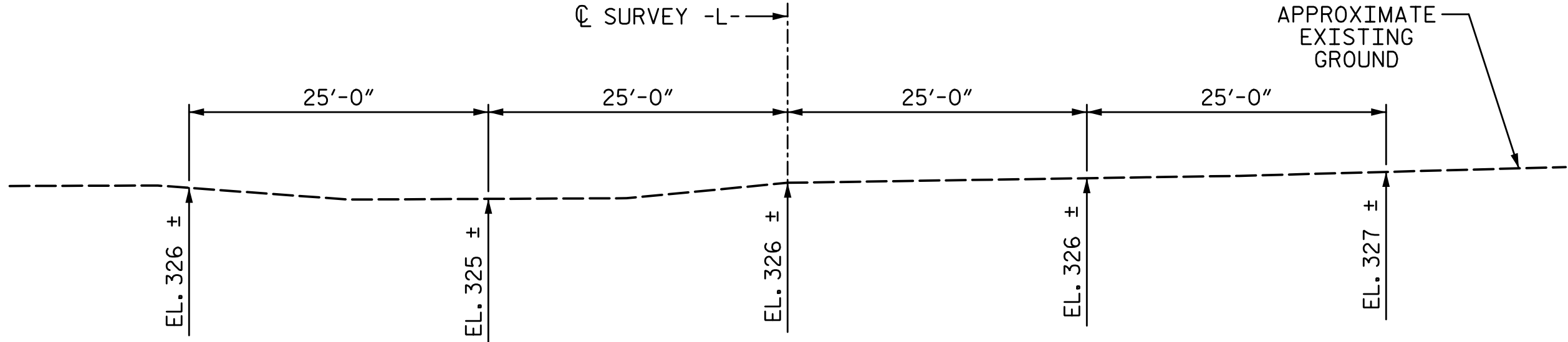
PI STA. 17+53.84 -L-
$\Delta = 15^{\circ}-17'-03.0"$ (LT.)
$D = 5^{\circ}-04'-13.5"$
$L = 301.44'$
$T = 151.62'$
$R = 1130.00'$

GRADE DATA:

GRADE POINT EL. @ STA. 15+68.00 -L- = EL. 336.92
BED EL. @ STA. 15+68.00 -L- = 325.29
ROADWAY SLOPE 2:1

NOTES:

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL----- 2'-9" (MIN.) AND 4'-3" (MAX.)
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE 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 FOOTINGS 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 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 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.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTS OF 1 SPAN @ 35'-7" WITH A CLEAR ROADWAY WIDTH OF 23.9'. THE SUPERSTRUCTURE CONSISTS OF A STEEL PLANK FLOOR ON STEEL I BEAMS. THE ABUTMENTS ARE TIMBER CAPS ON TIMBER PILES. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- 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.
- 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 15+68.00 -L-"
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.



PROFILE ALONG Q CULVERT

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @	2.366 CY/FT	121.9 C.Y.
HEADWALLS		2.0 C.Y.
SILLS		2.2 C.Y.
WING ETC.		23.8 C.Y.
TOTAL		149.9 C.Y.
REINFORCING STEEL		
BARREL		19,185 LBS.
WINGS ETC.		1,453 LBS.
TOTAL		20,638 LBS.
CULVERT EXCAVATION		LUMP SUM
FOUNDATION CONDITIONING MATERIAL		95 TONS
REMOVAL OF EXISTING STRUCTURE		LUMP SUM
ASBESTOS ASSESSMENT		LUMP SUM

PROJECT NO. 17BP.5.R.51
WAKE COUNTY
 STATION: 15+68.00 -L-

SHEET 1 OF 6 REPLACES BRIDGE #27

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 10 FT. X 8 FT.
 CONCRETE BOX CULVERT
 90° SKEW

REVISIONS

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

SHEET NO. C-1
 TOTAL SHEETS 6

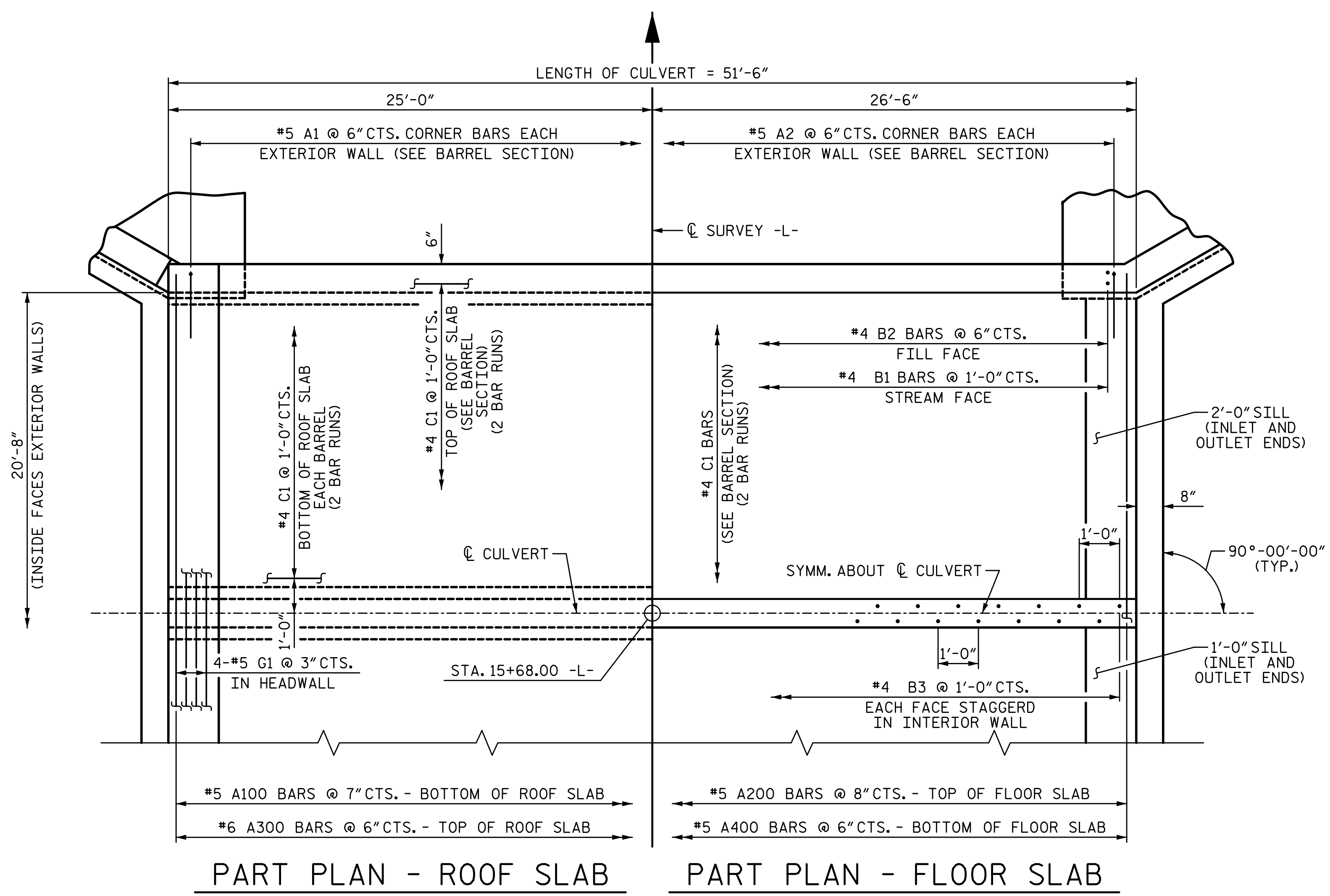
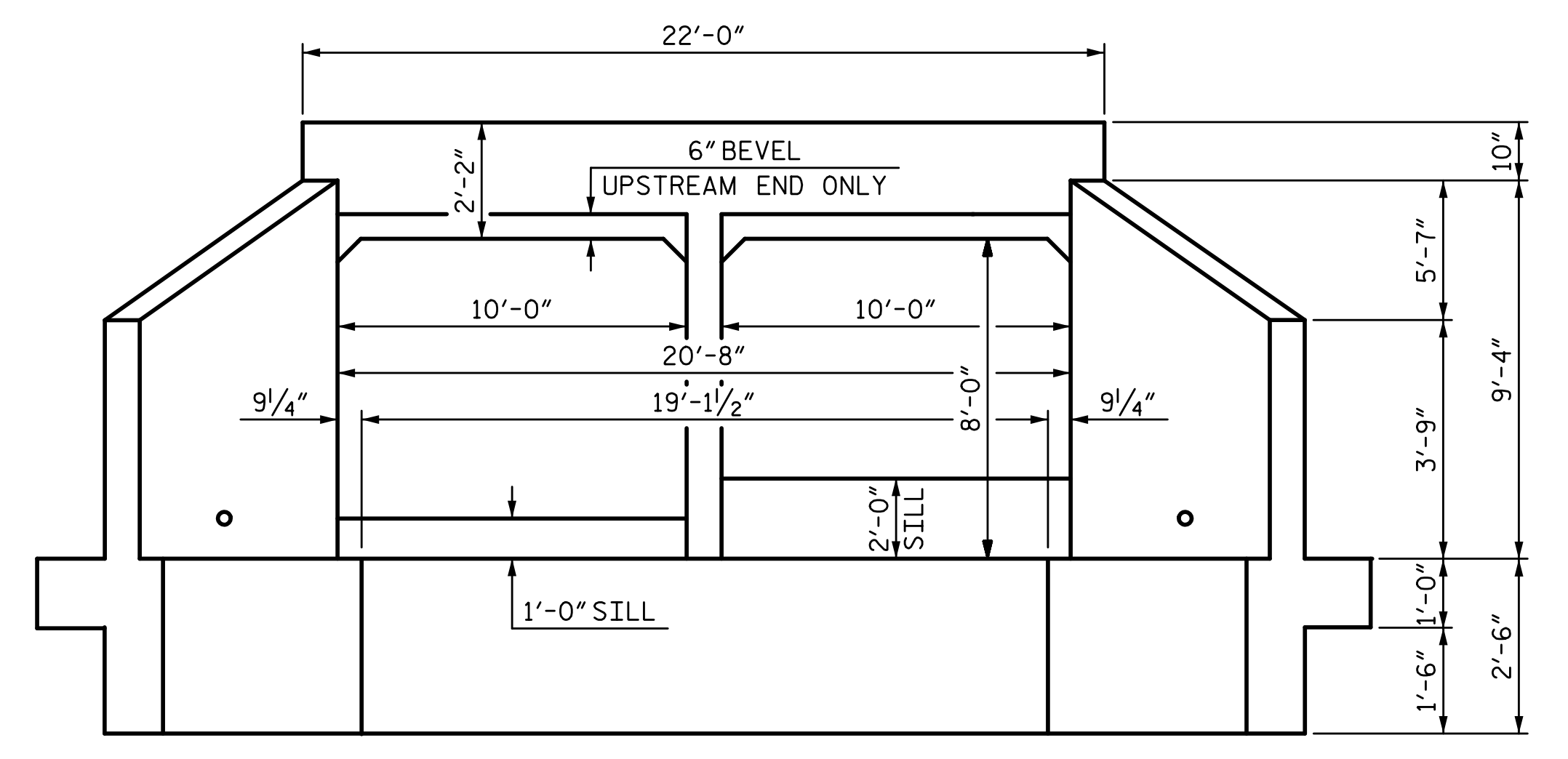
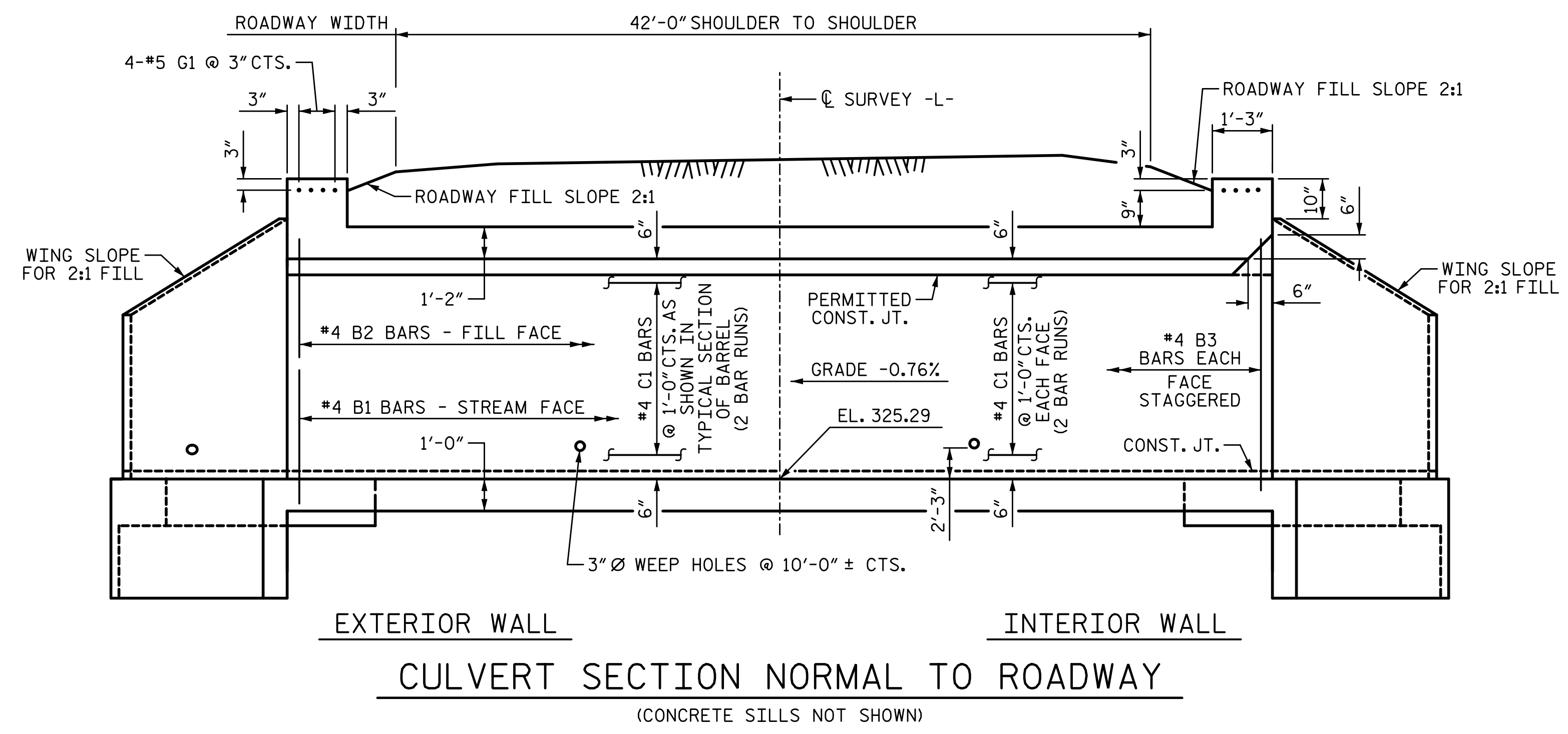
PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0538 (Fax)
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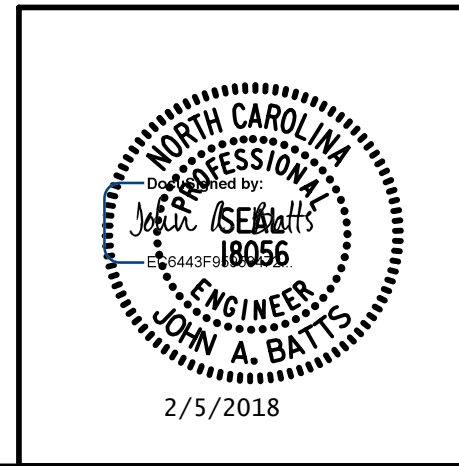
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 CHECKED BY: B.S. COX DATE: 2-18
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-18



PROJECT NO. 17BP.5.R.51
WAKE COUNTY
 STATION: 15+68.00 -L-
 SHEET 2 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**DOUBLE 10 FT. X 8 FT.
 CONCRETE BOX CULVERT
 90° SKEW**

PLANS PREPARED BY:
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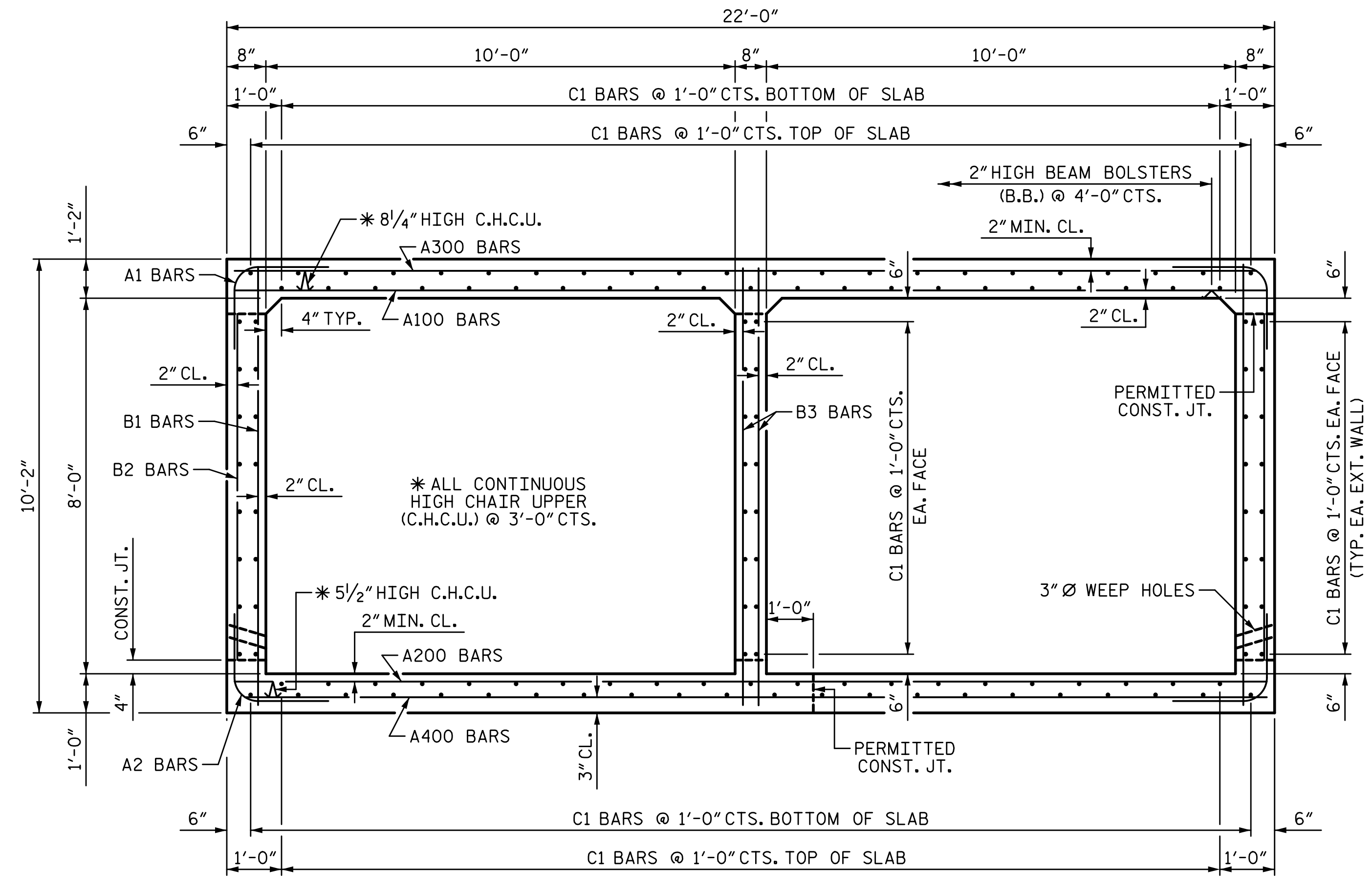
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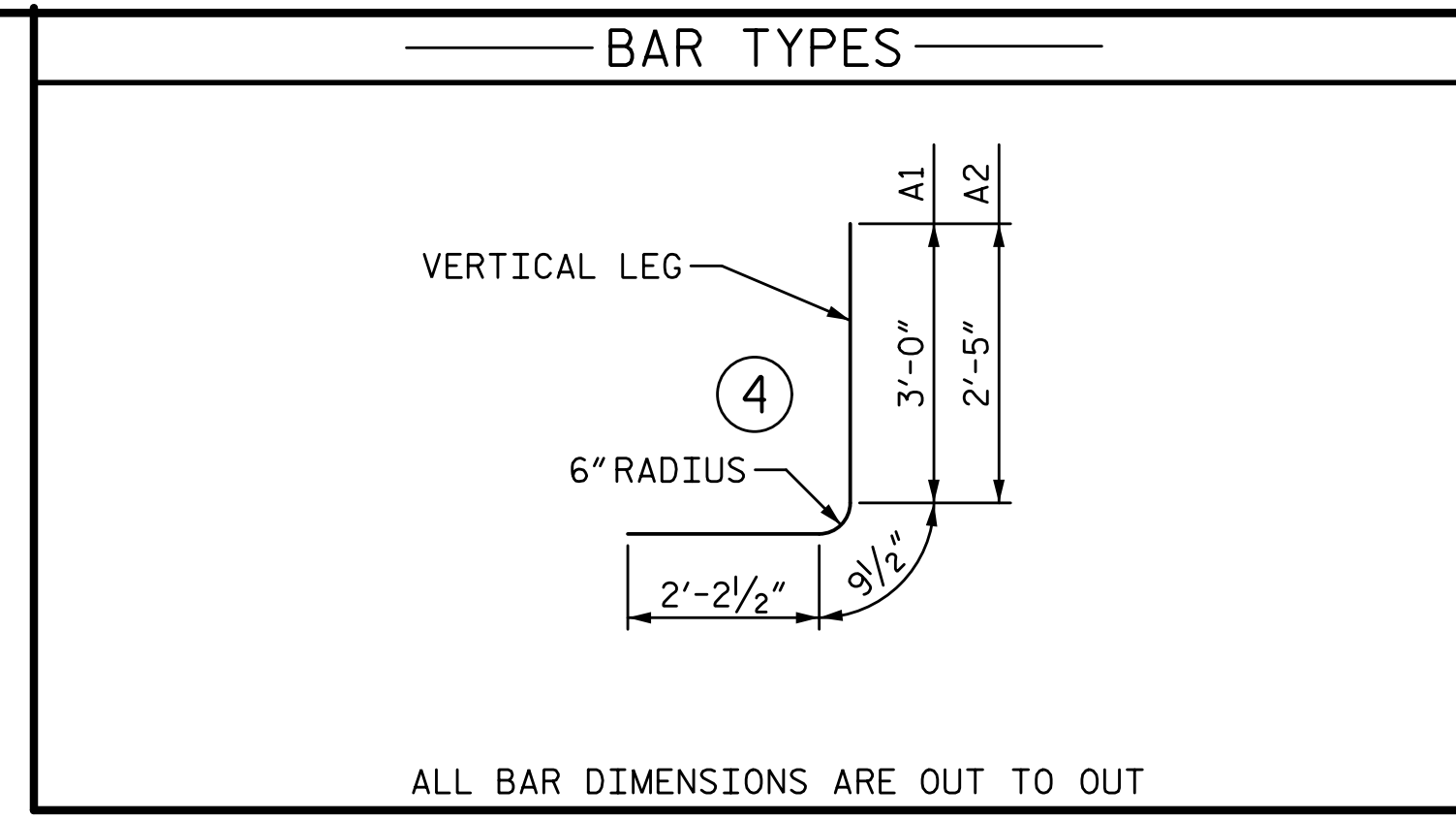
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SECTION OF BARREL
(THERE ARE 134 C1 BARS IN SECTION OF BARREL)



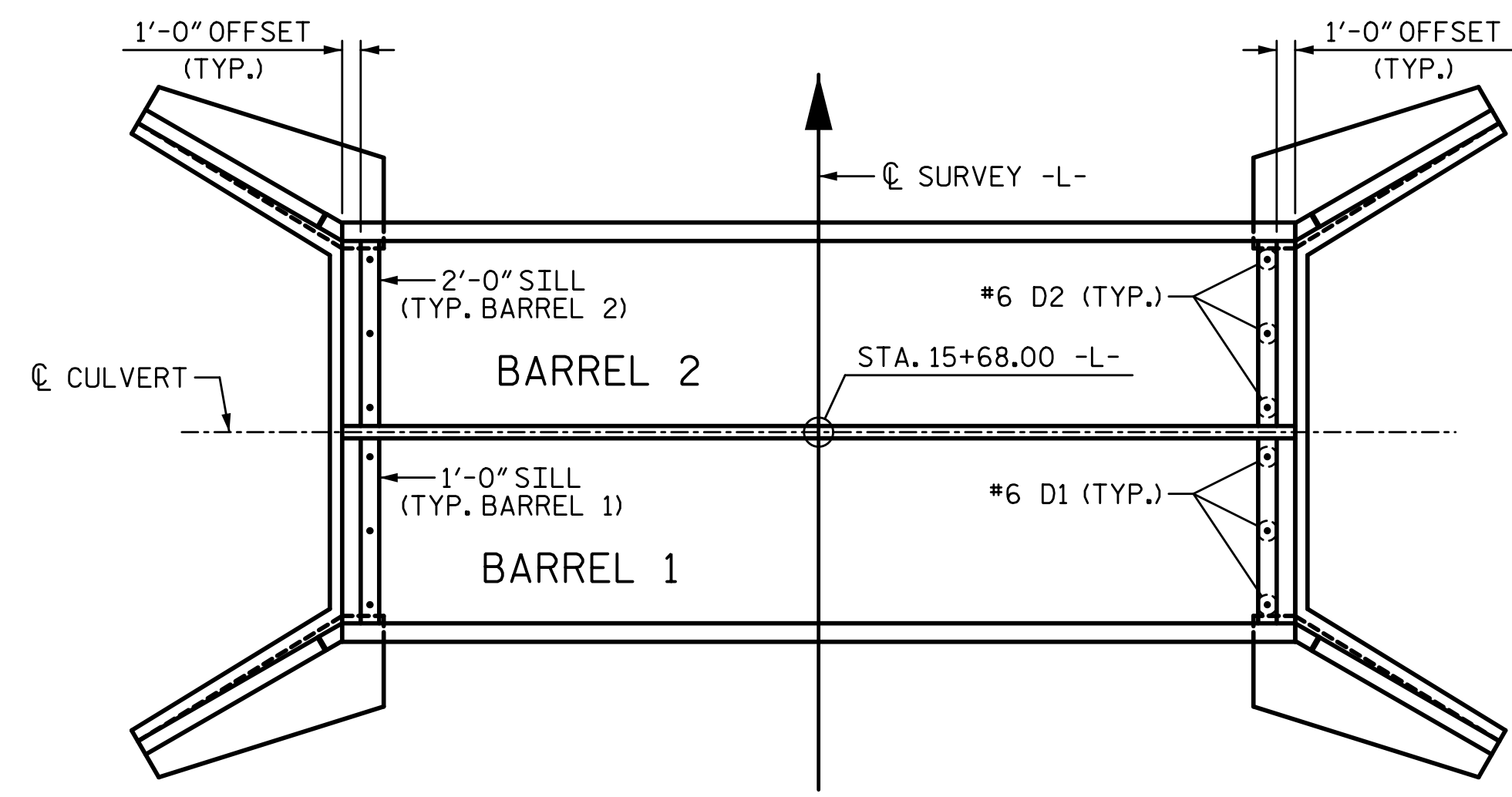
ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART

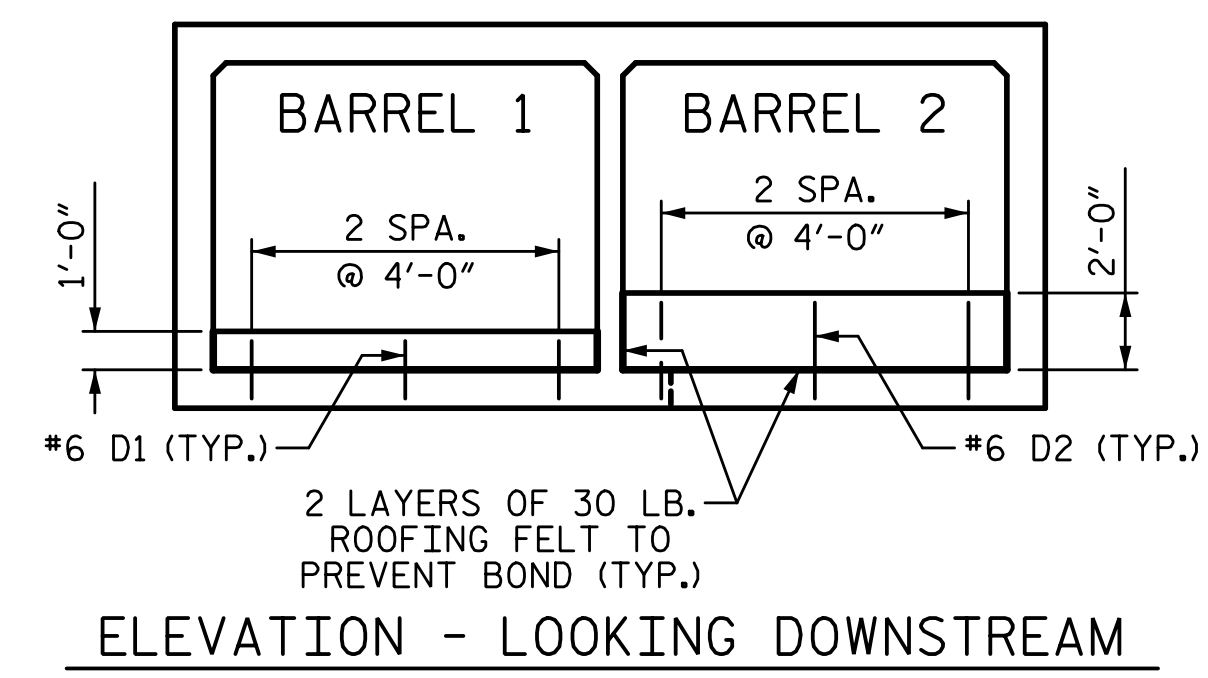
- *4 B1 SPLICE LENGTH = 1'-9"
- *4 B3 SPLICE LENGTH = 1'-9"
- *4 C1 SPLICE LENGTH = 1'-11"
- *5 A200 SPLICE LENGTH = 2'-2"
- *5 A400 SPLICE LENGTH = 2'-2"

BILL OF MATERIAL

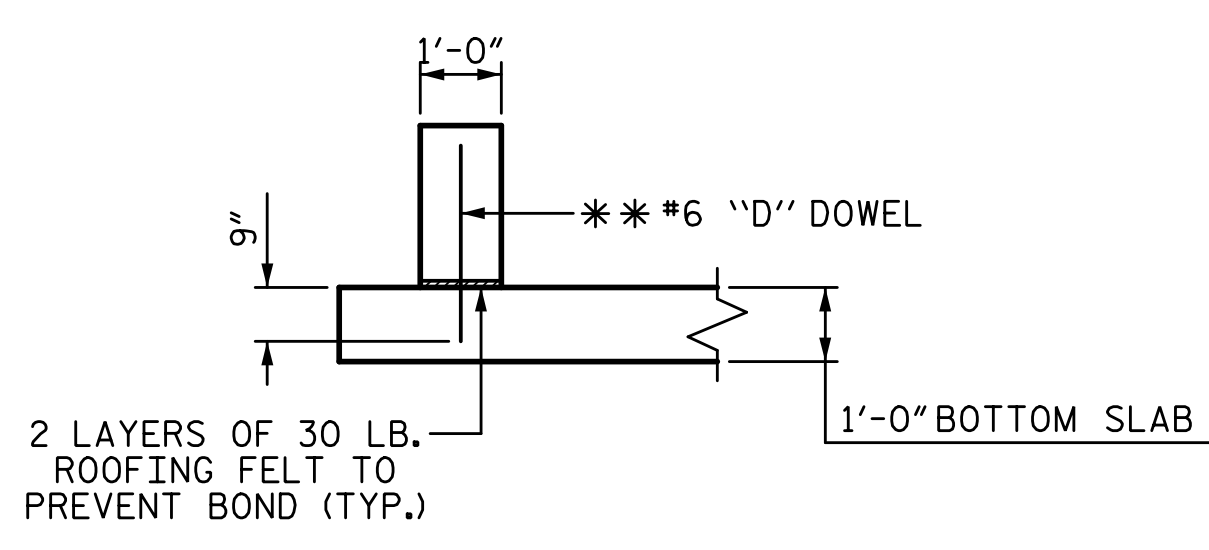
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	206	5	4	6'-0"	1289
A2	206	5	4	5'-5"	1164
A100	89	5	STR	21'-7"	2004
A200	78	5	STR	21'-7"	1756
A300	103	6	STR	21'-7"	3339
A400	103	5	STR	21'-7"	2319
B1	104	4	STR	9'-8"	672
B2	206	4	STR	7'-4"	1009
B3	104	4	STR	9'-8"	672
C1	268	4	STR	26'-6"	4744
D1	6	6	STR	1'-6"	14
D2	6	6	STR	2'-6"	23
G1	8	5	STR	21'-7"	180
TOTAL REINFORCING STEEL				19185 LB	
CLASS "A" CONCRETE BREAKDOWN					
BARREL				121.9 CY	
HEADWALLS				2.0 CY	
SILLS				2.2 CY	



FLOOR PLAN
(SHOWING PLACEMENT OF SILLS)



ELEVATION - LOOKING DOWNSTREAM



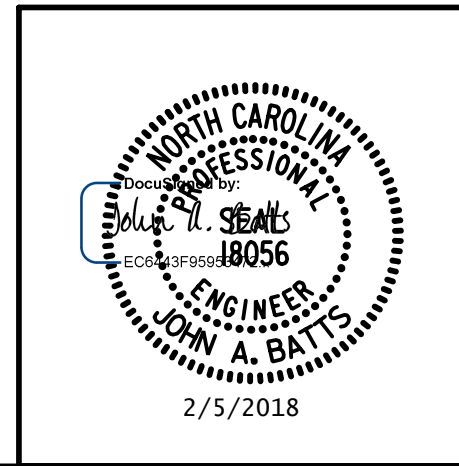
SECTION THROUGH SILL
* * DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

PROJECT NO. 17BP.5.R.51
WAKE COUNTY
STATION: 15+68.00 -L-
SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
DOUBLE 10 FT. X 8 FT. CONCRETE BOX CULVERT
90° SKEW

DRAWN BY: T. BANKOVICH	DATE: 2-18
CHECKED BY: B.S. COX	DATE: 2-18
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-18

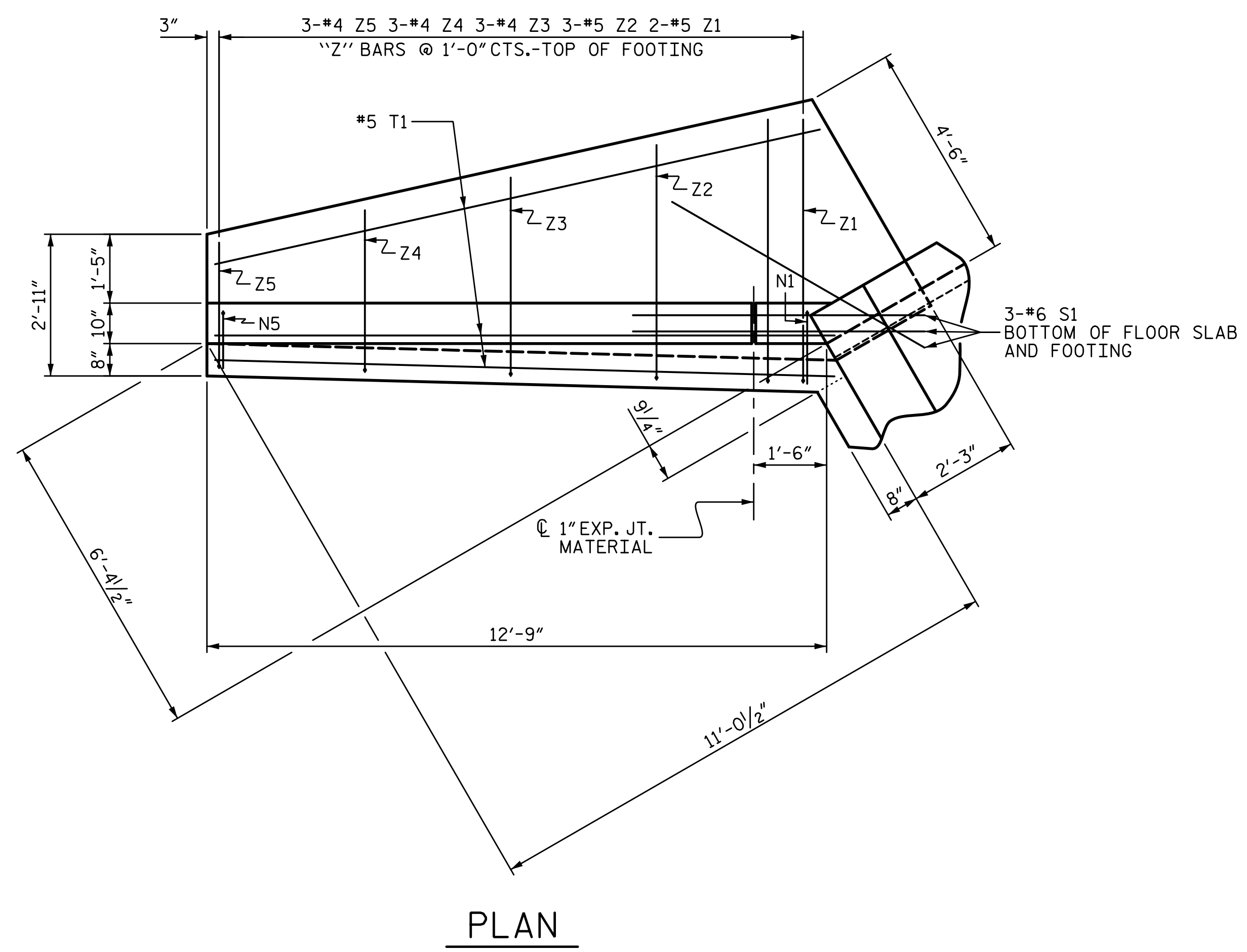
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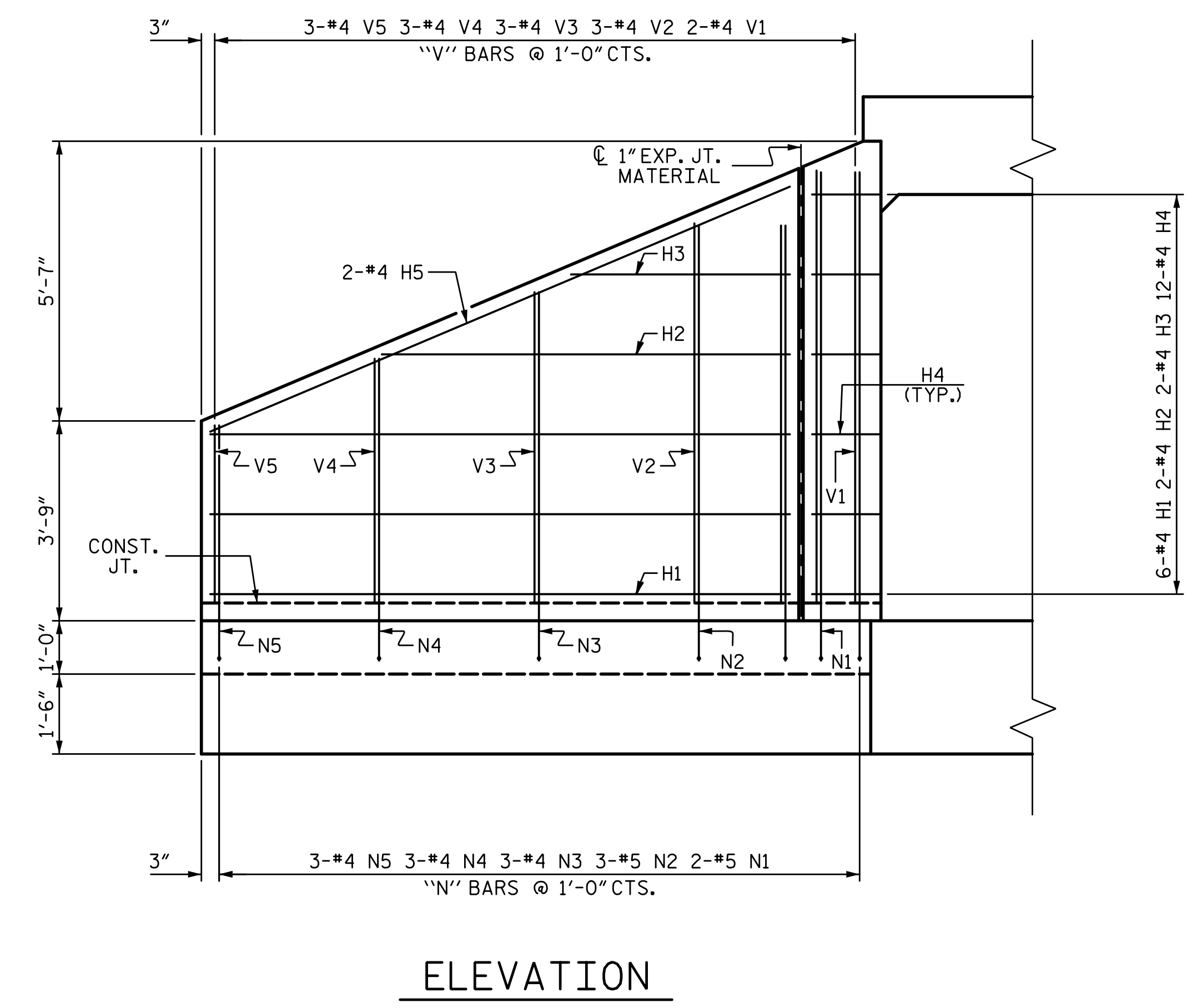
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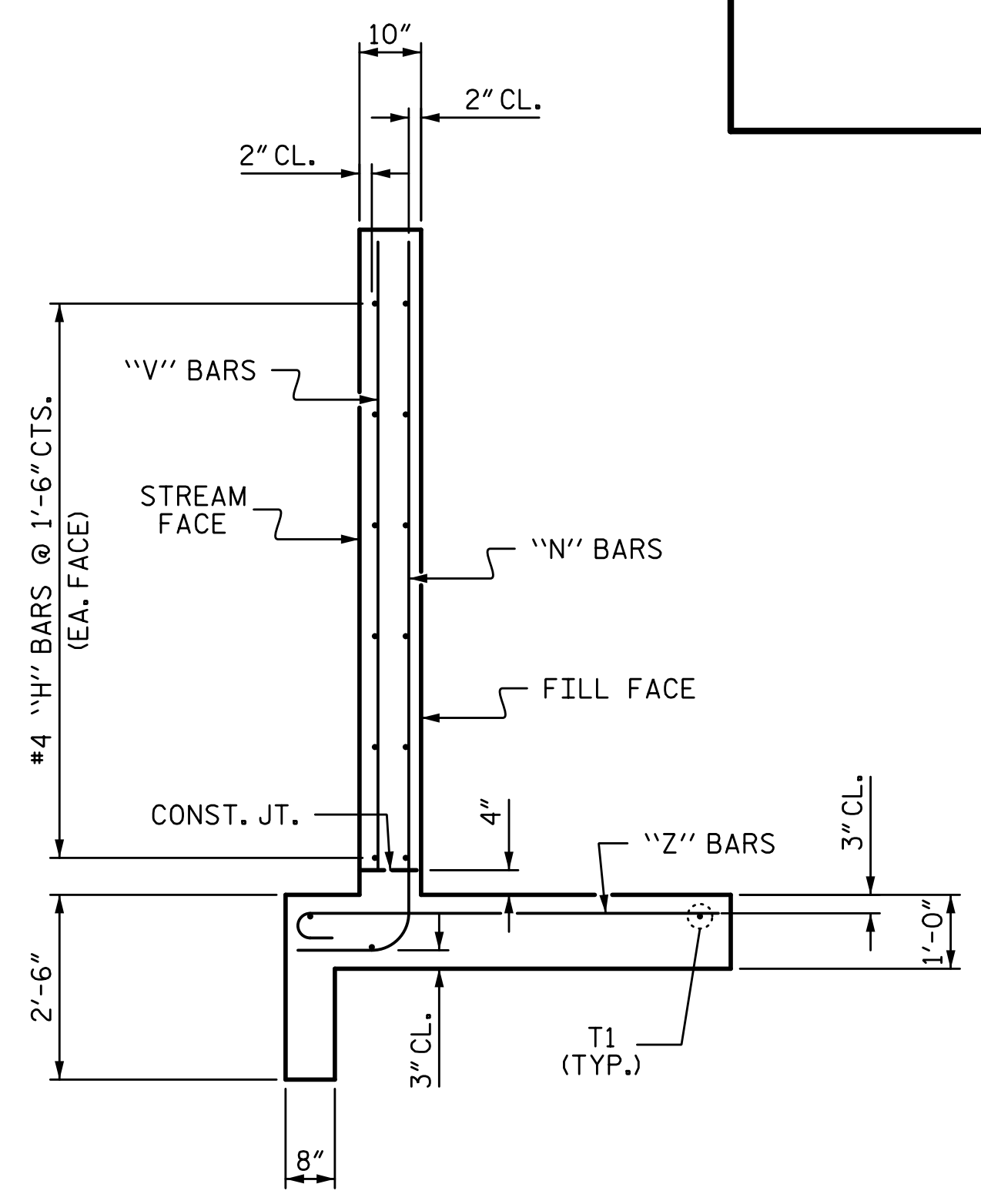
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PLAN



ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	4	STR	10'-10"	174
H2	8	4	STR	7'-8"	41
H3	8	4	STR	4'-1"	22
H4	48	4	1	3'-3"	104
H5	8	4	STR	11'-9"	63
N1	8	5	2	10'-2"	85
N2	12	5	2	9'-2"	115
N3	12	4	2	7'-11"	63
N4	12	4	2	6'-7"	53
N5	12	4	2	5'-4"	43
S1	12	6	STR	6'-0"	108
T1	12	5	STR	12'-9"	160
V1	8	4	STR	8'-1"	43
V2	12	4	STR	7'-1"	57
V3	12	4	STR	5'-10"	47
V4	12	4	STR	4'-7"	37
V5	12	4	STR	3'-4"	27
Z1	8	5	3	6'-0"	50
Z2	12	5	3	5'-5"	68
Z3	12	4	3	4'-7"	37
Z4	12	4	3	3'-10"	31
Z5	12	4	3	3'-1"	25
REINFORCING STEEL FOR 4 WINGS					1453 LB
CLASS "A" CONCRETE					
4 WINGS					21.4 CY
2 END CURTAIN WALLS					2.4 CY
TOTAL					23.8 CY

PROJECT NO. 17BP.5.R.51
WAKE COUNTY
 STATION: 15+68.00 -L-
 SHEET 4 OF 6

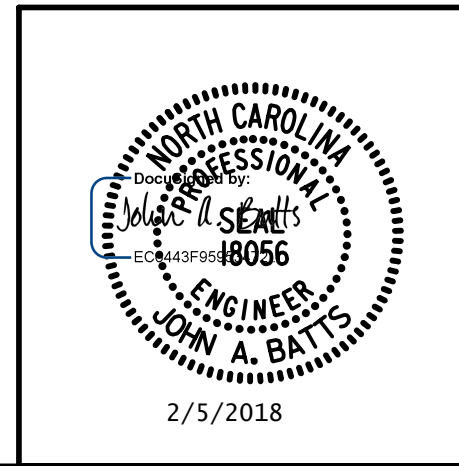
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**WINGS FOR
 CONCRETE BOX CULVERT**
 H = 8'-0" SLOPE 2:1
 90° SKEW

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

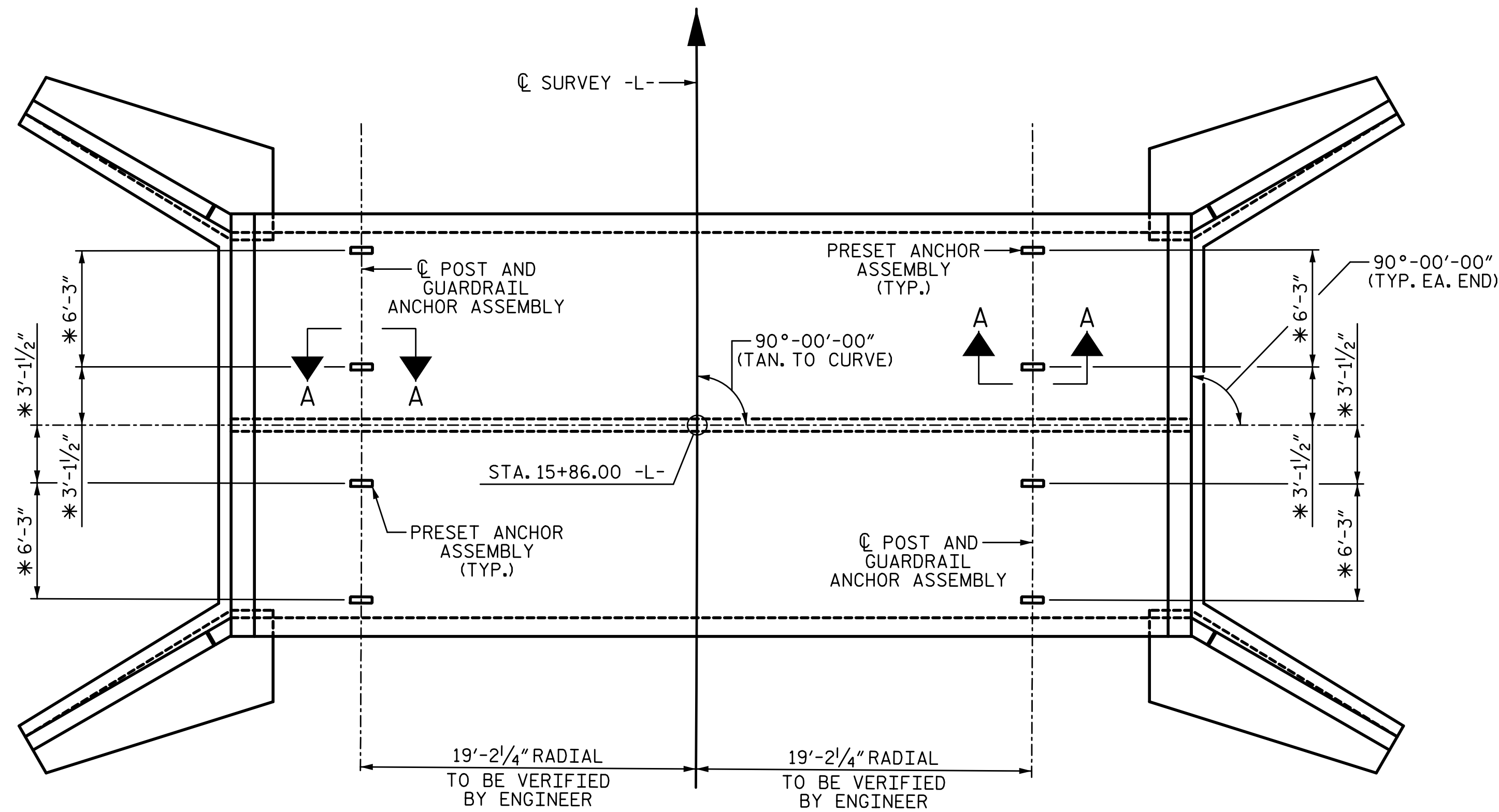
DRAWN BY: T. BANKOVICH DATE: 2-18
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 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-18

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SHEET NO.
 C-4
 TOTAL SHEETS
 6



PLAN

* DIMENSION ALONG ARC
(SHOWING GUARDRAIL ANHOR ASSEMBLY SPACING)

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 2 1/2".
- B. 4 - 1" Ø X 2 1/4" 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 2 1/4" 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 1/16" 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.

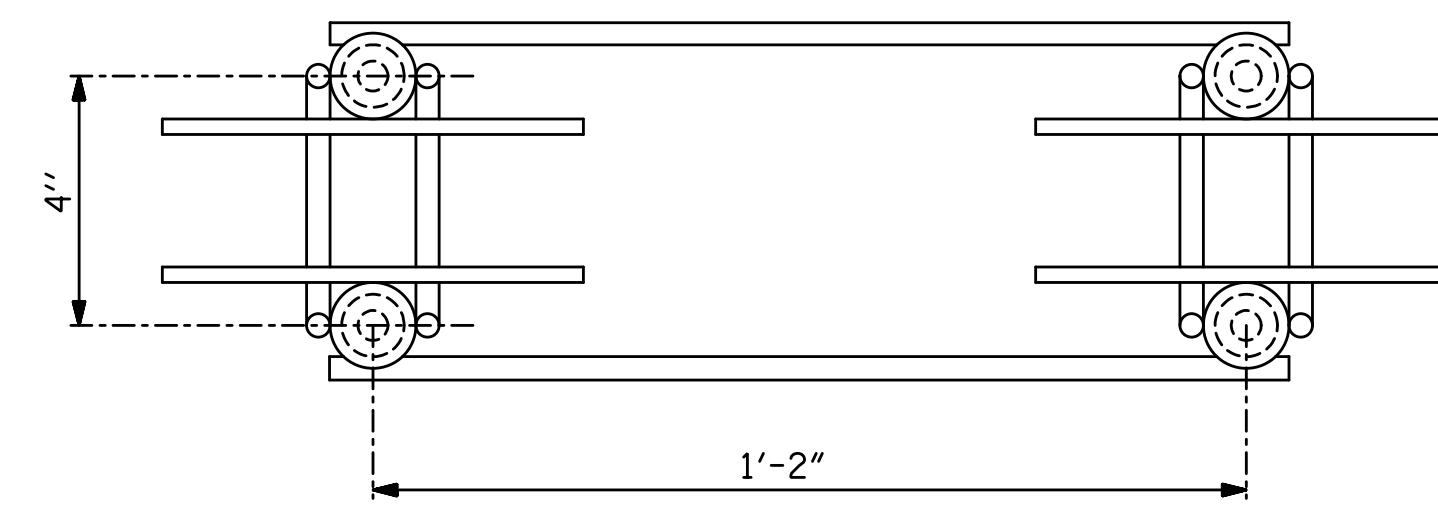
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

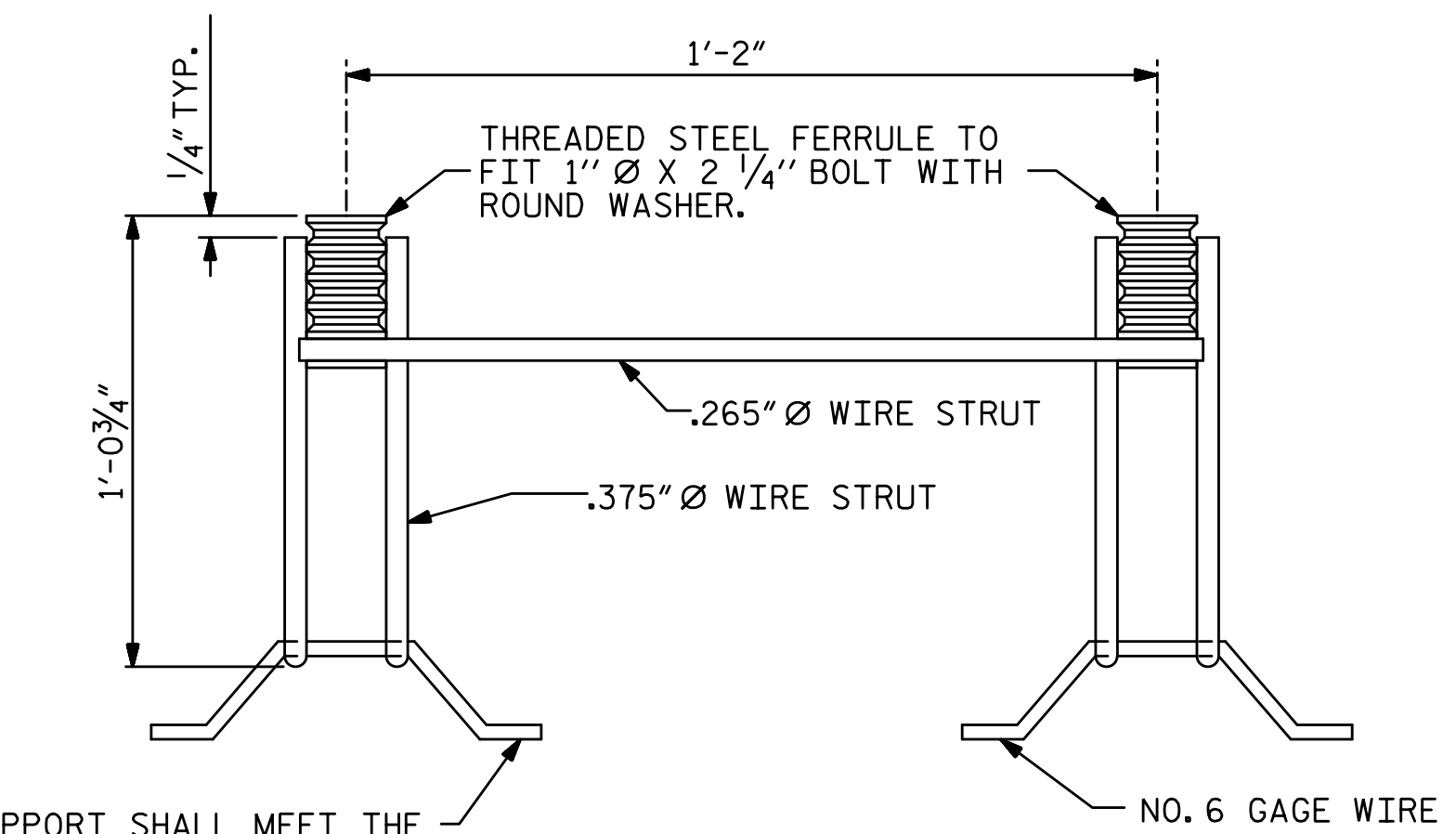
PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

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.

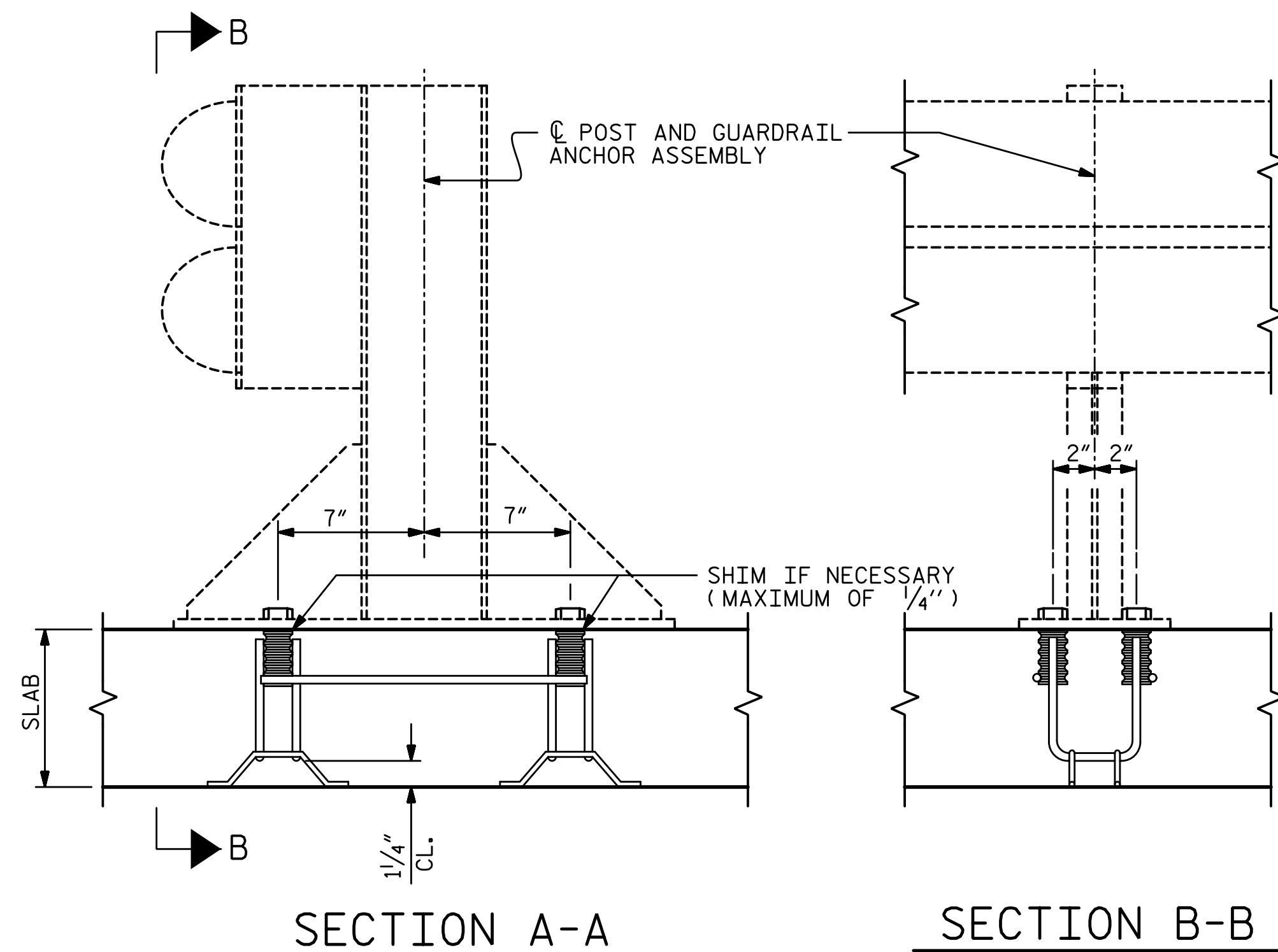


PLAN



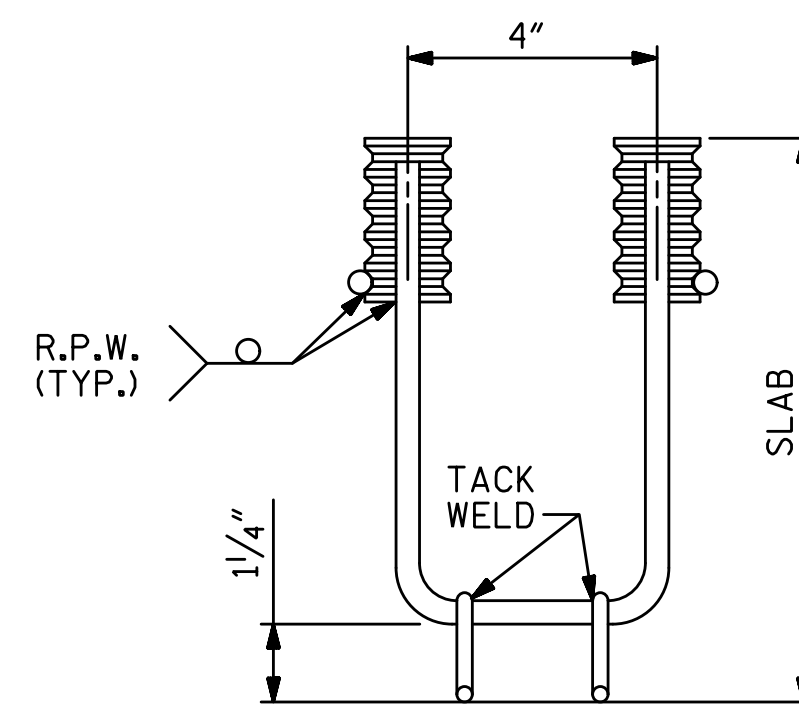
SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS



SECTION A-A

SECTION B-B

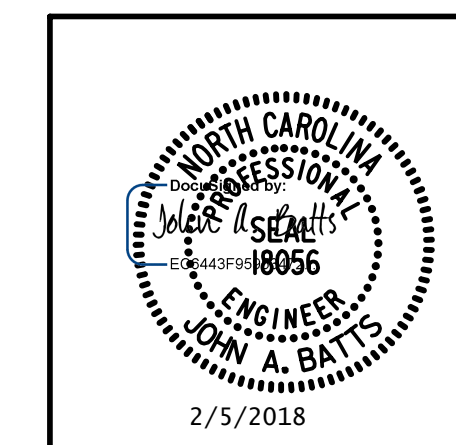


ELEVATION

THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

PLANS PREPARED BY:

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LICENSURE NO. C-2521



PROJECT NO. 17BP.5.R.51
WAKE COUNTY
STATION: 15+68.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS

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

SHEET NO.	C-5
TOTAL SHEETS	6

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DRAWN BY:	T. BANKOVICH	DATE:	2-18
CHECKED BY:	B.S. COX	DATE:	2-18
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	2-18

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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 x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{L1})	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	1.04	--	1.75	1.26	1	BOT SLAB - RIGHT	8.2	1.04	1	TOP SLAB - RT END	9.6		
	HL-93 (OPERATING)	N/A		1.35	--	1.35	1.63	1	BOT SLAB - RIGHT	8.2	1.35	1	TOP SLAB - RT END	9.6		
	HS-20 (INVENTORY)	36.000	②	1.07	38.5	1.75	1.13	2	BOT SLAB - RIGHT	8.2	1.07	1	TOP SLAB - RT END	9.6		
	HS-20 (OPERATING)	36.000		1.39	49.9	1.35	1.46	1	BOT SLAB - RIGHT	8.2	1.39	1	TOP SLAB - RT END	9.6		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.10	28.4	1.40	2.10	1	TOP SLAB - MID	8.2	2.39	1	TOP SLAB - RT END	9.6		
		SNGARBS2	20.000		1.97	39.4	1.40	1.97	1	TOP SLAB - MID	8.2	2.21	1	BOT SLAB - RT END	9.6	
		SNAGRIS2	22.000		2.04	44.9	1.40	2.04	1	BOT SLAB - RIGHT	8.2	2.13	1	TOP SLAB - RT END	9.6	
		SNCOTTS3	27.250		1.44	39.2	1.40	1.45	1	TOP SLAB - MID	8.2	1.44	1	BOT SLAB - RT END	9.6	
		SNAGGRS4	34.925		1.56	54.5	1.40	1.56	1	BOT SLAB - RIGHT	8.2	1.65	1	TOP SLAB - RT END	9.6	
		SNS5A	35.550		1.53	54.4	1.40	1.53	1	BOT SLAB - RIGHT	8.2	1.62	1	TOP SLAB - RT END	9.6	
		SNS6A	39.950		1.54	61.5	1.40	1.54	1	BOT SLAB - RIGHT	8.2	1.57	1	TOP SLAB - RT END	9.6	
		SNS7B	42.000		1.49	62.6	1.40	1.49	1	BOT SLAB - RIGHT	8.2	1.52	1	BOT SLAB - RT END	9.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.45	47.9	1.40	1.45	1	BOT SLAB - RIGHT	8.2	1.50	1	BOT SLAB - RT END	9.6	
		TNT4A	33.075		1.65	54.6	1.40	1.74	1	TOP SLAB - MID	8.2	1.65	1	TOP SLAB - RT END	9.6	
		TNT6A	41.600		1.53	63.6	1.40	1.53	1	BOT SLAB - RIGHT	8.2	1.60	1	TOP SLAB - RT END	9.6	
		TNT7A	42.000		1.49	62.6	1.40	1.49	1	BOT SLAB - RIGHT	8.2	1.53	1	BOT SLAB - RT END	9.6	
		TNT7B	42.000		1.58	66.4	1.40	1.58	1	BOT SLAB - RIGHT	8.2	1.63	1	TOP SLAB - RT END	9.6	
		TNAGRIT4	43.000		1.60	68.8	1.40	1.71	1	BOT SLAB - RIGHT	8.2	1.60	1	TOP SLAB - RT END	9.6	
TNAGT5A	45.000		1.60	72.0	1.40	1.60	1	BOT SLAB - RIGHT	8.2	1.60	1	TOP SLAB - RT END	9.6			
TNAGT5B	45.000		③	1.32	59.4	1.40	1.32	1	BOT SLAB - RIGHT	8.2	1.37	1	BOT SLAB - RT END	9.6		

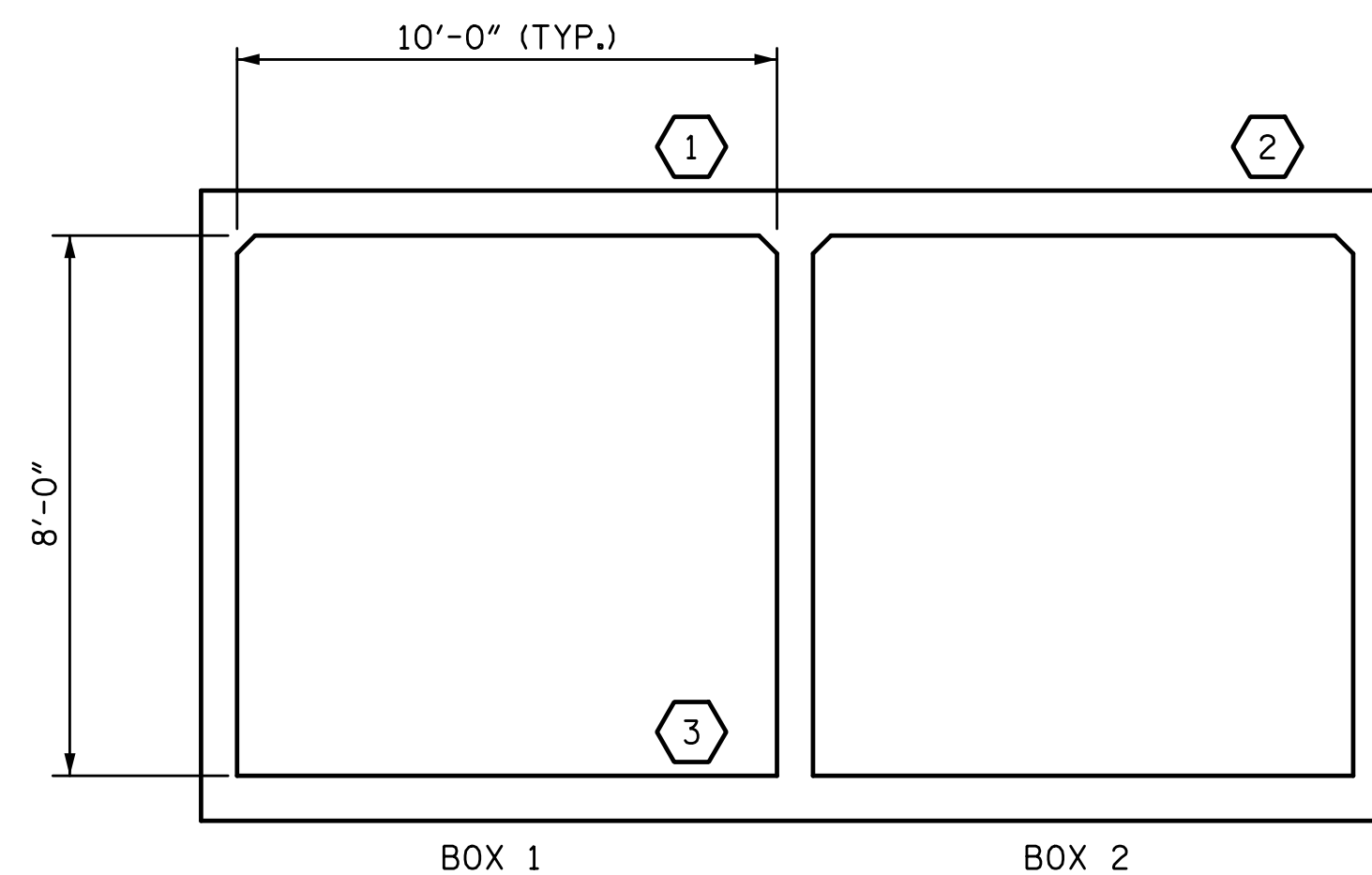
LOAD FACTORS:

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	--

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

#	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.5.R.51
WAKE COUNTY
STATION: 15+68.00 -L-

SHEET 6 OF 6

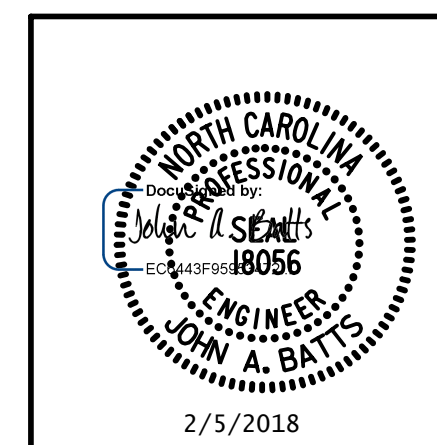
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

PLANS PREPARED BY:

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DRAWN BY: T. BANKOVICH DATE: 2-18
CHECKED BY: B.S. COX DATE: 2-18
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-18

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 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 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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.

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