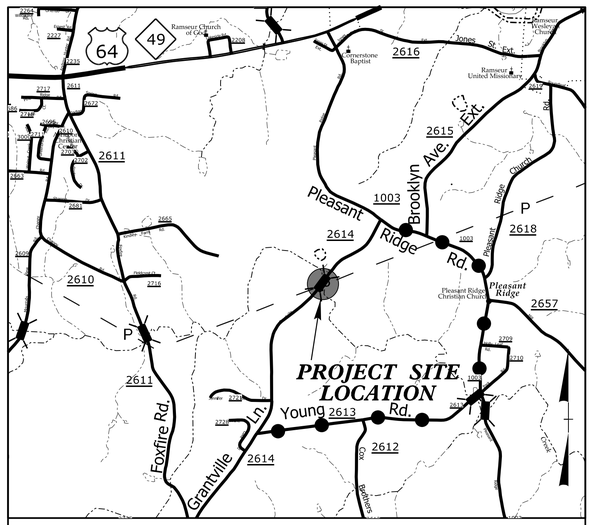
09/08/99

TIP PROJECT: B-5928

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFF-SITE DETOUR ROUTE

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

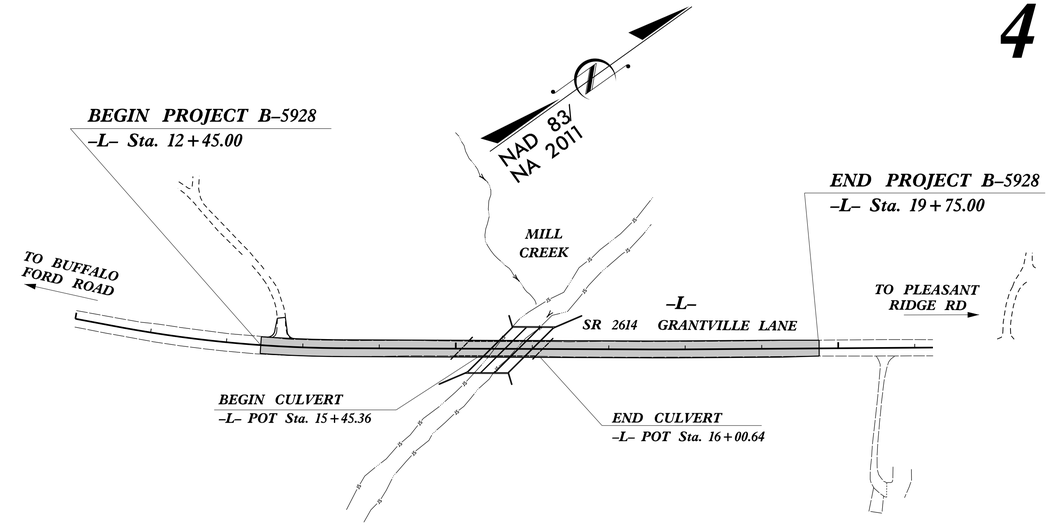
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5928	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46371.1.1		P.E.
46371.2.1		R/W

LOCATION: BRIDGE NO. 750175 ON SR 2614 (GRANTVILLE LANE) OVER MILL CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND BOX CULVERT

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 2012 = 1100
ADT =
K = %
D = %
T = 6 % *
V = 60 MPH
* TTST = DUAL
FUNC CLASS =
MINOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT B-5928	=	0.128 mi
LENGTH STRUCTURE PROJECT B-5928	=	0.010 mi
TOTAL LENGTH OF PROJECT B-5928	=	0.138 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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JULY 15, 2016

LETTING DATE: JANUARY 2017

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS
DIVISION 8
902 N Sandhills Blvd
Aberdeen, NC 28315

BRIAN A. WILES, PE
PROJECT ENGINEER

TIM WELCH, PE
NCDOT CONTACT
DIV 8 BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

3/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 31025 ENGINEER KAREN HEFNER

DocuSigned by: Karen Hefner 8E3552047D81492...

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

3/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

DocuSigned by: Brian A Wiles B890D0FEA2E34DE...

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/28/2017
R:\Roadway\Proj\B5928_Rdy_tsh.dgn
USERNAME

PROJECT REFERENCE NO.	SHEET NO.
B-5928	1A

ROADWAY DESIGN ENGINEER

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

3/13/2017
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES
Brian A Wiles

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY 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.

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Duke Energy Progress - Power,
Duke Energy Progress - Transmission Power,
RTMC - Telephone and CenturyLink - Telephone.

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.

EFF. 01-17-2012
REV. 02-29-2016

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
B-5928	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
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/99

SURVEY CONTROL SHEET B–5928

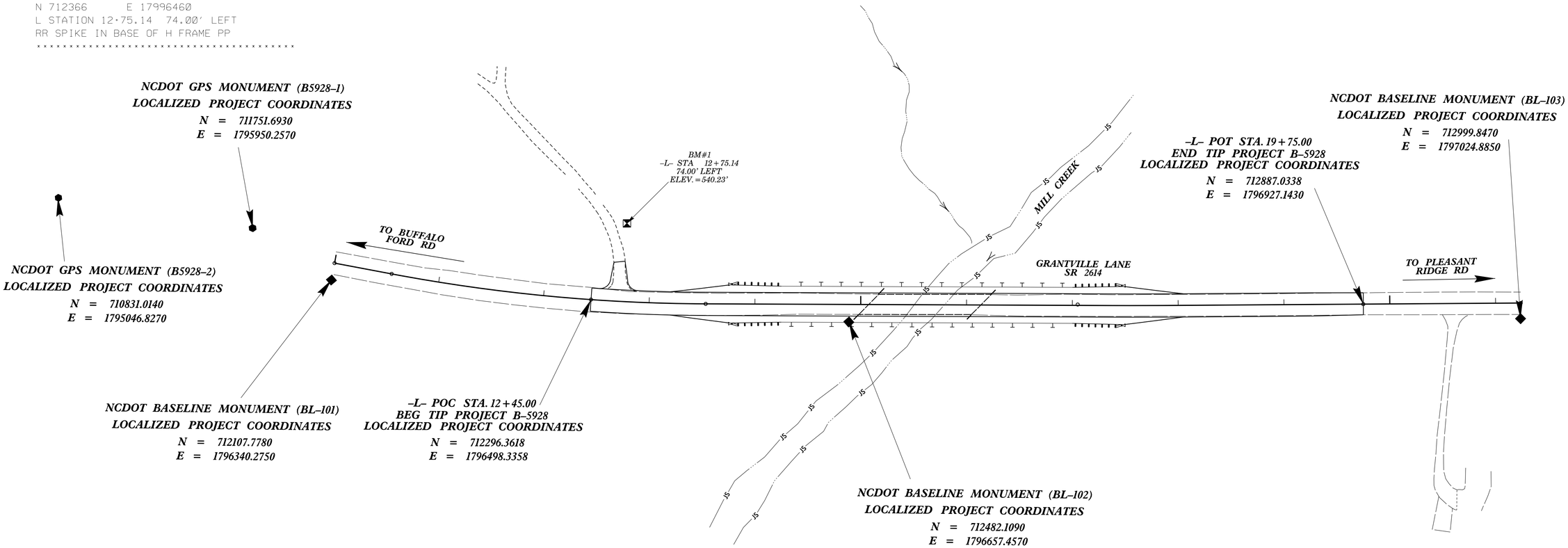
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
B–5928	1C–1

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1		GPS B-5928-1	711751.6930	1795950.2570	557.31	OUTSIDE PROJECT LIMITS	
2		GPS B-5928-2	710831.0140	1795046.8270	565.08	OUTSIDE PROJECT LIMITS	
101		BL-101	712107.7780	1796340.2750	547.34	10+00.02	16.21 RT
102		BL-102	712482.1090	1796657.4570	522.03	14+88.84	16.50 RT
103		BL-103	712999.8470	1797024.8850	530.89	21+23.54	14.72 RT

NAD 83 NC GRID NA 2011

****
BM1 ELEVATION = 540.23
N 712366 E 1796460
L STATION 12+75.14 74.00' LEFT
RR SPIKE IN BASE OF H FRAME PP
****



NOTES:

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

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

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5928-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 711751.6930(ft) EASTING: 1795950.2570(ft)
ELEVATION: 557.307(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998724140
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5928-1" TO -L- STATION 12+45.00 IS
N 45°10' 43.66" E 772.69'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

2/28/2017
R:\Roadway\Proj\B5928_rdy_1C-1.dgn
ESTRADA

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

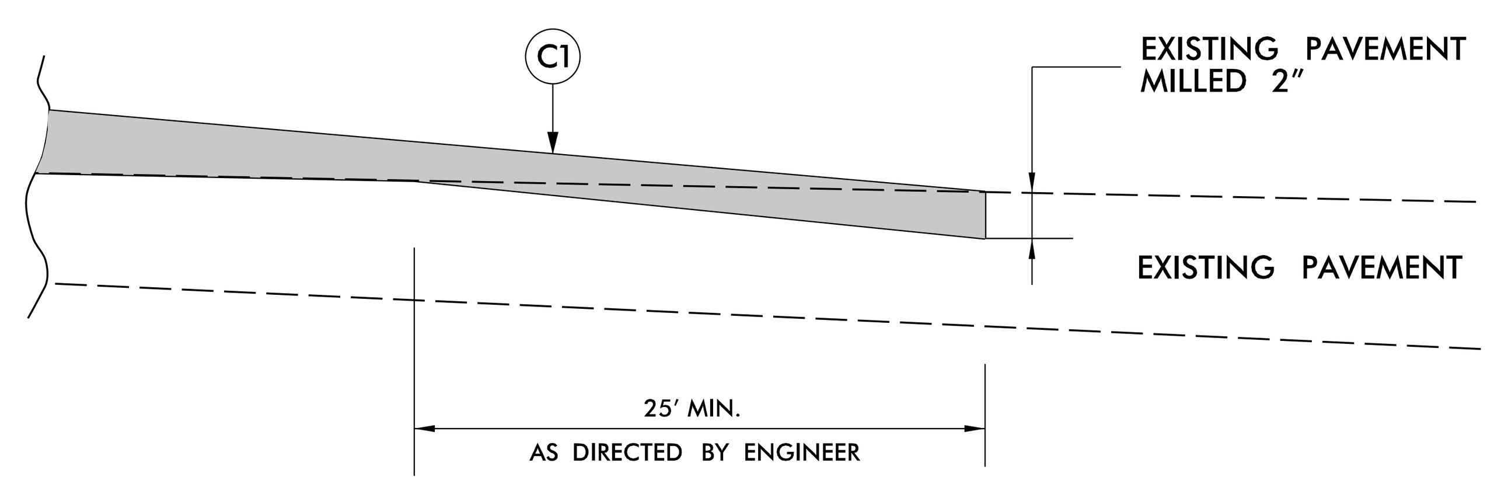
PROJECT REFERENCE NO.	SHEET NO.
B-5928	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
3/1/2017 NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES — Brian A Wiles	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

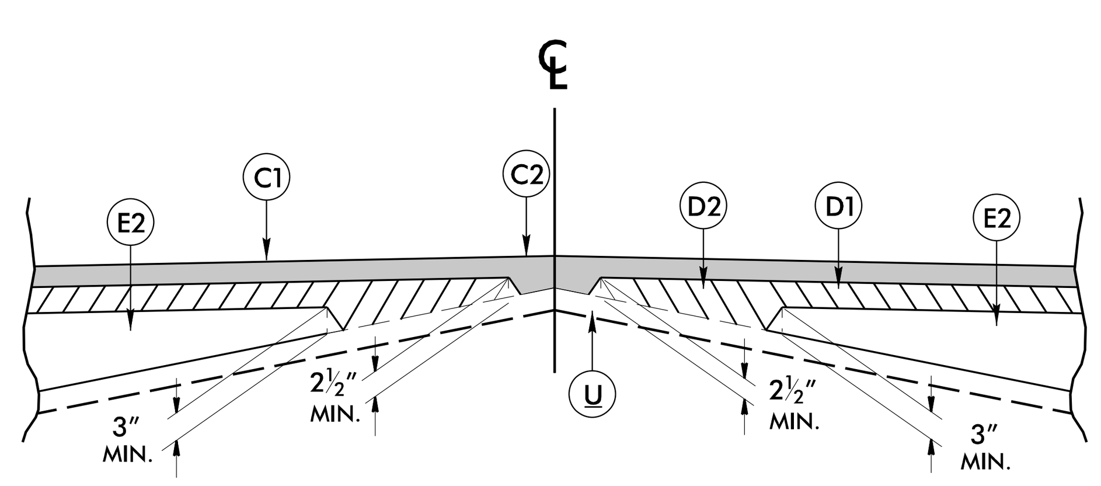
PAVEMENT SCHEDULE

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

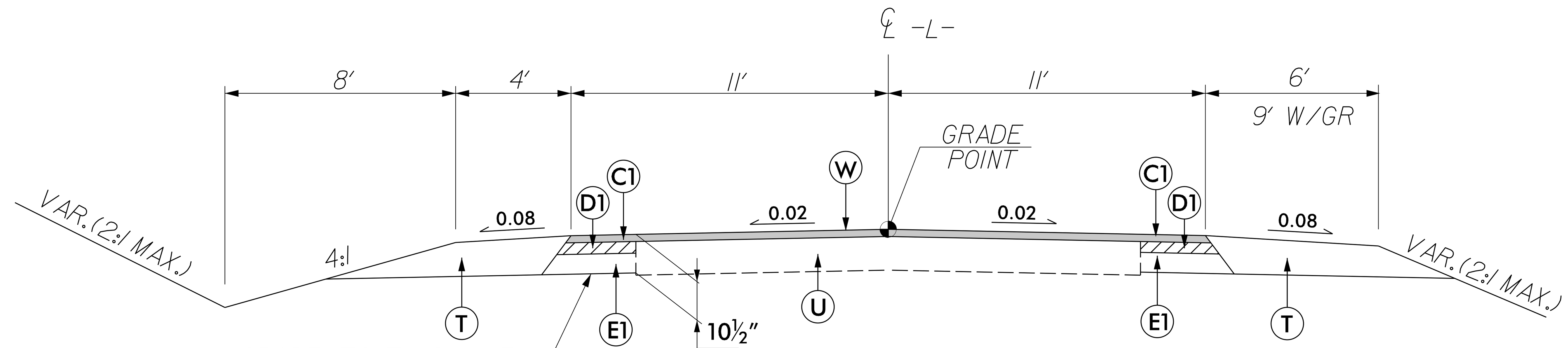
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



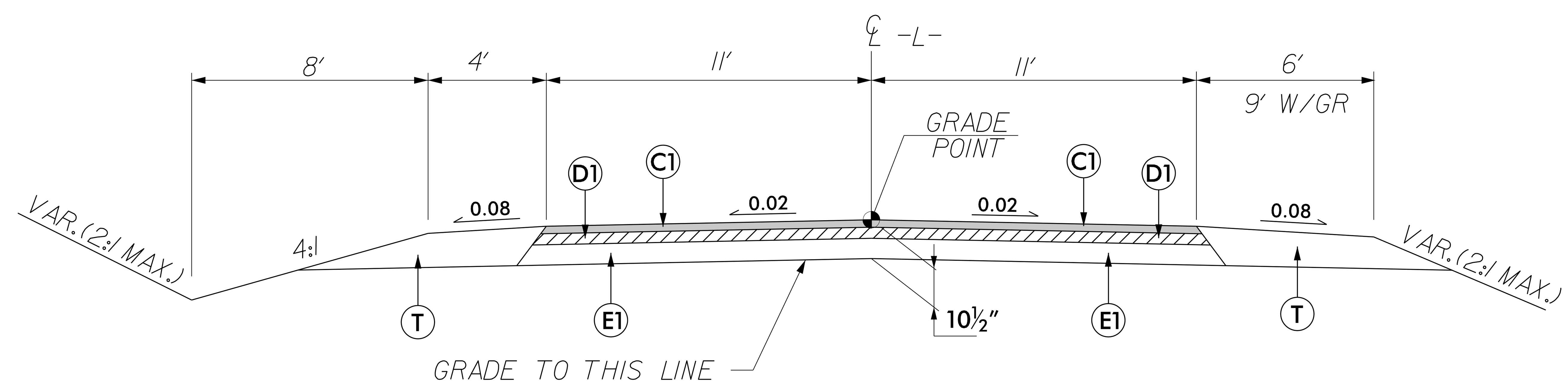
Incidental Milling Existing Pavement



Detail Showing Method of Wedging



TYPICAL SECTION NO. 1
-L- STA 12+45.00 TO -L- STA 14+00.00
-L- STA 16+40.00 TO -L- STA 19+75.00



TYPICAL SECTION NO. 2
-L- STA 14+00.00 TO -L- STA 16+40.00

COMPUTED BY:	DATE:
CHECKED BY:	DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5928	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 12+45	19+75	145	3,424	3,279	
	SUBTOTAL	145	3,424	3,279	
	SUBTOTAL	145	3,424	3,279	
TOTAL		145	3,424	3,279	
MATERIAL FOR SHOULDER CONSTRUCTION			270	270	
LOSS DUE TO CLEARING & GRUBBING					
WASTE IN LIEU OF BORROW					
PROJECT TOTAL		145	3,694	3,549	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				177	
GRAND TOTALS:		145		3,726	
SAY:		150		3,750	

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.

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
L	14+00	15+05	CL	245
L	16+15	16+40	CL	58
			TOTAL:	303
			SAY:	310

"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	XI	GRAU 350	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
L	13+75	17+50	LT	375				16+50				50		1			1													
L	13+75	17+50	RT	375			14+75				50		1				1													
							14+75				50		1				1													
								16+50				50		1			1													
		SUBTOTAL		750													4													
		LESS ANCHOR DEDUCTIONS																												
		GRAU-350 4 @ 50'		-200.00																										
		TOTAL		550.00													4													
		SAY		550			5 ADDITIONAL GUARDRAIL POSTS										4													

12/06/07
2/28/2017
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USERNAME

COMPUTED BY: ________ DATE: ________
CHECKED BY: BAW DATE: 12/7/15

PROJECT REFERENCE NO. B-5928 | SHEET NO. 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) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
12+70	LT	0400							24										
TOTALS									24										

SIZE / THICKNESS OR GAUGE:

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
12+70																								
TOTALS																								

STATION	**" R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		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									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
12+70																																					22	
TOTALS																																					22	

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

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.
R-5928	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER 3/1/2017 — NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES — Brian A Wiles

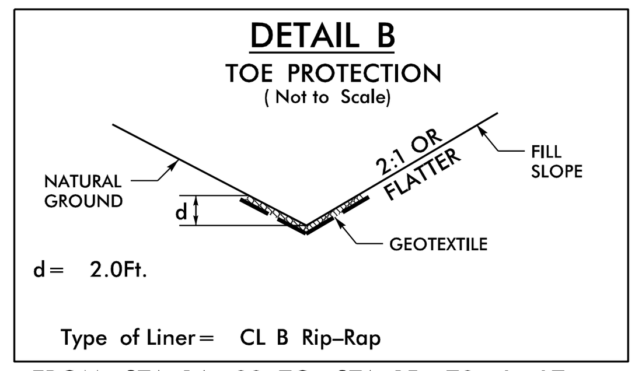
HYDRAULICS ENGINEER 3/1/2017 — NORTH CAROLINA PROFESSIONAL SEAL 31025 ENGINEER KAREN HEFNER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

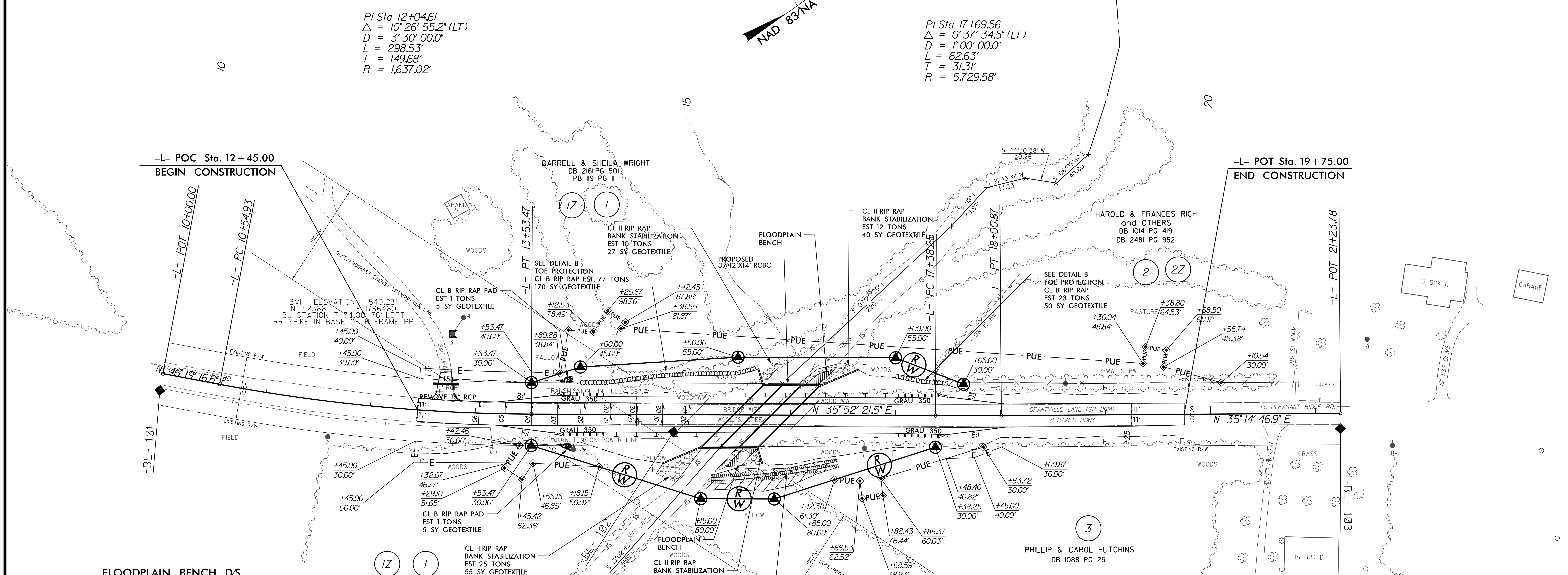
REVISIONS

DETAIL B

TOE PROTECTION (Not to Scale)

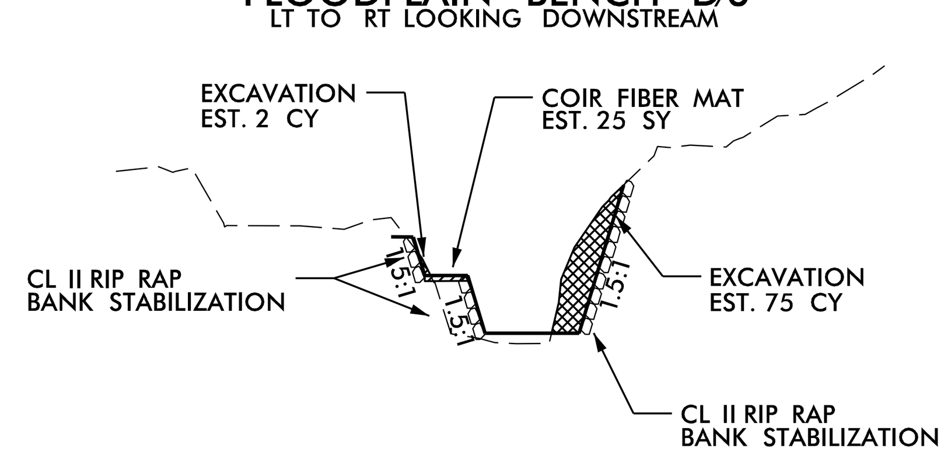


FROM STA. 14+00 TO STA. 15+70 -L- LT
FROM STA. 17+00 TO STA. 17+50 -L- LT



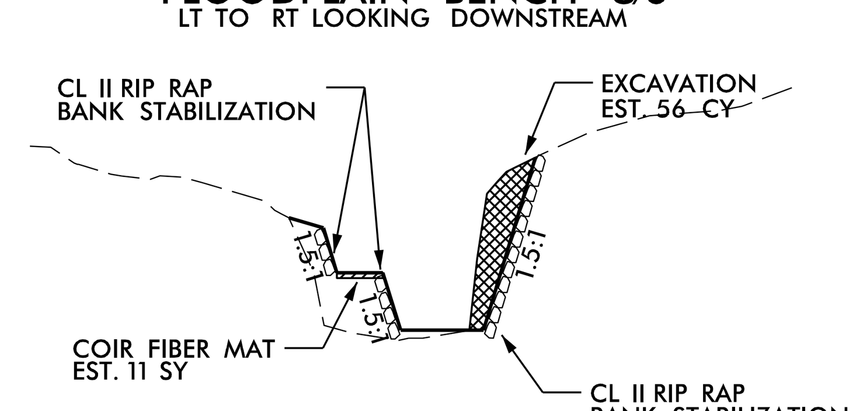
FLOODPLAIN BENCH D/S

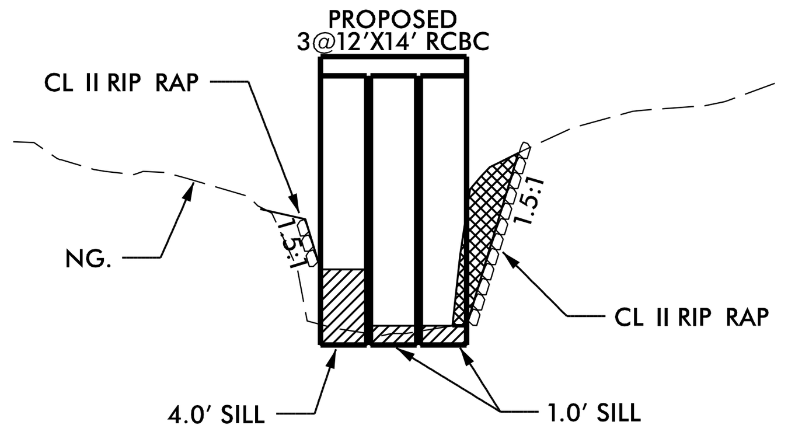
LT TO RT LOOKING DOWNSTREAM



FLOODPLAIN BENCH U/S

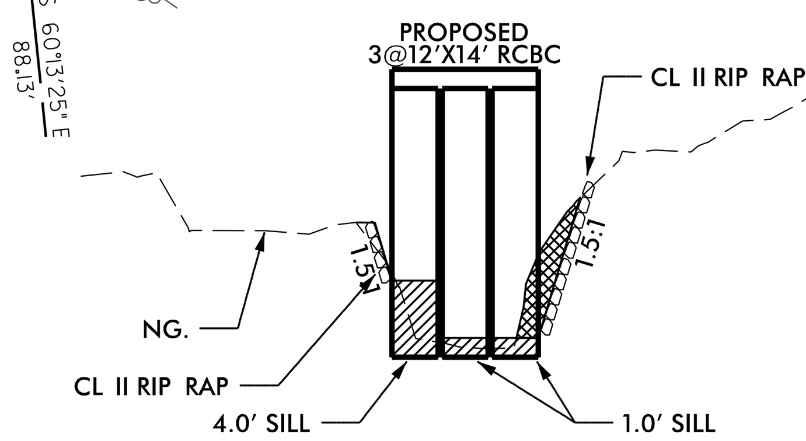
LT TO RT LOOKING DOWNSTREAM





CULVERT INLET

TYPICAL CHANNEL SECTION
(LT TO RT LOOKING DOWNSTREAM)



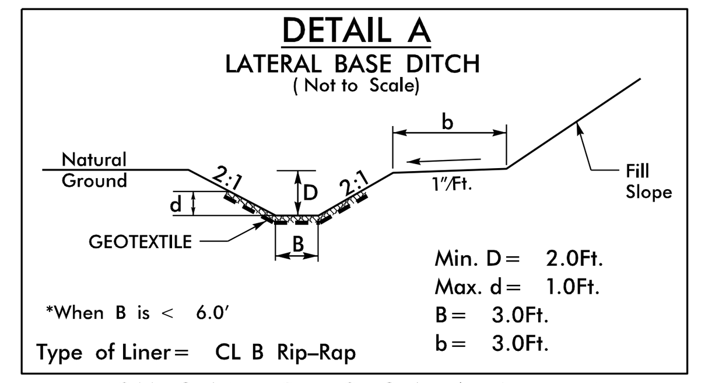
CULVERT OUTLET

TYPICAL CHANNEL SECTION
(LT TO RT LOOKING DOWNSTREAM)

*NOTE: BACKFILL CULVERT BARRELS TO SILL HEIGHT WITH NATIVE MATERIAL. SEE NATIVE MATERIAL SPECIFICATION UNDER ADDITIONAL INFORMATION & COMPUTATIONS

DETAIL A

LATERAL BASE DITCH (Not to Scale)



FROM STA.15+25 TO STA. 16+45 -L- RT

FOR PROFILE, SEE SHEET 5

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.
B-5928	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
3/1/2017	3/1/2017
NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES	NORTH CAROLINA PROFESSIONAL SEAL 31025 ENGINEER KAREN HEFNER
DocuSigned by: Brian A Wiles 8890D0FEA2E34DE...	DocuSigned by: Karen Hefner 8E3552047D81492...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

BM 1 ELEV = 540.23'
N 712,366 E 1,796,460
-L- STA 12+75 74' LEFT
RR SPIKE IN BASE OF H-FRAME PP

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	2000	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	514.6	FT
BASE DISCHARGE	=	2976	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	516.71	FT
OVERTOPPING DISCHARGE	=	5330	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	522.41	FT

FOR PLAN, SEE SHEET 4

PROJ. REFERENCE NO.	SHEET NO.
B-5928	TMP-1

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

STD.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - TYPES AND MOUNTING
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

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

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

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

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

F) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE.

PHASING

STEP 1: USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, AND TMP-2, PERFORM THE FOLLOWING:
- INSTALL ALL ROAD CLOSURE AND DETOUR SIGNING INCLUDING BARRICADES
- CLOSE SR 2614 (GRANTVILLE LANE)
- PLACE TRAFFIC ONTO OFF-SITE DETOUR

STEP 2: REMOVE EXISTING BRIDGE #175 AND CONSTRUCT THE PROPOSED BRIDGE AND APPROACHES AS SHOWN IN THE CONSTRUCTION PLANS.

STEP 3: INSTALL FINAL PAVEMENT MARKINGS.

STEP 4: REMOVE ALL TRAFFIC CONTROL SIGNING AND DEVICES AND RE-OPEN SR 2614 (GRANTVILLE LANE) TO THE FINAL TRAFFIC PATTERN.

PAVEMENT MARKING

THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	1460 LF
THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	1460 LF
PERMANENT RAISED PAVEMENT MARKERS	10 EACH

APPROVED: Digitally signed by: Brian A Wiles 889ODOFEA2E34DE...

DATE: 3/1/2017

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16689 ENGINEER BRIAN ALLEN WILES

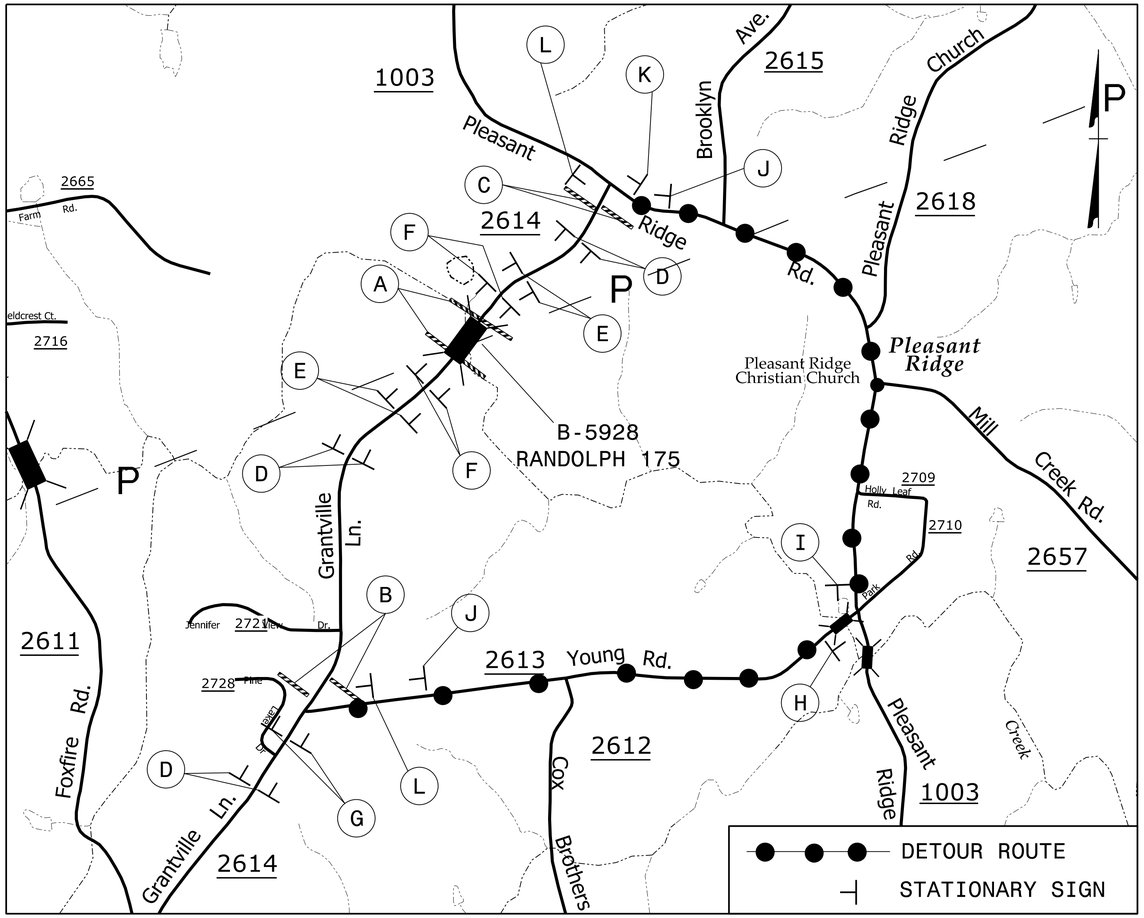
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION OPERATIONS PLAN

2/28/2017
R:\Traffic\TrafficControl\TCP\B5928_TC_TMP.dgn
USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	TMP-2



ROAD CLOSED AHEAD
W20-3
48″ x 48″

Ⓓ

ROAD CLOSED 1000 FT
W20-3
48″ x 48″

Ⓔ

ROAD CLOSED 500 FT
W20-3
48″ x 48″

Ⓕ

DETOUR AHEAD
W20-2
48″ x 48″

Ⓖ

GRANTVILLE LANE
SP-1
42″ x 24″
DETOUR
M4-8
24″ x 12″
M6-1
21″ x 15″

Ⓗ

GRANTVILLE LANE
SP-1
42″ x 24″
DETOUR
M4-8
24″ x 12″
M6-1
21″ x 15″

Ⓘ

END DETOUR
M4-8 A
24″ X 18″

Ⓙ

ROAD CLOSED AHEAD
W20-3
48″ x 48″
NEXT LEFT
SP-4L
42″ X 12″

Ⓚ

ROAD CLOSED AHEAD
W20-3
48″ x 48″
NEXT RIGHT
SP-4R
42″ X 12″

Ⓛ

R11-2
48″ x 30″
ROAD CLOSED

TYPE III BARRICADE(S)

Ⓐ

R11-3
60″ x 30″
ROAD CLOSED
1 MILES AHEAD
LOCAL TRAFFIC ONLY
DETOUR
M4-10R
48″ x 18″

TYPE III BARRICADE

Ⓑ

R11-3
60″ x 30″
ROAD CLOSED
0.5 MILES AHEAD
LOCAL TRAFFIC ONLY
DETOUR
M4-10L
48″ x 18″

TYPE III BARRICADE

Ⓒ

APPROVED: Brian A Wiles
DATE: 3/1/2017
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

DETOUR ROUTE AND SIGNS

2/28/2017
R:\Traffic\TrafficControl\TCP\B5928_TC_TMP.dgn
USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	TMP-3

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

SIGN WIDTH: 3′-6″
HEIGHT: 2′-0″
TOTAL AREA: 7.0 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

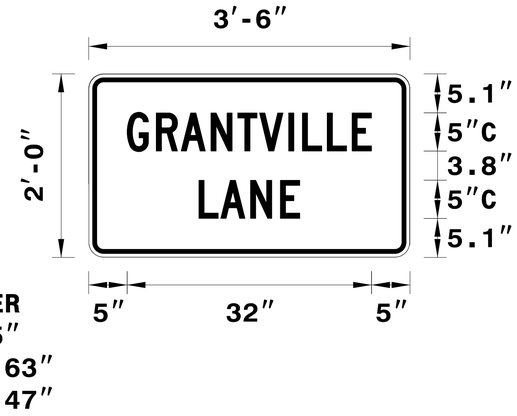
SYMBOL	X	Y	WID	HT

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 fluoresent orange retroreflective sheeting.

DESIGN BY:
PROJECT ID: B-5928
CHECKED BY:
DIV: 8
DATE: Feb 27, 2017



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter — Series/Size Text Length

		G	R	A	N	T	V	I	L	L	E															C 2000
	5	3.8	3.3	3.9	3.5	2.8	3.8	1.8	3.3	3.3	2.6	5														32
		L	A	N	E																					C 2000
	14.4	2.9	3.9	3.9	2.6	14.4																				13.2

FILENAME: ch_div8_sgn_desgins

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: DocuSigned by: Brian A Wiles — 8890DDFEA2E34DE...
DATE: 3/1/2017
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

SIGN DESIGN

2/28/2017
N:\Traffic\TrafficControl\TCP\B5928_TC_specialsign.dgn
USERNAME:

TIP PROJECT: B-5928

See Sheet 1-A For Index of Sheets

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5928	EC-1	

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

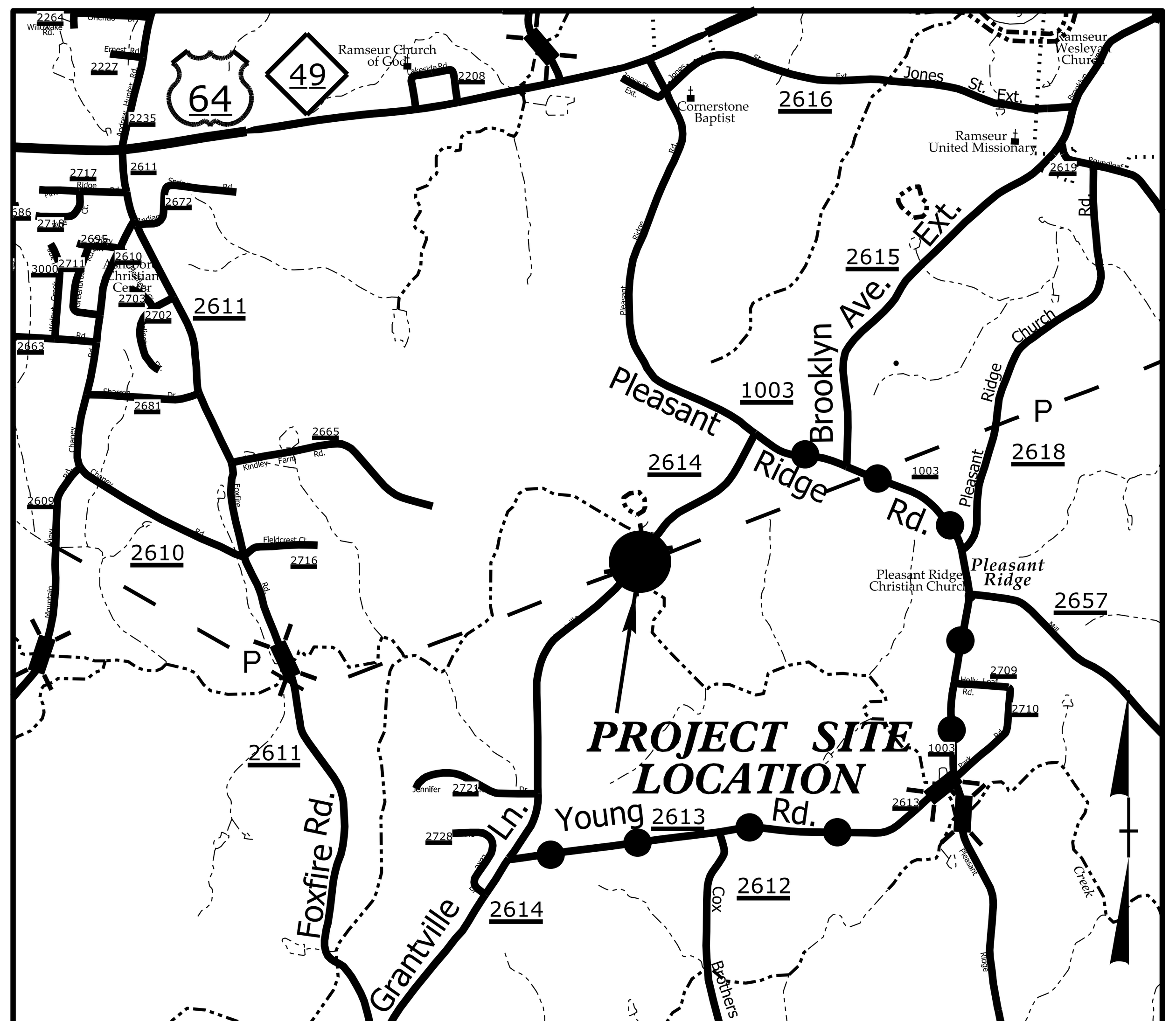
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

RANDOLPH COUNTY

LOCATION: BRIDGE NO. 750175 ON SR 2614 (GRANTVILLE LANE) OVER MILL CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND BOX CULVERT

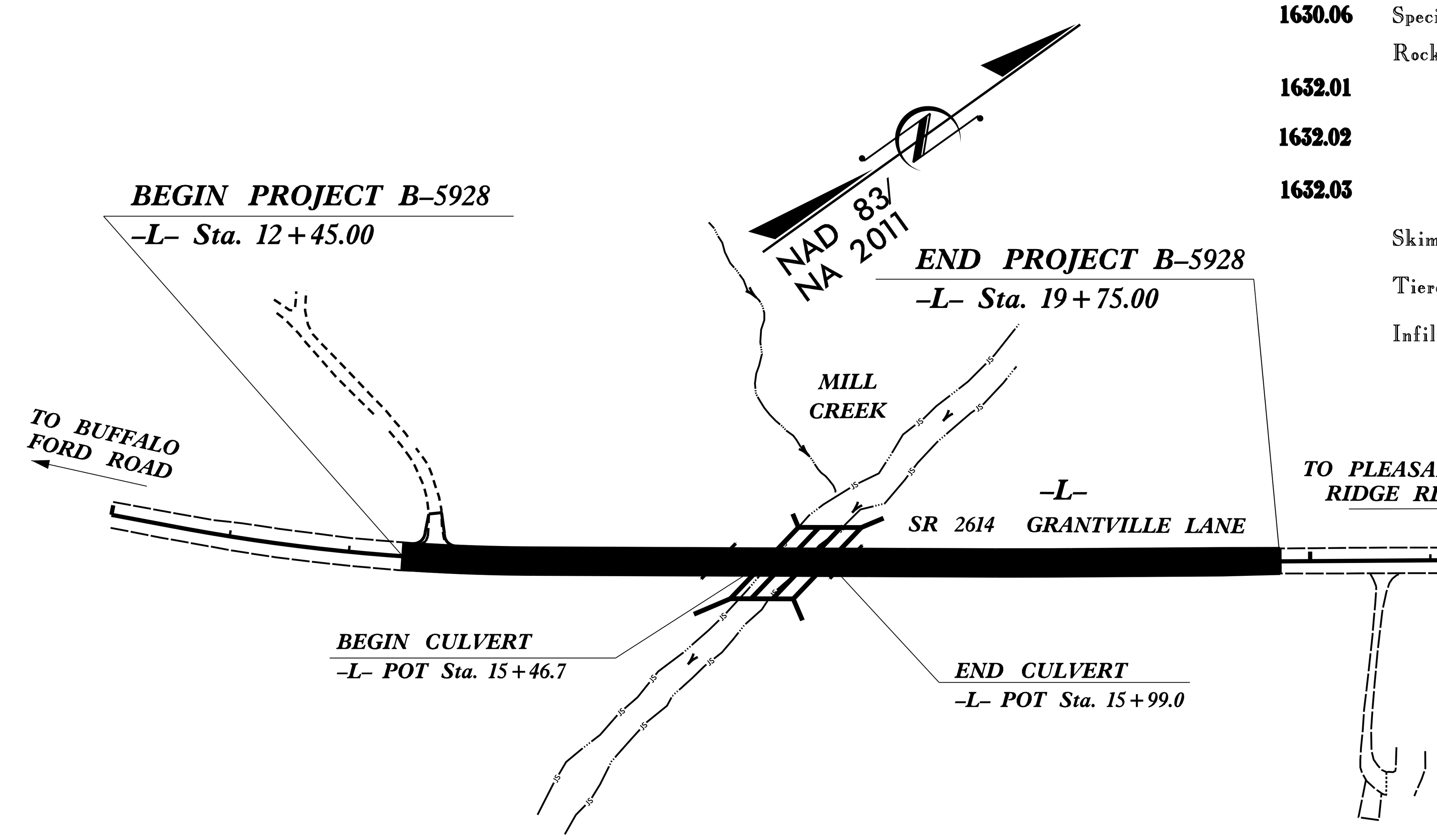


VICINITY MAP

●—●—●—● OFF-SITE DETOUR ROUTE

N.T.S.

R/W Plans 7/15/16



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 AUGUST 3, 2011 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

MI ENGINEERING

1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606

Designed by:

KAREN HEFNER, PE — *3824*

NAME — *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

WES CHANDLER, EI

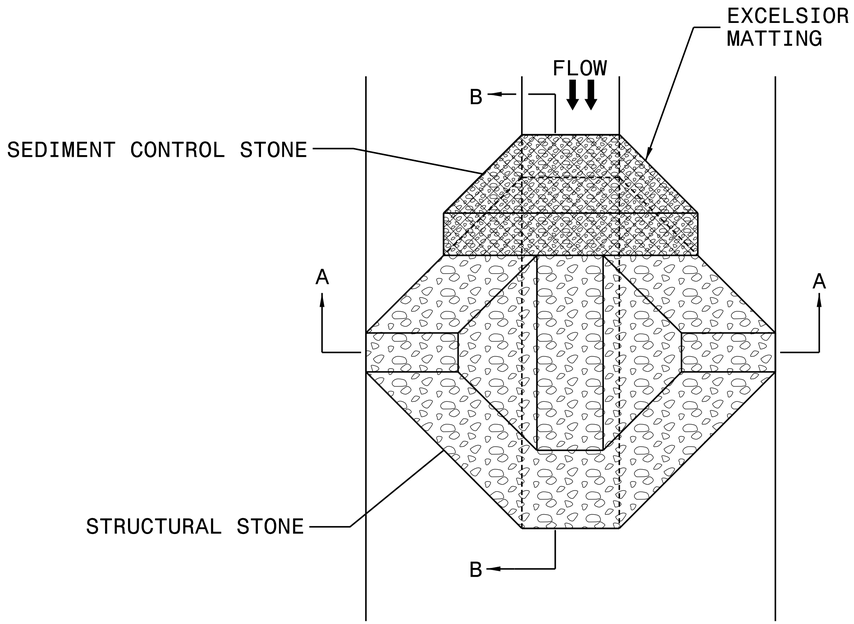
Roadway Standard Drawings

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

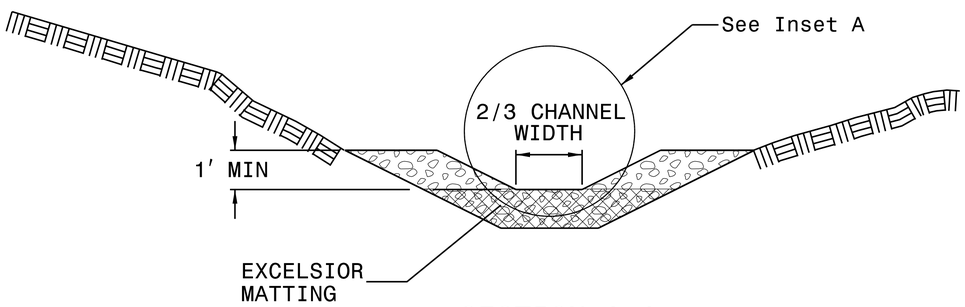
1604.01	Railroad Erosion Control Detail
1605.01	Temporary Silt Fence
1606.01	Special Sediment Control Fence
1607.01	Gravel Construction Entrance
1622.01	Temporary Berms and Slope Drains
1630.01	Riser Basin
1630.02	Silt Basin Type B
1630.03	Temporary Silt Ditch
1630.04	Stilling Basin
1630.05	Temporary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

PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

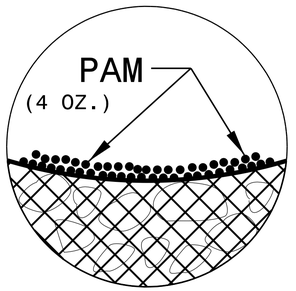
NOTES:

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

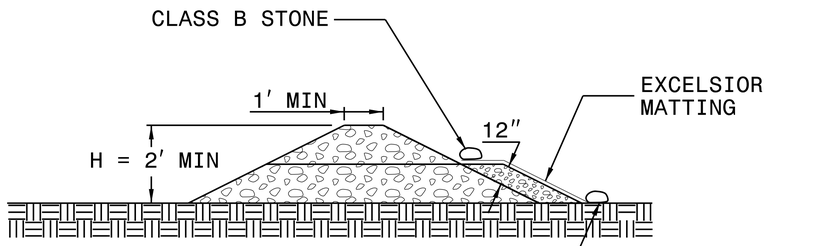
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

PROJECT REFERENCE NO.	SHEET NO.
B-5928	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+50	13+75	-LT-	115
4	-L-	12+50	13+75	-RT-	90
4	-L-	15+30	16+50	-RT-	100
				SUBTOTAL	305
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					6,410
				TOTAL	6,715
				SAY	6,715

MATTING FOR EROSION CONTROL

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

PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

REVISIONS

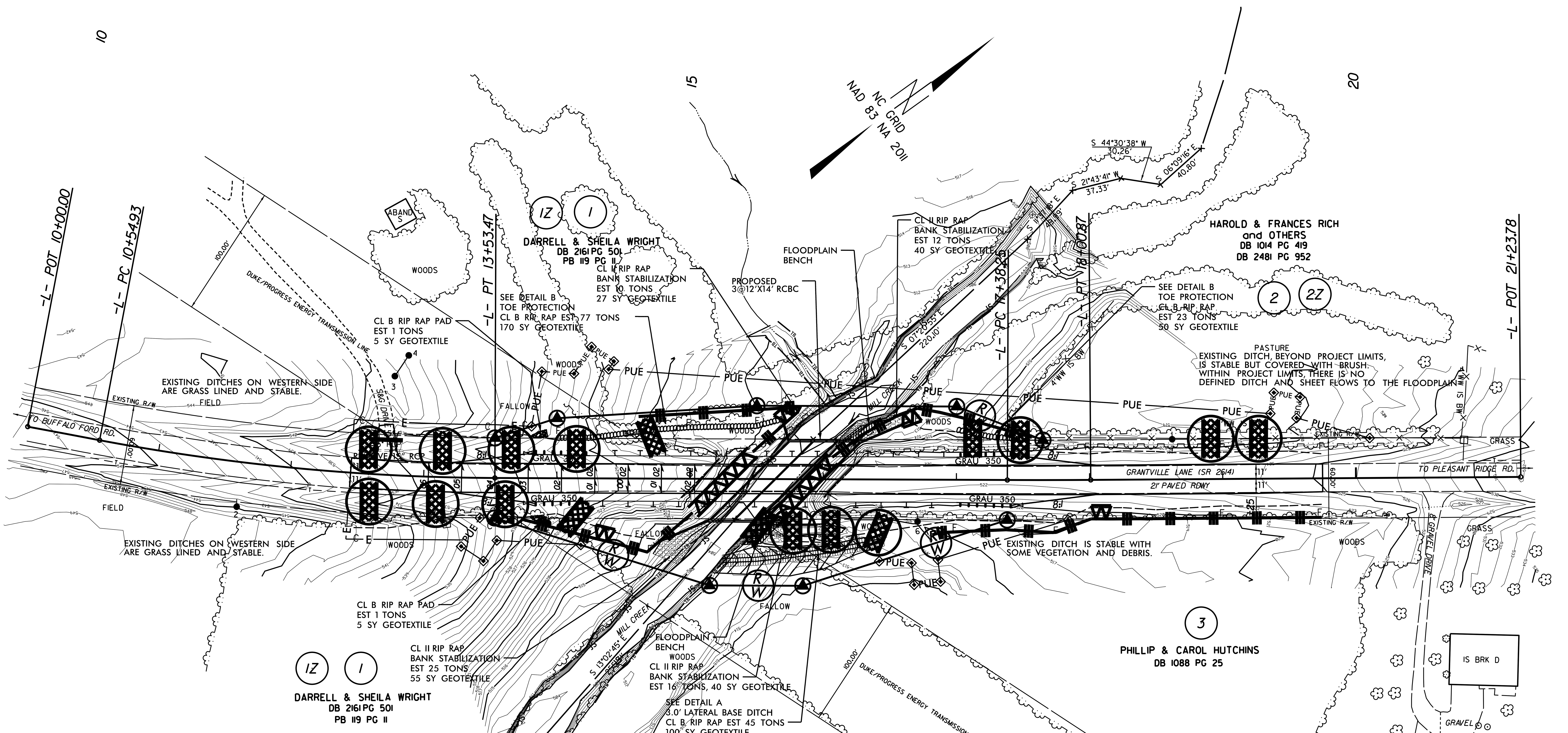
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

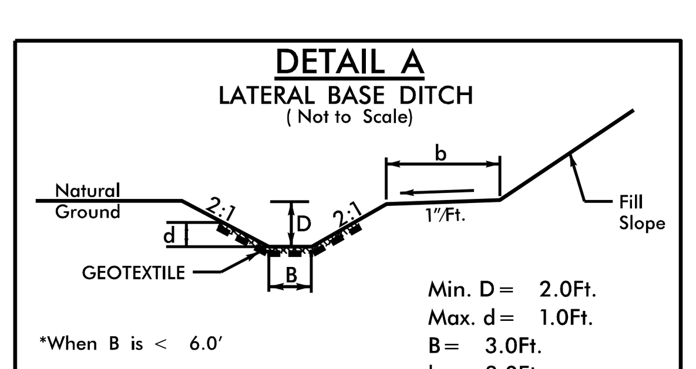
CLEARING & GRUBBING PLAN

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

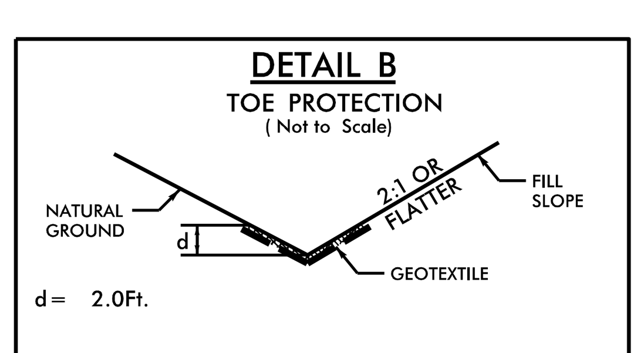
NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

40' 0' 40' 80'
ENGLISH





FROM STA.15+25 TO STA. 16+45 -L- RT



FROM STA. 14+00 TO STA. 15+70 -L- LT
FROM STA. 17+00 TO STA. 17+00 TO 17+50 -L- LT

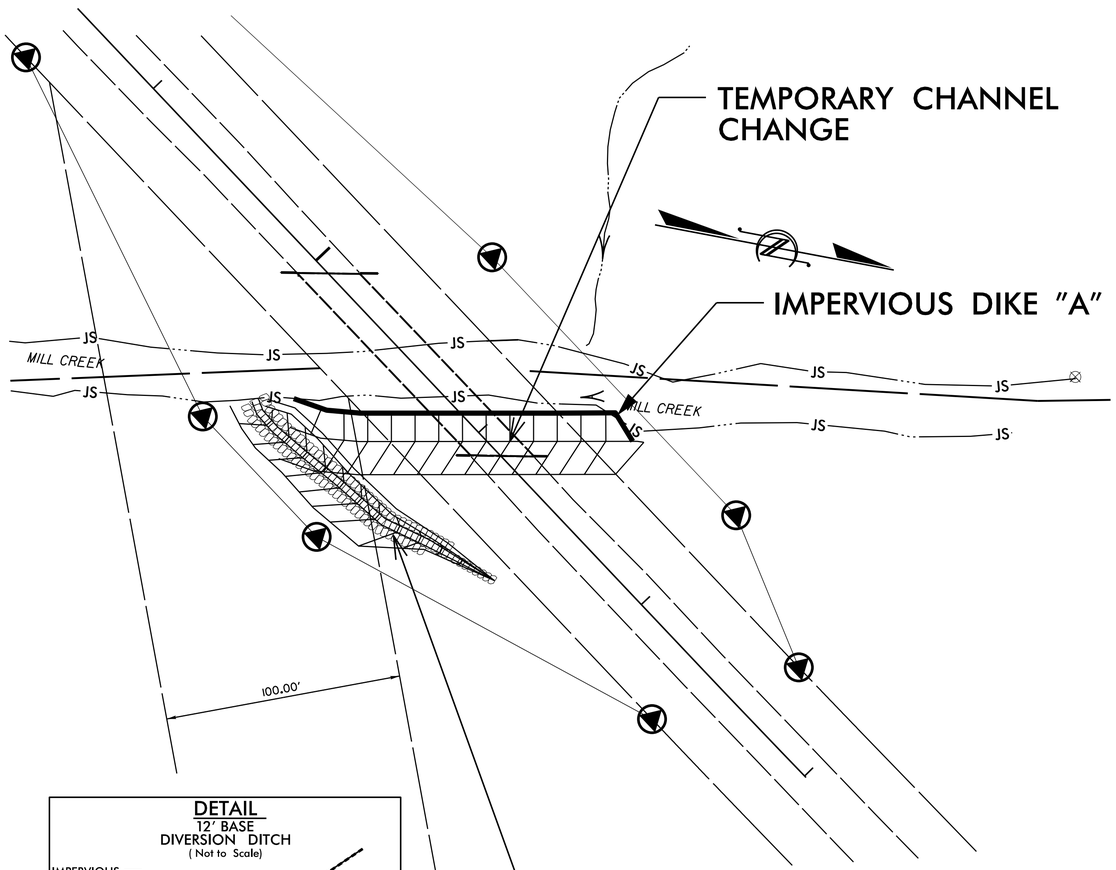
$$$$$$SYSTIME$$$$$$ $$$$$$$USERNAME$$$$$$ $$$$$$DGN$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-04A/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

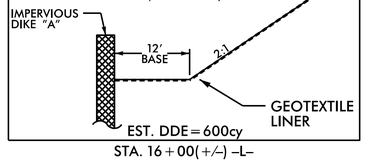
3@12'X14' RCBC
CONSTRUCTION SEQUENCE STA. 15+73 –L–

PHASE I

1. UTILIZE SPECIAL STILLING BASIN AS STILLING BASINS WHERE APPLICABLE
2. INSTALL IMPERVIOUS DIKE "A".
3. REMOVE EXISTING BRIDGE AND WING WALLS
4. CONSTRUCT TEMPORARY CHANNEL CHANGE (SEE DETAIL)
5. CONSTRUCT LATERAL BASE DITCH.



DETAIL
12' BASE
DIVERSION DITCH
(Not to Scale)

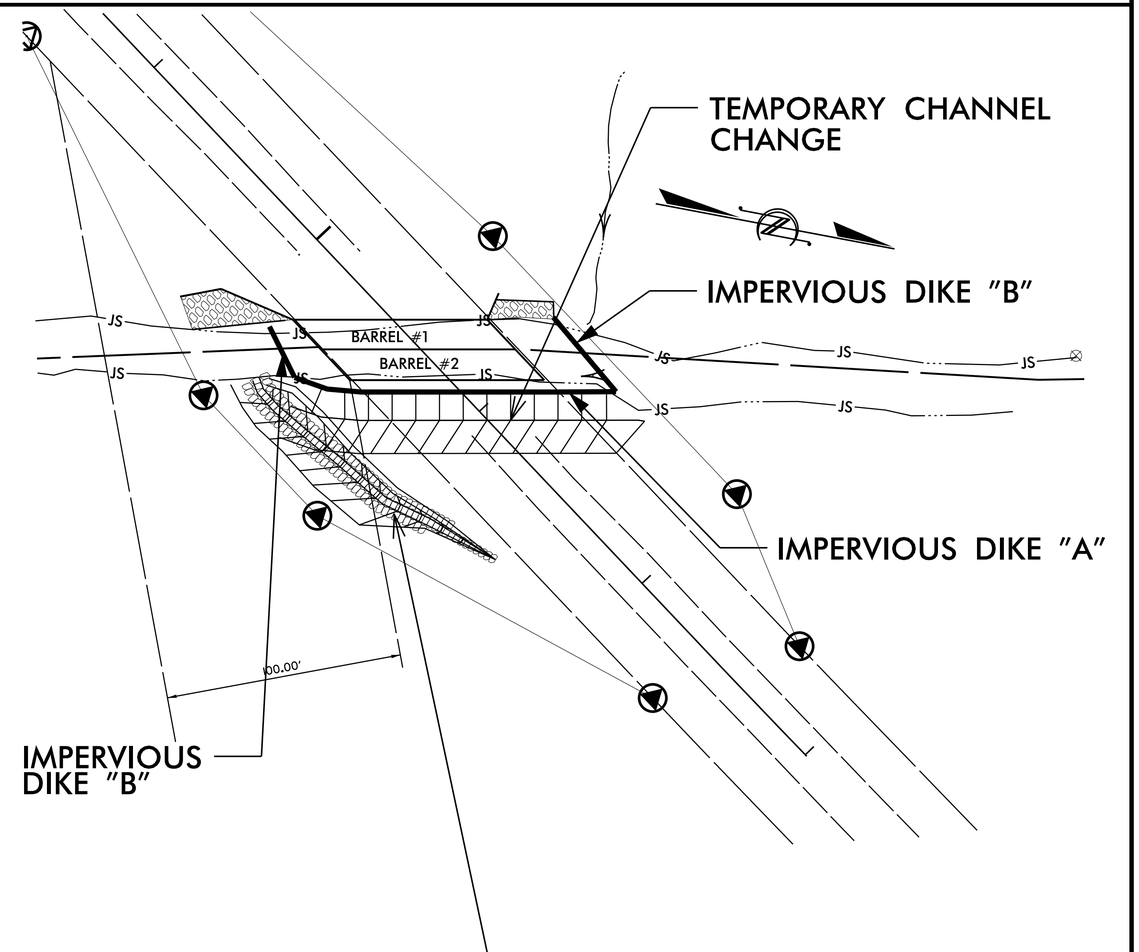


STA. 16+00(+/–) –L–

N.T.S.

PHASE II

6. INSTALL IMPERVIOUS DIKES "B".
7. REMOVE PORTION OF IMPERVIOUS DIKE "A" TO ALLOW WATER INTO THE TEMPORARY CHANNEL CHANGE.
8. DIVERT FLOW INTO THE TEMPORARY CHANNEL CHANGE.
9. CONSTRUCT THE WESTERN 2 CULVERT BARRELS AND CHANNEL IMPROVEMENTS ALONG THE WESTERN STREAM BANK.



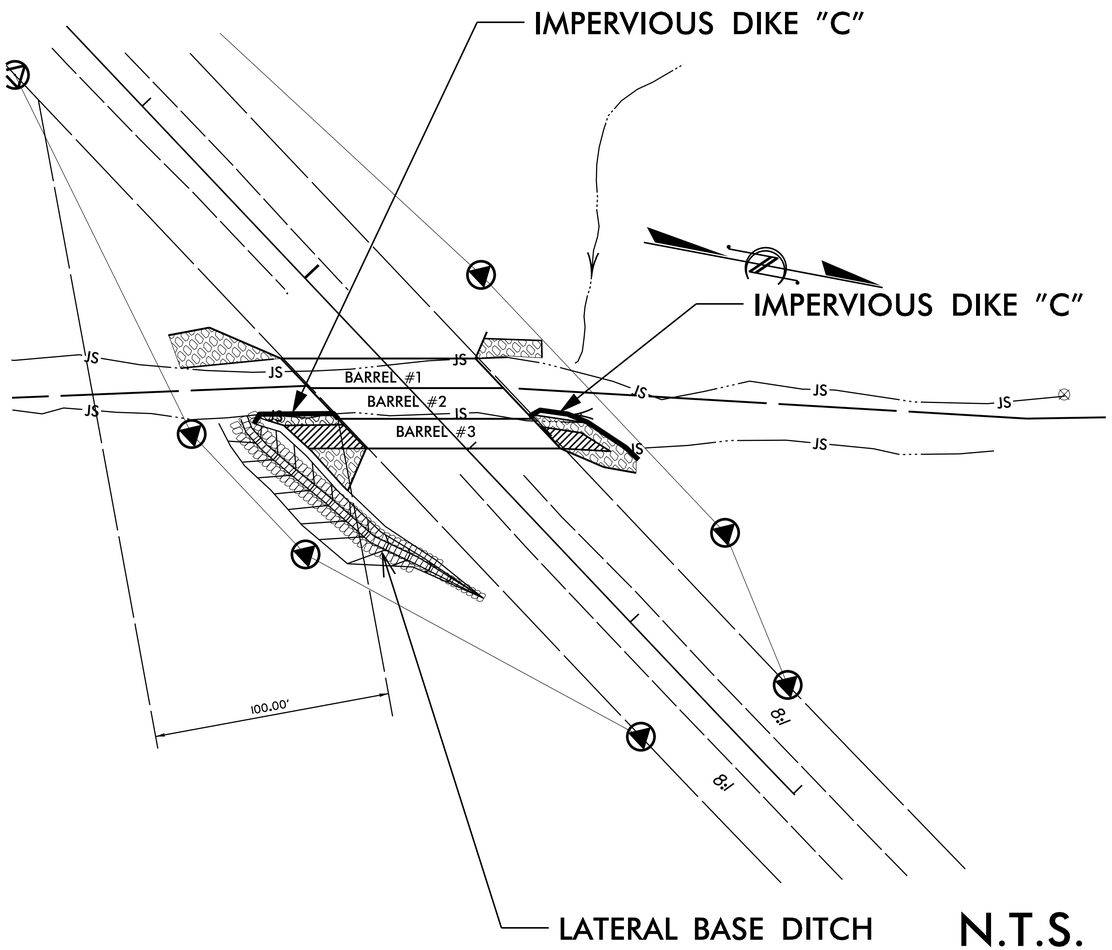
N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-04B/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

3@12'X14' RCBC
CONSTRUCTION SEQUENCE STA. 15+73 –L–

PHASE III

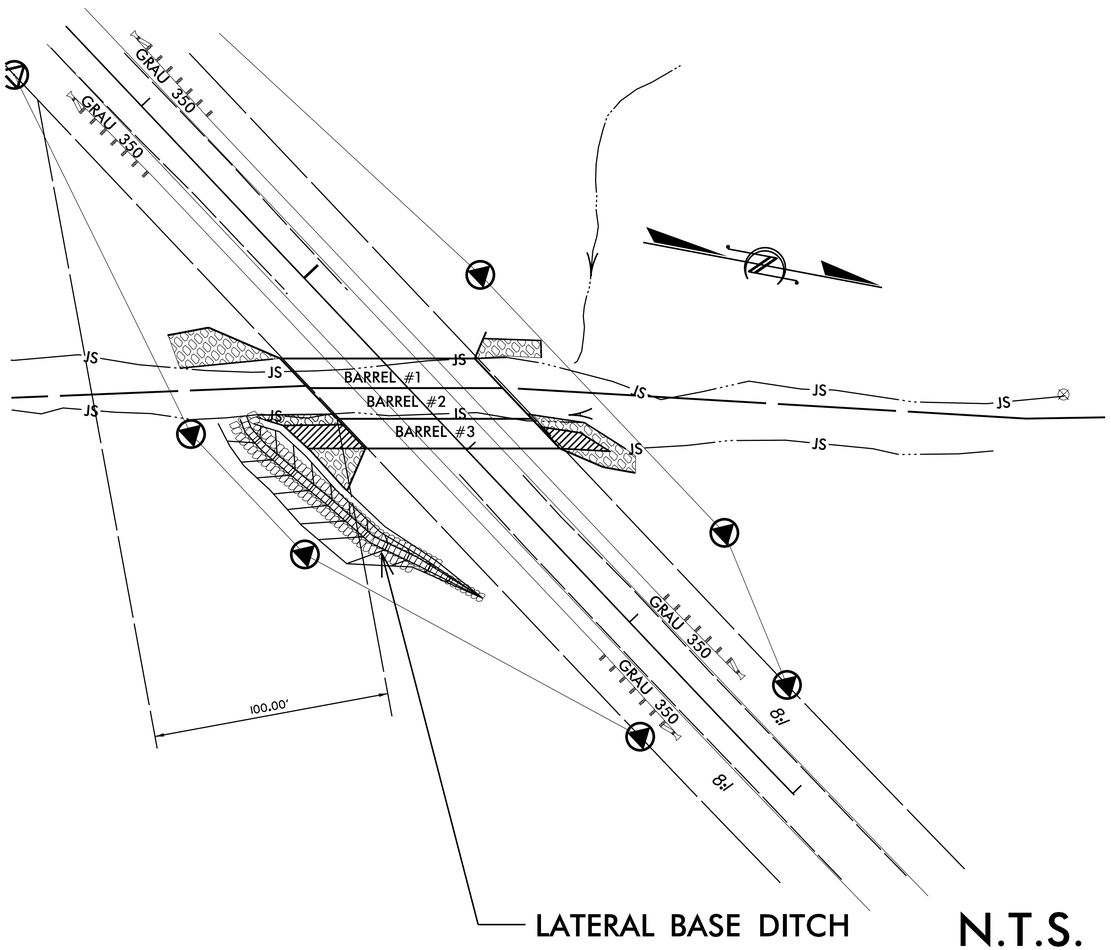
10. INSTALL IMPERVIOUS DIKES "C".
11. REMOVE IMPERVIOUS DIKES "A" AND "B".
12. DIVERT FLOW INTO THE 2 NEWLY INSTALLED CULVERT BARRELS.
13. REMOVE THE TEMPORARY CHANNEL CHANGE.
14. CONSTRUCT THE FINAL CULVERT BARREL AND CHANNEL IMPROVEMENTS ALONG THE EASTERN STREAM.



N.T.S.

PHASE IV

15. REMOVE IMPERVIOUS DIKES "C" AND SPECIAL STILLING BASINS
16. COMPLETE ROADWAY.



N.T.S.

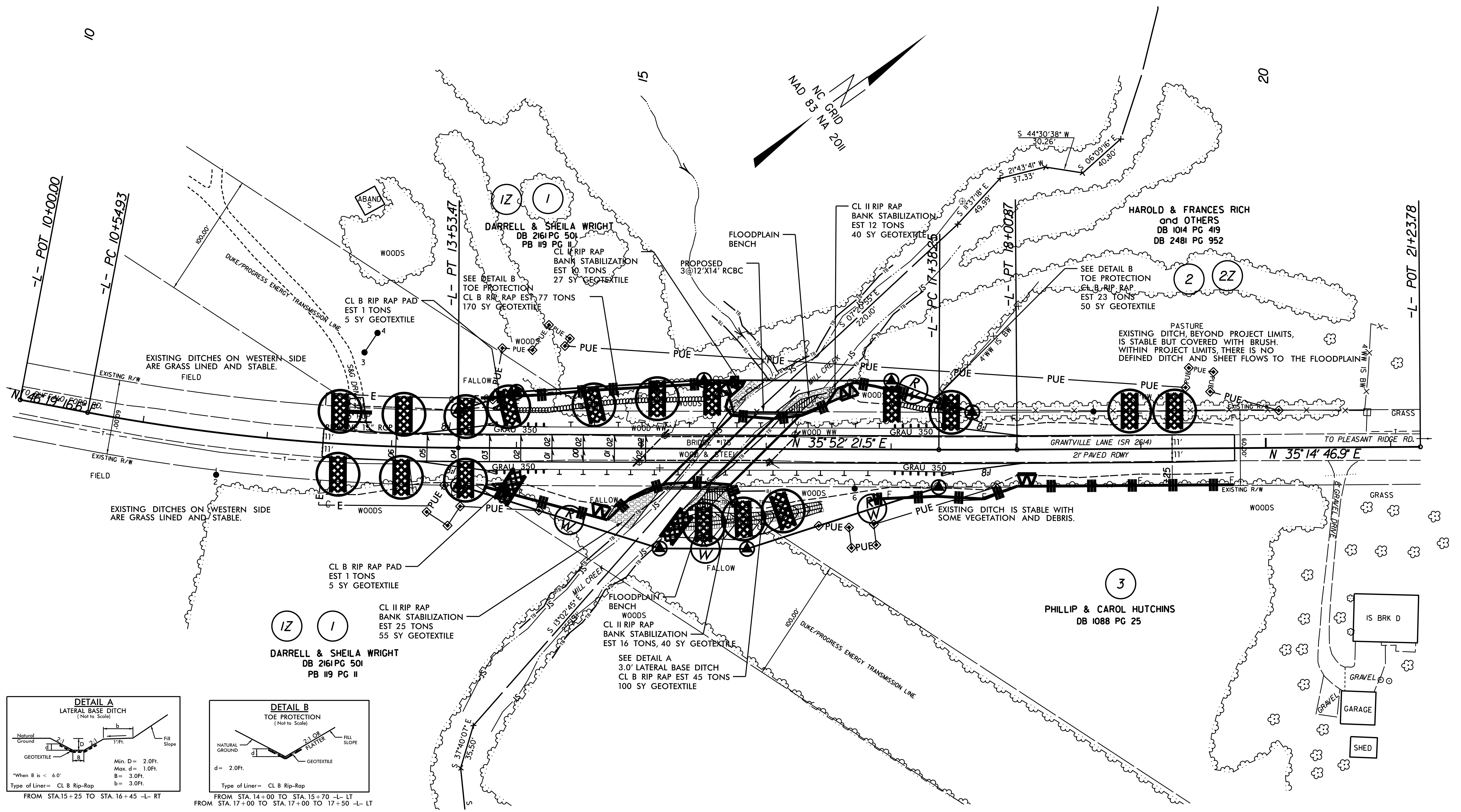
PROJECT REFERENCE NO.	SHEET NO.
B-5928	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADE PLAN

40' 0' 40' 80'
ENGLISH

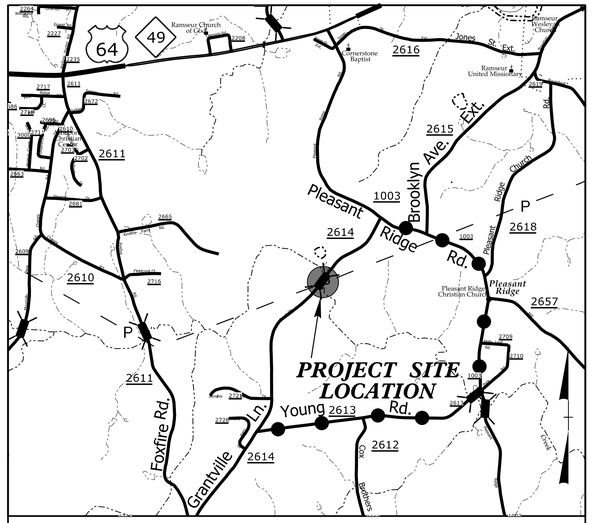
REVISIONS

8/17/99



09/08/99

TIP PROJECT: B–5928



VICINITY MAP

OFF-SITE DETOUR ROUTE

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
RANDOLPH COUNTY

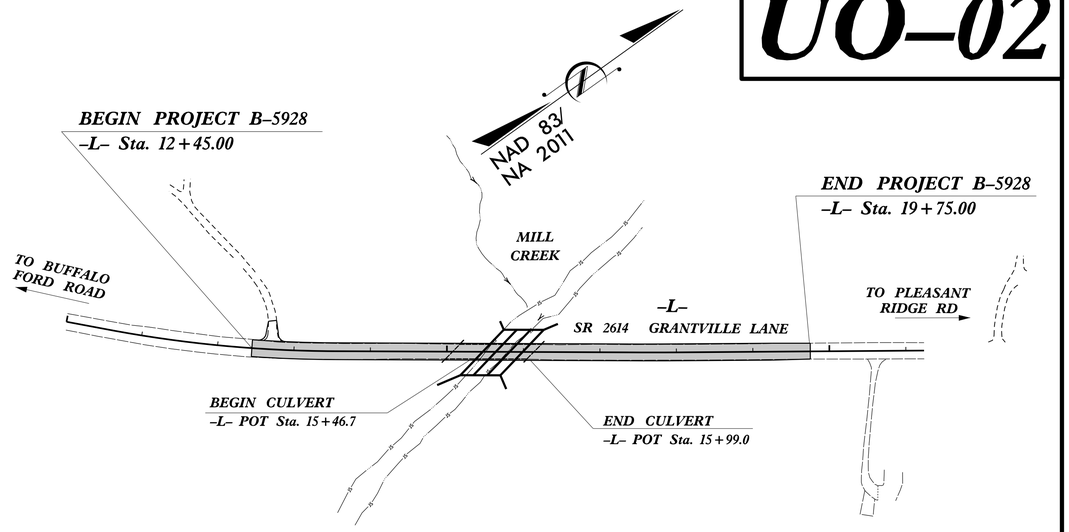
T.I.P. NO.	SHEET NO.
B–5928	UO–01

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

LOCATION: BRIDGE NO. 750175 ON SR 2614 (GRANTVILLE LANE) OVER MILL CREEK

TYPE OF WORK: AERIAL & BURIED RELOCATION

UO–02



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–01	*TITLE SHEET*
UO–02	*UBO PLAN SHEET*

UTILITY OWNERS ON PROJECT

(A) POWER DISTRIBUTION – DUKE ENERGY PROGRESS
(B) POWER TRANSMISSION – DUKE ENERGY PROGRESS
(C) TELEPHONE – CENTURYLINK
(D) TELEPHONE – RTMC

PLANS PREPARED BY:

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
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

	UTILITIES REGIONAL ENGINEER
	UTILITIES ENGINEER
JAMIE YOW	*UTILITIES AREA COORDINATOR*
	UTILITIES COORDINATOR

1/4/2017
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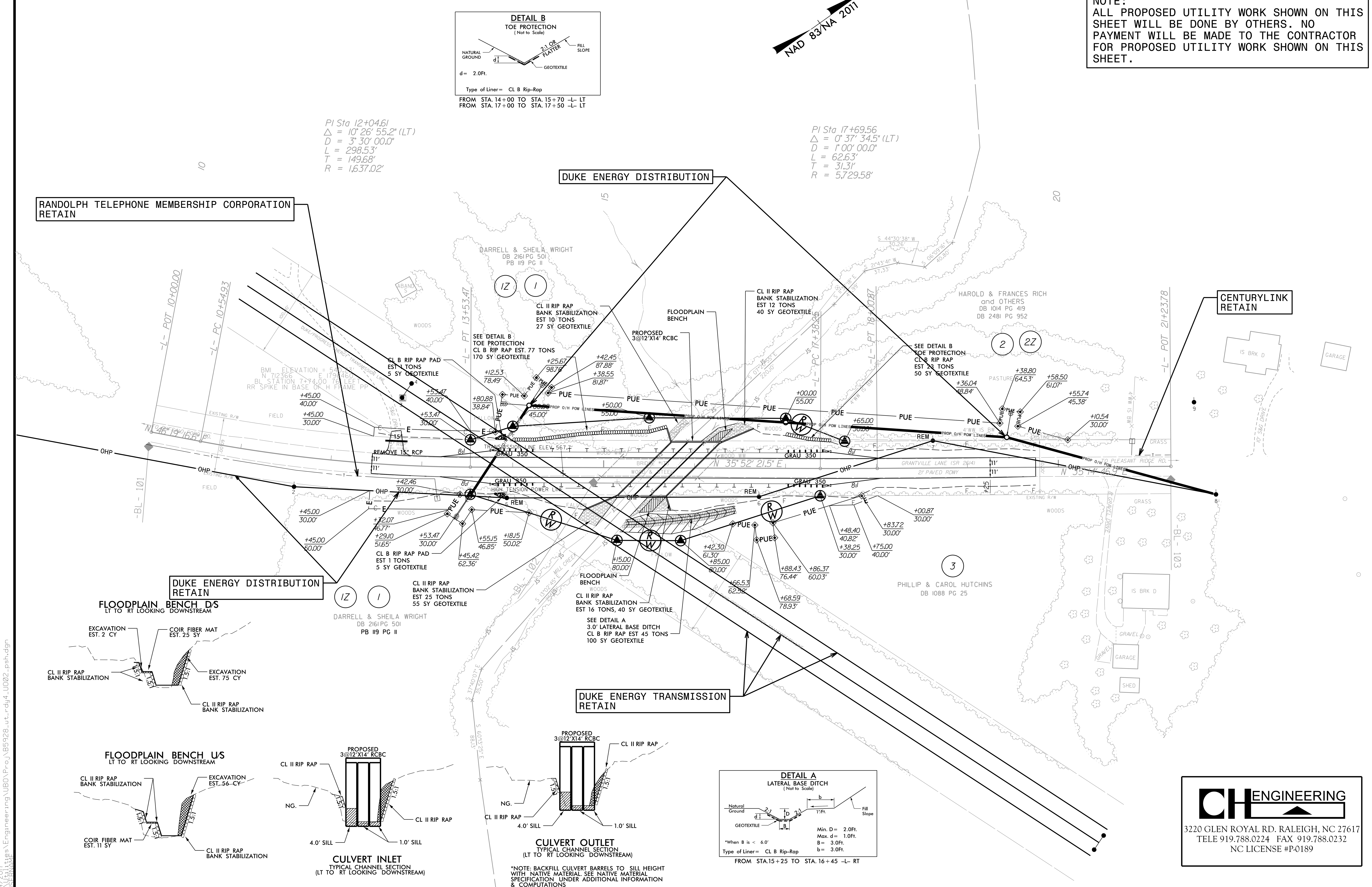
USERNAME

PROJECT REFERENCE NO.	SHEET NO.
B-5928	U0-02

UTILITIES BY OTHERS

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



NAD 83/NA 2011
DETAIL B
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d = 2.0Ft.
Type of Liner = CL B Rip-Rap
FROM STA. 14+00 TO STA. 15+70 -L- LT
FROM STA. 17+00 TO STA. 17+50 -L- LT
PI Sta 12+04.61
△ = 10° 26' 55.2" (LT)
D = 3° 30' 00.0"
L = 298.53'
T = 149.68'
R = 1,637.02'
PI Sta 17+69.56
△ = 0° 37' 34.5" (LT)
D = 1° 00' 00.0"
L = 62.63'
T = 31.31'
R = 5,729.58'
DUKE ENERGY DISTRIBUTION
RANDOLPH TELEPHONE MEMBERSHIP CORPORATION
RETAIN
CENTURYLINK
RETAIN
DARRELL & SHEILA WRIGHT
DB 2161 PG 501
PB 119 PG 11
HAROLD & FRANCES RICH
and OTHERS
DB 1014 PG 419
DB 2481 PG 952
PHILLIP & CAROL HUTCHINS
DB 1088 PG 25
CL II RIP RAP
BANK STABILIZATION
EST 10 TONS
27 SY GEOTEXTILE
CL II RIP RAP
BANK STABILIZATION
EST 12 TONS
40 SY GEOTEXTILE
FLOODPLAIN BENCH
PROPOSED
3@12'X14' RCBC
SEE DETAIL B
TOE PROTECTION
CL B RIP RAP EST. 77 TONS
170 SY GEOTEXTILE
CL B RIP RAP PAD
EST 1 TONS
5 SY GEOTEXTILE
SEE DETAIL B
TOE PROTECTION
CL B RIP RAP
EST 23 TONS
50 SY GEOTEXTILE
REMOVE 15" RCP
GRANTVILLE LANE (SR 2614)
N 35° 52' 21.5" E
DUKE ENERGY DISTRIBUTION
RETAIN
CL B RIP RAP PAD
EST 1 TONS
5 SY GEOTEXTILE
CL II RIP RAP
BANK STABILIZATION
EST 25 TONS
55 SY GEOTEXTILE
FLOODPLAIN BENCH
CL II RIP RAP
BANK STABILIZATION
EST 16 TONS, 40 SY GEOTEXTILE
SEE DETAIL A
3.0' LATERAL BASE DITCH
CL B RIP RAP EST 45 TONS
100 SY GEOTEXTILE
DUKE ENERGY TRANSMISSION
RETAIN
FLOODPLAIN BENCH D/S
LT TO RT LOOKING DOWNSTREAM
EXCAVATION EST. 2 CY
COIR FIBER MAT EST. 25 SY
CL II RIP RAP BANK STABILIZATION
EXCAVATION EST. 75 CY
CL II RIP RAP BANK STABILIZATION
FLOODPLAIN BENCH U/S
LT TO RT LOOKING DOWNSTREAM
CL II RIP RAP BANK STABILIZATION
EXCAVATION EST. 56 CY
COIR FIBER MAT EST. 11 SY
CL II RIP RAP BANK STABILIZATION
PROPOSED
3@12'X14' RCBC
CL II RIP RAP
NG.
4.0' SILL
1.0' SILL
CULVERT INLET
TYPICAL CHANNEL SECTION
(LT TO RT LOOKING DOWNSTREAM)
PROPOSED
3@12'X14' RCBC
CL II RIP RAP
NG.
CL II RIP RAP
4.0' SILL
1.0' SILL
CULVERT OUTLET
TYPICAL CHANNEL SECTION
(LT TO RT LOOKING DOWNSTREAM)
*NOTE: BACKFILL CULVERT BARRELS TO SILL HEIGHT WITH NATIVE MATERIAL. SEE NATIVE MATERIAL SPECIFICATION UNDER ADDITIONAL INFORMATION & COMPUTATIONS
DETAIL A
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
GEOTEXTILE
Fill Slope
*When B is < 6.0'
Type of Liner = CL B Rip-Rap
Min. D = 2.0Ft.
Max. d = 1.0Ft.
B = 3.0Ft.
b = 3.0Ft.
FROM STA. 15+25 TO STA. 16+45 -L- RT

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


0 2.5 5
PROJ. REFERENCE NO.
B-5928
SHEET NO.
X-1
S.S. 538.75
S.S. 544.13
2:1
4:1
0.060
537.46
0.060
4:1
2:1
EP
EP
534.32
537.42
536.12
12 + 50.0000
EP
EP
538.79
12 + 25.0000
EP
EP
540.10
12 + 00.0000
8/23/99
2/28/2017
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USERNAME

2/28/2017
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-3

8/23/99

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USERNAME

8/23/99

2/28/2017
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USERNAME

PROJ. REFERENCE NO. B-5928

SHEET NO. X-5

8/23/99

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USERNAME

2/28/2017
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-7

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-8

8/23/99

2/28/2017
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-9

2/28/2017
R:\Roadway\XSC\B5928_Rdy_xpl.dgn
USERNAME

8/23/99

2/28/2017
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-11

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-12

8/23/99

2/28/2017
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USERNAME

PROJ. REFERENCE NO.	SHEET NO.
B-5928	X-13

8/23/99
2/28/2017
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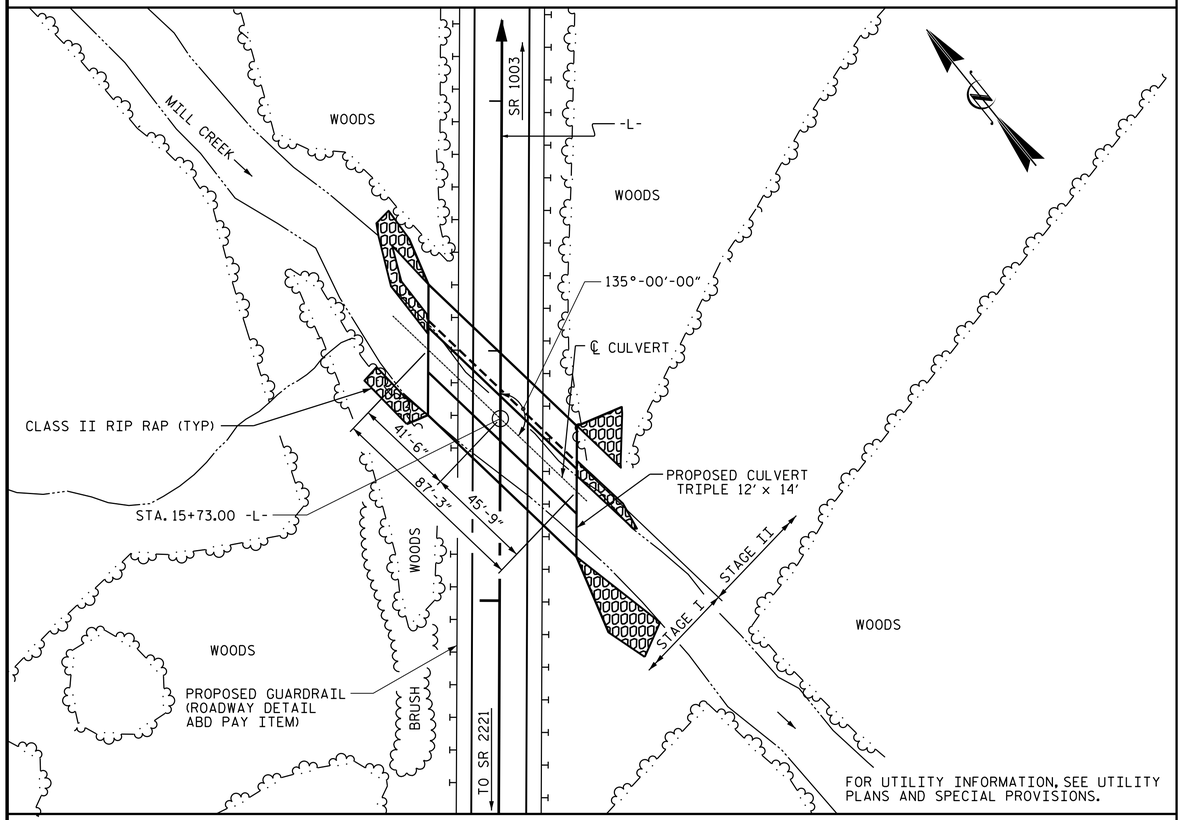
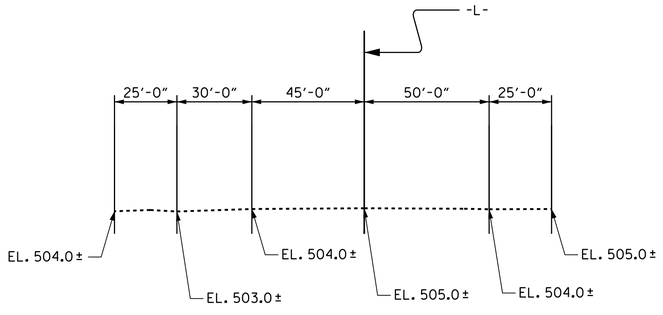
USERNAME

BM: RR SPIKE IN BASE OF H-FRAME PP; -BL- STA. 7+74.00, 76' LEFT, EL 540.23



LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM	
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION CONDITIONING MATERIAL	265	TONS
CLASS A CONCRETE		
BARRELS @ 4.386 C.Y./FT.	382.7	C.Y.
SILLS	7.5	C.Y.
WING, ETC.	98.8	C.Y.
TOTAL	489.0	C.Y.
REINFORCING STEEL		
BARRELS @	56,448	LBS.
WING, ETC.	8,725	LBS.
TOTAL	65,173	LBS.
PLACEMENT OF NATURAL STREAM BED MATERIAL	LUMP SUM	
ASBESTOS ASSESSMENT	LUMP SUM	

DRAWN BY : H. B. DESAI DATE : 6-22-16
CHECKED BY : H. P. KIM DATE : 8-10-16
DESIGN ENGINEER OF RECORD: R.P. PATEL DATE : 8-22-16

31-AUG-2016 10:51
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rppatel

NOTES

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

DESIGN FILL----------5.16 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, CURTAIN WALL, AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS IN STAGE I.
2. THE REMAINING PORTIONS OF STAGE I WALLS, SILLS, BAFFLES, AND WINGS FULL HEIGHT.
3. WING FOOTING, CURTAIN WALL, AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS IN STAGE II.
4. THE REMAINING PORTION OF STAGE II WALL, SILL, AND WING FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL

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.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 14'-2", 1 SPAN @ 13'-1", 1 SPAN @ 17'-0", 1 SPAN @ 28'-7", 1 SPAN @ 17'-1" AND 1 SPAN @ 17'-7" WITH A TIMBER DECK ON STEEL I-BEAMS, ON TIMBER CAPS AND PILES WITH CONCRETE ENCASED AT END BENTS AND INTERIOR BENTS, WITH A CLEAR ROADWAY WIDTH OF 19'-1" LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+73.00 -L-."

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS CULVERT SHALL BE SUBMITTED. SEE SHEET SN.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

NATURAL STREAM BED MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN THE SILLS, SEE SPECIAL PROVISIONS.

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

GRADE DATA -L-

GRADE POINT ELEV. @ STA. 15+73.00 -L- _____ = 524.34'
BED ELEVATION @ STA. 15+73.00 -L- _____ = 504.00'
ROADWAY SLOPES _____ = 2:1

HYDRAULIC DATA

DESIGN DISCHARGE	= 2,000 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 514.6 FT.
DRAINAGE AREA	= 9.1 SQ. MI.
BASE DISCHARGE (Q100)	= 2976 CFS
BASE HIGH WATER ELEVATION	= 516.71 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 5330 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 522.41 FT

PROJECT NO. B-5928
RANDOLPH COUNTY
STATION: 15+73.00 -L-

SHEET 1 OF 8 REPLACES BRIDGE NO. 175

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by:
Raman Patel
60F537B5DAE41D...
8/31/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

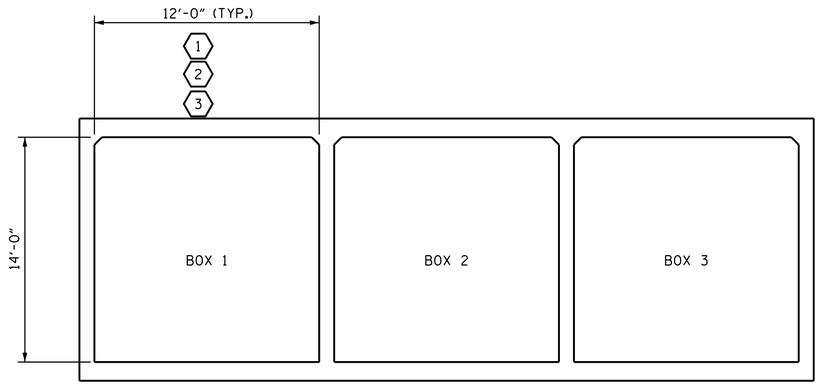
TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT 135° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.16	--	1.75	1.16	1	TOP SLAB	5.75	1.31	1	TOP SLAB	11.75	
		HL-93 (OPERATING)	N/A		1.50	--	1.35	1.50	1	TOP SLAB	5.75	1.70	1	TOP SLAB	11.75	
		HS-20 (INVENTORY)	36.00	2	1.50	54.05	1.75	1.51	1	TOP SLAB	5.75	1.50	1	TOP SLAB	11.75	
		HS-20 (OPERATING)	36.00		1.95	70.06	1.35	1.96	1	TOP SLAB	5.75	1.95	1	TOP SLAB	11.75	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50		2.05	27.67	1.40	2.05	1	EXTERIOR WALL	7.85	2.88	1	TOP SLAB	11.75	
		SNGARBS2	20.00		2.05	40.99	1.40	2.05	1	EXTERIOR WALL	7.85	2.68	1	TOP SLAB	11.75	
		SNAGRIS2	22.00		2.05	45.09	1.40	2.05	1	EXTERIOR WALL	7.85	2.84	1	TOP SLAB	11.75	
		SNCOTTS3	27.25	3	1.44	39.36	1.40	1.44	1	TOP SLAB	5.75	1.63	1	TOP SLAB	11.75	
		SNAGGRS4	34.93		1.75	61.13	1.40	1.75	1	TOP SLAB	6.07	1.81	1	TOP SLAB	11.75	
		SNS5A	35.55		1.61	57.37	1.40	1.61	1	TOP SLAB	5.75	1.68	1	TOP SLAB	11.75	
		SNS6A	39.95		1.61	64.47	1.40	1.61	1	TOP SLAB	5.75	1.63	1	TOP SLAB	11.75	
		SNS7B	42.00		1.60	67.40	1.40	1.66	1	TOP SLAB	5.75	1.60	1	TOP SLAB	11.75	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		2.05	67.64	1.40	2.05	1	EXTERIOR WALL	7.85	2.40	1	TOP SLAB	11.75	
		TNT4A	33.08		1.72	56.77	1.40	1.72	1	TOP SLAB	5.75	1.94	1	TOP SLAB	11.75	
		TNT6A	41.60		1.73	71.79	1.40	1.76	1	TOP SLAB	5.75	1.73	1	TOP SLAB	11.75	
		TNT7A	42.00		1.74	73.14	1.40	1.84	1	TOP SLAB	5.75	1.74	1	TOP SLAB	11.75	
		TNT7B	42.00		1.66	69.77	1.40	1.66	1	TOP SLAB	5.75	1.83	1	TOP SLAB	11.75	
		TNAGRIT4	43.00		1.64	70.57	1.40	1.64	1	TOP SLAB	5.75	1.85	1	TOP SLAB	11.75	
		TNAGT5A	45.00		1.68	75.45	1.40	1.68	1	TOP SLAB	5.75	1.75	1	TOP SLAB	11.75	
		TNAGT5B	45.00		1.66	74.69	1.40	1.72	1	TOP SLAB	5.75	1.66	1	TOP SLAB	11.75	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	0.00
WA	1.00	0.00

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

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

PROJECT NO. B-5928
RANDOLPH COUNTY
STATION: 15+73.00 -L-

SHEET 2 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1F41D... 8/31/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

(NON-INTERSTATE TRAFFIC)

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

STD. NO. LRFR5

ASSEMBLED BY : H. B. DESAI DATE : 6-30-16
CHECKED BY : H. P. KIM DATE : 8-10-16

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

REV. 10/1/11 MAA/GM

DESIGN ENGINEER OF RECORD:
R.P. PATEL DATE : 8-22-16

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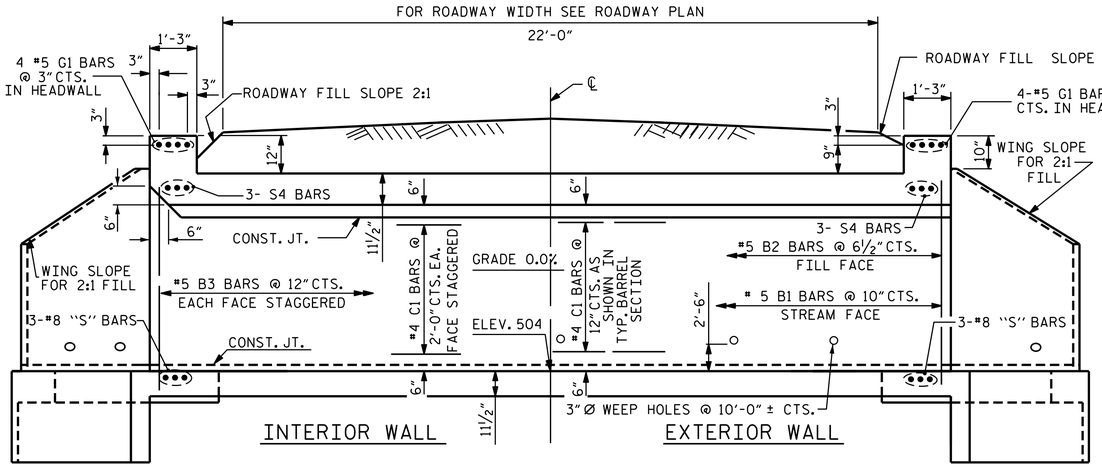
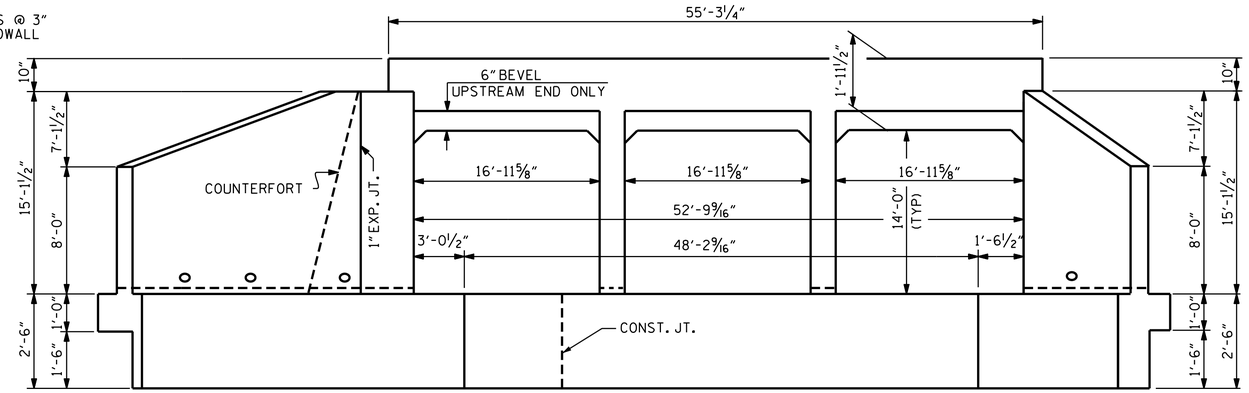
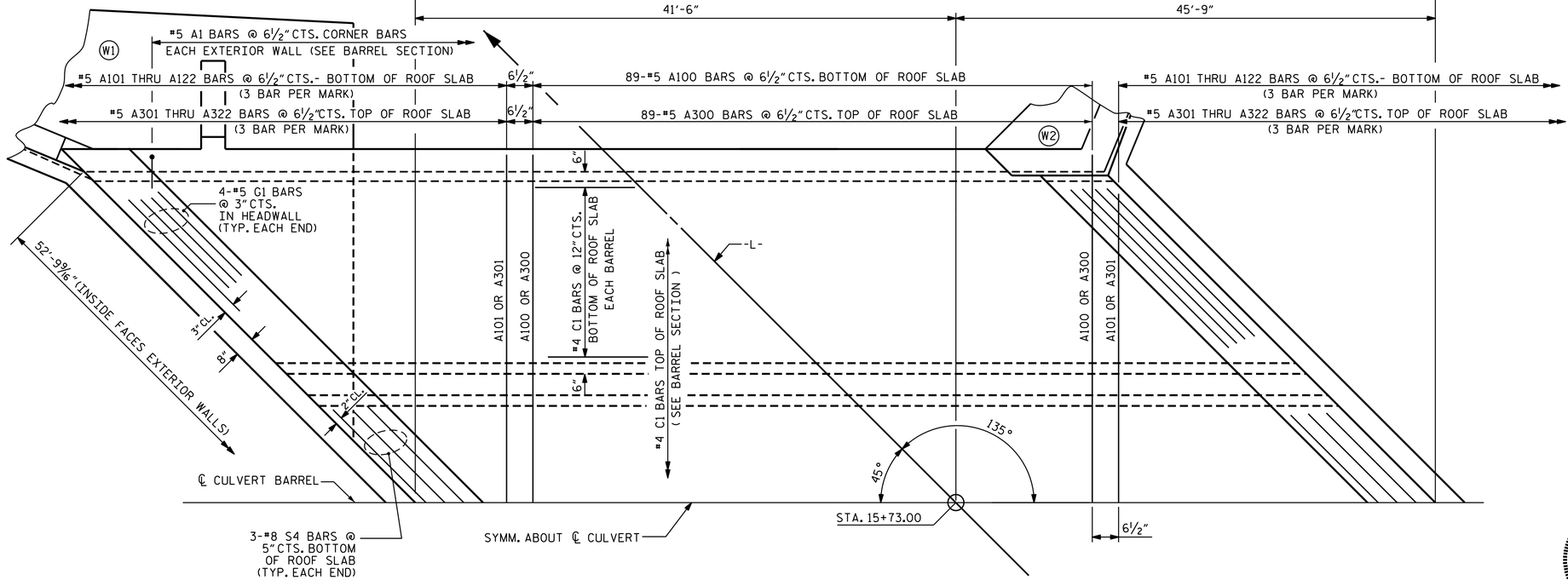


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW



PART PLAN - ROOF SLAB

PROJECT NO. B-5928
RANDOLPH COUNTY
STATION: 15+73.00 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT 135° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1E47D...
8/31/2016

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CHECKED BY :	H. P. KIM	DATE : 8-10-16
DESIGN ENGINEER OF RECORD:	R.P. PATEL	DATE : 8-22-16

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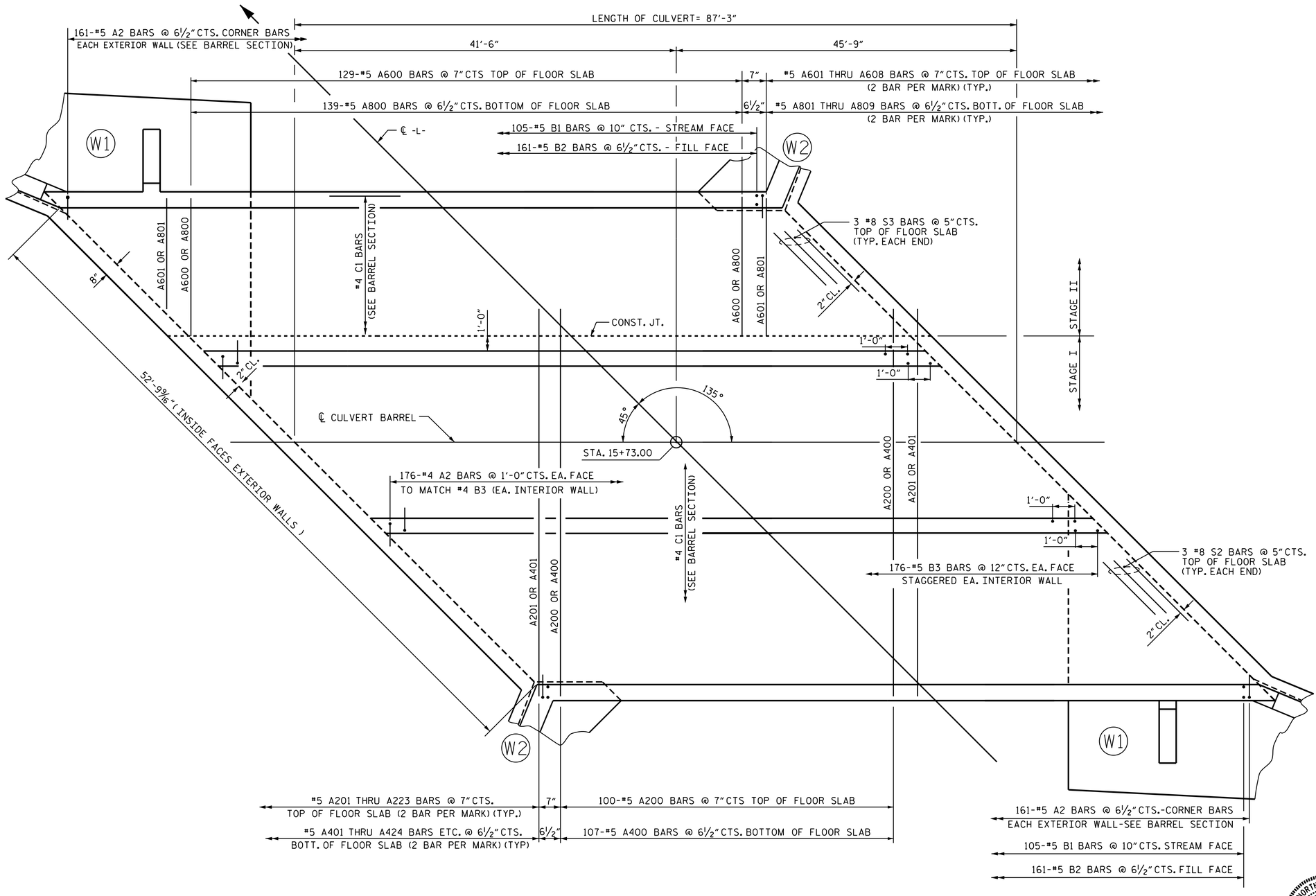
STD. NO. CB553



PLAN - FLOOR SLAB

PROJECT NO. B-5928

RANDOLPH COUNTY

STATION: 15+73.00 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT 135° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1F41D... 8/31/2016

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DESIGN ENGINEER OF RECORD: R.P. PATEL DATE : 8-22-16

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STAGE I QUANTITIES

CLASS A CONCRETE

BARREL @ 2.084 CY/FT	181.8	C.Y.
SILLS	2.5	C.Y.
WING ETC.	48.3	C.Y.
TOTAL	232.6	C.Y.

REINFORCING STEEL

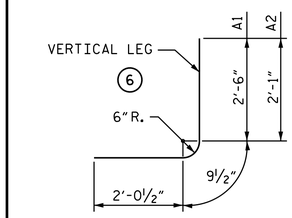
BARREL	27,830	LBS.
WINGS	4362	LBS.
TOTAL	32,192	LBS.

FOUNDATION CONDITION MATERIAL	180	TONS
CULVERT EXCAVATION	LUMP SUM	

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A200	#5	1'-9"
A400	#5	1'-9"
B1, B3	#5	1'-9"
C1	#4	1'-11"
S2	#8	4'-0"

BAR TYPE

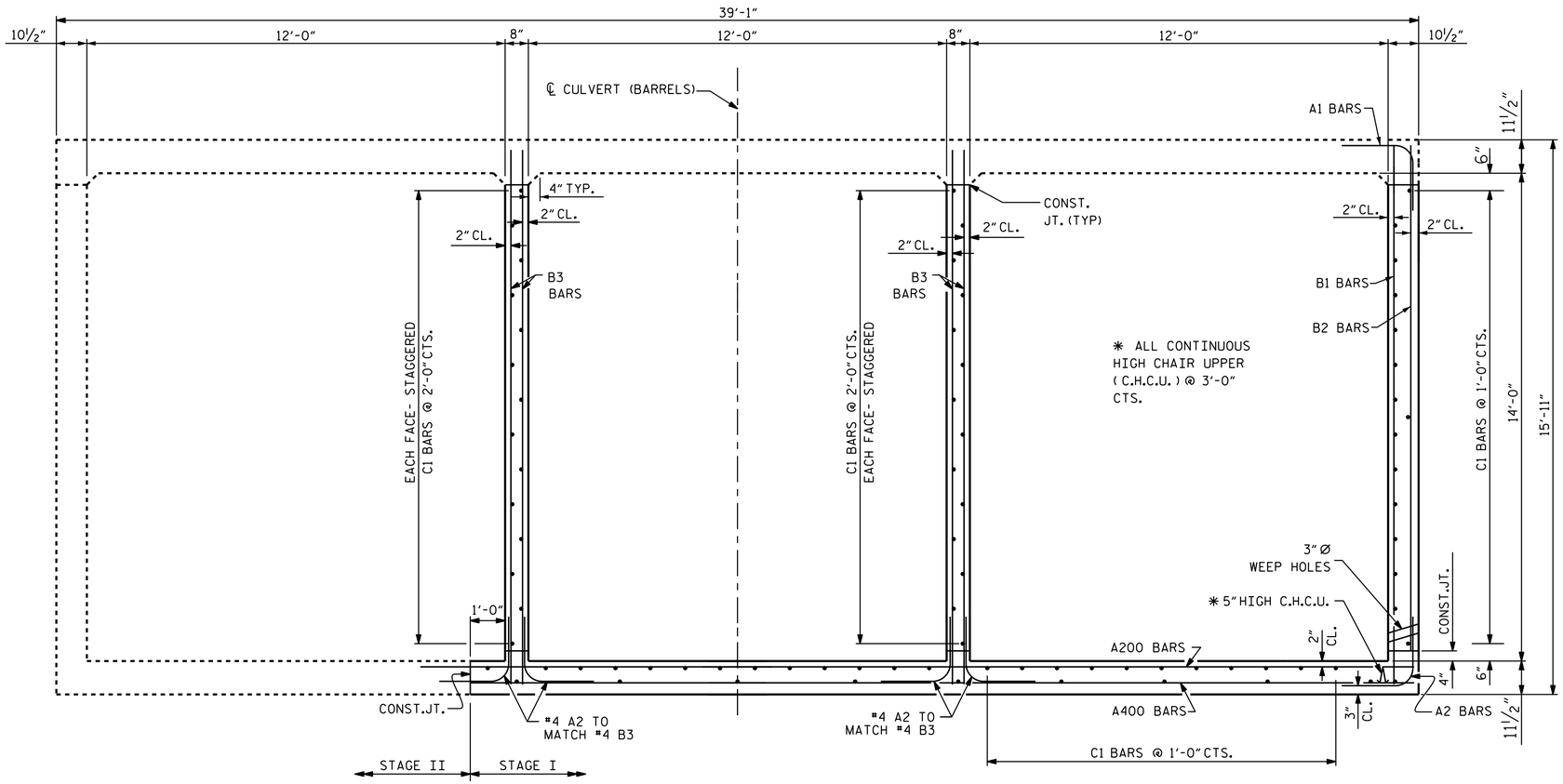


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL (STAGE I)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	161	#5	6	5'-4"	896	A221	4	#5	STR	4'-5"	18	A420	4	#5	STR	7'-5"	31
A2	513	#5	6	4'-11"	2631	A222	4	#5	STR	3'-3"	13	A421	4	#5	STR	6'-4"	26
						A223	4	#5	STR	2'-1"	9	A422	4	#5	STR	5'-3"	22
A200	100	#5	STR	28'-9"	2999							A423	4	#5	STR	4'-2"	17
A201	4	#5	STR	27'-9"	116	A400	107	#5	STR	28'-9"	3209	A424	4	#5	STR	3'-1"	13
A202	4	#5	STR	26'-7"	111	A401	4	#5	STR	28'-0"	117	A425	4	#5	STR	2'-0"	8
A203	4	#5	STR	25'-5"	106	A402	4	#5	STR	26'-11"	113						
A204	4	#5	STR	24'-3"	101	A403	4	#5	STR	25'-10"	108	B1	105	#5	STR	15'-5"	1689
A205	4	#5	STR	23'-1"	96	A404	4	#5	STR	24'-9"	103	B2	161	#5	STR	13'-4"	2239
A206	4	#5	STR	21'-11"	91	A405	4	#5	STR	23'-8"	99	B3	352	#5	STR	15'-5"	5660
A207	4	#5	STR	20'-9"	86	A406	4	#5	STR	22'-7"	94						
A208	4	#5	STR	19'-7"	82	A407	4	#5	STR	21'-6"	90	C1	308	#4	STR	23'-4"	4801
A209	4	#5	STR	18'-5"	77	A408	4	#5	STR	20'-5"	85						
A210	4	#5	STR	17'-3"	72	A409	4	#5	STR	19'-4"	81	D1	16	#6	STR	1'-6"	36
A211	4	#5	STR	16'-1"	67	A410	4	#5	STR	18'-3"	76						
A212	4	#5	STR	14'-11"	62	A411	4	#5	STR	17'-2"	72	S2	6	#8	STR	42'-4"	678
A213	4	#5	STR	13'-9"	57	A412	4	#5	STR	16'-1"	67						
A214	4	#5	STR	12'-7"	52	A413	4	#5	STR	15'-0"	62						
A215	4	#5	STR	11'-5"	48	A414	4	#5	STR	13'-11"	58						
A216	4	#5	STR	10'-3"	43	A415	4	#5	STR	12'-10"	53						
A217	4	#5	STR	9'-1"	38	A416	4	#5	STR	11'-9"	49						
A218	4	#5	STR	7'-11"	33	A417	4	#5	STR	10'-8"	44						
A219	4	#5	STR	6'-9"	28	A418	4	#5	STR	9'-7"	40						
A220	4	#5	STR	5'-6"	23	A419	4	#5	STR	8'-6"	35						

REINFORCING STEEL = LBS. 27,830



RIGHT ANGLE SECTION OF BARREL

THERE ARE 77 "C" BARS IN SECTION OF BARREL.
(LOOKING DOWNSTREAM)

DRAWN BY : H. B. DESAI DATE : 6-30-16
CHECKED BY : H. P. KIM DATE : 8-10-16
DESIGN ENGINEER OF RECORD: R.P. PATEL DATE : 8-22-16

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NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1F41D... 8/31/2016

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PROJECT NO. B-5928
RANDOLPH COUNTY
STATION: 15+73.00 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT (STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			8

STAGE II QUANTITIES

CLASS A CONCRETE

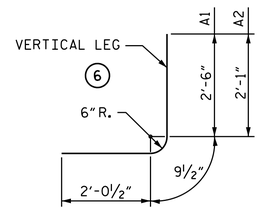
BARREL @ 2.302 CY/FT	200.8	C.Y.
SILLS	5.0	C.Y.
WING ETC.	50.5	C.Y.
TOTAL	256.3	C.Y.

REINFORCING STEEL

BARREL	28,618	LBS.
WINGS	4363	LBS.
TOTAL	32,981	LBS.

FOUNDATION CONDITION MATERIAL	85	TONS
CULVERT EXCAVATION	LUMP SUM	

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL (STAGE II)

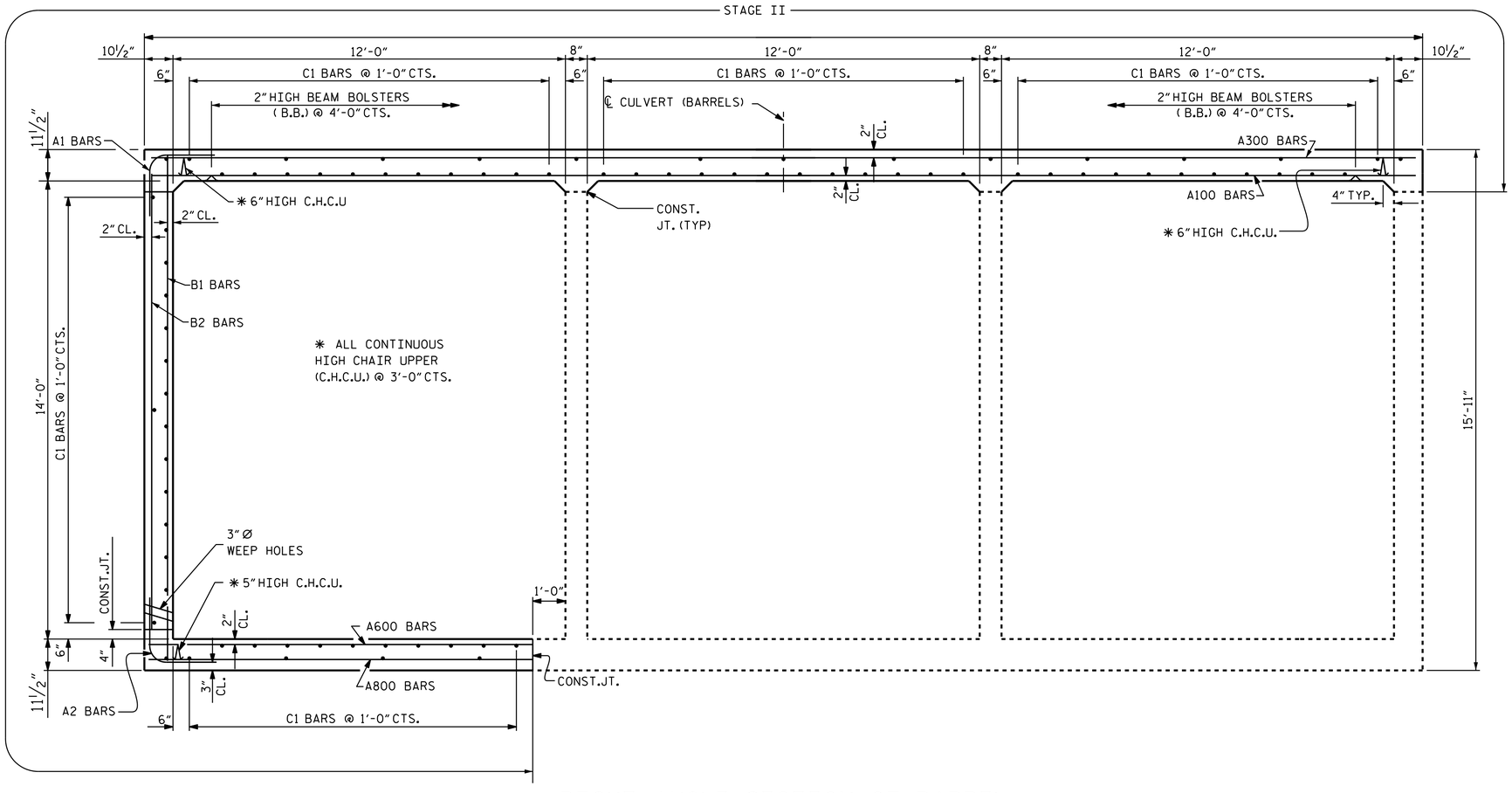
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	161	#5	6	5'-4"	895
A2	161	#5	6	4'-11"	825
A100	89	#5	STR	38'-8"	3589
A101	6	#5	STR	37'-0"	232
A102	6	#5	STR	35'-5"	222
A103	6	#5	STR	33'-9"	211
A104	6	#5	STR	32'-2"	201
A105	6	#5	STR	30'-6"	191
A106	6	#5	STR	28'-11"	181
A107	6	#5	STR	27'-3"	171
A108	6	#5	STR	25'-8"	161
A109	6	#5	STR	24'-0"	150
A110	6	#5	STR	22'-5"	140
A111	6	#5	STR	20'-9"	130
A112	6	#5	STR	19'-2"	120
A113	6	#5	STR	17'-6"	110
A114	6	#5	STR	15'-11"	100
A115	6	#5	STR	14'-3"	89
A116	6	#5	STR	12'-8"	79
A117	6	#5	STR	11'-0"	69
A118	6	#5	STR	9'-5"	59
A119	6	#5	STR	7'-9"	48
A120	6	#5	STR	6'-2"	39

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A121	6	#5	STR	4'-6"	28
A122	6	#5	STR	2'-11"	18
A600	129	#5	STR	11'-8"	1570
A601	4	#5	STR	10'-7"	44
A602	4	#5	STR	9'-5"	39
A603	4	#5	STR	8'-3"	34
A604	4	#5	STR	7'-1"	29
A605	4	#5	STR	5'-11"	25
A606	4	#5	STR	4'-9"	20
A607	4	#5	STR	3'-7"	15
A608	4	#5	STR	2'-5"	10
A300	89	#5	STR	38'-8"	3589
A301	6	#5	STR	37'-0"	232
A302	6	#5	STR	35'-5"	222
A303	6	#5	STR	33'-9"	211
A304	6	#5	STR	32'-2"	201
A305	6	#5	STR	30'-6"	191
A306	6	#5	STR	28'-11"	181
A307	6	#5	STR	27'-3"	171
A308	6	#5	STR	25'-8"	161
A309	6	#5	STR	24'-0"	150

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A310	6	#5	STR	22'-5"	140
A311	6	#5	STR	20'-9"	130
A312	6	#5	STR	19'-2"	120
A313	6	#5	STR	17'-6"	110
A314	6	#5	STR	15'-11"	100
A315	6	#5	STR	14'-3"	89
A316	6	#5	STR	12'-8"	79
A317	6	#5	STR	11'-0"	69
A318	6	#5	STR	9'-5"	59
A319	6	#5	STR	7'-9"	48
A320	6	#5	STR	6'-2"	39
A321	6	#5	STR	4'-6"	28
A322	6	#5	STR	2'-11"	18
A800	139	#5	STR	11'-8"	1691
A801	4	#5	STR	10'-9"	45
A802	4	#5	STR	9'-8"	40
A803	4	#5	STR	8'-7"	36
A804	4	#5	STR	7'-6"	31
A805	4	#5	STR	6'-5"	27
A806	4	#5	STR	5'-4"	22
A807	4	#5	STR	4'-3"	18
A808	4	#5	STR	3'-2"	13
A809	4	#5	STR	2'-1"	9

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	105	#5	STR	15'-5"	1688
B2	161	#5	STR	13'-4"	2239
C1	316	#4	STR	23'-4"	4925
D2	8	#6	STR	4'-6"	54
G1	8	#5	STR	54'-9"	457
S3	6	#8	STR	16'-6"	264
S4	6	#8	STR	54'-9"	877

REINFORCING STEEL = LBS. 28,618



RIGHT ANGLE SECTION OF BARREL

THERE ARE 79 "C" BARS IN SECTION OF BARREL.
(LOOKING DOWNSTREAM)

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A600	#5	1'-9"
A800	#5	1'-9"
B1, B3	#5	1'-9"
C1	#4	1'-11"
S3	#8	4'-0"

PROJECT NO. B-5928

RANDOLPH COUNTY

STATION: 15+73.00 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT (STAGE II)

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1E41D... 8/31/2016

DRAWN BY : H. B. DESAI DATE : 6-30-16
CHECKED BY : H. P. KIM DATE : 8-10-16
DESIGN ENGINEER OF RECORD: R.P. PATEL DATE : 8-22-16

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2			4			8

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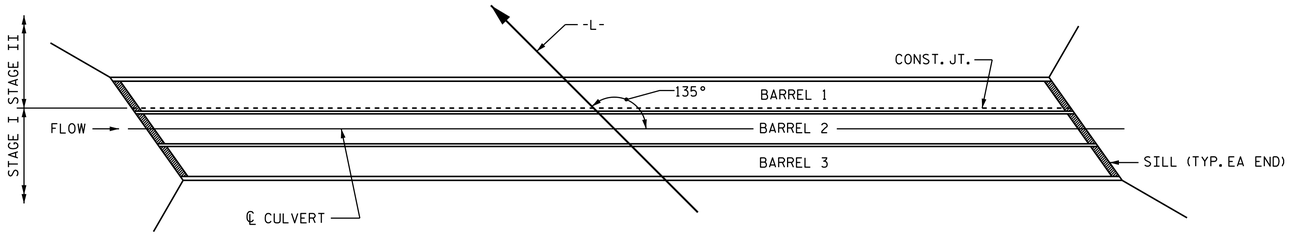
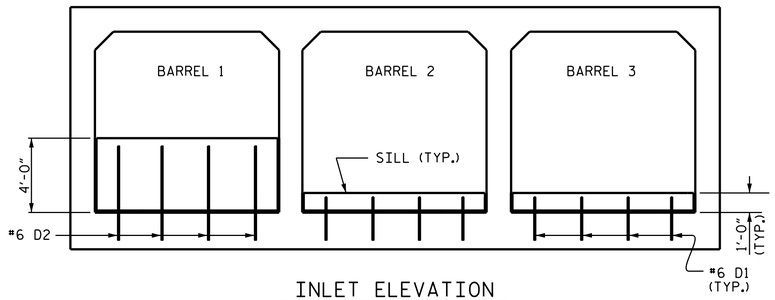
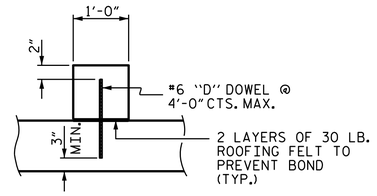


PLAN



INLET ELEVATION



SECTION THROUGH SILL

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

NOTES

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.

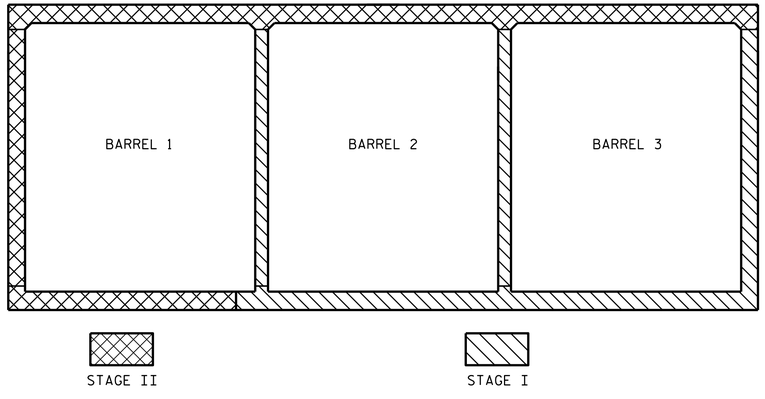
ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL.

RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARREL. RIP-RAP may USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

CULVERT SILL DETAILS

(LOOKING DOWNSTREAM)

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE NATIVE MATERIAL BACKFILL SHALL BE PLACED PRIOR TO THE CASTING OF THE ROOF SLAB.



CONSTRUCTION SEQUENCE

(LOOKING DOWNSTREAM)

PROJECT NO. B-5928

RANDOLPH COUNTY

STATION: 15+73.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRIPLE 12 FT. X 14 FT. CONCRETE BOX CULVERT 135° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1F410...
8/31/2016

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DRAWN BY : H. B. DESAI DATE : 6-30-16
CHECKED BY : H. P. KIM DATE : 8-10-16
DESIGN ENGINEER OF RECORD: R.P. PATEL DATE : 8-22-16

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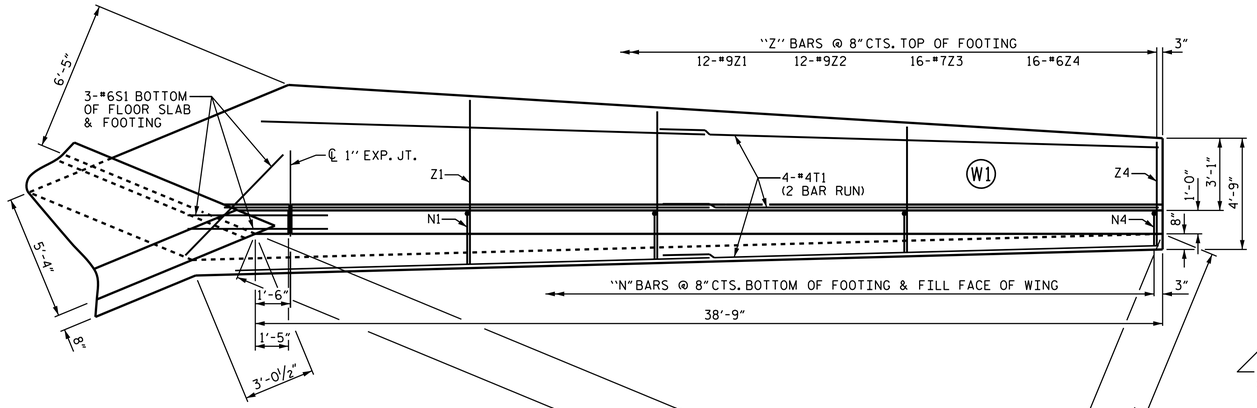
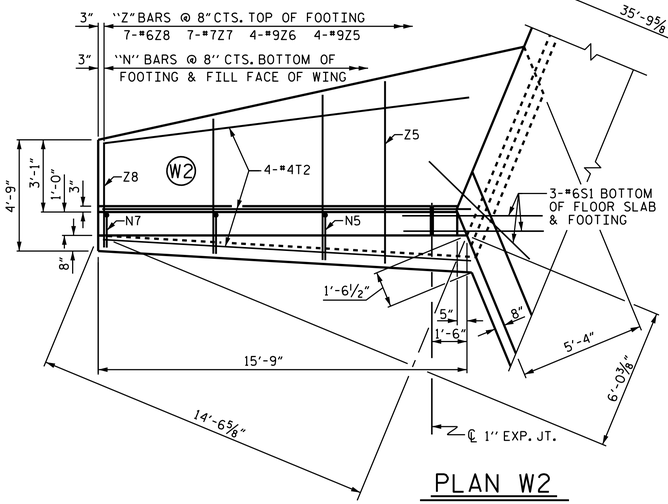
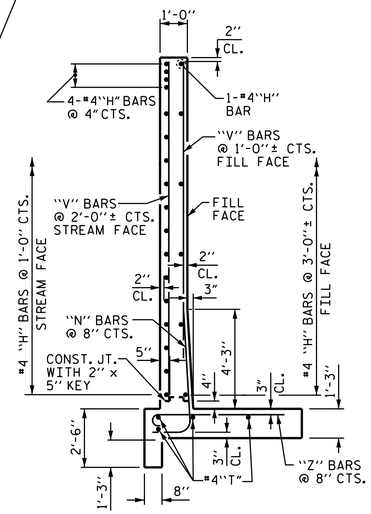


PLAN W1

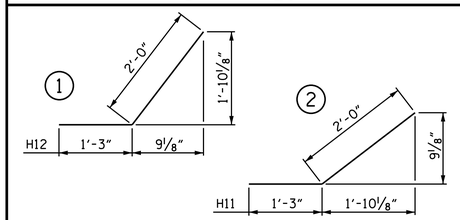


PLAN W2

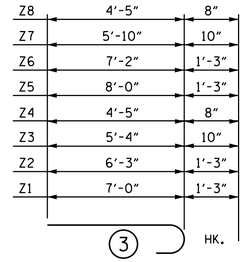


TYPICAL WING SECTION

BAR TYPES



Z8	4'-5"	8"
Z7	5'-10"	10"
Z6	7'-2"	1'-3"
Z5	8'-0"	1'-3"
Z4	4'-5"	8"
Z3	5'-4"	10"
Z2	6'-3"	1'-3"
Z1	7'-0"	1'-3"

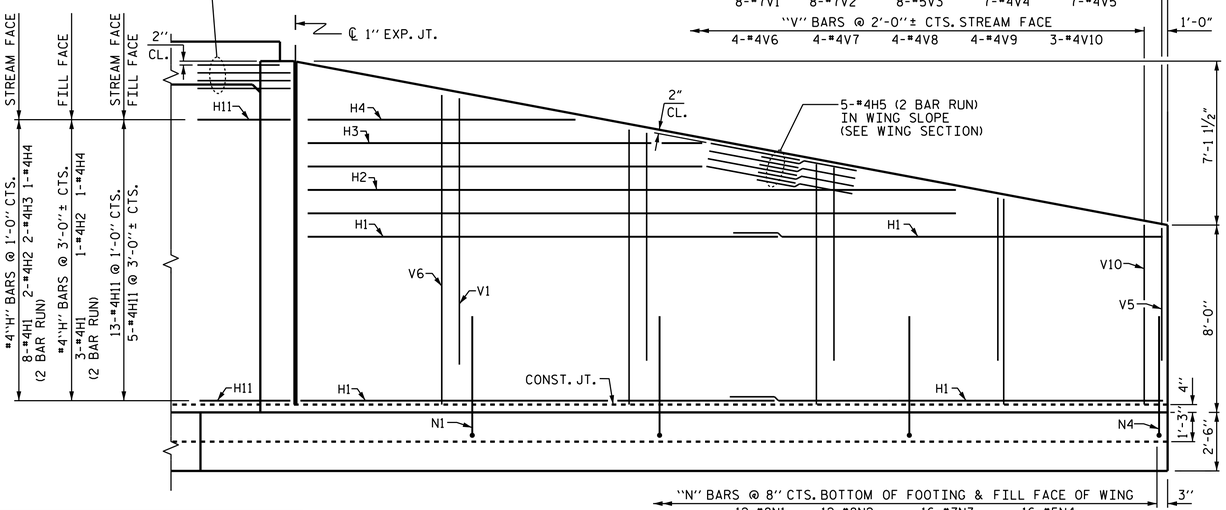


ALL BAR DIMENSIONS ARE OUT TO OUT.

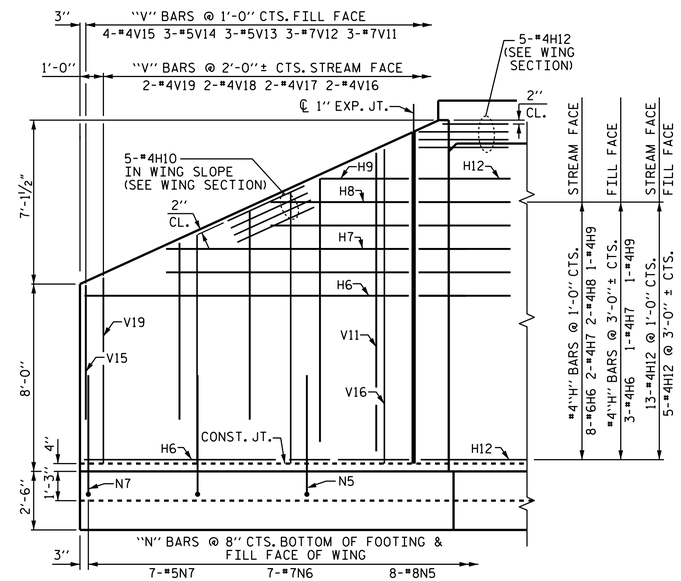
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	44	#4	STR	19'- 2"	563
H2	6	#4	STR	27'- 0"	108
H3	4	#4	STR	17'- 2"	46
H4	4	#4	STR	11'- 8"	31
H5	20	#4	STR	19'- 2"	256
H6	22	#4	STR	13'-10"	203
H7	6	#4	STR	10'- 4"	41
H8	4	#4	STR	5'-10"	16
H9	4	#4	STR	3'- 7"	10
H10	10	#4	STR	14'- 7"	97
H11	46	#4	2	3'- 3"	100
H12	46	#4	1	3'- 3"	100
N1	24	#8	4	7'- 5"	475
N2	24	#8	4	7'- 3"	465
N3	32	#7	4	6'-11"	452
N4	32	#5	4	6'- 8"	223
N5	16	#8	4	7'- 3"	310
N6	14	#7	4	7'- 0"	200
N7	14	#5	4	6'- 8"	97
S1	12	#6	STR	6'- 0"	108
T1	16	#4	STR	20'- 3"	216
T2	8	#4	STR	15'- 9"	84
V1	16	#7	STR	12'- 3"	401
V2	16	#7	STR	10'- 9"	352
V3	16	#5	STR	8'- 3"	138
V4	14	#4	STR	6'- 9"	63
V5	14	#4	STR	5'- 6"	51
V6	8	#4	STR	13'- 3"	71
V7	8	#4	STR	11'- 9"	63
V8	8	#4	STR	10'- 3"	55
V9	8	#4	STR	8'- 9"	47
V10	6	#4	STR	7'- 6"	30
V11	6	#7	STR	12'- 9"	156
V12	6	#7	STR	11'- 3"	138
V13	6	#5	STR	9'- 0"	56
V14	6	#5	STR	7'- 9"	48
V15	8	#4	STR	5'- 9"	31
V16	4	#4	STR	12'- 9"	34
V17	4	#4	STR	11'- 6"	31
V18	4	#4	STR	10'- 0"	27
V19	4	#4	STR	8'- 0"	21
Z1	24	#9	3	8'- 3"	673
Z2	24	#9	3	7'- 6"	612
Z3	32	#7	3	6'- 2"	403
Z4	32	#6	3	5'- 1"	244
Z5	8	#9	3	9'- 3"	252
Z6	8	#9	3	8'- 5"	229
Z7	14	#7	3	6'- 8"	191
Z8	14	#6	3	5'- 1"	107

REINFORCING STEEL	8,725	LBS.
CLASS A CONCRETE		
4 WINGS	87.8	C.Y.
2 CURTAIN WALLS (STAGE I)	4.4	C.Y.
2 HEADWALLS (STAGE II)	5.1	C.Y.
2 CURTAIN WALLS (STAGE II)	1.5	C.Y.
TOTAL	98.8	C.Y.



ELEVATION W1



ELEVATION W2

STATE OF NORTH CAROLINA
PROFESSIONAL SEAL 29048 ENGINEER RAMAN P. PATEL

DocuSigned by: Raman Patel 60F537B5DA1E493... 8/31/2016

PROJECT NO. B-5928
RANDOLPH COUNTY
STATION: 15+73.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR SINGLE BARREL CONCRETE BOX CULVERT

HEIGHT=14' SLOPE=2:1
135° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY :	H. B. DESAI	DATE :	6-30-16
CHECKED BY :	H. P. KIM	DATE :	8-10-16
DRAWN BY :	DAN PLATICA	DATE :	4/2005
CHECKED BY :	D. V. JOYNER	DATE :	5/2005

31-AUG-2016 10:12
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STD. NO. CW4514

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM
17-AUG-2016 14:00
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jahawk