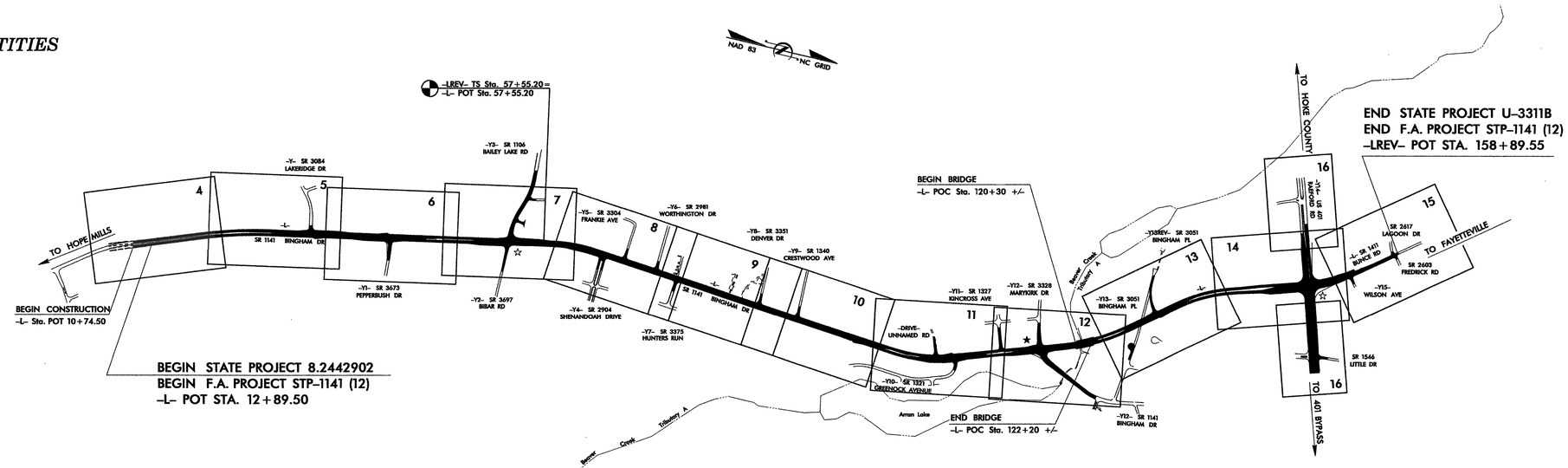
03/30/04

AS CONSTRUCTED PLANS

U–3311B

1 of 78

1 TITLE SHEET
2 ORIGINAL TITLE SHEET
3–10 TYPICAL SECTIONS
11–23 SUMMARY OF DRAINAGE QUANTITIES
24–36 PLAN SHEETS
37–49 PROFILE SHEETS
50–78 STRUCTURE PLAN SHEETS



Project No.: ***34917.3.3***
F.A. No.: ***STP–1141(14)***
TIP No.: ***U–3311B***
County: ***CUMBERLAND***
Description: ***SR 1141 (Bingham Dr.) from Proposed Hope Mills Bypass to US 401 (Raeford Rd.)***
Type of Work: ***Design–Build As Specified in the scope of Work Contained in the Design–Build Package***
Division: ***Six***
Contractor: ***Barnhill Contracting Co., Inc.***
PO Box 1529, Tarboro, NC 27886
Divison Engineer: ***Terry Gibson, PE***
Resident Engineer: ***Randy K. Wise, PE***

I hereby certify that this project was constructed according to plans except as noted herein.

Michael L. Taylor
CONTRACTOR

I hereby certify that this project was constructed according to plans except as noted herein.

Randy K. Wise
RESIDENT ENGINEER

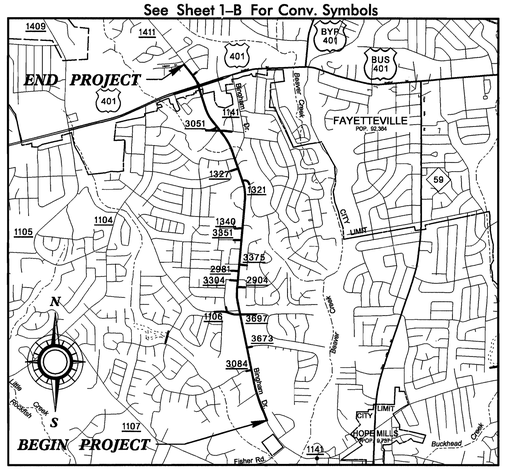
Final right-of-way has been checked.

R M Abbott Jr by W C Harmon
DIVISION RIGHT OF WAY AGENT

Prepared In the Office of:
DIVISION OF HIGHWAYS
PO BOX 1150, Fayetteville, NC, 28302

CONTRACT: C20110 TIP PROJECT: U-3311B

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conv. Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

AS Built

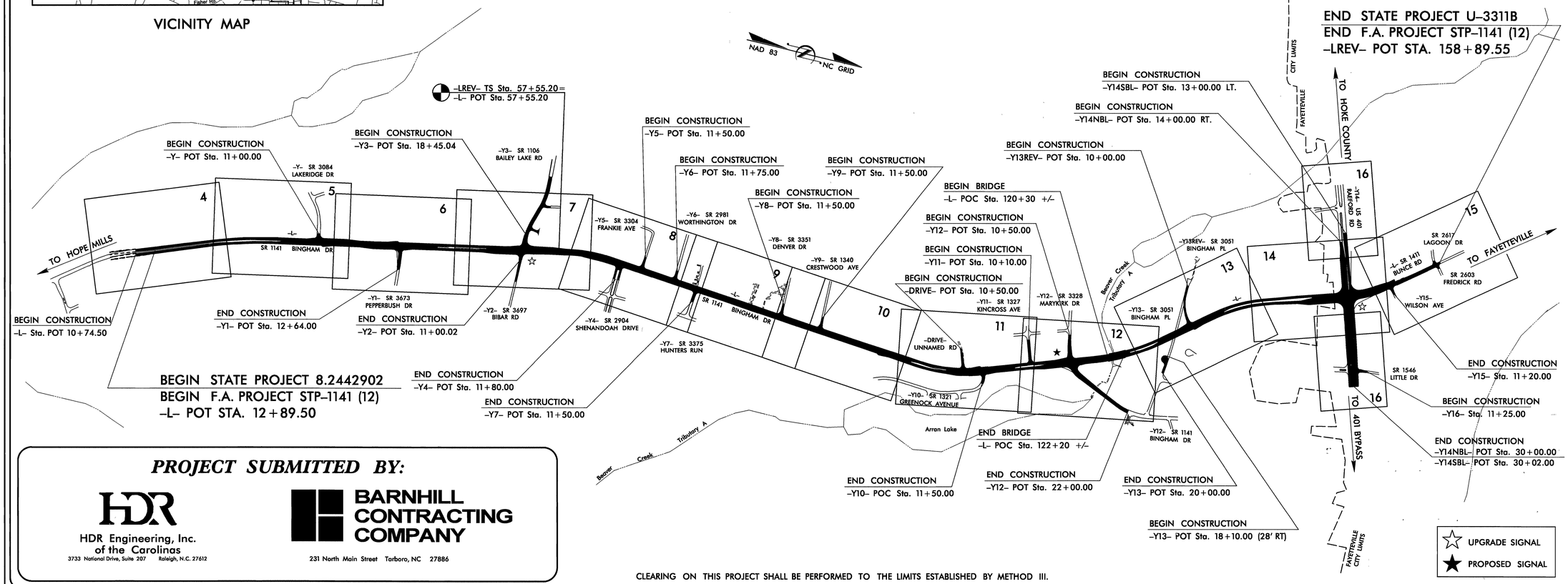
CUMBERLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3311B	2 1	78

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
8.2442901	STP-1141 (7)	PE
8.2442902	STP-1141 (12)	R/W UTILITIES
34917.3.3	STP-1141 (14)	CONST.

LOCATION: FAYETTEVILLE – SR 1411 (BINGHAM DR.) FROM PROPOSED HOPE MILLS BYP. TO US 401 (RAEFORD RD.)

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



PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

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

GRAPHIC SCALES

PLANS: 50 0 50 100
PROFILE (HORIZONTAL): 50 0 50 100
PROFILE (VERTICAL): 10 0 10 20

DESIGN DATA

ADT 2004 = 16,600
ADT 2024 = 28,900
DHV = 10%
D = 55%
T = 4%*
V = 50 mph
*TTST 3% DUAL 1%
FUNC CLASS = URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT STP-1141(12) = 2.729 +/– mi

LENGTH STRUCTURES F.A. PROJECT STP-1141(12) = 0.036 +/– mi

TOTAL LENGTH STATE PROJECT 8.2442902 = 2.765 mi

Prepared For:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 28, 2002

LETTING DATE: SEPTEMBER 21, 2004

GREGORY A. KEMPF, PE
PROJECT ENGINEER

PAUL A. MEEHAN, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

4:17:53 PM
4/18/2007
K:\PWworking\TPA\charnden\dms23640\u3311b_rdy_psh_tsh.dgn

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~E REV.~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN

8-25-05

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON

2/24/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.50" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 Lbs PER SQUARE YARD IN TWO LAYERS.	E6	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 Lbs PER SQUARE YARD IN TWO LAYERS.	E7	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
C3	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 Lbs PER SQUARE YARD IN TWO LAYERS.	J1	6" AGGREGATE BASE COURSE
C4	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2.0" IN DEPTH.	R1	2'-6" CONCRETE CURB AND GUTTER
C5	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2.0" IN DEPTH.	R2	1'-6" CONCRETE CURB AND GUTTER
D1	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 Lbs PER SQUARE YARD IN ONE LAYER.	R3	5" MONOLITHIC CONCRETE ISLAND
D2	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 Lbs PER SQUARE YARD IN ONE LAYER.	R4	8" X 18" CONCRETE CURB
D3	PROP. VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.25" OR GREATER THAN 4.0" IN DEPTH.	S	4" CONCRETE SIDEWALK
D4	PROP. VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.25" OR GREATER THAN 4.0" IN DEPTH.	T	EARTH MATERIAL
E1	PROP. APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 Lbs PER SQUARE YARD IN ONE LAYER.	U	EXISTING PAVEMENT
E2	PROP. APPROX. 3.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 Lbs PER SQUARE YARD IN ONE LAYER.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 1, SHEET 2-G)
E3	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 Lbs PER SQUARE YARD IN ONE LAYER.	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 2, SHEET 2-G)
E4	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 Lbs PER SQUARE YARD IN ONE LAYER.	W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 3, SHEET 2-G)
E5	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 Lbs PER SQUARE YARD IN ONE LAYER.		

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~2-A REV.8~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN

8-25-05

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON

8/29/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

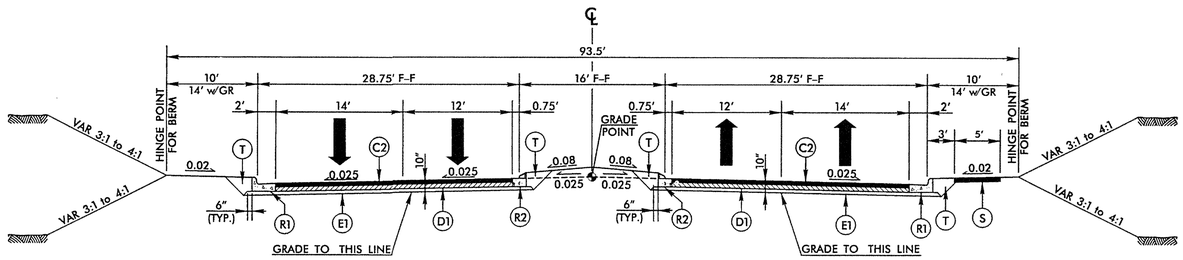
REVISIONS

RFC 1 REV.C (7/01/05)
RE-RELEASE OF ALL RFC SHEETS

PAVEMENT SCHEDULE

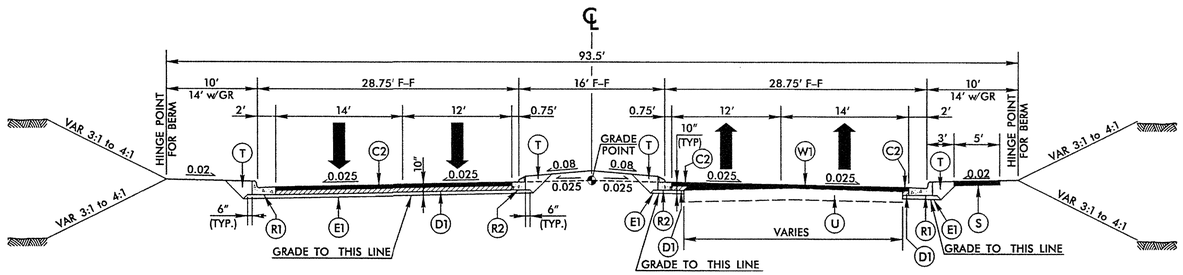
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
R2	PROP. 1'-6" CONCRETE CURB AND GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

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



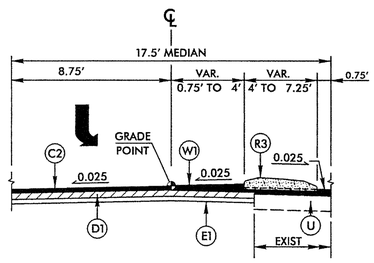
TYPICAL SECTION NO. 1

LINE	FROM STATION	TO STATION
-L-	12+89.50	19+50.00
-LREV-	122+80.00	126+14.77
-LREV-	134+12.82	143+99.86



TYPICAL SECTION NO. 2

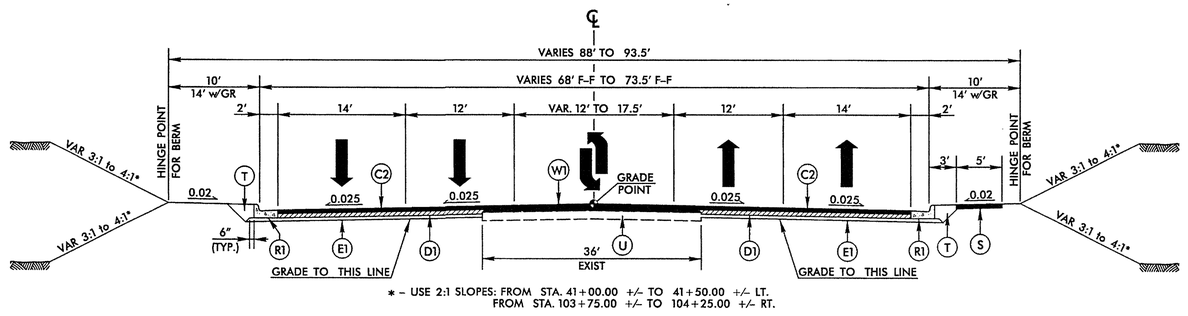
LINE	FROM STATION	TO STATION
-L-	19+50.00	27+07.97
-L-	44+17.03	49+52.96
-LREV-	98+35.91	102+37.18
-LREV-	109+97.00	113+42.96



TYPICAL SECTION NO. 3A

USE WITH TYPICAL SECTION NO. 3

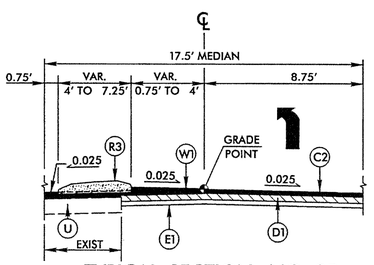
LINE	FROM STATION	TO STATION
-L-	31+60.00	35+87.00
-L-	40+60.00	44+17.00
-L-	54+05.00	55+00.00
-LREV-	94+80.00	98+37.00
-LREV-	106+80.00	109+97.00
-LREV-	130+50.00	134+07.00
-LREV-	148+75.00	152+33.00



* - USE 2:1 SLOPES: FROM STA. 41+00.00 +/- TO 41+50.00 +/- LT.
FROM STA. 103+75.00 +/- TO 104+25.00 +/- RT.

TYPICAL SECTION NO. 3

LINE	FROM STATION	TO STATION
-L-	27+07.97	44+17.03
-L-	49+52.96	57+55.20
-LREV-	57+55.20	98+35.91
-LREV-	102+37.18	109+97.04
-LREV-	113+42.96	115+50.00
-LREV-	148+43.08	153+50.00 LT.
-LREV-	148+43.08	152+75.00 RT.



TYPICAL SECTION NO. 3B

USE WITH TYPICAL SECTION NO. 3

LINE	FROM STATION	TO STATION
-L-	27+07.97	30+65.00
-L-	35+87.00	39+60.00
-L-	49+53.00	53+10.00
-LREV-	102+43.00	106+00.00
-LREV-	113+70.00	115+50.00
-LREV-	126+18.00	129+75.00
-LREV-	143+48.00	147+05.00

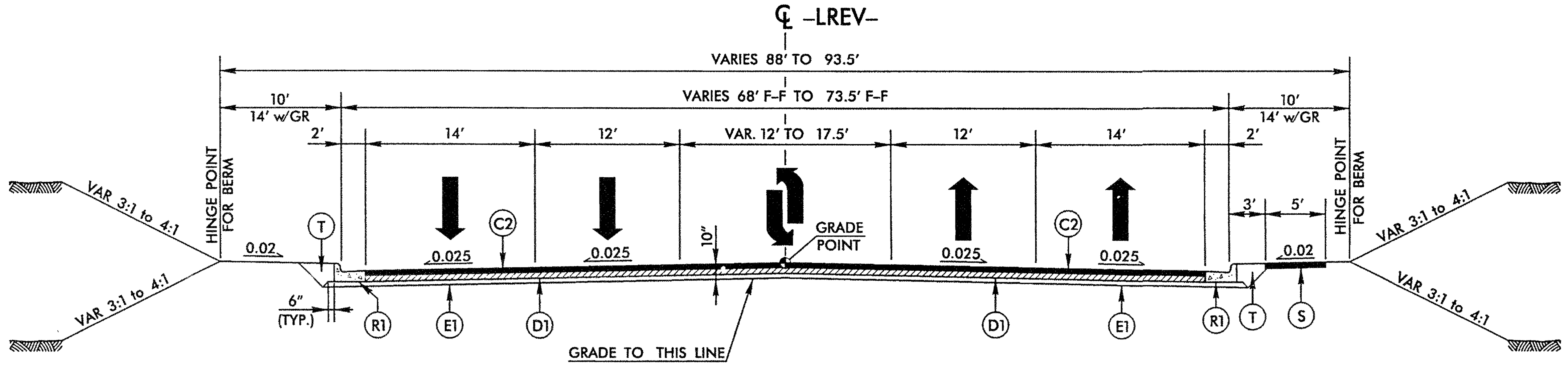
$$$$USERNAME=$$$$DGN
$$$$SYSTIME=$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~2-B REV.C~~
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN — Paul A. Meehan 8-25-05	NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON — Clark S. Morrison 6/29/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

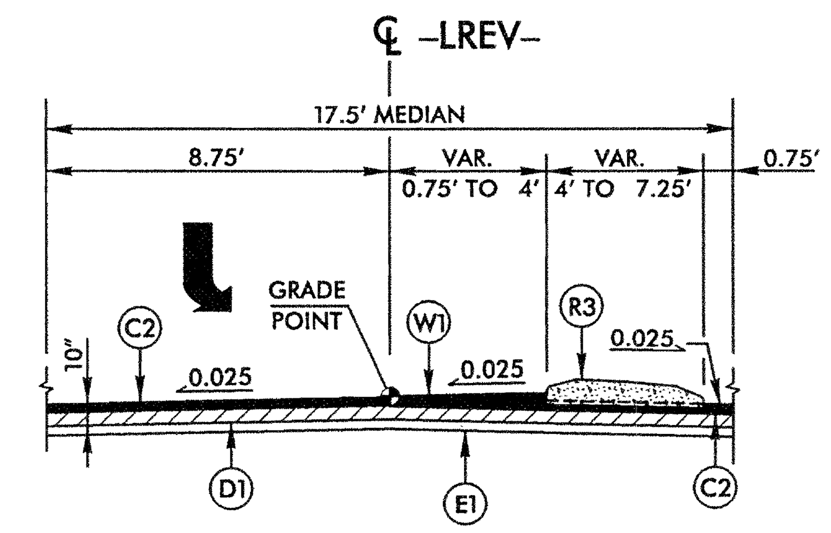
BARNHILL CONTRACTING COMPANY

REVISIONS
RFC I REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS



TYPICAL SECTION NO. 4

LINE	FROM STATION	TO STATION
-LREV-	115+50.00	120+24.75
-LREV-	122+24.81	122+80.00
-LREV-	126+14.77	134+12.82
-LREV-	143+99.86	147+39.08



TYPICAL SECTION NO. 4A

USE WITH TYPICAL NO. 4

LINE	FROM STATION	TO STATION
-LREV-	116+80.00	119+87.00

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
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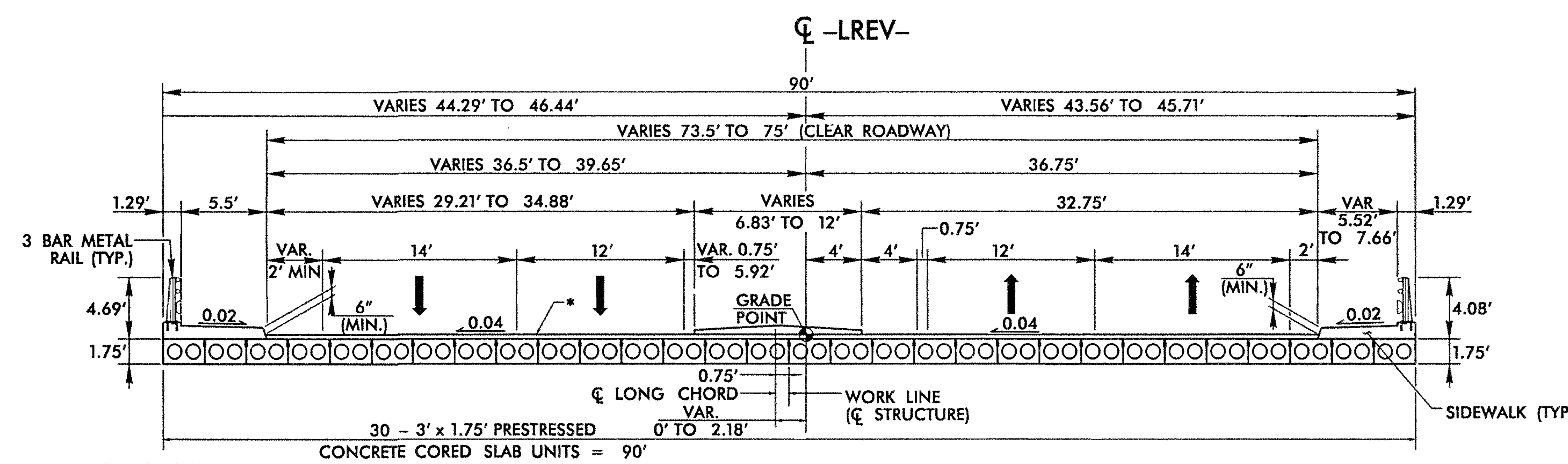
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

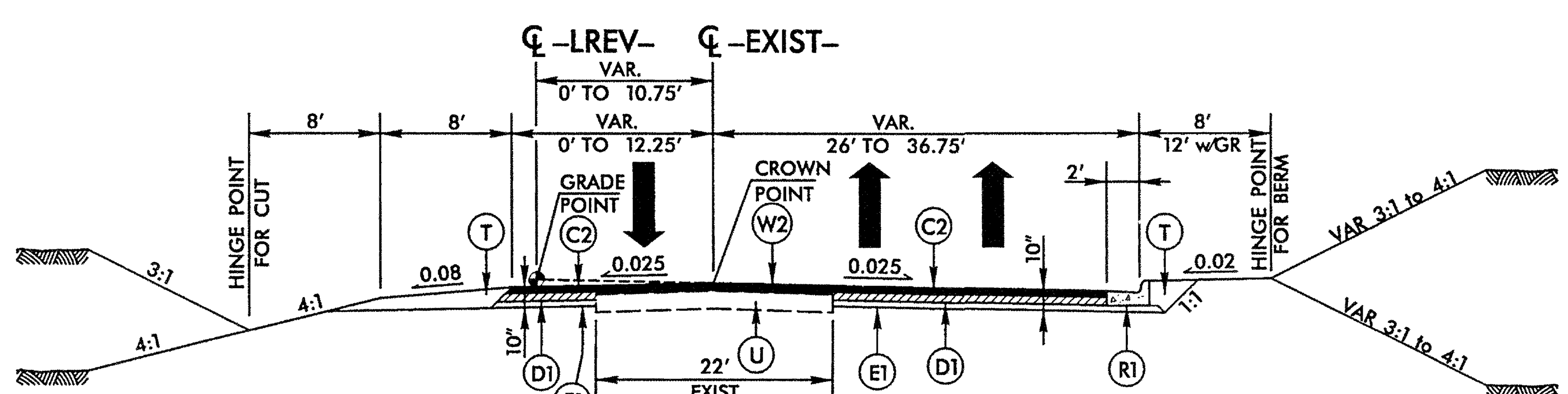
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



* = 2.5" MIN. ASPHALT WEARING SURFACE S9.5B

TYPICAL SECTION NO. 4B

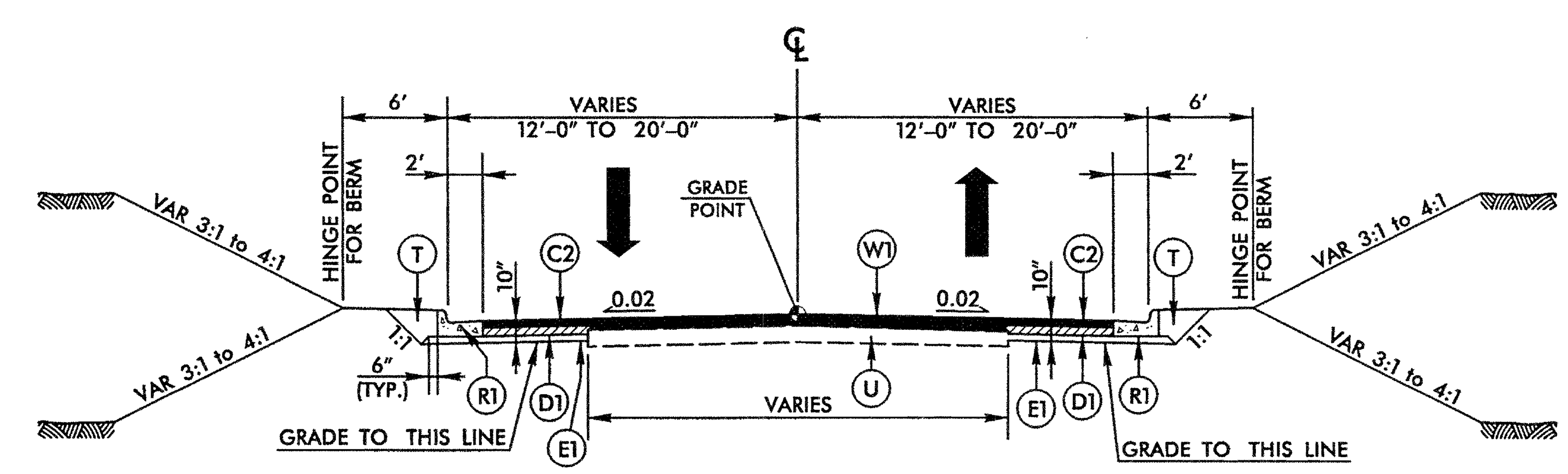
LINE	FROM STATION	TO STATION
-LREV-	120+24.75	122+24.81



TYPICAL SECTION NO. 5

LINE	FROM STATION	TO STATION
-LREV-	152+75.00	158+00.00 RT.
-LREV-	153+50.00	158+00.00 LT.

* -L- 158+00.00 TO 158+90.00 RESURFACE AND WIDEN



TYPICAL SECTION NO. 6

LINE	FROM STATION	TO STATION
-Y-	11+00.00	11+10.93
-Y6-	11+75.00	12+33.75 LT.
-Y7-	10+64.44	11+50.00

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

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~2-C REV.C~~
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN 8-25-05	NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 6/29/05

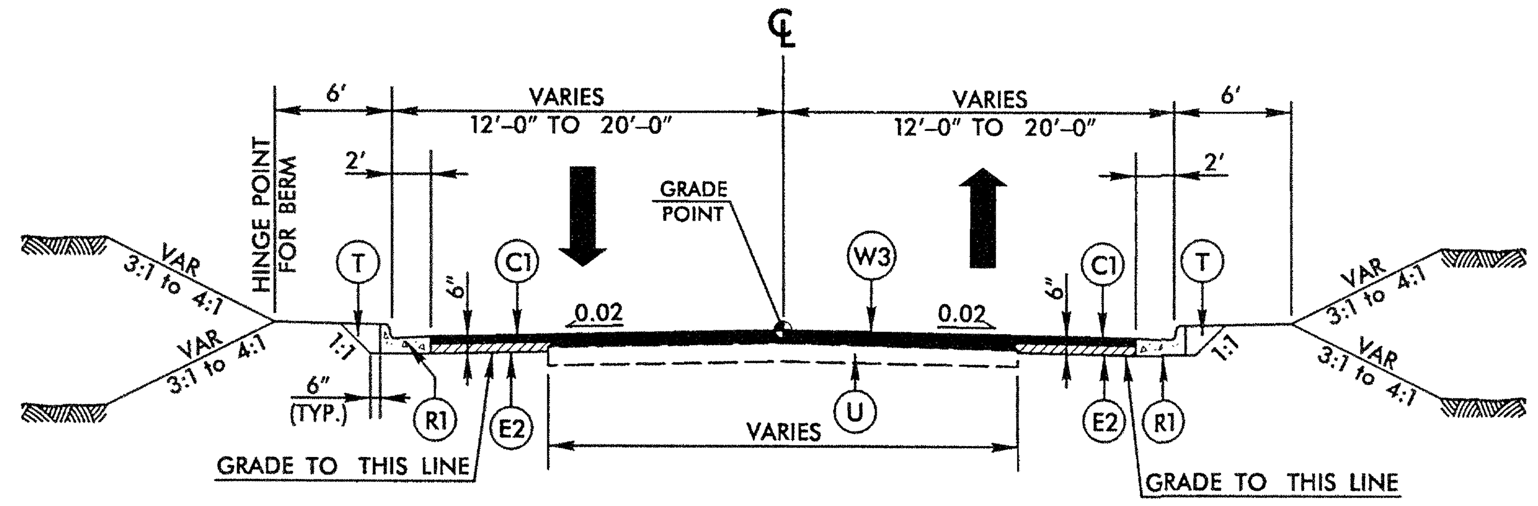
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
R2	PROP. 1'-6" CONCRETE CURB AND GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

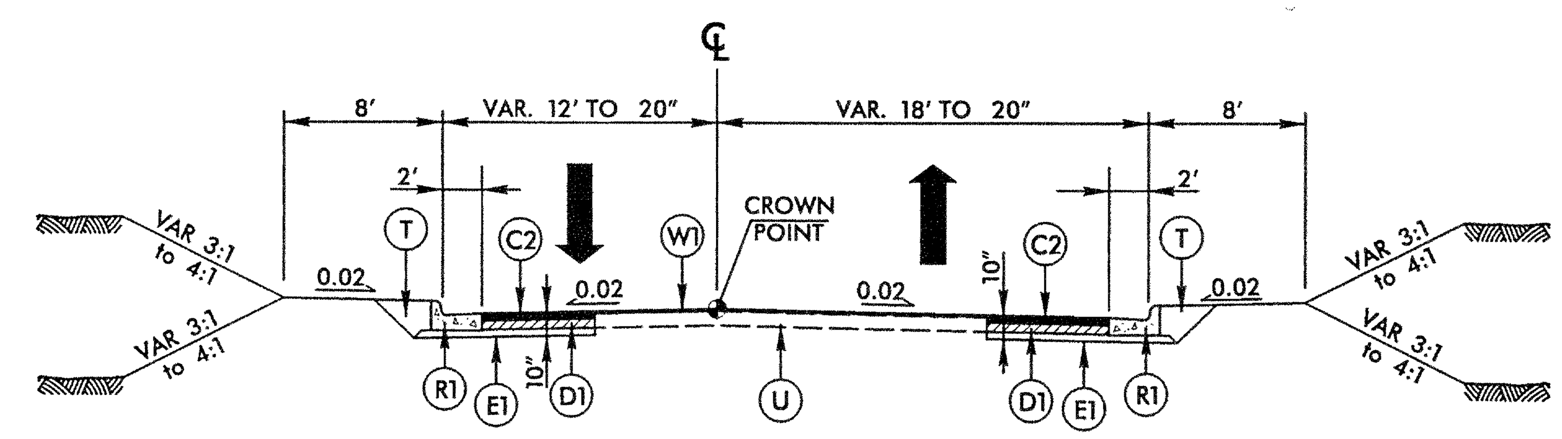
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS



TYPICAL SECTION NO. 7

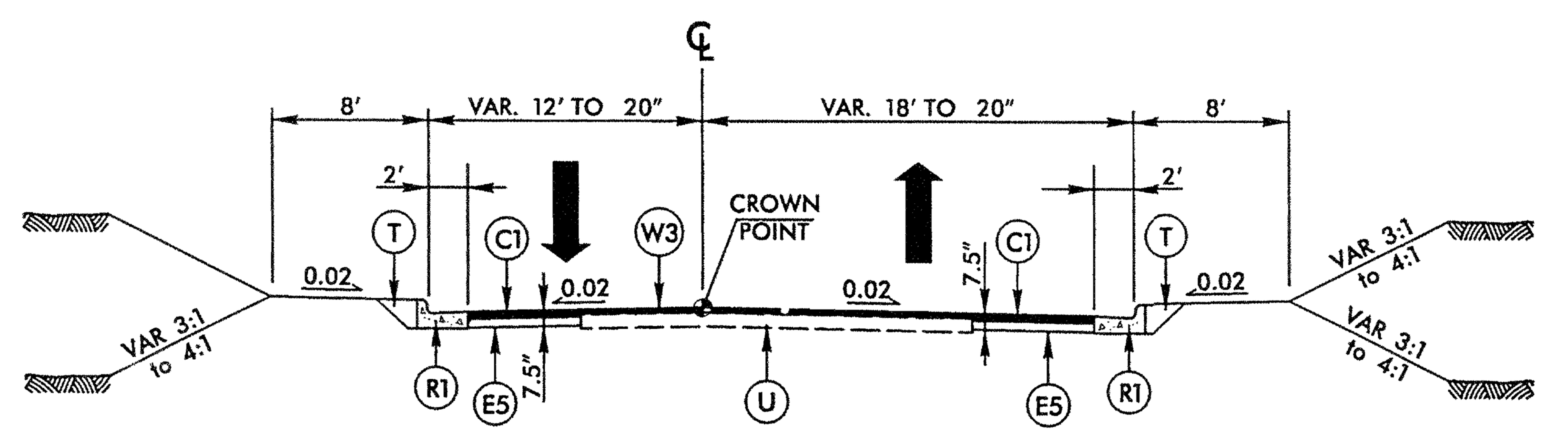
LINE	FROM STATION	TO STATION
-Y1-	10+98.52	12+64.00



TYPICAL SECTION NO. 8

LINE	FROM STATION	TO STATION
-Y2-	10+35.43	11+00.02

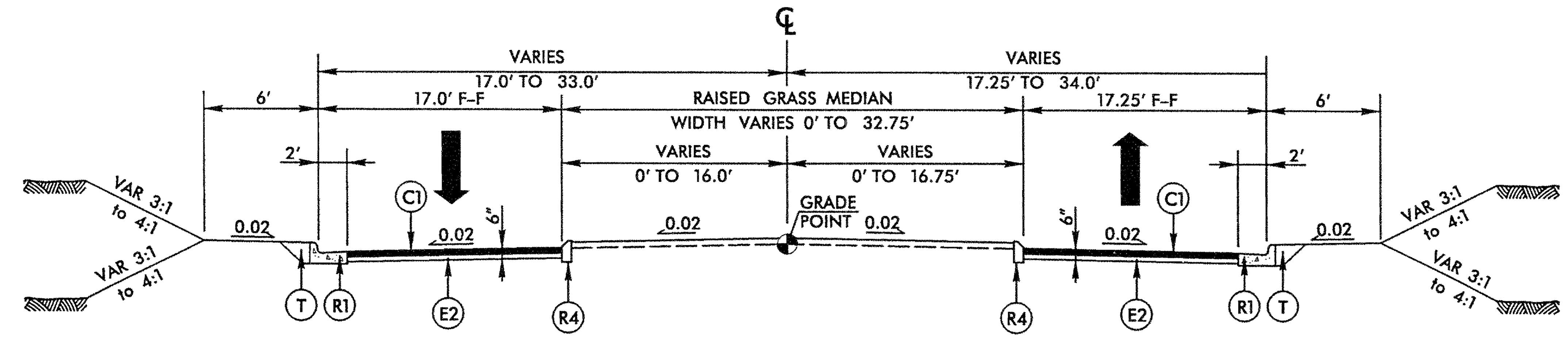
NOTE: THIS TYPICAL COVERS WIDENING, RESURFACING, AND PLACING CURB & GUTTER ON THE -Y2- TURNOUT THAT WAS CONSTRUCTED UNDER PROJECT U-3311A.



TYPICAL SECTION NO. 9

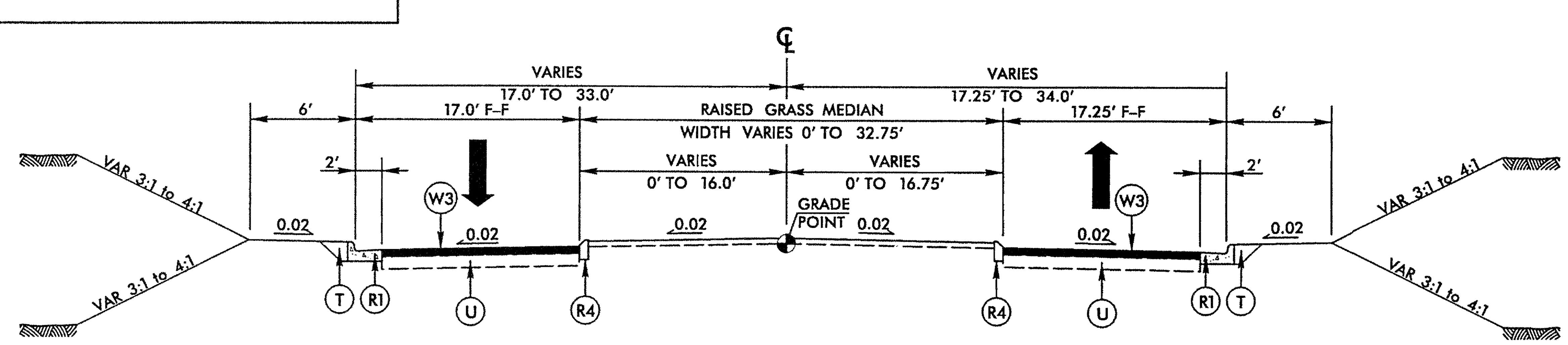
LINE	FROM STATION	TO STATION
-Y3-	18+45.04	19+84.47

NOTE: THIS TYPICAL COVERS WIDENING, RESURFACING, AND PLACING CURB & GUTTER ON THE -Y3- TURNOUT THAT WAS CONSTRUCTED UNDER PROJECT U-3311A.



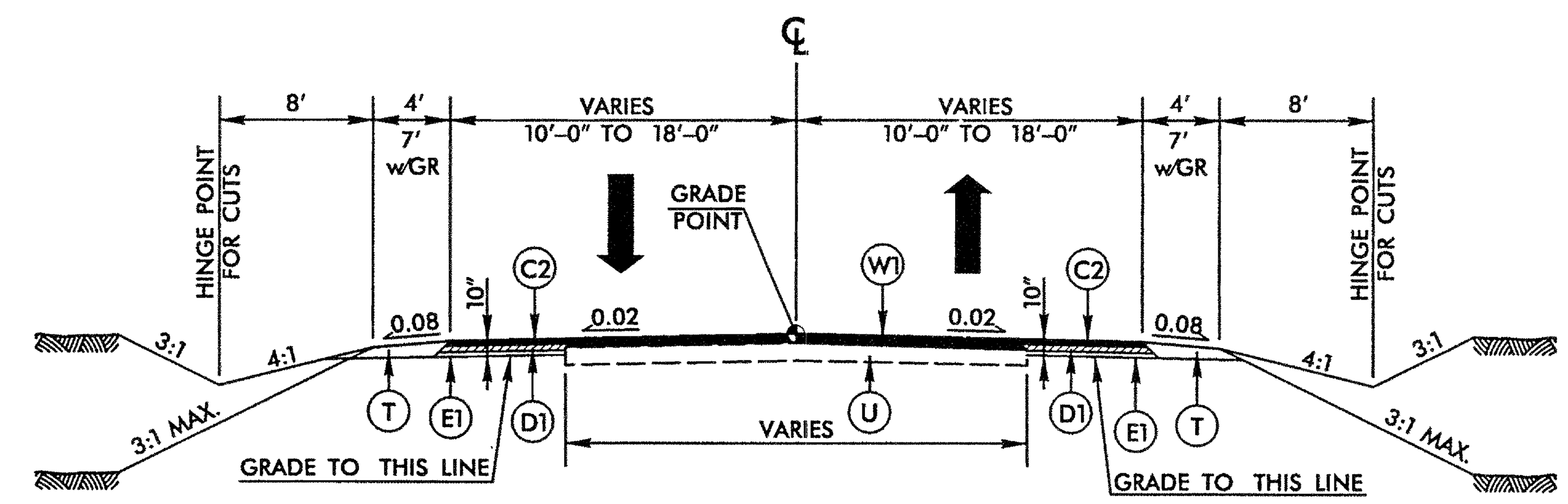
TYPICAL SECTION NO. 10

LINE	FROM STATION	TO STATION
-Y4-	10+72.83	11+00.00



TYPICAL SECTION NO. 11

LINE	FROM STATION	TO STATION
-Y4-	11+00.00	11+80.00



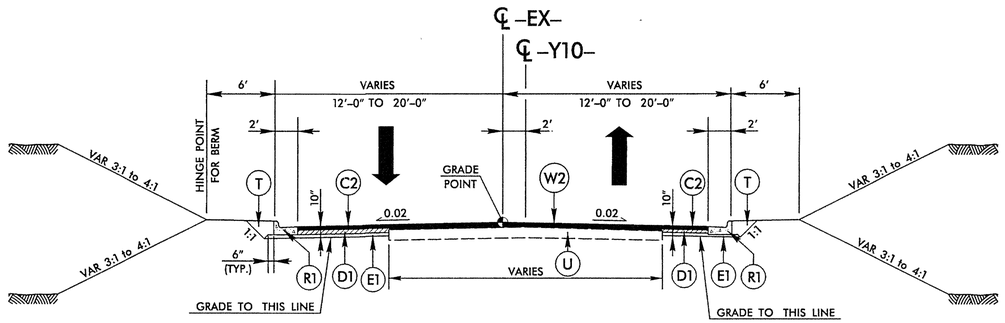
TYPICAL SECTION NO. 12

LINE	FROM STATION	TO STATION
-Y5-	11+50.00	12+35.61
-Y6-	11+75.00 (RT.)	12+33.75 (RT.)
-Y8-	11+50.00	12+31.56
-Y9-	11+50.00	12+30.31
-Y15-	10+68.88	11+20.00
-Y16-	11+25.00	12+07.05

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

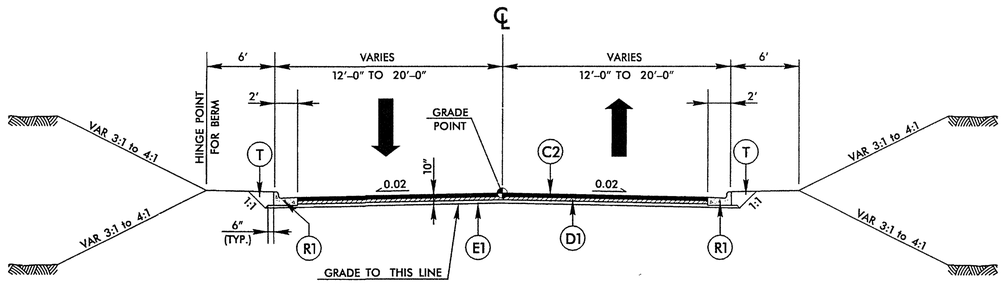
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
R2	PROP. 1'-6" CONCRETE CURB AND GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

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



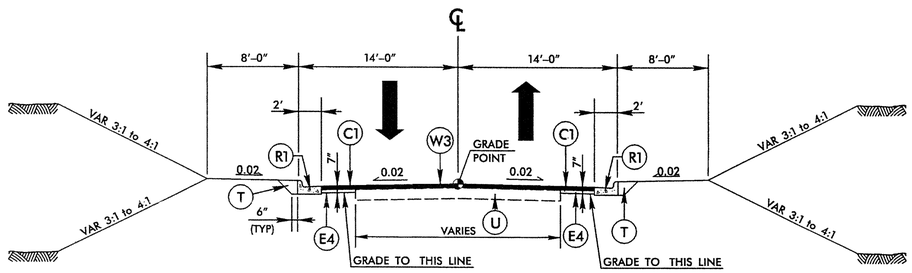
TYPICAL SECTION NO. 13

LINE	FROM STATION	TO STATION
-Y10-	10+89.16	11+50.00



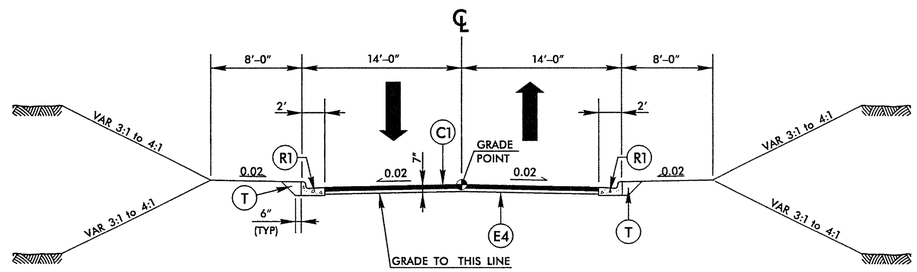
TYPICAL SECTION NO. 14

LINE	FROM STATION	TO STATION
-Y11-	10+10.00	12+22.81



TYPICAL SECTION NO. 15

LINE	FROM STATION	TO STATION
-Y12-	10+50.00	11+75.00



TYPICAL SECTION NO. 16

LINE	FROM STATION	TO STATION
-Y12-	11+75.00	12+69.84
-Y12-	14+00.00	14+81.50

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~E-D REV.C~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN

Paul A. Meehan

8-25-05

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22898 ENGINEER CLARK S. MORRISON

6/24/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS

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

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~2-E REV.6~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN

8-25-05

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON

6/29/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

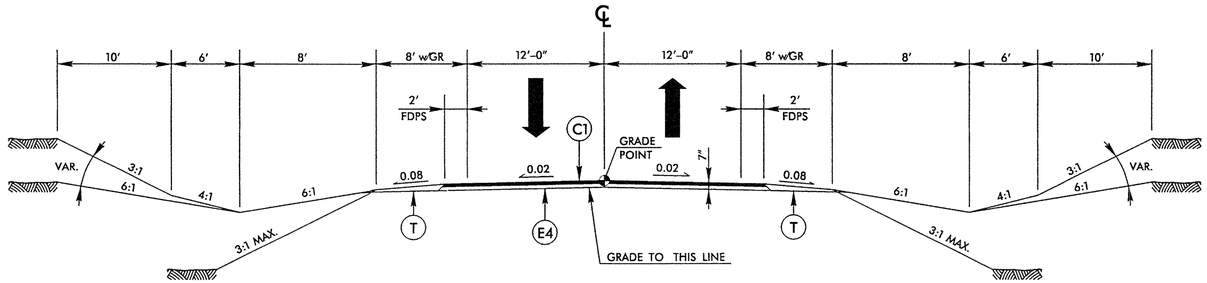
BARNHILL CONTRACTING COMPANY

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS

PAVEMENT SCHEDULE

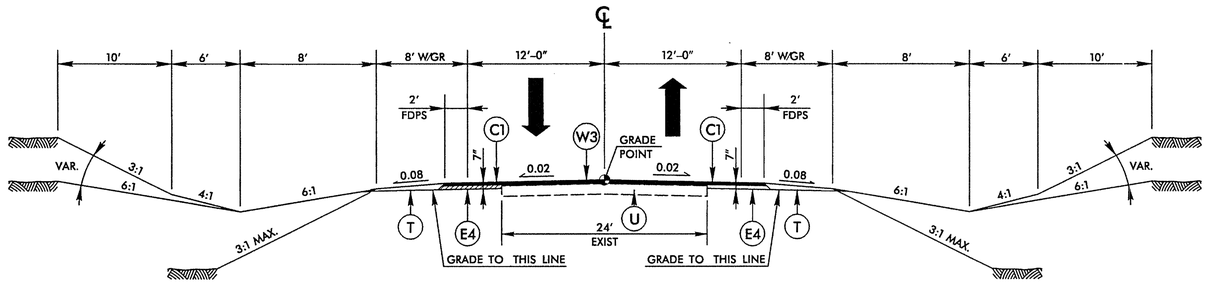
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
R2	PROP. 1'-6" CONCRETE CURB AND GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

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



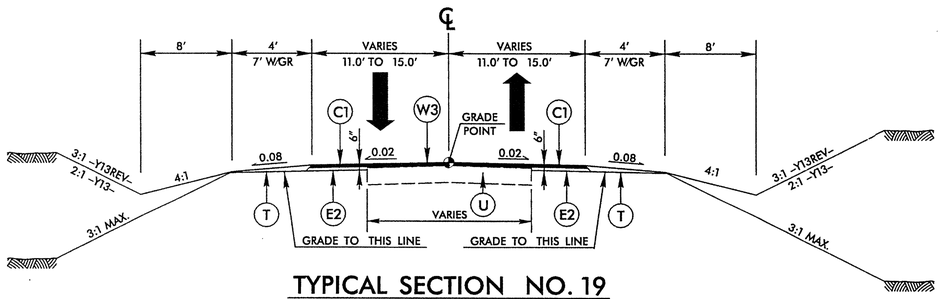
TYPICAL SECTION NO. 17

LINE	FROM STATION	TO STATION
-Y12-	14+81.50	18+50.00



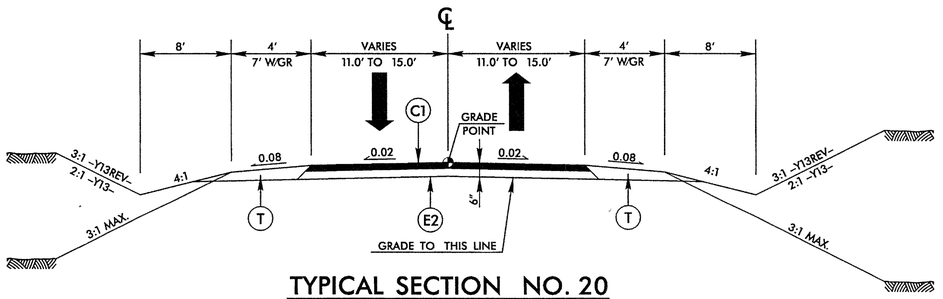
TYPICAL SECTION NO. 18

LINE	FROM STATION	TO STATION
-Y12-	18+50.00	22+00.00



TYPICAL SECTION NO. 19

LINE	FROM STATION	TO STATION
-Y13-	18+10.00	20+00.00
-Y13REV-	10+00.00	11+50.00



TYPICAL SECTION NO. 20

LINE	FROM STATION	TO STATION
-Y13REV-	11+50.00	13+93.86

$$$$$$SYSTIME$$$$
$$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	2 F REV.C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN

8-25-05

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON

6/24/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D4	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	PROP. APPROX. 3.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
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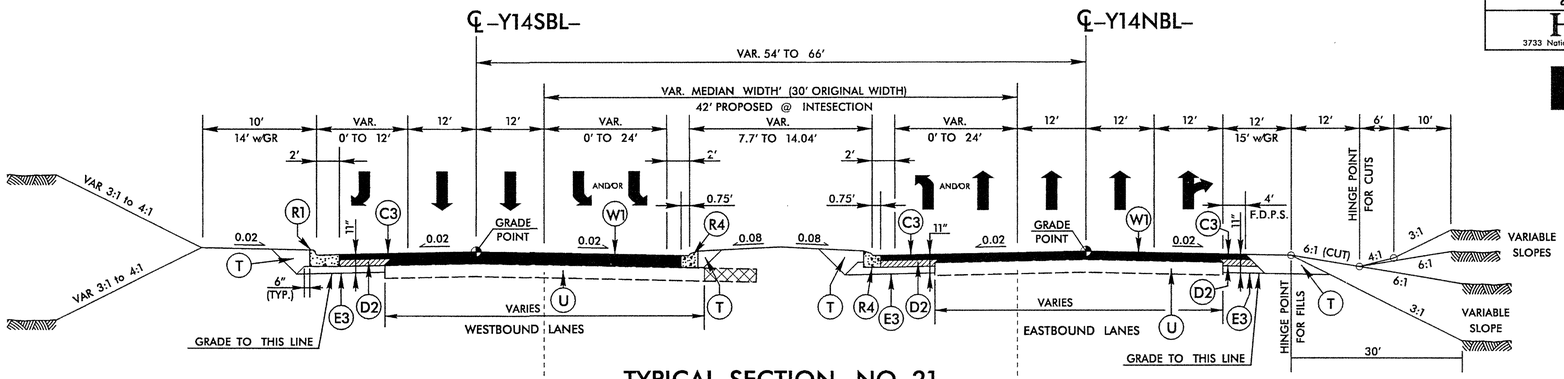
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE SHEET 2-G)

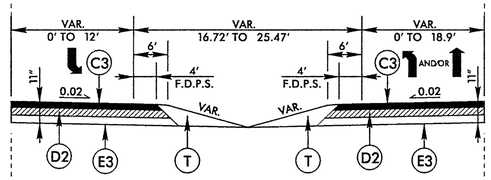
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS



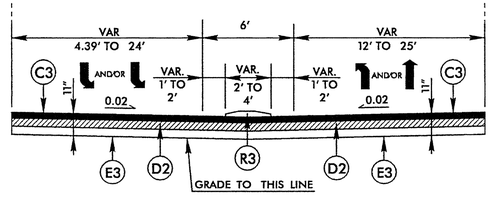
TYPICAL SECTION NO. 21

LINE	FROM STATION	TO STATION
-Y14NBL-	15+81.26	19+45.00
-Y14SBL-	15+80.96	19+45.12



TYPICAL SECTION NO. 21A

LINE	FROM STATION	TO STATION
-Y14NBL-	14+00.00	15+81.26
-Y14SBL-	13+00.00	15+80.96



TYPICAL SECTION NO. 21B

LINE	FROM STATION	TO STATION
-Y14NBL-	19+45.00	30+00.00
-Y14SBL-	19+45.12	30+00.00

$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.50" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C4	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C5	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
D2	PROP. APPROX. 4.0" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D3	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B
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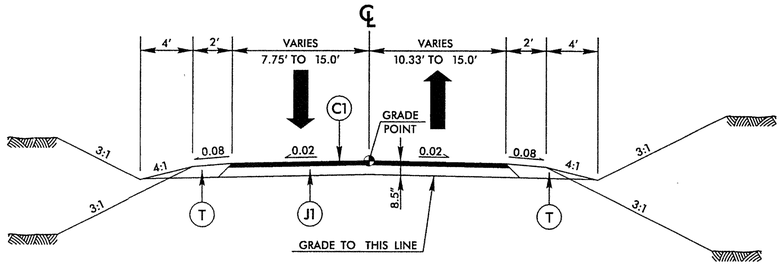
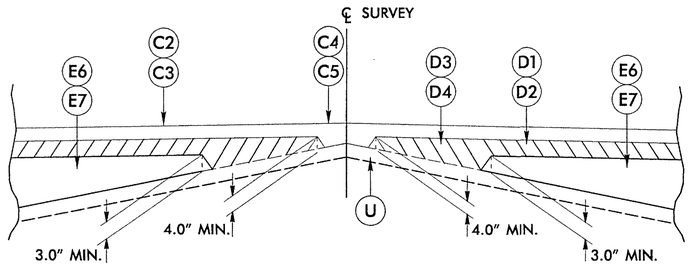
E2	PROP. APPROX. 3.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	PROP. APPROX. 4.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C
E4	PROP. APPROX. 4.50" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E5	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E7	PROP. APPROX. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	PROP. 6.0" AGGREGATE BASE COURSE.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.
R2	PROP. 1'-6" CONCRETE CURB AND GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND
R4	PROP. 8" X 18" CONCRETE CURB
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W1	VAR. DEPTH ASPHALT PAVEMENT (SEE THIS SHEET)
W2	VAR. DEPTH ASPHALT PAVEMENT (SEE THIS SHEET)
W3	VAR. DEPTH ASPHALT PAVEMENT (SEE THIS SHEET)

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



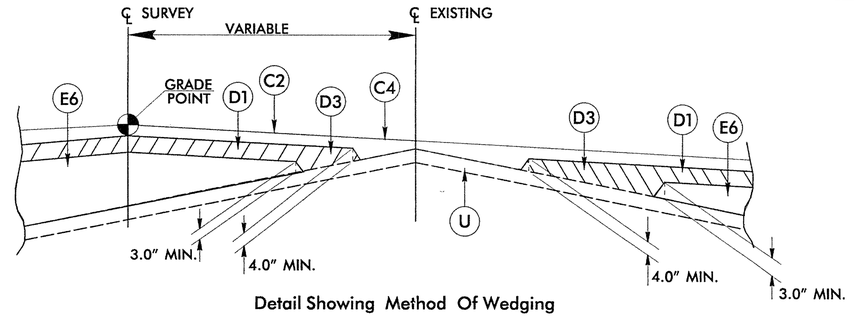
TYPICAL SECTION NO. 22

LINE	FROM STATION	TO STATION
–DRIVE–	10+50.00	12+26.00



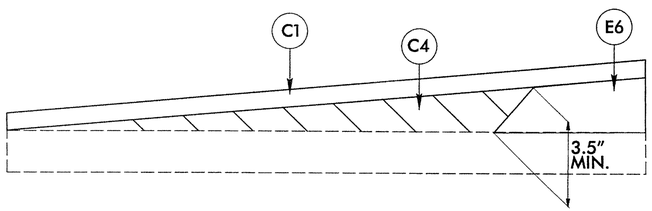
Detail Showing Method of Wedging

STANDARD WEDGE DETAIL NO. 1



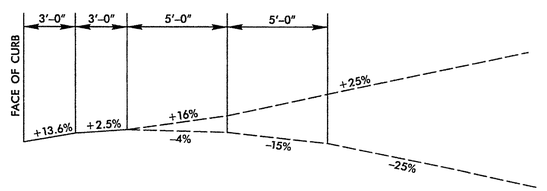
Detail Showing Method Of Wedging

STANDARD WEDGE DETAIL NO. 2



Wedging Detail For Resurfacing

STANDARD WEDGE DETAIL NO. 3



STANDARD DRIVEWAY DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	2-C REV.C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 26298 ENGINEER PAUL A. MEEHAN — 8-25-05

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER MARK S. MORRISON — 6/29/05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

REVISIONS
RFC 1 REV.C (7/01/05) RE-RELEASE OF ALL RFC SHEETS

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

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	-A-

CHS-IT0526547

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE							
								12"	15"	18"	24"	30"	36"	42" ELLIPTICAL EQUIV.	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																.064	.064	.064	.064	.138	.079	.079	.109	.109
SHEET 4																								
11+75 L	RT	1A		160.62	156.71																			
15+40 L	LT	1B	1		162.76	161.56					28 42.4													
15+40 L	LT	1		165.31	161.56																			
15+40 L	LT	1	2		161.56	161.22					86 69.75													
15+40 L	RT	2		165.31	161.22																			
15+40 L	RT	2	1A		161.22	156.71					384 360													
18+75 L	LT	3		175.89	172.89																			
18+75 L	LT	3	4		172.89	171.87			44 42.5															
18+75 L	RT	4		174.87	171.87																			
18+75 L	RT	4	2		171.87	161.22		336																
18+95 L	LT	3A		176.51	173.51																			
18+95 L	LT	3A	3		173.51	172.89		20 16.5																
SHEET 5																								
23+48 L	LT	5	6		178.34	176.20		24			(30) was changed by handy/wise.													
23+50 L	LT	6		180.45	176.20																			
23+50 L	LT	6	8		176.20	174.40					84 59													
23+80 L	RT	7A		178.54	174.35																			
23+80 L	RT	7A	OUT		174.35	174.22								44 39.75										
23+95 L	LT	8B		179.62	176.62																			
23+95 L	LT	8B	8A		176.62	176.01		20 19																
24+15 L	LT	8		180.36	174.40																			
24+15 L	LT	8	8A		174.40	174.26						24 27												
24+15 L	LT	8A		179.61	174.46																			
24+15 L	LT	8A	7		174.46	174.35						44 36.8												
24+12 L	RT	7		178.52	174.46																			
24+12 L	RT	7	7A		174.46	174.35						36 27.8												
24+32 L	RT	9		178.52	175.52																			
24+32 L	RT	9	7		175.52	174.46		20 15.9																
24+35 L	LT	10		179.62	176.62																			
24+35 L	LT	10	8A		176.62	176.01		20 19																
26+15 L	LT	11		180.37	177.37																			
26+15 L	LT	11	12		177.37	176.31			18 41.2															
26+15 L	RT	12		179.31	176.31																			
26+15 L	RT	12	9		176.31	175.52		200 178																
28+25 L	RT	14		180.82	177.82																			
28+25 L	RT	14	12		177.82	176.31		288 206.25																
28+25 L	LT	15		181.19	176.44																			
28+25 L	LT	15	8		176.44	174.40						108 40.625												
28+45 L	LT	18		181.26	177.01																			
28+45 L	LT	18	15		177.01	176.44					20 15.5													
SHEET TOTALS								0	916	0	460	108	516	44	0	0	0	0	0	0	0	0	0	0	0

STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS 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')	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A: 5.0' THRU 10.0'	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. B: 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE m	F	G	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.	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
SHEET 4																																
11+75 L			1			1		1																								ADJUST EXISTING CB
15+40 L			1																													OPEN END PIPE
15+40 L			1			1			1																							
15+40 L																																
15+40 L			1			1				1																						
15+40 L			1			1				1																						
18+75 L			1			1				1																						
18+75 L			1			1				1																						
18+75 L			1			1				1																						
18+75 L			1			1				1																						
18+95 L			1			1				1																						
18+95 L			1			1				1																						
SHEET 5																																
23+48 L																																
23+50 L			1			1				1																						
23+50 L			1			1				1																						
23+80 L			1	0.25		1			1																							
23+80 L																																42" EQUIVALENT ELLIPTICAL 34" RISE X 53" SPAN
23+95 L			1			1			1																							
23+95 L																																
24+15 L			1	0.96		1	1																									
24+15 L																																
24+15 L			1	0.35		1	1																								54	REMOVE 18" RCP
24+15 L																																
24+12 L			1			1	1																									
24+12 L																																
24+32 L			1			1				1																						
24+32 L																																
24+35 L			1			1				1																						
24+35 L																																
26+15 L			1			1				1																						
26+15 L																																
26+15 L			1	0.57		1			1																							
26+15 L																																
28+25 L			1			1				1																						
28+25 L																																
28+25 L			1			1			1																							
28+25 L																																
28+45 L			1			1			1																							
28+45 L																																
SHEET TOTALS	0	0	19	2.13	0	19	3	6	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

CHS-IT0526547

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONTRACT	SHEET NO.
201110	~~8-B~~

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
SHEET 5															
31+56 L	RT	19		183.50	179.75										
31+56 L	RT	19	20		179.75	179.29					~~96~~ ← 93.7				
31+60 L	LT	20		183.54	179.29										
31+60 L	LT	20	18		179.29	177.01						~~316~~ ← 312			
31+76 L	RT	21		183.74	180.49										
31+76 L	RT	21	19		180.49	179.75				~~20~~ ← 16.7					
31+80 L	LT	22		183.72	179.47										
31+80 L	LT	22	20		179.47	179.29						~~20~~ ← 16			
SHEET 6															
37+00 L	RT	24	25		186.07	184.27				~~20~~ ← 19.7					
37+00 L	RT	25		187.52	184.27										
37+00 L	RT	25	21		184.27	180.49				~~524~~ ← 520.3					
37+00 L	LT	26		187.81	181.52										
37+00 L	LT	26	22		181.52	179.47						~~520~~ ← 512			
40+55 L	RT	27		191.95	183.97										
40+55 L	RT	27	28		183.97	183.30				~~84~~ ← 85.3					
40+55 L	LT	28		192.27	183.30										
40+55 L	LT	28	26		183.30	181.52					~~356~~ ← 348.6				
43+15 L	RT	30		193.50	191.25										
43+15 L	RT	30	31		191.25	191.15			~~20~~ ← 17.5						
45+30 L	RT	32	32A						12.5						
43+15 L	RT	31		194.94	191.15										
43+15 L	RT	31	27		191.15	183.97			~~260~~ 256.4						
45+30 L	RT	32		196.70	194.45										
45+30 L	RT	32	33		194.45	194.26			~~16~~ ← 15.5						
45+30 L	RT	33		197.26	194.26										
45+30 L	RT	33	31		194.26	191.15			~~216~~ 212.2						
45+30 L	LT	34		197.26	194.26										
45+30 L	LT	34	28		194.26	183.30			~~476~~ ← 472						
SHEET 7															
47+35 L	RT	35		201.29	197.49										
47+35 L	RT	~~35~~ 32	32A		197.49	194.45			~~132~~ ← 125 Contr. Added Junction Box Str. #32A						
47+54 L	RT	36		199.90	197.65										
47+54 L	RT	36	35		197.65	197.49			~~20~~ ← 16						
52+60 L	RT	38		202.81	199.81										
52+60 L	RT	38	39		199.81	199.71			~~20~~ ← 21						
52+80 L	RT	39		202.70	193.41										
52+80 L	RT	39	40		193.41	192.95				~~92~~ ← 90.25					
52+80 L	LT	40		202.79	192.95										
52+80 L	LT	40	43		192.95	189.71				~~260~~ ← 255					
18+69 Y3	LT	40A		198.69	195.69										
18+69 Y3	LT	40A	OUT		195.69	195.57			~~24~~ ← 22.2						
11+10 Y2	RT	41		200.62	198.45										
11+10 Y2	RT	41	39		198.45	198.15				~~60~~ ← 61					
11+10 Y2	LT	41A	41		200.80	198.45				~~48~~ ← Contr. Elected Not to use! used Existing RCP!					
SHEET TOTALS								0	1184	1108	452	856	0	0	0

STATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET 5																				
31+56 L	19																			
31+56 L	19	20																		
31+60 L	20																			
31+60 L	20	18																		
31+76 L	21																			
31+76 L	21	19																		
31+80 L	22																			
31+80 L	22	20																		
SHEET 6																				
37+00 L	24	25																		
37+00 L	25																			
37+00 L	25	21																		
37+00 L	26																			
37+00 L	26	22																		
40+55 L	27																			
40+55 L	27	28																		
40+55 L	28																			
40+55 L	28	26																		
43+15 L	30																			
43+15 L	30	31																		
45+30 L	32	32A																		
43+15 L	31																			
43+15 L	31	27																		
45+30 L	32																			
45+30 L	32	33																		
45+30 L	33																			
45+30 L	33	31																		
45+30 L	34																			
45+30 L	34	28																		
SHEET 7																				
47+35 L	35																			
47+35 L	~~35~~ 32	32A																		
47+54 L	36																			
47+54 L	36	35																		
52+60 L	38																			
52+60 L	38	39																		
52+80 L	39																			
52+80 L	39	40																		
52+80 L	40																			
52+80 L	40	43																		
18+69 Y3	40A																			
18+69 Y3	40A	OUT																		
11+10 Y2	41																			
11+10 Y2	41	39																		
11+10 Y2	41A	41																		
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	FROM	TO	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
SHEET 5																												
31+56 L	19		1			1			1																			
31+56 L	19	20																										
31+60 L	20		1			1		1																				
31+60 L	20	18																										
31+76 L	21		1			1			1																			
31+76 L	21	19																										
31+80 L	22		1			1		1																				
31+80 L	22	20																										
SHEET 6																												
37+00 L	24	25																										
37+00 L	25		1			1			1																			
37+00 L	25	21																										
37+00 L	26		1			1		1																				
37+00 L	26	22																										
40+55 L	27		1			1			1																			
40+55 L	27	28																										
40+55 L	28		1			1		1																				
40+55 L	28	26																										
43+15 L	30		1																							1	1	
43+15 L	30	31																										
45+30 L	32	32A																										
43+15 L	31		1			1			1																			
43+15 L	31	27																										
45+30 L	32		1																							1	1	
45+30 L	32	33																										
45+30 L	33		1			1			1																			
45+30 L	33	31																										
45+30 L	34		1			1		1																				
45+30 L	34	28																										
SHEET 7																												
47+35 L	35		1													1		1										
47+35 L	~~35~~ 32	32A																										
47+54 L	36		1																							1	1	
47+54 L	36	35																										
52+60 L	38		1			1		1																				
52+60 L	38	39																										
52+80 L	39		1			1		1																				
52+80 L	39	40																										
52+80 L	40		1			1			1																			
52+80 L	40	43																										
18+69 Y3	40A		1			1		1																				
18+69 Y3	40A	OUT																										
11+10 Y2	41		1									1			1													
11+10 Y2	41	39																										
11+10 Y2	41A	41																										
SHEET TOTALS			20	0	0	15	0	8	7	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	3	3	0

STATION	FROM	TO														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
SHEET 5																				
31+56 L	19																			
31+56 L	19	20																		
31+60 L	20																			
31+60 L	20	18																		
31+76 L	21																			
31+76 L	21	19																		
31+80 L	22																			
31+80 L	22	20																		
SHEET 6																				
37+00 L	24	25																		OPEN END PIPE
37+00 L	25																			
37+00 L	25	21																		
37+00 L	26																			
37+00 L	26	22																		
40+55 L	27																			
40+55 L	27	28																		
40+55 L	28																			
40+55 L	28	26																		
43+15 L	30																			
43+15 L	30	31																		
45+30 L	32	32A																		
43+15 L	31																			
43+15 L	31	27																		
45+30 L	32																			
45+30 L	32	33																		
45+30 L	33																			
45+30 L	33	31																		
45+30 L	34																			
45+30 L	34	28																		
SHEET 7																				
47+35 L	35																			
47+35 L	~~35~~ 32	32A															0.399			COLLAR AND EXTEND 15" RCP
47+54 L	36																			
47+54 L	36	35																		
52+60 L	38																			
52+60 L	38	39																		
52+80 L	39																			EXTRA DEPTH TO PASS UNDER 24" WM
52+80 L	39	40																	94	REMOVE 18" RCP
52+80 L	40																			
52+80 L	40	43																		
18+69 Y3	40A																			
18+69 Y3	40A	OUT																		
11+10 Y2	41																			
11+10 Y2	41	39																		
11+10 Y2	41A	41																		OPEN END
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.399	0	94	

ABBREVIATIONS

C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
M.D.I. MEDIAN DROP INLET
M.D.I.(N.S.) MEDIAN 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

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	~~2C~~

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
SHEET 7															
55+00 L	RT	42A		200.84	197.84										
55+00 L	RT	42A	42		197.84	197.72			~~24~~←21.2						
55+25 L	RT	42		200.90	190.41										
55+25 L	RT	42	43		190.41	189.71					~~88~~←87.5				
55+39 L	LT	43		200.22	189.71										
55+39 L	LT	43	44		189.71	189.37						~~68~~←63.5			
55+50 L	LT	44		195.56	189.37										
55+50 L	LT	44	OUT		189.37	189.19						(36)			
16+52 Y3	LT	44A										(24)			
15+04 Y3	LT	44B										(20)			
14+59 Y3	LT	44C										(48)			
13+97 Y3	LT	44D										(24)			
56+08 L	RT	47		197.87	195.37										
56+08 L	RT	47	48		195.37	195.07			16.5	~~20~~ Constr. Elected to use 15" RCP!					
56+07 L	RT	48		200.90	195.07										
56+07 L	RT	48	42		195.07	190.41					~~84~~	79			
56+43 L	RT	49		200.03	196.86										
56+43 L	RT	49	48		196.86	195.07			~~36~~←33						
56+43 L	LT	50		199.90	196.90										
56+43 L	LT	50	43		196.90	196.38			~~104~~←99.25						
56+95 L	RT	52		200.12	197.12										
56+95 L	RT	52	49		197.12	196.86			~~52~~←48						
57+15 L	RT	52A		200.21	197.21										
57+15 L	RT	52A	52		197.21	197.12			~~20~~←17						
SHEET 8															
62+24 L	RT	56		200.21	197.21										
62+24 L	RT	56	57		197.21	197.05			~~32~~←28.5						
62+56 L	RT	57		200.47	197.05										
62+56 L	RT	57	60		197.05	196.51			~~108~~←104.5						
63+42 L	LT	58		201.43	199.18										
63+42 L	LT	58	59		199.18	198.76			~~28~~←28.8						
63+60 L	LT	59		203.68	198.76										
63+60 L	LT	59	60		198.76	196.51			~~36~~	36 used 18" RCP					
63+65 L	RT	60		201.92	196.51										
63+65 L	RT	60	61		196.51	196.35				64	~~64~~ used 18" RCP				
10+75 Y4	RT	61		200.41	196.35										
10+75 Y4	RT	61	66		196.35	189.61					~~248~~ was not installed conflict with Power!				
65+17 L	RT	62		205.03	202.03										
65+17 L	RT	62	61		202.03	196.35			~~104~~←100.5						
SHEET TOTALS								0	544	20	484	220	0	0	0

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.													
55+00 L (RT 42A)	1			1		1																																	
55+25 L (RT 42)	1	4.4												1		1																							
55+39 L (LT 43)	1	4.42		1			1																																
55+50 L (LT 44)	1	0.1							1				1																										
56+08 L (RT 47)	1																							1	1														
56+07 L (RT 48)	1	0.83													1	1																							
56+43 L (RT 49)	1			1	1																																		
56+43 L (LT 50)	1			1	1																																		
56+95 L (RT 52)	1			1			1																																
57+15 L (RT 52A)	1			1			1																																
62+24 L (RT 56)	1			1	1																																		
62+56 L (RT 57)	1			1			1																																
63+42 L (LT 58)																								1	1														
63+60 L (LT 59)	1			1	1																																		
63+65 L (RT 60)	1	0.41		1			1																																
10+75 Y4 (RT 61)	1			1		1																																	
65+17 L (RT 62)	1			1			1																																
SHEET TOTALS	16	10.16	0	12	4	2	6	0	1	0	0	0	1	1	1	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	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
55+00 L (RT 42A–42)				42	REMOVE 15" RCP & JB
55+25 L (RT 42)					EXTRA DEPTH TO PASS UNDER 24" WM
55+25 L (RT 42–43)				78	REMOVE 15" RCP & DI
55+50 L (LT 44)				103	REMOVE 18" RCP & DI
16+52 Y3 (LT 44A)				24	30" SIDE DRAIN/REMOVE 18" RCP
15+04 Y3 (LT 44B)				20	30" SIDE DRAIN/REMOVE 18" RCP
14+59 Y3 (LT 44C)				47	30" SIDE DRAIN/REMOVE 18" RCP
13+97 Y3 (LT 44D)				22	30" SIDE DRAIN/REMOVE 15" RCP
56+07 L (RT 48)				18	REMOVE 15" RCP & JB
63+60 L (LT 59–60)		0.798			COLLAR & EXTEND 15" RCP
63+65 L (RT 60)				91	REMOVE 15" RCP & JB
10+75 Y4 (RT 61)				305	REMOVE 15" RCP
SHEET TOTALS	0	0.798	0	750	

ABBREVIATIONS

C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
M.D.I. MEDIAN DROP INLET
M.D.I.(N.S.) MEDIAN 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

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE	12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) THICKNESS OR GAUGE	12"	15"	18"	24"	30"	36"	42"	48"
																		.064	.064	.064	.064	.138	.079	.079	.109	.109
SHEET 8																											
65+17 L	LT	63		205.37	202.37																						
65+17 L	LT	63	59		202.37	198.76				18@	156.8																
65+37 L	LT	63A		205.67	202.67																						
65+37 L	LT	63A	63		202.67	202.37				20'	17																
67+33 L	LT	65		208.48	205.48																						
67+33 L	LT	65	63A		205.48	202.67				18@	193																
13+23 Y4	RT	66		193.36	189.61																						
13+23 Y4	RT	66	67		189.61	187.60						24' ← CONTR. DECIDED NOT TO INSTALL!!															
13+70 Y4	RT	67		192.50	187.60																						
70+25 L	LT	68A		208.35	205.35																						
70+25 L	LT	68A	69		205.35	202.20				36@	45.25																
11+80 Y6	RT	68B	68C	205.60	203.09					10@	36																
11+75 Y6	LT	68C		206.34	203.09																						
11+75 Y6	LT	68C	68		203.09	202.79				6@	4.5	7															
12+36 Y6	LT	68		206.51	202.79																						
12+36 Y6	LT	68	70		202.79	202.25				3@	2.9.8																
71+20 L	LT	69		207.41	202.20																						
71+20 L	LT	69	77		202.20	201.40				12@	11.6.5																
71+19 L	LT	70		205.67	202.25																						
71+19 L	LT	70	69		202.25	202.20				18@	15.5																
SHEET 9																											
72+25 L	LT	75		205.11	201.94																						
72+25 L	LT	75	76		201.94	201.48				18@	15.2.5																
72+43 L	LT	76		204.65	201.48																						
72+43 L	LT	76	77		201.48	201.41				24@	19.5																
72+43 L	LT	77		206.31	201.41																						
72+43 L	LT	77	82A		201.41	201.19						72@	44.4														
72+67 L	RT	78		206.52	203.35																						
72+67 L	RT	78	79		203.35	203.21				16@	15.5																
72+73 L	RT	79		206.21	203.21																						
72+73 L	RT	79	81		203.21	203.05				16@	15.15																
72+90 L	RT	81		206.20	200.99																						
72+90 L	RT	81	84		200.99	200.86							40@	38.5													
SHEET TOTALS									0	540	272	164	40	0	0	0		0	0	0	0	0	0	0	0	0

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')' LIN. FT. A (5.0' THRU 10.0')	LIN. FT. 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
SHEET 8																													
65+17 L						1			1		1																		
65+17 L																													
65+37 L						1			1		1																		
65+37 L																													
67+33 L						1			1		1																		
67+33 L																													
13+23 Y4						1			1		1																		
13+23 Y4																													
13+70 Y4						1															1	1							
70+25 L						1			1			1																		
70+25 L																													
11+80 Y6																													
11+75 Y6						1			1		1																		
11+75 Y6																													
12+36 Y6						1			1		1																		
12+36 Y6																													
71+20 L						1	0.21		1		1																		
71+20 L																													
71+19 L																											1	1	
71+19 L																													
SHEET 9																													
72+25 L						1																					1	1	
72+25 L																													
72+43 L						1																					1	1	
72+43 L																													
72+43 L						1	0.22		1			1																		
72+43 L																													
72+67 L						1																					1	1	
72+67 L																													
72+73 L						1			1		1																		
72+73 L																													
72+90 L						1	0.21		1	1																			
72+90 L																													
SHEET TOTALS						15	0.64	0	11	1	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0

STATION	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
SHEET 8					
65+17 L					
65+17 L					
65+37 L					
65+37 L					
67+33 L					
67+33 L					
13+23 Y4				40	REMOVE 15" RCP & CB
13+23 Y4					
13+70 Y4					REMOVE JB REPLACE WITH TBJB
70+25 L					
70+25 L			0.13		PLUG BOTH ENDS 18" RCP
11+80 Y6					OPEN END PIPE
11+75 Y6					
11+75 Y6					
12+36 Y6					
12+36 Y6					
71+20 L					
71+20 L					
71+19 L					
71+19 L					
SHEET 9					
72+25 L					
72+25 L					
72+43 L					
72+43 L					
72+43 L					
72+43 L					
72+67 L					
72+67 L					
72+73 L					
72+73 L					
72+90 L				49	REMOVE 15" RCP & CB
72+90 L					
SHEET TOTALS	0	0	0.13	89	

ABBREVIATIONS	
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

CHS-IT0526547,4/27/2007,C:\PWworking\TPA\mdarby\dms23598\Drainage_summaries_latest_greatest.xls

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	~~25~~

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"
SHEET 9																												
73+47 L	LT	82		206.36	201.57																							
73+47 L	LT	82	82A		201.57	201.57					~~56~~ ← 53																	
72+90 L	LT	82A		206.20	201.19																							
72+90 L	LT	82A	81		201.19	200.99						~~68~~ ← 65																
73+47 L	LT	83		204.64	201.64																							
73+47 L	LT	83	82		201.64	201.40					~~24~~ ← 19.5																	
10+66 Y7	RT	84		206.32	200.86																							
10+66 Y7	RT	84	93		200.86	199.85						~~224~~ 220.5																
10+66 Y7	LT	85		206.49	203.28																							
10+66 Y7	LT	85	84		203.28	200.86			~~32~~ 30.7																			
73+82 L	RT	86		207.07	203.53																							
73+82 L	RT	86	85		203.53	203.28			~~36~~ ← 36.5																			
73+82 L	RT	87		206.63	203.63																							
73+82 L	RT	87	86		203.63	203.53			~~20~~ ← 14.75																			
74+02 L	RT	89		206.84	203.84																							
74+02 L	RT	89	87		203.84	203.63			~~20~~ ← 17.2																			
12+92 Y7	RT	93	OUT	206.28	199.85																							
82+59 L	LT	95		207.96	204.71																							
82+59 L	LT	95	98		204.71	203.09				~~100~~ ← 97.1																		
12+14 Y8	RT	96	95		206.03	204.71				~~56~~ ← 54																		
12+14 Y8	LT	97	98		206.00	203.09				~~60~~ ← 60.2																		
11+80 Y8	LT	97A							24 Contr. Elected to use 15" RCP!																			
83+60 L	LT	98		206.34	203.09																							
83+60 L	LT	98	99		203.09	196.10				~~336~~ ← 333.5																		
SHEET 10																												
86+97 L	LT	99		199.35	196.10																							
86+97 L	LT	99	100		196.10	195.18				~~20~~	16. Contr. Elected to use 24" RCP.																	
87+17 L	LT	100		198.93	195.18																							
87+17 L	LT	100	103		195.18	192.72					~~76~~ ← 71.5																	
12+25 Y9	RT	101	100		197.18	195.18					(48)																	
11+70 Y9	RT	101A									24 Contr. Elected to use 24" RCP.																	
12+25 Y9	LT	102	103		196.83	192.72				(40)																		
12+02 Y9	LT	102A																										
87+92 L	LT	103		197.62	192.72																							
87+92 L	LT	103	107		192.72	187.40					~~336~~ 330																	
87+79 L	RT	104		197.61	194.61																							
87+79 L	RT	104	105		194.61	194.19			~~20~~ ← 13.0																			
87+99 L	RT	105		197.19	194.19																							
87+99 L	RT	105	103		194.19	192.72			~~24~~ Contr. Elected Not to use. used existing 15" RCP																			
SHEET TOTALS								0	152	612	540	292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
SHEET 9																																	
73+47 L	82							1			1		1																				
73+47 L	82	82A																															
72+90 L	82A							1			1	1																					
72+90 L	82A	81																															
73+47 L	83							1																							1	1	
73+47 L	83	82																															
10+66 Y7	84							1	1.4		1		1																				
10+66 Y7	84	93																															
10+66 Y7	85							1			1			1																			
10+66 Y7	85	84																															
73+82 L	86							1																							1	1	
73+82 L	86	85																															
73+82 L	87							1			1			1																			
73+82 L	87	86																															
74+02 L	89							1			1			1																			
74+02 L	89	87																															
12+92 Y7	93	OUT						1	2.21		1	1																					
82+59 L	95							1			1			1																			
82+59 L	95	98																															
12+14 Y8	96	95																															
12+14 Y8	97	98																															
11+80 Y8	97A		~~24~~																														
83+60 L	98							1			1			1																			
83+60 L	98	99																															
SHEET 10																																	
86+97 L	99							1			1			1																			
86+97 L	99	100																															
87+17 L	100							1			1			1																			
87+17 L	100	103																															
12+25 Y9	101	100																															
11+70 Y9	101A				~~24~~																												
12+25 Y9	102	103																															
12+02 Y9	102A			~~24~~ Contr. elected not to install!																													
87+92 L	103							1														1	1										
87+92 L	103	107																															
87+79 L	104							1			1		1																				
87+79 L	104	105																															
87+99 L	105							1			1		1																				
87+99 L	105	103																															
SHEET TOTALS			24	24	24	0	0	16	3.61	0	13	2	4	7	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	2	0

STATION	FROM	TO														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
SHEET 9																				
73+47 L	82																			
73+47 L	82	82A																		
72+90 L	82A																			
72+90 L	82A	81																		
73+47 L	83																			
73+47 L	83	82																		
10+66 Y7	84																		222	REMOVE 15" RCP & CB
10+66 Y7	84	93																		
10+66 Y7	85																		26	REMOVE 15" RCP & CB
10+66 Y7	85	84																		
73+82 L	86																			
73+82 L	86	85																		
73+82 L	87																		97	REMOVE 15" RCP & CB
73+82 L	87	86																		
74+02 L	89																			
74+02 L	89	87																		
12+92 Y7	93	OUT																		REMOVE CB AND REPLACE WITH CB
82+59 L	95																		64	REMOVE 3-15" RCP DRIVEWAY PIPES
82+59 L	95	98																		
12+14 Y8	96	95																		OPEN END PIPE
12+14 Y8	97	98																		OPEN END PIPE
11+80 Y8	97A																			
83+60 L	98																			DRIVEWAY PIPE
83+60 L	98	99																		
SHEET 10																				
86+97 L	99																		25	REMOVE 24" RCP DRIVEWAY PIPE
86+97 L	99	100																		
87+17 L	100																			
87+17 L	100	103																		
12+25 Y9	101	100																		OPEN END PIPE
11+70 Y9	101A																		21	REMOVE 15" RCP/DRIVEWAY PIPE
12+25 Y9	102	103																		
12+02 Y9	102A																		22	REMOVE 15" RCP/DRIVEWAY PIPE
87+92 L	103																		46	REMOVE 15" RCP
87+92 L	103	107																		
87+79 L	104																			
87+79 L	104	105																		
87+99 L	105																		84	REMOVE 5-24" RCP DRIVEWAY PIPES
87+99 L	105	103																0.798			COLLAR AND EXTEND BOTH ENDS 15" RCP
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.798	0	607	

COMPUTED BY: MMD DATE: 4/27/2007

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CONTRACT	SHEET NO.
201110	35

RAL-IT0423382

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
								THICKNESS OR GAUGE								
SHEET 10																
91+27 L	LT	106		191.87	188.37											
91+27 L	LT	106	107		188.37	187.40						26+16				
91+27 L	LT	107		191.65	187.40											
91+27 L	LT	107	107A		187.40	183.68							38+35	65		
94+91 L	LT	107A		187.93	183.68											
94+91 L	LT	107A	112		183.68	177.56							18+	15.5		
94+50 L	RT	108		188.34	185.34											
94+50 L	RT	108	109		185.34	184.67				44+	31.75					
94+91 L	RT	109		187.67	184.67											
94+91 L	RT	109	110		184.67	183.90				152+	14.75					
96+42 L	RT	110		186.90	183.90											
96+42 L	RT	110	111		183.90	183.84				126+	7					
96+54 L	RT	114		180.82	173.57											
97+98 L	LT	115		187.96	180.69											
97+98 L	LT	115	112		180.69	175.56							182+	36		
97+98 L	LT	116	115		189.21	184.71				16						
SHEET 11																
98+59 L	LT	117		188.55	181.05											
98+59 L	LT	117	115		181.05	180.75				80+	59.2					
98+59 L	RT	118		189.57	181.27											
98+59 L	RT	118	117		181.27	181.05				44+	41.6					
99+09 L	RT	119		190.13	187.13											
99+09 L	RT	119	118		187.13	186.57				52+	46.7					
103+50 L	LT	120		189.81	186.81											
103+50 L	LT	120	121		186.81	186.38				20+	16					
103+70 L	LT	121		189.63	186.38											
103+70 L	LT	121	124		186.38	184.93					189+	103				
12+12 DRIVE	RT	122	121		187.68	186.38					52+	48				
12+12 DRIVE	LT	123	124		187.86	184.93					84					
11+30 DRIVE	LT	123A	123							[illegible]	103, ADD CH					
104+80 L	LT	124		188.18	184.93											
104+80 L	LT	124	127		184.93	179.17					112+	10				
SHEET TOTALS									0	384	484	20	520	0	0	0

BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE	.064	.064	.064	.064	.138	.079	.079	.109	.109
	0	0	0	12	0	0	0	0	0

	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
	0	0	0

ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS	R.C.P.	C.S.P.
	28	0	0

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'	LIN. FT. B 10.0' AND ABOVE
	14	2.25	0

C.B. STD. 840.01 OR STD. 840.02
12

FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE	E	F	G
	1	6	5

	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
	0	2	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0

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
0	0	0	482	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

REMARKS

- 25 — REMOVE 15" DRIVEWAY PIPE
- 73 — REMOVE 30" RCP
- 10 — REMOVE 24" RCP/TIE TO EXISTING
- BDO
- 27 — REMOVE 15" RCP DRIVEWAY PIPE
- OPEN END PIPE
- 210 — REMOVE 15" RCP/OPEN END PIPE
- 97 — REMOVE 15" RCP/DRIVEWAY PIPE
- 40 — REMOVE 12" PLASTIC

12 ← Constr. Elected not to use!

28 ← Constr. Elected not to use!

CHS-IT0526547,4/27/2007,C:\PWworking\TPA\mdarby\dms23598\Drainage_summaries_latest_greatest.xls

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONTRACT	SHEET NO.
201110	~~8-8~~

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET 11																																	
105+76 L	CL	125		188.18	185.01																												
105+76 L	CL	125	126		185.01	184.57			~~20~~ 16.5																								
105+96 L	CL	126		187.74	179.39																												
105+96 L	CL	126	127		179.39	179.17			~~44~~ 39.75																								
105+96 L	LT	127	127A	186.44	179.17					180.2 ADD ON!																							
105+96 L	LT	~~127~~	~~128~~		179.17	170.06				~~384~~																							
109+83 L	LT	128	127A	175.10	170.06					199.5 ADD ON!																							
109+83 L	LT	128	131		170.06	166.30						~~76~~ ← 72																					
109+83 L	LT	129		173.66	170.16																												
109+83 L	LT	129	128		170.16	170.06						~~20~~ 15.5																					
110+58 L	RT	130		173.72	163.41																												
110+58 L	RT	130	OUT		163.41	158.00							~~152~~ ← 146.25																				
110+58 L	LT	131		173.72	163.84																												
110+58 L	LT	131	130		163.84	163.41							~~72~~ ← 70																				
110+69 L	LT	132		173.45	171.20																												
110+69 L	LT	132	131		171.20	163.84											(16)																
SHEET 12																																	
111+23 L	LT	133		172.94	167.30																												
111+23 L	LT	133	131		167.30	163.84				~~64~~ ← 60.3																							
12+16 Y11	RT	134		175.28	171.46																												
12+16 Y11	RT	134	133		171.46	167.30			~~56~~ ← 54																								
12+16 Y11	RT	135	136						30.2																								
12+16 Y11	RT	135		174.48	171.48																												
12+16 Y11	RT	135	134		171.48	171.46			~~4~~ ← 2																								
12+16 Y11	LT	136		174.39	171.39																												
12+16 Y11	LT	136	137		171.39	168.74			56																								
112+21 L	LT	137		172.50	168.74																												
112+21 L	LT	137	133		168.74	167.30				~~96~~ ← 94.3																							
112+21 L	RT	138		172.38	169.26																												
112+21 L	RT	138	130		169.26	163.41			~~164~~ ← 158.2																								
112+41 L	RT	139		172.36	169.36																												
112+41 L	RT	139	138		169.36	169.26			~~20~~ ← 14.7																								
113+00 L	LT	140		172.79	169.54																												
113+00 L	LT	140	137		169.54	168.74				~~80~~ 76.2																							
113+00 L	LT	141	140		173.99	169.54											~~24~~ 22.15																
10+57 Y12	RT	143	144		176.10	172.92			12								~~12~~ ← Contr. Elected not to use!																
10+57 Y12	RT	144		175.92	172.92																												
10+57 Y12	RT	144	145		172.92	172.63			~~24~~ ← 24.6																								
10+57 Y12	LT	145		175.88	172.63																												
10+57 Y12	LT	145	146		172.63	171.38				~~92~~ 85.5																							
SHEET TOTALS								0	388	716	0	96	224	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	STRUCTURE NO. FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.														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
105+76 L	125		1																							1	1																			TBDI
105+96 L	126		1																							1	1																			TBDI
105+96 L	127	127A	1			1			1																																					
109+83 L	128	127A	1			1			1																																					
109+83 L	129		1																							1	1																			
110+58 L	130		1	2.85		1		1																																					206	EXTRA DEPTH/REMOVE 18" RCP/PLASTIC
110+58 L	130	OUT																																												PIPE EXTENDS TO POND PER ROW
110+58 L	131		1	2.42		1			1																																				90	EXTRA DEPTH/REMOVE 24" RCP & DI
110+69 L	132		1																							1	1																			
111+23 L	133		1	0.64		1			1																																				43	REMOVE 15" RCP & DI
12+16 Y11	134		1													1		1																											60	REMOVE 18" RCP
12+16 Y11	135		1			1		1																																						
12+16 Y11	136		1			1			1																																					
112+21 L	137		1			1	1																					4.1																	39	REMOVE 15" RCP & DI
112+21 L	138		1			1	1																																							
112+41 L	139		1			1	1																					2.4																		
113+00 L	140		1			1		1																																						
113+00 L	141	140																			1																									
10+57 Y12	143	144																			1																									
10+57 Y12	144		1			1		1																																						
10+57 Y12	145		1			1			1																																					
SHEET TOTALS			18	5.91	0	13	3	4	6	0	0	0	0	0	0	1	0	1	0	0	2	0	0	0	0	4	4	6.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	438	

ABBREVIATIONS	
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	~~[illegible]~~

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"
SHEET 12																												
11+49 Y12	LT	146		174.63	171.38																							
11+49 Y12	LT	146	OUT		171.38	170.58				(16)																		
11+77 Y12	RT	146A																										
12+72 Y12	LT	147		176.61	173.61																							
12+72 Y12	LT	147	146		173.61	171.38			~~120~~ 119.2																			
116+82 L	LT	148		178.60	175.60																							
116+82 L	LT	148	147		175.60	173.61			60																			
118+25 L	LT	149		179.95	176.95																							
118+25 L	LT	149	148		176.95	175.60			~~144~~ 143.2																			
118+25 L	CL	150		181.20	178.03																							
118+25 L	CL	150	149		178.03	176.95			~~44~~ 37.0																			
118+45 L	CL	151		181.42	178.25																							
118+45 L	CL	151	150		178.25	178.03			~~20~~ 16.6																			
119+93 L	CL	152		182.70	179.53																							
119+93 L	CL	152	153		179.53	177.91			~~40~~ 37.5																			
119+91 L	LT	153		180.91	177.91																							
119+91 L	LT	153	OUT		177.91	167.88											~~40~~ 44											
122+56 L	CL	154		187.27	184.10																							
122+56 L	CL	154	155		184.10	181.21			~~44~~ 36.75																			
122+76 L	CL	154A		187.80	184.63																							
122+76 L	CL	154A	154		184.63	184.10			~~20~~ 16.0																			
122+56 L	LT	155		184.96	181.21																							
122+56 L	LT	155	OUT		181.21	169.85													~~48~~ 47									
122+76 L	LT	155A		185.49	182.24																							
122+76 L	LT	155A	155		182.24	181.21				~~20~~ 16.75																		
15+50 Y12	RT	208		174.44	171.27																							
15+50 Y12	RT	208	OUT		171.27	171.16			36																			
19+89 Y12	LT	212		172.37	167.97																							
19+89 Y12	LT	212	213		167.97	167.43					4																	
20+27 Y12	LT	213		171.83	167.43																							
20+27 Y12	LT	213	OUT		167.43	167.27					32																	
21+29 Y12	LT	214		178.28	174.36																							
21+29 Y12	LT	214	213		174.36	167.43																						
21+80 Y12	LT	215		182.59	179.09																							
21+80 Y12	LT	215	212		179.09	167.97																						
SHEET TOTALS								0	528	36	36	0	0	0	0	0	40	0	48	0	0	0	0	0	0	0	0	0

STATION	LOCATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
SHEET 12																																		
11+49 Y12	LT	146							1			1	1																					
11+49 Y12	LT	146	OUT																															
11+77 Y12	RT	146A		32																														
12+72 Y12	LT	147							1			1		1																				
12+72 Y12	LT	147	146																															
116+82 L	LT	148							1			1		1																				
116+82 L	LT	148	147																															
118+25 L	LT	149							1			1		1																				
118+25 L	LT	149	148																															
118+25 L	CL	150							1																							1	1	
118+25 L	CL	150	149																															
118+45 L	CL	151							1																							1	1	
118+45 L	CL	151	150																															
119+93 L	CL	152							1																							1	1	
119+93 L	CL	152	153																															
119+91 L	LT	153							1			1		1																				
119+91 L	LT	153	OUT																															
122+56 L	CL	154							1																							1	1	
122+56 L	CL	154	155																															
122+76 L	CL	154A							1																							1	1	
122+76 L	CL	154A	154																															
122+56 L	LT	155							1			1		1																				
122+56 L	LT	155	OUT																															
122+76 L	LT	155A							1			1		1																				
122+76 L	LT	155A	155																															
15+50 Y12	RT	208							1																							1	1	
15+50 Y12	RT	208	OUT																															
19+89 Y12	LT	212							1													1		1										
19+89 Y12	LT	212	213																															
20+27 Y12	LT	213							1													1		1										
20+27 Y12	LT	213	OUT																															
21+29 Y12	LT	214							1																							1	1	
21+29 Y12	LT	214	213																															
21+80 Y12	LT	215							1								1				1													
21+80 Y12	LT	215	212																															
SHEET TOTALS				32	0	0	0	0	17	0	0	7	1	6	0	0	1	0	0	0	1	2	0	2	0	0	0	0	0	0	0	7	7	0

STATION	LOCATION	STRUCTURE NO. FROM	STRUCTURE NO. TO														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
SHEET 12																					
11+49 Y12	LT	146																		42	REMOVE 18" RCP & 2 DI'S
11+49 Y12	LT	146	OUT																		
11+77 Y12	RT	146A																			DRIVEWAY PIPE
12+72 Y12	LT	147																			
12+72 Y12	LT	147	146																		
116+82 L	LT	148																			
116+82 L	LT	148	147																		
118+25 L	LT	149																			
118+25 L	LT	149	148																		
118+25 L	CL	150																			TBDI
118+25 L	CL	150	149																		
118+45 L	CL	151																			TBDI
118+45 L	CL	151	150																		
119+93 L	CL	152																			TBDI
119+93 L	CL	152	153																		
119+91 L	LT	153																			
119+91 L	LT	153	OUT														2@15"				
122+56 L	CL	154																			TBDI
122+56 L	CL	154	155																		
122+76 L	CL	154A																			TBDI
122+76 L	CL	154A	154																		
122+56 L	LT	155																			
122+56 L	LT	155	OUT														2@24"				
122+76 L	LT	155A																			
122+76 L	LT	155A	155																		
15+50 Y12	RT	208																			TBDI
15+50 Y12	RT	208	OUT																		
19+89 Y12	LT	212																		36	REMOVE 24" RCP
19+89 Y12	LT	212	213																		
20+27 Y12	LT	213																		36	CONVERT DI TO JB W/ MH/REMOVE 24" RCP
20+27 Y12	LT	213	OUT																		EXISTING 24" RCP
21+29 Y12	LT	214																		45	ADJUST DI/REMOVE 24" RCP
21+29 Y12	LT	214	213																		EXISTING 24" RCP
21+80 Y12	LT	215																			
21+80 Y12	LT	215	212																		EXISTING 24" RCP
																	2@15"				
SHEET TOTALS				0	0	0	0	0	0	0	0	0	0	0	0	0	2@24"	0	0	159	

ABBREVIATIONS

C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
M.D.I. MEDIAN DROP INLET
M.D.I.(N.S.) MEDIAN 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

CHS-IT0526547,4/27/2007,C:\PWworking\TPA\mdarby\dms23598\Drainage_summaries_latest_greatest.xls

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT: 201110 SHEET NO.: ~~21~~

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.														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
SHEET 12																																																																												
22+03 Y12	RT	216		188.34	184.44																													1													1		1																												
22+03 Y12	RT	216	OUT		184.44	179.02				~~60~~ ← 63.5																																																																		
SHEET 13																																																																											
125+50 L	RT	156		197.03	194.03																													1			1		1																																						
125+50 L	RT	156	157		194.03	192.69			~~44~~ ← 38.6																																																																			
125+50 L	LT	157		195.94	192.69																													1			1		1																																						
125+50 L	LT	157	155A		192.69	182.24				~~276~~ ← 273.15																																																																		
128+29 L	RT	158		206.44	203.44																													1			1			1																																			26	REMOVE 15" RCP
128+29 L	RT	158	159		203.44	202.82			~~72~~ ← 69.8																																																																				
128+29 L	LT	159		206.07	202.82																													1			1		1																																			20	REMOVE 15" RCP
128+29 L	LT	159	157		202.82	192.69				~~276~~ 273.5																																																																		
128+49 L	RT	160		206.79	203.79																													1			1			1																																				
128+49 L	RT	160	158		203.79	203.44			~~20~~ ← 17.5																																																																	48	REMOVE 18" RCP
13+75 Y13	LT	161	164		208.17	206.58				~~48~~ ← 44																																																																		
130+47 L	RT	162		209.98	206.98																													1			1			1																																				
130+47 L	RT	162	164		206.98	206.58			~~80~~ ← 81.75																																																																			
130+58 L	LT	164		210.36	206.58																													1			1		1																																						
130+58 L	LT	164	159		206.58	202.82				~~228~~ 226																																																																		
137+16 L	RT	165		207.40	203.48																													1								1				1																														
137+16 L	RT	165	166		203.48	201.99					~~16~~ ← 14.6																																																																	
137+16 L	RT	166		207.48	201.99																													1			1		1																																						
137+16 L	RT	166	167		201.99	201.75							~~48~~ ← 45.95																																																																
137+16 L	CL	167		209.88	201.75																													1	3.13		1		1																																						
137+16 L	CL	167	OUT		201.75	201.40							~~60~~ ← 63.25																																																																
137+83 L	RT	168		206.93	202.18																													1			1	1																																							
137+83 L	RT	168	166		202.18	201.99							~~64~~ 60.55																																																																
137+83 L	CL	169		209.68	206.56																													1			1	1																																								
137+83 L	CL	169	167		206.56	206.22			~~68~~ ← 64																																																																			
SHEET 14																																																																											
141+14 L	RT	170		209.39	204.35																													1			1			1																																				
141+14 L	RT	170	168		204.35	202.18							~~328~~ ← 323.25																																																																	
141+14 L	LT	171		209.31	204.61																													1			1		1																																						
141+14 L	LT	171	170		204.61	204.35			~~88~~ ← 87.5																																																																			
141+34 L	LT	172		209.43	206.43																													1			1		1																																						
141+34 L	LT	172	171		206.43	206.29			~~20~~ ← 22.2																																																																			
10+00 DRIVE1	RT	171A		208.08	205.08																													1			1			1																																				
10+00 DRIVE1	RT	171A	171B		205.08	204.96			~~40~~ ← 40.4																																																																			
10+00 DRIVE1	LT	171B		208.79	204.96																													1			1		1																																						
10+00 DRIVE1	LT	171B	171C		204.96	204.77			~~64~~ ← 63.0																																																																		
140+63 L	LT	171C		209.06	204.77																													1			1		1																																						
140+63 L	LT	171C	171		204.77	204.61			~~52~~ ← 47.3																																																																		
SHEET TOTALS								0	548	888	16	0	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	3.13	0	17	2	10	5	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	

ABBREVIATIONS

C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
M.D.I. MEDIAN DROP INLET
M.D.I.(N.S.) MEDIAN 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

CHS-IT0526547,4/27/2007,C:\PWworking\TPA\mdarby\dms23598\Drainage_summaries_latest_greatest.xls

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	~~90~~

CHS-IT0526547

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ABBREVIATIONS
C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
M.D.I. MEDIAN DROP INLET
M.D.I.(N.S.) MEDIAN 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

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.														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
SHEET 14																																																																											
144+27 L	RT	173	174		213.00	205.71												(28)																1																		1																							
144+27 L	RT	174		209.96	205.71																													1			1			1																																			17	REMOVE 18" RCP
144+27 L	RT	174	174A		205.71	205.39						~~68~~ ← 60.7																																																																
143+60 L	RT	174A		209.69	205.39																													1			1	1																			1	1																			TBDI
143+60 L	RT	174A	170		205.39	204.35						~~248~~ 244.9																																																																	
144+27 L	LT	176		210.56	207.31																													1			1		1																																						
144+27 L	LT	176	174		207.31	205.71				~~108~~ ← 105.4																																																																		
146+58 L	RT	178		213.29	208.31																													1			1			1																																					
146+58 L	RT	178	174		208.31	205.71					~~232~~ ← 225.9																																																																	
146+58 L	LT	179		212.89	208.64																													1			1		1																																						
146+58 L	LT	179	178		208.64	208.31					~~108~~ 104																																																																	
146+58 L	LT	180		211.71	208.71																													1																							1	1																			
146+58 L	LT	180	179		208.71	208.64					~~24~~ 20.5																																																																				
21+09 Y14 NBL	RT	181		216.18	213.18																													1			1			1																																					
21+09 Y14 NBL	RT	181	178		213.18	207.13			~~84~~ ← 81.5																																																																					
20+77 Y14 NBL	LT	182		216.31	213.14																													1																							1	1																			TBDI
20+77 Y14 NBL	LT	182	183		213.14	213.08			~~12~~ ← 9.0																																																																					
20+65 Y14 SBL	RT	183		216.06	212.89																													1																							1	1																			TBDI
20+65 Y14 SBL	RT	183	185		212.89	212.21			~~92~~ 91.0																																																																				
148+60 L	LT	184		215.33	199.39																													1	5	5.56												1	1																													EXTRA DEPTH TBJB W/MH
148+60 L	LT	184	199		199.39	198.52																																																																							EXISTING 24" RCP
20+56 Y14 SBL	LT	185		215.46	212.21																													1			1		1																					1.3																		34	REMOVE 18" RCP
20+56 Y14 SBL	LT	185	189		212.21	211.12				~~84~~ ← 84.8																																																																				
149+75 L	LT	186		212.92	209.92																													1			1	1																																							
149+75 L	LT	186	187		209.92	209.58			~~56~~ ← 55.5																																																																					
149+54 L	CL	187		215.35	199.79																													1	5	5.56												1	1																													EXTRA DEPTH TBJB W/MH
149+54 L	CL	187	184		199.79	199.39																																																																							EXISTING 24" RCP
149+75 L	RT	188		215.71	205.80																													1																							1	1																			TBDI
149+75 L	RT	188	187		205.80	205.68				~~24~~ ← 23																																																																				
149+68 L	RT	189		216.45	211.02																													1	0.33		1	1																																							
149+68 L	RT	189	188		211.02	210.88				~~28~~ 27.3																																																																				
150+23 L	RT	190		214.51	211.34																													1																							1	1	6.1																		29	REMOVE 15" RCP/FLOWABLE FILL 18" RCP
150+23 L	RT	190	189		211.34	211.02			~~64~~ ← 63																																																																					
15+50 Y14 NBL	RT	198A		210.13	207.13																													1			1		1																																					42	REMOVE 2 15" RCP DRIVEWAY PIPES
15+50 Y14 NBL	RT	198A	OUT		207.13	207.00			~~32~~ ← 31.5																																																																					
15+00 Y14 NBL	RT	198B							20																				~~20~~																																															19	REMOVE 15" RCP/DRIVEWAY PIPE
14+20 Y14 NBL	RT	198C							20																				~~24~~																																															21	REMOVE 15" RCP/DRIVEWAY PIPE
SHEET TOTALS								0	340	244	364	316	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	18	10.33	11.12	10	3	4	3	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	0	6	6	7.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	

CHS-IT0526547,4/27/2007,C:\PWworking\TPA\mdarby\dms23598\Drainage_summaries_latest_greatest.xls

RAL-IT0423382

COMPUTED BY:	MMD	DATE:	4/27/2007
CHECKED BY:	JRR	DATE:	4/27/2007

CONTRACT	SHEET NO.
201110	[illegible]

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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 III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
SHEET 14															
16+35 Y14 SBL	LT	198		212.05	209.05										
16+35 Y14 SBL	LT	198	199		209.05	208.99			~~12~~ ← 10						
16+35 Y14 SBL	LT	199		212.67	198.52										
16+35 Y14 SBL	LT	199	OUT		198.52	193.75									
16+35 Y14 SBL	LT	200		209.76	207.26										
16+35 Y14 SBL	LT	200	199		207.26	207.22				(8)					
SHEET 15															
10+72 Y15	LT	~~191~~ 191A	192		211.16	210.88				~~44~~ ← 59 Contr. Added Extra Pipe!					
10+90 Y15	CL	191A			211.30	211.16				(48)					
153+24 L	RT	192		215.76	210.88										
153+24 L	RT	192	194		210.88	210.44				~~86~~ ← 80					
154+06 L	RT	193		215.18	212.01										
154+06 L	RT	193	194		212.01	210.44			~~16~~ ← 15.5						
154+15 L	RT	194		215.56	208.21										
154+15 L	RT	194	195		208.21	201.36				~~64~~ ← 62					
154+15 L	LT	195		211.96	201.36										
154+15 L	LT	195	187		201.36	199.79									
154+75 L	LT	196		212.93	210.18										
154+75 L	LT	196	195		210.18	208.04			~~60~~ ← 48						
155+90 L	RT	197		215.31	212.31										
155+90 L	RT	197	194		212.31	210.44			~~180~~ ← 180.7						
155+00 L	LT	197A							20						
155+73 L	LT	197B							20						
156+61 L	LT	197C							20						
157+60 L	LT	197D							20						
SHEET 16															
13+08 Y14 SBL	LT	201		205.35	202.35										
13+08 Y14 SBL	LT	201	OUT		202.35	202.25			~~24~~ ← 26.5						
25+50 Y14 NBL	LT	202		215.76	212.59										
25+50 Y14 NBL	LT	202	203		212.59	212.53			~~12~~ ← 6.5						
25+62 Y14 SBL	RT	203		215.76	212.53										
25+62 Y14 SBL	RT	203	204		212.53	210.34			~~188~~ ← 187.5						
27+49 Y14 NBL	LT	204		214.79	210.34										
27+49 Y14 NBL	LT	204	OUT		210.34	209.60									
27+39 Y14 NBL	LT	205		215.13	211.96										
27+39 Y14 NBL	LT	205	206		211.96	211.90			~~12~~ ← 6.0						
27+49 Y14 SBL	RT	206		214.58	211.90										
27+49 Y14 SBL	RT	206	204		211.90	210.34			~~4~~ ← 6.0						
SHEET TOTALS								0	508	252	0	0	0	0	0

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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
SHEET 14														
16+35 Y14 SBL	198							1			1		1	
16+35 Y14 SBL	198	199												
16+35 Y14 SBL	199							1	5	4.15				
16+35 Y14 SBL	199	OUT												
16+35 Y14 SBL	200							1						
16+35 Y14 SBL	200	199												
SHEET 15														
10+72 Y15	191A	192												
10+90 Y15	191A													
153+24 L	192							1			1			1
153+24 L	192	194												
154+06 L	193							1						
154+06 L	193	194												
154+15 L	194							1	0.12		1			1
154+15 L	194	195												
154+15 L	195							1	5	0.6				
154+15 L	195	187												
154+75 L	196							1						
154+75 L	196	195												
155+90 L	197							1			1			1
155+90 L	197	194												
155+00 L	197A		~~20~~											
155+73 L	197B		~~20~~											
156+61 L	197C		~~20~~											
157+60 L	197D		~~20~~											
SHEET 16														
13+08 Y14 SBL	201							1			1		1	
13+08 Y14 SBL	201	OUT												
25+50 Y14 NBL	202							1						
25+50 Y14 NBL	202	203												
25+62 Y14 SBL	203							1						
25+62 Y14 SBL	203	204												
27+49 Y14 NBL	204							1						
27+49 Y14 NBL	204	OUT												
27+39 Y14 NBL	205							1						
27+39 Y14 NBL	205	206												
27+49 Y14 SBL	206							1						
27+49 Y14 SBL	206	204												
SHEET TOTALS			80	0	0	0	0	15	10.12	4.75	5	0	2	3

STATION	FROM	TO	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.
SHEET 14																					
16+35 Y14 SBL	198																				
16+35 Y14 SBL	198	199																			
16+35 Y14 SBL	199								1		1										
16+35 Y14 SBL	199	OUT																			
16+35 Y14 SBL	200																		1	1	
16+35 Y14 SBL	200	199																			
SHEET 15																					
10+72 Y15	191A	192																			
10+90 Y15	191A																				
153+24 L	192																				
153+24 L	192	194																			
154+06 L	193																		1	1	
154+06 L	193	194																			
154+15 L	194																				
154+15 L	194	195																			
154+15 L	195																		1	1	
154+15 L	195	187																			
154+75 L	196			1				1													
154+75 L	196	195																			
155+90 L	197																				
155+90 L	197	194																			
155+00 L	197A																				
155+73 L	197B																				
156+61 L	197C																				
157+60 L	197D																				
SHEET 16																					
13+08 Y14 SBL	201																				
13+08 Y14 SBL	201	OUT																			
25+50 Y14 NBL	202																		1	1	
25+50 Y14 NBL	202	203																			
25+62 Y14 SBL	203																		1	1	
25+62 Y14 SBL	203	204																			
27+49 Y14 NBL	204									1	1										
27+49 Y14 NBL	204	OUT																			
27+39 Y14 NBL	205																		1	1	
27+39 Y14 NBL	205	206																			
27+49 Y14 SBL	206																		1	1	
27+49 Y14 SBL	206	204																			
SHEET TOTALS			0	1	0	0	0	1	1	1	2	0	0	0	0	0	0	0	7	7	0

STATION													
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	FROM	TO	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
SHEET 14							
16+35 Y14 SBL	198						
16+35 Y14 SBL	198	199					
16+35 Y14 SBL	199						EXTRA DEPTH JB W/MH
16+35 Y14 SBL	199	OUT					RETAIN EXISTING 30" RCP
16+35 Y14 SBL	200						
16+35 Y14 SBL	200	199					
SHEET 15							
10+72 Y15	191A	192				46	REMOVE 12" RCP/OPEN END PIPE
10+90 Y15	191A					20	CROSS PIPE/REMOVE 15" RCP
153+24 L	192					24	REMOVE 15" RCP
153+24 L	192	194					
154+06 L	193						
154+06 L	193	194					
154+15 L	194						
154+15 L	194	195					
154+15 L	195					16	REMOVE 15" RCP
154+15 L	195	187					EXISTING 24" RCP
154+75 L	196						
154+75 L	196	195					
155+90 L	197						
155+90 L	197	194					
155+00 L	197A					20	REMOVE 15" RCP/DRIVEWAY PIPE
155+73 L	197B					16	REMOVE 15" RCP/DRIVEWAY PIPE
156+61 L	197C					16	REMOVE 15" RCP/DRIVEWAY PIPE
157+60 L	197D					17	REMOVE 15" RCP/DRIVEWAY PIPE
SHEET 16							
13+08 Y14 SBL	201						
13+08 Y14 SBL	201	OUT					
25+50 Y14 NBL	202						TBDI
25+50 Y14 NBL	202	203					
25+62 Y14 SBL	203						TBDI
25+62 Y14 SBL	203	204					
27+49 Y14 NBL	204						REMOVE DI
27+49 Y14 NBL	204	OUT					
27+39 Y14 NBL	205						TBDI
27+39 Y14 NBL	205	206					
27+49 Y14 SBL	206						TBDI
27+49 Y14 SBL	206	204					
SHEET TOTALS			0	0	0	175	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

RAL-IT0423382

COMPUTED BY: MMD DATE: 4/27/2007

CHECKED BY: JRR DATE: 4/27/2007

CONTRACT	SHEET NO.
201110	[illegible]

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
SHEET 16															
27+82 Y14 SBL	LT	207		214.64	211.64										
27+82 Y14 SBL	LT	207	~~OUT~~ 207A		211.64	211.44			~~40~~ 85.5 ADD ON						
11+50 Y16	CL	207A	OUT		209.64	209.52			~~40~~ 40.0						
SHEET TOTALS								0	80	0	0	0	0	0	0
GRAND TOTALS								0	6112	4632	2536	2448	1240	44	0

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24" .138	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') 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
SHEET 16																									
27+82 Y14 SBL																			1			1			1
27+82 Y14 SBL																									
11+50 Y16																									
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1
GRAND TOTALS	0	92	40	48	0	0	0	0	0	0	0	0	0	208	24	24	0	0	188	48.28	15.87	135	20	60	55

STATION	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH TWO GRATES STD. 840.20	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.46	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	6" D.I.P. FOR SPRING BOX	BDO STD. 850.10	BDO STD. 850.11	36" BDO SPECIAL EDETAIL	24" SMOOTH STEEL PIPE, t=0.5"	36" SMOOTH STEEL PIPE, t=0.5"	DROP INLET STD. 840.14	DROP INLET FRAME & GRATE STD. 840.16	FLOWABLE FILL, C.Y.														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
SHEET 16																																					
27+82 Y14 SBL																																					
27+82 Y14 SBL																																					
11+50 Y16																																					CROSS PIPE
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
GRAND TOTALS	0	6	1	0	0	7	7	6	13	0	0	4	0	0	0	0	35	35	13.9	0	0	0	0	0	0	0	0	0	0	0	0	0	2@15" 2@24"	1.995	0.13	3104	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

23 of 78

COMPUTED BY:	MMD	DATE:	4/27/2007
CHECKED BY:	JRR	DATE:	4/27/2007

CONTRACT	SHEET NO.
201110	3M

CHS-IT0526547

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

STATION	LOCATION (LT, RT, OR CL)*	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE						BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE												STRUCTURAL PLATE PIPE SIZE					
								54"	60"	66"	72"	78"	84"	54"				60"	66"	72"						60"	66"	72"			
THICKNESS OR GAUGE														.109	.138	.168	SHOP ELON-GATED .138	SHOP ELON-GATED .168	.168	.280	.138	.168	.139	.168						
																										12	10	12	10	12	10
Sheet 10																															
96+41 L	LT	112		186.90	175.56																										
96+41 L	LT	112	111		175.56	175.22		~~66~~ 69																							
96+70 L	LT	113	112		178.00	175.56		~~264~~ 274																							
96+52 L	LT	111		186.90	175.22																										
96+52 L	LT	111	114		175.22	173.57		~~66~~ 33.5																							
SHEET 12																															
17+56 Y12	LT	209		169.00	158.51																										
17+56 Y12	LT	IN	209		158.51	158.51																		24							
17+65 Y12	RT	210	OUT		157.40	156.10																		28							
SHEET TOTALS								140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	0	0	0
GRAND TOTALS								140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	0	0	0

STATION	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	J.B. STD. 840.31 OR 840.32	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
96+41 L				1	1									
96+41 L														
96+70 L	5.2													OPEN END PIPE W/ HEADWALL
96+52 L				1	1									
96+52 L														
17+56 Y12								1						
17+56 Y12		7.5												
17+65 Y12												3.4176		
SHEET TOTALS	5.2	7.5	0	2	2	0	0	1	0	0	0	3.4176	0	0
GRAND TOTALS	5.2	7.5	0	2	2	0	0	1	0	0	0	3.4176	0	0

ABBREVIATIONS	
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

REVISIONS

RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "TASTEE" WITH STATE PLANE GRID COORDINATES OF NORTHING: 470471.29400(ft) EASTING: 2011708.95000(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988238 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "TASTEE" TO -L- STATION 10+00.00 IS S 24° 42' 39.81" W 1467.008 FEET ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~1 REV.C~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — Paul A. Meehan — 8-25-05

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL L-0603 ENGINEER MICHAEL M. DARBY — 8-25-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

NAD 83

BEGIN STATE PROJECT U-3311B
-L- STA. 12+89.50 LA (U-3311B) =
-L- STA. 14+85.00 LB (U-620)

STATIONING U-620 ← | STATIONING U-3311B →

U-3311B POT Sta. 13+94.50 =
U-620 POT Sta. 13+80.00
END CONSTRUCTION (U-620)

-L-
PI Sta 22+59.53
△ = 9°24' 40.6" (RT)
Dc = 1°15' 00.0"
L = 752.90'
T = 377.30'
R = 4,583.66'
SE = RC (0.025)

-L- PC STA. 18+82.23

U-3311B POT Sta. 10+.00.00 LA =
U-620 TS Sta. 17+74.50 LB

-BL- PINCSta. 27+11.71 (BL-2)
-L- Sta. 11+66.25 (41.22' LT)

BEGIN 2'-6" C&G CONST. 5' CONC. SW & WEDGING/WIDENING

BOARD OF TRUSTEES OF CUMBERLAND MILLS CEMETERY DB 2693 PG 59

CUMBERLAND CEMETERY

GRAVE AREAS ARE APPROX.

RICHARD H. BAXTER DB 3655 PG 575

BEN D. LOVELL DB 4177 PG 231

WILLIAM HENRY BUNDY PB 2095 PG 359

EDGAR LYNWOOD MANESS DB 775 PG 172

BILLY C. JONES DB 2034 PG 491

DO NOT DISTURB BLOCK WALL OR BURIAL PLOT

24" RCP

PROP. SLOPE STAKE

PROP. RW

PROP. 2'-6" C&G

PROP. SIDEWALK

16.5' 15" RCP

42.5' 15" RCP

33.6' 15" RCP

360.0' 24" RCP

134.27' TRANSITION

1'-6" C&G

4" GAS PLAS

TEL DATUM

ADJ CB

WAS NOT INSTALLED BY THIS PROJECT

BEGIN CONSTRUCTION (U-3311B)
-L- STA. 10+74.50 LA (U-3311B) =
-L- STA. 17+.00.00 LB (U-620)
BEGIN RAISED ISLAND CONST.

N 20° 43' 25.6" W

SR 1141 BINGHAM DR

WILLIAM REID AUTRY HEIRS DB 1148 PG 227 PB 28 PG 23

WILLIAM STACY RODGERS DB 2021 PG 389 PB 28 PG 23

JAMES A. PARKER, JR. DB 2454 PG 747 DB 3444 PG 873 PB 28 PG 23

VICTOR J. PLANT DB 2426 PG 581 PB 29 PG 23

VIRGIL D. PHILLIPS DB 2412 PG 1 DB 2461 PG 39

EDGAR LYNWOOD MANESS DB 775 PG 172

MATCH LINE STA. 20+00 -L-
SEE SHEET NO. 5 Rev.C

New RCP

NOTES: SEE SHEET NO. 17 Rev.C FOR -L- PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

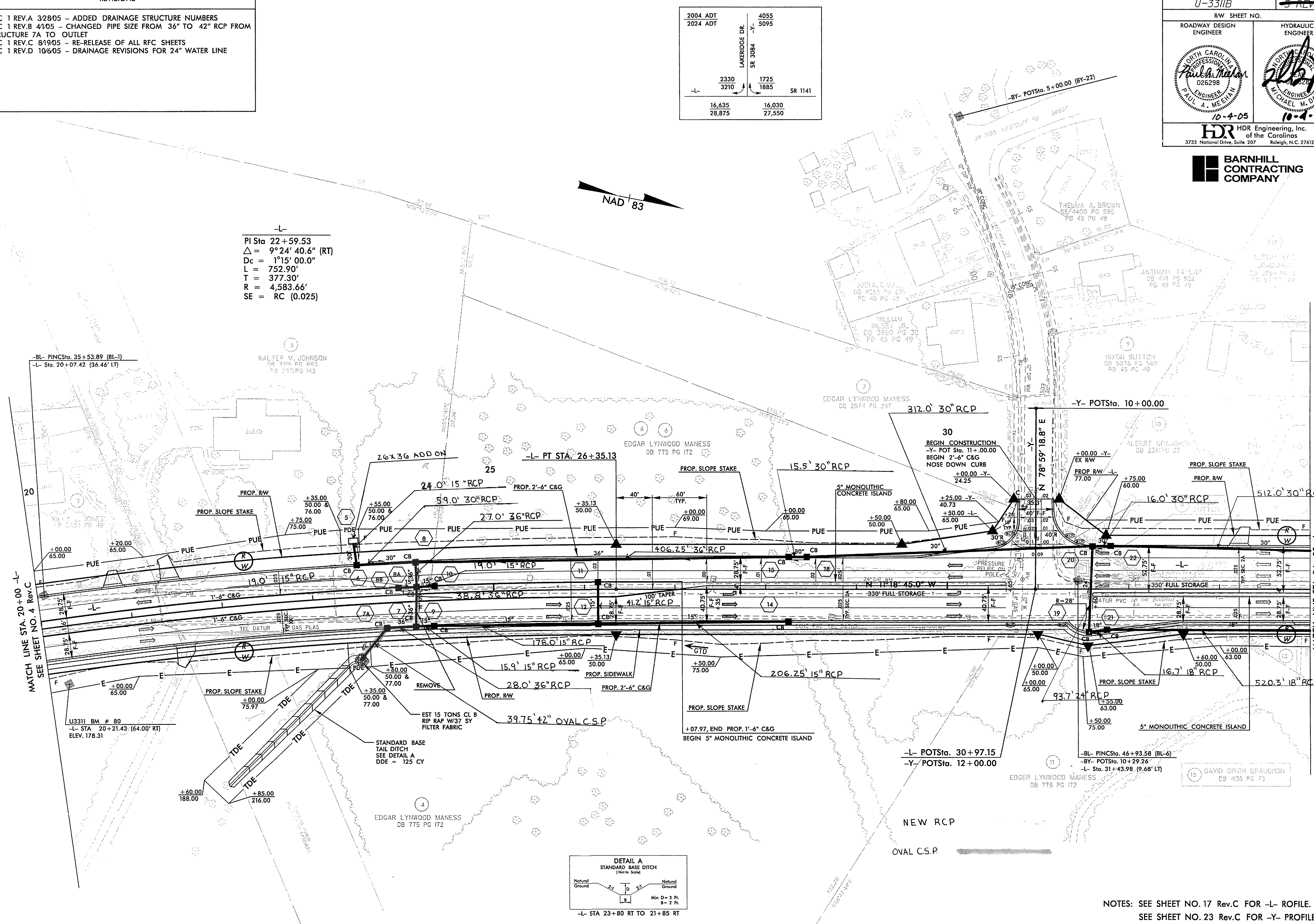
PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~5 REV.D~~
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — Paul A. Meehan 10-4-05	NORTH CAROLINA PROFESSIONAL SEAL ENGINEER MICHAEL M. DA… — 10-4-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

REVISIONS

RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.B 4/1/05 – CHANGED PIPE SIZE FROM 36" TO 42" RCP FROM STRUCTURE 7A TO OUTLET
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE



NOTES: SEE SHEET NO. 17 Rev.C FOR -L- ROFILE.
SEE SHEET NO. 23 Rev.C FOR -Y- PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

REVISIONS
RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
– ADDED 15" RCP FROM STR #32 TO #35
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE
RFC 1 REV.E 4/20/06 – MODIFIED DRIVE WIDTH ON PROPERTY NO. 10A

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~6 REV.E~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026298 ENGINEER PAUL A. MEEHAN

4-20-06

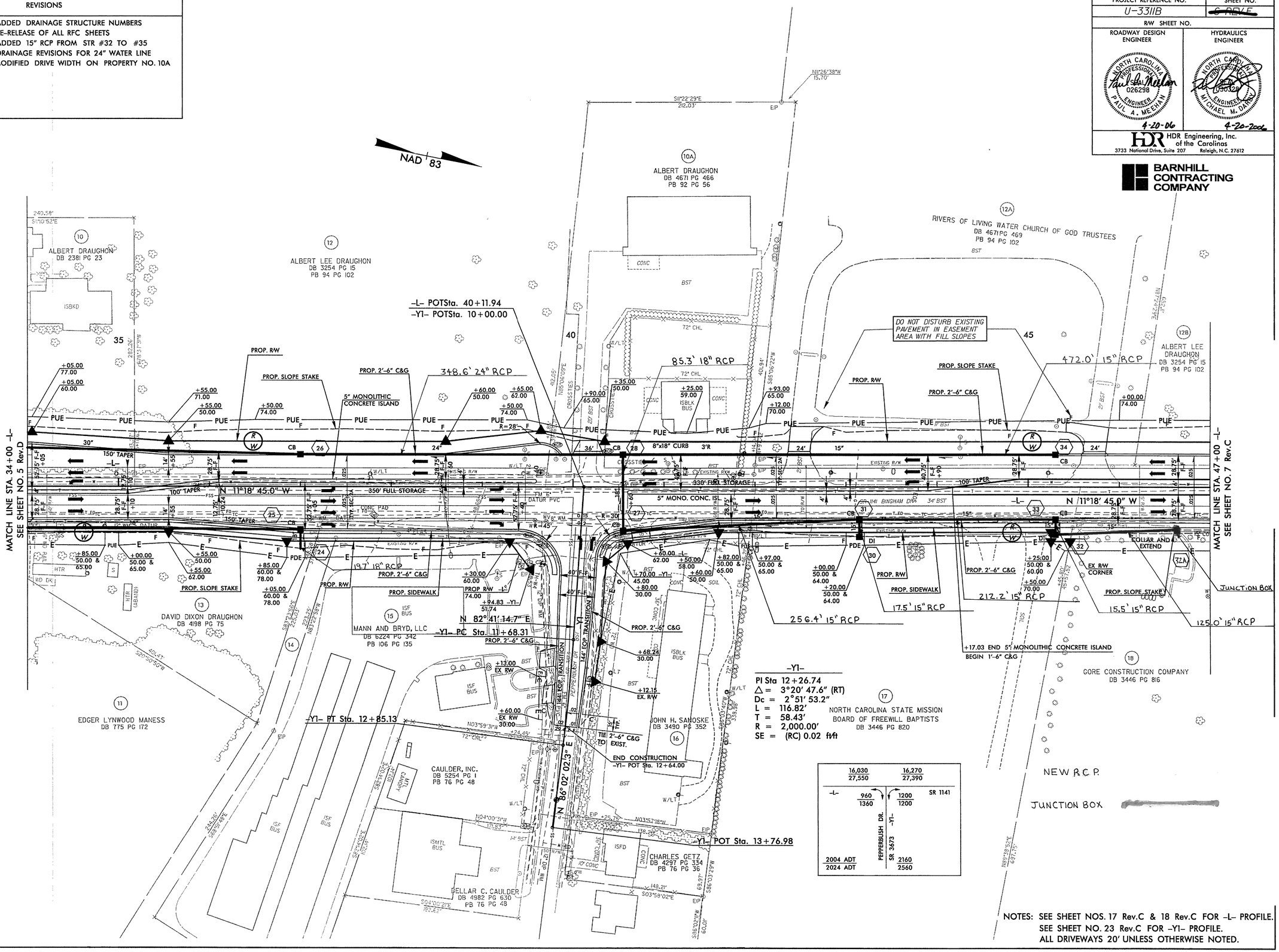
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030328 ENGINEER MICHAEL M. DARBY

4-20-2006

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY



NOTES: SEE SHEET NOS. 17 Rev.C & 18 Rev.C FOR –L– PROFILE.
SEE SHEET NO. 23 Rev.C FOR –Y1– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

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

REVISIONS

RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.C 8/19/05 – STR #35 & #36 ADDED DUE TO NEW SURVEY
– L, Y2 & Y3 GRADE REVISED TO INCORPORATE NEW SURVEY DATA.
– RE-RELEASE OF ALL RFC SHEETS
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE
RFC 1 REV.H 4/10/07 – CHANGED Y2 PROFILE TO ELIMINATE UNDERCUT

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	7 REV.H
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MECHAN — 4-12-07

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DIREK — 4-11-2007

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

2004 ADT / 2024 ADT
BAILEY LAKE RD. SR 1106 –Y3– 6335/8575
–L– 3465/5225 2360/2760 SR 1141
16,270/27,390 470/950 335/575 15,030/24,550
BIBAR RD. SR 3697 –Y2– 1320/2120

–Y3–
PI Sta 13+77.16
△ = 20°21' 24.8" (RT)
Dc = 7°30' 00.0"
L = 271.43'
T = 137.16'
R = 763.94'
SE = EXIST.

PI Sta 17+84.28
△ = 17°42' 23.7" (LT)
Dc = 7°00' 00.0"
L = 252.95'
T = 127.49'
R = 818.51'
SE = EXIST.

NAD 83

NOTE: THE BAILEY LAKE ROAD REALIGNMENT AND BIBAR ROAD DESIGN, WHICH IS SHOWN IN GRAY, DEPICTS WORK DONE UNDER THE DIVISION 6 DDC PROJECT U-3311A. R/W AND EASEMENTS, ALSO SHOWN IN GRAY, ON PARCELS 19, 20, 21, 26, 27, 28, THE BETANCOURT PROPERTY, AND THE EASEMENT ALONG BIBAR ROAD ON PARCEL 18 WERE ACQUIRED UNDER PROJECT U-3311A.

–LREV–
PI = 61+03.92
△ = 16°24' 37.0" (RT)
Dc = 3°30' 00.0"
Θs = 3°56' 15.0"
Ls = 225.00'
Ts = 348.72'
Lc = 243.87'
Rc = 1,637.02'
LT = 150.04'
ST = 75.03'
e = 0.05
DS = 50 mph

–L–
PIs Sta 59+02.76
Θs = 3°40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

PI Sta 61+02.43
△ = 9°03' 37.0" (RT)
Dc = 3°30' 00.0"
L = 258.87
T = 129.70'
R = 1,637.02'
SE = 0.05 ft/ft

PIs Sta 63+01.62
Θs = 3°40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

–Y3– PTSta. 15+11.42
–Y3– PCSta. 16+56.79
–Y3– PT Sta. 19+09.74
–L– POTSta. 53+52.77
–Y3– POTSta. 20+19.03
–BL– PINCSta. 68+89.71 (BL-8)
–BY2– POTSta. 5+00.00
–L– Sta. 53+40.07 (1.32 LT)
BEGIN CONSTRUCTION
–Y3– POT Sta. 18+45.04
BEGIN 2'-6" C&G
–L– POTSta. 53+58.89
–Y2– POTSta. 10+00.00
–BL– POTSta. 70+72.28
–BY3– POTSta. 13+71.88
–BY3– POTSta. 13+93.51 (BY3-27)
–L– Sta. 55+19.68 (34.02 RT)
END CONSTRUCTION
–Y2– POT Sta. 11+00.02
END 2'-6" C&G
NOSE DOWN CURB
–LREV– TS Sta. 57+55.20
–L– POT Sta. 57+55.20
–L– TS Sta. 57+62.73
–L– SC Sta. 59+72.72
–LREV– SC Sta. 59+80.20

REGINALD McLAURIN DB 4557 PG 325 PB 89 PG 173
ROY A. MYNATT JR. DB 4542 PG 318 PB 89 PG 173
DOUGLAS JOLLEY REMOVE 3036 PG 218
DIANE DRAUGHON JOHNSON DB 3254 PG 12
ALBERT LEE DRAUGHON DB 3254 PG 15 PB 94 PG 102
MARION VALASCO DB 2580 PG 746
HEIDI M. SNYDER DB 3625 PG 280 PB 25 PG 40
WILLIAM MURCHISON DB 3048 PG 553 PB 25 PG 40
RICHARD G. WILLIAMS DB 4202 PG 254 PB 25 PG 40
CHARLES N. HATLEY DB 953 PG 281 PB 25 PG 40
MARGARET A. BROWN DB 2389 PG 594 PB 25 PG 40
IAN TRUMAN DB 3662 PG 334 PB 25 PG 40
FRANK E. RICHARDSON DB 4349 PG 60 PB 85 PG 194
WILLIAM H. SMITH DB 3160 PG120 PB 40 PG
REGINALD LANE DB 4349 PG 183 PB 40 PG 74
KENNETH CAUDILL DB 3089 PG 534 PB 40 PG 74
BASIL CATANZARO DB 2153 PG 356 PB 40 PG 74
PAMELA WITZ DB 3816 PG 323 PB 42 PG 12
WILLIAM MUREHEAD DB 4354 PG 146 PB 42 PG12
RICARDO BETANCOURT DB 4273 PG 620 PB 85 PG 194
WALTER BEARDEN JR. DB 4853 PG 62 PB 85 PG 194
GORE CONSTRUCTION COMPANY DB 3446 PG 816

U3311 BM # 81
–L– STA. 48+68.72 (135.05 RT)
ELEV. 205.77

MATCH LINE STA. 47+00 –L– SEE SHEET NO. 6 Rev.D
MATCH LINE STA. 60+00 –LREV– SEE SHEET NO. 8 Rev.D

NOTES: SEE SHEET NO. 18 Rev.C FOR –L–/–LREV– PROFILE.
SEE SHEET NO. 23 Rev.C FOR –Y2– & –Y3– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

1:46:49 P.M.
4/10/2007
C:\PW working\TPA\charnden\dms23640\u3311b_rdy_psh_07.dgn

REVISIONS

RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.B 4/1/05 – DUPLICATE STRUCTURE NUMBERS 66, 67, 67A CHANGED TO 68A, 68B, 68C
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL SHEETS
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE
RFC 1 REV.G 2/15/07 – CHANGE PIPE FROM STR. 60–61 TO 18" FROM 24". RETAIN EXISTING FROM 61 TO OUTFALL.

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	9 REV.G
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — 2-15-07
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030220 ENGINEER MICHAEL M. DARBY — 2-15-07

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

–L–
Pls Sta 59+02.76 | Pl Sta 61+02.43 | Pls Sta 63+01.62
Θs = 3° 40' 30.0" | Δ = 9° 03' 37.0" (RT) | Θs = 3° 40' 30.0"
Ls = 210.00' | Dc = 3° 30' 00.0" | Ls = 210.00'
LT = 140.03' | L = 258.87 | LT = 140.03'
ST = 70.03' | T = 129.70' | ST = 70.03'
R = 1,637.02'
SE = 0.05 ft/ft

–LREV–
PI = 61+03.92
Δ = 16° 24' 37.0" (RT)
Dc = 3° 30' 00.0"
Θs = 3° 56' 15.0"
Ls = 225.00'
Ts = 348.72'
Lc = 243.87'
Rc = 1,637.02'
LT = 150.04'
ST = 75.03'
e = 0.05
DS = 50 mph

NAD 83

MARGARET A. BROWN DB 2389 PG 594 PB 25 PG 40
JOYCE V. DAVIS, ET AL DB 972 PG 97 PB 25 PG 40
JAMES R. POOLE DB 4528 PG 494 PB 25 PG 40
DIXIE MAE CROLEY DB 3050 PG 5 PB 25 PG 40
ANTHONY M. WALKER DB 3304 PG 689 PB 25 PG 40
PERVIA E. ROWLAND DB 1008 PG 587 PB 25 PG 40
JAMES PETERS DB 3032 PG 383 PB 25 PG 40
FRED J. PROSPERI DB 2868 PG 247 PB 25 PG 40
RUFUS WAYNE PETERS DB 5151 PG 233 PB 47 PG 54
HTM INVESTMENTS, INC. DB 3591 PG 781 DB 4294 PG 788
CONNIE L. CHAVIS DB 2458 PG 562 PB 39 PG 80
SHERRY C. KERSEY DB 3381 PG 24 PB 39 PG 80
HENRIETTA BOOZER DB 3388 PG 253 PB 39 PG 80
MARTHA S. WALTERS DB 2886 PG 763 PB 39 PG 80
ROLAND E. SASSER DB 3420 PG 414 PB 39 PG 80
KAREN T. BROWN DB 2761 PG 825 PB 39 PG80
CLETHIE A. HALL DB 4505 PG 604 PB 25 PG 40
JEAN W. BROWN DB 4292 PG 861 PB 25 PG 40
PAUL STRICKLAND EACH DB 2477 PG 41 PB 39 PG 80
WILLIAM MUREHEAD DB 4354 PG 146 PB 42 PG12
DANIEL EBERHARDT DB 2983 PG 185 PB 42 PG 12
NICK D. WELLS DB 3906 PG 575 PB 42 PG 12
CAROLINA TELEPHONE & TELEGRAPH COMPANY DB 3719 PG 717 PB 42 PG 12
RICARDO MORGAN DB 2743 PG 546 PB 40 PG 74
GENE W. GASKINS DB2671 PG 618 ISBKD PB 40 PG 74
RAMON JUARBE-MENDEZ DB 3887 PG 656 PB 42 PG 12
BENJAMIN SYLVIA DB 2516 PG 395 PB 40 PG 74
ERNESTINE HENDRICKS DB 3723 PG 860 PB 40 PG 74
MILDRED BREEDEN DB 2815 PG 260 PB 40 PG 74
FLORENCE GREER DB 4449 PG 751 PB 40 PG 74
ANNETTE W. LEWIS DB 4415 PG 899 PB 40 PG 74
EDDIE MICHAELS & KELLY A. AIKEN DB 6228 PG 095 PB 40 PG 74
ANDRE DIMITROV DB 4206 PG 102 PB 54 PG 14
MATHEW FREDERICK DB 4693 PG 183 PB 54 PG 14
LAWRENCE SURLES DB 3101 PG 491 PB 54 PG 14

(42) DIXIE RAY TEW DB 2461 PG 243 PB 39 PG 80
(43) LARRY BOND DB 3157 PG 70 PB 39 PG 80
(55) ANTHONY WILSON DB 4402 PG 146 PB 54 PG 14

2004 ADT / 2024 ADT: 445/765 (–Y6–) | WORTHINGTON DR. SR 2981 | 135/375 (–L–) | 310/390 | SR 1141 | 15,705/25,065 | 15,880/25,080

U3311 BM # 82 –Y6– STA. 11+16.79 (41.41 LT) ELEV. 207.38

2004 ADT / 2024 ADT: 410/490 | FRANKIE AVE. SR 3304 (–Y5–) | 110/190 (–L–) | 300/300 | SR 1141 | 15,515/24,955 | 15,705/25,065

2004 ADT / 2024 ADT: 725/885 | SHENANDOAH DR. SR 2904 (–Y4–) | 1,210/1,290 | SR 1141 | 1,935/2,175 | 15,030/24,550 | 15,515/24,955

–L CS Sta. 62+31.59
–L ST Sta. 64+41.59
–LREV– ST Sta. 64+49.07
–LREV– POTSta. 64+50.35
–Y4– POTSta. 10+00.00
–Y5– POTSta. 10+00.00
–Y6– POTSta. 10+00.00
BEGIN CONSTRUCTION –Y5– POT Sta. 11+50.00
BEGIN CONSTRUCTION –Y6– POT Sta. 11+75.00
–BL– PINCSta. 64+71.64 (BL–9)
–BY4– POTSta. 5+00.00
–L– Sta. 64+22.16 (26.03' LT)
–BY5– POTSta. 5+00.00 (BY5–29)
–BY6– POTSta. 5+00.00 (BY6–31)
–LREV– CS Sta. 62+24.07
–Y4– POT Sta. 11+80.00
–BY5– POTSta. 8+66.57 (BY5–30)
–L– Sta. 66+69.54 (20.89' LT)
–BL– PINCSta. 86+81.75 (BL–10)
–BY6– POTSta. 10+45.92
–L– Sta. 71+32.17 (14.95' LT)
–BY4– POTSta. 9+28.15 (BY4–28)
–LREV– POTSta. 66+92.46
–Y5– POTSta. 13+00.00
–LREV– POTSta. 70+76.89
–Y6– POTSta. 13+00.00
–Y4– POTSta. 13+00.00
MATCH LINE STA. 60+00 –LREV– SEE SHEET NO. 7 Rev.C
MATCH LINE STA. 77+00 –LREV– SEE SHEET NO. 9 Rev.D

S 85°22'36.9" E
S 87°33'25.4" E
S 87°47'51.6" E
N 5°05'52.0" E

60.75' 18" RCP
50.75' 18" RCP
28.8' 15" RCP
56.8' 15" RCP
17.0' 15" RCP
104.5' 15" RCP
28.5' 15" RCP
36.0' 18" RCP
57.0' 18" RCP
29.8' 18" RCP
15.3' 18" RCP
116.5' 18" RCP
95.25' 15" RCP
NEW RCP

PROP. SLOPE STAKE
PROP. R/W
PROP. 2'–6" C&G
PROP. SIDEWALK
PROP. SLOPE STAKE
GRADE DITCHES TO DRAIN
GRADE CURB TO DRAIN
NOSE DOWN CURB
BEGIN 2'–6" C&G
EX R/W & 34.00
EX R/W & 36.00
EX R/W & 37.00
EX R/W & 43.00
EX R/W
RETAIN
REMOVE
TIE C&G TO EXIST.
END CONSTRUCTION
CLEAN OUT CB. & PIPES
JUNCTION BOX NOT LOCATED
150' TAPER
CHORD
PUE
CB
DCB
JB
FDE
EOS
EOP
BST
ISFD
ISBKD
ISBUS
ISMD
FBUS
SBKBUS
ISBK
SBKD
CONC
EIP
EIPF
SMH
FLAGPOLE
CANOPY
POOL
GAZEBO
SR 3304 FRANKIE AVE
SR 2972 SHIVELY CT
SR 3077 CARTER BARON PL
SR 2981 WORTHINGTON DR.
SR 2904 SHENANDOAH DR.
SR 1141
WINGHAM DR.
EXISTING R/W
24" DIP WM
8" AC W
4" HLAS
12" CMP
24" BST
20' BST
12' CMP
6" PVC DATUM
15" CONC
72" WD
36" WD RAIL
48" CHL
10' CONC
20' CONC
ISBK BUS

NOTES: SEE SHEET NOS. 18 Rev.C & 19 Rev.C FOR –LREV– PROFILE.
SEE SHEET NO. 24 Rev.C FOR –Y4–, –Y5–, & –Y6– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

3:48:28 PM
2/15/2007
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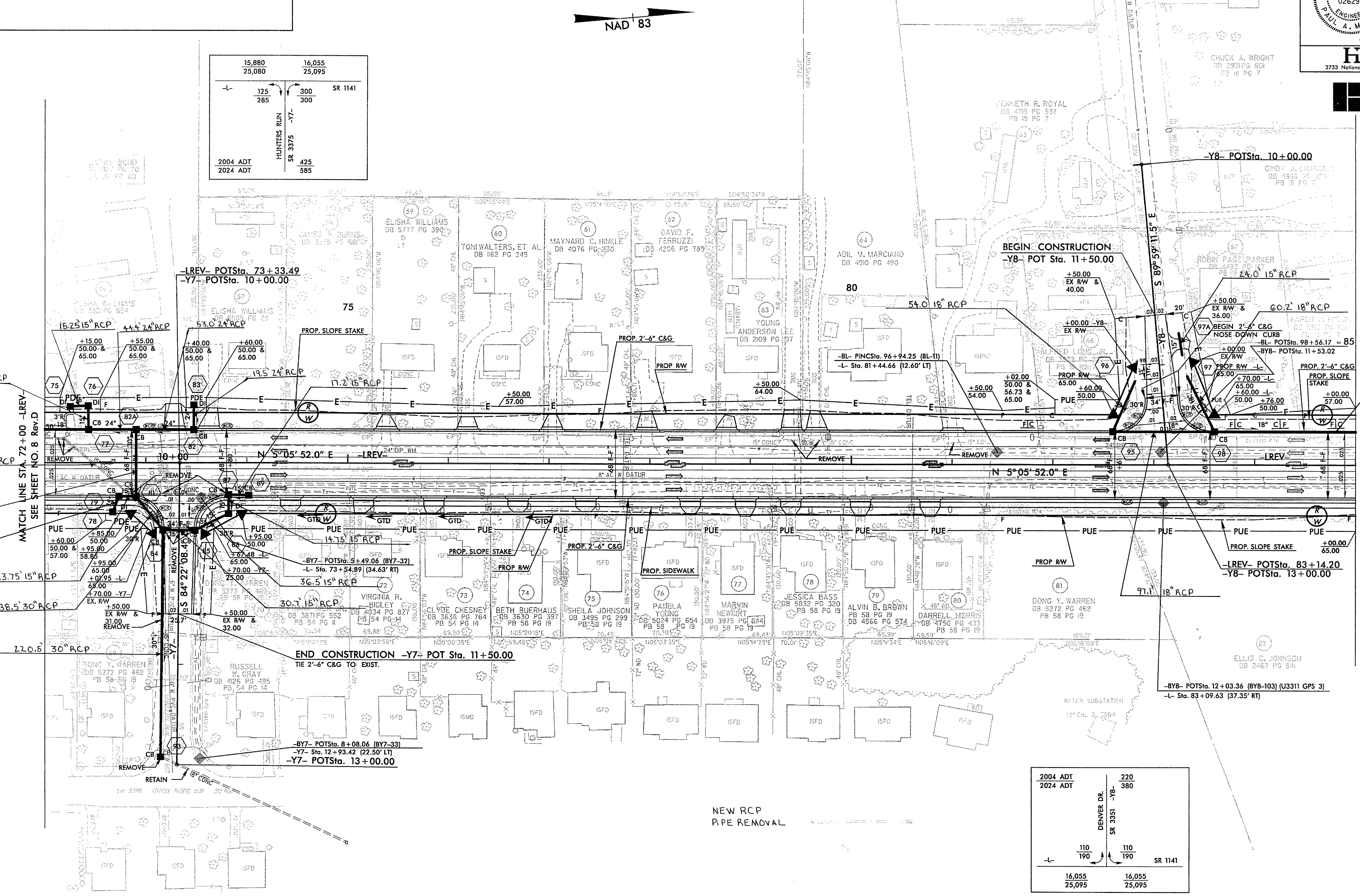
PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~8 REV.D~~
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — Paul A. Meehan 10-4-05	NORTH CAROLINA PROFESSIONAL SEAL ENGINEER MICHAEL M. DA… — 10-4-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

REVISIONS

RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.B 4/1/05 – REMOVED FILL 50' W/FLOWABLE GROUT NOTE FOR EXISTING 15" RCP BETWEEN DRAINAGE STRUCTURES 73 & 80
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE



NOTES: SEE SHEET NO. 19 Rev.C FOR -L- PROFILE.
SEE SHEET NO. 24 Rev.C FOR -Y7- & -Y8- PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

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

REVISIONS
RFC 1 REV.A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV.C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
RFC 1 REV.D 10/6/05 – DRAINAGE REVISIONS FOR 24" WATER LINE
RFC 1 REV.F 5/4/06 – MOVE INLET OF STR. 113 FROM –L– 96+70 LT. TO –L– 96+61 LT.

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~10 REV.F~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — 5-4-06

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030429 ENGINEER MICHAEL M. DARR — 5-4-2006

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

NAD 83

–LREV–
PI = 102+57.59
Δ = 24° 02' 32.0" (LT)
Dc = 3° 30' 00.0"
~~Ds~~ = 4° 22' 30.0"
Ls = 250.00'
Ts = 473.90'
Lc = 436.92'
Rc = 1,637.02'
LT = 166.72'
ST = 83.38'
e = 0.05
DS = 50 mph

DETAIL C
BERM BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, RDWY, B, 2:1
Min. D = 1 Ft.
B = 2 Ft.
b = 2 Ft.
–L– STA 89+50 LT TO 91+27 LT

DETAIL B
HEAD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, Filter Fabric, D, 2:1, B, Natural Ground
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
Type of Liner = CLASS 1 RIP RAP
–L– STA 96+66 LT TO 96+71 LT

–L–
Pls Sta 99+43.85
~~Os~~ = 3° 40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

PI Sta 102+53.98
Δ = 16 41' 32.0" (LT)
Dc = ~~3° 30' 00.0"~~
L = 476.92
T = 240.16'
R = 1,637.02'
SE = 0.05 ft/ft

Pls Sta 105+60.77
~~Os~~ = 3° 40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

2004 ADT 220
2024 ADT 380
CRESTWOOD AVE. –Y9– SR 1340 SR 1141
110/190 110/190
16,055/25,095 16,055/25,095

JACQUELINE M. PETERSON DB 4303 PG 868 PB 18 PG 7
BETTY C. McLEAN DB 4297 PG 424 PB 18 PG 7
WILLIAM D. SHERMAN DB 1095 PG 315 PB 18 PG 7
CLIFFORD HART DB 2834 PG 191 PB 18 PG 7
HEINZ GROHMANN DB 3936 PG 269 PB 18 PG 7
KAREN JOHNSON DB 5510 PG 126
THOMAS J. FOLDESI DB 5995 PG 668 PB 18 PG 7
THOMAS J. FOLDESI DB 6084 PG 185 PB 18 PG 7
ALBERT E. TOLAR JR. DB 1177 PG 447
ROGER D. HOLMES DB 3099 PG 551
FRANKLIN DEE HAWKS DB 2602 PG 28
DAVID JONAK HAAES DB 4516 PG 557
MARVIN R. JEFFCOAT DB 4603 PG 118 PB 81PG 188
MELVIN C. LADSON DB 5100 PG 384 PB 81PG 188
MICHAEL MACK DB 3358 PG 494 PB 81PG 188
FORNEY RAY DUCK DB 4718 PG 355
ELLIS C. JOHNSON DB 2467 PG 541
MICHAEL A. SESSOMS DB 3977 PG 198 PB 81PG88
CORY L. BLUE DB 6397 PG 766 PB 41PG 24
HARRY E. CHANDLER III DB 4537 PG 716 PB 41PG 24
RONALD BLACKWELDER DB 2584 PG 516 PB 41PG 24

–BY9– POTSta. 5+00.00 (BY9–36)
–Y9– POTSta. 10+00.00
–Y9– ROT Sta. 11+50.00
–Y9– POTSta. 13+00.00
–LREV– POTSta. 87+73.58
–BY9– POTSta. 10+12.71 (BY9–37)
–L– Sta. 87+43.17 (21.65' LT)
–BL– POTSta. 102+93.46 =
–BY9– POTSta. 10+20.67
–BL– PINCSta. 107+17.27 (BL–12)
–L– Sta. 91+67.68 (14.52' LT)
–L– TS Sta. 98+03.82
–LREV– TS Sta. 97+83.69
U3311 BM # 83
–L– STA. 93+50.20 (78.25 RT)
ELEV. 189.74

BEGIN CONSTRUCTION
BEGIN 2'-6" C&G NOSE DOWN CURB
PROP 2'-6" C&G
PROP R/W
PROP. SLOPE STAKE
PROP. SIDEWALK
BERM BASE DITCH SEE DETAIL C DDE= 30 CY
HEAD BASE DITCH SEE DETAIL B DDE 33 CY
FALSE SUMP
PROP. 2'-6" C&G
PROP. SLOPE STAKE
5' MONO. CONC. ISL.
REMOVE 10' EXISTING PIPE
RETAIN
Not Installed
REMOVE
EX R/W
EXISTING R/W
SR 1340 CRESTWOOD AVENUE 20' BST
SR 1321 GREENOCK AVENUE 27' BST
SR 1141 SR RW DINGHAM DR
48" PAVED DITCH 24" DIP WM
8" Al. W DATUR
8" W DATUR PVC
15" CONC
24" CONC
36" CONC
48" CHL
60" CHL
CONC PAD
SOIL
ISFD
ISBKD
POOL
HTR
WM
W/LT
GTD
ECM
EIP
CHL
CB
F
PUE
PDE
TDE
DDE
BDE
MATCH LINE STA. 85+00 –LREV– SEE SHEET NO. 9 Rev.D
MATCH LINE STA. 98+50 –LREV– SEE SHEET NO. 11 Rev.C

24.0' 24" RCP
48.0' 24" RCP
16.0' 24" RCP
71.5' 24" RCP
13.0' 18" RCP
40.0' 18" RCP
330.0' 24" RCP
356.0' 30" RCP
158.5' 30" RCP
69.0' 54" RCP
152.0' 15" RCP
37.75' 15" RCP
12.0' 15" RCP
33.5' 54" RCP
16.0' 15" RCP
59.2' 15" RCP
2-6'x3'6" DROP INLET

NEW RCP
ADD ON
NOT INSTALLED

NOTES: SEE SHEET NOS. 19 Rev.C & 20 Rev.C FOR –LREV– PROFILE.
SEE SHEET NO. 25 Rev.C FOR –Y9– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

9:04:00 AM
5/4/2006
C:\Working\TPA\cherndev\dms23640\u3311b_rdy_psh_10.dgn

REVISIONS
RFC 1 REV A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS RFC 1 REV C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	11 REV.C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030828 ENGINEER MICHAEL M. DAVIS

8-25-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

NAD 83

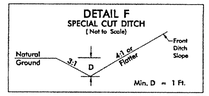
-LREV-
CURVE 15004
PI = 102+57.59
Δ = 24° 02' 32.0" (LT)
Dc = 3° 30' 00.0"
Ds = 4° 22' 30.0"
Ls = 250.00'
Ts = 473.90'
Lc = 436.92'
Rc = 1,637.02'
LT = 166.72'
ST = 83.38'
e = 0.05
DS = 50 mph

~~-L-~~
~~PIs Sta 99+43.85~~
~~Ds = 3° 40' 30.0"~~
~~Ls = 210.00'~~
~~LT = 140.03'~~
~~ST = 70.03'~~

~~PI Sta 102+53.98~~
~~Δ = 16 41' 32.0" (LT)~~
~~Dc = 3° 30' 00.0"~~
~~L = 476.92~~
~~T = 240.16'~~
~~R = 1,637.02'~~
~~SE = 0.05 ft/ft~~

~~PIs Sta 105+60.77~~
~~Ds = 3° 40' 30.0"~~
~~Ls = 210.00'~~
~~LT = 140.03'~~
~~ST = 70.03'~~

DETAIL F
SPECIAL CUT DITCH
(Not to Scale)



-DRIVE- STA 10+75 TO 12+12 LT & RT

BEGIN CONSTRUCTION
-DRIVE- POT Sta. 10+50.00

-DRIVE- POTSta. 10+00.00

-L- STSta. 107+00.74

-L- CS Sta. 104+90.74

-LREV- POTSta. 106+45.40

-Y10- POTSta. 10+00.00

-L- SC Sta. 100+13.82

-LREV- SC Sta. 100+33.69

-LREV- POTSta. 104+29.72

-DRIVE- POTSta. 13+00.00

-LREV- CS Sta. 104+70.61

-LREV- ST Sta. 107+20.61

-BY10- POTSta. 5+14.33 (BY10-38)
-L- Sta. 106+94.87 (19.20' RT)

-Y10- PCSta. 10+56.37

-Y10- PTSta. 13+00.69

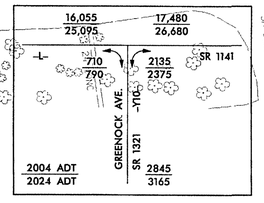
-Y10- POTSta. 13+50.70

-BY10- POTSta. 7+72.74 (BY10-39)
-Y10- Sta. 12+60.04 (15.29' LT)

END CONSTRUCTION
-Y10- POC Sta. 11+50.00

-BL- PINCSta. 118+01.37 (BL-13)
-L- Sta. 102+46.54 (36.78' RT)

-Y10-
PI Sta 12+12.20
Δ = 90°17' 21.0" (RT)
Dc = 36° 57' 19.7"
L = 244.32'
T = 155.82'
R = 155.04'
SE = EXIST.



NOT INSTALLED
NEW CSP
NEW RCP
ADD ON

NOTES: SEE SHEET NO. 20 Rev.C FOR -LREV- PROFILE.
SEE SHEET NO. 25 Rev.C FOR -Y10- PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

$$$$$$$SYSTIME$$$$$$$
$$$$$$$USERNAME$$$$$$$

REVISIONS
RFC 1 REV A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
RFC 1 REV.D 10/6/05 – DRIVEWAY ADDED AT PROPERTY 114

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~2~~ REV.D
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026298 — PAUL A. MEEHAN — ENGINEER — 10-4-05

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031641 — MICHAEL N. DARDEN — ENGINEER — 10-4-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

NOTES:
SEE SHEET NOS. 20 Rev.C & 21 Rev.C FOR –LREV– PROFILE.
SEE SHEET NO. 25 Rev.C FOR –Y11– PROFILE.
SEE SHEET NO. 25 Rev.C FOR –Y12– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.
SEE SHEET 2–H FOR BRIDGE DETAIL

NAD 83

DETAIL A
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground
Min. D = 1 Ft.
B = 2 Ft.

DETAIL N
PREFORMED SCOUR HOLE
(Not to Scale)
PERMANENT SOIL REINFORCEMENT MATTING - PERM
INSTALL LEVEL AND FLUSH WITH NATURAL GROUND.
PIPE OR DITCH OUTLET
SQUARE PREFORMED SCOUR HOLE (PSH)
(RIP RAP IN BASIN NOT SHOWN FOR CLARITY)
INTO WITH NATIVE GRASSES AT INSTALLATION
B = 5.0'
D = 2.0'
W = 4.0'–10.0'
d = 1.0'
Section A-A
PIPE OR DITCH OUTLET
"D" (1.0' min.)
PERM
NATURAL GROUND
FILL MATERIAL
1.0' TUCK
LINER: CLASS I RIP RAP 1.5" THICK W/FILTER FABRIC

–L– 114+28 RT TO 114+26 RT
–Y12– STA 11+49 LT

–L– STA 120+07 LT

BEGIN CONSTRUCTION
–Y12– POT Sta. 10+50.00

–Y12– POTSta. 10+00.00

–BY11– POTSta. 5+00.00 (BY11–43)

–Y11– POTSta. 10+00.00
BEGIN CONSTRUCTION
–Y11– POT Sta. 10+10.00

–LREV– POTSta. 116+19.78
WAS NOT INSTALLED –Y12– PINCSta. 13+50.49

–LREV– SC Sta. 119+49.58
–Y12– PCSta. 11+04.38
–L– SCSta. 119+33.83
–Y12– PTSta. 12+61.76
–LREV– TS Sta. 117+49.58
–L– TSSta. 117+65.83

–LREV– POTSta. 111+71.25
–Y11– POTSta. 13+00.00

–Y12– PCSta. 13+88.41

–Y12– PTSta. 15+54.25

–Y12– PCSta. 20+52.58

–Y12– PTSta. 24+51.96

END CONSTRUCTION
–Y12– POT Sta. 22+00.00

MATCH LINE STA. 111+00 –LREV– SEE SHEET NO. 11 Rev.C

MATCH LINE STA. 121+00.00 –LREV– SEE SHEET NO. 13 Rev.C

Pls Sta 118+77.84	Pl Sta 122+53.95	Pls Sta 126+25.96
Θs = 2° 06' 00.0"	△ = 15° 54' 11.0" (LT)	Θs = 2° 06' 00.0"
Ls = 168.00'	Dc = 2° 30' 00.0"	Ls = 168.00'
LT = 112.01'	L = 636.12	LT = 112.01'
ST = 56.01'	T = 320.12'	ST = 56.01'
	R = 2,291.83'	
	SE = 0.04 ft/ft	

–LREV–	
Pl	= 122+55.93
△	= 20° 06' 11.0" (LT)
Dc	= 2° 30' 00.0"
Θs	= 2° 30' 00.0"
Ls	= 200.00'
Ts	= 506.36'
Lc	= 604.12'
Rc	= 2,291.83'
LT	= 133.35'
ST	= 66.68'
e	= 0.04
DS	= 50 mph

–BL– PINCSta. 131+52.33 (BL–14)
–BY12– POTSta. 10+90.73
–L– Sta. 115+92.04 (27.84' RT)

–BL– PINCSta. 138+29.69 (BL–15)
–L– Sta. 120+40.55 (505.40' RT)

–BY11– POTSta. 8+05.55 (BY11–44)
–L– Sta. 111+99.33 (18.35' LT)

U3311 BM # 84
–Y12– STA. 15+00.37
(67.07 RT)
ELEV. 182.71

–Y12–
PI Sta 11+83.15	PI Sta 14+73.51	PI Sta 22+58.80
△ = 6° 00' 41.5" (LT)	△ = 31° 40' 21.7" (LT)	△ = 35° 12' 15.2" (LT)
Dc = 3° 49' 11.0"	Dc = 19° 05' 54.9"	Dc = 8° 48' 53.0"
L = 157.38'	L = 165.84'	L = 399.38'
T = 78.76'	T = 85.10'	T = 206.22'
R = 1,500.00'	R = 300.00'	R = 650.00'

DETAIL F
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D = 1 Ft.
–Y12– STA 15+00 RT TO 16+00 RT

DETAIL G
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, 2:1, b, Fill Slope, Filter Fabric
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 2 Ft.
When B is <6.0'
Type of Liner = CLASS B STONE
–Y12– STA 20+23 RT TO 21+50 RT

DETAIL H
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground, Natural Ground, CHANNEL BED
Length = 24'
Ext = 6 Tons of Class 1 RipRap
D = 1'
–Y12– STA 17+72 RT

(101) JOHN DALKO
DB 2578 PG 899
PB 27 PG 63

(102) DAISY L. LITTLE
DB 4572 PG 562
PB 27 PG 63

2004 ADT / 2024 ADT
KINCROSS AVE. –Y11– SR 1327
1360 / 1760
525 / 685 –L– 835 / 1075 SR 1141
17,480 / 26,680
17,790 / 27,070

2004 ADT / 2024 ADT
MAYKIRK DR. SR 3328
1610 / 2330
SR 1141 635 / 875 750 / 1070 –L–
17,790 / 27,070 3690 / 4970 560 / 960 14,775 / 23,255
OLD BINGHAM DR.
4475 / 6315

NOT INSTALLED
NEW RCP
NEW CSP
ADD ON
FLOWABLE GROUT

3.0 C.Y. FLOWABLE GROUT
4.0 C.Y. FLOWABLE GROUT

EXTEND 72" CSP W/CONCRETE COLLAR
112" x 75" Aluminum CMP w/ 2 Wing Walls

PIPE OUTLET CHANNEL SEE DETAIL H

EST 8 TONS CL B RIP RAP W/21 SY FILTER FABRIC
EST 2 TONS CL B RIP RAP W/7 SY FILTER FABRIC
EST 5 TONS CL B RIP RAP W/14 SY FILTER FABRIC
EST 3 TONS CL B RIP RAP W/10 SY FILTER FABRIC
EST 20 TONS CL I RIP RAP W/39 SY FILTER FABRIC

CLASS II RIP RAP (SEE STRUCTURE PLANS)

BEGIN BRIDGE –LREV– POC Sta. 120+24.75
END BRIDGE –LREV– POC Sta. 122+24.81

LATERAL BASE DITCH SEE DETAIL G
DDE=25 CY

PREFORMED SCOUR HOLE SEE DETAIL N

TAIL BASE DITCH SEE DETAIL A
DDE= 180 CY

BERM DITCH SEE RDWY STD. 240.01

PROP. SIDEWALK

PROP SLOPE STAKE

BEGIN 2'P.S.
END 2'P.S.

BEGIN 2'–6" C&G (NOSE DOWN)
END 2'–6" C&G

BEGIN 5" MONO. CONC. ISL.
END 5" MONO. CONC. ISL.

300' LT & RT. EOP TRANSITION

100' TAPER
150' TAPER
147.42' TRANSITION

180' FULL STORAGE FILL W/FLOWABLE GROUT
280' FULL STORAGE
FILL 20' W/FLOWABLE GROUT

REMOVE

TIE 2'–6" C&G TO EXIST.

PAINTED ISLAND

PROP. RW

PROP. SIDEWALK

PROP. SLOPE STAKE

ADJUST DI TO MATCH NEW SIDEWALK

RETAIN

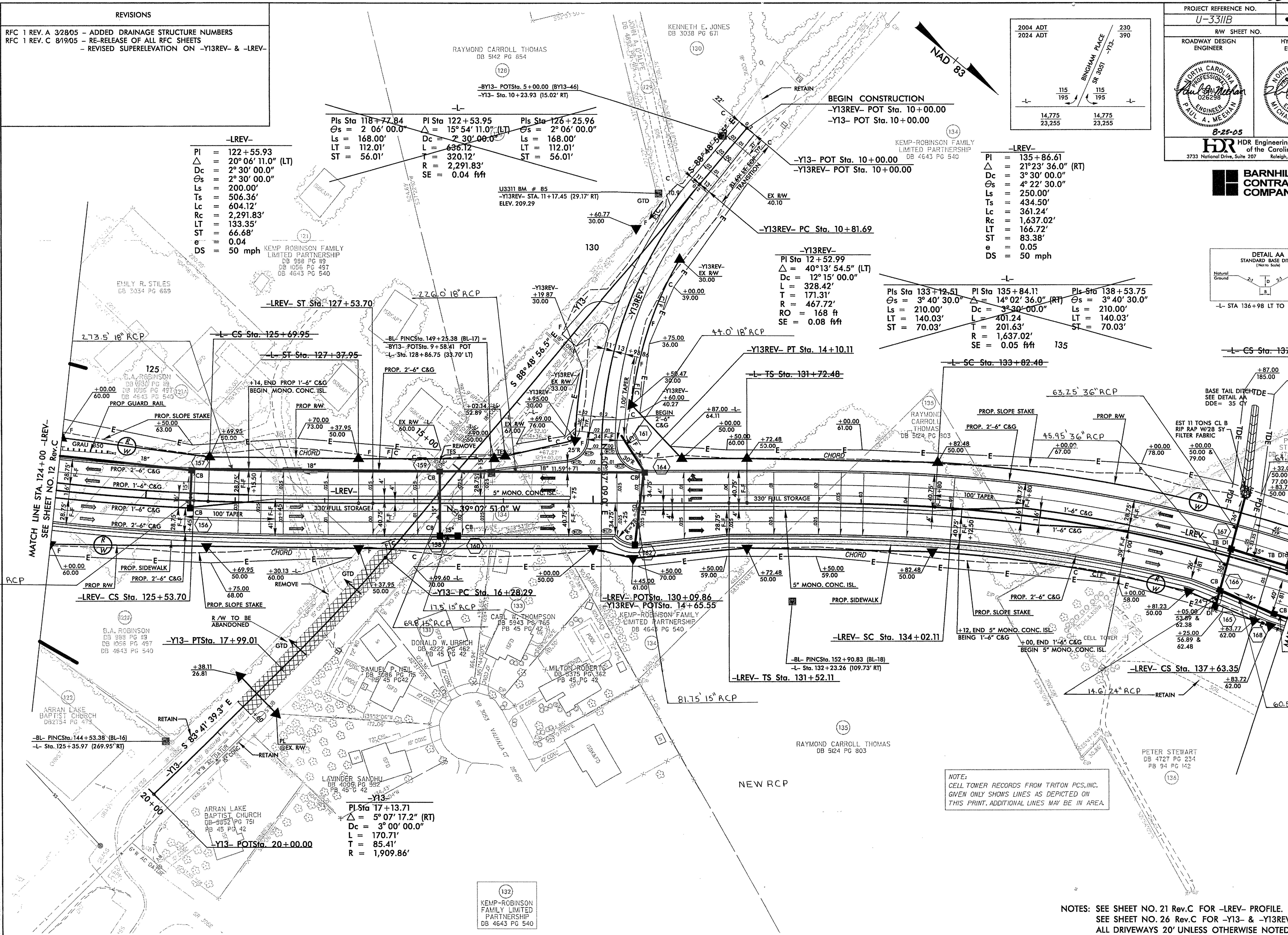
$$$$$$SYSTIME$$$$$$
$$$$$$DESIGN$$$$$$
$$$$$$USERNAME$$$$$$

REVISIONS
RFC 1 REV. A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS
– REVISED SUPERELEVATION ON –Y13REV– & –LREV–

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~13 REV.C~~
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN 8-25-05	NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY 8-25-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY



NOTES: SEE SHEET NO. 21 Rev.C FOR –LREV– PROFILE.
SEE SHEET NO. 26 Rev.C FOR –Y13– & –Y13REV– PROFILE.
ALL DRIVEWAYS 20′ UNLESS OTHERWISE NOTED.

REVISIONS

RFC 1 REV. A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV. B 4/1/05 – DUPLICATE STRUCTURE NUMBERS 197, 197A, 197B CHANGED TO 198A, 198B, 198C
RFC 1 REV. C 8/19/05 – RE-RELEASE ALL RFC SHEETS – DRIVEWAYS, TURN LANES & DRAINAGE ADDED AND SUPERELEVATION REVISED FOR PROPERTY 136.
RFC 1 REV. D 10/6/05 – DRAINAGE REVISION FOR 24" WATER LINE
RFC 1 REV. F 5/4/06 – MOVED STR. 182 FROM –Y14NBL– 20+65 LT. TO –Y14NBL– 20+77 LT.

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	1 REV. F
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026298 PAUL A. MEEHAN — 5-4-06

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030328 MICHAEL M. DARDI — 5-4-2006

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY

MATCH LINE STA. 14+00 –Y14– SEE SHEET NO. 16 Rev.C

NAD 83

–LREV–
PI = 135+86.61
Δ = 21°23' 36.0" (RT)
Dc = 3° 30' 00.0"
Os = 4° 22' 30.0"
Ls = 250.00'
Ts = 434.50'
Lc = 361.24'
Rc = 1,637.02'
LT = 166.72'
ST = 83.38'
e = 0.05
DS = 50 mph

–L–
Pls Sta 133+12.51
Os = 3° 40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

PI Sta 135+84.11
Δ = 14° 02' 36.0" (RT)
Dc = 3° 30' 00.0"
L = 401.24
T = 201.63'
R = 1,637.02'
SE = 0.05 ft/ft

Pls Sta 138+53.75
Os = 3° 40' 30.0"
Ls = 210.00'
LT = 140.03'
ST = 70.03'

–LREV–
PI Sta 149+79.35
Δ = 15° 34' 59.0" (LT)
Dc = 6° 00' 00.0"
L = 259.72
T = 130.67'
R = 954.93'
SE = 0.04 ft/ft

Pls Sta 151+64.45
Os = 5° 02' 24.0"
Ls = 168.00'
LT = 112.05'
ST = 56.04'

–Y14SBL– POTSta. 19+00.12

–LREV– PC Sta. 148+48.69
~~–L– PC Sta. 148+49.14~~

–Y14NBL– POTSta. 20+00.00
–LREV– POTSta. 147+63.63

–DRIVE1– POTSta. 10+00.00

~~–L– ST Sta. 139+93.72~~

–LREV– ST Sta. 140+13.35

–DRIVE1– POTSta. 13+65.54

–BL– PINCSta. 162+05.72 (BL–19)
–L– Sta. 141+90.68 (143.39' RT)

–BL– PINCSta. 167+49.87 (BL–20) =
–BY14– PINCSta. 15+62.75
–L– Sta. 147+34.81 (140.12' RT)

~~–L– CSSta. 151+08.86~~
–LREV– CSSta. 151+08.41

NOTES: SEE SHEET NOS. 21 Rev.C & 22 Rev.C FOR –LREV– PROFILE.
SEE SHEET NO. 27 Rev.C FOR –Y14NBL– PROFILE.
SEE SHEET NO. 28 Rev.C FOR –Y14SBL– PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

MATCH LINE STA. 138+00 –LREV– SEE SHEET NO. 13 Rev.C

MATCH LINE STA. 24+00 –Y14– SEE SHEET NO. 16 Rev.C

MATCH LINE STA. 152+00 –LREV– SEE SHEET NO. 15 Rev.D

NEW RCP
NEW CSP
FLOWABLE GROUT

DETAIL C
BERM BASE DITCH
(Not to Scale)

–L– STA 144+27 RT TO 144+90 RT

2004 ADT / 2024 ADT			
		36,150 / 50,470	
	RAEFORD RD. –Y14–	US 401	
–L–	1705 / 3065	2120 / 2920	SR 1141 BUNCE RD.
14,775 / 23,255	8540 / 12140	1655 / 2695	8,305 / 13,665
	RAEFORD RD. –Y14–	US 401	
		42,520 / 59,320	

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5/4/2006
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REVISIONS

RFC 1 REV. A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS
RFC 1 REV. C 8/19/05 – RE-RELEASE ALL RFC SHEETS

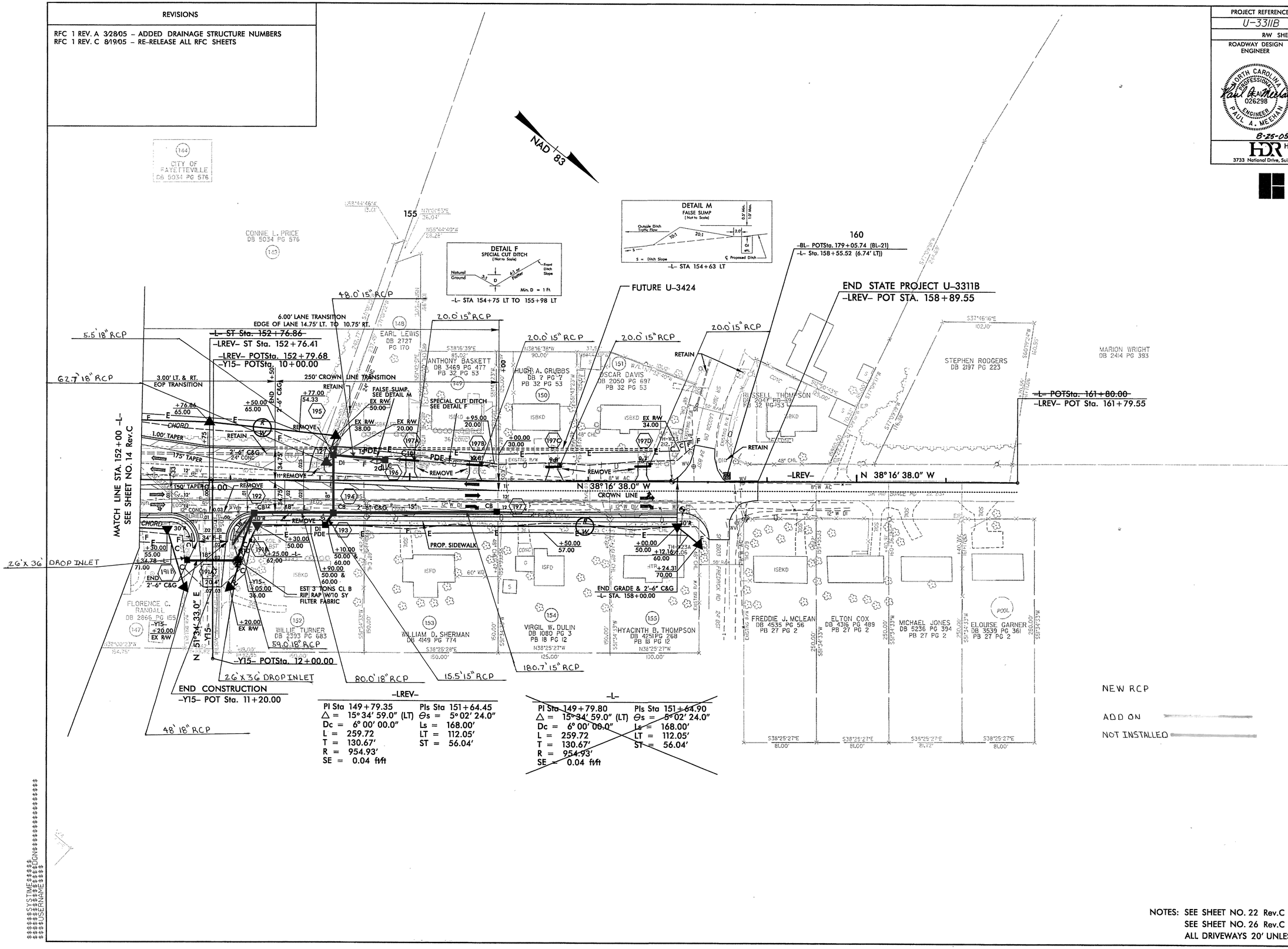
PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~15 REV.B~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN — 8-25-05

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY — 8-25-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY



NEW RCP

ADD ON

NOT INSTALLED

NOTES: SEE SHEET NO. 22 Rev.C FOR -LREV- PROFILE.
SEE SHEET NO. 26 Rev.C FOR -Y15- PROFILE.
ALL DRIVEWAYS 20' UNLESS OTHERWISE NOTED.

USERNAME = SYSTIME = DGN = PLOTSCALE = PLOTDATE =

REVISIONS
RFC 1 REV. A 3/28/05 – ADDED DRAINAGE STRUCTURE NUMBERS RFC 1 REV. C 8/19/05 – RE-RELEASE ALL RFC SHEETS

SEE SHEET NO. 27 Rev.C FOR –Y14NBL– PROFILE.
SEE SHEET NO. 28 Rev.C FOR –Y14SBL– PROFILE.
SEE SHEET NO. 26 Rev.C FOR –Y16– PROFILE.
ALL DRIVES 20' UNLESS OTHERWISE NOTED.

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~15 REV.B~~
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL L. MEEHAN

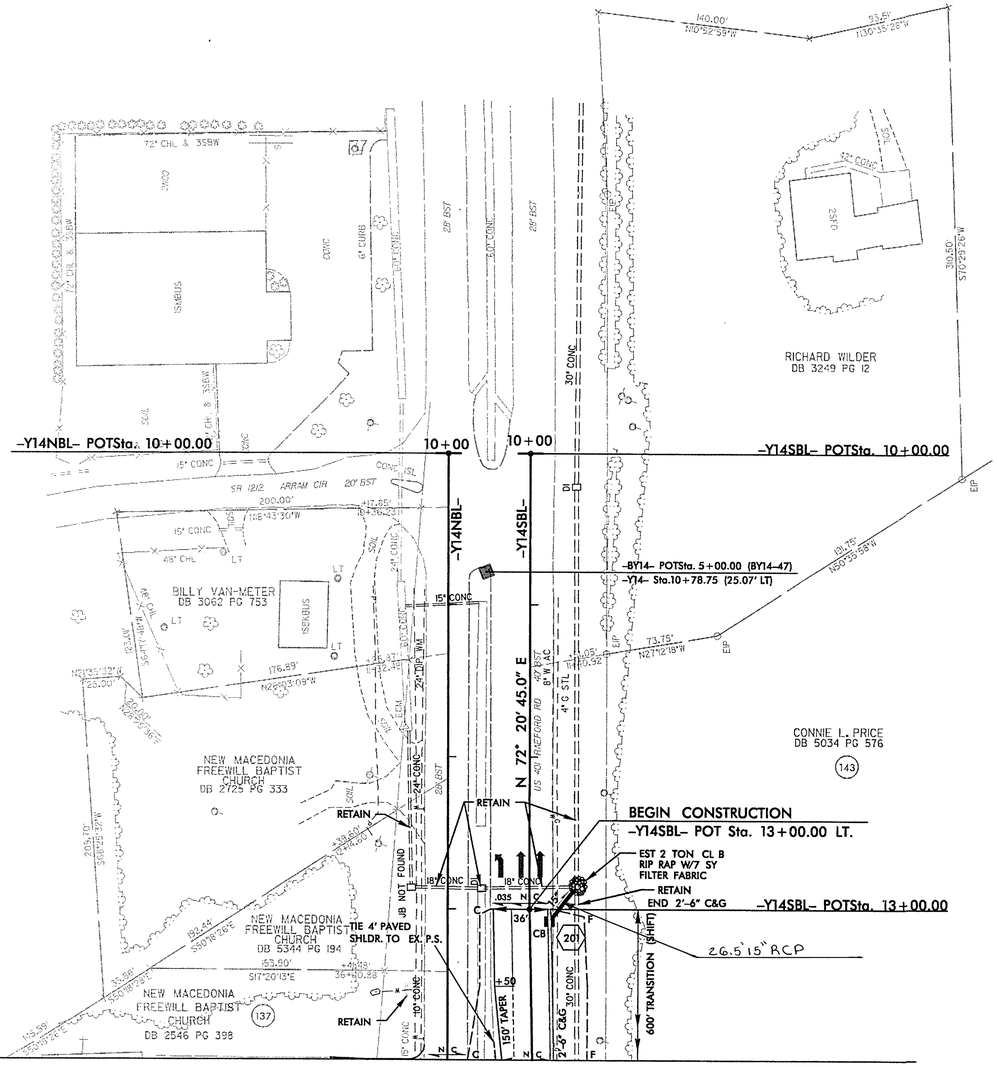
8-25-05

HYDRAULICS ENGINEER

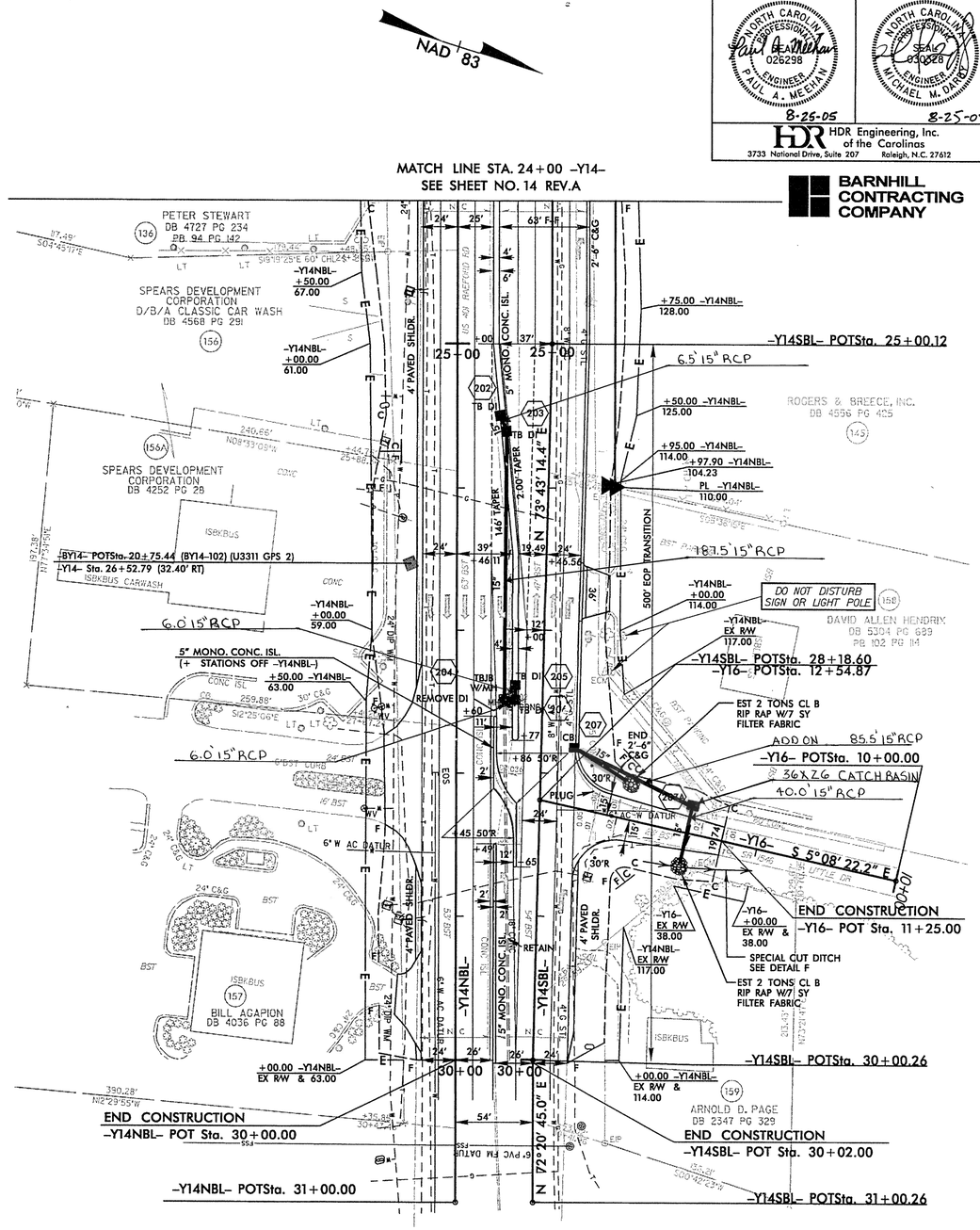
NORTH CAROLINA PROFESSIONAL SEAL 030628 ENGINEER MICHAEL N. DAVID

8-25-05

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

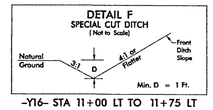


MATCH LINE STA. 14+00 –Y14–
SEE SHEET NO. 14 Rev.C



NEW RCP
ADD ON
NOT INSTALLED

DETAIL F
SPECIAL CUT DITCH
(Not to Scale)



–Y16– STA 11+00 LT TO 11+75 LT

$$$$$$SYSTIME$$$$
$$$$$$USERNAME$$$$

REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~7 REV.C~~

ROADWAY DESIGN ENGINEER

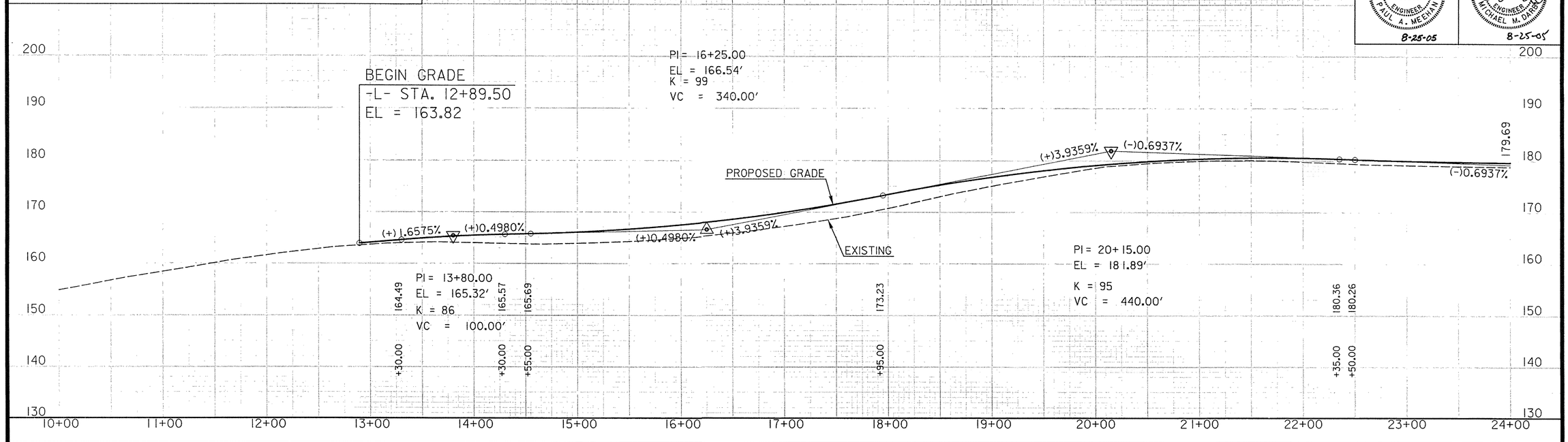
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026298 PAUL A. MEEHAN

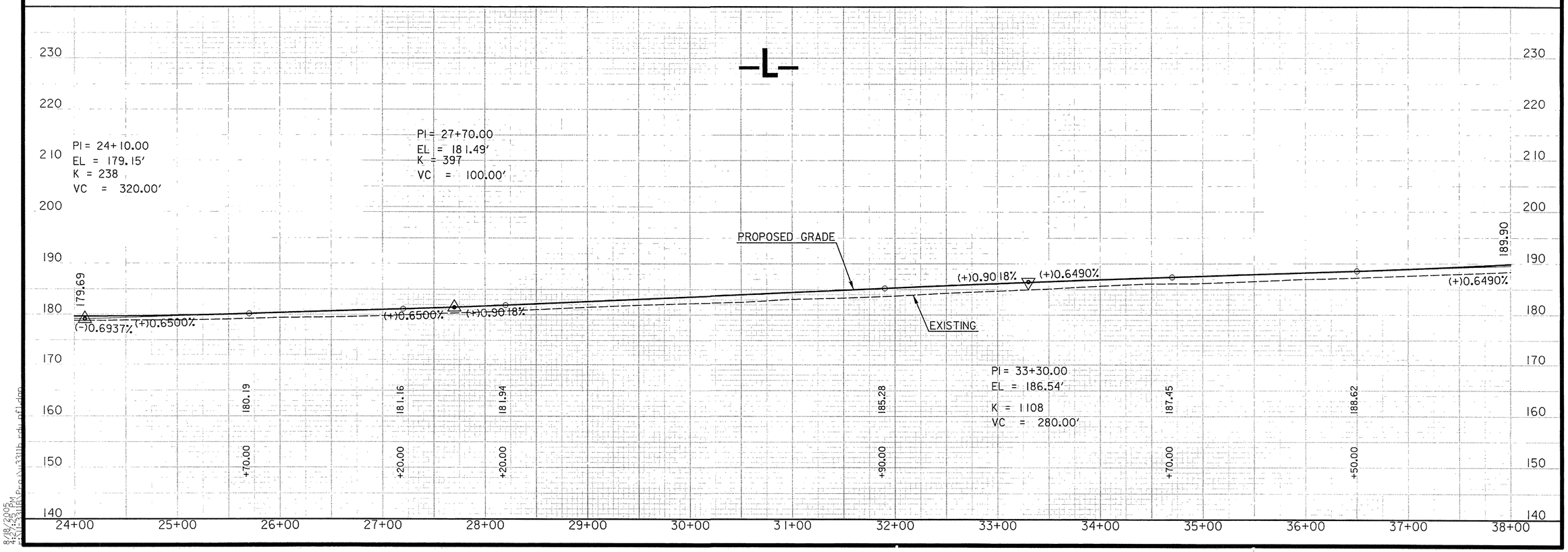
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030326 MICHAEL M. DARBY

8-25-05





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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~10~~ REV. C

ROADWAY DESIGN ENGINEER

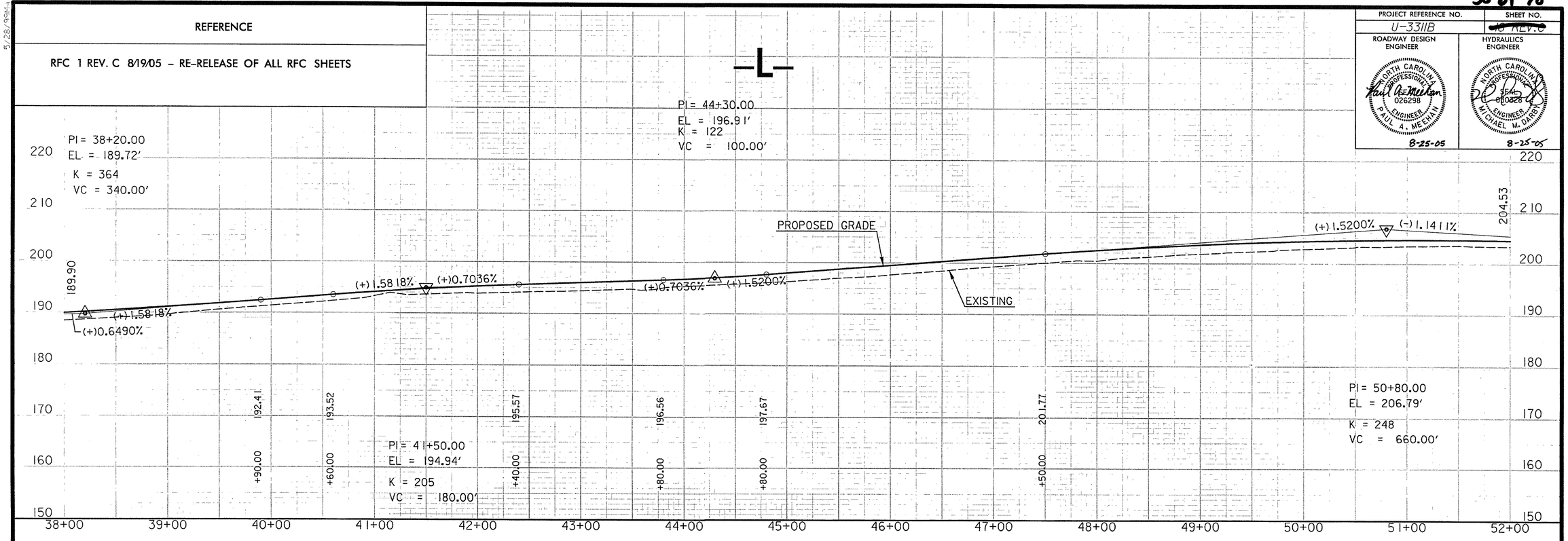
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

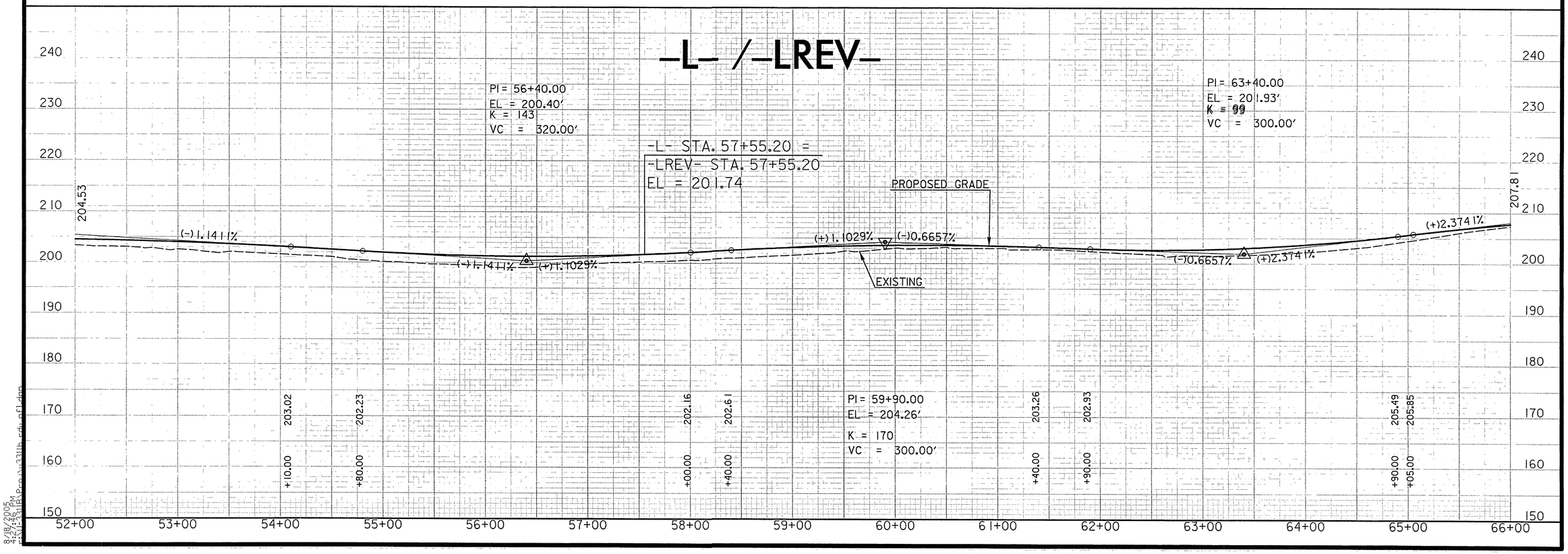
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030828 ENGINEER MICHAEL M. DARR

8-25-05





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5/26/99

REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

-LREV-

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~9~~ REV. C

ROADWAY DESIGN ENGINEER

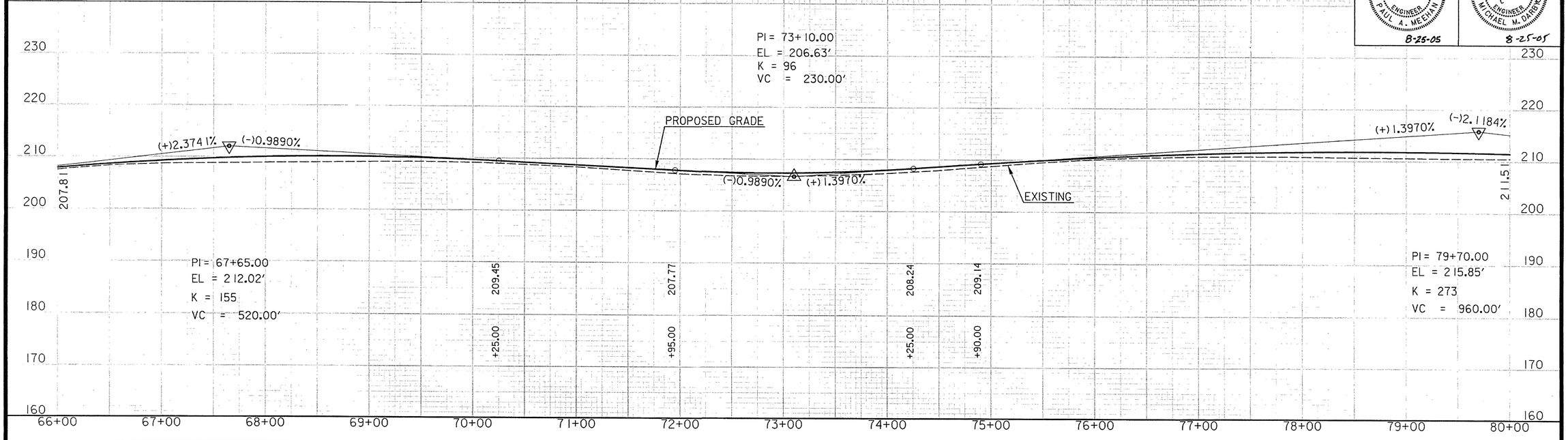
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

8-25-05

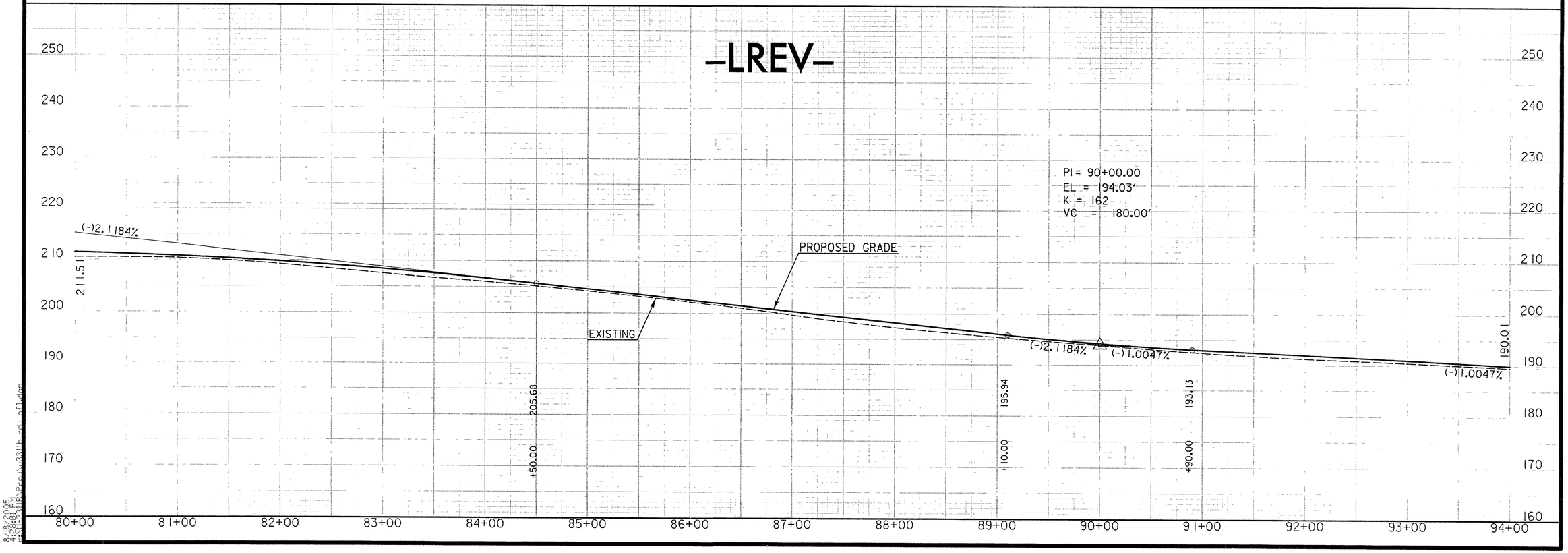
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY

8-25-05



-LREV-



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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

–LREV–

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~99~~ REV. C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030228 ENGINEER MICHAEL M. DARO

8-25-05

PI = 96+40.00
EL = 187.60'
K = 96
VC = 190.00'

PROPOSED GRADE

EXISTING

190.01

(-) 1.0047%

(+)0.970 1%

(+)0.970 1%

(-)3.4233%

181.72

54" RCP
INV. IN = 181.40
INV. OUT = 173.57

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 94.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1200	CFS
DESIGN HW ELEVATION	= 186.28	FT
100 YEAR DISCHARGE	= 1400	CFS
100 YEAR HW ELEVATION	= 186.88	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 1720	CFS
OVERTOPPING ELEVATION	= 188.05	FT

188.55 +45.00 188.52 +35.00 191.72 +65.00 183.26 +55.00

PI = 104+10.00
EL = 195.07'
K = 157
VC = 690.00'

94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00

210 200 190 180 170 160 150 140

–LREV–

PI = 111+40.00
EL = 170.08'
K = 108
VC = 580.00'

PROPOSED GRADE

EXISTING

181.72

(-)3.4233%

(-)3.4233%

(+)1.9362%

(+)1.9362%

(+)0.9046%

(+)0.9046%

185.36

BEGIN BRIDGE
-LREV- STA. 120+24.75

STRUCTURE HYDRAULIC DATA		
DRAINAGE AREA	= 2.15	SQ.MI.
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 740	CFS
DESIGN HW ELEVATION	= 170.8	FT
100 YEAR DISCHARGE	= 940	CFS
100 YEAR HW ELEVATION	= 171.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 15000	CFS
OVERTOPPING ELEVATION	= 179.2	FT

180.01 +50.00 175.69 +30.00 176.76 +85.00 180.31 +35.00 183.25 +60.00

PI = 116+10.00
EL = 179.18'
K = 242
VC = 250.00'

108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00

220 210 200 190 180 170 160 150 140 130

8/18/2005
4:28:17 PM
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5/28/99kt

REFERENCE

RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

-LREV-

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~8LREV6~~

ROADWAY DESIGN ENGINEER

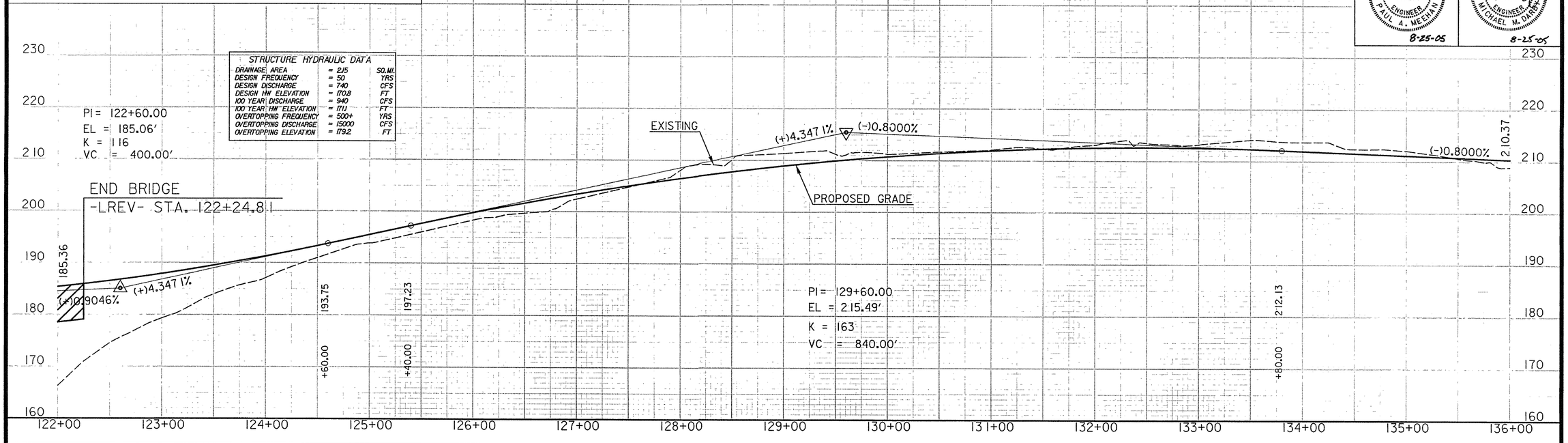
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

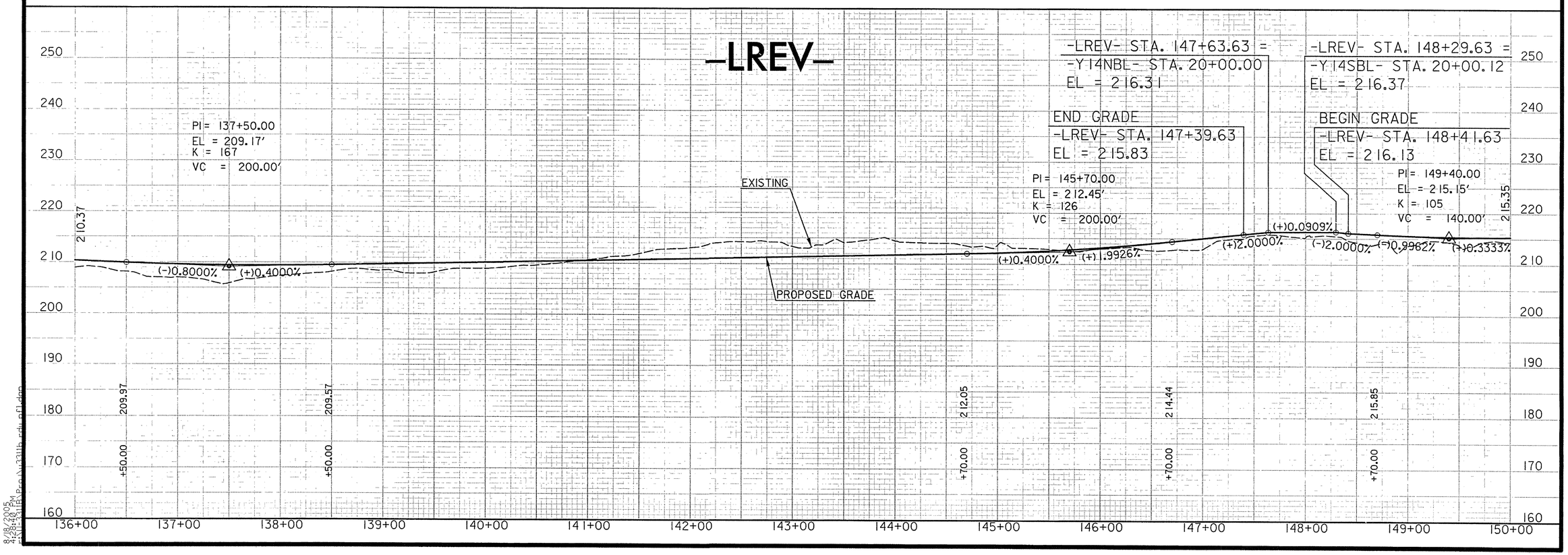
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036328 ENGINEER MICHAEL M. DARR

8-25-05





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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

-LREV-

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~22-REV.C~~

ROADWAY DESIGN ENGINEER

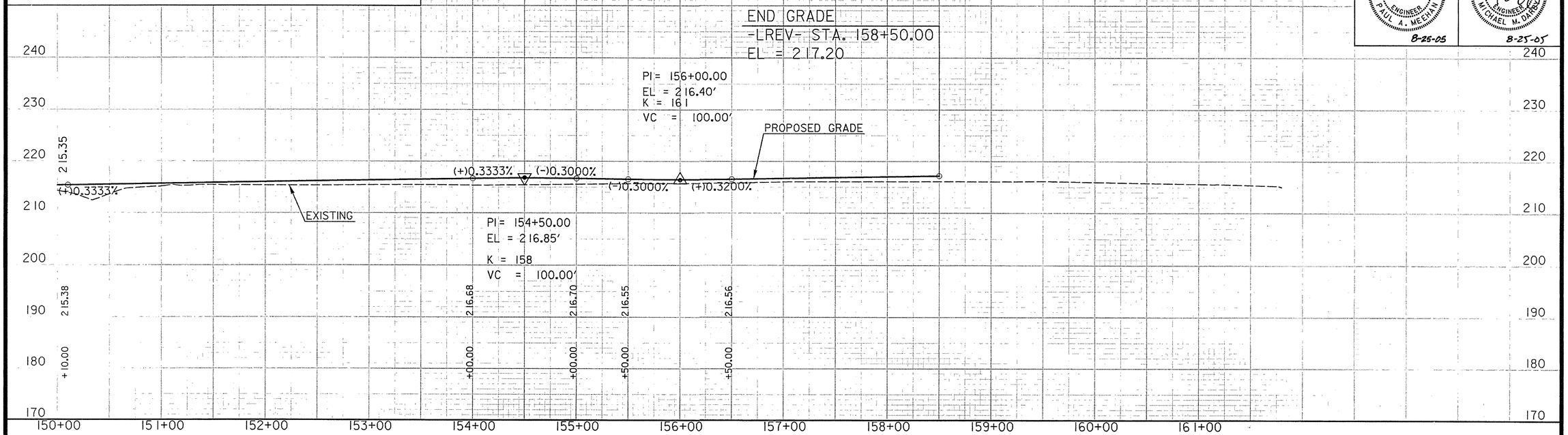
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026298 PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030289 MICHAEL M. DARR

8-25-05



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5/28/99MA

REVISION
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS RFC 1 REV. H 4/10/07: CHANGED –Y2– PROFILE TO ELIMINATE UNDERCUT.

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~23 REV.H~~

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026238 ENGINEER PAUL A. MEEHAN

4-12-07

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DARBY

4-11-2007

–Y1–
PEPPERBUSH DR
SR 3673

BEGIN GRADE
-Y1- STA. 10+34.84 =
-L- STA. 40+09.51
EL = 191.82

END GRADE
-Y1- STA. 12+64.00
EL = 191.10

PROPOSED GRADE

(+)0.5373%

(-)1.7857%

EXISTING

PI = 11+80.00
EL = 192.60'
K = 43
VC = 100.00'

192.35

191.71

+30.00

+30.00

–Y2–
BIBAR RD
SR 3697

BEGIN GRADE
-Y2- STA. 10+35.43 =
-L- STA. 53+51.96
EL = 202.75

202.75

204.48

(+)2.6638%

PROPOSED GRADE

EXISTING

END GRADE
-Y2- STA. 11+00.02
EL = 204.48

PI = 11+00.00
EL = 204.47'

–Y–
LAKERIDGE DR
SR 3084

END GRADE
-Y- STA. 11+65.25 =
-L- STA. 30+97.93
EL = 183.22

BEGIN GRADE
-Y- STA. 11+00.00
EL = 182.20

PROPOSED GRADE

EXISTING

–Y3–
BAILEY LAKE RD
SR 1106

END GRADE
-Y3- STA. 19+83.60 =
-L- STA. 53+59.70
EL = 202.65

PROPOSED GRADE

(+)2.3267%

(+)2.7392%

EXISTING

BEGIN GRADE
-Y3- STA. 18+45.04
EL = 199.08

PI = 19+00.00
EL = 200.36'
K = 97
VC = 40.00'

198.68

200.36

+80.00

+20.00

4/10/2007
10:54:12 AM
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	24 REV. C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026238 ENGINEER PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

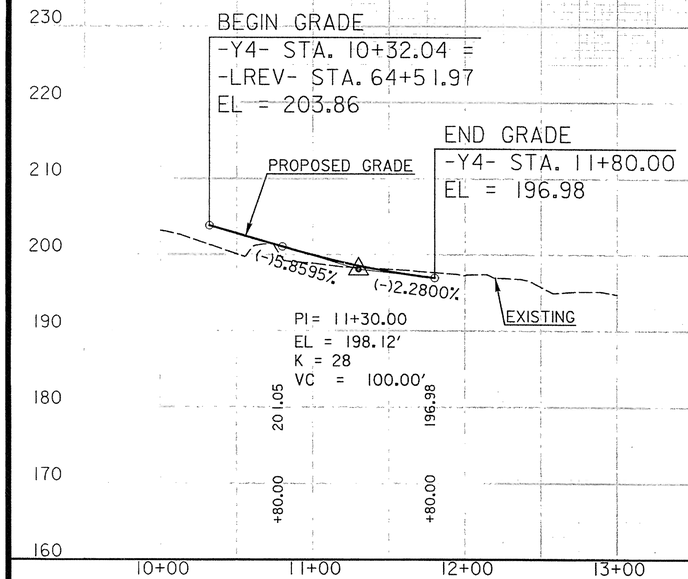
NORTH CAROLINA PROFESSIONAL SEAL 036326 ENGINEER MICHAEL M. DARDEN

8-25-05

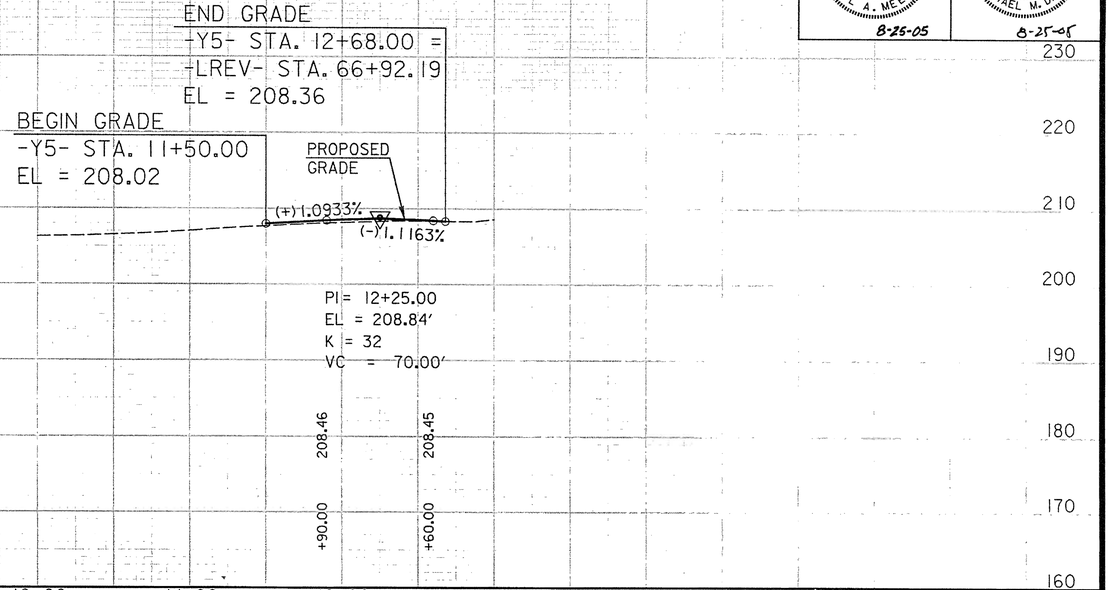
REFERENCE

RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

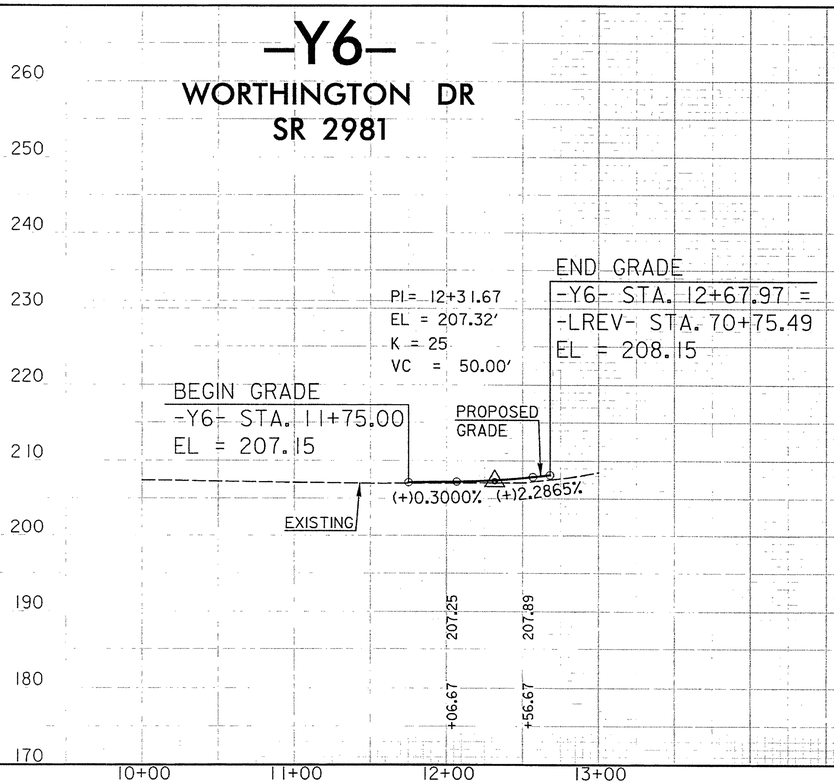
-Y4-
SHENANDOAH DR
SR 2904



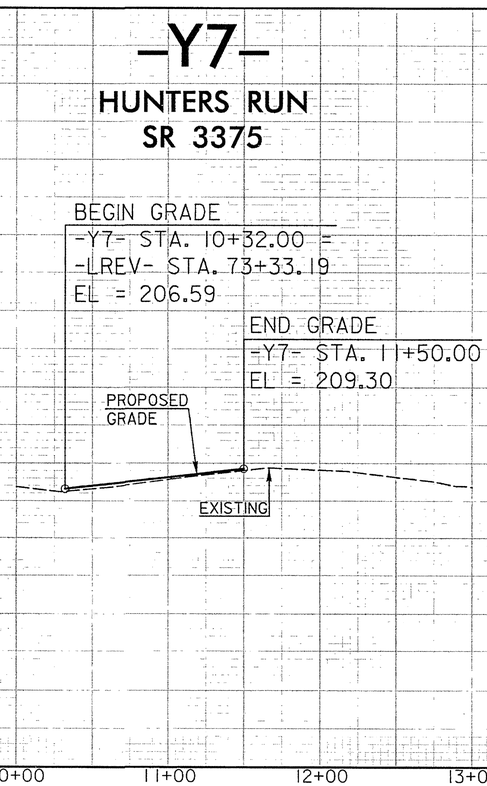
-Y5-
FRANKIE AVE
SR 3304



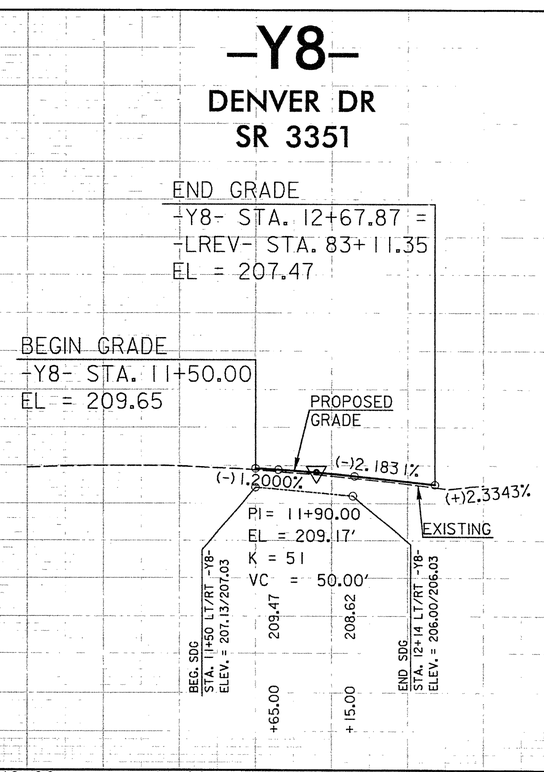
-Y6-
WORTHINGTON DR
SR 2981



-Y7-
HUNTERS RUN
SR 3375



-Y8-
DENVER DR
SR 3351



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PROJECT REFERENCE NO.	SHEET NO.
U-3311B	2E-RFC

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY

8-25-05

REFERENCE

RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

–Y9–

CRESTWOOD AVE
SR 1340

END GRADE
-Y9- STA. 12+67.80 =
-LREV- STA. 87+69.98
EL = 198.10

BEGIN GRADE
-Y9- STA. 11+50.00
EL = 200.90

PROPOSED GRADE

EXISTING

(-)2.3769%

BEG. SDG STA. 11+50 RT -Y9- ELEV. = 198.38

BEG. SDG STA. 12+00 LT -Y9- ELEV. = 197.13

END SDG STA. 12+25 LT -Y9- ELEV. = 196.83

END SDG STA. 12+25 RT -Y9- ELEV. = 197.18

–Y10–

GREENOCK AVE
SR 1321

BEGIN GRADE
-Y10- STA. 10+34.84 =
-LREV- STA. 106+45.47
EL = 186.11

END GRADE
-Y10- STA. 11+50.00
EL = 185.00

PROPOSED GRADE

(-)0.9631%

EXISTING

–Y11–

KINCROSS AVE
SR 1327

BEGIN GRADE
-Y11- STA. 10+10.00
EL = 185.59

END GRADE
-Y11- STA. 12+65.25 =
-LREV- STA. 111+71.52
EL = 172.91

PI = 12+35.00
EL = 173.65'
K = 11
VC = 50.00'

(-)2.9000%

(-)16.9111%

(-)6.9111%

(-)2.4463%

EXISTING

PROPOSED GRADE

PI = 11+00.00
EL = 182.98'
K = 45
VC = 180.00'

185.59 | 176.76 | 175.38 | 173.04

+10.00 | +90.00 | +10.00 | +60.00

–Y12–

MARYKIRK DR
SR 3328

BEGIN GRADE
-Y12- STA. 10+50.00
EL = 176.53

END GRADE
-Y12- STA. 13+15.74
EL = 178.13

PI = 11+60.00
EL = 174.33'
K = 32
VC = 170.00'

(-)2.0000%

(+)3.2455%

(+)0.5000%

PI = 12+70.00
EL = 177.90'
K = 18
VC = 50.00'

176.03

+75.00

+45.00 | 177.09

+95.00 | 178.03

BINGHAM DR (OLD)
SR 1141

BEGIN GRADE
-Y12- STA. 13+86.46
-LREV- STA. 116+29.09
EL = 178.25

(-)2.4199%

BEG. SDG STA. 15+00 RT -Y12- ELEV. = 173.88

SDG STA. 15+50 RT -Y12- ELEV. = 171.78

END SDG STA. 16+00 RT -Y12- ELEV. = 170.89

EXISTING

RETAIN & EXTEND 72" CSP
INV. IN = 158.51
INV. OUT = 156.10

171.15

+80.00

PROPOSED GRADE

(-)2.4199%

(+)7.0982%

PI = 19+15.00
EL = 165.46'
K = 49
VC = 470.00'

END GRADE
-Y12- STA. 22+00.00
EL = 185.69

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 1446.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 6700	CFS
DESIGN HW ELEVATION	= 170.37	FT
100 YEAR DISCHARGE	= 8070.0	CFS
100 YEAR HW ELEVATION	= 170.75	FT
OVERTOPPING FREQUENCY	= 10-	YRS
OVERTOPPING DISCHARGE	= 3817.0	CFS
OVERTOPPING ELEVATION	= 169.69	FT

BEG. 2' LAT. BASE DITCH STA. 20+23 RT -Y12- ELEV. = 163.93

2' LAT. BASE DITCH STA. 20+66 RT -Y12- ELEV. = 167.87

182.14

+50.00

END 2' LAT. BASE DITCH STA. 21+50 RT -Y12- ELEV. = 179.02

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5/26/99

REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~C~~ REV. C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 023329 ENGINEER MICHAEL M. DARBY
8-25-05

–Y13–

BINGHAM PLACE
SR 3051

PI = 18+78.57
EL = 203.70'

EXISTING
PROPOSED GRADE
204.50
200.63
(-)2.8001%
(-)2.5282%

–Y13REV–

BINGHAM PLACE
SR 3051

BEGIN GRADE
-Y13REV- STA. 10+00.00
EL = 204.30

END GRADE
-Y13REV- STA. 14+30.80 =
-LREV- STA. 130+09.86
EL = 210.03

PROPOSED GRADE
(+)4.4000%
(-)1.3302%
(-)1.3302%
EXISTING
BEG. SDG STA. 12+00 LT -Y13- ELEV. = 208.06
PI = 12+00.00
EL = 213.10'
K = 60
VC = 345.00'
END SDG STA. 13+88 LT -Y13- ELEV. = 207.50
205.51
210.81
+27.50
+72.50

–Y15–

BEGIN GRADE
-Y15- STA. 10+36.10 =
-LREV- STA. 152+79.77
EL = 216.26

END GRADE
-Y15- STA. 11+20.00
EL = 215.88

PROPOSED GRADE
EXISTING
(-)1.9134%
(+)1.1500%
PI = 10+80.00
EL = 215.42'
K = 26
VC = 80.00'
18" RCP
INV. IN = 211.30
INV. OUT = 211.16
216.19
215.88
+40.00
+20.00

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 0.76	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 2.30	CFS
DESIGN HW ELEVATION	= 212.24	FT
100 YEAR DISCHARGE	= 2.80	CFS
100 YEAR HW ELEVATION	= 212.29	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 17.0	CFS
OVERTOPPING ELEVATION	= 215.76	FT

–Y16–

LITTLE DRIVE

END GRADE
-Y16- STA. 12+30.41
-Y14SBL- STA. 28+23.33
EL = 214.55

BEGIN GRADE
-Y16- STA. 11+25.00
EL = 211.40

PROPOSED GRADE
(+)2.9883%
EXISTING

–DRIVE–

UNNAMED ROAD

BEGIN GRADE
-DRIVE- STA. 10+50.00
EL = 199.16

END GRADE
-DRIVE- STA. 12+65.46 =
-LREV- STA. 104+25.43
EL = 189.35

PI = 12+40.00
EL = 189.27'
K = 6
VC = 40.00'
EXISTING
(-)1.5500%
(-)6.1787%
(+)0.300 %
PROPOSED GRADE
PI = 10+90.00
EL = 198.54'
K = 17
VC = 80.00'
199.16
196.07
190.51
189.33
BEG. SDG STA. 10+75 RT/LT -DRIVE- ELEV. = 197.2 / 197.25
END SDG STA. 12+12 RT/LT -DRIVE- ELEV. = 187.69/ 187.86
+50.00
+30.00
+20.00
+60.00

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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

-Y14NBL-
RAEFORD RD
US 401

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	47 REV. C

ROADWAY DESIGN ENGINEER

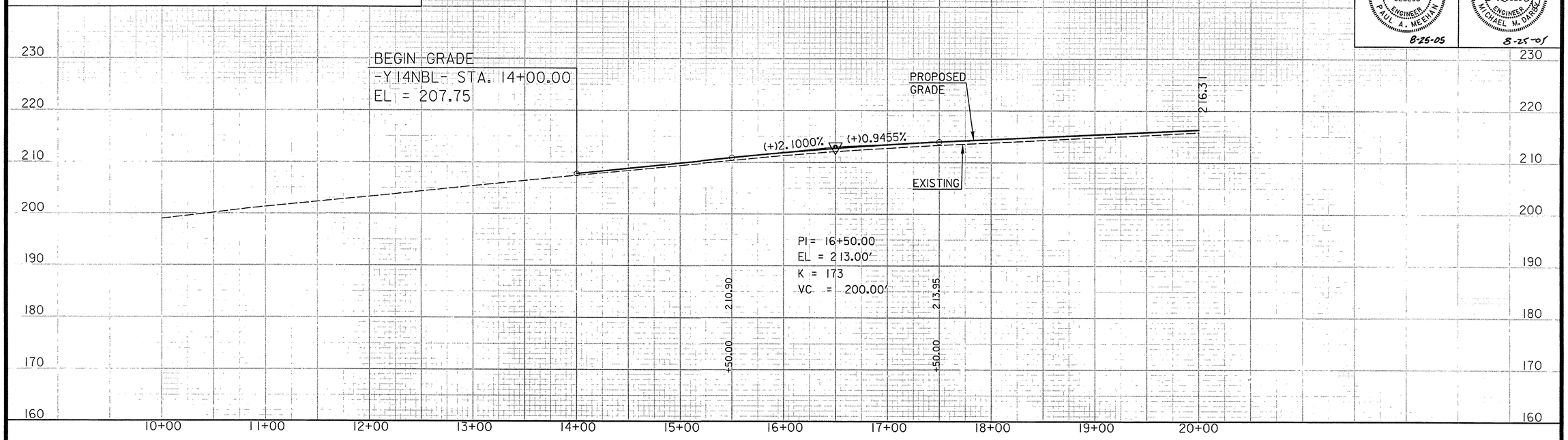
NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

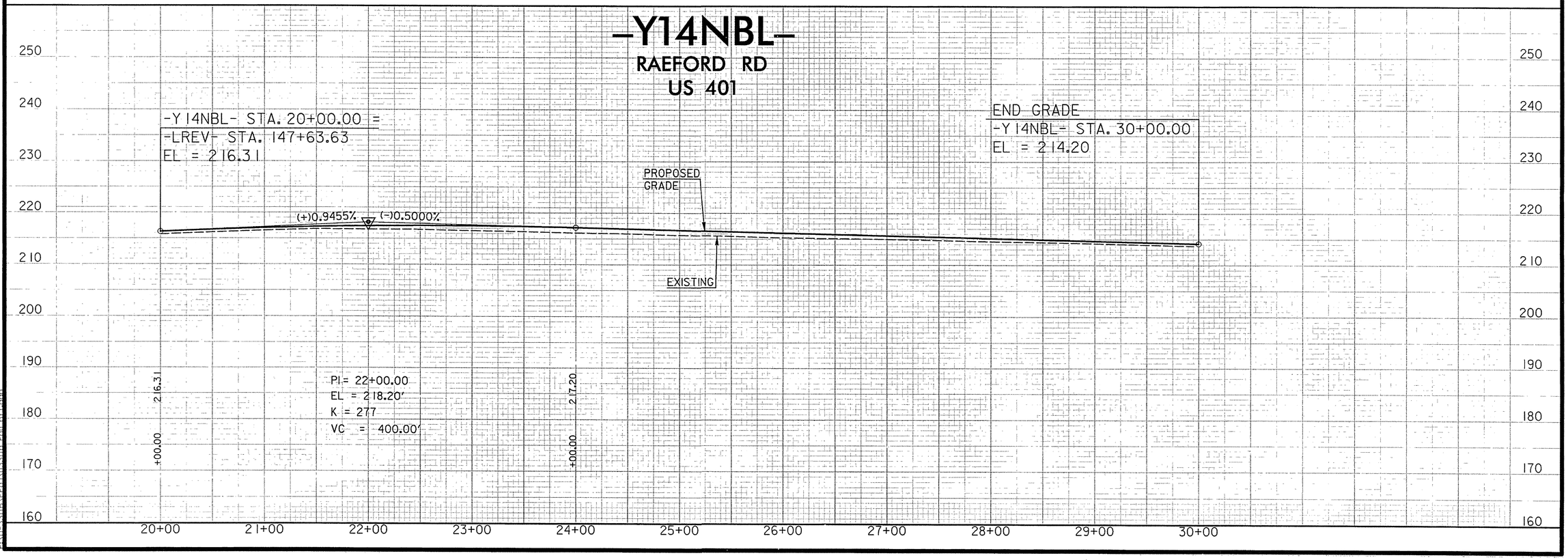
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030928 ENGINEER MICHAEL M. DARBY

8-25-05





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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~8B REV.C~~

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

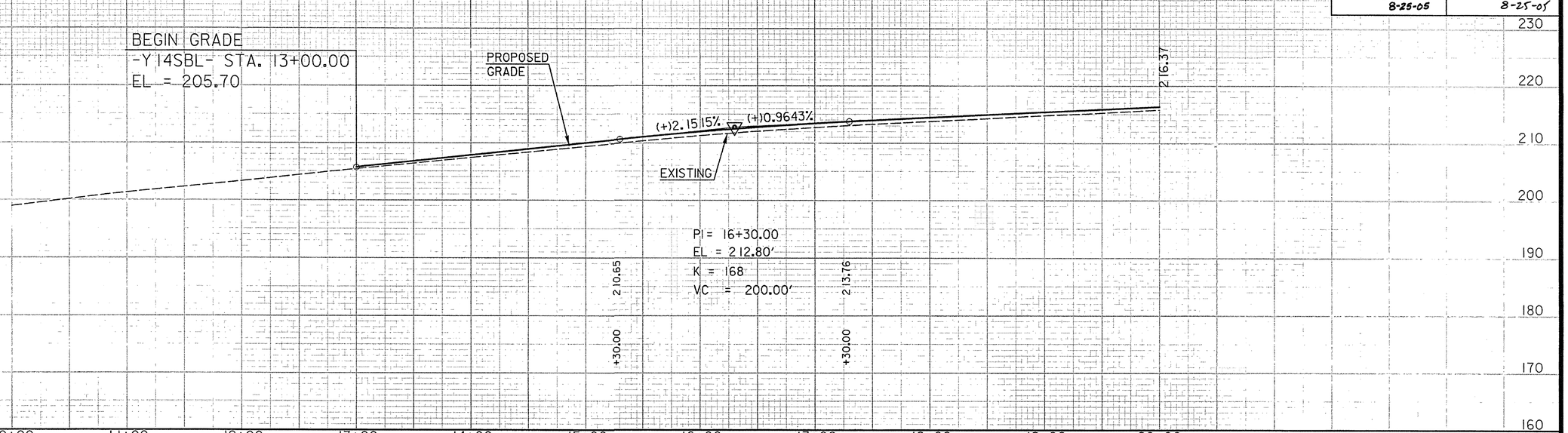
8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033328 ENGINEER MICHAEL M. DAVIS

8-25-05

–Y14SBL–
RAEFORD RD
US 401



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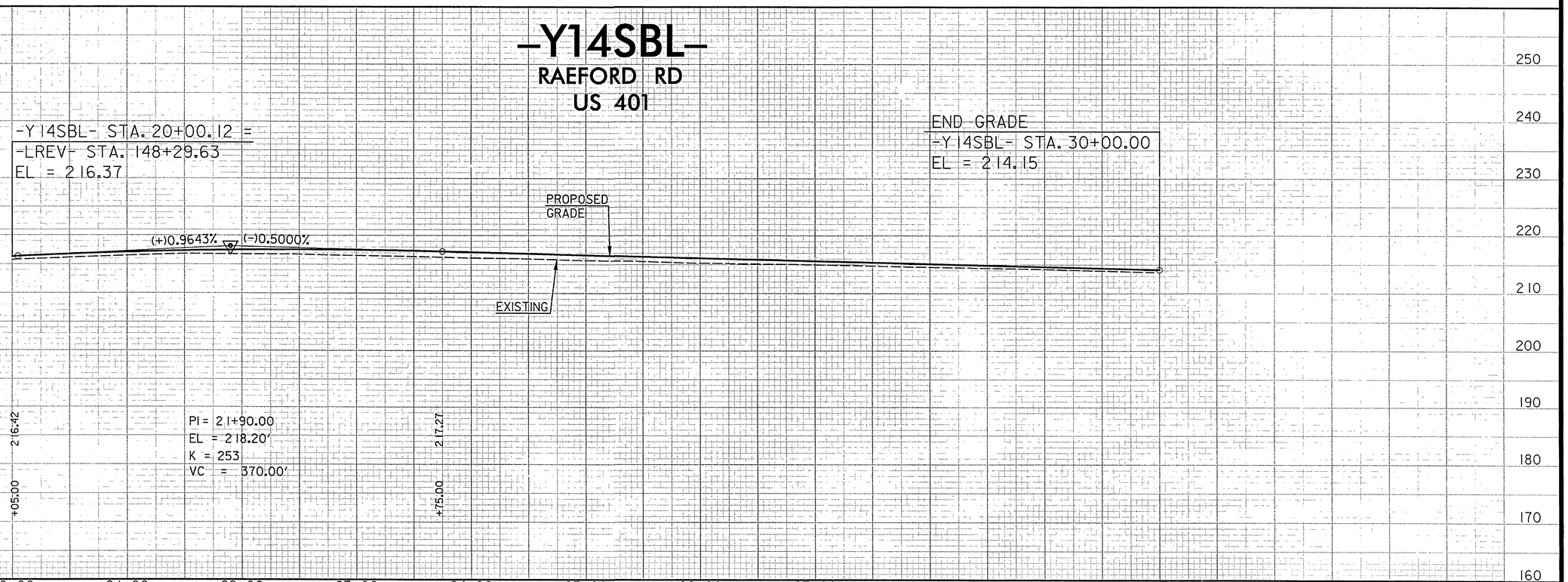
RAEFORD RD
US 401



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REFERENCE
RFC 1 REV. C 8/19/05 – RE-RELEASE OF ALL RFC SHEETS – –DRIVE1– ADDED TO PROJECT

–DRIVE1–

PROJECT REFERENCE NO.	SHEET NO.
U-3311B	~~29 REV.C~~

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026298 ENGINEER PAUL A. MEEHAN

8-25-05

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030220 ENGINEER MICHAEL M. DARBY

8-25-05

PI = 12+27.94
EL = 209.27'

208.86

209.70

(+)3.5172%

(+)0.0065%

(+)0.7511%

209.04

209.92

+05.00

+55.00

PI = 11+30.00
EL = 209.92'

PI = 11+58.44
EL = 209.92'

230 220 210 200 190 180 170 160

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

250 240 230 220 210 200 190 180 170 160

20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00

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TIP PROJECT: U-3311B

CONTRACT: C201110

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

As Built

LOCATION: FAYETTEVILLE – SR 1411 (BINGHAM DR.) FROM PROPOSED HOPE MILLS BYP. TO US 401 (RAEFORD RD.)

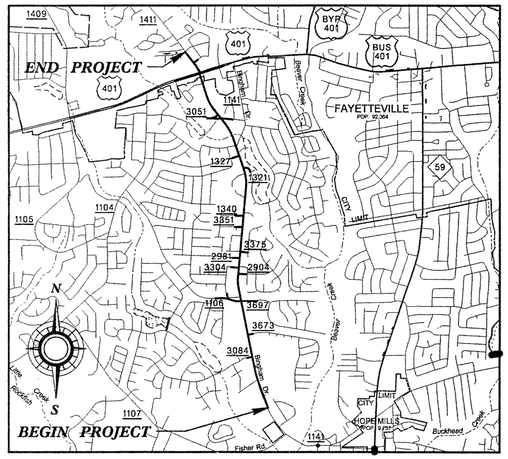
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3311B		SEE SHEET 1A

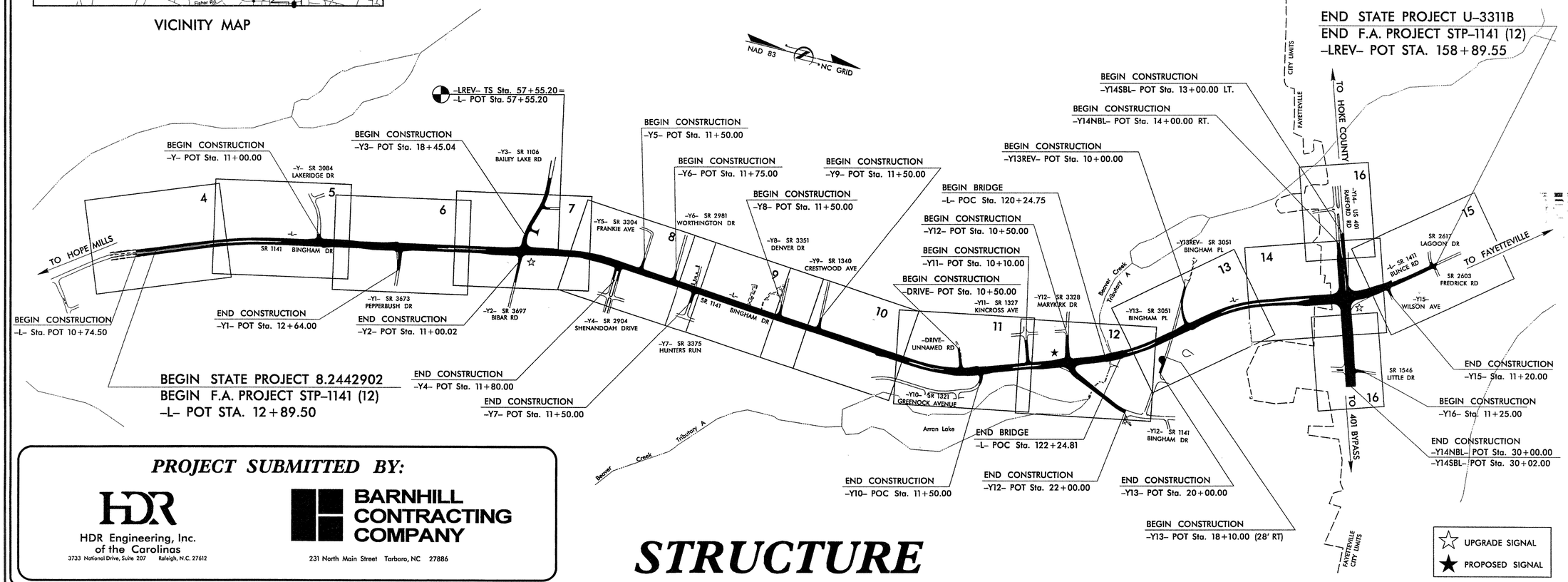
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
8.2442901	STP-1141 (7)	PE
8.2442902	STP-1141 (12)	R/W UTILITIES
34917.3.3	STP-1141 (14)	CONST.

BRIDGE ON SR 1141 (BINGHAM DRIVE) OVER BEAVER CREEK TRIBUTARY A SUPERSTRUCTURE
STRUCTURE 1

RFC-S1-1B
DATE: 9-2-05



VICINITY MAP



PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

STRUCTURE

GRAPHIC SCALES

PLANS: 5 0 5 10

PROFILE (HORIZONTAL): 5 0 5 10

PROFILE (VERTICAL): 1 0 1 2

DESIGN DATA

ADT 2004 = 16,600
ADT 2024 = 28,900
DHV = 10%
D = 55%
T = 4%*
V = 50 mph
*TTST 3% DUAL 1%
FUNC CLASS = URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT STP-1141(12) = 2.729 +/- mi

LENGTH STRUCTURES F.A. PROJECT STP-1141(12) = 0.036 +/- mi

TOTAL LENGTH STATE PROJECT 8.2442902 = 2.765 mi

Prepared For:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 28, 2002

LETTING DATE: SEPTEMBER 21, 2004

GREGORY A. KEMPF, PE
PROJECT ENGINEER

PAUL A. MEEHAN, PE
PROJECT DESIGN ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI

9-2-05

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

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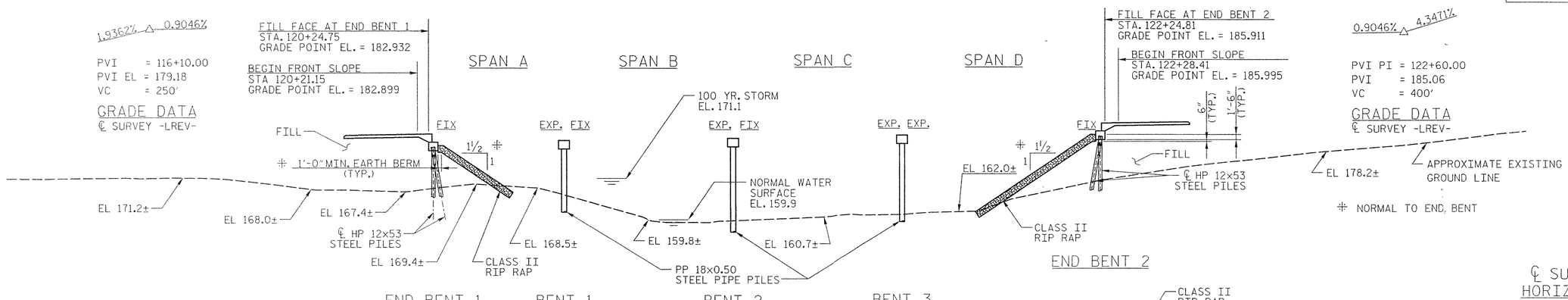
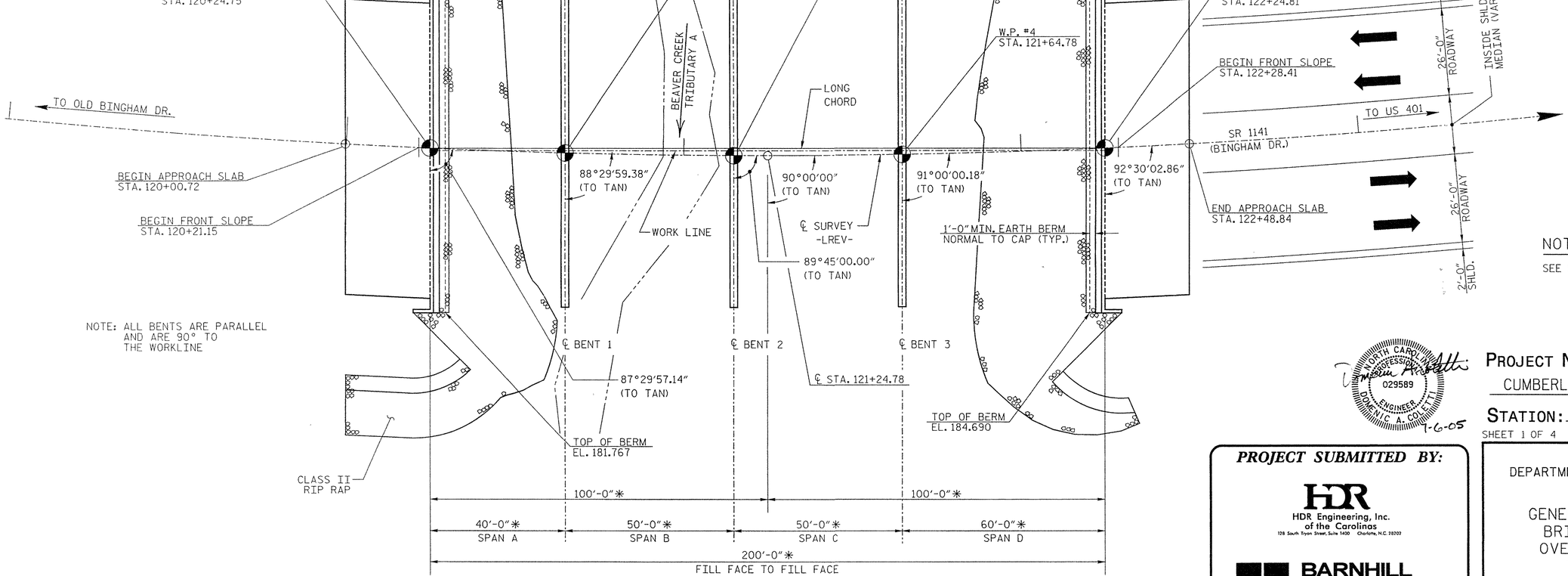
F.A. PROJECT NO. STP-1141(12)



SECTION ALONG ℄ SURVEY -LREV-

(SECTIONS ALONG BENTS AND ENDBENTS TAKEN AT RIGHT ANGLES TO BENTS.)



PLAN

(PILES NOT SHOWN FOR CLARITY)

* SPAN LENGTHS SHOWN ARE MEASURED ALONG THE WORKLINE

℄ SURVEY -LREV- HORIZ. CURVE DATA

PI = 122+53.93
△ = 20° 06' 11.00"
Dc = 2° 30' 00.0"
Θs = 2° 30' 00.0"
Ls = 200.00'
Ts = 506.36'
Lc = 604.12'
Rc = 2,291.83'
LT = 133.35'
ST = 66.68'

NOTES

SEE SHEET 2 OF 4 FOR NOTES

DRAWN BY: A. COOK DATE: 01/05
CHECKED BY: D. COLETTI DATE: 01/05

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NORTH CAROLINA PROFESSIONAL SEAL 029589 ENGINEER DOMENIC A. COLETTI
1-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 1 OF 4 BRIDGE NO. 351

PROJECT SUBMITTED BY:

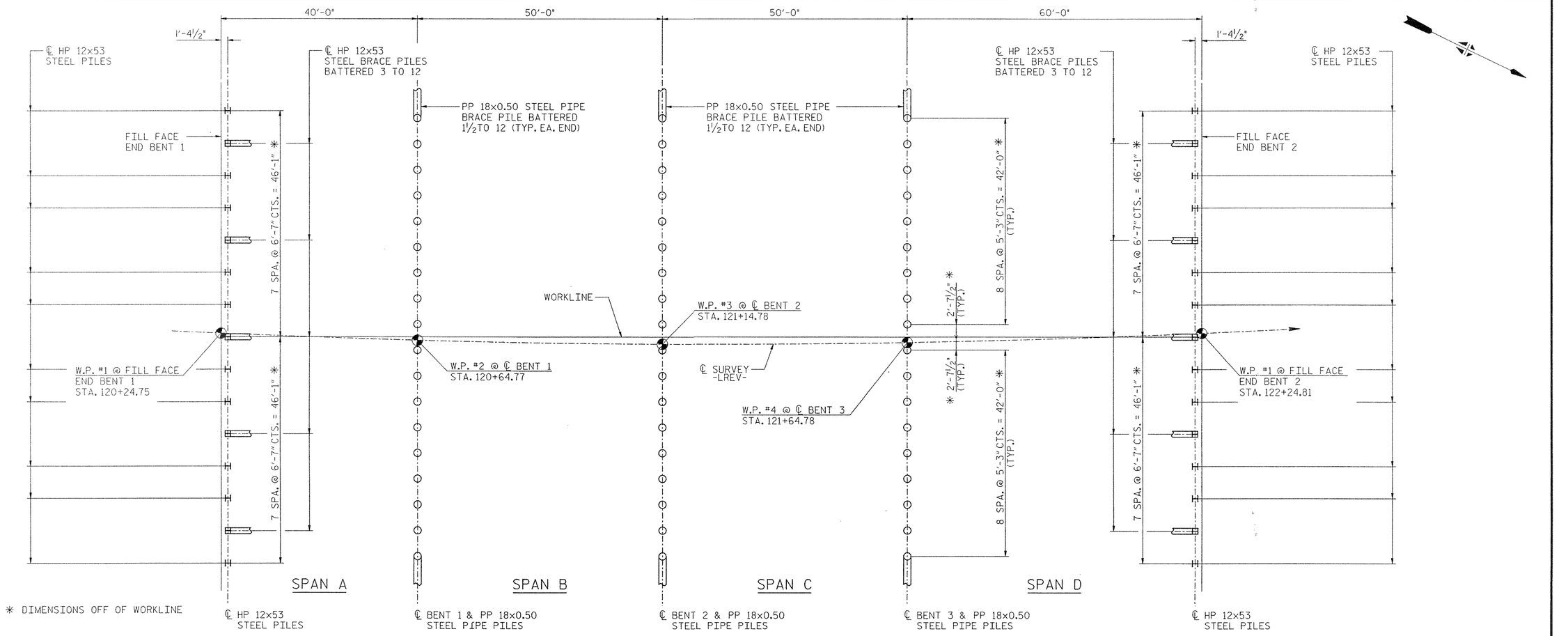
HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON SR 1141 OVER BEAVER CREEK TRIBUTARY A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			



NOTES

END BENT 1, BENTS 1, 2 AND 3, AND END BENT 2 ARE PERPENDICULAR TO THE WORKLINE.

W.P. IS AT THE INTERSECTION OF FILL FACE AND ℄ SURVEY -LREV- FOR END BENTS AND AT THE INTERSECTION OF ℄ SURVEY -LREV- AND ℄ BENT FOR BENTS 1, 2 AND 3.

DIMENSIONS TO PILES ARE MEASURED TO THE CENTERLINE OF PILES.

THE CONTRACTOR SHALL OBSERVE A 3 MONTH WAITING PERIOD BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT END BENT 1.

PILES AT END BENTS 1 AND 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 60 TONS EACH.

PILES AT BENTS 1, 2 AND 3 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 75 TONS EACH.

PILES AT BENTS 1, 2 AND 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN:

BENT 1: EL 113
BENT 2: EL 118
BENT 3: EL 110

WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC18 "EVALUATING SCOUR AT BRIDGES", NOVEMBER 1995.

THE SCOUR CRITICAL ELEVATIONS (SCE) FOR THE INTERIOR BENTS ARE SHOWN BELOW:

BENT 1, SCE: EL 151
BENT 2, SCE: EL 146
BENT 3, SCE: EL 144

THE SCOUR CRITICAL ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

FOUNDATION LAYOUT

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DONALD C. A. COLETTI
7-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

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

R:\U-3311B\Structures\CAD\U3311B_SD_FL_01.DGN

SHORT CHORD LENGTHS

Ⓐ = 40.024′

Ⓑ = 50.006′

Ⓒ = 50.001′

Ⓓ = 60.028′

OFFSETS FROM LONG CHORD

D1 = 1.397′

D2 = 2.161′

D3 = 2.183′

D4 = 1.834′

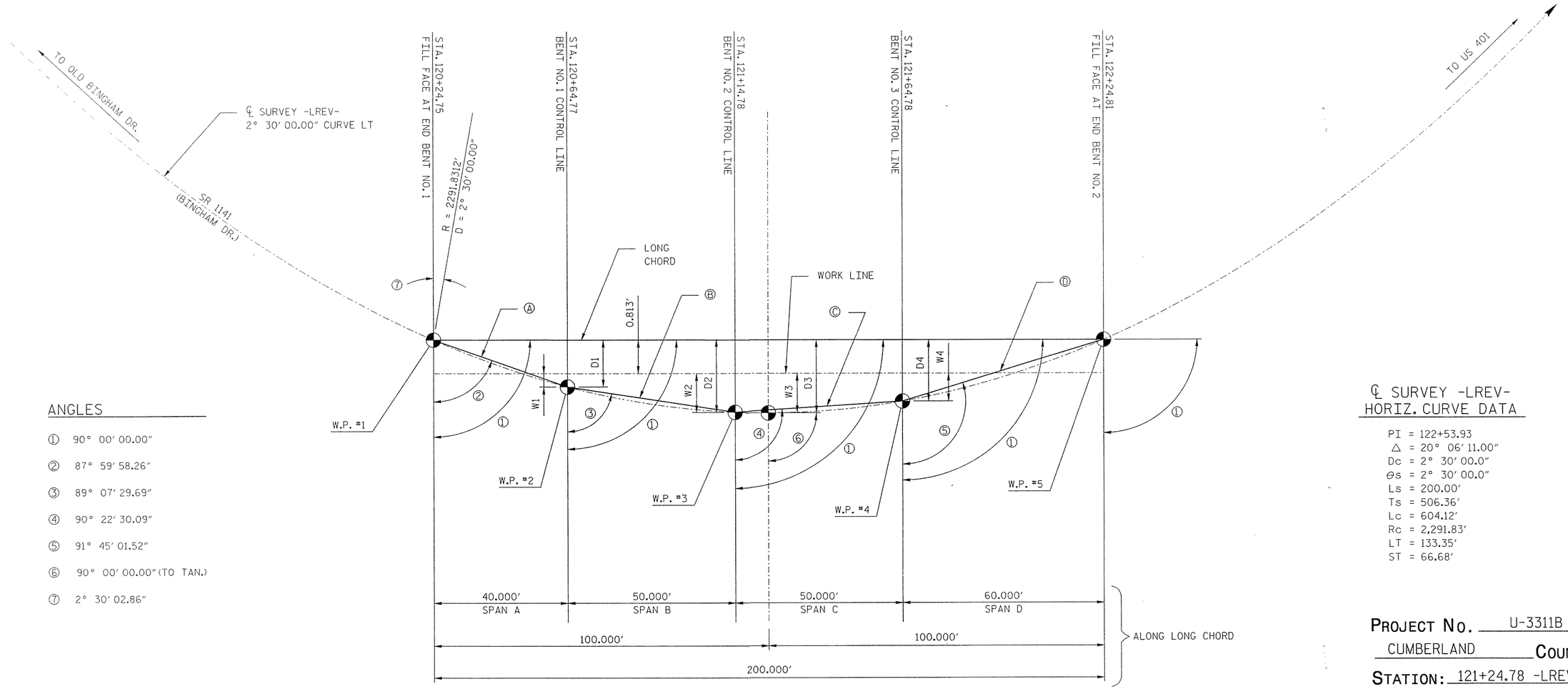
OFFSETS FROM WORKLINE

W1 = 0.710′

W2 = 1.474′

W3 = 1.496′

W4 = 1.147′



ANGLES

① 90° 00′ 00.00″

② 87° 59′ 58.26″

③ 89° 07′ 29.69″

④ 90° 22′ 30.09″

⑤ 91° 45′ 01.52″

⑥ 90° 00′ 00.00″(TO TAN.)

⑦ 2° 30′ 02.86″

℄ SURVEY -LREV- HORIZ. CURVE DATA

PI = 122+53.93
△ = 20° 06′ 11.00″
Dc = 2° 30′ 00.0″
ℓs = 2° 30′ 00.0″
Ls = 200.00′
Ts = 506.36′
Lc = 604.12′
Rc = 2,291.83′
LT = 133.35′
ST = 66.68′

NOTE: ALL BENTS ARE PARALLEL (N 64° 10′ 31.40″E)

LONG CHORD LAYOUT

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI
1-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT

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

DRAWN BY: C. HARNDEN DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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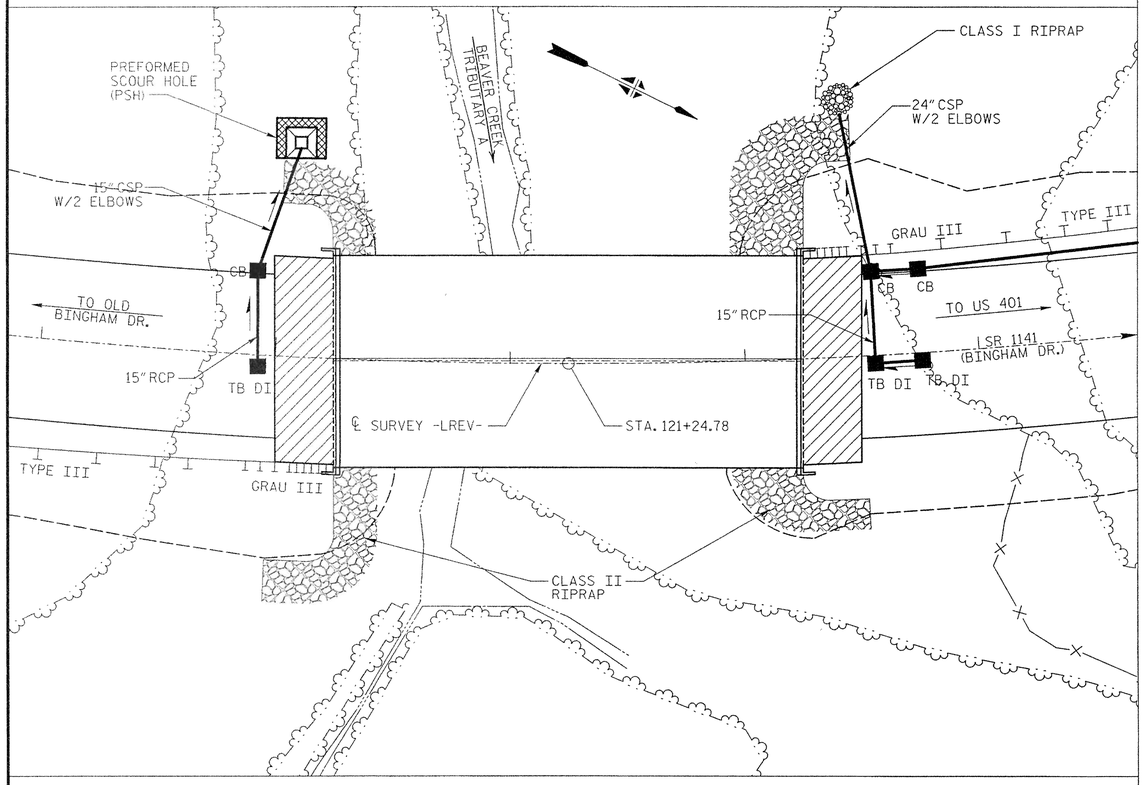
BENCHMARK: BM 84 176.72' RT. OF -LREV- STA. 116+24.07 EL 182.71 NGVD 29



LOCATION SKETCH

----------HYDRAULIC DATA----------

DESIGN DISCHARGE----------740 CFS.
FREQUENCY OF DESIGN FLOOD----------50 YEAR
DESIGN HIGHWATER ELEVATION----------170.8
DRAINAGE AREA----------2.15 SQ. MILE
BASIC DISCHARGE (Q100)----------940 CFS.
BASIC HIGHWATER ELEVATION----------171.1

-----OVERTOPPING FLOOD DATA-----

OVERTOPPING DISCHARGE----------15000 +/- CFS.
FREQUENCY OF OVERTOPPING FLOOD--------500 YEARS+
OVERTOPPING FLOOD ELEVATION----------179.2

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING EXCEPT THAT CORED SLAB UNITS IN SPANS A, B, AND C HAVE BEEN DESIGNED FOR HS 25

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED

THE SEQUENCE OF CONSTRUCTION SHALL BE GENERALLY FROM SOUTH TO NORTH. NO TOP DOWN CONSTRUCTION ACTIVITY SHALL BE STAGED FROM SPAN D.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES" FOR SEISMIC PERFORMANCE CATEGORY A.

FOR UTILITY INFORMATION SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

ALL STATIONS SHOWN ARE ON ℄ SURVEY -LREV- U.N.O.

PILES AT END BENTS 1 AND 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 60 TONS EACH.

THE CONTRACTOR SHALL OBSERVE A 3 MONTHS WAITING PERIOD BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER THE COMPLETION OF THE EMBANKMENT AT END BENT 1.

PILES AT INTERIOR BENTS 1, 2, AND 3, SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 75 TONS EACH.

WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

PILES AT BENTS 1, 2, AND 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN:

BENT 1: EL 113
BENT 2: EL 118
BENT 3: EL 110

THE SCOUR CRITICAL ELEVATIONS (SCE) FOR THE INTERIOR BENTS ARE SHOWN BELOW:

BENT 1: EL 151
BENT 2: EL 146
BENT 3: EL 144

THE SCOUR CRITICAL ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TOTAL BILL OF MATERIAL

	CLASS A CONCRETE	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	HP 12X53 STEEL PILES		PP 18X0.50 STEEL PILES		3 BAR METAL RAIL	PLAIN RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	CU. YDS.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE		30.1	LUMP SUM		478					380.5			LUMP SUM	120	5921.25
END BENT NO. 1	27.4			4617		15	1021				758	842			
BENT NO. 1	33.4			5283				18	1201						
BENT NO. 2	33.4			5283				18	1121						
BENT NO. 3	33.4			5283				18	1280						
END BENT NO. 2	27.4			4617		15	1005				1032	1147			
TOTAL	155.0	30.1	LUMP SUM	25083	478	30	2026	54	3602	380.5	1790	1989	LUMP SUM	120	5921.25

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 4 OF 4

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI
1-6-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LOCATION SKETCH,
GENERAL NOTES, &
TOTAL BILL OF MATERIAL

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

DRAWN BY: A. COOK DATE: 01/05
CHECKED BY: D. COLETTI DATE: 01/05

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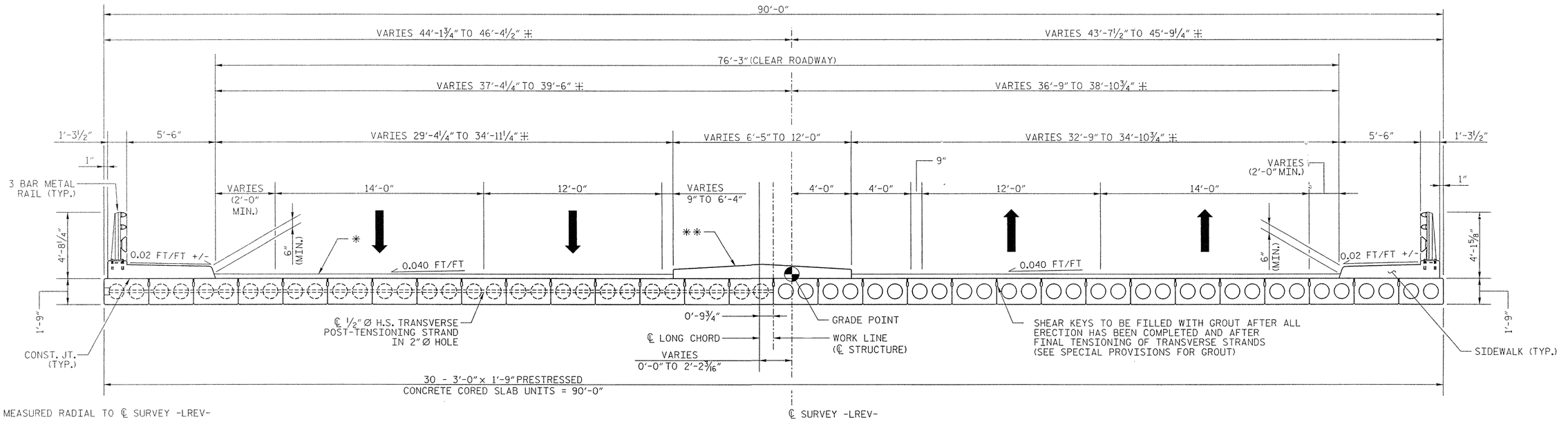

⌗ = MEASURED RADIAL TO ℄ SURVEY -LREV-

* = 3¼" MIN. @ ℄ BRG. ASPHALT WEARING SURFACE S9.5B

** = CONCRETE MEDIAN - SEE SHEETS 6 OF 6 FOR DETAILS.

HALF SECTION
AT INTERMDEIATE DIAPHRAGMS

HALF SECTION
AT ENDS BENTS AND BENTS

TYPICAL SECTION

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	DAC	7-1-05	3			TOTAL SHEETS
2			4			

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI
7-6-05

DRAWN BY: A. COOK DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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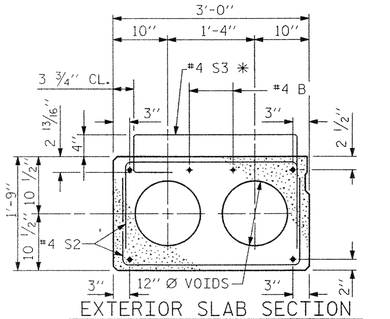
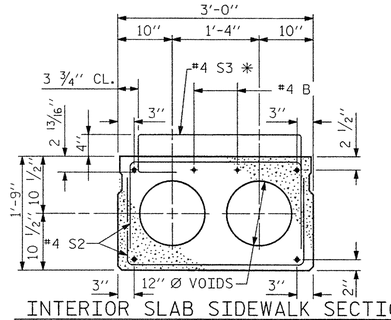
* S3 BARS PROVIDED IN SELECTED CORED SLABS UNDER SIDEWALKS



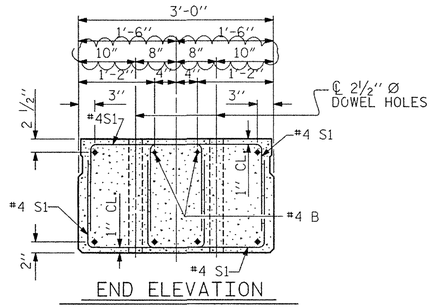
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTIONS.)



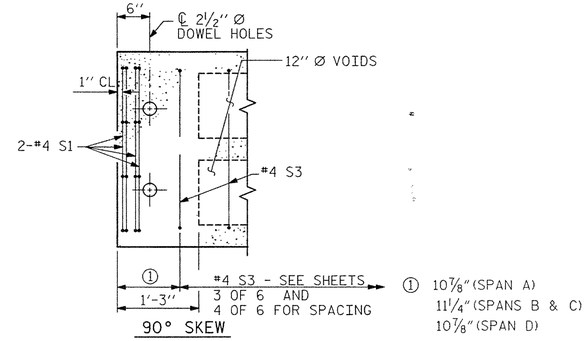
INTERIOR SLAB SIDEWALK SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTIONS.)



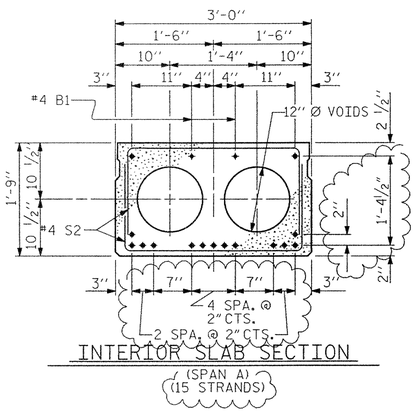
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB SECTION SHOWN - EXTERIOR SLAB SECTION SIMILAR EXCEPT FOR SHEAR KEY LOCATION.



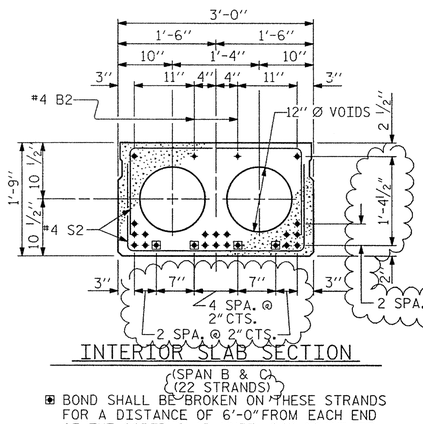
PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS WHEN NO SIDEWALK IS PRESENT.



INTERIOR SLAB SECTION

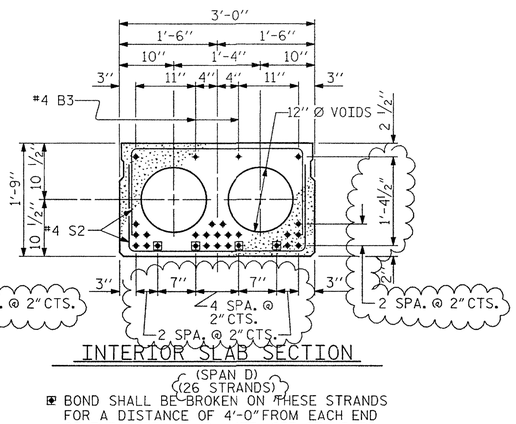
(SPAN A)
(15 STRANDS)



INTERIOR SLAB SECTION

(SPAN B & C)
(22 STRANDS)

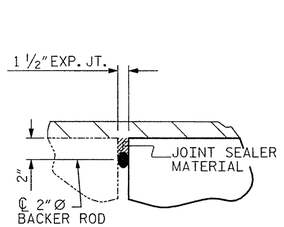
◘ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM EACH END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATION ARTICLE 1078-7.



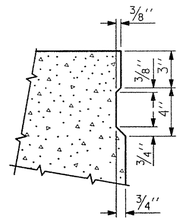
INTERIOR SLAB SECTION

(SPAN D)
(26 STRANDS)

◘ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM EACH END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATION ARTICLE 1078-7.

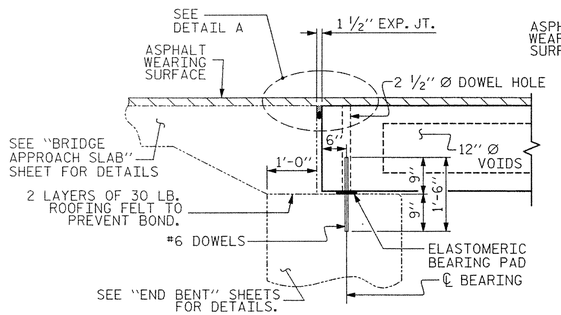


DETAIL A



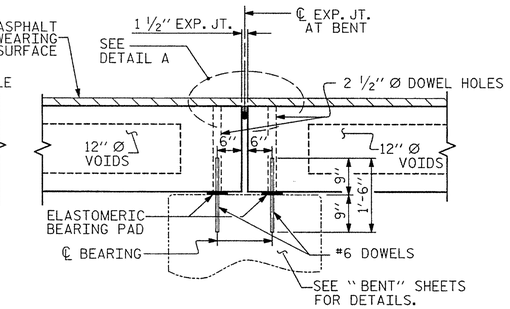
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



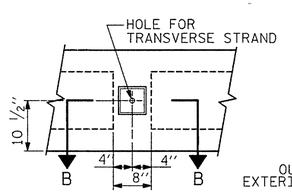
FIXED END

SECTION AT END BENT

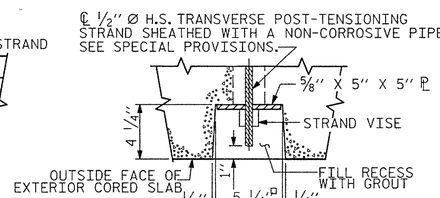


EXPANSION END FIXED END

SECTION AT BENT



ELEVATION VIEW



SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI
9-2-05

DRAWN BY: A. COOK DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	DAC	9-2-05	3			TOTAL SHEETS
2			4			20

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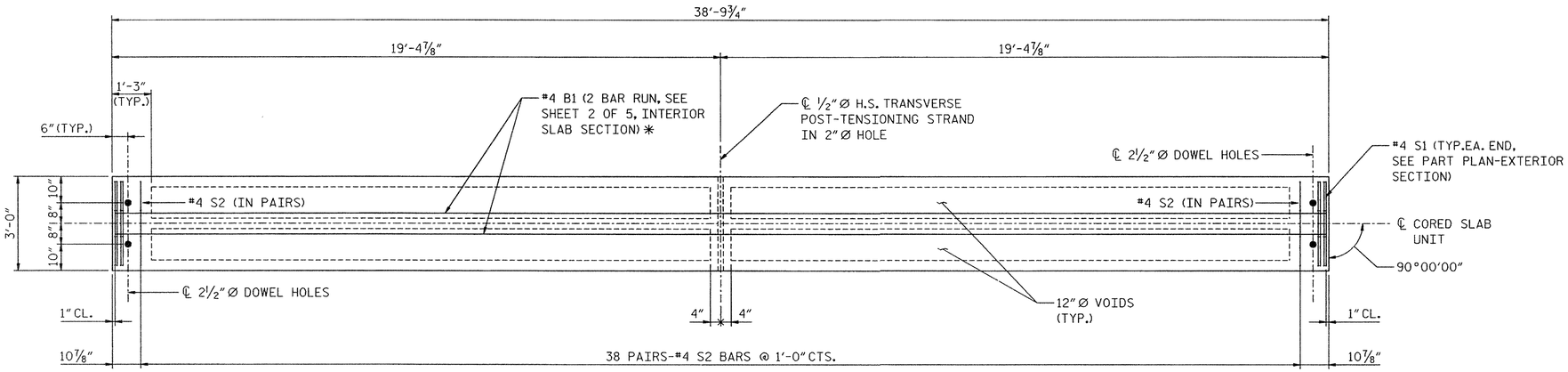
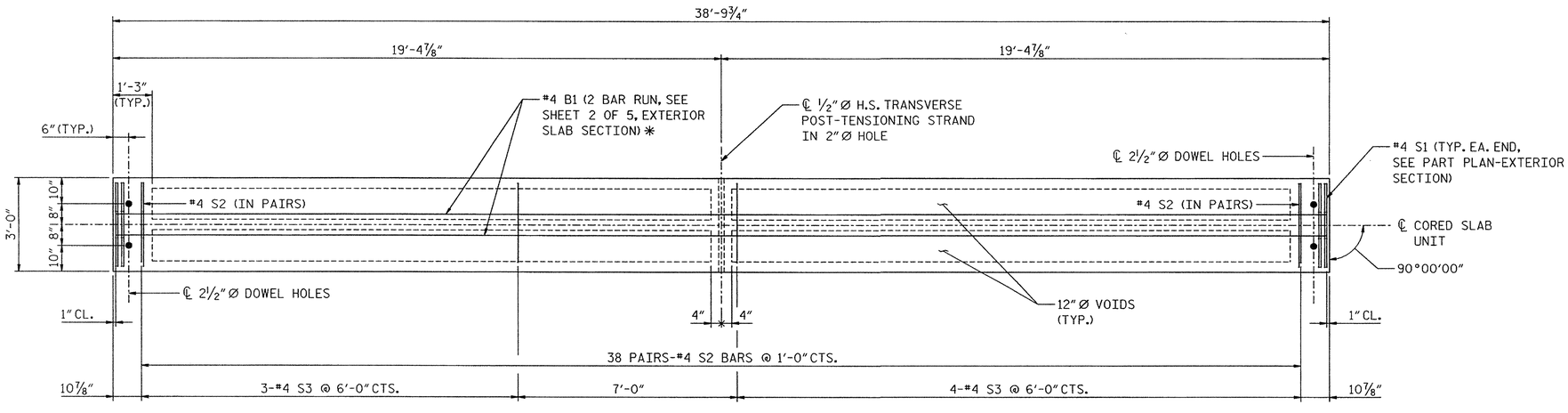


* #4 B1 MIN. SPLICE 1'-11"

PLAN OF INTERIOR SLAB



NOTE

S2 & S3 BARS IN INTERIOR & EXTERIOR SLABS MAY BE MOVED SLIGHTLY TO MAINTAIN 2" CLEARANCE OF HOLES FOR TRANSVERSE STRANDS.

PLAN OF EXTERIOR SLAB

SPAN A

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL SEAL 029589 ENGINEER DOMENIC A. COLETTI
6-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

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

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 3 OF 6

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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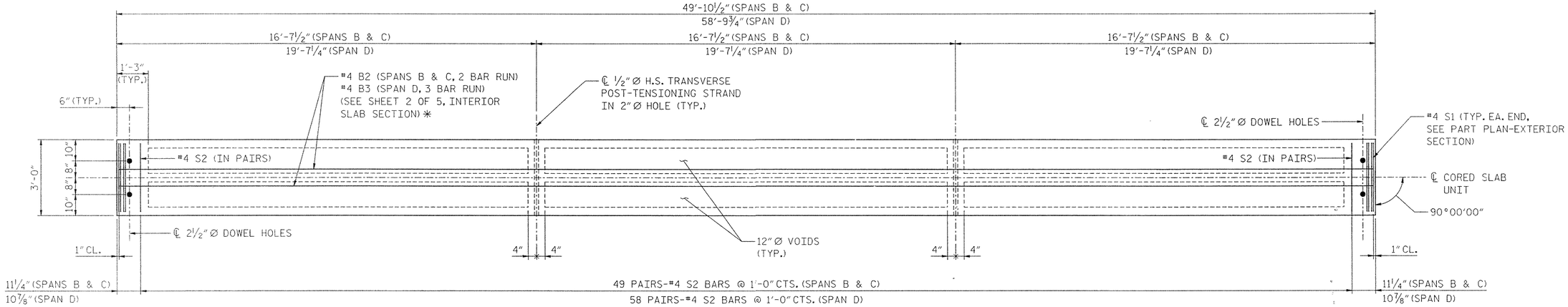
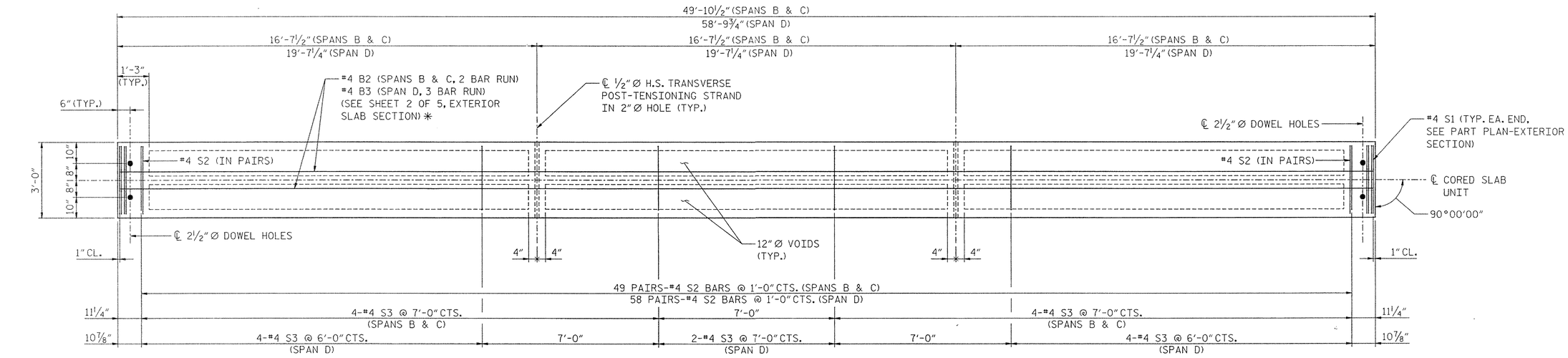


* #4 B2 MIN. SPLICE 1'-11"
#4 B3 MIN. SPLICE 1'-11"

PLAN OF INTERIOR SLAB



PLAN OF EXTERIOR SLAB

SPANS B, C & D

NOTE

S2 & S3 BARS IN INTERIOR & EXTERIOR SLABS MAY BE MOVED SLIGHTLY TO MAINTAIN 2" CLEARANCE OF HOLES FOR TRANSVERSE STRANDS.

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A COLETTI 7-6-05

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	DAC	7-1-05	3			TOTAL SHEETS
2			4			

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BILL OF MATERIAL FOR ONE CORED SLAB SECTION, SPAN A

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT W/ SDWK LENGTH	INTERIOR UNIT W/ SDWK WEIGHT	INTERIOR UNIT W/O SDWK LENGTH	INTERIOR UNIT W/O SDWK WEIGHT
B1	4	# 4	STR	20 - 3"	54	20 - 3"	54	20 - 3"	54
S1	16	# 4	1	4' - 3"	45	4' - 3"	45	4' - 3"	45
S2	76	# 4	1	5' - 4"	271	5' - 4"	271	5' - 4"	271
*S3	7	# 4	2	5' - 5"	25	5' - 5"	25		
REINFORCING STEEL				LBS.	370	LBS.	370	LBS.	370
*EPOXY COATED REINFORCING STEEL				LBS.	25	LBS.	25	LBS.	0
5,000 P.S.I. CONCRETE				CU. YDS.	5.5	CU. YDS.	5.5	CU. YDS.	5.5
1/2" Ø L.R. STRANDS				No.	15	No.	15	No.	15

BILL OF MATERIAL FOR ONE CORED SLAB SECTION, SPAN B & C

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT W/ SDWK LENGTH	INTERIOR UNIT W/ SDWK WEIGHT	INTERIOR UNIT W/O SDWK LENGTH	INTERIOR UNIT W/O SDWK WEIGHT
B2	4	# 4	STR	25 - 9"	69	25 - 9"	69	25 - 9"	69
S1	16	# 4	1	4' - 3"	45	4' - 3"	45	4' - 3"	45
S2	98	# 4	1	5' - 4"	349	5' - 4"	349	5' - 4"	349
*S3	8	# 4	2	5' - 5"	29	5' - 5"	29		
REINFORCING STEEL				LBS.	463	LBS.	463	LBS.	463
*EPOXY COATED REINFORCING STEEL				LBS.	29	LBS.	29	LBS.	0
6,000 P.S.I. CONCRETE				CU. YDS.	7.1	CU. YDS.	7.0	CU. YDS.	7.0
1/2" Ø L.R. STRANDS				No.	22	No.	22	No.	22

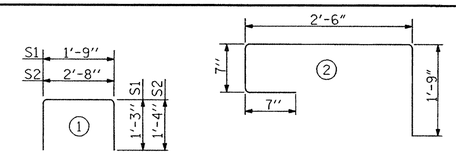
BILL OF MATERIAL FOR ONE CORED SLAB SECTION, SPAN D

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT W/ SDWK LENGTH	INTERIOR UNIT W/ SDWK WEIGHT	INTERIOR UNIT W/O SDWK LENGTH	INTERIOR UNIT W/O SDWK WEIGHT
B1	6	# 4	STR	20 - 10"	84	20 - 10"	84	20 - 10"	84
S1	16	# 4	1	4' - 3"	45	4' - 3"	45	4' - 3"	45
S2	116	# 4	1	5' - 4"	413	5' - 4"	413	5' - 4"	413
*S3	10	# 4	2	5' - 5"	36	5' - 5"	36		
REINFORCING STEEL				LBS.	542	LBS.	542	LBS.	542
*EPOXY COATED REINFORCING STEEL				LBS.	36	LBS.	36	LBS.	0
6,500 P.S.I. CONCRETE				CU. YDS.	8.3	CU. YDS.	8.2	CU. YDS.	8.2
1/2" Ø L.R. STRANDS				No.	26	No.	26	No.	26

GRADE 270 STRANDS

	1/2" Ø L.R.
AREA (SQUARE INCHES)	0.153
ULTIMATE STRENGTH (LBS. PER STRAND)	41,300
APPLIED PRESTRESS (LBS. PER STRAND)	30,980

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

DEAD LOAD DEFLECTION AND CAMBER

	SPAN A 3'-0" x 1'-9" 1/2" Ø L.R. STRAND	SPANS B & C 3'-0" x 1'-9" 1/2" Ø L.R. STRAND	SPAN D 3'-0" x 1'-9" 1/2" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE) ↑	13/16"	1 7/8"	2"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ** ↓	1/16"	1/8"	1/4"
FINAL CAMBER ↑	3/4"	1 3/4"	1 3/4"

** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQ'D, SPAN A

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	38' - 9 3/4"	77' - 7 1/2"
INTERIOR C.S. W/ SDWK	2	38' - 9 3/4"	77' - 7 1/2"
INTERIOR C.S. W/O SDWK	26	38' - 9 3/4"	1009' - 1 1/2"
TOTAL	30		1164' - 4 1/2"

CORED SLABS REQ'D, SPAN B

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	49' - 10 1/2"	99' - 9"
INTERIOR C.S. W/ SDWK	2	49' - 10 1/2"	99' - 9"
INTERIOR C.S. W/O SDWK	26	49' - 10 1/2"	1296' - 9"
TOTAL	30		1496' - 3"

CORED SLABS REQ'D, SPAN C

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	49' - 10 1/2"	99' - 9"
INTERIOR C.S. W/ SDWK	2	49' - 10 1/2"	99' - 9"
INTERIOR C.S. W/O SDWK	26	49' - 10 1/2"	1296' - 9"
TOTAL	30		1496' - 3"

CORED SLABS REQ'D, SPAN D

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	58' - 9 3/4"	117' - 7 1/2"
INTERIOR C.S. W/ SDWK	2	58' - 9 3/4"	117' - 7 1/2"
INTERIOR C.S. W/O SDWK	26	58' - 9 3/4"	1529' - 1 1/2"
TOTAL	30		1764' - 4 1/2"

TOTAL CORED SLABS REQ'D FOR BRIDGE

	NUMBER		TOTAL LENGTH
TOTAL	120		5921' - 3"

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN:
- SPAN A: 4000 PSI
- SPANS B & C: 4500 PSI
- SPAN D: 5000 PSI

ALL REINFORCING STEEL IN MEDIANS, SIDEWALKS AND PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK AND PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR SIDEWALK AND PARAPET REINFORCING SEE "3 BAR METAL RAIL" SHEETS.

PROJECT SUBMITTED BY:

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BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL SEAL 029589 ENGINEER DOMENIC A COLETTI
6-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED
CONCRETE CORED
SLAB UNIT

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

SHEET NO.
TOTAL SHEETS

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 5 OF 6

DRAWN BY: A. COOK DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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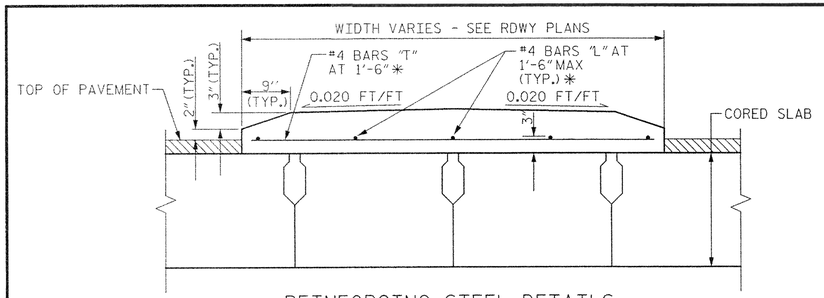
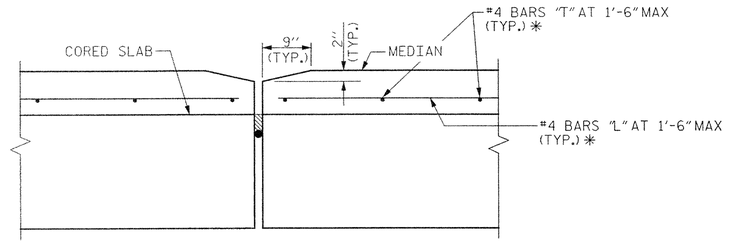


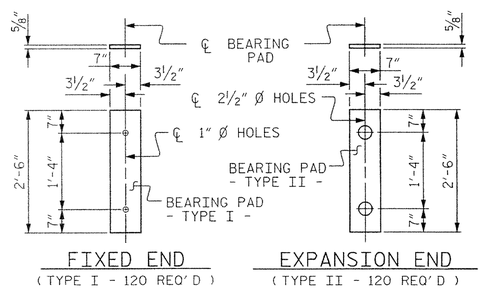
REINFORCING STEEL DETAILS



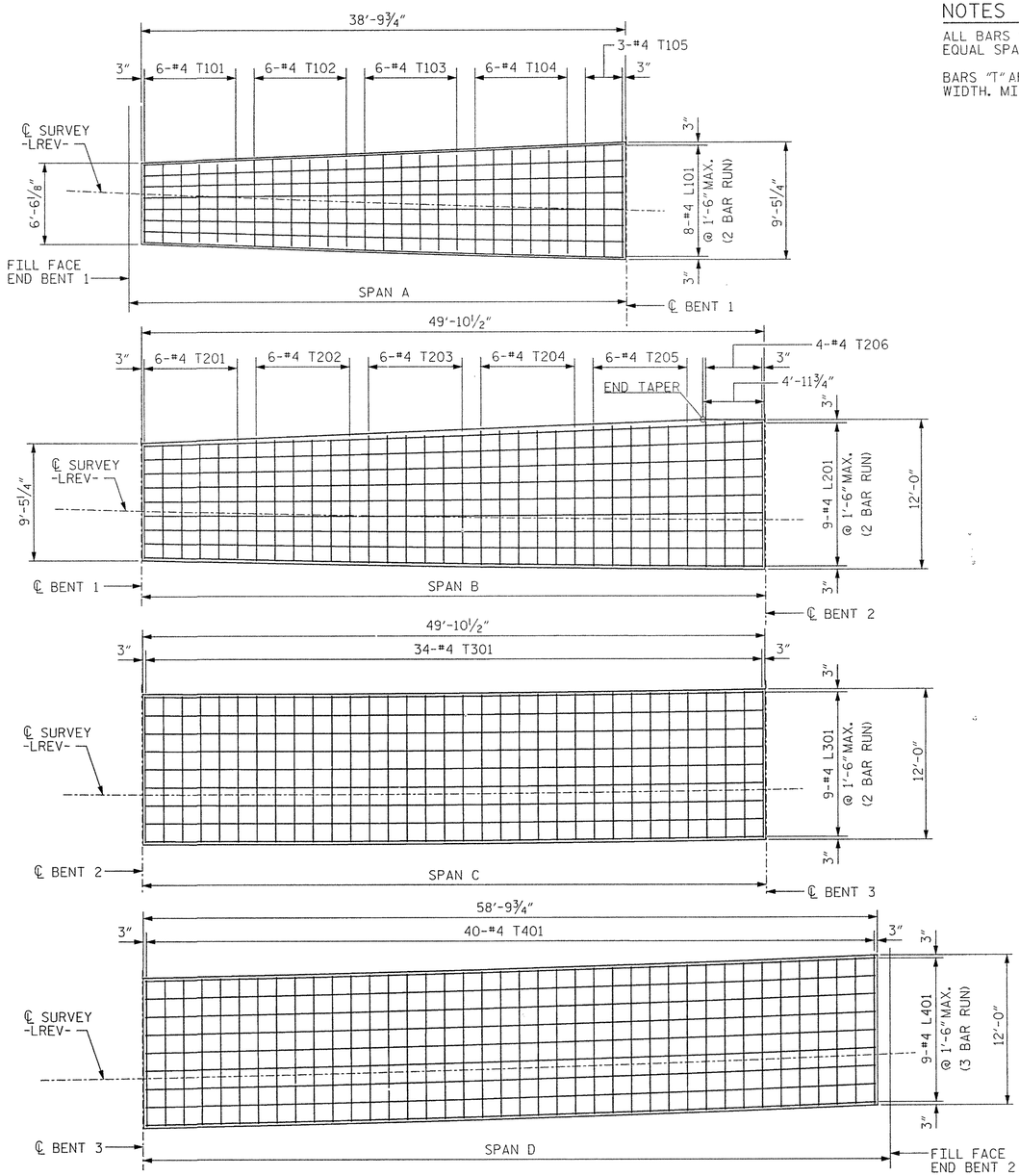
* = ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED

DETAIL AT EXPANSION JOINTS

CONCRETE MEDIAN STRIP DETAILS



ELASTOMERIC BEARING DETAILS



CONCRETE MEDIAN STRIP REINFORCING PLAN

NOTES

ALL BARS "T" AND BARS "L" SHALL BE INSTALLED AT EQUAL SPACING WITHIN EACH SPAN (1'-6" MAX SPACING).

BARS "T" ARE TO BE CENTERED WITHIN THE MEDIAN WIDTH. MIN END COVER = 2". MAX END COVER = 5".

BILL OF MATERIALS

TOTAL SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*T101	6	4	STR.	6'-2"	25
*T102	6	4	STR.	6'-10"	27
*T103	6	4	STR.	7'-6"	30
*T104	6	4	STR.	8'-2"	33
*T105	3	4	STR.	8'-10"	18
*T201	6	4	STR.	9'-1"	36
*T202	6	4	STR.	9'-7"	38
*T203	6	4	STR.	10'-1"	40
*T204	6	4	STR.	10'-7"	42
*T205	6	4	STR.	11'-1"	44
*T206	4	4	STR.	11'-8"	31
*T301	34	4	STR.	11'-8"	265
*T401	40	4	STR.	11'-8"	312
*L101	16	4	STR.	20'-3"	216
*L201	18	4	STR.	25'-9"	310
*L301	18	4	STR.	25'-9"	310
*L401	27	4	STR.	20'-10"	376
TOTAL EPOXY REINF. STEEL				(LB)	2153
CLASS AA CONCRETE				(CY)	
SPAN A				(CY)	7.8
SPAN B				(CY)	14.2
SPAN C				(CY)	15.8
SPAN D				(CY)	18.7
TOTAL				(CY)	56.5

* EPOXY COATED REINFORCING STEEL

DRAWN BY: A. COOK DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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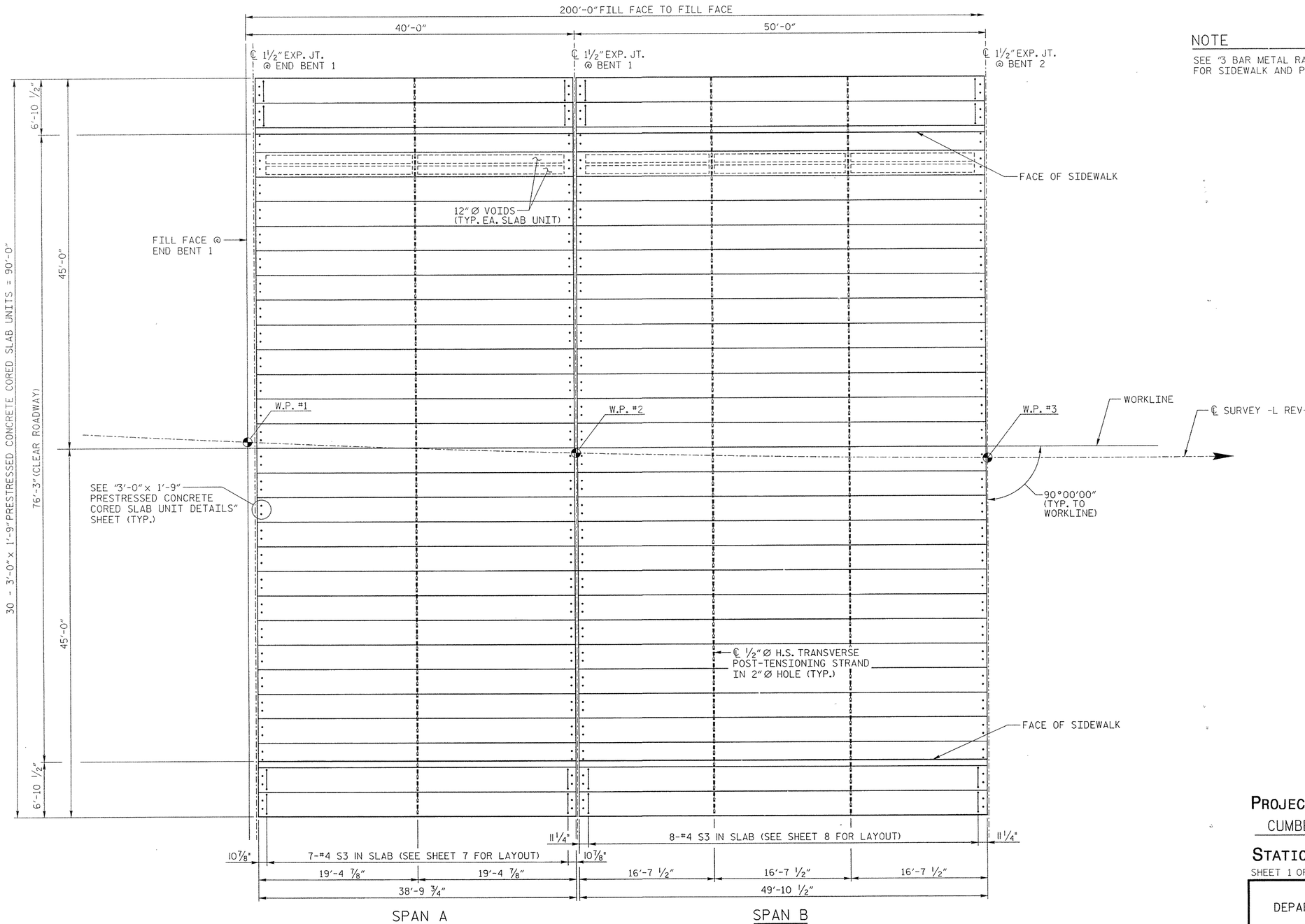
NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI 7-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED
CONCRETE CORED
SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	6
1	AKC	6-17-05	3			TOTAL SHEETS
2			4			28



NOTE

SEE "3 BAR METAL RAIL" SHEETS FOR SIDEWALK AND PARAPET REINFORCING.

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DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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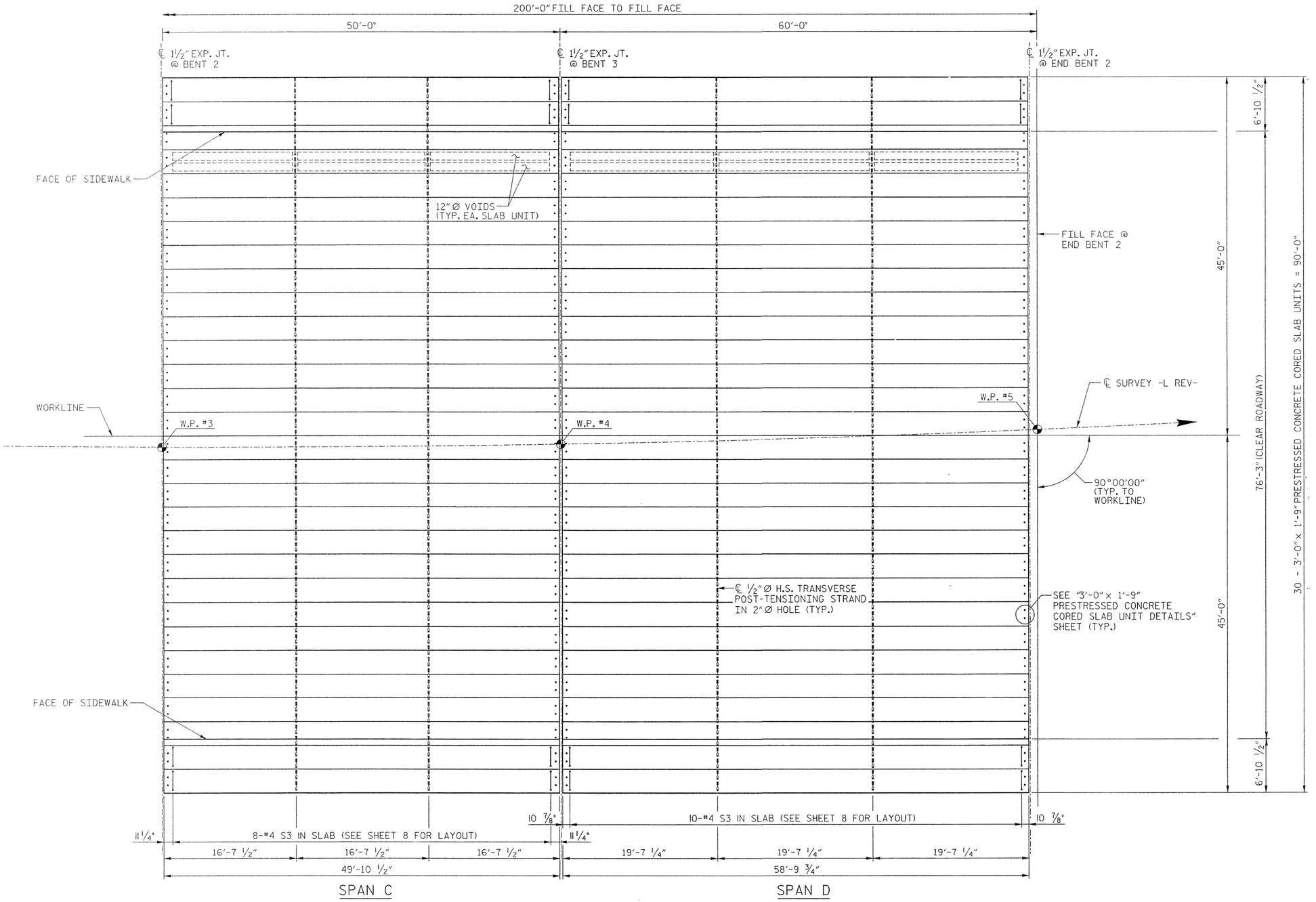
7-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	AKC	6-17-05	3			TOTAL SHEETS
2			4			



NOTE

SEE "3 BAR METAL RAIL" SHEETS FOR SIDEWALK AND PARAPET REINFORCING.

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS C & D

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	AKC	6-17-05	3			TOTAL SHEETS
2			4			

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231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI
1-6-05

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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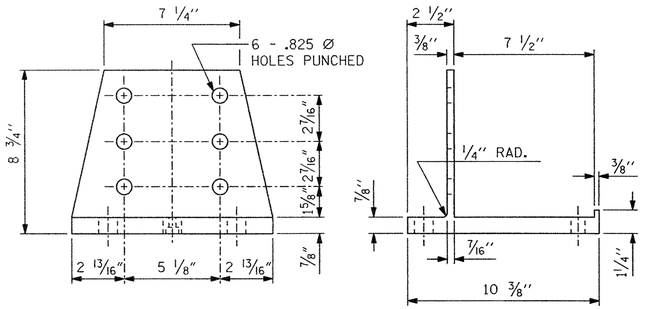
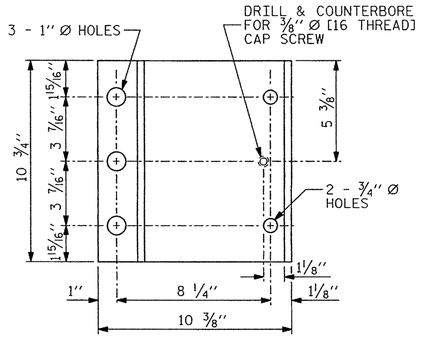


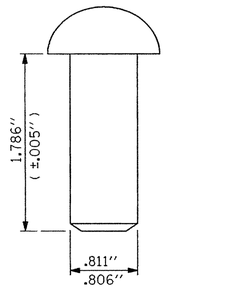
FRONT ELEVATION

SIDE ELEVATION

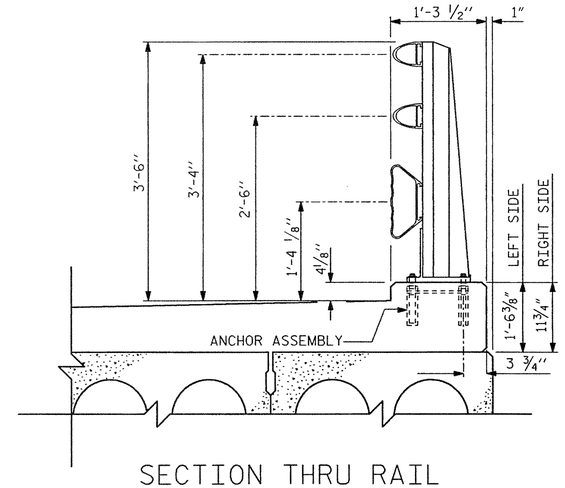


PLAN

POST BASE DETAILS

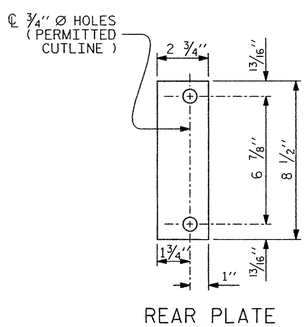


RIVET DETAIL

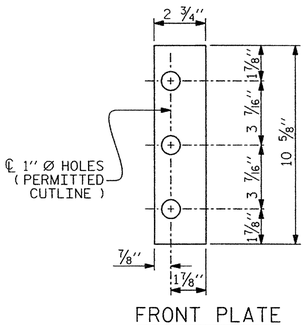


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 3 OF 5
(SIDEWALK REINF. NOT SHOWN FOR CLARITY)



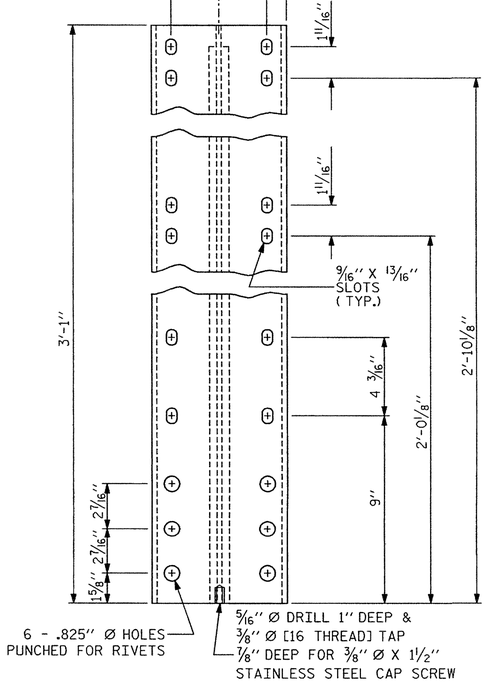
REAR PLATE



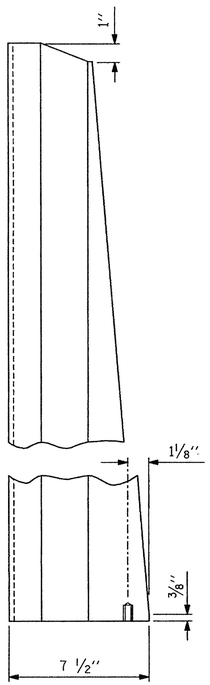
FRONT PLATE

SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

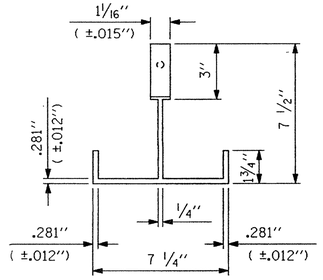


FRONT ELEVATION



SIDE ELEVATION

DETAILS OF POST



PLAN

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE I, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 380.5 LIN.FT.

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 1 OF 5

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI 6-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

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

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05	
CHECKED BY : D. COLETTI		DATE : 5/9/05	
DRAWN BY : JMB 1/88	REV. 8/16/99	RWW/LES	
CHECKED BY : GGH 1/88	REV. 10/17/00	RWW/LES	
	REV. 5/7/03	RWW/JTE	

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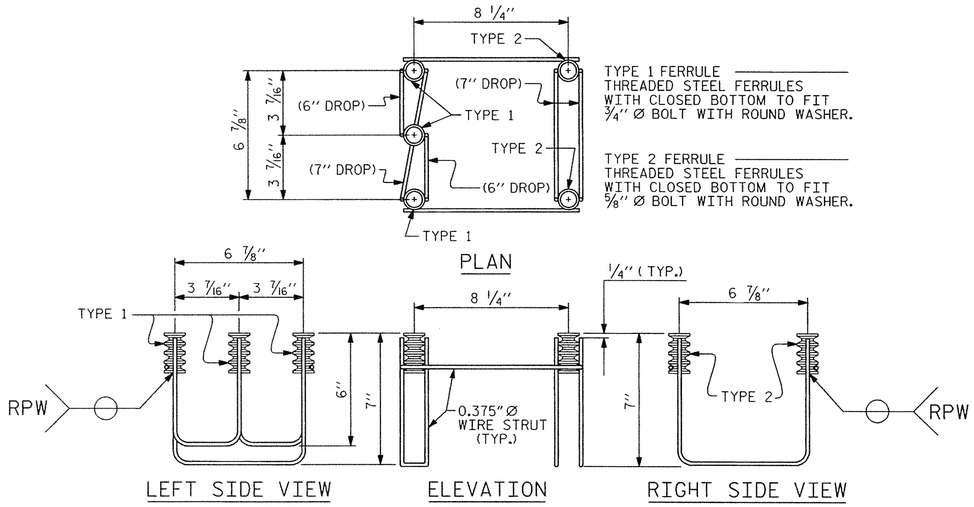
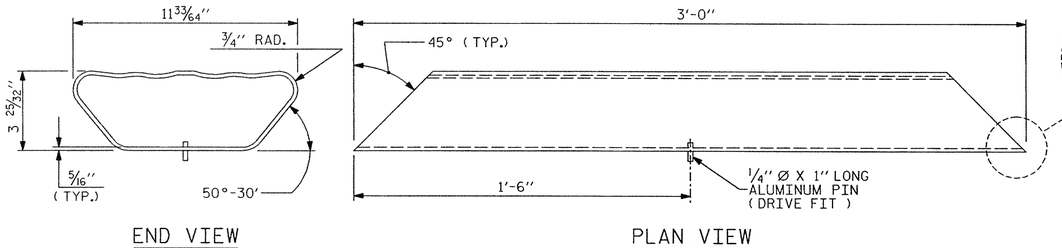
STD. NO. BMR5

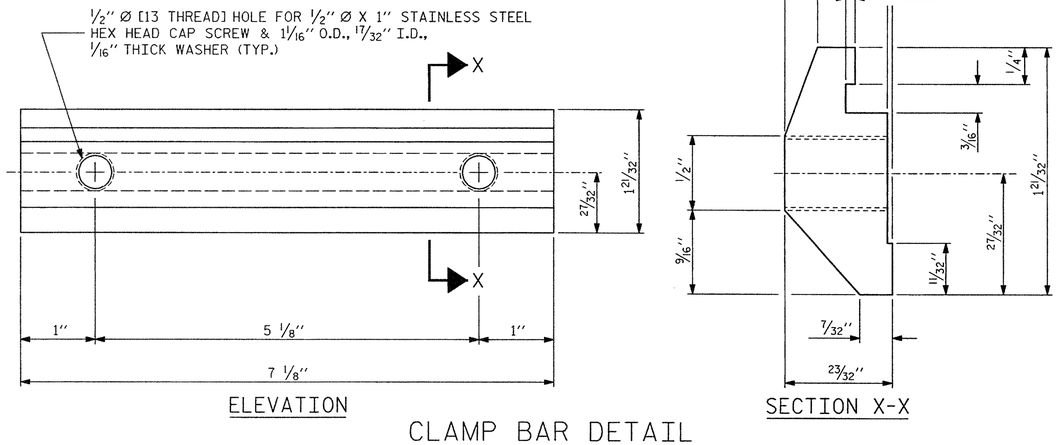


5-BOLT METAL RAIL ANCHOR ASSEMBLY

(66 ASSEMBLIES REQUIRED)



BOTTOM RAIL EXPANSION BAR



CLAMP BAR DETAIL

(6 REQUIRED PER POST)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY 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 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.

B. 3 - 3/4" Ø X 2 1/2" 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 3/4" Ø X 2 1/2" 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.

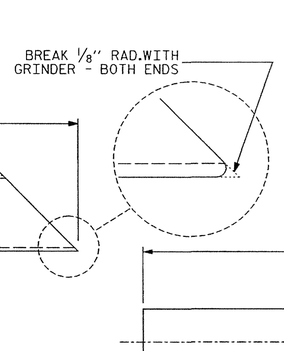
C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

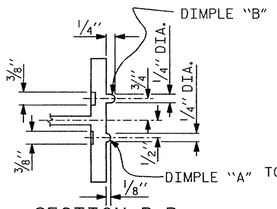
D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

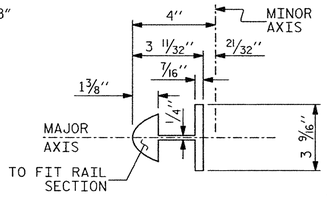
F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

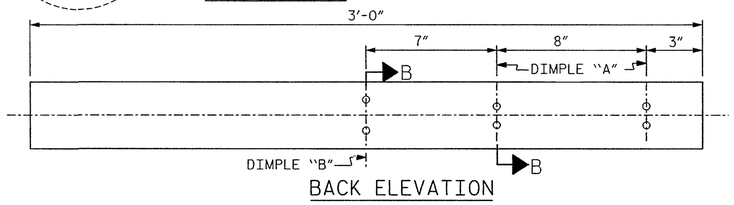




SECTION B-B

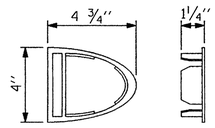


BAR SECTION

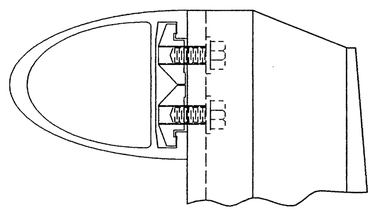


BACK ELEVATION

TOP & MIDDLE RAIL EXPANSION BAR

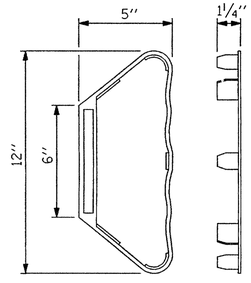


TOP & MIDDLE RAIL CAP

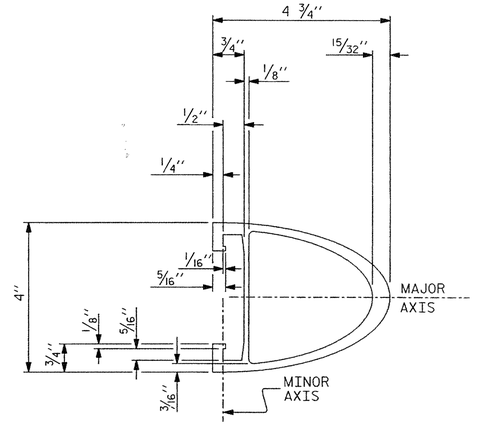


CLAMP ASSEMBLY

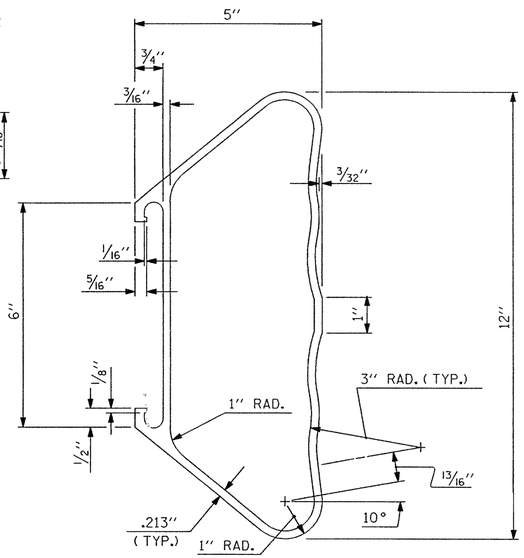
TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)



BOTTOM RAIL CAP



TOP & MIDDLE RAIL SECTION



BOTTOM RAIL SECTION

PROJECT NO. U-3311B

CUMBERLAND **COUNTY**

STATION: 121+24.78 -LREV-

SHEET 2 OF 5

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENICA COLETTI 5-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

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

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05	
CHECKED BY : D. COLETTI		DATE : 5/9/05	
DRAWN BY : JMB 1/88	REV. 8/16/99	RWW/LES	
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	REV. 5/7/03	RWW/JTE	

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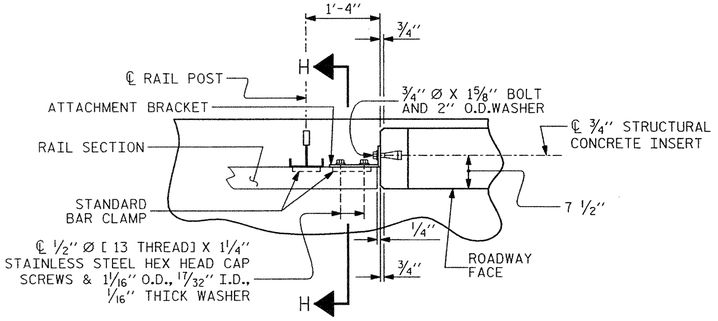
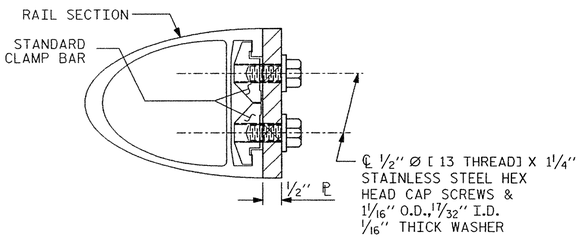
STD. NO. BMR6



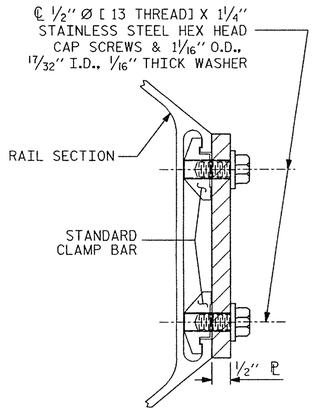
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" ℙ NOT SHOWN FOR CLARITY)



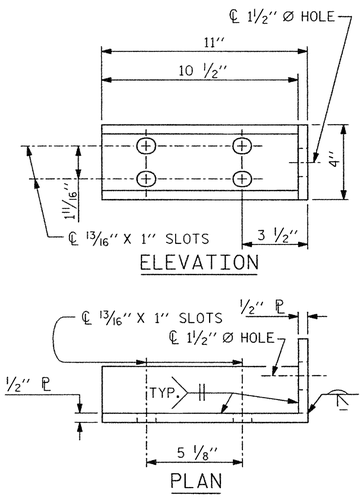
SECTION H-H

(FOR TOP & MIDDLE RAIL)



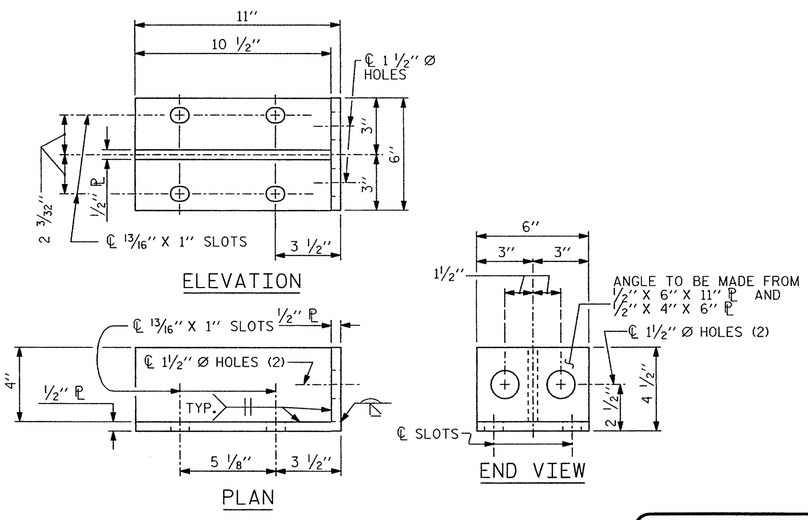
SECTION H-H

(FOR BOTTOM RAIL)



DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D.WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS". FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

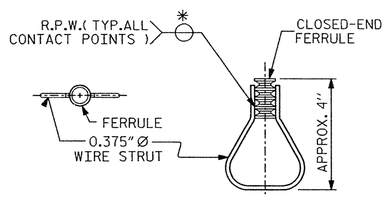
STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY 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 1 1/2".

B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. 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 STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. U-3311B

CUMBERLAND **COUNTY**

STATION: 121+24.78 -LREV-

SHEET 3 OF 5

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05			
CHECKED BY : D. COLETTI		DATE : 5/9/05			
DRAWN BY : JMB 1/88	REV. 8/16/99	RWW/LES			
CHECKED BY : GGH 1/88	REV. 10/17/00	RWW/LES			
	REV. 5/1/03	RWW/JTE			

PROJECT SUBMITTED BY:

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI 6-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

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

STD. NO. BMR7

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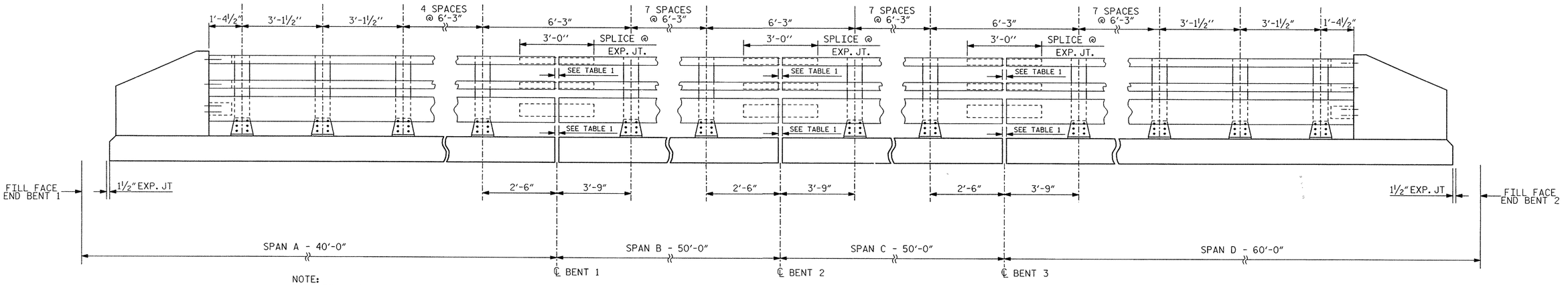
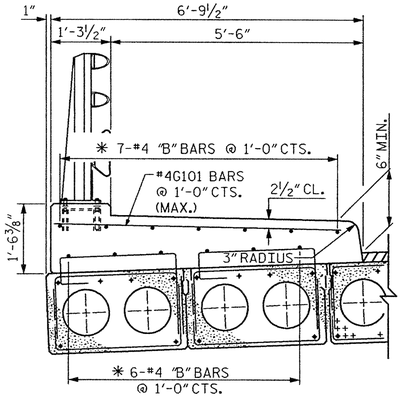


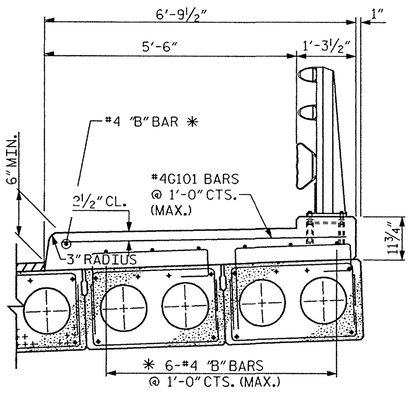
NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 5 AND 5 OF 5.

RAIL POST SPACING ELEVATION

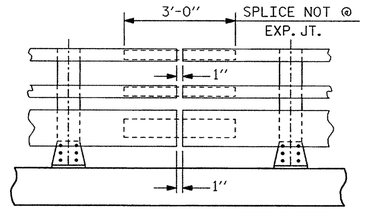
TABLE 1	
℄ EXP.JT. @ BENT	RAIL OPENING
BENT No. 1	1½"
BENT No. 2	1½"
BENT No. 3	1½"



LEFT SIDE
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 3 OF 5



RIGHT SIDE
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 3 OF 5



SPLICE DETAIL
NOT @ EXP. JT.

* #4B101 FOR SPAN A
#4B102 FOR SPANS B & C
#4B103 FOR SPAN D

SECTIONS THROUGH SIDEWALK

PROJECT No. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 4 OF 5

ASSEMBLED BY : D. CHAPMAN	DATE : 5/9/05		
CHECKED BY : D. COLETTI	DATE : 5/9/05		
DRAWN BY : JMB 1/88	REV. 8/16/99	RWW/LES	
CHECKED BY : GGH 1/88	REV. 10/17/00	RWW/LES	
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3 BAR METAL RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			20

STD. NO. BMR5

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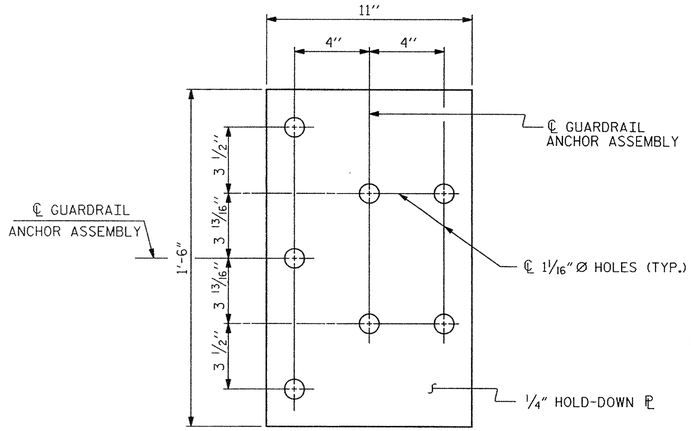
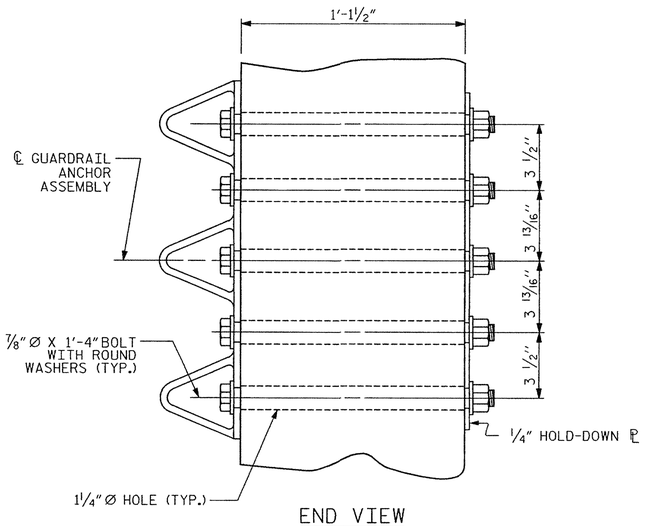


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS 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.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

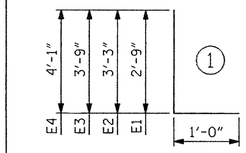
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

BAR TYPES

ALL DIMENSIONS ARE OUT-TO-OUT



BILL OF MATERIALS

FOR ONE END POST

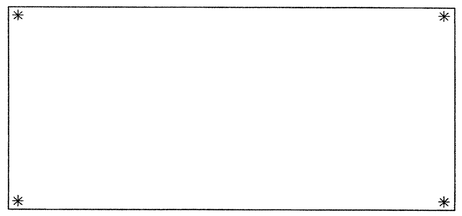
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	2	7	1	3'-9"	15
*E2	2	7	1	4'-3"	17
*E3	2	7	1	4'-9"	19
*E4	2	7	1	5'-1"	21
*F1	2	6	STR.	3'-3"	10
*F2	4	6	STR.	3'-6"	21
*F3	2	6	STR.	3'-9"	11
TOTAL EPOXY REINF. STEEL				(LB)	114
CLASS AA CONCRETE				(CY)	0.4

BILL OF MATERIALS

TOTAL SIDEWALK

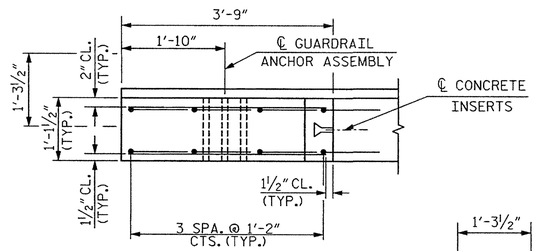
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B101	46	4	STR.	20'-3"	541
*B102	80	4	STR.	25'-10"	1382
*B103	60	4	STR.	20'-10"	835
*G101	396	4	STR.	6'-7"	1742
TOTAL EPOXY REINF. STEEL				(LB)	4500
CLASS AA CONCRETE				(CY)	
LEFT SIDEWALK				(CY)	48.8
RIGHT SIDEWALK				(CY)	32.3
TOTAL				(CY)	81.1

*EPOXY COATED REINFORCING STEEL

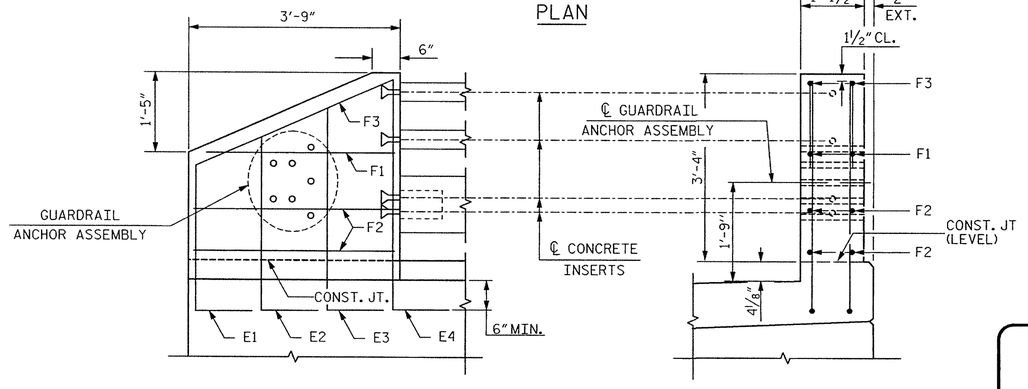


SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT



PLAN



ELEVATION
(THREE BAR METAL RAIL)

END VIEW
(THREE BAR METAL RAIL)

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI
6-3-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5Z
1			3			TOTAL SHEETS
2			4			78

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 5 OF 5

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05	
CHECKED BY : D. COLETTI		DATE : 5/9/05	
DRAWN BY : JMB 1/88	REV. 8/16/99	RWW/LES	
CHECKED BY : GGH 1/88	REV. 10/17/00	RWW/LES	
	REV. 5/7/03	RWW/JTE	

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STD. NO. BMR8

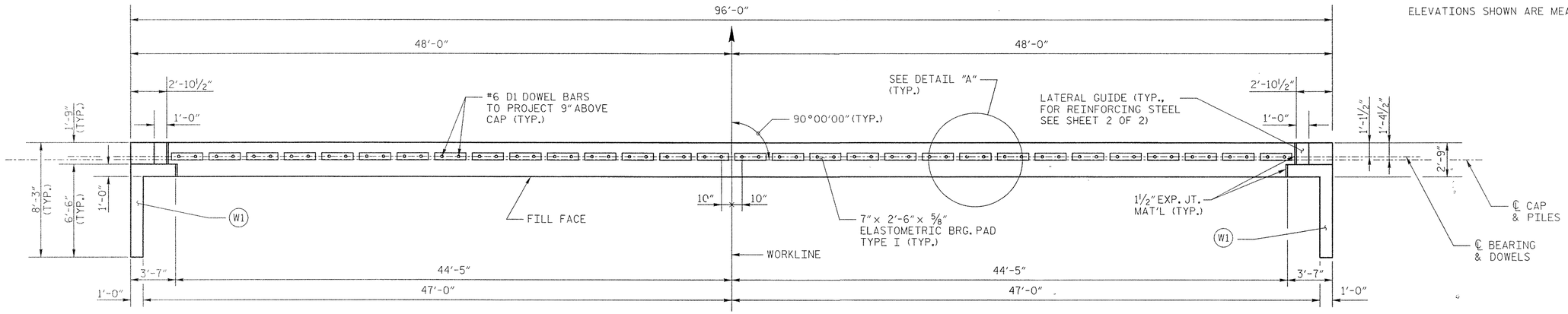
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

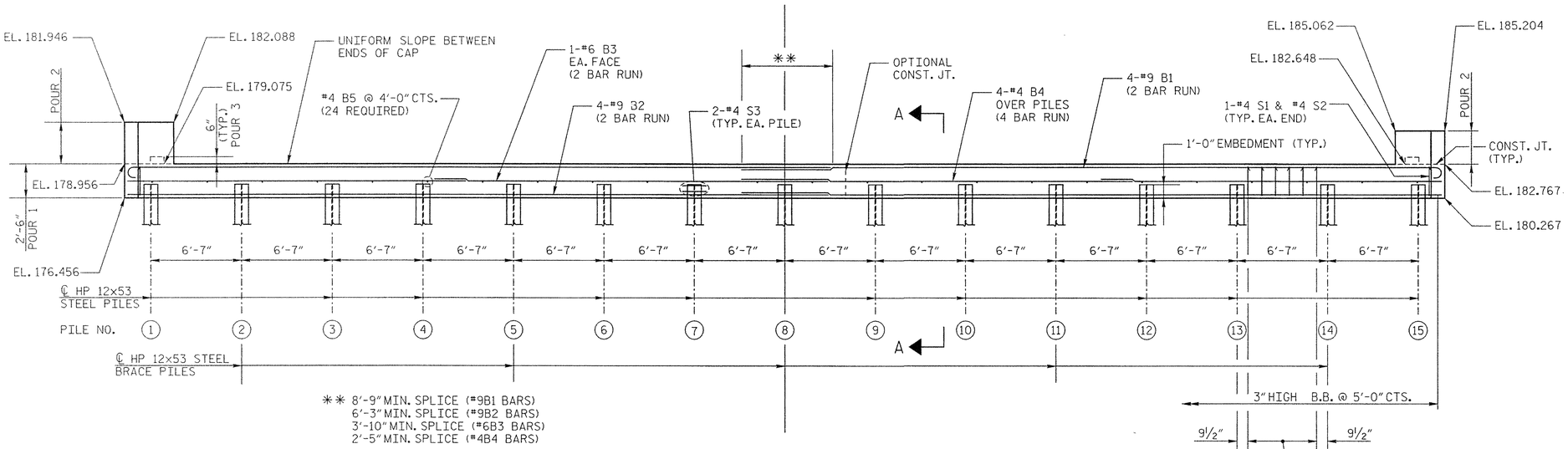
FOR PILE SPLICE DETAILS, SEE END BENT 2, SHEET 2 OF 2.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

ELEVATIONS SHOWN ARE MEASURED AT THE FILL FACE.

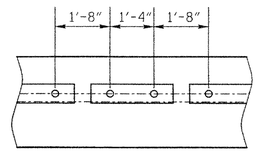


PLAN



TOP OF PILE ELEVATIONS															
PILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
EL.	177.532	177.793	178.055	178.316	178.578	178.839	179.100	179.362	179.623	179.884	180.146	180.407	180.668	180.930	181.191

ELEVATION



DETAIL "A"

EB #1 PILE DATA CHART

PILE #	LENGTH
1	67' 2"
2	64' 5"
3	60' 10"
4	53' 6"
5	53' 2"
6	63' 1"
7	66' 2"
8	61' 6"
9	67' 9"
10	67' 1"
11	68' 2"
12	68' 10"
13	68' 6"
14	68' 3"
15	64' 11"
Total	963' 4"

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 1 OF 2

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMINIC A. COLETTI 7-6-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

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

SHEET NO.

TOTAL SHEETS 20

DRAWN BY: A. ABERNATHY DATE: 05/05

CHECKED BY: D. COLETTI DATE: 05/05

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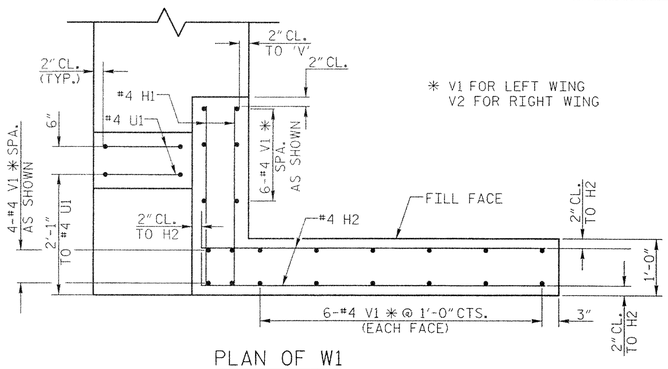
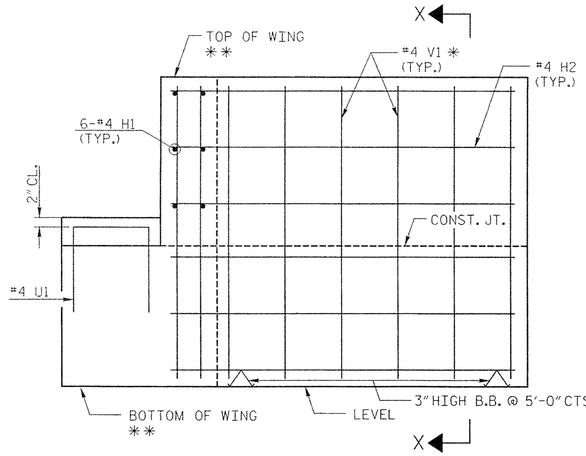


PLAN OF W1

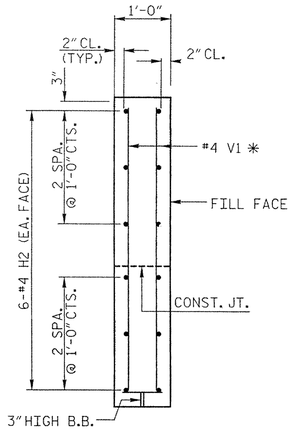
(LEFT WING SHOWN, RIGHT WING SIMILAR)



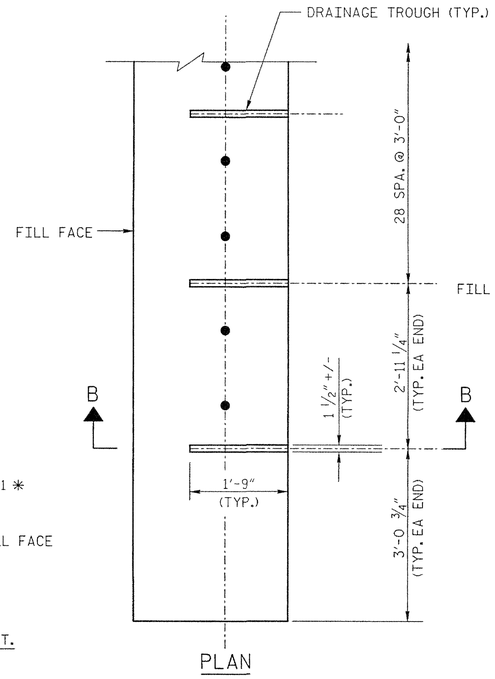
ELEVATION W1

(LEFT WING SHOWN, RIGHT WING SIMILAR)

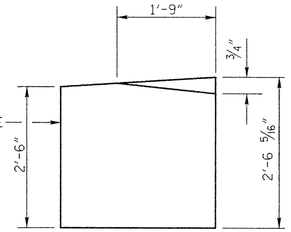
** SEE SHEET 1 OF 2 FOR TOP AND BOTTOM OF WING ELEVATIONS.



SECTION X-X



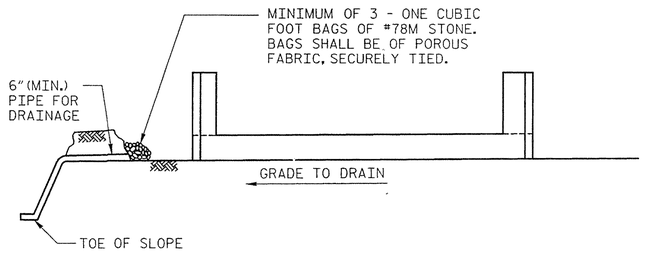
PLAN



SECTION B-B

(SECTION THROUGH END BENT CAP AT DRAINAGE TROUGH)

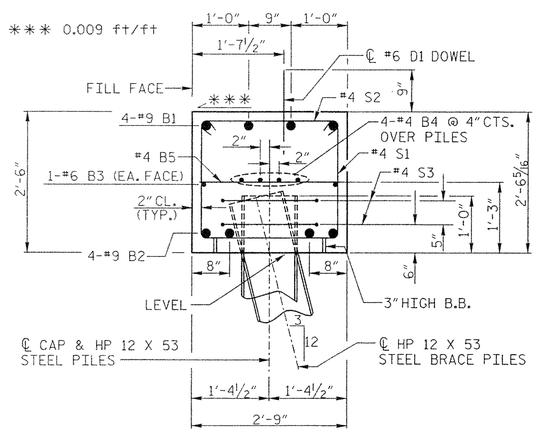
DRAINAGE TROUGH DETAILS



BAGGED STONE AND PIPE SHALL PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

TEMPORARY DRAINAGE AT END BENT



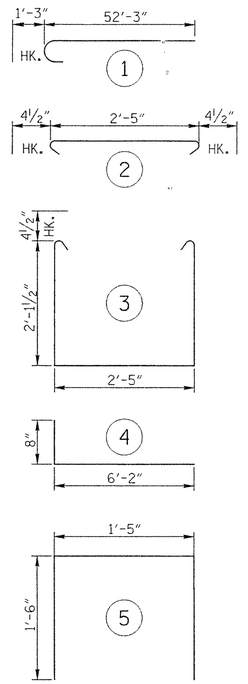
SECTION A-A

AHEAD STATION

DRAWN BY: A. ABERNATHY DATE: 05/05

CHECKED BY: D. COLETTI DATE: 05/05

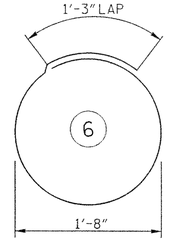
BAR TYPES



BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	53'-6"	1455
B2	8	#9	STR.	51'-0"	1387
B3	4	#6	STR.	49'-9"	299
B4	16	#4	STR.	25'-9"	275
B5	24	#4	STR.	2'-5"	39
D1	60	#6	STR.	1'-6"	135
H1	12	#4	STR.	3'-3"	26
H2	24	#4	4	6'-10"	110
S1	86	#4	3	7'-5"	426
S2	86	#4	2	3'-2"	182
S3	30	#4	6	6'-6"	130
U1	4	#4	5	4'-5"	12
V1	22	#4	STR.	5'-1"	75
V2	22	#4	STR.	4'-6"	66
REINFORCING STEEL				LBS.	4617
CLASS 'A' CONCRETE					
POUR 1				CU. YDS.	25.5
POUR 2				CU. YDS.	1.8
POUR 3				CU. YDS.	0.1
TOTAL				CU. YDS.	27.4
HP 12 X 53 STEEL PILES					
NO. 15				LIN. FT.	1021



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 2 OF 2

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI
7-6-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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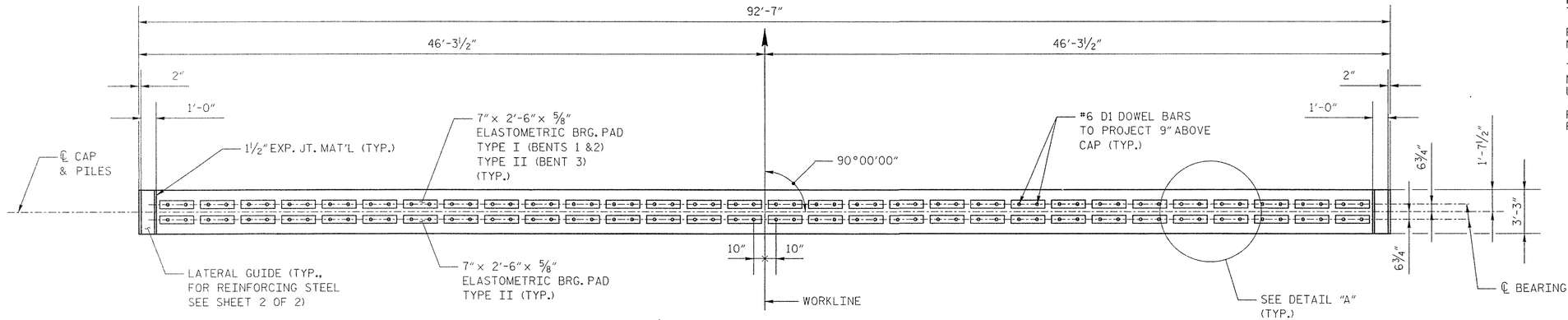


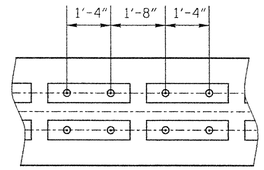
PLAN

NOTES

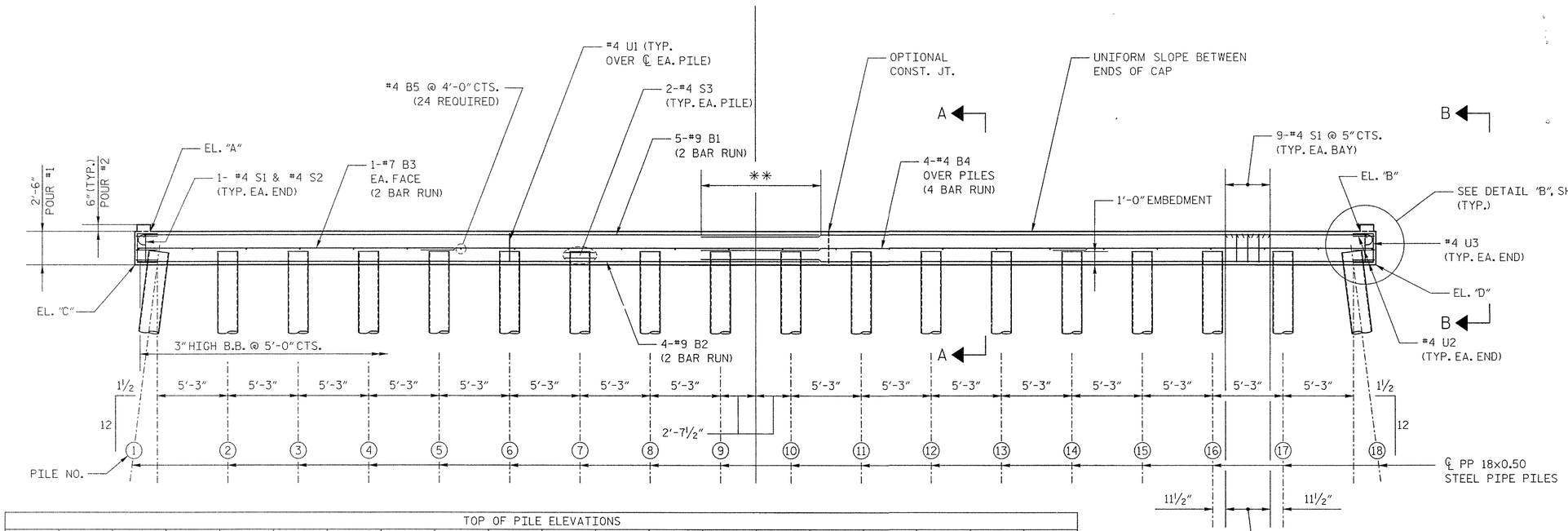
REINFORCING STEEL IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

FOR PIPE PILE DETAILS, SEE STANDARD 18" STEEL PIPE PILE SHEET.



DETAIL "A"



	BENT 1	BENT 2	BENT 3
EL. "A"	179.388	179.946	180.771
EL. "B"	182.961	183.519	184.344
EL. "C"	176.837	177.395	178.220
EL. "D"	180.512	181.070	181.895

ELEVATIONS "C" & "D" ARE @ THE BOTTOM ENDS OF THE BENT CAP.

TOP OF PILE ELEVATIONS																			
BENT	PILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	EL.	177.903	178.112	178.320	178.528	178.737	178.945	179.154	179.362	179.571	179.779	179.987	180.196	180.404	180.613	180.821	181.030	181.238	181.446
2	EL.	178.461	178.670	178.878	179.086	179.295	179.503	179.712	179.920	180.129	180.337	180.545	180.754	180.962	181.171	181.379	181.588	181.796	182.004
3	EL.	179.286	179.495	179.703	179.911	180.120	180.328	180.537	180.745	180.954	181.162	181.370	181.579	181.787	181.996	182.204	182.413	182.621	182.829

** 8'-9" MIN. SPLICE (#9B1 BARS)
6'-3" MIN. SPLICE (#9B2 BARS)
5'-3" MIN. SPLICE (#7B3 BARS)
2'-5" MIN. SPLICE (#4B4 BARS)

ELEVATION

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS 1, 2 & 3

REVISIONS						SHEET NO. C-20
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 28
1			3			
2			4			

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A COLETTI
7-6-05

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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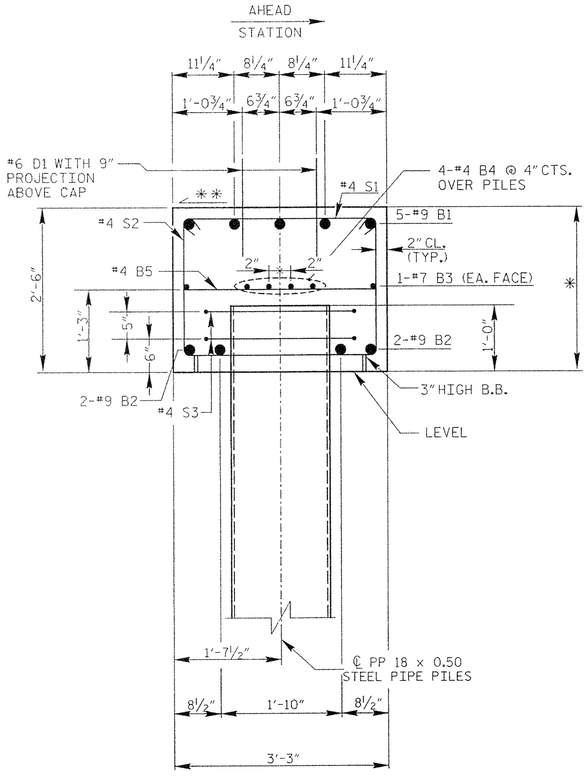
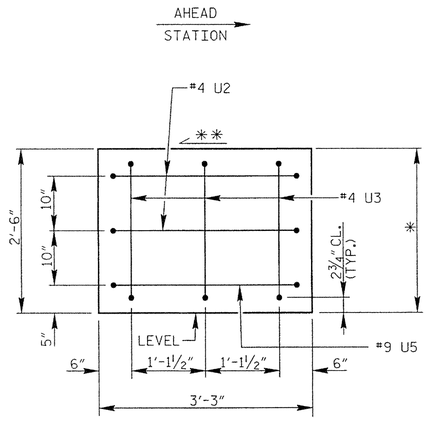


SECTION A-A



VIEW B-B

* 2'-6⅜" (BENT 1)
2'-6⅝" (BENT 2)
2'-6¾" (BENT 3)

** SLOPE TOP OF CAP, SEE CAP DIMENSIONS.
APPROX. SLOPES:
0.010 ft/ft (BENT 1)
0.014 ft/ft (BENT 2)
0.019 ft/ft (BENT 3)

Pile Data Charts

Bent # 1

Pile #	Length
1	65'10"
2	66' 1"
3	67' 7"
4	66'
5	66' 11"
6	64' 6"
7	65' 11"
8	68' 10"
9	66' 6"
10	66' 5"
11	66' 11"
12	65' 2"
13	68' 8"
14	67' 6"
15	67' 5"
16	70' 5"
17	67' 10"
18	65'
Totals	1,196'6"

Bent # 2

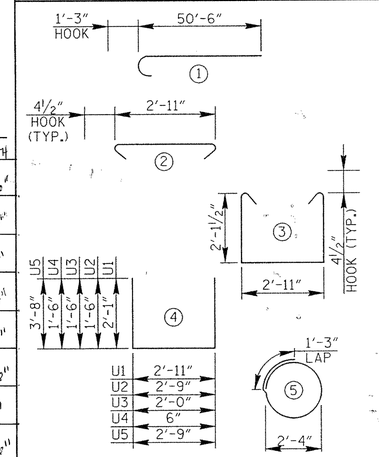
Pile #	Length
1	67' 4"
2	68' 10"
3	72' 1"
4	70' 4"
5	72' 2"
6	67' 5"
7	67' 10"
8	73' 3"
9	70' 2"
10	69' 11"
11	68' 6"
12	69' 3"
13	69' 4"
14	71' 3"
15	69' 11"
16	70' 4"
17	70' 2"
18	69'
Totals	1,257'6"

Bent # 3

Pile #	Length
1	67' 6"
2	68' 5"
3	70' 3"
4	69' 4"
5	69' 2"
6	69' 6"
7	71' 1"
8	68' 6"
9	71' 8"
10	71' 8"
11	71' 5"
12	71' 4"
13	72' 10"
14	71' 5"
15	72' 5"
16	72' 10"
17	73' 3"
18	72'
Totals	1,128'7"

BAR TYPES

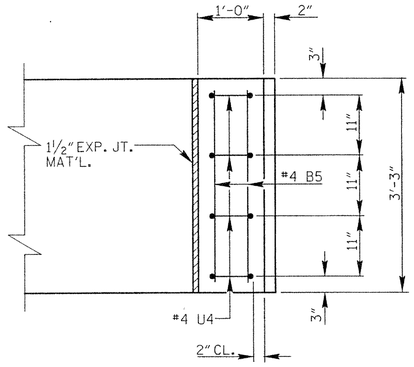
ALL DIMENSIONS ARE OUT TO OUT



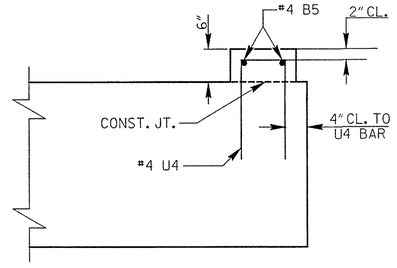
BILL OF MATERIAL FOR EACH BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	51'-9"	1760
B2	8	9	STR.	49'-3"	1340
B3	4	7	STR.	48'-9"	399
B4	16	4	STR.	24'-11"	266
B5	28	4	STR.	2'-11"	55
D1	120	6	STR.	1'-6	270
S1	155	4	2	3'-8"	380
S2	87	4	3	7'-11"	460
S3	36	4	5	8'-7"	206
U1	18	4	4	7'-1"	85
U2	4	4	4	5'-9"	15
U3	6	4	4	5'-0"	20
U4	8	4	4	3'-6"	19
U5	2	9	4	10'-1"	69

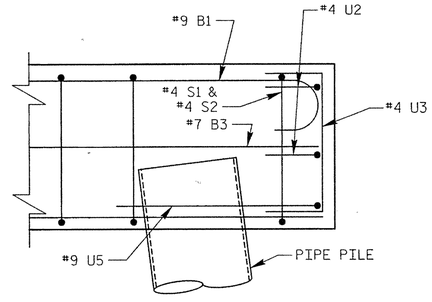
TOTAL REINFORCING STEEL (LB) -	5344
TOTAL CLASS A CONCRETE (CY)	33.4
PP 18x0.50 STEEL PILES	
BENT 1 No. = 18	1201 LF
BENT 2 No. = 18	1121 LF
BENT 3 No. = 18	1280 LF
CONCRETE BREAKDOWN BY POURS	
POUR 1 - (PIPE PILE PLUGS)	CY 5.4
POUR 2 - (CAP)	CY 27.9
POUR 3 - (LATERAL GUIDE)	CY 0.1
TOTAL CONCRETE	CY 33.4



PLAN



ELEVATION



DETAIL B

LATERAL GUIDE DETAIL

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI
1-6-05

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS 1, 2 & 3

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

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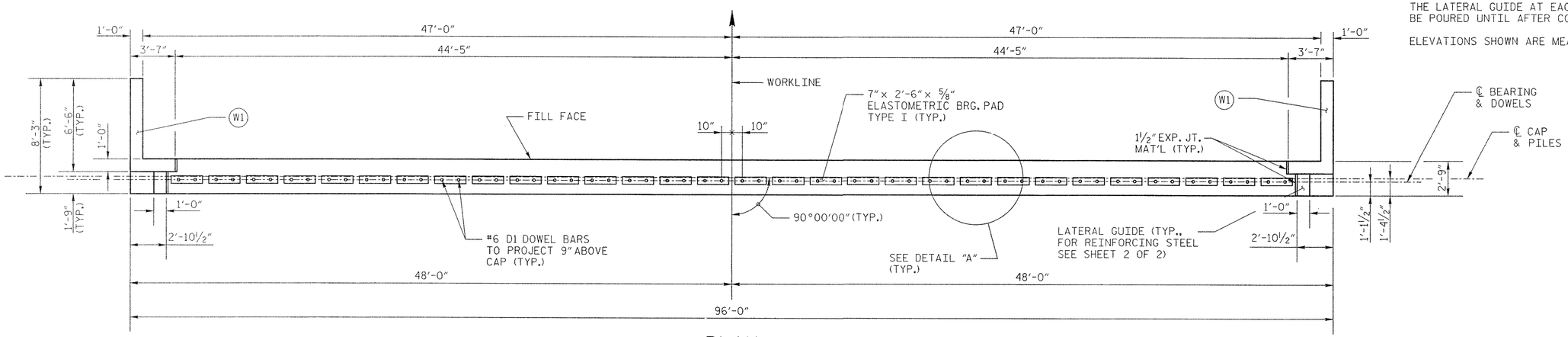
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

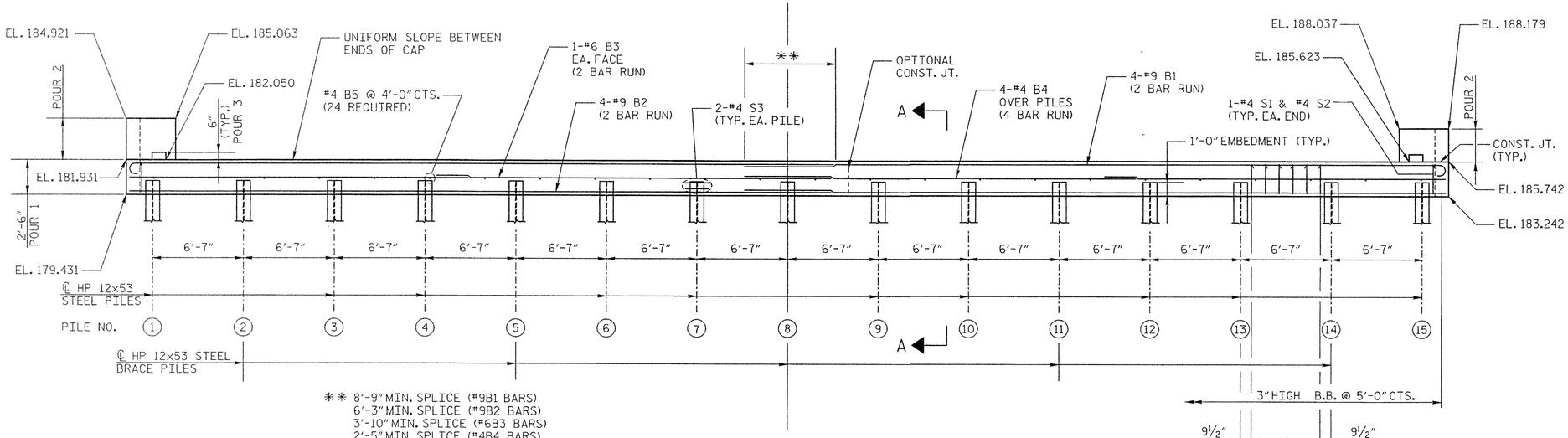
FOR TEMPORARY DRAINAGE AT END BENT 2, SEE END BENT 1, SHEET 2 OF 2.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

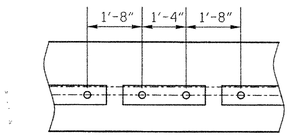
ELEVATIONS SHOWN ARE MEASURED AT THE FILL FACE.



PLAN



** 8'-9" MIN. SPLICE (#9B1 BARS)
6'-3" MIN. SPLICE (#9B2 BARS)
3'-10" MIN. SPLICE (#6B3 BARS)
2'-5" MIN. SPLICE (#4B4 BARS)



DETAIL "A"

TOP OF PILE ELEVATIONS															
PILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
EL.	180.507	180.768	181.030	181.291	181.553	181.814	182.075	182.337	182.598	182.859	183.121	183.382	183.643	183.905	184.166

ELEVATION

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

R:\U-3311B\Structures\CADD\U3311B_SD_E2a_01.DGN

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

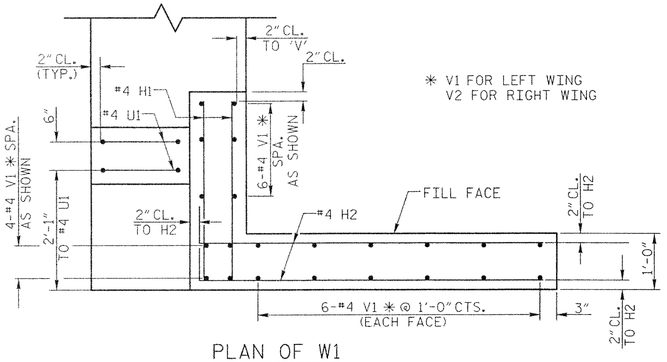
NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI
1-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

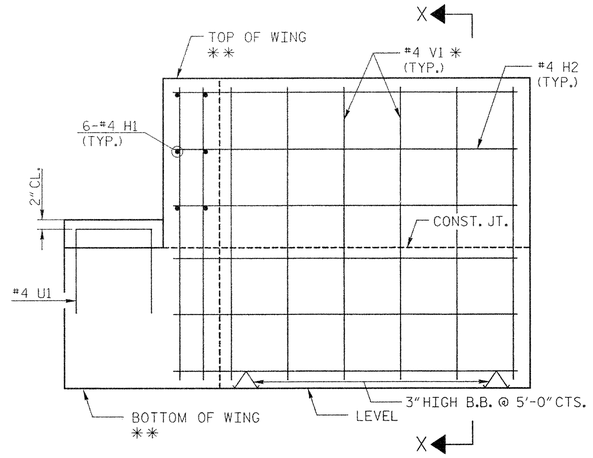
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			



* V1 FOR LEFT WING
V2 FOR RIGHT WING

PLAN OF W1

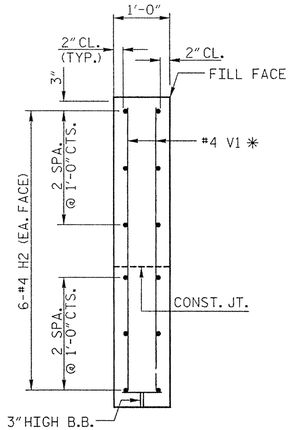
(LEFT WING SHOWN, RIGHT WING SIMILAR)



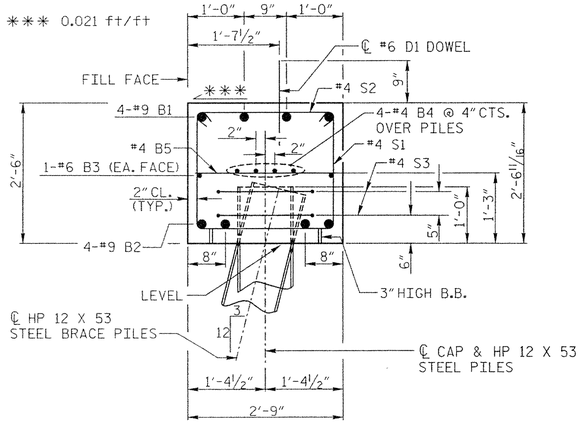
ELEVATION W1

(LEFT WING SHOWN, RIGHT WING SIMILAR)

** SEE SHEET 1 OF 2 FOR TOP AND BOTTOM OF WING ELEVATIONS.

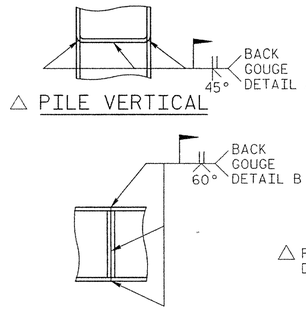


SECTION X-X



SECTION A-A

AHEAD STATION

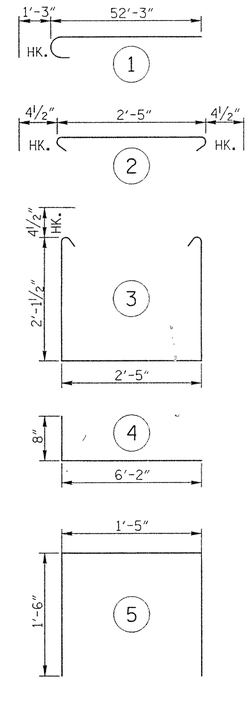


PILE SPLICE DETAILS

EB #2 PILE DATA

PILE #	LENGTH
1	71'
2	70' 10"
3	70'
4	70' 5"
5	68' 9"
6	67' 8"
7	67' 7"
8	69' 4"
9	69'
10	68' 4"
11	65'
12	69' 10"
13	70' 4"
14	68' 11"
15	67' 9"
Total:	1,034' 9"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	53'-6"	1455
B2	8	#9	STR.	51'-0"	1387
B3	4	#6	STR.	49'-9"	299
B4	16	#4	STR.	25'-9"	275
B5	24	#4	STR.	2'-5"	39
D1	60	#6	STR.	1'-6"	135
H1	12	#4	STR.	3'-3"	26
H2	24	#4	4	6'-10"	110
S1	86	#4	3	7'-5"	426
S2	86	#4	5	3'-2"	182
S3	30	#4	6	6'-6"	130
U1	4	#4	5	4'-5"	12
V1	22	#4	STR.	5'-7"	75
V2	22	#4	STR.	4'-6	66
REINFORCING STEEL				LBS.	4617
CLASS 'A' CONCRETE					
POUR 1				CU. YDS.	25.5
POUR 2				CU. YDS.	1.8
POUR 3				CU. YDS.	0.1
TOTAL				CU. YDS.	27.4
HP 12 X 53 STEEL PILES					
NO. 15				LIN. FT.	1005

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1600 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI
7-605

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

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

DRAWN BY: A. ABERNATHY DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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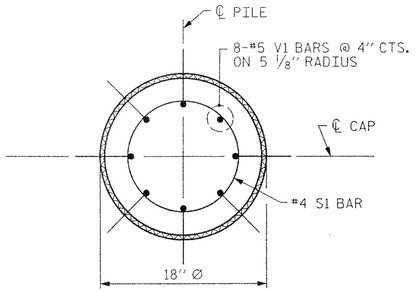
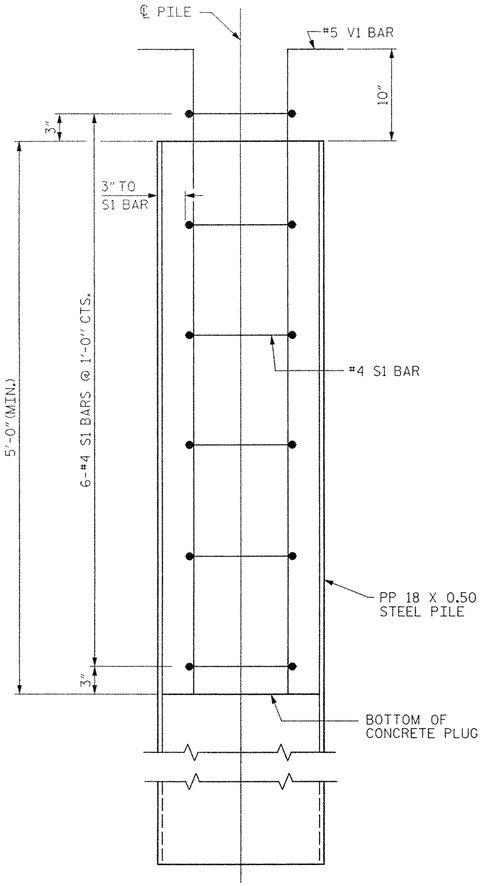


PLAN



ELEVATION

PP 18 X 0.50 STEEL PILE

(OPEN END)

ASSEMBLED BY : C. HARNDEN		DATE : 05/05	
CHECKED BY : D. COLETTI		DATE : 05/05	
DRAWN BY : RWW 1/01	REV. 7/10/01	RWW/LES	
CHECKED BY : LES 1/01	REV. 5/7/03	RWW/JTE	

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NOTES

STEEL PILES SHALL MEET THE REQUIREMENTS OF ASTM A252 GRADE 2 AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE DRIVING PLATE, IF REQUIRED, MAY BE GALVANIZED.

THE CONCRETE IN THE PLUG SHALL BE CLASS A CONCRETE.

STEEL PILES SHALL BE EXAMINED FOR DAMAGE OR COLLAPSE AFTER BEING DRIVEN AND PRIOR TO PLACING REINFORCING STEEL AND CONCRETE IN THE TOP OF THE PILE. REJECTED PILES SHALL BE REMOVED OR THE CONTRACTOR SHALL SUBMIT A PROPOSAL TO REPAIR THE PILE.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1. A MAXIMUM OF 2 PILE SPLICES PER PILE IS ALLOWED.

THE CONTRACTOR WILL NOT BE REQUIRED TO REMOVE THE SOIL FROM WITHIN THE PILES AFTER DRIVING UNLESS IT IS NECESSARY TO OBTAIN THE MINIMUM CONCRETE PLUG.

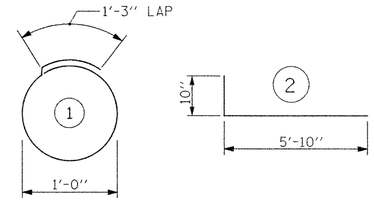
THE PILES SHALL BE DEWATERED TO THE SATISFACTION OF THE ENGINEER TO THE EXTENT NECESSARY TO OBTAIN THE MINIMUM CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

THE CONCRETE PLUG WITHIN THE PILES SHALL BE FORMED SUCH THAT NO MOVEMENT OF THE REINFORCING STEEL OR CONCRETE OCCURS EITHER DURING OR AFTER THE CONCRETE PLACEMENT. THE CONCRETE PLUG SHALL BE CAST AND SHALL OBTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI PRIOR TO PLACING THE CONCRETE IN THE BENT CAP.

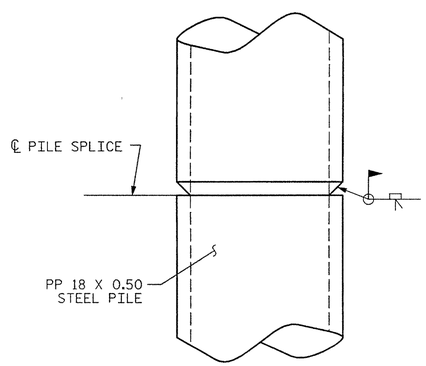
BILL OF MATERIAL FOR ONE PP 18 X 0.50 STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =					74 lbs
CLASS A CONCRETE					
5'-0" MINIMUM PLUG					0.3 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029589 DOMENIC A. COLETTI
1-6-05

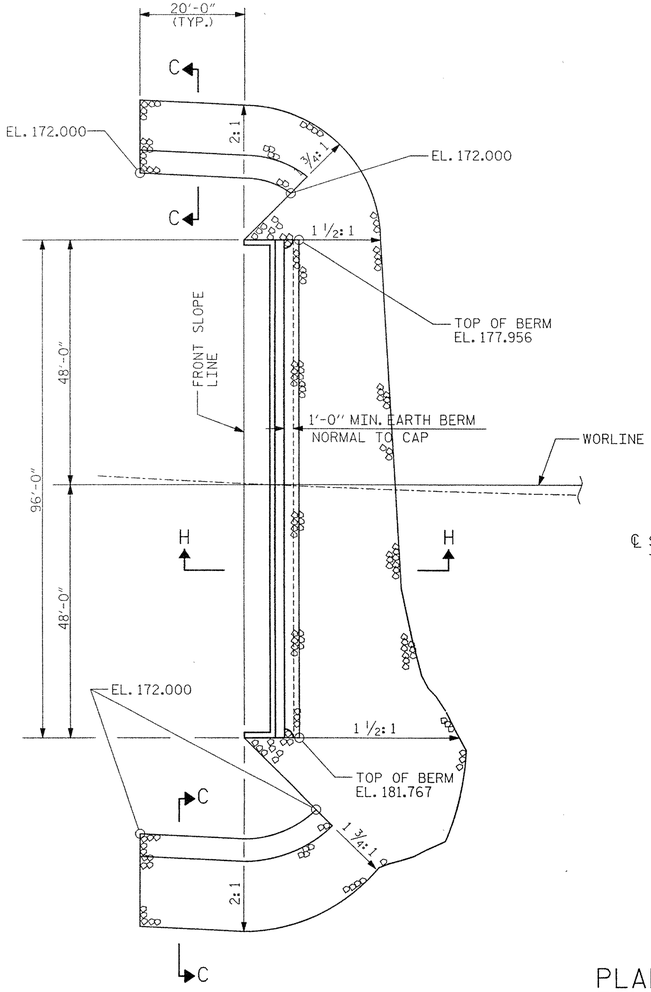
PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-

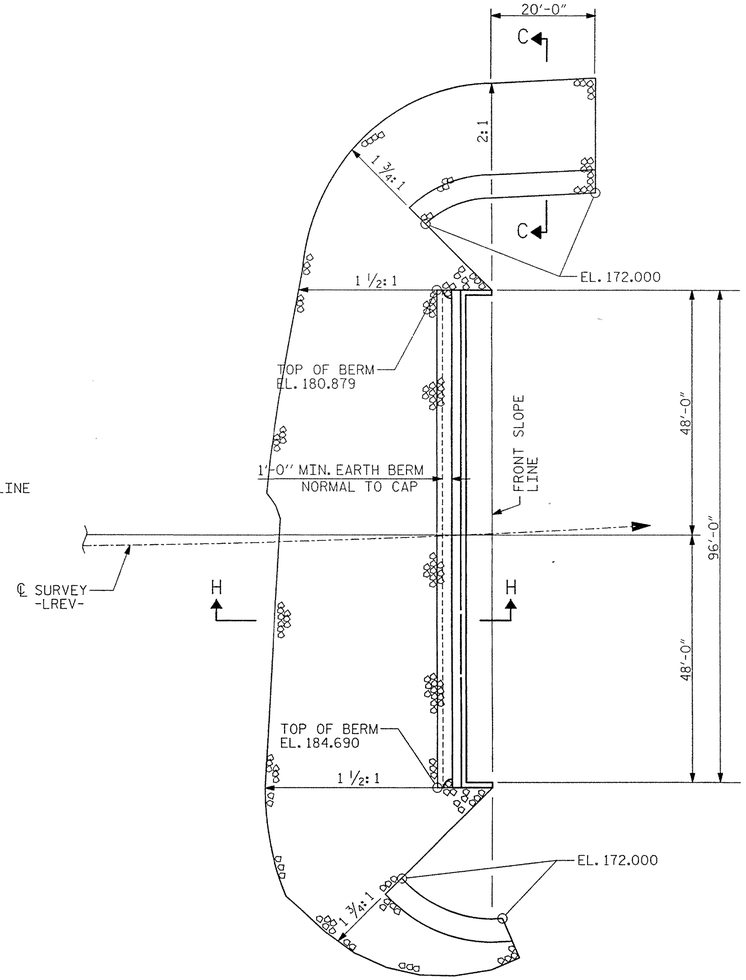
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
18" STEEL PIPE PILE

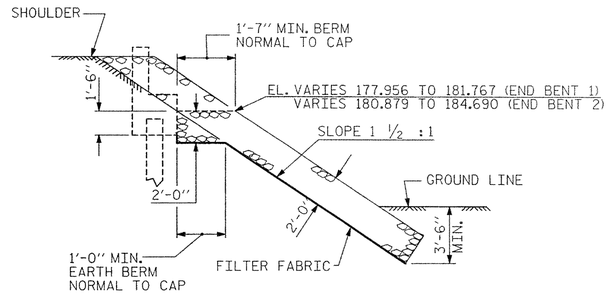
REVISIONS						SHEET NO. 24
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			
2			4			

STD. NO. SPP1

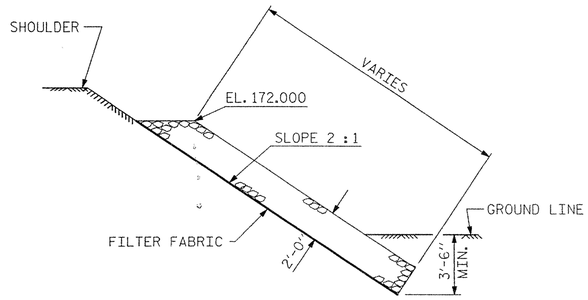




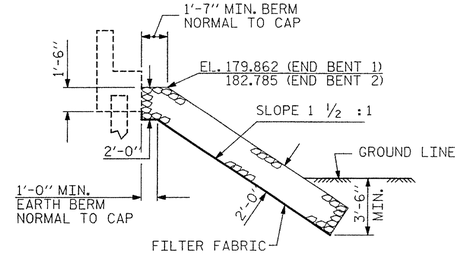
PLAN



SECTION H-H



SECTION C-C



℄ SECTION

BERM RIP RAPPED

NOTE

IN SEVERAL LOCATIONS THE LIMITS OF THE RIP RAP ARE IN CLOSE PROXIMITY TO THE HIGH QUALITY WETLAND BOUNDARIES, CARE SHALL BE TAKEN TO AVOID CONSTRUCTION ACTIVITY IN THE HIGH QUALITY WETLAND.

ESTIMATED QUANTITIES		
	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	758	842
END BENT 2	1032	1147

PROJECT SUBMITTED BY:

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128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMENIC A. COLETTI
7-6-05

PROJECT NO. U-3311B
CUMBERLAND COUNTY
STATION: 121+24.78 -LREV-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05	
CHECKED BY : D. COLETTI		DATE : 5/9/05	
DRAWN BY : JMB 1/88	REV. 8/16/99		RWW/LES
CHECKED BY : GGH 1/88	REV. 10/17/00		RWW/LES
	REV. 5/7/03		RWW/JTE

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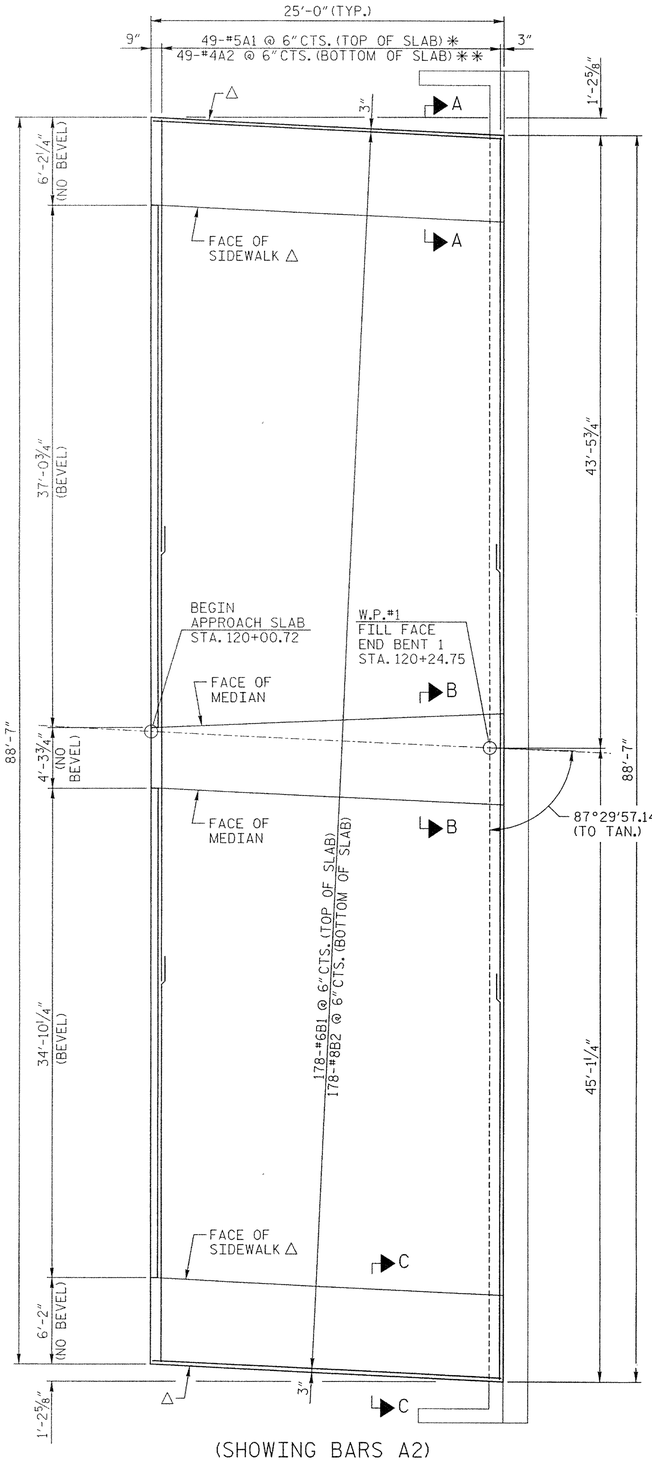
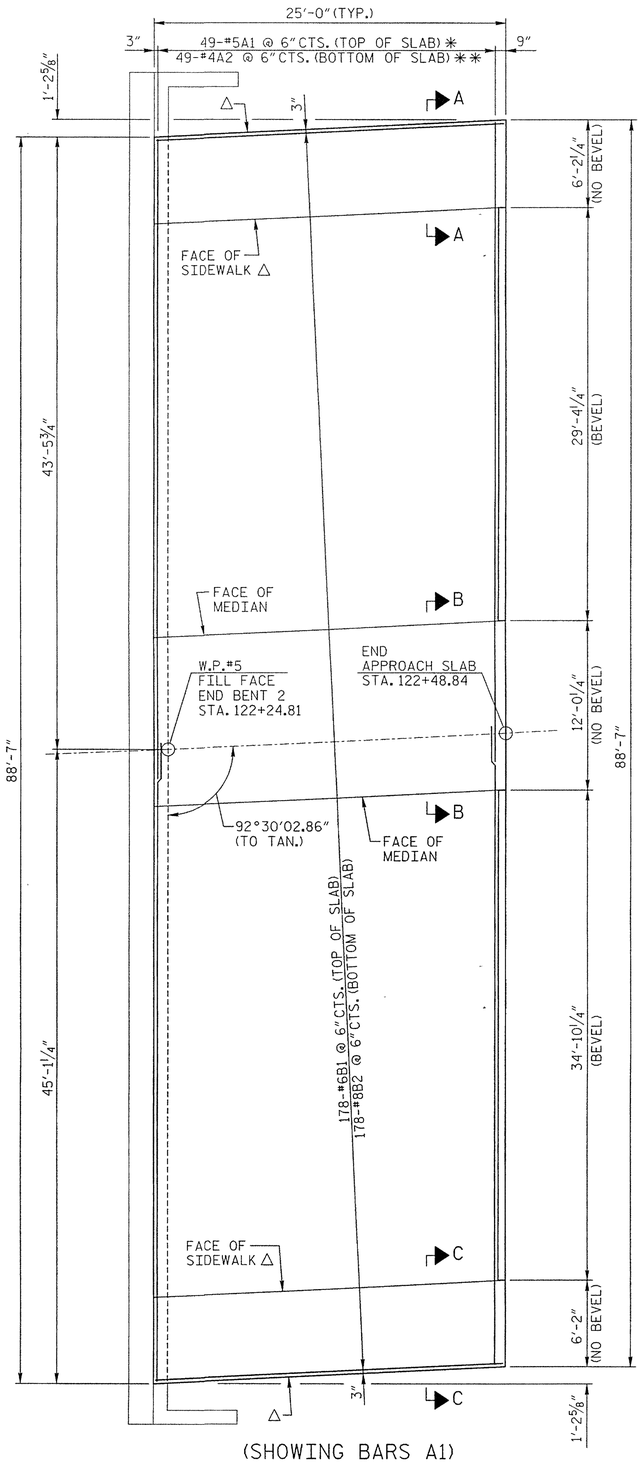
STD. NO. RR2



(SHOWING BARS A2)



(SHOWING BARS A1)

PLAN

✱ = 2 BAR RUN

✱✱ = 4 BAR RUN

△ = PERMISSIBLE TO FORM EDGES OF APPROACH SLAB, FACES OF SIDEWALKS, AND BACKS OF SIDEWALKS TO CHORD LINES.

SPLICE LENGTHS	
#5A1	2'-6"
#5A2	1'-9"

BILL OF MATERIAL
FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	98	#5	STR	45'-5"	4642
A2	196	#4	STR	23'-5"	3066
✱B1	178	#6	STR	24'-3"	6483
B2	178	#8	STR	24'-8"	11,723
REINFORCING STEEL				LBS.	14,789
✱EPOXY COATED REINFORCING STEEL				LBS.	11,125
CLASS AA CONCRETE				C.Y.	86.5

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE SEALED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

CONCRETE AND REINFORCING FOR MEDIAN AND SIDEWALK ARE NOT INCLUDED IN THE BILL OF MATERIALS ON THIS SHEET.

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI 7-6-05

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 1 OF 2

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB

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

DRAWN BY: D. CHAPMAN DATE: 05/05
CHECKED BY: D. COLETTI DATE: 05/05

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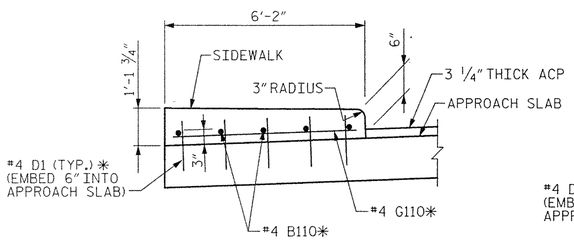
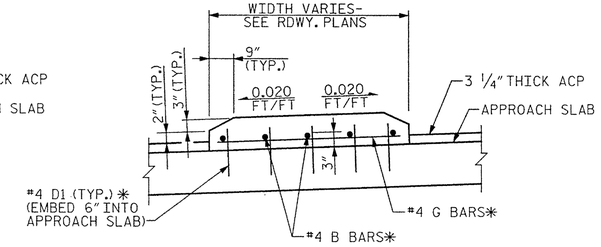
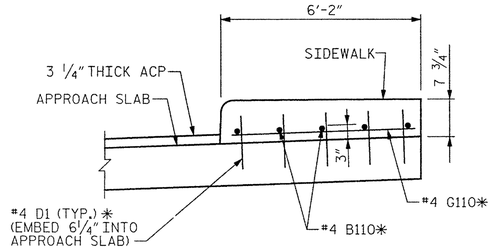


SECTION A-A

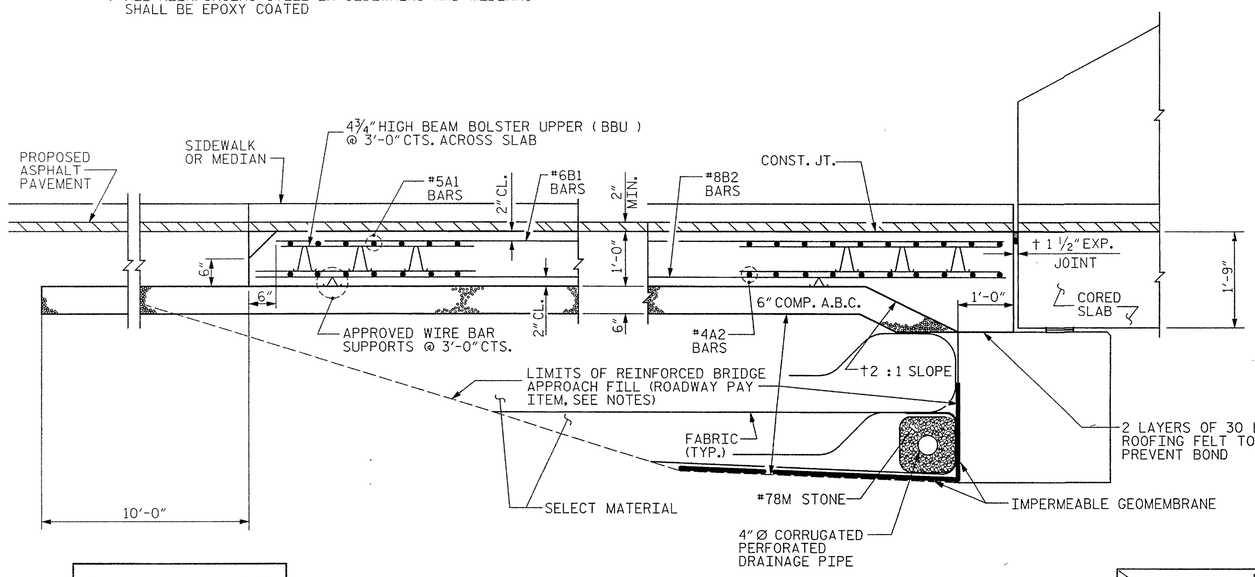


SECTION B-B



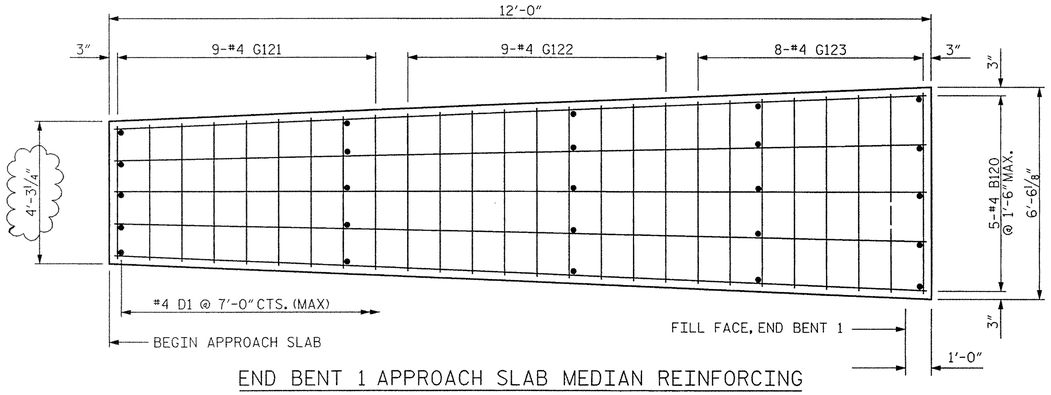
SECTION C-C

* ALL REINFORCING STEEL IN SIDEWALKS AND MEDIANS SHALL BE EPOXY COATED



† NORMAL TO END BENT

SECTION THRU SLAB



END BENT 1 APPROACH SLAB MEDIAN REINFORCING

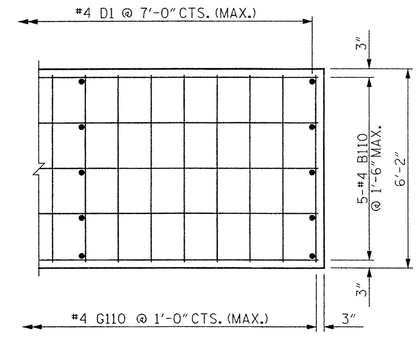
BILL OF MATERIAL
SIDEWALKS & MEDIANS
ON APPROACH SLABS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B110	20	#4	STR	24'-8"	330
* B120	5	#4	STR	24'-8"	82
* B220	9	#4	STR	24'-8"	148
* G110	104	#4	STR	5'-10"	405
* G121	9	#4	STR	3'-11"	24
* G122	9	#4	STR	4'-8"	28
* G123	8	#4	STR	5'-5"	29
* D1	170	#4	STR	1'- 0"	114
* G220	26	#4	STR	11'- 8"	203
* EPOXY COATED REINFORCING STEEL				LBS.	1363
CLASS 'AA' CONCRETE				CU. YDS.	30.1

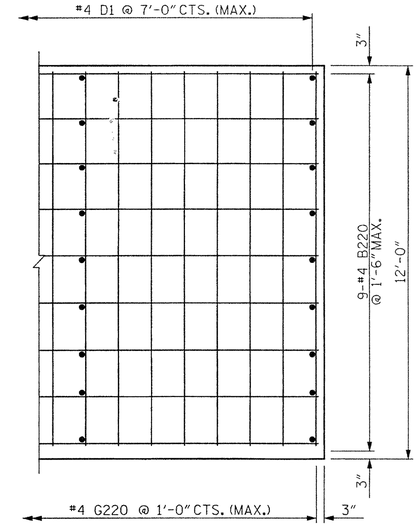
NOTES

G121, G122, & G123 SHALL BE SPACED AT 1'-6" MAX CTS.

G121, G122, & G123 SHALL BE CENTERED WITHIN THE MEDIAN WIDTH. MIN END COVER = 2", MAX END COVER = 6".



TYPICAL APPROACH SLAB SIDEWALK REINFORCING



END BENT 2 APPROACH SLAB MEDIAN REINFORCING

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

SHEET 2 OF 2

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA PROFESSIONAL 029589 ENGINEER DOMINIC A. COLETTI
9-2-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	27
1	DAC	9-2-05	3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : D. CHAPMAN		DATE : 5/9/05
CHECKED BY : D. COLETTI		DATE : 5/9/05
DRAWN BY : JMB	1/88	REV. 8/16/99 RWW/LES
CHECKED BY : GGH	1/88	REV. 10/17/00 RWW/LES
		REV. 5/7/03 RWW/JTE

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STD. NO. SN

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

PROJECT NO. U-3311B

CUMBERLAND COUNTY

STATION: 121+24.78 -LREV-

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DRAWN BY: D. CHAPMAN DATE: 05/05

CHECKED BY: D. COLETTI DATE: 05/05

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE
REV. 8-16-99 RWW (W) LES

ENGLISH

JANUARY, 1990

PROJECT SUBMITTED BY:

HDR Engineering, Inc. of the Carolinas
128 South Tryon Street, Suite 1400 Charlotte, N.C. 28202

BARNHILL CONTRACTING COMPANY
231 North Main Street Tarboro, NC 27886

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER 029589 DONNA A. COLETTI
1-6-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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

STD NO. SN