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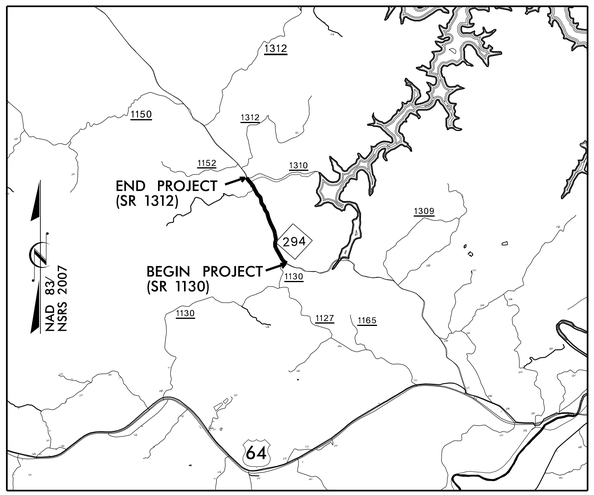
09/08/99

TIP PROJECT: R–3622B

CONTRACT: C203648

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R–3622B	0	17

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38068.1.1		PE
38068.2.R3		R/W & UTILITIES
38068.3.R3		CONST.



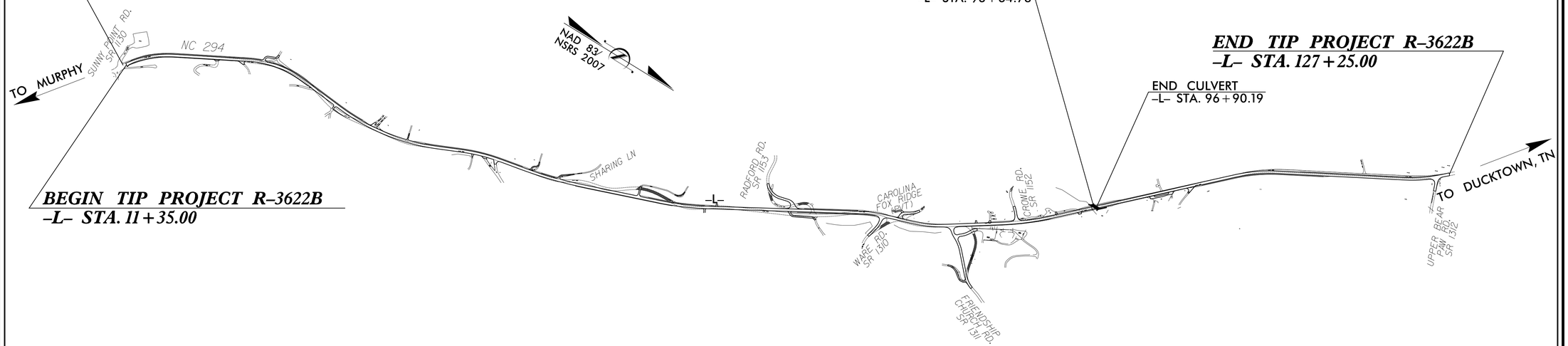
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHEROKEE COUNTY

REPLACES 2@66" CMP ALONG NC 294
APPROX. 657 FT. NW OF SR 1152

BEGIN CONSTRUCTION
STA. 11+09.00 –L–



BEGIN TIP PROJECT R–3622B
–L– STA. 11+35.00

STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT = 3,050
ADT = 6,000
DHV = — %
D = — %
T = 3 % *
V = 50 MPH
* TTST 3% DUAL—%
FUNC = MAJOR
CLASS COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R–3622B = 2.190 MILES
LENGTH STRUCTURE TIP PROJECT R–3622B = 0.005 MILES
TOTAL LENGTH OF TIP PROJECT R–3622B = 2.195 MILES

Prepared in the Office of:
VAUGHN & MELTON, INC.
1318–F PATTON AVENUE ASHEVILLE, NC 28806 PHONE(828) 253–2796

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 12, 2013

LETTING DATE:
JUNE 16, 2015

REECE SCHULER, P.E.
PROJECT ENGINEER

CHRIS CORDELL, E.I.
PROJECT DESIGN ENGINEER

DocuSigned by:
Hardy Willis
CC281FCF022346F...
4/24/2015

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

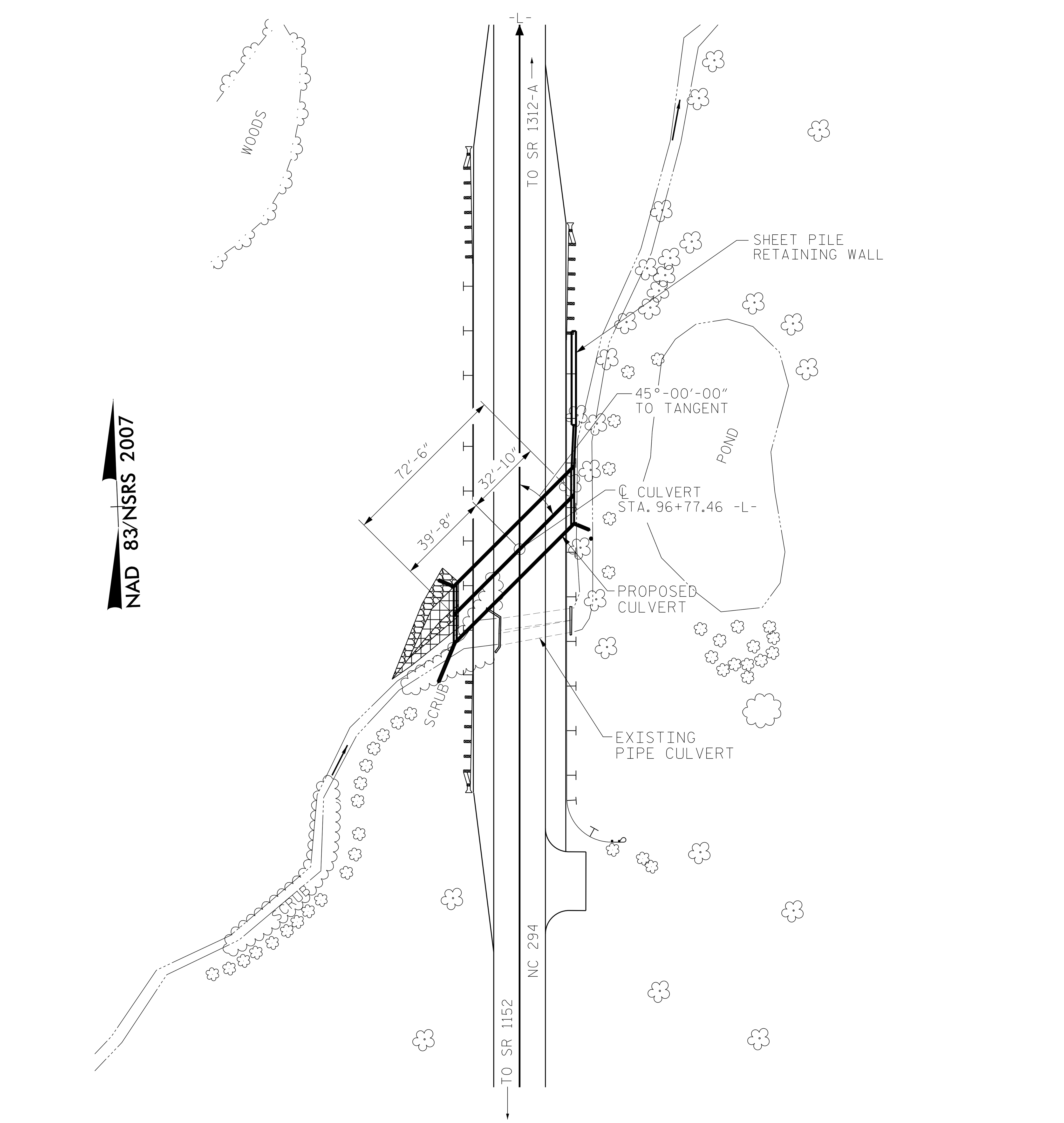
P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

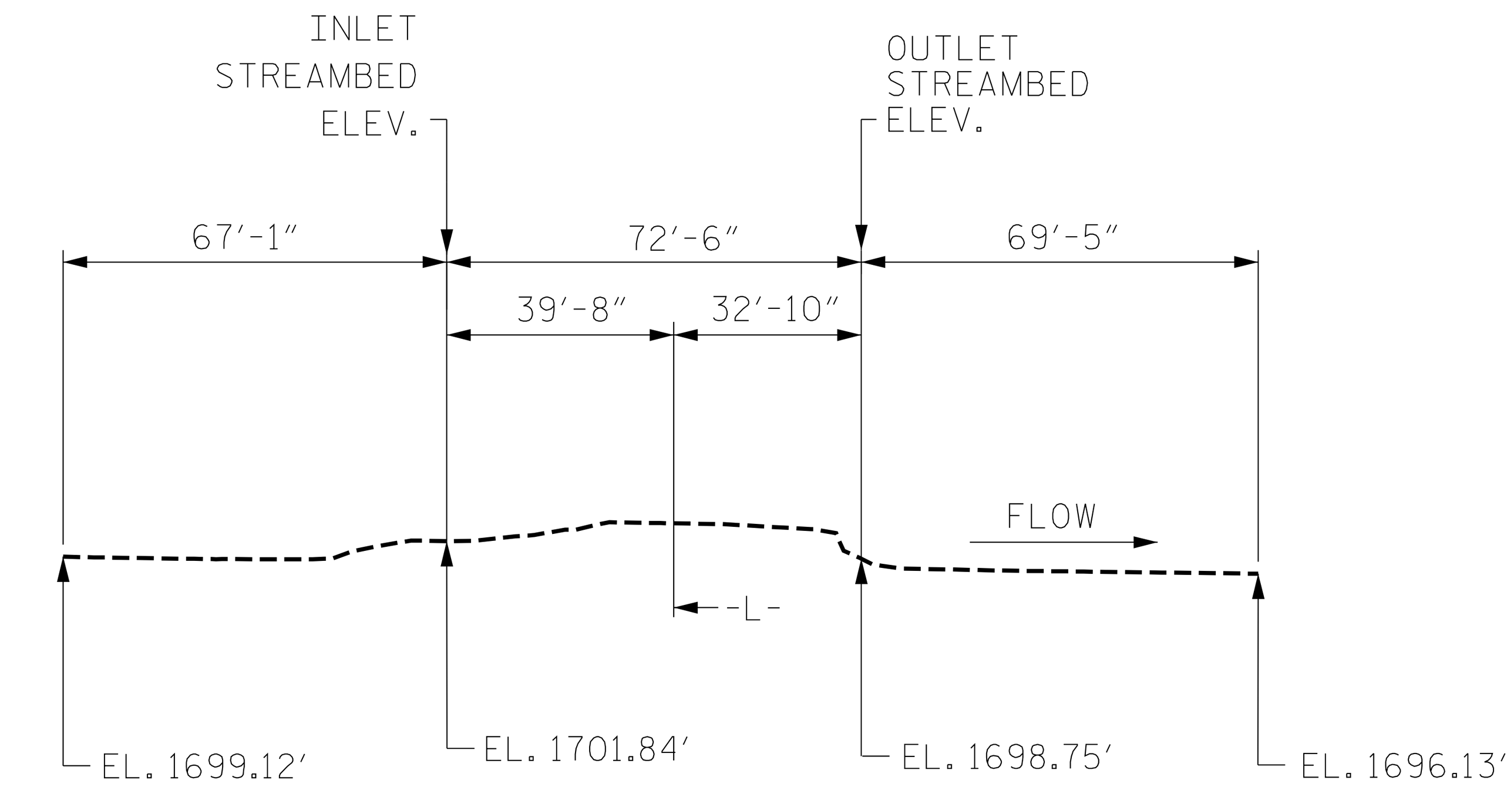
$$$$SYSTIME$$$$
$$$$USERNAME$$$$ $$$$DGN$$$$

BM #9: RR SPIKE IN TRIPLE 36′ POPLAR TREE, STA. 101+25.00 -L- 225′ RT.
N 524326 E446532, EL. 1702.98



FOR UTILITY INFORMATION, SEE UTILITY PLANS & SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

HYDRAULIC DATA

DESIGN DISCHARGE	400 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS
DESIGN HIGH WATER ELEVATION	1703.1 FT
BASE DISCHARGE	480 CFS
BASE FREQUENCY	100 YRS
BASE HW ELEVATION	1703.38 FT
DRAINAGE AREA	0.89 SQ. MI.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	550 CFS
FREQUENCY OF OVERTOPPING FLOOD	100 + YRS
OVERTOPPING FLOOD ELEVATION	1703.9 FT

GRADE DATA

GRADE POINT ELEV. @ STA. 96+77.46 -L-	1706.61 FT
BED ELEV. @ STA. 96+77.46 -L-	1696.89 FT
ROADWAY SLOPES	2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE TOTAL	160.9	C.Y.
REINFORCING STEEL TOTAL	22,405	LBS.
STEEL SHEET PILING TOTAL	400	SQ. FT.
CULVERT EXCAVATION		LUMP SUM
GEOTEXTILE FABRIC	245	SQ. YD.
FOUNDATION CONDITIONING MATERIAL	276	TONS
REMOVAL OF EXISTING STRUCTURE		LUMP SUM
RIP RAP CLASS II	30	TONS

NOTES:

ASSUMED LIVE LOAD ----------HL-93

DESIGN FILL-----------------MAX. = 3.40′ MIN. = 1.40′

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER (STAGE 1 & 2):

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4″ OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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

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

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 CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS

EXCAVATE THREE FEET BELOW THE BOTTOM OF CULVERT AND WING FOOTING ELEVATIONS. PLACE A LAYER OF GEOTEXTILE FABRIC, COVERING THE ENTIRE AREA, IN ACCORDANCE WITH SECTION 270 OF THE STANDARD SPECIFICATIONS. THEN BACKFILL UP TO BOTTOM OF CULVERT WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 2 @ 66″ CORRUGATED METAL PIPE AND STONE HEADWALLS LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. REFER TO TRAFFIC CONTROL PLANS FOR PHASING NOTES.

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

PROJECT NO. R-3622B
CHEROKEE COUNTY
STATION: 96+77.46 -L-

DocuSigned by: Hardy Willis
CC287...
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL HARDY L. WILLIS
4/24/2015

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Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509
Asheville, NC 828-253-2796
Boone, NC 828-355-9933

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

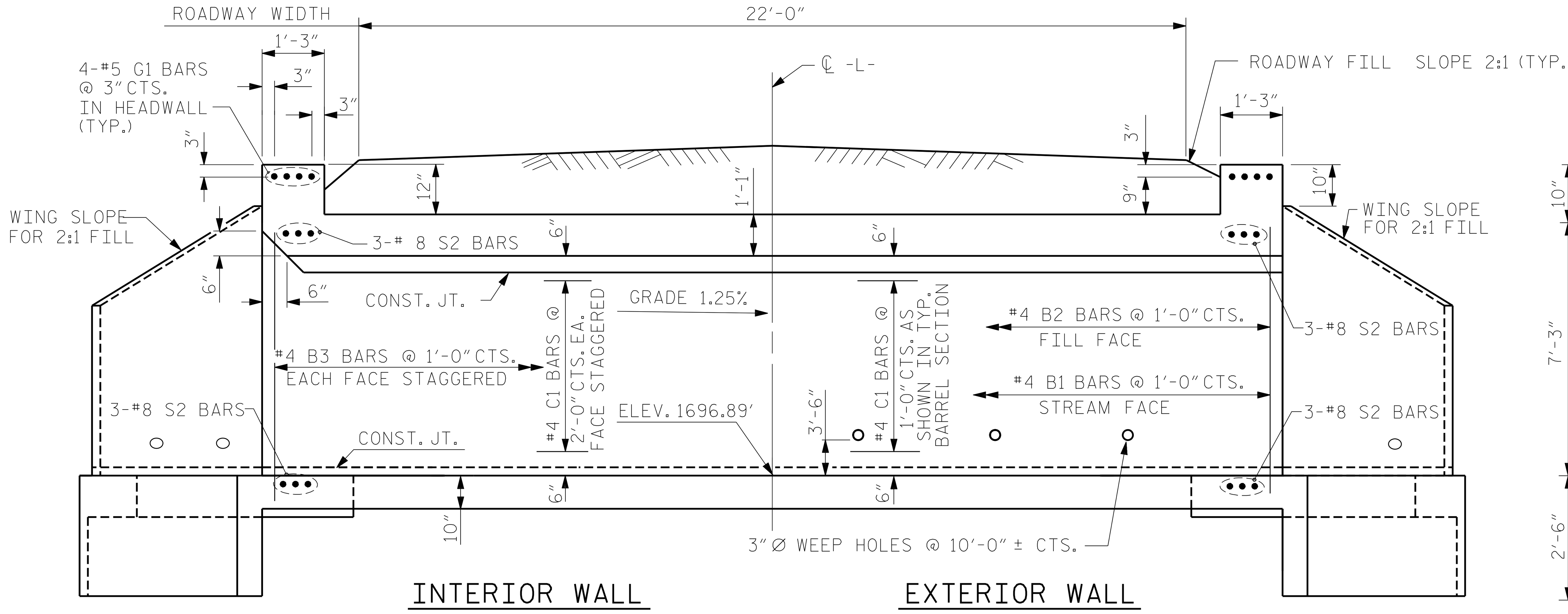
DOUBLE 8′ X 6′
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

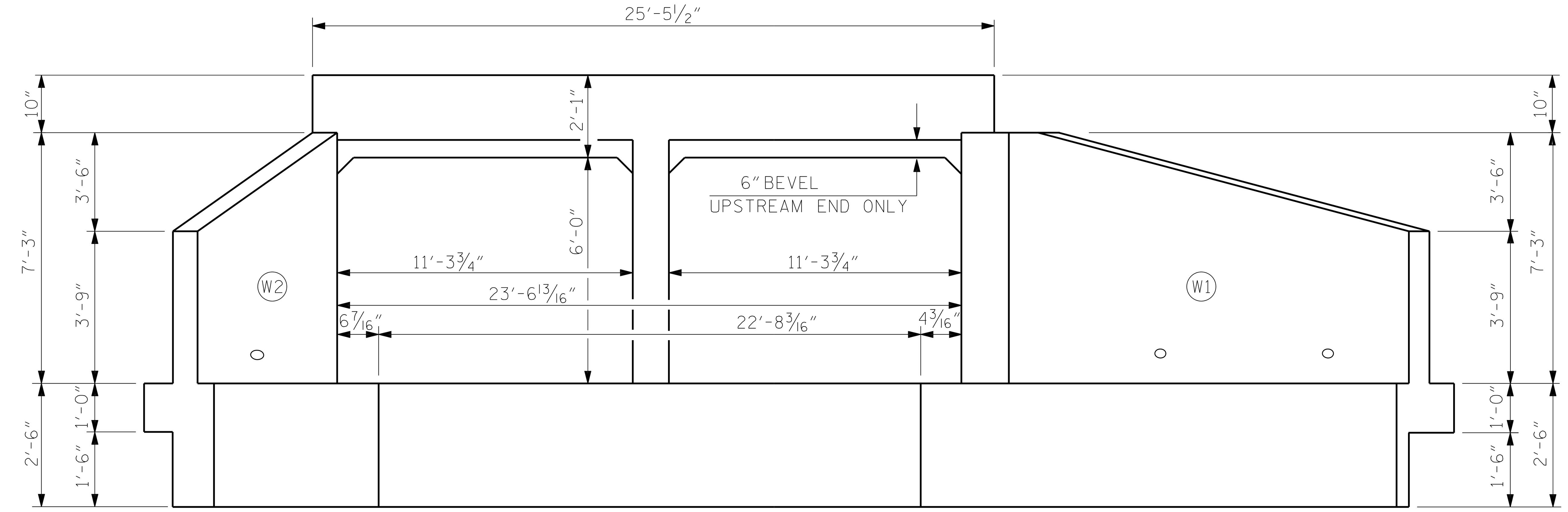
REVISIONS

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

SHEET NO. S-1
TOTAL SHEETS 17

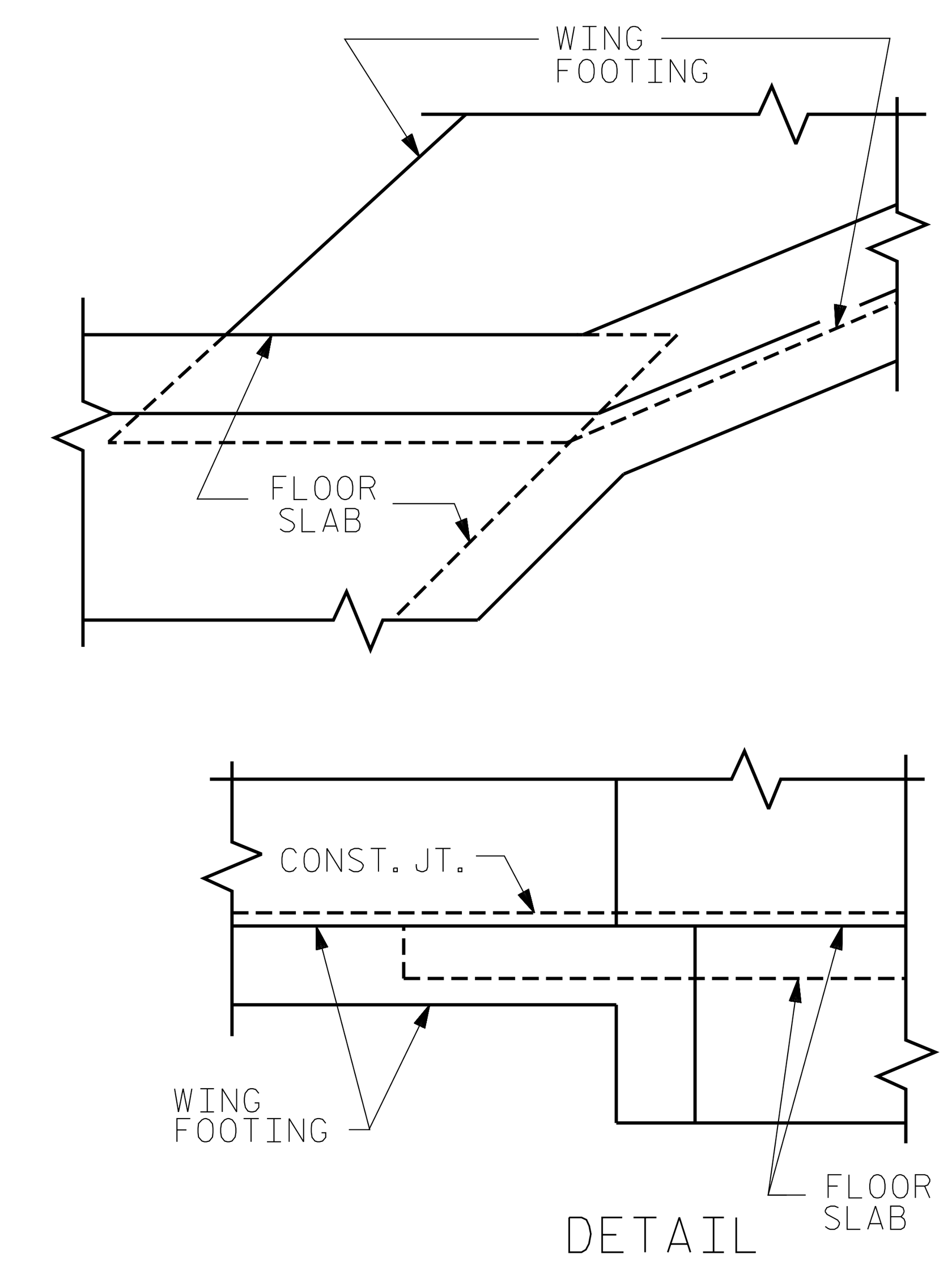

ROADWAY WIDTH
22'-0"
1'-3"
3"
4-#5 G1 BARS @ 3" CTS. IN HEADWALL (TYP.)
℄ -L-
ROADWAY FILL SLOPE 2:1 (TYP.)
1'-3"
12"
1'-1"
9"
10"
WING SLOPE FOR 2:1 FILL
3-# 8 S2 BARS
6"
CONST. JT.
GRADE 1.25%
#4 B2 BARS @ 1'-0" CTS. FILL FACE
3-#8 S2 BARS
#4 B3 BARS @ 1'-0" CTS. EACH FACE STAGGERED
#4 C1 BARS @ 2'-0" CTS. EA. FACE STAGGERED
#4 C1 BARS @ 1'-0" CTS. AS SHOWN IN TYP. BARREL SECTION
#4 B1 BARS @ 1'-0" CTS. STREAM FACE
3-#8 S2 BARS
ELEV. 1696.89'
3'-6"
CONST. JT.
10"
3" Ø WEEP HOLES @ 10'-0" ± CTS.
INTERIOR WALL
EXTERIOR WALL

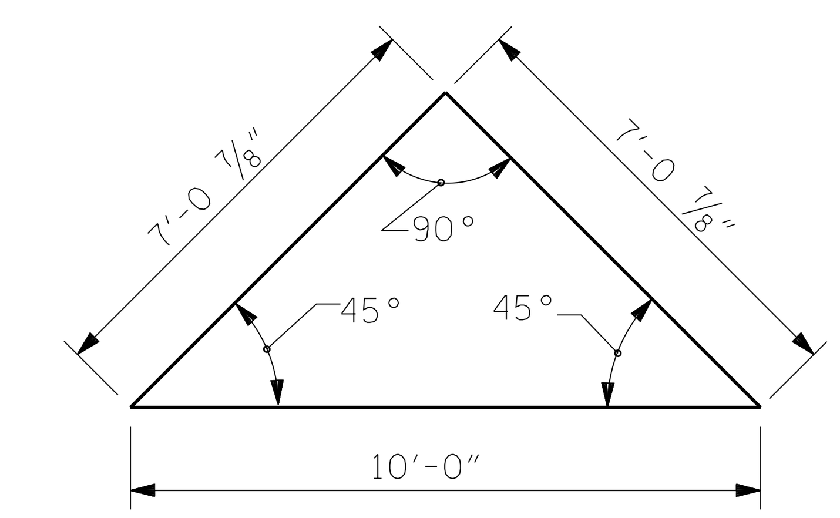
CULVERT SECTION NORMAL TO ROADWAY



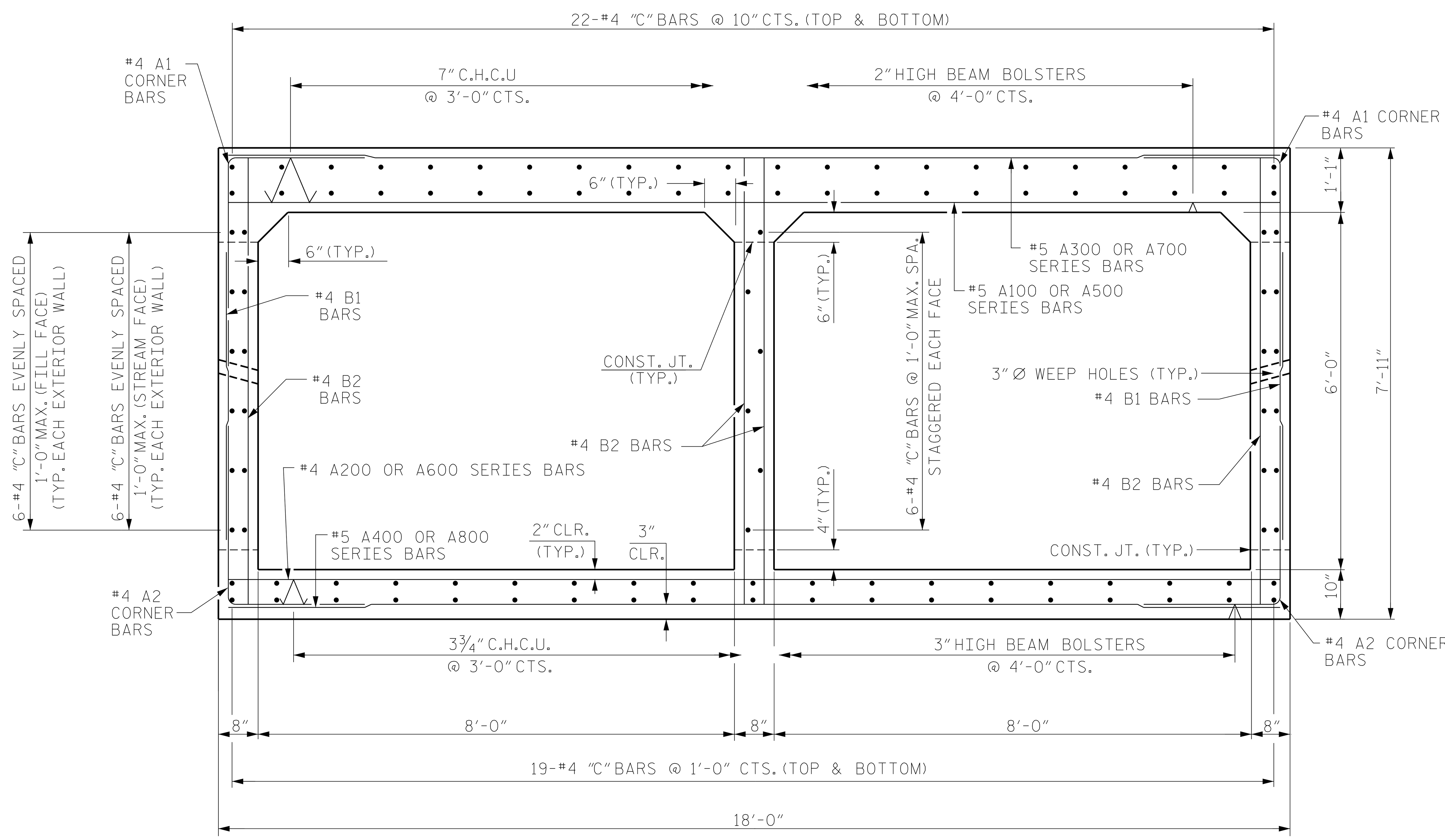
END ELEVATION NORMAL TO SKEW

(LOOKING DOWNSTREAM)





SKEW TRIANGLE


22-#4 "C" BARS @ 10" CTS. (TOP & BOTTOM)
#4 A1 CORNER BARS
7" C.H.C.U @ 3'-0" CTS.
2" HIGH BEAM BOLSTERS @ 4'-0" CTS.
#4 A1 CORNER BARS
6" (TYP.)
1'-1"
6" (TYP.)
#5 A300 OR A700 SERIES BARS
#5 A100 OR A500 SERIES BARS
#4 B1 BARS
6" (TYP.)
6-#4 "C" BARS @ 1'-0" MAX. SPA. STAGGERED EACH FACE
CONST. JT. (TYP.)
3" Ø WEEP HOLES (TYP.)
#4 B1 BARS
#4 B2 BARS
6'-0"
7'-11"
6-#4 "C" BARS EVENLY SPACED 1'-0" MAX. (FILL FACE) (TYP. EACH EXTERIOR WALL)
6-#4 "C" BARS EVENLY SPACED 1'-0" MAX. (STREAM FACE) (TYP. EACH EXTERIOR WALL)
#4 B2 BARS
#4 A200 OR A600 SERIES BARS
#4 B2 BARS
4" (TYP.)
#5 A400 OR A800 SERIES BARS
2" CLR. (TYP.)
3" CLR.
CONST. JT. (TYP.)
10"
#4 A2 CORNER BARS
#4 A2 CORNER BARS
3¾" C.H.C.U. @ 3'-0" CTS.
3" HIGH BEAM BOLSTERS @ 4'-0" CTS.
8"
8'-0"
8"
8'-0"
8"
19-#4 "C" BARS @ 1'-0" CTS. (TOP & BOTTOM)
18'-0"

RIGHT ANGLE SECTION OF BARREL

** THERE ARE 112 "C" BARS IN SECTION OF BARREL **
(LOOKING UPSTREAM)

CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN WING FOOTING IS THICKER THAN SLAB

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

V&M
Vaughn & Melton
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Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509
Asheville, NC 828-828-2796
Boone, NC 828-355-9933

DocuSigned by: Hardy Willis
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27177 HARDY L. WILLIS
4/24/2015

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

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

LAYOUT PLAN

(SEE TRAFFIC CONTROL PLANS FOR STAGING NOTES)

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

V&M Vaughn & Melton Consulting Engineers
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Boone, NC 828-355-9933

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER
DocuSigned by: Hardy Willis
CC287FCF0423461...
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

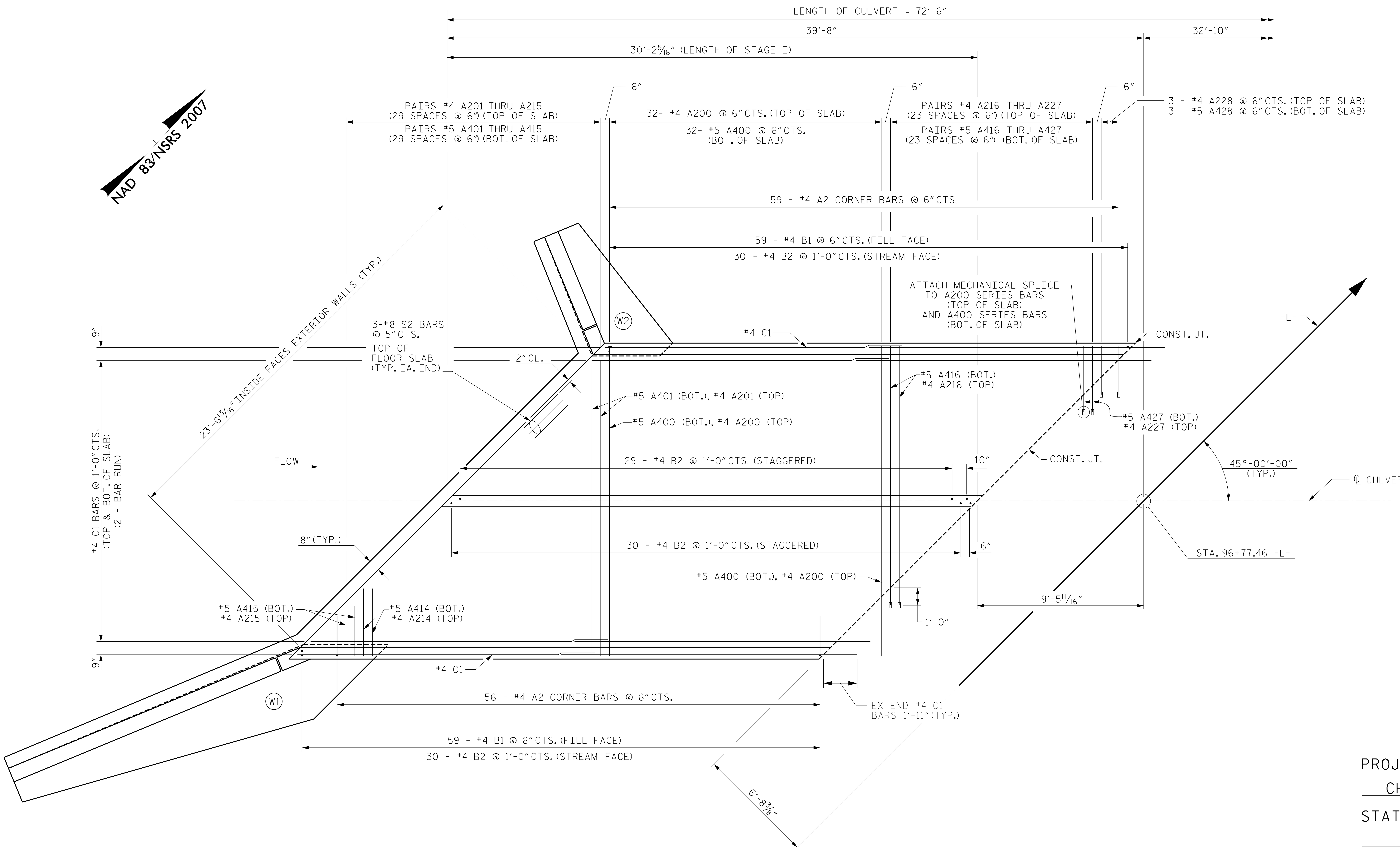
DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

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

SHEET NO. S-3

TOTAL SHEETS 17



LENGTH OF CULVERT = 72'-6"
39'-8"
32'-10"
30'-2⁵⁄₁₆" (LENGTH OF STAGE I)
6"
PAIRS #4 A201 THRU A215
(29 SPACES @ 6") (TOP OF SLAB)
PAIRS #5 A401 THRU A415
(29 SPACES @ 6") (BOT. OF SLAB)
32- #4 A200 @ 6" CTS. (TOP OF SLAB)
32- #5 A400 @ 6" CTS.
(BOT. OF SLAB)
PAIRS #4 A216 THRU A227
(23 SPACES @ 6") (TOP OF SLAB)
PAIRS #5 A416 THRU A427
(23 SPACES @ 6") (BOT. OF SLAB)
3 - #4 A228 @ 6" CTS. (TOP OF SLAB)
3 - #5 A428 @ 6" CTS. (BOT. OF SLAB)
NAD 83/NSRS 2007
59 - #4 A2 CORNER BARS @ 6" CTS.
59 - #4 B1 @ 6" CTS. (FILL FACE)
30 - #4 B2 @ 1'-0" CTS. (STREAM FACE)
ATTACH MECHANICAL SPLICE
TO A200 SERIES BARS
(TOP OF SLAB)
AND A400 SERIES BARS
(BOT. OF SLAB)
-L-
CONST. JT.
23'-6¹³⁄₁₆" INSIDE FACES EXTERIOR WALLS (TYP.)
3-#8 S2 BARS
@ 5" CTS.
TOP OF
FLOOR SLAB
(TYP. EA. END)
2" CL.
W2
#4 C1
#5 A416 (BOT.)
#4 A216 (TOP)
#5 A401 (BOT.), #4 A201 (TOP)
#5 A400 (BOT.), #4 A200 (TOP)
#5 A427 (BOT.)
#4 A227 (TOP)
9"
#4 C1 BARS @ 1'-0" CTS.
(TOP & BOT. OF SLAB)
(2 - BAR RUN)
FLOW
29 - #4 B2 @ 1'-0" CTS. (STAGGERED)
10"
CONST. JT.
45°-00'-00"
(TYP.)
℄ CULVERT
8" (TYP.)
30 - #4 B2 @ 1'-0" CTS. (STAGGERED)
6"
STA. 96+77.46 -L-
#5 A400 (BOT.), #4 A200 (TOP)
9'-5¹¹⁄₁₆"
1'-0"
#5 A415 (BOT.)
#4 A215 (TOP)
#5 A414 (BOT.)
#4 A214 (TOP)
#4 C1
W1
56 - #4 A2 CORNER BARS @ 6" CTS.
EXTEND #4 C1
BARS 1'-11" (TYP.)
59 - #4 B1 @ 6" CTS. (FILL FACE)
30 - #4 B2 @ 1'-0" CTS. (STREAM FACE)
6'-8⅜"

FLOOR SLAB PLAN

(STAGE I)
(SEE TRAFFIC CONTROL PLANS FOR STAGING NOTES)

PROJECT NO. R-3622B
CHEROKEE COUNTY
STATION: 96+77.46 -L-

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CC287FCF0228464...
NORTH CAROLINA PROFESSIONAL ENGINEER 20777 HARDY L. WILLIS
4/24/2015

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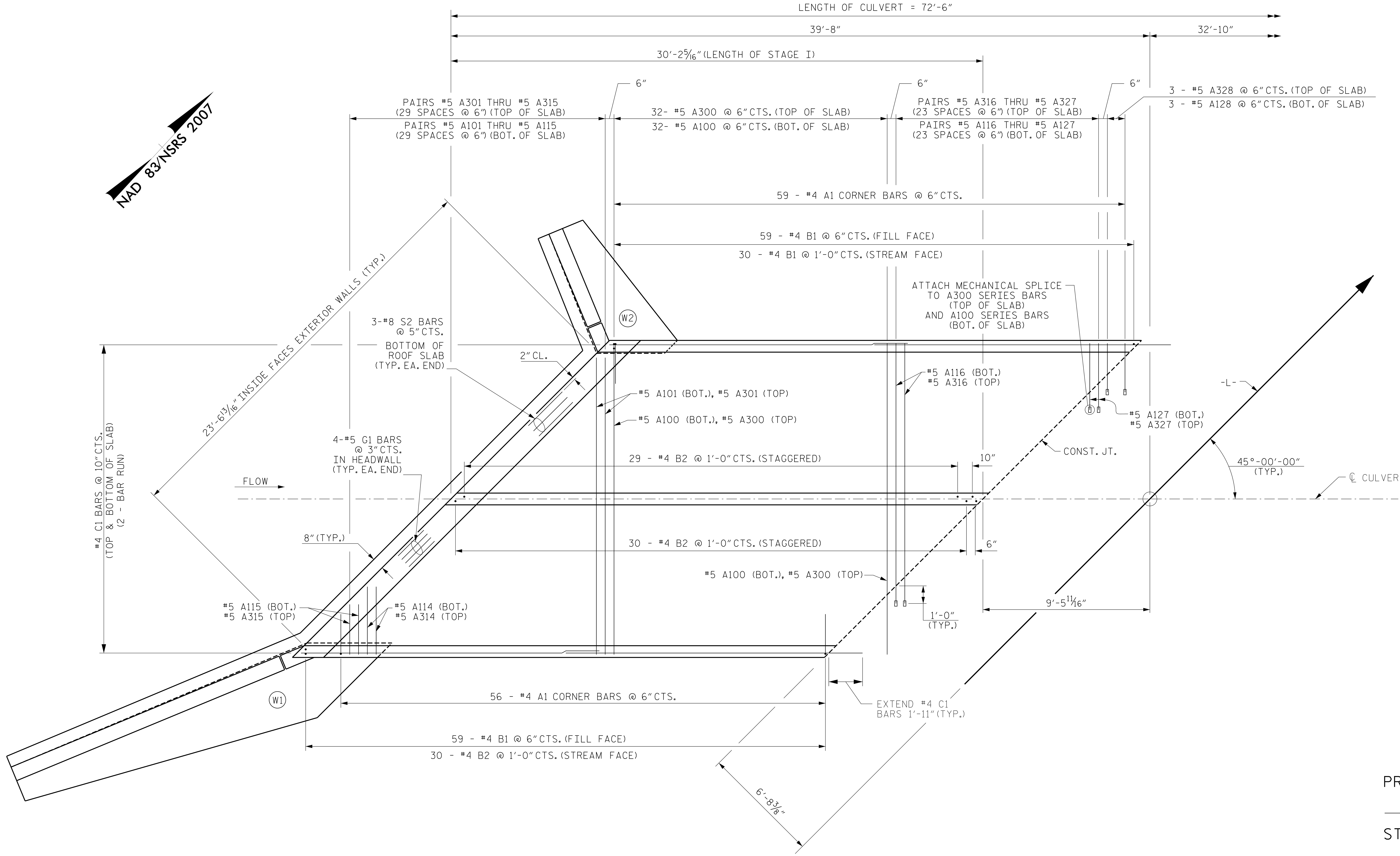
Boone, NC 828-355-9933

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

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



NAD 83/NSRS 2007
LENGTH OF CULVERT = 72'-6"
39'-8"
32'-10"
30'-2 5/16" (LENGTH OF STAGE I)
6"
6"
6"
PAIRS #5 A301 THRU #5 A315
(29 SPACES @ 6") (TOP OF SLAB)
PAIRS #5 A101 THRU #5 A115
(29 SPACES @ 6") (BOT. OF SLAB)
32- #5 A300 @ 6" CTS. (TOP OF SLAB)
32- #5 A100 @ 6" CTS. (BOT. OF SLAB)
PAIRS #5 A316 THRU #5 A327
(23 SPACES @ 6") (TOP OF SLAB)
PAIRS #5 A116 THRU #5 A127
(23 SPACES @ 6") (BOT. OF SLAB)
3 - #5 A328 @ 6" CTS. (TOP OF SLAB)
3 - #5 A128 @ 6" CTS. (BOT. OF SLAB)
59 - #4 A1 CORNER BARS @ 6" CTS.
59 - #4 B1 @ 6" CTS. (FILL FACE)
30 - #4 B1 @ 1'-0" CTS. (STREAM FACE)
23'-6 13/16" INSIDE FACES EXTERIOR WALLS (TYP.)
ATTACH MECHANICAL SPLICE
TO A300 SERIES BARS
(TOP OF SLAB)
AND A100 SERIES BARS
(BOT. OF SLAB)
3-#8 S2 BARS
@ 5" CTS.
BOTTOM OF
ROOF SLAB
(TYP. EA. END)
W2
2" CL.
#5 A116 (BOT.)
#5 A316 (TOP)
#5 A101 (BOT.), #5 A301 (TOP)
#5 A100 (BOT.), #5 A300 (TOP)
-L-
#5 A127 (BOT.)
#5 A327 (TOP)
#4 C1 BARS @ 10" CTS.
(TOP & BOTTOM OF SLAB)
(2 - BAR RUN)
4-#5 G1 BARS
@ 3" CTS.
IN HEADWALL
(TYP. EA. END)
CONST. JT.
10"
29 - #4 B2 @ 1'-0" CTS. (STAGGERED)
45°-00'-00"
(TYP.)
℄ CULVERT
FLOW
8" (TYP.)
30 - #4 B2 @ 1'-0" CTS. (STAGGERED)
6"
#5 A100 (BOT.), #5 A300 (TOP)
9'-5 11/16"
#5 A115 (BOT.)
#5 A315 (TOP)
#5 A114 (BOT.)
#5 A314 (TOP)
1'-0"
(TYP.)
W1
56 - #4 A1 CORNER BARS @ 6" CTS.
EXTEND #4 C1
BARS 1'-11" (TYP.)
59 - #4 B1 @ 6" CTS. (FILL FACE)
30 - #4 B2 @ 1'-0" CTS. (STREAM FACE)
6'-8 3/8"

ROOF SLAB PLAN

(STAGE I)

(SEE TRAFFIC CONTROL PLANS FOR STAGING NOTES)

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

Vaughn & Melton
Consulting Engineers
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704-357-0488

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Middlesboro, KY 606-248-6600
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Atlanta, GA 770-627-3509

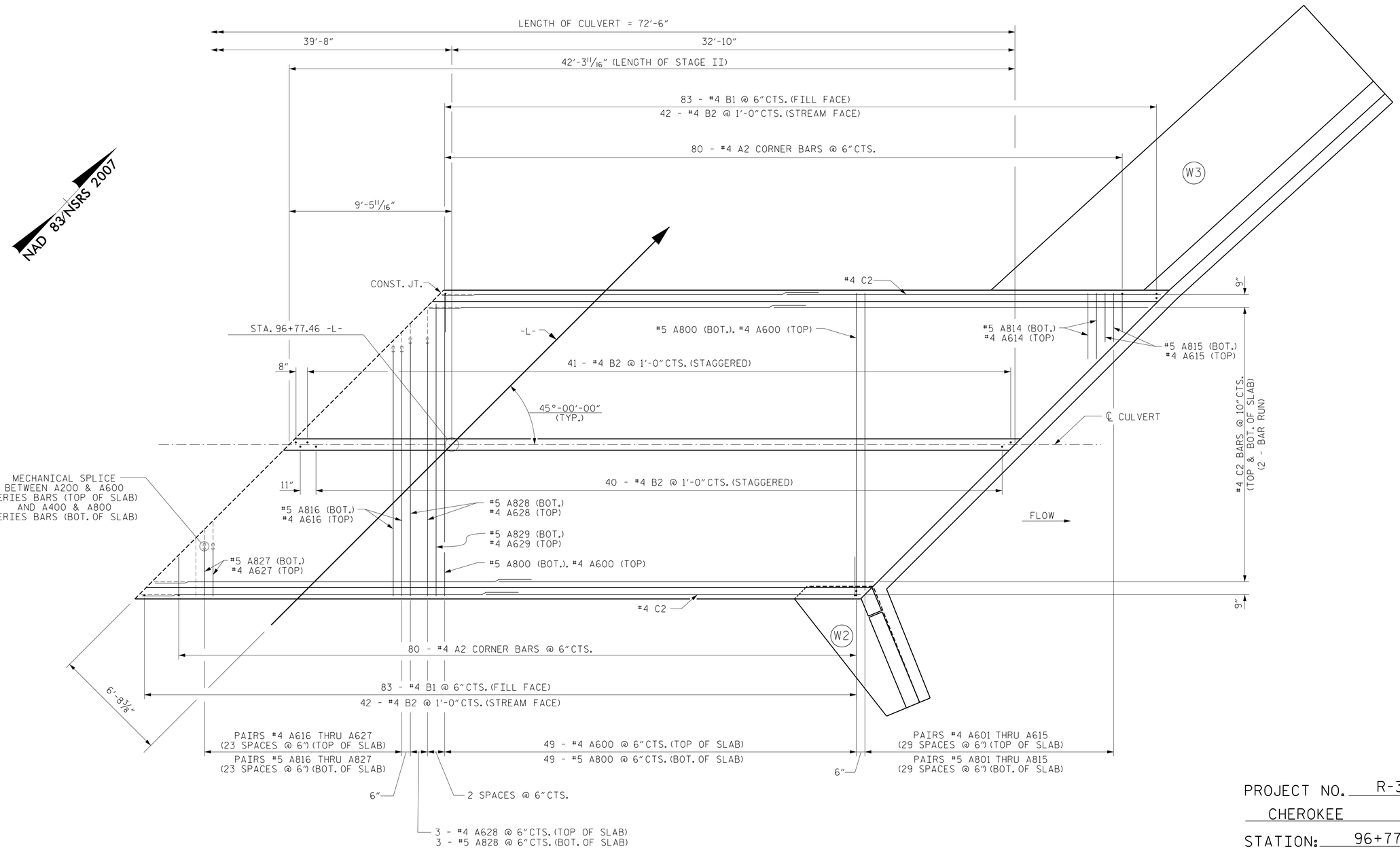
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS
DocuSigned by: Hardy Willis
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			17



FLOOR SLAB PLAN

(STAGE II)
(SEE TRAFFIC CONTROL PLANS FOR STAGING NOTES)

PROJECT NO. R-3622B
CHEROKEE COUNTY
STATION: 96+77.46 -L-

DocuSigned by: Haley Willis 20777 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — CANDY L. WILLIS — 4/24/2015

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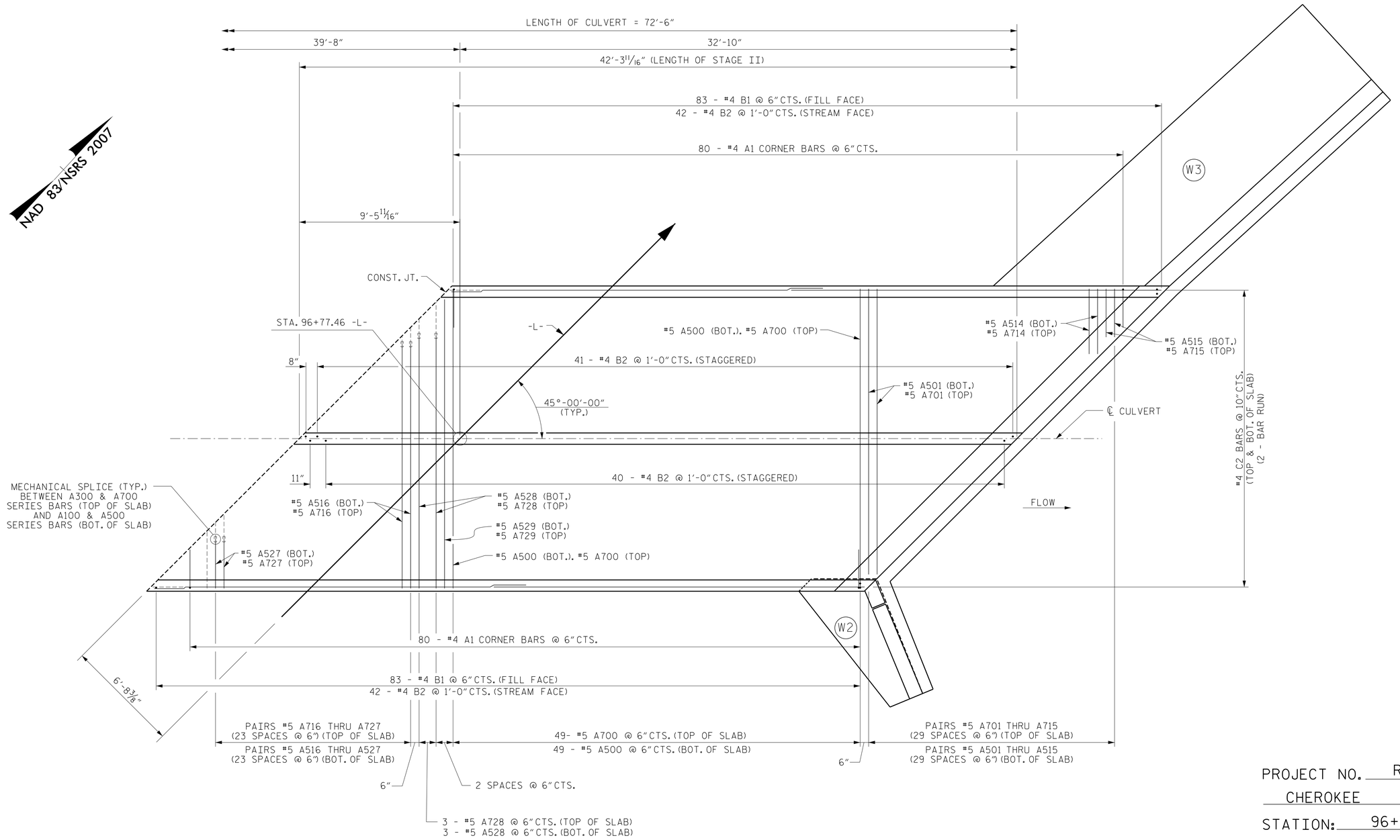
Middlesboro, KY 606-248-6600
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Atlanta, GA 770-627-3509

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW DATE: MAR 2015
CHKD. BY: HLW DATE: MAR 2015
DES. EGR. OF RECORD: CBC DATE: MAR 2015

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



ROOF SLAB PLAN

(STAGE II)
(SEE TRAFFIC CONTROL PLANS FOR STAGING NOTES)

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina
704-357-0488
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middleboro, KY 606-248-6600
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Atlanta, GA 770-627-3509

DocuSigned by:
Hardy Willis
CC287CF0223461...

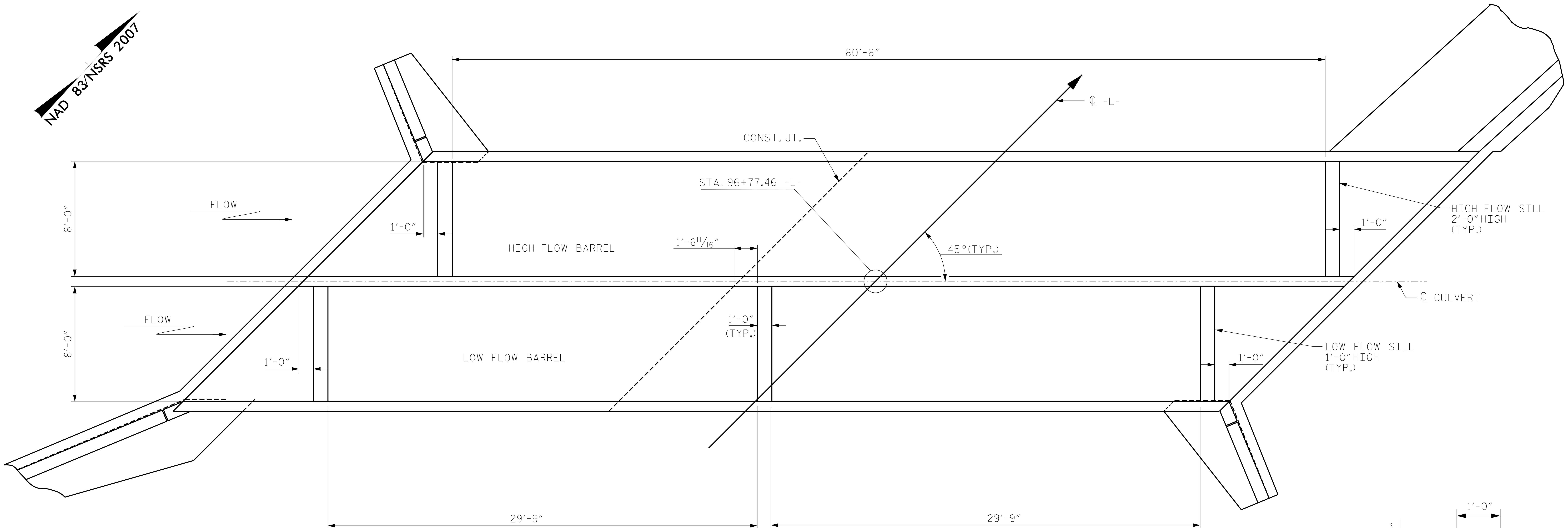
NORTH CAROLINA PROFESSIONAL SEAL 027017 ENGINEER HARDY L. WILLIS
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

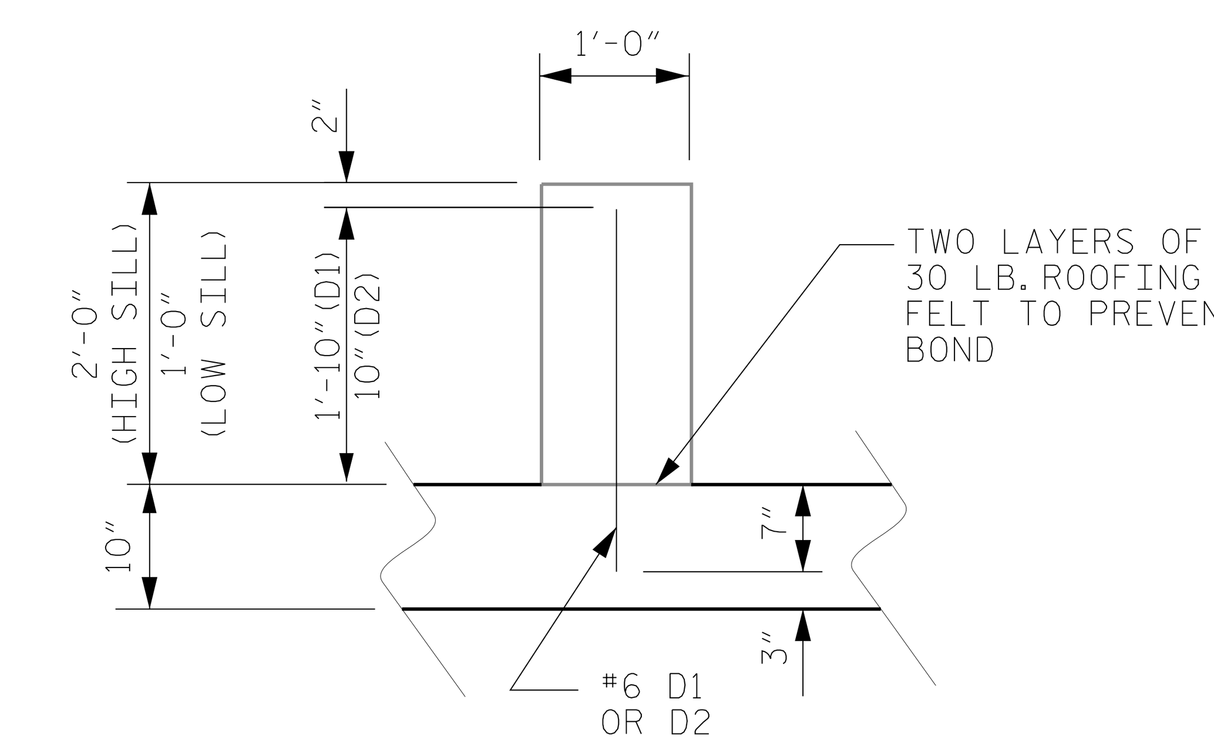
DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			17

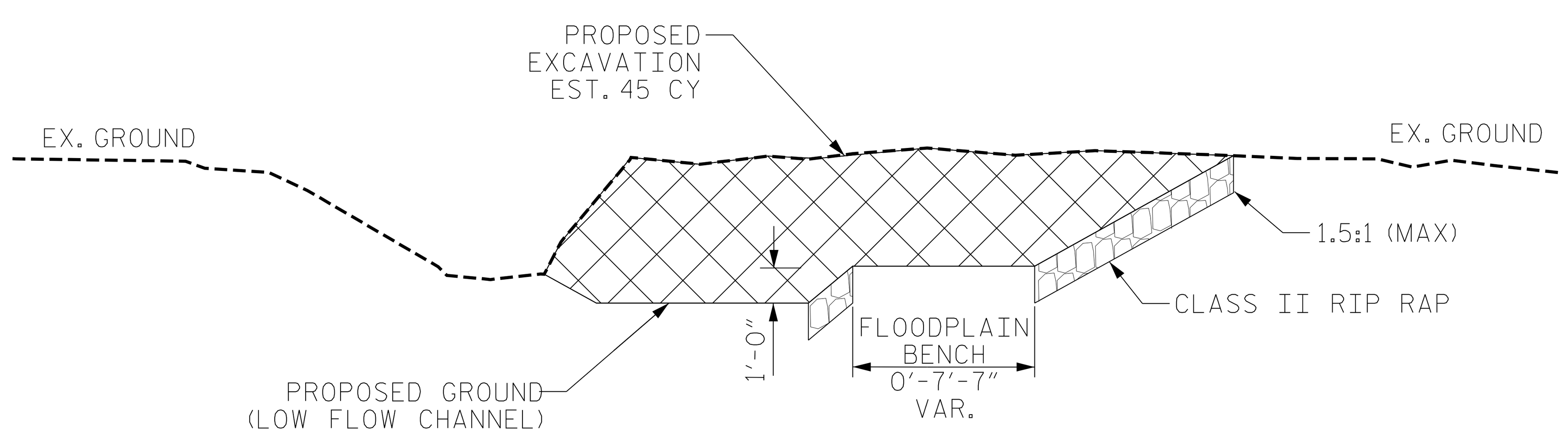


CULVERT SILL LAYOUT



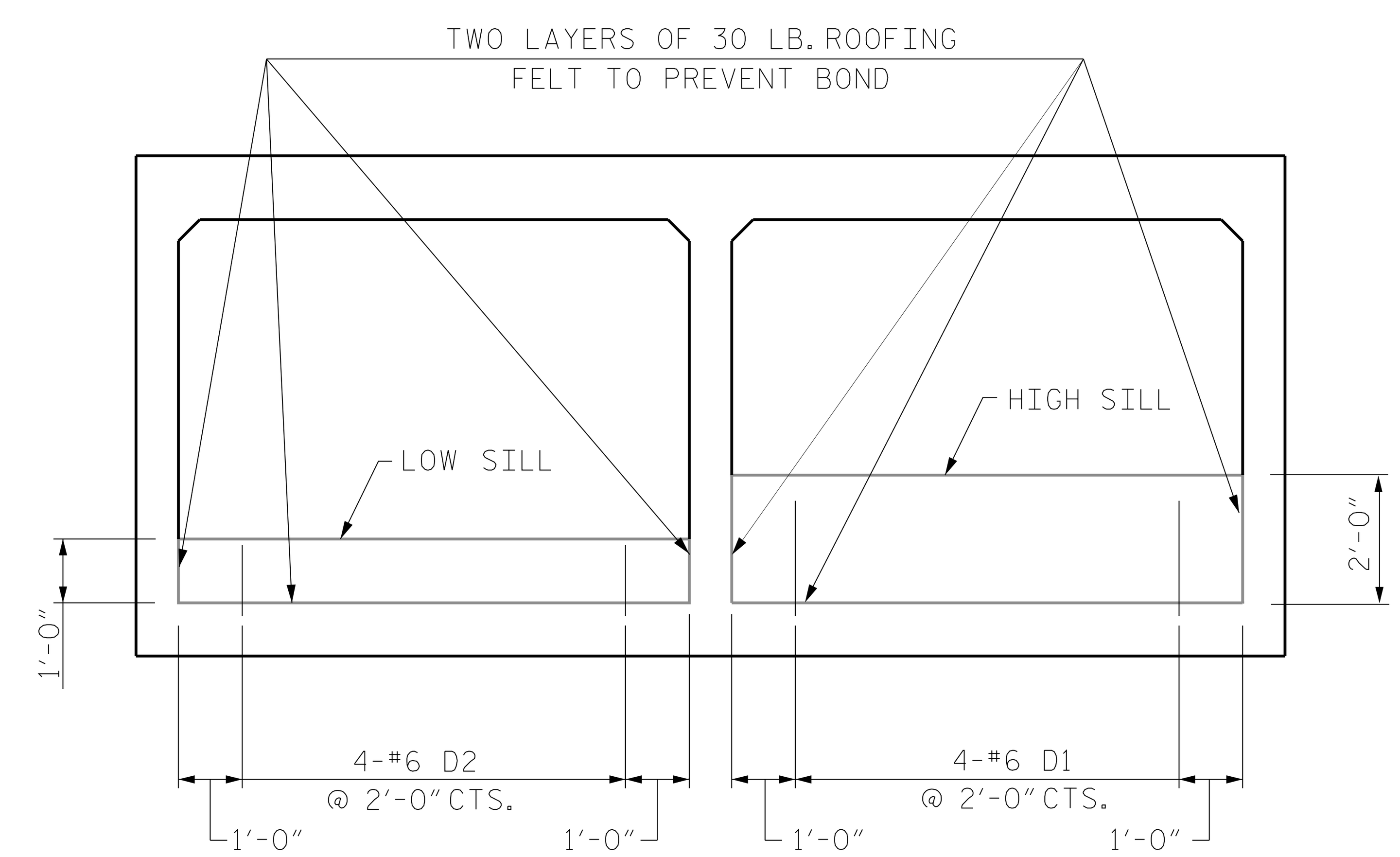
SECTION THROUGH SILL

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



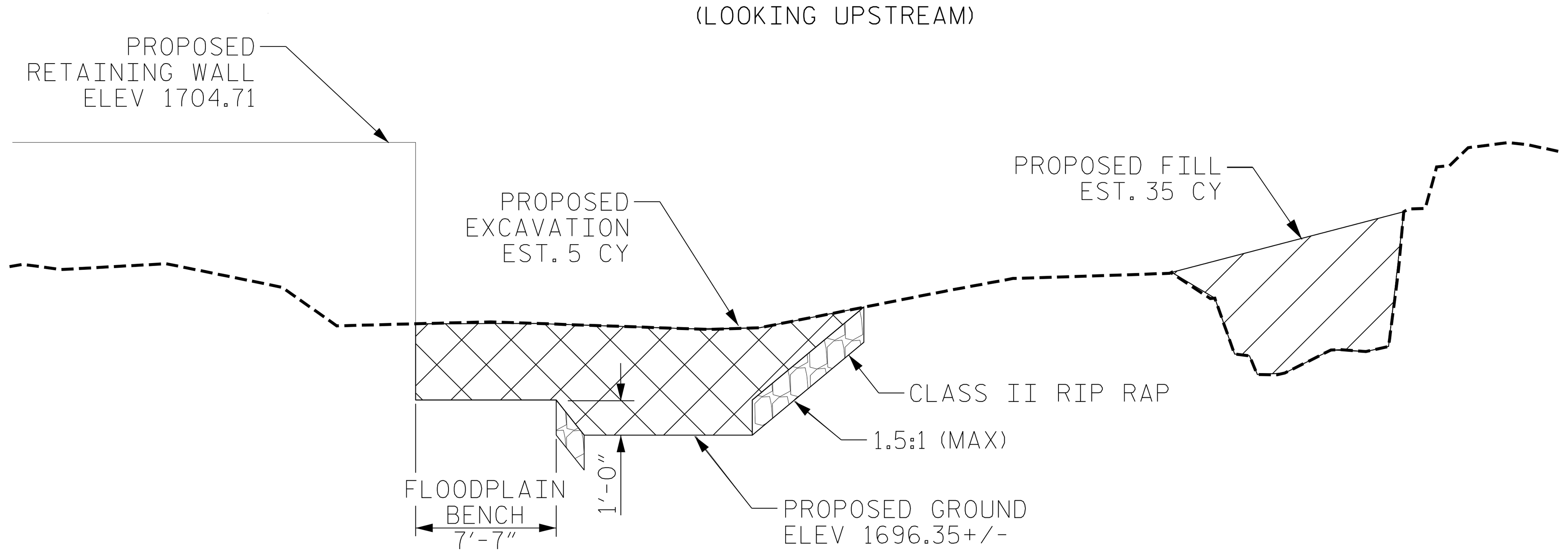
INLET CHANNEL EXCAVATION DETAIL

(LOOKING UPSTREAM)



END ELEVATION

(LOOKING UPSTREAM)



OUTLET CHANNEL EXCAVATION DETAIL

(LOOKING DOWNSTREAM)

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

V&M
Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina 704-357-0488
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509
Asheville, NC 828-828-2796
Boone, NC 828-355-9933

DocuSigned by: Hardy Willis
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			17

BARREL BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	115	4	(1)	5'-5"	416
A2	115	4	(1)	4'-11"	378
A100	32	5	STR.	17'-8"	590
A101	2	5	STR.	16'-10"	35
A102	2	5	STR.	15'-10"	33
A103	2	5	STR.	14'-10"	31
A104	2	5	STR.	13'-10"	29
A105	2	5	STR.	12'-10"	27
A106	2	5	STR.	11'-10"	25
A107	2	5	STR.	10'-10"	23
A108	2	5	STR.	9'-10"	21
A109	2	5	STR.	8'-10"	18
A110	2	5	STR.	7'-10"	16
A111	2	5	STR.	6'-10"	14
A112	2	5	STR.	5'-10"	12
A113	2	5	STR.	4'-10"	10
A114	2	5	STR.	3'-10"	8
A115	2	5	STR.	2'-10"	6
A116	2	5	STR.	14'-3"	30
A117	2	5	STR.	13'-3"	28
A118	2	5	STR.	12'-3"	26
A119	2	5	STR.	11'-3"	24
A120	2	5	STR.	10'-3"	22
A121	2	5	STR.	9'-3"	20
A122	2	5	STR.	8'-3"	17
A123	2	5	STR.	7'-3"	15
A124	2	5	STR.	6'-3"	13
A125	2	5	STR.	5'-3"	11
A126	2	5	STR.	4'-3"	9
A127	2	5	STR.	3'-3"	7
A128	3	5	STR.	2'-9"	9
A200	32	4	STR.	17'-8"	378
A201	2	4	STR.	16'-10"	22
A202	2	4	STR.	15'-10"	21
A203	2	4	STR.	14'-10"	20
A204	2	4	STR.	13'-10"	18
A205	2	4	STR.	12'-10"	17
A206	2	4	STR.	11'-10"	16
A207	2	4	STR.	10'-10"	14
A208	2	4	STR.	9'-10"	13
A209	2	4	STR.	8'-10"	12
A210	2	4	STR.	7'-10"	10
A211	2	4	STR.	6'-10"	9
A212	2	4	STR.	5'-10"	8
A213	2	4	STR.	4'-10"	6
A214	2	4	STR.	3'-10"	5
A215	2	4	STR.	2'-10"	4
A216	2	4	STR.	14'-3"	19
A217	2	4	STR.	13'-3"	18
A218	2	4	STR.	12'-3"	16
A219	2	4	STR.	11'-3"	15
A220	2	4	STR.	10'-3"	14
A221	2	4	STR.	9'-3"	12
A222	2	4	STR.	8'-3"	11
A223	2	4	STR.	7'-3"	10
A224	2	4	STR.	6'-3"	8
A225	2	4	STR.	5'-3"	7
A226	2	4	STR.	4'-3"	6
A227	2	4	STR.	3'-3"	4
A228	3	4	STR.	2'-9"	6
A300	32	5	STR.	17'-8"	590
A301	2	5	STR.	16'-10"	35
A302	2	5	STR.	15'-10"	33
A303	2	5	STR.	14'-10"	31
A304	2	5	STR.	13'-10"	29
A305	2	5	STR.	12'-10"	27
A306	2	5	STR.	11'-10"	25
A307	2	5	STR.	10'-10"	23
A308	2	5	STR.	9'-10"	21
A309	2	5	STR.	8'-10"	18
A310	2	5	STR.	7'-10"	16
A311	2	5	STR.	6'-10"	14
A312	2	5	STR.	5'-10"	12
A313	2	5	STR.	4'-10"	10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A314	2	5	STR.	3'-10"	8
A315	2	5	STR.	2'-10"	6
A316	2	5	STR.	14'-3"	30
A317	2	5	STR.	13'-3"	28
A318	2	5	STR.	12'-3"	26
A319	2	5	STR.	11'-3"	24
A320	2	5	STR.	10'-3"	22
A321	2	5	STR.	9'-3"	20
A322	2	5	STR.	8'-3"	17
A323	2	5	STR.	7'-3"	15
A324	2	5	STR.	6'-3"	13
A325	2	5	STR.	5'-3"	11
A326	2	5	STR.	4'-3"	9
A327	2	5	STR.	3'-3"	7
A328	3	5	STR.	2'-9"	9
A400	32	5	STR.	17'-8"	590
A401	2	5	STR.	16'-10"	35
A402	2	5	STR.	15'-10"	33
A403	2	5	STR.	14'-10"	31
A404	2	5	STR.	13'-10"	29
A405	2	5	STR.	12'-10"	27
A406	2	5	STR.	11'-10"	25
A407	2	5	STR.	10'-10"	23
A408	2	5	STR.	9'-10"	21
A409	2	5	STR.	8'-10"	18
A410	2	5	STR.	7'-10"	16
A411	2	5	STR.	6'-10"	14
A412	2	5	STR.	5'-10"	12
A413	2	5	STR.	4'-10"	10
A414	2	5	STR.	3'-10"	8
A415	2	5	STR.	2'-10"	6
A416	2	5	STR.	14'-3"	30
A417	2	5	STR.	13'-3"	28
A418	2	5	STR.	12'-3"	26
A419	2	5	STR.	11'-3"	24
A420	2	5	STR.	10'-3"	22
A421	2	5	STR.	9'-3"	20
A422	2	5	STR.	8'-3"	17
A423	2	5	STR.	7'-3"	15
A424	2	5	STR.	6'-3"	13
A425	2	5	STR.	5'-3"	11
A426	2	5	STR.	4'-3"	9
A427	2	5	STR.	3'-3"	7
A428	3	5	STR.	2'-9"	9
B1	118	4	STR.	5'-6"	434
B2	121	4	STR.	7'-6"	606
C1	224	4	STR.	16'-10"	2519
D1	4	6	STR.	2'-5"	15
D2	4	6	STR.	1'-5"	9
G1	4	5	STR.	24'-11"	104
S2	3	8	STR.	24'-11"	200

TOTAL STAGE I REINFORCING STEEL 8,787 LB.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	160	4	(1)	5'-5"	579
A2	160	4	(1)	4'-11"	526
A500	49	5	STR.	17'-8"	903
A501	2	5	STR.	16'-10"	35
A502	2	5	STR.	15'-10"	33
A503	2	5	STR.	14'-10"	31
A504	2	5	STR.	13'-10"	29
A505	2	5	STR.	12'-10"	27
A506	2	5	STR.	11'-10"	25
A507	2	5	STR.	10'-10"	23
A508	2	5	STR.	9'-10"	21
A509	2	5	STR.	8'-10"	18
A510	2	5	STR.	7'-10"	16
A511	2	5	STR.	6'-10"	14
A512	2	5	STR.	5'-10"	12
A513	2	5	STR.	4'-10"	10
A514	2	5	STR.	3'-10"	8
A515	2	5	STR.	2'-10"	6
A516	2	5	STR.	14'-3"	30
A517	2	5	STR.	13'-3"	28
A518	2	5	STR.	12'-3"	26
A519	2	5	STR.	11'-3"	24
A520	2	5	STR.	10'-3"	22
A521	2	5	STR.	9'-3"	20
A522	2	5	STR.	8'-3"	17
A523	2	5	STR.	7'-3"	15
A524	2	5	STR.	6'-3"	13
A525	2	5	STR.	5'-3"	11
A526	2	5	STR.	4'-3"	9
A527	2	5	STR.	3'-3"	7
A528	3	5	STR.	16'-10"	53
A529	1	5	STR.	17'-0"	18
A600	49	4	STR.	17'-8"	578
A601	2	4	STR.	16'-10"	22
A602	2	4	STR.	15'-10"	21
A603	2	4	STR.	14'-10"	20
A604	2	4	STR.	13'-10"	18
A605	2	4	STR.	12'-10"	17
A606	2	4	STR.	11'-10"	16
A607	2	4	STR.	10'-10"	14
A608	2	4	STR.	9'-10"	13
A609	2	4	STR.	8'-10"	12
A610	2	4	STR.	7'-10"	10
A611	2	4	STR.	6'-10"	9
A612	2	4	STR.	5'-10"	8
A613	2	4	STR.	4'-10"	6
A614	2	4	STR.	3'-10"	5
A615	2	4	STR.	2'-10"	4
A616	2	4	STR.	14'-3"	19
A617	2	4	STR.	13'-3"	18
A618	2	4	STR.	12'-3"	16
A619	2	4	STR.	11'-3"	15
A620	2	4	STR.	10'-3"	14
A621	2	4	STR.	9'-3"	12
A622	2	4	STR.	8'-3"	11
A623	2	4	STR.	7'-3"	10
A624	2	4	STR.	6'-3"	8
A625	2	4	STR.	5'-3"	7
A626	2	4	STR.	4'-3"	6
A627	2	4	STR.	3'-3"	4
A628	3	4	STR.	16'-10"	34
A629	1	4	STR.	17'-0"	11
A700	49	5	STR.	17'-8"	903
A701	2	5	STR.	16'-10"	35
A702	2	5	STR.	15'-10"	33
A703	2	5	STR.	14'-10"	31
A704	2	5	STR.	13'-10"	29
A705	2	5	STR.	12'-10"	27
A706	2	5	STR.	11'-10"	25
A707	2	5	STR.	10'-10"	23
A708	2	5	STR.	9'-10"	21
A709	2	5	STR.	8'-10"	18
A710	2	5	STR.	7'-10"	16
A711	2	5	STR.	6'-10"	14

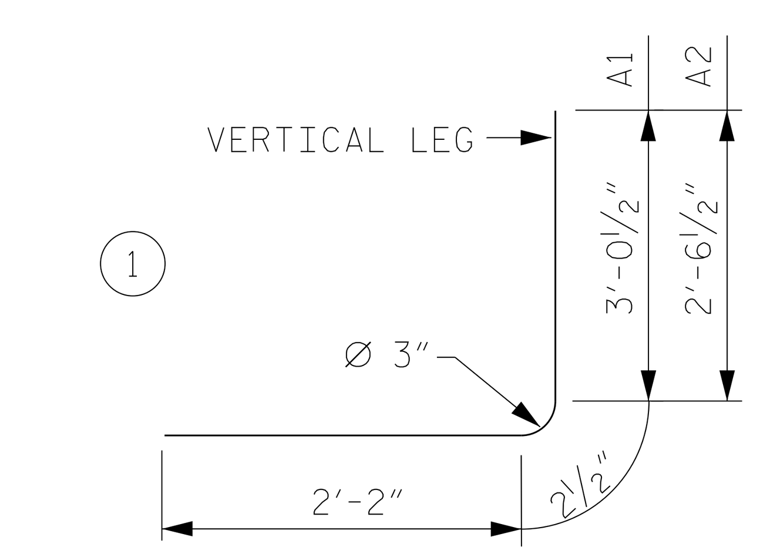
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A712	2	5	STR.	5'-10"	12
A713	2	5	STR.	4'-10"	10
A714	2	5	STR.	3'-10"	8
A715	2	5	STR.	2'-10"	6
A716	2	5	STR.	14'-3"	30
A717	2	5	STR.	13'-3"	28
A718	2	5	STR.	12'-3"	26
A719	2	5	STR.	11'-3"	24
A720	2	5	STR.	10'-3"	22
A721	2	5	STR.	9'-3"	20
A722	2	5	STR.	8'-3"	17
A723	2	5	STR.	7'-3"	15
A724	2	5	STR.	6'-3"	13
A725	2	5	STR.	5'-3"	11
A726	2	5	STR.	4'-3"	9
A727	2	5	STR.	3'-3"	7
A728	3	5	STR.	16'-10"	53
A729	1	5	STR.	17'-0"	18
A800	49	5	STR.	17'-8"	903
A801	2	5	STR.	16'-10"	35
A802	2	5	STR.	15'-10"	33
A803	2	5	STR.	14'-10"	31
A804	2	5	STR.	13'-10"	29
A805	2	5	STR.	12'-10"	27
A806	2	5	STR.	11'-10"	25
A807	2	5	STR.	10'-10"	23
A808	2	5	STR.	9'-10"	21
A809	2	5	STR.	8'-10"	18
A810	2	5	STR.	7'-10"	16
A811	2	5	STR.	6'-10"	14
A812	2	5	STR.	5'-10"	12
A813	2	5	STR.	4'-10"	10
A814	2	5	STR.	3'-10"	8
A815	2	5	STR.	2'-10"	6
A816	2	5	STR.	14'-3"	30
A817	2	5	STR.	13'-3"	28
A818	2	5	STR.	12'-3"	26
A819	2	5	STR.	11'-3"	24
A820	2	5	STR.	10'-3"	22
A821	2	5	STR.	9'-3"	20
A822	2	5	STR.	8'-3"	17
A823	2	5	STR.	7'-3"	15
A824	2	5	STR.	6'-3"	13
A825	2	5	STR.	5'-3"	11
A826	2	5	STR.	4'-3"	9
A827	2	5	STR.	3'-3"	7
A828	3	5	STR.	16'-10"	53
A829	1	5	STR.	17'-0"	18
B1	166	4	STR.	5'-6"	610
B2	167	4	STR.	7'-6"	837
C2	224	4	STR.	21'-11"	3279
D1	4	6	STR.	2'-5"	15
D2	8	6	STR.	1'-5"	17
G1	4	5	STR.	24'-11"	104
S2	3	8	STR.	24'-11"	200

TOTAL STAGE II REINFORCING STEEL 11,637 LB.

STAGE I REINFORCING STEEL	8,787 LB.
STAGE II REINFORCING STEEL	11,637 LB.
TOTAL REINFORCING STEEL	20,424 LB.

BARREL CLASS A CONCRETE	
STAGE I	52.6 C.Y.
STAGE II	73.6 C.Y.
SILLS CLASS A CONCRETE	
STAGE I	0.9 C.Y.
STAGE II	1.2 C.Y.
TOTAL CLASS A CONCRETE	128.3 C.Y.

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

SPLICE LENGTH CHART

BAR SIZE	SPLICE LENGTH
#4	1'-9"
#5	2'-2"
#6	2'-9"
#8	4'-11"

TOTAL BILL OF MATERIALS

REINFORCING STEEL		
BARREL & SILLS	20,424	LBS.
WINGWALLS, HEADWALLS & CURTAIN WALLS	1,422	LBS.
WALL COPING	559	LBS.
TOTAL	22,405	LBS.
CLASS A CONCRETE		
BARREL & SILLS	128.3	CY
WINGWALLS, HEADWALLS & CURTAIN WALLS	28.1	CY
WALL COPING	4.5	CY
TOTAL	160.9	CY

PROJECT NO. R-3622B
CHEROKEE COUNTY
STATION: 96+77.46 -L-

V&M Vaughn & Melton Consulting Engineers
Charlotte, North Carolina 704-357-0488
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
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Middlesboro, KY 606-248-6600
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Atlanta, GA 770-627-3509

DocuSigned by: Hardy Willis CC287FCF02234B1...
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER HARDY L. WILLIS 2015

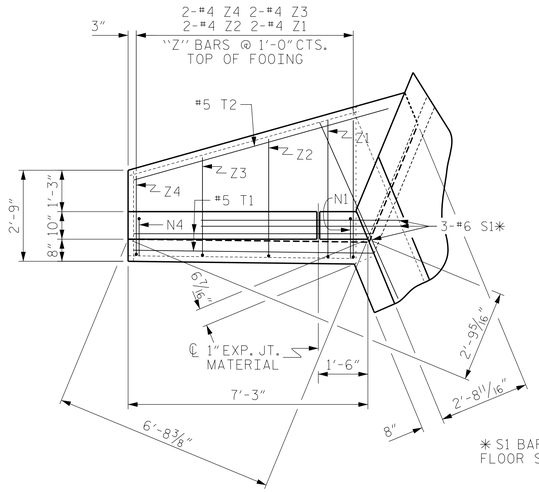
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

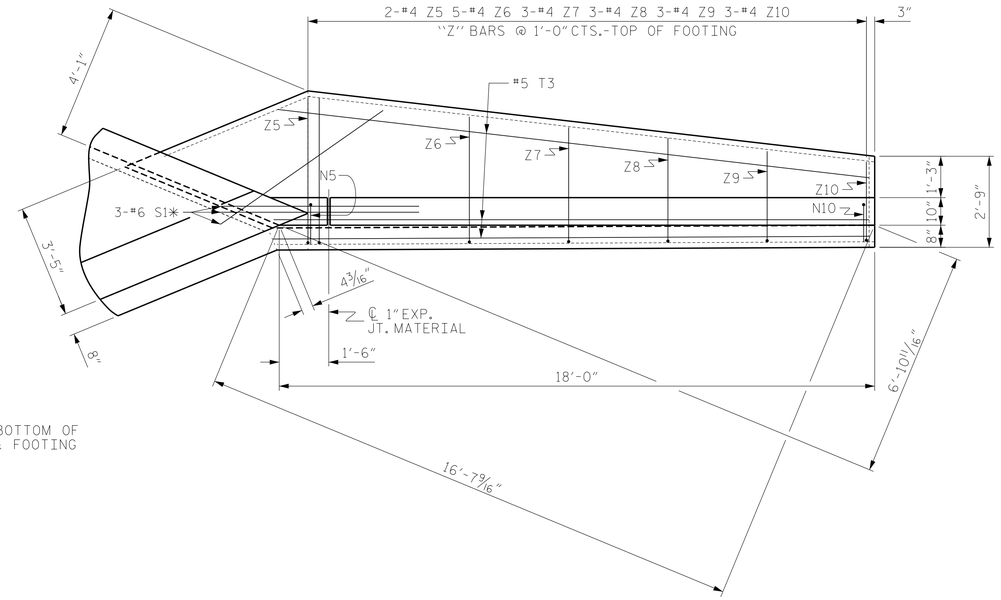
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-9
TOTAL SHEETS 17

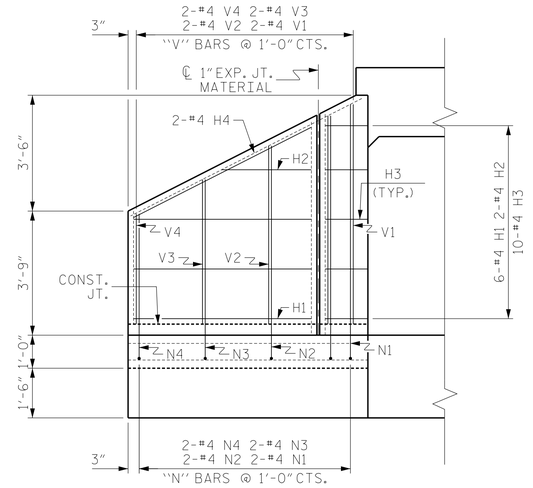


* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

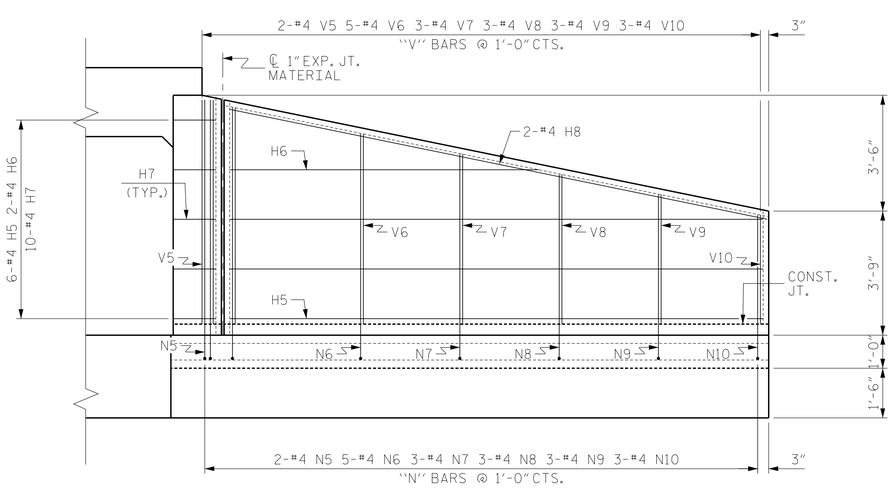
PLAN W2



PLAN W1



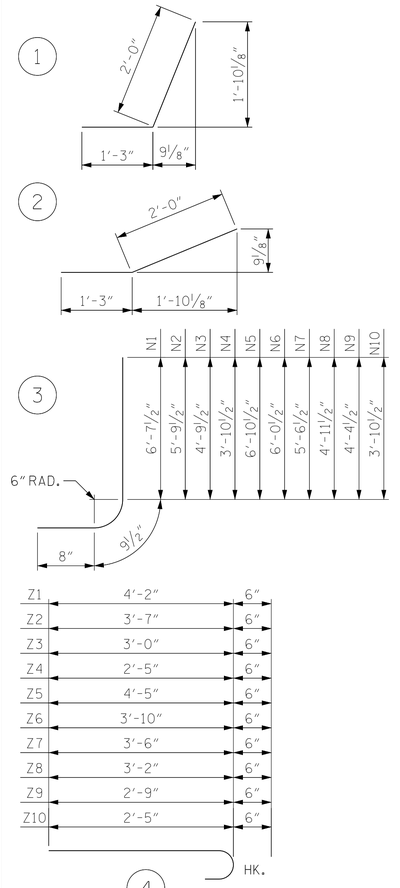
ELEVATION W2



ELEVATION W1

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



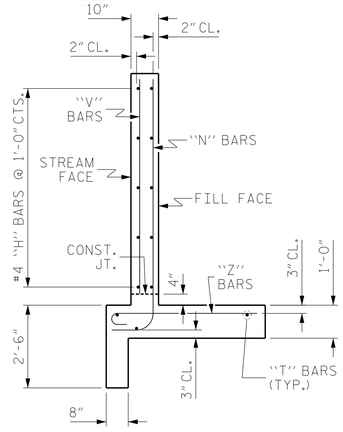
BILL OF MATERIAL- STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	5'-4"	21
H2	2	#4	STR	2'-6"	3
H3	10	#4	1	3'-3"	22
H4	4	#4	STR	5'-11"	8
H5	6	#4	STR	16'-1"	64
H6	2	#4	STR	9'-4"	12
H7	10	#4	2	3'-3"	22
H8	2	#4	STR	16'-4"	22
N1	2	#4	3	8'-1"	11
N2	2	#4	3	7'-3"	10
N3	2	#4	3	6'-3"	8
N4	2	#4	3	5'-4"	7
N5	2	#4	3	8'-4"	11
N6	5	#4	3	7'-6"	25
N7	3	#4	3	7'-0"	14
N8	3	#4	3	6'-5"	13
N9	3	#4	3	5'-10"	12
N10	3	#4	3	5'-4"	11
S1	6	#6	STR	6'-0"	54
T1	2	#5	STR	7'-3"	15
T2	1	#5	STR	8'-0"	8
T3	3	#5	STR	18'-0"	56
V1	2	#4	STR	6'-1"	8
V2	2	#4	STR	5'-2"	7
V3	2	#4	STR	4'-3"	6
V4	2	#4	STR	3'-4"	4
V5	2	#4	STR	6'-3"	8
V6	5	#4	STR	5'-6"	18
V7	3	#4	STR	4'-11"	10
V8	3	#4	STR	4'-5"	9
V9	3	#4	STR	3'-10"	8
V10	3	#4	STR	3'-3"	7
Z1	2	#4	4	4'-8"	6
Z2	2	#4	4	4'-1"	5
Z3	2	#4	4	3'-6"	5
Z4	2	#4	4	2'-11"	4
Z5	2	#4	4	4'-11"	7
Z6	5	#4	4	4'-4"	14
Z7	3	#4	4	4'-0"	8
Z8	3	#4	4	3'-8"	7
Z9	3	#4	4	3'-3"	7
Z10	3	#4	4	2'-11"	6

REINFORCING STEEL FOR 2 WINGS 583 LBS

CLASS A CONCRETE

2 WINGS	9.1 C.Y.
1 HEADWALLS	1.2 C.Y.
1 END CURTAIN WALLS	1.4 C.Y.
TOTAL	11.7 C.Y.



TYPICAL WING SECTION

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

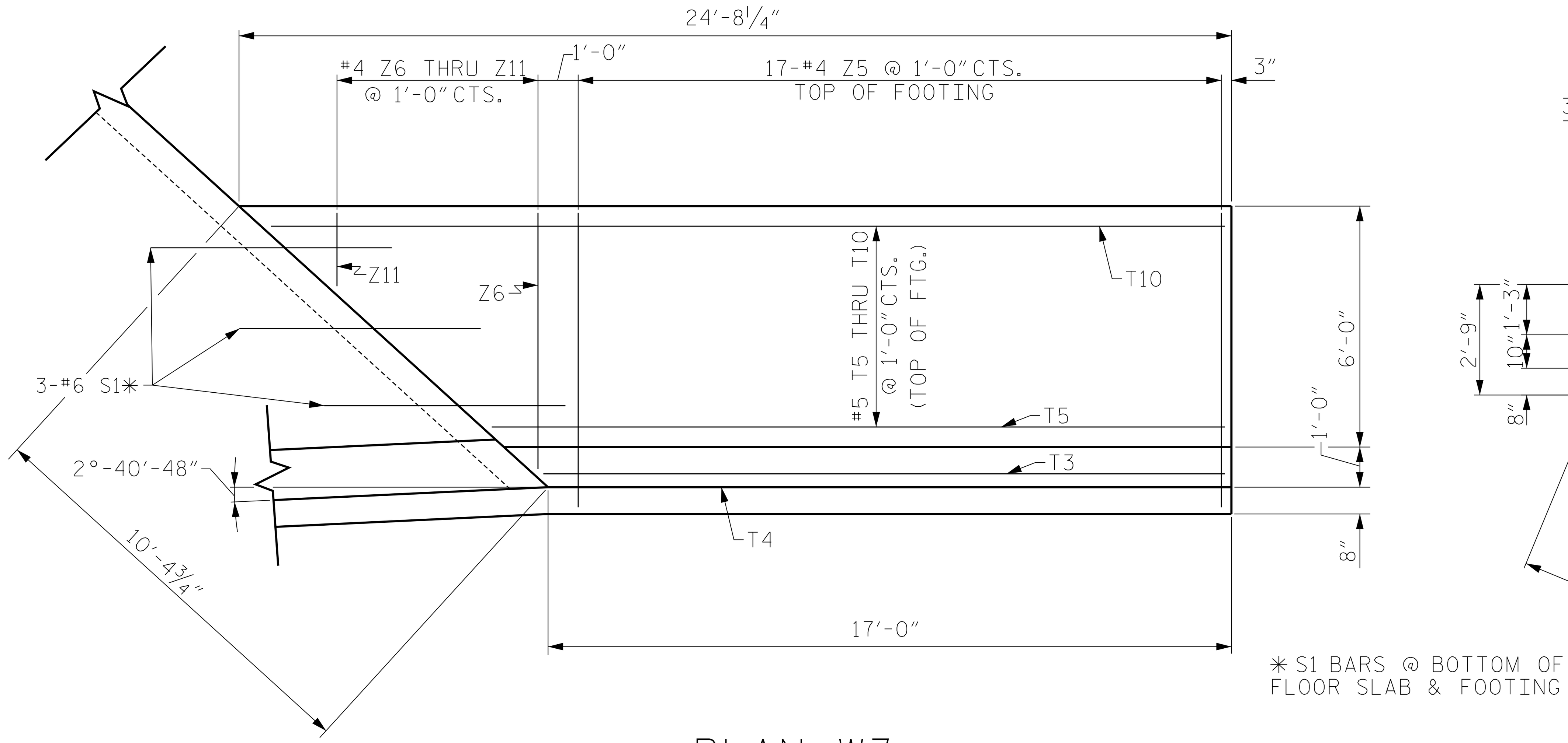
STANDARD WINGS FOR CONCRETE BOX CULVERT

H = 6'-0" SLOPE = 2:1
45° OR 135° SKEW

ASSEMBLED BY : RWW	DATE : FEB 2015
CHECKED BY : HLW	DATE : FEB 2015
DRAWN BY : CCJ 01/00	
CHECKED BY : RWW 03/00	

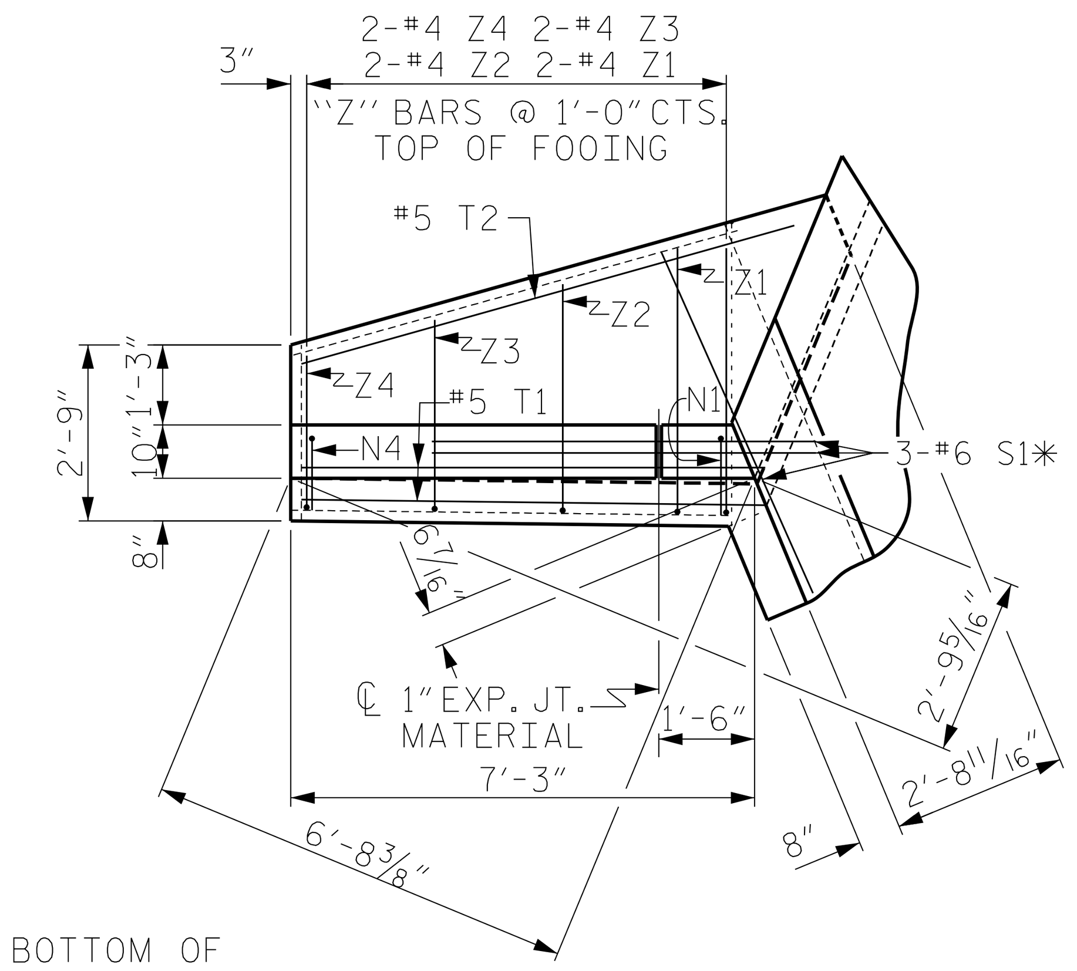
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			17

STD. NO. CW4506

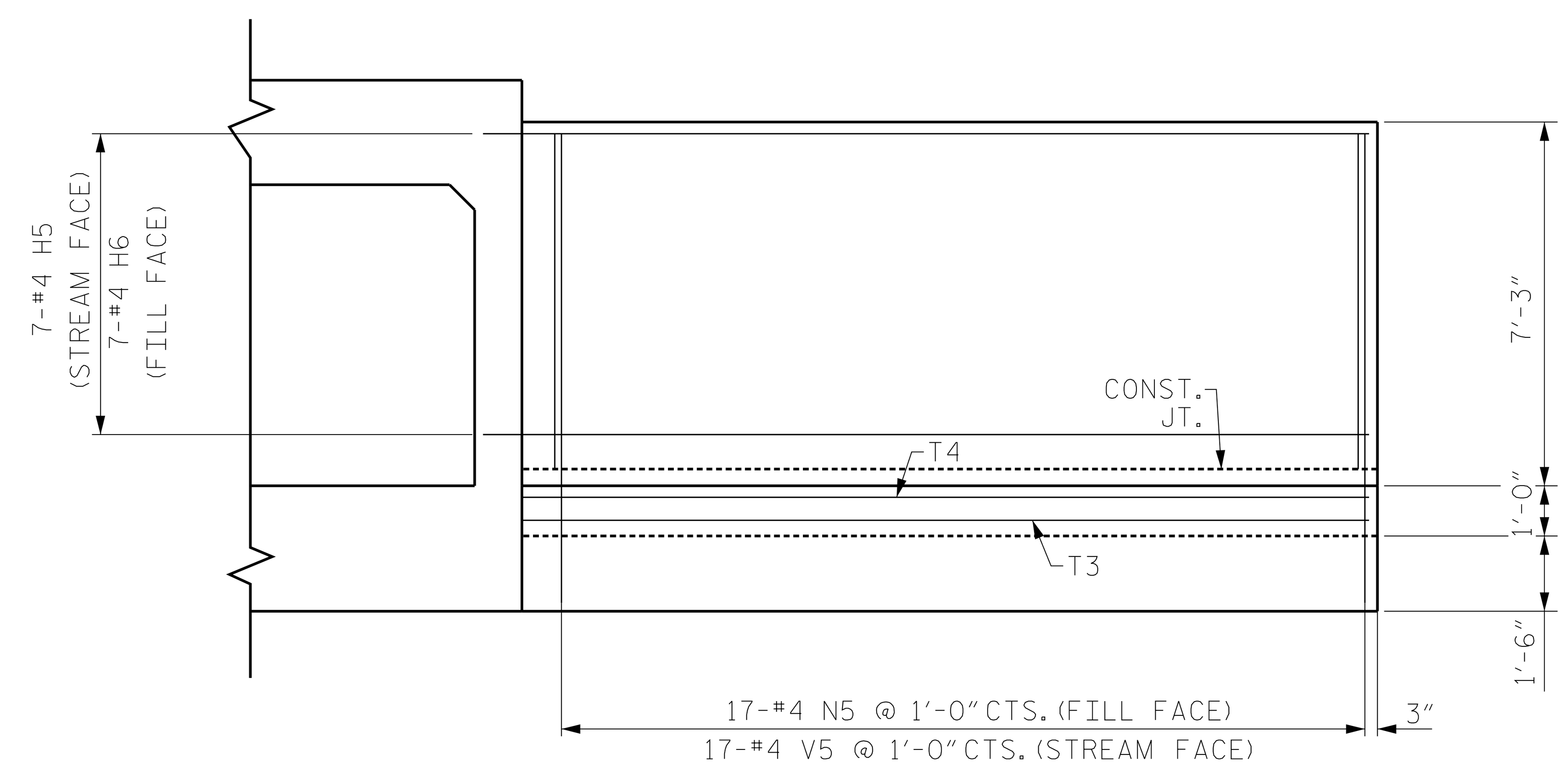


✱ S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

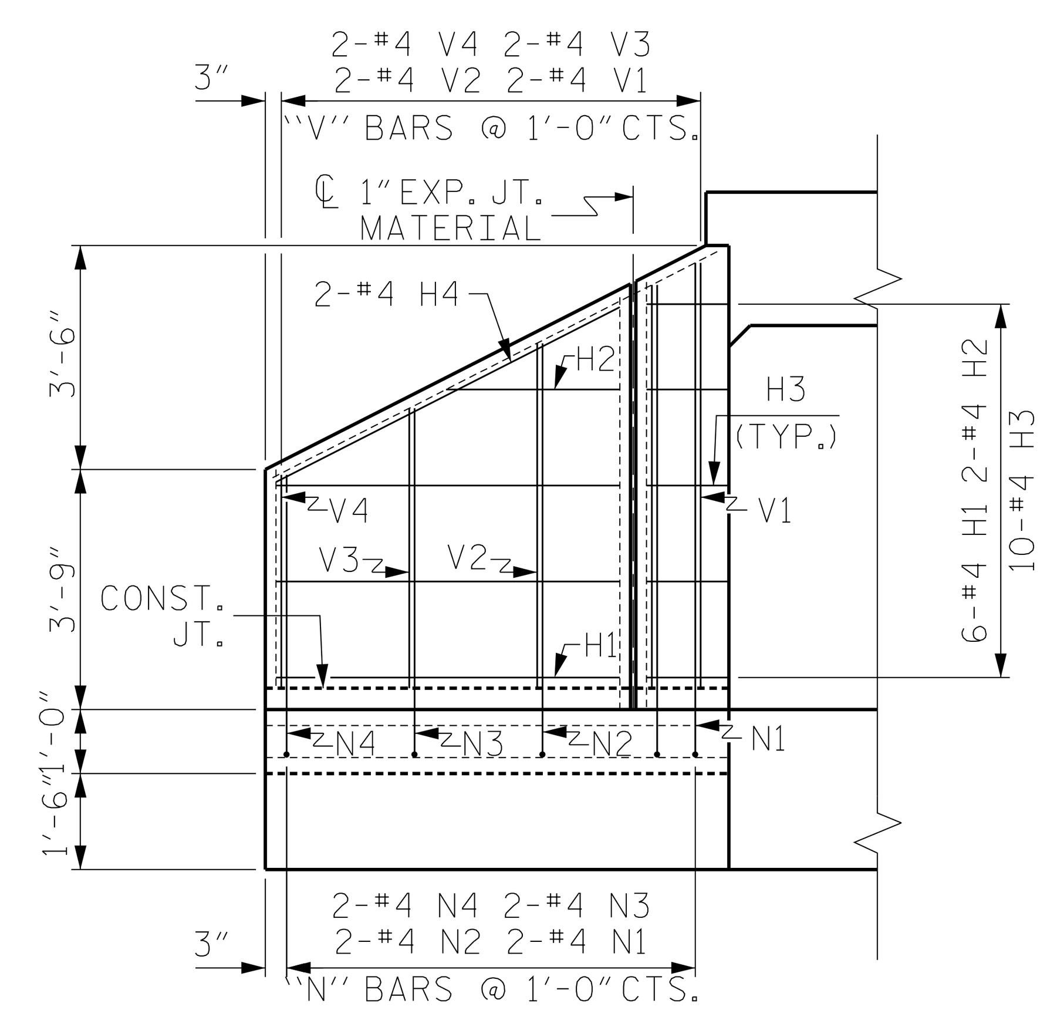
PLAN W3



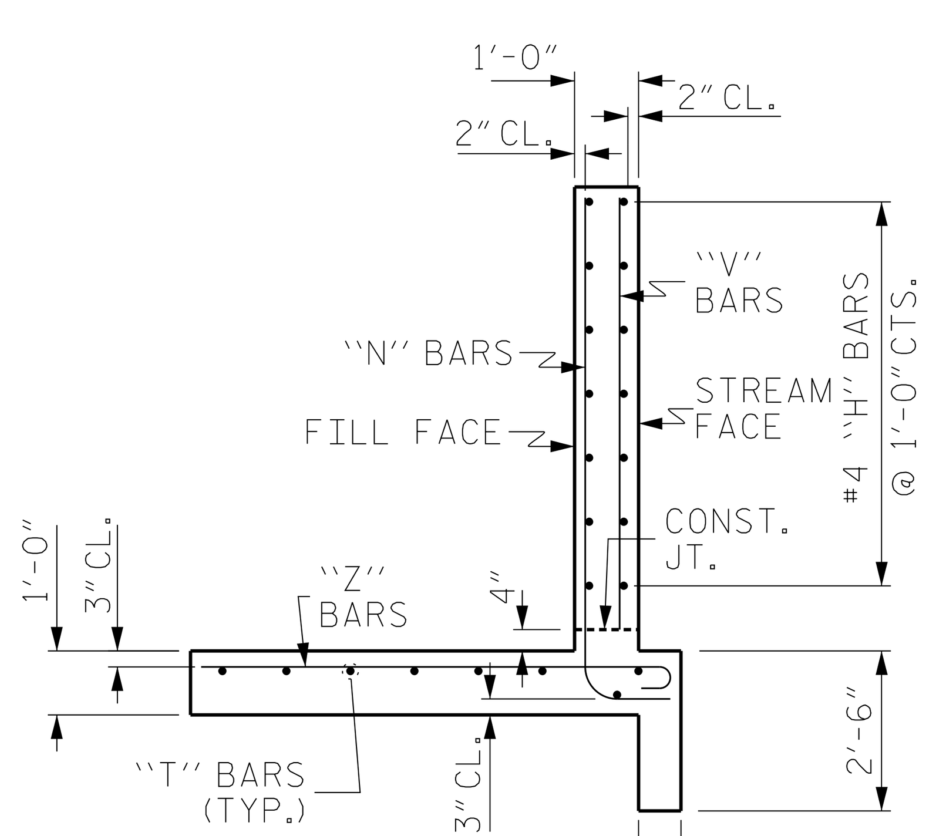
PLAN W2



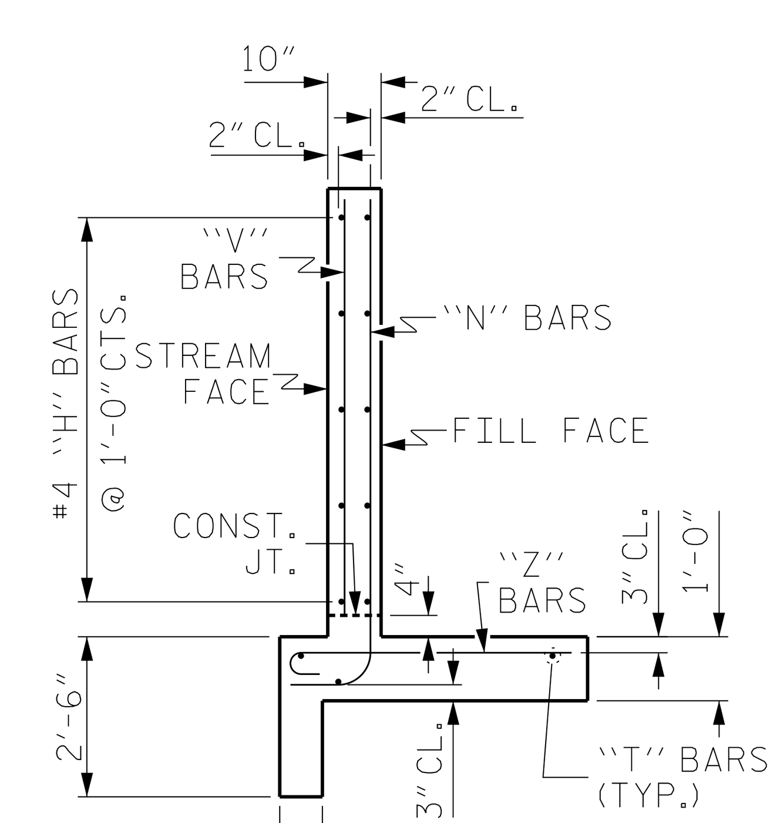
ELEVATION W3



ELEVATION W2



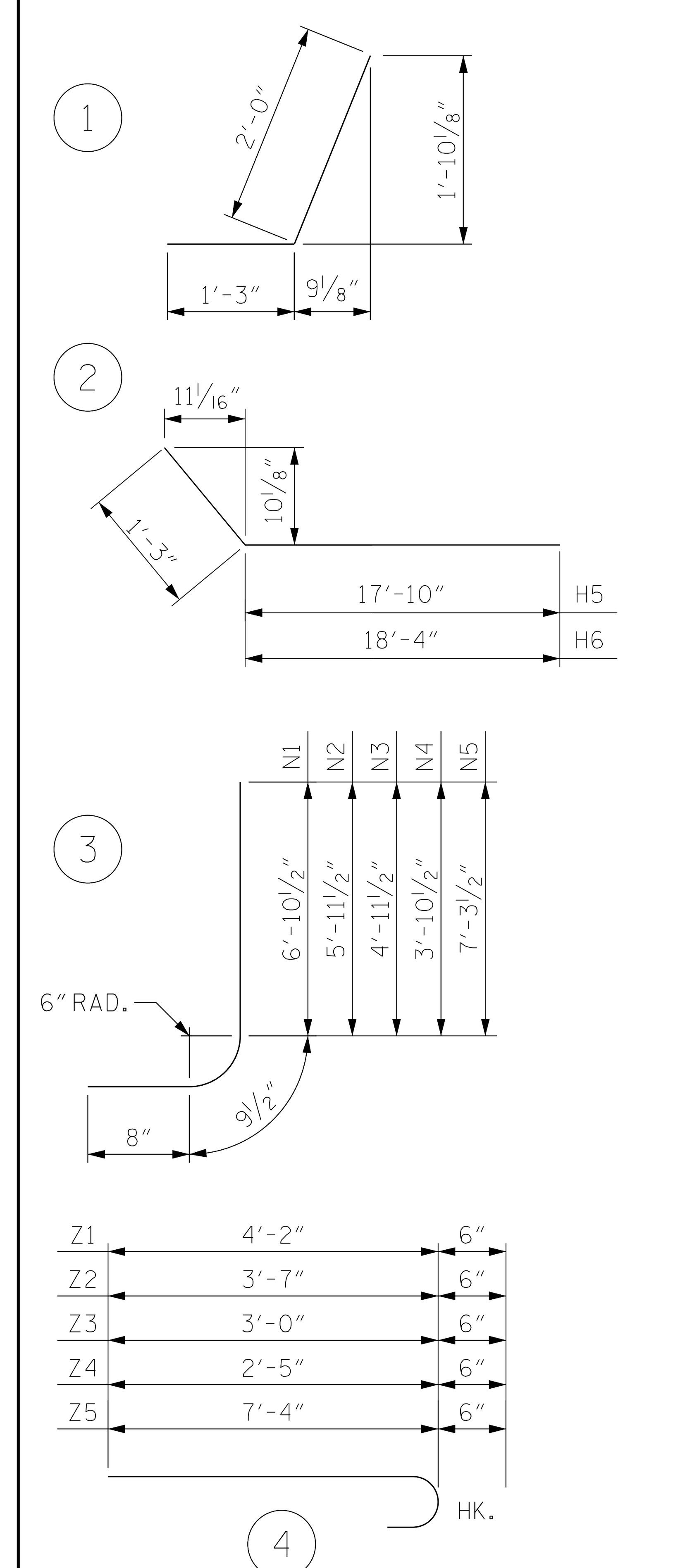
TYPICAL WING SECTION (W3)



TYPICAL WING SECTION (W2)

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL-STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	5′-4″	21
H2	2	#4	STR	2′-6″	3
H3	10	#4	1	3′-3″	22
H4	2	#4	STR	5′-11″	8
H5	7	#4	2	19′-1″	89
H6	7	#4	2	19′-7″	92
N1	2	#4	3	8′-1″	11
N2	2	#4	3	7′-3″	10
N3	2	#4	3	6′-3″	8
N4	2	#4	3	5′-4″	7
N5	17	#4	3	8′-9″	99
S1	6	#6	STR	6′-0″	54
T1	2	#5	STR	7′-3″	15
T2	1	#5	STR	8′-0″	8
T3	1	#5	STR	16′-11″	18
T4	1	#5	STR	16′-7″	17
T5	1	#5	STR	18′-2″	19
T6	1	#5	STR	19′-4″	20
T7	1	#5	STR	20′-5″	21
T8	1	#5	STR	21′-6″	22
T9	1	#5	STR	22′-7″	24
T10	1	#5	STR	23′-8″	25
V1	2	#4	STR	6′-1″	8
V2	2	#4	STR	5′-2″	7
V3	2	#4	STR	4′-3″	6
V4	2	#4	STR	3′-4″	4
V5	17	#4	STR	6′-8″	76
Z1	2	#4	4	4′-8″	6
Z2	2	#4	4	4′-1″	5
Z3	2	#4	4	3′-6″	5
Z4	2	#4	4	2′-11″	4
Z5	17	#4	4	7′-10″	89
Z6	1	#4	STR	6′-4″	4
Z7	1	#4	STR	5′-5″	4
Z8	1	#4	STR	4′-6″	3
Z9	1	#4	STR	3′-7″	2
Z10	1	#4	STR	2′-8″	2
Z11	1	#4	STR	1′-9″	1

REINFORCING STEEL FOR 2 WINGS 839 LBS

CLASS A CONCRETE

2 WINGS	13.8 C.Y.
1 HEADWALLS	1.2 C.Y.
1 END CURTAIN WALLS	1.4 C.Y.
TOTAL	16.4 C.Y.

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina 704-357-0488
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509
Asheville, NC 828-828-2796
Boone, NC 828-355-9933

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

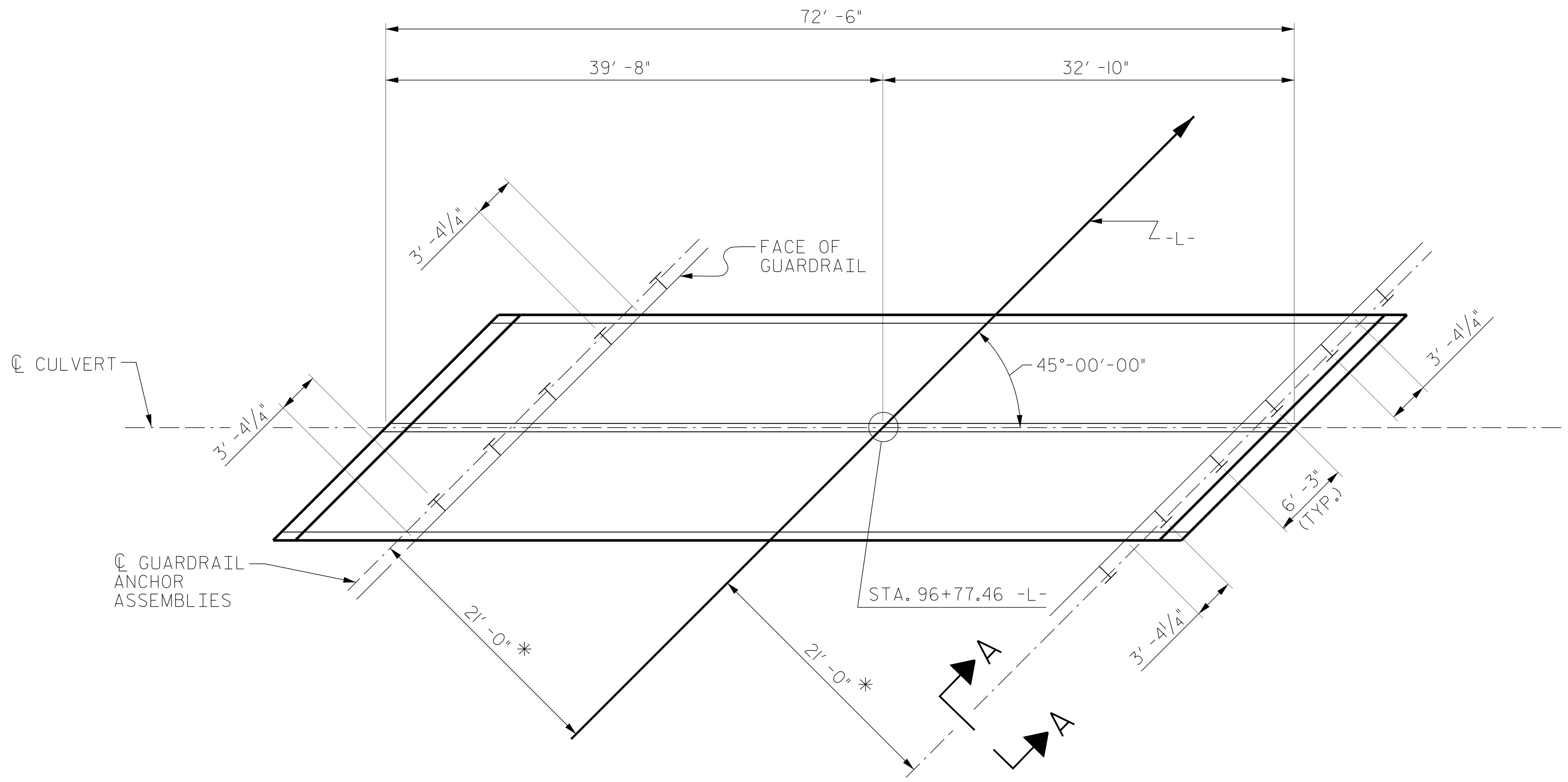
DOUBLE 8′ X 6′
CONCRETE BOX CULVERT
45° SKEW

DWN. BY: RWW	DATE: MAR 2015
CHKD. BY: HLW	DATE: MAR 2015
DES. EGR. OF RECORD: CBC	DATE: MAR 2015

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

SHEET NO. S-11

TOTAL SHEETS 17



PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

* THESE DIMENSIONS SHALL BE FIELD-VERIFIED BY THE ENGINEER.

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 2 1/2".

B. 4 - 1" 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 1" 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.)

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

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

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

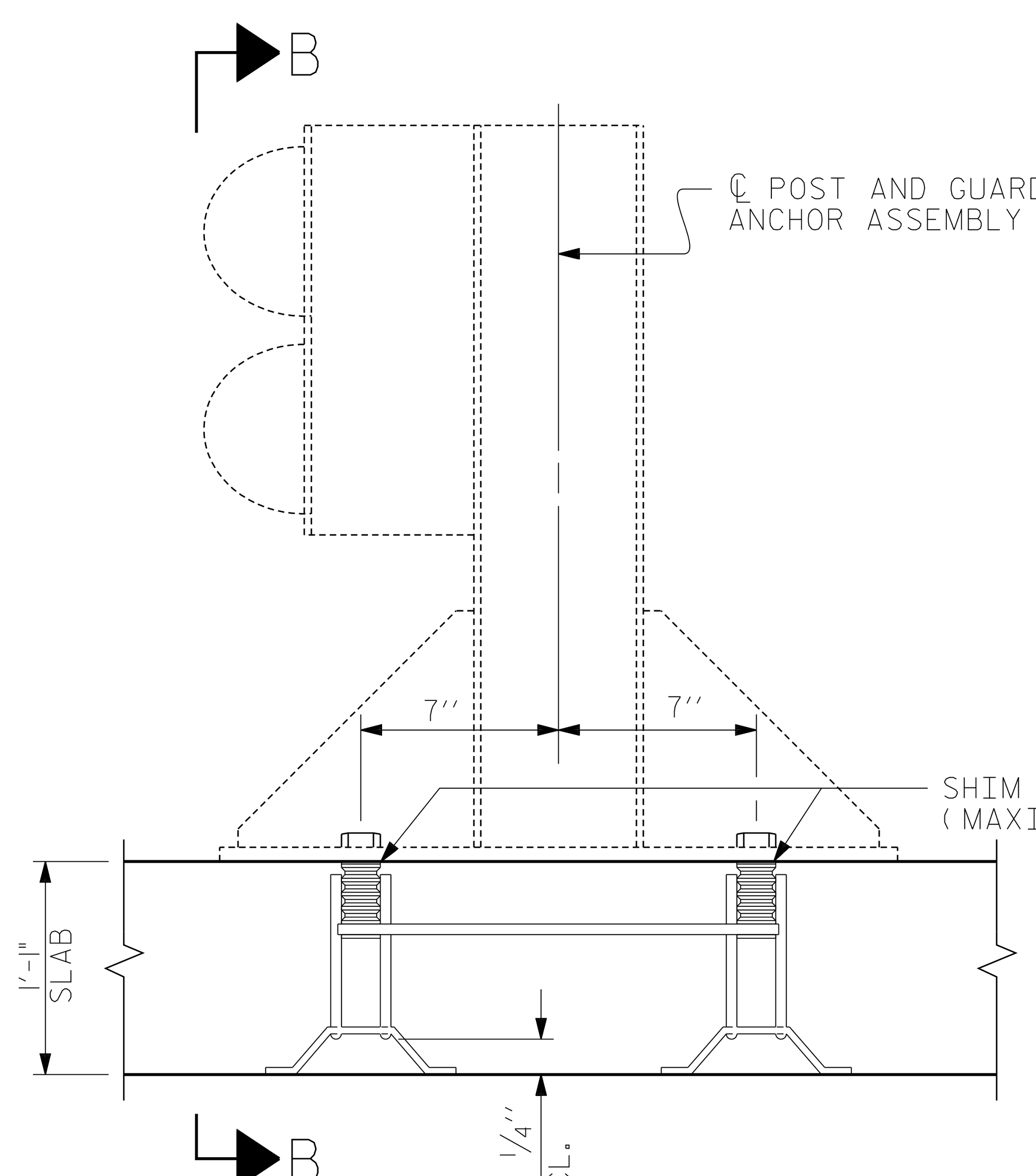
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

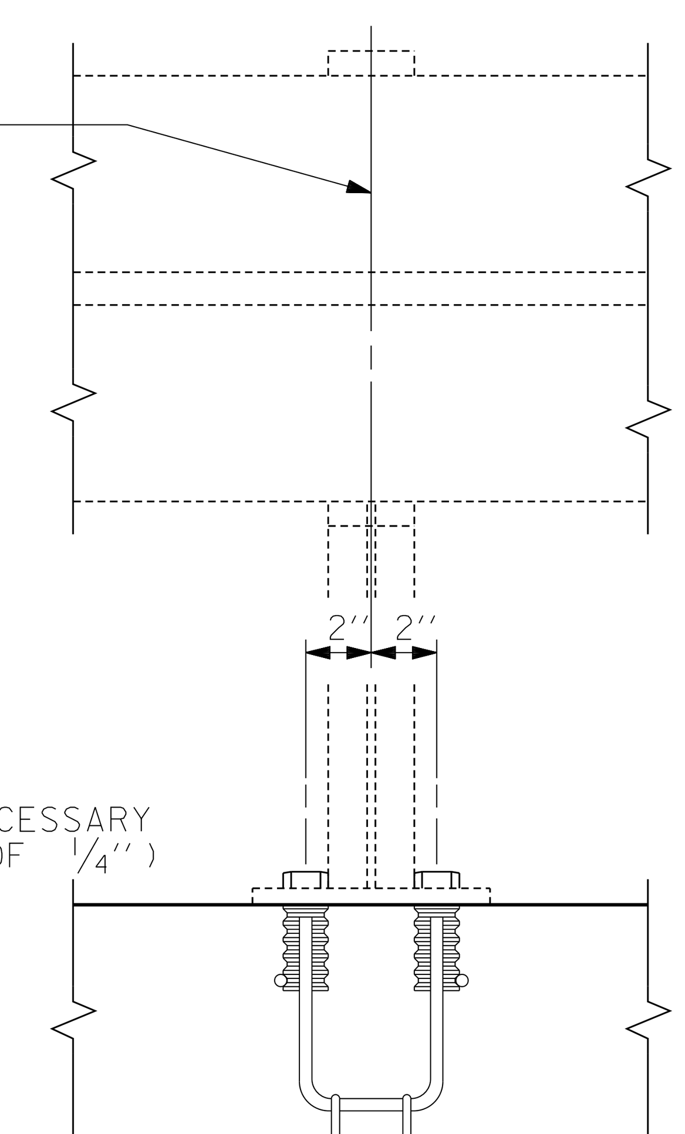
PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

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

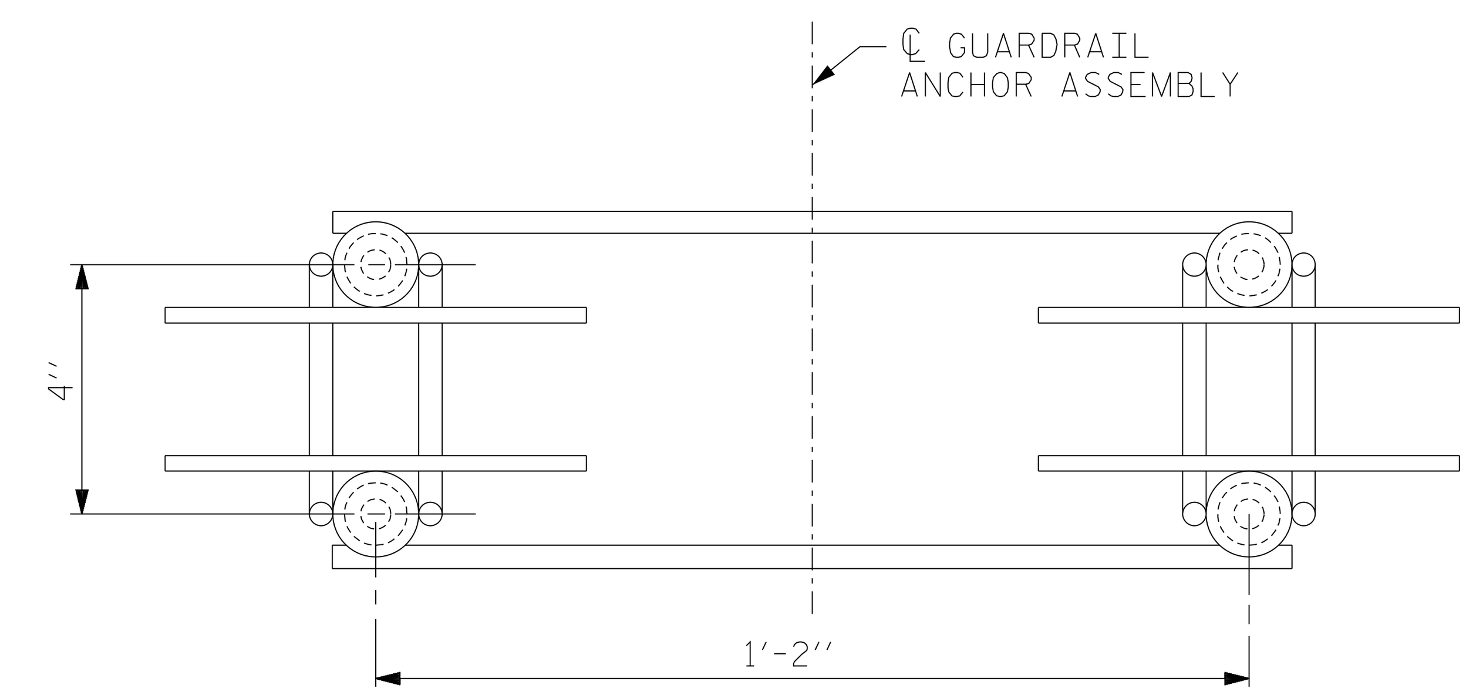
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



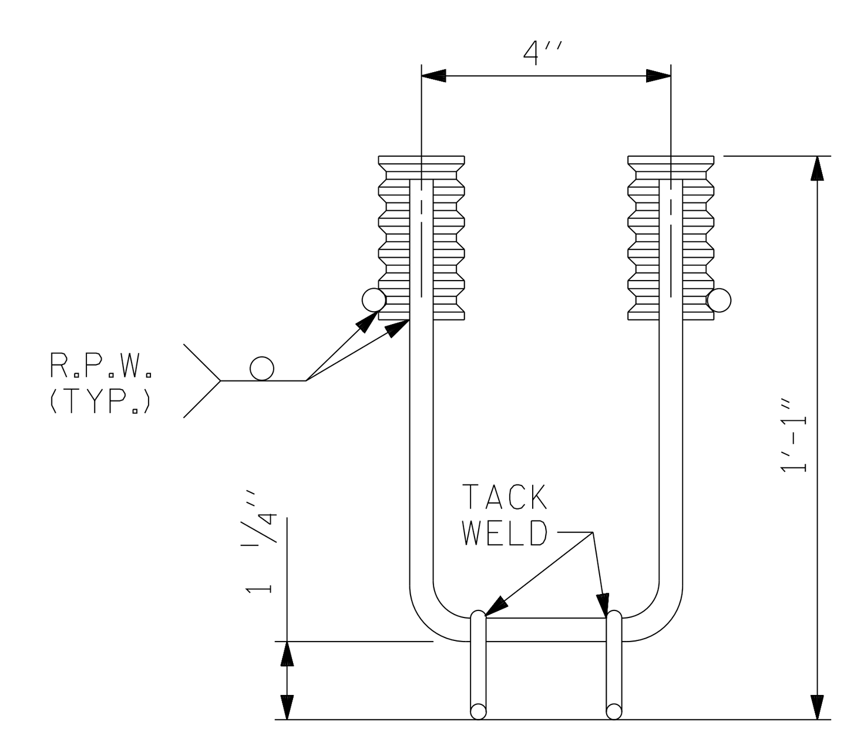
SECTION A-A



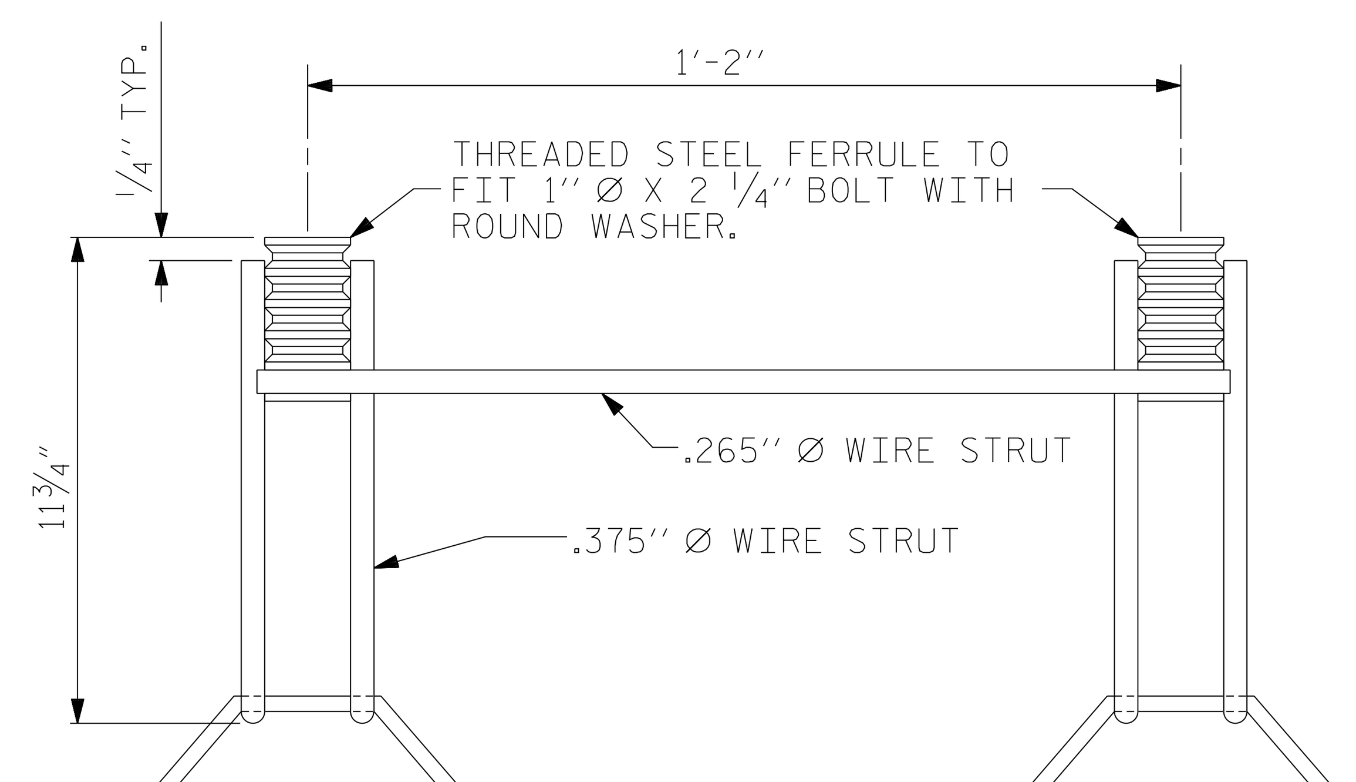
SECTION B-B



PLAN



ELEVATION



THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

DocuSigned by: Hardy Willis
CC2B7FCF0223461...
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
4/24/2015

ASSEMBLED BY : RWW	DATE : MAR 2015
CHECKED BY : HLW	DATE : MAR 2015

DRAWN BY : FCJ 6/88	REV. 7/10/01	LES/RDR
CHECKED BY : ARB 6/88	REV. 5/7/03	RWW/JTE
	REV. 5/1/06R	KMM/GM

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

REVISIONS

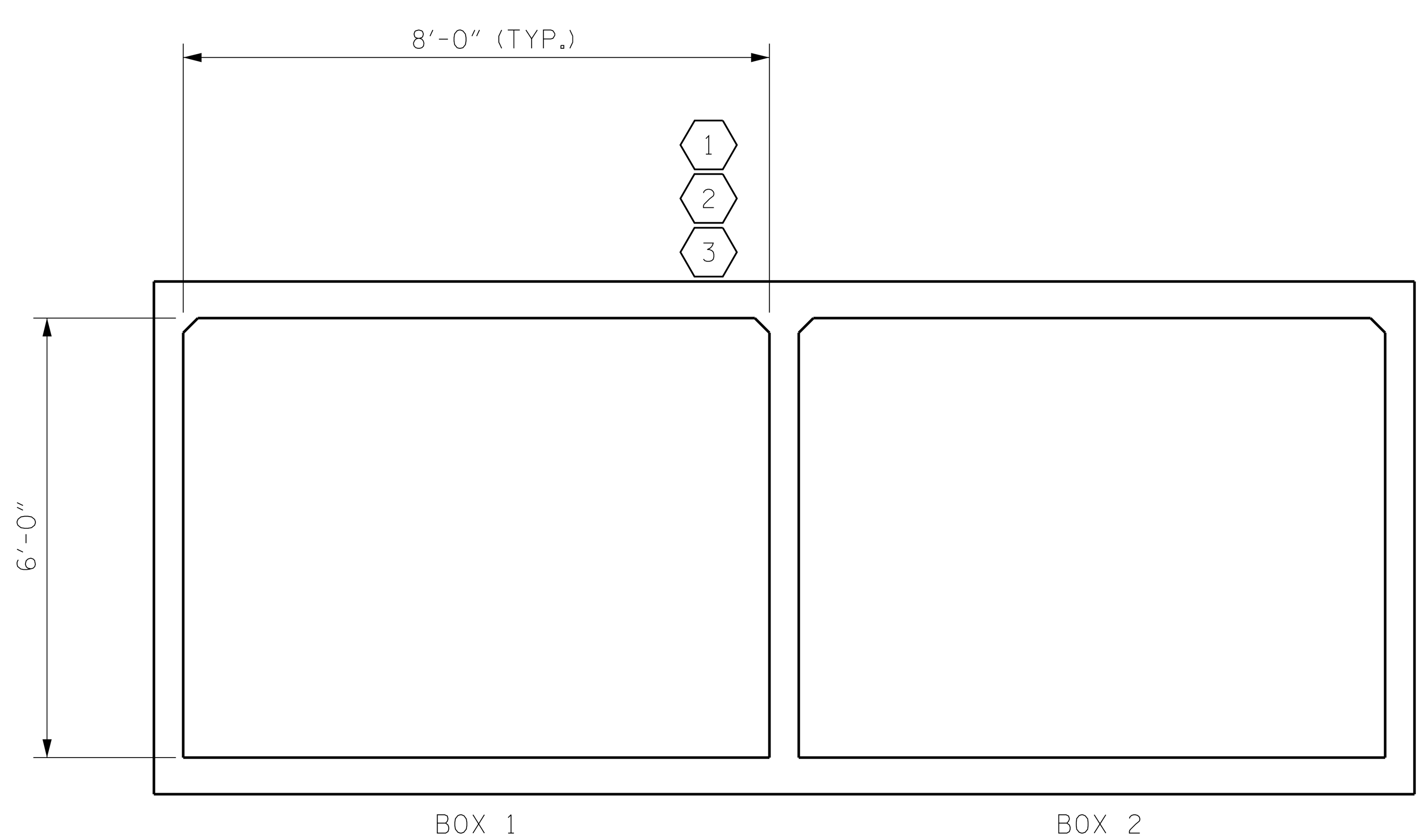
SHEET NO. S-12

TOTAL SHEETS 17

STD. NO. GRA1

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	MOMENT: RATING FACTOR	MOMENT: BOX NO.	MOMENT: ELEMENT TYPE	MOMENT: DISTANCE FROM LEFT END OF ELEMENT (ft)	SHEAR: RATING FACTOR	SHEAR: BOX NO.	SHEAR: ELEMENT TYPE	SHEAR: DISTANCE FROM LEFT END OF ELEMENT (ft)	COMMENT NUMBER
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.06	--	1.75	2.06	1	BOTTOM SLAB	8.33	1.06	1	TOP SLAB	7.54	
		HL-93 (OPERATING)	N/A		1.38	--	1.35	2.67	1	BOTTOM SLAB	8.33	1.38	1	TOP SLAB	7.54	
		HS-20 (INVENTORY)	36.000	2	1.11	39.96	1.75	2.06	1	BOTTOM SLAB	8.33	1.11	1	TOP SLAB	7.54	
		HS-20 (OPERATING)	36.000		1.44	51.84	1.35	2.67	1	BOTTOM SLAB	8.33	1.44	1	TOP SLAB	7.54	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.23	30.11	1.40	3.93	1	TOP SLAB	4.33	2.23	1	TOP SLAB	7.54	
		SNGARBS2	20.000		2.08	41.60	1.40	3.67	1	TOP SLAB	4.33	2.08	1	TOP SLAB	7.54	
		SNAGRIS2	22.000		2.23	49.06	1.40	3.73	1	BOTTOM SLAB	8.33	2.23	1	TOP SLAB	7.54	
		SNCOTTS3	27.250	3	1.46	39.79	1.40	2.69	1	TOP SLAB	4.33	1.46	1	TOP SLAB	7.54	
		SNAGGRS4	34.925		1.85	64.61	1.40	2.81	1	BOTTOM SLAB	8.33	1.85	1	TOP SLAB	7.54	
		SNS5A	35.550		1.71	60.79	1.40	2.76	1	BOTTOM SLAB	8.33	1.71	1	TOP SLAB	7.54	
		SNS6A	39.950		1.66	66.32	1.40	2.54	1	BOTTOM SLAB	8.33	1.66	1	TOP SLAB	7.54	
		SNS7B	42.000		1.66	69.72	1.40	2.54	1	BOTTOM SLAB	8.33	1.66	1	TOP SLAB	7.54	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.08	68.64	1.40	3.69	1	BOTTOM SLAB	8.33	2.08	1	TOP SLAB	7.54	
		TNT4A	33.075		1.69	55.90	1.40	2.85	1	BOTTOM SLAB	8.33	1.69	1	TOP SLAB	7.54	
		TNT6A	41.600		1.70	70.72	1.40	2.88	1	BOTTOM SLAB	8.33	1.70	1	TOP SLAB	7.54	
		TNT7A	42.000		1.69	70.98	1.40	2.85	1	BOTTOM SLAB	8.33	1.69	1	TOP SLAB	7.54	
		TNT7B	42.000		1.67	70.14	1.40	2.66	1	BOTTOM SLAB	8.33	1.67	1	TOP SLAB	7.54	
		TNAGRIT4	43.000		1.65	70.95	1.40	2.47	1	BOTTOM SLAB	8.33	1.65	1	TOP SLAB	7.54	
		TNAGT5A	45.000		1.65	74.25	1.40	2.47	1	BOTTOM SLAB	8.33	1.65	1	TOP SLAB	7.54	
		TNAGT5B	45.000		1.65	74.25	1.40	2.45	1	BOTTOM SLAB	8.33	1.65	1	TOP SLAB	7.54	



LRFR SUMMARY

(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

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

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL HARDY L. WILLIS

DocuSigned by: Hardy Willis

CC28FCFCD223461...

4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

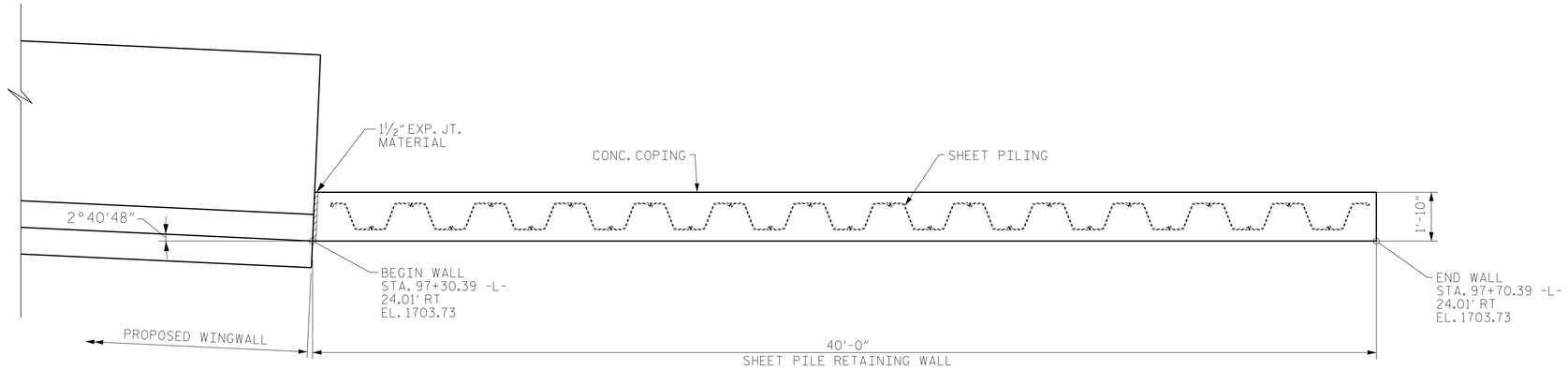
STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			17

ASSEMBLED BY : RWW	DATE : FEB 2015		
CHECKED BY : HLW	DATE : FEB 2015		
DRAWN BY : WMC 7/11	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 7/11			

STD. NO. LRFR5



PLAN

NOTES

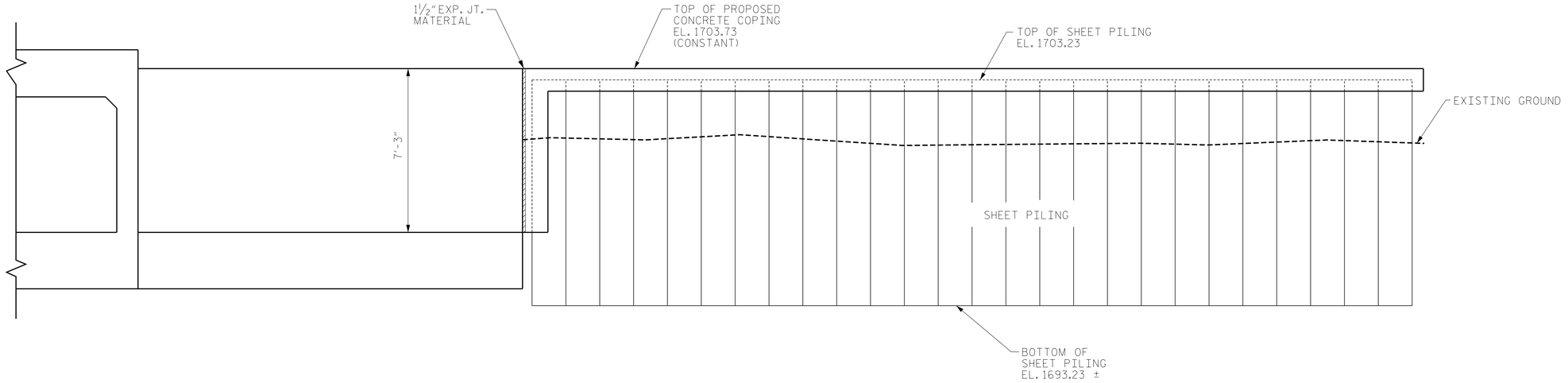
FIELD ADJUSTMENT OF "A" BARS MAY BE NECESSARY FOR PLACEMENT IN COPING.

ALL REINFORCING SHALL BE GRADE 60 AS DESCRIBED IN SECTION 1070 OF THE STANDARD SPECIFICATIONS.

FOR 18" STEEL SHEET PILES, SEE SECTION 1084-2 OF THE STANDARD SPECIFICATIONS.

INSTALL SHEET PILING TO THE MINIMUM DEPTH SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

FIELD ADJUSTMENT OF THE COPING/WING WALL INTERFACE MAY BE NECESSARY, AS DIRECTED BY THE ENGINEER.



WALL ENVELOPE

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

SHEET 1 OF 4

Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina 704-357-0488
Asheville, NC 828-828-2796 · Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3509

NORTH CAROLINA PROFESSIONAL SEAL 037711 ENGINEER HARDY L. WILLIS

DocuSigned by: Hardy Willis 0C287FCF0223461...

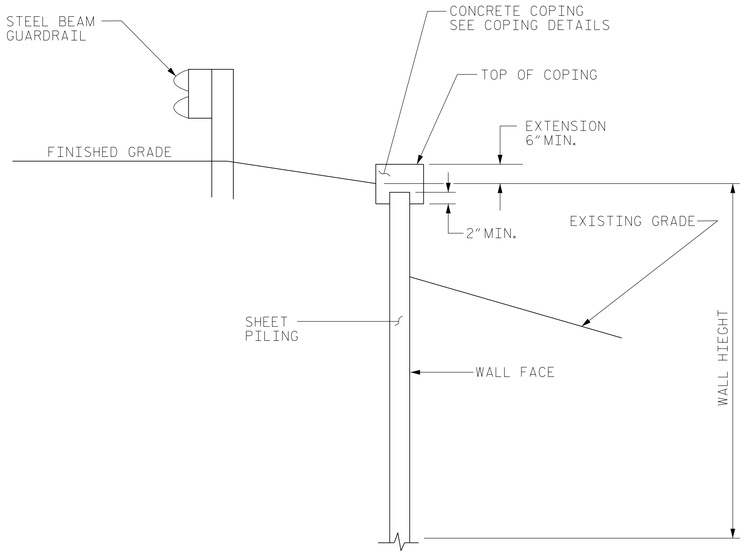
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

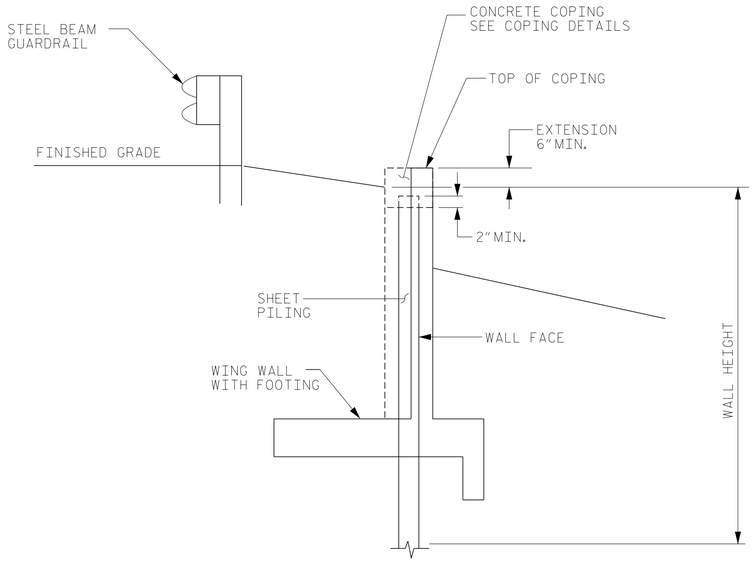
DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW
SHEET PILE DETAILS

DWN. BY: RWW DATE: MAR 2015
CHKD. BY: HLW DATE: MAR 2015
DES. EGR. OF RECORD: CBC DATE: MAR 2015

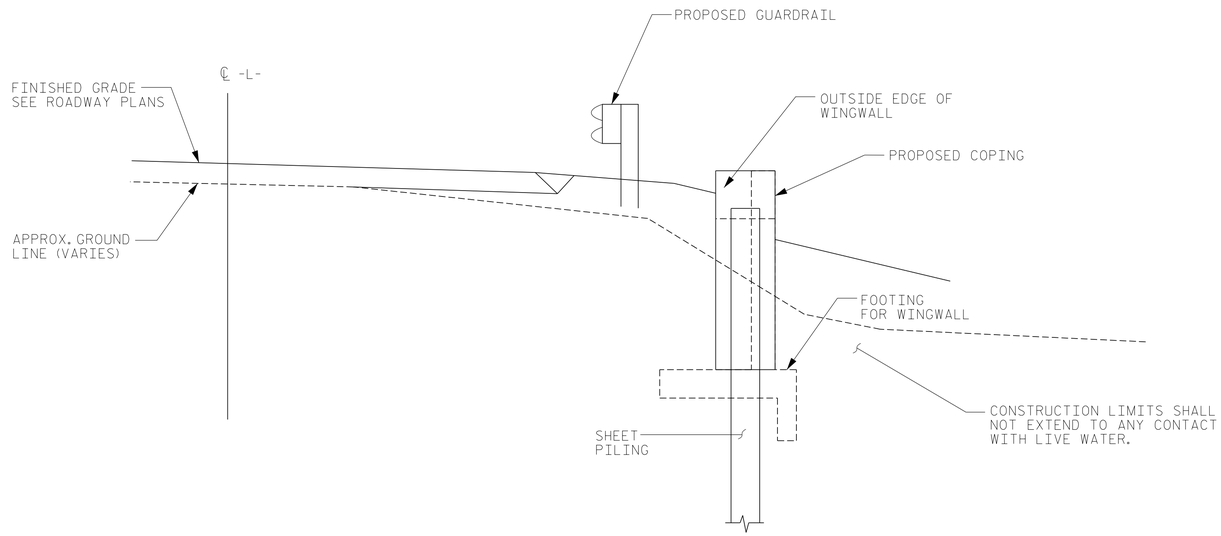
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			17



SHEET PILE WALL - TYPICAL SECTION



SHEET PILE WALL - TYPICAL SECTION AT WALL/ WING INTERFACE



SHEET PILE RETAINING WALL

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

SHEET 2 OF 4

Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina
704-357-0488
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509

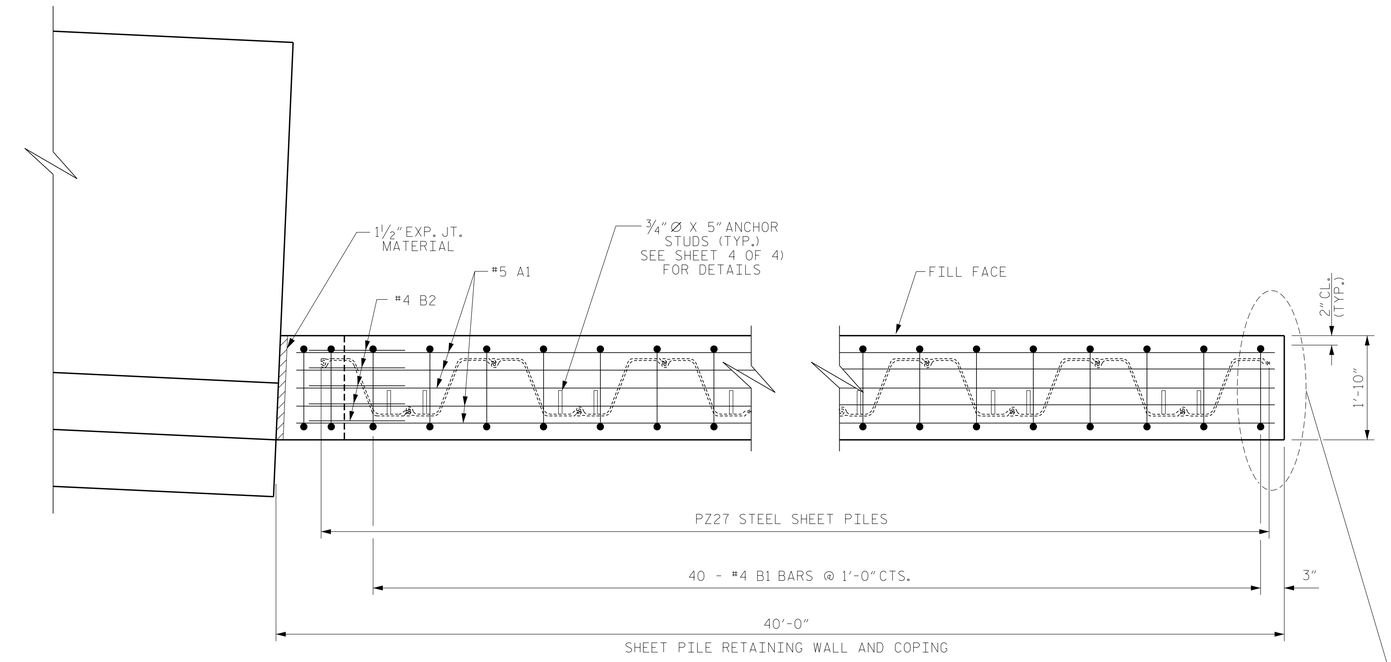
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 HARDY L. WILLIS
DocuSigned by: Hardy Willis
CC287F0E022361...
4/24/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

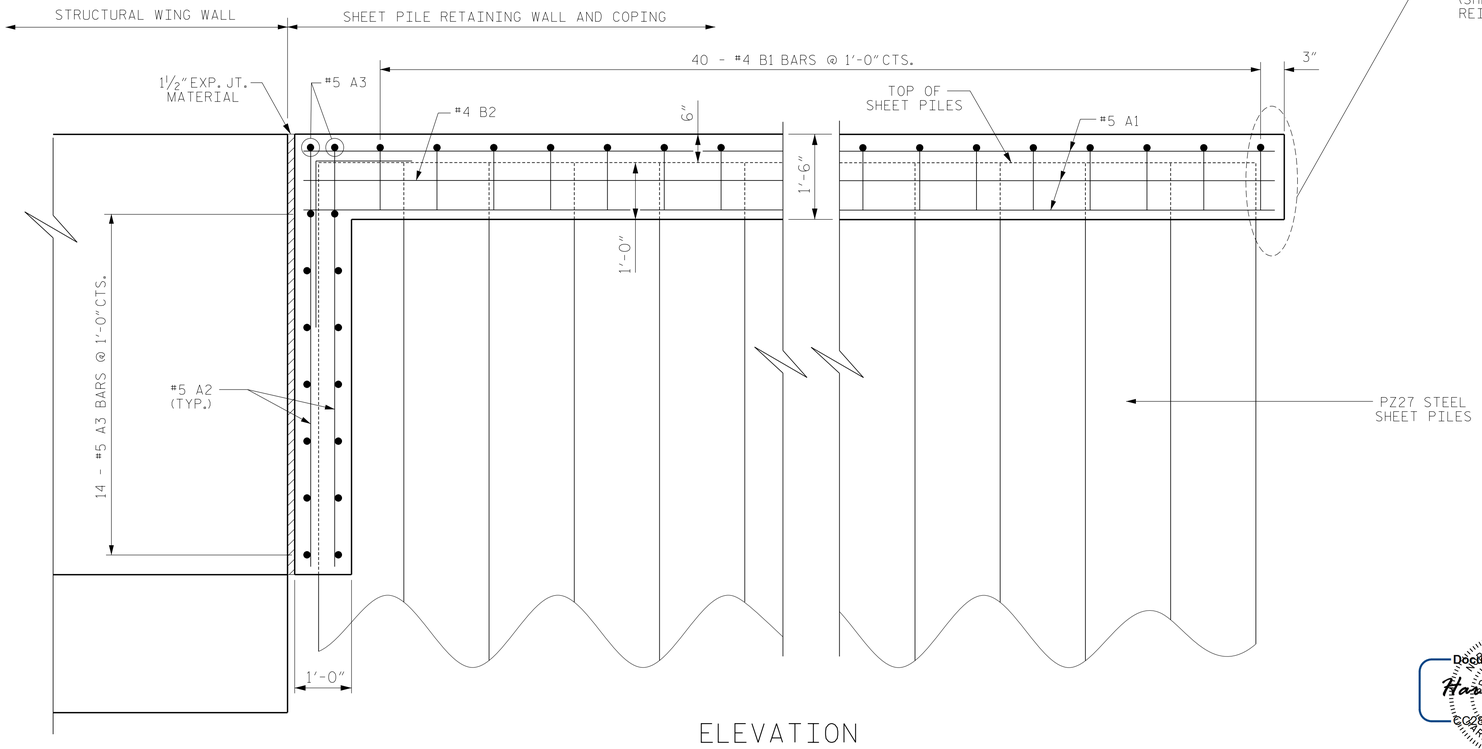
DOUBLE 8' X 6'
CONCRETE BOX CULVERT
45° SKEW
SHEET PILE DETAILS

DWN. BY: RWW	DATE: MAR 2015	
CHKD. BY: HLW	DATE: MAR 2015	
DES. EGR. OF RECORD: CBC	DATE: MAR 2015	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			17



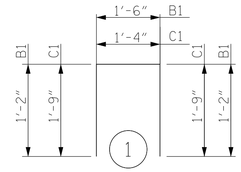
PLAN

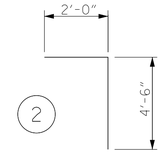


ELEVATION

SEE END OF COPING DETAILS (SHEET 4 OF 4) FOR ADDITIONAL REINFORCEMENT IN THIS AREA.

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	9	#5	STR	39'-8"	372
A2	4	#5	STR	6'-9"	28
A3	16	#5	STR	1'-6"	25
B1	40	#4	1	3'-10"	102
B2	5	#4	2	6'-6"	22
C1	2	#5	1	4'-10"	10

REINFORCING STEEL 559 LBS

CLASS A CONCRETE

WALL COPING AND TRANSITION 4.5 C.Y.

TOTAL 4.5 C.Y.

18" STEEL SHEET PILES

NO. PZ27 = 26

TOTAL NO. = 400 SQ. FT.

DocuSigned by:
Hardy Willis
20777
CC2871CF022346...
4/24/2015

Vaughn & Melton
Consulting Engineers
Charlotte, North Carolina 704-357-0488
Asheville, NC 828-828-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
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PROJECT NO. R-3622B

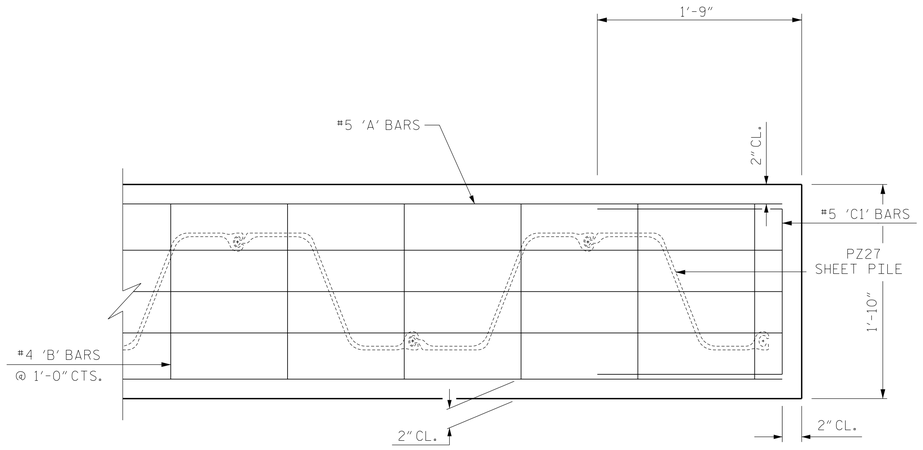
CHEROKEE COUNTY

STATION: 96+77.46 -L-

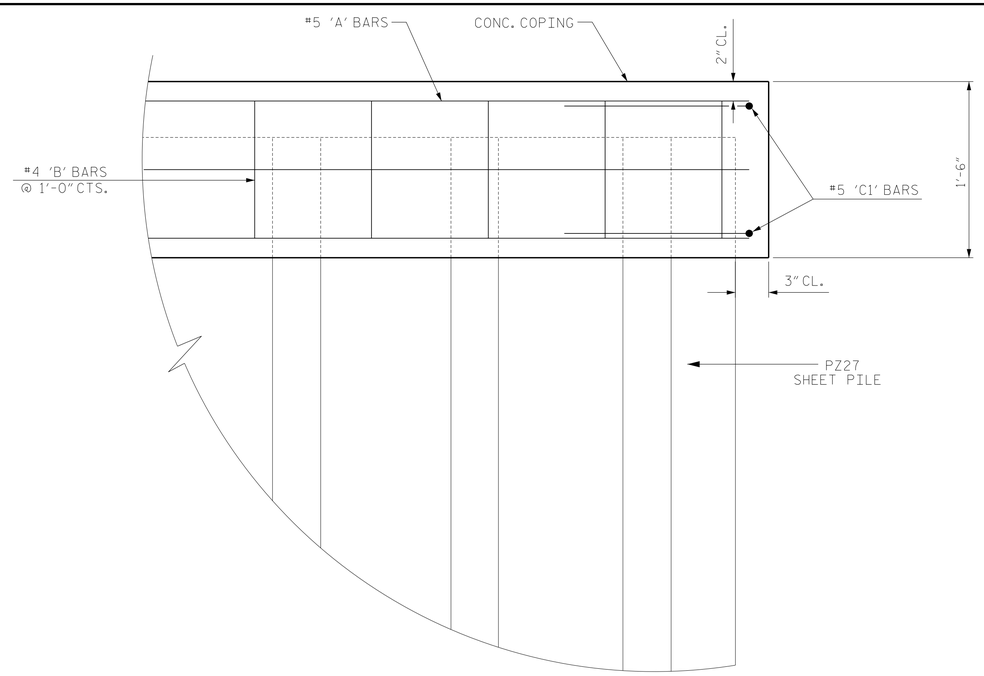
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8' X 6' CONCRETE BOX CULVERT 45° SKEW SHEET PILE DETAILS

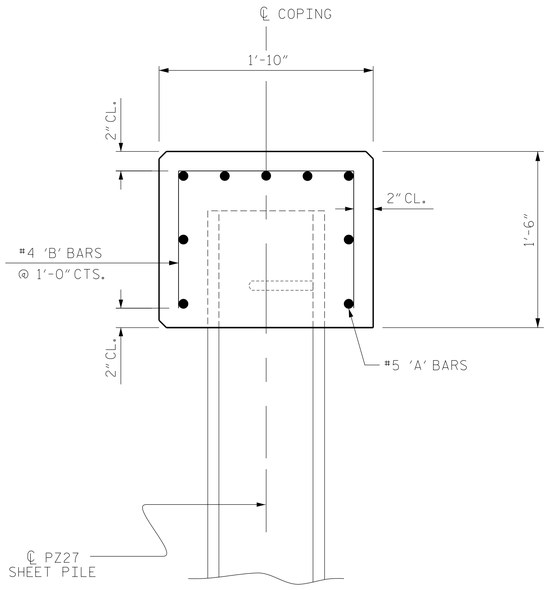


PLAN VIEW

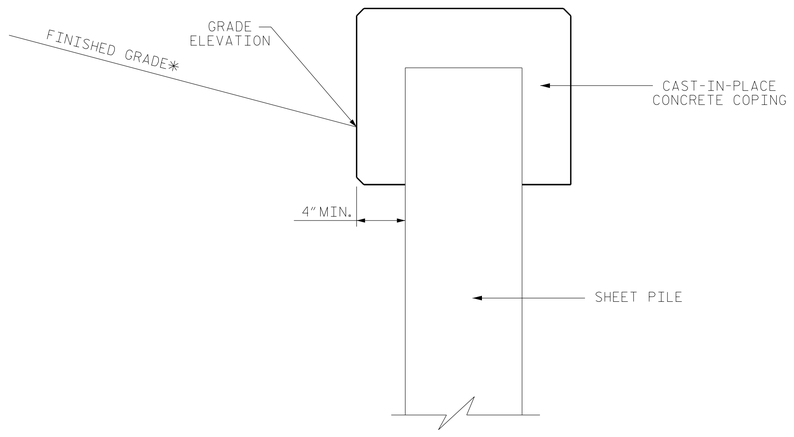


SIDE VIEW

END OF COPING DETAIL

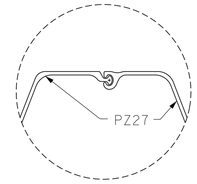


FULL COPING DETAIL

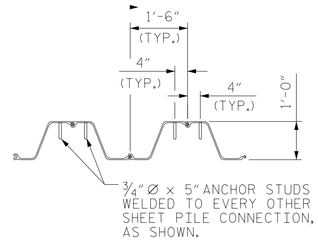


COPING DETAIL

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



DETAIL 'A'



ANCHOR STUD DETAIL

SHEET PILE CONNECTION DETAILS

PROJECT NO. R-3622B

CHEROKEE COUNTY

STATION: 96+77.46 -L-

SHEET 4 OF 4

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER

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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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM
27-AUG-2014 11:58
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STD. NO. SN