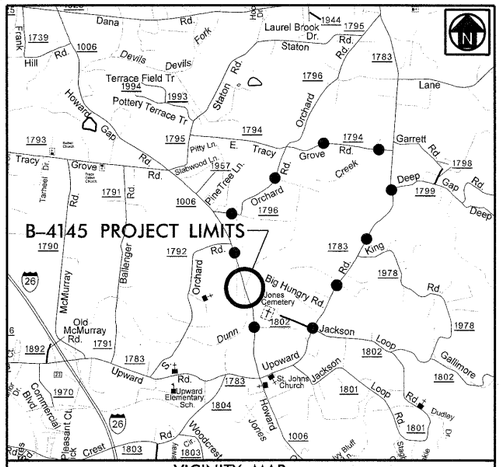
CONTRACT NO.: DO00066 TIP: B-4145



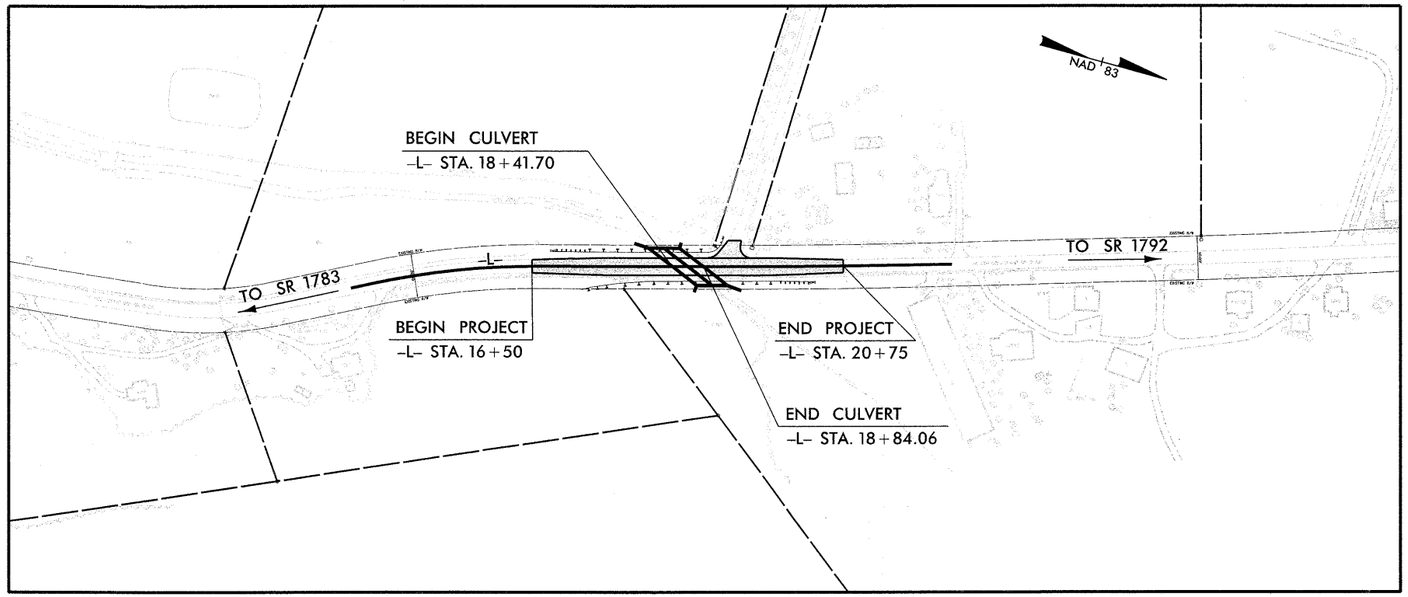
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
HENDERSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4145	1	

STATE PROJECT NO.	F. A. PROJ. NO.	DESCRIPTION
33494.1.1		P.E.
33494.1.1		R/W & UTILITIES
33494.3.1		CONST

LOCATION: BRIDGE NO. 56 ON SR 1006 OVER N. BRANCH HUNGRY CREEK (DUNN CREEK)

TYPE OF WORK: BRIDGE REPLACEMENT WITH REINFORCED CONCRETE BOX CULVERT AND ROADWAY APPROACHES



LOCATION SKETCH

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2006 = 2000

ADT 2025 = 3600

V = 60 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.072 MILE

LENGTH STRUCTURE TIP PROJECT = 0.008 MILE

TOTAL LENGTH TIP PROJECT = 0.080 MILE

BRIDGE MANAGEMENT UNIT

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

LETTING DATE: 6/24/2010

DAN HOLDERMAN, PE
STATE BRIDGE MANAGEMENT ENGINEER

NCDOT CONTACT: MIKE SUMMERS
BRIDGE MANAGEMENT PROJECT MANAGER

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON JR.
5-18-10

DAVID B. SIMPSON, JR., PE
DESIGN ENGINEER

Prepared in the Office of:

SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

GIBSON ENGINEERS, PC
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.gibsonengineers.com

5/18/2010
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PROJECT REFERENCE	SHEET NO.
33494[illegible].1	2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Prepared in the Office of: GIBSON ENGINEERS, PC

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-18-06

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

GUARDRAIL:

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

SUBSURFACE PLANS:

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

UTILITIES:

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

APPROXIMATE GUARDRAIL LENGTH				
STATION	LOCATION	STATION	LOCATION	LENGTH
-L- 17+17.34 +/-	RT	-L- 20+36.53 +/-	RT	319.19'
-L- 16+75.00 +/-	LT	-L- 19+12.00 +/-	LT	250.00'
		SUBTOTAL		569.19'
		ANCHOR DEDUCTIONS		106.25'
		TOTAL		462.94'
		SAY		475'

ANCHOR DEDUCTIONS		
GRAU-350	2 X 50'	100'
AT-1	1 X 6.25'	6.25'
TOTAL ANCHOR DEDUCTIONS		106.25'

EFF. 07-18-06
REV. 01-02-07

2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units

mpekarek
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HENDERSON COUNTY (BRIDGE #56) B–4145

PROJECT REFERENCE	SHEET NO.
334943.1	3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK

4/10/07

HYDRAULICS ENGINEER

Prepared in the Office of: GIBSON ENGINEERS, PC

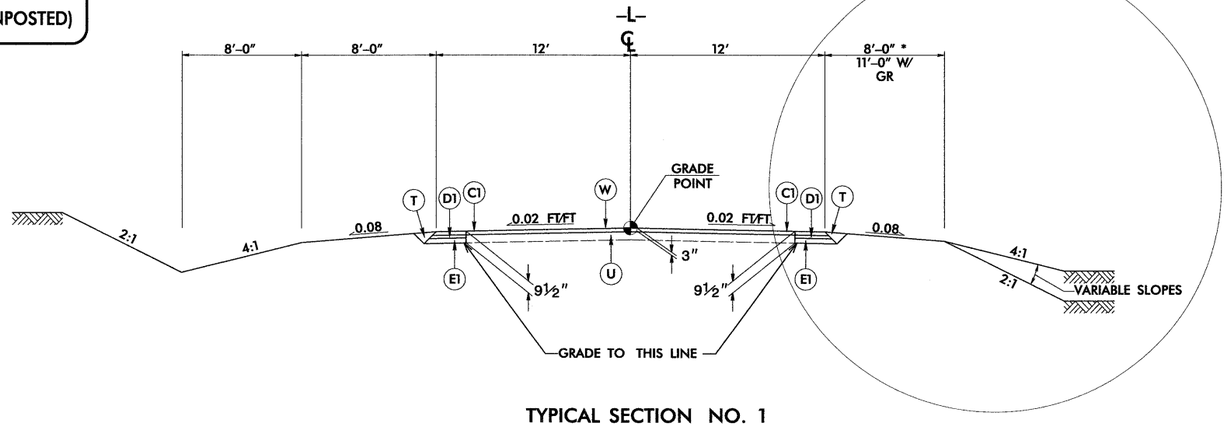
DESIGN DATA

ADT 2006 = 2000

ADT 2025 = 3600

V (PROPOSED) = 60 MPH

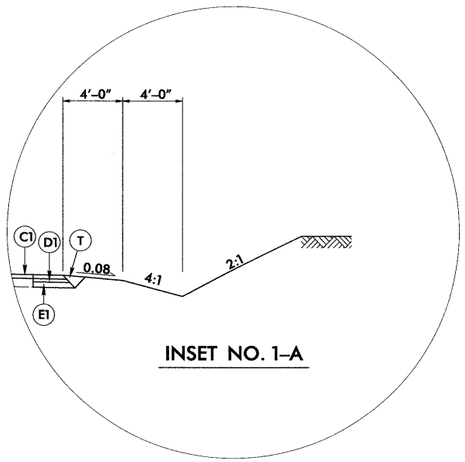
V (EXISTING) = 55 MPH (UNPOSTED)



TYPICAL SECTION NO. 1

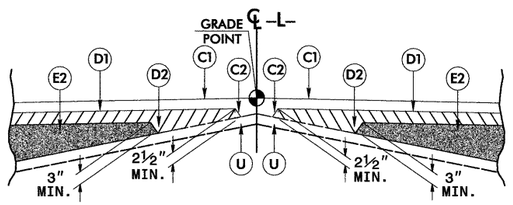
USE TYPICAL SECTION NO. 1:
–L– STA 16+50.00 TO 20+75.00

NOTES: * SEE INSET 1–A FOR RIGHT SIDE SHOULDER TRANSITION
FOR VARIABLE SLOPES SEE CROSS SECTIONS.
SEE PLANS FOR TAPERS.

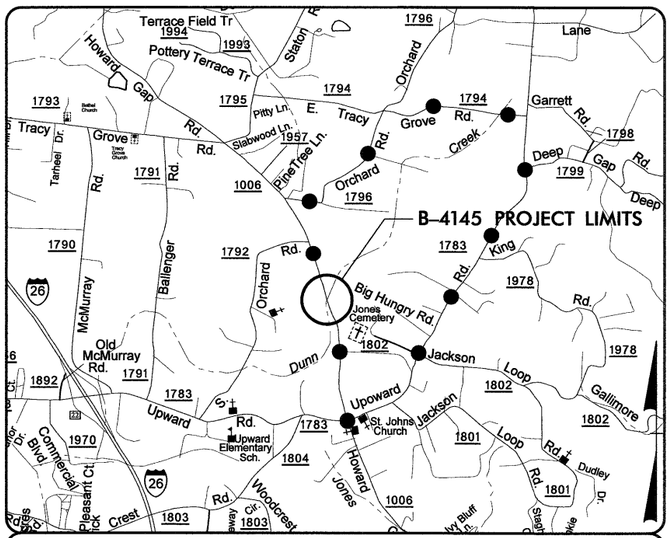


INSET NO. 1–A

USE INSET NO. 1–A:
–L– STA 16+50.00 TO 17+50.00
FROM –L– STA 17+50.00 TO 18+06.00 RIGHT
TRANSITION RIGHT SHOULDER AND DITCH WIDTH
FROM INSET NO. 1–A TO TYPICAL SECTION NO. 1



DETAIL SHOWING METHOD OF WEDGING
USE IN CONJUCTION WITH TYPICAL SECTION NO. 1



VICINITY MAP
OFFSITE DETOUR ROUTE

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH.
D1	PROP. APPROX. 2½″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

mpekarek
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4/16/2007
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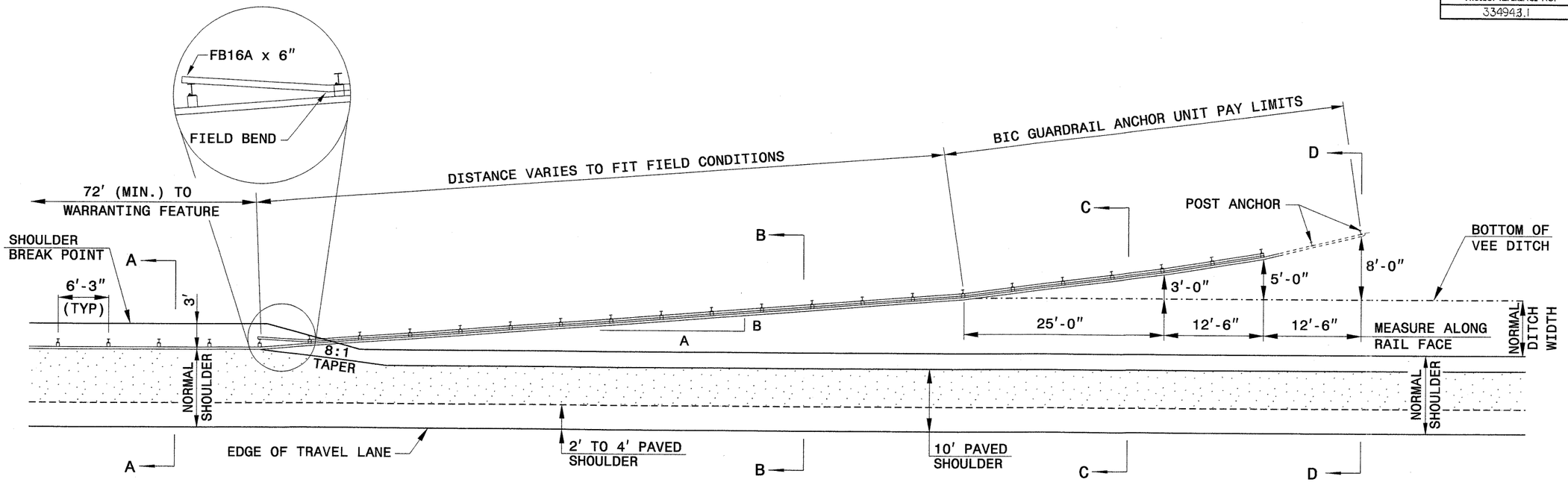
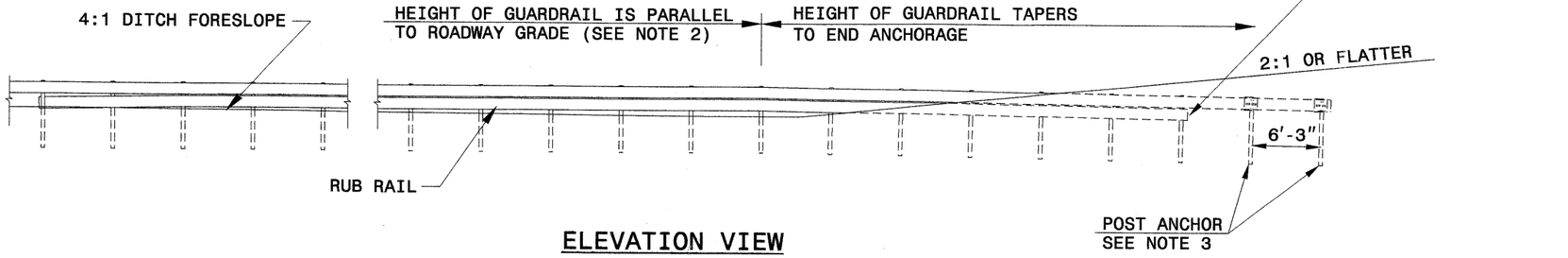
PROJECT REFERENCE NO.	SHEET NO.
33494.3.1	4

5/14/99

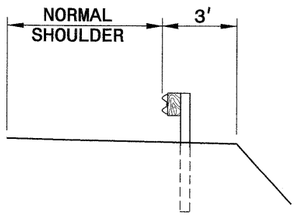


PLAN VIEW

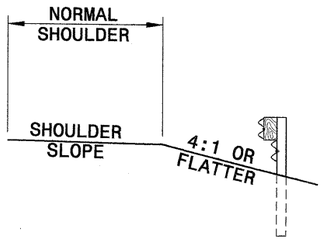
DESIGN SPEED mph	A:B
≥ 60	13:1
55	12:1
50	11:1
45	10:1
40	9:1
30 or less	7:1



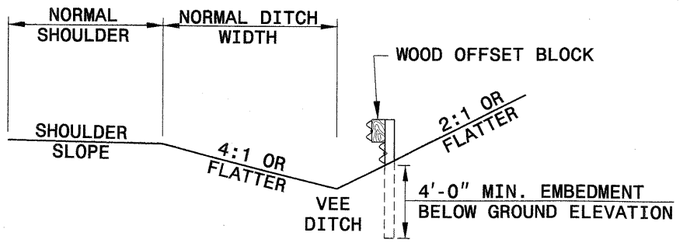
ELEVATION VIEW



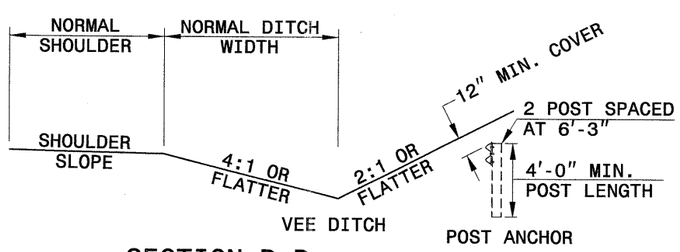
SECTION A-A



SECTION B-B
(WITH RUBRAIL)



SECTION C-C
(WITH RUBRAIL)



SECTION D-D

NOTES:

1. VARIABLE DITCH OFFSETS MAY BE USED TO FIT FIELD CONDITINS.
2. HEIGHT OF GUARDRAIL MAY BE TAPERED DOWN IN ELEVATION TO MAINTAIN 3'-9" MAXIMUM HEIGHT.
3. ALL POSTS ARE 8'-0" IN LENGTH FROM WHERE THE GUARDRAIL FLARES AWAY FROM THE SHOULDER BACK TO THE DITCH FLOW LINE. GUARDRAIL POSTS BEYOND THE DITCH FLOW LINE MAY BE SHORTENED AS LONG AS A MINIMUM OF 4 FT. EMBEDMENT REMAINS BELOW THE EXISTING GROUND LINE. POST FOR POST ANCHOR MAY BE REDUCED TO 4 FT., ALL OF WHICH WILL BE BELOW GROUND.
4. REFER TO NCDOT STANDARD DRAWINGS 862.02 FOR GUARDRAIL INSTALLATION NOT COVERED IN THIS DETAIL.
5. INSTALL GUARDRAIL IN ACCORDANCE NCDOT STANDARD SPECIFICATION 862
6. PAYMENT FOR ANY RUBRAIL INSTALLATION BEYOND BIC GUARDRAIL ANCHOR UNIT PAY LIMIITS WILL BE INCIDENTAL TO PAYMENT FOR BIC ANCHOR UNIT.

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

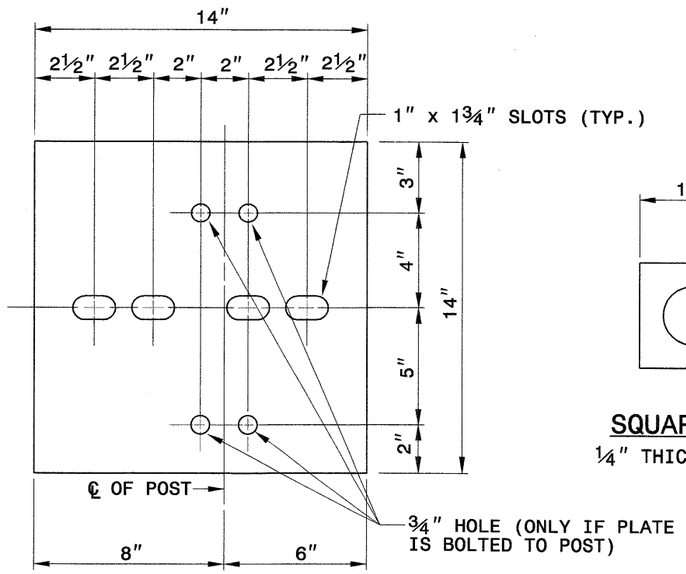
DETAIL OF GUARDRAIL BURIED IN CUT (BIC)

ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: E.E. WARD DATE: 12-7-01
CHECKED BY: [illegible] DATE: 12-01
FILE SPEC.: ericward/misc. guardrail/BIC.dgn

18-DEC-2000 08:43
W:\Special Details\ericward\Misc. guardrail\BIC\BICe.dgn
ericward RT DS18660

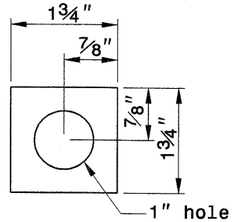
PROJECT REFERENCE NO.	SHEET NO.
33494 3.1	5

5/14/99



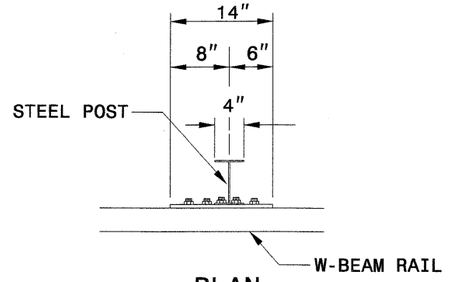
STEEL PLATE - ½"

GALVANIZED
WELDED OR BOLTED TO POST

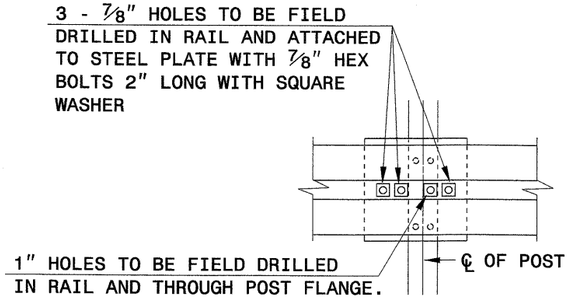


SQUARE WASHER

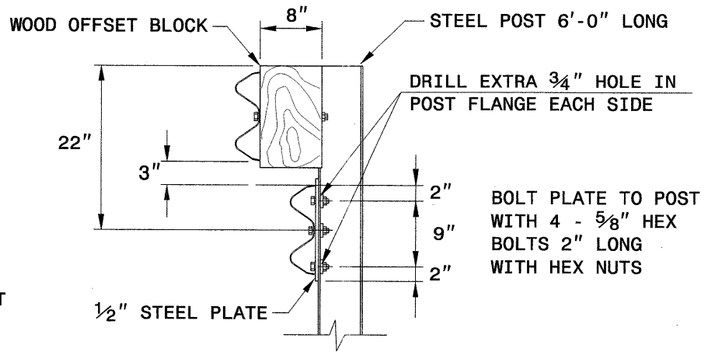
¼" THICK - GALVANIZED



PLAN

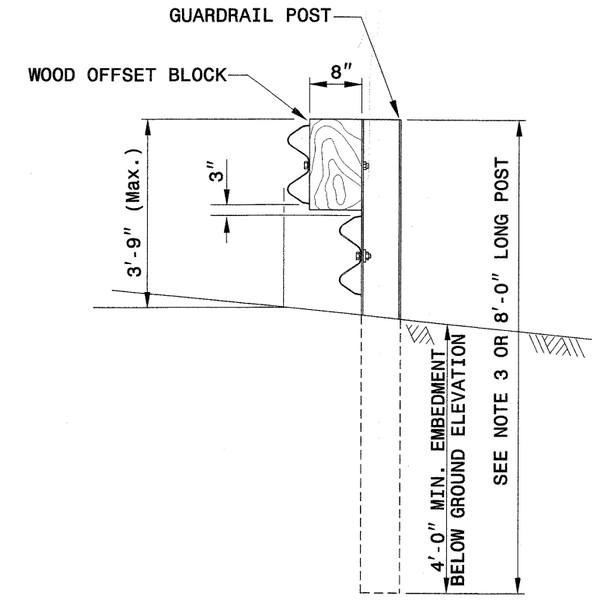


FRONT VIEW



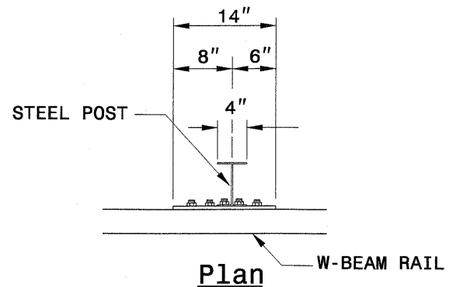
ELEVATION

RUBRAIL ANCHOR DETAILS

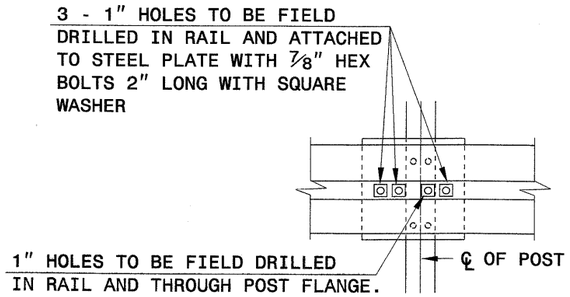


ELEVATION

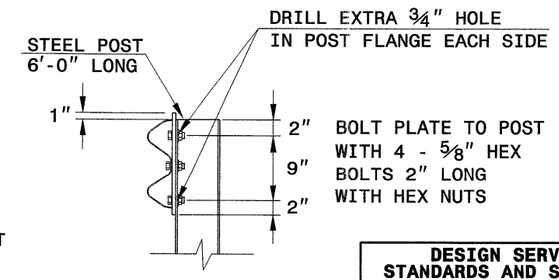
RAIL ATTACHMENT DETAIL



Plan



FRONT VIEW



ELEVATION

POST ANCHOR DETAILS

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF GUARDRAIL BURIED IN CUT (BIC)

ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: E.E. WARD DATE: 12-7-01
CHECKED BY: DATE:
FILE SPEC.: ericward/misc. guardrail/BIC.dgn

18-DEC-2001 08:43
W:\Special Details\ericward\Misc. guardrail\BIC\BICe.dgn
ericward AT 0510560

PROJECT REFERENCE	SHEET NO.
33494.3.1	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK
4/16/07

HYDRAULICS ENGINEER

Prepared in the Office of: GIBSON ENGINEERS, PC

VERTICAL SCALE 5' 0 5' 10'

HORIZONTAL SCALE 25' 0 25' 50'

NAD 83

-L-

PI Sta 15+44.10
Δ = 11° 58' 06.8" (RT)
D = 5° 12' 31.3"
L = 229.78'
T = 115.31'
R = 1100.00'
SE = SEE PLAN VIEW

PI Sta 20+11.00
Δ = 0° 51' 31.4" (LT)
D = 0° 31' 15.1"
L = 164.87'
T = 82.43'
R = 11,000.00'
SE = SEE PLAN VIEW

RONALD & BRENDA LIVESAY FAMILY TRUST
DB 1001 PG 249

RONALD & BRENDA LIVESAY FAMILY TRUST
DB 951 PG 345

RONALD & BRENDA LIVESAY FAMILY TRUST
DB 1001 PG 249

RICHARD HERMAN
DB 1161 PG 139

SHARON JACKSON
DB 1045 PG 545

MAE THOMPSON
DB 331 PG 499

RUTH CHILEN
DB 444 PG 237

-BL- 1 POT 5+00.00

-BL- 2 7+49.72 PINC

-L- STA 15+56.28 OFF 18.90'
-BL- 3 10+68.15 PINC

POT Sta. 14+00.00

PC Sta. 14+28.29

PT Sta. 16+58.57

PC Sta. 19+28.57

PT Sta. 20+93.43

POT Sta. 22+23.43

-BL- 5 19+03.94 POT

-L- STA 19+17.59 OFF 12.82'
-BL- 4 14+32.05 PINC

BEGIN CULVERT
STA 18+41.70

END CULVERT
STA 18+84.06

BEGIN PROJECT B-4145
-L- POT STA 16+50.00

END PROJECT B-4145
-L- POT STA 20+75.00

100' TAPER

LATERAL 'V' DITCH
SEE DETAIL A
EST 40 CY DDE

SEE CROSS SECTION AND DETAIL FOR CONSTRUCTION OF BIC GUARDRAIL

BM #1
-BL- STA 7+09.60
55.40' RIGHT
ELEV. 2146.81

BM #2
-BL- STA 13+37.26
32.26' RIGHT
ELEV. 2148.05

BM #3
-BL- STA 17+98.11
19.80' RIGHT
ELEV. 2151.50

N 27° 23' 20.0" W

N 15° 25' 13.2" W

N 16° 16' 44.6" W

S 23° 59' 35" E
609.09'

SR 1006 HOWARD GAP RD. (8' BST

SR 1005 HOWARD GAP RD. (8' BST

POND

DUNN CREEK

MTL RAILING

ELECTRONIC MTL GATE

SEPTIC

DRAIN FIELD

WOODS

ISFD

GR

EIP

DETAIL A

LATERAL 'V' DITCH
(Not to Scale)

-L- STA. 18+50 LT. +/- TO STA. 20+75 LT. +/-

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "I-4400 BL-47" WITH STATE PLANE GRID COORDINATES OF NORTHING: 604761.298(ft) EASTING: 968222.385(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977884 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "I-4400 BL-47" TO -L- 16+50.00 IS S 43° 40' 54.6" E DISTANCE 305043.1' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAD 88

-L-

PI = 18+60.00
EL = 2,139.63'
VC = 420'
K = 143

(-)1.1810%

(+)1.7581%

BEGIN CULVERT
STA = 18+41.70

END CULVERT
STA = 18+84.06

BEGIN GRADE
STA = 16+50.00
ELE = 2,142.11

END GRADE
STA = 20+75.00
ELE = 2,143.41

2,150
2,140
2,130
2,120
2,110
2,100

10 11 12 13 14 15 16 17 18 19 20 21 22

BENCH MARKS

BM 1: 8" SPIKE IN BASE OF 18" PINE STUMP
-BL- STA 7+09.60 RIGHT 55.40'
NOT ON CHAIN -L-
N = 582287.4760 E = 989499.8140
EL = 2146.81'

BM 2: 8" SPIKE IN BASE OF A 18" RED OAK
-BL- STA 13+37.26 RIGHT 32.26'
-L- STA 18+20.67 RIGHT 37.98'
N = 582875.6190 E = 989281.4820
EL = 2148.05'

BM 3: 8" SPIKE IN ROOT OF 24" PINE TREE
-BL- Sta 17+98.11 RIGHT 19.80'
NOT ON CHAIN -L-
N = 583319.0160 E = 989146.7130
EL = 2151.50'

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 650	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 2136.67	FT
BASE DISCHARGE	= 800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2137.27	FT
OVERTOPPING DISCHARGE	= 1750	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2140.87	FT
DATE OF SURVEY	= 2-3-2004	
W.S. ELEVATION AT DATE OF SURVEY	= 2132.57	FT

4/16/2007
5:56:35 PM
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mpekarek

PROJ. REFERENCE NO.	SHEET NO.
334943.1	7
HENDERSON #56	

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2210 2200 2190 2180 2170 2160 2150 2140 2130

A=1 EXIST EXIST 4=1

2141.86

16+50.00

2142.52

16+00.00

-L-

Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the contract lump sum price for "Grdding".

mpekarek
r:\roadway\xsc\xpl\b4145_rdy_xpl_1.dgn
4/16/2007
3:10:07 PM

PROJ. REFERENCE NO.	SHEET NO.
33494**3**.1	8
HENDERSON #56	

0 5 10

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2200 2190 2180 2170 2160 2150 2140 2130

4' 4' 2:1 4:1 3 0.0200 0.0200 2140.83 2139.72

17+50.00

2200 2190 2180 2170 2160 2150 2140 2130

4:1 3 0.0192 0.0192 2140.12 4' 4' 4:1 2:1 2140.23

17+00.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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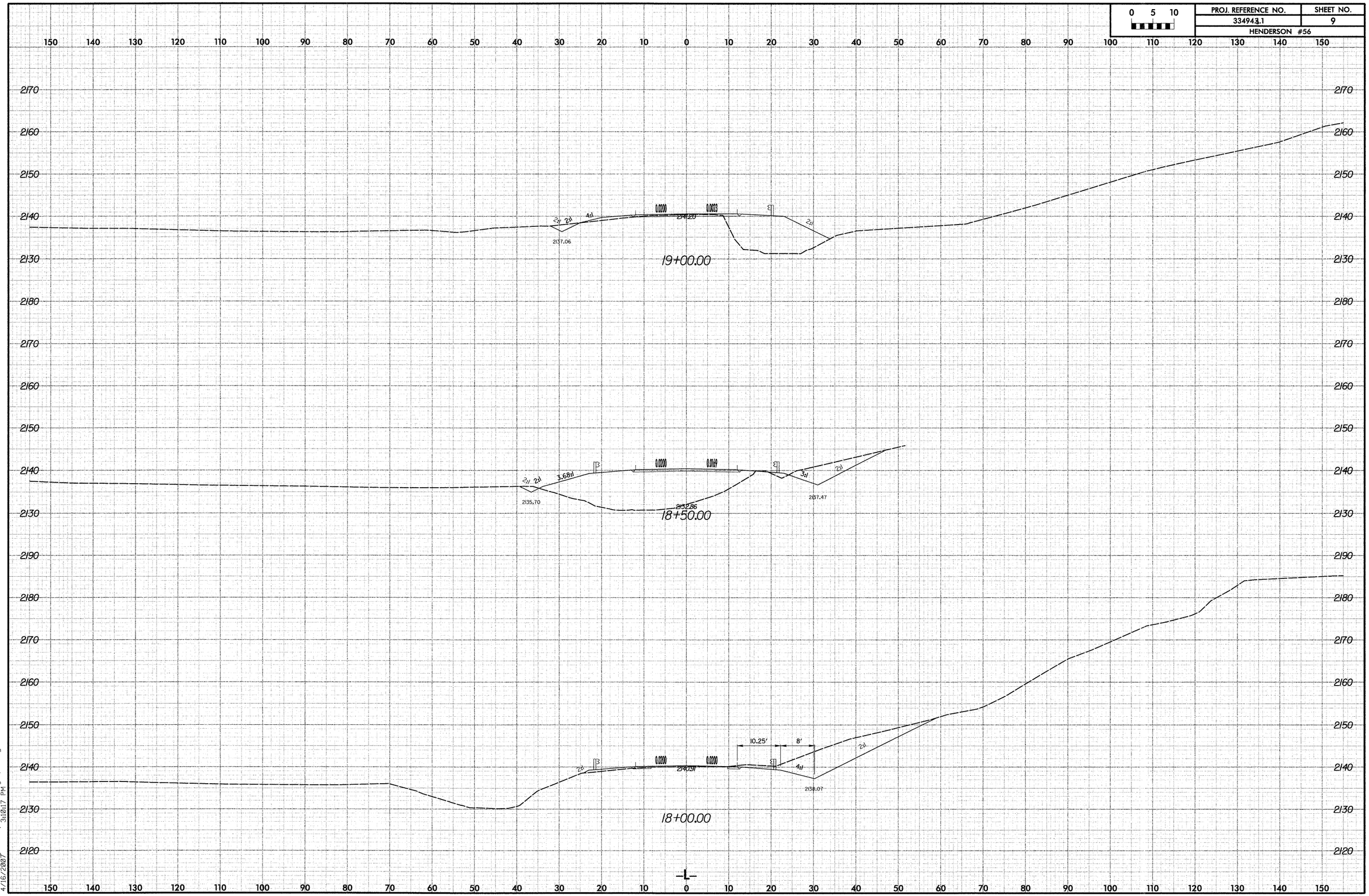
334943.1	9
HENDERSON #56	

0 5 10



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PROJ. REFERENCE NO.	SHEET NO.
33494(3.1	10
HENDERSON #56	

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2150
2140
2130

21+00.00

214372

20+50.00

2138.86
214264
0.0302
0.0197
4:1
2:1
2:1

20+00.00

2137.36
214131
0.0200
0.0200
4:1
2:1
2:1

19+50.00

2137.21
214139
0.0200
0.0200
4:1
2:1
2:1
3:1

-L-

mpekarek
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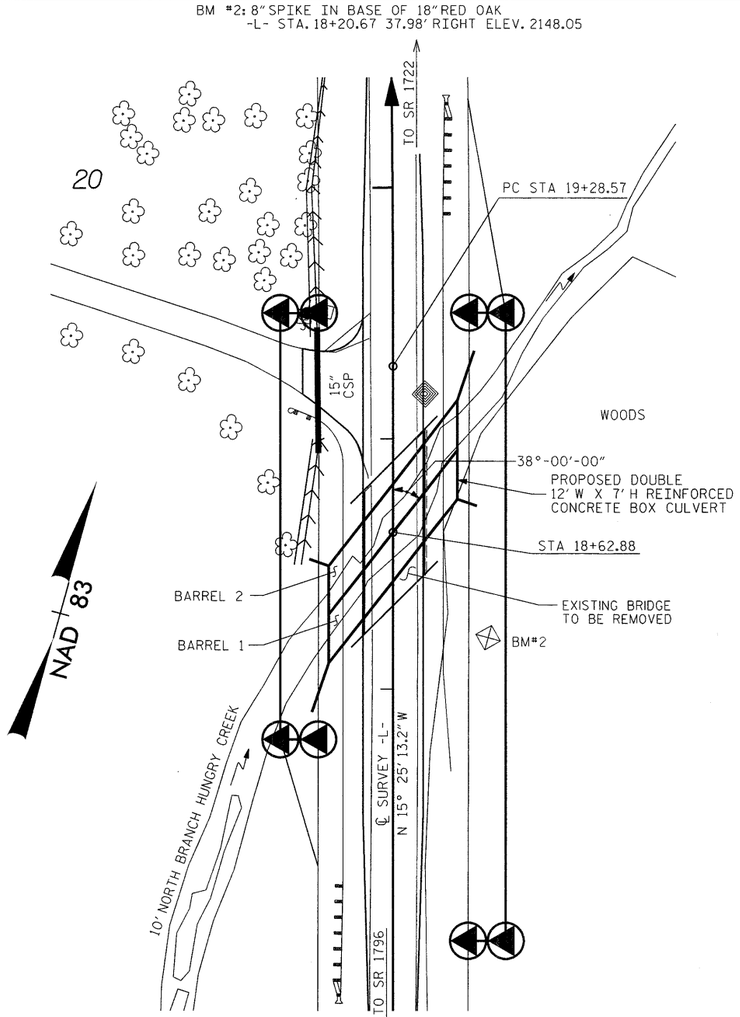
4/16/2007
3:10:26 PM

CONTRACT NO. DO0066

(BRIDGE #56) TIP: B-4145



LOCATION SKETCH

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

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.319 CY/FT	199.4	C.Y.
HEADWALLS, SILLS	9.7	C.Y.
WINGS ETC.	24.4	C.Y.
TOTAL	233.5	C.Y.
REINFORCING STEEL		
BARREL, HEADWALLS, SILLS	49,917	LBS.
WINGS ETC.	1,895	LBS.
TOTAL	51,812	LBS.
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	158	TONS
CULVERT EXCAVATION, STA.18+62.88	LUMP SUM	
REMOVAL OF EXISTING STRUCTURE	LUMP SUM	

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 650	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 2136.67	FT
BASE DISCHARGE	= 800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2137.27	FT
OVERTOPPING DISCHARGE	= 1750	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2140.87	FT
DATE OF SURVEY	= 2-3-2004	
W.S. ELEVATION AT DATE OF SURVEY	= 2132.57	FT

NOTES

ASSUMED LIVE LOAD ----------HS20-44 OR ALTERNATE LOADING.

DESIGN FILL----------2.23'

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

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

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

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

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

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

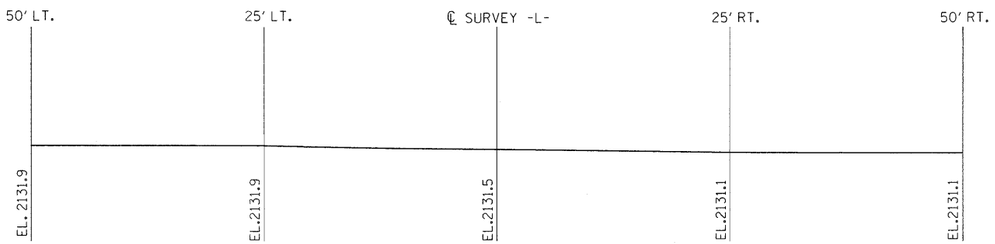
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

CULVERT CONCRETE POUR SEQUENCE

NOTE: COORDINATE THIS CONCRETE POUR SEQUENCE WITH THE CULVERT CONSTRUCTION SEQUENCE ON "EROSION CONTROL PLAN" SHEET 1 OF 5.

1. WING FOOTINGS AND FLOOR SLAB OF BARREL 1, INCLUDING 4" OF BARREL 1 WINGS, BARREL 1 EXTERIOR WALL, AND INTERIOR WALL.
2. FULL HEIGHT OF BARREL 1 WINGS AND REMAINING PORTIONS OF BARREL 1 EXTERIOR WALL AND INTERIOR WALL.
3. SILL IN BARREL 1.
4. WING FOOTINGS AND FLOOR SLAB OF BARREL 2, INCLUDING 4" OF WINGS AND EXTERIOR WALL OF BARREL 2.
5. FULL HEIGHT OF BARREL 2 WINGS AND REMAINING PORTION OF BARREL 2 EXTERIOR WALL.
6. SILL IN BARREL 2.
7. ROOF SLAB AND HEADWALLS.



PROFILE ALONG ℄ CULVERT

WBS NO. 33494.3.1

HENDERSON COUNTY

STATION: 18+62.88 -L-

SHEET 1 OF 7 REPLACES BRIDGE #56

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 38° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	11
1			3			TOTAL SHEETS
2			4			22

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
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Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
5-18-10

DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

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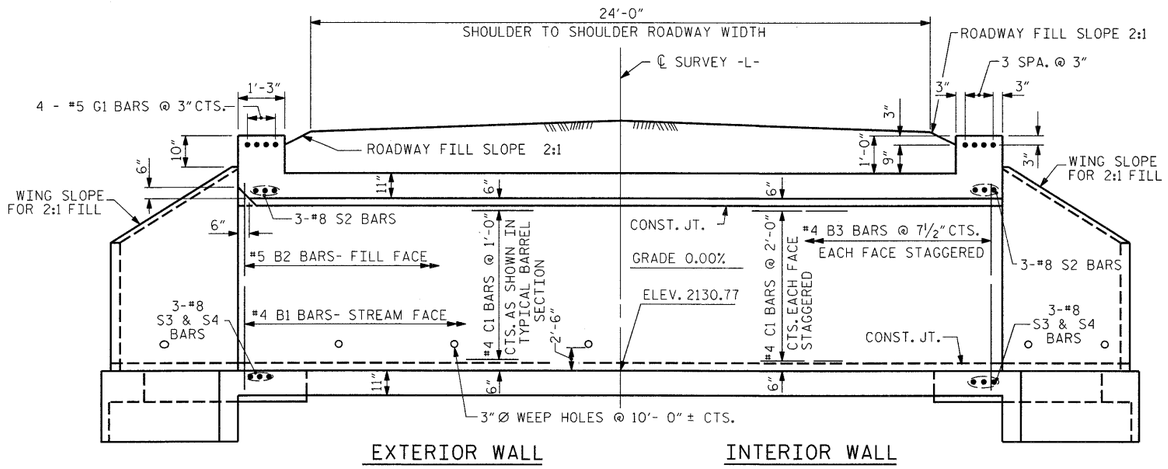
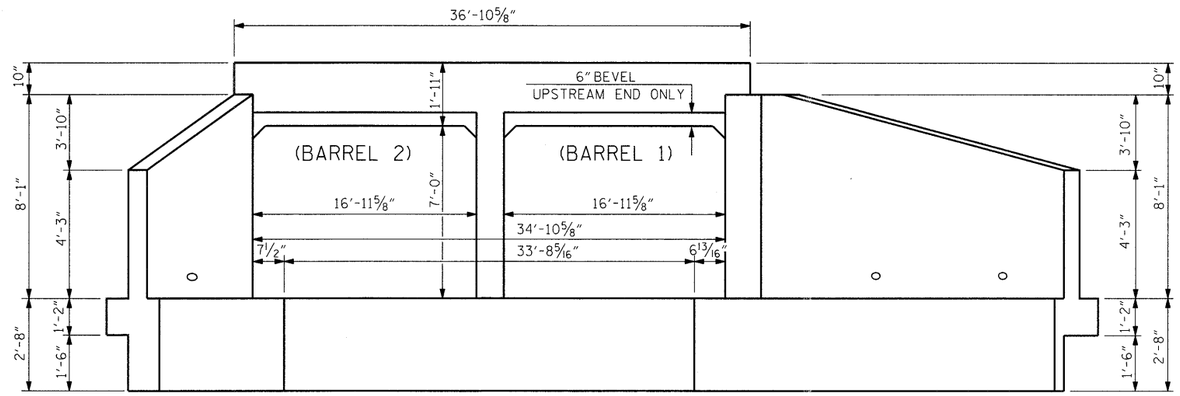
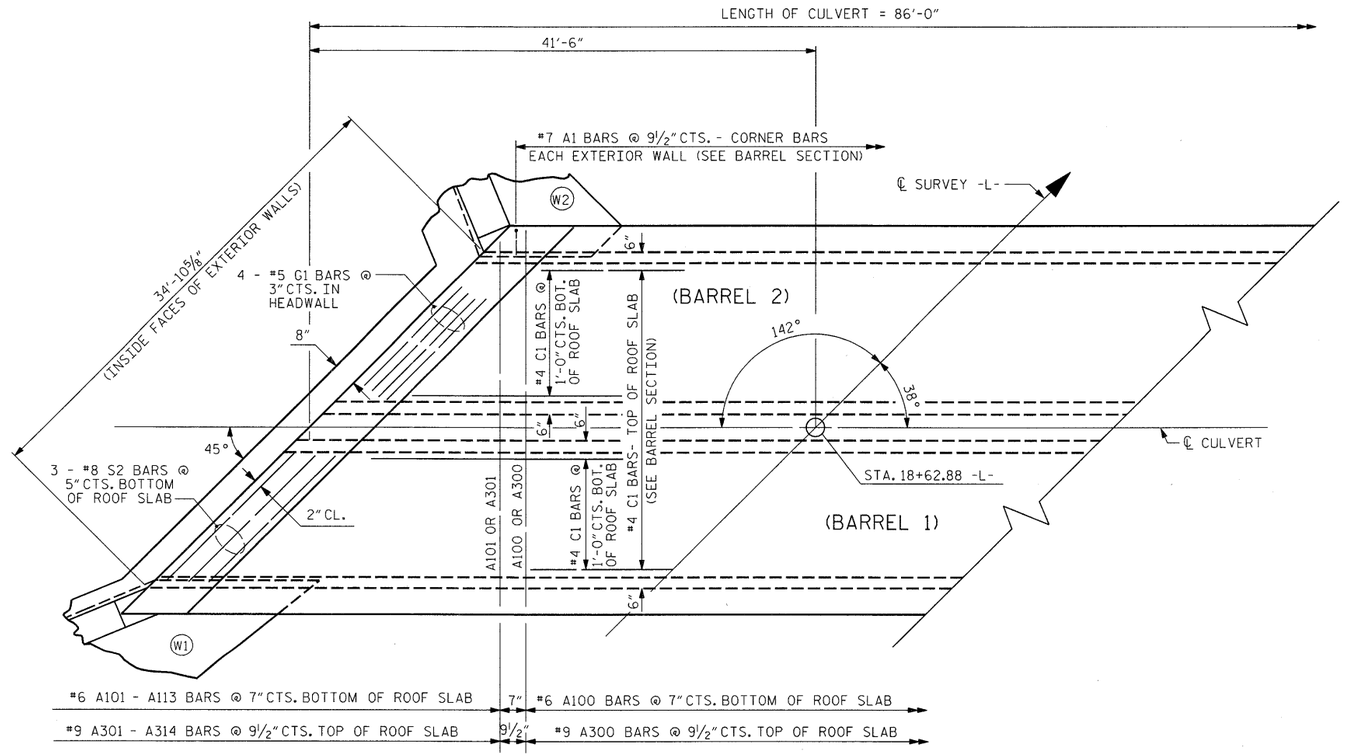


CULVERT SECTION NORMAL TO ROADWAY

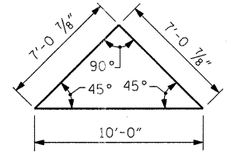


END ELEVATION NORMAL TO SKEW



PART PLAN - ROOF SLAB

NOTE: FOR GUARDRAIL ANCHORAGE DETAILS, SEE SHEET 3 OF 7.
NOTE: FOR FLOOR SLAB PLAN, SEE SHEET 4 OF 7.



SKEW TRIANGLE

DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

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PLANS PREPARED BY:
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(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
5-18-10

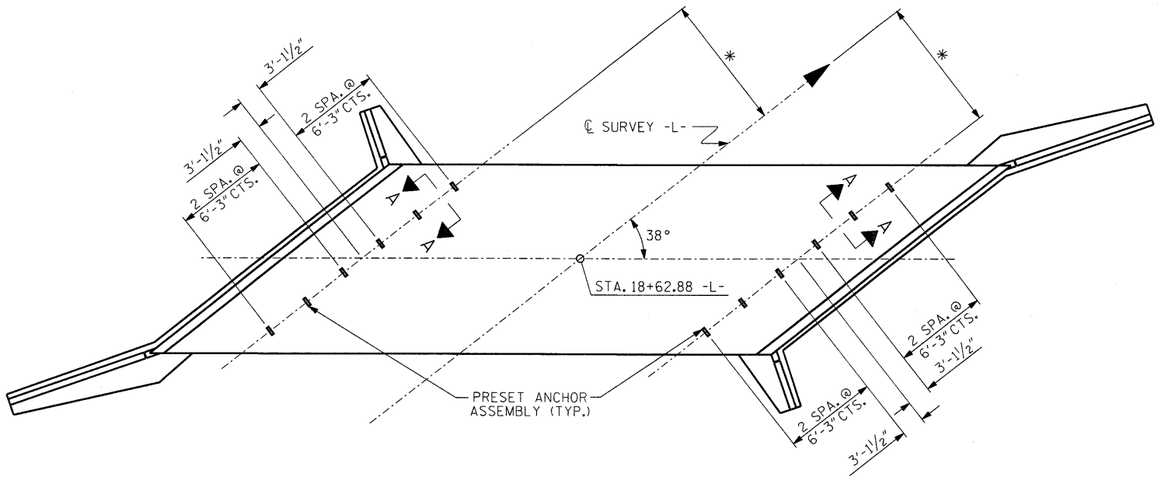
WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-
SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT.X 7 FT. CONCRETE BOX CULVERT 38° SKEW

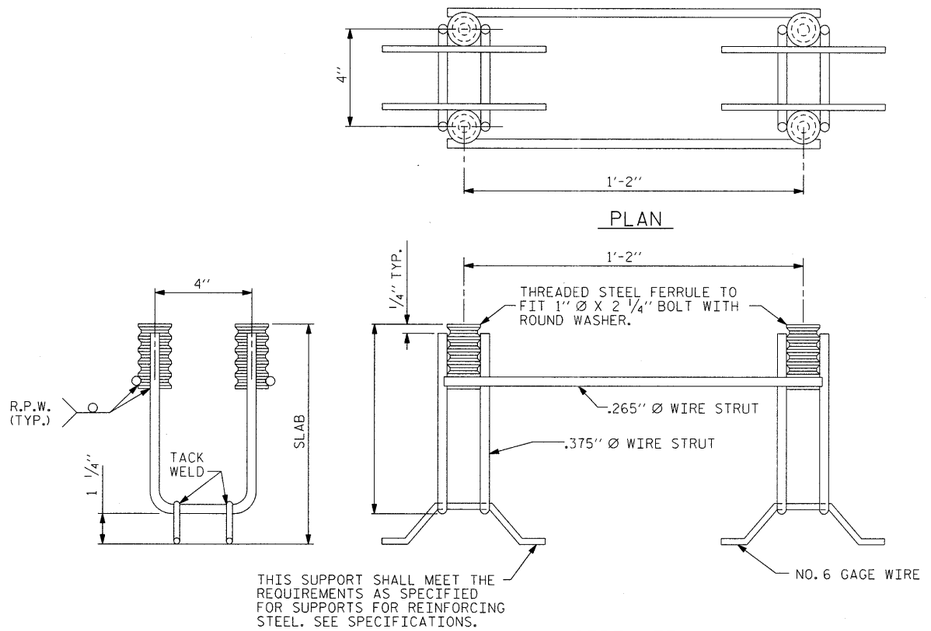
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	12
1			3			TOTAL SHEETS
2			4			22

* THIS DIMENSION TO BE FURNISHED BY THE ENGINEER

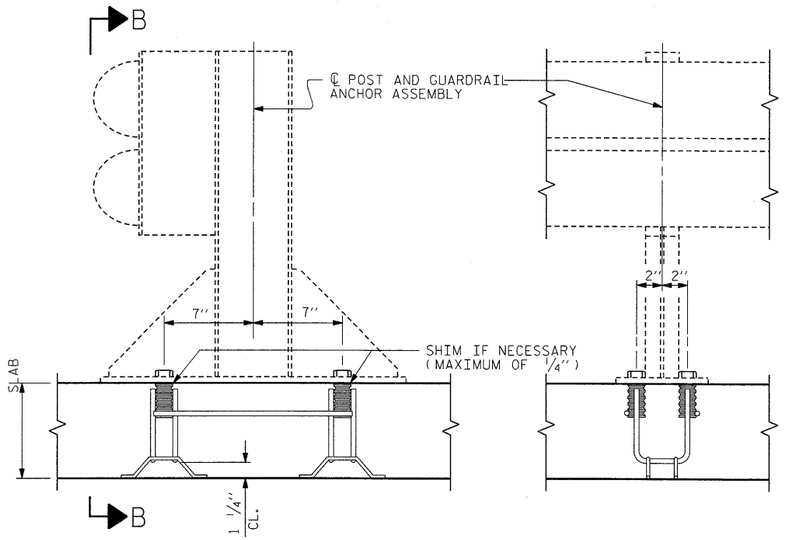


PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING OFF CENTERLINE OF CULVERT.



GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS



SECTION A-A

SECTION B-B

NOTES

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

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

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

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

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

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

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

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

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

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

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED, SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS".

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
5-18-10

ASSEMBLED BY : D. G. VESTER	DATE : 12/06		
CHECKED BY : J. A. BATTS	DATE : 12/06		
DRAWN BY : FCJ 6/88	REV. 8/16/99	RAL/LES	
CHECKED BY : ARB 6/88	REV. 7/10/01	LES/RDR	
	REV. 5/7/03	RWW/JTE	

WBS NO. 33494.3.1

HENDERSON COUNTY

STATION: 18+62.88 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

MARCH 1990

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	13
1			3			TOTAL SHEETS
2			4			22

STD. NO. GRA1

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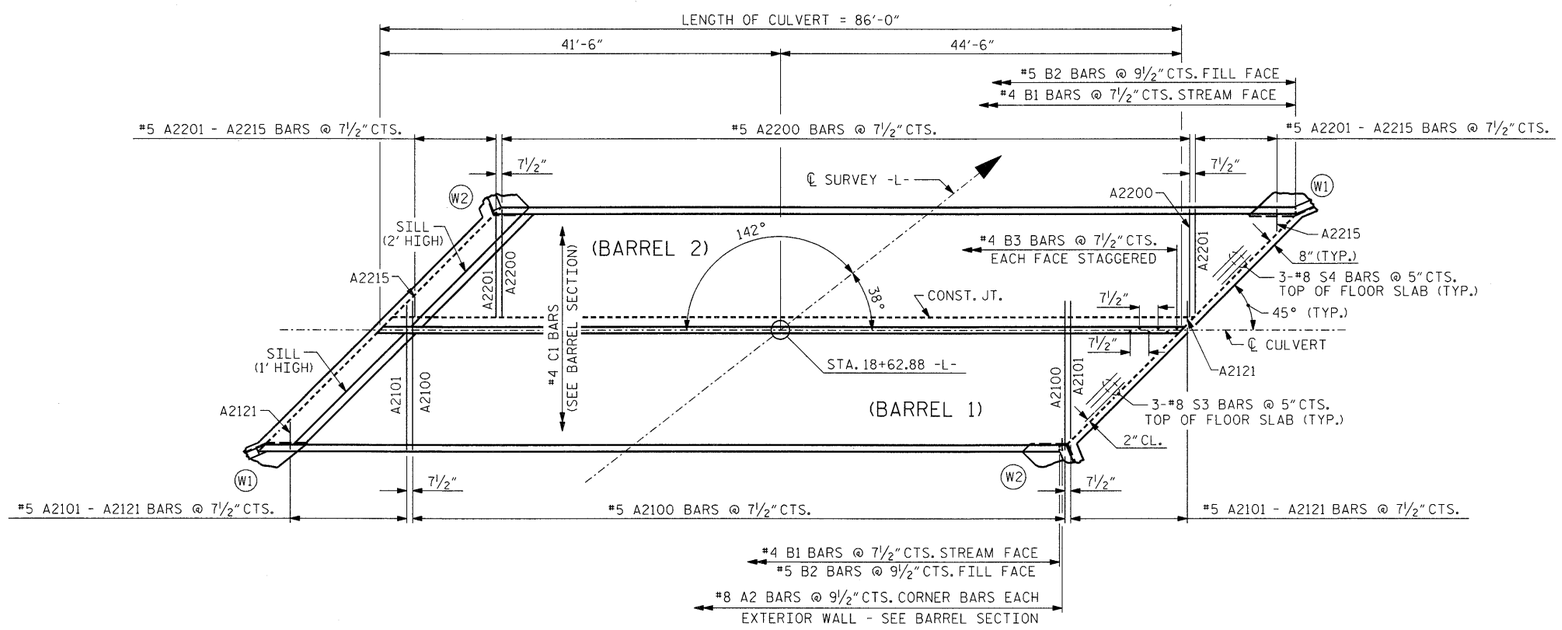
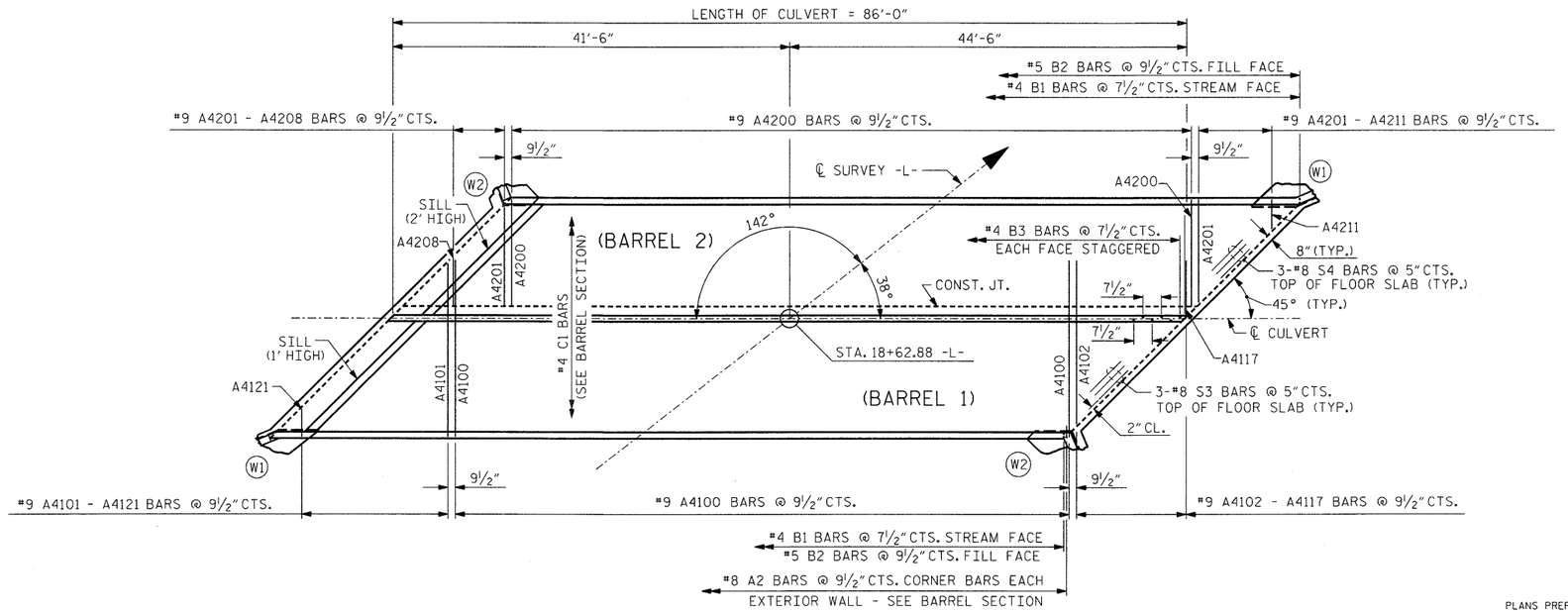


FLOOR SLAB (A2100 & A2200 BARS)



FLOOR SLAB (A4100 & A4200 BARS)

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DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 4 OF 7

PLANS PREPARED BY:
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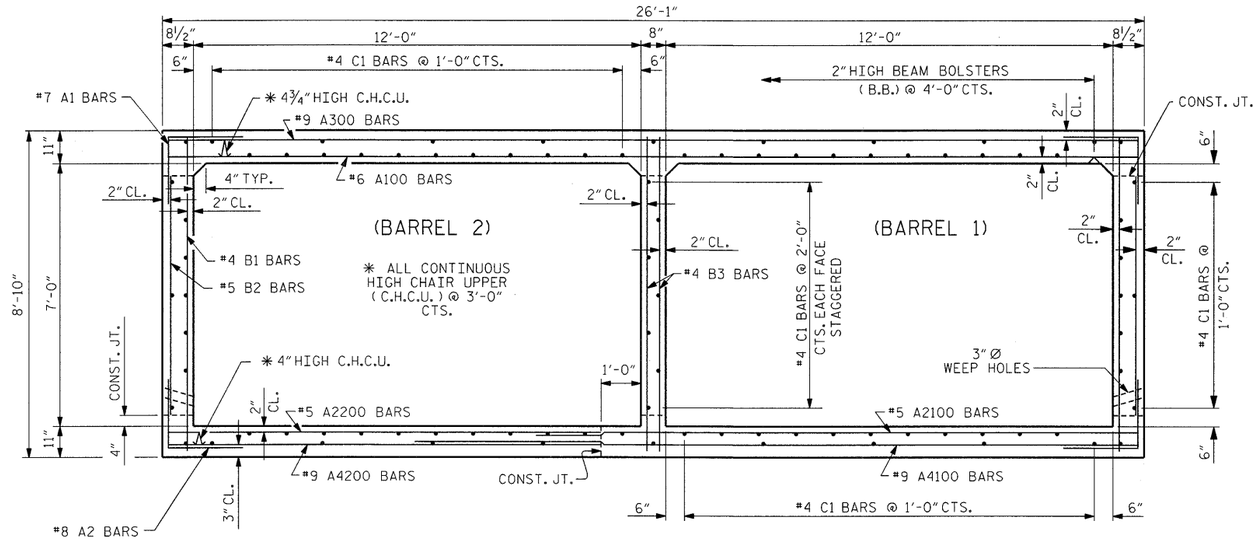
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON, JR.
David B. Simpson 5-18-10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

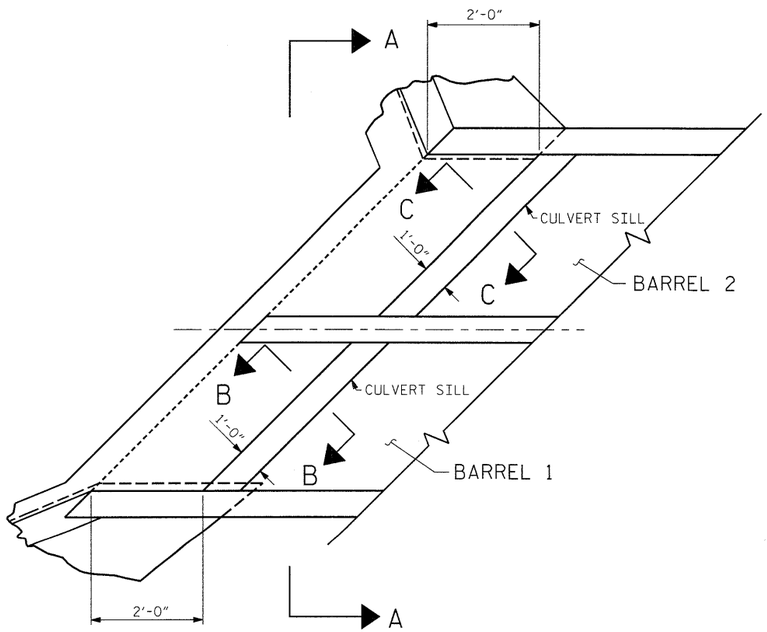
DOUBLE 12 FT.X 7 FT. CONCRETE BOX CULVERT 38° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	14
1			3			TOTAL SHEETS
2			4			22

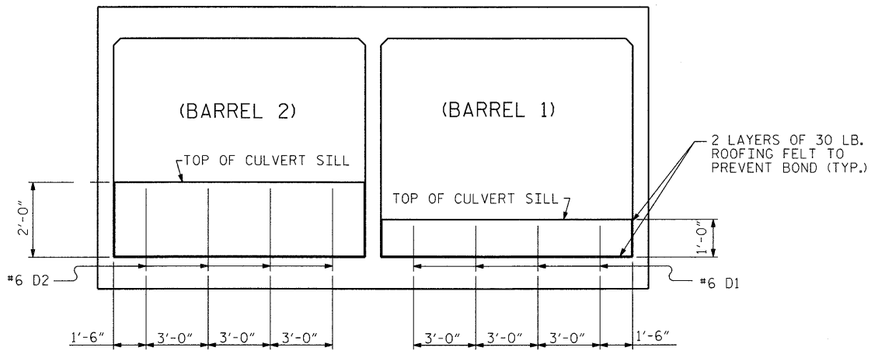


RIGHT ANGLE SECTION OF BARREL

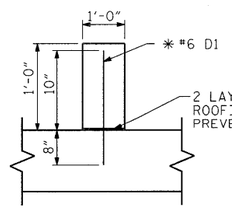
THERE ARE 89 C1 BARS IN SECTION OF BARREL.



PLAN
(INLET END)

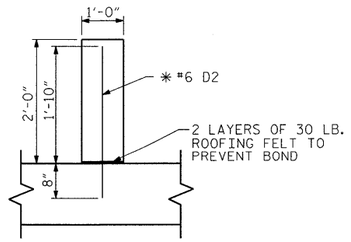


ELEVATION A-A



SECTION B-B

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



SECTION C-C

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

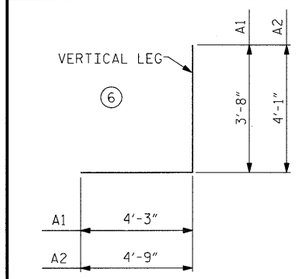
CULVERT SILL DETAILS

DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

BILL OF MATERIAL
BARREL REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	103	6	STR	25'-8"	3971
A101	6	6	STR	23'-10"	215
A102	6	6	STR	22'-1"	199
A103	6	6	STR	20'-4"	183
A104	6	6	STR	18'-7"	167
A105	6	6	STR	16'-10"	152
A106	6	6	STR	15'-1"	136
A107	6	6	STR	13'-4"	120
A108	6	6	STR	11'-7"	104
A109	6	6	STR	9'-10"	89
A110	6	6	STR	8'-1"	73
A111	6	6	STR	6'-4"	57
A112	6	6	STR	4'-7"	41
A113	6	6	STR	2'-10"	26

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
BARREL REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2100	113	5	STR	16'-0"	1886
A2101	2	5	STR	15'-6"	32
A2102	2	5	STR	14'-10"	31
A2103	2	5	STR	14'-3"	30
A2104	2	5	STR	13'-7"	28
A2105	2	5	STR	13'-0"	27
A2106	2	5	STR	12'-4"	26
A2107	2	5	STR	11'-9"	25
A2108	2	5	STR	11'-1"	23
A2109	2	5	STR	10'-6"	22
A2110	2	5	STR	9'-10"	21
A2111	2	5	STR	9'-3"	19
A2112	2	5	STR	8'-7"	18
A2113	2	5	STR	8'-0"	17
A2114	2	5	STR	7'-4"	15
A2115	2	5	STR	6'-9"	14
A2116	2	5	STR	6'-1"	13
A2117	2	5	STR	5'-6"	11
A2118	2	5	STR	4'-10"	10
A2119	2	5	STR	4'-3"	9
A2120	2	5	STR	3'-7"	7
A2121	2	5	STR	3'-0"	6
A2200	119	5	STR	11'-6"	1427
A2201	2	5	STR	10'-11"	23
A2202	2	5	STR	10'-3"	21
A2203	2	5	STR	9'-8"	20
A2204	2	5	STR	9'-0"	19
A2205	2	5	STR	8'-5"	18
A2206	2	5	STR	7'-9"	16
A2207	2	5	STR	7'-2"	15
A2208	2	5	STR	6'-6"	14
A2209	2	5	STR	5'-11"	12
A2210	2	5	STR	5'-3"	11
A2211	2	5	STR	4'-8"	10
A2212	2	5	STR	4'-0"	8
A2213	2	5	STR	3'-5"	7
A2214	2	5	STR	2'-9"	6
A2215	2	5	STR	2'-2"	5
A300	76	9	STR	25'-8"	6632
A301	4	9	STR	24'-0"	326
A302	4	9	STR	22'-5"	305
A303	4	9	STR	20'-10"	283
A304	4	9	STR	19'-3"	262
A305	4	9	STR	17'-8"	240
A306	4	9	STR	16'-1"	219
A307	4	9	STR	14'-6"	197
A308	4	9	STR	12'-11"	176
A309	4	9	STR	11'-4"	154
A310	4	9	STR	9'-9"	133
A311	4	9	STR	8'-2"	111
A312	4	9	STR	6'-7"	90
A313	4	9	STR	5'-0"	68
A314	4	9	STR	3'-5"	46

BILL OF MATERIAL
BARREL REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A4100	85	9	STR	19'-3"	5563
A4101	1	9	STR	18'-10"	64
A4102	2	9	STR	18'-0"	122
A4103	2	9	STR	17'-3"	117
A4104	2	9	STR	16'-5"	112
A4105	2	9	STR	15'-8"	107
A4106	2	9	STR	14'-10"	101
A4107	2	9	STR	14'-1"	96
A4108	2	9	STR	13'-3"	90
A4109	2	9	STR	12'-6"	85
A4110	2	9	STR	11'-8"	79
A4111	2	9	STR	10'-11"	74
A4112	2	9	STR	10'-1"	69
A4113	2	9	STR	9'-4"	63
A4114	2	9	STR	8'-6"	58
A4115	2	9	STR	7'-9"	53
A4116	2	9	STR	6'-11"	47
A4117	2	9	STR	6'-2"	42
A4118	1	9	STR	5'-4"	18
A4119	1	9	STR	4'-7"	16
A4120	1	9	STR	3'-9"	13
A4121	1	9	STR	3'-0"	10
A4200	94	9	STR	11'-6"	3675
A4201	2	9	STR	10'-9"	73
A4202	2	9	STR	9'-11"	67
A4203	2	9	STR	9'-2"	62
A4204	2	9	STR	8'-4"	57
A4205	2	9	STR	7'-7"	52
A4206	2	9	STR	6'-9"	46
A4207	2	9	STR	6'-0"	41
A4208	2	9	STR	5'-2"	35
A4209	1	9	STR	4'-9"	16
A4210	1	9	STR	3'-11"	13
A4211	1	9	STR	3'-2"	11
A1	218	7	6	7'-11"	3528
A2	218	8	6	8'-10"	5142
B1	276	4	STR	8'-4"	1536
B2	218	5	STR	6'-4"	1440
B3	276	4	STR	8'-4"	1536
C1	267	4	STR	29'-11"	5336
D1	4	6	STR	1'-6"	9
D2	4	6	STR	2'-6"	15
G1	8	5	STR	36'-4"	303
S2	6	8	STR	36'-4"	582
S3	6	8	STR	24'-2"	387
S4	6	8	STR	16'-2"	259

REINFORCING STEEL	49917 LBS
CLASS A CONCRETE	
BARREL	199.4 CY
2 HEADWALLS	3.4 CY
2 SILLS	3.8 CY
2 CURTAIN WALLS	2.5 CY
TOTAL	209.1 CY

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
"A2000"	5	1'-9"
"A4000"	9	5-0"
B1	4	1'-9"
B3	4	1'-9"
C1	4	1'-11"
"S"	8	4'-0"

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 7 FT. CONCRETE BOX CULVERT 38° SKEW

REVISIONS

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

SHEET NO. 15
TOTAL SHEETS 22

PLANS PREPARED BY:
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LICENSURE NO. C2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON Jr.
5-18-10

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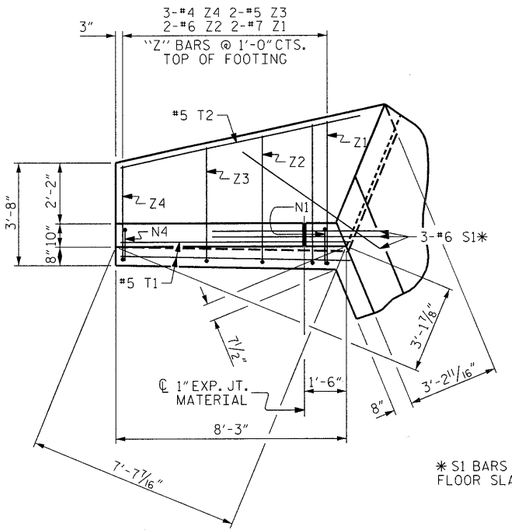
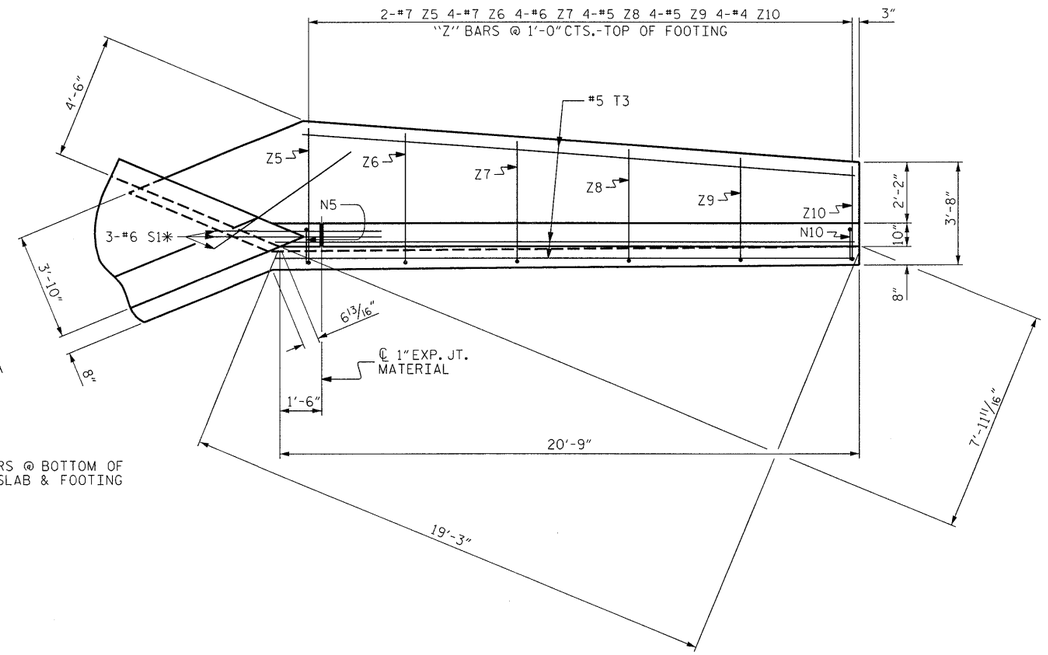
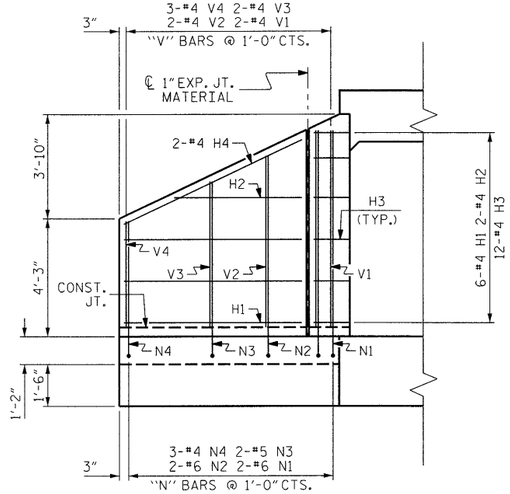


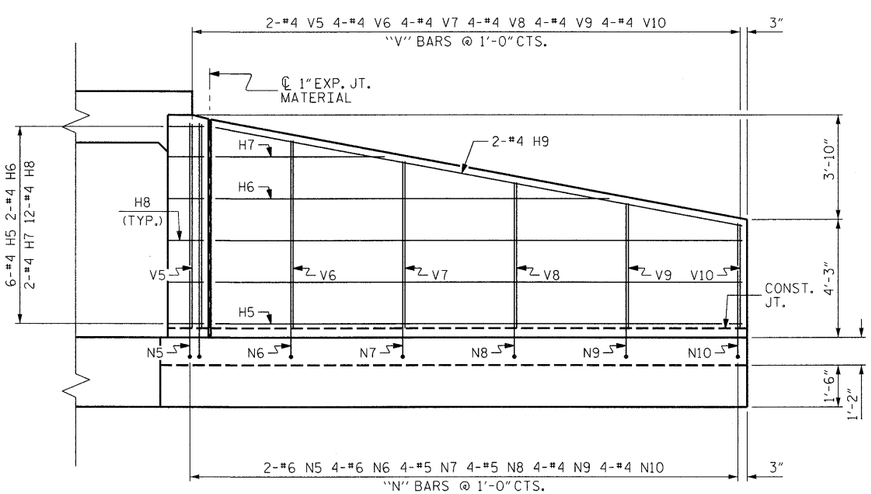


* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

PLAN W2

PLAN W1

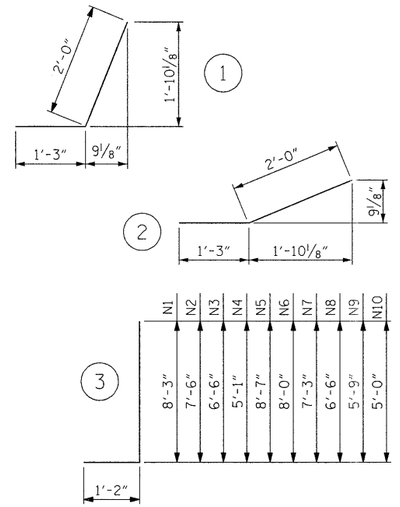




ELEVATION W2

ELEVATION W1

BAR TYPES



Z1	4'-9"	10"
Z2	4'-4"	8"
Z3	3'-11"	7"
Z4	3'-4"	6"
Z5	4'-10"	10"
Z6	4'-7"	10"
Z7	4'-3"	8"
Z8	3'-11"	7"
Z9	3'-7"	7"
Z10	3'-4"	6"

HK.

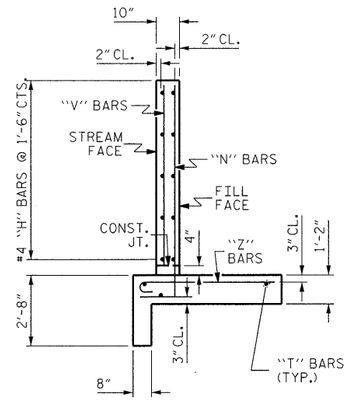
4

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	4	STR	6'-5"	51
H2	4	4	STR	4'-8"	12
H3	24	4	1	3'-3"	52
H4	4	4	STR	7'-1"	19
H5	12	4	STR	18'-11"	152
H6	4	4	STR	14'-2"	38
H7	4	4	STR	6'-2"	16
H8	24	4	2	3'-3"	52
H9	4	4	STR	19'-2"	51
N1	4	6	3	9'-5"	57
N2	4	6	3	8'-8"	52
N3	4	5	3	7'-8"	32
N4	6	4	3	6'-3"	25
N5	4	6	3	9'-9"	59
N6	8	6	3	9'-2"	110
N7	8	5	3	8'-5"	70
N8	8	5	3	7'-8"	64
N9	8	4	3	6'-11"	37
N10	8	4	3	6'-2"	33
S1	12	6	STR	6'-0"	108
T1	4	5	STR	8'-3"	34
T2	2	5	STR	9'-0"	19
T3	6	5	STR	20'-9"	130
V1	4	4	STR	7'-0"	19
V2	4	4	STR	6'-3"	17
V3	4	4	STR	5'-3"	14
V4	6	4	STR	3'-10"	15
V5	4	4	STR	7'-4"	20
V6	8	4	STR	6'-9"	36
V7	8	4	STR	6'-0"	32
V8	8	4	STR	5'-3"	28
V9	8	4	STR	4'-6"	24
V10	8	4	STR	3'-9"	20
Z1	4	7	4	5'-7"	46
Z2	4	6	4	5'-0"	30
Z3	4	5	4	4'-6"	19
Z4	6	4	4	3'-10"	15
Z5	4	7	4	5'-8"	46
Z6	8	7	4	5'-5"	89
Z7	8	6	4	4'-11"	59
Z8	8	5	4	4'-6"	38
Z9	8	5	4	4'-2"	35
Z10	8	4	4	3'-10"	20

REINFORCING STEEL	1895	LBS.
FOR 4 WINGS		
CLASS A CONCRETE		
4 WINGS	11	CY
4 FOOTINGS	11.3	CY
4 CURTAIN WALLS	2.1	CY
TOTAL	24.4	CY



TYPICAL WING SECTION

WBS NO. 33494.3.1

HENDERSON COUNTY

STATION: 18+62.88 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 7'-0" SLOPE = 2:1

45° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	16
1			3			TOTAL SHEETS
2			4			22

PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
5-18-10

DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

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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 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 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.

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.

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DRAWN BY : D. G. VESTER DATE : 3-10
CHECKED BY : J. A. BATTS DATE : 3-10

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 7 OF 7

PLANS PREPARED BY:
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NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
David B. Simpson 5-18-10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

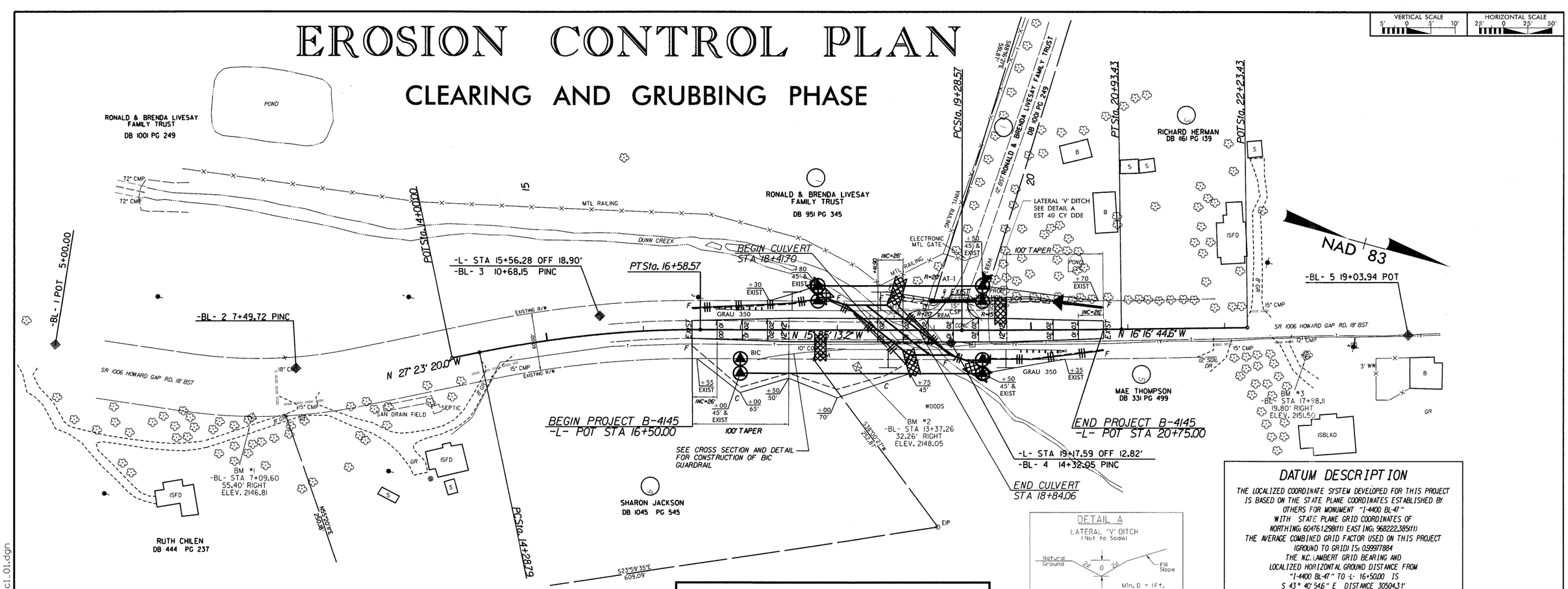
STANDARD NOTES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	17
1			3			TOTAL SHEETS
2			4			22

STD. NO. SN

EROSION CONTROL PLAN

CLEARING AND GRUBBING PHASE



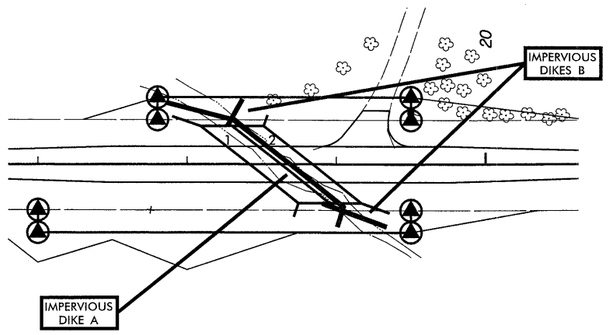
DETAIL A
LATERAL 'V' DITCH
(Not to Scale)

-L- STA. 18+50 LT. +/- TO STA. 20+75 LT. +/-

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "I-4400 BL-47" WITH STATE PLANE GRID COORDINATES OF NORTHING: 604761.298(ft) EASTING: 968222.385(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999977884
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "I-4400 BL-47" TO -L- 16+50.00 IS S 43° 40' 54.6" E DISTANCE 3050.43'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

CULVERT CONSTRUCTION SEQUENCE STA. 18+62.88 -L-



CULVERT CONSTRUCTION SEQUENCE

1. UTILIZE SPECIAL STILLING BASINS AS NEEDED DURING CULVERT CONSTRUCTION.
2. CONSTRUCT IMPERVIOUS DIKE A.
3. CONSTRUCT CULVERT BARREL 1.
4. REMOVE IMPERVIOUS DIKE A.
5. CONSTRUCT IMPERVIOUS DIKES B.
6. CONSTRUCT CULVERT BARREL 2.
7. REMOVE IMPERVIOUS DIKES B.
8. COMPLETE ROADWAY.

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

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

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-B	

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

2006 STANDARD SPECIFICATIONS

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	18
1			3			TOTAL SHEETS
2			4			22

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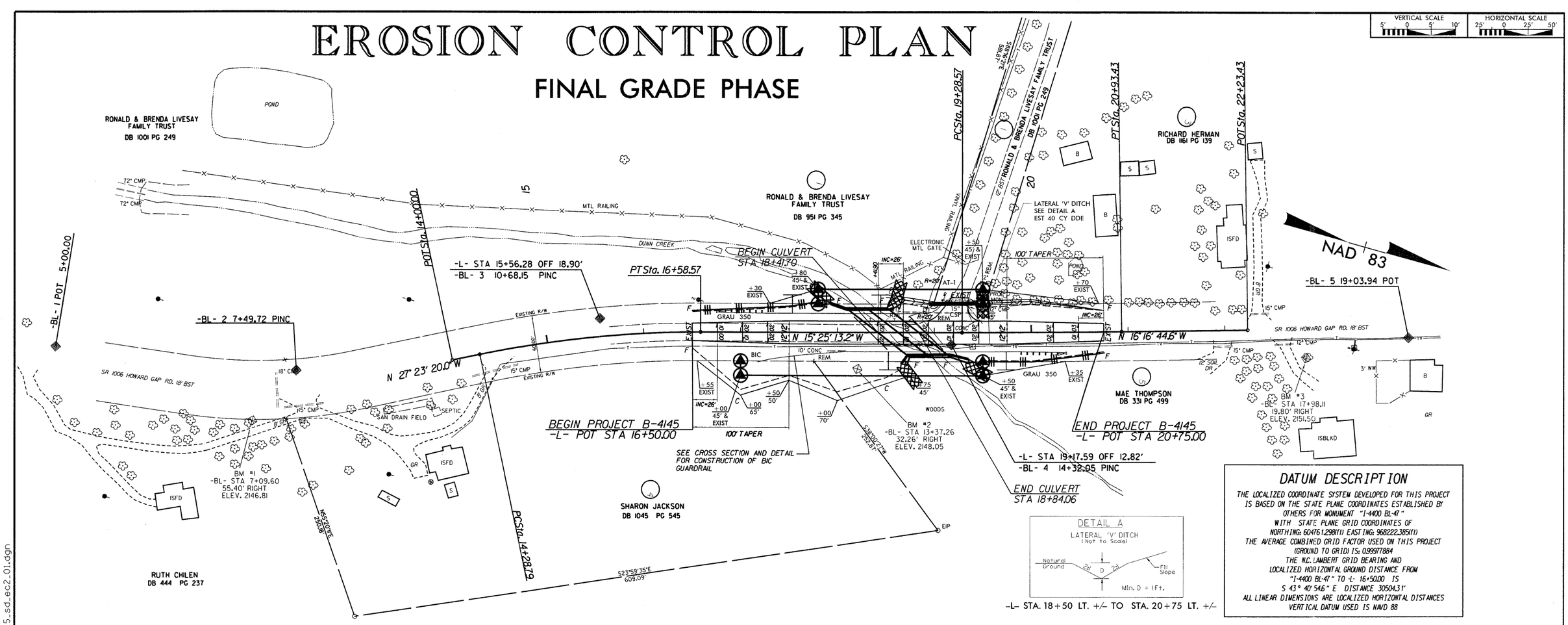
EROSION CONTROL PLAN

FINAL GRADE PHASE



DETAIL A
LATERAL 'V' DITCH
(Not to Scale)

-L- STA. 18+50 LT. +/- TO STA. 20+75 LT. +/-

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "I-4400 BL-47" WITH STATE PLANE GRID COORDINATES OF NORTHING: 604761.298(ft) EASTING: 968222.385(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977884
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "I-4400 BL-47" TO -L- 16+50.00 IS S 43° 40' 54.6" E DISTANCE 3050.43'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-B	

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

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

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

2006 STANDARD SPECIFICATIONS

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	19
1			3			TOTAL SHEETS
2			4			22

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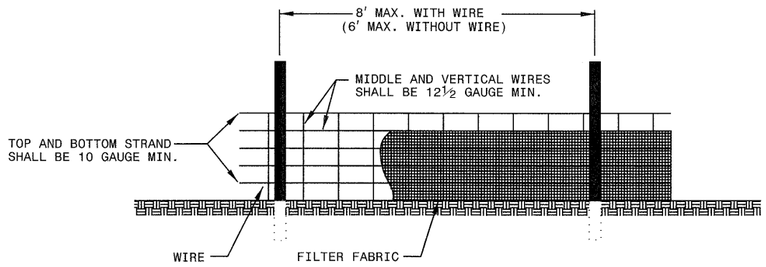
EROSION CONTROL PLAN

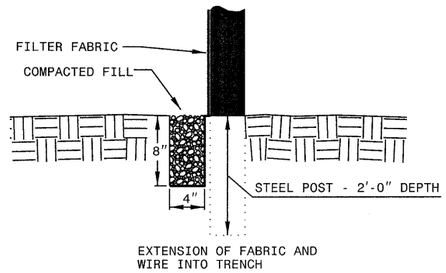
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01



NOTES
USE WIRE A MINIMUM OF 32″ IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12″ STAY SPACING.
USE FILTER FABRIC A MINIMUM OF 36″ IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
PROVIDE 5′-0″ STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.



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

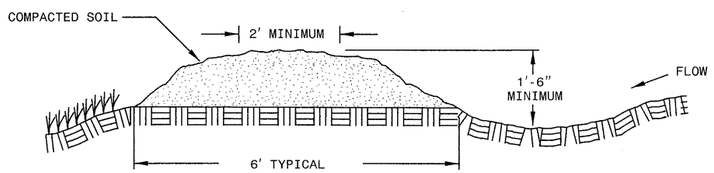
ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01

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

ENGLISH STANDARD DRAWING FOR
TEMPORARY DIVERSION

SHEET 1 OF 1
1630.05



CROSS SECTIONAL VIEW

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

ENGLISH STANDARD DRAWING FOR
TEMPORARY DIVERSION

SHEET 1 OF 1
1630.05

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	20
1			3			TOTAL SHEETS
2			4			22

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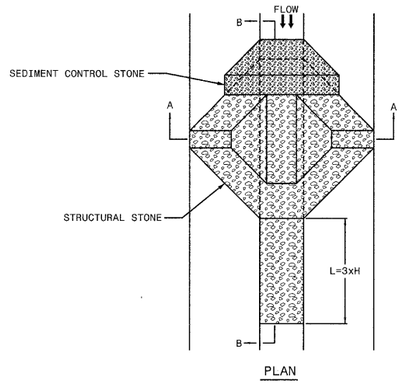
EROSION CONTROL PLAN

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

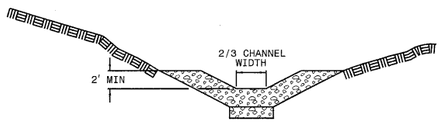
ENGLISH STANDARD DRAWING FOR
TEMPORARY ROCK SILT CHECK TYPE 'A'

SHEET 1 OF 1
1633.01

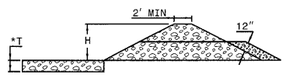


PLAN

NOTE
USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.



SECTION A-A



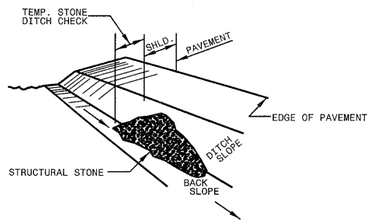
SECTION B-B
*T = 12" MIN., 18" MAX.

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

ENGLISH STANDARD DRAWING FOR
TEMPORARY ROCK SILT CHECK TYPE 'A'

SHEET 1 OF 1
1633.01

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

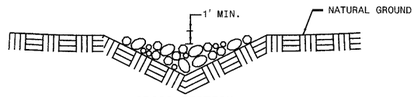


ISOMETRIC VIEW

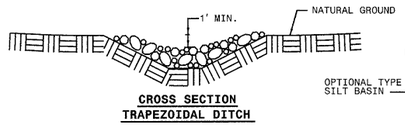
NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

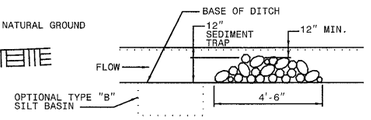
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH



ELEVATION VIEW

WBS NO. 33494.3.1
HENDERSON COUNTY
STATION: 18+62.88 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	21
1			3			TOTAL SHEETS
2			4			22

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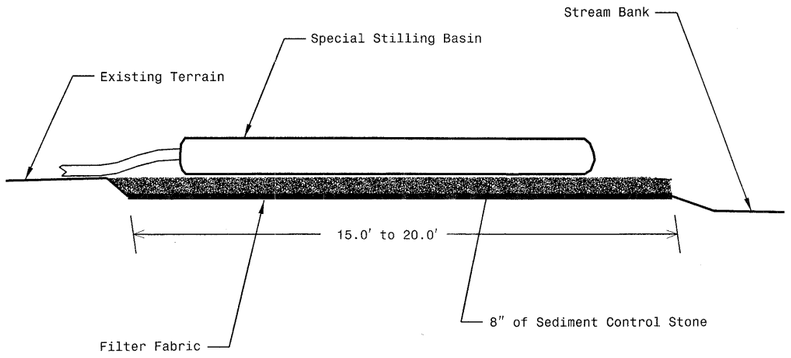
EROSION CONTROL PLAN

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

7-06

ENGLISH STANDARD DRAWING FOR

SPECIAL STILLING BASIN



Note: Provide Stabilized Outlet to Streambank
Not To Scale

SHEET 1 OF 1
1630.06

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

7-06

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06

Special Stilling Basin(s):

The work covered by this section consists of furnishing, placing, and removing a special stilling basin(s) as directed by the Engineer. The special stilling basin(s) shall be used to filter pumped water during the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The filter fabric shall meet the requirements of Section 1056 for Type 2 Fabric.

Sediment control stone shall meet the requirements of Section 1005 and shall be clean of dirt and debris. Install stone according to the detail shown on the plans.

The special stilling basin(s) shall be a water permeable fabric bag that traps sand, silt, and fines as sediment laden water is pumped into it. This device shall be constructed such that it is portable and can be used adjacent to the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The special stilling basin(s) shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8 in. (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lbf/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Units	Min. Specifications
Weight	ASTM D-3776	oz/yd	8.0
Grab tensile	ASTM D-4632	lb	200.0
Puncture	ASTM D-4833	lb	130.0
Flow rate	ASTM D-4491	gal/min/sf	80.0
Permittivity	ASTM D-4991	1/sec	1.2
UV Resistance	ASTM D-4355	%	70.0

The Contractor shall install the special stilling basin in accordance with the details in the plans and at locations as directed by the Engineer.

The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls.

The special stilling basin(s) shall be replaced and disposed of when it is 3/4 full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer must be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during the drilled pier operation, footing excavation, and/or culvert or pipe construction.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limted to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

Impervious Dike:

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

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

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

No direct payment shall be made for the work of installation, maintenance, and removal of impervious dike(s) as described in this provision. Payment for such work shall be included in the contract bid price for "Lump Sum for Erosion Control".

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

2006 STANDARD SPECIFICATIONS

WBS NO. 33494.3.1

HENDERSON COUNTY

STATION: 18+62.88 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	22
1			3			TOTAL SHEETS
2			4			22

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