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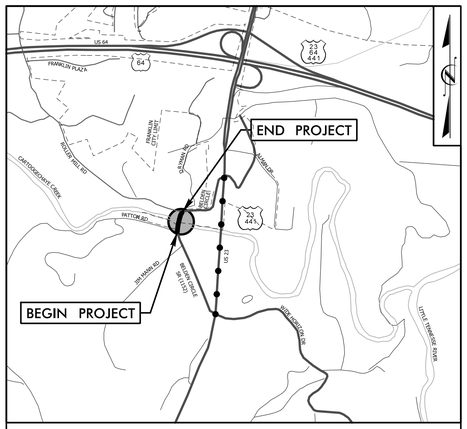
TIP PROJECT: 17BP.14.R.154

CONTRACT: C204130

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet



DETOUR

VICINITY MAP

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MACON COUNTY

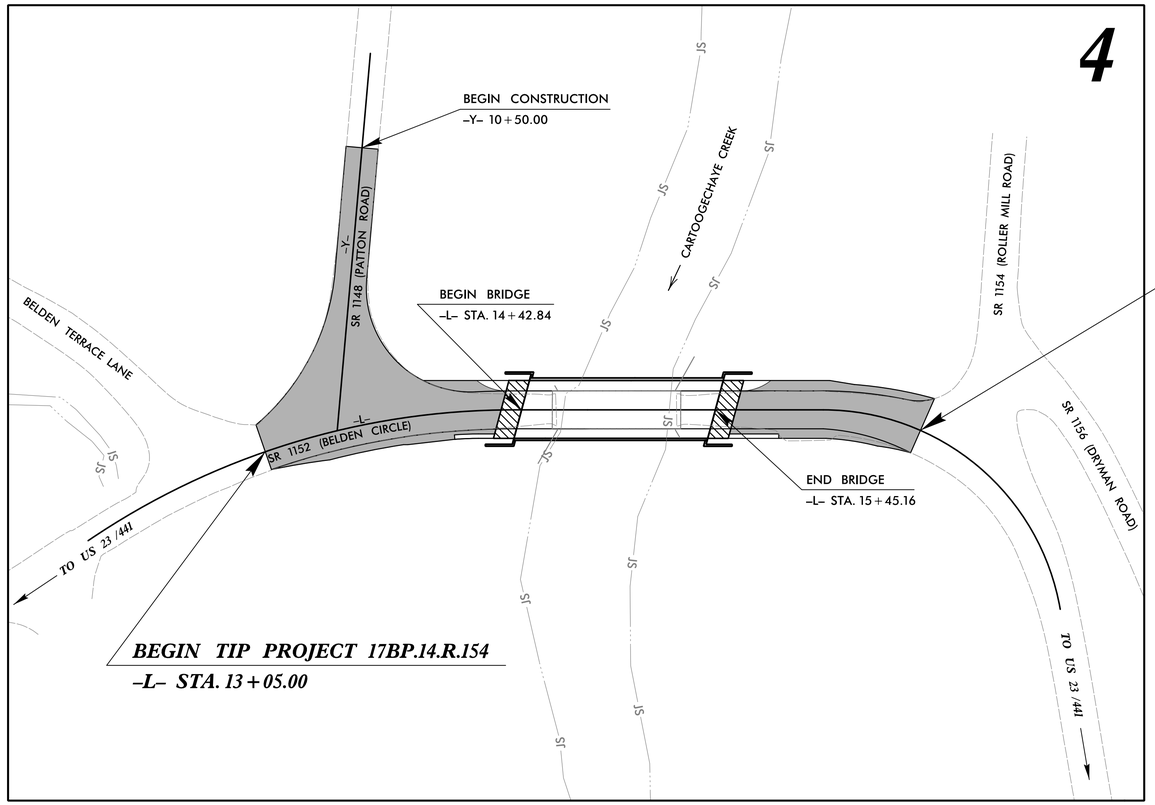
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.154	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.154		P.E.
17BP.14.R.154		ROW & UTILITIES
50192.3.1		CONSTRUCTION

LOCATION: BRIDGE #314 OVER CARTOOGECHAYE CREEK ON SR 1152 (BELDEN CIR)

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

NAD 83 NA 2011



BEGIN TIP PROJECT 17BP.14.R.154
–L– STA. 13+05.00

END TIP PROJECT 17BP.14.R.154
–L– STA. 16+55.00

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2018 = 1388
ADT 2038 = 1971
K = N/A
D = N/A
T = 6%
V = 25 MPH
FUNC. CLASSIFICATION: LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT TIP 17BP.14.R.154 = 0.047 MILES

LENGTH OF STRUCTURE PROJECT TIP 17BP.14.R.154 = 0.019 MILES

TOTAL LENGTH OF PROJECT TIP 17BP.14.R.154 = 0.066 MILES

NCDOT CONTACT: JOSH DEYTON, PE
Division Bridge Manager

PLANS PREPARED FOR THE NCDOT BY:

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 4, 2017

LETTING DATE: NOVEMBER 20, 2018

NIKKI T. HONEYCUTT, PE
PROJECT ENGINEER

MAAMOON K. ABDELAZIZ
PROJECT DESIGNER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040590 ENGINEER SHIRSHANT SHARMA

DocuSigned by: Shirshant Sharma C6DBA107SAAE461...
SIGNATURE: P.E. 9/20/2018

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039234 ENGINEER NIKKI T. HONEYCUTT

DocuSigned by: Nikki T. Honeycutt E8E3E4EA9E44473...
SIGNATURE: P.E. 9/20/2018

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

9/20/2018
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WindsoWA

09/08/99

TIP PROJECT: 17BP.14.R.154

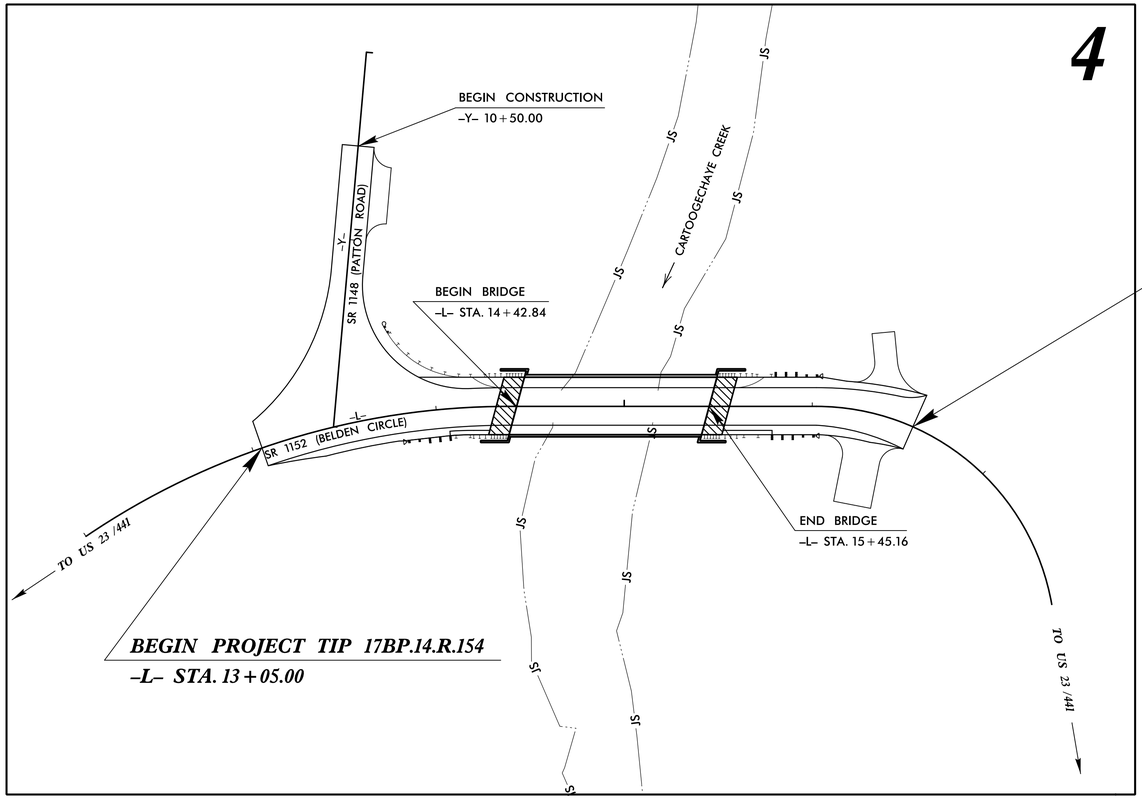
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.154	RW01	

MACON COUNTY

LOCATION: BRIDGE #314 OVER CARTOOGECHAYE CREEK ON SR 1152 (BELDEN CIR)

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



GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT "U102"
WITH NAD 83/NSRS XXXX STATE PLANE GRID COORDINATES OF
NORTHING: 546,326.359(ft) EASTING: 688,880.503(ft)
ELEVATION: 2,161.20(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9997791217
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"U102" TO -L- STATION 13+05.00 IS
S 20° 44' 55.8" W 5,081.36'(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 4, 2017

LETTING DATE:
SEPTEMBER 18, 2018

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4727 LAND SURVEYOR BRIAN A BARWATT

DocuSigned by:
Brian A Barwatt
SIGNATURE:
9/10/2018

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

7/26/2018
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cgroves

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

SEE SHEET 2C-2 FOR FURTHER ALIGNMENT DETAILS

NCDOT BASELINE MONUMENT (BY8-38)
LOCALIZED PROJECT COORDINATES
N = 541,703.3110
E = 686,791.9590
ELEV. = 2,040.99'

NCDOT BASELINE MONUMENT (BY9-39)
LOCALIZED PROJECT COORDINATES
N = 542,021.4820
E = 686,841.4850
ELEV. = 2,045.86'

NCDOT BASELINE MONUMENT (BY7-37)
LOCALIZED PROJECT COORDINATES
N = 541,125.0720
E = 686,857.5540
ELEV. = 2,055.48'

BM-13
ELEV. = 2,051.71'

BM-14
ELEV. = 2,038.77'

BM-12
ELEV. = 2,042.42'

NCDOT BASELINE MONUMENT (BY2-20)
LOCALIZED PROJECT COORDINATES
N = 541,972.2680
E = 687,157.7880
ELEV. = 2,041.81'

NCDOT BASELINE MONUMENT (BY2-18)
LOCALIZED PROJECT COORDINATES
N = 541,320.3910
E = 687,160.4110
ELEV. = 2,045.18'

BM-10
ELEV. = 2,042.90'

NCDOT BASELINE MONUMENT (BY2-19)
LOCALIZED PROJECT COORDINATES
N = 541,662.9190
E = 687,055.2200
ELEV. = 2,035.37'

NCDOT BASELINE MONUMENT (BY4-26)
LOCALIZED PROJECT COORDINATES
N = 542,082.9010
E = 687,387.5600
ELEV. = 2,086.72'

NC GRID
NAD 83 NA 2011

NOTES:

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

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

REVISIONS 6/2/99

7/26/2018
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cgroce

6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EY2

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	540207.422	687729.106							
LINE			N 69°18'08.0" W	40.62					
PC	540221.778	687691.108							
CURVE			N 42°20'08.0" W	122.44	53°56'00.0"(RT)	42°26'28.7"	127.08	68.69	135.00
PT	540312.286	687608.649							
LINE			N 15°22'08.0" W	57.92					
PC	540368.130	687593.300							
CURVE			N 19°39'17.1" W	97.15	08°34'18.1"(LT)	08°48'53.0"	97.24	48.71	650.00
PT	540459.622	687560.623							
LINE			N 23°56'26.1" W	1113.56					
PC	541477.383	687108.750							
CURVE			N 06°51'14.0" W	229.18	34°10'24.3"(RT)	14°41'28.4"	232.61	119.88	390.00
PT	541704.924	687081.400							
LINE			N 10°13'58.1" E	172.47					
PC	541874.651	687112.039							
CURVE			N 50°18'23.4" E	154.51	80°08'50.4"(RT)	47°44'47.3"	167.86	100.96	120.00
PT	541973.331	687230.927							
LINE			S 89°37'11.4" E	302.63					
PC	541971.323	687533.551							
CURVE			N 83°39'42.2" E	52.34	13°26'12.8"(LT)	25°36'51.3"	52.46	26.35	223.69
PCC	541977.101	687585.569							
CURVE			N 56°53'34.2" E	92.57	40°06'03.2"(LT)	42°26'28.7"	94.49	49.27	135.00
PCC	542027.663	687663.109							
CURVE			N 24°11'49.2" E	58.79	25°17'26.8"(LT)	42°40'04.1"	59.27	30.13	134.28
PT	542081.291	687687.207							
LINE			N 11°33'05.8" E	239.87					
PC	542316.301	687735.241							
CURVE			N 11°19'32.3" E	45.20	00°27'07.0"(LT)	01°00'00.0"	45.20	22.60	5729.58
PT	542360.616	687744.117							
LINE			N 11°05'58.8" E	98.59					
PC	542457.364	687763.098							
CURVE			N 15°15'58.3" E	40.07	08°19'59.0"(RT)	20°46'44.5"	40.10	20.09	275.74
PCC	542496.018	687773.648							
CURVE			N 40°34'47.9" E	49.06	42°17'40.2"(RT)	84°15'30.6"	50.20	26.30	68.00
PCC	542533.282	687805.564							
CURVE			N 76°15'40.5" E	21.60	29°04'05.0"(RT)	133°08'06.6"	21.83	11.16	43.04
PT	542538.412	687826.546							
LINE			S 89°12'17.0" E	43.26					
POT	542537.811	687869.802							
LINE			N 79°34'51.9" E	83.99					
PC	542553.000	687952.407							
CURVE			N 81°02'36.7" E	97.49	02°55'29.6"(RT)	03°00'00.0"	97.50	48.76	1909.86
PT	542568.177	688048.704							
LINE			N 82°30'21.4" E	153.48					
PC	542588.195	688200.874							
CURVE			N 82°19'04.6" E	18.80	00°22'33.7"(LT)	02°00'00.0"	18.80	9.40	2864.79
PT	542590.708	688219.507							
LINE			N 82°07'47.7" E	58.87					
PC	542598.769	688277.822							
CURVE			N 86°53'06.9" E	41.45	09°30'38.4"(RT)	22°55'05.9"	41.50	20.80	250.00
PT	542601.021	688319.211							
LINE			S 88°21'33.9" E	56.85					
PC	542599.394	688376.040							
CURVE			S 87°07'55.0" E	21.42	02°27'17.9"(RT)	11°27'33.0"	21.42	10.71	500.00
PT	542598.322	688397.435							
LINE			S 85°54'16.0" E	160.73					
POT	542586.843	688557.751							

EY4

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	541960.667	687104.305							
CURVE			N 40°45'41.4" E	45.45	54°04'04.8"(RT)	114°35'29.6"	47.18	25.51	50.00
PT	541995.094	687133.982							
LINE			N 67°47'43.8" E	19.29					
PC	542002.383	687151.840							
CURVE			N 72°29'10.0" E	53.97	09°22'52.5"(RT)	17°21'44.5"	54.03	27.08	330.00
PT	542018.625	687203.310							
LINE			N 77°10'36.3" E	115.73					
PC	542044.312	687316.156							
CURVE			N 67°56'19.3" E	38.53	18°28'34.0"(LT)	47°44'47.3"	38.70	19.52	120.00
PT	542058.783	687351.864							
LINE			N 58°42'02.3" E	1.58					
PC	542059.605	687353.215							
CURVE			N 23°54'43.4" E	51.35	69°34'37.7"(LT)	127°19'26.2"	54.65	31.26	45.00
PT	542106.547	687374.029							
LINE			N 10°52'35.4" W	5.61					
PC	542112.056	687372.970							

EY7

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	541149.474	686902.996							
LINE			N 47°05'00.4" E	137.35					
PC	541243.002	687003.586							
CURVE			N 50°27'38.7" E	117.82	06°45'16.6"(RT)	05°43'46.5"	117.89	59.01	1000.00
PT	541318.009	687094.449							
LINE			N 53°50'17.0" E	79.55					
POT	541364.946	687158.671							

EY8

POINT	N	E	BEARING	DIST
POT	541706.730	686735.916		
LINE			S 74°44'36.0" E	352.30
POT	541614.025	687075.796		

EY9

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	542047.829	686794.221							
LINE			S 72°57'41.5" E	85.91					
PC	542022.656	686876.359							
CURVE			S 74°11'49.7" E	123.55	02°28'16.5"(LT)	02°00'00.0"	123.56	61.79	2864.79
PT	541989.009	686995.243							
LINE			S 75°25'58.0" E	165.64					
POT	541947.348	687155.557							

BASELINE

BY2

POINT	DESC.	NORTH	EAST	ELEVATION
B3	BY2	540172.5470	687684.8020	2034.67
16	BY2-16	540783.3440	687431.9960	2051.31
17	BY2-17	541117.1280	687285.2370	2053.75
18	BY2-18	541320.3910	687160.4110	2045.18
19	BY2-19	541662.9190	687055.2200	2035.37
20	BY2-20	541972.2680	687157.7880	2041.81
21	BY2-21	541983.4910	687647.2170	2069.01
22	BY2-22	542363.3020	687758.8050	2080.78

BY4

POINT	DESC.	NORTH	EAST	ELEVATION
B20	BY4	541972.2680	687157.7880	2041.81
26	BY4-26	542082.9010	687387.5600	2086.72
27	BY4-27	542295.8200	687290.0380	2117.14
28	BY4-28	542538.9230	687315.0510	2131.96
29	BY4-29	542676.2800	687170.5660	2147.61
30	BY4-30	542994.0230	687244.6180	2152.13
31	BY4-31	543134.0360	687375.2110	2141.83
32	BY4-32	543189.9840	687638.8450	2143.84

BY7

POINT	DESC.	NORTH	EAST	ELEVATION
37	BY7-37	541125.0720	686857.5540	2055.48
A18	BY7	541320.3910	687160.4110	2045.18

BY8

POINT	DESC.	NORTH	EAST	ELEVATION
38	BY8-38	541703.3110	686791.9590	2040.99
A19	BY8	541662.9190	687055.2200	2035.37

BY9

POINT	DESC.	NORTH	EAST	ELEVATION
39	BY9-39	542021.4820	686841.4850	2045.86
A20	BY9	541972.2680	687157.7880	2041.81

```
.....................................
BM10      ELEVATION = 2042.90
N 541397      E 687174
PUNCH HOLE IN CONCRETE SLAB
.....................................
.....................................
BM12      ELEVATION = 2042.42
N 541607      E 686997
ANCHOR SCREW ON DUKE ENERGY POLE
.....................................
.....................................
BM13      ELEVATION = 2051.71
N 542046      E 686907
8" SPIKE IN BASE OF 27" RED MAPLE
.....................................
.....................................
BM14      ELEVATION = 2038.77
N 541946      E 687055
8" SPIKE IN BASE OF 16" SYCAMORE
.....................................
```

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

7/26/2018
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	RW02D-1
Location and Surveys	

PROPOSED ALIGNMENT CONTROL SHEET

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	541291.3437	687191.0760
PC	12+00.00	541474.1370	687109.9181
PT	14+38.58	541707.5121	687081.8672
PC	16+02.17	541868.5074	687110.9300
PT	17+79.82	541972.9433	687236.7526
POT	19+98.01	541971.4956	687454.9365

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	541666.5617	686883.1879
POT	12+00.00	541613.9330	687076.1392

NOTES:

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

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

7/26/2018
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REVISIONS

RIGHT OF WAY AND PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	RW03E-1
Location and Surveys	

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4727 LAND SURVEYOR BRIAN A BARWATT
DocuSigned by: Brian A Barwatt A935SFE84BAC5...
7/30/2018

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

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

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

Witness my original signature, registration number and seal this 12th day of March, 2018.

DocuSigned by: Brian A Barwatt A935SFE84BAC5...

Professional Land Surveyor — L-4727 PLS # — Seal

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+25.00	-30.34	541591.2040	687047.5543
L	13+93.00	-41.33	541664.9681	687035.0998
L	15+60.00	-55.00	541836.7759	687049.3129
L	16+14.00	-30.45	541888.2035	687084.2397
L	15+45.00	30.00	541806.9144	687130.2961
L	15+45.00	43.00	541804.6050	687143.0894
L	15+16.00	43.00	541776.0663	687137.9376
L	15+16.00	30.00	541778.3757	687125.1443

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	11+20.00	-11.00	541645.5968	687001.8532
Y	11+22.00	11.00	541623.8458	686997.9936

PUE

ROW MARKER PERMANENT EASTEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+73.00	-65.00	541752.9363	687024.0165
L	14+73.00	-46.62	541749.6706	687042.1070
L	15+60.00	-75.00	541840.3291	687029.6297
L	15+77.00	-75.00	541857.0585	687032.6510
L	16+00.00	-37.23	541872.9835	687073.9030
L	16+05.00	29.98	541865.3032	687140.8365
L	15+45.00	63.00	541801.0520	687162.7712
L	15+16.00	63.00	541772.5133	687157.6194

PDE

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+70.00	27.81	541910.7990	687160.8641
L	16+56.00	40.00	541895.2444	687164.2254
L	15+85.00	40.75	541844.3680	687147.9836

NOTES:

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

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

7/26/2018
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geovas

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	RW04

Location and Surveys

PROJECT SURVEYOR

SEAL L-4727 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR BRIAN A BARWATT 7/30/2018

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

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

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

Witness my original signature, registration number and seal this 12th day of March, 2018.

DocuSigned by: Brian A Barwatt

Professional Land Surveyor L-4727 PLS # Seal

NOTES:

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

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

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R154	2A-1
R/W SHEET NO.	

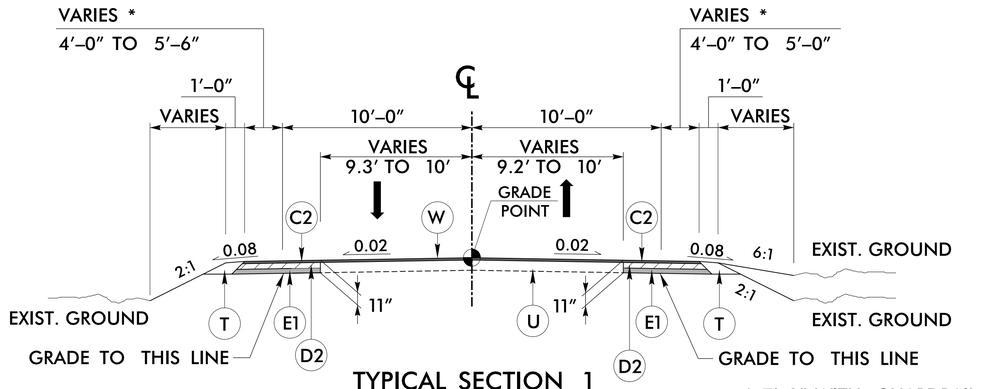
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 ENGINEER MICHAEL T. HONEYCUTT 7/26/2018

PAVEMENT DESIGN ENGINEER

PAVEMENT DESIGN PROVIDED BY NCDOT

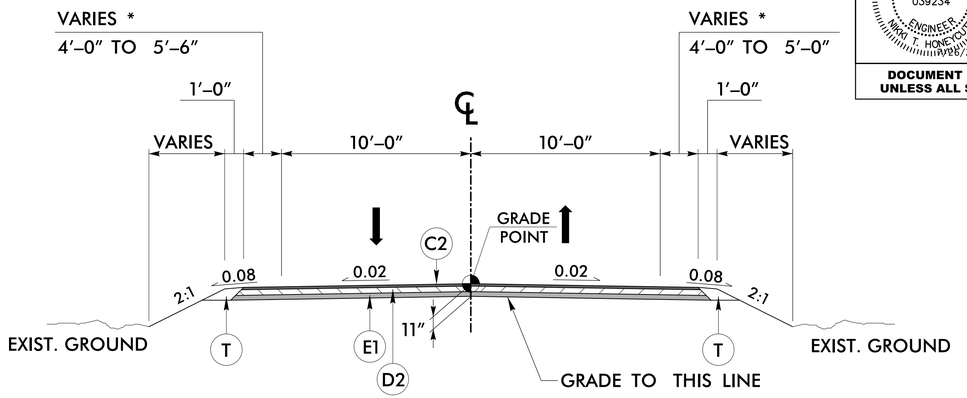
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION 1

–L– STA. 13+05.00 TO 13+85.00
–L– STA. 15+60.00 TO 16+55.00

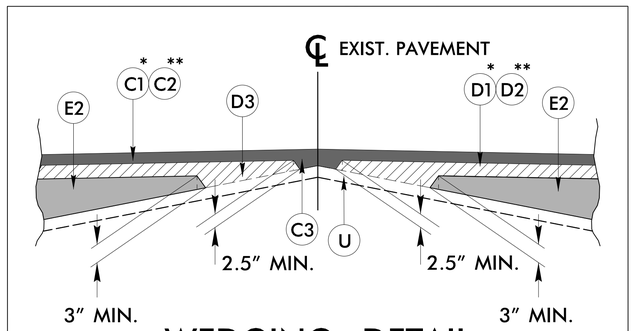
* 7′–0″ WITH GUARDRAIL



TYPICAL SECTION 2

* 7′–0″ WITH GUARDRAIL

–L– STA. 13+85.00 TO 14+42.84 (BEGIN BRIDGE)
–L– STA. 15+45.16 (END BRIDGE) TO 15+60.00

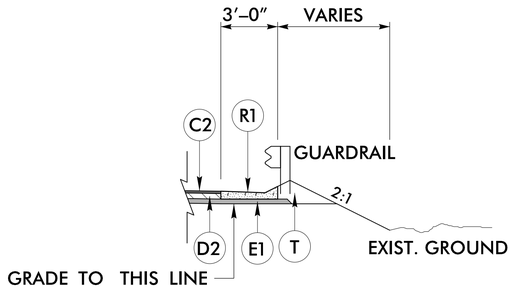


WEDGING DETAIL

* USE WITH –Y– TYPICAL SECTIONS
** USE WITH –L– TYPICAL SECTIONS

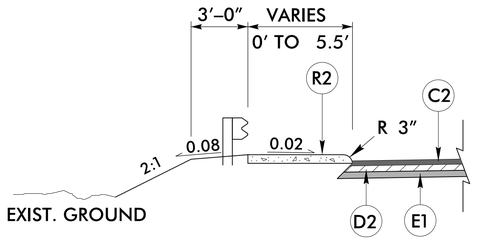
	PAVEMENT SCHEDULE
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.
D1	PROP. APPROX. 3.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D2	PROP. APPROX. 4.0″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3.0″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
R1	CONCRETE SHOULDER BERM GUTTER
R2	5.5″ MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PAVEMENT WEDGING

ALL PAVEMENT SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



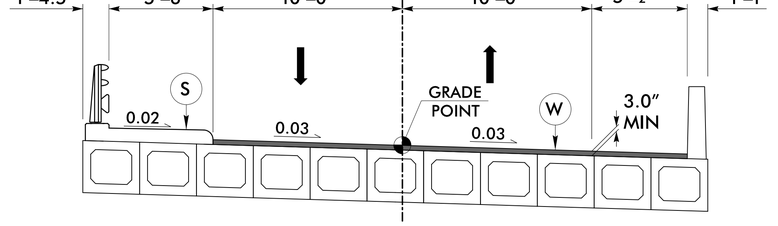
DETAIL A

–L– STA. 14+06.38 TO 14+28.27 (RT)
–L– STA. 15+53.32 TO 15+78.53 (RT)



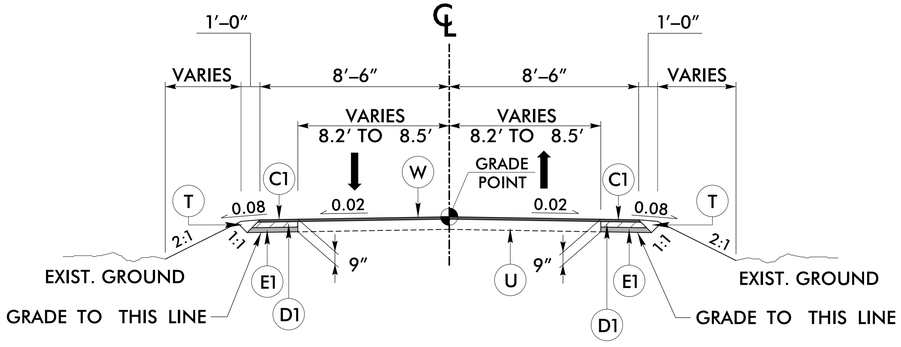
DETAIL B

–L– STA. 14+19.85 TO 14+36.24 (LT)
–L– STA. 15+60.15 TO 15+74.46 (LT)



TYPICAL SECTION 3

–L– STA. 14+42.84 TO 15+45.16



TYPICAL SECTION 4

–Y– STA. 10+50.00 TO 11+89.47

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	2C-1

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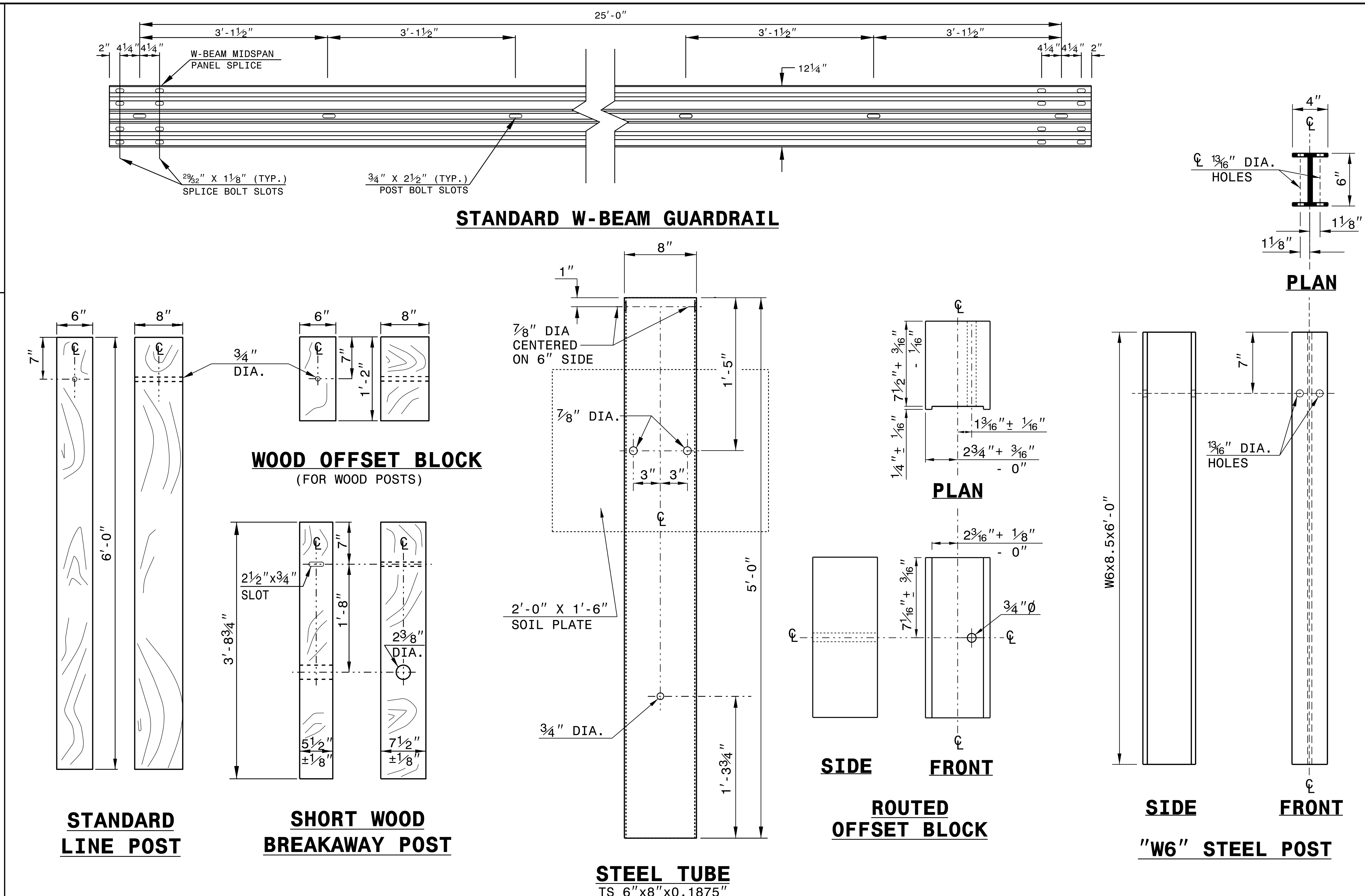
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SYSTEM PARTS

SHEET 6 OF 8
862D02

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

SEE TITLE BLOCK

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/26/2018

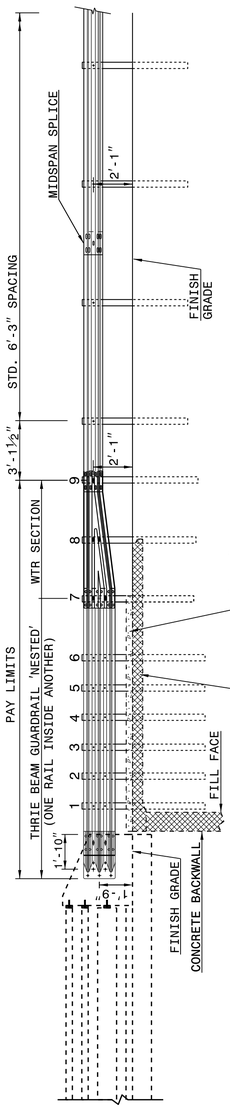
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	2C-2

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

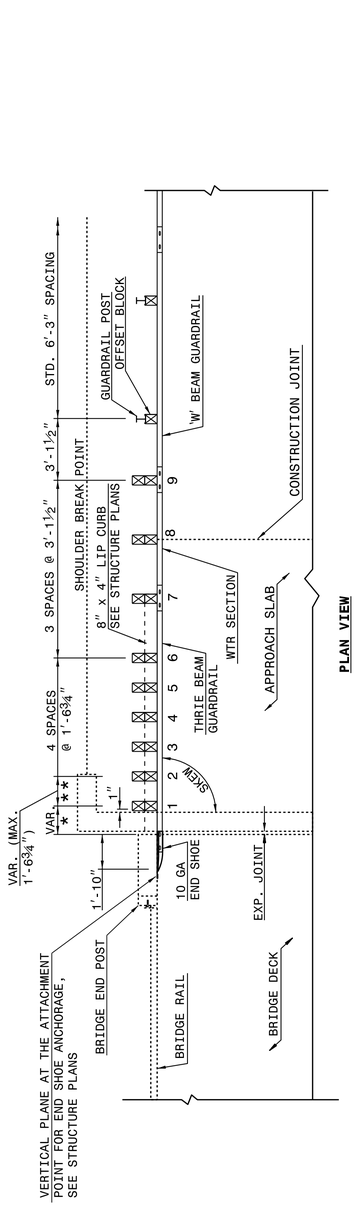
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



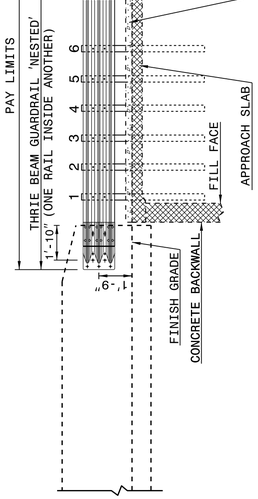
PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

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*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
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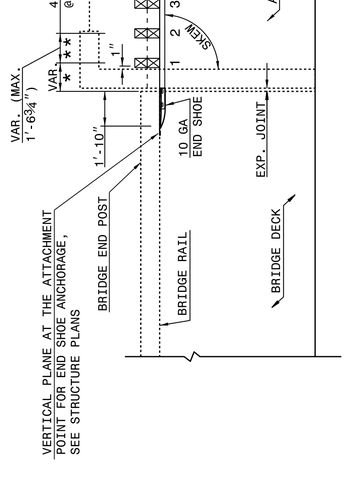
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

Digitally signed by Joel S. Howerton
NORTH CAROLINA
SEAL 022966
ENGINEER
Joel S. Howerton
7/26/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

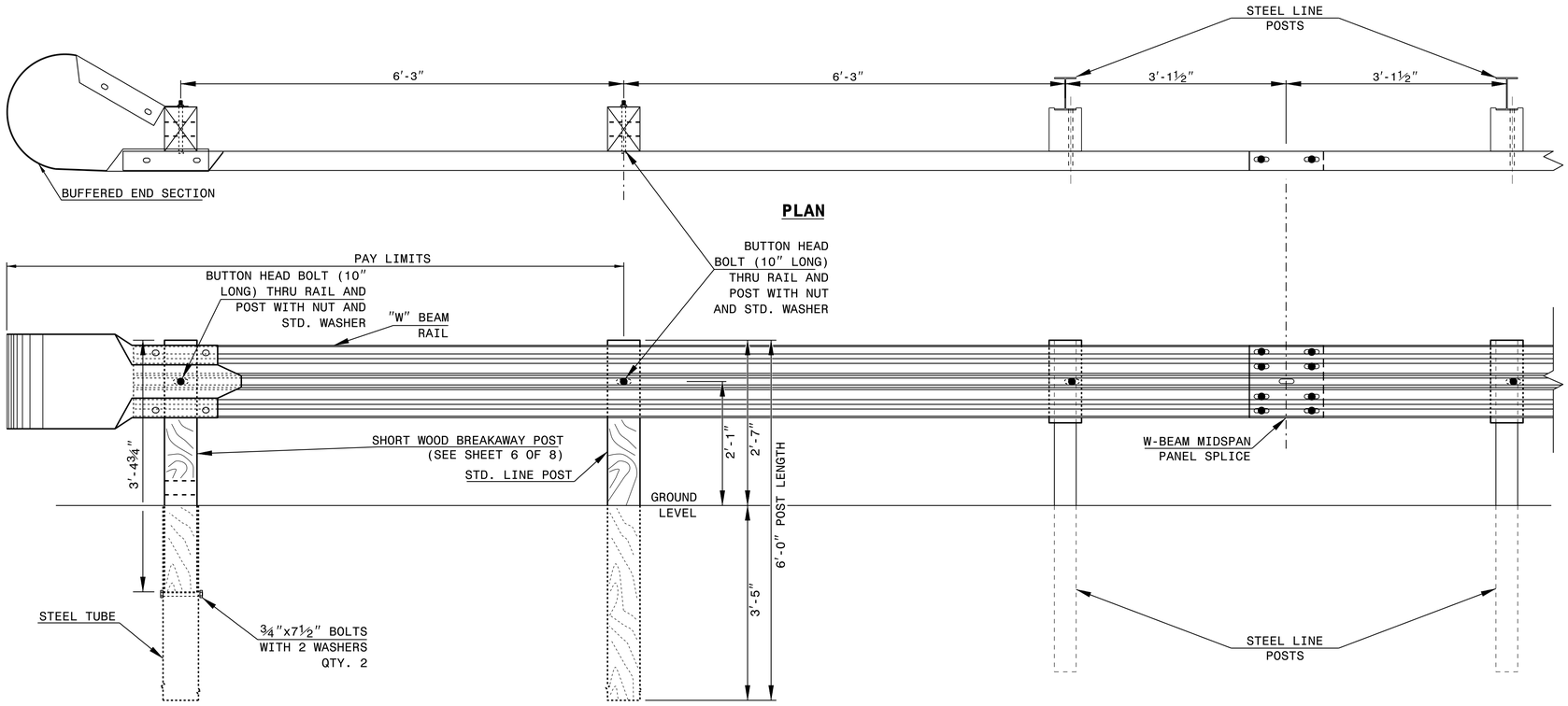
ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

14-DEC-2017 10:36
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn
jhowerton AT CSD-2425965

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	2C-3

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER DEREK S. HOWERTON

8/6/2018

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

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

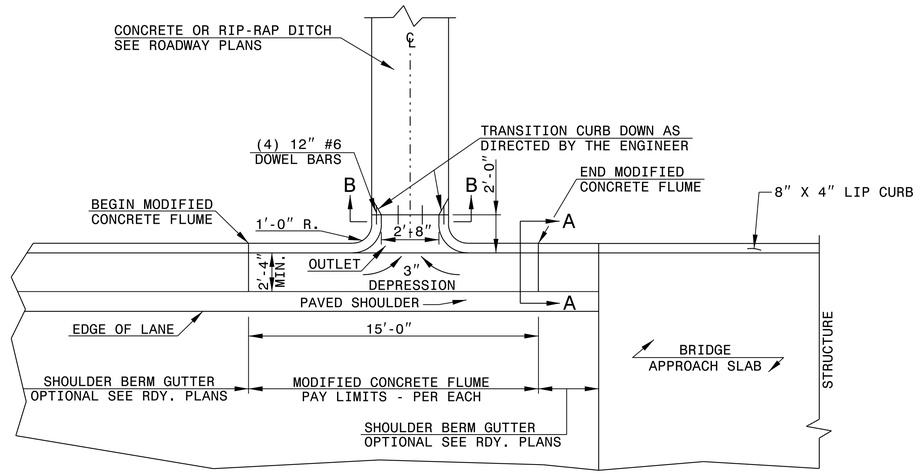
PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	2C-4

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

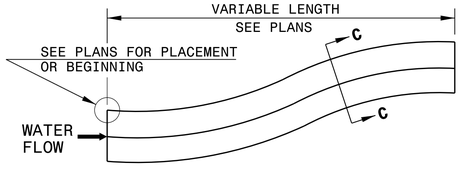
ENGLISH DETAIL DRAWING FOR

MODIFIED CONCRETE FLUME

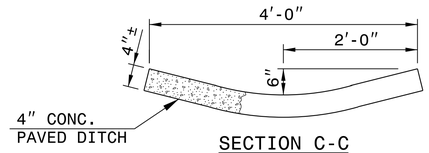
WITH CONCRETE OR RIP-RAP DITCH



PLAN VIEW

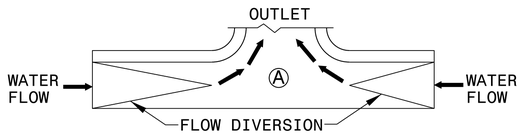


DOWNGRADE OR SAG

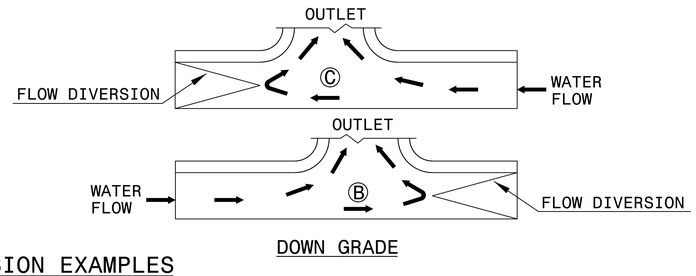


SECTION C-C

SECTION A-A

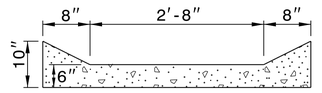


SAG

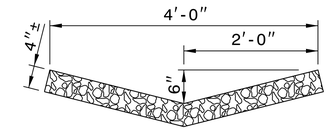


DOWN GRADE

FLOW DIVERSION EXAMPLES



SECTION B-B



RIP-RAP LINED DITCH

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18″ PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

SHEET 1 OF 1
MODFLMDTCH

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

ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. Ward DATE: Apr. 2002
MODIFIED BY: J.S. Howerton DATE: October 2017
CHECKED BY: _____ DATE: _____
FILE SPEC.: w:details\stand\modifiedflume.dgn

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	3B-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULIC DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EARTHWORK SUMMARY (IN CUBIC YARDS)

CHAIN	FROM STATION	TO STATION	SIDE	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L-	13+05.00	14+42.84	LT & RT	24		86	62	
-L-	15+45.16	16+55.00	LT & RT	6		115	109	
-Y-	10+50.00	11+89.47	LT & RT	0		30	30	
TOTAL				30		231	201	
MATERIAL FOR SHOULDER CONSTRUCTION						49	49	
LOSS DUE TO CLEARING AND GRUBBING								
WASTE IN LIEU OF BORROW								
PROJECT TOTAL				30		280	250	
ESTIMATE 5% FOR TOPSOIL ON BORROW PITS							13	
GRAND TOTAL				30		280	263	
SAY				35			270	

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

SHOULDER BERM GUTTER SUMMARY

LINE	FROM STATION	TO STATION	LENGTH
-L-	14+06.38(RT)	14+28.27(RT)	21.9
-L-	15+53.32(RT)	15+78.53(RT)	25.2
		TOTAL:	47.1
		SAY:	48

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	14+24	14+59	CL	73
-L-	15+26	16+66	CL	75
			TOTAL:	148
			SAY:	150

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	CLASS IV R.C. PIPE 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
-L- STA. 15+67	RT	402	401	2032.4	2026.5	2026.0				44																					
-L- STA. 15+67	RT	403	402	2035.7	2034.5	2034.3			12																						
-L- STA. 16+55	RT	404	402	2033.1	2028.0	2026.5				72																					
TOTAL									12	116																					

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- STA. 15+67						1						
-L- STA. 15+67						1						
-L- STA. 16+55						1	0.1					
TOTAL						3	0.1					

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND 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	TRAFFIC BEARING G.D.I. STD. 840.35	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	PRECAST M.H. STD. 840.52	MANHOLE FRAME AND COVER, STD 840.54	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- STA. 15+67											1	1					
-L- STA. 15+67						1			1								
-L- STA. 16+55				1						1							
TOTAL				1		1			1	1	1	1					

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

* W MEASURED FROM "N" AT THE BEGINNING OF THE ANCHOR TO "N" AT THE END OF THE ANCHOR.
"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 STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W* APPROACH END	TRAILING END	ANCHORS XI MOD	B-77	GREU TL-2	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+78.51	14+46.99	LT	37.5	50.00			14+46.99	5.5 – 6.1	9.1									1				1							
-L-	13+80.50	14+38.80	RT	56.25			14+38.780		4.3 – 5.0	8.0		25		0.5			1		1											
-L-	15+49.32	16+05.20	LT	56.25			15+49.32		5.5	8.5	25		0.5				1		1											
-L-	15+41.13	16+03.72	RT	56.25				15+41.13	5.0	8.0		25		0.5			1		1											
			TOTAL:	206.25	50												3		4				1							
			DEDUCTION FOR ANCHOR UNITS:	156.25																										
			TOTAL GUARDRAIL LENGTH:	50	50																									
			SAY:	50 LF	50 LF			ADD. GUARDRAIL POSTS: 5 EA																						

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 039234 — ENGINEER — NIKKI T. HONEYCUTT — 8/8/2018

HYDRAULICS ENGINEER — SEAL 040590 — ENGINEER — CHINSHANT SHARMA — 8/8/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BRIDGE: 550314

NAD 83 NA 2011

8/17/99

③ BOWLES ENTERPRISES OF NC LLC
DB A-33 PG 1000
DB P-32 PG 182

④ TIM BATES
DB M-27 PG 1632
PC 1 PG 21

⑤ JANET J GREENE
DB I-A PG 4598

② BOWLES ENTERPRISES OF NC LLC
DB A-33 PG 1000
DB P-32 PG 182

① INGLES MARKETS, INC.
DB A-37 PG 945

⑥ SOUTHERN CONCRETE MATERIALS INC
DB S-32 PG 1602
PC 4 CARD 6107

SBB DEVELOPMENT LLC
DB E-35 PG 281
DB P-32 PG 182

JAMES A VANDERWOUDE
DB V-29 PG 1379

BEGIN CONSTRUCTION
-Y- STA 10+50.00

PI Sta 13+22.95
△ = 34° 10' 24.3" (RT)
D = 14° 19' 26.2"
L = 238.58'
T = 122.95'
R = 400.00'

POT Sta. 10+00.00

PT Sta. 14+38.58

PC Sta. 16+02.17

PC Sta. 12+80.00

BEGIN TIP PROJECT 17BP.14.R.154
-L- STA 13+05.00

END TIP PROJECT 17BP.14.R.154
-L- STA 16+55.00

-L- Sta. 13+44.61 =
-Y- Sta. 12+00.00

BEGIN APPROACH SLAB
-L- STA 14+31.99

END SBG
+28.27

BEGIN BRIDGE
-L- STA 14+42.84

END BRIDGE
-L- STA 15+45.16

END APPROACH SLAB
-L- STA 15+56.00

BEGIN SBG
+06.38

BEGIN SBG
+53.32

BEGIN FENCE
+53.99

END FENCE
+55.00

PI Sta 17+09.02
△ = 80° 08' 50.4" (RT)
D = 45° 06' 53.2"
L = 177.65'
T = 106.84'
R = 127.00'

PT Sta. 17+79.82

PATTON RD
SR 1148

BELDEN CIR
SR 1152

ROLLER MILL ROAD - SR 1154

DRYMAN ROAD - SR 1156

CARTOOGECHAYE CREEK

ISMTLBUS

ISFBUS

APPROXIMATED LOCATION
NOT SURVEYED

PROPOSED MACON COUNTY 6" DIP
15' SANITARY SEWER EASEMENT
DB N-26 PG 1768

68' POWER EASEMENT
PB 4 CARD 7007

SIGN EASEMENT
PB 4 CARD 8501

CLASS II RIP RAP
SEE STRUCTURE PLANS

CLASS B RIP RAP
EST 2 TONS
GEOTEXTILE FABRIC
EST 7 S.Y.

CLASS B RIP RAP
EST 3 TONS
GEOTEXTILE FABRIC
EST 8 S.Y.

MODIFIED CONCRETE
FLUME SEE SHEET 2C-4

5.5" MONO ISLAND
(KEYED IN)
SEE DETAIL ON 2A-1

GREU TL-2

TYPE-III

FDPS

5.5' SIDEWALK

6" CONC DRIVE

8" CONC DRIVE

GRAVEL DRIVE 12'

18" RCP-IV

15" RCP-IV

2GI

TB 2GI

MH

BMI2

BMI4

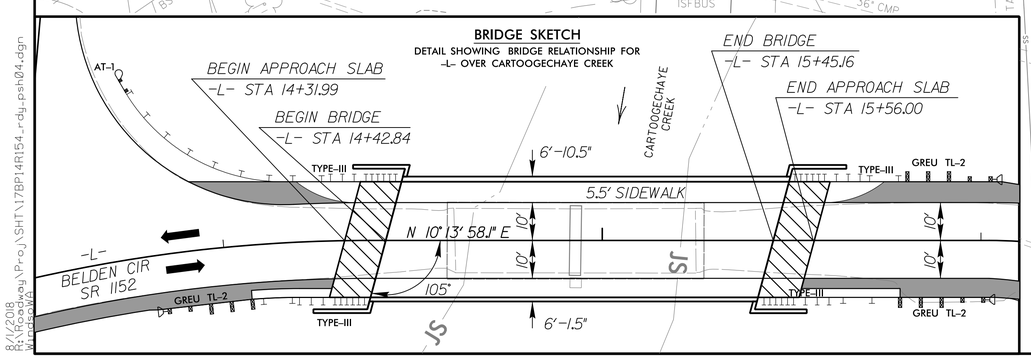
GATE

SOIL

R/W MON

BRIDGE SKETCH

DETAIL SHOWING BRIDGE RELATIONSHIP FOR -L- OVER CARTOOGECHAYE CREEK



SEE SHEET 5 FOR -L- & -Y- PROFILE
SEE SHEET S-1 THRU S-21 FOR STRUCTURES PLANS

8/1/2018
K:\Projects\Proj\SHT\17BP14R154_rdy_psh04.dgn
Windsor

8/17/99

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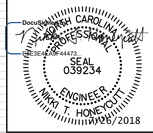
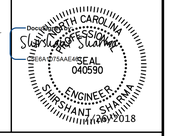
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.154	5
RW SHEET NO.	

ROADWAY DESIGN ENGINEER



HYDRAULICS ENGINEER



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BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	8700	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	2033.2	FT
BASE DISCHARGE	=	10000	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	2035.8	FT
OVERTOPPING DISCHARGE	=	12000	CFS
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING ELEVATION	=	2036.9	FT
DATE OF SURVEY	=	9/30/16	
W.S. ELEVATION AT DATE OF SURVEY	=	2017.0	FT