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

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.14.R.1		PE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HAYWOOD COUNTY

LOCATION: BRIDGE NO. 368 ON SR 1863 OVER GARDEN CREEK

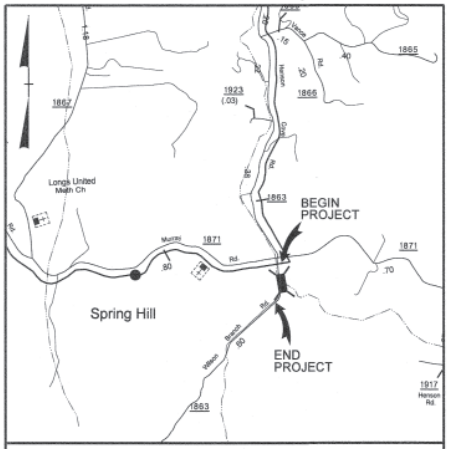
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNING, AND STRUCTURE

PROJECT: 17BP.14.R.1

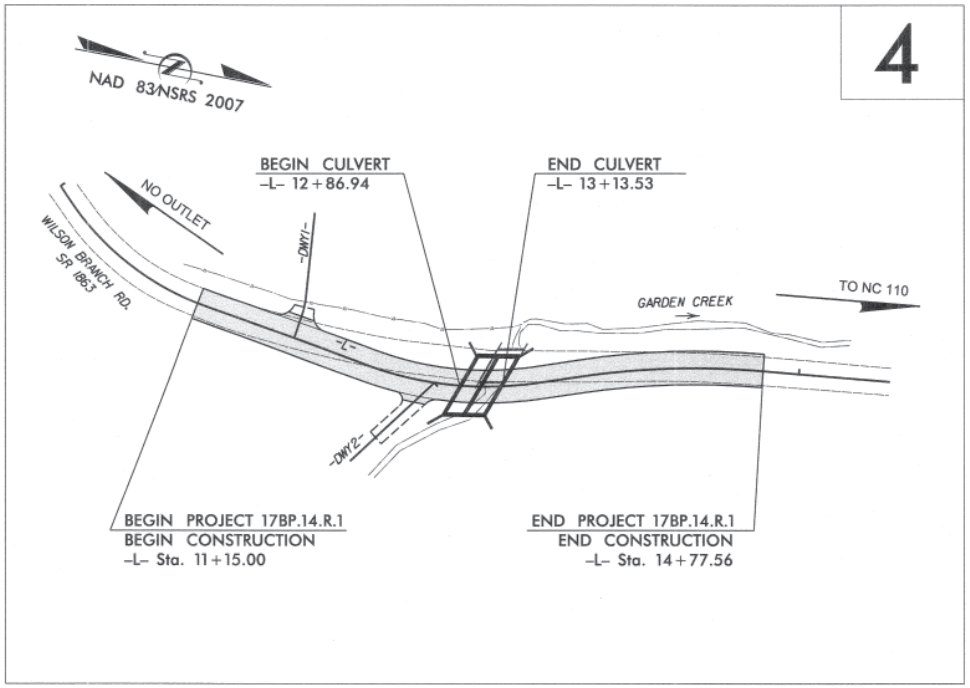
CONTRACT: DN00135

FINAL PLANS

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



VICINITY MAP NTS



NCDOT CONTACT:
JOSH DEYTON, PE
HIGHWAY DIVISION 14
BRIDGE MANAGER

GRAPHIC SCALES

20 10 0 20 40 — PLANS
20 10 0 20 40 — PROFILE (HORIZONTAL)
4 2 0 4 8 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 520
ADT =
DHV = %
D = %
T = % *
V = 35 MPH
* TTST = DUAL
FUNC CLASS = LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT	=	0.064 MILES
LENGTH STRUCTURES PROJECT	=	0.005 MILES
TOTAL LENGTH PROJECT	=	0.069 MILES

Prepared in the Office of:
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605
License No.: F-0840

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 19, 2013

LETTING DATE:
FEBRUARY 25, 2014

DEAN HATFIELD, PE
PROJECT ENGINEER

WILLIAM TILLITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.
NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER WALTER ROBERTS

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E. 1-21-14
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER D. HARRELD

1-21-14

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
3	SUMMARY OF QUANTITIES
3A	SUMMARIES OF EARTHWORK, GUARDRAIL & SUMMARY OF DRAINAGE QUANTITIES
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
X-1 THRU X-10	CROSS-SECTIONS
C-1 THRU C-8	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11/01/11

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

HAYWOOD ELECTRIC MEMBERSHIP CORP. & AT&T COMMUNICATION

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT IN ACCORDANCE WITH SECTION 801 OF THE 2012 NORTH CAROLINA STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES

ROADWAY ENGLISH STANDARD DRAWINGS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- 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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access — 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 HW

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	1C
Location and Surveys	

SURVEY CONTROL SHEET 43-0368

-FINAL-

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	653657.0700	855857.4230	2748.80	11+03.43	11.38 RT
2	BL-2	653911.7370	855855.1740	2742.49	13+57.46	6.12 RT
3	BL-3	654059.5653	855831.3265	2740.28	15+09.43	11.74 RT

****
BM1 ELEVATION = 2745.47
N 653814 E 855929
L STATION 12+60.00 61 RIGHT
6 INCH SPIKE SET IN BASE OF 36 INCH
POPLAR TREE
****

-FINAL- ROW MARKER IRON PIN AND CAP-E

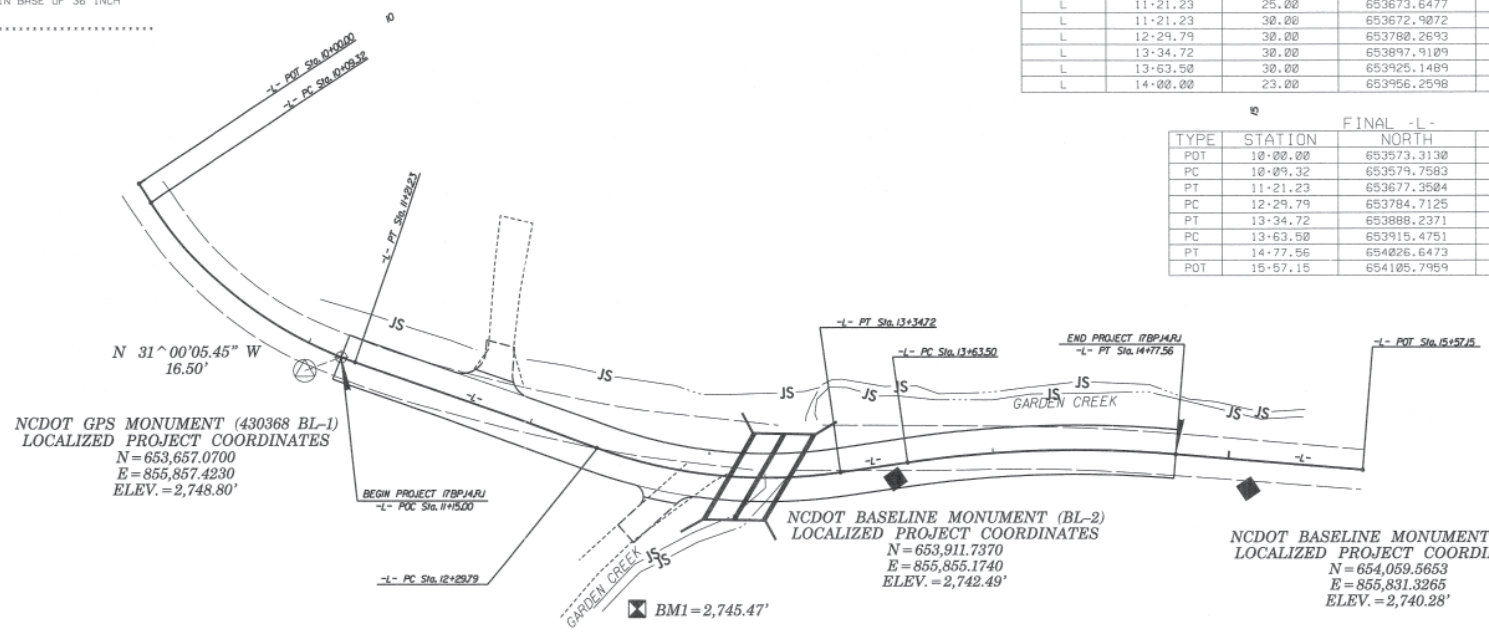
ALIGN	STATION	OFFSET	NORTH	EAST
L	11+21.23	25.00	653673.6477	855874.6857
L	11+21.23	30.00	653672.9072	855879.6306
L	12+29.79	30.00	653780.2693	855895.7090
L	13+34.72	30.00	653897.9109	855885.1121
L	13+63.50	30.00	653925.1489	855875.8333
L	14+00.00	23.00	653956.2598	855859.1577

-FINAL- ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+21.23	25.00	653673.6477	855874.6857
L	11+21.23	30.00	653672.9072	855879.6306
L	12+29.79	30.00	653780.2693	855895.7090
L	13+34.72	30.00	653897.9109	855885.1121
L	13+63.50	30.00	653925.1489	855875.8333
L	14+00.00	23.00	653956.2598	855859.1577

FINAL -L-

TYPE	STATION	NORTH	EAST
POT	10+00.00	653573.3130	855792.6973
PC	10+09.32	653579.7583	855799.4265
PT	11+21.23	653677.3504	855849.9615
PC	12+29.79	653784.7125	855866.0399
PT	13+34.72	653888.2371	855856.7146
PC	13+63.50	653915.4751	855847.4358
PT	14+77.56	654026.6473	855822.9842
POT	15+57.15	654105.7959	855814.6698



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "430368 (BL-1)
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 653657.0700(ft) EASTING: 855857.4230(ft)
ELEVATION: 2748.80(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999754121
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"430368 (BL-1) TO -L- STATION 11+15.00 IS
N 31°00'05.45 W 16.50'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GEOID MODEL - G09NC
NOTE: DRAWING NOT TO SCALE

NOTES:

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
430368_LS_CONTROL.TXT

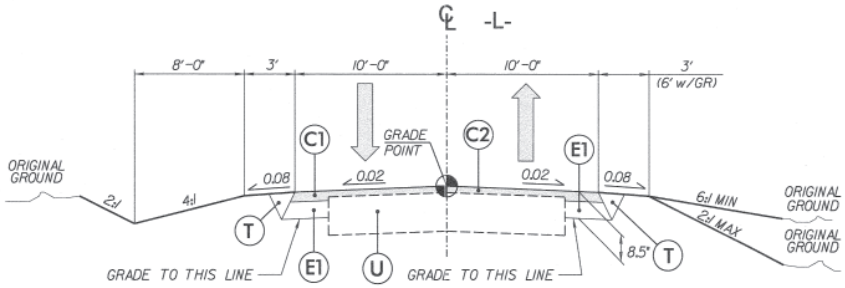
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

6/2/99

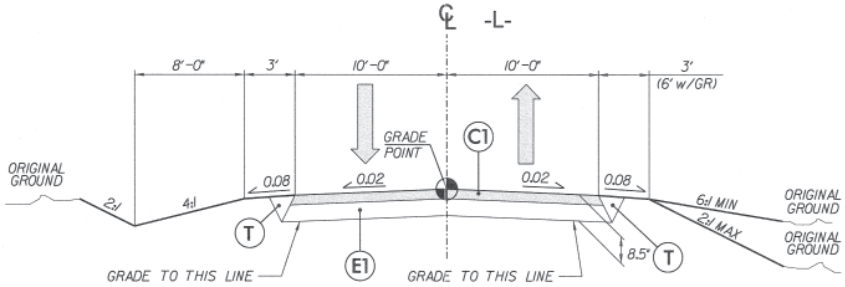
N.T.S

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER R. AN DUNCAN JR.	NORTH CAROLINA PROFESSIONAL SEAL 14008 ENGINEER MARK A. ROSTER
REGISTERED ENGINEER 1-21-14	REGISTERED ENGINEER 1-21-14



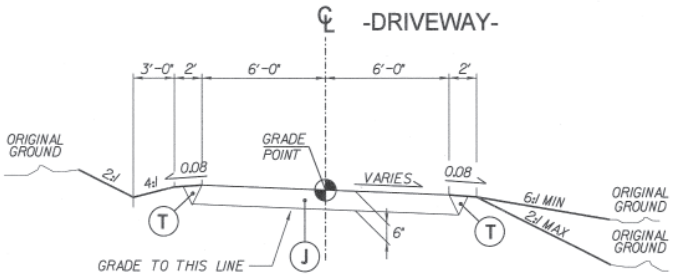
TYPICAL SECTION No. 1

–L– STA 11+15.00 TO –L– STA 12+00.00
–L– STA 13+50.00 TO –L– STA 14+77.56



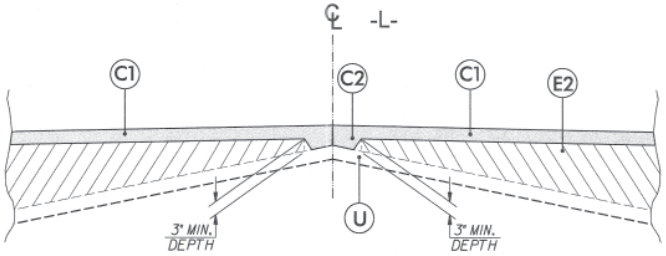
TYPICAL SECTION No. 2

–L– STA 12+00.00 TO –L– STA 13+50.00



TYPICAL SECTION No. 3

–DWY1– STA 10+10.00 TO –DWY1– STA 10+20.00
–DWY2– STA 10+12.67 TO –DWY2– STA 10+50.00



DETAIL SHOWING METHOD OF WEDGING

Note: Pavement edge slopes are 1:1 unless shown otherwise.

PAVEMENT SCHEDULE	
ITEM	DESCRIPTION
C1	Prop. Approx 3.0" Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 168 lbs. Per sq. yard in each of two layers.
C2	Prop. Var. Depth Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 112 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 1.5" or greater than 2" in depth.
E1	Prop. Approx 5.5" Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 627 lbs. Per sq. yard.
E2	Prop. Var. Depth Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 114 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 4" or greater than 5.5" in depth.
J	6" ABC
T	Earth Material
U	Existing Pavement
W	Var. Depth Asphalt Pavement

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

Line Item	Des	See No.	Description	Quantity	Unit
1	0000100000-N	800	MOBILIZATION	1	LS
2	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS
3	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB-BING	1	ACR
4	0036000000-E	225	UNDERCUT EXCAVATION	50	CY
5	0043000000-N	226	GRADING	1	LS
-	-	200	CLEARING & GRUBBING (1 Acres)	1	LS
-	-	225	UNCLASSIFIED EXCAVATION	175	CY
-	-	500	FINE GRADING (420 SY)	1	LS
9	0195000000-E	265	SELECT GRANULAR MATERIAL	50	CY
10	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	50	SY
11	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL MINOR STRUCTURES	10	TON
12	0320000000-E	300	FOUNDATION CONDITIONING FABRIC	10	SY
13	0335300000-E	305	18" DRAINAGE PIPE	28	LF
14	0995300000-E	340	PIPE REMOVAL	35	LF
15	1121000000-E	520	AGGREGATE BASE COURSE	18	TON
16	1220000000-E	545	INCIDENTAL STONE BASE	50	TON
17	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	180	TON
18	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	130	TON
19	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	20	TON
20	3030000000-E	862	STEEL BM GUARDRAIL	162.5	LF
21	3045000000-E	862	STEEL BM GUARDRAIL, SHOP CURVED	25	LF
22	3165000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350 TL-2	2	EA
23	3195300000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	2	EA
24	3572000000-E	867	CHAIN LINK FENCE RESET	100	LF
25	3628000000-E	876	RIP RAP, CLASS I	22	TON
26	3649000000-E	876	RIP RAP, CLASS B	15	TON
27	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	130	SY
28	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	124	SF
29	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	20	SF
30	4430000000-N	1130	DRUMS	27	EA
31	4445000000-E	1145	BARRICADES (TYPE III)	32	LF
32	4450000000-E	1150	FLAGGER	48	HR
33	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	2	EA
34	4485000000-E	1170	PORTABLE CONCRETE BARRIER	100	LF
35	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	30	LF
36	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	2,960	LF
37	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	24	LF
38	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	24	LF
39	6000000000-E	1605	TEMPORARY SILT FENCE	345	LF
40	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	50	TON
41	6012000000-E	1610	SEDIMENT CONTROL STONE	35	TON
42	6015000000-E	1615	TEMPORARY MULCHING	0.5	ACR
43	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	50	LB
44	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	0.25	TON
45	6036000000-E	1631	MATTING FOR EROSION CONTROL	1,790	SY
46	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	55	SY
47	6042000000-E	1632	1/4" HARDWARE CLOTH	15	LF
48	6070000000-N	1639	SPECIAL STILLLING BASIN (10 X 15)	1	EA
49	6071010000-E	SP	WATTLE	25	LF
50	6071020000-E	SP	POLYACRYLAMIDE (PAM)	15	LB
51	6084000000-E	1660	SEEDING & MULCHING	0.6	ACR
52	6090000000-E	1661	SEED FOR REPAIR SEEDING	50	LB
53	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25	TON
54	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	50	LB
55	6108000000-E	1665	FERTILIZER TOPDRESSING	0.50	TON
56	6111000000-E	SP	IMPERVIOUS DIKE	245	LF
57	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	9	EA
58	7980000000-N	SP	GENERIC SIGNAL ITEM - TEMP. TRAFFIC SIGNAL SYSTEM	1	EA
			STRUCTURES		
58	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION -L- 13+22.20	1	LS
59	8126000000-N	414	CULVERT EXCAVATION, STATION -L- 13+22.20	1	LS
60	8133000000-E	414	FOUNDATION CONDITIONING MATER-IAL, BOX CULVERT	77	TON
61	8196000000-E	420	CLASS A CONCRETE (CULVERT)	103.4	CY
62	8245000000-E	425	REINFORCING STEEL (CULVERT)	28,650	LB
63	8594000000-E	876	RIP RAP, CLASS B	58	TON

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ4.RJ	3-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 16003 — DEAN D. HATFIELD — REGISTERED ENGINEER 1-21-14	SEAL 021… — WALTER ROBERTS — REGISTERED ENGINEER 1-22-14

0' 20' 40'

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350 TL-2	M-350	TYPE-III	CAT-1	VI MOD	B-77	AT-1	EA	G	NG				
-L-	12+00.00	13+75.00	LT	175'	-	-	-	-	3'	6'	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
-L-	12+62.50	13+37.50	RT	50'	25'	-	-	-	3'	6'	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			SUB-TOTAL	225'	25'										DEDUCTIONS FOR GUARDRAIL ANCHOR UNITS															
	DEDUCTIONS FOR GUARDRAIL ANCHOR UNITS			62.5'											TYPE GRAU 350 TL-2			2 @ 25' =		50'										
			TOTAL	162.5'											TYPE AT-1			2 @ 6.25' =		12.5'										
			SAY	162.5'	25'														TOTAL =	62.5'										

NOTE: INVERT ELEVATIONS INDICATED ARE FOR BID PURPOSES ONLY AND SHALL NOT BE USED FOR PROJECT CONSTRUCTION STAKEOUT.
SEE "STANDARDS SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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"	** R.C. PIPE (CLASS V)	*** R.C. PIPE CULVERTS, CONTRACTOR DESIGN	**** R.C. PIPE CULVERTS, CONTRACTOR DESIGN	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 TRASITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATE STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	TB G.D.I STD. 840.35	F.E.S. FLARED END SECTION STD	CONVERT TO MH	DRAINAGE PIPE 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
-L- 12+50	RT	0401			2742.42	2742.30																																									28																													35	remove existing driveway pipe (18" CMP)
SHEET TOTALS																																															28																													35	

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

SUMMARY OF EARTHWORK (IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 11+60.00	13+00.00	100	38	-	62
-L- 13+00.00	14+77.56	82	132	50	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
PROJECT TOTALS:		182	170	50	62
		-	-	-	-
-		-	-	-	-
WASTE IN LIEU OF BORROW		-	-	-50	-50
-		-	-	-	-
LOSS DUE TO CLEARING & GRUBBING		-10	-	-	-5
-		-	-	-	-
GRAND TOTALS:		172	170	0	7
-		-	-	-	-
SAY:		175	-	0	-

CONTINGENCY ITEMS
UNDERCUT EXCAVATION 50 CY
SELECT GRANULAR MATERIAL 50 CY
GEOTEXTILE FOR SOIL STABILIZATION 50 SY
INCIDENTAL STONE BASE 50 TON

Note: Approximate quantities only. Unclassified Excavation, Fine Grading, and Clearing and Grubbing will be paid for at the contract lump sum price for "Grading."

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — REGISTERED ENGINEER 1-21-14

HYDRAULICS ENGINEER — REGISTERED ENGINEER 1-22-14

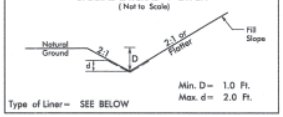
0' 20' 40'

NAD 83/NSRS 2007

-L- POT Sta. 10+00.00
-L- PC Sta. 10+09.32
10+00
15+00
-L- POT Sta. 15+57.15
N 46° 14' 04.7" E
CAROLYN SUE DUCKWORTH
LISA D. MASHBURN
DB 656 PG 268
-DWY1- POT Sta. 10+79.40
END CONSTRUCTION
-DWY1- POC Sta. 10+20.00
-L- PT Sta. 11+21.23
S 85° 17' 16.4" W
BEGIN CULVERT
-L- 12+86.94
C STA. 13+00.00 -L-
PROP. 2 @ 10' X 4' RCBC
GP. ELEV. 2745.08'
SKEW 120°
END CULVERT
-L- 13+13.53
-DWY1-
PT Sta. 10+26.38
-DWY1-
PC Sta. 10+14.83
N 81° 28' 57.9" W
PAVING LIMITS
R=10' (TYP.)
BEGIN
8 TONS CLASS I RIP RAP EST. 17 SY. FABRIC
4 TONS CLASS I RIP RAP EST. 8 SY. FABRIC
-L- PT Sta. 13+34.72
TAMMY GALLOWAY HASH
DB 693 PG 2214
MELISSA LINDSEY
DB 590 PG 1357
DO NOT DISTRUB CREEK
PASTURE
END PROJECT 17BP.14.R.1
-L- PT Sta. 14+77.56
GARDEN CREEK
EXISTING R/W
SR 1863 18' BST
-L-
N 81° 31' 02.5" E
TYPE TL-2
16.5' Typ.
20'
N 18° 48' 42.2" W
N 5° 59' 48.8" W
RETAIN
18" CMP
BEGIN PROJECT 17BP.14.R.1
-L- POC Sta. 11+15.00
+21.23 -L- EXIST R/W 30' RT
+21.23 -L- 35.00 RT
-DWY1- POT Sta. 10+00.00 =
-L- POT Sta. 11+79.07
SPECIAL LATERAL "V" DITCH DETAIL "A"
+75.00 -L- 60.00 RT
+29.79 -L- 30' RT
KENNETH HENSON
DB 678 PG 909
-L- PC Sta. 12+29.79
-DWY2- POT Sta. 10+71.71
+40.00 -L- 60.00 RT
S 53° 18' 21.2" E
-DWY2-
PAVING LIMITS
R=5'
REMOVE 18" CMP
AT-1
PDE
+63.40 -L- 30.00 RT
+80.00 -L- 40.00 RT
+60.86 -L- 35.00 RT
2 TONS CLASS B RIP-RAP EST. 7 SY. FABRIC
GARDEN CREEK
PASTURE
CHARLES EDWARD LOWE
DB 791 PG 1893
10 TONS CLASS I RIP RAP EST. 25 SY. FABRIC
20' MIN. FROM PL
12.3' Typ.
+34.72 -L- 30' RT
SPECIAL LATERAL "V" DITCH DETAIL "A"
+63.50 -L- 30' RT
+00.00 -L- EXIST R/W
DO NOT DISTURB FENCE
REMOVE AND RESET FENCE
-L- PC Sta. 13+63.50
SUSAN LEE JOINER
DB 429 PG 697
HTR
JILL M. BAKER
LORRIE J. REECE
DB 620 PG 1774
END CONSTRUCTION
-DWY2- POT Sta. 10+50.00
BM#1
-BL- STA. 6+56.36
73' LEFT
ELEV.=2,745.47'
-DWY2- POT Sta. 10+00.00 =
-L- POC Sta. 11+79.07

DETAIL A

SPECIAL LATERAL "V" DITCH
(Not to Scale)

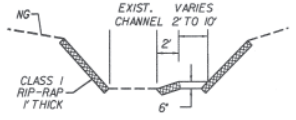


Min. D= 1.0 Ft.
Max. d= 2.0 Ft.

Type of Liner= SEE BELOW

FROM -L- STA. 11+20 TO -L- STA. 11+90 RT (MATTING)
FROM -L- STA. 11+90 TO -L STA. 12+45 RT (PSRM)
FROM -L- STA. 13+30 TO -L STA. 13+60 RT (N/A)
FROM -L- STA. 13+60 TO -L STA. 14+80 RT (MATTING)

FLOOD PLAIN BENCH DETAIL N.T.S.



LOOKING DOWNSTREAM

CURVE DATA FOR -L-			CURVE DATA FOR -DWY1-
PI Sta 10+67.39	PI Sta 12+83.27	PI Sta 14+20.77	PI Sta 10+20.63
Δ = 37° 43' 02.6" (LT)	Δ = 27° 19' 44.3" (LT)	Δ = 12° 48' 53.4" (RT)	Δ = 13° 13' 45.7" (LT)
D = 33° 42' 12.2"	D = 26° 02' 36.7"	D = 11° 14' 04.1"	D = 114° 35' 29.6"
L = 111.91'	L = 104.94'	L = 114.07'	L = 11.54'
T = 58.07'	T = 53.49'	T = 57.27'	T = 5.80'
R = 170.00'	R = 220.00'	R = 510.00'	R = 50.00'
Se = Exist.	Se = 0.03	Se = 0.02	

SEE SHEET 5 FOR PROFILE
SEE SHEETS C1-C8 FOR CULVERT PLANS

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

REVISIONS

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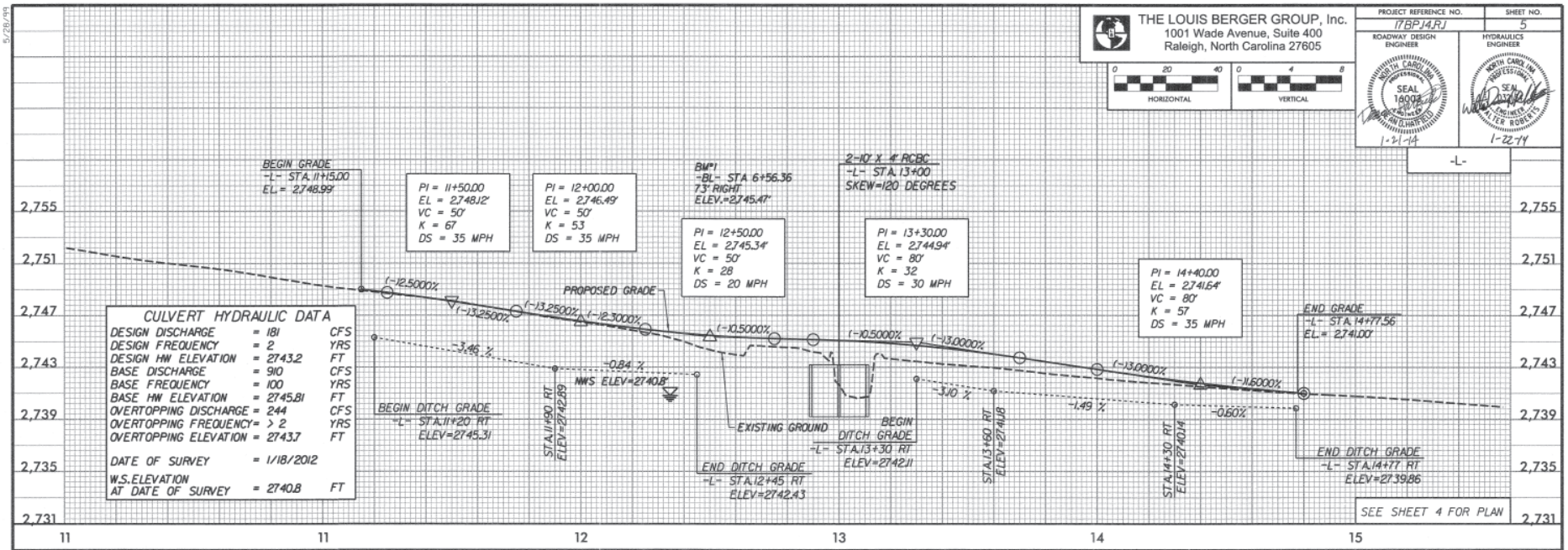
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

PROJECT REFERENCE NO.	SHEET NO.
17BP14.R.1	5

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER JOHN C. HAYNES III — 1-21-14

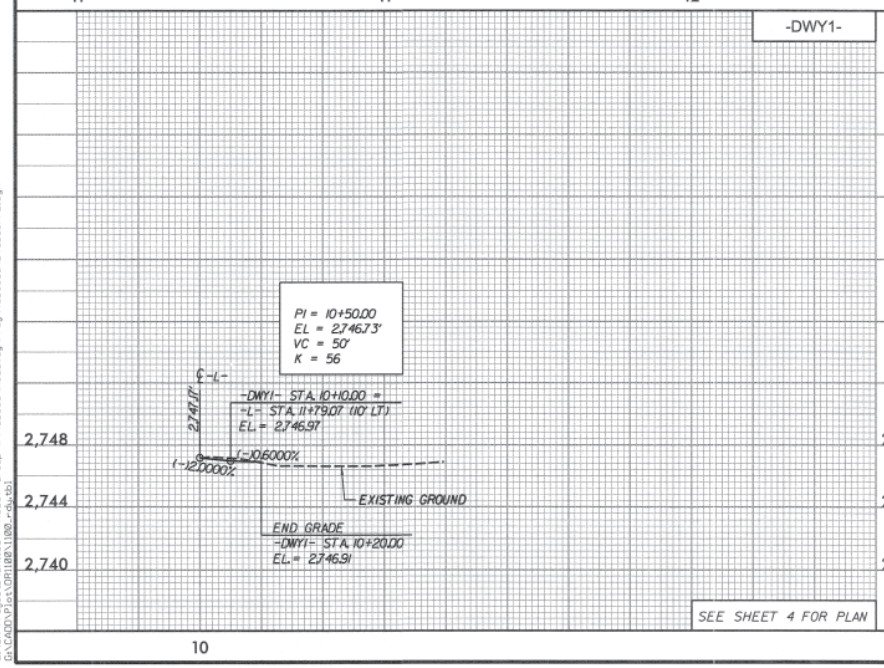
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER WALTER ROBERTS — 1-22-14

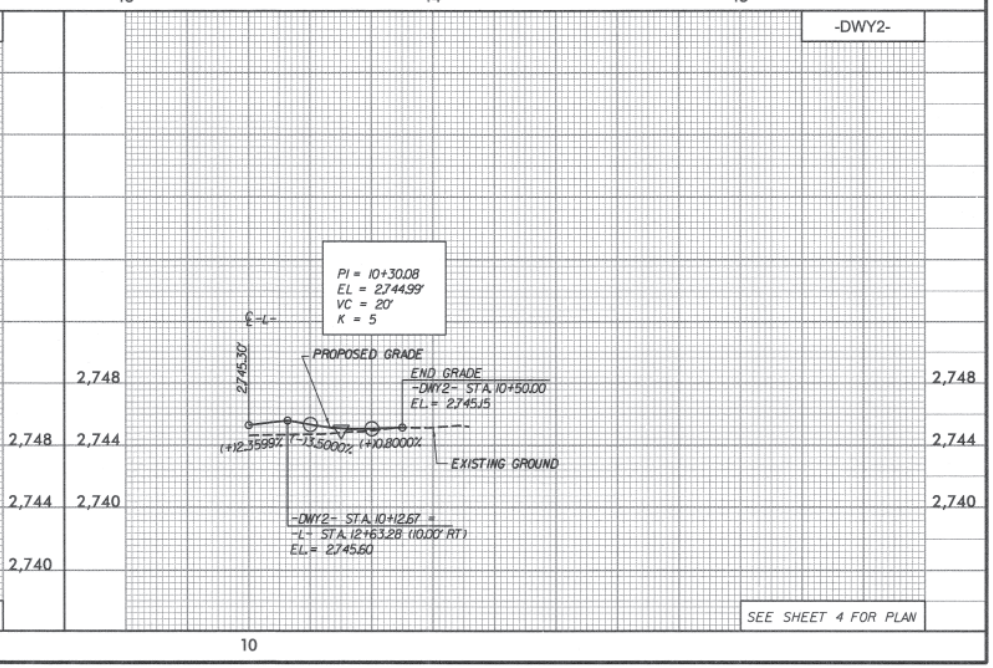
0 20 40 HORIZONTAL
0 4 8 VERTICAL



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 181	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 2743.2	FT
BASE DISCHARGE	= 910	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2745.81	FT
OVERTOPPING DISCHARGE	= 244	CFS
OVERTOPPING FREQUENCY	= > 2	YRS
OVERTOPPING ELEVATION	= 2743.7	FT
DATE OF SURVEY	= 1/18/2012	
W.S. ELEVATION AT DATE OF SURVEY	= 2740.8	FT





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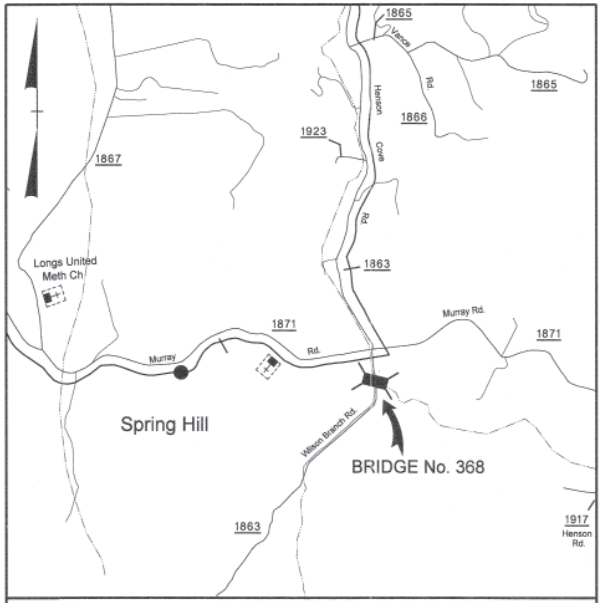
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HAYWOOD COUNTY



VICINITY MAP NTS

VICINITY MAP NTS

LOCATION: BRIDGE NO. 368 ON SR 1863 OVER GARDEN CREEK

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

SHEET NO.
TMP-1

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

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

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

J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
D. HATFIELD, P.E. TRAFFIC CONTROL PROJECT ENGINEER
C. WHITE, P. E. TRAFFIC CONTROL PROJECT DESIGN ENGINEER
_____ TRAFFIC CONTROL DESIGN ENGINEER

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

APPROVED: Dan Hatfield
DATE: 1-21-14

SEAL

PROJECT: 17BP.14.R.1

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

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUMS
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1170.01	PORTABLE CONCRETE BARRIER
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

DIRECTION OF TRAFFIC FLOW

NORTH ARROW

REMOVAL

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)

DRUM

TEMPORARY CRASH CUSHION

TEMPORARY SIGNING

STATIONARY SIGN

SIGNALS

T
E
M
P
TEMPORARY

TEMPORARY PAVEMENT MARKING

STOPBAR

P4 24" WHITE STOPBAR

APPROVED: [signature] DATE: 1-21-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HAYFIELD

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

ROADWAY STANDARD DRAWINGS & LEGEND

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

MANAGEMENT STRATEGIES

-DURING CONSTRUCTION, SR 1863 (WILSON BRANCH DR) TRAFFIC WILL BE PLACED IN A ONE LANE, TWO WAY PATTERN PER NCDOT.

-TEMPORARY SIGNALS AT THE BEGINNING AND END OF CONSTRUCTION WILL MANAGE SR 1863 TRAFFIC.

-THE CONSTRUCTION OF TIE INS, TRAFFIC SHIFTS, PLACEMENT OF FINAL SURFACE COURSE AND PAVEMENT MARKINGS WILL BE PERFORMED USING FLAGGERS FOR ONE LANE, TWO WAY TRAFFIC OPERATION.

GENERAL NOTES / LOCAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

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

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

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

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

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

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

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

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

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

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

TRAFFIC BARRIER

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

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

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

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

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

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

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

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

TRAFFIC CONTROL DEVICES

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

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

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

ROAD NAME	MARKING	MARKER
-L-	PAINT	NONE

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

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

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

MISCELLANEOUS

R) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 200 ft AND 400 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

APPROVED: Dean Debbie DATE: 1-21-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HARFIELD

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

TRANSPORTATION OPERATIONS PLAN

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PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.1	TMP-2

PROJECT PHASING

MAINTAIN ACCESS TO ALL RESIDENCES WITHIN THE PROJECT LIMITS.

PHASE I

STEP 1:
INSTALL ADVANCE WORK ZONE WARNING SIGNS USING RDWY STD 1101.01, SHEET 3 OF 3.

STEP 2:
USING RDWY STD 1101.02, SHEET 1 OF 15, COMPLETE THE FOLLOWING ON SR 1863 IN ONE WORK PERIOD:

- CONSTRUCT/INSTALL TEMPORARY TRAFFIC SIGNAL AND PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) AT THE BEGINNING AND END OF PROJECT.
- UTILIZE EXISTING PAVEMENT MARKINGS FOR A TEMPORARY ONE LANE, TWO WAY TRAFFIC PATTERN. REMOVE OR COVER EXISING DOUBLE YELLOW CENTER LINE IN LANE SHIFT AT THE BEGINNING AND END OF PROJECT. (SEE SHEET TMP-3).
- INSTALL ADDITIONAL SIGNS FOR TEMPORARY TRAFFIC SIGNAL AND TRAFFIC CONTROL DEVICES, ACTIVATE THE SIGNAL AND SHIFT TRAFFIC TO THE TEMPORARY ONE-LANE, TWO-WAY PATTERN AS SHOWN ON SHEET TMP-3.

STEP 3:
USING RDWY STD 1101.02, SHEET 1 OF 15, PERFORM THE FOLLOWING WORK ON SR 1863:

- CONSTRUCT PHASE 1 OF PROPOSED CULVERT. (SEE STRUCTURES PLANS)
- CONSTRUCT PHASE 1 OF PROPOSED ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -L- STA 11+95+/- TO -L- STA 14+00+/-, AND PROPOSED DRIVEWAY IMPROVEMENTS. (SEE SHEET TMP-3)

STEP 4:
IN ONE WORK PERIOD, PERFORM THE FOLLOWING WORK ON SR 1863:

- USING FLAGGERS, RDWY STD 1101.02, SHEET 1 OF 15, CONSTRUCT TIE INS FROM -L- STA 11+15+/- TO -L- STA 11+95+/- AND FROM -L- STA 14+00+/- TO -L- STA 14+80+/-.
- INSTALL PORTABLE CONCRETE BARRIER AND CRASH CUSHIONS FROM -L- STA 12+30+/- TO -L- STA 13+60+/-. (SEE SHEET TMP-4)
- RETAIN ADVANCE WORK ZONE SIGNS AND TEMPORARY TRAFFIC SIGNAL FROM PHASE 1 AND SWITCH TRAFFIC ONTO THE NEWLY CONSTRUCTED SECTION OF SR 1863 AT THE END OF THE WORK PERIOD.

PHASE II

STEP 1:
USING RDWY STD 1101.02, SHEET 1 OF 15, PERFORM THE FOLLOWING WORK ON SR 1863:

- REMOVE THE EXISTING BRIDGE IN ACCORDANCE WITH ROADWAY AND STRUCTURE PLANS.
- CONSTRUCT PHASE II OF PROPOSED CULVERT. (SEE STRUCTURE PLANS)
- CONSTRUCT PHASE II OF PROPOSED ROADWAY FROM -L- STA 11+30+/- TO -L- STA 14+45+/-, UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE, AND PROPOSED DRIVEWAY IMPROVEMENTS. (SEE SHEET TMP-4)

STEP 2:
USING FLAGGERS, RDWY STD 1101.02, SHEET 1 OF 15, IN ONE WORK PERIOD, REMOVE PORTABLE CONCRETE BARRIER AND CRASH CUSHIONS AND PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS ON PROPOSED -L- FROM STA 11+15+/- TO STA 14+80+/-. SHIFT TRAFFIC ONTO NEWLY CONSTRUCTED ROADWAY AND CULVERT IN A TWO LANE, TWO WAY PATTERN AT THE END OF THAT WORK PERIOD.

STEP 3:
USING FLAGGERS AS NECESSARY, COMPLETE REMOVAL OF ANY REMAINING ROADWAY AND STUCTURE. REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO THE FINAL TRAFFIC PATTERN.

APPROVED: Dean Hatfield DATE: 1-21-14

SEAL

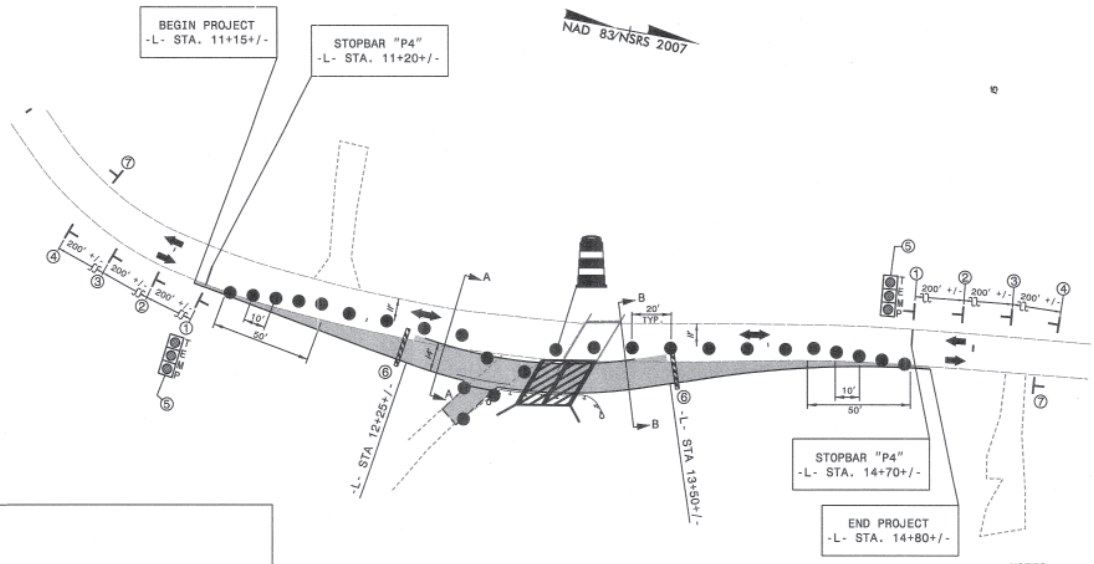
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

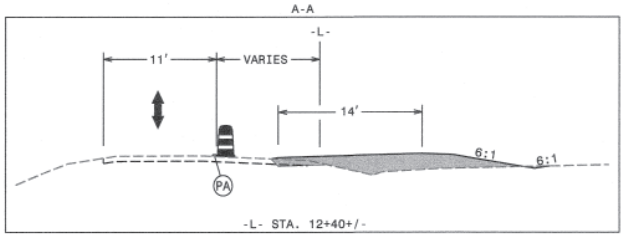
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

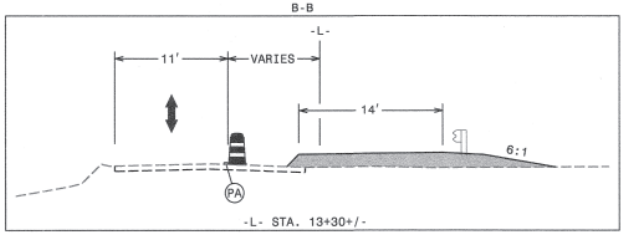
TEMPORARY TRAFFIC CONTROL PHASING

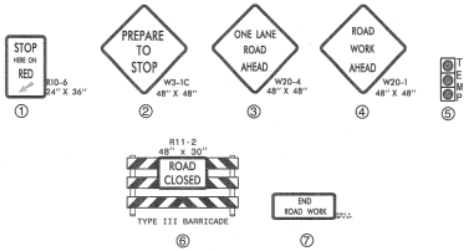
$$$$$$SYSTIME$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.1	TMP-3









NOTES:
1. FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-2.
2. ALL SIGN LOCATIONS ARE APPROXIMATE.
3. SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 FOR SIGNS 7 LOCATION AND APPLICABLE NOTES.

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

APPROVED: Dean Hatfield DATE: 1-31-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

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

TEMPORARY TRAFFIC CONTROL PHASE I

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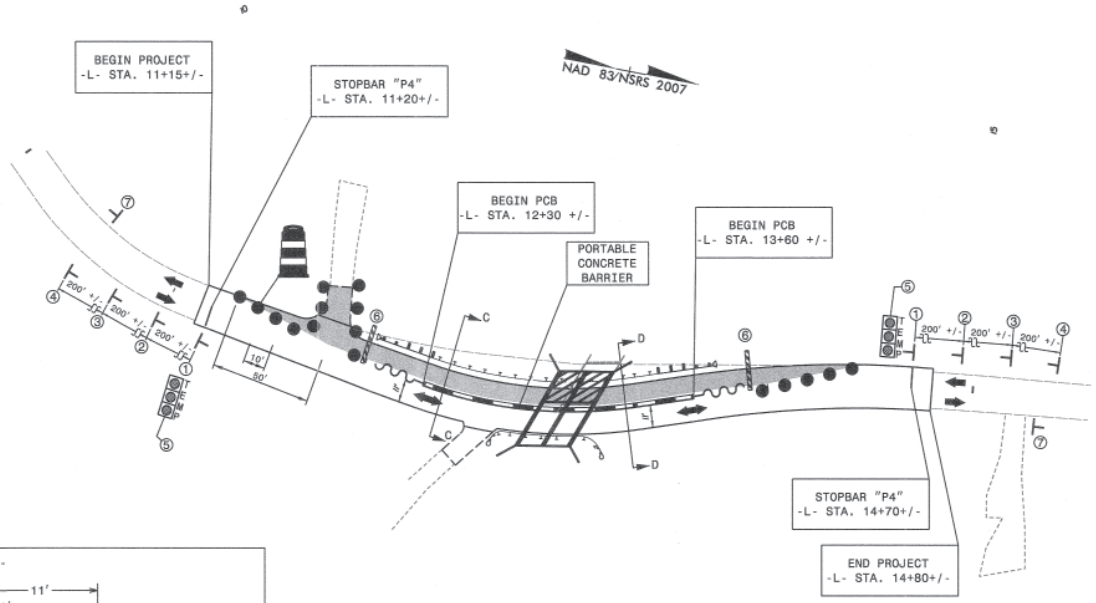
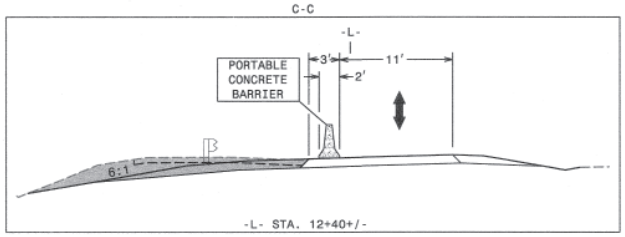
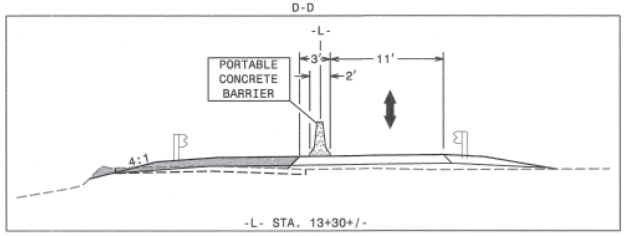
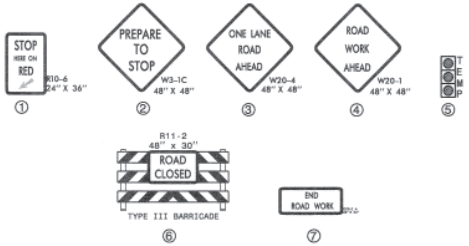
PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.1	TMP-4









NOTES:

1. FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-2
2. ALL SIGN LOCATIONS ARE APPROXIMATE.
3. SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 FOR SIGN 7 LOCATIONS AND APPLICABLE NOTES.
4. ALL PCB SECTIONS CROSSING CULVERT SHALL BE FULLY ANCHORED. SEE STRUCTURE PLANS FOR DETAIL.
5. ALL PCB SHALL BE DRAINAGE BARRIER.

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

APPROVED: Dean Hatfield DATE: 1-21-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

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

TEMPORARY TRAFFIC CONTROL PHASE II

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STATE	PROJECT NO.	SHEET NO.	TOTAL SHTS.
N.C.	17BP.14.R.1	PMP-1	2

APPROVED: Dean Hatfield
DATE: 1-21-14
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLANS

LOCATION: BRIDGE NO. 368 ON SR 1863 OVER GARDEN CREEK

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"- ROADWAY DESIGN 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. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS

PAVEMENT MARKING SCHEDULE

ASPHALT PAVEMENT DESIGN
(AS SHOWN)

PAVEMENT MARKING LINES

PA - PAINT - WHITE EDGELINE (4")
PI - PAINT - YELLOW DOUBLE CENTER LINE (4")

GENERAL NOTES

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

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

ASPHALT PAVEMENT DESIGN:

ROAD NAME	MARKING	MARKER
ALL	PAINT	NONE

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

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

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

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN COVER SHEET
PMP-2	PAVEMENT MARKING DETAIL

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

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STATE	PROJECT NO.	SHEET NO.	TOTAL SHTS.
N.C.	17BP.14.R.1	PMP-2	2

0' 20' 40'

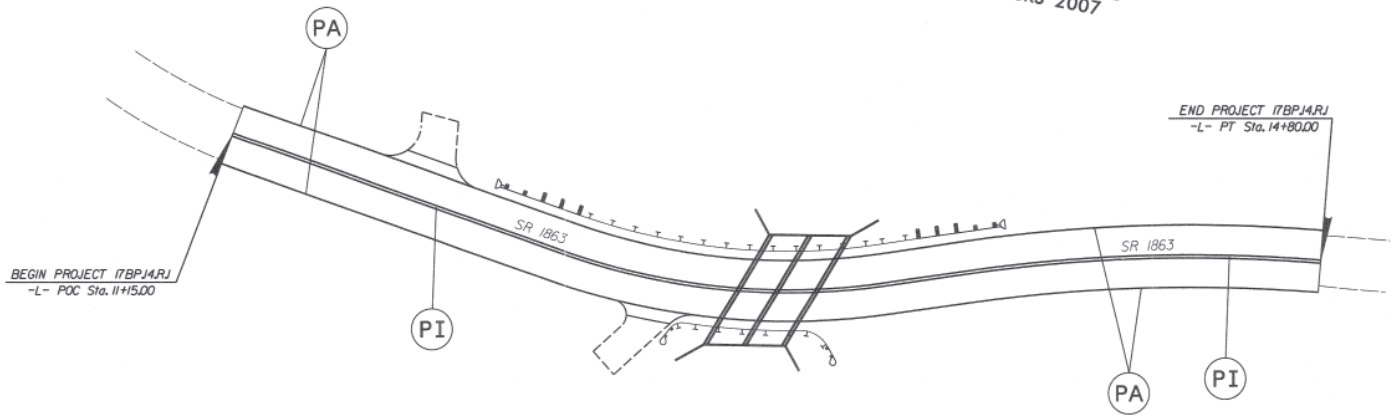
APPROVED: Dean Hatfield

DATE: 1-21-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

NAD 83/NSRS 2007



LEGEND

PA - PAINT - WHITE EDGELINE (4")

PI - PAINT - YELLOW DOUBLE CENTER LINE (4")

PAVEMENT MARKING DETAIL
WILSON BRANCH RD.

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	EC-01/CONST.04
R/W SHEET NO.	

0' 20' 40'

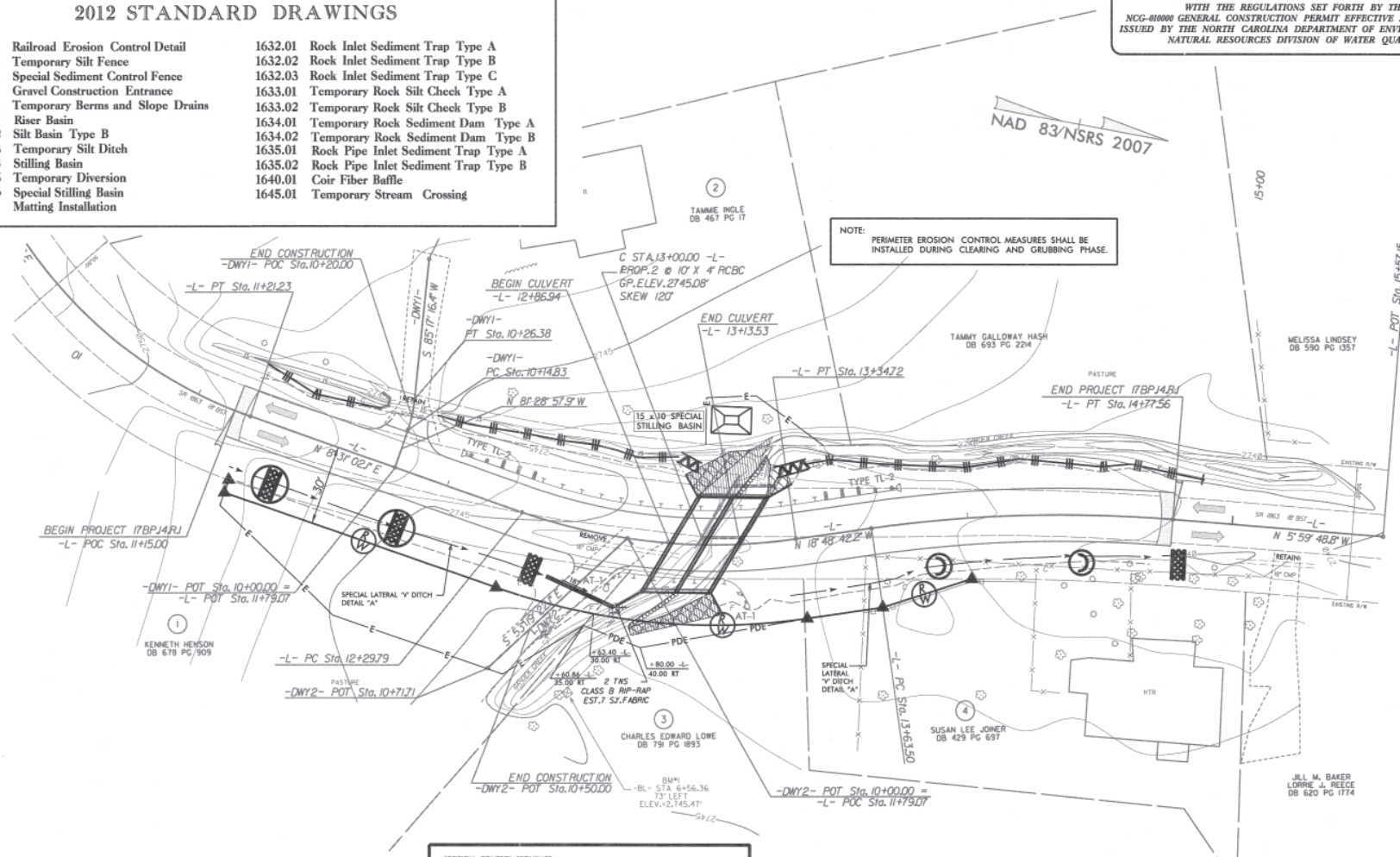
EROSION CONTROL PLANS

2012 STANDARD DRAWINGS

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

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

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



Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM	

EROSION CONTROL SEQUENCE:

1. INSTALL SPECIAL STILLING BASIN AND SILT FENCE FOR CULVERT CONSTRUCTION.
2. ONCE CULVERT CONSTRUCTION IS COMPLETE, REMOVE SPECIAL STILLING BASIN, GRADE SITE, AND CONSTRUCT ROADSIDE CHANNELS.

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

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

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

Rana Stansell, PE
LEVEL III A: Designer of Erosion and Sediment Control Plans
Certification Number: 635

SEE SHEET 5 FOR PROFILE

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	EC-02

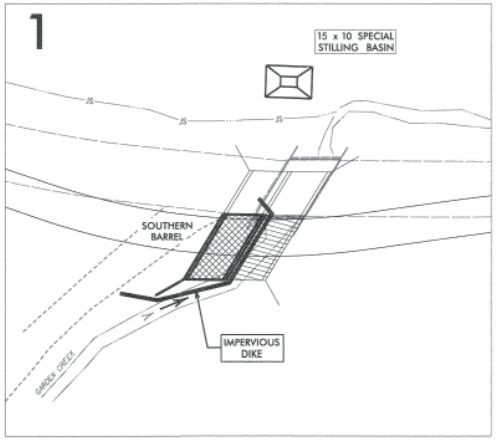
CULVERT CONSTRUCTION SEQUENCE STA. 13+00 -L-

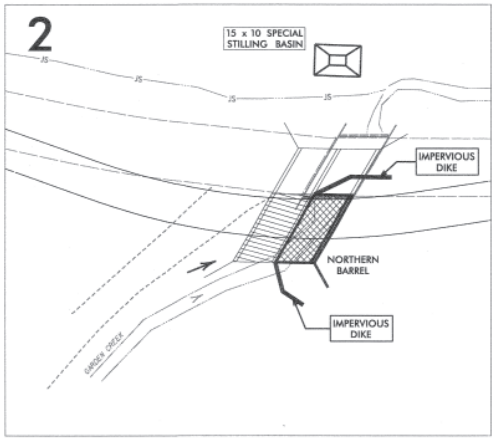
PHASE I

1. IN CONJUNCTION WITH ROADWAY CONSTRUCTION AND TRAFFIC CONTROL PHASING, THE UPSTREAM SOUTHERN SECTION OF CULVERT WILL BE INSTALLED AS FOLLOWS:
   a) INSTALL IMPERVIOUS DIKE UPSTREAM OF PROPOSED SOUTHERN BARREL LOCATION TO DIVERT FLOW AROUND AND BEYOND WORK AREA FOR INSTALLATION OF THAT BARREL
   b) DEWATER WORK AREA AND UTILIZE SPECIAL STILLING BASIN ON NORTH BANK FOR EROSION CONTROL PRIOR TO RETURNING WATER TO THE STREAM
   c) CONSTRUCT EASTERN PORTION OF SOUTHERN BARREL, WINGWALL, & BANK WORK THEN REMOVE DIKES ONCE AREA IS STABILIZED AND CONCRETE HAS CURED
2. IN CONJUNCTION WITH ROADWAY CONSTRUCTION AND TRAFFIC CONTROL PHASING, THE UPSTREAM NORTHERN SECTION OF CULVERT WILL BE INSTALLED AS FOLLOWS:
   a) INSTALL IMPERVIOUS DIKE UPSTREAM OF PROPOSED NORTHERN BARREL LOCATION TO DIVERT FLOW THROUGH THE NEWLY CONSTRUCTED SOUTHERN BARREL
   b) DEWATER WORK AREA AND UTILIZE SPECIAL STILLING BASIN ON NORTH BANK FOR EROSION CONTROL PRIOR TO RETURNING WATER TO THE STREAM
   c) CONSTRUCT EASTERN PORTION OF NORTHERN BARREL, WINGWALL, & BANK WORK THEN REMOVE DIKES ONCE AREA IS STABILIZED AND CONCRETE HAS CURED

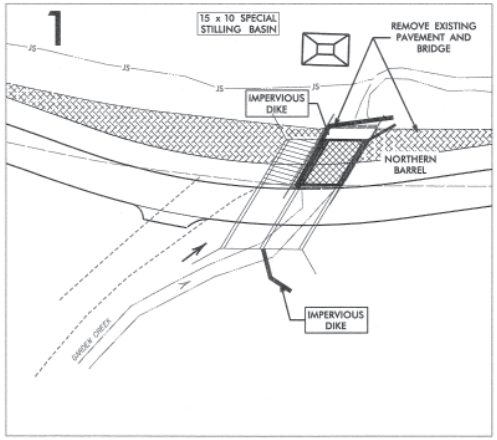
PHASE II

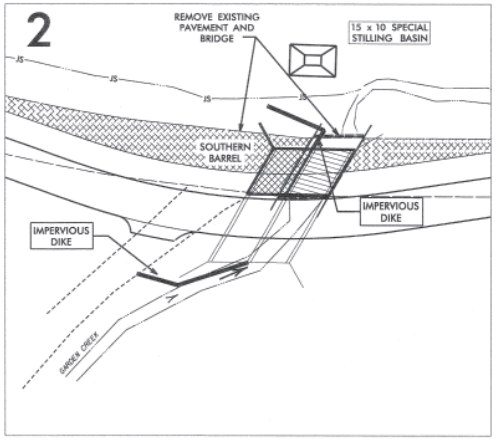
1. IN CONJUNCTION WITH ROADWAY CONSTRUCTION AND TRAFFIC CONTROL PHASING, THE DOWNSTREAM NORTHERN SECTION OF CULVERT WILL BE INSTALLED AS FOLLOWS:
   a) INSTALL IMPERVIOUS DIKE AT THE INLET OF THE NORTHERN BARREL CONSTRUCTED IN PHASE I & DIKE DOWNSTREAM AREA AS NEEDED TO DIVERT FLOW AROUND WORK AREA
   b) DEWATER WORK AREA AND UTILIZE SPECIAL STILLING BASIN ON NORTH BANK FOR EROSION CONTROL PRIOR TO RETURNING WATER TO THE STREAM
   c) CONSTRUCT WESTERN PORTION OF NORTHERN BARREL, WINGWALL, & BANK WORK THEN REMOVE DIKES ONCE AREA IS STABILIZED AND CONCRETE HAS CURED
2. IN CONJUNCTION WITH ROADWAY CONSTRUCTION AND TRAFFIC CONTROL PHASING, THE DOWNSTREAM SOUTHERN SECTION OF CULVERT WILL BE INSTALLED AS FOLLOWS:
   a) INSTALL IMPERVIOUS DIKE AT INLET OF SOUTHERN BARREL CONSTRUCTED IN PHASE I TO DIVERT FLOW THROUGH THE NEWLY CONSTRUCTED NORTHERN BARREL
   b) DEWATER WORK AREA AND UTILIZE SPECIAL STILLING BASIN ON NORTH BANK FOR EROSION CONTROL PRIOR TO RETURNING WATER TO THE STREAM
   c) CONSTRUCT WESTERN PORTION OF SOUTHERN BARREL, WINGWALL & BANK WORK THEN REMOVE DIKES ONCE AREA IS STABILIZED AND CONCRETE HAS CURED





NAD 83/NSRS 2007 NC GRID





NAD 83/NSRS 2007 NC GRID

Impervious Dike:

The work covered by this section consists of furnishing, installing, maintaining, and removing an impervious dike for the purpose of diverting normal stream flow around the construction site. The Contractor shall construct an impervious dike in such a manner approved by the Engineer. The impervious dike shall not permit seepage of water into the construction site or contribute to siltation of the stream. The impervious dike shall be constructed of an acceptable material in the locations noted on the plans or as directed by the Engineer.

Acceptable materials shall include but not be limited to sheet piles, sandbags, and/or the placement of an acceptable size stone lined with polypropylene or other impervious fabric.

Earth material shall not be used to construct an impervious dike when it is in direct contact with the stream unless vegetation can be established before contact with the stream takes place.

No direct payment shall be made for the work of installation, maintenance, and removal of impervious dike(s) as described in this provision.

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

REVISIONS

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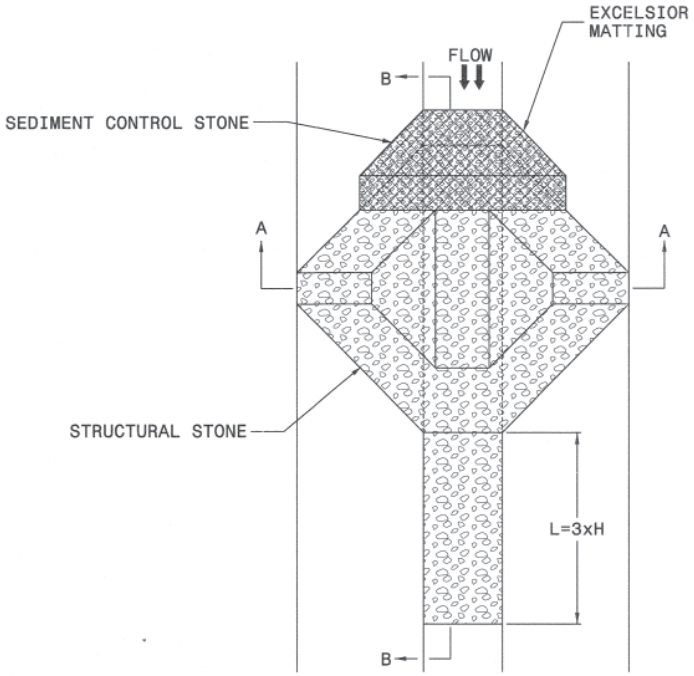
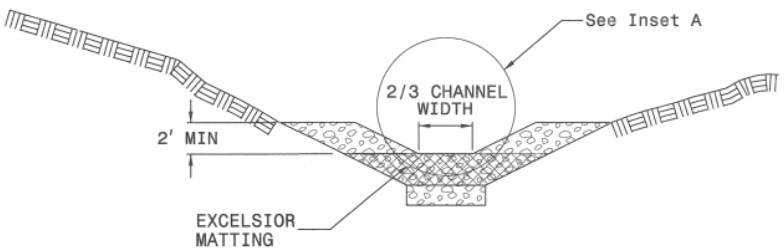
PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	EC-03

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



PLAN



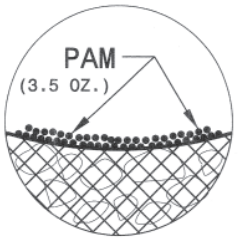
SECTION A-A

NOTES

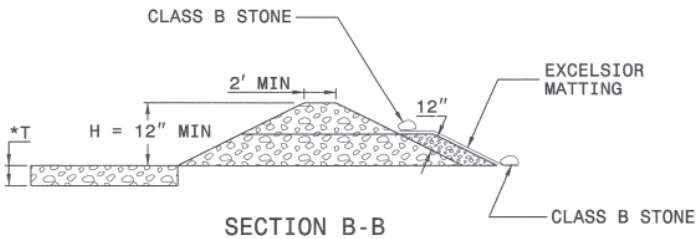
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A



SECTION B-B

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

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ROADWAY PLANS

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.1	EC-04

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HOW) 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 HOW ZONES.

REVISIONS

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ROADWAY PLANS

PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.1	X-1

17BP.14.R.1
CROSS SECTIONS

INDEX OF SHEETS

TITLE	STATION	SHEET NO.
CROSS-SECTION INDEX		X-1
CROSS-SECTION SUMMARY		X-1A
-L- CROSS-SECTIONS	11+20 - 14+90	X-2 THROUGH X-10

NOTE: Approximate quantities only. Unclassified Excavation, Fine Grading, and Clearing and Grubbing will be paid for at the contract lump sum price for "Grading".

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+20.00	0	0
11+30.00	6	2
11+40.00	6	2
11+50.00	5	2
11+60.00	6	3
11+70.00	7	3
11+80.00	10	3
11+90.00	10	4
12+00.00	10	4
12+10.00	13	4
12+20.00	13	3
12+30.00	14	4
12+40.00	14	4
12+50.00	12	4
12+60.00	8	3
12+70.00	8	1
12+80.00	6	2
12+90.00	5	10
13+00.00	3	22
13+10.00	1	26
13+20.00	1	22
13+30.00	3	11
13+40.00	3	4
13+50.00	2	5
13+60.00	1	4
13+70.00	2	2
13+80.00	2	1
13+90.00	2	1
14+00.00	3	1
14+10.00	3	0
14+20.00	3	0
14+30.00	3	0
14+40.00	4	0
14+50.00	7	0
14+60.00	5	0
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14+80.00	2	0

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
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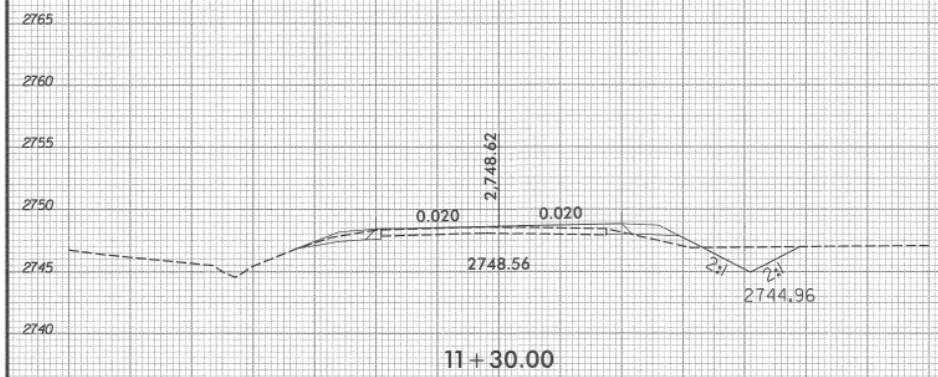

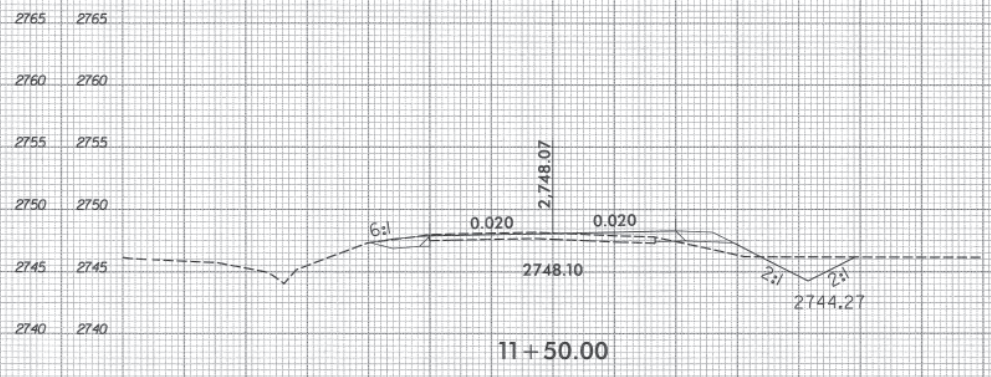

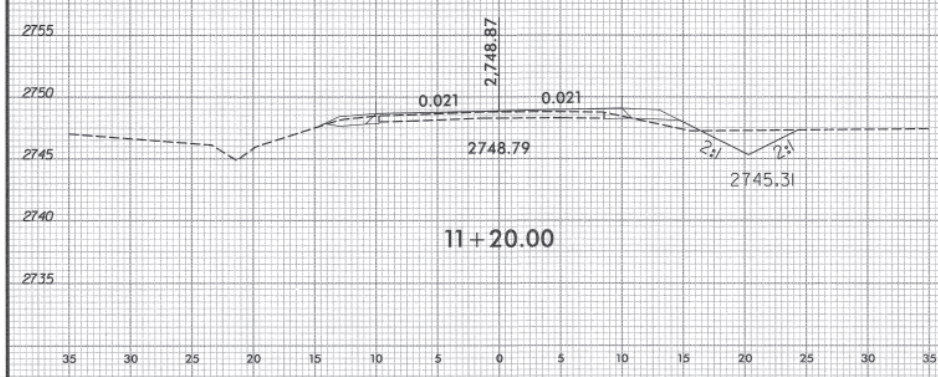

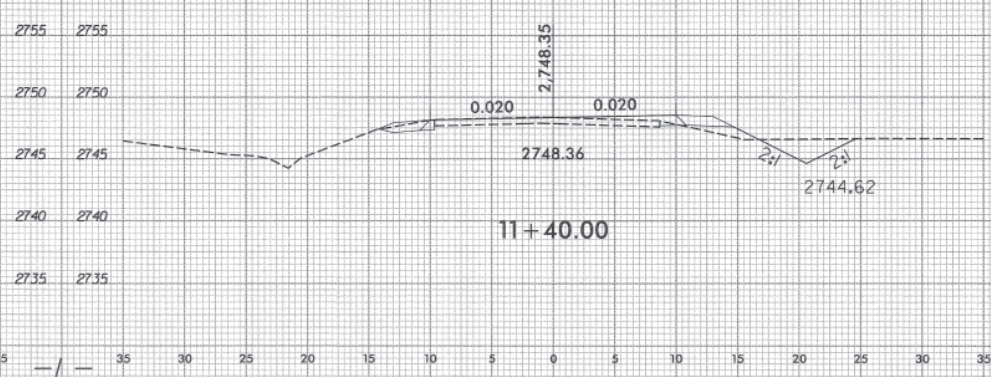

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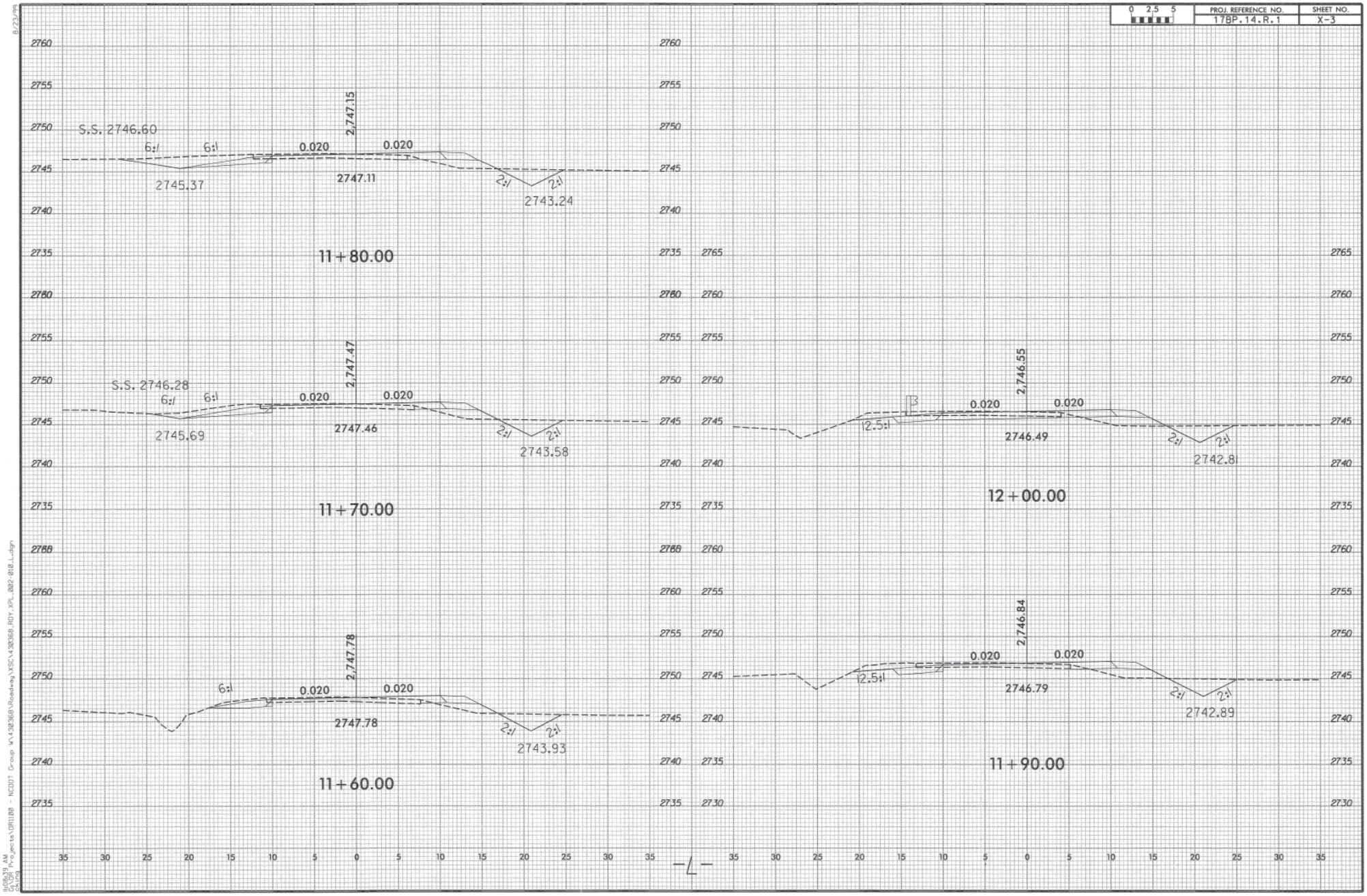

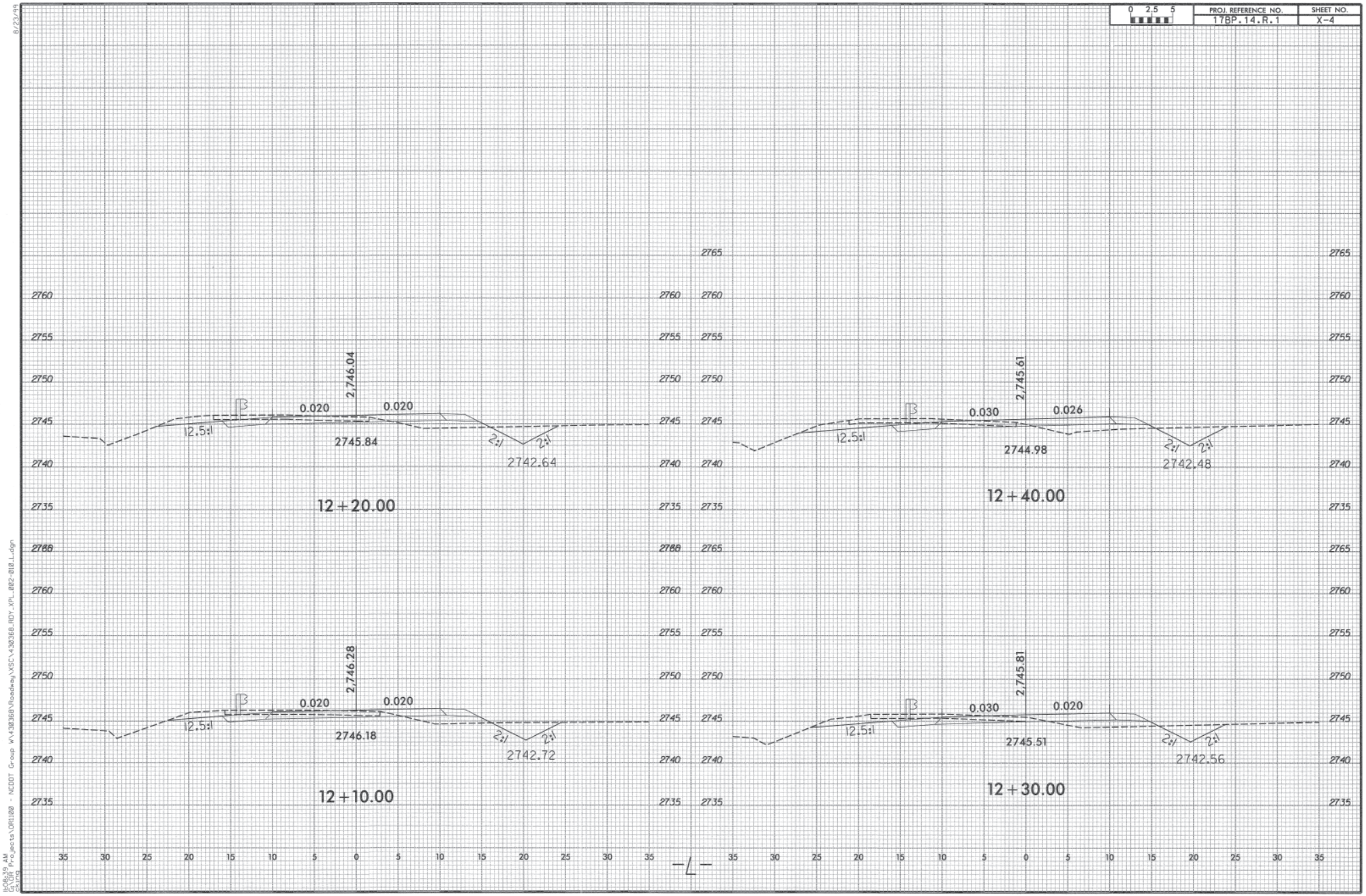

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2:1
2:1
2742.64
12+20.00
2,746.28
0.020
0.020
12.5:1
2746.18
2:1
2:1
2742.72
12+10.00
2,745.61
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0.026
12.5:1
2744.98
2:1
2:1
2742.48
12+40.00
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0.030
0.020
12.5:1
2745.51
2:1
2:1
2742.56
12+30.00
2760
2755
2750
2745
2740
2735
2765
35 30 25 20 15 10 5 0 5 10 15 20 25 30 35
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
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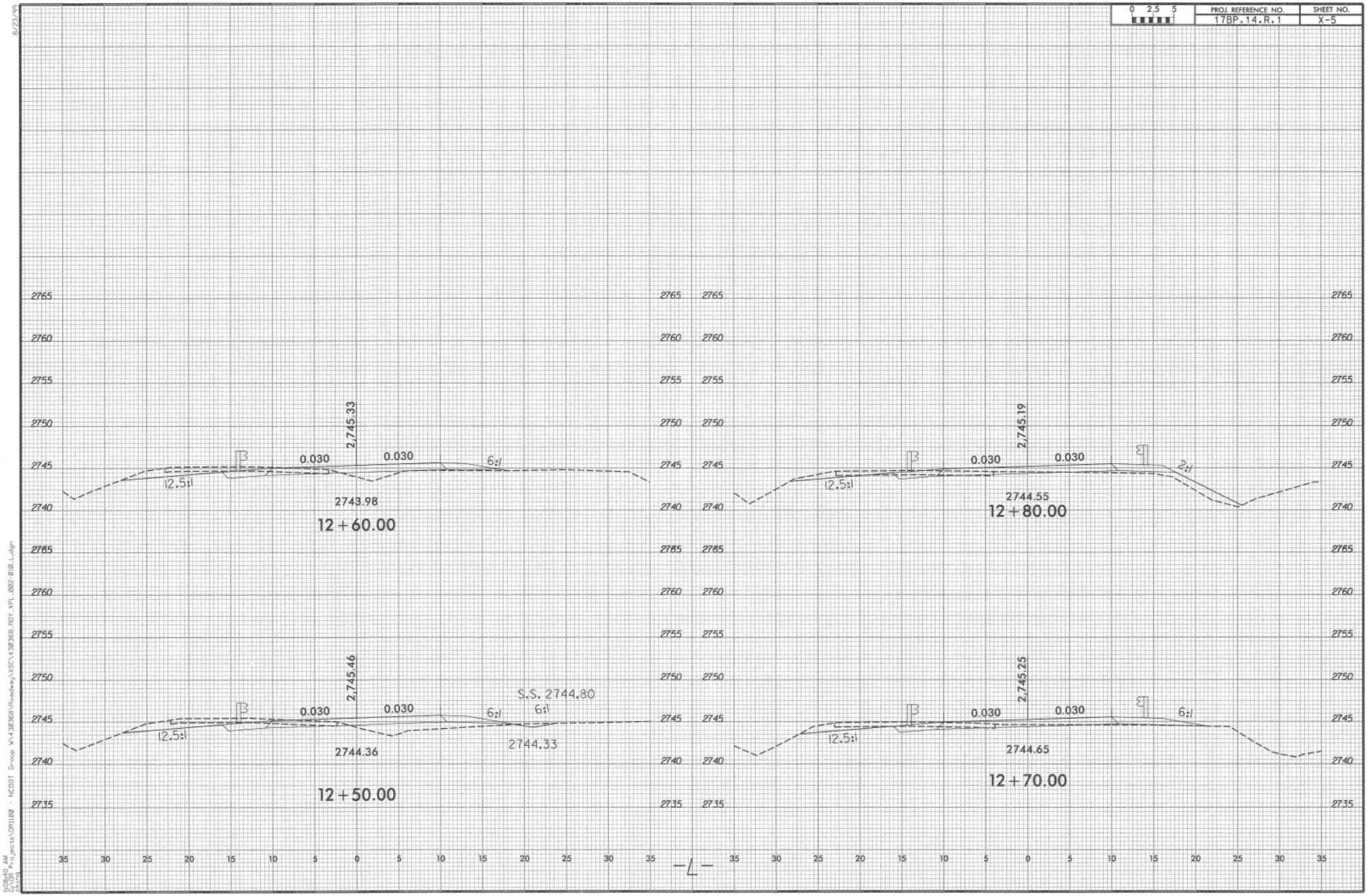

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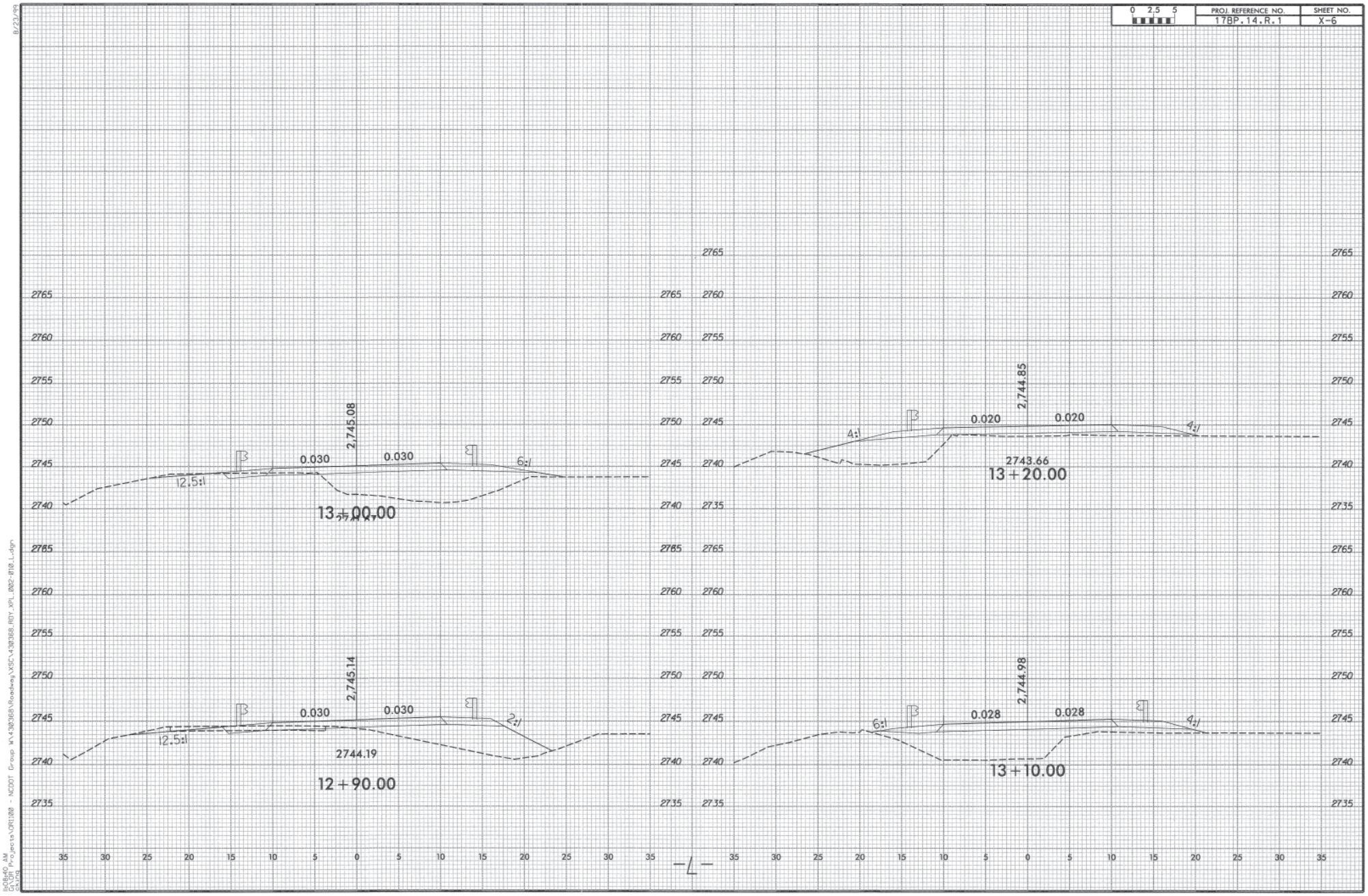

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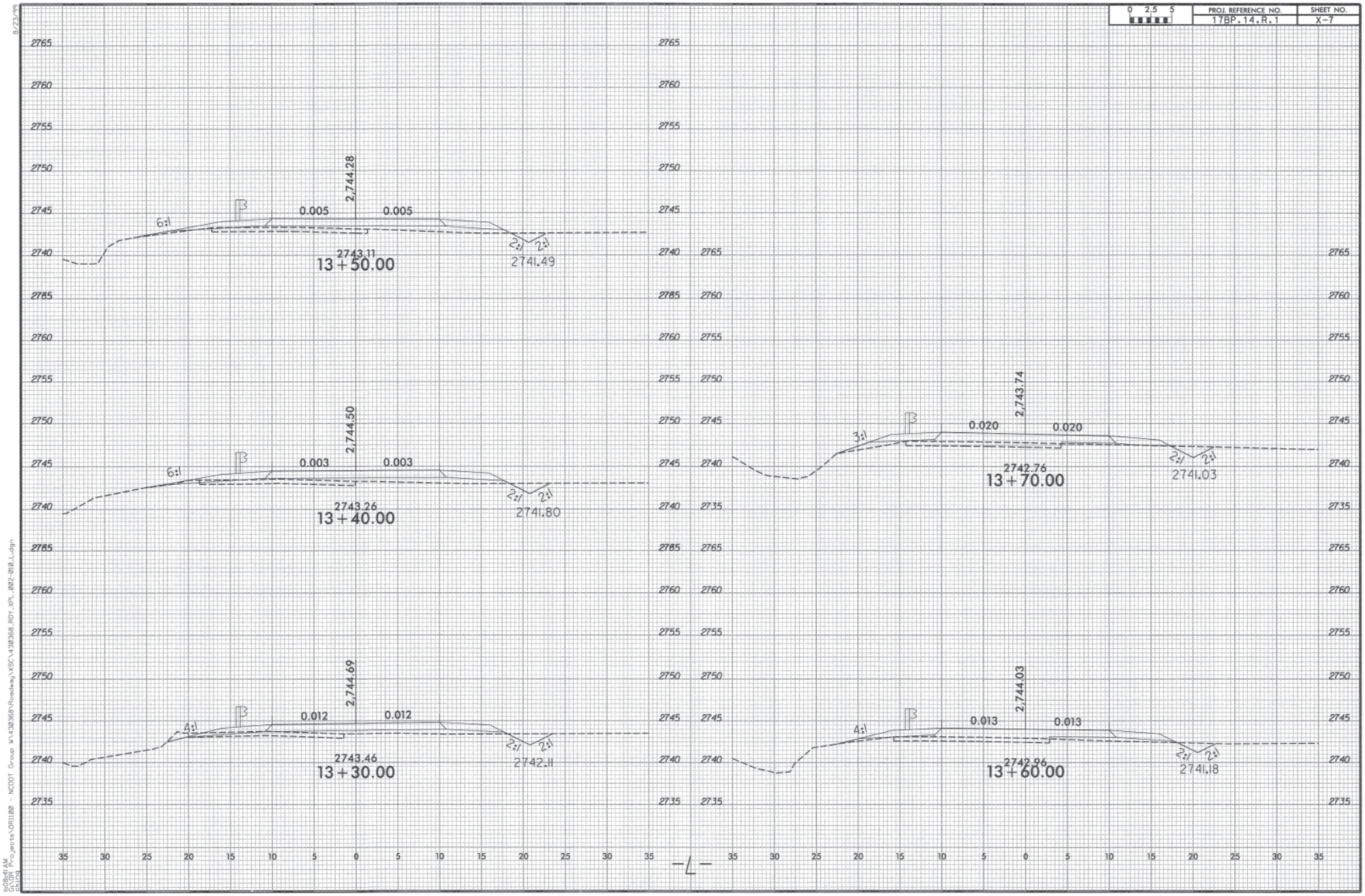

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6:1
2:1
2:1
2743.26
13+40.00
2741.80
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0.012
4:1
2:1
2:1
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2:1
2:1
2742.76
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2:1
2:1
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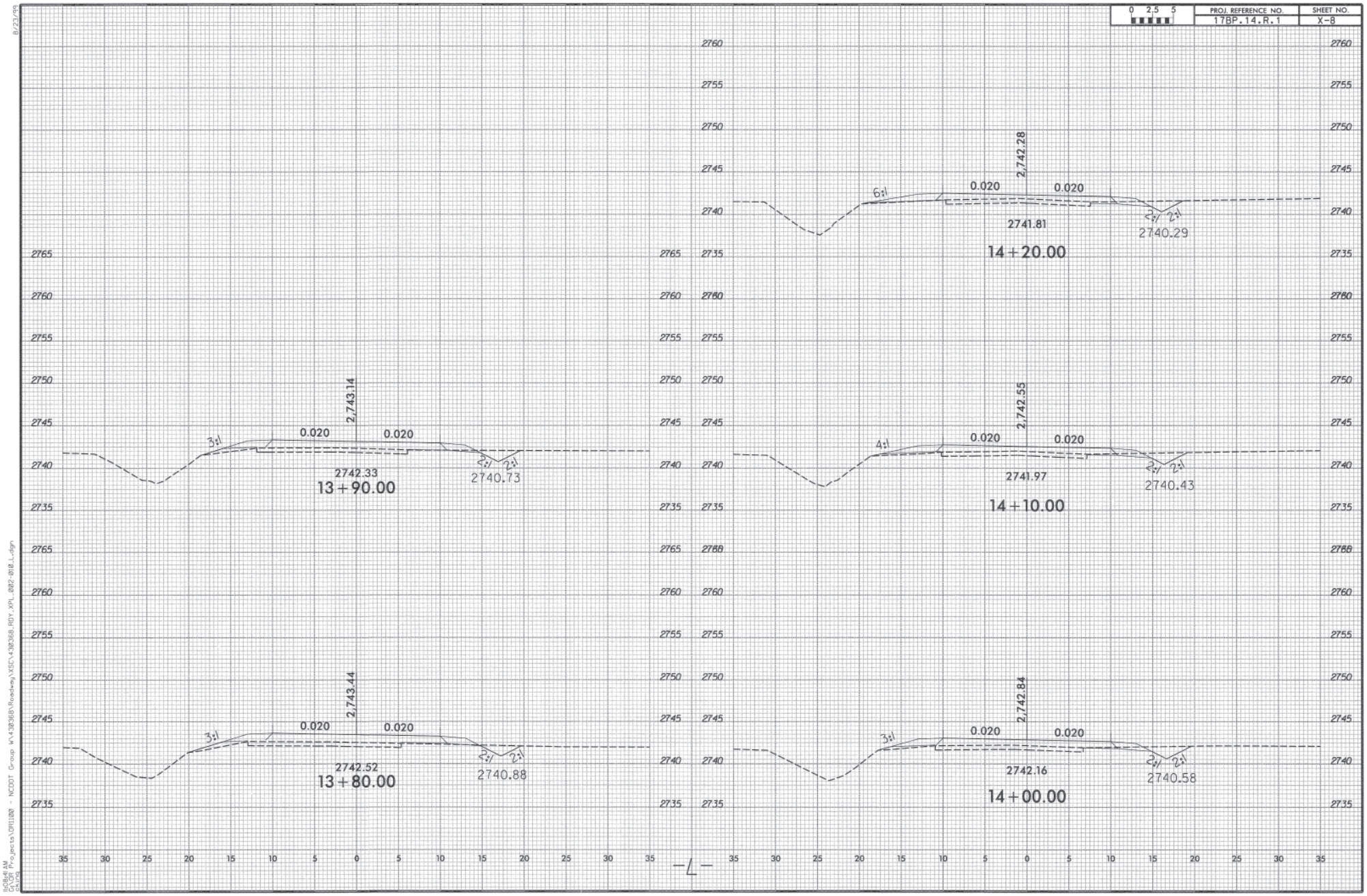
2741.18
-L-



0 2.5 5
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2:1
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2740.29
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2:1
2:1
2741.97
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2740.43
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2:1
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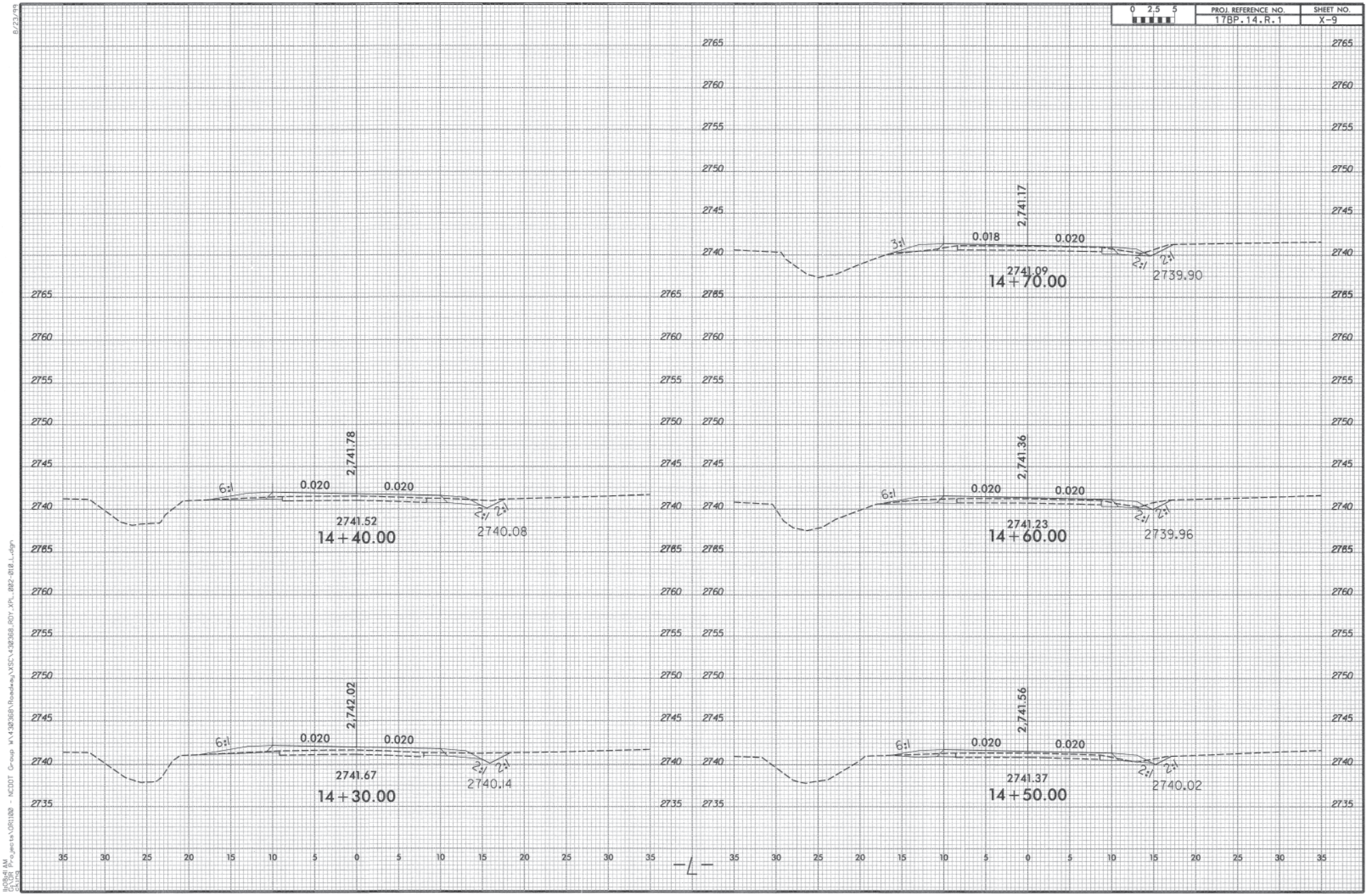
-L-



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2741.23
14+60.00
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14+30.00
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14+50.00
2740.02
-L-

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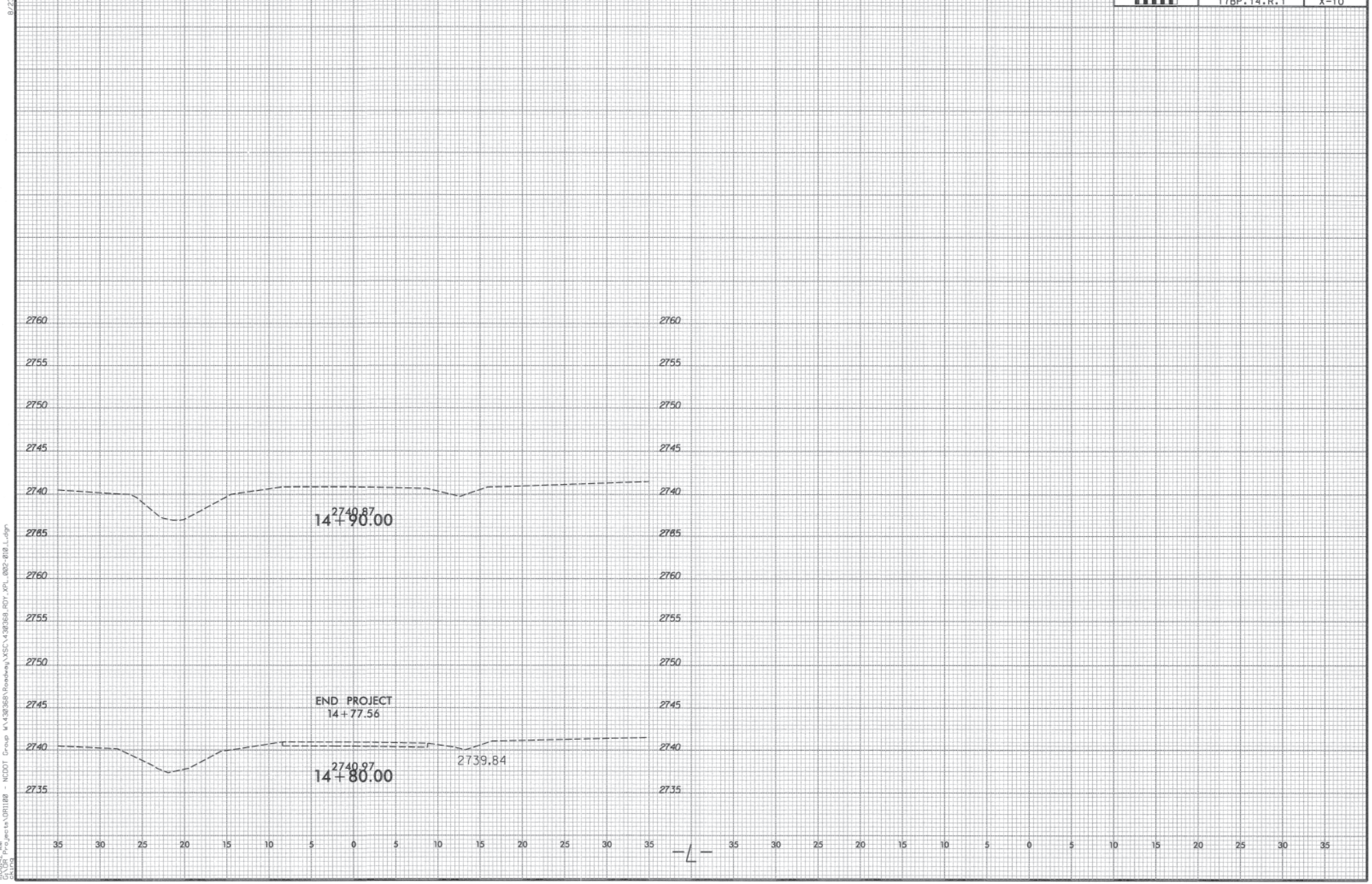

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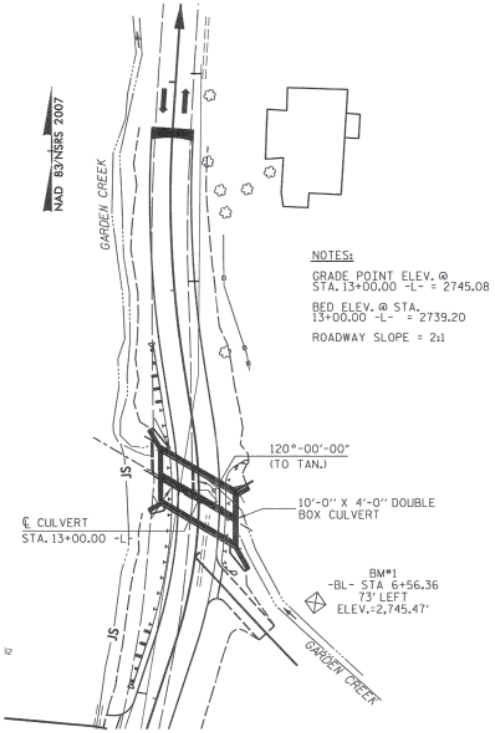
BM #1 -BL- STA 6+56.00 73.0' RT ELEV. = 2745.47' (6" SPIKE SET IN BASE 36" POPLAR)



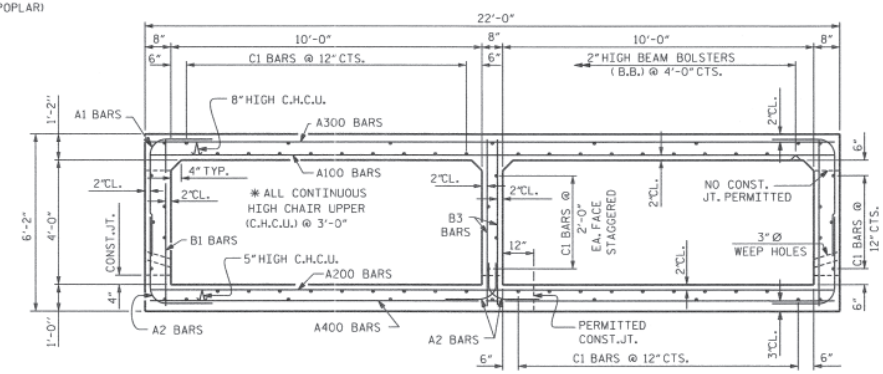
NOTES:

GRADE POINT ELEV. @ STA. 13+00.00 -L- = 2745.08

BED ELEV. @ STA. 13+00.00 -L- = 2739.20

ROADWAY SLOPE = 2:1

LOCATION SKETCH



RIGHT ANGLE SECTION OF BARREL

THERE ARE 73 "C" BARS IN SECTION OF BARREL.

HYDRAULIC DATA

DESIGN DISCHARGE	= 181 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 2 YEARS
DESIGN HIGH WATER ELEVATION	= 2743.2'
DRAINAGE AREA	= 1.9 SQ. MI.
BASE DISCHARGE (Q100)	= 910 C.F.S.
BASE HIGH WATER ELEVATION	= 2745.81'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 244 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 2 YEARS+
OVERTOPPING FLOOD ELEVATION	= 2743.7'

FOUNDATION NOTES:

SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING.

EXCAVATE AT LEAST 1-FOOT BELOW THE CULVERT AND FOOTINGS, AND REPLACE THE EXCAVATED MATERIALS WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414-4 OF THE STANDARD SPECIFICATIONS.

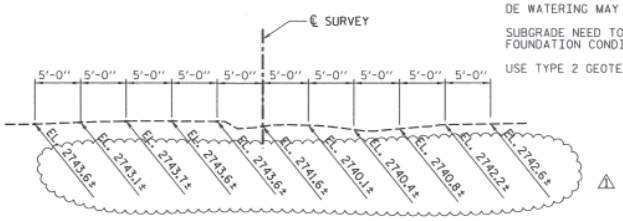
WINGWALL BACKFILL SHALL MEET CLASS II OR BETTER AS SPECIFIED IN SECTION 1016 OF THE STANDARD SPECIFICATIONS.

ISOLATED AREAS WITH WEAK SOILS MAY REQUIRE EXCAVATION MORE THAN 1 FOOT BELOW THE BOTTOM OF THE CULVERT AND FOOTINGS.

DE WATERING MAY BE REQUIRED DURING CONSTRUCTION.

SUBGRADE NEED TO BE VERIFIED BY THE ENGINEER HIS/HER REPRESENTATIVE PRIOR TO PLACING FOUNDATION CONDITIONING MATERIAL.

USE TYPE 2 GEOTEXTILE MEETING SECTION 1056 OF THE NCDOT STANDARD SPECIFICATIONS.



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE			REINFORCING STEEL		
STAGE I	51.7	C.Y	STAGE I	14,302	LBS.
STAGE II	51.7	C.Y	STAGE II	14,348	LBS.
TOTAL	103.4	C.Y	TOTAL	28,650	LBS.
FOUNDATION COND. MAT.'L			**RIP RAP CLASS B**		
STAGE I	38.5	TONS	STAGE I	29	TONS
STAGE II	38.5	TONS	STAGE II	29	TONS
TOTAL	77.0	TONS	TOTAL	58	TONS
CULVERT EXCAVATION -- LUMP SUM					
REMOVAL OF EXIST. STRUCTURE -- LUMP SUM					

⚠ REVISED EXISTING GROUND ELEVATIONS TO 1 DECIMAL ACCURACY

NOTES

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

DESIGN FILL ----------1.4'.

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: (APPLIES TO STAGE 1 AND STAGE 2)

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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

THIS BARREL STANDARD TO BE USED ONLY ON CULVERT ON 120° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.

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

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.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

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

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

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.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 1 SPAN OF 16'-6" CONSISTING OF TIMBER FLOOR ON TIMBER JOISTS ON TIMBER CAPS AND TIMBER POST AND CONCRETE SILLS PILES @ VARIOUS CENTERS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

SEE TRAFFIC CONTROL PLANS FOR STAGE 1, AND STAGE 2 TRAFFIC DETAILS.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTORS OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.

FOR UTILITY INFORMATION, SEE UTILITY PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.14.R.1

HAYWOOD COUNTY

STATION: 13+00.00 -L-

SHEET 1 OF 8 REPLACES BRIDGE #430368

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
DOUBLE 10 FT. X 4 FT.
CONCRETE BOX CULVERT
120° SKEW

SEPTEMBER 1990

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX
2/19/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-1
1	SDC	2/19/14	3					TOTAL SHEETS
2			4					8

ASSEMBLED BY : J. MYA DATE : MAR 2013	CHECKED BY : R. DECOLA DATE : MAR 2013	SPECIAL
DRAWN BY : B. WYNN/D.DONOVAN DATE : SEPT. 1990	CHECKED BY : A.R.BISSETTE DATE : OCT. 90	STANDARD

STD. NO. CB32A

G:\OR Projects\OR1100 - NCDOT Group W\430368\Structures\430368_SD_RCBC01.dgn
2/19/2014 1100_PDF_full.pltcfg 1100_str.tbl

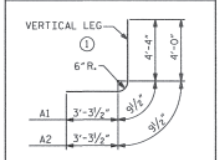
BILL OF MATERIAL (STAGE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	84	7	1	8'-5"	1445	A133	1	6	STR	16'-2"	24	A219	1	6	STR	5'-2"	8	A305	1	7	STR	17'-2"	35	A341	1	7	STR	10'-3"	21	A427	1	6	STR	21'-4"	32
A2	168	7	1	8'-1"	2776	A134	1	6	STR	15'-4"	23	A220	1	6	STR	4'-3"	6	A306	1	7	STR	16'-3"	33	A342	1	7	STR	9'-4"	19	A428	1	6	STR	20'-6"	31
						A135	1	6	STR	14'-5"	22	A221	1	6	STR	3'-4"	5	A307	1	7	STR	15'-7"	32	A343	1	7	STR	8'-6"	17	A429	1	6	STR	19'-8"	30
A100	17	6	STR	21'-8"	553	A136	1	6	STR	13'-9"	20	A222	1	6	STR	2'-7"	4	A308	1	7	STR	14'-8"	30	A344	1	7	STR	7'-8"	16	A430	1	6	STR	18'-9"	28
A101	1	6	STR	20'-9"	31	A137	1	6	STR	12'-9"	19	A223	1	6	STR	1'-8"	3	A309	1	7	STR	13'-9"	28	A345	1	7	STR	6'-9"	14	A431	1	6	STR	17'-11"	27
A102	1	6	STR	19'-11"	30	A138	1	6	STR	11'-10"	18	A224	1	6	STR	1'-6"	2	A310	1	7	STR	13'-0"	27	A346	1	7	STR	5'-11"	12	A432	1	6	STR	17'-1"	26
A103	1	6	STR	19'-0"	29	A139	1	6	STR	11'-0"	17	A225	1	6	STR	21'-8"	33	A311	1	7	STR	12'-1"	25	A347	1	7	STR	5'-1"	10	A433	1	6	STR	16'-2"	24
A104	1	6	STR	18'-2"	27	A140	1	6	STR	10'-2"	15	A226	1	6	STR	21'-8"	33	A312	1	7	STR	11'-2"	23	A348	1	7	STR	4'-2"	9	A434	1	6	STR	15'-4"	23
A105	1	6	STR	17'-2"	26	A141	1	6	STR	9'-3"	14	A227	1	6	STR	21'-4"	32	A313	1	7	STR	10'-3"	21							A435	1	6	STR	14'-5"	22
A106	1	6	STR	16'-3"	24	A142	1	6	STR	8'-4"	13	A228	1	6	STR	20'-6"	31	A314	1	7	STR	9'-6"	19	A400	17	6	STR	21'-8"	553	A436	1	6	STR	13'-7"	20
A107	1	6	STR	15'-7"	23	A143	1	6	STR	7'-6"	11	A229	1	6	STR	19'-8"	30	A315	1	7	STR	8'-7"	18	A401	1	6	STR	20'-9"	31	A437	1	6	STR	12'-9"	19
A108	1	6	STR	14'-8"	22	A144	1	6	STR	6'-7"	10	A230	1	6	STR	18'-9"	28	A316	1	7	STR	7'-8"	16	A402	1	6	STR	19'-11"	30	A438	1	6	STR	11'-10"	18
A109	1	6	STR	13'-9"	21	A145	1	6	STR	5'-9"	9	A231	1	6	STR	17'-11"	27	A317	1	7	STR	6'-10"	14	A403	1	6	STR	19'-0"	29	A439	1	6	STR	11'-0"	17
A110	1	6	STR	13'-0"	20	A146	1	6	STR	4'-11"	7	A232	1	6	STR	17'-1"	26	A318	1	7	STR	6'-0"	12	A404	1	6	STR	18'-2"	27	A440	1	6	STR	10'-2"	15
A111	1	6	STR	12'-1"	18	A147	1	6	STR	4'-1"	6	A233	1	6	STR	16'-2"	24	A319	1	7	STR	5'-2"	11	A405	1	6	STR	17'-2"	26	A441	1	6	STR	9'-3"	14
A112	1	6	STR	11'-2"	17	A148	1	6	STR	3'-2"	5	A234	1	6	STR	15'-4"	23	A320	1	7	STR	4'-3"	9	A406	1	6	STR	16'-3"	24	A442	1	6	STR	8'-4"	13
A113	1	6	STR	10'-3"	15							A235	1	6	STR	14'-5"	22	A321	1	7	STR	3'-4"	7	A407	1	6	STR	15'-7"	23	A443	1	6	STR	7'-6"	11
A114	1	6	STR	9'-6"	14	A200	17	6	STR	21'-8"	553	A236	1	6	STR	13'-7"	20	A322	1	7	STR	2'-7"	5	A408	1	6	STR	14'-8"	22	A444	1	6	STR	6'-7"	10
A115	1	6	STR	8'-7"	13	A201	1	6	STR	20'-9"	31	A237	1	6	STR	12'-9"	19	A323	1	7	STR	1'-8"	3	A409	1	6	STR	13'-9"	21	A445	1	6	STR	5'-9"	9
A116	1	6	STR	7'-8"	12	A202	1	6	STR	19'-11"	30	A238	1	6	STR	11'-10"	18	A324	1	7	STR	1'-6"	3	A410	1	6	STR	13'-0"	20	A446	1	6	STR	4'-11"	7
A117	1	6	STR	6'-10"	10	A203	1	6	STR	19'-0"	29	A239	1	6	STR	11'-0"	17	A325	1	7	STR	21'-8"	44	A411	1	6	STR	12'-1"	18	A447	1	6	STR	4'-1"	6
A118	1	6	STR	6'-0"	9	A204	1	6	STR	18'-2"	27	A240	1	6	STR	10'-2"	15	A326	1	7	STR	21'-8"	44	A412	1	6	STR	11'-2"	17	A448	1	6	STR	3'-2"	5
A119	1	6	STR	5'-2"	8	A205	1	6	STR	17'-2"	26	A241	1	6	STR	9'-3"	14	A327	1	7	STR	21'-8"	44	A413	1	6	STR	10'-3"	15						
A120	1	6	STR	4'-3"	6	A206	1	6	STR	16'-3"	24	A242	1	6	STR	8'-4"	13	A328	1	7	STR	21'-6"	44	A414	1	6	STR	9'-6"	14	B1	84	6	STR	5'-6"	694
A121	1	6	STR	3'-4"	5	A207	1	6	STR	15'-7"	23	A243	1	6	STR	7'-6"	11	A329	1	7	STR	20'-7"	42	A415	1	6	STR	8'-7"	13	B3	84	7	STR	5'-6"	944
A122	1	6	STR	2'-7"	4	A208	1	6	STR	14'-8"	22	A244	1	6	STR	6'-7"	10	A330	1	7	STR	19'-9"	40	A416	1	6	STR	7'-8"	12						
A123	1	6	STR	1'-8"	3	A209	1	6	STR	13'-9"	21	A245	1	6	STR	5'-9"	9	A331	1	7	STR	18'-11"	39	A417	1	6	STR	6'-10"	10	C1	73	4	STR	22'-11"	1118
A124	1	6	STR	1'-6"	2	A210	1	6	STR	13'-0"	20	A246	1	6	STR	4'-11"	7	A332	1	7	STR	18'-1"	37	A418	1	6	STR	6'-0"	9						
A125	1	6	STR	21'-8"	33	A211	1	6	STR	12'-1"	18	A247	1	6	STR	4'-1"	6	A333	1	7	STR	17'-2"	35	A419	1	6	STR	5'-2"	8	G1	4	5	STR	25'-0"	104
A126	1	6	STR	21'-8"	33	A212	1	6	STR	11'-2"	17	A248	1	6	STR	3'-2"	5	A334	1	7	STR	16'-4"	33	A420	1	6	STR	4'-3"	6						
A127	1	6	STR	21'-4"	32	A213	1	6	STR	10'-3"	15							A335	1	7	STR	15'-5"	32	A421	1	6	STR	3'-4"	5	S2	9	8	STR	25'-0"	601
A128	1	6	STR	20'-6"	31	A214	1	6	STR	9'-6"	14	A300	17	7	STR	21'-8"	753	A336	1	7	STR	14'-8"	30	A422	1	6	STR	2'-7"	4						
A129	1	6	STR	19'-8"	30	A215	1	6	STR	8'-7"	13	A301	1	7	STR	20'-9"	42	A337	1	7	STR	13'-9"	28	A423	1	6	STR	1'-8"	3						
A130	1	6	STR	18'-9"	28	A216	1	6	STR	7'-8"	12	A302	1	7	STR	19'-11"	41	A338	1	7	STR	12'-11"	26	A424	1	6	STR	1'-6"	2						
A131	1	6	STR	17'-11"	27	A217	1	6	STR	6'-10"	10	A303	1	7	STR	19'-0"	39	A339	1	7	STR	12'-0"	25	A425	1	6	STR	21'-8"	33						
A132	1	6	STR	17'-1"	26	A218	1	6	STR	6'-0"	9	A304	1	7	STR	18'-2"	37	A340	1	7	STR	11'-2"	23	A426	1	6	STR	21'-8"	33						

BILL OF MATERIAL (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
																								A410	2	6	STR.	13'-0"	39
A1	88	7	1	8'-5"	1514	A119	2	6	STR.	5'-3"	16	A216	2	6	STR.	7'-8"	23	A313	2	7	STR.	10'-3"	42	A411	2	6	STR.	12'-1"	36
						A120	2	6	STR.	4'-3"	13	A217	2	6	STR.	6'-10"	21	A314	2	7	STR.	9'-6"	39	A412	2	6	STR.	11'-2"	34
A2	176	7	1	8'-1"	2908	A121	2	6	STR.	3'-4"	10	A218	2	6	STR.	6'-0"	18	A315	2	7	STR.	8'-7"	35	A413	2	6	STR.	10'-3"	31
						A122	2	6	STR.	2'-7"	8	A219	2	6	STR.	5'-2"	16	A316	2	7	STR.	7-8"	31	A414	2	6	STR.	9'-6"	29
A100	20	6	STR.	21'-8"	651	A123	2	6	STR.	1'-8"	5	A220	2	6	STR.	4'-3"	13	A317	2	7	STR.	6'-10'	28	A415	2	6	STR.	8'-7"	26
A101	2	6	STR.	20'-9"	62	A124	2	6	STR.	1'-6"	5	A221	2	6	STR.	3'-4"	10	A318	2	7	STR.	6'-0"	25	A416	2	6	STR.	7-8"	23
A102	2	6	STR.	19'-11"	60							A222	2	6	STR.	2'-7"	8	A319	2	7	STR.	5'-2"	21	A417	2	6	STR.	6'-10'	21
A103	2	6	STR.	19'-0"	57	A200	20	6	STR.	21'-8"	651	A223	2	6	STR.	1'-8"	5	A320	2	7	STR.	4'-3"	17	A418	2	6	STR.	6'-0"	18
A104	2	6	STR.	18'-2"	55	A201	2	6	STR.	20'-9"	62	A224	2	6	STR.	1'-6"	5	A321	2	7	STR.	3'-4"	14	A419	2	6	STR.	5'-2"	16
A105	2	6	STR.	17'-2"	52	A202	2	6	STR.	19'-11"	60							A322	2	7	STR.	2'-7"	11	A420	2	6	STR.	4'-3"	13
A106	2	6	STR.	16'-3"	49	A203	2	6	STR.	19'-0"	57	A300	20	7	STR.	21'-8"	886	A323	2	7	STR.	1'-8"	7	A421	2	6	STR.	3'-4"	10
A107	2	6	STR.	15'-7"	47	A204	2	6	STR.	18'-2"	55	A301	2	7	STR.	20'-9"	85	A324	2	7	STR.	1'-6"	6	A422	2	6	STR.	2'-7"	8
A108	2	6	STR.	14'-8"	44	A205	2	6	STR.	17'-2"	52	A302	2	7	STR.	19'-11"	81							A423	2	6	STR.	1'-8"	5
A109	2	6	STR.	13'-9"	41	A206	2	6	STR.	16'-3"	49	A303	2	7	STR.	19'-0"	78	A400	20	6	STR.	21'-8"	651	A424	2	6	STR.	1'-6"	5
A110	2	6	STR.	13'-0"	39	A207	2	6	STR.	15'-7"	47	A304	2	7	STR.	18'-2"	74	A401	2	6	STR.	20'-9"	62						
A111	2	6	STR.	12'-1"	36	A208	2	6	STR.	14'-8"	44	A305	2	7	STR.	17'-2"	70	A402	2	6	STR.	19'-11"	60	B1	88	6	STR.	5'-6"	727
A112	2	6	STR.	11'-2"	34	A209	2	6	STR.	13'-9"	41	A306	2	7	STR.	16'-3"	66	A403	2	6	STR.	19'-0"	57	B3	88	7	STR.	5'-6"	989
A113	2	6	STR.	10'-3"	31	A210	2	6	STR.	13'-0"	39	A307	2	7	STR.	15'-7"	64	A404	2	6	STR.	18'-2"	55						
A114	2	6	STR.	9'-6"	29	A211	2	6	STR.	12'-1"	36	A308	2	7	STR.	14'-8"	60	A405	2	6	STR.	17'-2"	52	C1	73	4	STR.	21'-8"	1057
A115	2	6	STR.	8'-7"	26	A212	2	6	STR.	11'-2"	34	A309	2	7	STR.	13'-9"	56	A406	2	6	STR.	16'-3"	49						
A116	2	6	STR.	7-8"	23	A213	2	6	STR.	10'-3"	31	A310	2	7	STR.	13'-0"	53	A407	2	6	STR.	15'-7"	47	G1	4	5	STR.	25'-0"	104
A117	2	6	STR.	6'-10'	21	A214	2	6	STR.	9'-6"	29	A311	2	7	STR.	12'-1"	49	A408	2	6	STR.	14'-8"	44						
A118	2	6	STR.	6'-0"	18	A215	2	6	STR.	8'-7"	26	A312	2	7	STR.	11'-2"	46	A409	2	6	STR.	13'-9"	41	S2	6	8	STR.	25'-0"	401

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART	
*4C1	1'-9"
*5B1	2'-0"
*6"A"	2'-9"
*7"A"	3'-9"

TOTAL STRUCTURE QUANTITIES (STAGE 1)

CLASS A CONCRETE

BARREL @ 2.07 CY/FT 43.5 C.Y.

WING ETC. 7.7 C.Y.

SILLS 0.5 C.Y.

TOTAL 51.7 C.Y.

REINFORCING STEEL

BARREL 13,894 LBS.

WINGS ETC. 378 LBS.

SILLS 30 LBS.

TOTAL 14,302 LBS.

FOUNDATION COND. MAT.'L	38.5	TONS
CLASS "B" RIP RAP	29	TONS
CULVERT EXCAVATION	LUMP SUM	

TOTAL STRUCTURE QUANTITIES (STAGE 2)

CLASS A CONCRETE

BARREL @ 2.07 CY/FT 45.5 C.Y.

WING ETC. 7.7 C.Y.

SILLS 0.5 C.Y.

TOTAL 51.7 C.Y.

REINFORCING STEEL

BARREL 13,940 LBS.

WINGS ETC. 378 LBS.

SILLS 30 LBS.

TOTAL 14,348 LBS.

FOUNDATION COND. MAT.'L	38.5	TONS
CLASS "B" RIP RAP	29	TONS
CULVERT EXCAVATION	LUMP SUM	

PROJECT NO. 17BP.14.R.1

HAYWOOD COUNTY

STATION: 13+00.00 -L-

SHEET 2 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX

2/19/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL DOUBLE 10 FT. X 4 FT. CONCRETE BOX CULVERT

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

DRAWN BY : J. MYA DATE : MAR. 2013

CHECKED BY : R. DECOLA DATE : MAR. 2013

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BILL OF MATERIAL (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	86	7	1	8'-9"	1538
A2	86	6	1	8'-3"	1066
A100	21	6	STR.	22'-8"	715
A101	1	6	STR.	20'-11"	31
A102	1	6	STR.	20'-0"	30
A103	1	6	STR.	19'-2"	29
A104	1	6	STR.	18'-3"	27
A105	1	6	STR.	17'-5"	26
A106	1	6	STR.	16'-7"	25
A107	1	6	STR.	15'-8"	24
A108	1	6	STR.	14'-10"	22
A109	1	6	STR.	13'-11"	21
A110	1	6	STR.	13'-1"	20
A111	1	6	STR.	12'-3"	18
A112	1	6	STR.	11'-4"	17
A113	1	6	STR.	10-6"	16

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A114	1	6	STR.	9'-7"	14
A115	1	6	STR.	8'-9"	13
A116	1	6	STR.	7'-11"	12
A117	1	6	STR.	7'-0"	11
A118	1	6	STR.	6'-2"	9
A119	1	6	STR.	5'-3"	8
A120	1	6	STR.	4'-5"	7
A121	1	6	STR.	3'-7"	5
A122	1	6	STR.	2'-9"	33
A123	1	6	STR.	20'-11"	31
A124	1	6	STR.	20'-1"	30
A125	1	6	STR.	19'-2"	29
A126	1	6	STR.	18'-4"	28
A127	1	6	STR.	17'-6"	26
A128	1	6	STR.	16'-7"	25
A129	1	6	STR.	15'-9"	24
A130	1	6	STR.	14'-10"	22

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A131	1	6	STR	14'-0"	21
A132	1	6	STR	13'-2"	20
A133	1	6	STR	12'-3"	18
A134	1	6	STR	11'-5"	17
A135	1	6	STR	10'-6"	16
A136	1	6	STR	9'-8"	15
A137	1	6	STR	8'-10"	13
A138	1	6	STR	7'-11"	12
A139	1	6	STR	7'-1"	11
A140	1	6	STR	6'-2"	9
A141	1	6	STR	5'-4"	8
A142	1	6	STR	4'-6"	7
A143	1	6	STR	3'-7"	5
A144	1	6	STR	2'-9"	4
A145	1	6	STR	1'-10"	3
A146	1	6	STR	1'-0"	2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A200	21	6	STR	22'-8"	715
A201	1	6	STR	20'-11"	31
A202	1	6	STR	20'-0"	30
A203	1	6	STR	19'-2"	29
A204	1	6	STR	18'-3"	27
A205	1	6	STR	17'-5"	26
A206	1	6	STR	16'-7"	25
A207	1	6	STR	15'-8"	24
A208	1	6	STR	14'-10"	22
A209	1	6	STR	13'-11"	21
A210	1	6	STR	13'-1"	20
A211	1	6	STR	12'-3"	18
A212	1	6	STR	11'-4"	17
A213	1	6	STR	10-6"	16
A214	1	6	STR	9'-7"	14
A215	1	6	STR	8'-9"	13
A216	1	6	STR	7'-11"	12

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A217	1	6	STR	7'-0"	11
A218	1	6	STR	6'-2"	9
A219	1	6	STR	5'-3"	8
A220	1	6	STR	4'-5"	7
A221	1	6	STR	3'-7"	5
A222	1	6	STR	21'-9"	33
A223	1	6	STR	20'-11"	31
A224	1	6	STR	20'-1"	30
A225	1	6	STR	19'-2"	29
A226	1	6	STR	18'-4"	28
A227	1	6	STR	17'-6"	26
A228	1	6	STR	16'-7"	25
A229	1	6	STR	15'-9"	24
A230	1	6	STR	14'-10"	22
A231	1	6	STR	14'-1"	21
A232	1	6	STR	13'-2"	20
A233	1	6	STR	12'-3"	18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A234	1	6	STR	11'-5"	17
A235	1	6	STR	10'-6"	16
A236	1	6	STR	9'-8"	15
A237	1	6	STR	8'-10"	13
A238	1	6	STR	7'-11"	12
A239	1	6	STR	7'-1"	11
A240	1	6	STR	6'-2"	9
A241	1	6	STR	5-4"	8
A242	1	6	STR	4'-6"	7
A243	1	6	STR	3'-7"	5
A244	1	6	STR	2'-9"	4
A245	1	6	STR	1'-10"	3
A246	1	6	STR	1'-0"	2
A300	21	7	STR	22'-8"	973
A301	1	7	STR	21'-11"	45

BILL OF MATERIAL (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A300	21	7	STR	22'-8"	973
A301	1	7	STR	21'-11"	45
A302	1	7	STR	21'-0"	43
A303	1	7	STR	20'-2"	41
A304	1	7	STR	19'-3"	39
A305	1	7	STR	18'-5"	38
A306	1	7	STR	17'-7"	36
A307	1	7	STR	16'-8"	34
A308	1	7	STR	15'-10"	32
A309	1	7	STR	14'-11"	30
A310	1	7	STR	14'-1"	29
A311	1	7	STR	13'-3"	27
A312	1	7	STR	12'-4"	25
A313	1	7	STR	11'-6"	24
A314	1	7	STR	10'-7"	22
A315	1	7	STR	9'-9"	20

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A316	1	7	STR	8'-11"	18
A317	1	7	STR	8'-0"	16
A318	1	7	STR	7'-2"	15
A319	1	7	STR	6'-3"	13
A320	1	7	STR	5'-5"	11
A321	1	7	STR	4'-7"	9
A322	1	7	STR	21'-9"	44
A323	1	7	STR	20'-11"	43
A324	1	7	STR	20'-1"	41
A325	1	7	STR	19'-2"	39
A326	1	7	STR	18'-4"	37
A327	1	7	STR	17'-6"	36
A328	1	7	STR	16'-7"	34
A329	1	7	STR	15'-9"	32
A330	1	7	STR	14'-10"	30
A331	1	7	STR	14'-0"	29

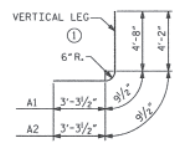
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A332	1	7	STR	13'-2"	27
A333	1	7	STR	12'-3"	25
A334	1	7	STR	11'-5"	23
A335	1	7	STR	10'-6"	21
A336	1	7	STR	9'-8"	20
A337	1	7	STR	8'-10"	18
A338	1	7	STR	7'-11"	16
A339	1	7	STR	7'-1"	14
A340	1	7	STR	6'-2"	13
A341	1	7	STR	5'-4"	11
A342	1	7	STR	4'-6"	9
A343	1	7	STR	3'-7"	7
A344	1	7	STR	2'-9"	6
A345	1	7	STR	1'-10"	4
A346	1	7	STR	1'-0"	2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A400	21	6	STR	22'-8"	715
A401	1	6	STR	20'-11"	31
A402	1	6	STR	20'-0"	30
A403	1	6	STR	19'-2"	29
A404	1	6	STR	18'-3"	27
A405	1	6	STR	17'-5"	26
A406	1	6	STR	16'-7"	25
A407	1	6	STR	15'-8"	24
A408	1	6	STR	14'-10"	22
A409	1	6	STR	13'-11"	21
A410	1	6	STR	13'-1"	20
A411	1	6	STR	12'-3"	18
A412	1	6	STR	11'-4"	17
A413	1	6	STR	10-6"	16
A414	1	6	STR	9'-7"	14
A415	1	6	STR	8'-9"	13

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A416	1	6	STR	7'-11"	12
A417	1	6	STR	7'-0"	11
A418	1	6	STR	6'-2"	9
A419	1	6	STR	5'-3"	8
A420	1	6	STR	4'-5"	7
A421	1	6	STR	3'-7"	5
A422	1	6	STR	21'-9"	33
A423	1	6	STR	20'-11"	31
A424	1	6	STR	20'-1"	30
A425	1	6	STR	19'-2"	29
A426	1	6	STR	18'-4"	28
A427	1	6	STR	17'-6"	26
A428	1	6	STR	16'-7"	25
A429	1	6	STR	15'-9"	24
A430	1	6	STR	14'-10"	22
A431	1	6	STR	14'-0"	21

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A432	1	6	STR	13'-2"	20
A433	1	6	STR	12'-3"	18
A434	1	6	STR	11'-5"	17
A435	1	6	STR	10'-6"	16
A436	1	6	STR	9'-8"	15
A437	1	6	STR	8'-10"	13
A438	1	6	STR	7'-11"	12
A439	1	6	STR	7'-1"	11
A440	1	6	STR	6'-2"	9
A441	1	6	STR	5-4"	8
A442	1	6	STR	4'-6"	7
A443	1	6	STR	3'-7"	5
A444	1	6	STR	2'-9"	4
A445	1	6	STR	1'-10"	3
A446	1	6	STR	1'-0"	2
B1	86	6	STR.	4'-6"	581
B3	86	7	STR.	5'-9"	1011
C1	73	4	STR.	22'-8"	1105
G1	4	5	STR.	25'-0"	104
S1	6	8	2	25'-0"	401

BAR TYPES



TOTAL STRUCTURE QUANTITIES (STAGE 2)

CLASS A CONCRETE			
BARREL @	2.07 CY/FT	43.5	C.Y.
WING ETC.		10.0	C.Y.
SILLS		1.0	C.Y.
TOTAL		54.4	C.Y.
REINFORCING STEEL			
BARREL		11,922	LBS.
WINGS ETC.		10.0	LBS.
SILLS		67	LBS.
TOTAL		11,999	LBS.
FOUNDATION COND. MAT.'L		37.6	TONS
CLASS "B" RIP RAP		58	TONS
CULVERT EXCAVATION		LUMP	SUM
REMOVAL OF EXIST. STRUTURE		LUMP	SUM

PROJECT NO. 17BP.14.R.1

HAYWOOD COUNTY

STATION: 13+00.00 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL DOUBLE 10 FT. X 4 FT. CONCRETE BOX CULVERT

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX

2/19/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-3
1	SDC	2/19/2014	3				TOTAL SHEETS
2			4				9

⚠ THIS SHEET REMOVED FROM CONTRACT PLAN SET

DRAWN BY : J. MYA DATE : MAR 2013
CHECKED BY : R. DECOLA DATE : MAR. 2013

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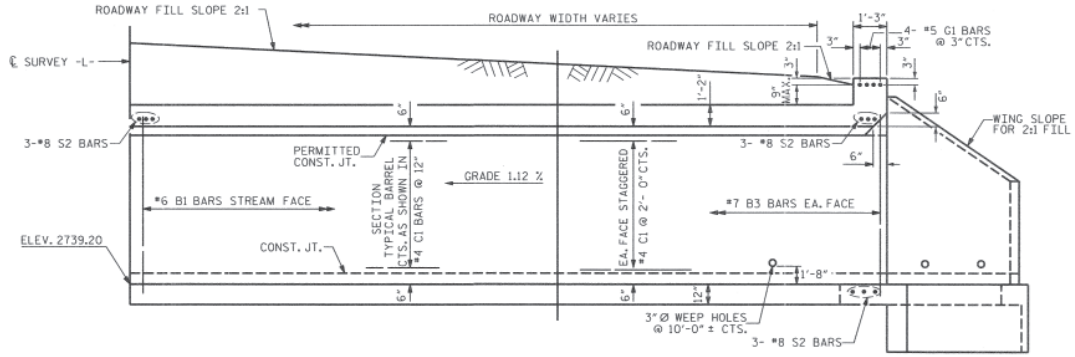
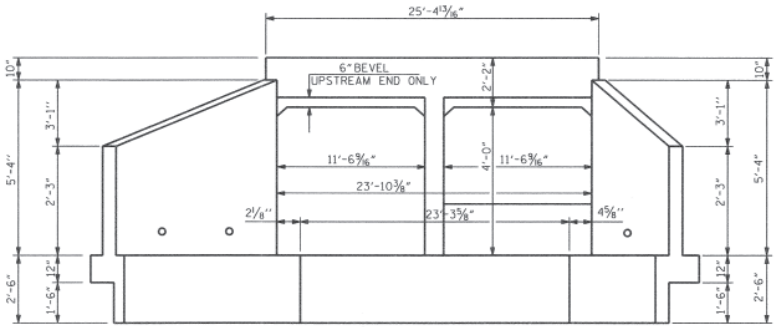
2/19/2014 1100_PDF_full.pltcfg 1100_str.tbl



EXTERIOR WALL INTERIOR WALL

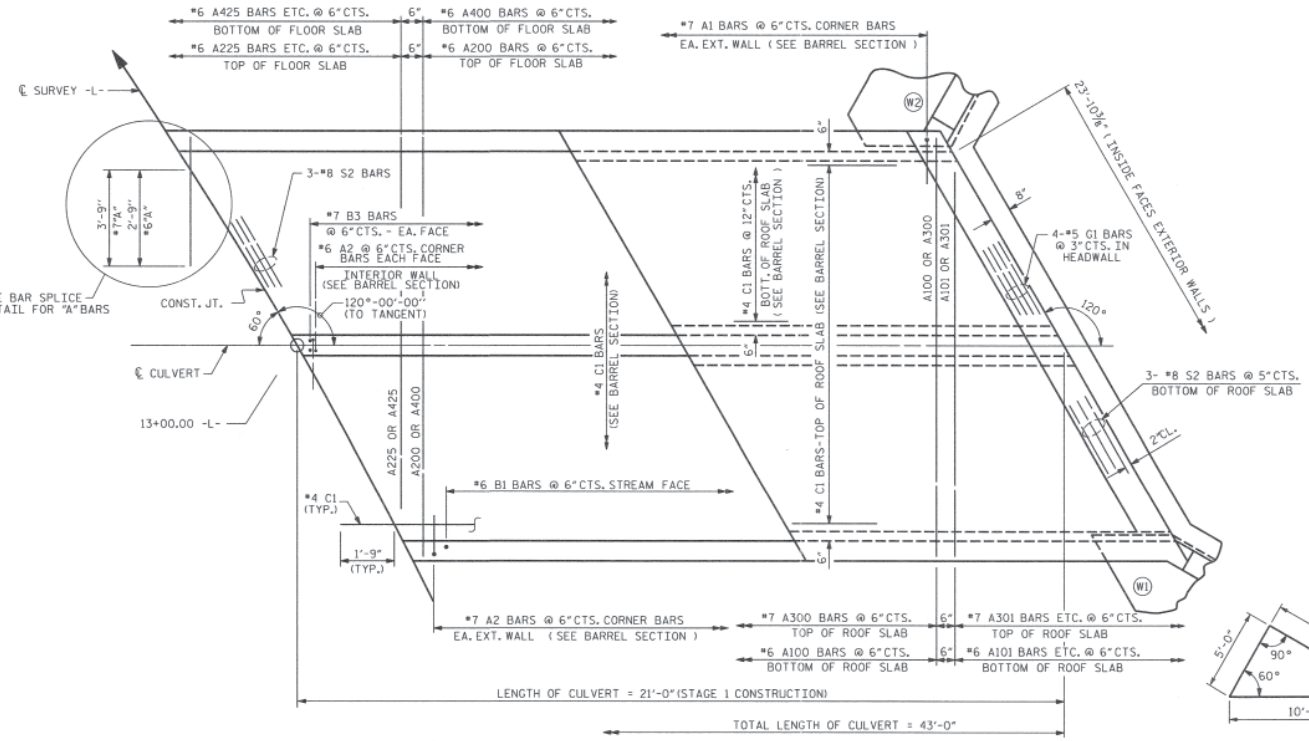
CULVERT SECTION NORMAL TO ROADWAY

(STAGE 1)



END ELEVATION NORMAL TO SKEW

FOR SILL DETAILS, SEE SHEEET 5 OF 8.
(LOOKING DOWNSTREAM)

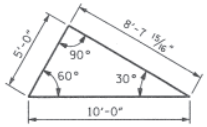


PART PLAN - FLOOR SLAB

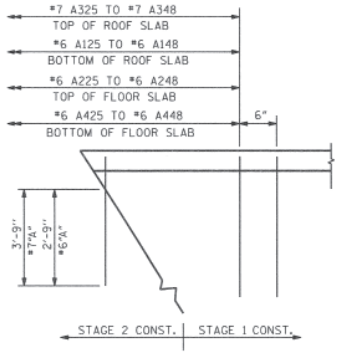
(STAGE 1)

PART PLAN - ROOF SLAB

(STAGE 1)



SKEW TRIANGLE



BAR SPLICE DEATAIL AT STAGE 1 CONSTRUCTION JOINT

SHOWING PROJECTION OF "A" BARS

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

DOUBLE 10 FT. x 4 FT. CONCRETE BOX CULVERT 120° SKEW

1971

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER ANDREW D. COX
2/19/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	C-3
1	SDC	2/19/2014	3			TOTAL SHEETS	8
2			4				

ASSEMBLED BY : J. MYA	DATE : MAR. 2013	SPECIAL	
CHECKED BY : R. DECOLA	DATE : MAR. 2013		
DRAWN BY : W.BRYAN STALEY II	DATE : NOV.5,1971	STANDARD	
CHECKED BY : JOEL A. JOHNSON	DATE : NOV.13,1971		

⚠ THIS SHEET INSERTED INTO CONTRACT PLAN SET

STD. NO. CB332

REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.
REVISED 8-28-92 BY E.L.R. CHECKED BY G.R.P.
REDRAWN 8/1990 BY S.A.T. CHECKED BY E.L.R.

G:\OR Projects\OR1100 - NCDOT Group W\430368\Structures\430368_SD_RCBC03.dgn
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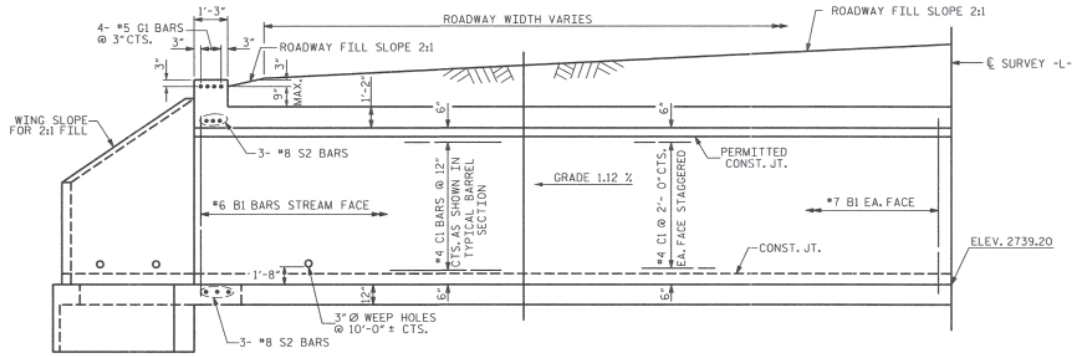
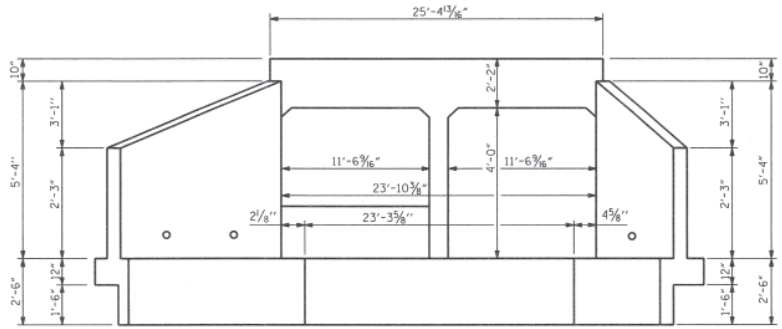
2/19/2014



EXTERIOR WALL INTERIOR WALL

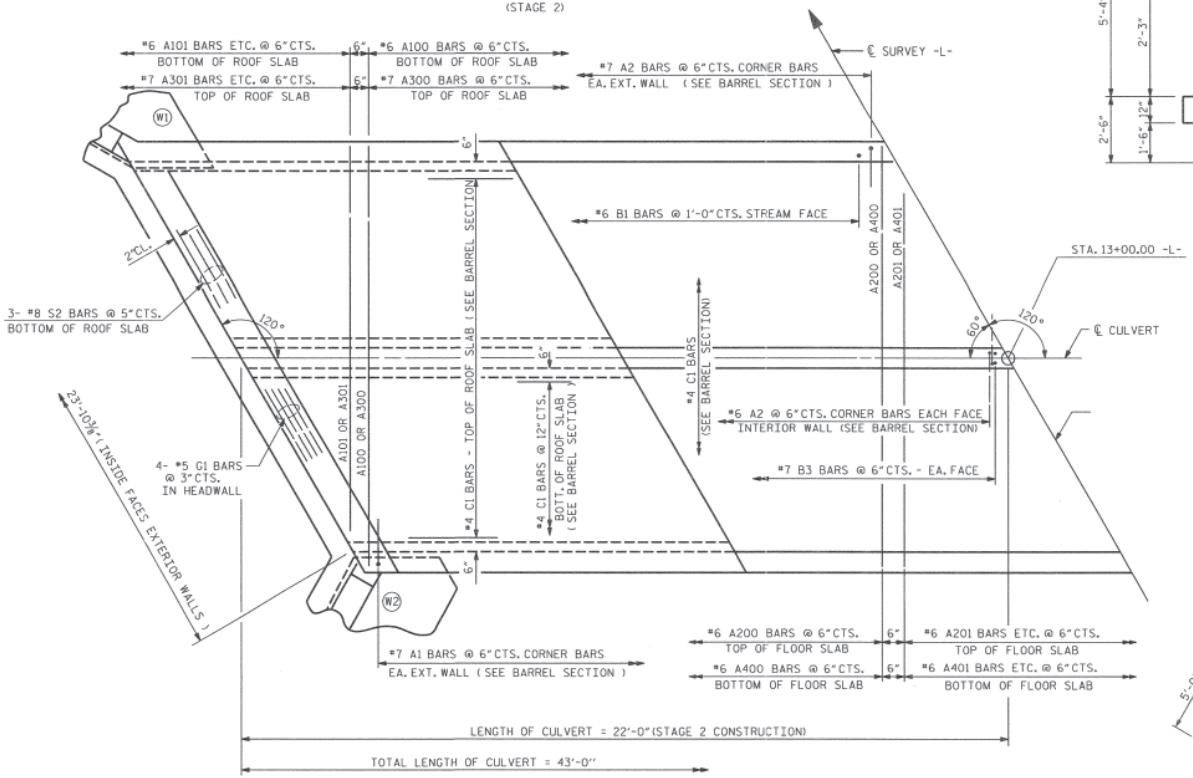
CULVERT SECTION NORMAL TO ROADWAY

(STAGE 2)



END ELEVATION NORMAL TO SKEW

FOR SILL DETAILS, SEE SHEEET 5 OF 8.
(LOOKING UPTREAM)

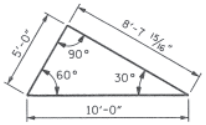


PART PLAN - ROOF SLAB

(STAGE 2)

PART PLAN - FLOOR SLAB

(STAGE 2)



SKEW TRIANGLE

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

DOUBLE 10 FT. x 4 FT.
CONCRETE BOX CULVERT
120° SKEW

1971

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

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER
2/19/14

ASSEMBLED BY : J. MYA DATE : MAR. 2013
CHECKED BY : R. DECOLA DATE : MAR. 2013
DRAWN BY : W.BRYAN STALEY II DATE : NOV.5,1971
CHECKED BY : JOEL A. JOHNSON DATE : NOV.13,1971

SPECIAL
STANDARD

STD. NO. CB332

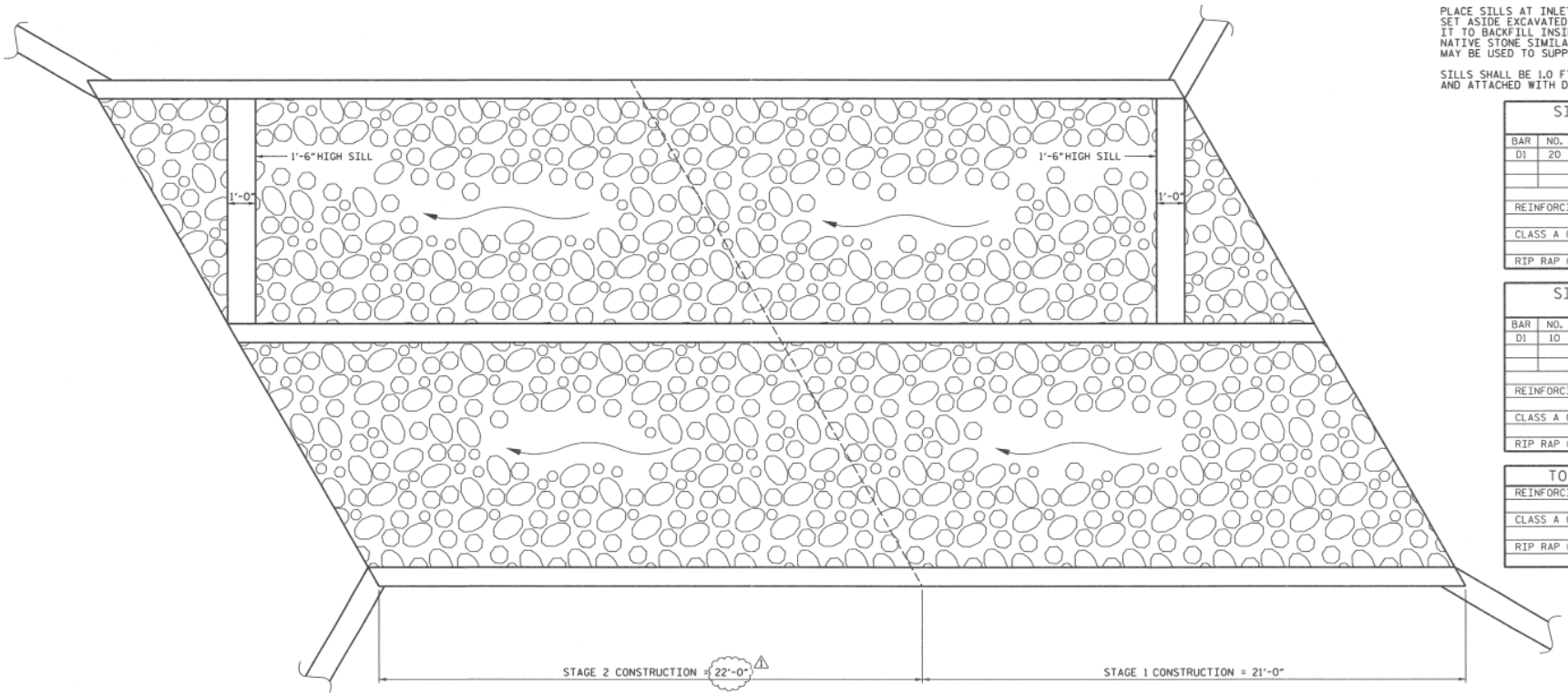
G:\OR Projects\OR1100 - NCDOT Group W\430368\Structures\430368_SD_RCBC04.dgn
2/19/2014 1100_PDF_fullplt.cfg 1100_str.tbl

REVISED 11-19-99 BY M.M. CHECKED BY R.W.K.
REVISED 8-28-92 BY E.L.R. CHECKED BY G.R.P.
REDRAWN 8/1990 BY S.A.T., CHECKED BY E.L.R.

NOTES:

PLACE SILLS AT INLET AND OUTLET OF CULVERT ONLY. SET ASIDE EXCAVATED NATURAL BED MATERIAL AND USE IT TO BACKFILL INSIDE BOTTOM OF RCBC CELLS. NATIVE STONE SIMILAR IN SIZE TO CLASS B RIP-RAP MAY BE USED TO SUPPLEMENT NATURAL BED MATERIAL.

SILLS SHALL BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED WITH DOWELS.



PLAN

SILL QUANTITIES
STAGE 1

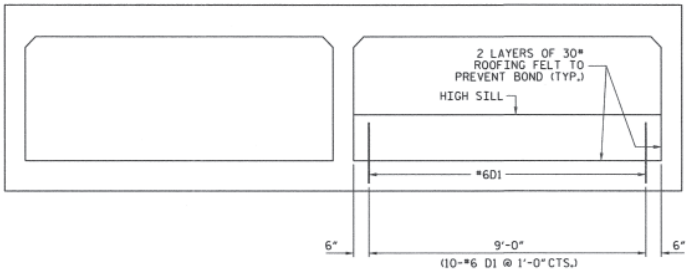
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	20	#6	STR	2'-0"	60
REINFORCING STEEL					30 LBS
CLASS A CONCRETE					0.5 CY
RIP RAP CLASS B					29 TONS

SILL QUANTITIES
STAGE 2

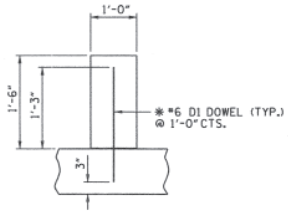
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	10	#6	STR	2'-0"	30
REINFORCING STEEL					30 LBS
CLASS A CONCRETE					0.5 CY
RIP RAP CLASS B					29 TONS

TOTAL QUANTITIES

REINFORCING STEEL	60 LBS
CLASS A CONCRETE	1.0 CY
RIP RAP CLASS B	58 TONS



ELEVATION VIEW - INLET



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

SECTION THRU 1'-6" SILL

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SILL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX
2/19/14

DRAWN BY : J. MYA DATE : MAR 2013
CHECKED BY : R. DECOLA DATE : MAR 2013

REVISED STAGE 2 CONSTRUCTION LENGTH TO SHOW 22'-0"

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	SDC	2/19/2014	3		
2			4		

SHEET NO. C-5
TOTAL SHEETS 8

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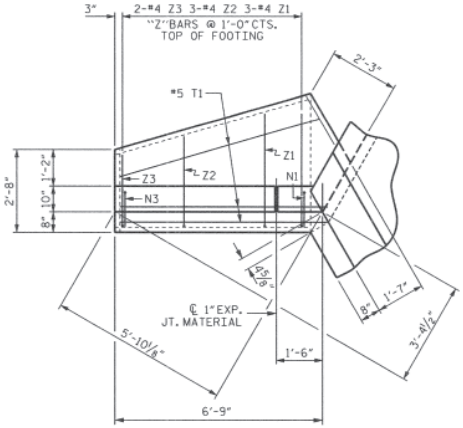
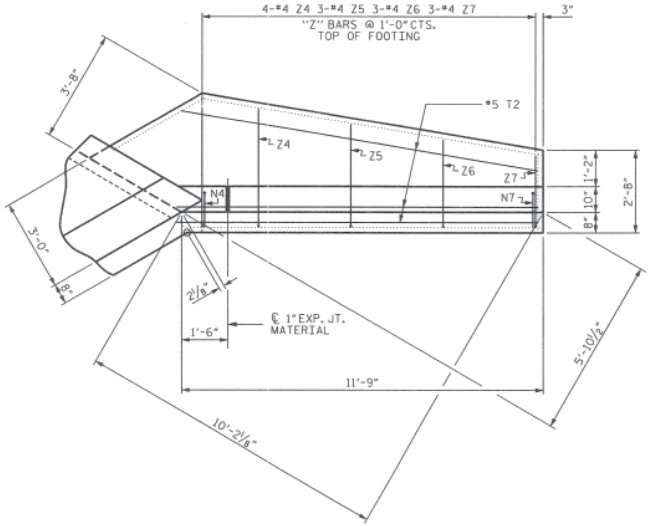
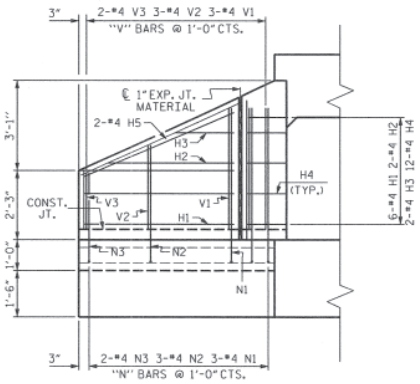


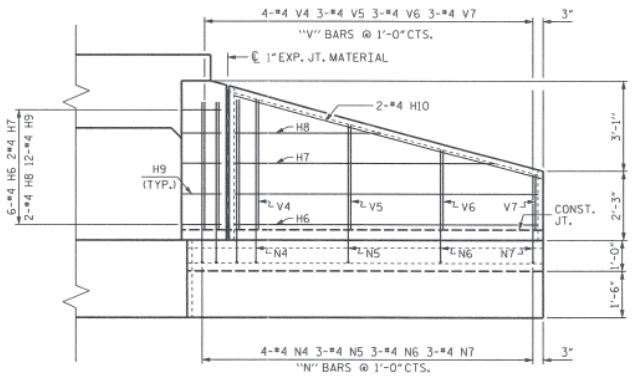
PLAN W2



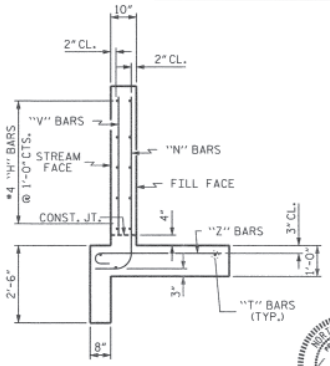
PLAN W1



ELEVATION W2



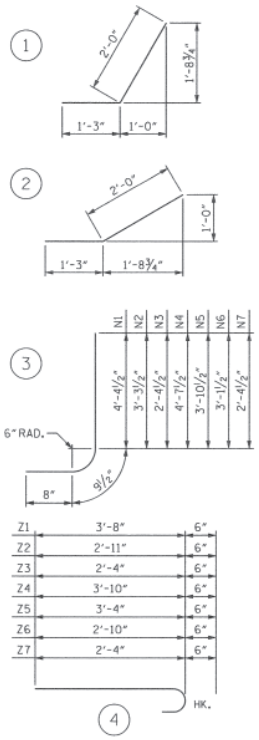
ELEVATION W1



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	4'-10"	19
H2	2	#4	STR	4'-0"	5
H3	2	#4	STR	1'-9"	2
H4	12	#4	1	3'-3"	26
H5	2	#4	STR	5'-3"	7
H6	6	#4	STR	9'-10"	39
H7	2	#4	STR	8'-4"	11
H8	2	#4	STR	4'-3"	6
H9	12	#4	2	3'-3"	26
H10	2	#4	STR	10'-2"	14
N1	3	#4	3	5'-10"	12
N2	3	#4	3	4'-9"	10
N3	2	#4	3	3'-10"	5
N4	4	#4	3	6'-1"	16
N5	3	#4	3	5'-4"	11
N6	3	#4	3	4'-7"	9
N7	3	#4	3	3'-10"	8
T1	3	#5	STR	6'-9"	21
T2	3	#5	STR	11'-9"	37
V1	3	#4	STR	3'-9"	8
V2	3	#4	STR	2'-8"	5
V3	2	#4	STR	1'-10"	2
V4	4	#4	STR	4'-0"	11
V5	3	#4	STR	3'-3"	7
V6	3	#4	STR	2'-6"	5
V7	3	#4	STR	1'-10"	4
Z1	3	#4	4	4'-2"	8
Z2	3	#4	4	3'-4"	7
Z3	2	#4	4	2'-10"	4
Z4	4	#4	4	4'-4"	12
Z5	3	#4	4	4'-0"	8
Z6	3	#4	4	3'-4"	7
Z7	3	#4	4	2'-10"	6

REINFORCING STEEL FOR 2 WINGS 378 LBS

CLASS A CONCRETE
2 WINGS 5.9 CY
1 HEADWALL 1.0 CY
1 END CURTAIN WALL 0.8 CY
TOTAL 7.7 CY

NOTE:
QUANTITIES ARE FOR STAGE 1.
STAGE 2 SIMILAR.

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 10 FT. x 4 FT. CONCRETE BOX CULVERT

H = 4'-0" SLOPE = 2:1
60° OR 120° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14047 STEPHEN D. COX
2/19/14

ASSEMBLED BY : J. MYA DATE : FEB 2013
CHECKED BY : R. DECOLA DATE : FEB 2013
DRAWN BY : CCJ 11/99
CHECKED BY : RWW 03/00

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-6
1			3					TOTAL SHEETS
2			4					8

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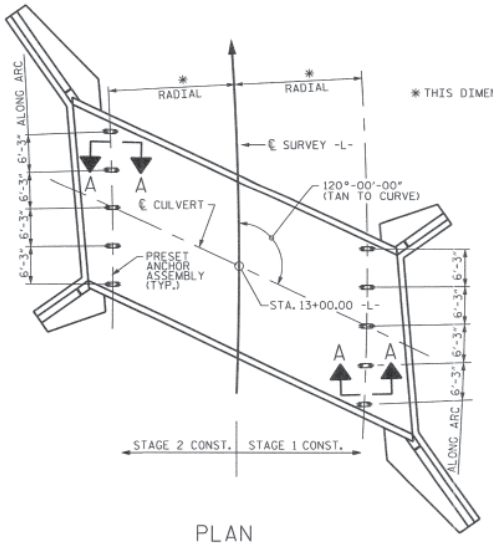
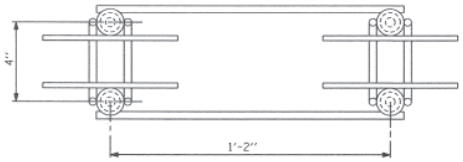


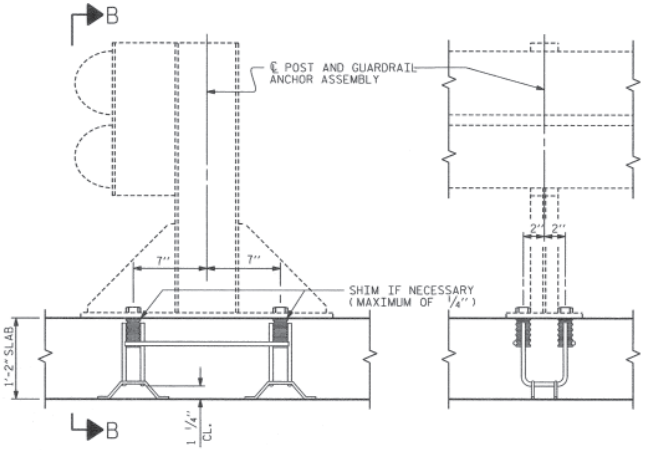
* THIS DIMENSION TO BE FURNISHED BY THE ENGINEER.

PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

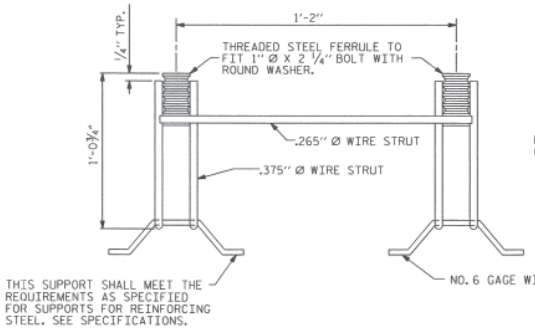


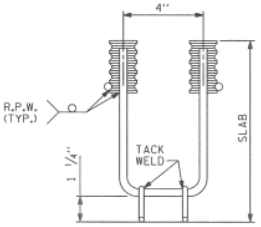
PLAN



SECTION A-A

SECTION B-B





ELEVATION

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

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

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

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

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

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

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

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

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

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

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX
2/19/14

ASSEMBLED BY : J. MYA		DATE : MAR. 2013	
CHECKED BY : R. DECOLA		DATE : MAR. 2013	
DRAWN BY : FCJ	6/88	REV. 7/10/01	LES/RDR
CHECKED BY : ARB	6/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	KMM/GM

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

REVISIONS									SHEET NO.
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1			3						TOTAL SHEETS
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STD. NO. GRAI

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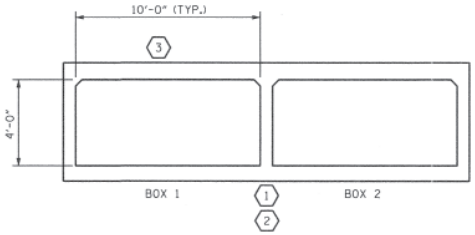
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × 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	1.53	--	1.75	2.02	1	BOTTOM SLAB	10.00	1.53	1	TOP SLAB	10.00	1, 2
		HL-93 (OPERATING)	N/A		1.98	--	1.35	2.62	1	BOTTOM SLAB	10.00	1.98	1	TOP SLAB	10.00	1, 2
		HS-20 (INVENTORY)	36.000	2	1.53	55.08	1.75	2.02	1	BOTTOM SLAB	10.00	1.53	1	TOP SLAB	10.00	1, 2
		HS-20 (OPERATING)	36.000		1.98	71.28	1.35	2.62	1	BOTTOM SLAB	10.00	1.98	1	TOP SLAB	10.00	1, 2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.24	43.74	1.40	3.84	1	TOP SLAB	5.00	3.24	1	TOP SLAB	10.00	1, 2
		SNGARBS2	20.000		2.92	58.40	1.40	3.60	1	TOP SLAB	5.00	2.92	1	TOP SLAB	10.00	1, 2
		SNAGRIS2	22.000		3.13	68.86	1.40	3.67	1	BOTTOM SLAB	10.00	3.13	1	TOP SLAB	10.00	1, 2
		SNCOTTS3	27.250	3	1.40	38.15	1.40	2.81	1	TOP SLAB	5.00	1.40	1	TOP SLAB	10.00	1, 2
		SNAGGRS4	34.925		1.80	62.87	1.40	2.32	1	BOTTOM SLAB	10.00	1.80	1	TOP SLAB	10.00	1, 2
		SNS5A	35.550		1.65	58.66	1.40	2.29	1	BOTTOM SLAB	10.00	1.65	1	TOP SLAB	10.00	1, 2
		SNS6A	39.950		1.57	62.72	1.40	2.32	1	BOTTOM SLAB	10.00	1.57	1	TOP SLAB	10.00	1, 2
		SNS7B	42.000		1.57	65.94	1.40	2.21	1	BOTTOM SLAB	10.00	1.57	1	TOP SLAB	10.00	1, 2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.10	69.30	1.40	2.55	1	BOTTOM SLAB	10.00	2.10	1	BOTTOM SLAB	10.00	1, 2
		TNT4A	33.075		1.70	56.23	1.40	2.96	1	BOTTOM SLAB	10.00	1.70	1	TOP SLAB	10.00	1, 2
		TNT6A	41.600		1.63	67.81	1.40	2.29	1	BOTTOM SLAB	10.00	1.63	1	TOP SLAB	10.00	1, 2
		TNT7A	42.000		1.66	69.72	1.40	2.22	1	BOTTOM SLAB	10.00	1.66	1	TOP SLAB	10.00	1, 2
		TNT7B	42.000		1.66	69.72	1.40	2.38	1	BOTTOM SLAB	10.00	1.66	1	TOP SLAB	10.00	1, 2
		TNAGRIT4	43.000		1.62	69.66	1.40	2.54	1	BOTTOM SLAB	10.00	1.62	1	TOP SLAB	10.00	1, 2
		TNAGT5A	45.000		1.63	73.35	1.40	2.39	1	BOTTOM SLAB	10.00	1.63	1	TOP SLAB	10.00	1, 2
		TNAGT5B	45.000		1.46	65.70	1.40	1.96	1	BOTTOM SLAB	10.00	1.46	1	BOTTOM SLAB	10.00	1, 2



LRFR SUMMARY

(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

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

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. 17BP.14.R.1

HAYWOOD COUNTY

STATION: 13+00.00 -L-

SHEET 8 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. COX

2/19/14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

STD. NO. LRFR5

ASSEMBLED BY : J. MYA		DATE : MAR. 2013	
CHECKED BY : R. DECOLA		DATE : MAR. 2013	
DRAWN BY : WMC 7/8	REV. 10/1/8	MAA/GM	
CHECKED BY : GM 7/8			

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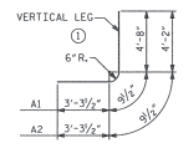
BILL OF MATERIAL (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	86	7	1	8'-9"	1538
A2	86	6	1	8'-3"	1066
A100	21	6	STR.	22'-8"	715
A101	1	6	STR.	20'-11"	31
A102	1	6	STR.	20'-0"	30
A103	1	6	STR.	19'-2"	29
A104	1	6	STR.	18'-3"	27
A105	1	6	STR.	17'-5"	26
A106	1	6	STR.	16'-7"	25
A107	1	6	STR.	15'-8"	24
A108	1	6	STR.	14'-10"	22
A109	1	6	STR.	13'-11"	21
A110	1	6	STR.	13'-1"	20
A111	1	6	STR.	12'-3"	18
A112	1	6	STR.	11'-4"	17
A113	1	6	STR.	10-6"	16
A114	1	6	STR.	9'-7"	14
A115	1	6	STR.	8'-9"	13
A116	1	6	STR.	7'-11"	12
A117	1	6	STR.	7'-0"	11
A118	1	6	STR.	6'-2"	9
A119	1	6	STR.	5'-3"	8
A120	1	6	STR.	4'-5"	7
A121	1	6	STR.	3'-7"	5
A122	1	6	STR.	2'-9"	33
A123	1	6	STR.	20'-11"	31
A124	1	6	STR.	20'-1"	30
A125	1	6	STR.	19'-2"	29
A126	1	6	STR.	18'-4"	28
A127	1	6	STR.	17'-6"	26
A128	1	6	STR.	16'-7"	25
A129	1	6	STR.	15'-9"	24
A130	1	6	STR.	14'-10"	22
A131	1	6	STR	14'-0"	21
A132	1	6	STR	13'-2"	20
A133	1	6	STR	12'-3"	18
A134	1	6	STR	11'-5"	17
A135	1	6	STR	10'-6"	16
A136	1	6	STR	9'-8"	15
A137	1	6	STR	8'-10"	13
A138	1	6	STR	7'-11"	12
A139	1	6	STR	7'-1"	11
A140	1	6	STR	6'-2"	9
A141	1	6	STR	5-4"	8
A142	1	6	STR	4'-6"	7
A143	1	6	STR	3'-7"	5
A144	1	6	STR	2'-9"	4
A145	1	6	STR	1'-10"	3
A146	1	6	STR	1'-0"	2
A200	21	6	STR	22'-8"	715
A201	1	6	STR	20'-11"	31
A202	1	6	STR	20'-0"	30
A203	1	6	STR	19'-2"	29
A204	1	6	STR	18'-3"	27
A205	1	6	STR	17'-5"	26
A206	1	6	STR	16'-7"	25
A207	1	6	STR	15'-8"	24
A208	1	6	STR	14'-10"	22
A209	1	6	STR	13'-11"	21
A210	1	6	STR	13'-1"	20
A211	1	6	STR	12'-3"	18
A212	1	6	STR	11'-4"	17
A213	1	6	STR	10-6"	16
A214	1	6	STR	9'-7"	14
A215	1	6	STR	8'-9"	13
A216	1	6	STR	7'-11"	12
A217	1	6	STR	7'-0"	11
A218	1	6	STR	6'-2"	9
A219	1	6	STR	5'-3"	8
A220	1	6	STR	4'-5"	7
A221	1	6	STR	3'-7"	5
A222	1	6	STR	21'-9"	33
A223	1	6	STR	20'-11"	31
A224	1	6	STR	20'-1"	30
A225	1	6	STR	19'-2"	29
A226	1	6	STR	18'-4"	28
A227	1	6	STR	17'-6"	26
A228	1	6	STR	16'-7"	25
A229	1	6	STR	15'-9"	24
A230	1	6	STR	14'-10"	22
A231	1	6	STR	14'-0"	21
A232	1	6	STR	13'-2"	20
A233	1	6	STR	12'-3"	18
A234	1	6	STR	11'-5"	17
A235	1	6	STR	10'-6"	16
A236	1	6	STR	9'-8"	15
A237	1	6	STR	8'-10"	13
A238	1	6	STR	7'-11"	12
A239	1	6	STR	7'-1"	11
A240	1	6	STR	6'-2"	9
A241	1	6	STR	5-4"	8
A242	1	6	STR	4'-6"	7
A243	1	6	STR	3'-7"	5
A244	1	6	STR	2'-9"	4
A245	1	6	STR	1'-10"	3
A246	1	6	STR	1'-0"	2
A300	21	7	STR	22'-8"	973
A301	1	7	STR	21'-11"	45
A302	1	7	STR	21'-0"	43
A303	1	7	STR	20'-2"	41
A304	1	7	STR	19'-3"	39
A305	1	7	STR	18'-5"	38
A306	1	7	STR	17'-7"	36
A307	1	7	STR	16'-8"	34
A308	1	7	STR	15'-10"	32
A309	1	7	STR	14'-11"	30
A310	1	7	STR	14'-1"	29
A311	1	7	STR	13'-3"	27
A312	1	7	STR	12'-4"	25
A313	1	7	STR	11'-6"	24
A314	1	7	STR	10'-7"	22
A315	1	7	STR	9'-9"	20
A316	1	7	STR	8'-11"	18
A317	1	7	STR	8'-0"	16
A318	1	7	STR	7'-2"	15
A319	1	7	STR	6'-3"	13
A320	1	7	STR	5'-5"	11
A321	1	7	STR	4'-7"	9
A322	1	7	STR	21'-9"	44
A323	1	7	STR	20'-11"	43
A324	1	7	STR	20'-1"	41
A325	1	7	STR	19'-2"	39
A326	1	7	STR	18'-4"	37
A327	1	7	STR	17'-6"	36
A328	1	7	STR	16'-7"	34
A329	1	7	STR	15'-9"	32
A330	1	7	STR	14'-10"	30
A331	1	7	STR	14'-0"	29
A332	1	7	STR	13'-2"	27
A333	1	7	STR	12'-3"	25
A334	1	7	STR	11'-5"	23
A335	1	7	STR	10'-6"	21
A336	1	7	STR	9'-8"	20
A337	1	7	STR	8'-10"	18
A338	1	7	STR	7'-11"	16
A339	1	7	STR	7'-1"	14
A340	1	7	STR	6'-2"	13
A341	1	7	STR	5'-4"	11
A342	1	7	STR	4'-6"	9
A343	1	7	STR	3'-7"	7
A344	1	7	STR	2'-9"	6
A345	1	7	STR	1'-10"	4
A346	1	7	STR	1'-0"	2
A400	21	6	STR	22'-8"	715
A401	1	6	STR	20'-11"	31
A402	1	6	STR	20'-0"	30
A403	1	6	STR	19'-2"	29
A404	1	6	STR	18'-3"	27
A405	1	6	STR	17'-5"	26
A406	1	6	STR	16'-7"	25
A407	1	6	STR	15'-8"	24
A408	1	6	STR	14'-10"	22
A409	1	6	STR	13'-11"	21
A410	1	6	STR	13'-1"	20
A411	1	6	STR	12'-3"	18
A412	1	6	STR	11'-4"	17
A413	1	6	STR	10-6"	16
A414	1	6	STR	9'-7"	14
A415	1	6	STR	8'-9"	13
A416	1	6	STR	7'-11"	12
A417	1	6	STR	7'-0"	11
A418	1	6	STR	6'-2"	9
A419	1	6	STR	5'-3"	8
A420	1	6	STR	4'-5"	7
A421	1	6	STR	3'-7"	5
A422	1	6	STR	21'-9"	33
A423	1	6	STR	20'-11"	31
A424	1	6	STR	20'-1"	30
A425	1	6	STR	19'-2"	29
A426	1	6	STR	18'-4"	28
A427	1	6	STR	17'-6"	26
A428	1	6	STR	16'-7"	25
A429	1	6	STR	15'-9"	24
A430	1	6	STR	14'-10"	22
A431	1	6	STR	14'-0"	21
A432	1	6	STR	13'-2"	20
A433	1	6	STR	12'-3"	18
A434	1	6	STR	11'-5"	17
A435	1	6	STR	10'-6"	16
A436	1	6	STR	9'-8"	15
A437	1	6	STR	8'-10"	13
A438	1	6	STR	7'-11"	12
A439	1	6	STR	7'-1"	11
A440	1	6	STR	6'-2"	9
A441	1	6	STR	5-4"	8
A442	1	6	STR	4'-6"	7
A443	1	6	STR	3'-7"	5
A444	1	6	STR	2'-9"	4
A445	1	6	STR	1'-10"	3
A446	1	6	STR	1'-0"	2
B1	86	6	STR.	4'-6"	581
B3	86	7	STR.	5'-6"	1011
C1	73	4	STR.	22'-8"	1105
G1	4	5	STR.	25'-0"	104
S1	6	8	2	25'-0"	401

BAR TYPES



TOTAL STRUCTURE QUANTITIES (STAGE 2)

CLASS A CONCRETE

BARREL @	2.07	CY/FT	43.5	C.Y.
WING ETC.	10.0			C.Y.
SILLS	1.0			C.Y.
TOTAL	54.4			C.Y.

REINFORCING STEEL

BARREL	11,922	LBS.
WINGS ETC.	10.0	LBS.
SILLS	67	LBS.
TOTAL	11,999	LBS.

FOUNDATION COND. MAT.'L	37.6	TONS
CLASS "B" RIP RAP	58	TONS
CULVERT EXCAVATION	LUMP SUM	
REMOVAL OF EXIST. STRUTURE	LUMP SUM	

PROJECT NO. 17BP.14.R.1
HAYWOOD COUNTY
STATION: 13+00.00 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL DOUBLE 10 FT. X 4 FT. CONCRETE BOX CULVERT

NORTH CAROLINA PROFESSIONAL SEAL 14047 ENGINEER STEPHEN D. DECOLA 2/19/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322
NC COA No. F-0840

⚠ THIS SHEET REMOVED FROM CONTRACT PLAN SET

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-3
1	SDC	2/19/2014	3				TOTAL SHEETS
2			4				9

DRAWN BY : J. MYA DATE : MAR 2013
CHECKED BY : R. DECOLA DATE : MAR. 2013

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