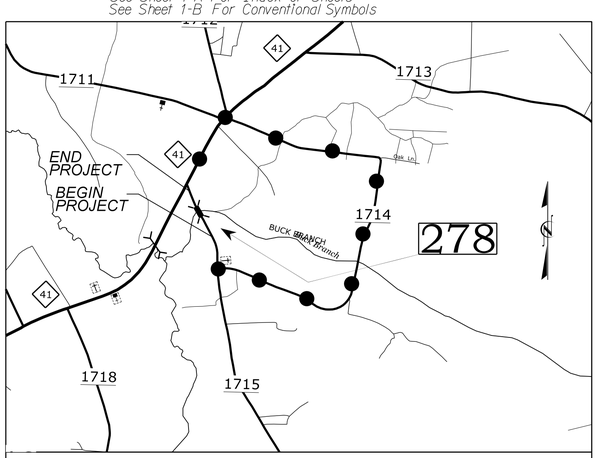
09/08/49

PROJECT: 17BP.3.R.38

CONTRACT: DC00170

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DUPLIN COUNTY

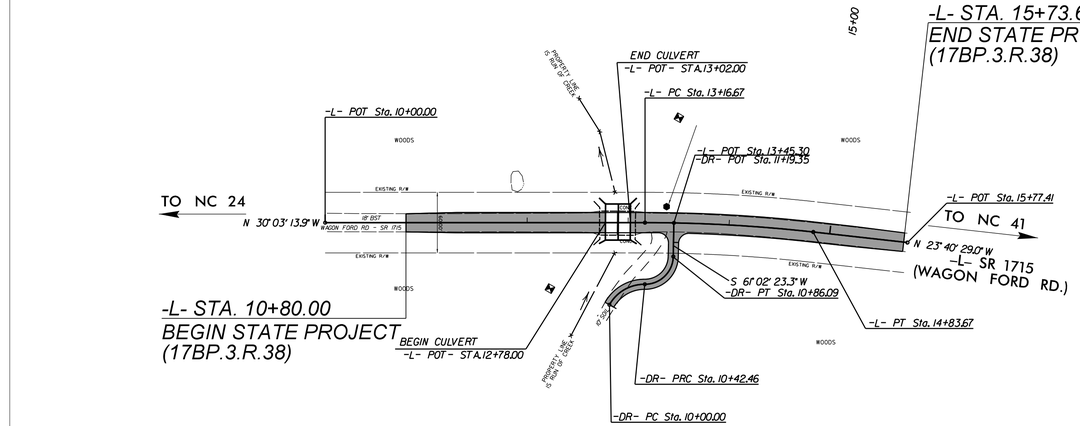
LOCATION: BRIDGE NO. 278 OVER BUCK BRANCH ON (SR 1715) WAGON FORD ROAD

TYPE OF WORK: GRADING, DRAINAGE, PAVING & CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.38	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.3.R.38		PE, RW, CONST.

NAD 83/11 • NC GRID



4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50′ 25′ 0 50′ 100′
PLANS

50′ 25′ 0 50′ 100′
PROFILE (HORIZONTAL)

10′ 5′ 0 10′ 20′
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 390
ADT 2033 = 480
DHV = 9 %
D = 60 %
T = 2 %
V = STATUTORY 55 MPH

FUNC CLASS = RURAL LOCAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.3.R.38 = 0.088 Miles
TOTAL STRUCTURE PROJECT 17BP.3.R.38 = 0.005 Miles
TOTAL LENGTH STATE PROJECT 17BP.3.R.38 = 0.093 Miles

Prepared In the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 31, 2015

LETTING DATE:
NOVEMBER 17, 2016

BRIAN K. EASON, PE
PROJECT ENGINEER

DAVID MARTIN
PROJECT DESIGNER

ALTON EDGERTON, JR
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by:
Frank F Fleming
84D521AA9FA4A6...
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
Brian K. Eason
9AF015AD7ACC48F... 9/30/2016
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	1-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
DocuSigned by: Brian K. Eason
9AF015AD7ACC48F...
9/30/2016

INDEX OF SHEETS

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

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01/17/12
REVISED: 10/31/14

GRADE LINE:

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

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

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

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

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

SUBSURFACE PLANS:
NO SUBSURFACE PLANS ARE AVAILABLE FOR THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATIONS AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE DUPLIN COUNTY UTILITIES, TRICOUNTY UTILITIES, AND CENTURY LINK. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

8/9/2016
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LOCHNER

04/06/15

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	1B

LOCHNER
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(919)571-7111
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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)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- 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
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

5/19/2016
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SEAL ONLY FOR ROADWAY DESIGN ELEMENTS

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
DocuSigned by: Brian K. Eason
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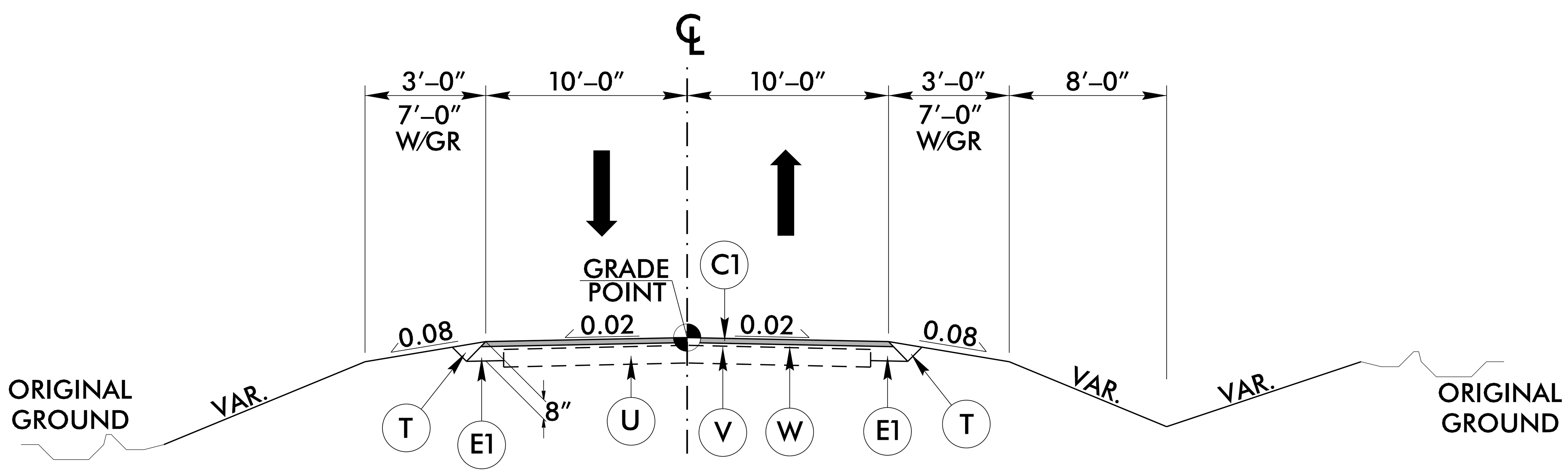
9/30/2016

PAVEMENT DESIGN SCHEDULE

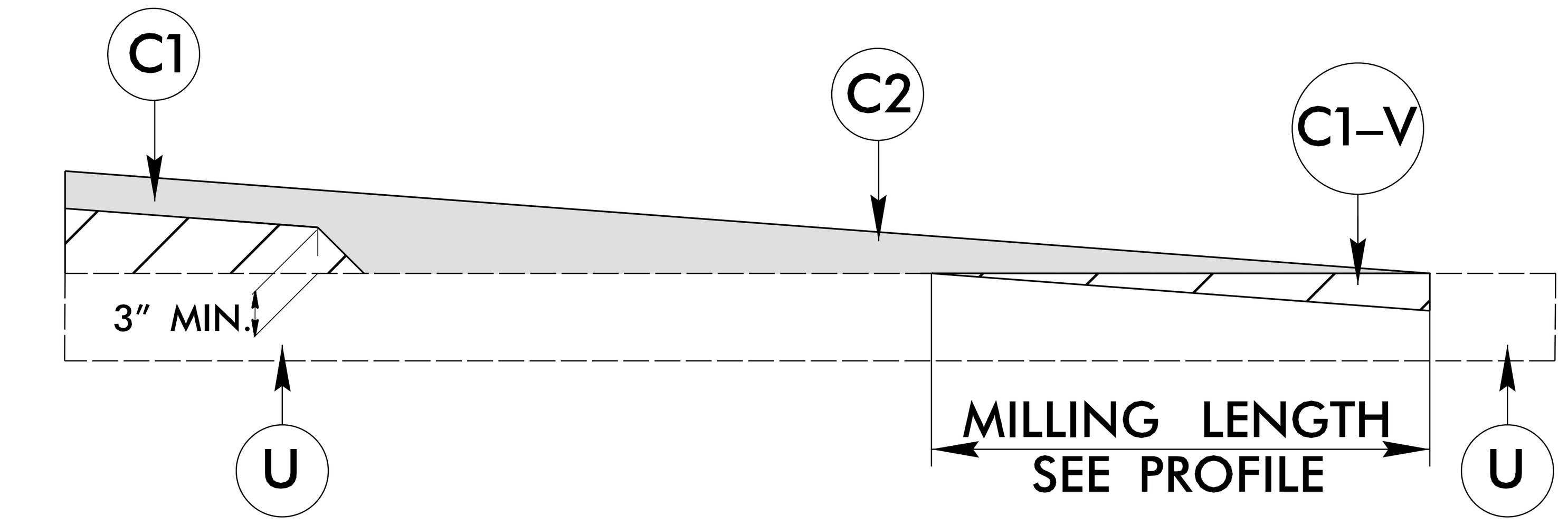
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	T	EARTH MATERIAL.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS* PER SQ* YD* PER 1″ DEPTH* TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2″ IN DEPTH*	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLING (VARIABLE DEPTH)
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.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
J1	PROP. 6″ AGGREGATE BASE COURSE		

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

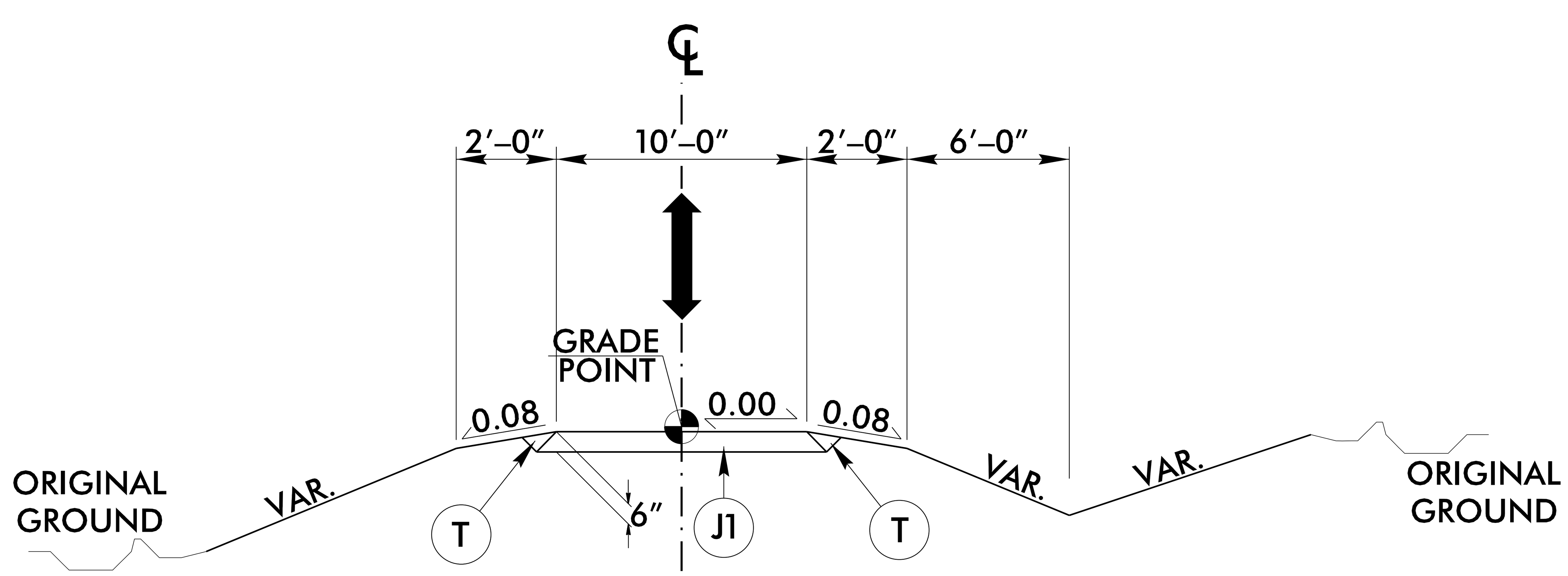


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
–L– STA. 10+80.00 TO STA. 15+73.67

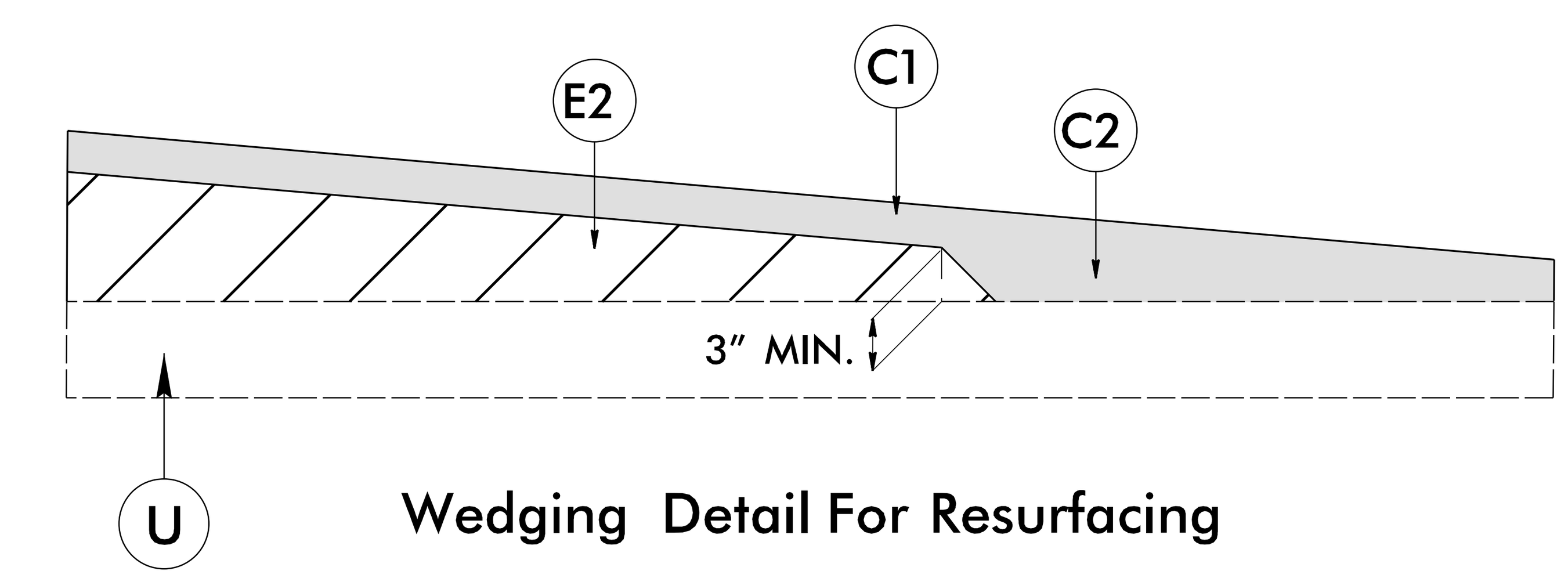


MILLING DETAIL



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
–DR– STA. 10+00.00 TO STA. 11+09.35



Wedging Detail For Resurfacing

WEDGING DETAIL

5/14/99
8/19/2016
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAMES	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RT.	AREA REMAINING LT.	CONST. EASE.	PERM. DRAIN. EASE.	PERM. UTILITY EASE.	DUAL UTILITY EASE.
1	DD KELLY JR EMILY M KELLY					0.014 AC			
2	MARINDA SHARON WHALEY TOLER								0.036 AC
3	KIMBERLY TURNER BALL					0.042 AC			0.062 AC
4	RANDY EARL BROWN & DONNA R BROWN					0.014 AC	0.007 AC		

SUMMARY OF EARTHWORK

CHAIN	STATION	STATION	UNCLASSIFIED EXCAVATION CY	EMBANK +% CY	BORROW CY	WASTE CY
-L-	10+80.00	15+73.67	33	364	331	0
-DR-	10+00.00	11+00.00	0	115	115	0
	PROJECT TOTAL		33	479	446	0
	EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				24	
	GRAND TOTAL		33		470	
	SAY		40		480	

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

CENTERLINE COORDINATE LIST

POINT NO.	SURVEY LINE	STATION	NORTHING (Y)	EASTING (X)
1	-L-	10+00.00	443,962.876	2,385,841.497
2	-L-	10+50.00	444,006.154	2,385,816.456
3	-L-	11+00.00	444,049.431	2,385,791.415
4	-L-	11+50.00	444,092.709	2,385,766.375
5	-L-	12+00.00	444,135.987	2,385,741.334
6	-L-	12+50.00	444,179.265	2,385,716.293
7	-L-	13+00.00	444,222.542	2,385,691.253
8	-L-	13+50.00	444,266.003	2,385,666.534
9	-L-	14+00.00	444,310.220	2,385,643.196
10	-L-	14+50.00	444,355.190	2,385,621.344
11	-L-	15+00.00	444,400.827	2,385,600.922
12	-L-	15+50.00	444,446.619	2,385,580.845
13	-L-	15+77.41	444,471.722	2,385,569.838

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		G.D.I. FRAME (N.S. FLAT) W/2 GRATES STD. 840.29	T.B.D.I. STD. 840.35					REMARKS
13+49 L	RT	0401																							32																		* ANCHORS REQUIRED FOR NON-RC PIPE
TOTAL																									32																		

ABBREVIATIONS

- C.B. CATCH BASIN
- N.D.I. NARROW DROP INLET
- D.I. DROP INLET
- G.D.I. GRATED DROP INLET
- G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
- J.B. JUNCTION BOX
- M.H. MANHOLE
- T.B.D.I. TRAFFIC BEARING DROP INLET
- T.B.J.B. TRAFFIC BEARING JUNCTION BOX

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GRAU 350	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	11+33.50	14+58.50	LT	325.00			13+02.00	12+78.00	4.00	7.00	50	50	1	1			2													
-L-	11+00.00	13+37.12	RT	237.50	37.50		12+78.00	13+02.00	4.00	7.00	50	6.25	1	1			1						1							
			SUB-TOTAL	562.50	37.50												3						1							
	LESS ANCHORS:																													
		GRAU 350	3@50.00	-150.00																										
		AT-1	1@6.25		-6.25																									
	ADDT'L POSTS	3																												
			TOTAL	412.5	31.25																									
			SAY	450.00	37.50												3						1							

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(919) 557-0929

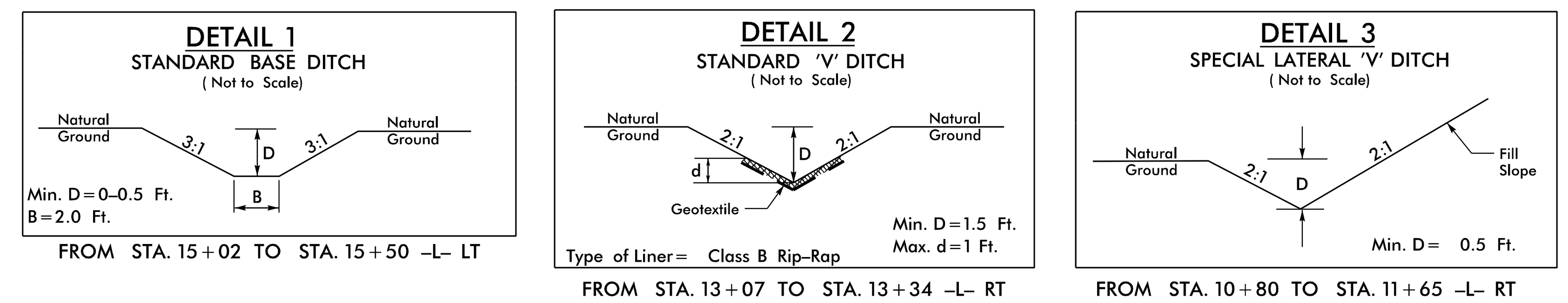
PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	4

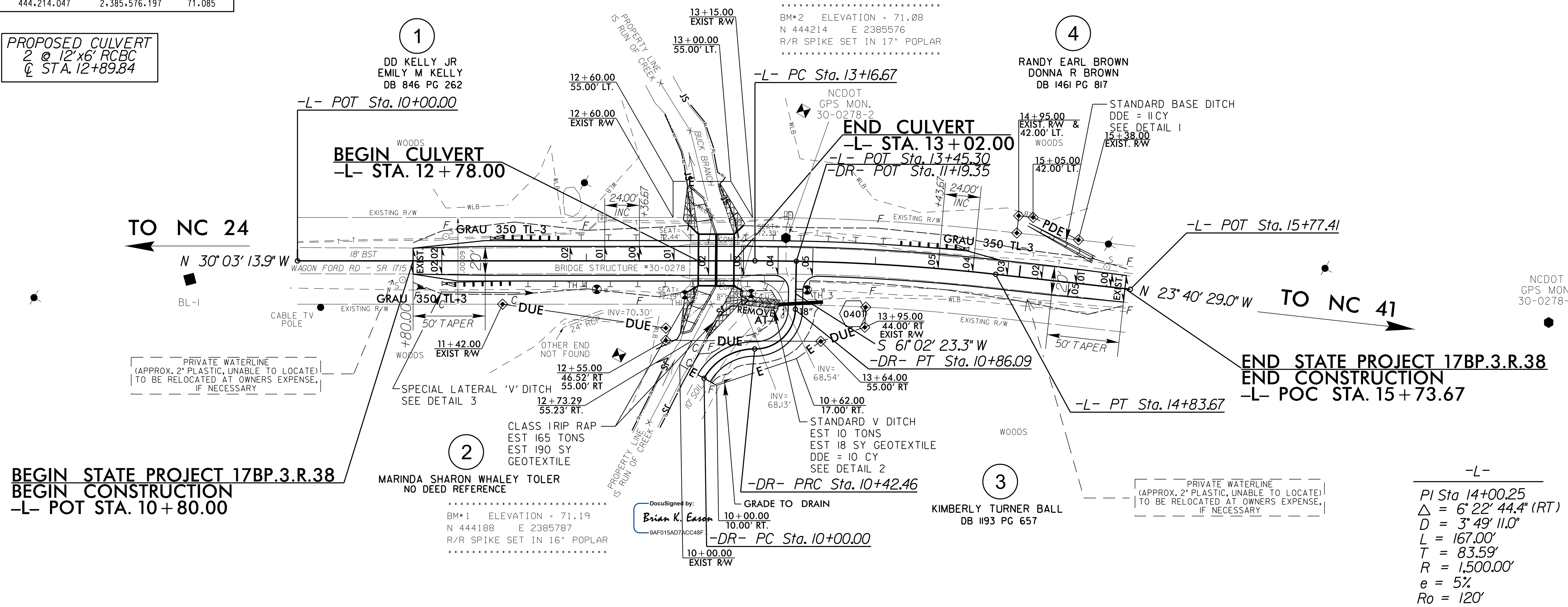
R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29523 ENGINEER BRIAN K. EASON — DocuSigned by: Brian K. Eason 9AF015AD7A0C48F... 9/29/2016	NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING — DocuSigned by: Frank F Fleming B1DD721AA9FA4A6... 9/28/2016

POINT	NORTHING	EASTING	ELEV.
NCDOT GPS MON 30-0278-2	444,247.574	2,385,658.492	73.040
NCDOT GPS MON 30-0278-3	444,733.888	2,385,444.712	73.520
BL-1	443,904.813	2,385,889.835	75.320
BM-1	444,188.218	2,385,786.552	71.190
BM-2	444,214.047	2,385,576.197	71.085

PROPOSED CULVERT
2 @ 12'x6' RCBC
℄ STA. 12+89.84





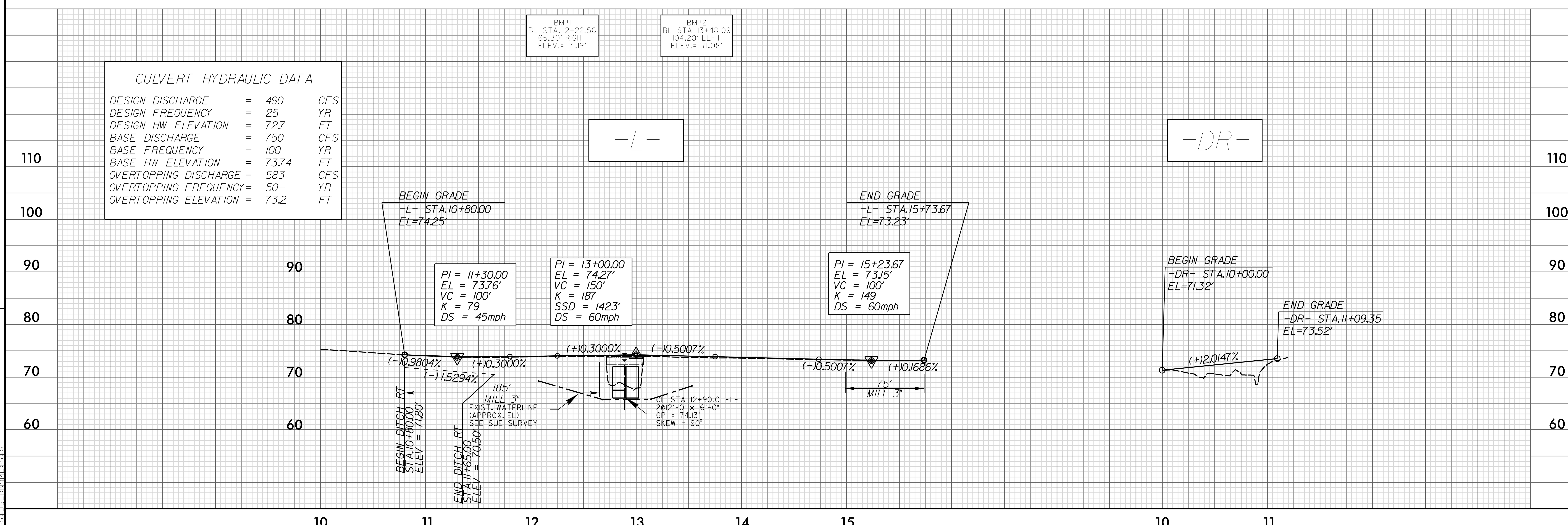
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "30-0278-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 444247.574(ft) EASTING: 2385658.492(ft)
ELEVATION: 73.0400(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999887357
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "30-0278-2" TO -L- STATION 10+00 IS 338.44'
S32°43'58.89"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

-L-	-DR-	-DR-
PI Sta 14+00.25	PI Sta 10+23.48	PI Sta 10+70.11
Δ = 6° 22' 44.4" (RT)	Δ = 60° 49' 30.3" (RT)	Δ = 89° 15' 52.4" (LT)
D = 3° 49' 11.0"	D = 143° 14' 22.0"	D = 204° 37' 40.0"
L = 167.00'	L = 42.46'	L = 43.62'
T = 83.59'	T = 23.48'	T = 27.64'
R = 1,500.00'	R = 40.00'	R = 28.00'
e = 5%		
Ro = 120'		

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	490	CFS
DESIGN FREQUENCY	=	25	YR
DESIGN HW ELEVATION	=	72.7	FT
BASE DISCHARGE	=	750	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	73.74	FT
OVERTOPPING DISCHARGE	=	583	CFS
OVERTOPPING FREQUENCY	=	50-	YR
OVERTOPPING ELEVATION	=	73.2	FT



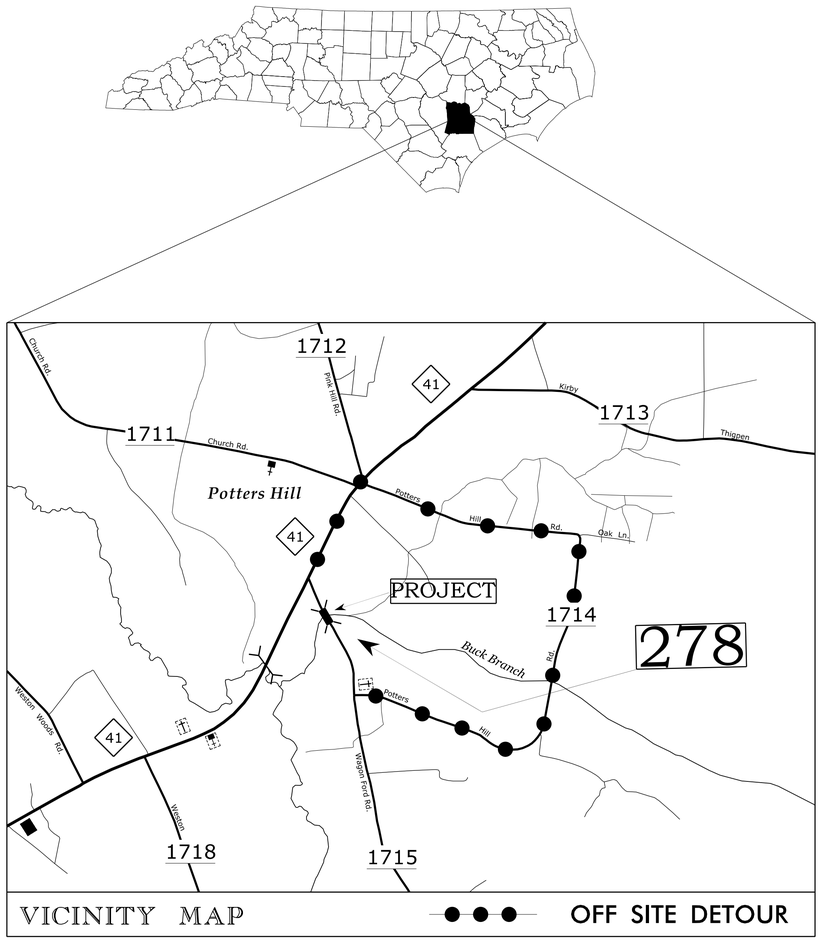
REVISIONS

8/17/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

DUPLIN COUNTY



VICINITY MAP — OFF SITE DETOUR

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS AND LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS
TMP-1A	PHASING, GENERAL NOTES AND LOCAL NOTES
TMP-2	DETOUR SIGNING
SP-1	SPECIAL SIGN DESIGN

ROADWAY STANDARD DRAWINGS

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (TEMPORARY & PERMANENT)
1261.01	GUARDRAIL AND BARRIER DELINEATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATION TYPE
1262.01	GUARDRAIL AND DELINEATION

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
LICENSE # F-0159

K Smith, PE — *QC ENGINEER*

B Eason, PE — *PROJECT ENGINEER*

D Martin — *DESIGN ENGINEER / TECHNICIAN*

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

KATHERINE HITE, PE — *DIVISION TRAFFIC ENGINEER*

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

APPROVED: Brian K. Eason
DocuSigned by:
DATE: 9AF015AD7ACC48F... 6/10/2016

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

SHEET NO.
TMP-1

17BP.3.R.38

TIP PROJECT:

6/6/2016
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LOCHNER

PROJ. REFERENCE NO.	SHEET NO.
17BP.3.R.38	TMP-1A

PHASING

PHASE I

PRIOR TO ANY CONSTRUCTION OPERATIONS, INSTALL AND COVER DETOUR SIGNS AS SHOWN ON TMP-2 AND IN ACCORDANCE WITH ROADWAY STANDARD DRAWING 1101.03 SHEET 1 OF 9. SIGNS SHALL BE COVERED IF DETOUR IS NOT OPENED WITHIN 3 DAYS OF SIGN INSTALLATION.

PHASE II

INSTALL BARRICADES AND UNCOVER DETOUR SIGNS. CLOSE -L- (SR 1715 /WAGON FORD RD.) TO TRAFFIC AS SHOWN ON TMP-2. CONSTRUCT BRIDGE, APPROACHES, AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.

PHASE III

UPON COMPLETION OF BRIDGE, APPROACHES AND ROADWAY, PLACE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH ROADWAY STANDARD DRAWINGS. REMOVE ALL ROAD CLOSURE SIGNS AND BARRICADES AND OPEN -L- (SR 1715 /WAGON FORD RD.) TO THROUGH TRAFFIC.

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 UNDESRIED OVERLAPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

D) 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.

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

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN ON SHEET TMP-2.

F) 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.

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
WAGON FORD ROAD	PAINT	RAISED

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.

T) PHASING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

DocuSigned by:
APPROVED: Brian K. Eason DATE: 6/10/2016
9AF015AD7AGC48F...

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATION PLAN

6/6/2016
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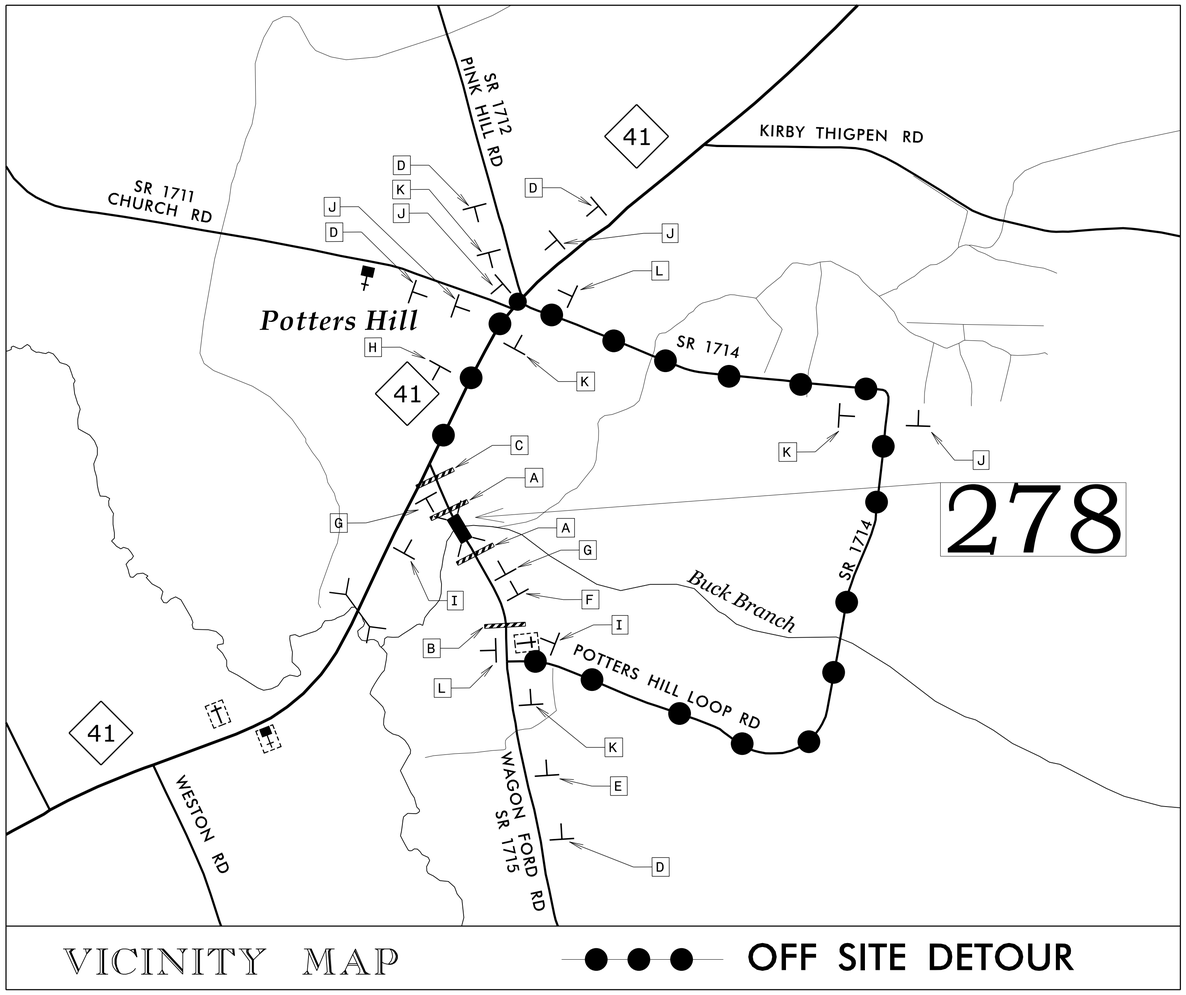
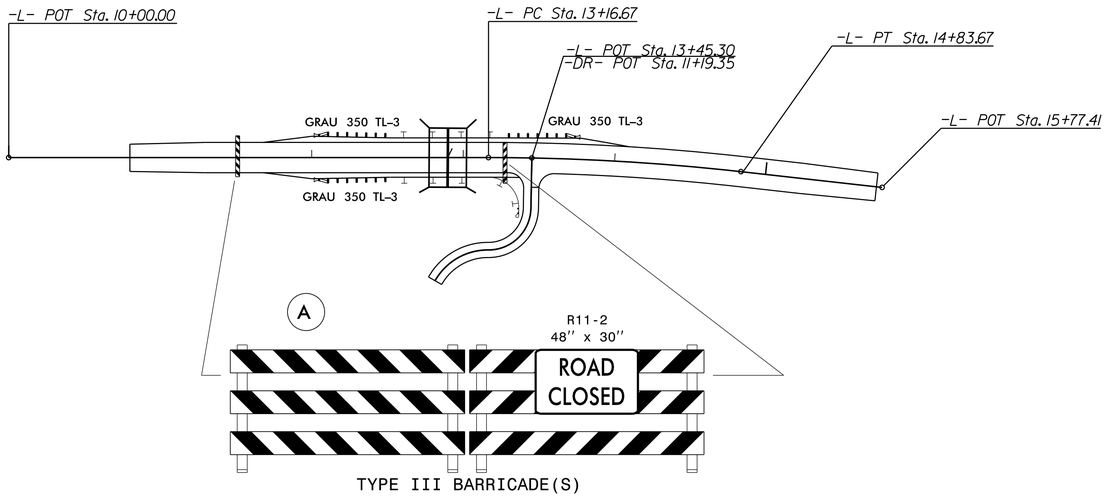
LOCHNER

PROJ. REFERENCE NO.	SHEET NO.
17BP.3.R.38	TMP-2

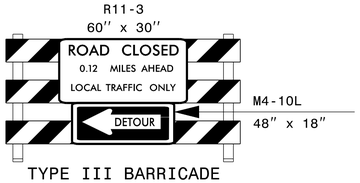




B

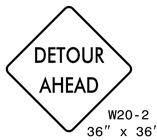
TYPE III BARRICADE

C



TYPE III BARRICADE

D



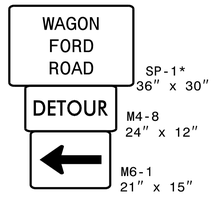
E

F

G

H

I



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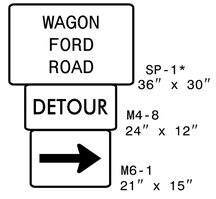

K

L

* SEE SP-1 FOR SIGN DESIGN

APPROVED: DocuSigned by: Brian K. Eason 9AF01BAD7A1C4BF... DATE: 6/10/2016

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

DETOUR SIGNING

6/6/2016
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LOCHNER

PROJ. REFERENCE NO.	SHEET NO.
17BP.3.R.38	SP-1

SIGN NUMBER: SP-1
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-6″
HEIGHT: 2′-6″
TOTAL AREA: 7.5 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

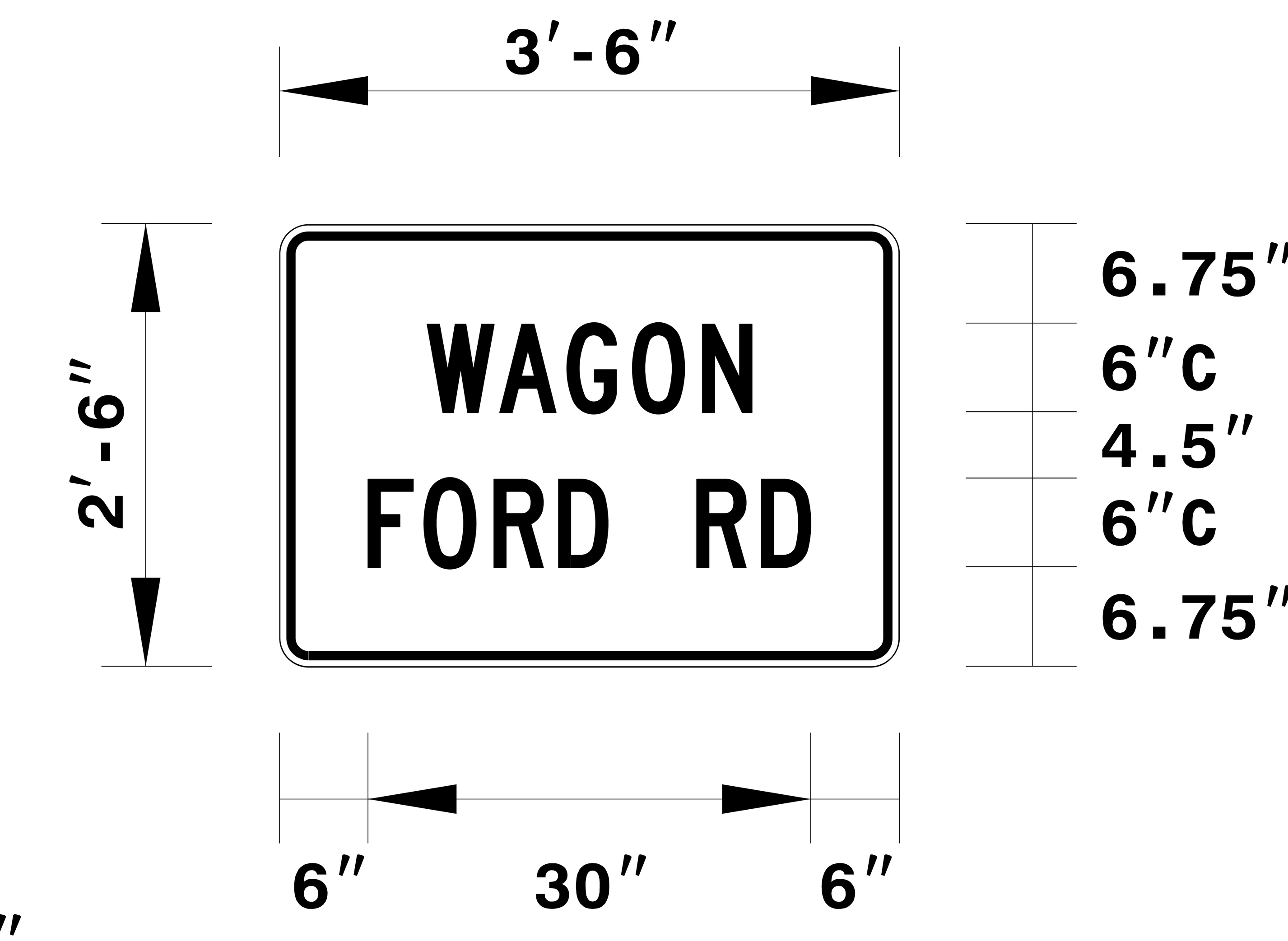
SYMBOL	X	Y	WID	HT

MAT'L: 0.080″ (2.0 mm) ALUMINUM

DESIGN BY: B. DEHLER
PROJECT ID: 17BP.3.R.38
CHECKED BY: D. WHEATLEY
DIV: 3
DATE: JANUARY 29, 2016

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.



BORDER
R=1.5″
TH=0.63″
IN=0.47″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner								Series/Size Text Length
	W	A	G	O	N			C 2000
	10.0	14.9	19.5	23.9	28.6			22.0
	F	O	R	D		R	D	C 2000
	6.0	9.8	14.5	18.9	22.3	28.3	32.6	30.0

FILENAME: WAGON FORD RD

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: Brian K. Eason DATE: 6/10/2016

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN

6/6/2016
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LOCHNER

TIP PROJECT: 17BP.3.R.38

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.38	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.3.R.38		PE, RW, CONST

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	W / 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	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

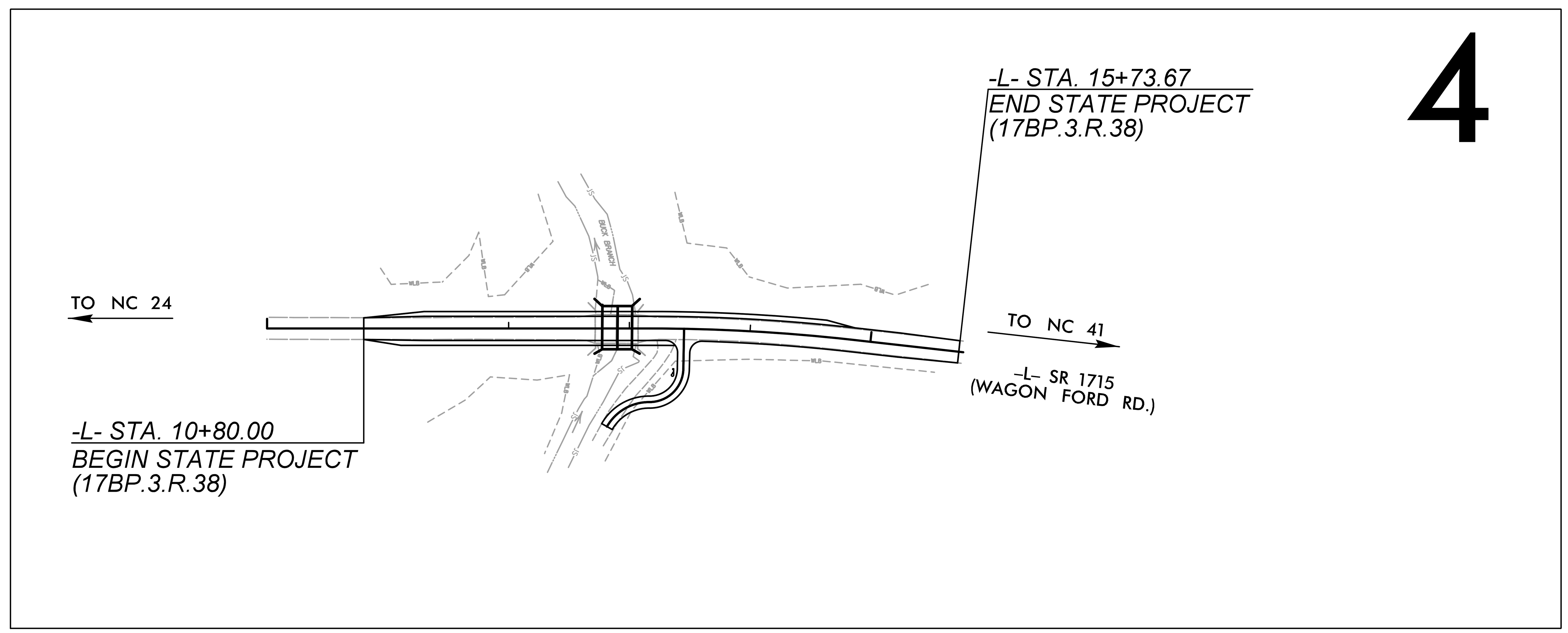
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

DUPLIN COUNTY

LOCATION: BRIDGE NO. 278 OVER BUCK BRANCH ON (SR 1715) WAGON FORD ROAD.

TYPE OF WORK: GRADING, DRAINAGE. STRUCTURE & PAVING

NAD 83/11 — NC GRID



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

GRAPHIC SCALE

50' 25' 0 50' 100' — PLANS

50' 25' 0 50' 100' — PROFILE (HORIZONTAL)

10' 5' 0 10' 20' — PROFILE (VERTICAL)

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

Prepared In the Office of:

ECOLOGICAL ENGINEERING

NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

2012 STANDARD SPECIFICATIONS

Designed by:

Reid Robol, EI — *3409*

NAME — LEVEL III CERTIFICATION NO.

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

Aaron Harper, EI

Roadway Standard Drawings

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

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

10:57:01 AM
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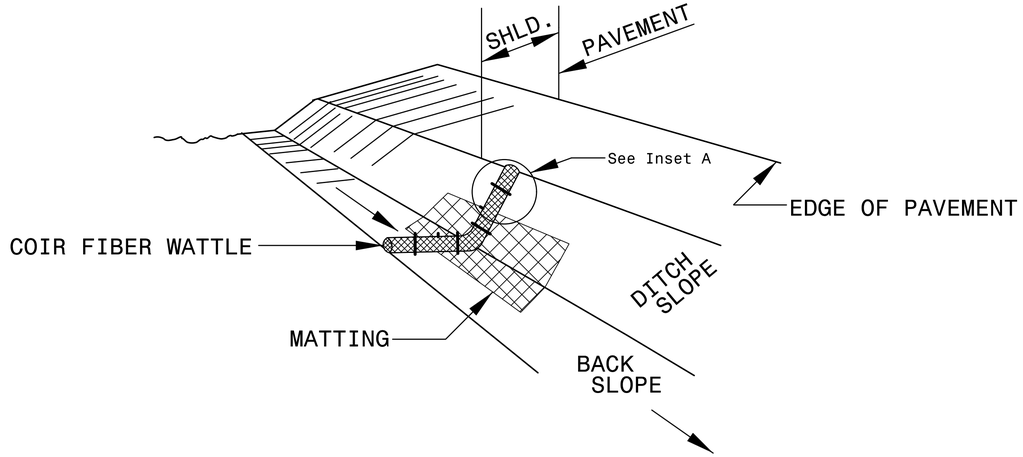
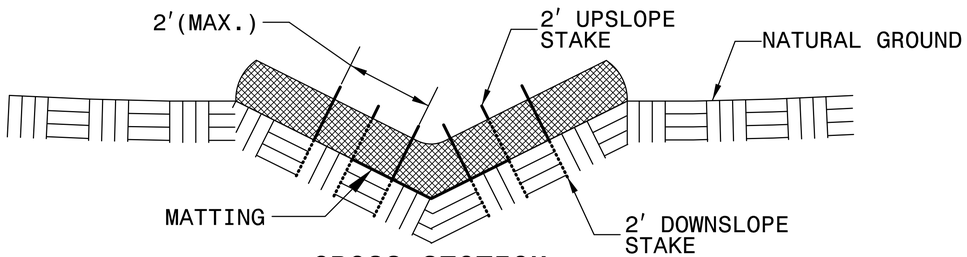
reidrobol

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

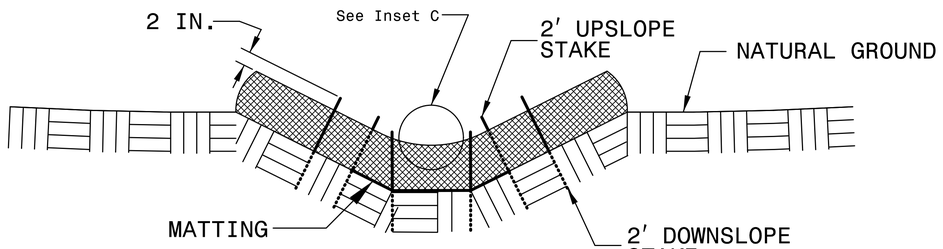
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

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

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

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

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

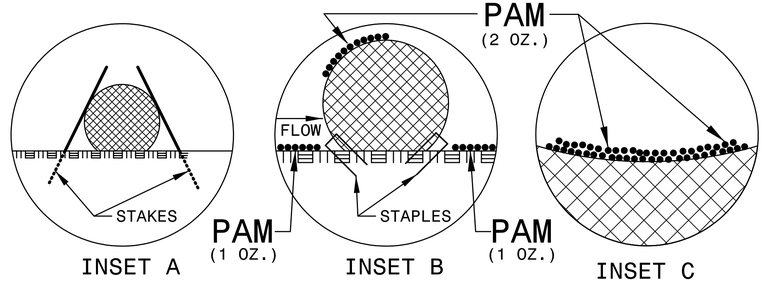
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

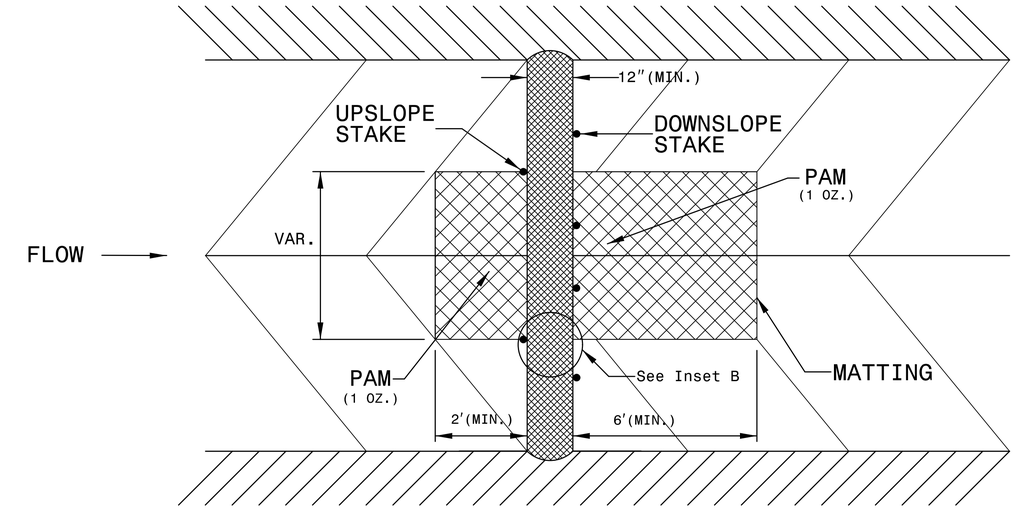
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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

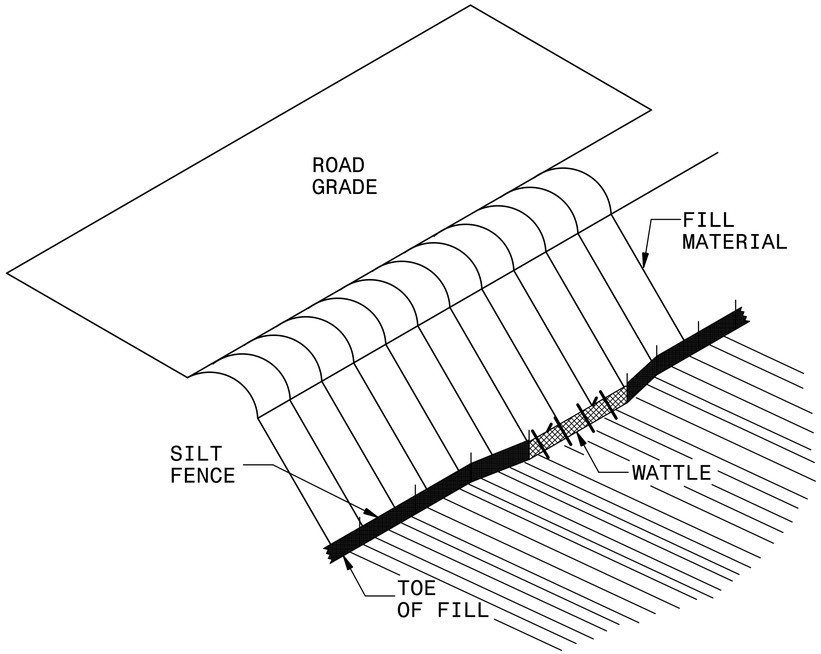




TOP VIEW

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



ISOMETRIC VIEW

NOTES:

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

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

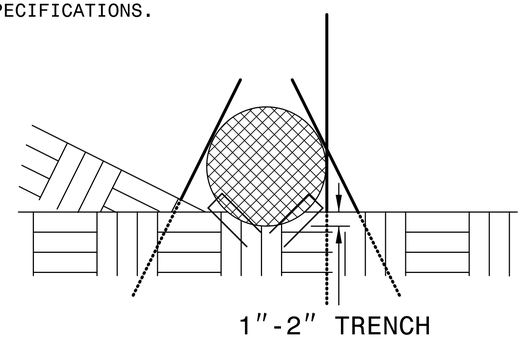
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

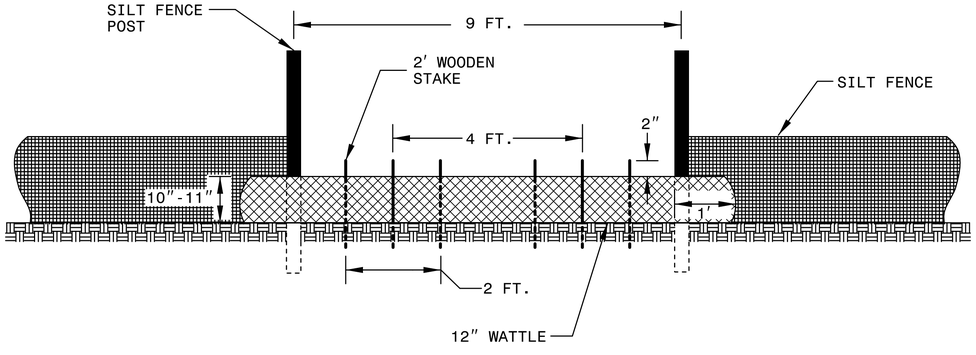
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

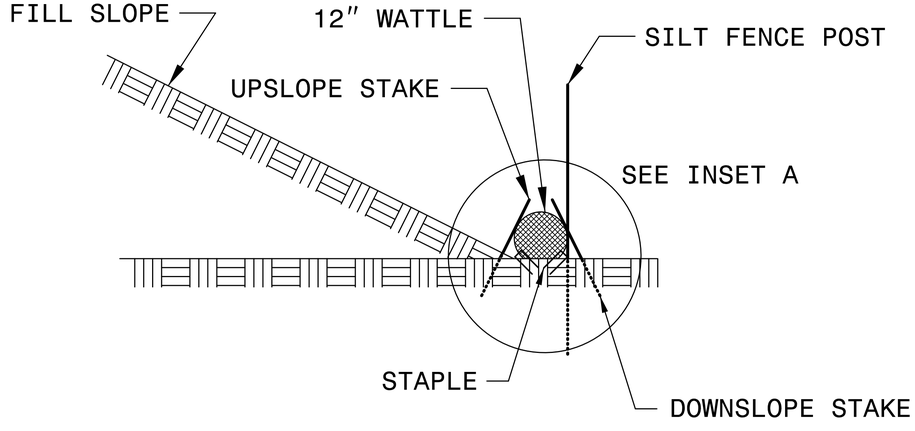
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-3B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	10+80	11+65	RT	25
				SUBTOTAL	25
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					-
				TOTAL	25
				SAY	25

MATTING FOR EROSION CONTROL

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

8/17/99

REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-04/CONST.04

R/W SHEET NO.

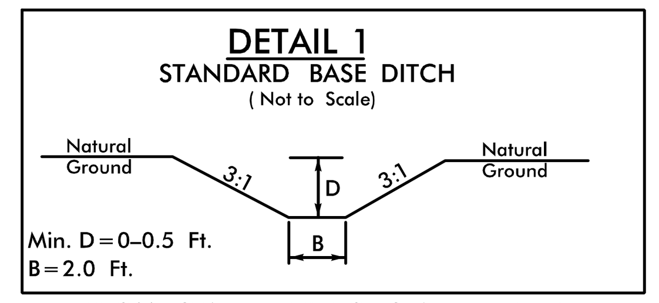
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

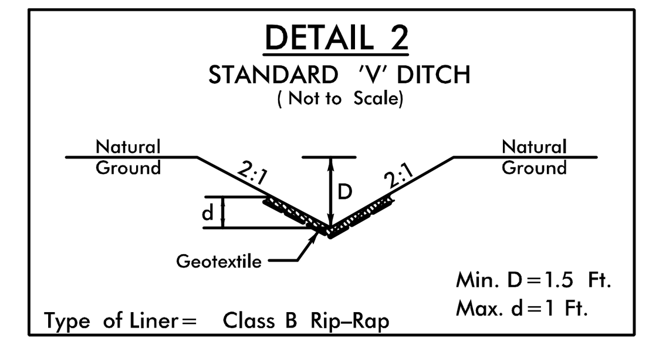
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

CONSTRUCTION SEQUENCE

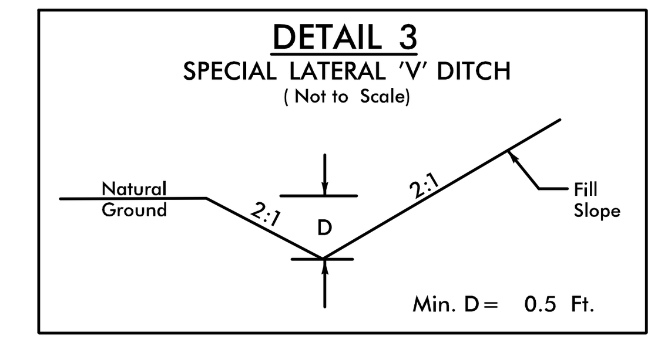
1) CLOSE ROAD AND DETOUR TRAFFIC
2) INSTALL IMPERVIOUS DIKES AND PUMP AROUND
4) DEWATER SITE UTILIZING SPECIAL STILLING BASIN
5) INSTALL 2 @ 12'–0" X 6'–0" REINFORCED CONCRETE BOX CULVERT
6) REMOVE IMPERVIOUS DIKES AND SPECIAL STILLING BASIN
7) COMPLETE ROADWAY



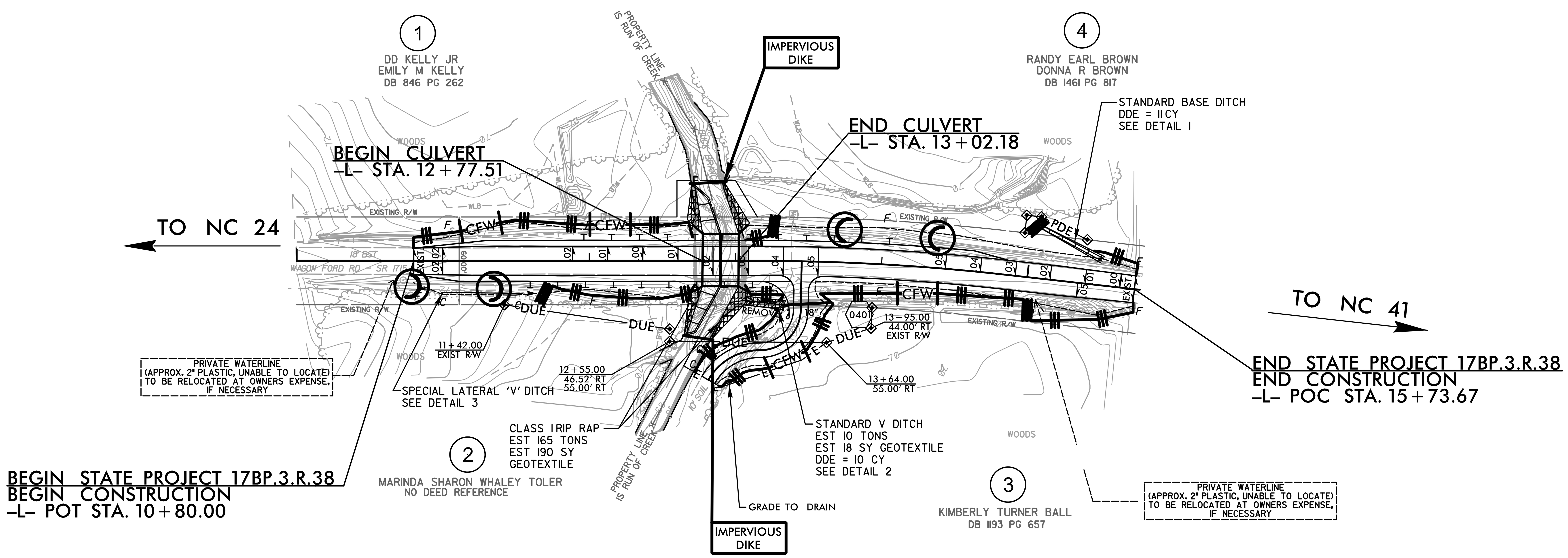
FROM STA. 15+02 TO STA. 15+50 –L–



FROM STA. 13+07 TO STA. 13+34 –L–

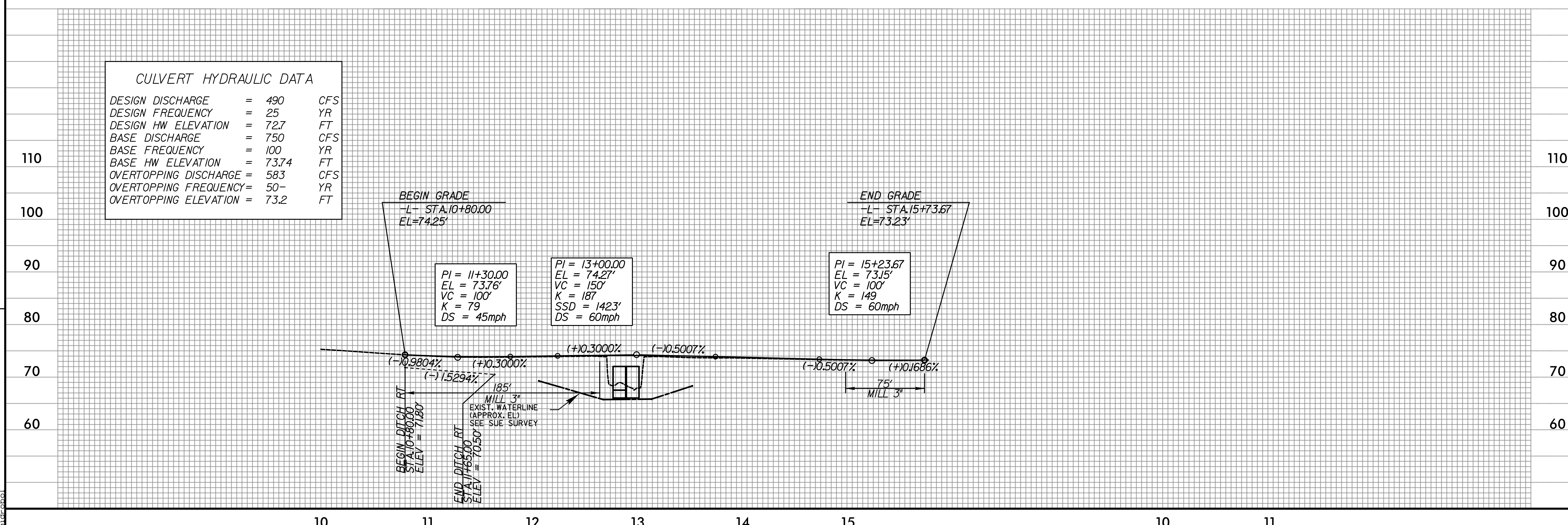


FROM STA. 10+80 TO STA. 11+65 –L–



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	490	CFS
DESIGN FREQUENCY	=	25	YR
DESIGN HW ELEVATION	=	72.7	FT
BASE DISCHARGE	=	750	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	73.74	FT
OVERTOPPING DISCHARGE	=	583	CFS
OVERTOPPING FREQUENCY	=	50–	YR
OVERTOPPING ELEVATION	=	73.2	FT



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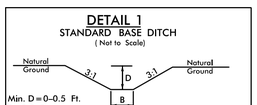
8/17/99

REVISIONS

CONSTRUCTION SEQUENCE

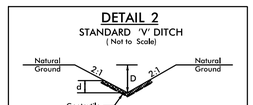
1) CLOSE ROAD AND DETOUR TRAFFIC
2) INSTALL IMPERVIOUS DIKES AND PUMP AROUND
4) DEWATER SITE UTILIZING SPECIAL STILLING BASIN
5) INSTALL 2 @ 12'-0" X 6'-0" REINFORCED CONCRETE BOX CULVERT
6) REMOVE IMPERVIOUS DIKES AND SPECIAL STILLING BASIN
7) COMPLETE ROADWAY

DETAIL 1
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 15+02 TO STA. 15+50 -L-

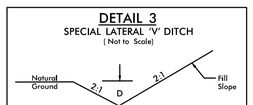
DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 13+07 TO STA. 13+34 -L-

DETAIL 3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 10+80 TO STA. 11+65 -L-

NAD 83

15+00

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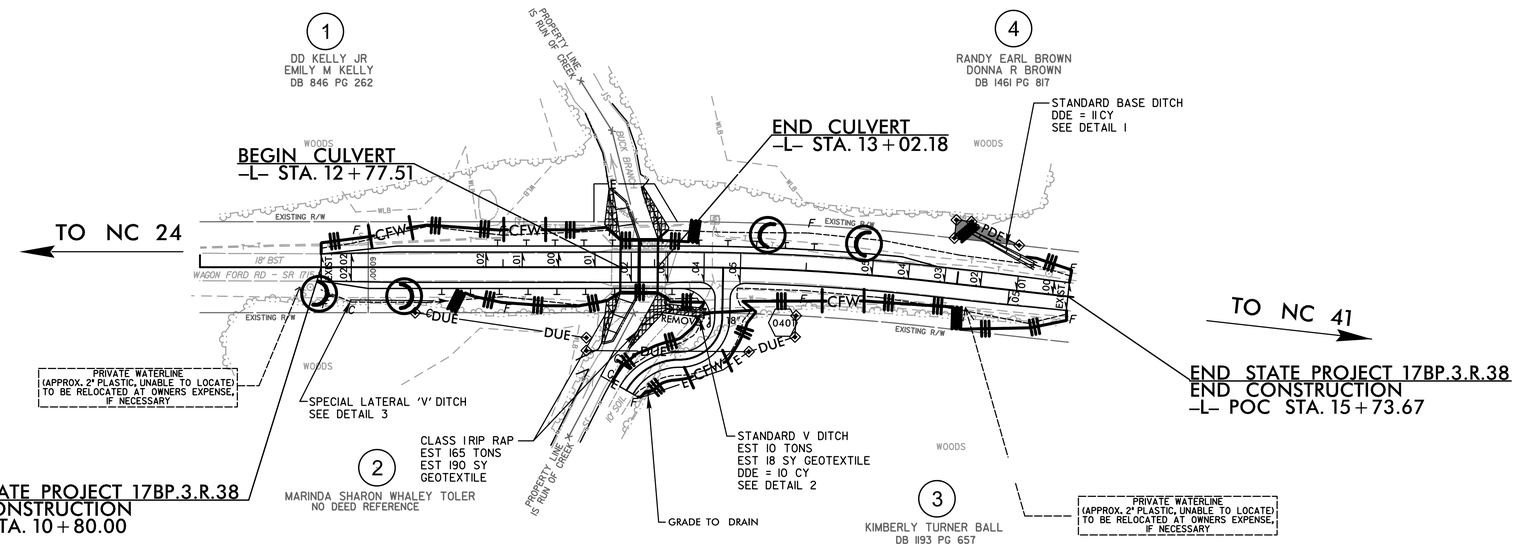
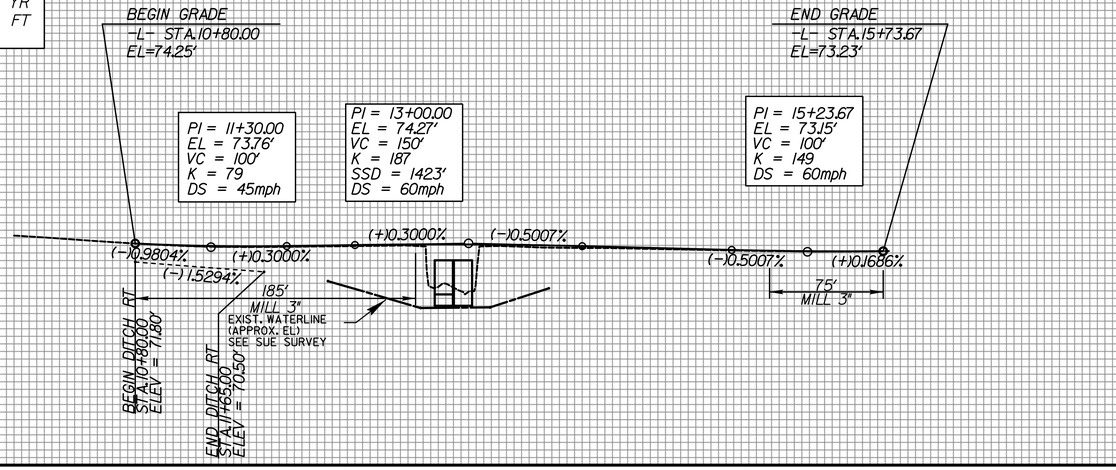
PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	490	CFS
DESIGN FREQUENCY	=	25	YR
DESIGN HW ELEVATION	=	72.7	FT
BASE DISCHARGE	=	750	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	73.74	FT
OVERTOPPING DISCHARGE	=	583	CFS
OVERTOPPING FREQUENCY	=	50-	YR
OVERTOPPING ELEVATION	=	73.2	FT



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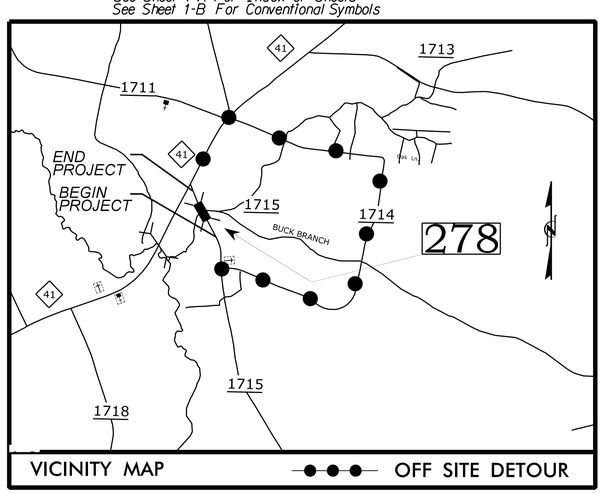
110 100 90 80 70 60

09/08/99

PROJECT: 17BP.3.R.38

CONTRACT:

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$$$$USERNAME$$$$



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DUPLIN COUNTY

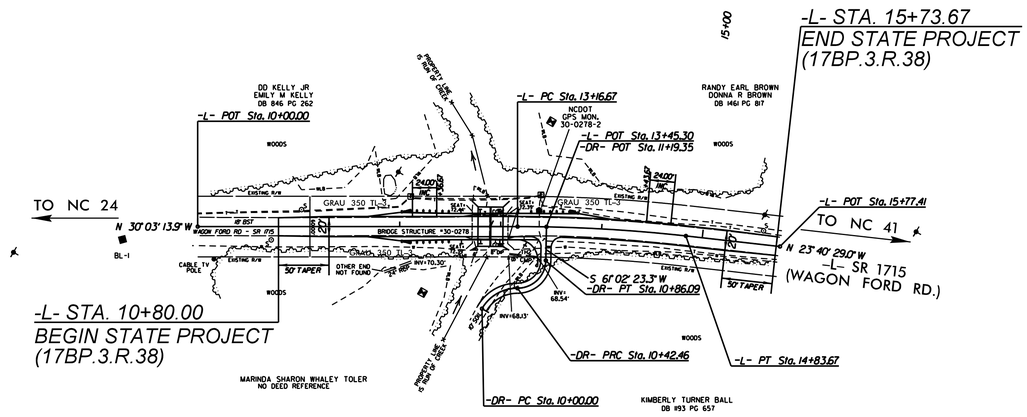
LOCATION: ***BRIDGE NO. 278 OVER BUCK BRANCH ON (SR 1715) WAGON FORD ROAD***

UTILITIES BY OTHERS

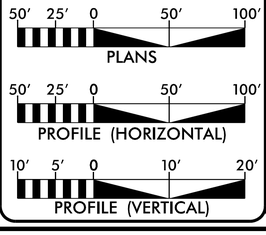
T.I.P. NO.	SHEET NO.
17BP.3.R.38	UO–01

NAD 83/11 NC GRID

UO–2 **4**



GRAPHIC SCALES



INDEX OF SHEETS

UTILITY OWNERS ON PROJECT

(A) CENTURYLINK – TELECOMMUNICATIONS
(B) POTTERS HILL WATER ASSOC. – WATER

Prepared In the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 31, 2015

LETTING DATE:
NOVEMBER 17, 2016

BRIAN K. EASON, PE
PROJECT ENGINEER

DAVID MARTIN
PROJECT DESIGNER

ALTON EDGERTON, JR
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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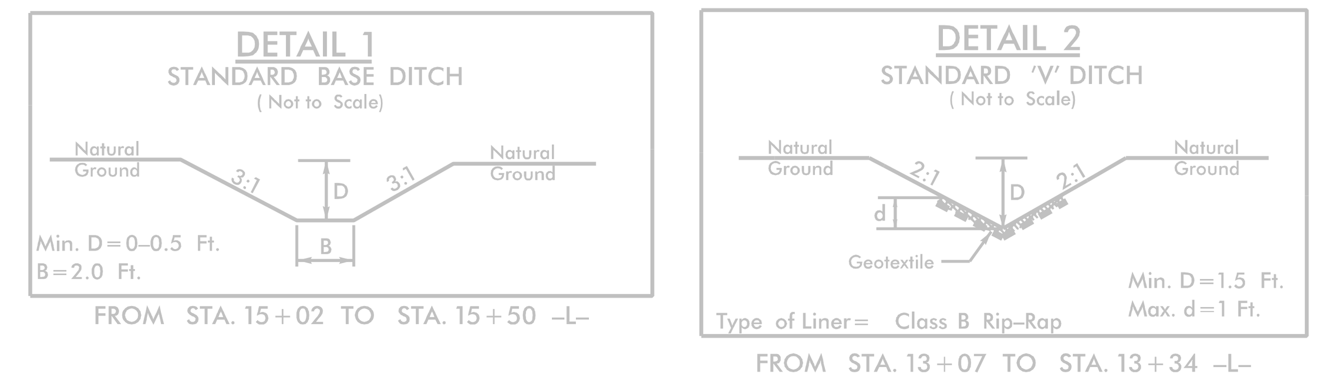
(919) 557-0929

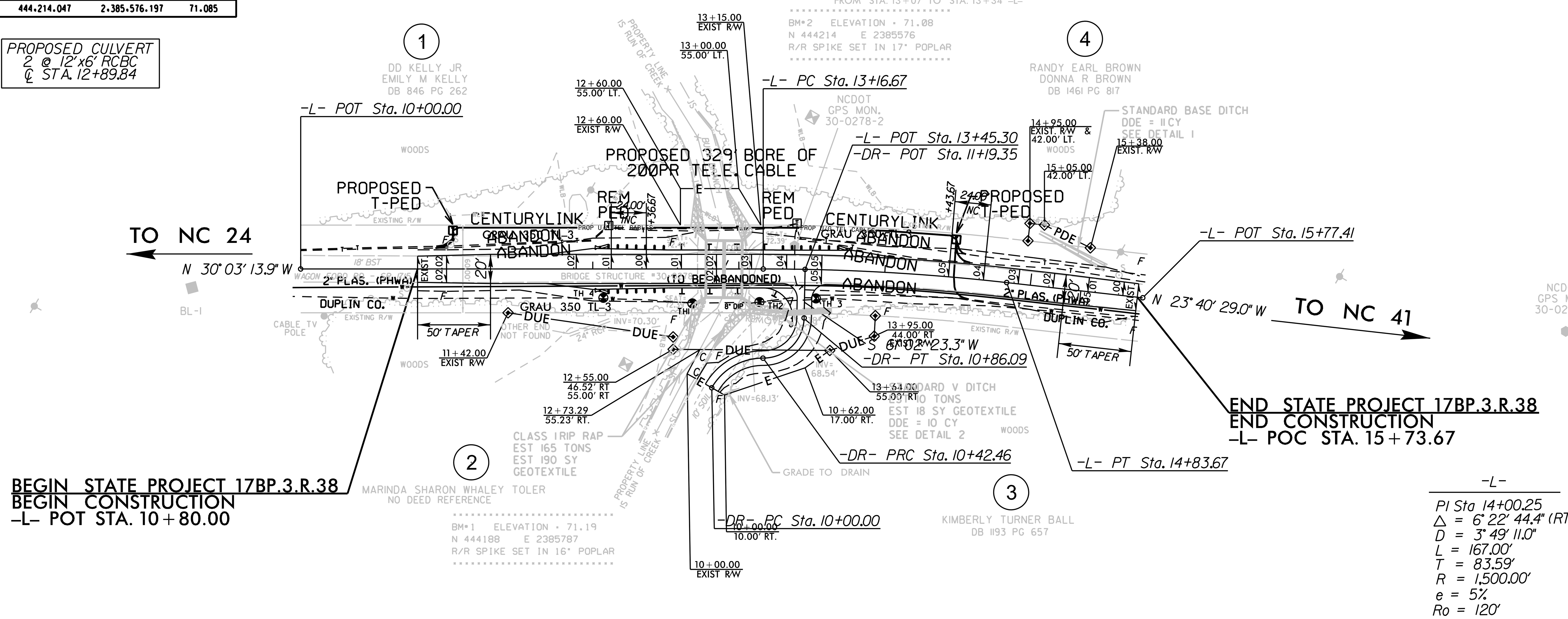
UTILITIES BY OTHERS

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

POINT	NORTHING	EASTING	ELEV.
NCDOT GPS MON 30-0278-2	444,247.574	2,385,658.492	73.040
NCDOT GPS MON 30-0278-3	444,733.888	2,385,444.712	73.520
BL-1	443,904.813	2,385,889.835	75.320
BM-1	444,188.218	2,385,786.552	71.190
BM-2	444,214.047	2,385,576.197	71.085

PROPOSED CULVERT
2 @ 12'x6' RCBC
℄ STA. 12+89.84

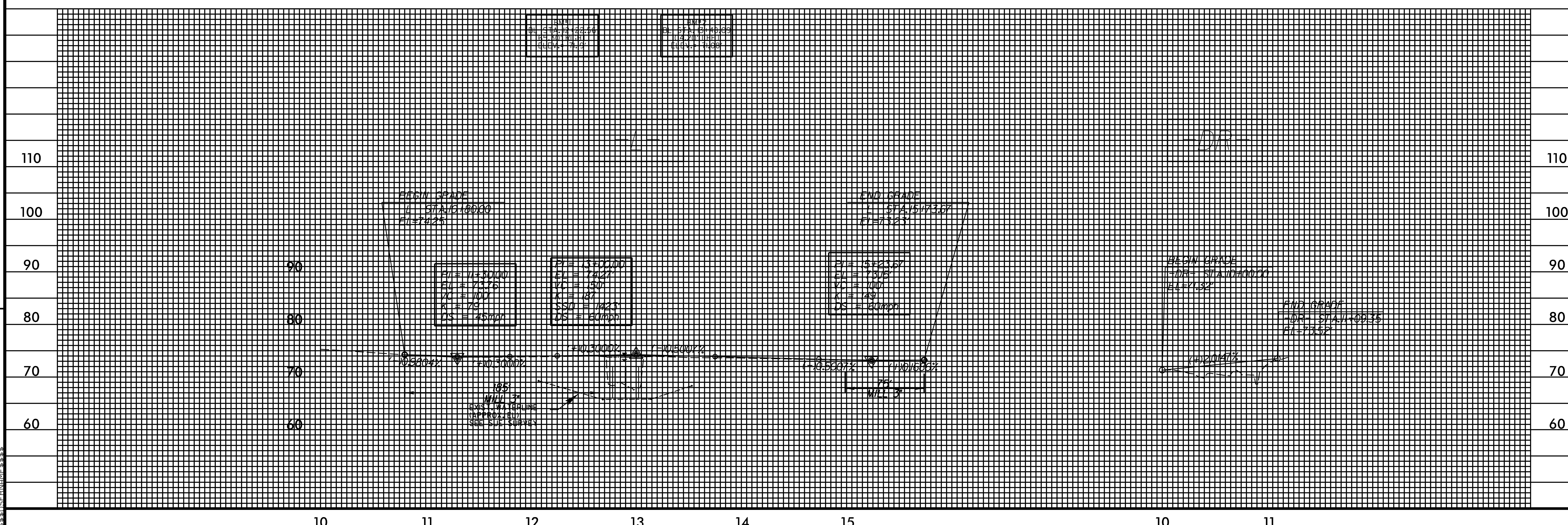




DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "30-0278-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 444247.574(ft) EASTING: 2385658.492(ft) ELEVATION: 73.0400(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999887357
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "30-0278-2" TO -L- STATION 10+00 IS 338.44' S32°43'58.89"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

-L-	-DR-	-DR-
PI Sta 14+00.25	PI Sta 10+23.48	PI Sta 10+70.11
Δ = 6° 22' 44.4" (RT)	Δ = 60° 49' 30.3" (RT)	Δ = 89° 15' 52.4" (LT)
D = 3° 49' 11.0"	D = 143° 14' 22.0"	D = 204° 37' 40.0"
L = 167.00'	L = 42.46'	L = 43.62'
T = 83.59'	T = 23.48'	T = 27.64'
R = 1,500.00'	R = 40.00'	R = 28.00'
e = 5%		
Ro = 120'		

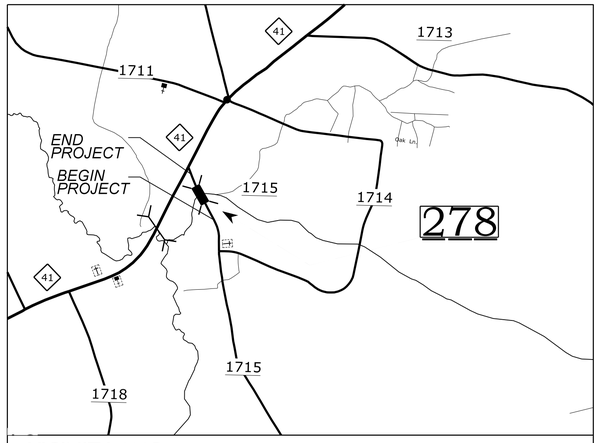


REVISIONS

8/17/99

PROJECT: 17BP.3.R.38

See Sheet UC-2 For Conventional Symbols



VICINITY MAP ●●● OFF SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
17BP.3.R.38	UC–1

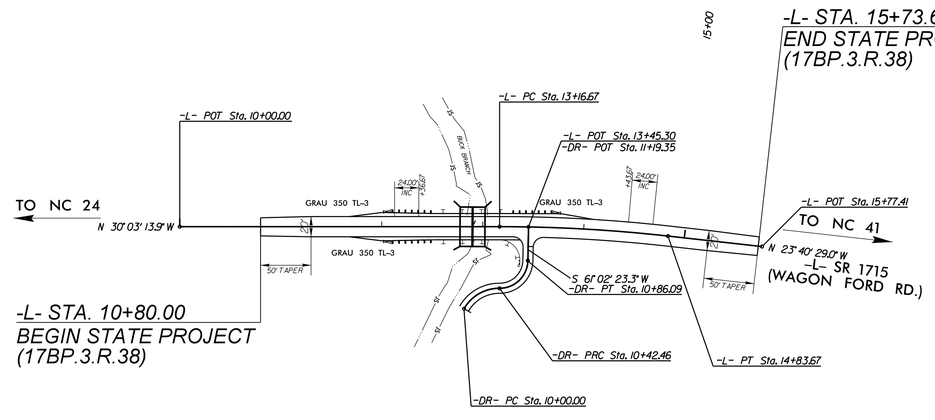
UTILITY CONSTRUCTION PLANS
DUPLIN COUNTY

LOCATION: BRIDGE NO. 300278 OVER BUCK BRANCH ON (SR 1715) WAGON FORD ROAD

TYPE OF WORK: UTILITY CONSTRUCTION (WATER)

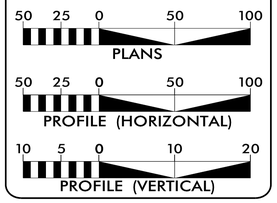
NAD 83/11 NC GRID

(UC–4) **4**



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER– DUPLIN COUNTY WATER DEPARTMENT

SEAL

6/22/2016

NORTH CAROLINA PROFESSIONAL SEAL 23100 ENGINEER TRACY NEAL PARROTT

DocuSigned by: Tracy N. Parrott FCB7B35B99EC451...

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES FIRM NO. P-0339
504 Meadowland Drive
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.net

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 31, 2015

LETTING DATE: JANUARY 7, 2016

TRACY N. PARROTT, PE
PROJECT ENGINEER

BRANDON W. JOHNSON, PE
PROJECT DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PBPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL_PED
- Utility Line by Others (Type as Shown)
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT

- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole — W
- Power Manhole — P
- Telephone Manhole — T
- Sanitary Sewer Manhole — S
- Hand Hole for Cable — HH
- Power Transformer — PT
- Telephone Pedestal — T
- CATV Pedestal — C
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

- *Underground Power Line
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line
- Underground Unknown Utility Line
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

REV: 2/1/2012

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	UC-3

DESIGNED BY: SWM
DRAWN BY: ——
CHECKED BY: BWJ
APPROVED BY: TNP
REVISED:

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
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Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

6/22/2016
NORTH CAROLINA PROFESSIONAL SEAL 23100 ENGINEER TRACY NEAL PARROTT
DocuSigned by: Tracy N. Parrott FCBYB35B99EC451...
UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY CONSTRUCTION

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.

2. THE EXISTING UTILITIES BELONG TO DUPLIN COUNTY WATER DEPARTMENT .

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM -L- STATION 12+37 TO -L- STATION 13+20 SHALL BE HDPE (HIGH-DENSITY POLYETHYLENE) PIPE BY DIRECTIONAL BORE.

2. PROPOSED WATER LINE FROM -L- STATION 11+41 APPROX. TIE-IN) TO -L- STATION 12+37 AND FROM -L-STATION 13+20 TO -L- STATION 14+10 (APPROX. TIE-IN)SHALL BE PVC (POLYVINL CHLORIDE) PIPE IN ACCORDANCE WITH SECTON 1034 OF THE 2012 STANDARD SPECIFICATIONS.

3. USE APPROPRIATE FITTINGS TO TRANSITION AND CONNECT HDPE AND PVC PIPE MATERIAL AND TO TIE TO EXISTING WATER LINE.

4. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

5. IF HDPE PIPE IS INSTALLED BY DIRECTIONAL DRILL. IT SHALL BE FILLED WITH WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR ONE WEEK FROM THE TIME OF INSTALLATION.

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	UC-3A

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

6/22/2016

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23100 TRACY NEAL PARROTT

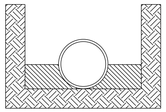
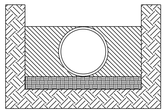
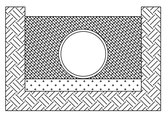
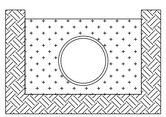
SUMMIT

NC FIRM LICENSE Nos P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

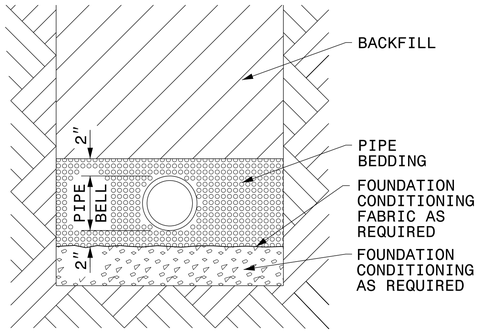
UTILITY CONSTRUCTION

LAYING CONDITIONS	DESCRIPTION	PROJECT USE
 TYPE 1	FLAT BOTTOM UNDISTURBED EARTH TRENCH, LOOSE BACKFILL	NOT USED.
 TYPE 2	FLAT BOTTOMED UNDISTURBED EARTH TRENCH. BACKFILL LIGHTLY CONSOLIDATED TO CENTERLINE OF PIPE.	NOT USED.
 TYPE 3	PIPE BEDDED IN 4" MINIMUM JOB EXCAVATED MATERIAL. BACKFILL LIGHTLY CONSOLIDATED TO TOP OF PIPE.	ALL DUCTILE WATER AND SEWER LINE.
 TYPE 4	PIPE BEDDED IN SAND, GRANULAR MATERIAL OR GRADED GRAVEL TO THE DEPTH OF 1/8 PIPE DIAMETER, 4" MIN. JOB EXCAVATED MATERIAL COMPACTED TO 4" ABOVE TOP OF PIPE. (APPROX. 95% STANDARD PROCTOR, AASHTO T-99)	ALL PVC WATER LINE AND PVC FORCE MAIN.
 TYPE 5	PIPE BEDDED TO ITS CENTERLINE IN COMPACTED GRANULAR MATERIAL 4" MIN. UNDER PIPE. COMPACTED GRANULAR OR SAND MATERIAL TO 4"ABOVE TOP OF PIPE. (APPROX. 95% STANDARD PROCTOR, AASHTO T-99)	ALL PVC GRAVITY SEWER LINE.

TYPICAL LAYING CONDITIONS

NOT TO SCALE

TRENCH DETAIL



PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.38	UC-4
DESIGNED BY: SWM	6/22/2016
DRAWN BY: ——	
CHECKED BY: BWJ	
APPROVED BY: TNP	
REVISED:	

Prepared in the Office of: SUMMIT ENGINEERING AND SURVEYING SERVICES
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23100 TRACY NEAL PARROTT

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

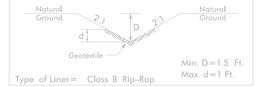
UTILITY CONSTRUCTION

PROP.
270 LF REMOVE
6" WATER LINE

DETAIL 1
STANDARD BASE DITCH
(Not to Scale)

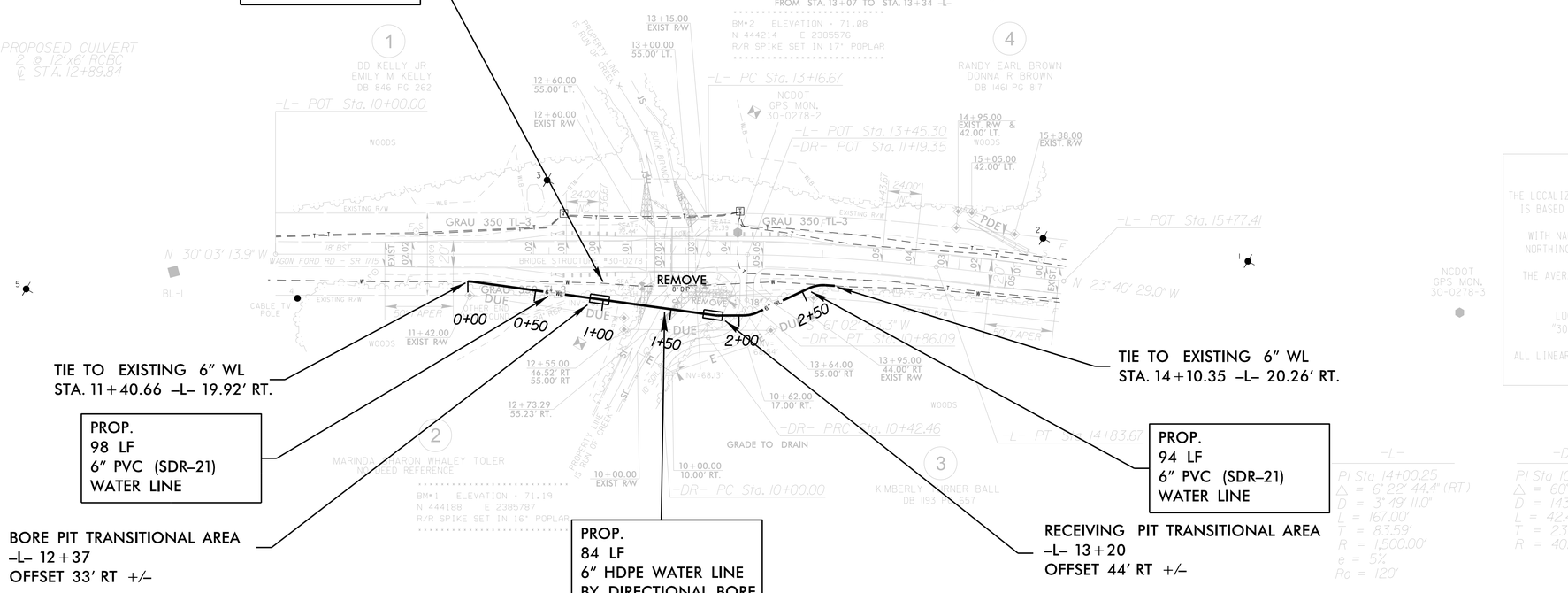
FROM STA. 15+02 TO STA. 15+50 –L–

DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

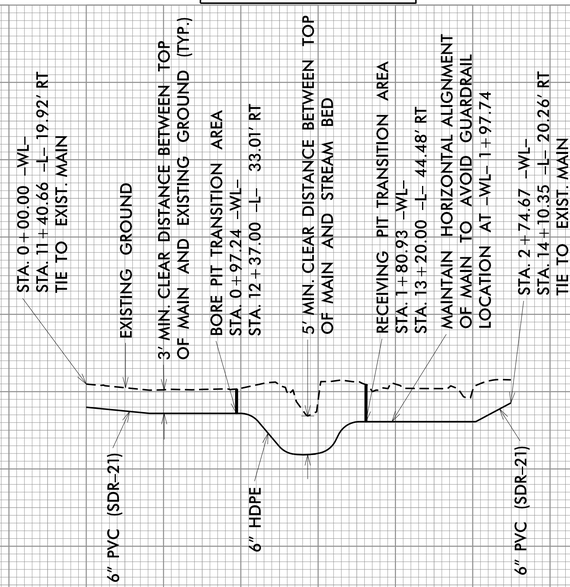
FROM STA. 13+07 TO STA. 13+34 –L–



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "30-0278-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 444247.574(ft) EASTING: 2385658.492(ft) ELEVATION: 73.0400(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999887357
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "30-0278-2" TO –L– STATION 10+00 IS 338.44' S32°43'58.89"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

–L–	–DR–	–DR–
PI Sta 14+00.25	PI Sta 10+23.48	PI Sta 10+70.11
Δ = 6° 22' 44.4" (RT)	Δ = 60° 49' 30.3" (RT)	Δ = 89° 15' 52.4" (LT)
D = 3° 49' 11.0"	D = 143° 14' 22.0"	D = 204° 37' 40.0"
L = 167.00'	L = 42.46'	L = 43.62'
T = 83.59'	T = 23.48'	T = 27.64'
R = 1,500.00'	R = 40.00'	R = 28.00'
e = 5%		
Ro = 120'		



8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.3.R.38	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

80 / 75 / 70 / 65

EX.R/W — 3:1 — 0.015 — 0.020 — 2:1 — EX.R/W — DUE

73.85

12+00.00

80 / 75 / 70 / 65

46.283

EX.R/W — 3:1 — 0.020 — 0.020 — 2:1 — EX. DU

73.78

70.8

11+50.00

80 / 75 / 70 / 65

EX.R/W — 3:1 — 0.020 — 0.020 — 2:1 — EX.R/W

74.04

71.6

11+00.00

80 / 75 / 70 / 65

EX.R/W — 3:1 — 0.020 — 0.020 — 2.84:1 — EX.R/W

74.25

10+80.00

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

7/29/2016
I:\RAL_PRJ\000009322\TIP\Roadway\XSC\300278_rdy_L_xp1.dgn
LOCHNER

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.3.R.38	X-2

EX.R/W

0.050

0.050

2:1

3:1

73.62

14+00.00

EX.R/W

EX.R/W

0.047

0.047

2:1

3:1

73.71

13+50.00

EX.R/W

DUE

TCE

TCE

EX.R/W

1.8:1

0.026

0.026

67.87

13+00.00

EX.R/W

DUE

EX.R/W

3:1

0.006

0.020

3:1

73.96

12+50.00

DUE

7/29/2016
I:\RAL_PRJ\000009322\TIP\Roadway\XSC\300278_rdy_L_xp1.dgn
LOCHNER

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.3.R.38	X-3

EX.R/W

3:1 0.015 0.066

73.23

15+73.67

EX.R/W

EX.R/W

2:1 0.003 0.056 3:1

73.19

15+50.00

EX.R/W

PDE

EX.R/W

2:1 0.022 0.050 3:1

73.25

15+00.00

EX.R/W

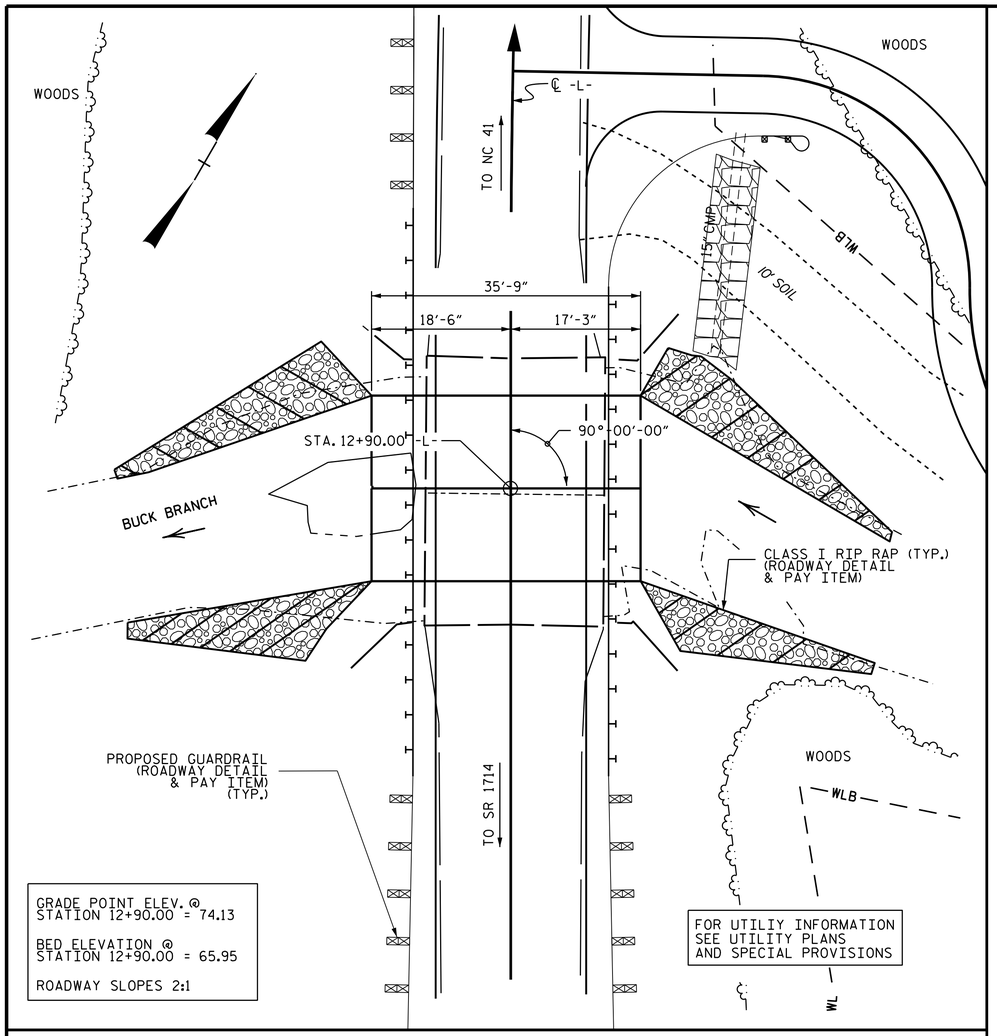
EX.R/W

2:1 0.047 0.050 3:1

73.42

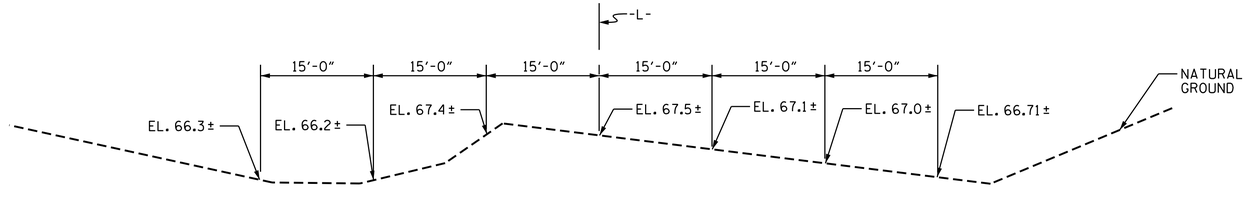
14+50.00

7/29/2016
I:\RAL_PRJ\000009322\TIP\Roadway\XSC\300278_rdy_L_xp1.dgn
LOCHNER



B.M. #1; RAILROAD SPIKE IN BASE OF 16" POPLAR 65' RT.
STA. 12+23.00 -L-; EL. 71.19'

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

HYDRAULIC DATA

DESIGN DISCHARGE	= 490 C.F.S
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 72.7'
DRAINAGE AREA	= 3.1 SQ. MI.
BASE DISCHARGE (Q100)	= 750 C.F.S
BASE HIGH WATER ELEVATION	= 73.7'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 583 C.F.S
FREQUENCY OF OVERTOPPING FLOOD	= < 50 YRS.
OVERTOPPING FLOOD ELEVATION	= 73.2'

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE

BARREL @	2.539 CY/FT	90.8	C.Y.
WING ETC.		20.4	C.Y.
TOTAL		111.2	C.Y.

REINFORCING STEEL

BARREL	11,108	LBS.
WINGS ETC.	793	LBS.
TOTAL	11,901	LBS.

FOUNDATION CONDITIONING MATERIAL	66 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM

NOTES

ASSUMED LIVE LOAD HL-93 OR ALTERNATE LOADING.

DESIGN FILL: 2.63'

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 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 CULVERT ON 90° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.

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.

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

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS, 1 @ 17'-6" AND 1 @ 18'-6", REINFORCED CONCRETE DECK WITH A CLEAR ROADWAY WIDTH OF 24.0' ON I-BEAMS, REINFORCED CONCRETE CAPS ON TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

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

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

FOR SUBMITTAL 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.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTORS 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 MATERIAL CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE."

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

PROJECT NO. 17BP.3.R.38

DUPLIN COUNTY

STATION: 12+90.00 -L-

SHEET 1 OF 6 REPLACES BRIDGE NO. 278

ADDED NOV. 1, 1990

ASSEMBLED BY : R. CAREATHERS	DATE : 9/11/15	SPECIAL
CHECKED BY : P.N.HOLDER	DATE : 10/20/15	
DESIGN ENGINEER OF RECORD: R. CAREATHERS	DATE : 9/11/15	
DRAWN BY : R.W. WRIGHT	DATE : JULY, 1990	STANDARD
CHECKED BY : D.A. GLADDEN	DATE : JULY, 1990	

NORTH CAROLINA PROFESSIONAL SEAL 022506 ENGINEER JESSE McARTHUR BAILEY

DocuSigned by: J. M. Bailey 9026554D9528471...

6/13/2016

NORTH CAROLINA PROFESSIONAL SEAL 21271 ENGINEER GREGORY W. DICKEY

DocuSigned by: Greg Dickey 884E468BCE5B4B6...

6/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 90° SKEW

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

STD. NO. CB12A

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)	**1.02**	--	1.75	1.23	1	BOTTOM SLAB	11.72	**1.02**	1	TOP SLAB	**11.34**	
		HL-93 (OPERATING)	N/A		1.32	--	1.35	1.60	1	BOTTOM SLAB	11.72	1.32	1	TOP SLAB	11.34	
		HS-20 (INVENTORY)	36.000	(2)	**1.08**	38.81	1.75	1.23	1	BOTTOM SLAB	11.72	**1.08**	1	BOTTOM SLAB	**11.70**	
		HS-20 (OPERATING)	36.000		1.40	50.31	1.35	1.60	1	BOTTOM SLAB	11.72	1.40	1	BOTTOM SLAB	11.70	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.37	32.01	1.40	2.77	1	TOP SLAB	5.07	2.37	1	TOP SLAB	11.34	
		SNGARBS2	20.000		2.15	42.96	1.40	2.40	1	BOTTOM SLAB	11.72	2.15	1	BOTTOM SLAB	11.70	
		SNAGRIS2	22.000		1.96	43.08	1.40	2.23	1	BOTTOM SLAB	11.72	1.96	1	BOTTOM SLAB	11.70	
		SNCOTTS3	27.250		1.28	34.78	1.40	1.66	1	BOTTOM SLAB	11.72	1.28	1	TOP SLAB	11.34	
		SNAGGRS4	34.925		1.23	43.13	1.40	1.37	1	BOTTOM SLAB	11.72	1.23	1	BOTTOM SLAB	11.70	
		SNS5A	35.550		1.22	43.30	1.40	1.34	1	BOTTOM SLAB	11.72	1.22	1	BOTTOM SLAB	11.70	
		SNS6A	39.950		1.21	48.33	1.40	1.33	1	BOTTOM SLAB	11.72	1.21	1	BOTTOM SLAB	11.70	
		SNS7B	42.000		1.14	47.87	1.40	1.31	1	BOTTOM SLAB	11.72	1.14	1	BOTTOM SLAB	11.70	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.31	43.32	1.40	1.51	1	BOTTOM SLAB	11.72	1.31	1	BOTTOM SLAB	11.70	
		TNT4A	33.075		1.30	43.10	1.40	1.45	1	BOTTOM SLAB	11.72	1.30	1	BOTTOM SLAB	11.70	
		TNT6A	41.600		1.20	49.81	1.40	1.43	1	BOTTOM SLAB	11.72	1.20	1	BOTTOM SLAB	11.70	
		TNT7A	42.000		1.14	48.02	1.40	1.33	1	BOTTOM SLAB	11.72	1.14	1	BOTTOM SLAB	11.70	
		TNT7B	42.000		1.24	52.23	1.40	1.37	1	BOTTOM SLAB	11.72	1.24	1	BOTTOM SLAB	11.70	
		TNAGRIT4	43.000	(3)	**1.01**	43.30	1.40	1.14	1	BOTTOM SLAB	11.72	**1.01**	1	BOTTOM SLAB	**11.70**	
		TNAGT5A	45.000		1.12	50.47	1.40	1.27	1	BOTTOM SLAB	11.72	1.12	1	BOTTOM SLAB	11.70	
		TNAGT5B	45.000		1.03	46.37	1.40	1.18	1	BOTTOM SLAB	11.72	1.03	1	BOTTOM SLAB	11.70	

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.

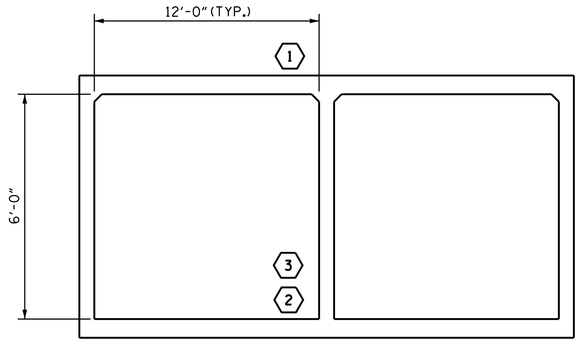
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.3.R.38

DUPLIN COUNTY

STATION: 12+90.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 21271 ENGINEER GREGORY W. DICKEY

DocuSigned by: Greg Dickey 884E46B8CE5B4B6...
6/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ASSEMBLED BY : R. CAREATHERS DATE : 9/14/15
CHECKED BY : P.N.HOLDER DATE : 10/8/15
DESIGN ENGINEER OF RECORD: R. CAREATHERS DATE : 9/14/15

DRAWN BY : WMC 7/11
CHECKED BY : GM 7/11

REV. 10/1/11 MAA/GM

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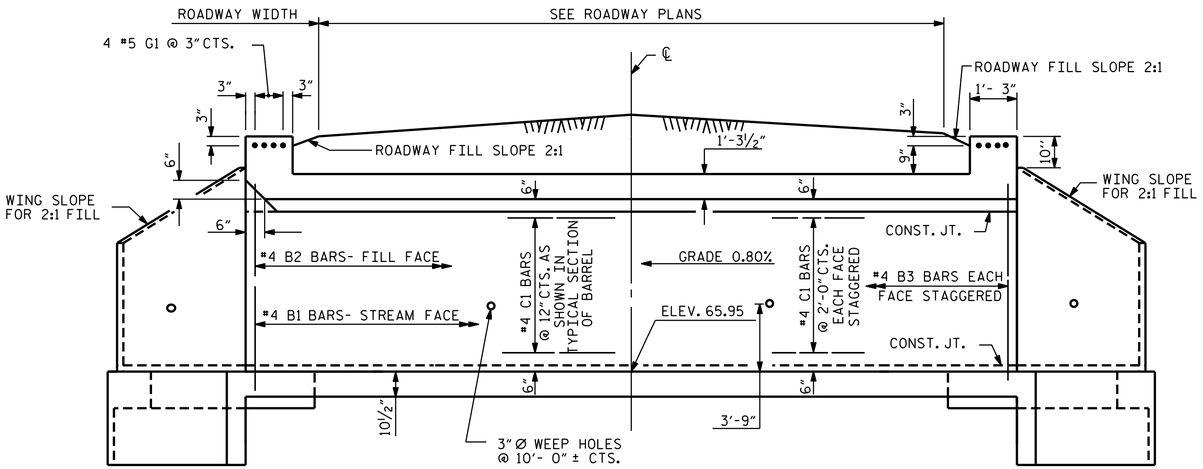
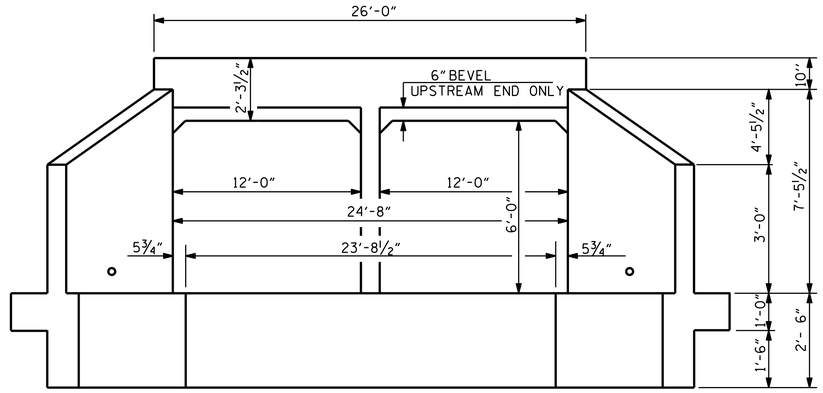
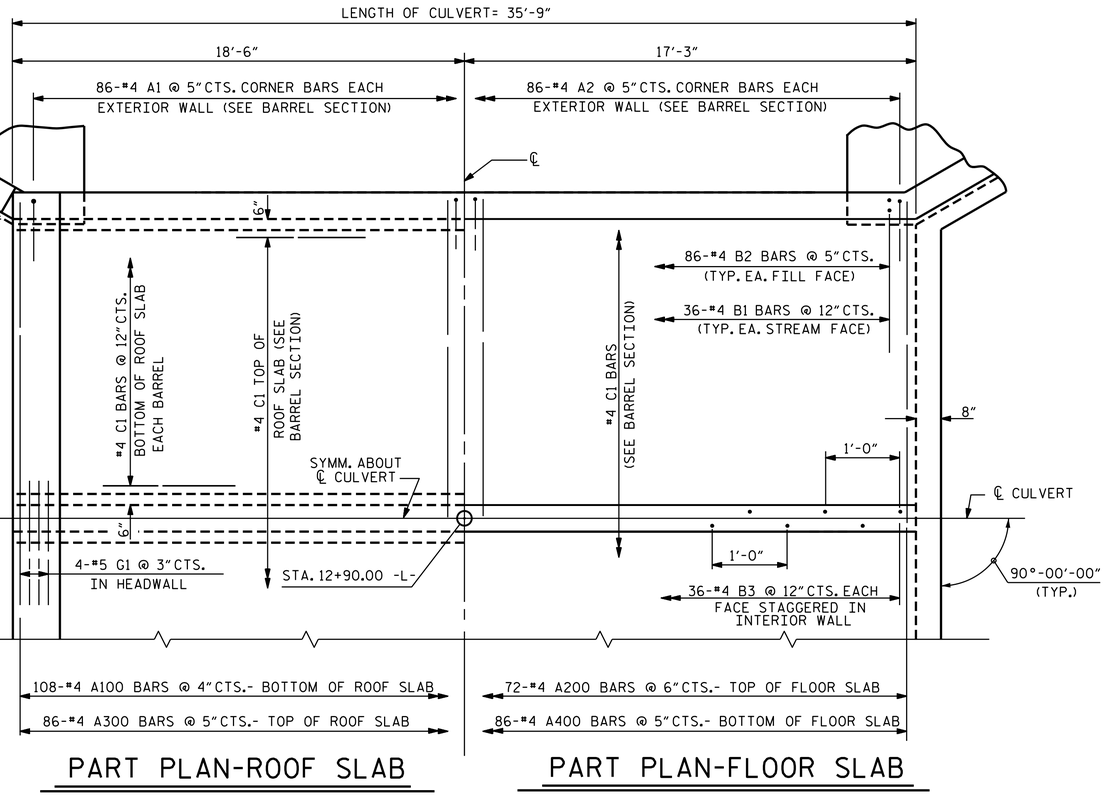


EXTERIOR WALL INTERIOR WALL

CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.
REDRAWN NOV. 1990 BY TSS CHECKED BY ARB

ASSEMBLED BY : R. CAREATHERS	DATE : 9/16/15	SPECIAL
CHECKED BY : P.N.HOLDER	DATE : 10/20/15	
DESIGN ENGINEER OF RECORD: R. CAREATHERS	DATE : 9/16/15	
DRAWN BY : RALPH D. UNDERWOOD	DATE : MAY 1971	STANDARD
CHECKED BY : JOEL A. JOHNSON	DATE : JULY 1971	

PROJECT NO. 17BP.3.R.38
DUPLIN COUNTY
STATION: 12+90.00 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 21271 ENGINEER GREGORY W. DICKEY

DocuSigned by: Greg Dickey 6/9/2016

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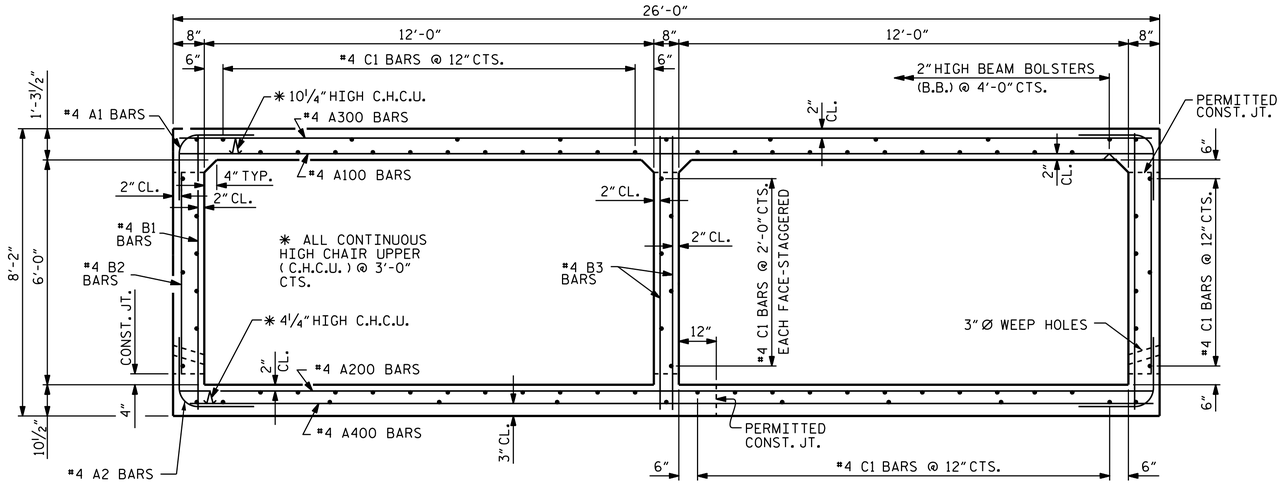
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 90° SKEW

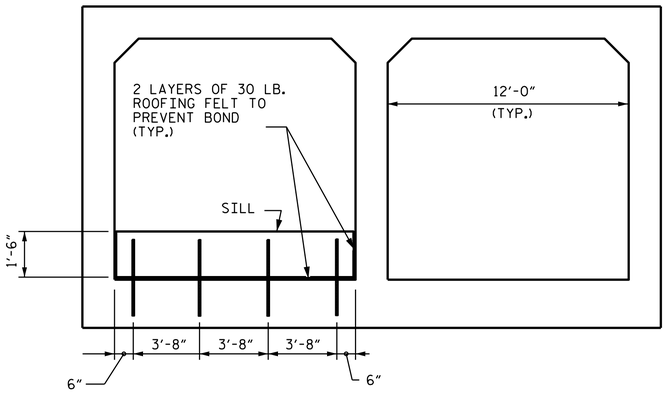
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			6

STD. NO. CB12



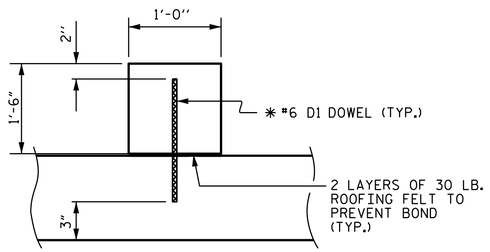
RIGHT ANGLE SECTION OF BARREL

THERE ARE 86 "C" BARS IN SECTION OF BARREL.



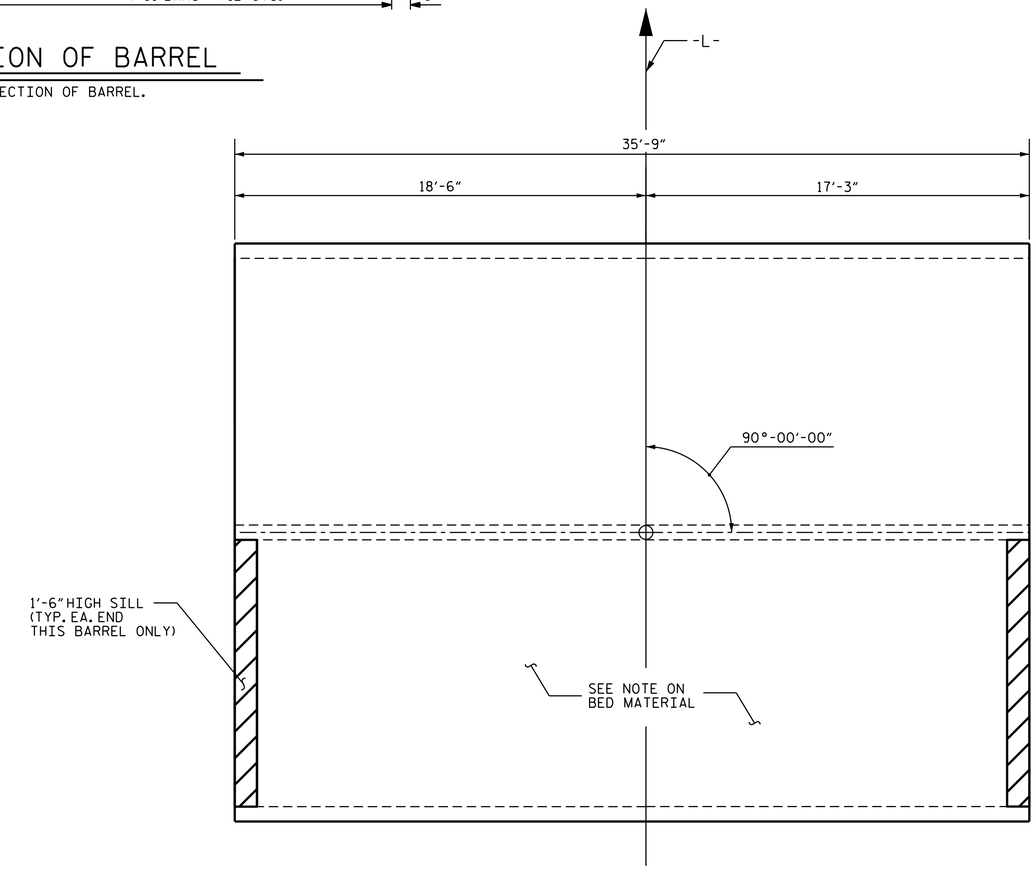
ELEVATION

(LOOKING DOWNSTREAM)
(TYP. BOTH ENDS)



SECTION THROUGH SILL

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



PLAN OF SILLS

CULVERT SILL DETAILS

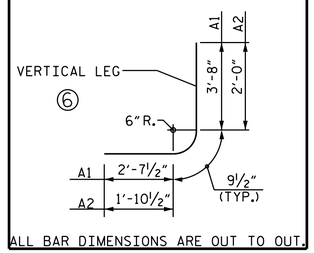
NOTE:

SILLS ARE LOCATED 1' INSIDE EACH END OF THE CULVERT. BACKFILL WITH NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSIST OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	108	#4	STR.	25'-7"	1846
A200	72	#4	STR.	25'-7"	1230
A300	86	#4	STR.	25'-7"	1470
A400	86	#4	STR.	25'-7"	1470
A1	172	#4	6	7'-1"	814
A2	172	#4	6	4'-8"	536
B1	72	#4	STR.	7'-8"	369
B2	172	#4	STR.	5'-4"	613
B3	72	#4	STR.	7'-8"	369
C1	172	#4	STR.	18'-9"	2154
D1	8	#6	STR.	1'-11"	23
G1	8	#5	STR.	25'-8"	214
TOTAL REINFORCING STEEL					11,108 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SPLICE CHART

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

PROJECT NO. 17BP.3.R.38

DUPLIN COUNTY

STATION: 12+90.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD DOUBLE 12 FT. X 6 FT. CONCRETE BOX CULVERT 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 21271 ENGINEER GREGORY W. DICKEY

DocuSigned by: Greg Dickey 884E46BB8CE5B4B6...
6/9/2016

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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. C-4

TOTAL SHEETS 6

DRAWN BY : R. CAREATHERS DATE : 9/21/15
CHECKED BY : P.N.HOLDER DATE : 10/20/15
DESIGN ENGINEER OF RECORD: R. CAREATHERS DATE : 9/21/15

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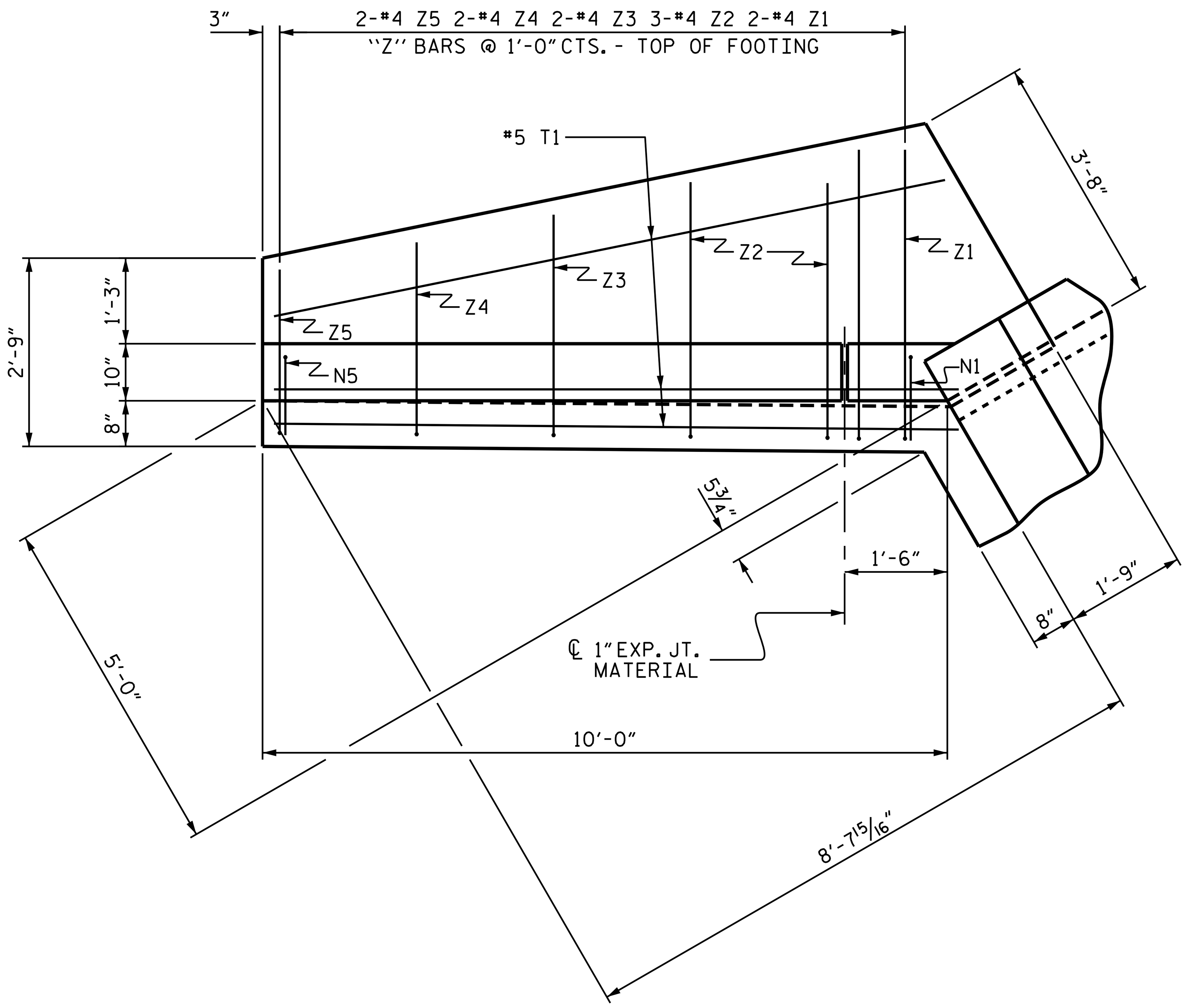
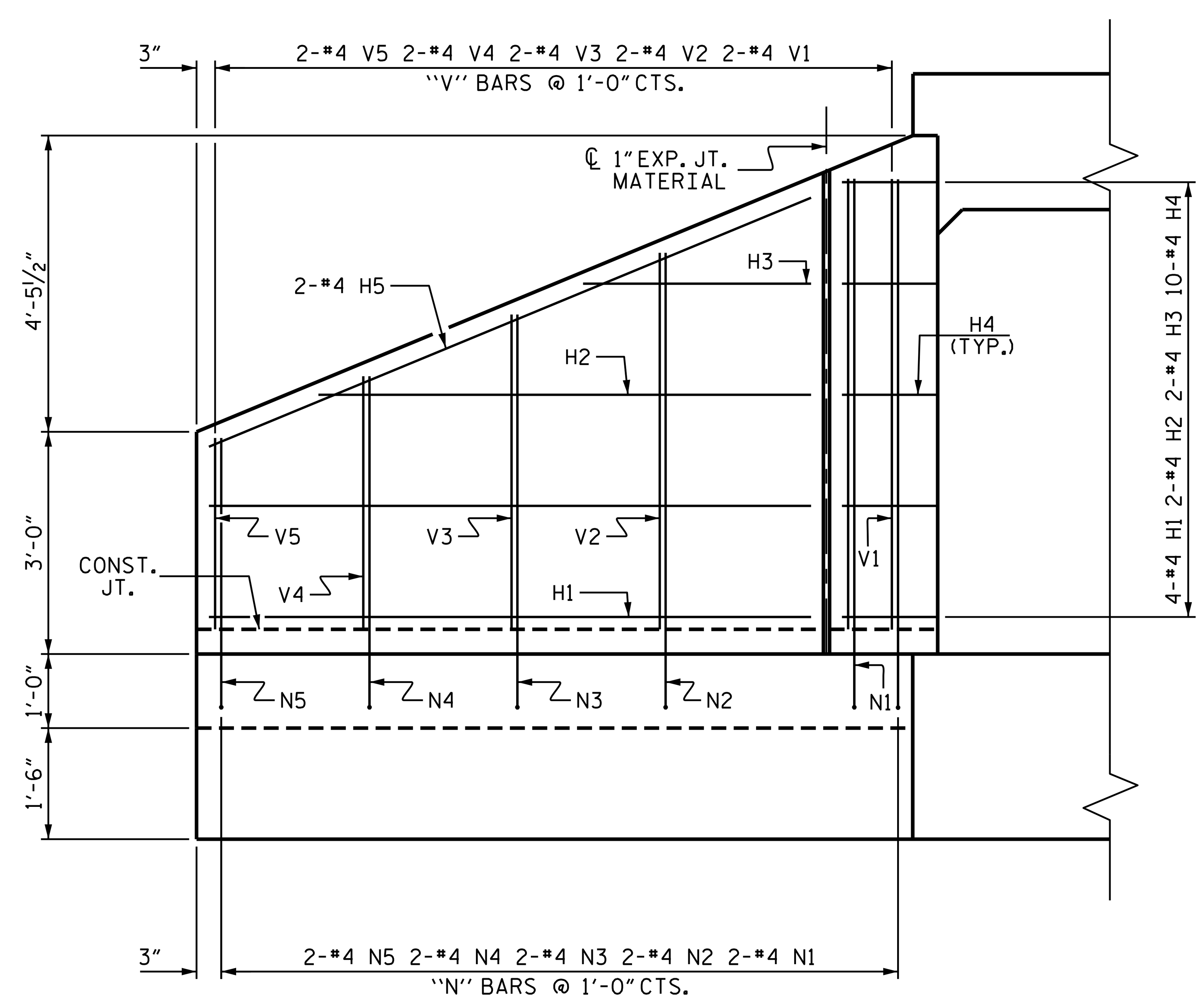


PLAN



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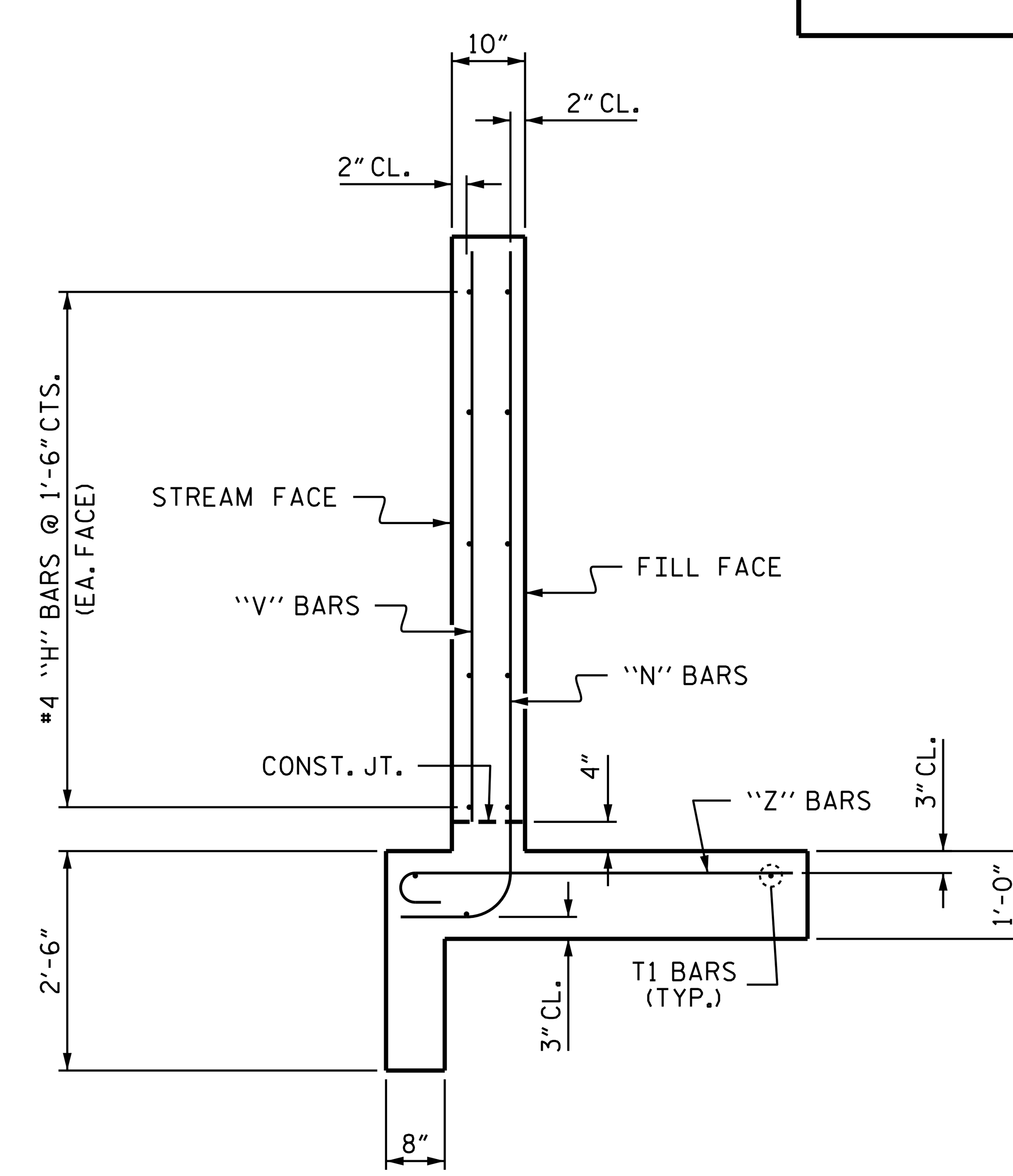
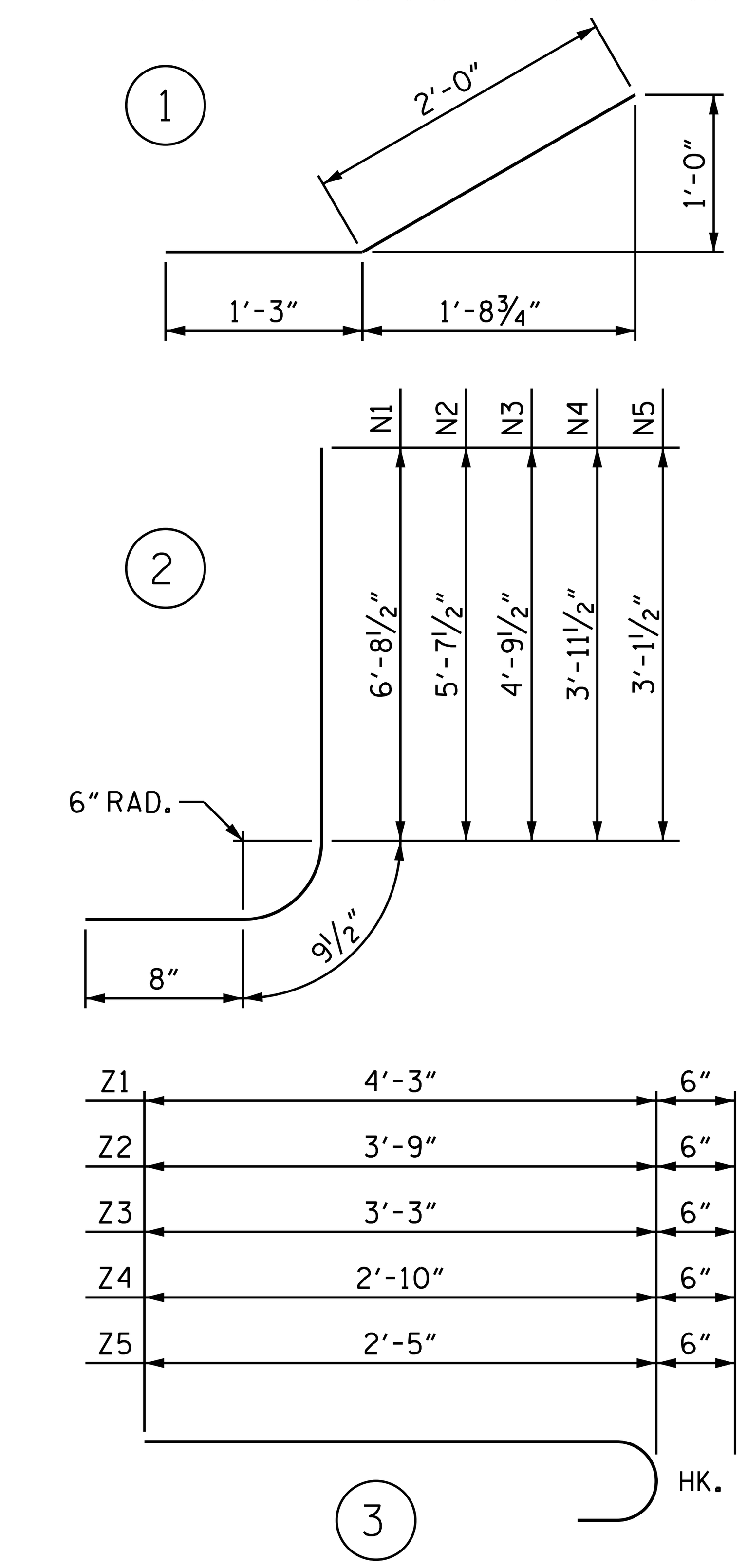


TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	8'-1"	86
H2	8	#4	STR	6'-8"	36
H3	8	#4	STR	3'-1"	16
H4	40	#4	1	3'-3"	87
H5	8	#4	STR	8'-9"	47
N1	8	#4	2	8'-2"	44
N2	8	#4	2	7'-1"	38
N3	8	#4	2	6'-3"	33
N4	8	#4	2	5'-5"	29
N5	8	#4	2	4'-7"	24
T1	12	#5	STR	10'-0"	125
V1	8	#4	STR	6'-1"	33
V2	8	#4	STR	5'-1"	27
V3	8	#4	STR	4'-3"	23
V4	8	#4	STR	3'-5"	18
V5	8	#4	STR	2'-7"	14
Z1	8	#4	3	4'-9"	25
Z2	12	#4	3	4'-3"	34
Z3	8	#4	3	3'-9"	20
Z4	8	#4	3	3'-4"	18
Z5	8	#4	3	2'-11"	16

REINFORCING STEEL FOR 4 WINGS 793 LBS

CLASS A CONCRETE

4 WINGS	13.8 CY
2 HEADWALL	2.4 CY
2 END CURTAIN WALLS	2.9 CY
2 SILLS	1.3 CY
TOTAL	20.4 CY

PROJECT NO. 17BP.3.R.38

DUPLIN COUNTY

STATION: 12+90.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

H = 6'-0" SLOPE = 2:1
90° SKEW

DocuSigned by: Greg Dickey
6/9/2016

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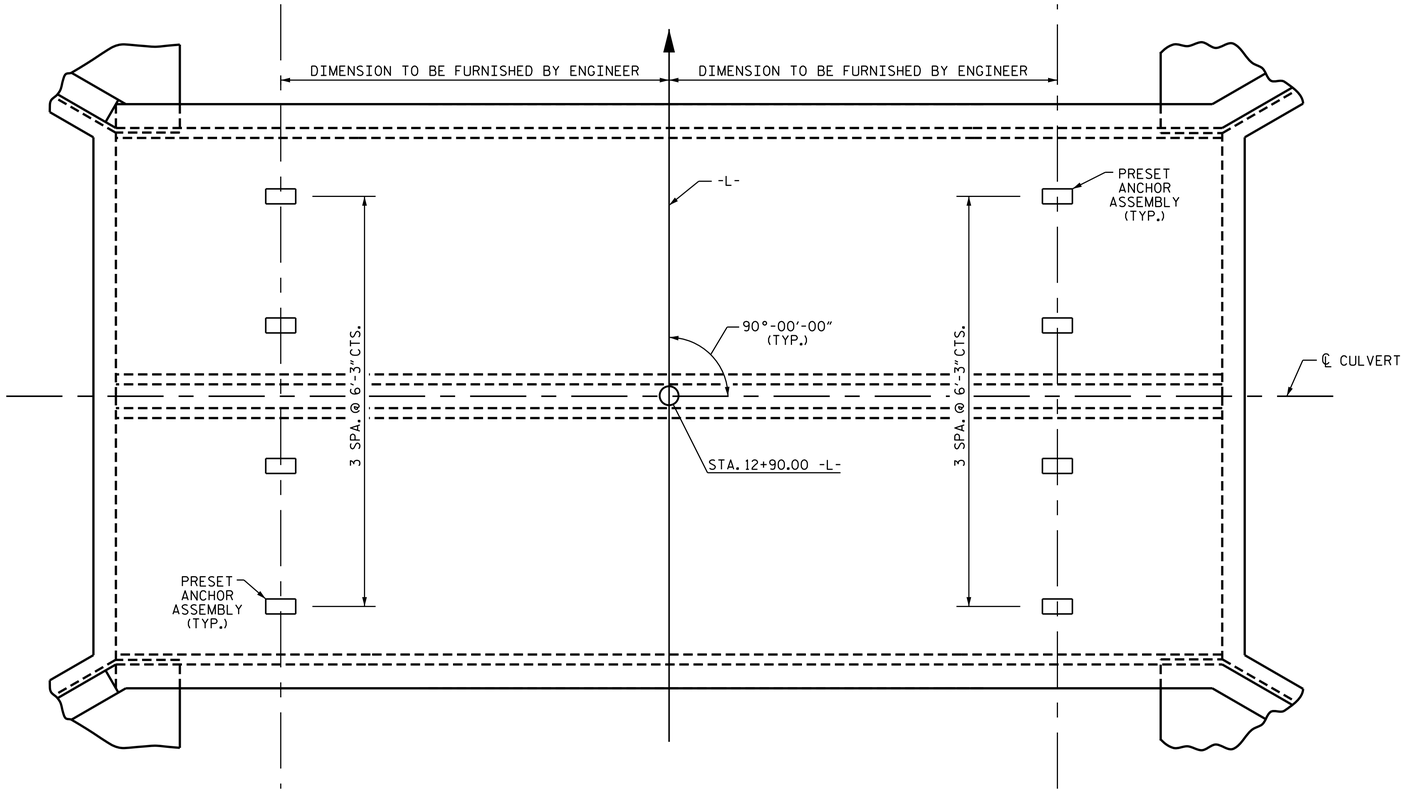
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. C-5
1			3			TOTAL SHEETS 6
2			4			

ASSEMBLED BY : R. CAREATHERS DATE : 9/16/15
CHECKED BY : P.N.HOLDER DATE : 10/8/15

DRAWN BY : CCJ 10/99
CHECKED BY : RWW 03/00

STD. NO. CW9006



PLAN

SHOWING : GUARDRAIL ANCHOR 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 2½".

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

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

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

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

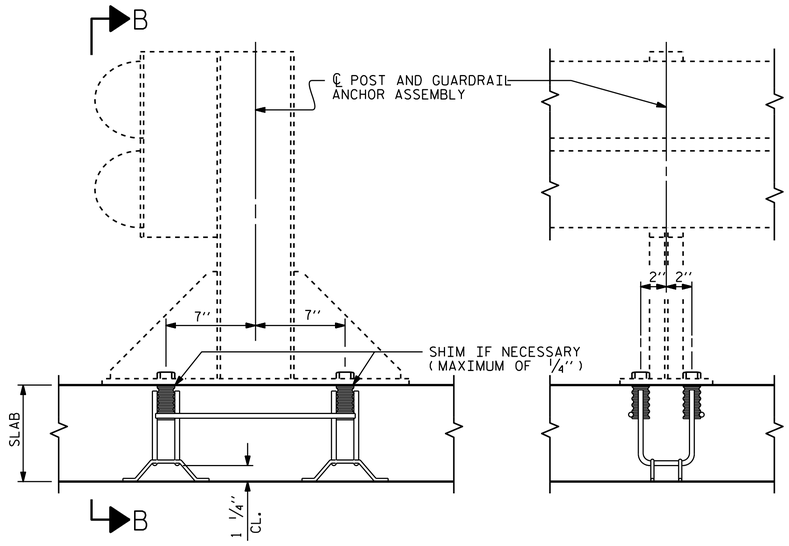
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

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

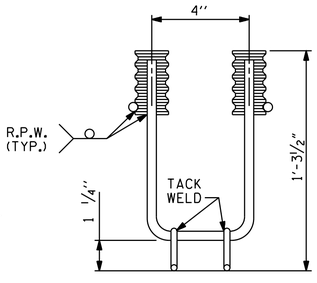
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

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



SECTION A-A

SECTION B-B



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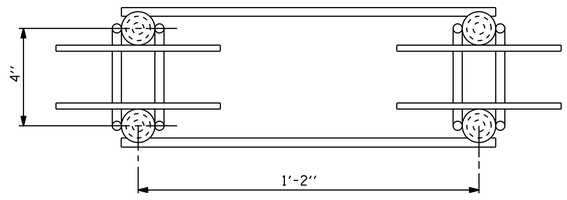
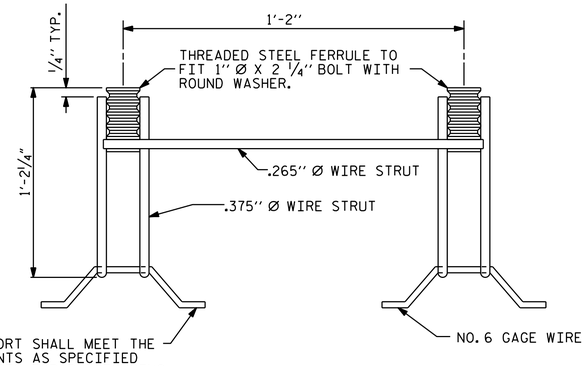


PLAN



SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

ASSEMBLED BY : R. CAREATHERS	DATE : 9/21/15	
CHECKED BY : P.N.HOLDER	DATE : 10/8/15	
DRAWN BY : FCJ 6/88	REV. 5/7/03	RWW/JTE
CHECKED BY : ARB 6/88	REV. 5/1/06R	KMM/GM
	REV. 10/1/11	MAA/GM

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NORTH CAROLINA PROFESSIONAL SEAL 21271 ENGINEER GREGORY W. DICKEY

Docusigned by: Greg Dickey 884E46B8CE5B4B6...
6/9/2016

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PROJECT NO. 17BP.3.R.38
DUPLIN COUNTY
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

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

STD. NO. GRA1

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 ¾" 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 (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM

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