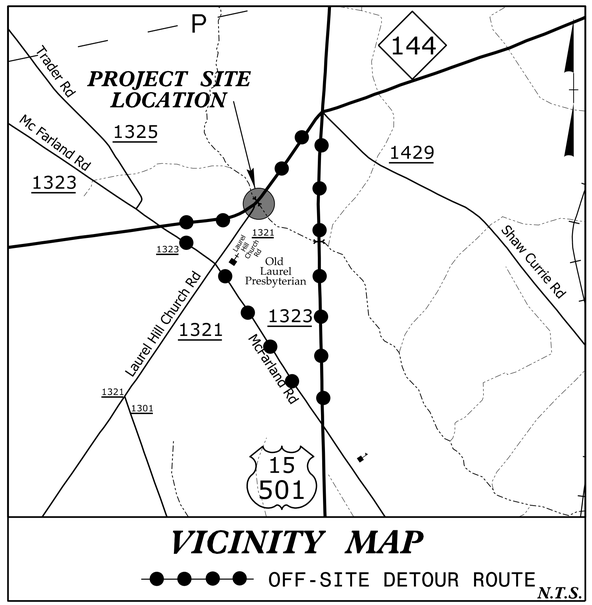
09/08/99

PROJECT: 15408.1083803

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP

OFF-SITE DETOUR ROUTE

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SCOTLAND COUNTY

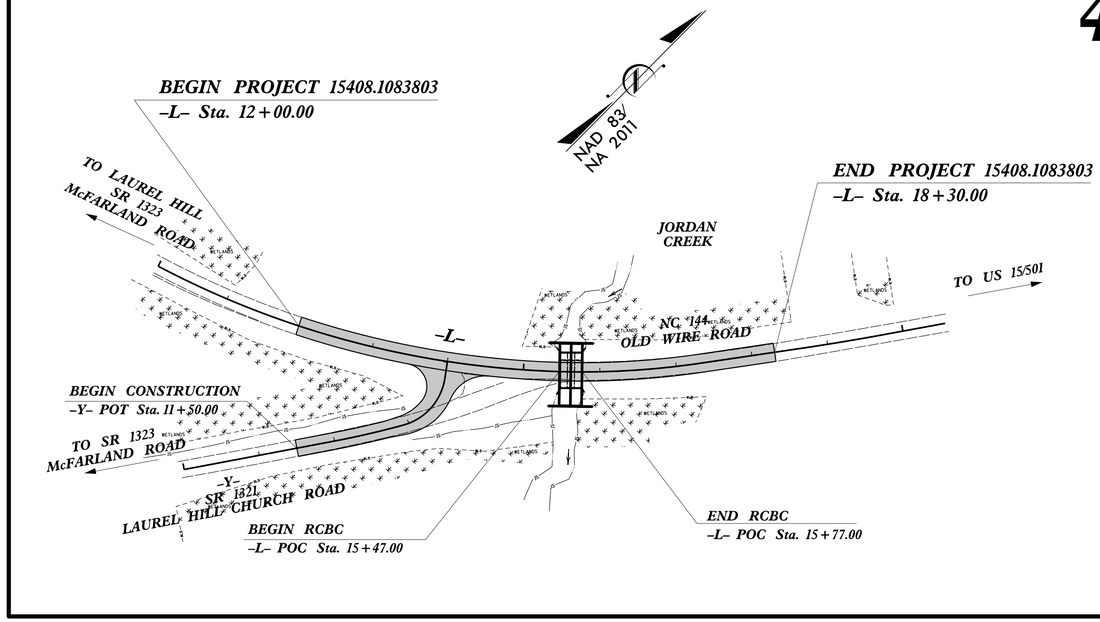
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15408.1083803	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15408.1083803		PE

LOCATION: CULVERT 106 OVER JORDAN CREEK ON NC 144 (OLD WIRE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & RCBC

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	=	2900
ADT 2025	=	5800
K	=	%
D	=	%
T	=	7 % *
V	=	MPH
* TTST	=	DUAL

FUNC CLASS = MAJOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 15408.1083803	=	0.113 mi
LENGTH STRUCTURE PROJECT 15408.1083803	=	0.006 mi
TOTAL LENGTH OF PROJECT 15408.1083803	=	0.119 mi

PLANS PREPARED BY:

CH ENGINEERING
3220 GLEN ROYAL RD, RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 6, 2019

LETTING DATE:

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS DIVISION 8
121 DOT Drive
Carthage, NC 28327

BRIAN A. WILES, PE
PROJECT ENGINEER

TIM WELCH, PE
NCDOT CONTACT
DIV 8 BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

10/14/2019

DocuSigned by:
Bill Jernigan
434375203584403...
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 040302 ENGINEER WILLIAM KEITH JERNIGAN, JR. P.E.

ROADWAY DESIGN ENGINEER

10/14/2019

DocuSigned by:
Brian A Wiles
889D0DFEA2E34DE...
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/14/2019
R:\Roadway\Proj\82C106_Rdy_tsh.dgn
USERNAME

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	1A

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL A-4689 ENGINEER BRIAN ALLEN WILLIS
DocuSigned by: Brian Willis
12/17/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SIDE ROADS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Windstream - Communications. and City of Laurinburg - Communications.

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.

TEMPORARY DIVERSIONS WETLAND REPAIRS:

THE TEMPORARY DIVERSIONS IN THE WETLAND AREAS WILL BE RESTORED TO PRECONSTRUCTION SLOPE AND CONTOURS. EXCAVATED MATERIAL SHALL BE STRATEGICALLY STOCKPILED AND PROTECTED. THIS MATERIAL WILL BE USED TO BACKFILL THE EXCAVATED AREAS TO THE ORIGINAL DENSITY. THE AREA WILL THEN BE RESEEDED WITH THE APPROPRIATE NATIVE WETLAND SEED MIX.

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
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

12/17/2019
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tlewis

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

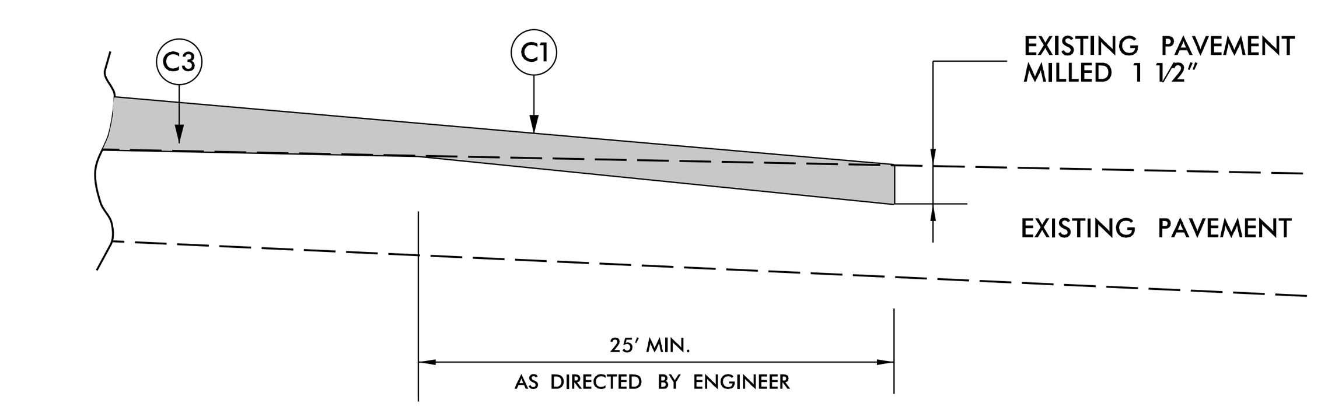
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES 10/23/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

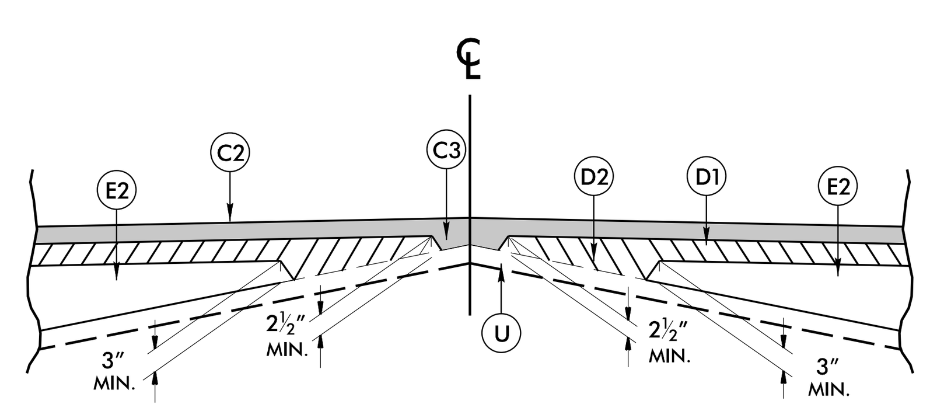
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 THIS SHEET)

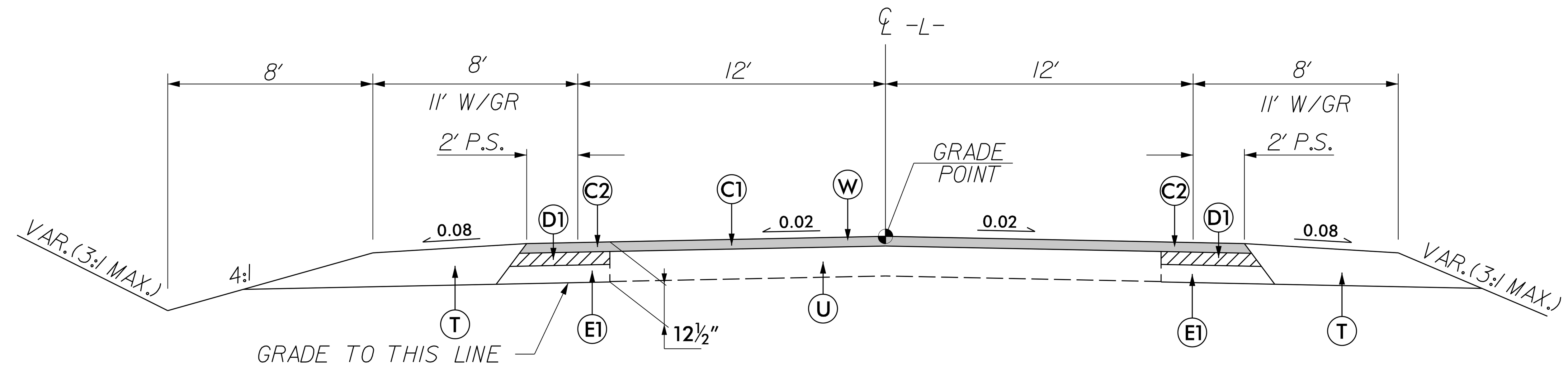
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Incidental Milling Existing Pavement

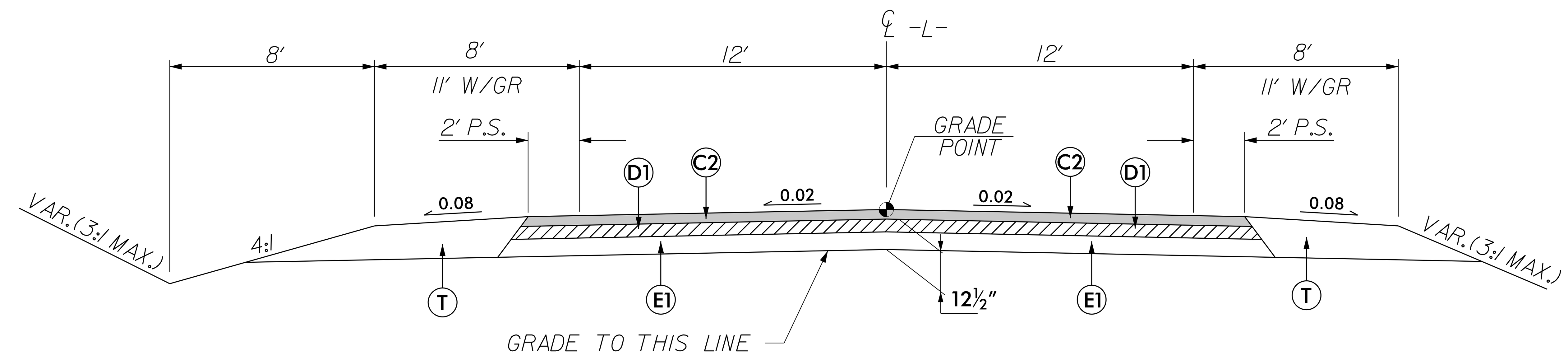


Detail Showing Method of Wedging

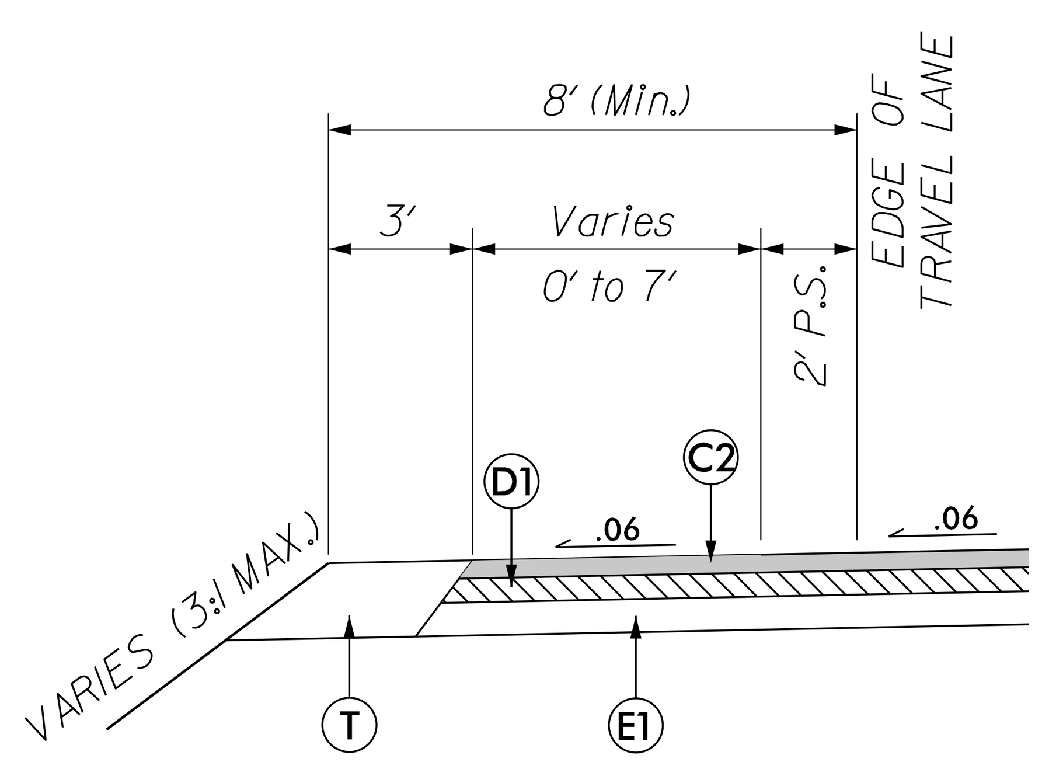


TYPICAL SECTION NO. 1
-L- STA 12+00.00 TO -L- STA 15+25.00
-L- STA 16+00.00 TO -L- STA 18+30.00

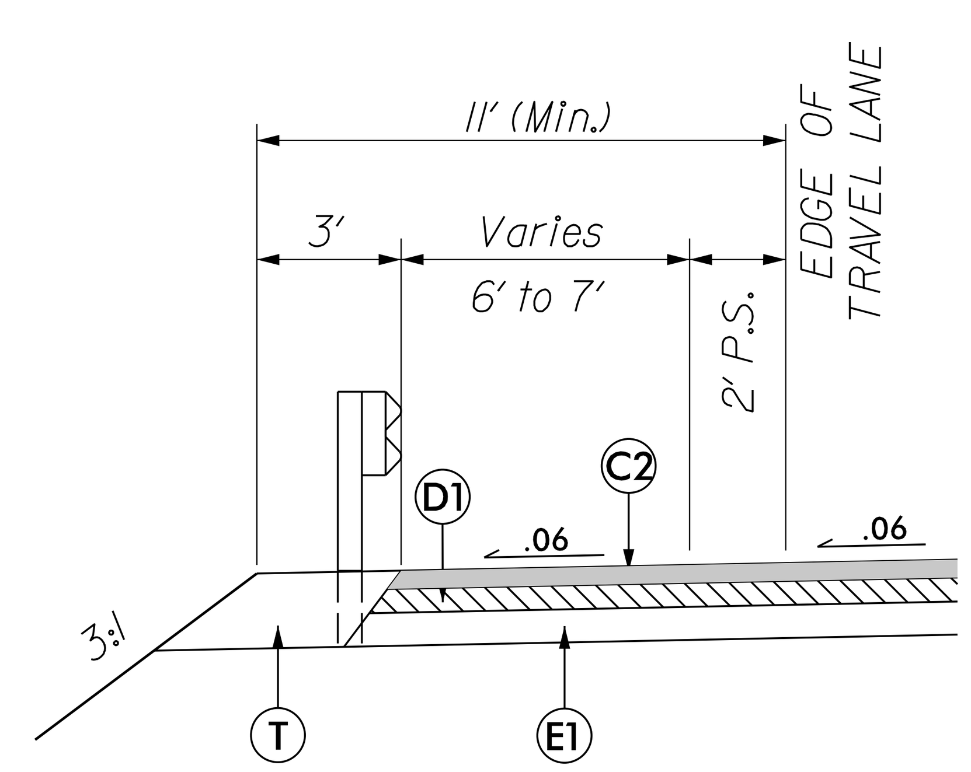
NOTE:
USE 6' SHOULDER ON LEFT -L- STA 16+75.00 TO -L- STA 18+00.00
USE 6' SHOULDER ON RIGHT -L- STA 16+50.00 TO -L- STA 18+00.00
TAPER SHOULDER TO EXISTING SHOULDER -L- STA 18+00.00 TO 18+30.00



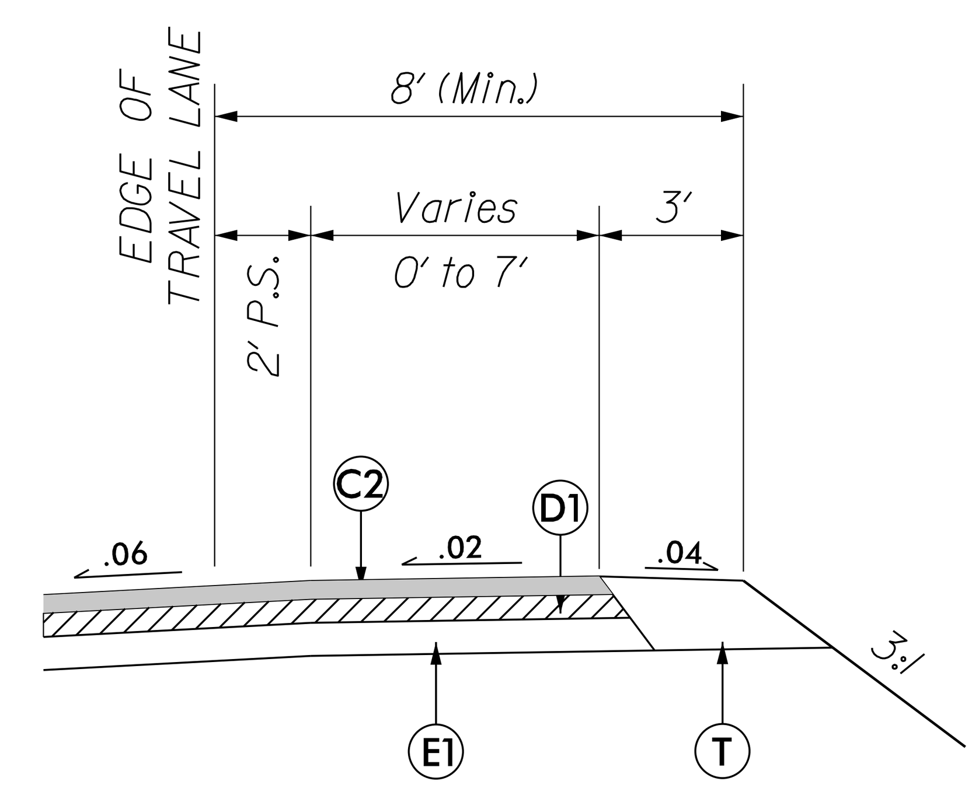
TYPICAL SECTION NO. 2
-L- STA 15+25.00 TO -L- STA 16+00.00



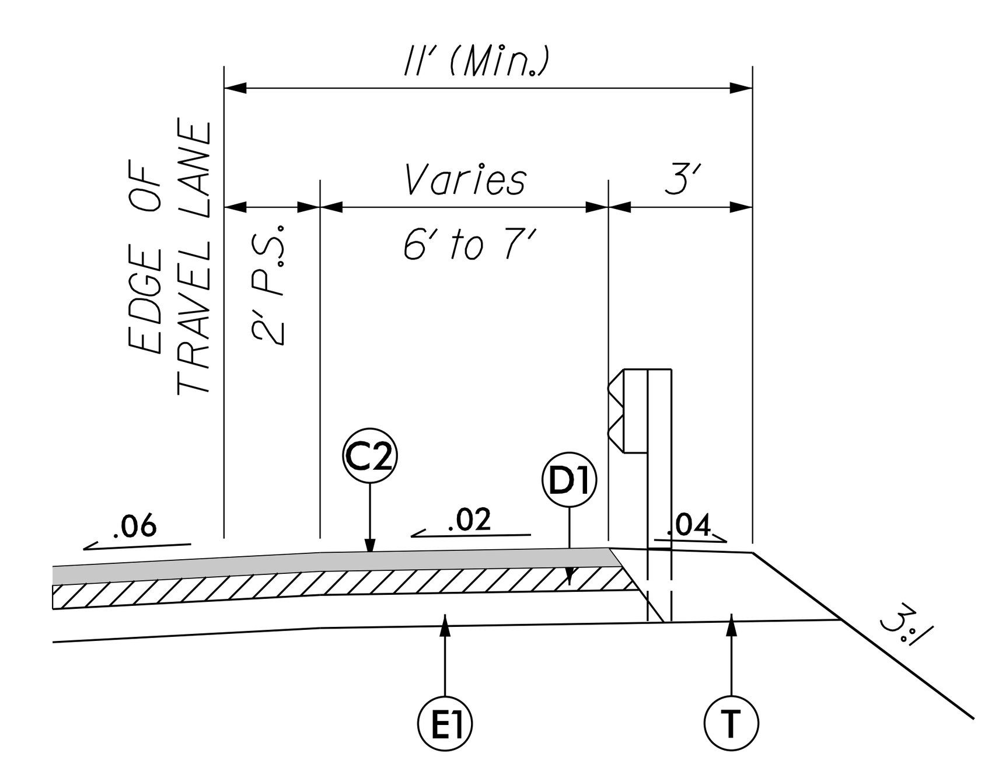
TYPICAL SECTION FOR
WIDENED PAVED SHOULDER
LEFT SIDE



TYPICAL SECTION FOR
PAVED SHOULDER WITH GR
LEFT SIDE



TYPICAL SECTION FOR
WIDENED PAVED SHOULDER
RIGHT SIDE



TYPICAL SECTION FOR
PAVED SHOULDER WITH GR
RIGHT SIDE

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
I5408J083803	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16689 BRIAN ALLEN WILES
DocuSigned by: Brian A Wiles
10/14/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
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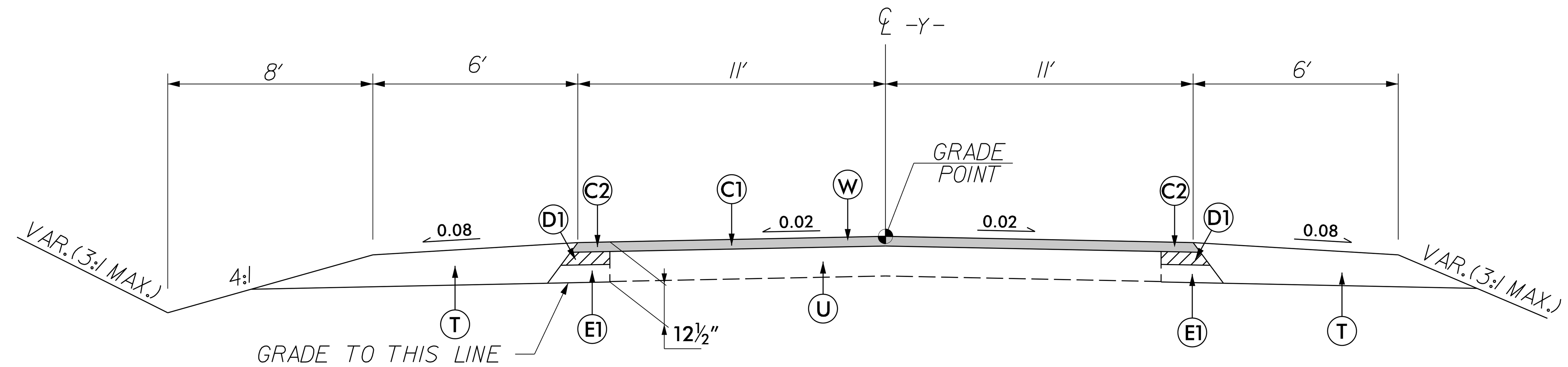
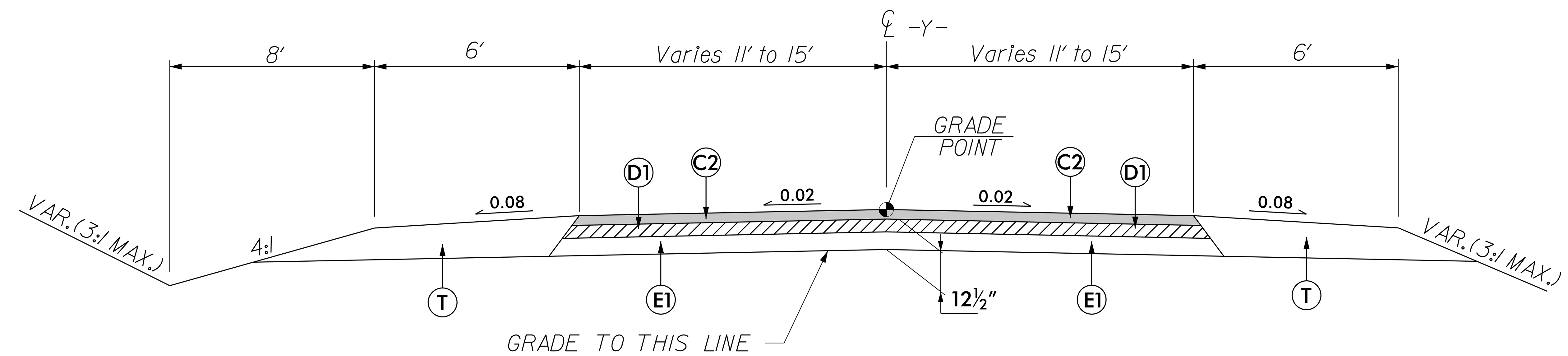
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

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



TYPICAL SECTION NO. 3
-Y- STA 11+50.00 TO -Y- STA 12+70.00



TYPICAL SECTION NO. 4
-Y- STA 12+70.00 TO -Y- STA 13+87.25

NOTE: FROM -Y- STA 13+29.06 TO STA 13+87.25
USE 2' P.S. ON LEFT SIDE
USE 4' P.S. ON RIGHT SIDE

6/2/99
9/20/2019
R:\Roadway\Proj\B2C106_Rdy_typ.dgn
USERNAME

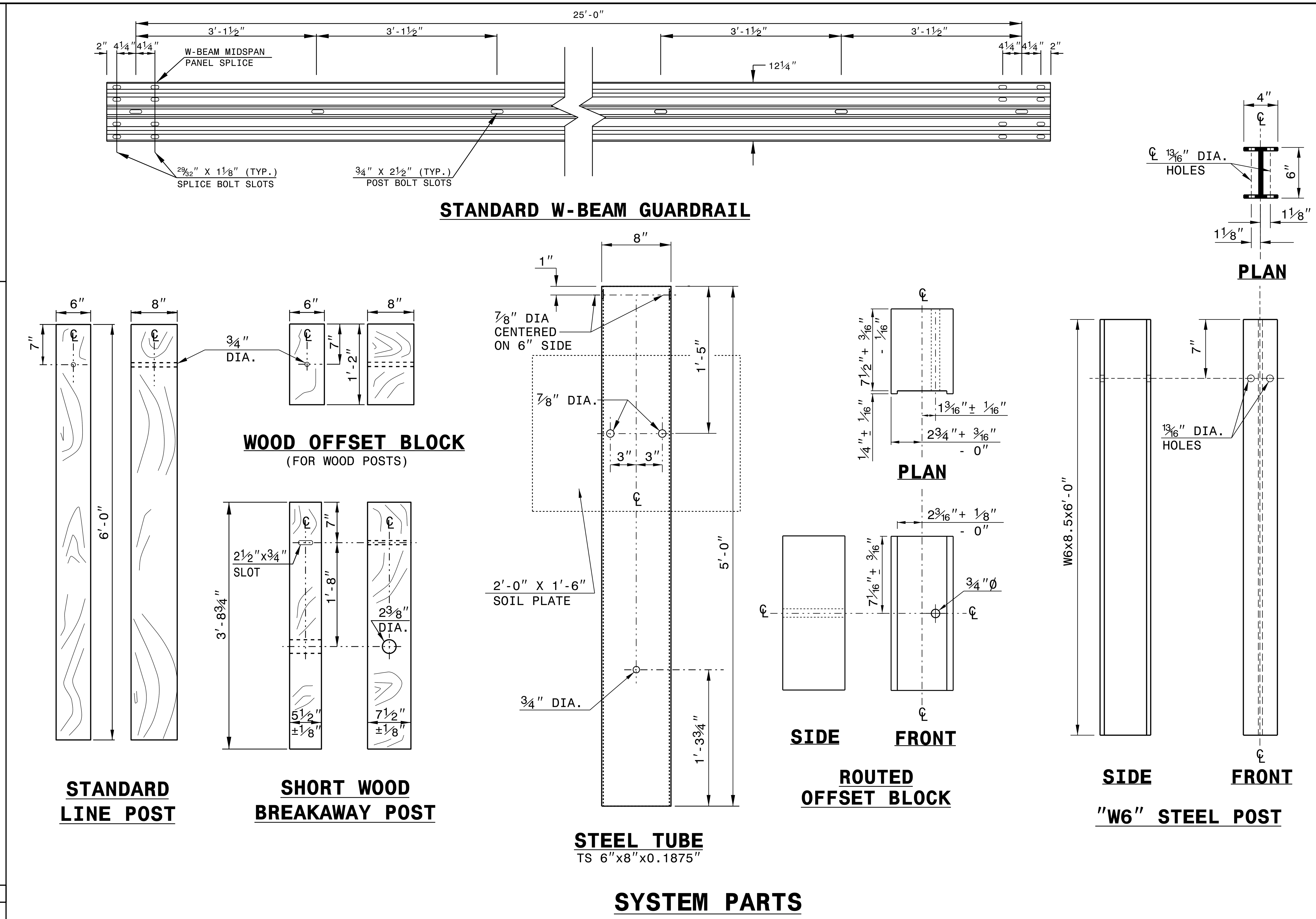
DocuSign Envelope ID: 9BF25CDD-B63C-4E7F-AC36-01C69C792E1D

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	2C-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SHEET 6 OF 8

862D02

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8

862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER J. S. HOWERTON

DocuSigned by: 10/14/2019

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

12/06/07

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– 12+00	18+30	507	850	343	
–Y– 11+50	13+87.25	298	179		119
	SUBTOTAL	805	1,028	343	119
TOTAL		805	1,028	343	119
MATERIAL FOR SHOULDER CONSTRUCTION			419	419	
LOSS DUE TO CLEARING & GRUBBING					
WASTE IN LIEU OF BORROW				–119	–119
PROJECT TOTAL		805	1,447	642	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				32	
GRAND TOTALS:		805		674	
SAY:		850		750	

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
L	15+25	16+00	CL	200
Y	12+70	14+01	CL/RT	637
			TOTAL:	637
			SAY:	840

"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 CONCRETE BARRIER	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	XI MOD	GREU TL-2	GREU TL-3	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
L	14+70	16+50	LT	180.00					8	11	50	50	1	1			2											142		
L	14+70	16+50	RT	180.00					8	11	50	50	1	1			2											142		
		SUBTOTAL		360.00													4											284		
		LESS ANCHOR DEDUCTIONS																												
		GREU TL-3 4 @ 50'		–200.00																										
		TOTAL		160.00													4											284		
		SAY		162.50			5 ADDITIONAL GUARDRAIL POSTS										4											285		

10/22/2019
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ksteadman

4/04/06

COMPUTED BY:_____ DATE:_____
CHECKED BY:BAW DATE:_____

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	3D-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	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) SIZE: 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
13+14 –Y–	CL	0401	0402		213.0	212.8													
TOTALS																			

C.S. PIPE SIZE: 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS III SIZE: 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV SIZE: 12"	15"	18"	24"	30"	36"	42"	48"	*** R.C. PIPE (CLASS V)	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE
.064	.064	.064	.064	.079	.079	.109	.109																				

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') LIN. FT. PER EACH (0' THRU 5.0')	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	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	G.D.I. TYPE "B" STD. 840.18 OR 840.27	T.B.D.I. STD. 840.35	G.D.I. FRAME WITH TWO N.S. SAG GRATES STD. 840.24	G.D.I. FRAME WITH TWO N.S. FLAT GRATES STD. 840.29	CORR. STEEL ELBOWS NO. & SIZE	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
3.4																		42	
3.4																		42	

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

9/20/2019
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tfenwar

8/17/99

REVISIONS

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	4
SCOTLAND COUNTY C106	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036889 ENGINEER BRIAN ALLEN WILS
10/23/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040302 ENGINEER CHRISTOPHER KEITH JERNIGAN, JR.
10/23/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L- PI Sta 12+72.64	-L- PI Sta 16+34.68	-L- PI Sta 19+14.82
△ = 25° 36' 02.0" (LT)	△ = 10° 34' 52.1" (LT)	△ = 1° 57' 46.7" (LT)
D = 4° 46' 28.7"	D = 5° 27' 24.3"	D = 1° 54' 35.5"
L = 536.18'	L = 193.91'	L = 102.78'
T = 272.64'	T = 97.23'	T = 51.40'
R = 1,200.00'	R = 1,050.00'	R = 3,000.00'

NAD 83/NA 2011

-L- PC Sta. 10+00.00

-L- POC Sta. 12+00.00
BEGIN CONSTRUCTION

-L- POC Sta. 14+00.00 = -Y- POT Sta. 14+01.25

-L- PT Sta. 15+36.18

-L- PC Sta. 15+37.45

-L- PT Sta. 17+31.36

-L- PC Sta. 18+63.42

-L- PT Sta. 19+66.21

-L- POT Sta. 20+56.17

SPECIAL CUT BASE DITCH W/RIP RAP
SEE DETAIL 'B'

SPECIAL CUT BASE DITCH
SEE DETAIL 'A'

BM#1
BL STA 9+64 76' LEFT
ELEV 216.92'
RR SPIKE IN BASE OF 24" PINE TREE

2@14'X9' RCBC W/BEVELS
BURIED 1' W/SILLS
US INV=203.0'
DS INV=203.0'
SLOPE=0.0%
FILL WITH NATIVE MATERIAL

JAMES GIBSON
DB 621 PG 96

JOSEPH WARWICK, JR.
& JEANNE WARWICK
DB 1323 PG 166
MB 9 PG 219

CREEK IS PROPERTY BOUNDARY

-Y- PT Sta. 13+78.77

NATURAL CHANNEL
SEE DETAIL 'C'
(RIP RAP IN
BASE NOT SHOWN)

-Y- POT Sta. 11+50.00
BEGIN CONSTRUCTION

REMOVE EXISTING
30" RCP W/HW

CUT DITCH
SEE DETAIL 'D'

11 TONS CL B RIP RAP
W/28 SY GEOTEXTILE

CL II RIP RAP
BANK STABILIZATION
LENGTH=20 FT
EST.=7 TON, 22 SY GEOTEXTILE

CL II RIP RAP
BANK STABILIZATION
LENGTH=20 FT
EST.=23 TON, 53 SY GEOTEXTILE

-L- POT Sta. 18+30.00
END CONSTRUCTION

OLD LAUREL PRESBYTERIAN CHURCH
NO DEED FOUND

BEANE WRIGHT PARTNERS, LLC
DB 1290 PG 77

-Y- POT Sta. 10+00.00

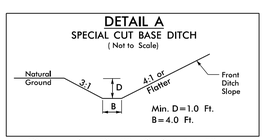
-Y- PC Sta. 11+97.71

-Y- PCC Sta. 12+92.27

-Y- PI Sta 12+45.01	-Y- PI Sta 13+41.05
△ = 4° 30' 53.3" (LT)	△ = 66° 04' 41.0" (LT)
D = 4° 46' 28.7"	D = 76° 23' 39.7"
L = 94.56'	L = 86.50'
T = 47.30'	T = 48.78'
R = 1,200.00'	R = 75.00'

PROPOSED PAVEMENT REMOVAL

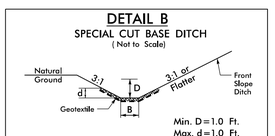
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B=4.0 Ft.

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

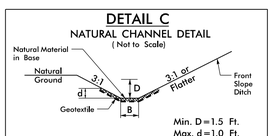
DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
Type of Liner= CL B Rip-Rap

FROM -L- STA. 14+50 TO STA. 15+00 LT
EST. 26 TONS CL B RIP RAP, 70 SY GEOTEXTILE

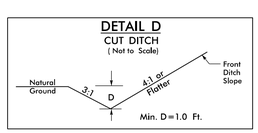
DETAIL C
NATURAL CHANNEL DETAIL
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
Type of Liner= CL B Rip-Rap COUNTERSUNK (BASE)

FROM -Y- STA. 12+25 TO STA. 13+25 LT
58 TONS CL B RIP RAP, 153 SY GEOTEXTILE

DETAIL D
CUT DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM -Y- STA. 13+25 TO STA. 13+75 RT

FOR PROFILE, SEE SHEET 5

10/22/2019
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PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	5

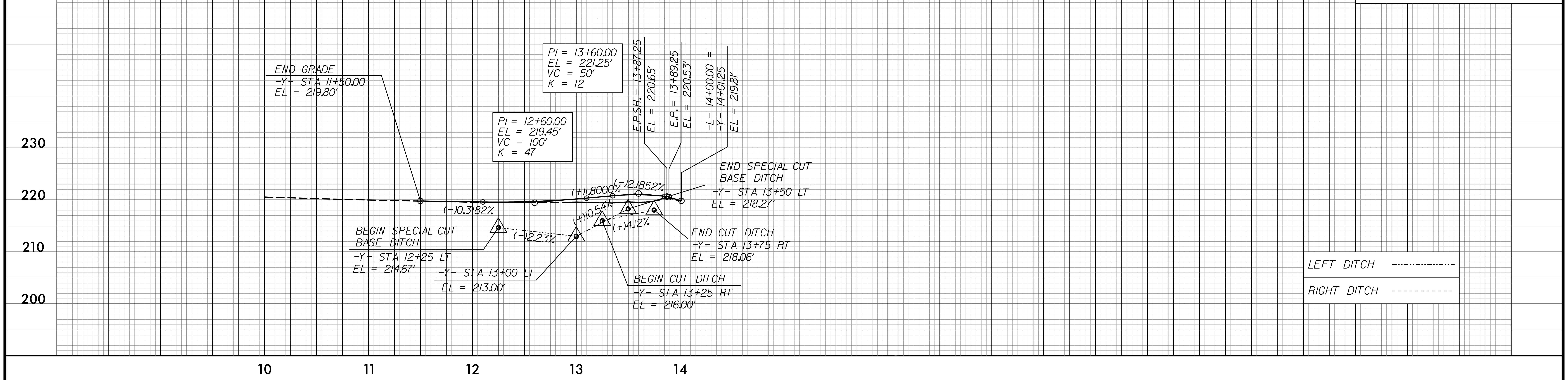
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16689 BRIAN ALLEN WILES
10/23/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040302 KEITH JERNIGAN, JR.
10/23/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOR PLAN, SEE SHEET 4

09/08/99

TIP PROJECT: 15408.108303

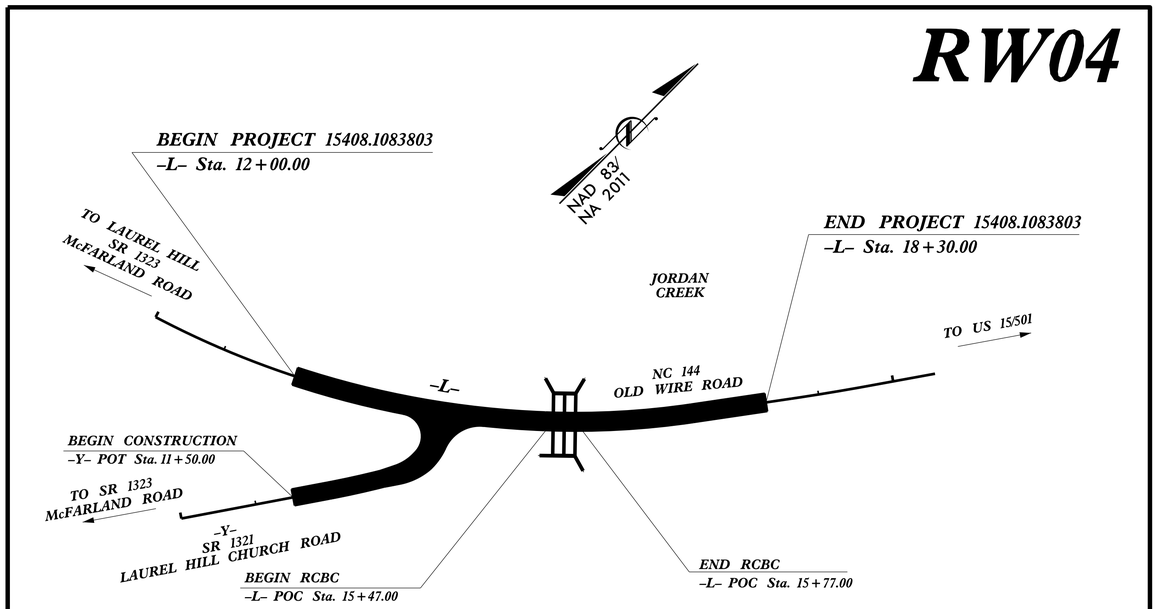
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15408.108303	RW01	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

SCOTLAND COUNTY

RW04



GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "82C106-2"
WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 395025.499(ft) EASTING: 1859819.165(ft)
ELEVATION: 244.746(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998922932
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"82C106-2" TO -L- STATION 12+00.00 IS
N 76-42'30.2" E 892.1529(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

GEL SOLUTIONS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 6, 2019

LETTING DATE:
SEPTEMBER 10, 2019

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA GEL ENGINEERING OF NC, INC. NO. C-1938 CERTIFICATE OF AUTHORIZATION

NORTH CAROLINA PROFESSIONAL SEAL L-3996 LAND SURVEYOR PARKER H. ICENHOUR, JR.

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

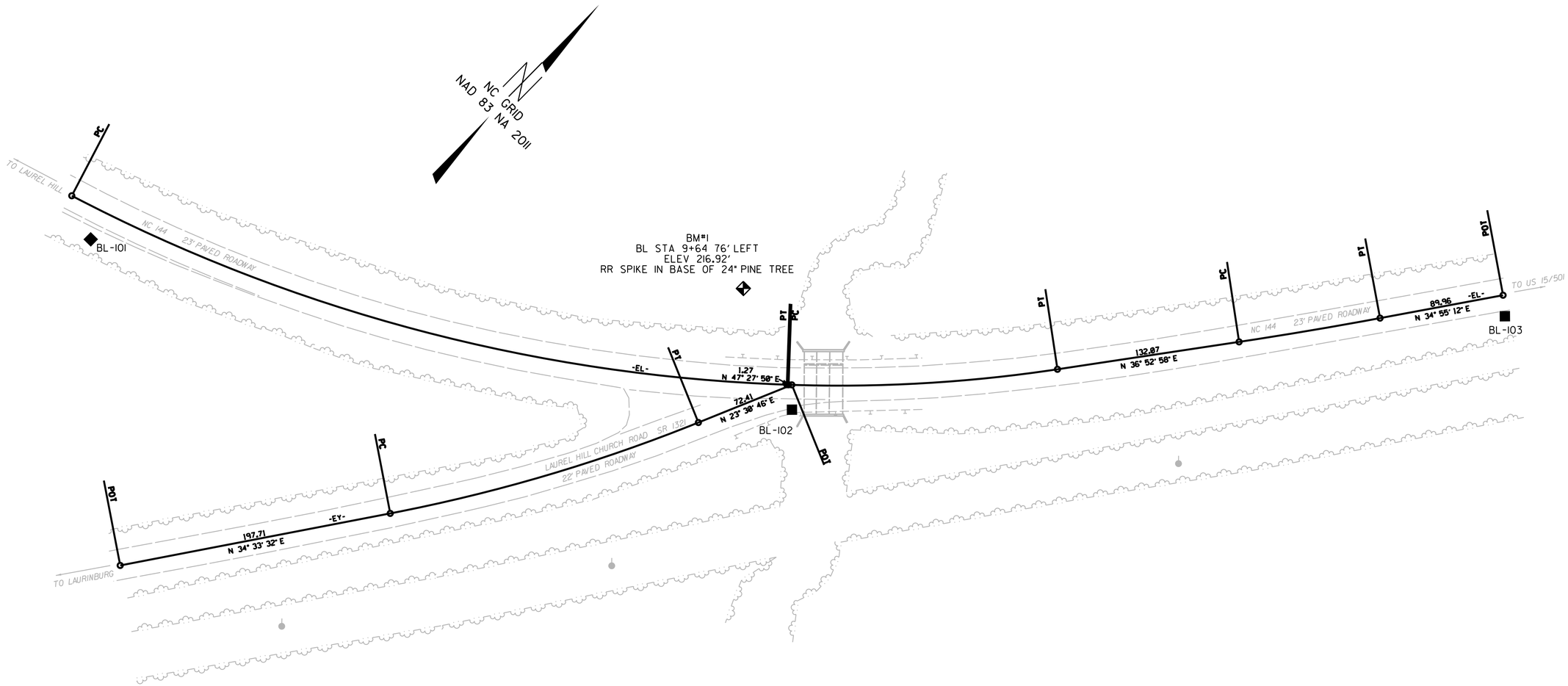
$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



NOTES:

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

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

09-SEP-2019 06:12
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Jason Prevatte AT JPREVATTE-GEO

6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL

POINT	DESC.	NORTH	EAST	ELEVATION
101	BL-101	395143.9360	1860533.4760	221.19
102	BL-102	395410.2230	1860978.7360	219.92
103	BL-103	395817.5960	1861296.9960	219.53

****
BM1 ELEVATION = 216.92
N 395448 E 1860893
RR SPIKE IN BASE OF 24"PINE TREE
****

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	395156.715	1860501.821							
CURVE			N 60°15'51.5" E	531.73	25°36'02.0"(LT)	04°46'28.7"	536.18	272.64	1200.00
PT	395420.452	1860963.532							
LINE			N 47°27'50.5" E	1.27					
PC	395421.311	1860964.468							
CURVE			N 42°10'24.4" E	193.63	10°34'52.1"(LT)	05°27'24.3"	193.91	97.23	1050.00
PT	395564.816	1861094.470							
LINE			N 36°52'58.3" E	132.07					
PC	395670.452	1861173.734							
CURVE			N 35°54'05.0" E	102.78	01°57'46.7"(LT)	01°54'35.5"	102.78	51.40	3000.00
PT	395753.703	1861234.001							
LINE			N 34°55'11.7" E	89.96					
POT	395827.468	1861285.498							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	394991.696	1860713.016							
LINE			N 34°33'31.8" E	197.71					
PC	395154.520	1860825.169							
CURVE			N 29°02'09.0" E	230.99	11°02'45.7"(LT)	04°46'28.7"	231.35	116.03	1200.00
PT	395356.478	1860937.281							
LINE			N 23°30'46.1" E	72.41					
POT	395422.874	1860966.168							

NOTES:

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

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

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Jason Prevatte AT JPREVATTE_GEG

PROJECT REFERENCE NO.	SHEET NO.
15408.108303	RW02D-1

Location and Surveys

GEL SOLUTIONS

PROPOSED ALIGNMENT CONTROL SHEET

REVISIONS

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	395156.7149	1860501.8209
PT	15+36.18	395420.4517	1860963.5321
PC	15+37.45	395421.3108	1860964.4684
PT	17+31.36	395564.8161	1861094.4699
PC	18+63.42	395670.4524	1861173.7345
PT	19+66.21	395753.7031	1861234.0011
POT	20+56.17	395827.4679	1861285.4982

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	394991.6961	1860713.0163
PC	11+97.71	395154.5204	1860825.1687
PCC	12+92.27	395234.4244	1860875.6847
PT	13+78.77	395316.0942	1860871.4117
POT	14+01.25	395334.2738	1860858.1870

NOTES:

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

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

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
15408.108303	RW03E-1

Location and Surveys

GEL SOLUTIONS

PROJECT SURVEYOR

NORTH CAROLINA GEL ENGINEERING OF NC, INC. NO. C-1938 CERTIFICATE OF AUTHORIZATION

NORTH CAROLINA PROFESSIONAL SEAL L-3996 LAND SURVEYOR PARKS H. ICENHOUR, JR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	17+31.36	-30.00	395582.8216	1861070.4740
L	17+31.36	-80.00	395612.8306	1861030.4808
L	17+31.36	30.00	395546.8107	1861118.4659
L	17+31.36	75.00	395519.8026	1861154.4597
L	15+37.45	75.00	395366.0468	1861015.1723
L	15+36.18	75.00	395365.1878	1861014.2360
L	15+36.18	-80.00	395479.4000	1860909.4478
L	15+37.45	-80.00	395480.2590	1860910.3841
L	14+00.00	-80.00	395398.9673	1860811.1257
L	14+00.00	-55.00	395378.7506	1860825.8324
L	13+00.00	30.00	395253.2380	1860790.5315
L	11+75.00	-55.00	395269.4244	1860641.4316
L	11+75.00	-30.00	395246.8207	1860652.1120
L	14+54.89	75.00	395308.9951	1860948.6640

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	18+63.42	-30.00	395688.4578	1861149.7386
L	18+63.42	30.00	395652.4469	1861197.7304
L	18+25.00	45.00	395612.7096	1861186.6666

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	12+15.00	-30.00	395185.4881	1860809.9237

I, Parks H. Icenhour, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 9th day of September, 2019.

---------------------------- Professional Land Surveyor

L-3996 PLS #

Seal

NOTES:

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

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

6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
15408.108303	RW04

Location and Surveys

GEL SOLUTIONS

PROJECT SURVEYOR

NORTH CAROLINA GEL ENGINEERING OF NC, INC. NO. C-1938 CERTIFICATE OF AUTHORIZATION

NORTH CAROLINA PROFESSIONAL SEAL L-3996 LAND SURVEYOR PARKS H. ICENHOUR, JR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Parks H. Icenhour, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

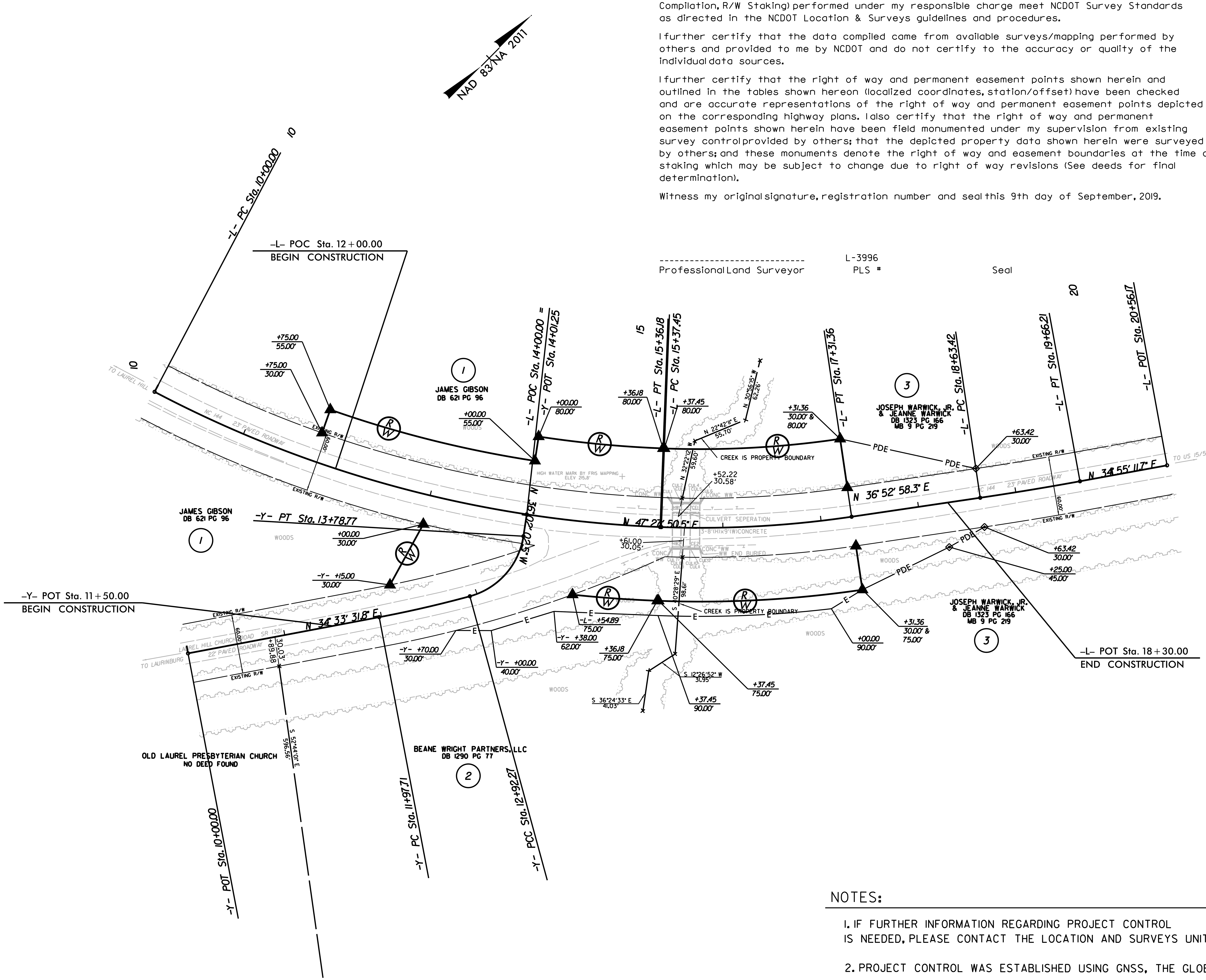
I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 9th day of September, 2019.

__________________________ L-3996

Professional Land Surveyor PLS # Seal



NOTES:

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

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

REVISIONS

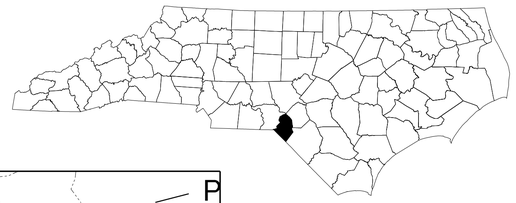
8/17/99

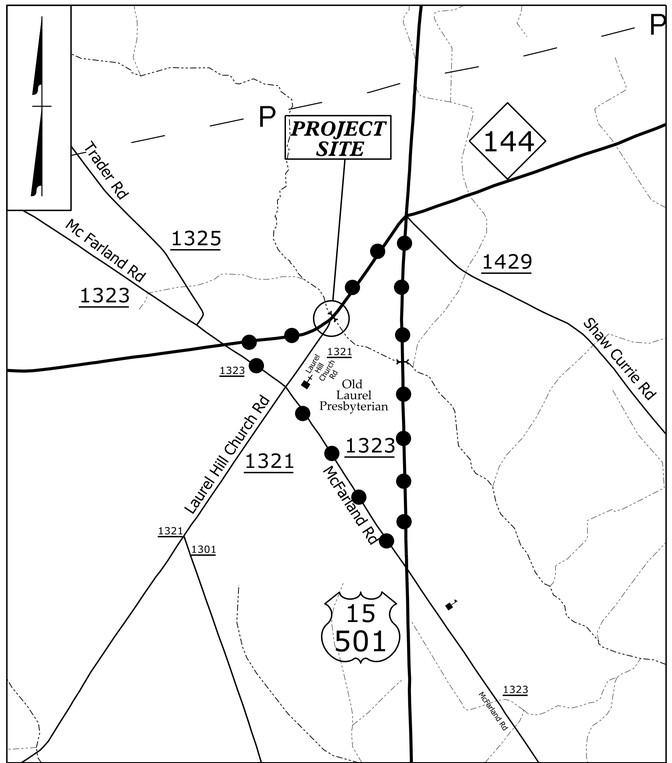
09-SEP-2019 08:33 C:\projects\sr1321\rw_control sheets\2019 06 06 C106 NC 144 RW Plans\Roadway\Proj\B2C106_Rdy_psh_04.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

SCOTLAND COUNTY





VICINITY MAP

DETOUR ROUTE

LOCATION: CULVERT 106 OVER JORDAN CREEK ON NC 144 (OLD WIRE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURE

INDEX OF SHEETS

SHEET NO.
TMP-1

15408.1083803

PROJECT:

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

PLANS PREPARED BY:

BRIAN A. WILES, PE
PROJECT MANAGER

NCDOT CONTACTS:

TIM WELCH, PE
DIV. 8 BRIDGE PROGRAM MANAGER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
DIVISION 8
121 DOT Drive
Carthage, NC 28327

PLANS PREPARED BY:
CH ENGINEERING
3220 GLEN ROYAL RD, RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

APPROVED: DocuSigned by: Brian A Wiles B890D0FEA2E34DE...

DATE: 10/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

9/11/2019
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	TMP-1A

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

EXIST. PVMT.

NORTH ARROW

PROPOSED PVMT.

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)

TEMPORARY SIGNING

STATIONARY SIGN

FINAL PAVEMENT MARKING

THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 mils)	1,800 LF
THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 mils)	1,800 LF
PERMANENT RAISED PAVEMENT MARKERS	15 EACH

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NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

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

ROADWAY STANDARD DRAWINGS & LEGEND

9/11/2019
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	TMP-1B

MANAGEMENT STRATEGIES

-CLOSE NC 144 (OLD WIRE ROAD) & SR 1321 (LAUREL HILL CHURCH ROAD) AND DETOUR TRAFFIC OFF-SITE

-MAINTAIN LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION

GENERAL NOTES

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

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

SIGNING

A) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRANSPORTATION MANAGEMENT PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRANSPORTATION MANAGEMENT PLANS.

B) 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.

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

LOCAL NOTES

1) NOTIFY THE ENGINEER AT LEAST 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

2) NOTIFY THE SCOTLAND SCHOOLS TRANSPORTATION OFFICE OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

3) NOTIFY THE SCOTLAND COUNTY EMERGENCY MANAGEMENT OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

PHASING

STEP 1) USING RSD 1101.03, SHEET 1 OF 9 AND TMP-4, CLOSE NC 144 (OLD WIRE ROAD) AND SR 1321 (LAUREL HILL CHURCH RD) AND DETOUR TRAFFIC OFF-SITE AS SHOWN ON TMP-3. MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN CLOSURE POINTS.

STEP 2) REMOVE THE EXISTING STRUCTURE.

STEP 3) CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY.

STEP 4) PLACE FINAL PAVEMENT MARKINGS.

STEP 5) OPEN NC 144 (OLD WIRE ROAD) AND SR 1321 (LAUREL HILL CHURCH RD) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

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NC LICENSE #P-0189

APPROVED: DocuSigned by: Brian A Wiles 889D0DFEA2E34DE...

DATE: 10/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

9/11/2019
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USERNAME:

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	TMP-2

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

SIGN WIDTH: 4′-6″
HEIGHT: 1′-6″
TOTAL AREA: 6.8 Sq.Ft.

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

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

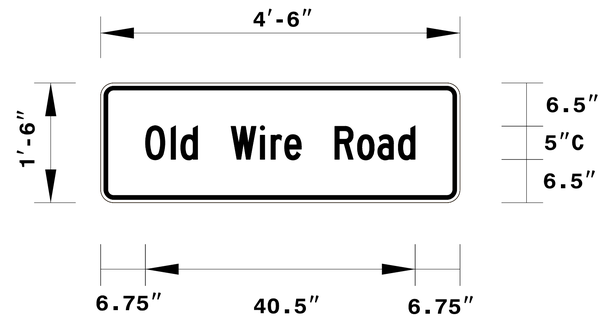
SYMBOL	X	Y	WID	HT

MAT′L: 0.080″ (2.0 mm) ALUMINUM

USE NOTES: 1,2

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

DESIGN BY: TAG
PROJECT ID: ID
CHECKED BY:
LOCATION:
Sep 09, 2019
DIV: DIV



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

	O	l	d		W	i	r	e		R	o	a	d														C 2000
	6.7	10.6	12	14.6	19.6	24	25.6	27.6	30.2	35.2	38.6	41.6	44.7														40.5

FILENAME: SIGN DESIGNS - Work Zone

NORTH CAROLINA D.O.T. SIGN DETAIL

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NC LICENSE #P-0189

APPROVED: Docu/Signed by: Brian A Wiles 889DDFEA2E34DE...
DATE: 10/14/2019
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

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

SPECIAL SIGN DESIGN

9/11/2019
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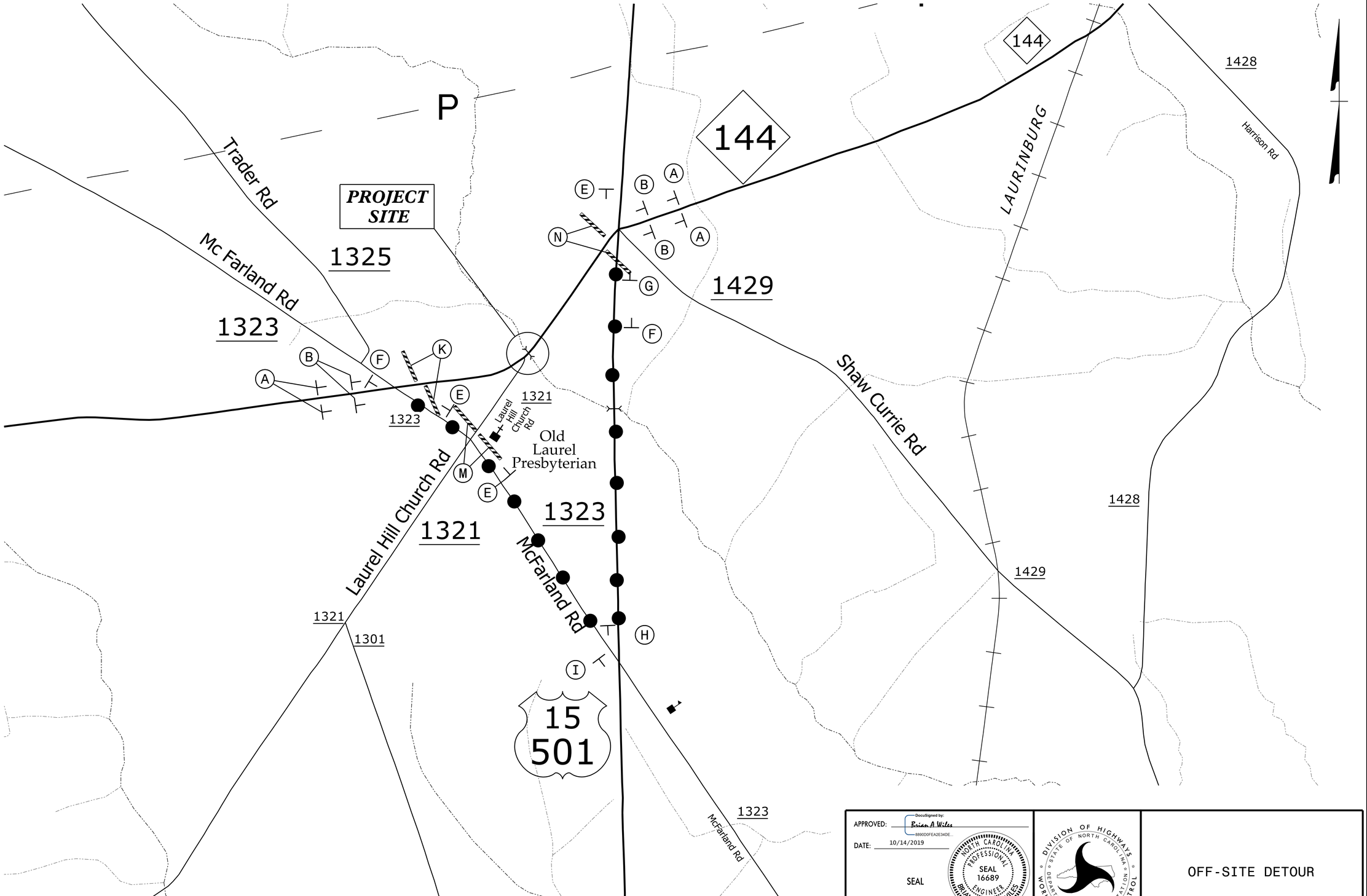
USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	TMP-3



APPROVED: DocuSigned by: Brian A Wiles 889DD0FEA2E34DE...

DATE: 10/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

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

OFF-SITE DETOUR

9/11/2019
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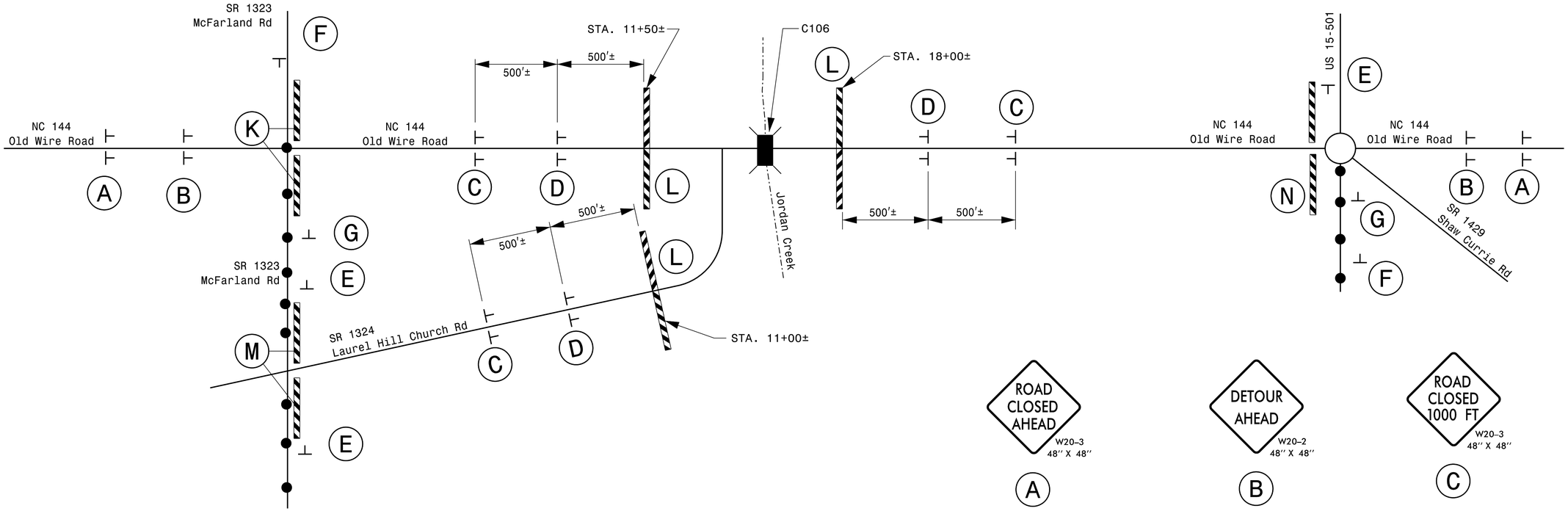
USERNAME=

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	TMP-4



A

B

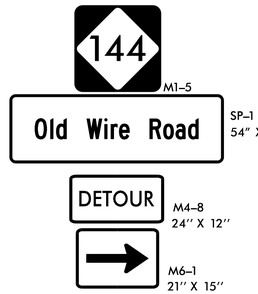
C

D

E

F

G



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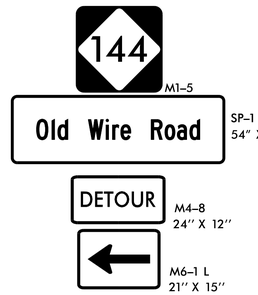

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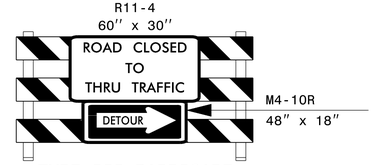
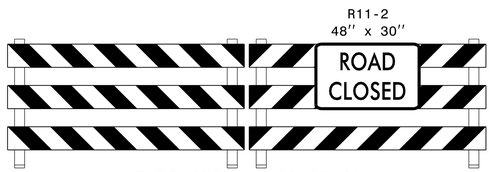


TYPE III BARRICADE

K

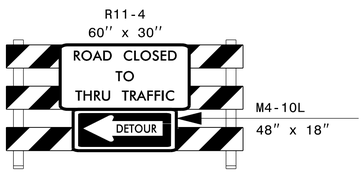


TYPE III BARRICADE(S)

L

TYPE III BARRICADE

M



TYPE III BARRICADE

N

CH ENGINEERING
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NC LICENSE #P-0189

APPROVED: DocuSigned by: Brian A Wiles 889DD0FEA2E34DE...

DATE: 10/14/2019

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROAD CLOSURE DETAIL and DETOUR SIGNS

9/25/2019
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USERNAME

TIP PROJECT: 15408.1083803

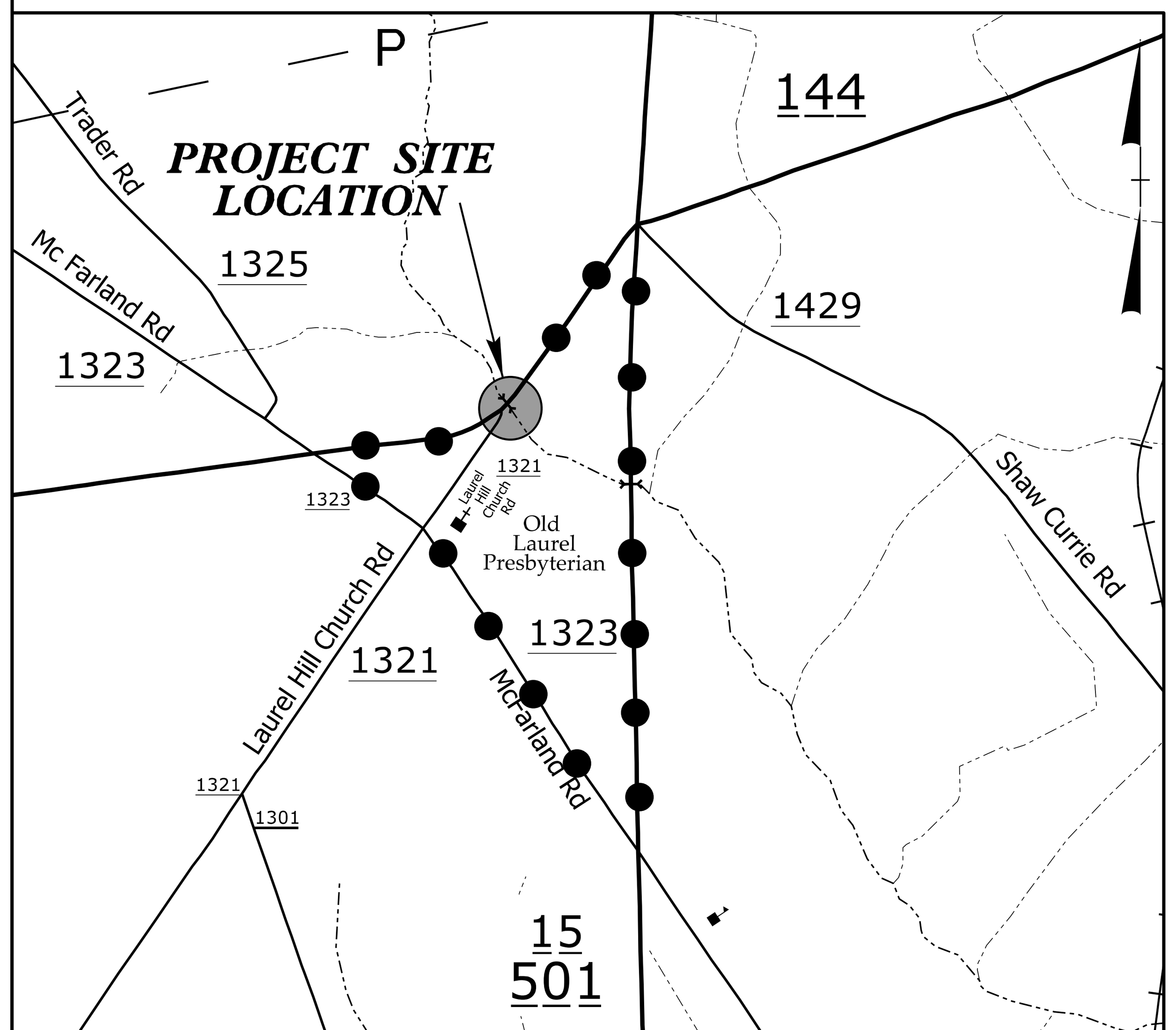
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15408.1083803	EC-1	

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

SCOTLAND COUNTY



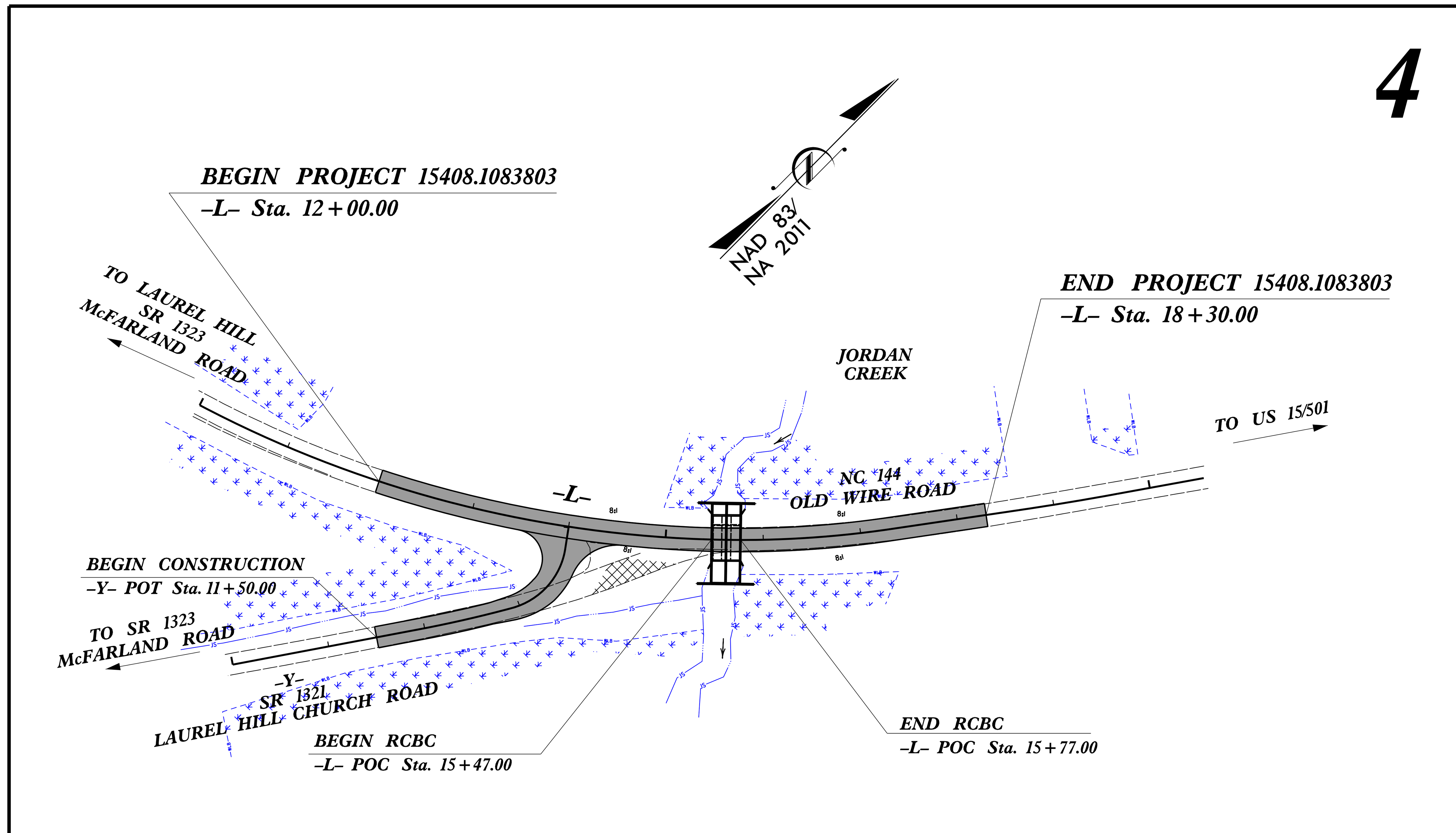
VICINITY MAP

●—●—●—● OFF-SITE DETOUR ROUTE

N.T.S.

LOCATION: CULVERT 106 OVER JORDAN CREEK ON NC 144 (OLD WIRE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & RCBC



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.

GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

MI ENGINEERING, PLLC
1011 SCHAUB DR, SUITE 100
RALEIGH, NC 27606

Designed by:

BILL JERNIGAN, JR., PE 3395
NAME — LEVEL III CERTIFICATION NO.

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2019 STANDARD SPECIFICATIONS

Reviewed by:

AARON HARPER, PE

Roadway Standard Drawings

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

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	EC-2
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.
15408.1083803	EC-3

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

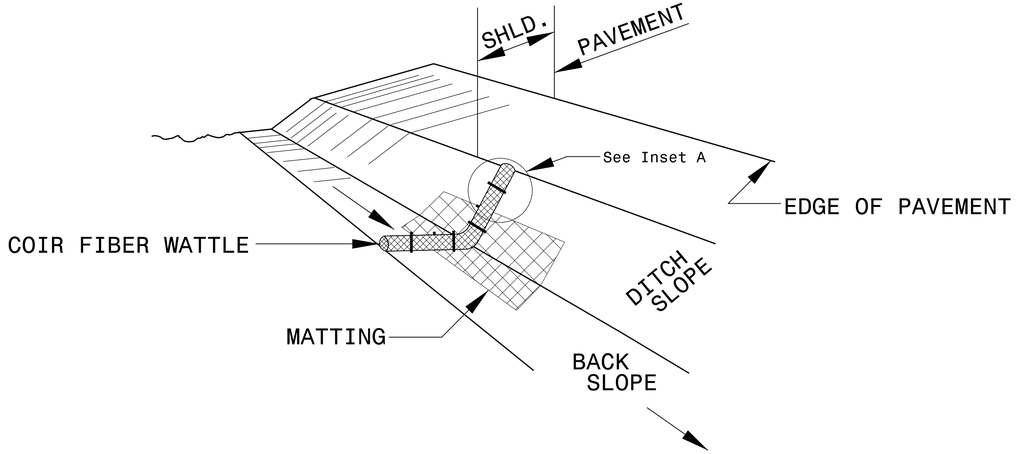
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	12+00	14+50	LT	205
				SUBTOTAL	350
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					6290
				TOTAL	6495
				SAY	7000

MATTING FOR EROSION CONTROL

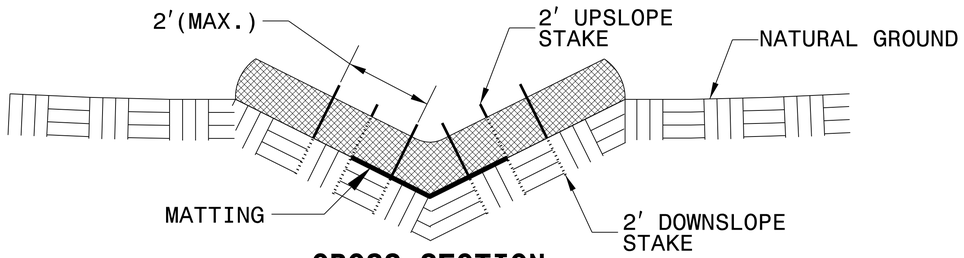
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	EC-3A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

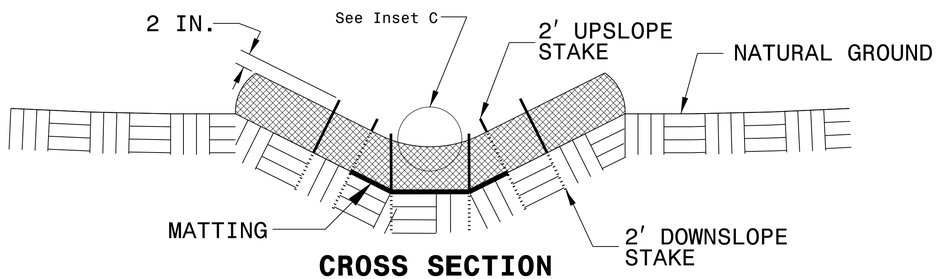
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

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

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

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

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

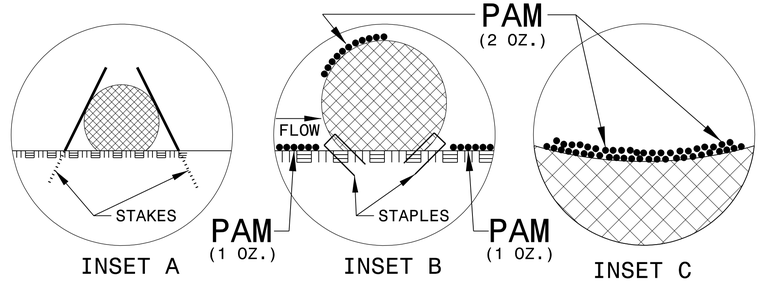
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

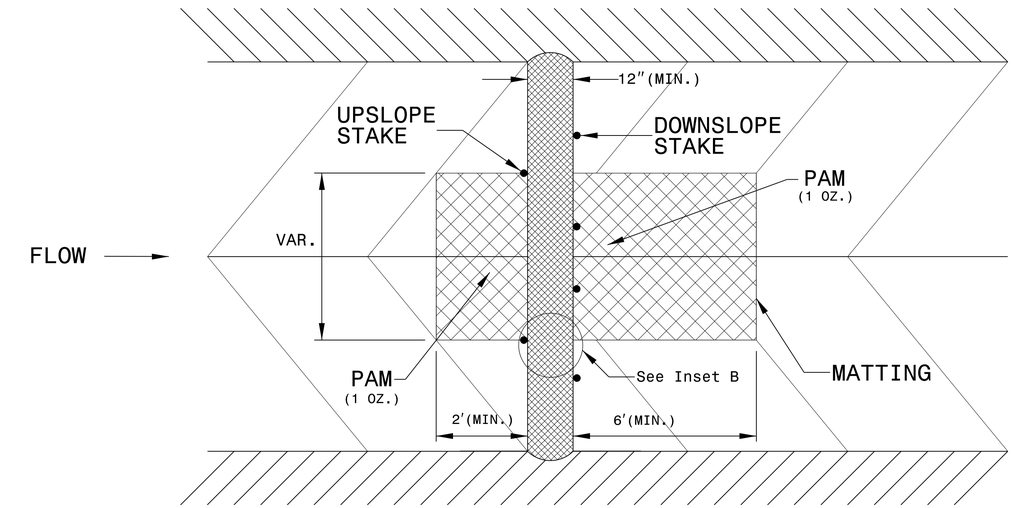
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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

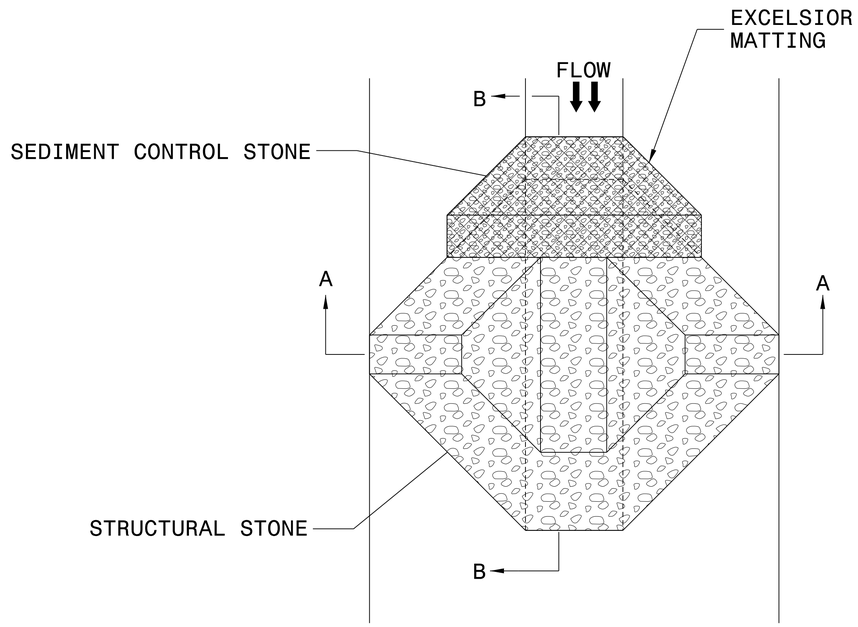




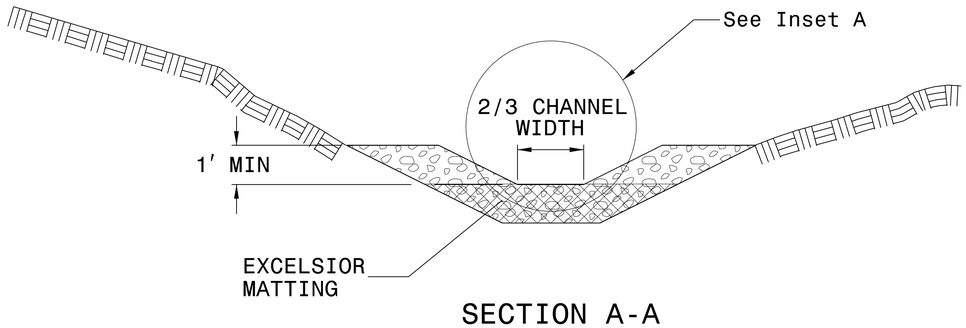
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	EC-3B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

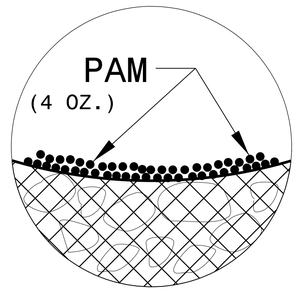
NOTES:

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

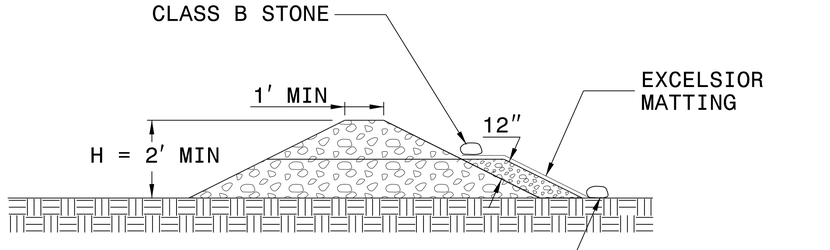
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A



SECTION B-B

NOT TO SCALE

CLEARING & GRUBBING PLAN

–L–		
PI Sta 12+72.64	PI Sta 16+34.68	PI Sta 19+14.82
△ = 25° 36' 02.0" (LT)	△ = 10° 34' 52.1" (LT)	△ = 1° 57' 46.7" (LT)
D = 4° 46' 28.7"	D = 5° 27' 24.3"	D = 1° 54' 35.5"
L = 536.18'	L = 193.91'	L = 102.78'
T = 272.64'	T = 97.23'	T = 51.40'
R = 1,200.00'	R = 1,050.00'	R = 3,000.00'

NAD 83/NA 2011

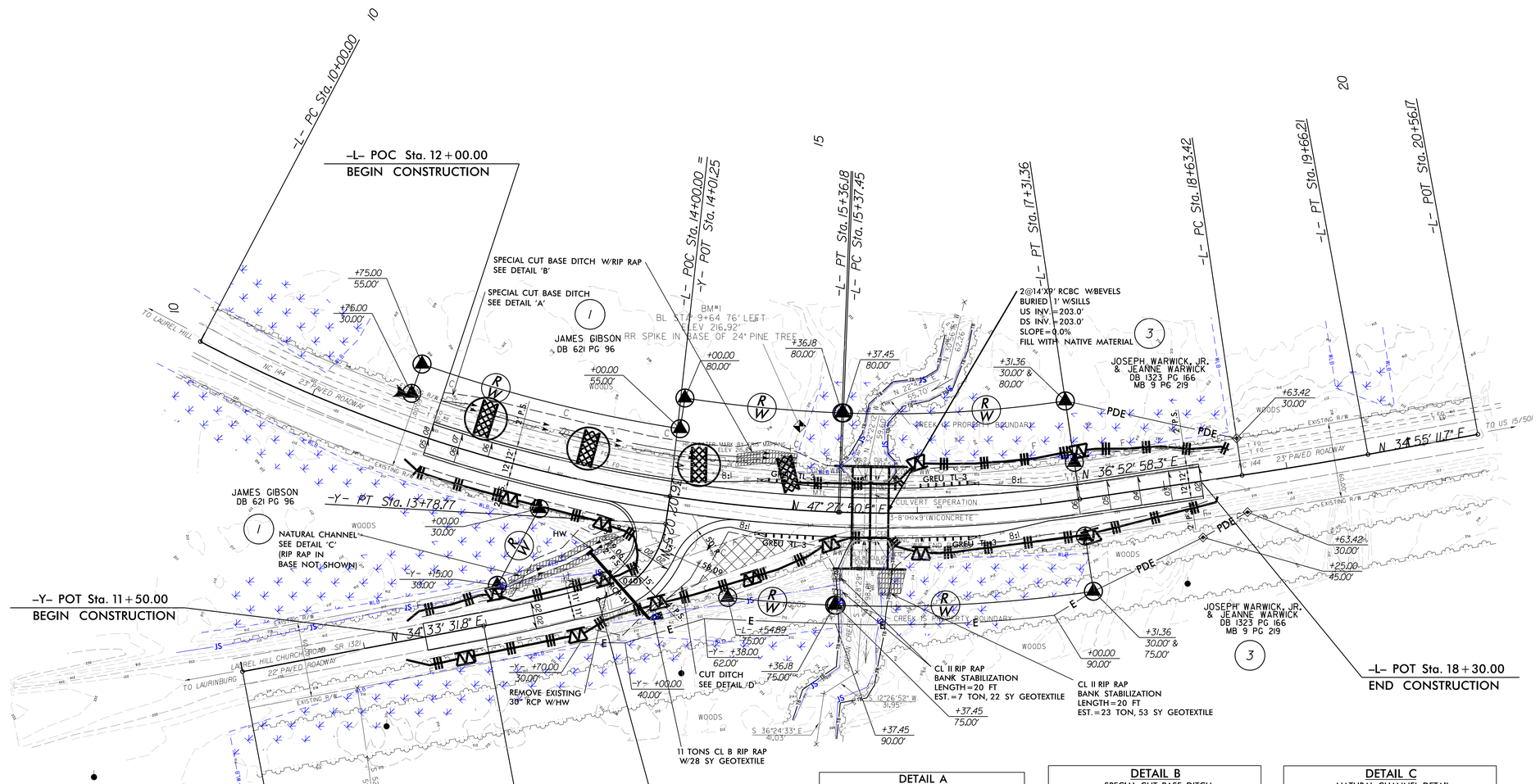
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	EC-04/CONST.04
SCOTLAND COUNTY C106	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

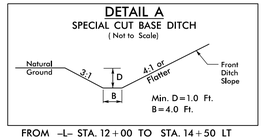
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



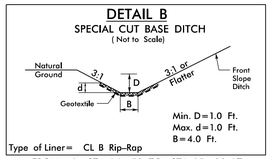
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B=4.0 Ft.

FROM –L– STA. 12+00 TO STA. 14+50 LT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)

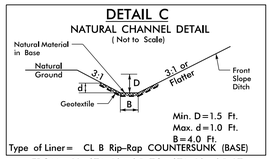


Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.

Type of Liner= CL B Rip-Rap

FROM –L– STA. 14+50 TO STA. 15+00 LT
EST. 26 TONS CL B RIP RAP, 70 SY GEOTEXTILE

DETAIL C
NATURAL CHANNEL DETAIL
(Not to Scale)

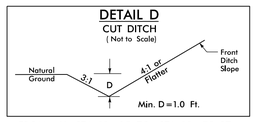


Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.

Type of Liner= CL B Rip-Rap COUNTERSUNK (BASE)

FROM –Y– STA. 12+25 TO STA. 13+25 LT
58 TONS CL B RIP RAP, 153 SY GEOTEXTILE

DETAIL D
CUT DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM –Y– STA. 13+25 TO STA. 13+75 RT

–Y–

PI Sta 12+45.01	PI Sta 13+41.05
△ = 4° 30' 53.3" (LT)	△ = 66° 04' 41.0" (LT)
D = 4° 46' 28.7"	D = 76° 23' 39.7"
L = 94.56'	L = 86.50'
T = 47.30'	T = 48.78'
R = 1,200.00'	R = 75.00'

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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

FOR PROFILE, SEE SHEET 5

REVISIONS 8/17/99

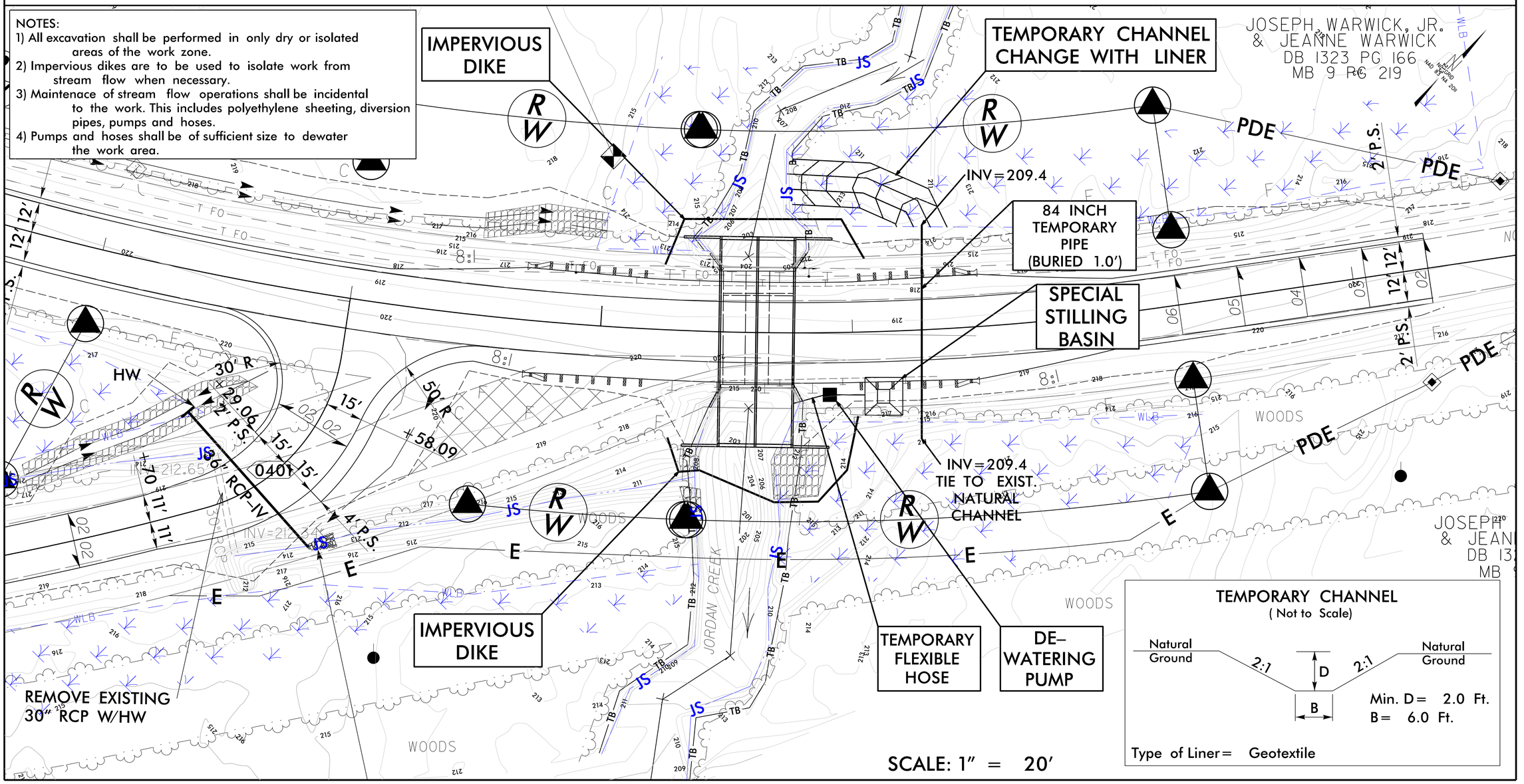
23-OCT-2019 16:26
K:\NC_HIGHWAY\15408033.01_Scotland_C106\Erosion Control\CADD\82C106_EC_psh_04.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	EC-4A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE STA. 15+62 –L–

1. CONSTRUCT SPECIAL STILLING BASIN PER NCDOT STANDARDS AT LOCATION SHOWN
2. CONSTRUCT IMPERVIOUS DIKES AND DIVERSION CHANNEL AS SHOWN. DIVERSION CHANNEL TIE–INS SHOULD BE ISOLATED FROM JS FLOW. INSTALL 84" TEMPORARY PIPE AND BACKFILL
3. DIVERT CHANNEL FLOW THROUGH TEMPORARY DIVERSION CHANNEL AND PIPE.
4. CONSTRUCT CULVERT AND CHANNEL IMPROVEMENTS.
5. REMOE IMPERVIOUS DIKES AND ALLOW FLOW THROUGH RCBC.
6. REMOVE STILLING BASIN AND TEMPORARY PIPE. FILL TEMPORARY DIVERSION CHANNEL TO EXISTING ELEVATIONS.
7. COMPLETE PROPOSED ROADWAY CONSTRUCTION.

NOTES:
1) All excavation shall be performed in only dry or isolated areas of the work zone.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) Maintenace of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
4) Pumps and hoses shall be of sufficient size to dewater the work area.



TEMPORARY CHANNEL
(Not to Scale)

Min. D = 2.0 Ft.
B = 6.0 Ft.

Type of Liner = Geotextile

PROJECT REFERENCE NO.	SHEET NO.
15408J083803	EC-05/CONST.04

SCOTLAND COUNTY C106

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

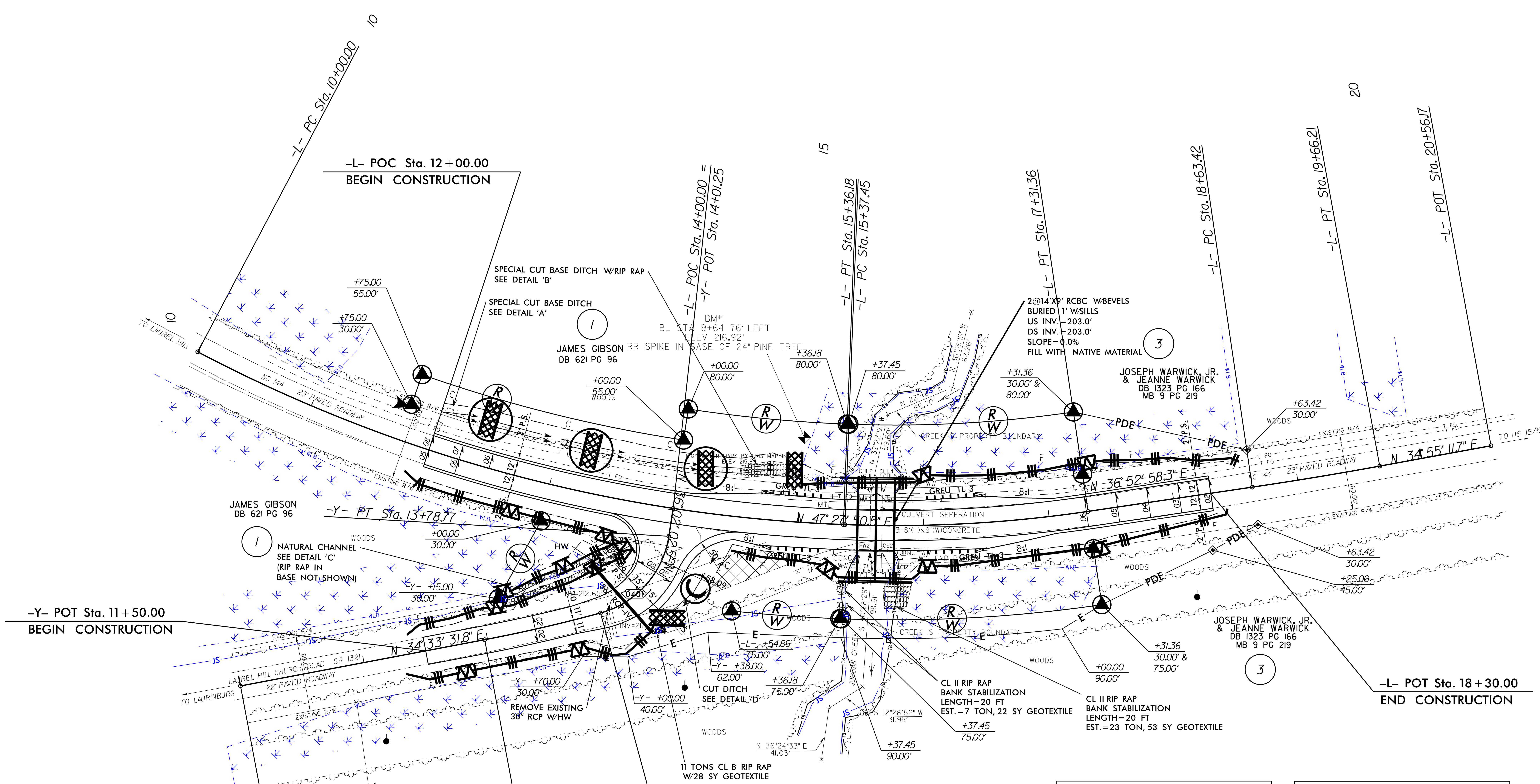
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

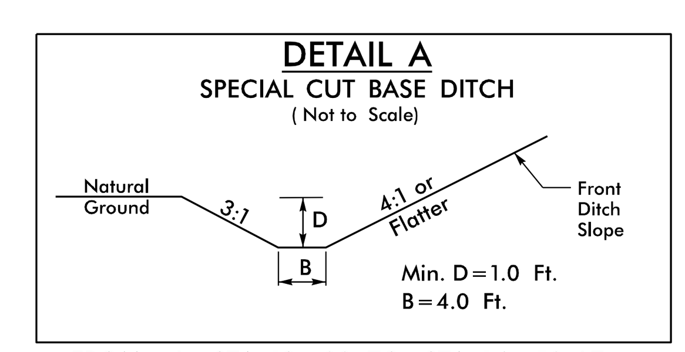
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

FINAL PLAN

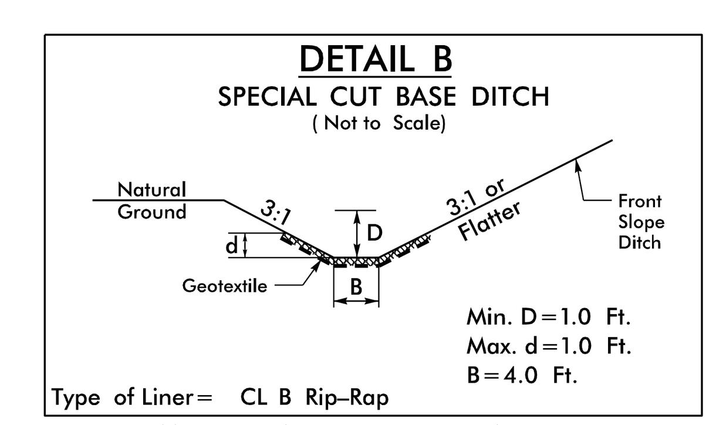
-L-

PI Sta 12+72.64	PI Sta 16+34.68	PI Sta 19+14.82
△ = 25° 36′ 02.0″ (LT)	△ = 10° 34′ 52.1″ (LT)	△ = 1° 57′ 46.7″ (LT)
D = 4° 46′ 28.7″	D = 5° 27′ 24.3″	D = 1° 54′ 35.5″
L = 536.18′	L = 193.91′	L = 102.78′
T = 272.64′	T = 97.23′	T = 51.40′
R = 1,200.00′	R = 1,050.00′	R = 3,000.00′

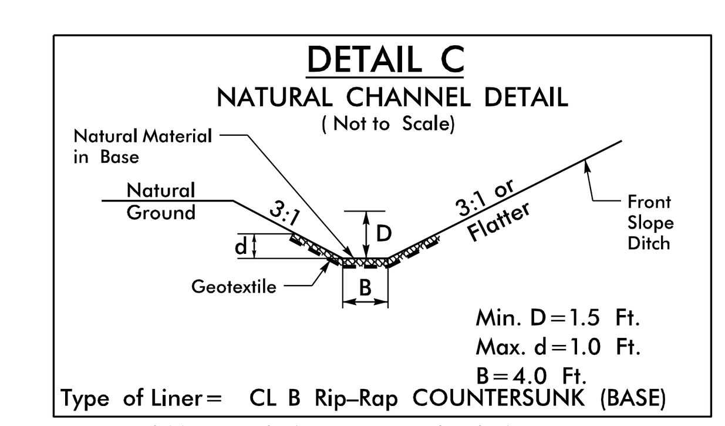




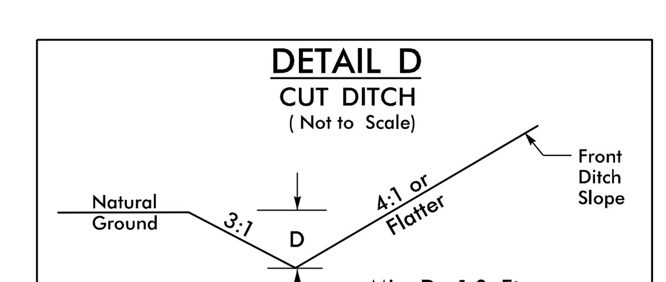
FROM -L- STA. 12+00 TO STA. 14+50 LT



FROM -L- STA. 14+50 TO STA. 15+00 LT
EST. 26 TONS CL B RIP RAP, 70 SY GEOTEXTILE



FROM -Y- STA. 12+25 TO STA. 13+25 LT
58 TONS CL B RIP RAP, 153 SY GEOTEXTILE



FROM -Y- STA. 13+25 TO STA. 13+75 RT

-Y-

PI Sta 12+45.01	PI Sta 13+41.05
△ = 4° 30′ 53.3″ (LT)	△ = 66° 04′ 41.0″ (LT)
D = 4° 46′ 28.7″	D = 76° 23′ 39.7″
L = 94.56′	L = 86.50′
T = 47.30′	T = 48.78′
R = 1,200.00′	R = 75.00′

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.

FOR PROFILE, SEE SHEET 5

REVISIONS

8/17/99
23-OCT-2019 16:27
N:\NC_Hydro\M18033.01_Scotland_C106\Erosion Control\CADD\B2C106_EC_psh_05.dgn
$$$$USERNAME$$$$

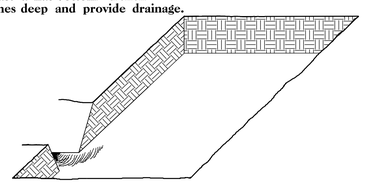
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15408.1083803	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

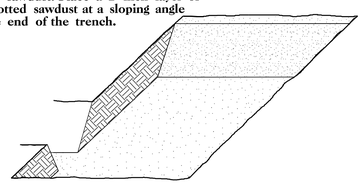
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

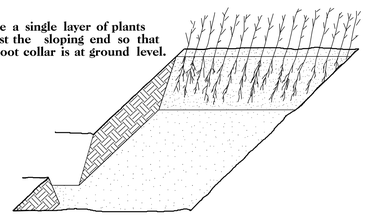
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



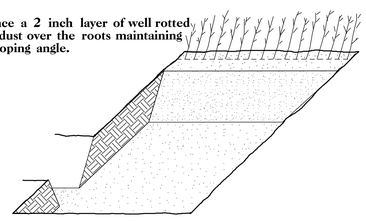
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

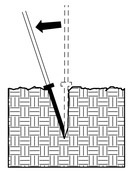


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

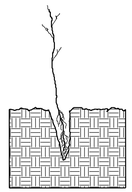


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

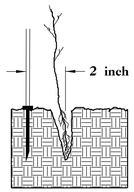
DI33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



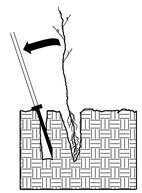
1. Insert planting bar as shown and pull handle toward planter.



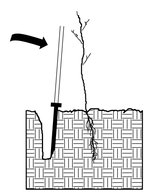
2. Remove planting bar and place seedling at correct depth.



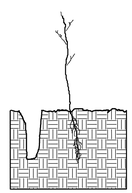
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

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

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

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

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in 3R
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in 3R
25% 3ETULA NIGRA	RIVER 3IRCH	12 in – 18 in 3R

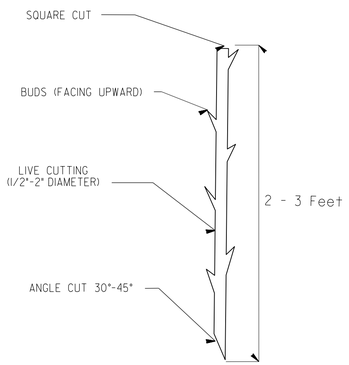
REFORESTATION DETAIL SHEET

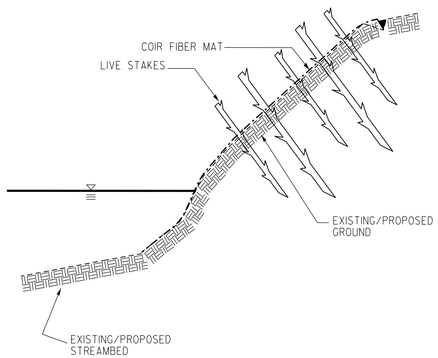
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	RF-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

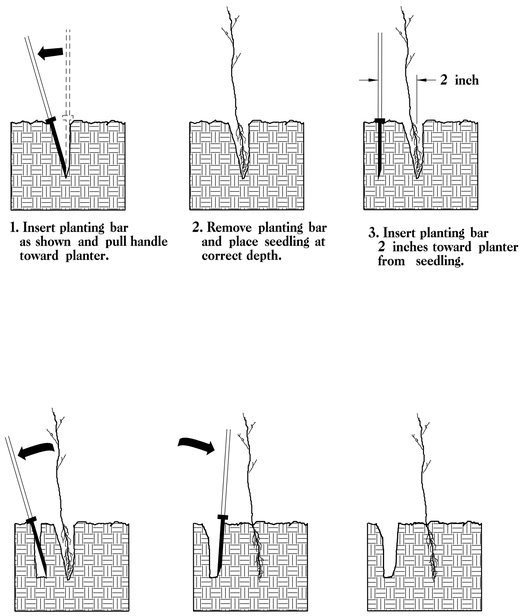




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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

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

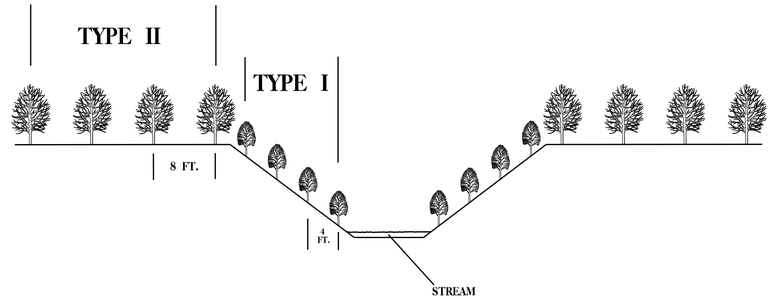
ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

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

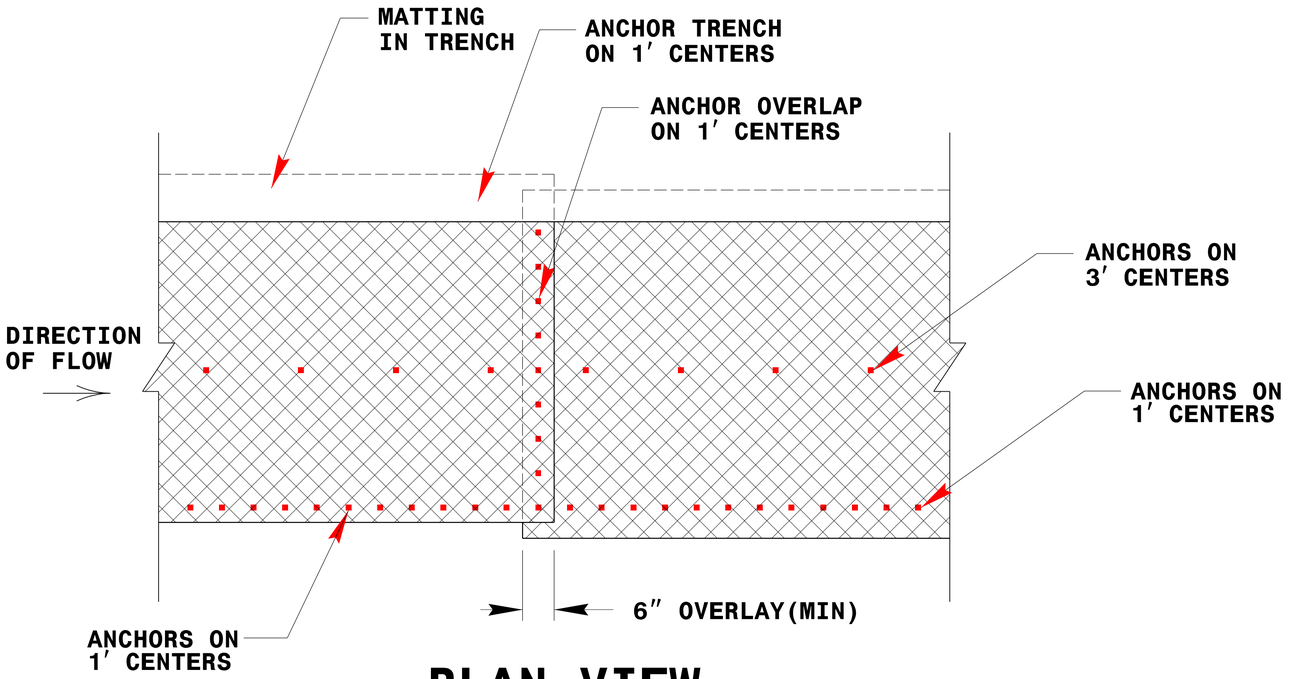
TYPE 1			
50%	SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50%	CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2			
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	PRUNUS SEROTINA	BLACK CHERRY	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

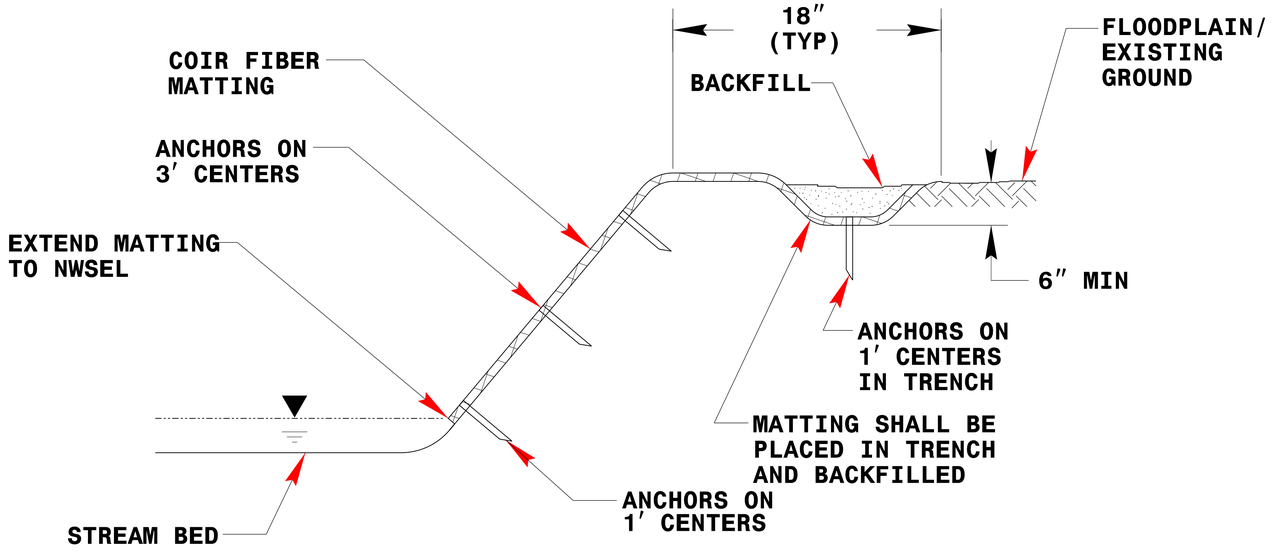
STREAMBANK REFORESTATION
DETAIL SHEET 1 OF 2

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

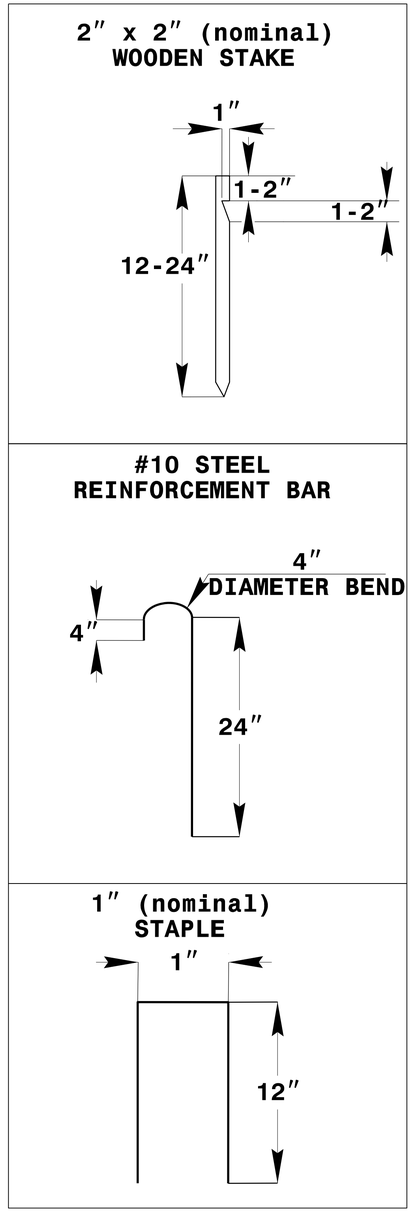
PROJECT REFERENCE NO.	SHEET NO.
154081083803	RF-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

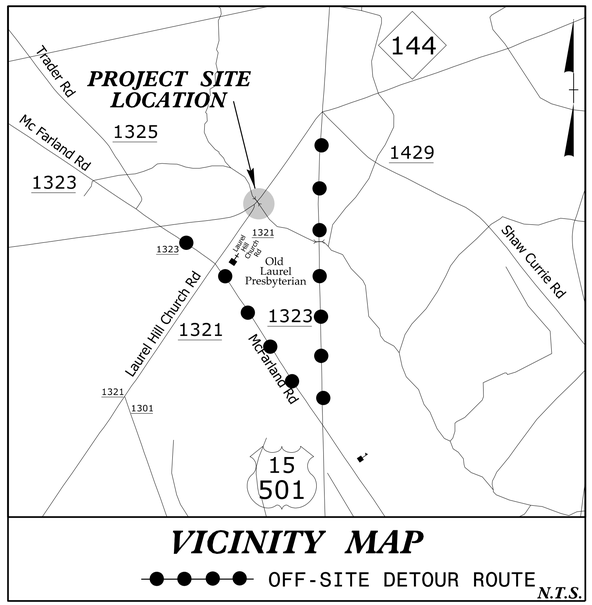
NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2

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

09/08/99

TIP PROJECT: 15408.1083803



VICINITY MAP

OFF-SITE DETOUR ROUTE

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
SCOTLAND COUNTY

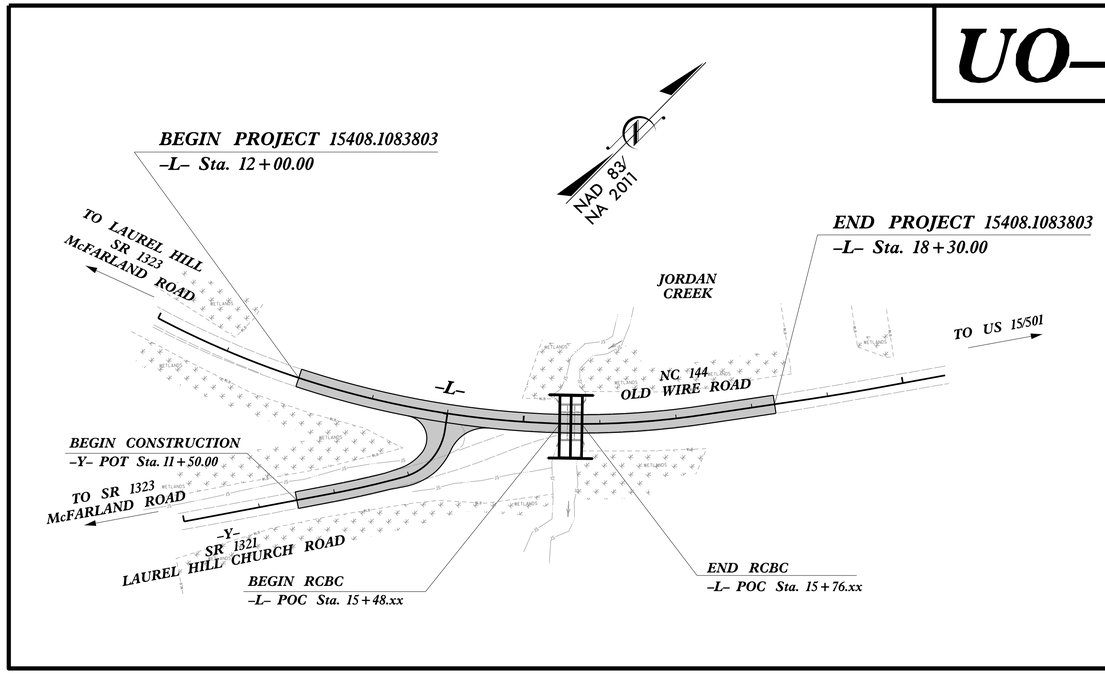
T.I.P. NO.	SHEET NO.
15408.1083803	UO–1

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

LOCATION: CULVERT 106 OVER JORDAN CREEK ON NC 144 (OLD WIRE ROAD)

TYPE OF WORK: UTILITY RELOCATION

UO–2



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2	*UBO PLAN SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) COMMUNICATIONS – CITY OF LAURINBURG
(B) COMMUNICATIONS – WINDSTREAM

PREPARED IN THE OFFICE OF:

CH ENGINEERING

3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

UTILITIES PROJECT ENGINEER
Mary Jo Lee, P.E.

DIVISION OF HIGHWAYS
DIVISION 8

121 DOT DRIVE
CARTHAGE, NC 28327

JAMIE YOW	*DIVISION CONTACT #1*
TRAVIS MORGAN, PE	*DIVISION CONTACT #2*
TIM WELCH, PE	*DIVISION CONTACT #3*
	DIVISION CONTACT #4

12/16/2019
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USERNAME

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
15408.1083803	U0-2
THIS SHEET CORRESPONDS TO RDY- 4	

UTILITIES BY OTHERS

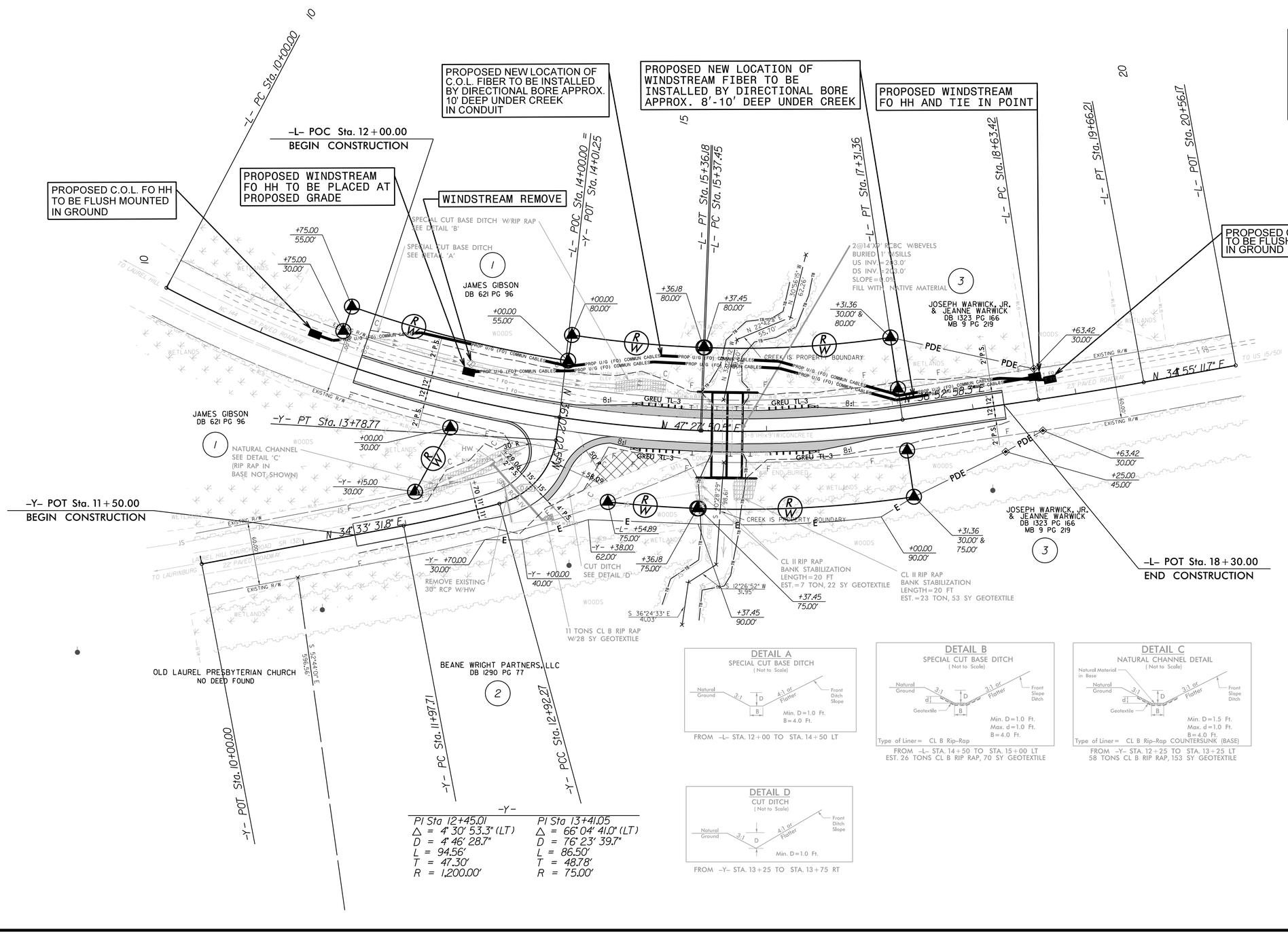
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

NAD 83/NA 2011

–L–

PI Sta 12+72.64	PI Sta 16+34.68	PI Sta 19+14.82
△ = 25° 36' 02.0" (LT)	△ = 10° 34' 52.1" (LT)	△ = 1° 57' 46.7" (LT)
D = 4° 46' 28.7"	D = 5° 27' 24.3"	D = 1° 54' 35.5"
L = 536.18'	L = 193.91'	L = 102.78'
T = 272.64'	T = 97.23'	T = 51.40'
R = 1,200.00'	R = 1,050.00'	R = 3,000.00'



–Y–

PI Sta 12+45.01	PI Sta 13+41.05
△ = 4° 30' 53.3" (LT)	△ = 66° 04' 41.0" (LT)
D = 4° 46' 28.7"	D = 76° 23' 39.7"
L = 94.56'	L = 86.50'
T = 47.30'	T = 48.78'
R = 1,200.00'	R = 75.00'

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
B=4.0 Ft.

FROM –L– STA. 12+00 TO STA. 14+50 LT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.

Type of Liner= CL B Rip–Rap

FROM –L– STA. 14+50 TO STA. 15+00 LT
EST. 26 TONS CL B RIP RAP, 70 SY GEOTEXTILE

DETAIL C
NATURAL CHANNEL DETAIL
(Not to Scale)

Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.

Type of Liner= CL B Rip–Rap COUNTERSUNK (BASE)

FROM –Y– STA. 12+25 TO STA. 13+25 LT
58 TONS CL B RIP RAP, 153 SY GEOTEXTILE

DETAIL D
CUT DITCH
(Not to Scale)

Min. D=1.0 Ft.

FROM –Y– STA. 13+25 TO STA. 13+75 RT

12/16/2019
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PROJ. REFERENCE NO.
15408.1083803
SHEET NO.
X-1
0 2.5 5
S.S. 218.8
3:1
4:1
0.070
220.54
0.060
4:1
S.S. 220.52
EP
EP
215.95
220.55
12+25.00
S.S. 218.41
3:1
4:1
0.080
220.65
0.050
4:1
S.S. 220.48
EP
EP
216.05
220.65
12+00.00
EP
EP
220.72
11+75.00

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	X-2

0 2.5 5

6/23/16

9/20/2019
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USERNAME

6/23/16
9/20/2019
R:\Roadway\XSC\B2C106_Rdy_xpl.dgn
USERNAME

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	15408.1083803	X-4

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	X-5

0 2.5 5
PROJ. REFERENCE NO.
15408.1083803
SHEET NO.
X-6
6/23/16
0.060
219.40
0.060
3:1
2.3:1
EP
EP
219.33
S.S. 218.45
S.S. 214.24
16+50.00
0.060
219.39
0.060
3:1
3:1
EP
EP
219.31
S.S. 218.65
S.S. 213.75
16+25.00
0.060
219.42
0.060
3:1
3:1
EP
EP
219.34
S.S. 218.80
S.S. 214.01
16+00.00
10/22/2019
USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	X-7

6/23/16

10/22/2019
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	X-8

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	15408.1083803	X-9

6/23/16

10/22/2019
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USERNAME

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	15408.1083803	X-10

6/23/16

9/20/2019
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USERNAME

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	15408.1083803	X-11

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	15408.1083803	X-12

6/23/16

9/20/2019
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
15408.1083803	X-13

6/23/16
9/20/2019
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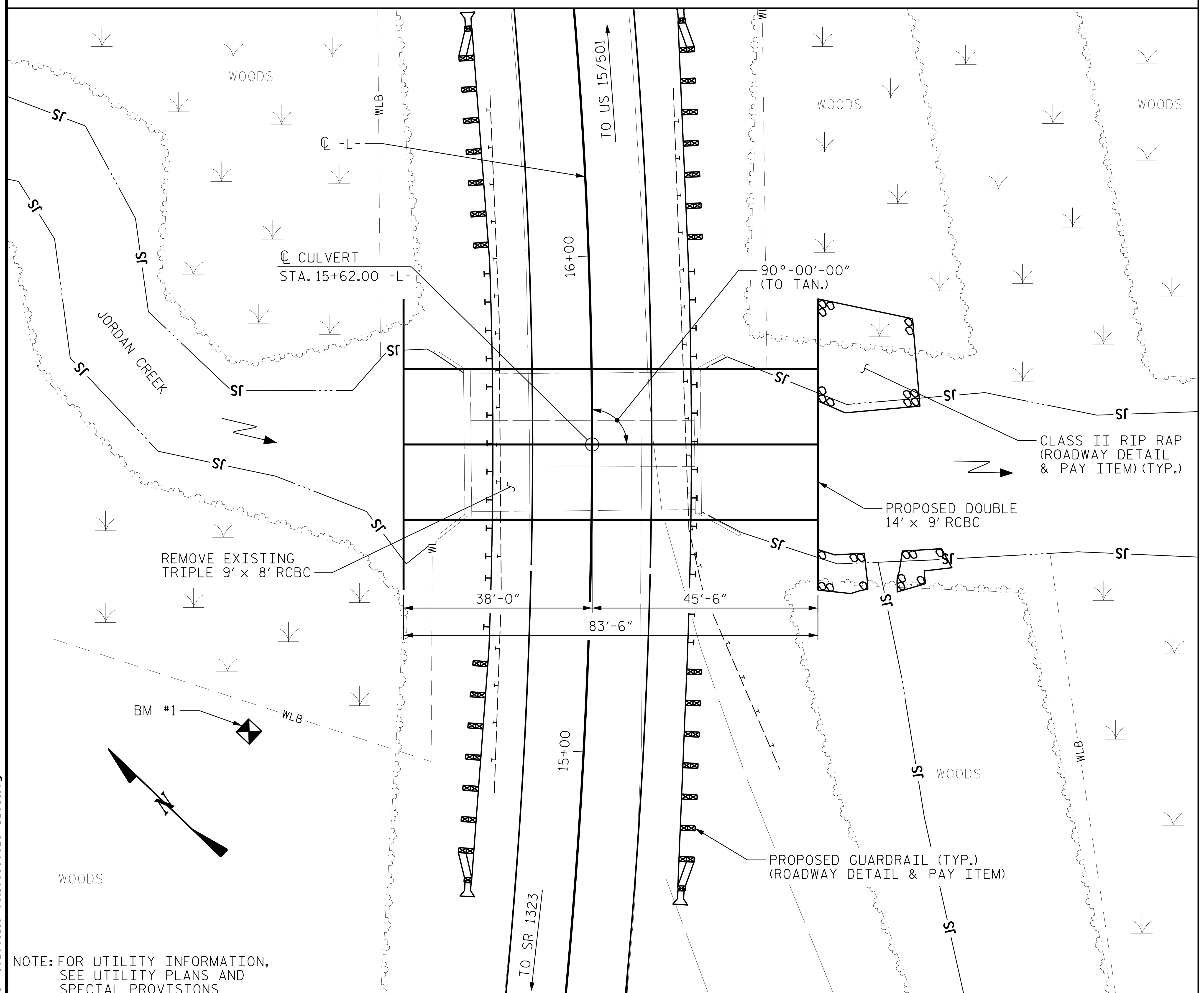
USERNAME

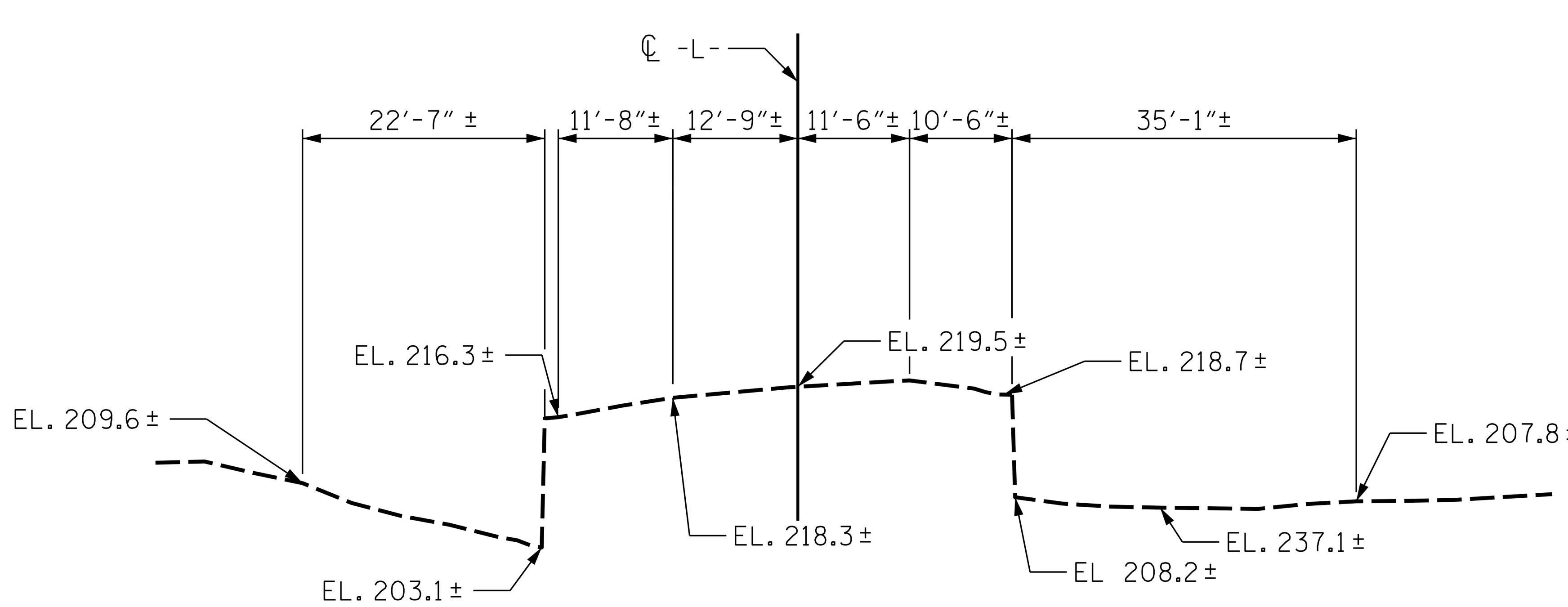
BM #1: RR SPIKE IN BASE OF 24" PINE TREE, 68' LT OF STA. 15+01.00 -L-, EL. 216.92'



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

LOCATION SKETCH

GRADE POINT ELEVATION @ 15+62.00 -L- = 219.49
BED ELEVATION @ 15+62.00 -L- = 203.0
ROADWAY SLOPES = 3:1



PROFILE ALONG ℄ CULVERT

NOTES

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

DESIGN FILL-----------------7.55 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:

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.

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.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

THE EXISTING STRUCTURE CONSISTING OF TRIPLE RCBC 9 FT (W) X 8 FT (H) LOCATED AT THE SITE OF 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.

EXCAVATE 1 FT. BELOW CULVERT AND 2 FT. BELOW WINGWALL FOOTINGS AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE TOTAL QUANTITY OF FOUNDATION CONDITIONING MATERIAL INCLUDES A CONTINGENCY AMOUNT OF 407 TONS TO BE USED AT THE DISCRETION OF THE ENGINEER.

CULVERT BACKFILL IS INCIDENTAL TO CULVERT EXCAVATION AND/OR LUMP SUM GRADING.

CULVERT BACKFILL SHOULD BE TYPE 3 SELECT MATERIAL (SECTION 1016) UP TO THE TOP OF WEEP HOLE ELEVATION.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

HYDRAULIC DATA

DESIGN DISCHARGE .... = 900 CFS
FREQUENCY OF DESIGN FLOOD .... = 50 YRS.
DESIGN HIGH WATER ELEVATION .... = 214.41 FT.
DRAINAGE AREA ....= 14.1 SQ. MI.
BASE DISCHARGE (Q100) ....= 1050 CFS
BASE HIGH WATER ELEVATION .... = 215.71 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE .... = 1297 CFS
FREQUENCY OF OVERTOPPING FLOOD .... = 100+ YRS.
OVERTOPPING FLOOD ELEVATION .... = 217.90 FT.

-L- PROFILE DATA

PVI STA. 16+45.00 -L-
PVI EL. = 219.33
VC = 90.00'
g1 = -0.1918%
g2 = +0.3622%

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

TOTAL STRUCTURE QUANTITIES			
CLASS A CONCRETE			
BARREL @ 3.60 CY/FT		300.2	C.Y.
WING ETC.		60.1	C.Y.
TOTAL		360.3	C.Y.
REINFORCING STEEL			
BARREL		51,100	LBS.
WINGS ETC.		9,426	LBS.
TOTAL		60,526	LBS.
CULVERT EXCAVATION			LUMP SUM
FOUNDATION CONDITIONING MATERIAL		700	TONS
REMOVAL OF EXISTING STRUCTURE			LUMP SUM
ASBESTOS ASSESSMENT			LUMP SUM

PROJECT NO. 15408.1083803
SCOTLAND COUNTY
STATION: 15+62.00 -L-

SHEET 1 OF 5 REPLACES CULVERT NO. 106

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 46029 JILLA I. BREWER 11/6/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 14 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

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

SHEET NO. C-1
TOTAL SHEETS 5

DRAWN BY : J.I. BREWER DATE : 07/19
CHECKED BY : B.E. ATKINSON DATE : 08/19
DESIGN ENGINEER OF RECORD : J.I. BREWER DATE : 08/19

11/6/2019
8:53:07 AM
User: jisraelnaim
Filename: N:\NC Bridges\M18033.01_Scotland_C106\15408.1083803\Structures\410_001_15408.1083803_SMU_CU1.dgn

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS γ_{LL}	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⟩	1.12	--	1.75	1.46	2	BOTTOM SLAB	0.00	1.12	1	TOP SLAB	0.00	
		HL-93 (OPERATING)	N/A		1.45	--	1.35	1.89	2	BOTTOM SLAB	0.00	1.45	1	TOP SLAB	0.00	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.12	40.32	1.75	1.46	2	BOTTOM SLAB	0.00	1.12	1	TOP SLAB	0.00	
		HS-20 (OPERATING)	36.000		1.45	52.20	1.35	1.89	2	BOTTOM SLAB	0.00	1.45	1	TOP SLAB	0.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.22	29.97	1.40	3.41	1	EXTERIOR WALL	4.50	2.22	2	TOP SLAB	0.00	
		SNGARBS2	20.000		1.99	39.80	1.40	2.91	2	BOTTOM SLAB	0.00	1.99	2	TOP SLAB	0.00	
		SNAGRIS2	22.000		2.07	45.54	1.40	2.72	2	BOTTOM SLAB	0.00	2.07	2	TOP SLAB	0.00	
		SNCOTTS3	27.250		1.17	31.88	1.40	1.97	2	BOTTOM SLAB	0.00	1.17	2	TOP SLAB	0.00	
		SNAGGRS4	34.925		1.16	40.51	1.40	1.64	2	BOTTOM SLAB	0.00	1.16	2	TOP SLAB	0.00	
		SNS5A	35.550		1.14	40.53	1.40	1.62	2	BOTTOM SLAB	0.00	1.14	2	TOP SLAB	0.00	
		SNS6A	39.950		1.12	44.74	1.40	1.50	2	BOTTOM SLAB	0.00	1.12	2	TOP SLAB	0.00	
		SNS7B	42.000	⟨3⟩	1.10	46.20	1.40	1.50	2	BOTTOM SLAB	0.00	1.10	2	TOP SLAB	0.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.69	55.77	1.40	1.83	2	BOTTOM SLAB	0.00	1.69	2	BOTTOM SLAB	0.00	
		TNT4A	33.075		1.33	43.99	1.40	1.76	2	BOTTOM SLAB	0.00	1.33	2	TOP SLAB	0.00	
		TNT6A	41.600		1.18	49.09	1.40	1.64	2	BOTTOM SLAB	0.00	1.18	2	TOP SLAB	0.00	
		TNT7A	42.000		1.24	52.08	1.40	1.52	2	BOTTOM SLAB	0.00	1.24	2	TOP SLAB	0.00	
		TNT7B	42.000		1.18	49.56	1.40	1.52	2	BOTTOM SLAB	0.00	1.18	2	TOP SLAB	0.00	
		TNAGRIT4	43.000		1.26	54.18	1.40	1.42	2	BOTTOM SLAB	0.00	1.26	2	TOP SLAB	0.00	
		TNAGT5A	45.000		1.26	56.70	1.40	1.42	2	BOTTOM SLAB	0.00	1.26	2	TOP SLAB	0.00	
		TNAGT5B	45.000		1.22	54.90	1.40	1.40	2	BOTTOM SLAB	0.00	1.22	2	TOP SLAB	0.00	

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.

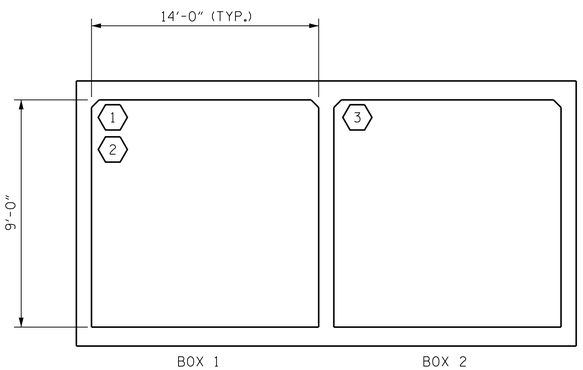
⟨#⟩ CONTROLLING LOAD RATING

⟨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. 15408.1083803

SCOTLAND COUNTY

STATION: 15+62.00 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 46029 ENGINEER JOSHUA I. BREWER

8/14/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

SHEET NO. C-2

TOTAL SHEETS 5

STD. NO. LRFR5

ASSEMBLED BY:	J.I. BREWER	DATE:	07/19
CHECKED BY :	B.E. ATKINSON	DATE:	08/19
DESIGN ENGINEER OF RECORD:	J.I. BREWER	DATE:	08/19
DRAWN BY :	WMC 7/11	REV.	10/1/11 MAA/GM
CHECKED BY :	GM 7/11	REV.	12/17 MAA/THC

8/14/2019
9:18:28 AM
User: jisrael
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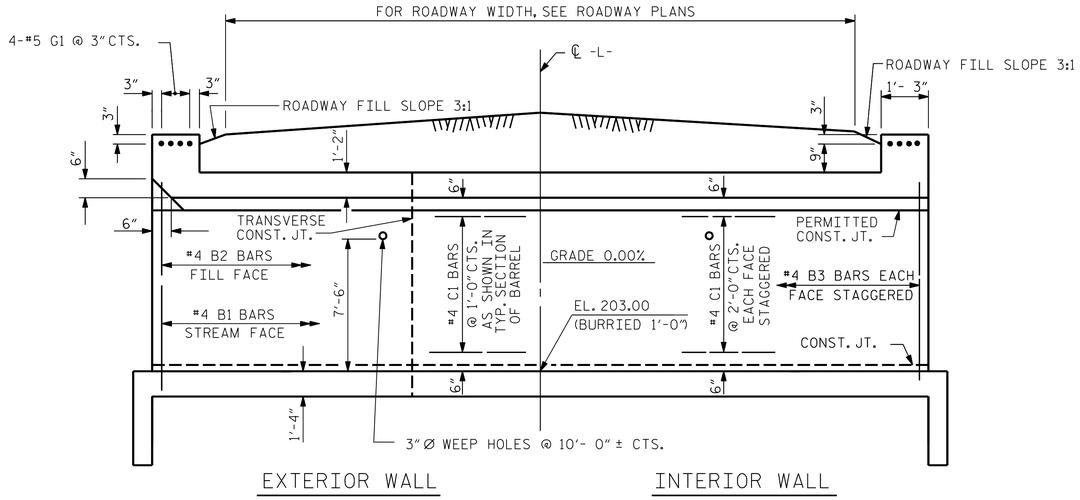
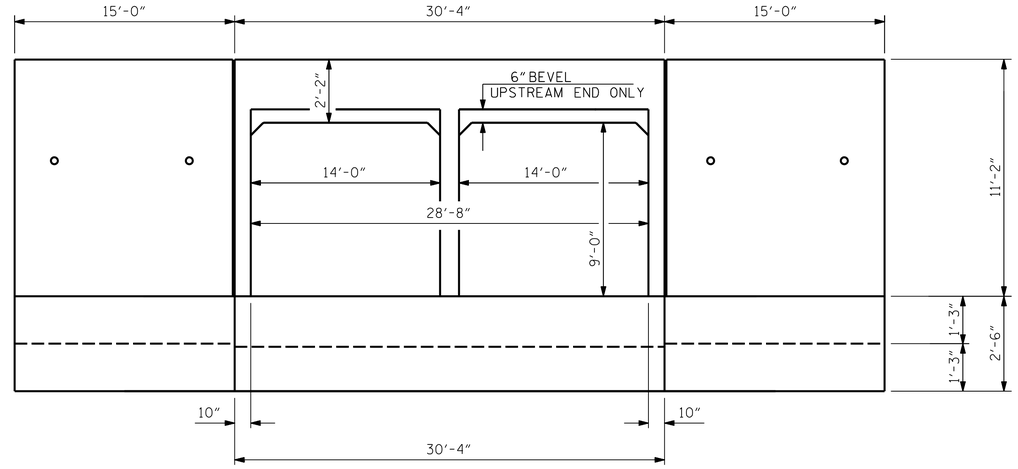
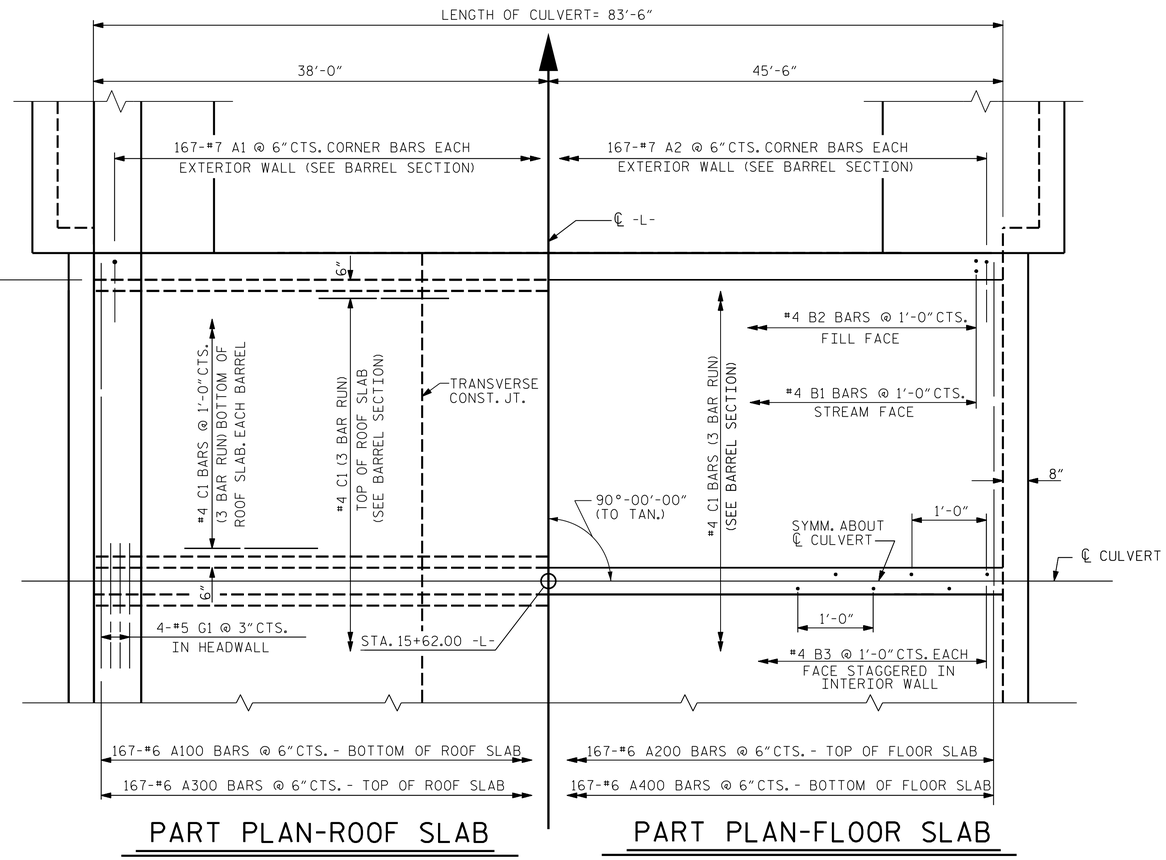


CULVERT SECTION NORMAL TO ROADWAY

(WINGS NOT SHOWN FOR CLARITY)



END ELEVATION



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

PROJECT NO. 15408.1083803

SCOTLAND COUNTY

STATION: 15+62.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 14 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 46029 ENGINEER JOSEPH I. BREWER
8/14/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

SHEET NO. C-3
TOTAL SHEETS 5

DRAWN BY :	J.I. BREWER	DATE :	07/19
CHECKED BY :	B.E. ATKINSON	DATE :	08/19
DESIGN ENGINEER OF RECORD :	J.I. BREWER	DATE :	08/19

8/14/2019
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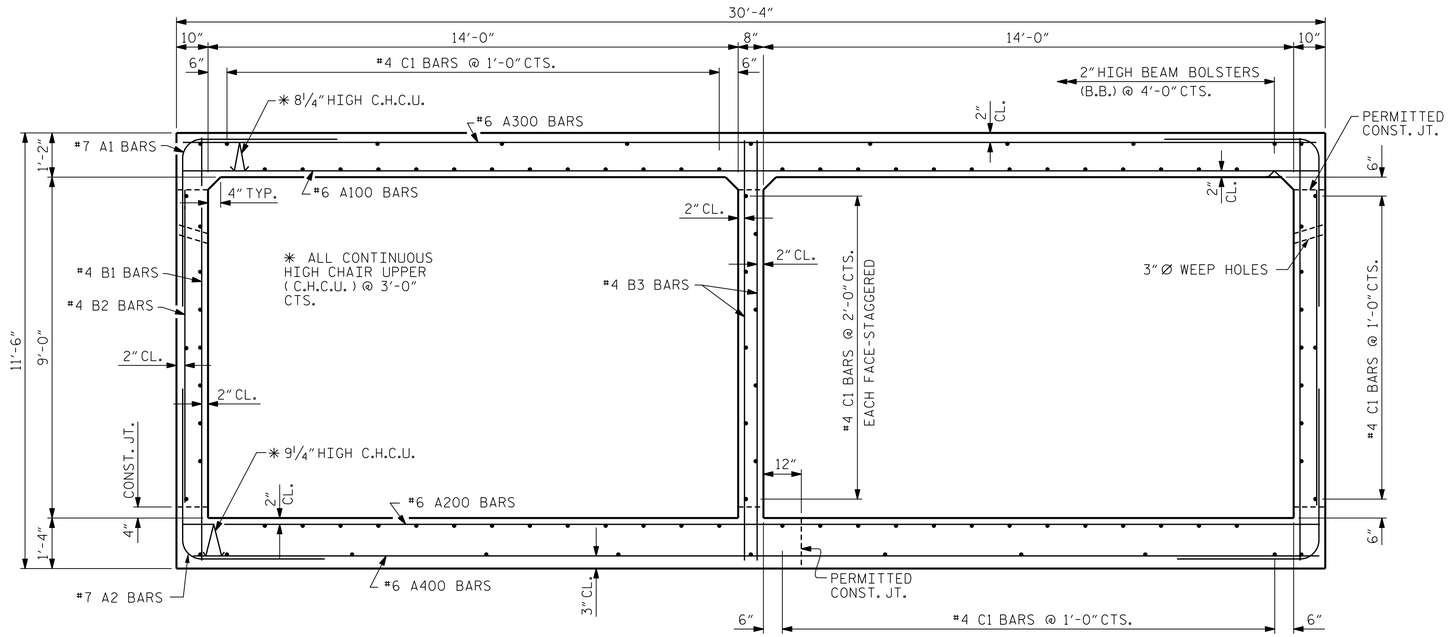
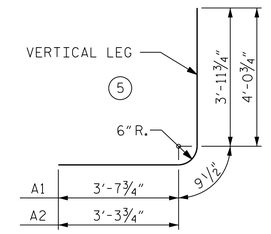


RIGHT ANGLE SECTION OF BARREL

THERE ARE 103 "C" BARS IN SECTION OF BARREL.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

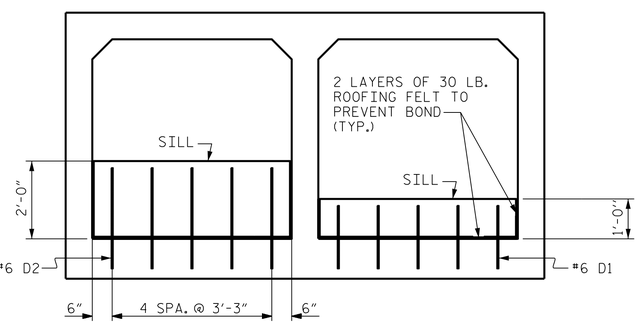


BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	334	#7	5	8'-4"	5689
A2	334	#7	5	8'-1"	5518
A100	167	#6	STR	30'-0"	7525
A200	167	#6	STR	30'-0"	7525
A300	167	#6	STR	30'-0"	7525
A400	167	#6	STR	30'-0"	7525
B1	168	#4	STR	11'-1"	1244
B2	168	#4	STR	8'-4"	935
B3	167	#4	STR	11'-1"	1236
C1	309	#4	STR	29'-4"	6055
D1	10	#6	STR	1'-11"	29
D2	10	#6	STR	2'-11"	44
G1	8	#5	STR	21'-8"	181
REINFORCING STEEL					51,100 LBS.

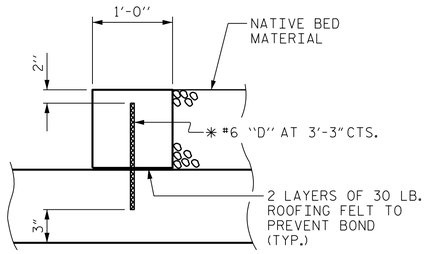
SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A200	#6	3'-7"
A400	#6	2'-9"
B1	#4	1'-10"
B3	#4	1'-10"
C1	#4	2'-5"



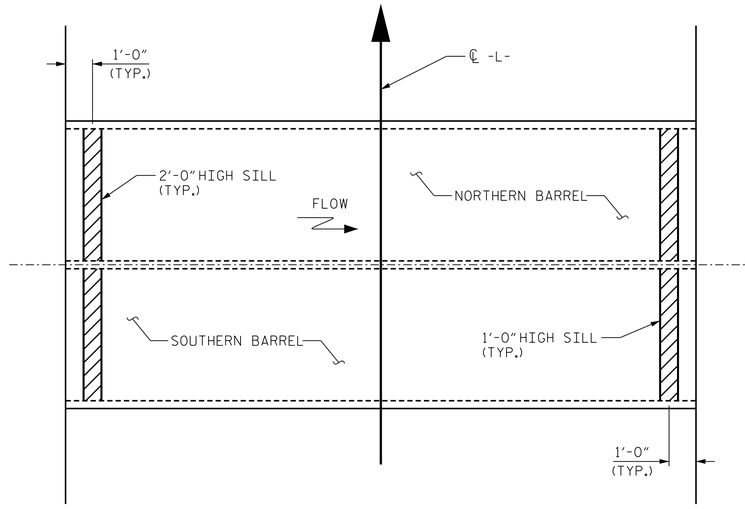
ELEVATION

LOOKING DOWNSTREAM



SECTION THROUGH SILL

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



PLAN OF SILL LOCATIONS

CULVERT SILL DETAILS

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT. THE MATERIAL SHALL BE PLACED IN BOTH BARRELS TO A DEPTH OF 1 FOOT. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

THE ENTIRE COST OF WORK REQUIRED TO PLACE THE EXCAVATED MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILL SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

NORTH CAROLINA PROFESSIONAL SEAL 46029 ENGINEER JULIA L BREWER
DocuSigned by: 8/14/2019

PROJECT NO. 15408.1083803

SCOTLAND COUNTY

STATION: 15+62.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 14 FT. X 9 FT. CONCRETE BOX CULVERT 90° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

DRAWN BY : J.I. BREWER DATE : 07/19
CHECKED BY : B.E. ATKINSON DATE : 08/19
DESIGN ENGINEER OF RECORD : J.I. BREWER DATE : 08/19

8/14/2019 9:19:52 AM
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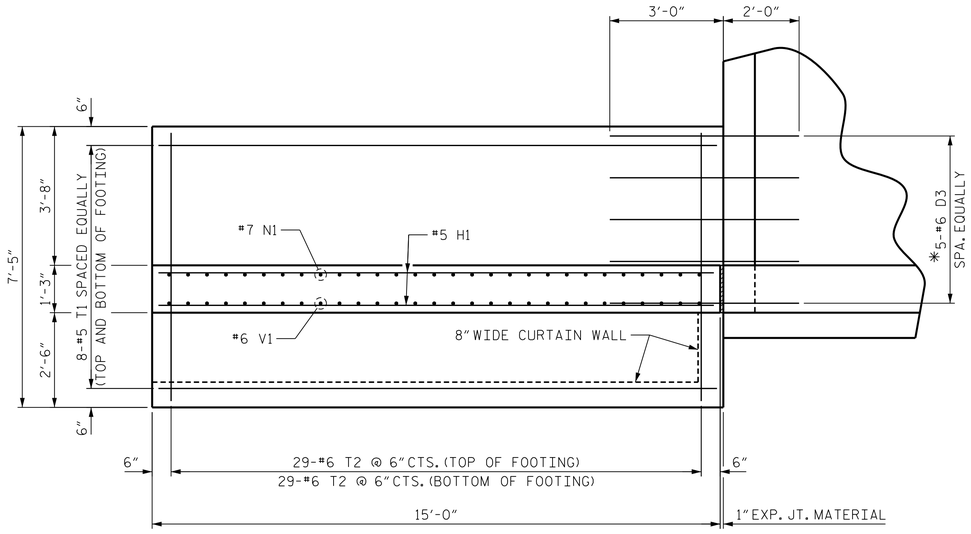
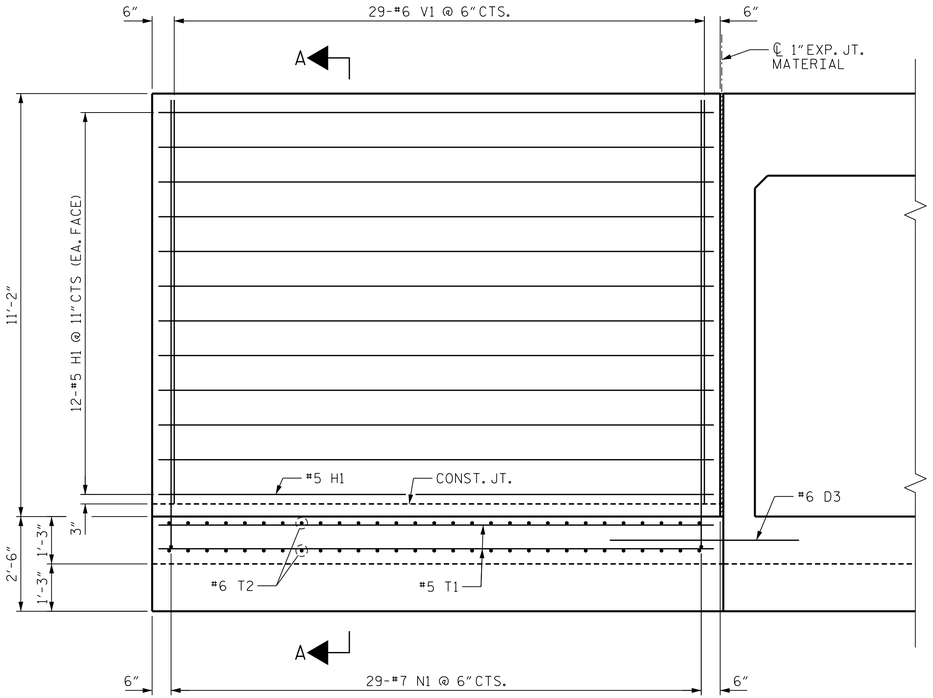
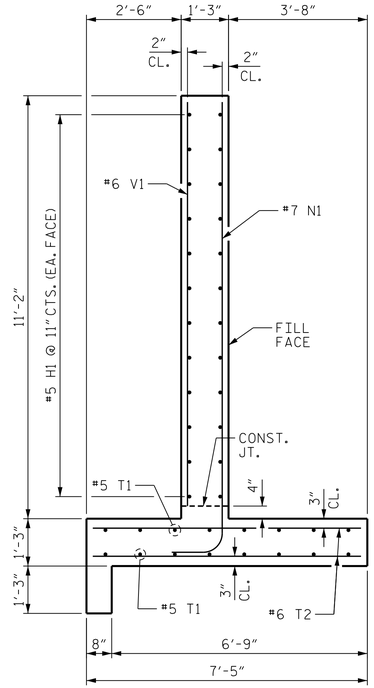


PLAN

* MIDDLE OF FLOOR SLAB AND FOOTING

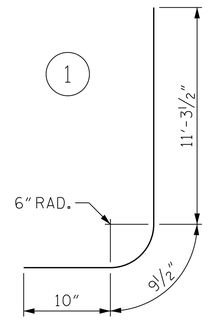


ELEVATION



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D3	20	#6	STR	5'-0"	150
H1	96	#5	STR	14'-8"	1469
N1	116	#7	1	12'-11"	3063
T1	64	#5	STR	14'-9"	985
T2	232	#6	STR	7'-1"	2468
V1	116	#5	STR	10'-8"	1291

REINFORCING STEEL FOR 4 WINGS 9,426 LBS

CLASS A CONCRETE

4 WINGS	53.5 CY
2 HEADWALLS	2.8 CY
2 END CURTAIN WALLS	3.8 CY
TOTAL	60.1 CY

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DRAWN BY : J.I. BREWER DATE : 07/19
CHECKED BY : B.E. ATKINSON DATE : 08/19
DESIGN ENGINEER OF RECORD : J.I. BREWER DATE : 08/19

NORTH CAROLINA PROFESSIONAL SEAL 46029 ENGINEER JULIA I. BREWER
Documents Signed By: Julia I. Brewer
8/14/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT NO. 15408.1083803
SCOTLAND COUNTY
STATION: 15+62.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT 90° SKEW

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" 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 ⅝" 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 REV. 12-17 MAA (/) THC