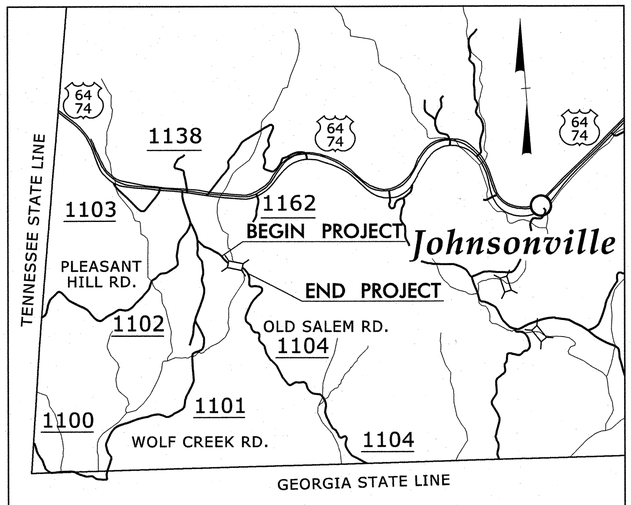
09/08/99

CONTRACT: DN00164 WBS ELEMENT: 17BP.14.R.31

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

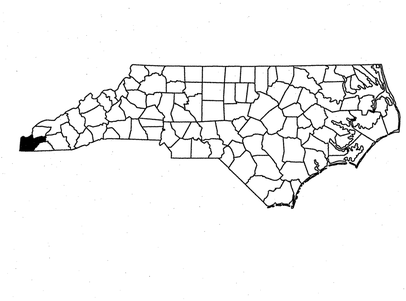
CHEROKEE COUNTY

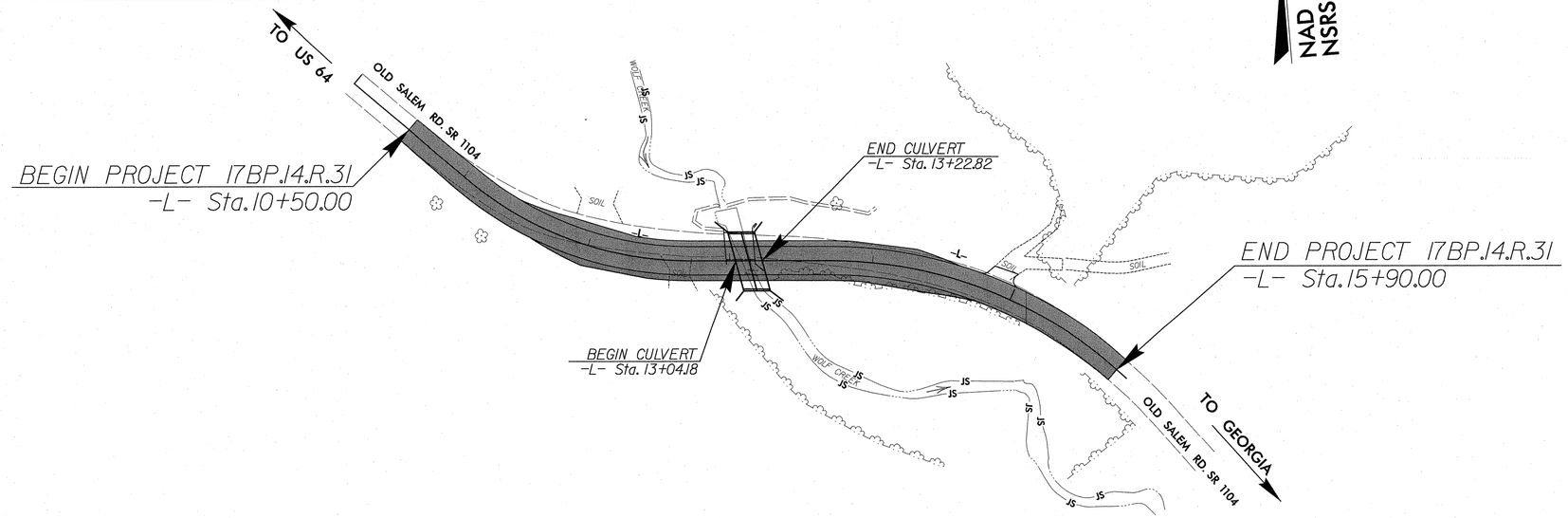
LOCATION: REPLACE BRIDGE No. 97 ON SR 1104 OVER WOLF CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.31	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.31	N/A	PE
17BP.14.R.31	N/A	ROW, UTL
17BP.14.R.31	N/A	CONST.





THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

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GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2012 = 120
ADT 2035 = 189

T = 6 %
V = 30 MPH

FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.14.R.31 = 0.098 MILES
LENGTH OF STRUCTURE TIP PROJECT 17BP.14.R.31 = 0.004 MILES
TOTAL LENGTH TIP PROJECT 17BP.14.R.31 = 0.102 MILES

Prepared In the Office of:
RS&H
ARCHITECTS–ENGINEERS–PLANNERS, INC.
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 1, 2012

LETTING DATE:
MARCH 11, 2014

KENNETH HERRING, PE
PROJECT ENGINEER

JASON TALLEY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.
11-21-2013
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY
11-21-2013
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/17/2013
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PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.31	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

12-18-13

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-6	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
UO-1	UTILITIES BY OTHERS
X-0	CROSS-SECTION SUMMARY
X-1 THRU X-5	CROSS-SECTIONS
C-1 THRU C-9	STRUCTURE PLANS

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 07/30/12

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

AT & T

BLUE RIDGE MOUNTAIN ELECTRIC MEMBERSHIP CORPORATION

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 IN ACCORDANCE WITH SECTION 801 OF THE 2012 NORTH CAROLINA STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

2012 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, 2012 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	
815.03	Pipe Underdrain and Blind Drain
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels

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PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.R.31	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

5/28/99

SURVEY CONTROL SHEET 17BP.14.R.31
–FINAL–

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	1-C
LOCATION AND SURVEYS	

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BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	499895.9920	414093.6110	1794.72	10+38.40	20.87 LT
2	BL-2	499789.8060	414273.6442	1781.48	12+68.24	23.44 LT
3	BL-3	499726.6406	414514.4221	1780.50	15+12.23	14.79 LT

BM1 ELEVATION - 1794.74
N 499794 E 414132
L STATION 11+34.00 26 RIGHT
8 INCH SPIKE SET IN BASE OF 18 INCH
WALNUT TREE

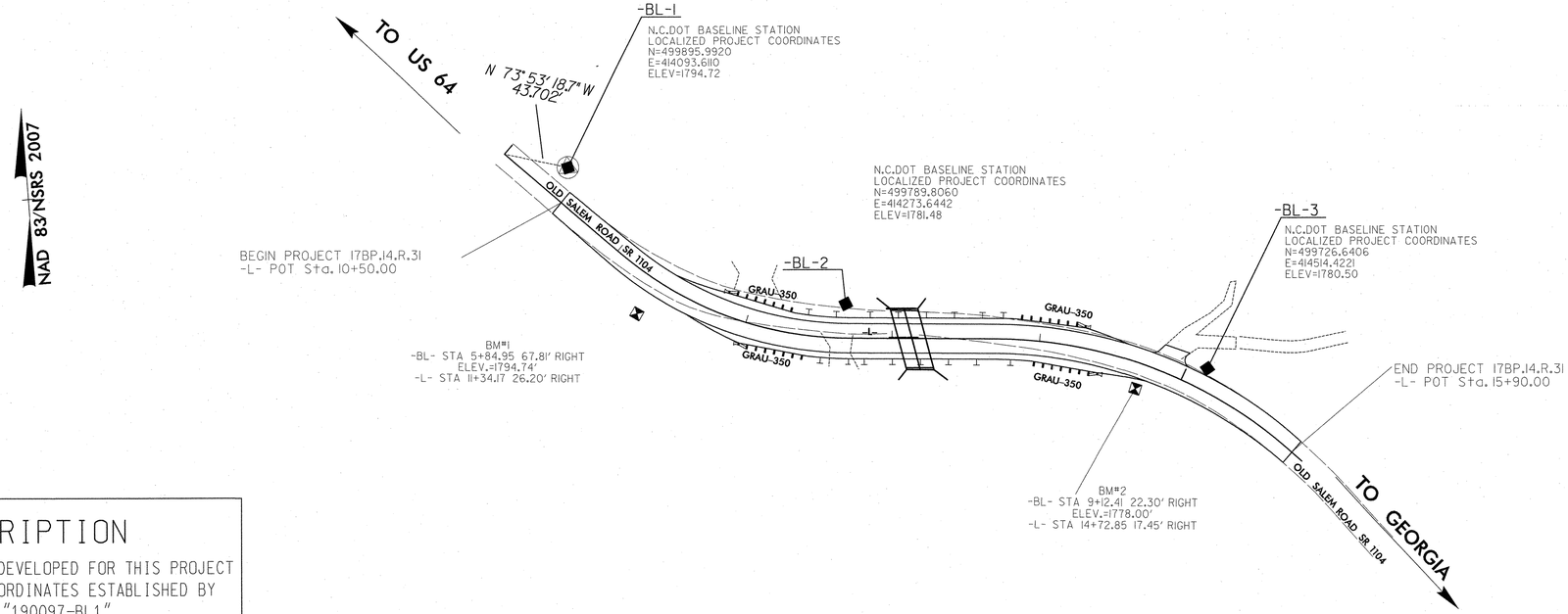
BM2 ELEVATION - 1778.00
N 499717 E 414465
L STATION 14+73.00 17 RIGHT
8 INCH SPIKE SET IN BASE OF 18 INCH
POPLAR TREE

FINAL -L-

TYPE	STATION	NORTH	EAST
POT	10+00.00	550765.92	557631.22
PC	12+10.20	550974.49	557657.38
PI	12+45.60	551009.61	557661.78
PT	12+80.67	551042.75	557674.24
PC	13+38.65	551097.01	557694.65
PI	14+13.31	551166.89	557720.93
PT	14+81.56	551236.90	557694.99
POT	15+75.39	551324.88	557662.39

ROW MARKER AND PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
-L-	10+50.00	25.00	499855.1998	414069.6399
-L-	11+04.70	55.00	499795.4200	414087.4854
-L-	12+00.00	50.00	499736.2360	414186.6573
-L-	12+71.77	40.00	499726.2995	414271.5558
-L-	12+71.77	65.00	499701.3854	414269.4847
-L-	13+70.81	65.00	499693.1798	414368.1888
-L-	13+70.81	40.00	499718.0939	414370.2595
-L-	15+85.49	40.00	499640.4045	414534.9662
-L-	15+85.49	25.00	499650.8709	414545.7112



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "190097-BL1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 499895.992(ft) EASTING: 414093.611(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998006735
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "190097-BL1" TO -L- STATION 10+00.00 IS N 73°53'18.69" W 43.702'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS BASED ON NCDOT MONUMENT 190097 -BL1- (ELEV = 1794.72')(NAVD 1988)
GEOIDAL MODEL: G09NC

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: 190097_LS_CONTROL.TXT

   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.

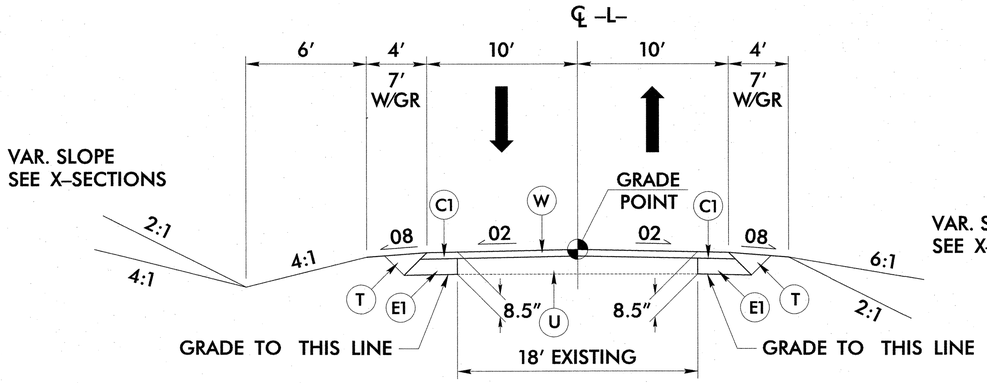
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PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 5½" 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 B25.0B, 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	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

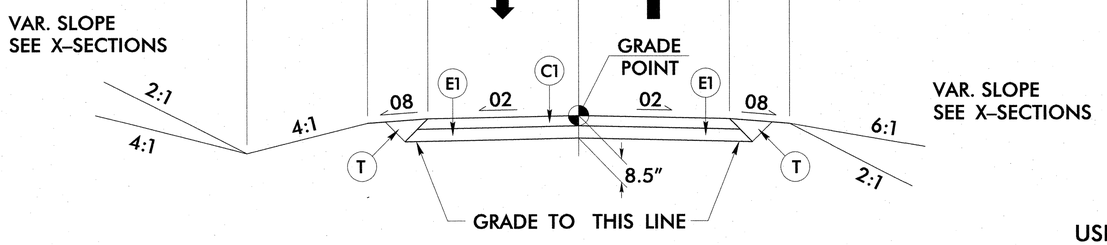
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

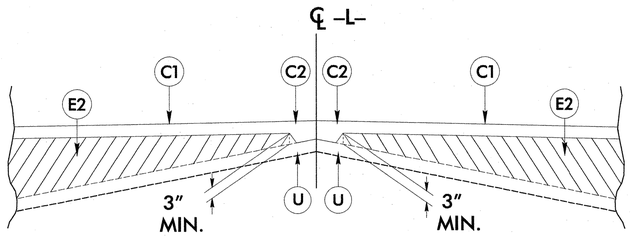
–L– STA. 10+50.00 TO –L– STA. 12+50.00
–L– STA. 13+50.00 TO –L– STA. 15+90.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 12+50.00 TO –L– STA. 13+50.00



STANDARD WEDGING DETAIL

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	2

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029472 ENGINEER JASON M. TALLEY 11-21-2013

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES FOR CONTRACT – DN00164

Item Number	Sec #	Quantity	Unit	Description
0000100000–N	800	1	LS	MOBILIZATION
0000400000–N	801	1	LS	CONSTRUCTION SURVEYING
0043000000–N	226	1	LS	GRADING
0050000000–E	226	1	ACR	SUPP CLEARING & GRUBBING
0057000000–E	226	50	CY	UNDERCUT EXCAVATION
0195000000–E	265	50	CY	SELECT GRANULAR MATERIAL
0196000000–E	270	50	SY	GEOTEXTILE SOIL STABILIZATION
1220000000–E	545	50	TON	INCIDENTAL STONE BASE
1489000000–E	610	320	TON	ASP CONC BASE CRS B25.0B
1519000000–E	610	270	TON	ASP CONC SURF CRS S9.5B
1575000000–E	620	35	TON	ASP FOR PLANT MIX
2022000000–E	815	23	CY	SUBDRAIN EXCAVATION
2033000000–E	815	17	CY	SUBDRAIN FINE AGGREGATE
2044000000–E	815	100	LF	6" PERF SUBDRN PIPE
2070000000–N	815	1	EA	SUBDRN PIPE OUTLET
2077000000–E	815	6	LF	6" OUTLET PIPE
3030000000–E	862	325	LF	STL BM GUARDRAIL
3150000000–N	862	5	EA	ADDIT GUARDRAIL POSTS
3270000000–N	SP	4	EA	GR ANCHOR TYPE 350
3649000000–E	876	70	TON	RIP RAP, CLASS B
3656000000–E	876	180	SY	GEOTEXTILE FOR DRAINAGE
4400000000–E	1110	160	SF	WORK ZONE SIGNS (STAT)
4410000000–E	1110	20	SF	WORK ZONE SIGNS (BARR)
4430000000–N	1130	70	EA	DRUMS
4445000000–E	1145	16	LF	BARRICADES (TYPE III)
4455000000–N	1150	6	DAY	FLAGGER
4465000000–N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4490000000–E	1170	75	LF	PORT CONC BARRIER(ANCHRD)
4795000000–E	1205	20	LF	24' COLD APPL PLSTIC LINE TYPE IV
4810000000–E	1205	4320	LF	PAINT PVMT MARKINGS 4"
6000000000–E	1605	755	LF	TEMPORARY SILT FENCE
6009000000–E	1610	30	TON	EROS CONTRL STONE CL B
6012000000–E	1610	85	TON	SEDIMENT CONTROL STONE
6015000000–E	1615	1	ACR	TEMPORARY MULCHING
6018000000–E	1620	50	LB	SEED FOR TEMP SEEDING
6021000000–E	1620	0.25	TON	FERT FOR TEMP SEEDING
6029000000–E	SP	100	LF	SAFETY FENCE
6030000000–E	1630	20	CY	SILT EXCAVATION
6036000000–E	1631	3000	SY	MATTING FOR EROS CONTROL
6042000000–E	1632	160	LF	¼" HARDWARE CLOTH
6070000000–N	1639	2	EA	SPECIAL STILLING BASINS
6071020000–E	SP	5	LB	POLYACRYLAMIDE (PAM)
6084000000–E	1660	0.75	ACR	SEEDING AND MULCHING
6090000000–E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000–E	1661	0.25	TON	FERT FOR REPAIR SEEDING
6096000000–E	1662	50	LB	SEED FOR SUPP SEEDING
6108000000–E	1665	1.25	TON	FERTILIZER TOPDRESSING
6111000000–E	SP	300	LF	IMPERVIOUS DIKE
6117000000–N	SP	7	EA	RESPONSE FOR EROS CONTROL
7980000000–N	SP	1	EA	GENERIC SIGNAL ITEM (EA) (PORTABLE TRAFFIC SIGNAL SYSTEM) (ACTUATED)
8035000000–N	402	1	LS	REMV EXIST STR (13+13.50)
8126000000–N	414	1	LS	CULV EXCAV @ (13+13.50)
8133000000–E	414	54.6	TON	FND CONDIT MAT, BOX CULV
8140000000–E	416	42	CY	CHANNEL EXCAVATION
8196000000–E	420	99.2	CY	CLASS A CONCRETE (CULV)
8245000000–E	425	14874	LB	REINF STEEL (CULVERT)
8608000000–E	876	55	TON	RIP RAP II (2'–0")

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12/06/07

COMPUTED BY: JMT DATE: 7/2012
CHECKED BY: RJD DATE: 11/2013

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	3-A

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- STA 10+50.00	-L- STA 15+90.00	439	405		34
SUBTOTALS:					
PROJECT TOTALS:		439	405		34
GRAND TOTALS:		439			
SAY:		450			

EST. DDE = 0 CY
EST UNDERCUT = 50 CY
EST SELECT GRANULAR MATERIAL = 50 CY
EST FABRIC FOR SOIL STABILIZATION = 50 CY

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	10+80.00	12+50.00	LT	120
-L-	12+50.00	12+97.00	CL	95
-L-	13+16.00	13+50.00	CL	67
-L-	13+50.00	15+49.00	LT	45
			TOTAL:	327
			SAY:	330

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE 350										EA	G	NG				
-L-	11+82.00	14+32.00	LT.	250.00			14+31.95	11+82.11	4	7	1	1	50	50	2																
-L-	11+97.00	14+47.00	RT.	250.00			11+97.00	14+46.83	4	7	1	1	50	50	2																
			SUBTOTALS	500																											
			ANCHOR DEDUCTION	-200																											
			TOTAL	300																											
			SAY	325																											

ANCHOR DEDUCTION
TYPE GRAU 350: 4 @ 50.00' = 200'
GRAND TOTAL = 200'
ADDITIONAL GUARDRAIL POSTS = 5

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER FRANK M. TALLEY 11-21-2013

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR. 11-21-2013

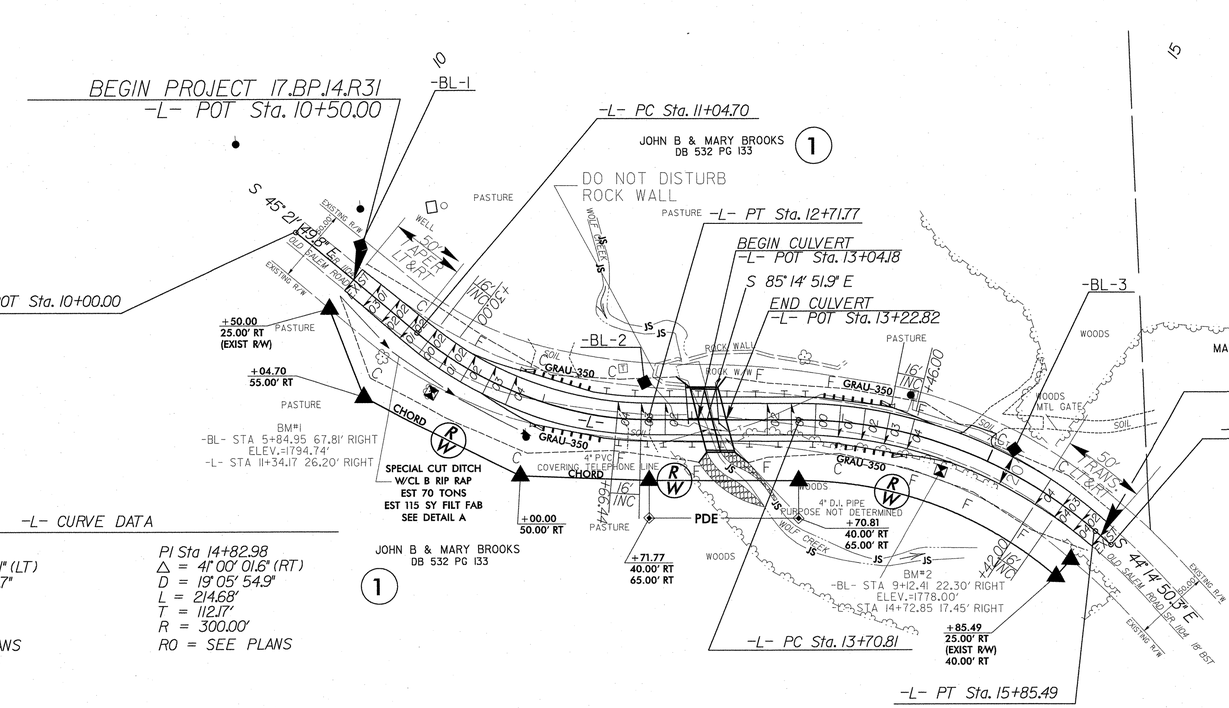
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NAD 83/NSRS 2007

REVISIONS 8/17/99

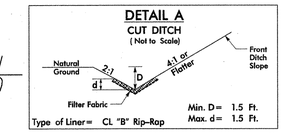


-L- CURVE DATA

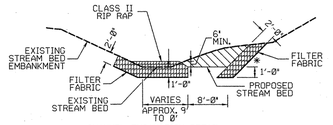
PI Sta 11+91.78
△ = 39° 53' 02.1" (LT)
D = 23° 52' 23.7"
L = 167.07'
T = 87.08'
R = 240.00'
RO = SEE PLANS

PI Sta 14+82.98
△ = 41° 00' 01.6" (RT)
D = 19° 05' 54.9"
L = 214.68'
T = 112.17'
R = 300.00'
RO = SEE PLANS

DETAIL A
CUT DITCH
(Not to Scale)



FROM -L- STA. 10+50.00 TO -L- STA. 12+00.00 RT.



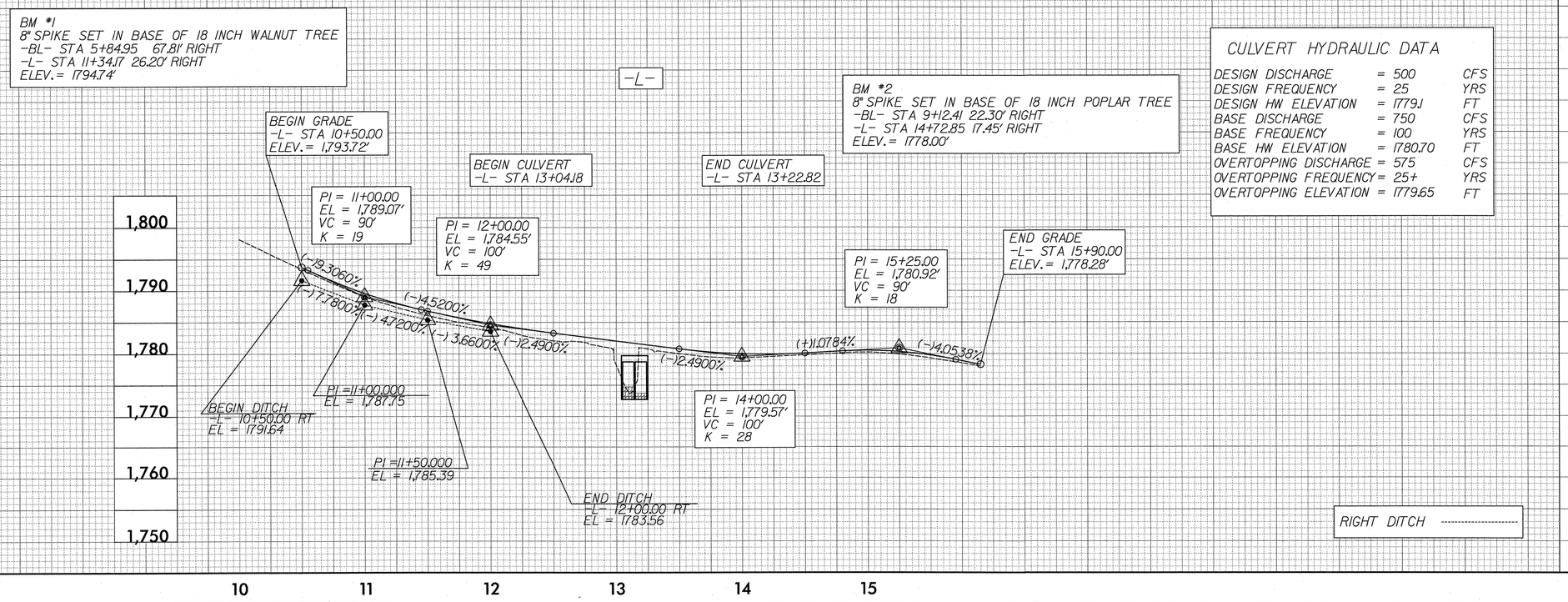
CHANNEL EXCAVATION DETAIL

CHANNEL EXCAVATION

*SLOPE VARIES FROM 2:1 TO EXISTING

EST. EXCAVATION = 42 CY (STRUCTURE PAY ITEM)
EST. CLASS II RIP RAP = 55 TONS (STRUCTURE PAY ITEM)
EST. FILTER FABRIC = 58 SY

FOR CULVERT PLANS, SEE SHEET C-1 THRU C-9



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1779.1	FT
BASE DISCHARGE	= 750	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1780.70	FT
OVERTOPPING DISCHARGE	= 575	CFS
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING ELEVATION	= 1779.65	FT

RIGHT DITCH ----------

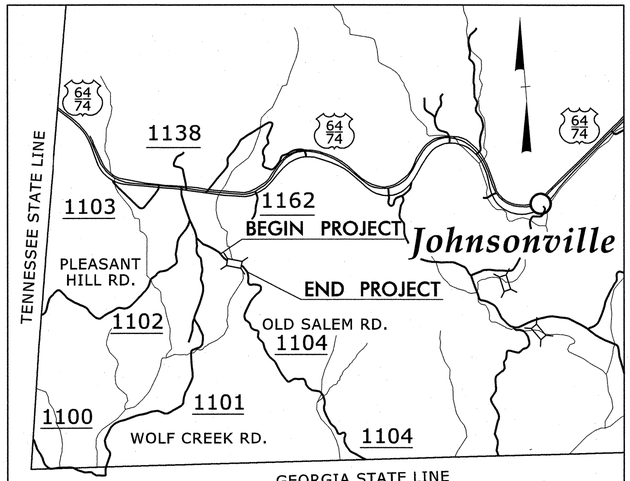
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

CHEROKEE COUNTY





VICINITY MAP

LOCATION: BRIDGE N0. 97 ON SR 1104 OVER WOLF CREEK

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND AND MANAGEMENT STRATEGIES
TMP-1B	TRANSPORTATION OPERATIONS PLAN: GENERAL NOTES
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE III
TMP-6	DETAIL FOR WORK ZONE SIGNING

SHEET NO.
TMP-1

17BP.14.R.31

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1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203

KENNETH HERRING, PE *PROJECT ENGINEER*

JASON TALLEY, PE *PROJECT DESIGN ENGINEER*

APPROVED: J. Talley
DATE: 11-21-2013

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANAUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.06	WARNING SIGNS FOR BLASTING ZONES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
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
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

MANAGEMENT STRATEGIES

- DURING CONSTRUCTION, SR 1104 TRAFFIC WILL BE PLACED IN A ONE-LANE, TWO-WAY PATTERN ON THE TEMPORARY ONSITE DETOUR.
- TEMPORARY PORTABLE TRAFFIC SIGNALS PLACED AT THE BEGINNING AND END OF AN ONSITE DETOUR WILL MANAGE SR 1104 TRAFFIC.
- THE TIE IN CONSTRUCTION, TRAFFIC SHIFTS, PLACEMENT OF FINAL SURFACE COURSE AND PAVEMENT MARKINGS WILL BE PERFORMED USING FLAGGER OPERATIONS.

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- PROPOSED CONSTRUCTION
- PAVEMENT REMOVAL
- PAVEMENT MILLING

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY PAVEMENT MARKING

NONE

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- TEMPORARY PORTABLE TRAFFIC SIGNAL SYSTEM

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

APPROVED: _____ DATE: 11-21-2013

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

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ROADWAY STANDARD DRAWINGS, LEGEND, AND MANAGEMENT STRATEGIES

11/20/2013
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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-1B

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

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

E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

F) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200' IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

K) 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.

L) 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.

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

N) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100' IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

O) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

P) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

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

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

S) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES DRUMS PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
-L- (SR 1104, OLD SALEM ROAD)	COLD APPLIED PLASTIC (TYPE 4)	N/A

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

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

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

MISCELLANEOUS

X) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 200' AND 200' RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

APPROVED: J. Talley DATE: 11-21-2013

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JOHN M. TALLEY

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TRANSPORTATION OPERATIONS PLAN

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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-2

PHASING

NOTE: MAINTAIN ACCESS TO ALL RESIDENCES WITHIN THE PROJECT LIMITS.

PHASE I

NOTE: PRIOR TO CONSTRUCTION, INSTALL ADVANCE WORK ZONE WARNING SIGNS AS SHOWN ON TMP-6.

USING FLAGGERS (RDS 1101.02, SHEET 1 OF 15) INSTALL AND COVER TEMPORARY PORTABLE TRAFFIC SIGNALS.

INSTALL TEMPORARY STOPBAR CAPS. PLACE DRUMS FROM -L- STA. 10+50.00 TO -L- STA. 15+90.00 AS SHOWN ON TMP-3.

THE CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE THE WORK IN PHASE I, STEP 1 IN ONE WORK PERIOD.

STEP 1: USING RSD 1101.02, SHEET 1 OF 15, SIGNALS, AND DRUMS COMPLETE THE FOLLOWING AS SHOWN ON TMP-3 AND CONSTRUCTION PLANS:

- ACTIVATE TEMPORARY PORTABLE TRAFFIC SIGNAL SYSTEM.
- SHIFT TRAFFIC TO A ONE-LANE, TWO-WAY PATTERN ON EXISTING SR 1104 -L- LT. FROM 250′ IN ADVANCE OF -L- STA. 10+50.00 +/- TO 250′ PAST -L- STA. 15+90.00 +/-.
- NOTE: THE CONTRACTOR SHALL UTILIZE SIGNALS, AS DIRECTED BY THE ENGINEER, FOR LANE/ROAD CLOSURES. HOWEVER, DRUMS SHALL BE USED TO DELINEATE THE TRAVEL WAY. PROVIDE MINIMUM OFFSET OF 2′ BETWEEN DRUMS AND TRAVEL WAY. PLACE DRUMS SPACED 10′ C-C IN LOCATIONS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
- UNDER INTERMITTENT ROAD CLOSURE AS NEEDED, REMOVE EXISTING RIGHT SIDE BRIDGE RAIL. CUT APPROXIMATELY 6′ OFF RIGHT SIDE OF EXISTING STRUCTURE AND REMOVE. REINSTALL BRIDGE RAIL TO BRIDGE DECK APPROXIMATELY 14′ FROM THE EXISTING LEFT SIDE BRIDGE RAIL.

NOTE: CONSTRUCT ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE.

STEP 2: USING RSD 1101.02, SHEET 1 OF 15, AND SIGNALS, COMPLETE THE FOLLOWING AS SHOWN ON TMP-3 AND CONSTRUCTION PLANS:

- CONSTRUCT -L- RT. PROPOSED 8′X6′ RCBC AND ROADWAY APPROACHES UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM -L- STA. 10+50 +/- RT. TO -L- STA. 15+90 +/- RT.
- INSTALL DRUMS AND TYPE III BARRICADES TO KEEP PROPOSED STRUCTURE AND APPROACHES CLOSED TO TRAFFIC FROM -L- STA. 10+50 +/- RT TO -L- STA. 15+90 +/- RT.
- INSTALL PERMANENT GUARDRAIL ON THE RIGHT SIDE OF -L- RT. FROM STA. 11+97 +/- TO STA. 14+47 +/-.

PHASE II

NOTE: THE CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE THE WORK IN PHASE II, STEP 1 IN ONE WORK PERIOD.

STEP 1: USING RSD 1101.02, SHEET 1 OF 15, SIGNALS, AND DRUMS TO DELINEATE THE TRAVEL WAY AND MAINTAIN ONE-LANE, TWO-WAY PATTERN, COMPLETE THE FOLLOWING AS SHOWN ON TMP-4 AND CONSTRUCTION PLANS:

- INSTALL PORTABLE CONCRETE BARRIER (PCB) 2′ TO THE RIGHT OF THE CENTERLINE OF PROPOSED -L- STA. 12+75 +/- TO -L- STA. 13+50 +/- AS SHOWN ON TMP-4. OFFSET THE LAST SECTION OF PCB AS DIRECTED BY THE ENGINEER. INSTALL TEMPORARY CRASH CUSHION ON EITHER END OF PCB.
- REMOVE TYPE III BARRICADES FROM -L- RT. APPROACHES.
- INSTALL DRUMS AND TYPE III BARRICADES TO CLOSE EXISTING SR 1104 -L- LT. TO TRAFFIC FROM -L- STA. 10+50 +/- TO -L- 15+90 +/- AND SHIFT TRAFFIC TO -L- RT.

NOTE: CONSTRUCT ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE.

STEP 2: USING RSD 1101.02, SHEET 1 OF 15, AND SIGNALS, COMPLETE THE FOLLOWING AS SHOWN ON TMP-4 AND CONSTRUCTION PLANS:

- REMOVE REMAINING PORTION OF EXISTING STRUCTURE (LEFT SIDE).
- REMOVE EXISTING ROADWAY BED AS SHOWN FROM -L- STA. 10+80 +/- LT. TO -L- STA. 15+49 +/- LT. OR AS DIRECTED BY ENGINEER.
- CONSTRUCT -L- LT. PROPOSED 8′X6′ RCBC AND ROADWAY APPROACHES UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM -L- STA. 10+50 +/- LT. TO -L- STA 15+90 +\- LT.
- INSTALL PERMANENT GUARDRAIL ON THE LEFT SIDE OF -L- LT. FROM STA. 11+82 +/- TO STA. 14+32 +/-.

PHASE III

NOTE: CONSTRUCT ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE.

STEP 1: USING RSD 1101.02, SHEET 1 OF 15, SIGNALS, AND DRUMS TO DELINEATE THE TRAVEL WAY AND MAINTAIN ONE-LANE, TWO-WAY PATTERN, COMPLETE THE FOLLOWING AS SHOWN ON TMP-5 AND CONSTRUCTION PLANS:

- REMOVE PORTABLE CONCRETE BARRIER ON THE LEFT SIDE OF -L- RT.
- PLACE THE FINAL SURFACE LAYER AND PAVEMENT MARKINGS ON -L- STA. 10+50.00 RT. TO -L- STA 15+90.00 RT. (SEE PMP-2).

STEP 2: USING RSD 1101.02, SHEET 1 OF 15, SIGNALS, AND DRUMS TO DELINEATE THE TRAVEL WAY AND MAINTAIN ONE-LANE, TWO-WAY PATTERN, COMPLETE THE FOLLOWING AS SHOWN ON CONSTRUCTION PLANS:

- PLACE THE FINAL SURFACE LAYER AND PAVEMENT MARKINGS ON -L- STA. 10+50.00 LT. TO -L- STA 15+90.00 LT. (SEE PMP-2).

STEP 3: - DEACTIVATE AND REMOVE TEMPORARY PORTABLE TRAFFIC SIGNAL SYSTEM, REMOVE SIGNING, AND REMOVE TEMPORARY DEVICES ASSOCIATED WITH ONE-LANE, TWO-WAY TRAFFIC PATTERN.

- OPEN TRAFFIC TO FINAL PATTERN.

APPROVED: J. Talley DATE: 12-06-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

RS&H

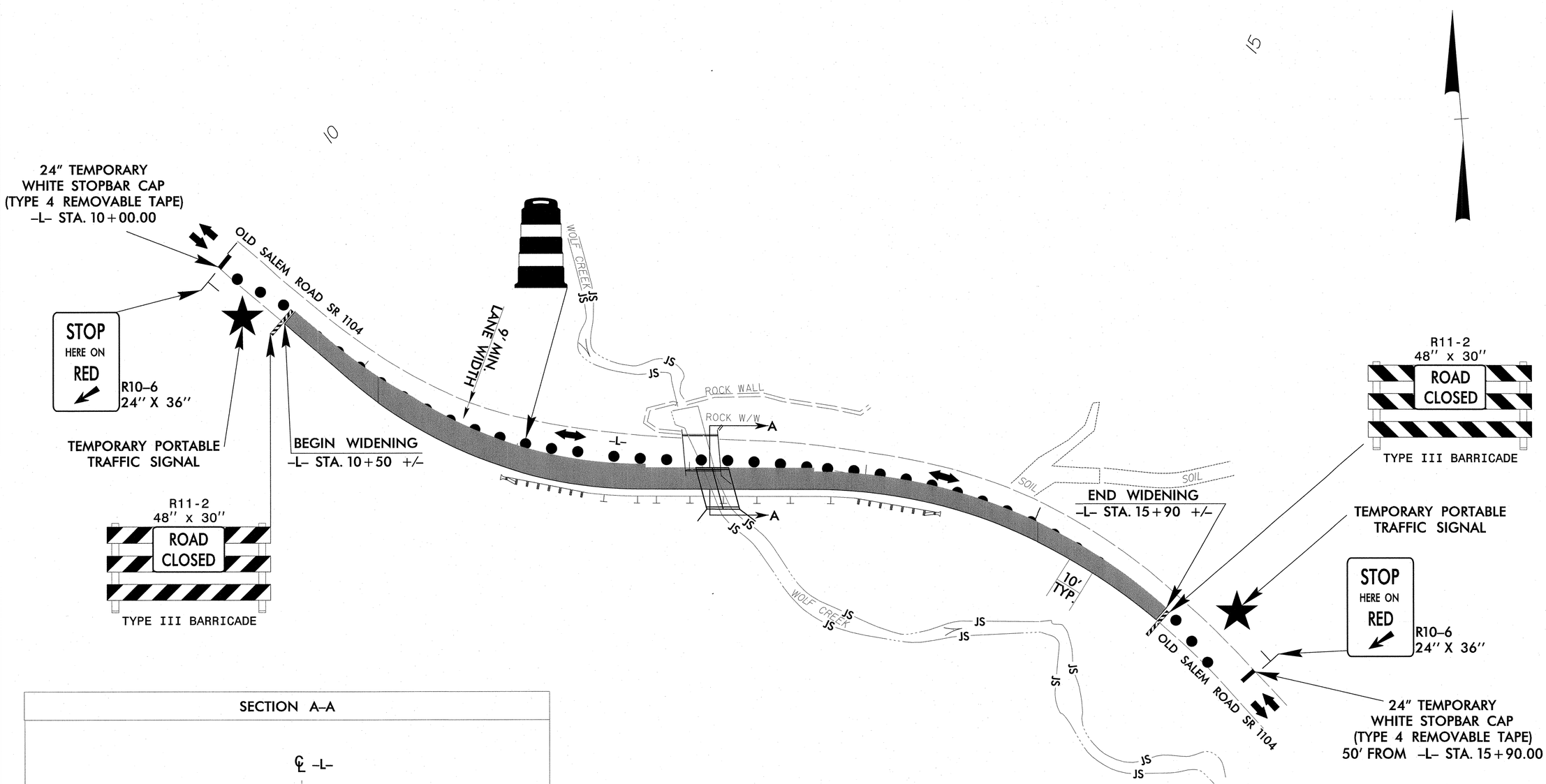
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TEMPORARY TRAFFIC CONTROL PHASING

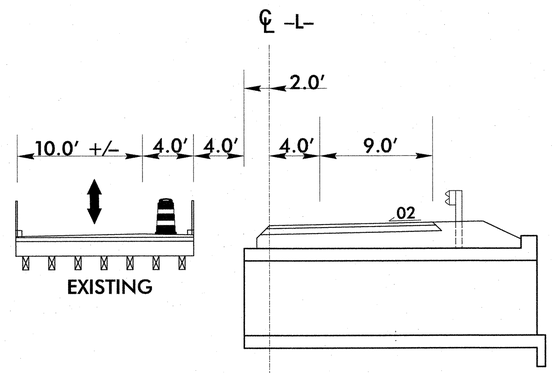
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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-3



PROPOSED CONSTRUCTION

SECTION A–A



APPROVED: [signature] DATE: 12-06-2013

SEAL

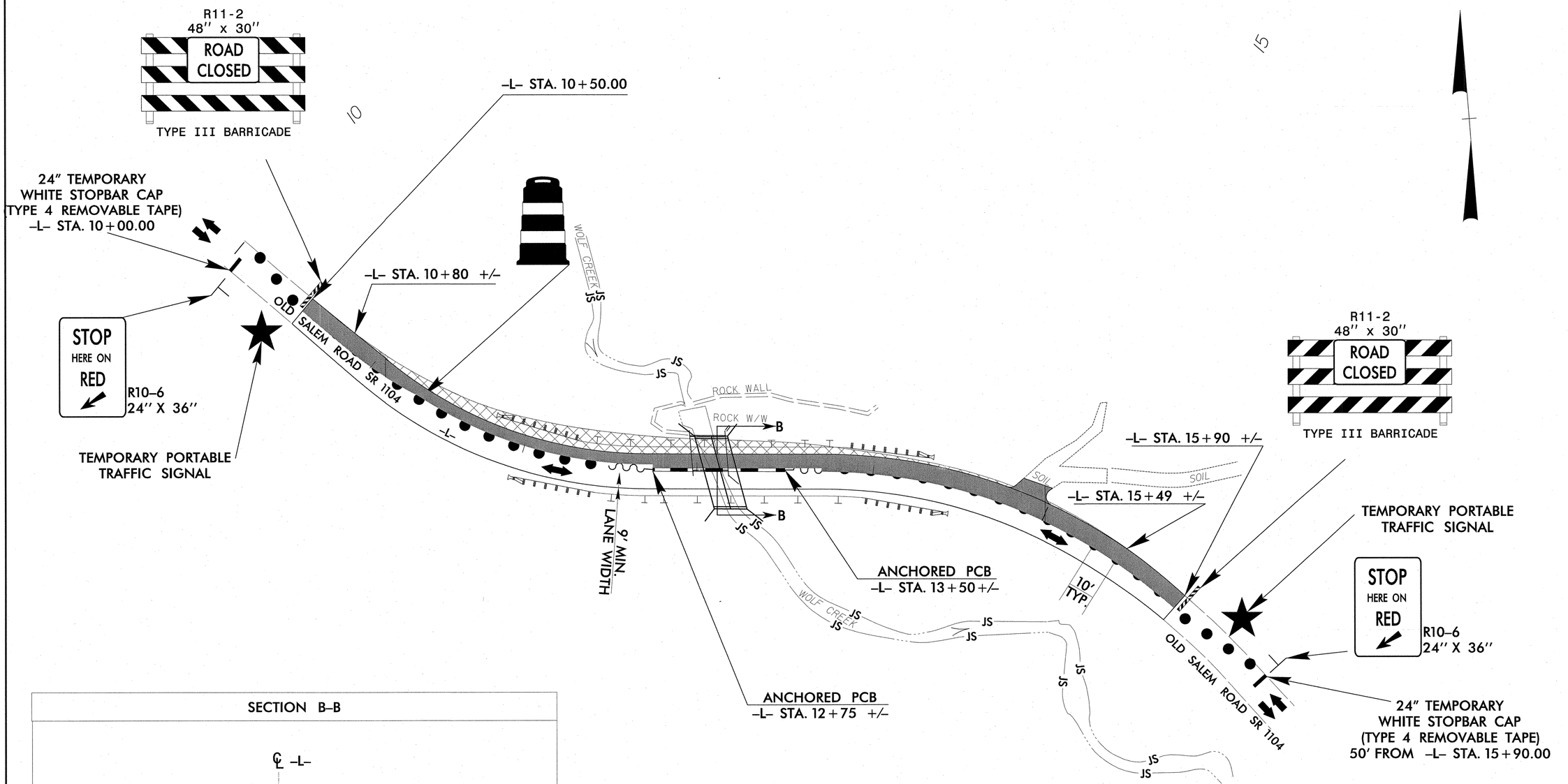
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JOHN M. TULL

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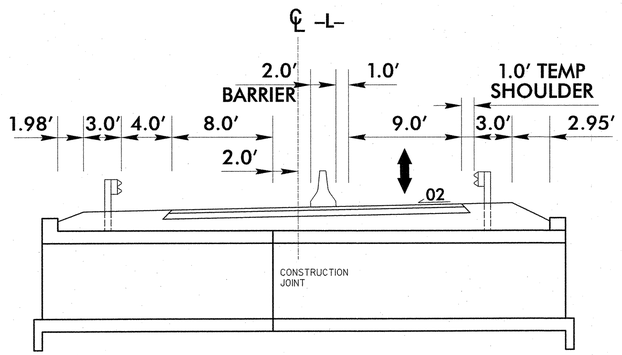
TEMPORARY TRAFFIC CONTROL PHASE I

12/6/2013
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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-4



SECTION B–B



PROPOSED PAVEMENT REMOVAL

PROPOSED CONSTRUCTION

APPROVED: J.S. Talley DATE: 12-06-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JOHN M. TALLEY

RS&H

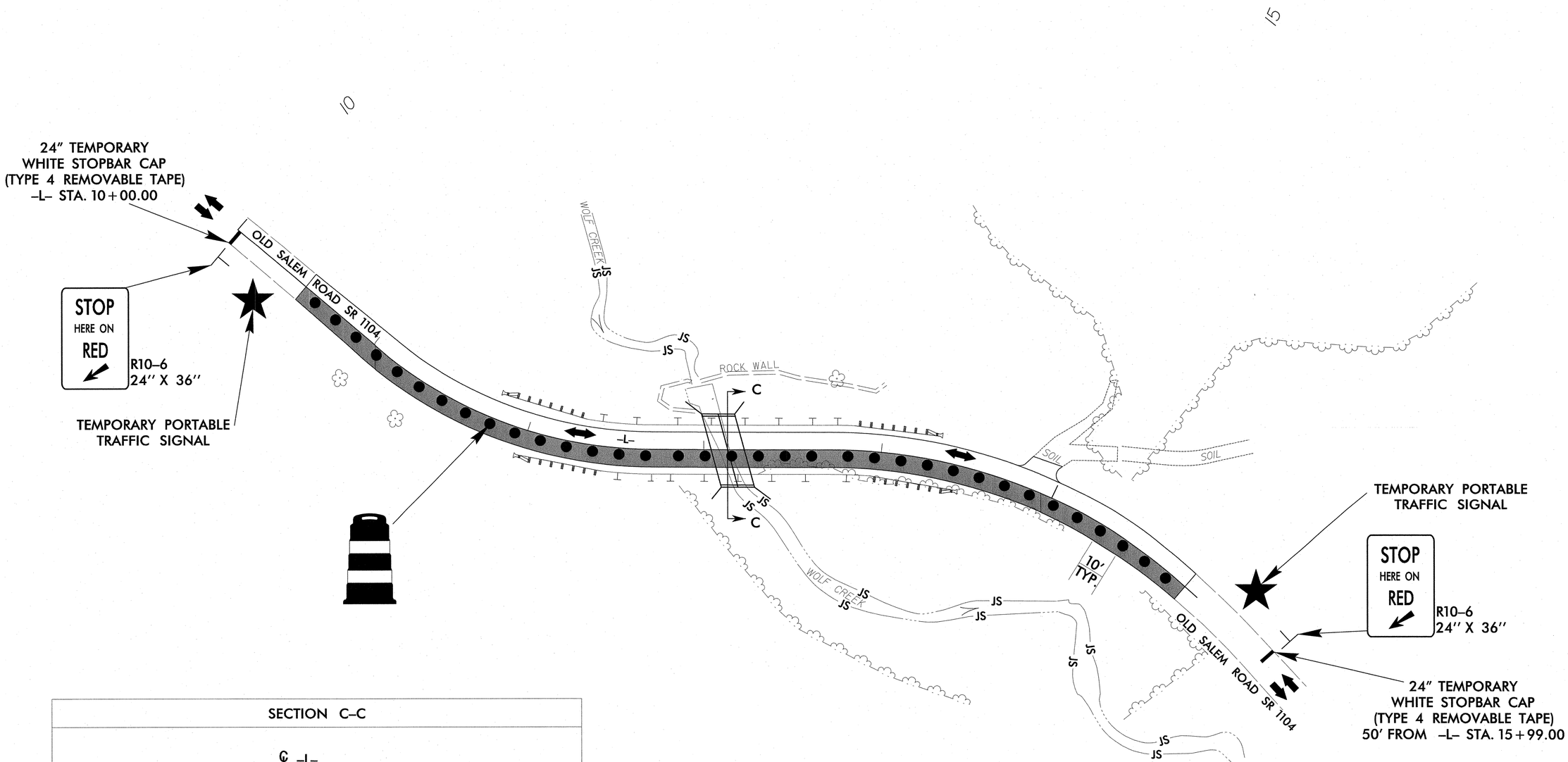
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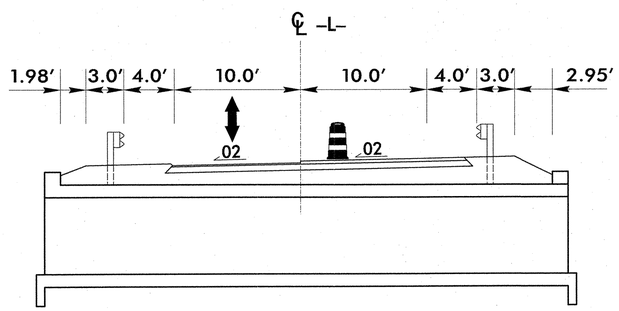
TEMPORARY TRAFFIC CONTROL PHASE II

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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-5



SECTION C–C



PROPOSED CONSTRUCTION

APPROVED: JP Talley DATE: 12-06-13

SEAL

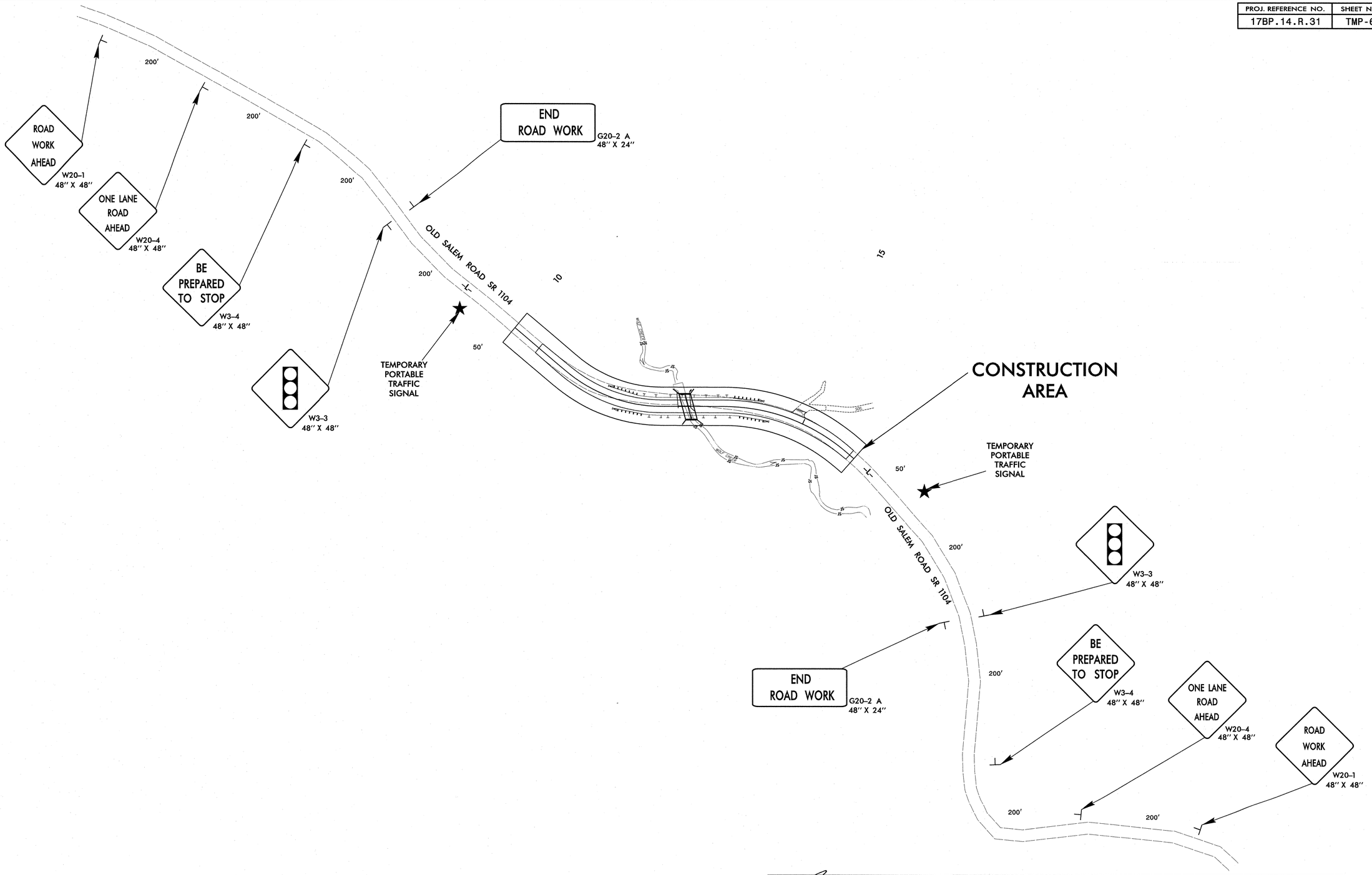
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

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TEMPORARY TRAFFIC CONTROL PHASE III STEP 1

12/6/2013
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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	TMP-6



APPROVED: _____ DATE: 11-21-2023

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

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DETAIL FOR WORK ZONE SIGNING

10/11/2012
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09/08/99

TIP PROJECT: 17BP.14.R.31

CONTRACT: DN00164

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHEROKEE COUNTY

LOCATION: REPLACE BRIDGE No. 97 ON SR 1104 OVER WOLF CREEK

PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	PMP-1

APPROVED:_____ DATE:_____

NORTH CAROLINA PROFESSIONAL SEAL 038718 ENGINEER JASON M. TALLEY — 11-21-2013

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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 JANAUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS
1261.01	GUARDRAIL AND BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
SR 1104	PAINT	N/A

PLACE TWO (2) APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF FIRST.

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

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

E) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON THE BRIDGE DECK PRIOR TO PLACING PAINT PAVEMENT MARKING.

PAVEMENT MARKING SCHEDULE
TIP PROJECT 17BP.14.R.31

		FINAL PAVEMENT MARKINGS
PA	WHITE EDGELINE	PAINT (4")
PI	YELLOW DOUBLE CENTER	PAINT (4")

PLAN PREPARED BY: RS&H ARCHITECT-ENGINEERS-PLANNERS, INC.

KENNETH HERRING, PE	PROJECT ENGINEER
JASON TALLEY, PE	PROJECT DESIGN ENGINEER

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING & SIGNING PLAN TITLE SHEET SIGNING & PAVEMENT MARKING SCHEDULE
PMP-2	PAVEMENT MARKING DETAIL

11/20/2013
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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	PMP-2
APPROVED:	DATE:

NORTH CAROLINA PROFESSIONAL SEAL 027477 ENGINEER JASON M. TALLEY
11-21-2013

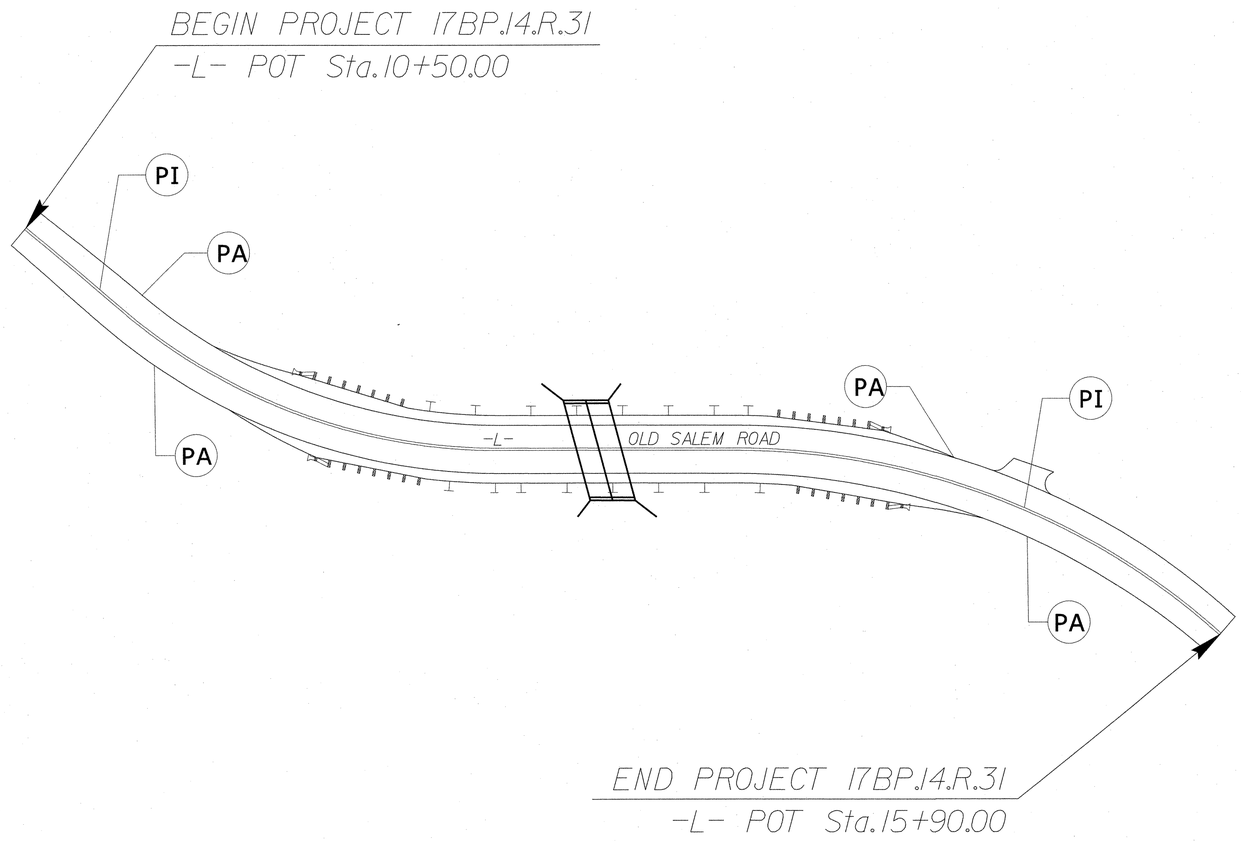
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SYMBOL AND PAVEMENT MARKING LEGEND

PA	WHITE EDGE LINE (4")
PI	YELLOW DOUBLE CENTER (4")

10

15



REFER TO RSD NO. 1205.01, 1205.12, 1250.01 AND 1251.01 FOR PLACEMENT OF FINAL PAVEMENT AND MARKERS UNLESS NOTED OTHERWISE.

PAVEMENT MARKING DETAIL

11/6/2013
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User:KortovIS

TIP PROJECT: 17BP.14.R.31

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.31	EC-1	

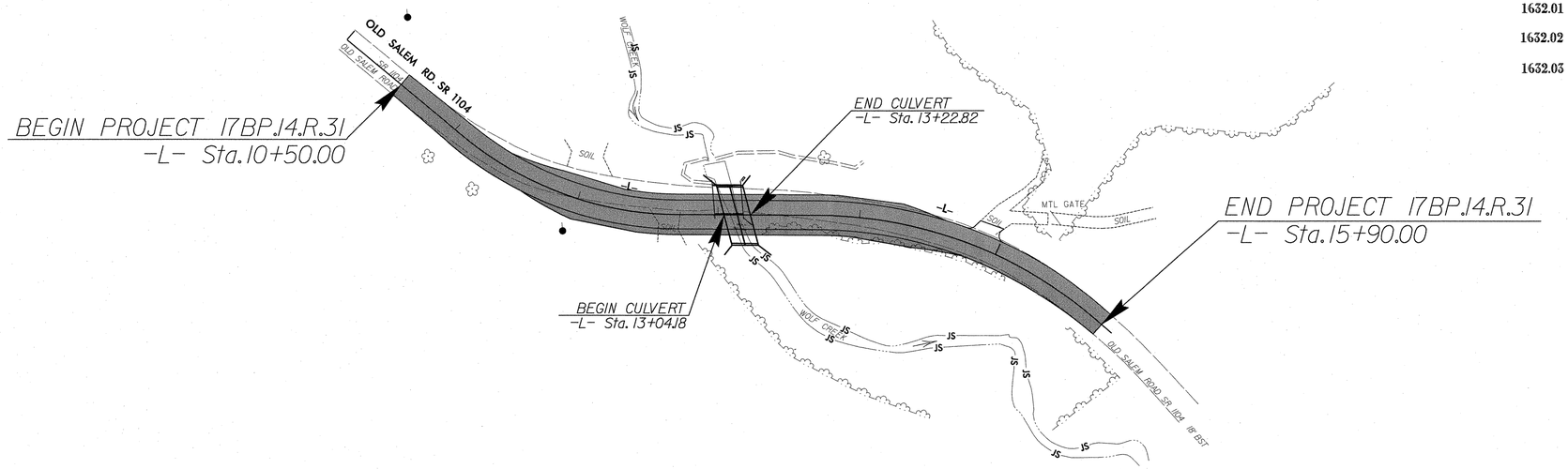
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.31	N/A	PE
17BP.14.R.31	N/A	ROW, UTL
17BP.14.R.31	N/A	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

CHEROKEE COUNTY

LOCATION: REPLACE BRIDGE NO. 97 ON SR 1104 OVER WOLF CREEK
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



EROSION AND SEDIMENT CONTROL MEASURES

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

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

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GRAPHIC SCALE

25 0 50

PLANS

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:
RS&H
ARCHITECTS-ENGINEERS-PLANNERS, INC.
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203

WILL WEATHERSBEE
LEVEL IIIA NAME

3161
LEVEL IIIA CERTIFICATION NO.

2012 STANDARD SPECIFICATIONS

Roadway Standard Drawings

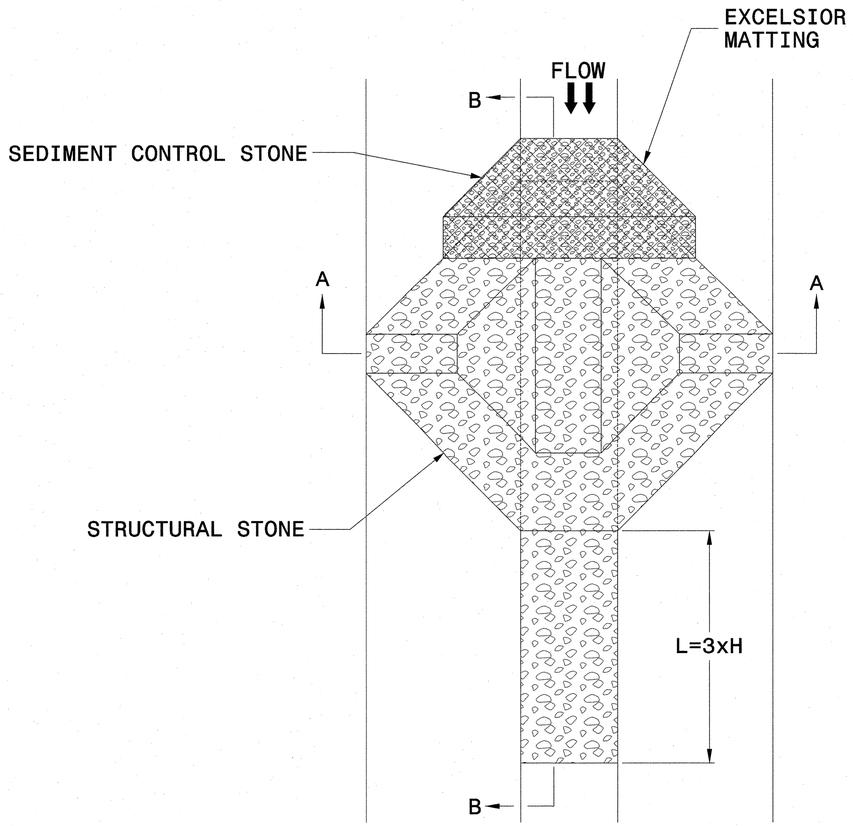
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

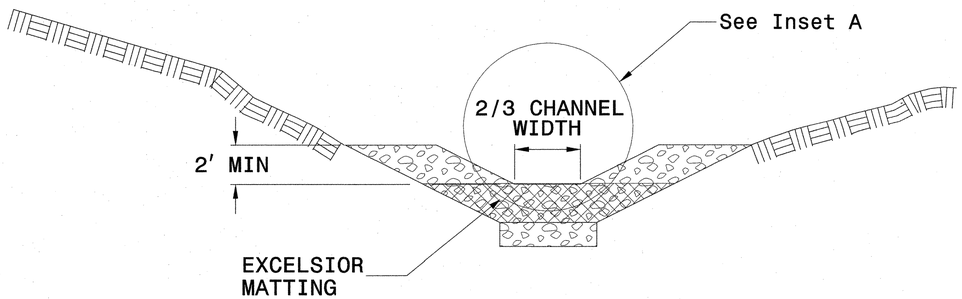
\\190897\Projects\Production\Environmental\B190897_EC_TSH.dgn
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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



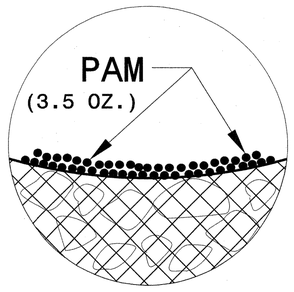
SECTION A-A

NOTES

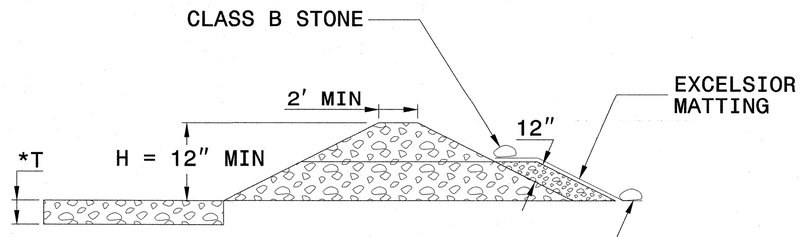
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

*T = 12" MIN., 18" MAX.

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

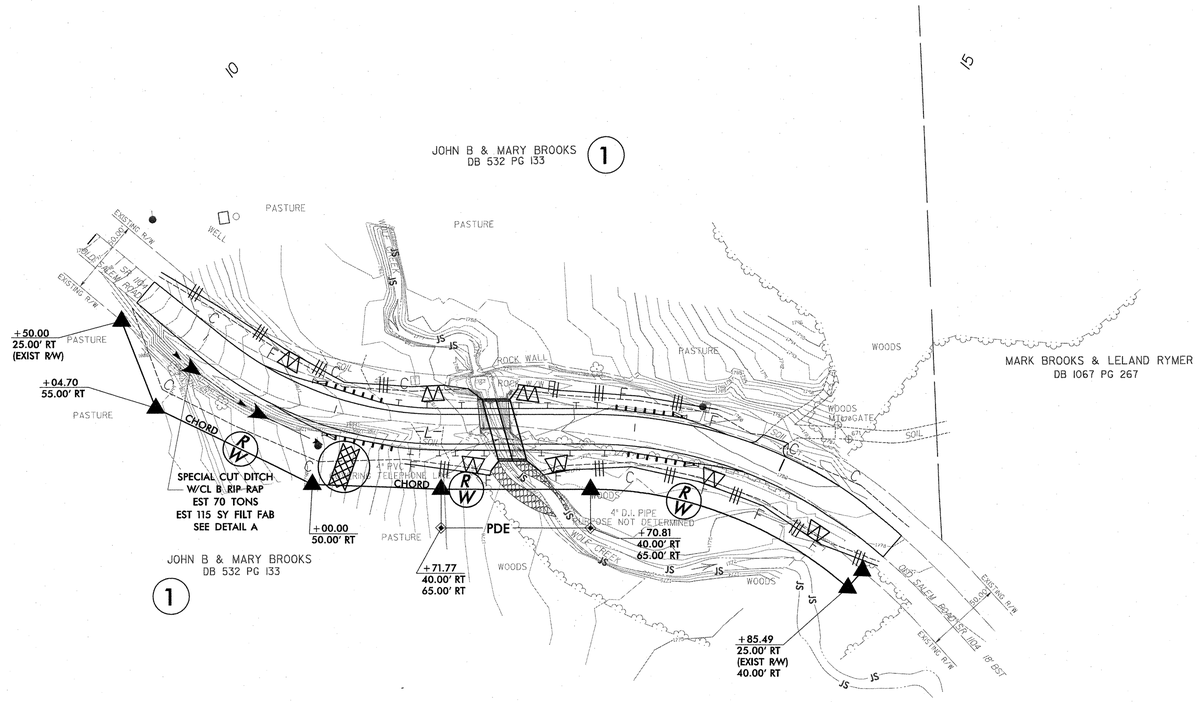
SOIL STABILIZATION TIMEFRAMES

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

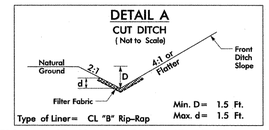
EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	EC-4/CONST.4

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DETAIL A
CUT DITCH
(Not to Scale)



FROM -L- STA. 10+50.00 TO -L- STA. 12+00.00 RT.

NOTE:
UTILIZE SPECIAL STILLING BASIN
AS STILLING BASIN WHERE APPLICABLE

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

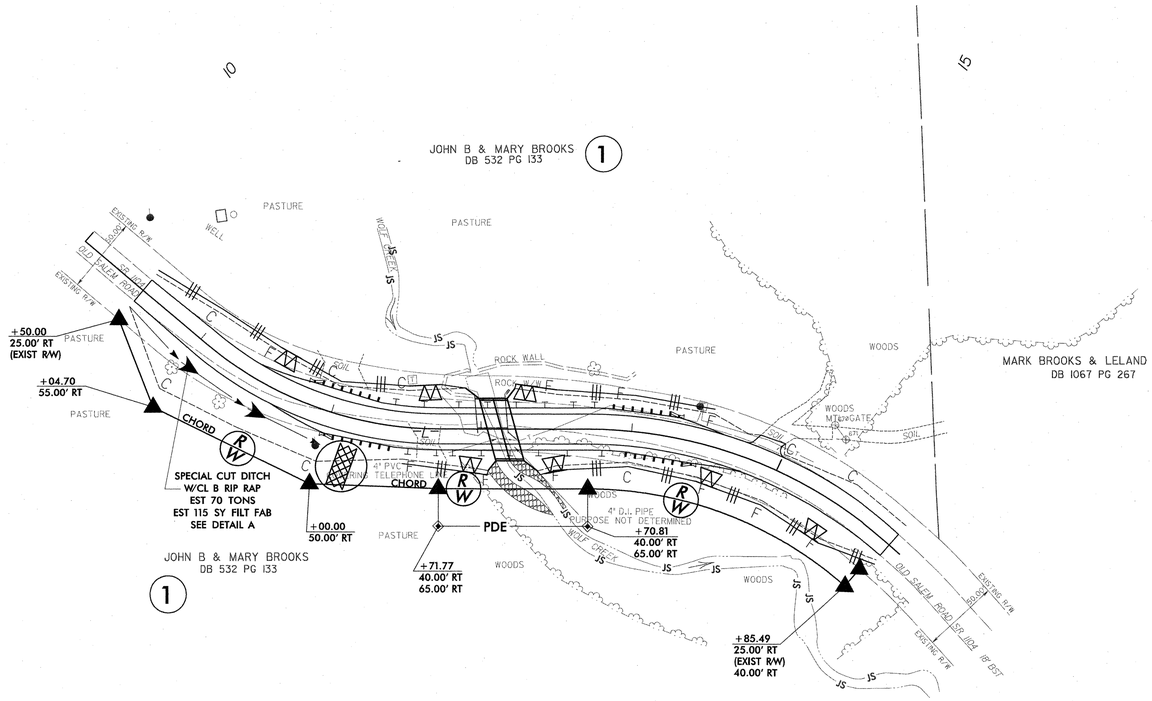
NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

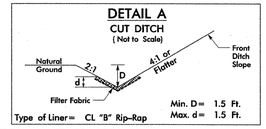
EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	EC-5/CONST.4

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DETAIL A
CUT DITCH
(Not to Scale)



FROM –L– STA. 10+50.00 TO –L– STA. 12+00.00 RT.

NOTE:
UTILIZE SPECIAL STILLING BASIN
AS STILLING BASIN WHERE APPLICABLE

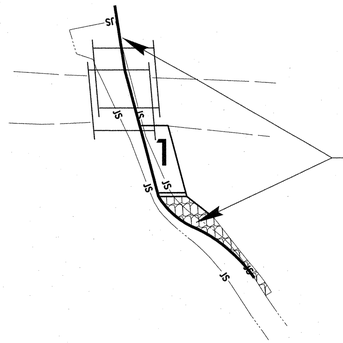
NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

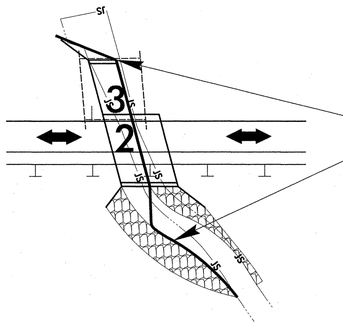
PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	EC-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE –L– STA. 13+13.50

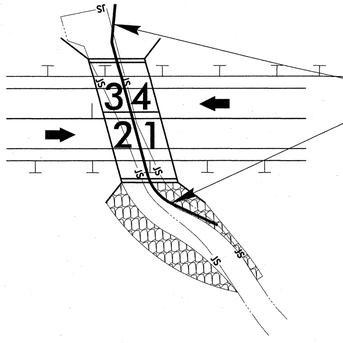
1. UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
2. CONSTRUCT 1ST IMPERVIOUS DIKE.
3. CONSTRUCT PROPOSED CULVERT SECTION 1 AND PORTION OF OUTLET CHANNEL IMPROVEMENTS.
4. REMOVE 1ST IMPERVIOUS DIKE AND DIVERT FLOW THROUGH PROPOSED CULVERT SECTION 1.
5. CONSTRUCT 2ND IMPERVIOUS DIKE.
6. CONSTRUCT PROPOSED CULVERT SECTION 2 AND PORTION OF OUTLET CHANNEL IMPROVEMENTS.
7. REMOVE EXISTING BRIDGE.
8. CONSTRUCT PROPOSED CULVERT SECTION 3 AND PORTION OF INLET CHANNEL IMPROVEMENTS.
9. REMOVE 2ND IMPERVIOUS DIKE AND DIVERT FLOW THROUGH PROPOSED CULVERT SECTIONS 2 & 3.
10. CONSTRUCT 3RD IMPERVIOUS DIKE.
11. CONSTRUCT PROPOSED CULVERT SECTION 4 AND PORTION OF INLET CHANNEL IMPROVEMENTS.
12. REMOVE 3RD IMPERVIOUS DIKE AND DIVERT FLOW THROUGH PROPOSED CULVERT.
13. COMPLETE ROADWAY.



1ST IMPERVIOUS DIKE

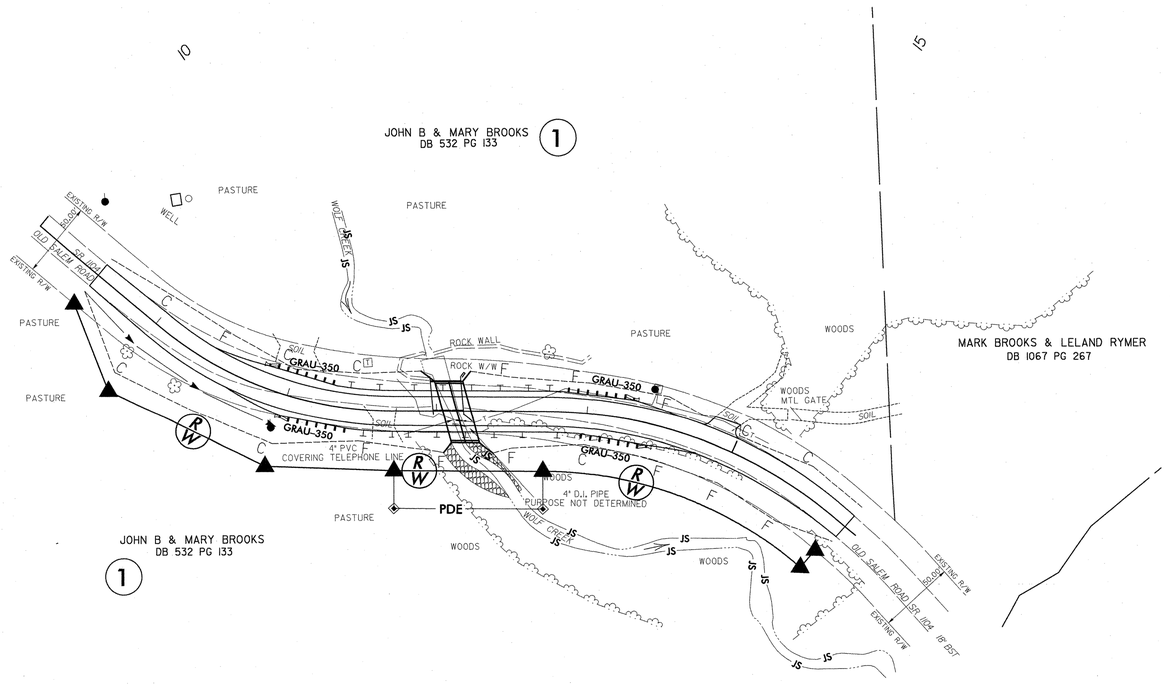


2ND IMPERVIOUS DIKE



3RD IMPERVIOUS DIKE

NAD 83/NSRS 2007



5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.31	U0-1

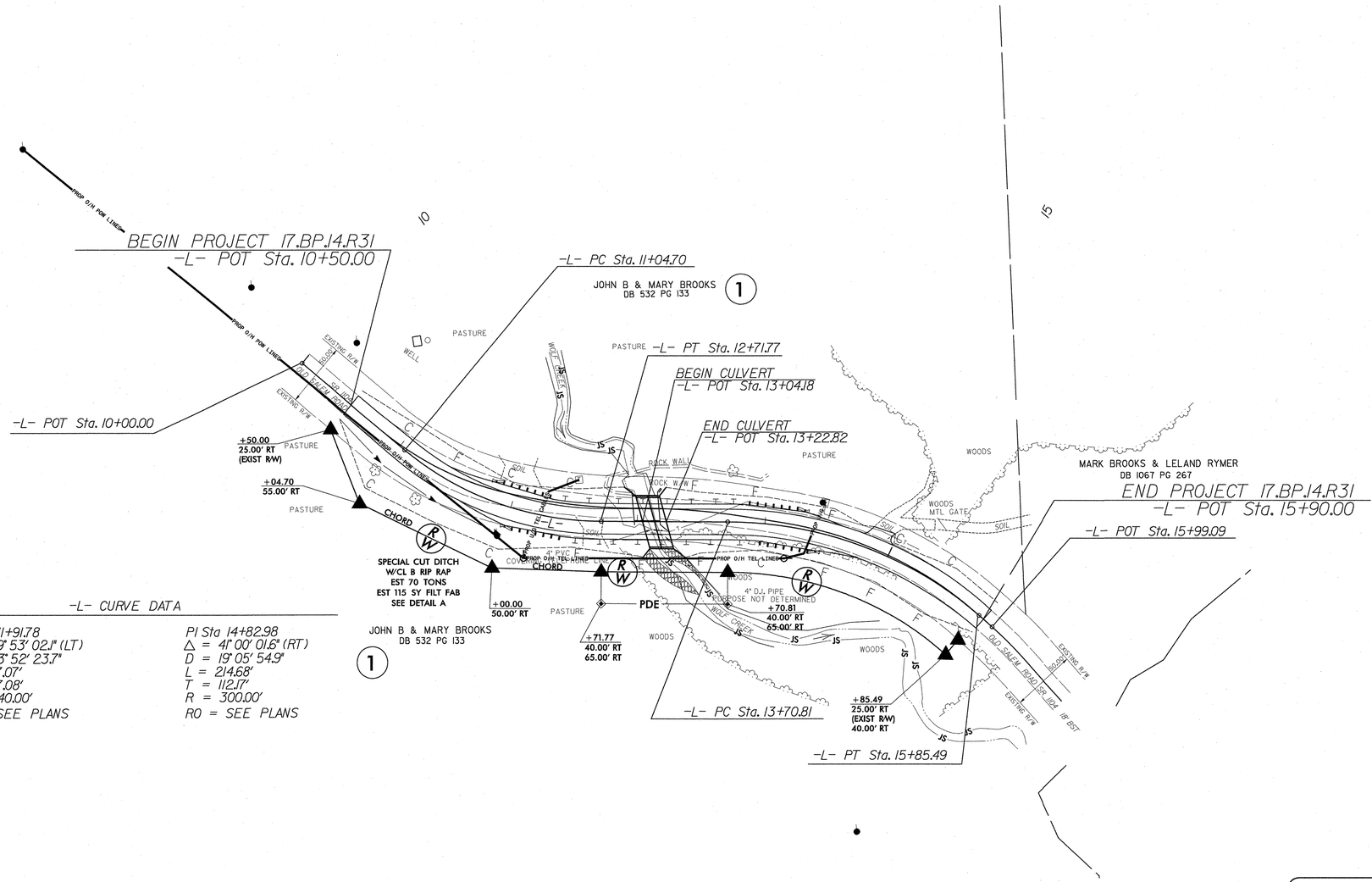
UTILITIES BY OTHERS

UTILITIES BY OTHERS PLANS

LOCATION: REPLACE BRIDGE No. 97 ON SR 1104 OVER WOLF CREEK
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

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

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-L- CURVE DATA

PI Sta 11+91.78
△ = 39° 53' 02.1" (LT)
D = 23° 52' 23.7"
L = 167.07'
T = 87.08'
R = 240.00'
RO = SEE PLANS

PI Sta 14+82.98
△ = 41° 00' 01.6" (RT)
D = 19° 05' 54.9"
L = 214.68'
T = 112.17'
R = 300.00'
RO = SEE PLANS

GRAPHIC SCALES
50 25 0 50 100

UTILITY OWNERS ON PROJECT

(1) AT&T
(2) BLUE RIDGE MOUNTAIN ELECTRIC MEMBERSHIP CORPORATION

NOTE:
FOR ROADWAY AND DRAINAGE INFORMATION, SEE SHEET 4.
FOR LOCATION AND SURVEY DATA SEE SHEET 1-C.

PREPARED IN THE OFFICE OF:
RS&H
ARCHITECTS-ENGINEERS-PLANNERS, INC.
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
PHONE (704) 752-0610

Kenneth Herring, PE — UTILITIES ENGINEER
Jason Talley, P.E. — UTILITIES COORDINATION ENGINEER

I:\Projects\17BP14R31\Design\Utilities\Rdy_Ut\Proj\B190097_Ut_U0put_1.dgn
11/19/2013
5:25:52 PM

PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.31	X-0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDES BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	86	8
11+50.00	136	19
12+00.00	126	16
12+50.00	80	20
13+00.00	4	97
13+15.00	0	38
13+50.00	1	41
14+00.00	2	25
14+50.00	1	18
15+00.00	2	18
15+50.00	1	33
15+90.00	0	19

INDEX OF SHEETS

-L-	X-1 THRU X-5

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.14.R.31	X-1

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

1805 1800 1795 1790 1785 1780

S.S. 1799.11

1789.61

0.020 0.009

8% 4% 2%

S.S. 1788.12 1789.09 1787.75

11+00.00

1805 1800 1795 1790 1785

1793.72

0.000 0.040

1793.42

10+50.00

1810 1805 1800 1795 1790

1798.15

10+00.00

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

11/6/2013
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8/23/99

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	17BP.14.R.31	X-2

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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

1782.06

0.020 0.020

3:1

1778.19

13+00.00

1783.31

S.S. 1781.74 12.5:1 0.040 0.040 4:1

1782.11 S.S. 1782.46

12+50.00

1784.80

S.S. 1789.23

4:1 0.040 0.040 4:1 2:1

S.S. 1783.49 1784.15 1783.56

12+00.00

1800

1786.81

S.S. 1792.61

8:1 0.022 0.023 4:1 2:1

1785.09 1786.10 1785.39

11+50.00

10/10/2012
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8/23/99

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1790 1785 1780 1775 1770

1780.02

4:1 B 0.011 0.011 E 4:1

1779.37

14+00.00

1790 1785 1780 1775 1795 1790 1785 1780 1775 1770 1765

1780.82

4:1 B 0.020 0.020 E 3:1

1780.06

S.S. 1778.206

13+50.00

1781.69

B 0.020 0.020 E

1774.93

13+15.00

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8/23/99

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1790 1785 1780 1775 1770 1795

1779.79

4:1 0.035 0.040 3:1

S.S. 1778.90 1779.31 S.S. 1775.23

15+50.00

1780.53

0.040 0.040 3:1

1780.25 S.S. 1776.993

15+00.00

1780.11

7.5:1 0.040 0.040 4:1

S.S. 1779.43 1779.84 S.S. 1777.21

14+50.00

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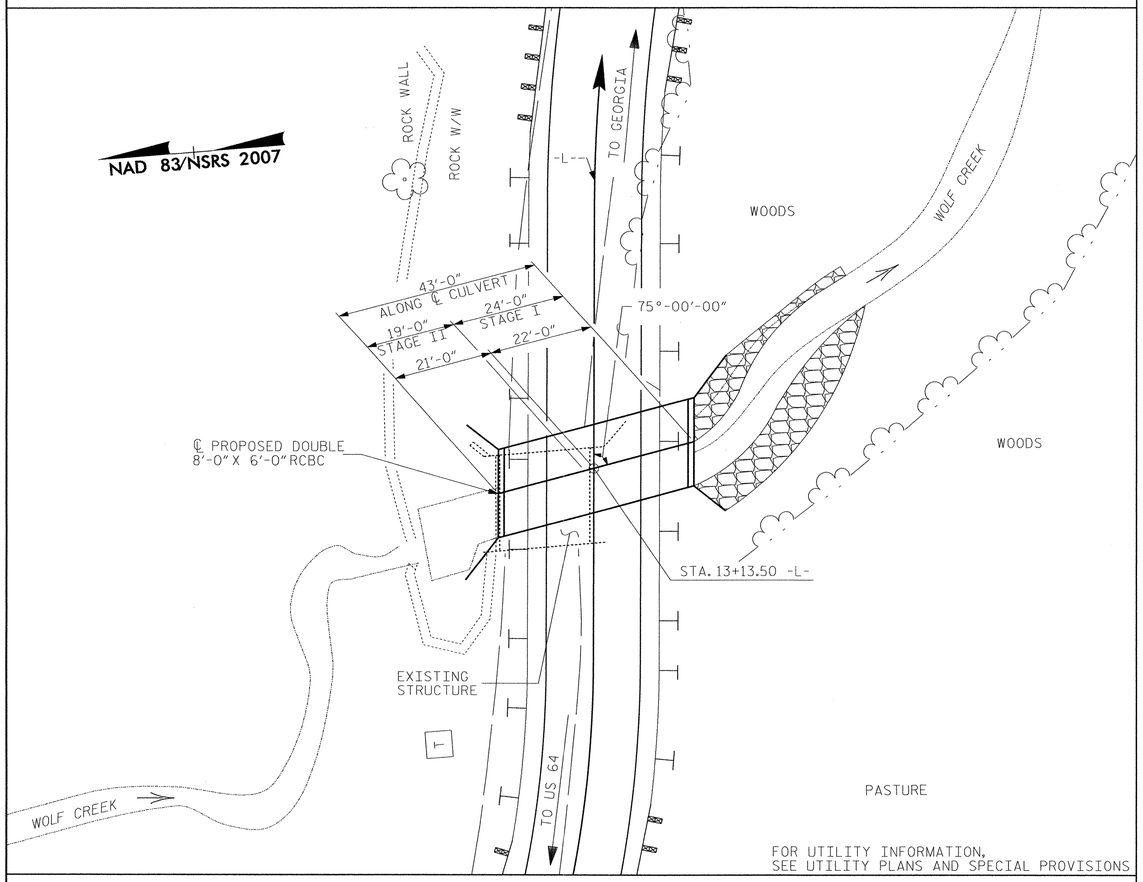
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1790
1785
1780
1775
1770

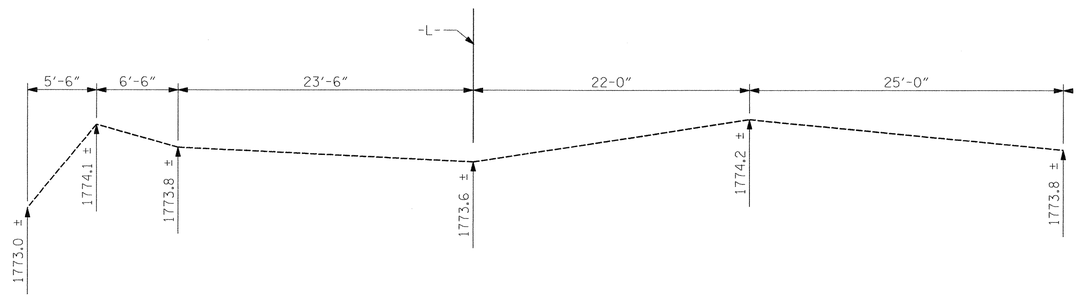
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0.050
1778.01
15+90.00

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BENCH MARK #2 8" SPIKE SET IN BASE OF 18" POPLAR TREE,
STA 14+72.85 -L-, 17.45 RT., EL. 1778.00



LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES	
STAGE I CLASS A CONCRETE	
BARREL @ 1.79 CY/FT	43.0 C.Y.
WING ETC.	11.1 C.Y.
TOTAL	54.1 C.Y.
STAGE I REINFORCING STEEL	
BARREL	7766 LBS.
WINGS ETC.	466 LBS.
TOTAL	8232 LBS.
STAGE I FOUNDATION COND. MAT'L.	30.5 TONS
STAGE II CLASS A CONCRETE	
BARREL @ 1.79 CY/FT	34.0 C.Y.
WING ETC.	11.1 C.Y.
TOTAL	45.1 C.Y.
STAGE II REINFORCING STEEL	
BARREL	6176 LBS.
WINGS ETC.	466 LBS.
TOTAL	6642 LBS.
STAGE II FOUNDATION COND. MAT'L.	24.1 TONS
TOTAL CLASS A CONCRETE	99.2 C.Y.
TOTAL REINFORCING STEEL	14874 LBS.
CULVERT EXCAVATION	LUMP SUM
TOTAL FOUNDATION COND. MAT'L.	54.6 TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CHANNEL EXCAVATION	42 C.Y.
CLASS II RIP RAP (2'-0")	55 TONS

ROADWAY DATA

GRADE POINT ELEVATION @ STA. 13+13.50 -L-	1781.72
BED ELEVATION @ STA. 13+13.50 -L-	1772.75
ROADWAY SLOPES	2:1 MAX.

HYDRAULIC DATA

DESIGN DISCHARGE	500 C.F.S.
FREQUENCY OF DESIGN FLOOD	25 YRS
DESIGN HIGH WATER ELEVATION	1779.1
DRAINAGE AREA	1.39 SQ. MI.
BASE DISCHARGE (Q100)	750 C.F.S.
BASE HIGH WATER ELEVATION	1780.70

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	575 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	25+ YRS
OVERTOPPING FLOOD ELEVATION	1779.65

NOTES:

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL----------1.2 ft

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, FOR EACH STAGE:

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

THIS BARREL STANDARD TO BE USED ONLY ON DOUBLE BARREL CULVERTS LESS THAN 8 FEET VERTICAL CLEARANCE ON 75° SKEW AND TO BE USED WITH STANDARD WING SHEET FOR THE SAME SKEW AND VERTICAL CLEARANCE.

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

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF ONE 20'-6" SPAN WITH A SUPERSTRUCTURE CONSISTING OF 4"X 8" TIMBER FLOORING ON 6"X 14" TIMBER JOISTS WITH A 1" ASPHALT WEARING SURFACE, AND A SUBSTRUCTURE CONSISTING OF TIMBER CAPS PLACED ON TIMBER POST AND SILLS ENCASED IN CONCRETE, AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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 THE ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

EXCAVATE 1 FOOT BELOW CULVERT AND FOOTINGS AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.

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

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 1 OF 9 REPLACES BRIDGE NO. 97

ADDED 11-1-90

ASSEMBLED BY : JML	DATE : 8/2012	SPECIAL
CHECKED BY : JMR	DATE : 11/2012	
DRAWN BY : R.W.WRIGHT	DATE : OCT. 1989	STANDARD
CHECKED BY : A.R.BISSETTE	DATE : OCT. 1989	

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOWMAN 11-21-2013

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RS&H Architects-Engineers-Planners, Inc.
8601 Six Forks Road, Suite 260
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919-846-6701 FAX 919-846-9080
www.rsandh.com
North Carolina License Nos. 50473 * F-0493 * C-28

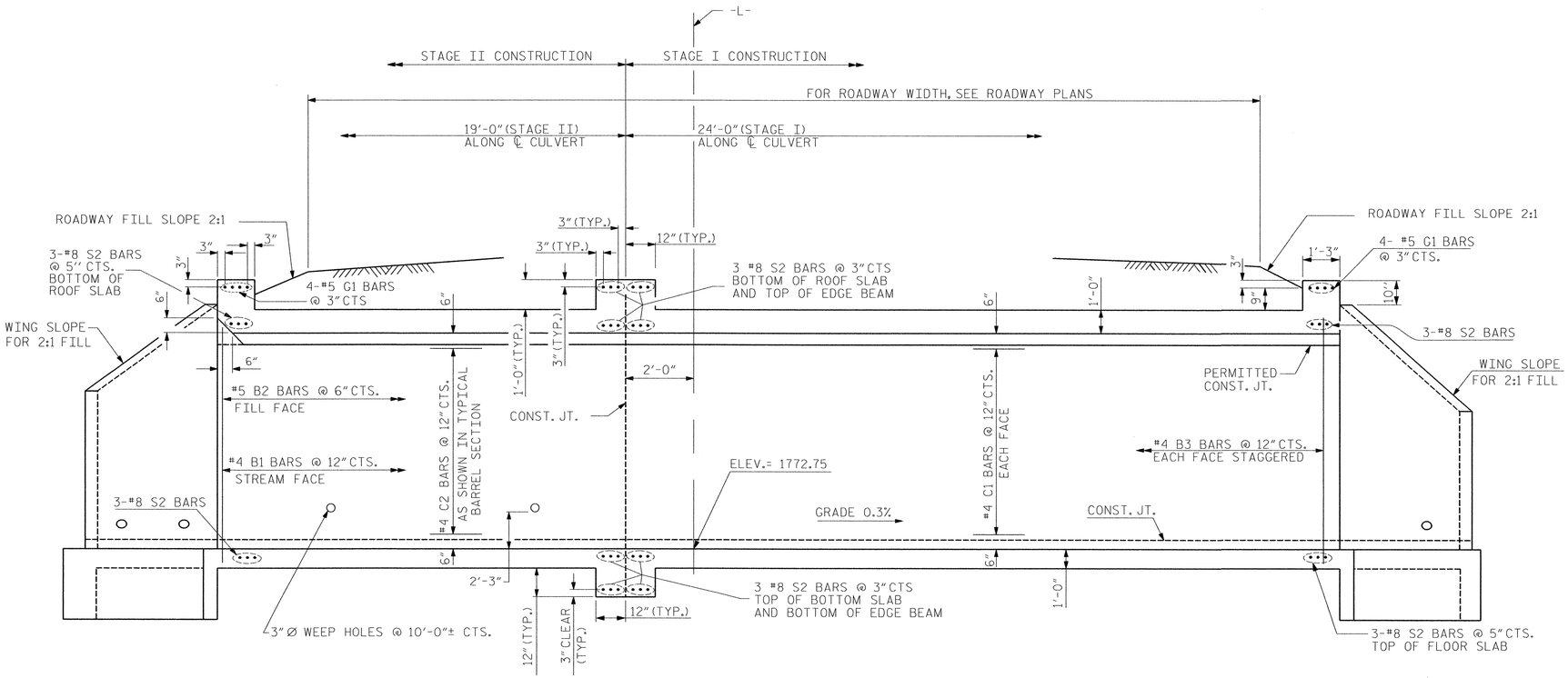
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

DOUBLE 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			9

STD. NO. CB22A

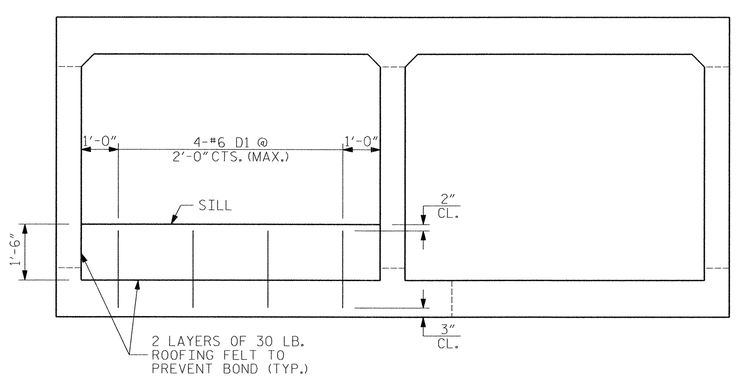


EXTERIOR WALL
(STAGE I SIMILAR)

INTERIOR WALL
(STAGE II SIMILAR)

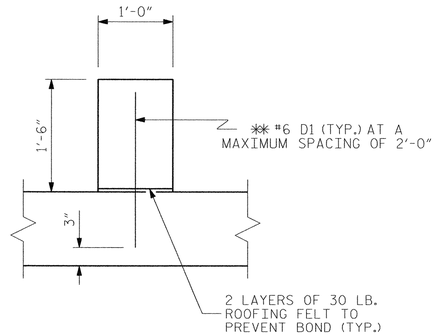
STAGE II CULVERT SECTION NORMAL TO ROADWAY

STAGE I CULVERT SECTION NORMAL TO ROADWAY



ELEVATION

SILLS LOCATED AT THE INLET AND OUTLET OF LEFT (EASTERN) CELL. BACKFILL BOTH BARRELS WITH NATIVE BED MATERIAL SIMILAR IN SIZE TO CLASS "B" RIP RAP. SUBISIDIZE WITH CLASS "B" RIP RAP IF NEEDED.

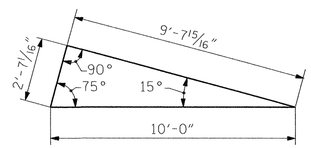


SECTION THROUGH SILL

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

CULVERT SILL DETAILS

(LOOKING DOWNSTREAM)



SKEW TRIANGLE

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 2 OF 9

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BORK 11-21-2013

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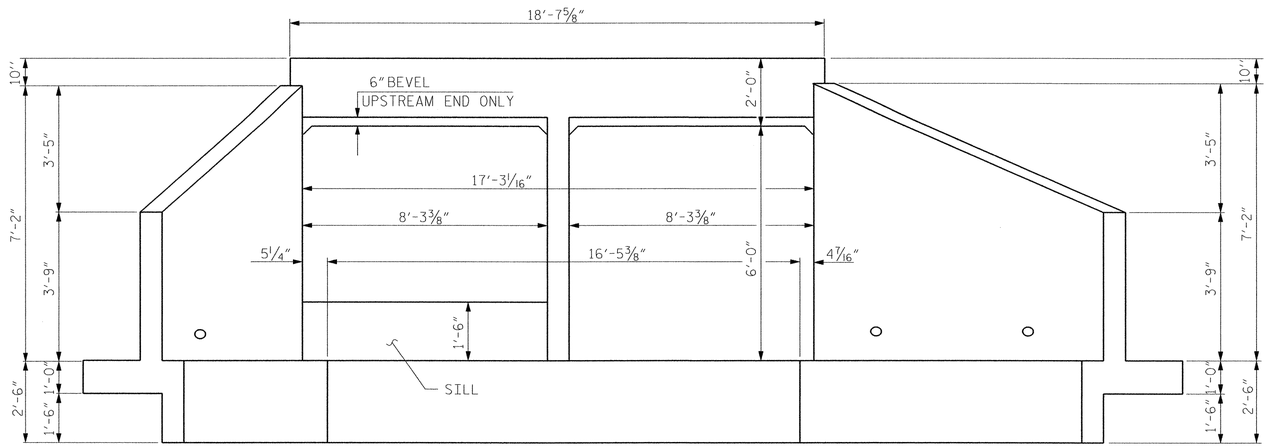
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8601 Six Forks Road, Suite 260
Raleigh, NC 27615
919-846-6701 FAX 919-846-8080
www.rsandh.com
North Carolina License Nos. 00073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

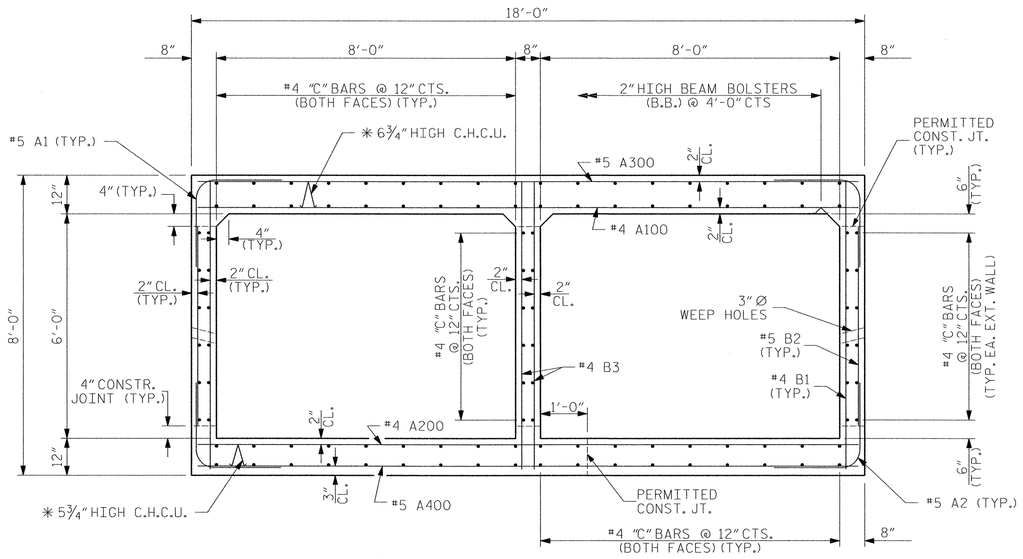
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			9

DRAWN BY : JML DATE : 8/2012
CHECKED BY : JMR DATE : 11/2012



END ELEVATION NORMAL TO SKEW

(INLET END SHOWN)



* ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.

BARREL SECTION

THERE ARE 108 "C" BARS IN SECTION OF BARREL.
LOOKING DOWNSTREAM

BILL OF MATERIAL

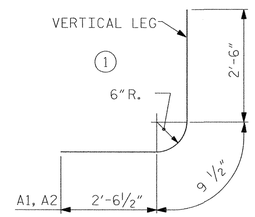
STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	90	#5	1	5'-10"	548
A2	90	#5	1	5'-10"	548
A100	39	#4	STR	17'-8"	460
A101	2	#4	STR	15'-7"	21
A102	2	#4	STR	13'-8"	18
A103	2	#4	STR	11'-9"	16
A104	2	#4	STR	9'-10"	13
A105	2	#4	STR	7'-11"	11
A106	2	#4	STR	6'-0"	8
A200	39	#4	STR	17'-8"	460
A201	2	#4	STR	15'-7"	21
A202	2	#4	STR	13'-8"	18
A203	2	#4	STR	11'-9"	16
A204	2	#4	STR	9'-10"	13
A205	2	#4	STR	7'-11"	11
A206	2	#4	STR	6'-0"	8
A300	39	#5	STR	17'-8"	719
A301	2	#5	STR	15'-7"	33
A302	2	#5	STR	13'-8"	29
A303	2	#5	STR	11'-9"	25
A304	2	#5	STR	9'-10"	21
A305	2	#5	STR	7'-11"	17
A306	2	#5	STR	6'-0"	13
A400	39	#5	STR	17'-8"	719
A401	2	#5	STR	15'-7"	33
A402	2	#5	STR	13'-8"	29
A403	2	#5	STR	11'-9"	25
A404	2	#5	STR	9'-10"	21
A405	2	#5	STR	7'-11"	17
A406	2	#5	STR	6'-0"	13
B1	48	#4	STR	7'-7"	243
B2	96	#5	STR	5'-4"	534
B3	48	#4	STR	7'-7"	243
C1	108	#4	STR	26'-0"	1876
D1	4	#6	STR	2'-1"	13
G1	4	#5	STR	18'-3"	76
S2	18	#8	STR	18'-3"	877
REINFORCING STEEL					7766 LBS

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	70	#5	1	5'-10"	426
A2	70	#5	1	5'-10"	426
A100	29	#4	STR	17'-8"	342
A101	2	#4	STR	15'-7"	21
A102	2	#4	STR	13'-8"	18
A103	2	#4	STR	11'-9"	16
A104	2	#4	STR	9'-10"	13
A105	2	#4	STR	7'-11"	11
A106	2	#4	STR	6'-0"	8
A200	29	#4	STR	17'-8"	342
A201	2	#4	STR	15'-7"	21
A202	2	#4	STR	13'-8"	18
A203	2	#4	STR	11'-9"	16
A204	2	#4	STR	9'-10"	13
A205	2	#4	STR	7'-11"	11
A206	2	#4	STR	6'-0"	8
A300	29	#5	STR	17'-8"	534
A301	2	#5	STR	15'-7"	33
A302	2	#5	STR	13'-8"	29
A303	2	#5	STR	11'-9"	25
A304	2	#5	STR	9'-10"	21
A305	2	#5	STR	7'-11"	17
A306	2	#5	STR	6'-0"	13
A400	29	#5	STR	17'-8"	534
A401	2	#5	STR	15'-7"	33
A402	2	#5	STR	13'-8"	29
A403	2	#5	STR	11'-9"	25
A404	2	#5	STR	9'-10"	21
A405	2	#5	STR	7'-11"	17
A406	2	#5	STR	6'-0"	13
B1	38	#4	STR	7'-7"	193
B2	76	#5	STR	5'-4"	423
B3	38	#4	STR	7'-7"	193
C2	108	#4	STR	18'-8"	1347
D1	4	#6	STR	2'-1"	13
G1	4	#5	STR	18'-3"	76
S2	18	#8	STR	18'-3"	877
REINFORCING STEEL					6176 LBS

BAR TYPE



BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE
C1 & C2	4	1'-11"

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 3 OF 9

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD JAMES LEON 60 11-21-2013

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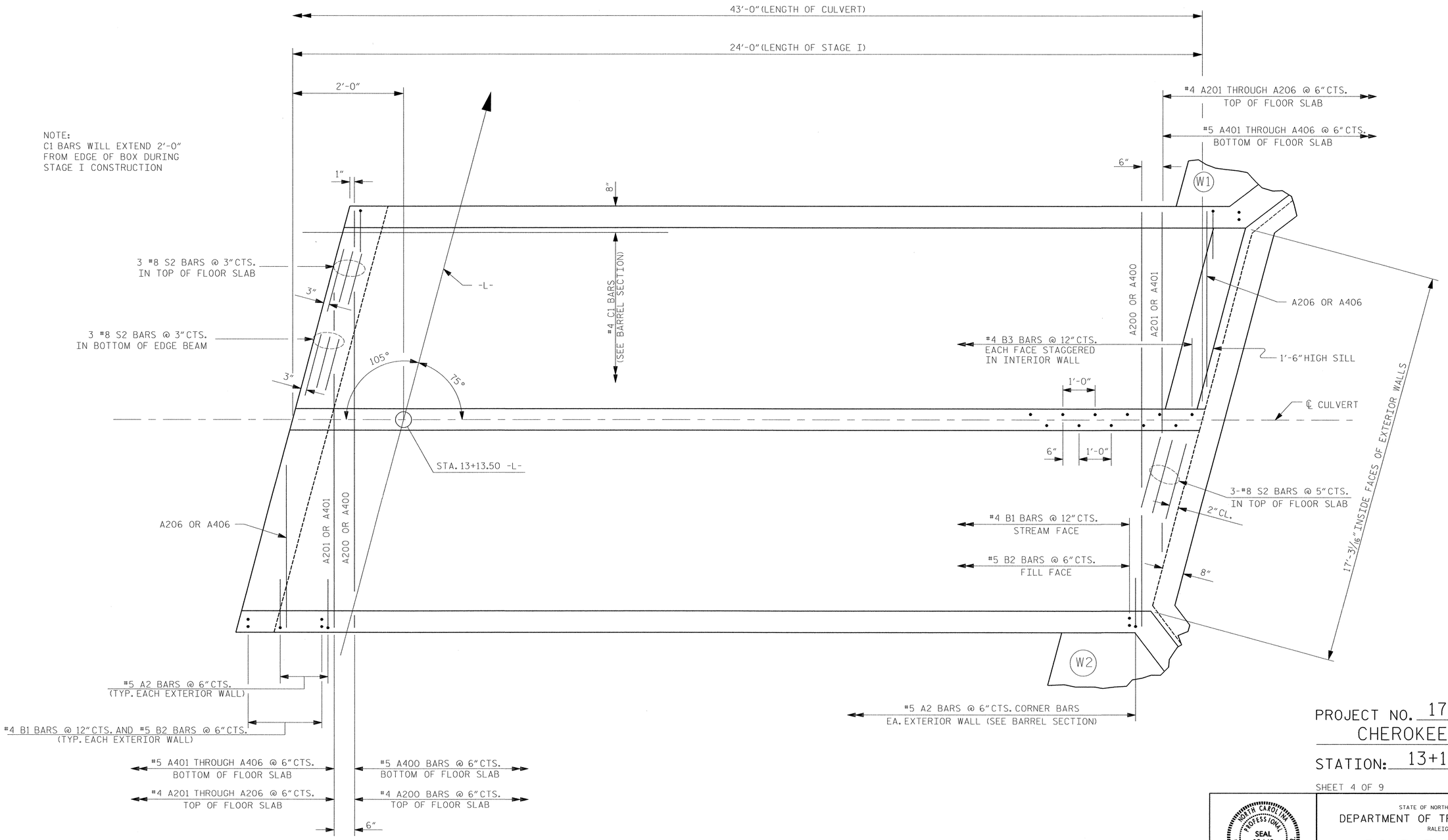
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			9

DRAWN BY : JML DATE : 8/2012
CHECKED BY : JMR DATE : 11/2012

NOTE:
C1 BARS WILL EXTEND 2'-0" FROM EDGE OF BOX DURING STAGE I CONSTRUCTION



STAGE I PLAN - FLOOR SLAB

PROJECT NO. 17BP.14.R.31
CHEROKEE COUNTY
STATION: 13+13.50 -L-

DRAWN BY : JML DATE : 8/2012
CHECKED BY : JMR DATE : 11/2012

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER JOHN MICHAEL RICHARD LEON 11-21-2013

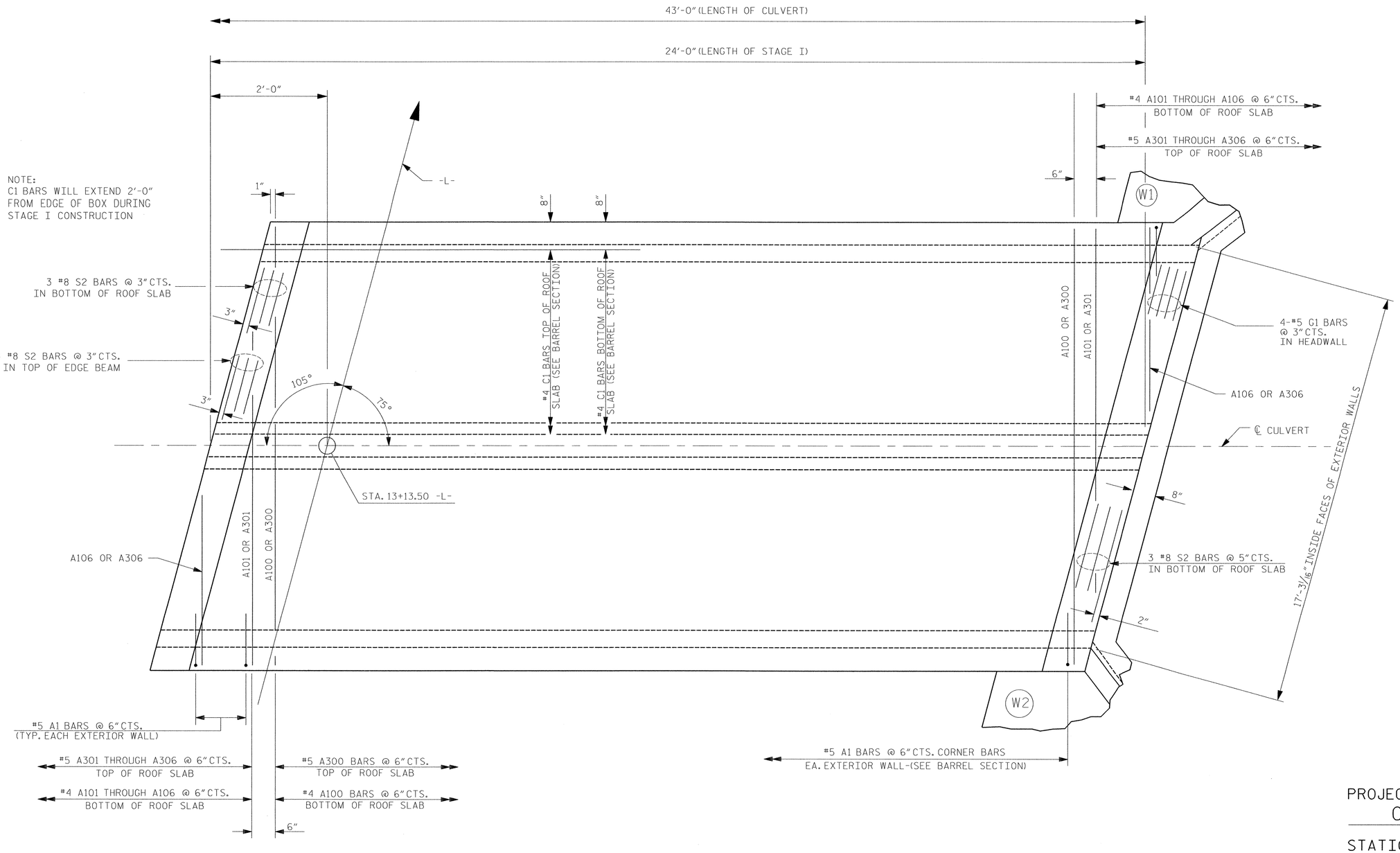
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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DOUBLE BARREL 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			9



STAGE I PLAN - ROOF SLAB

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 5 OF 9

DRAWN BY : JML DATE : 8/2012

CHECKED BY : JMR DATE : 8/2012

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON MORRISON
11-21-2013

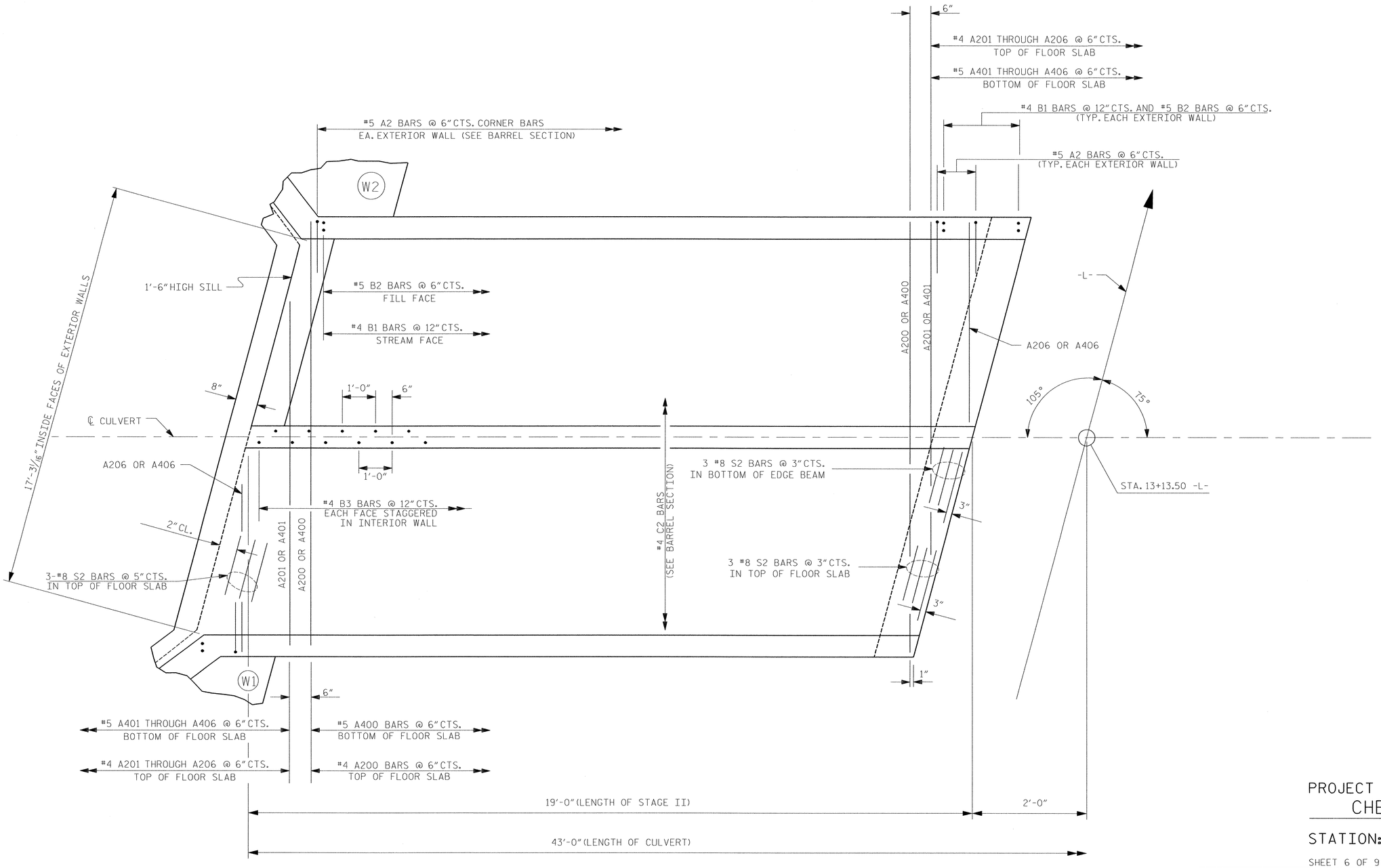
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			9



STAGE II PLAN - FLOOR SLAB

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 6 OF 9

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD JEON MILLER 11-21-2012

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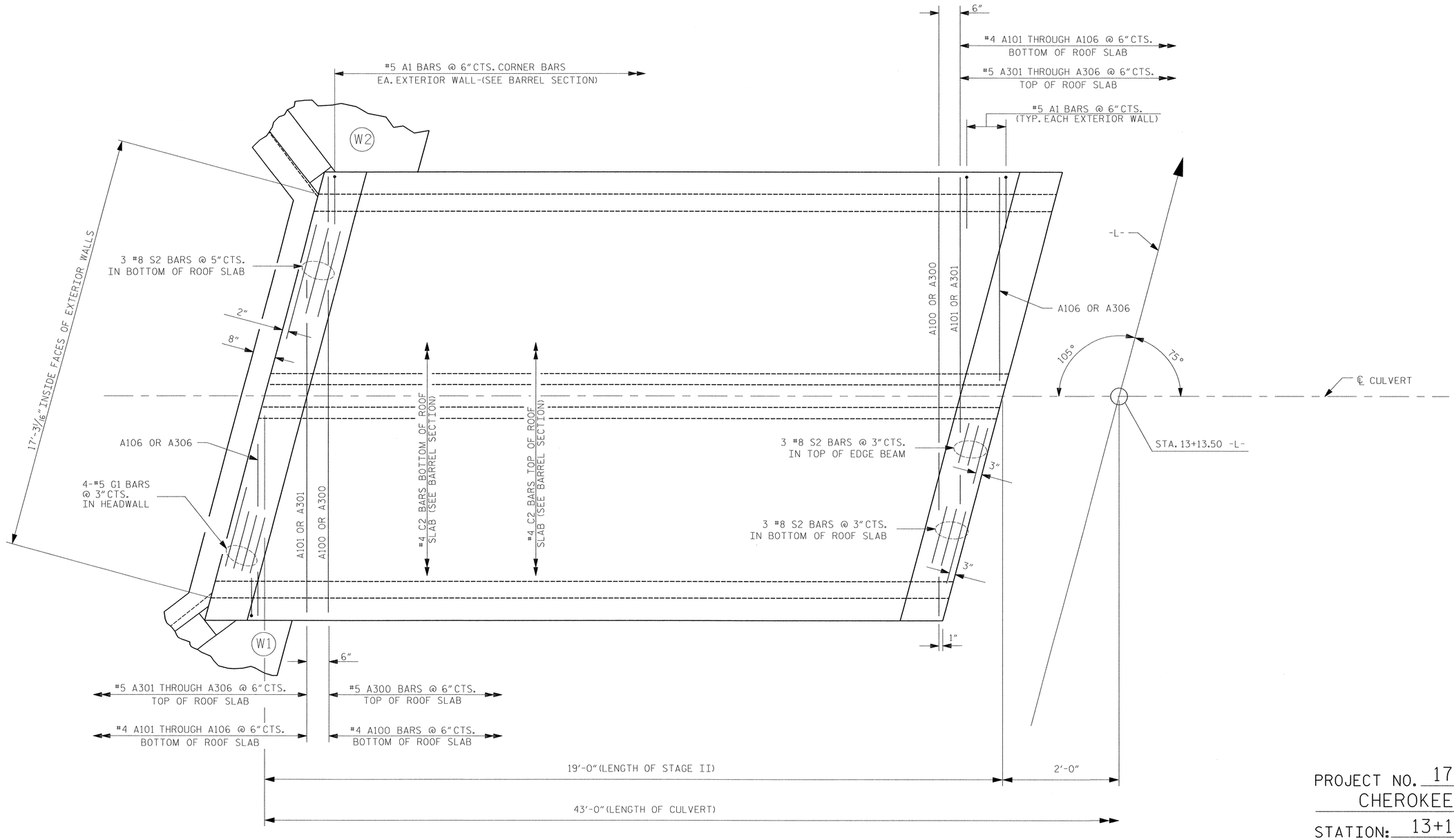
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			9

DRAWN BY : JML DATE : 8/2012

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STAGE II PLAN - ROOF SLAB

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 7 OF 9

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON ROLLINS 11-21-2013

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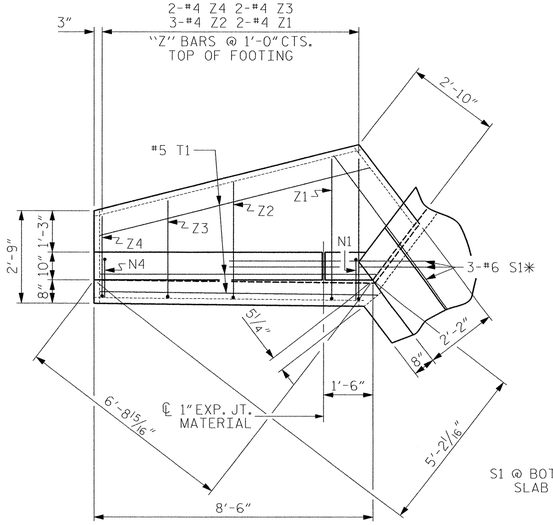
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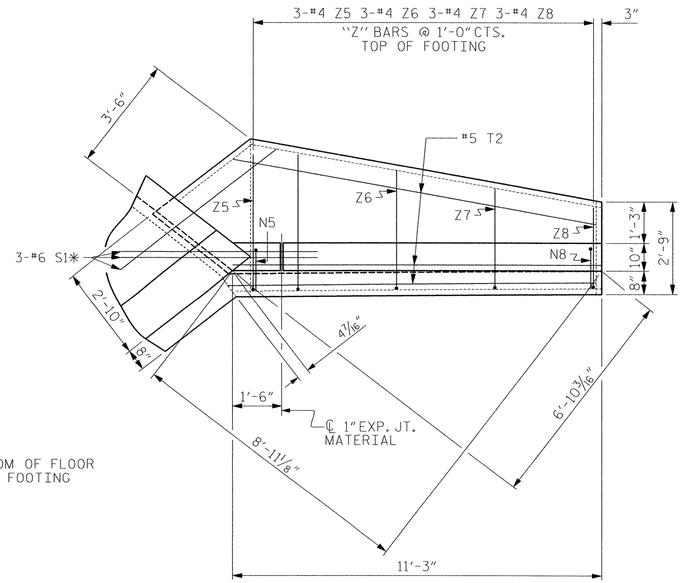
DOUBLE BARREL 8 FT. X 6 FT. CONCRETE BOX CULVERT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			9

DRAWN BY : JML DATE : 8/2012
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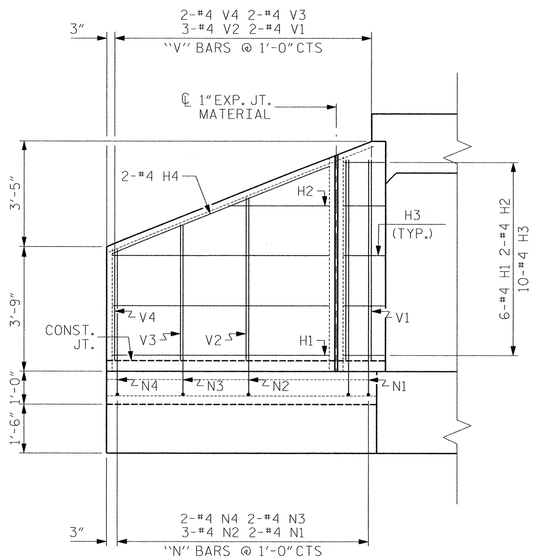


PLAN W2

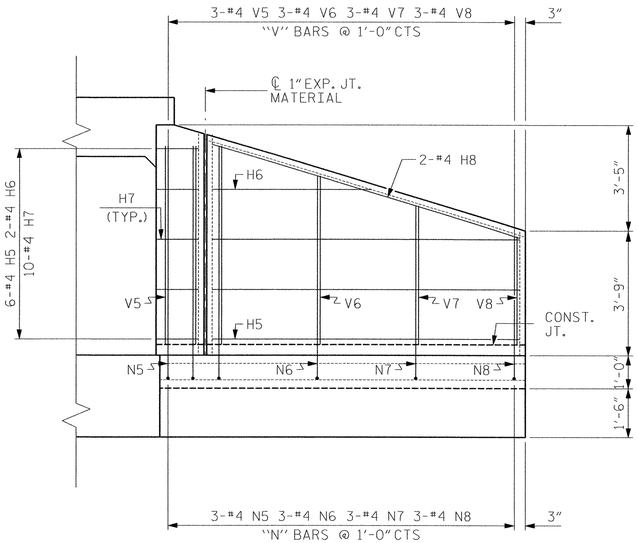


PLAN W1

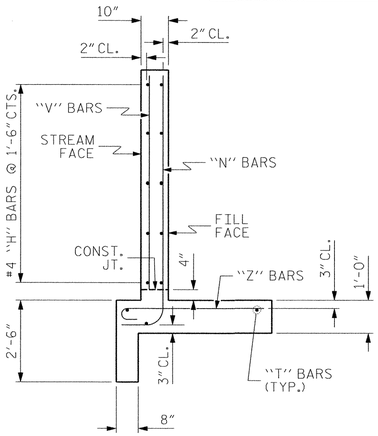
S1 @ BOTTOM OF FLOOR SLAB & FOOTING



ELEVATION W2



ELEVATION W1



TYPICAL WING SECTION

WING QUANTITIES

STAGE I

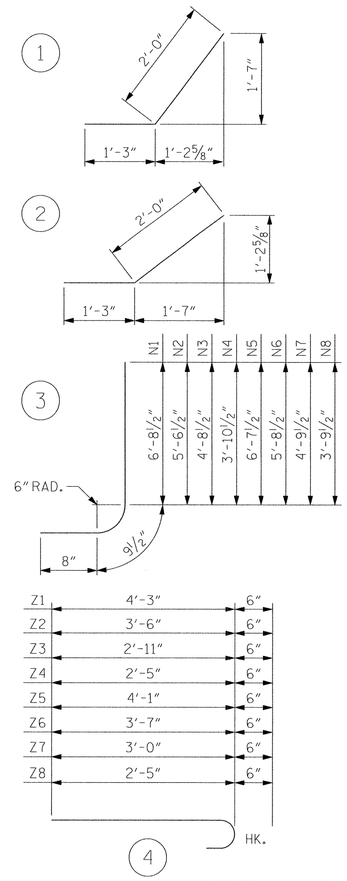
REINFORCING STEEL FOR 2 WINGS	466	LBS
CLASS A CONCRETE		
2 WINGS	7.1	CY
1 HEADWALL	0.9	CY
2 EDGE BEAMS	1.4	CY
1 END CURTAIN WALL	1.2	CY
1 SILL	0.5	CY
TOTAL	11.1	CY

STAGE II

REINFORCING STEEL FOR 2 WINGS	466	LBS
CLASS A CONCRETE		
2 WINGS	7.1	CY
1 HEADWALL	0.9	CY
2 EDGE BEAMS	1.4	CY
1 END CURTAIN WALL	1.2	CY
1 SILL	0.5	CY
TOTAL	11.1	CY

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

STAGE I OR STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	6'-7"	26
H2	2	#4	STR	3'-1"	4
H3	10	#4	1	3'-3"	22
H4	2	#4	STR	7'-1"	9
H5	6	#4	STR	9'-4"	37
H6	2	#4	STR	4'-10"	6
H7	10	#4	2	3'-3"	22
H8	2	#4	STR	9'-9"	13
N1	2	#4	3	8'-2"	11
N2	3	#4	3	7'-1"	14
N3	2	#4	3	6'-2"	8
N4	2	#4	3	5'-4"	7
N5	3	#4	3	8'-1"	16
N6	3	#4	3	7'-2"	14
N7	3	#4	3	6'-3"	13
N8	3	#4	3	5'-3"	11
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	8'-6"	27
T2	3	#5	STR	11'-3"	35
V1	2	#4	STR	6'-1"	8
V2	3	#4	STR	4'-11"	10
V3	2	#4	STR	4'-1"	5
V4	2	#4	STR	3'-4"	4
V5	3	#4	STR	6'-0"	12
V6	3	#4	STR	5'-1"	10
V7	3	#4	STR	4'-2"	8
V8	3	#4	STR	3'-3"	7
Z1	2	#4	4	4'-9"	6
Z2	3	#4	4	4'-0"	8
Z3	2	#4	4	3'-5"	5
Z4	2	#4	4	2'-11"	4
Z5	3	#4	4	4'-7"	9
Z6	3	#4	4	4'-1"	8
Z7	3	#4	4	3'-6"	7
Z8	3	#4	4	2'-11"	6

ASSEMBLED BY :	JML	DATE : 8/2012
CHECKED BY :	JMR	DATE : 11/2012
DRAWN BY : CCJ	12/99	
CHECKED BY : RWW	03/00	

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

SHEET 8 OF 9

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STATE OF NORTH CAROLINA
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RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

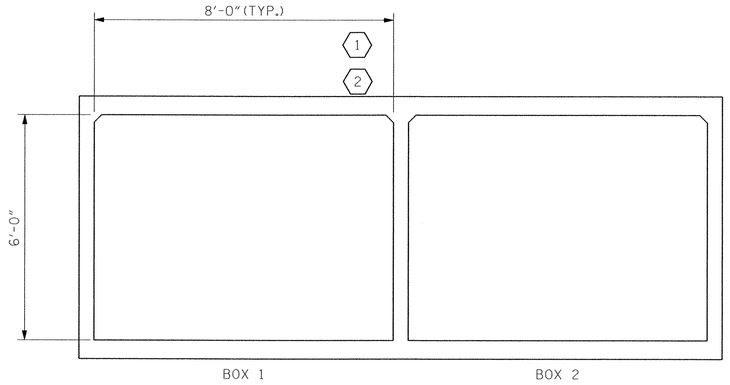
H = 6'-0" SLOPE = 2:1
75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			9

STD. NO. CW7506

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_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.00	--	1.75	1.11	1	TOP SLAB	4.67	1.00	1	TOP SLAB	8.33	
		HL-93 (OPERATING)	N/A	--	1.30	--	1.35	1.44	1	TOP SLAB	4.67	1.30	1	TOP SLAB	8.33	
		HS-20 (INVENTORY)	36.000	2	1.11	40	1.75	1.11	1	TOP SLAB	4.67	1.19	1	TOP SLAB	8.33	
		HS-20 (OPERATING)	36.000	--	1.44	52	1.35	1.44	1	TOP SLAB	4.67	1.54	1	TOP SLAB	8.33	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNGARBS2	20.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNAGRIS2	22.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNCOTTS3	27.250	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNAGGRS4	34.925	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNS5A	35.550	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNS6A	39.950	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		SNS7B	42.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNT4A	33.075	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNT6A	41.600	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNT7A	42.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNT7B	42.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNAGRIT4	43.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNAGT5A	45.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--
		TNAGT5B	45.000	--	--	--	1.40	--	--	--	--	--	--	--	--	--



LRFR SUMMARY

(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

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

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

PROJECT NO. 17BP.14.R.31

CHEROKEE COUNTY

STATION: 13+13.50 -L-

ASSEMBLED BY : JML	DATE : 8/2012
CHECKED BY : JMR	DATE : 11/2012
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			9

STD. NO. LRFR5

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 2012 "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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM

11/18/2013
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