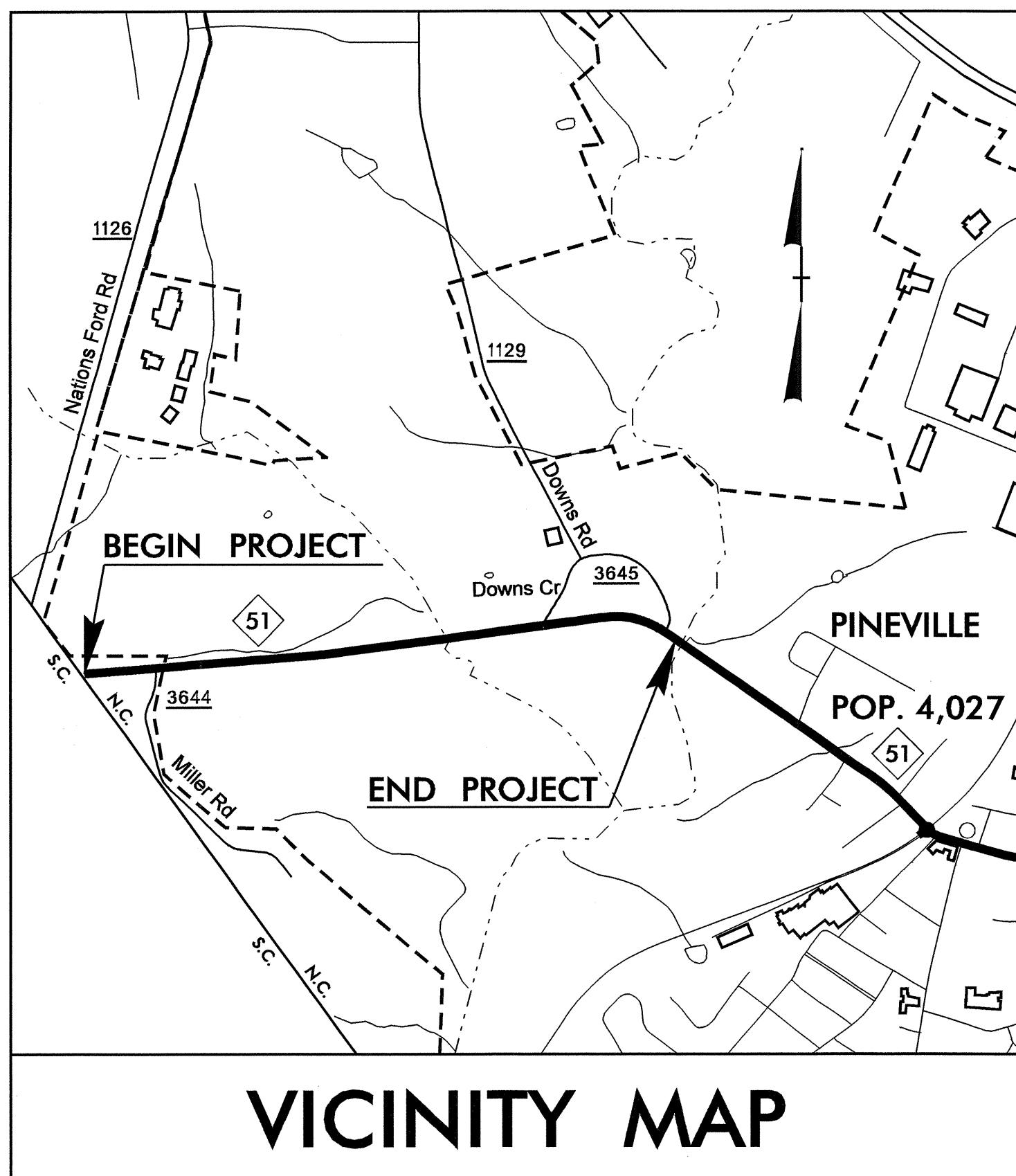


TIP PROJECT: U-3447

CONTRACT: C201829

CULVERT



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

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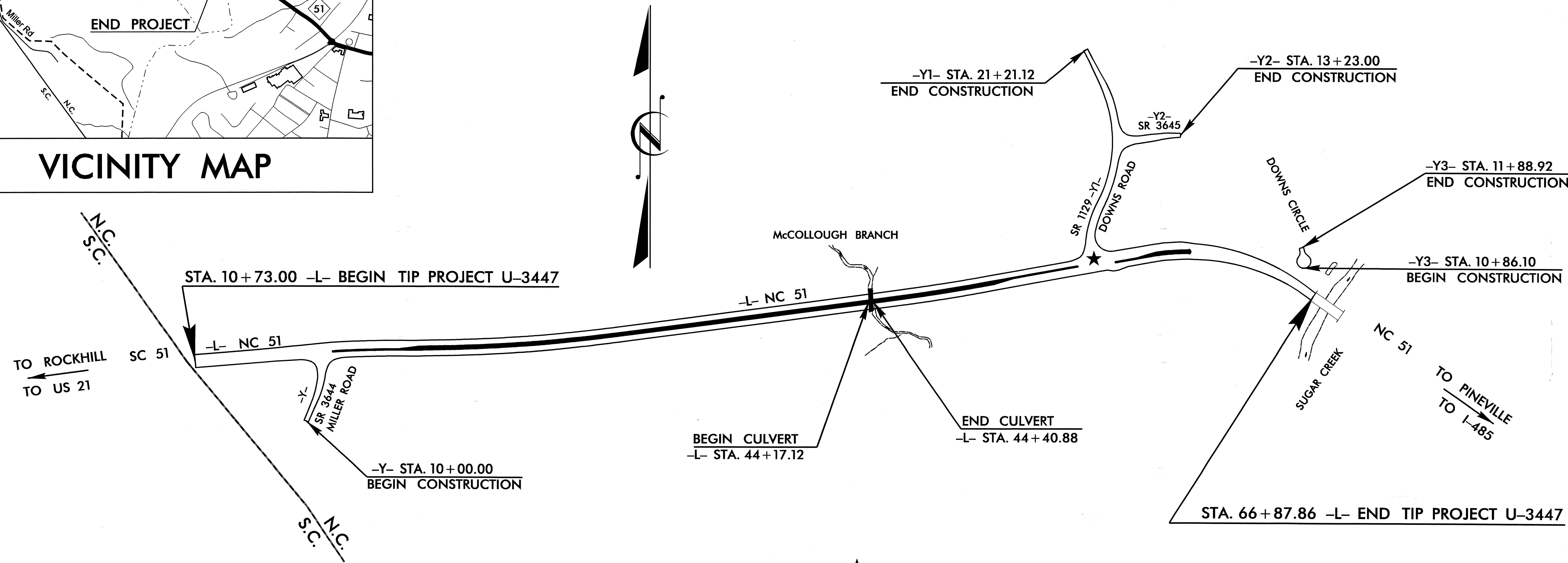
# MECKLENBURG COUNTY

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**LOCATION:** NC 51, ROCK HILL - PINEVILLE RD. FROM THE SC STATE LINE TO SR 3645 (DOWN CIRCLE)

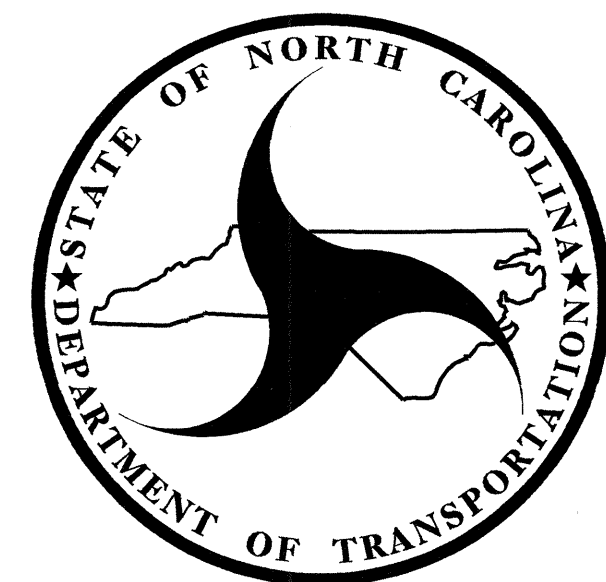
**TYPE OF WORK:** GRADING, DRAINAGE, PAVING & CULVERT AND SIGNALS.

STATE	STATE PROJECT REFERENCE NO.	
N.C.	U-3447	
WBS PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34948.1.1	STP-51(2)	PE
34948.2.1	STP-51(2)	R/W, UTIL
34948.3.1.ST1	STP-51(27)	CONSTR.



THIS IS NOT A CONTROL OF ACCESS PROJECT.

★ PROPOSED SIGNAL



**DESIGN DATA**  
(COLLECTOR)

ADT 2004 =	19300
ADT 2025 =	35900
DHV =	9 %
D =	60 %
T =	3 % *
V =	50 MPH
* TTST 1% +	DUAL 2%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-3447 =	1.059 MI
LENGTH STRUCTURE TIP PROJECT U-3447 =	0.004 MI
TOTAL LENGTH TIP PROJECT U-3447 =	1.063 MI

2006 STANDARDS SPECIFICATION

**LETTING DATE:**  
March 17, 2009

Prepared in the Office of:  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Drive Raleigh, N.C. 27610

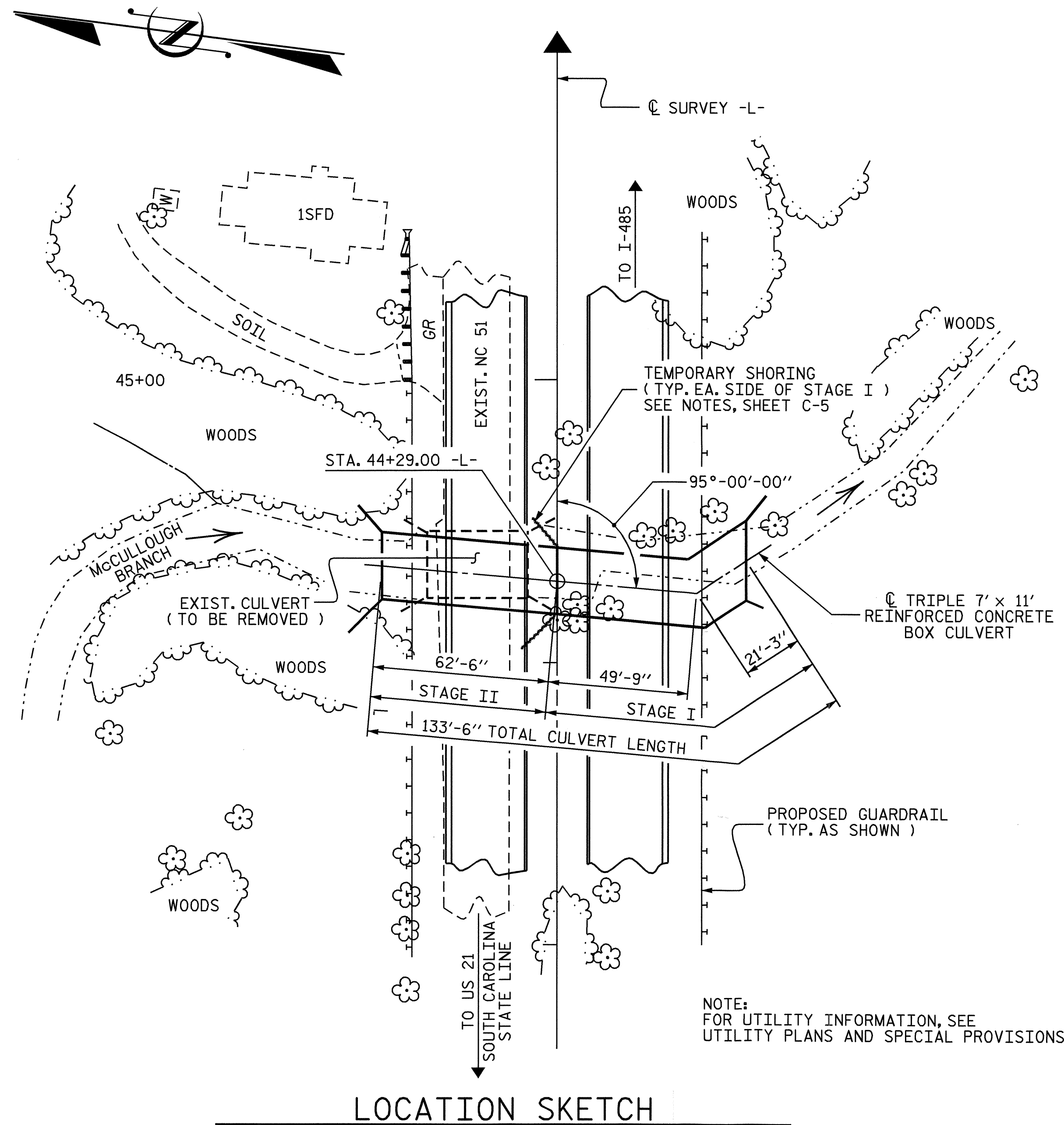
\_\_\_\_\_  
**B.S. COX, P.E.**  
PROJECT ENGINEER

\_\_\_\_\_  
**T.J. BEACH, P.E.**  
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

\_\_\_\_\_  
STATE HIGHWAY ENGINEER - DESIGN  
**DEPARTMENT OF TRANSPORTATION**  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED FOR  
DIVISION ADMINISTRATOR  
DATE



LOCATION SKETCH

STAGE I QUANTITIES	
CLASS A CONCRETE	
BARREL @ 2.45 C.Y./FT.	174.0 C.Y.
OUTLET WINGS ETC.	30.4 C.Y.
TOTAL	204.4 C.Y.
REINFORCING STEEL	
BARREL	26,302 LBS.
OUTLET WINGS ETC.	1,698 LBS.
TOTAL	28,000 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MAT'L	119 TONS

STAGE II QUANTITIES	
CLASS A CONCRETE	
BARREL @ 2.45 C.Y./FT.	153.1 C.Y.
SILLS	1.4 C.Y.
INLET WINGS ETC.	22.8 C.Y.
TOTAL	177.3 C.Y.
REINFORCING STEEL	
BARREL	24,315 LBS.
INLET WINGS ETC.	1,535 LBS.
TOTAL	25,850 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MAT'L	104 TONS

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE	
STAGE I	204.4 C.Y.
STAGE II	177.3 C.Y.
TOTAL	381.7 C.Y.
REINFORCING STEEL	
STAGE I	28,000 LBS.
STAGE II	25,850 LBS.
TOTAL	53,850 LBS.
FOUNDATION CONDITIONING MAT'L	
STAGE I	119 TONS
STAGE II	104 TONS
TOTAL	223 TONS
CULVERT EXCAVATION	LUMP SUM

HYDROGRAPHIC DATA

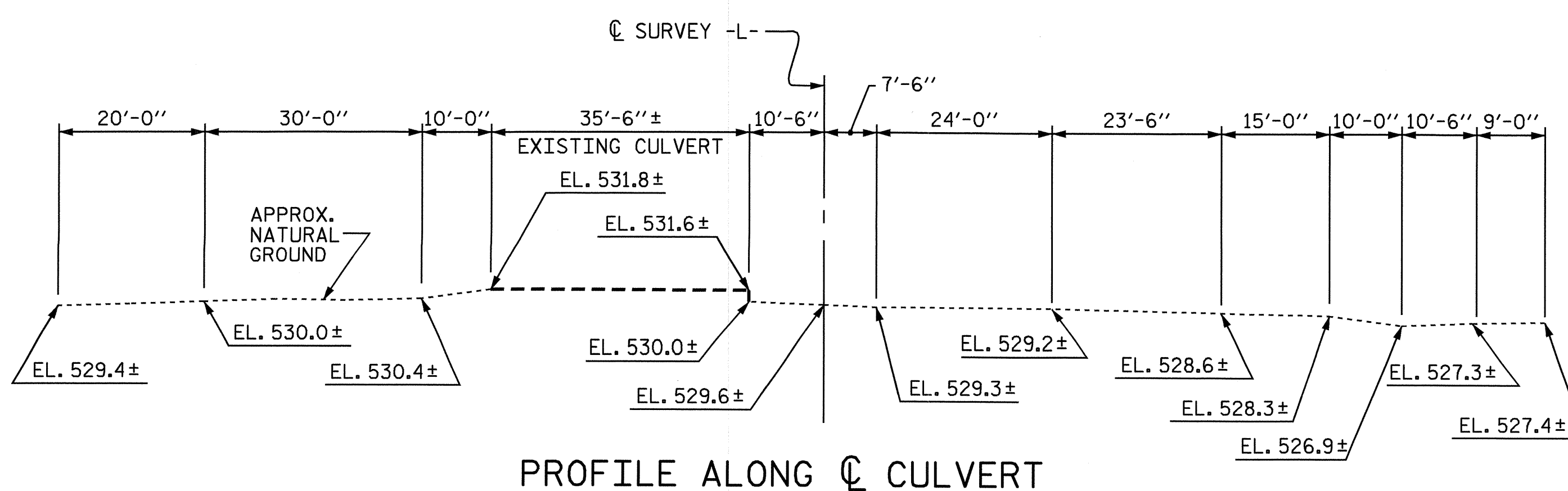
DESIGN DISCHARGE	2200 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS.
DESIGN HIGH WATER ELEVATION	540.3
DRAINAGE AREA	2.08 SQ. MI.
BASIC DISCHARGE (Q100)	2300 CFS
BASIC HIGH WATER ELEVATION	540.7

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	2615 CFS
FREQUENCY OF OVERTOPPING FLOOD	100+ YR.
OVERTOPPING FLOOD ELEVATION	541.8

GRADE DATA

GRADE POINT ELEV. @ STA. 44+29.00 -L-	= 545.444
BED ELEV. @ STA. 44+29.00 -L-	= 527.990
ROADWAY SLOPE	= 2:1



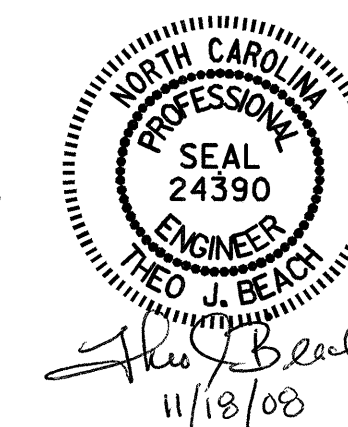
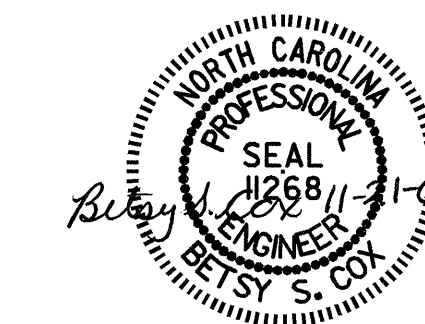
PROFILE ALONG CULVERT

PROJECT NO. U-3447  
 MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-

SHEET 1 OF 11 REPLACES STR. No. 10

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

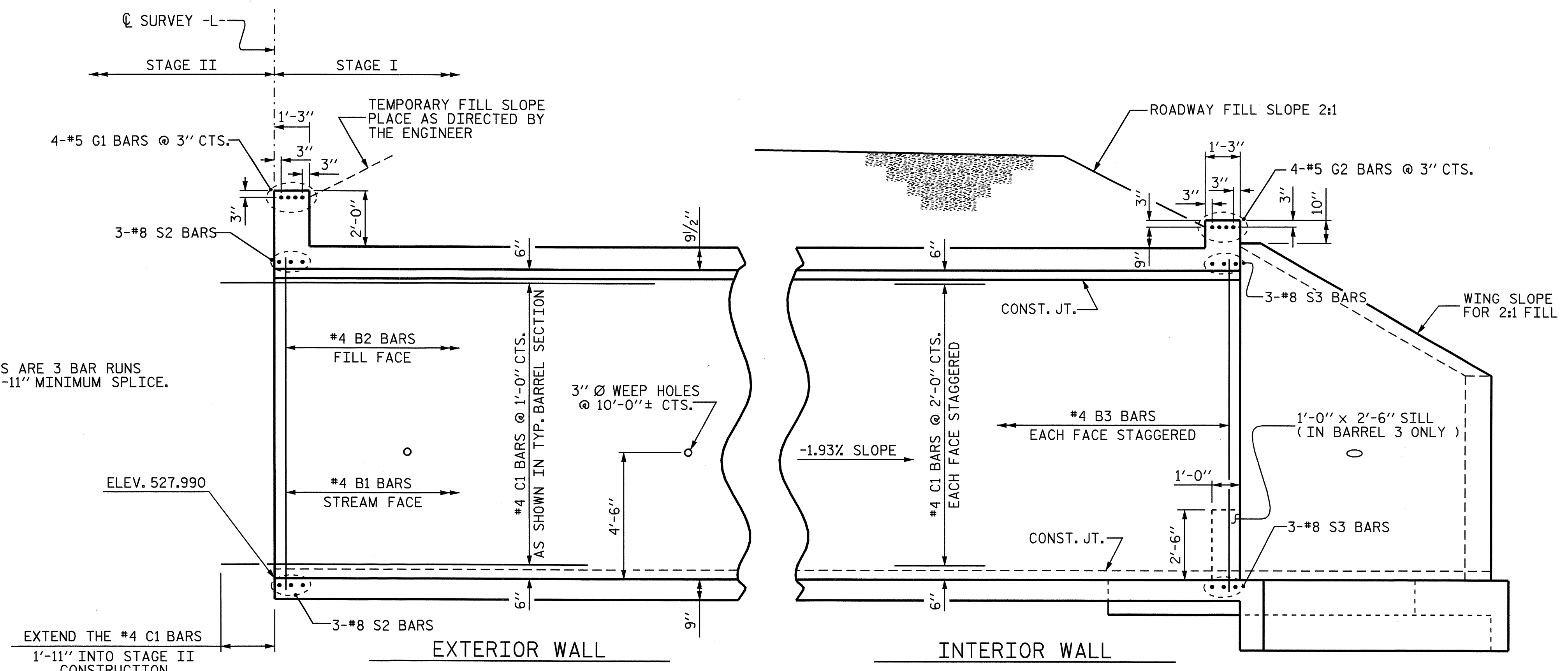
TRIPLE 7 FT. x 11 FT.  
 CONCRETE BOX CULVERT



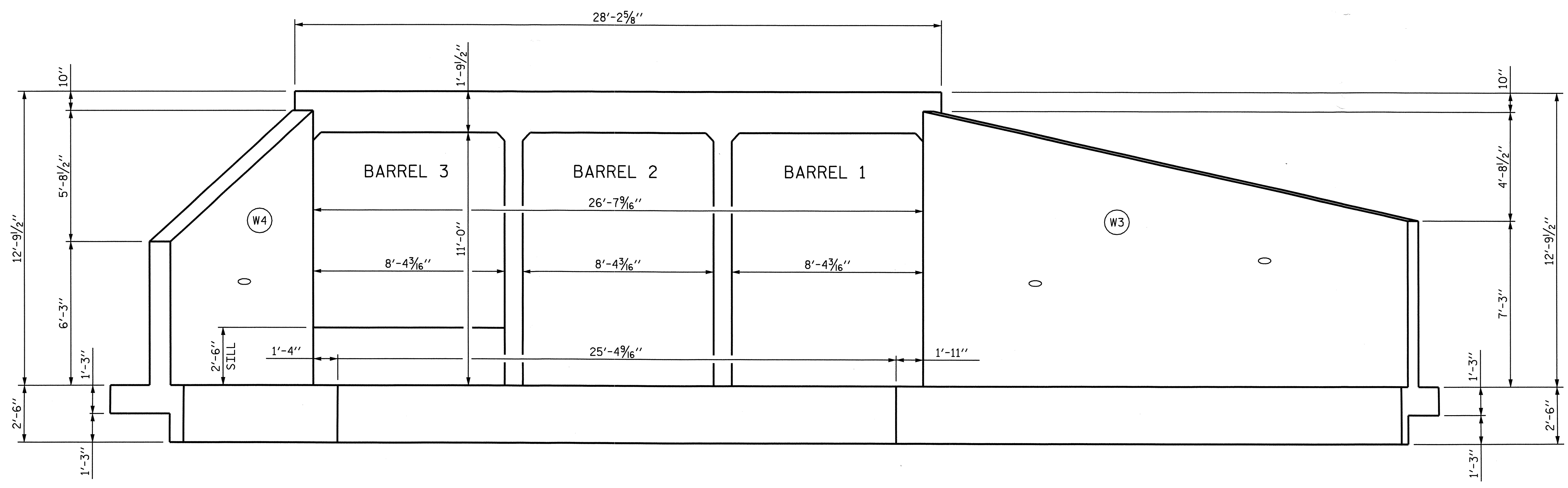
DRAWN BY : MIKE BRITT DATE : 10-12-05  
 CHECKED BY : T.J. BEACH DATE : 10-18-05

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

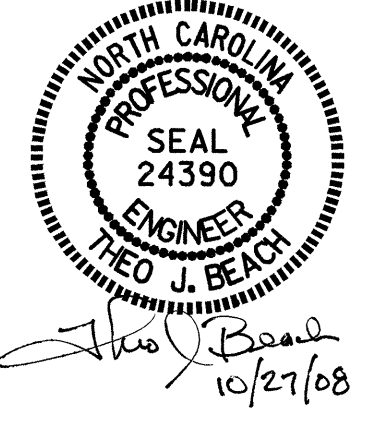
NOTE :  
 #4 C1 BARS ARE 3 BAR RUNS  
 WITH A 1'-11" MINIMUM SPLICE.



CULVERT SECTION  
 (STAGE I)



OUTLET END ELEVATION  
 (NORMAL TO SKEW)



PROJECT NO. U-3447  
MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-

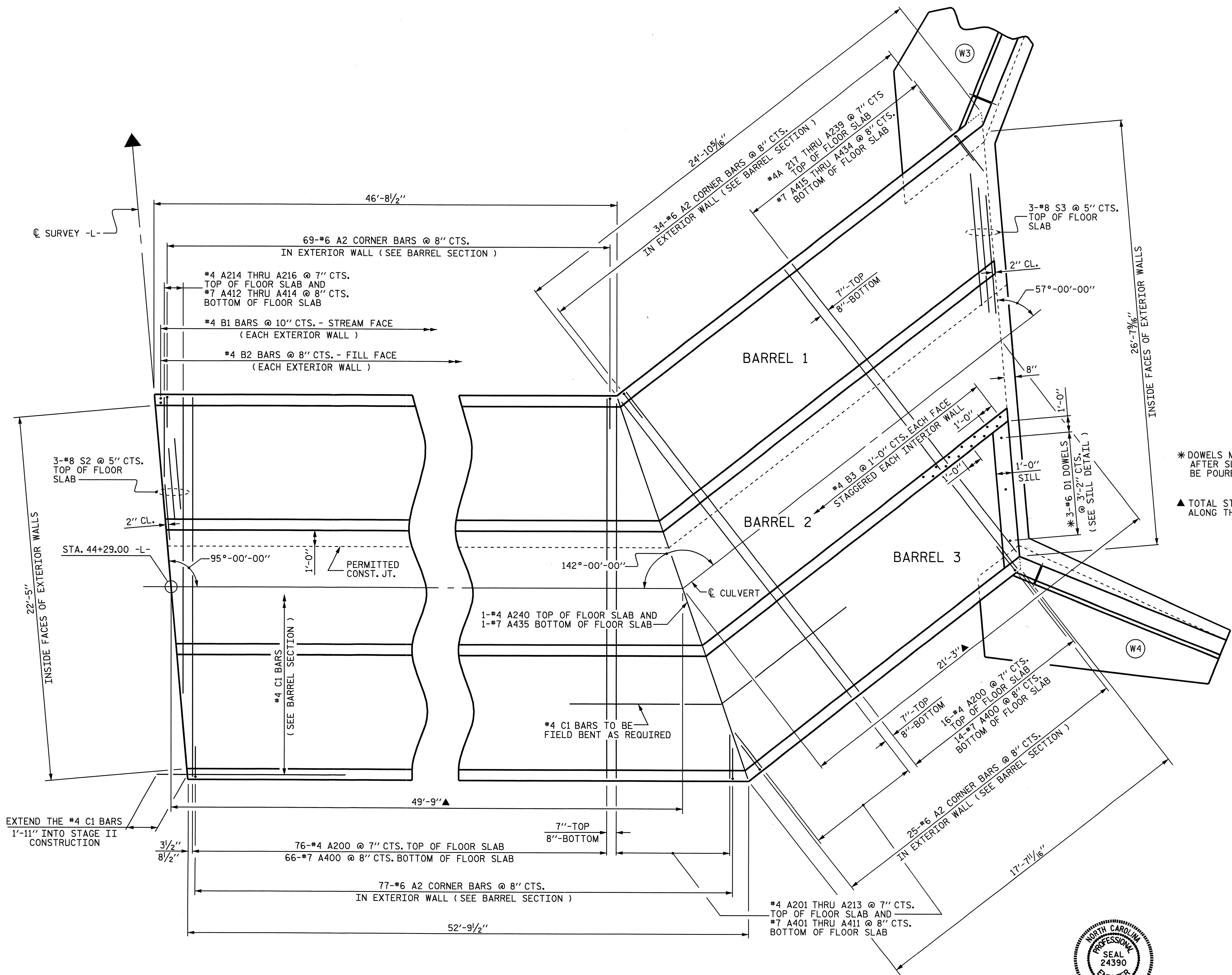
SHEET 2 OF 11  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TRIPLE 7 FT. x 11 FT.  
 CONCRETE BOX CULVERT  
 (STAGE I)

DRAWN BY : MIKE BRITT DATE : 9-22-05  
 CHECKED BY : T.J. BEACH DATE : 10-18-05

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

27-OCT-2008 13:04  
 R:\structures\drawings\U3447.sd.dgn  
 jbankovich





\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED. SILL IS TO BE POURED AFTER STAGE II CONSTRUCTION IS COMPLETE.

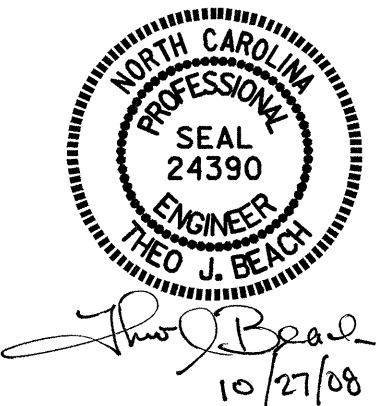
▲ TOTAL STAGE I CULVERT LENGTH ALONG THE C OF CULVERT = 71'-0"

NOTE :  
#4 C1 BARS ARE 3 BAR RUNS WITH A 1'-11" MINIMUM SPLICE.

PROJECT NO. U-3447  
MECKLENBURG COUNTY  
STATION: 44+29.00 -L-

SHEET 3 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
  
TRIPLE 7 FT. x 11 FT.  
CONCRETE BOX CULVERT  
( STAGE I )



PLAN OF FLOOR SLAB - STAGE I

DRAWN BY : MIKE BRITT DATE : 9-27-05  
CHECKED BY : T.J. BEACH DATE : 10-18-05

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





**REINFORCING STEEL BAR SCHEDULE FOR BARREL  
(STAGE I)**

BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT				
A1	205	#6	6	5'-8"	1745	A200	92	#4	STR	23'-4"	1434	A300	80	#5	STR	23'-4"	1947	A400	80	#7	STR	23'-4"	3815
A2	205	#6	6	5'-7"	1719	A201	2	#4	STR	23'-0"	31	A301	2	#5	STR	22'-9"	47	A401	2	#7	STR	22'-9"	93
A100	92	#4	STR	23'-4"	1434	A202	2	#4	STR	21'-4"	29	A302	2	#5	STR	20'-10"	43	A402	2	#7	STR	20'-10"	85
A101	2	#4	STR	23'-0"	31	A203	2	#4	STR	19'-7"	26	A303	2	#5	STR	18'-11"	39	A403	2	#7	STR	18'-11"	77
A102	2	#4	STR	21'-4"	29	A204	2	#4	STR	17'-11"	24	A304	2	#5	STR	16'-11"	35	A404	2	#7	STR	16'-11"	69
A103	2	#4	STR	19'-7"	26	A205	2	#4	STR	16'-3"	22	A305	2	#5	STR	15'-0"	31	A405	2	#7	STR	15'-0"	61
A104	2	#4	STR	17'-11"	24	A206	2	#4	STR	14'-6"	19	A306	2	#5	STR	13'-1"	27	A406	2	#7	STR	13'-1"	53
A105	2	#4	STR	16'-3"	22	A207	2	#4	STR	12'-10"	17	A307	2	#5	STR	12'-2"	25	A407	2	#7	STR	12'-2"	50
A106	2	#4	STR	14'-6"	19	A208	2	#4	STR	11'-2"	15	A308	2	#5	STR	9'-2"	19	A408	2	#7	STR	9'-2"	37
A107	2	#4	STR	12'-10"	17	A209	2	#4	STR	9'-5"	13	A309	2	#5	STR	7'-3"	15	A409	2	#7	STR	7'-3"	30
A108	2	#4	STR	11'-2"	15	A210	2	#4	STR	7'-9"	10	A310	2	#5	STR	5'-4"	11	A410	2	#7	STR	5'-4"	22
A109	2	#4	STR	9'-5"	13	A211	2	#4	STR	6'-1"	8	A311	2	#5	STR	3'-5"	7	A411	2	#7	STR	3'-5"	14
A110	2	#4	STR	7'-9"	10	A212	2	#4	STR	4'-4"	6	A312	1	#5	STR	22'-0"	23	A412	1	#7	STR	22'-0"	45
A111	2	#4	STR	6'-1"	8	A213	2	#4	STR	2'-8"	4	A313	1	#5	STR	14'-5"	15	A413	1	#7	STR	14'-5"	29
A112	2	#4	STR	4'-4"	6	A214	1	#4	STR	18'-2"	12	A314	1	#5	STR	6'-9"	7	A414	1	#7	STR	6'-9"	14
A113	2	#4	STR	2'-8"	4	A215	1	#4	STR	11'-6"	8	A315	1	#5	STR	22'-6"	23	A415	1	#7	STR	22'-6"	46
A114	1	#4	STR	18'-2"	12	A216	1	#4	STR	4'-10"	3	A316	1	#5	STR	21'-5"	22	A416	1	#7	STR	21'-5"	44
A115	1	#4	STR	11'-6"	8	A217	1	#4	STR	22'-6"	15	A317	1	#5	STR	20'-5"	21	A417	1	#7	STR	20'-5"	42
A116	1	#4	STR	4'-10"	3	A218	1	#4	STR	21'-7"	14	A318	1	#5	STR	19'-5"	20	A418	1	#7	STR	19'-5"	40
A117	1	#4	STR	22'-6"	15	A219	1	#4	STR	20'-8"	14	A319	1	#5	STR	18'-4"	19	A419	1	#7	STR	18'-4"	37
A118	1	#4	STR	21'-7"	14	A220	1	#4	STR	19'-9"	13	A320	1	#5	STR	17'-4"	18	A420	1	#7	STR	17'-4"	35
A119	1	#4	STR	20'-8"	14	A221	1	#4	STR	18'-11"	13	A321	1	#5	STR	16'-4"	17	A421	1	#7	STR	16'-4"	33
A120	1	#4	STR	19'-9"	13	A222	1	#4	STR	18'-0"	12	A322	1	#5	STR	15'-3"	16	A422	1	#7	STR	15'-3"	31
A121	1	#4	STR	18'-11"	13	A223	1	#4	STR	17'-1"	11	A323	1	#5	STR	14'-3"	15	A423	1	#7	STR	14'-3"	29
A122	1	#4	STR	18'-0"	12	A224	1	#4	STR	16'-2"	11	A324	1	#5	STR	13'-3"	14	A424	1	#7	STR	13'-3"	27
A123	1	#4	STR	17'-1"	11	A225	1	#4	STR	15'-3"	10	A325	1	#5	STR	12'-2"	13	A425	1	#7	STR	12'-2"	25
A124	1	#4	STR	16'-2"	11	A226	1	#4	STR	14'-5"	10	A326	1	#5	STR	11'-2"	12	A426	1	#7	STR	11'-2"	23
A125	1	#4	STR	15'-3"	10	A227	1	#4	STR	13'-6"	9	A327	1	#5	STR	10'-2"	11	A427	1	#7	STR	10'-2"	21
A126	1	#4	STR	14'-5"	10	A228	1	#4	STR	12'-7"	8	A328	1	#5	STR	9'-2"	10	A428	1	#7	STR	9'-2"	19
A127	1	#4	STR	13'-6"	9	A229	1	#4	STR	11'-8"	8	A329	1	#5	STR	8'-1"	8	A429	1	#7	STR	8'-1"	17
A128	1	#4	STR	12'-7"	8	A230	1	#4	STR	10'-10"	7	A330	1	#5	STR	7'-1"	7	A430	1	#7	STR	7'-1"	14
A129	1	#4	STR	11'-8"	8	A231	1	#4	STR	9'-11"	7	A331	1	#5	STR	6'-1"	6	A431	1	#7	STR	6'-1"	12
A130	1	#4	STR	10'-10"	7	A232	1	#4	STR	9'-0"	6	A332	1	#5	STR	5'-0"	5	A432	1	#7	STR	5'-0"	10
A131	1	#4	STR	9'-11"	7	A233	1	#4	STR	8'-1"	5	A333	1	#5	STR	4'-0"	4	A433	1	#7	STR	4'-0"	8
A132	1	#4	STR	9'-0"	6	A234	1	#4	STR	7'-2"	5	A334	1	#5	STR	3'-0"	3	A434	1	#7	STR	3'-0"	6
A133	1	#4	STR	8'-1"	5	A235	1	#4	STR	6'-4"	4	A335	1	#5	STR	24'-8"	26	A435	1	#7	STR	24'-8"	50
A134	1	#4	STR	7'-2"	5	A236	1	#4	STR	5'-5"	4												
A135	1	#4	STR	6'-4"	4	A237	1	#4	STR	4'-6"	3												
A136	1	#4	STR	5'-5"	4	A238	1	#4	STR	3'-7"	2												
A137	1	#4	STR	4'-6"	3	A239	1	#4	STR	2'-9"	2												
A138	1	#4	STR	3'-7"	2	A240	1	#4	STR	24'-8"	16												
A139	1	#4	STR	2'-9"	2																		
A140	1	#4	STR	24'-8"	16																		

**STAGE I CULVERT NOTES :**

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

DESIGN FILL----- 5.72'

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:

1. WINGS W3 & W4 FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS W3 & W4 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 WINGS W3 & W4 LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET 10 OF 11.

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.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

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

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED CONCRETE BOX CULVERT OPTION WILL BE ALLOWED.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

EXISTING BED MATERIAL SHALL BE STOCK PILED ON SITE AND REUSED AS BACK FILL MATERIAL INSIDE THE CULVERT TO BURY THE BOTTOM OF THE CULVERT THE REQUIRED 1'-0".

FOR LIMITS AND PAY ITEM FOR TEMPORARY SHORING, SEE ROADWAY PLANS.



*Theo J. Beach*  
11/21/08

PROJECT NO. U-3447

MECKLENBURG COUNTY

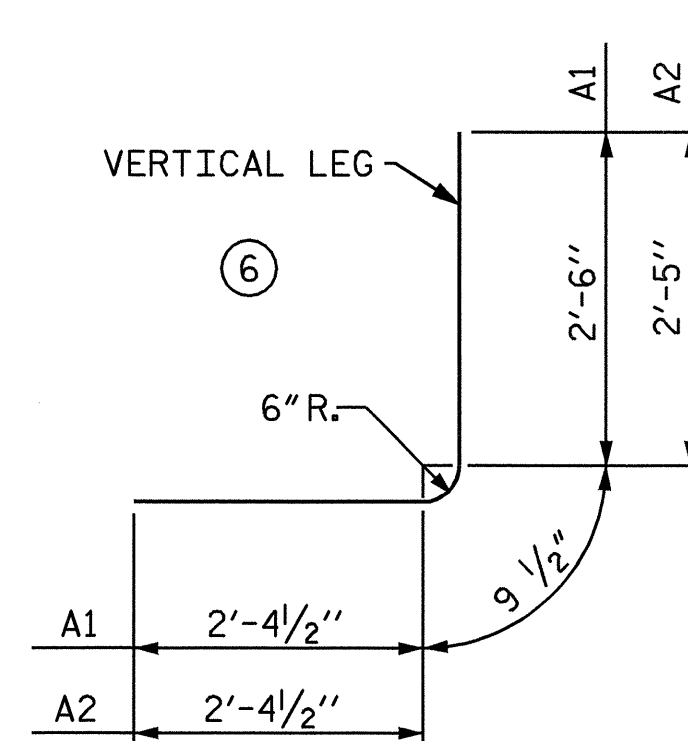
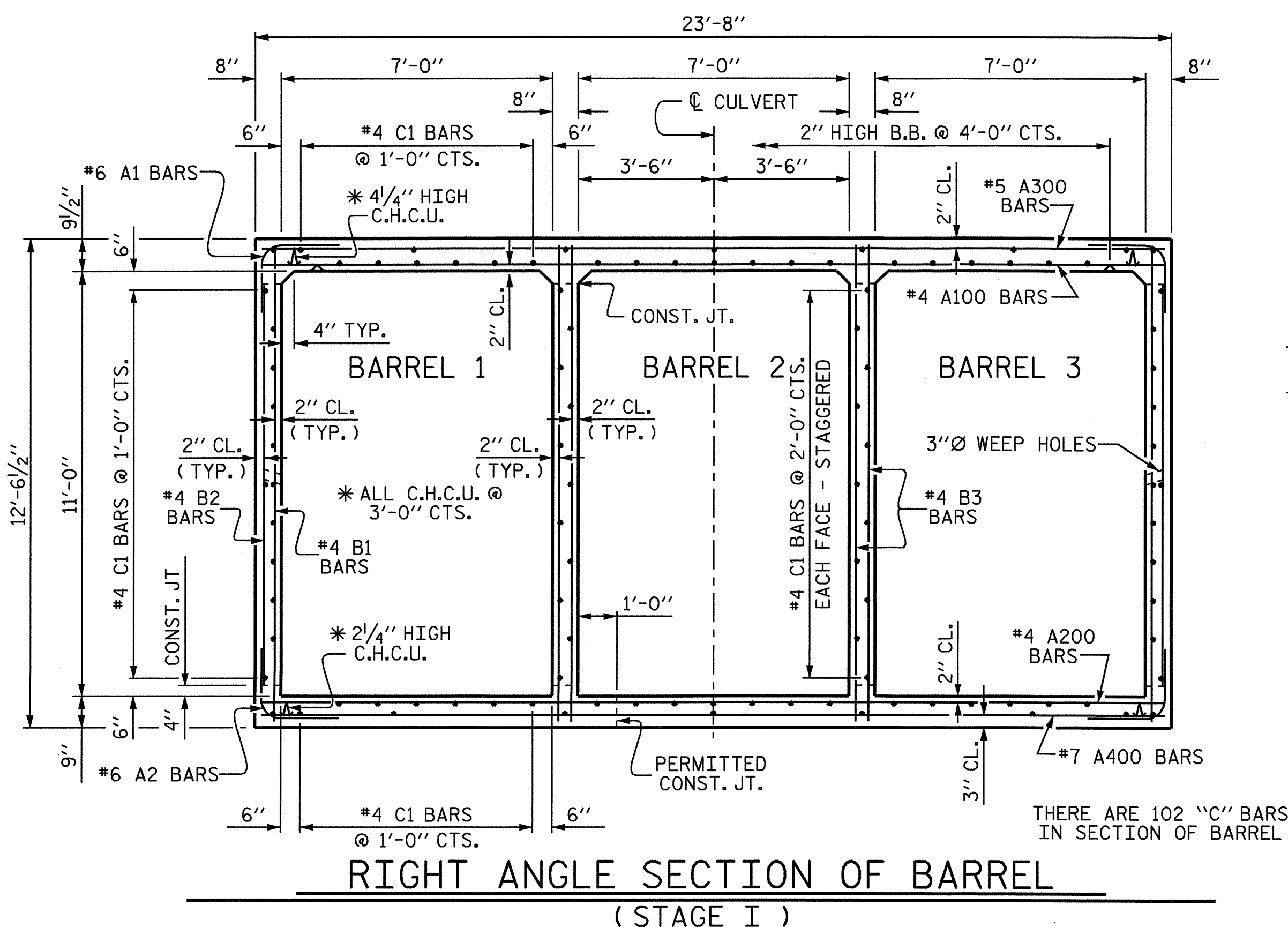
STATION: 44+29.00 -L-

SHEET 5 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**TRIPLE 7 FT. x 11 FT.  
CONCRETE BOX CULVERT  
(STAGE I)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			11



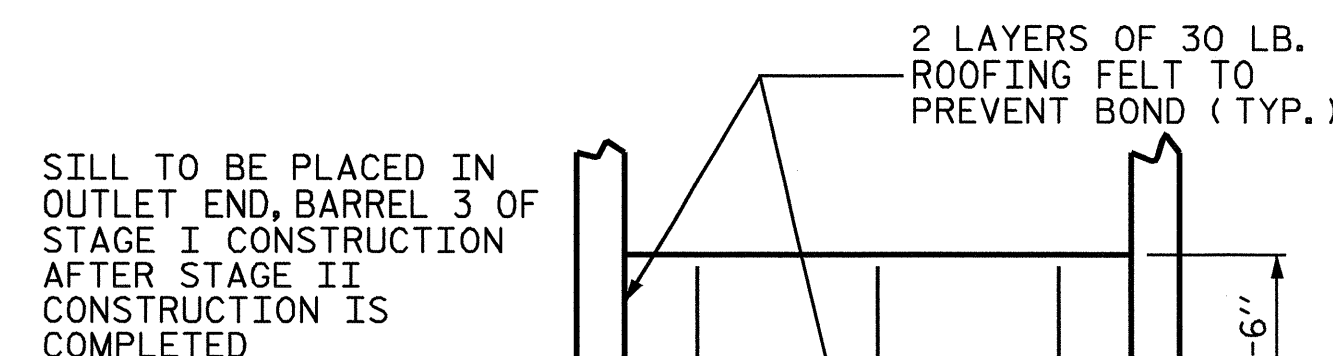
**BAR TYPE**  
BAR DIMENSIONS ARE OUT TO OUT

TOTAL REINFORCING STEEL (LBS.)

26,302

**SPLICE LENGTHS CHART**

BAR	SIZE	SPLICE LENGTH
A200	#4	1'-9"
A400	#7	3'-1"
B1	#4	1'-9"
B3	#4	1'-9"
C1	#4	1'-11"



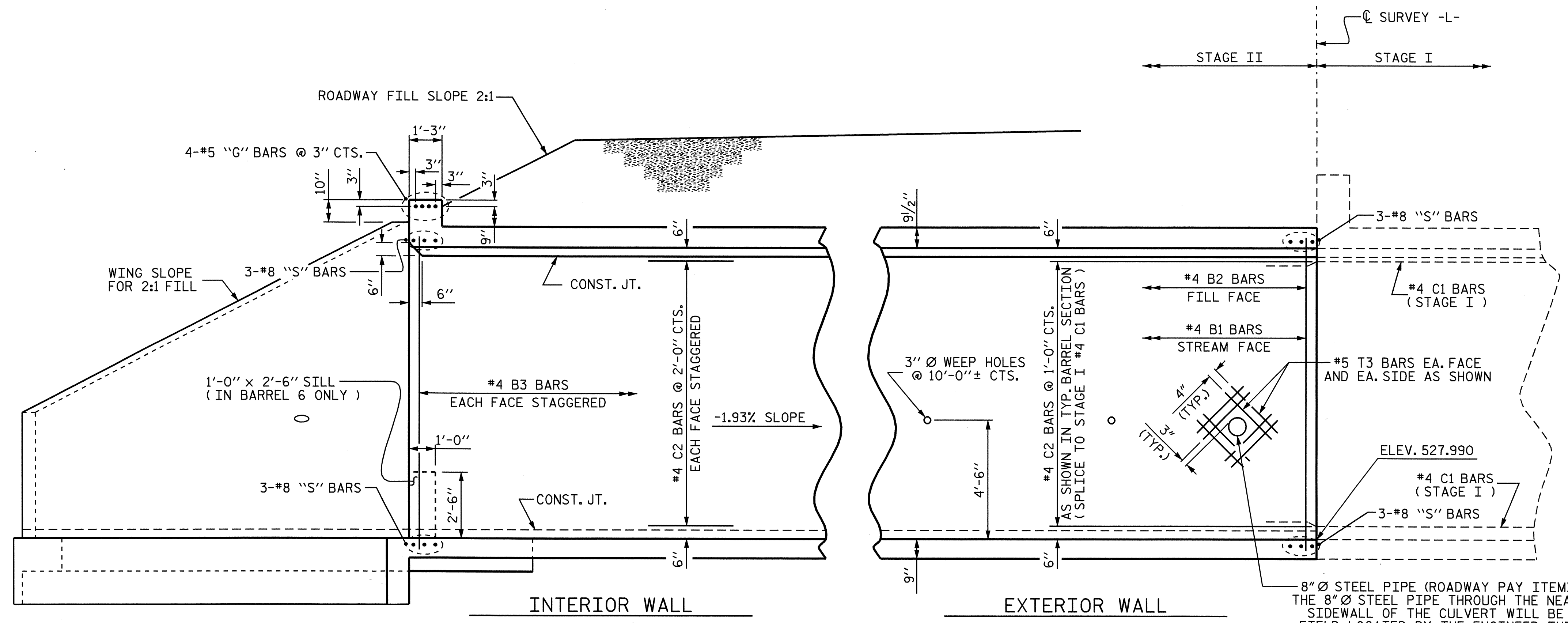
▲ #6 D1 DOWELS @ 3'-2" CTS.  
(SEE PLAN OF FLOOR SLAB - STAGE I)

**SECTION THRU SILL**

**BARREL 3 SILL DETAILS**

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

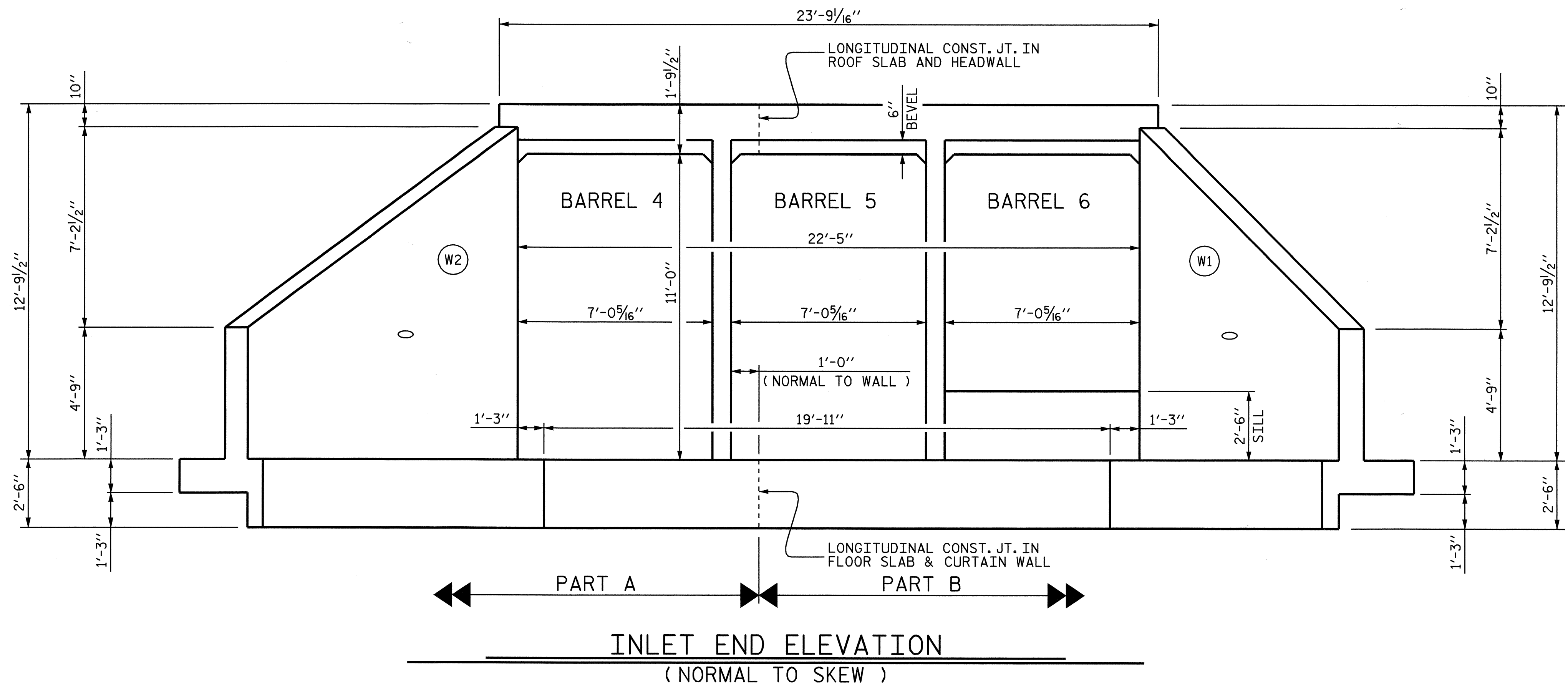
DRAWN BY: MIKE BRITT DATE: 9-30-05  
CHECKED BY: T.J. BEACH DATE: 10-18-05



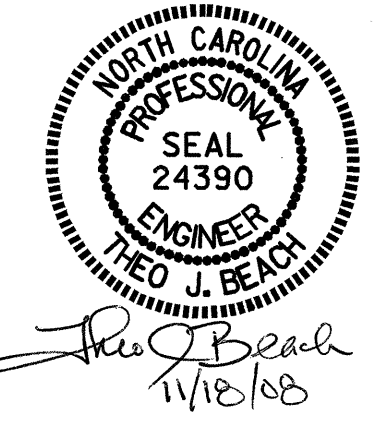
NOTE:  
#4 C2 BARS ARE 3 BAR RUNS  
WITH A 1'-11" MINIMUM SPLICE.

8" Ø STEEL PIPE (ROADWAY PAY ITEM)  
THE 8" Ø STEEL PIPE THROUGH THE NEAR  
SIDEWALL OF THE CULVERT WILL BE  
FIELD LOCATED BY THE ENGINEER. THE  
REINFORCING STEEL WILL BE FIELD  
BENT AS NECESSARY TO CLEAR PIPE.

CULVERT SECTION  
(STAGE II)



INLET END ELEVATION  
(NORMAL TO SKEW)



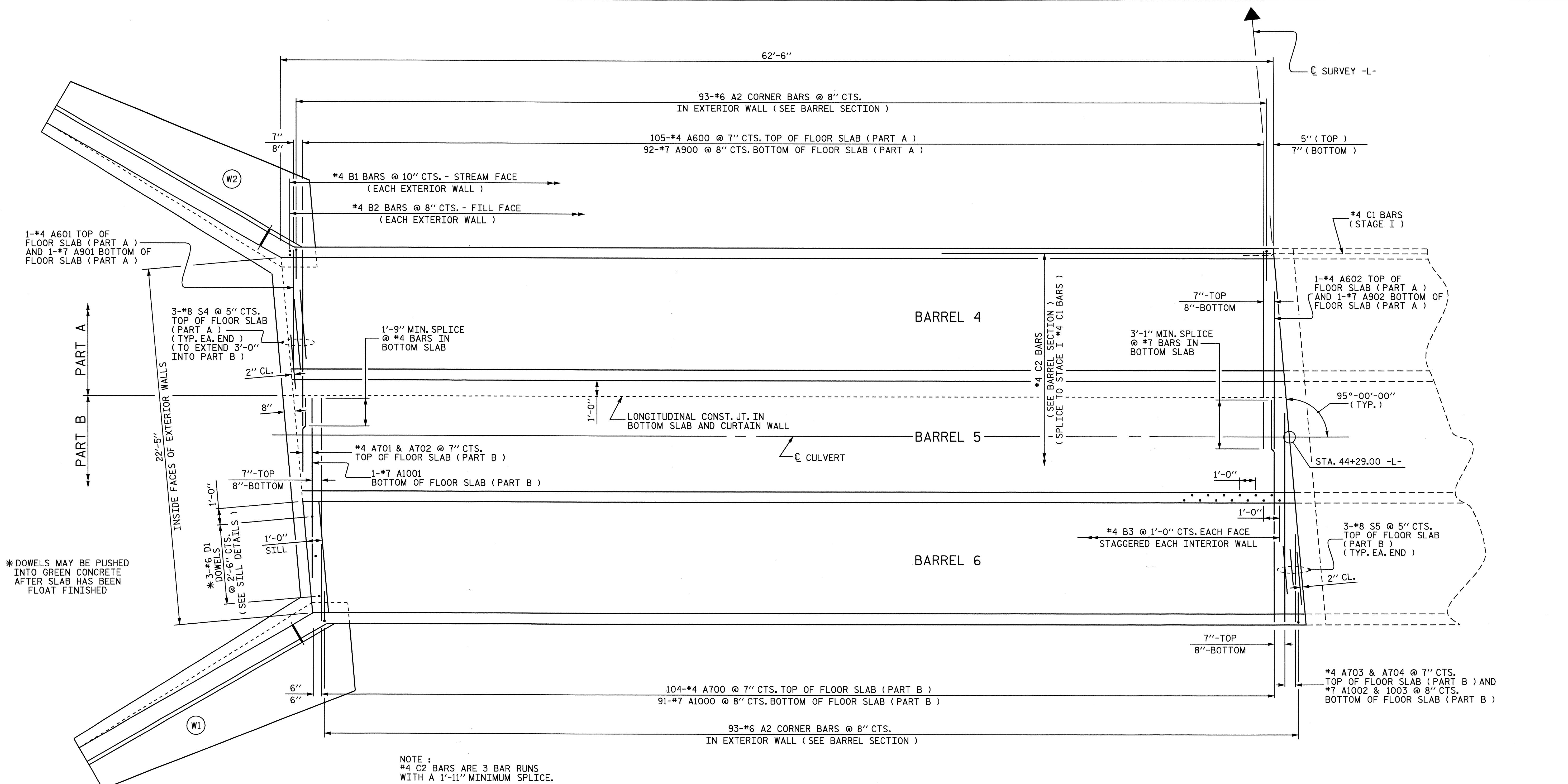
PROJECT NO. U-3447  
MECKLENBURG COUNTY  
STATION: 44+29.00 -L-

SHEET 6 OF 11  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
TRIPLE 7 FT. x 11 FT.  
CONCRETE BOX CULVERT  
(STAGE II)

DRAWN BY: MIKE BRITT DATE: 10-3-05  
CHECKED BY: T.J. BEACH DATE: 10-18-05

REVISIONS						SHEET NO. C-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 11
2			4			



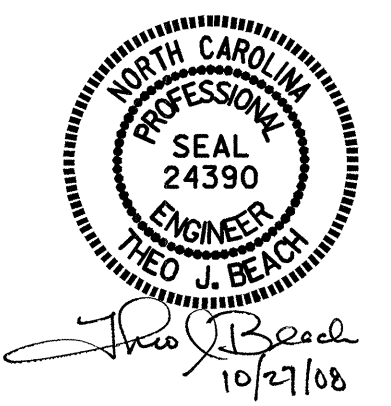


NOTE:  
 #4 C2 BARS ARE 3 BAR RUNS  
 WITH A 1'-11" MINIMUM SPLICE.

PLAN OF FLOOR SLAB - STAGE II

PROJECT NO. U-3447  
MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-

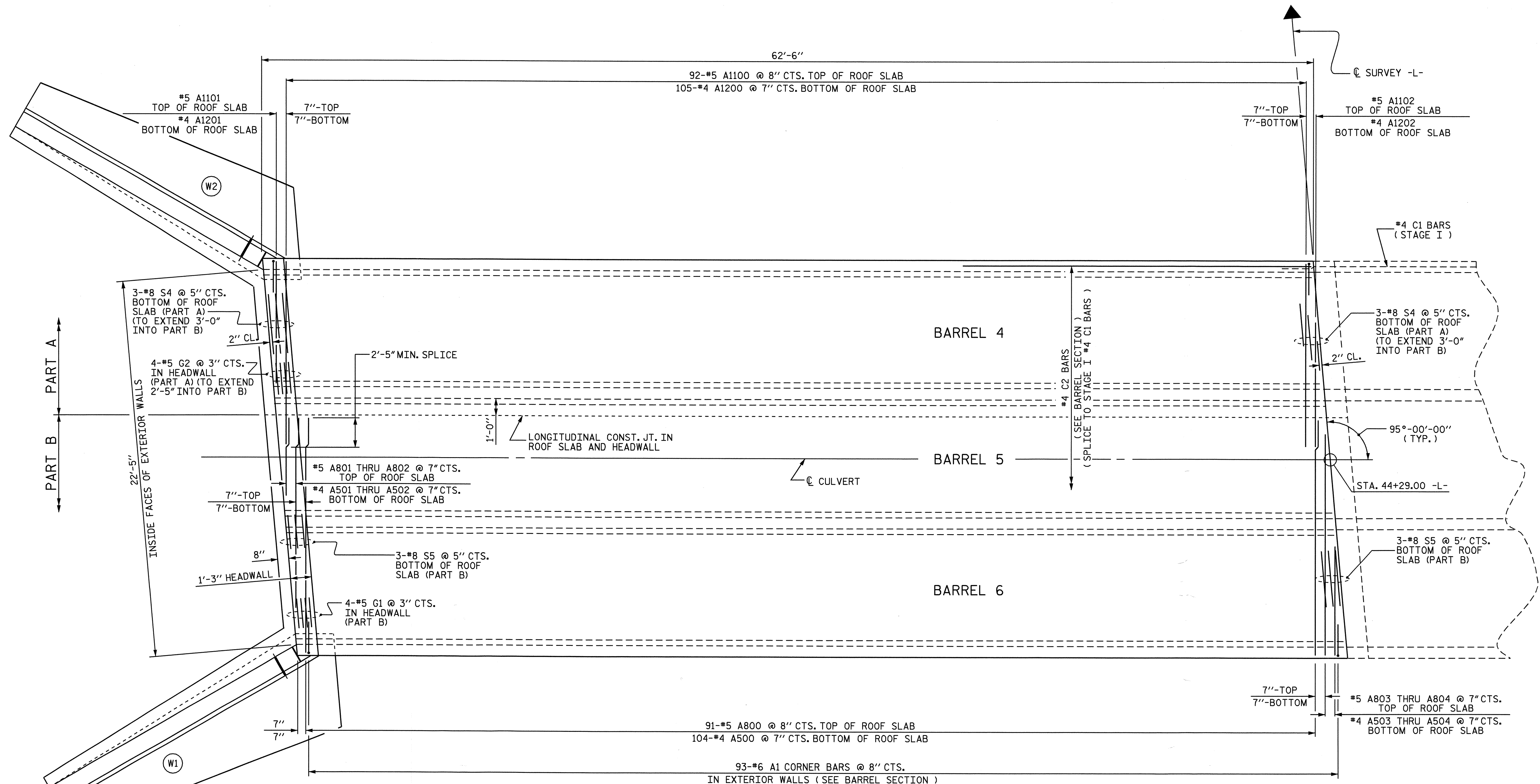
SHEET 7 OF 11  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TRIPLE 7 FT. x 11 FT.  
 CONCRETE BOX CULVERT  
 (STAGE II)



DRAWN BY: MIKE BRITT DATE: 10-12-05  
 CHECKED BY: T.J. BEACH DATE: 10-18-05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			11





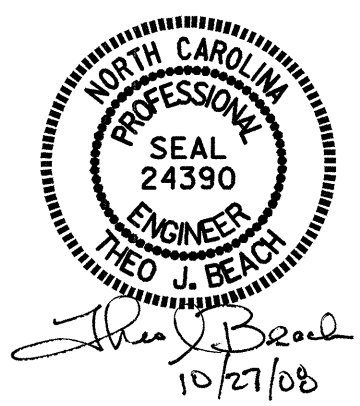
NOTE:  
 #4 C2 BARS ARE 3 BAR RUNS  
 WITH A 1'-11" MINIMUM SPLICE.

PLAN OF ROOF SLAB - STAGE II

PROJECT NO. U-3447  
MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-

SHEET 8 OF 11

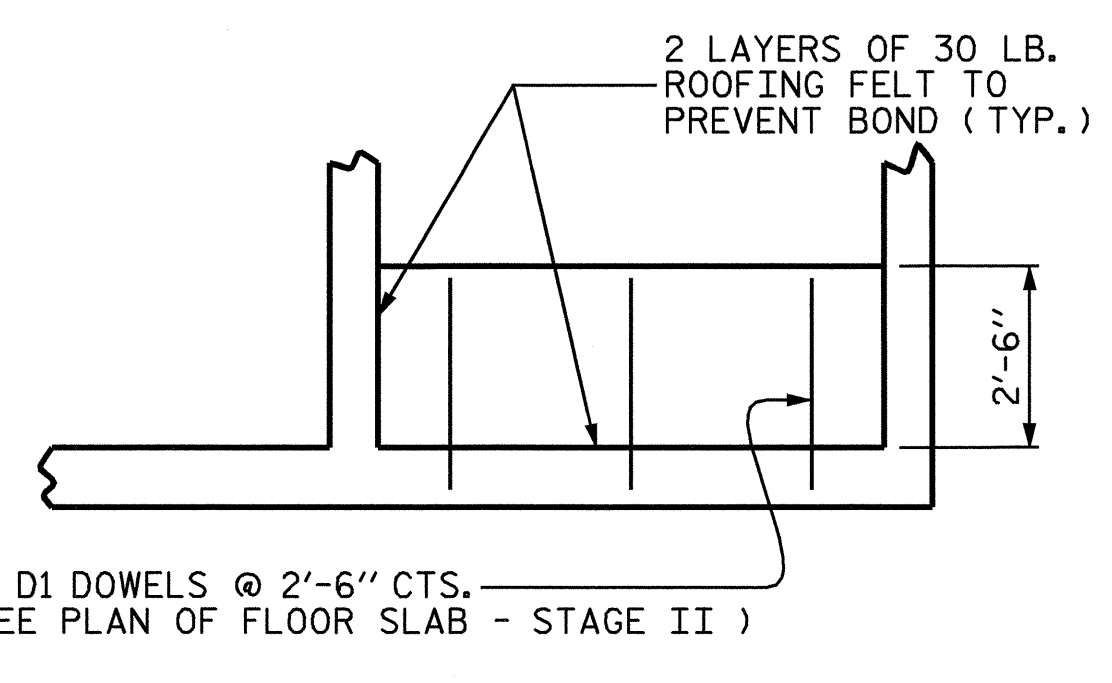
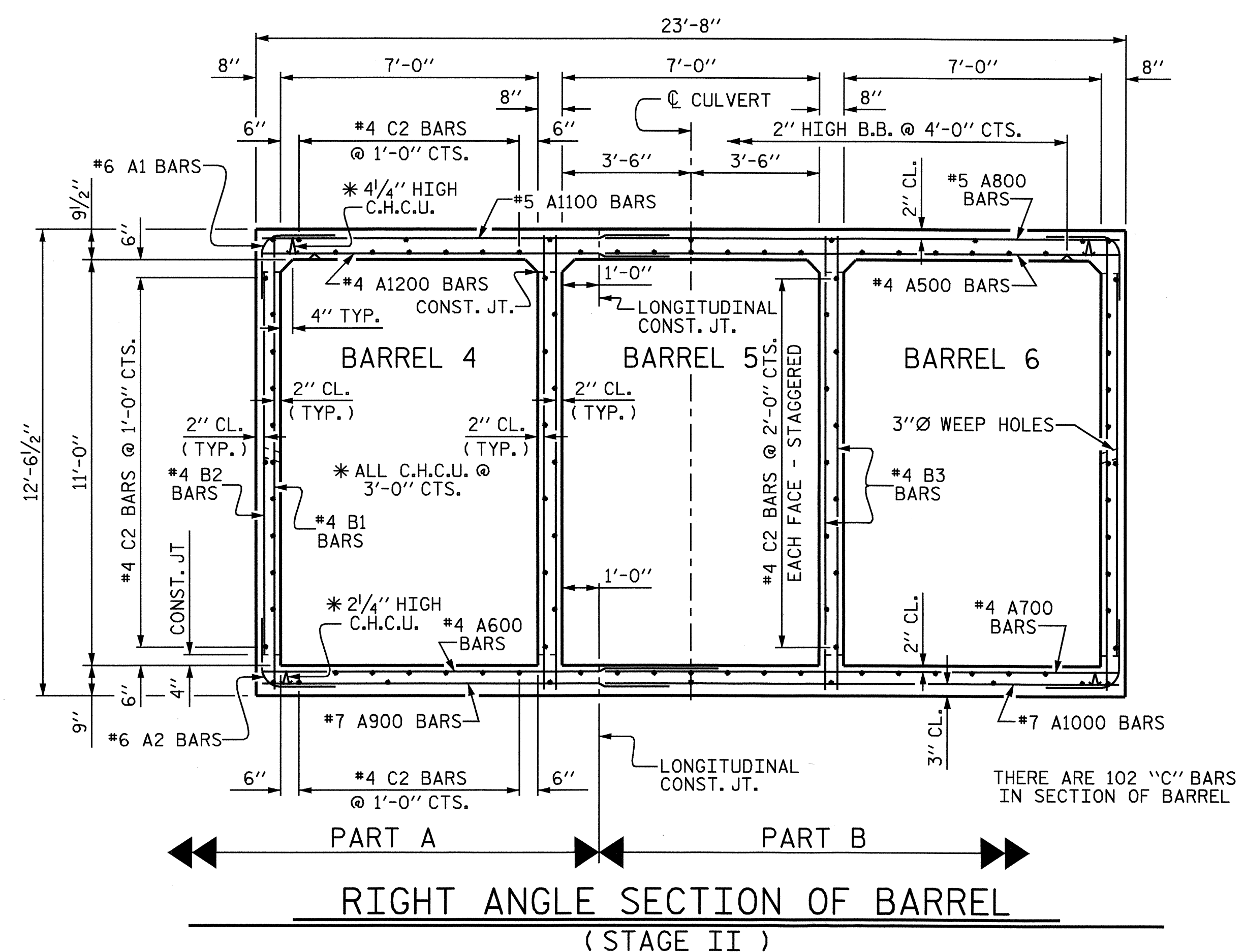
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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TRIPLE 7 FT. x 11 FT.  
 CONCRETE BOX CULVERT  
 (STAGE II)



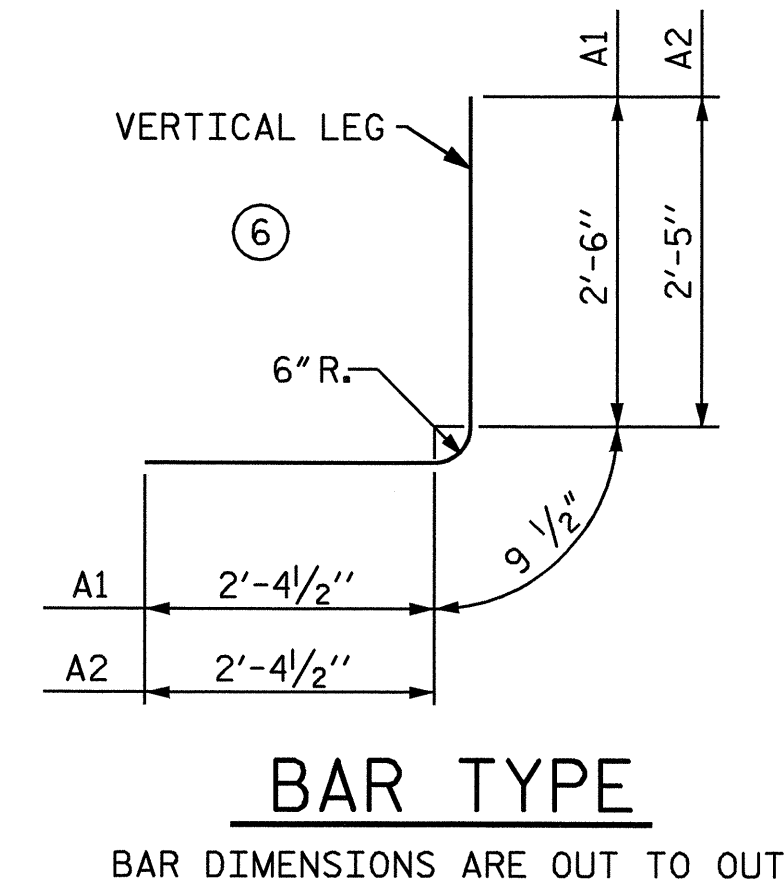
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 CHECKED BY: T.J. BEACH DATE: 10-18-05

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			11



**BARREL 6 SILL DETAILS**  
 ▲ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED



REINFORCING STEEL BAR SCHEDULE FOR BARREL (STAGE II)					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A1	186	#6	6	5'-8"	1583
A2	186	#6	6	5'-7"	1560
A500	104	#4	STR	14'-0"	973
A501	1	#4	STR	11'-3"	8
A502	1	#4	STR	4'-7"	3
A503	1	#4	STR	13'-2"	9
A504	1	#4	STR	6'-6"	4
A600	105	#4	STR	11'-1"	777
A601	1	#4	STR	7'-3"	5
A602	1	#4	STR	7'-7"	5
A700	104	#4	STR	14'-0"	973
A701	1	#4	STR	11'-3"	8
A702	1	#4	STR	4'-7"	3
A703	1	#4	STR	13'-2"	9
A704	1	#4	STR	6'-6"	4
A800	91	#5	STR	14'-0"	1329
A801	1	#5	STR	11'-3"	12
A802	1	#5	STR	4'-7"	5
A803	1	#5	STR	13'-2"	14
A804	1	#5	STR	6'-6"	7
A900	92	#7	STR	12'-5"	2335
A901	1	#7	STR	4'-5"	9
A902	1	#7	STR	9'-10"	20
A1000	91	#7	STR	14'-0"	2604
A1001	1	#7	STR	10'-6"	21
A1002	1	#7	STR	13'-2"	27
A1003	1	#7	STR	5'-6"	11
A1100	92	#5	STR	11'-9"	1127
A1101	1	#5	STR	7'-10"	8
A1102	1	#5	STR	8'-0"	8
A1200	105	#4	STR	11'-9"	824
A1201	1	#4	STR	7'-10"	5
A1202	1	#4	STR	8'-0"	5
B1	150	#4	STR	12'-0"	1202
B2	188	#4	STR	10'-4"	1298
B3	252	#4	STR	12'-0"	2020
C1	306	#4	STR	22'-0"	4497
D1	3	#6	STR	2'-10"	13
G1	4	#5	STR	14'-0"	58
G2	4	#5	STR	11'-9"	49
S4	12	#8	STR	12'-3"	392
S5	12	#8	STR	14'-0"	449
T3	16	#5	STR	2'-6"	42
TOTAL REINFORCING STEEL (LBS.)					24,315

SPLICE LENGTHS CHART		
BAR	SIZE	SPLICE LENGTH
A500 & A1200	#4	2'-5"
A600 & A700	#4	1'-9"
A800 & A1100	#5	2'-5"
A900 & A1000	#7	3'-1"
B1	#4	1'-9"
B3	#4	1'-9"
C2	#4	1'-11"

**STAGE II CULVERT NOTES :**

ASSUMED LIVE LOAD -----HS20-44 OR ALTERNATE LOADING.  
 DESIGN FILL----- 5.72'  
 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:  
 PART A  
 1. WING W2 FOOTING AND FLOOR SLAB OF BARREL 4 INCLUDING 4" OF VERTICAL WALLS  
 2. THE REMAINING PORTION OF BARREL 4 WALLS AND WING W2 FULL HEIGHT FOLLOWED BY THE ROOF SLAB AND HEADWALL.  
 PART B  
 1. WING W1 FOOTING AND FLOOR SLAB OF BARRELS 5 AND 6 INCLUDING 4" OF VERTICAL WALLS.  
 2. THE REMAINING PORTION OF BARRELS 5 AND 6 WALLS AND WING W1 FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL, AND 1'-0" X 2'-6" SILLS IN INLET AND OUTLET ENDS OF BARRELS 3 AND 6.  
 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 WINGS W1 & W2 LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET 11 OF 11.  
 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.  
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.  
 A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.  
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.  
 FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.  
 FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 NO PRECAST REINFORCED CONCRETE BOX CULVERT OPTION WILL BE ALLOWED.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 EXISTING BED MATERIAL SHALL BE STOCK PILED ON SITE AND REUSED AS BACK FILL MATERIAL INSIDE THE CULVERT TO BURY THE BOTTOM OF THE CULVERT THE REQUIRED 1'-0".  
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 35'-6" LONG TRIPLE 7' x 10' REINFORCED CONCRETE BOX CULVERT LOCATED AT THE PROPOSED CULVERT SHALL BE REMOVED.  
 THE CONTRACTOR SHALL REMOVE THE EXISTING CULVERT AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 NO SEPARATE PAYMENT SHALL BE MADE FOR REMOVAL OF EXISTING STRUCTURE. COST FOR REMOVAL OF THE EXISTING STRUCTURE SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CULVERT EXCAVATION.

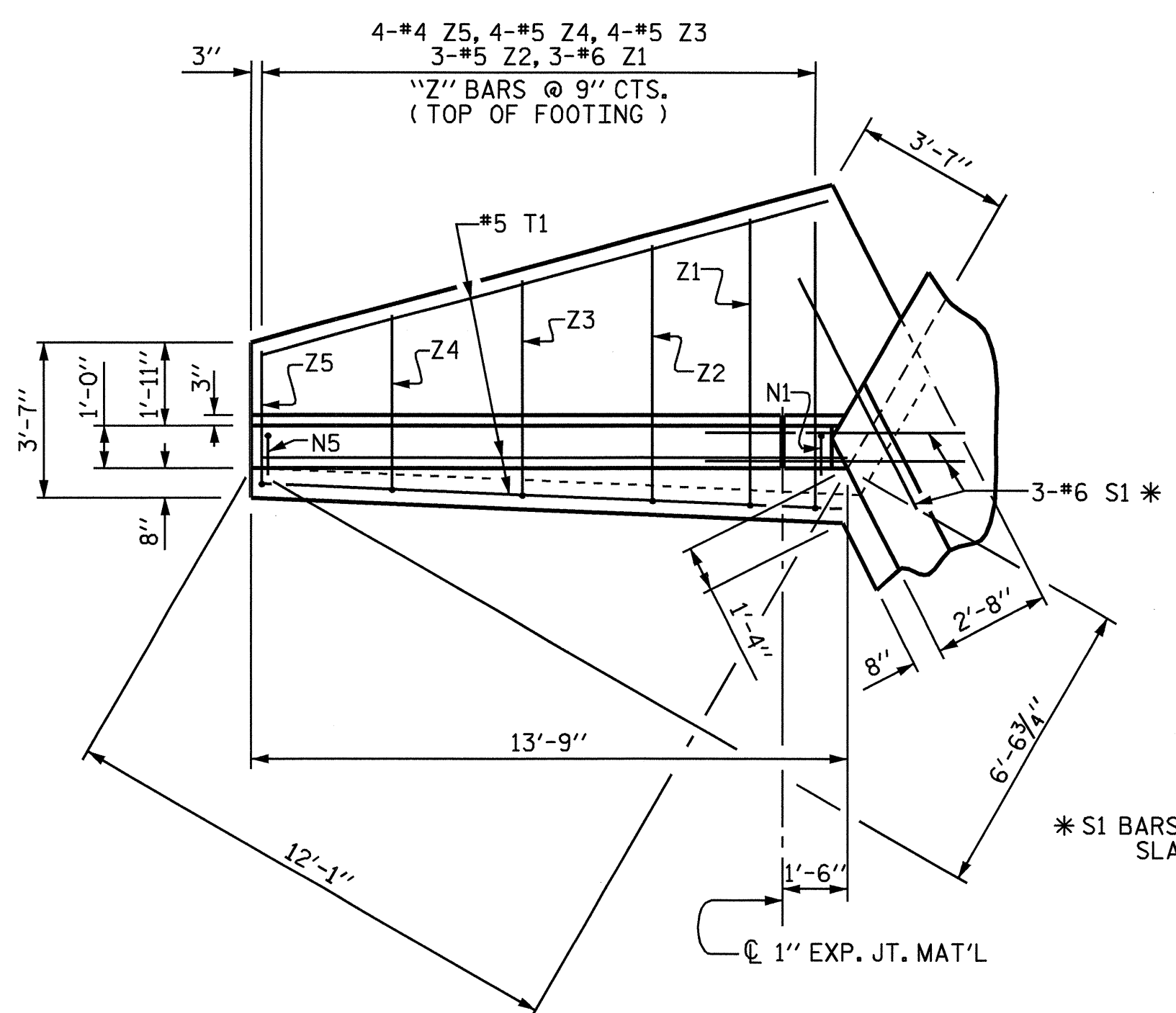
PROJECT NO. U-3447  
 MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-



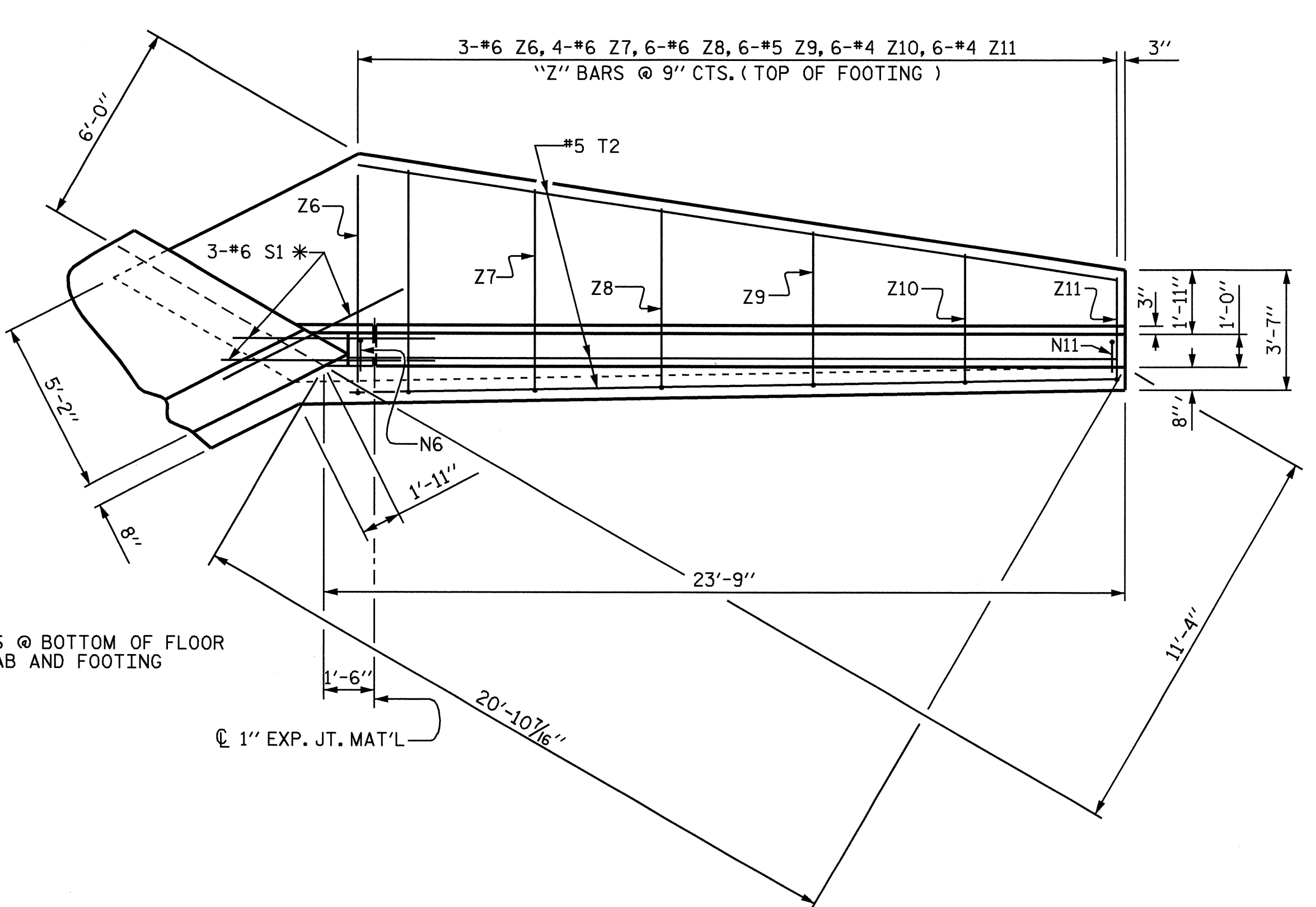
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			11

DRAWN BY : MIKE BRITT DATE : 10-5-05  
 CHECKED BY : T.J. BEACH DATE : 10-18-05

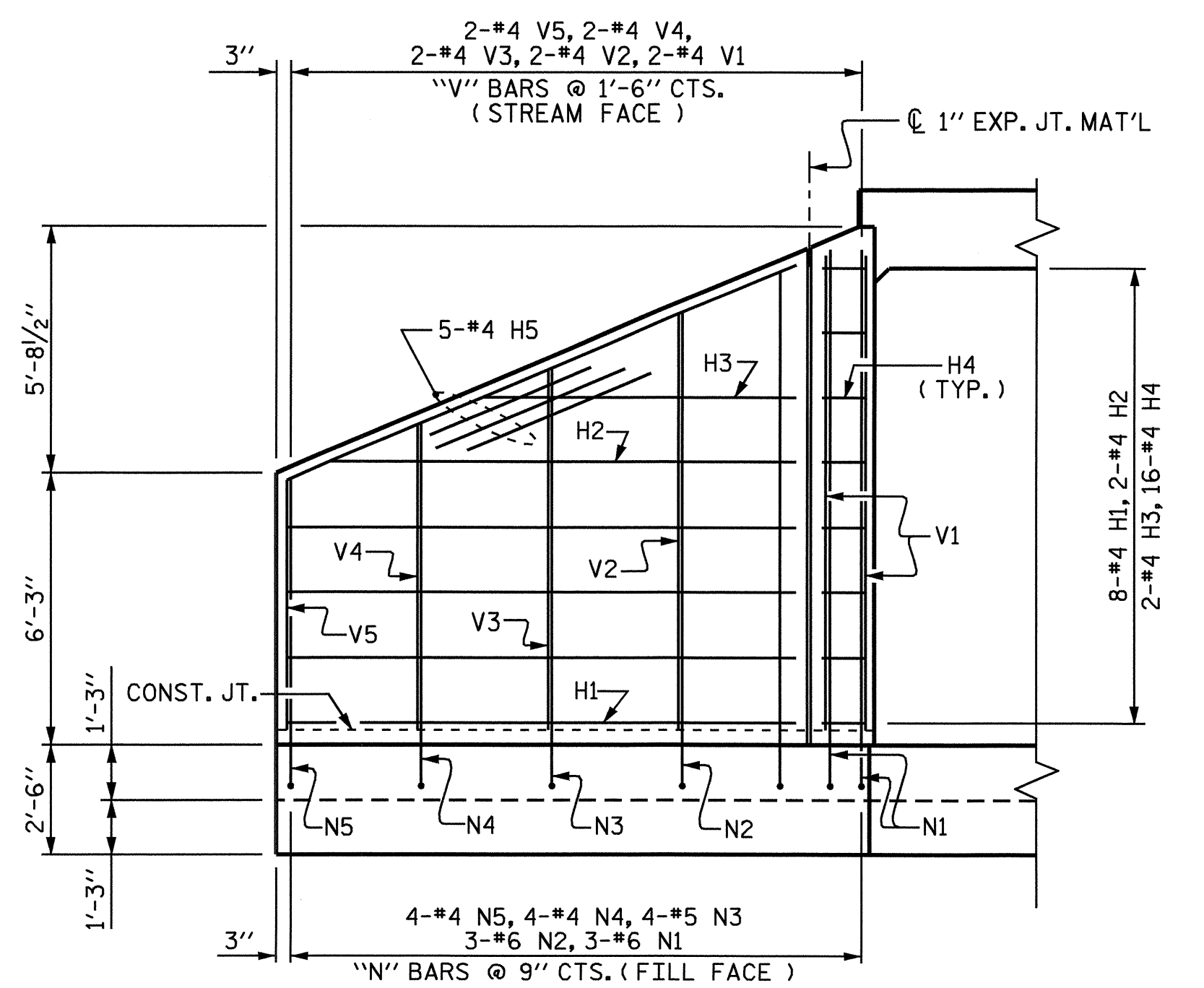




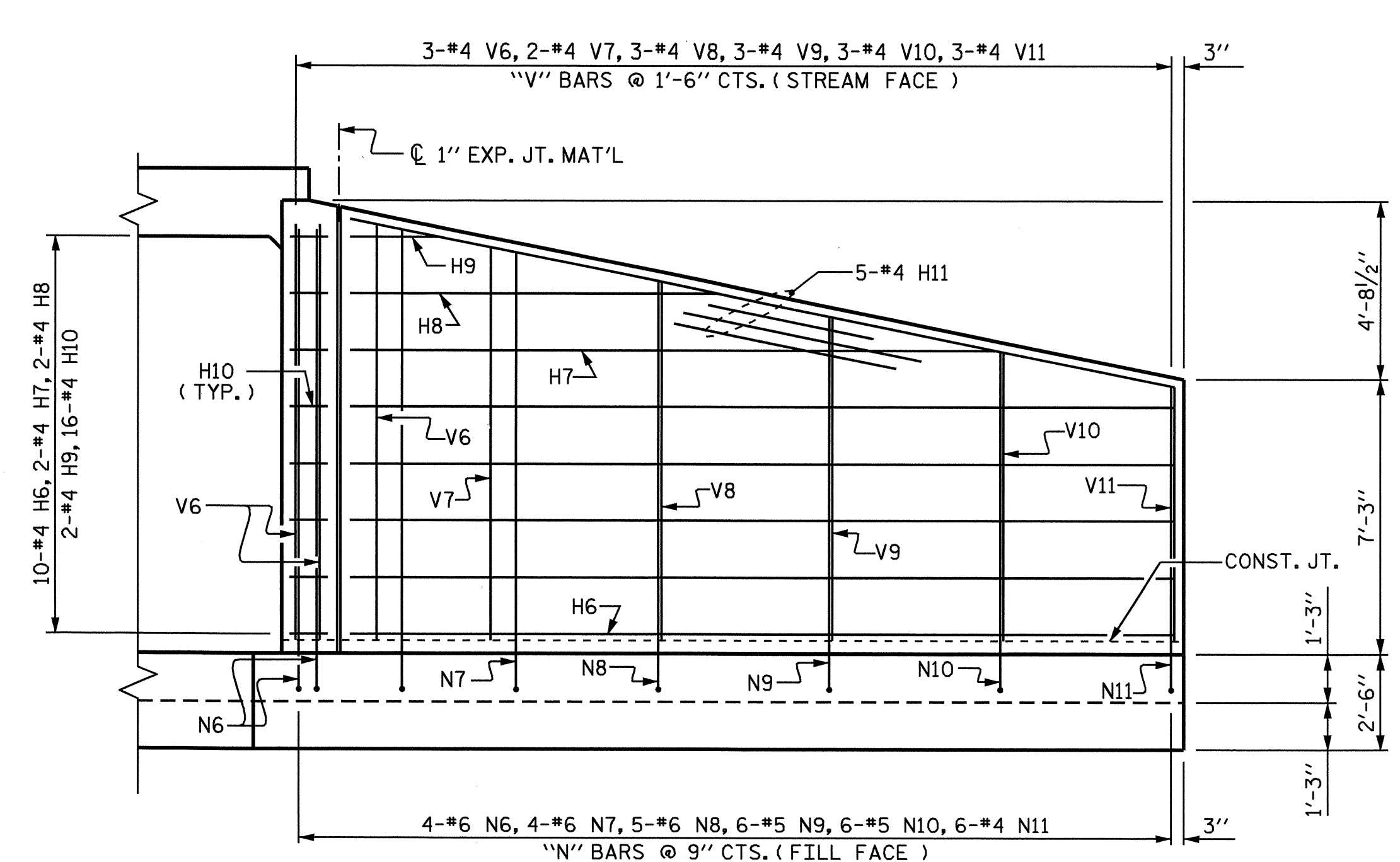
PLAN W4



PLAN W3



ELEVATION W4

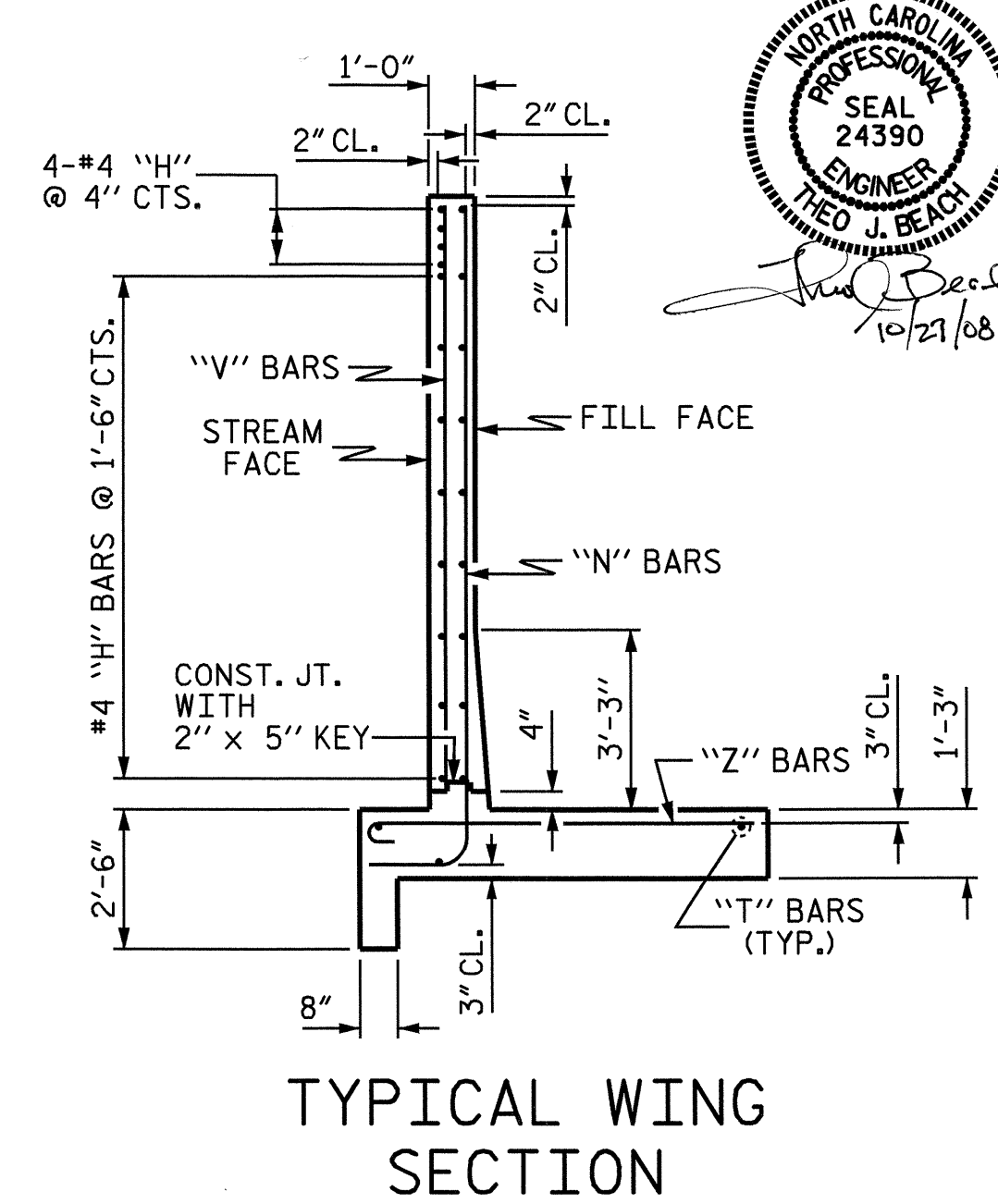


ELEVATION W3

**BAR TYPES**

ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
Z1	#4	STR	6'-8"	8"
Z2	#4	STR	5'-11"	7"
Z3	#4	STR	5'-0"	7"
Z4	#4	STR	4'-1"	7"
Z5	#4	STR	3'-1"	6"
Z6	#4	STR	6'-6"	8"
Z7	#4	STR	6'-2"	8"
Z8	#4	STR	5'-4"	8"
Z9	#4	STR	4'-7"	7"
Z10	#4	STR	3'-10"	6"
Z11	#4	STR	3'-1"	6"
N1	#4	STR	11'-8 1/2"	11"
N2	#4	STR	10'-4 1/2"	10"
N3	#4	STR	9'-0 1/2"	9"
N4	#4	STR	7'-9 9/16"	8"
N5	#4	STR	6'-6 1/2"	7"
N6	#4	STR	11'-8 1/2"	11"
N7	#4	STR	11'-1 1/2"	11"
N8	#4	STR	10'-3 1/2"	10"
N9	#4	STR	9'-4 1/2"	9"
N10	#4	STR	8'-5 1/2"	8"
N11	#4	STR	7'-6 1/2"	7"
S1	#6	STR	6'-0"	54
T1	#5	STR	13'-6"	42
T2	#5	STR	22'-9"	71
V1	#4	STR	10'-11"	15
V2	#4	STR	9'-7"	13
V3	#4	STR	8'-3"	11
V4	#4	STR	7'-0"	9
V5	#4	STR	5'-9"	8
V6	#4	STR	11'-0"	22
V7	#4	STR	10'-4"	14
V8	#4	STR	9'-5"	19
V9	#4	STR	8'-6"	17
V10	#4	STR	7'-7"	15
V11	#4	STR	6'-8"	13
H1	#4	STR	7'-4"	33
H2	#4	STR	6'-6"	20
H3	#4	STR	5'-7"	23
H4	#4	STR	4'-8"	19
H5	#4	STR	3'-7"	10
H6	#4	STR	7'-2"	32
H7	#4	STR	6'-10"	41
H8	#4	STR	6'-0"	54
H9	#4	STR	5'-2"	32
H10	#4	STR	4'-4"	17
H11	#4	STR	3'-7"	14



TYPICAL WING SECTION

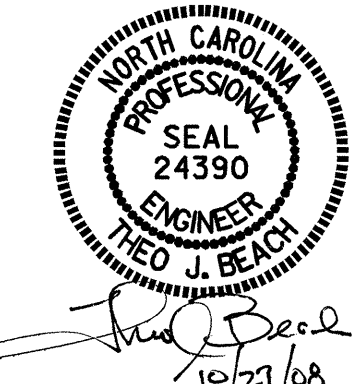
**BILL OF MATERIAL FOR OUTLET WINGS W3 & W4**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	#4	STR	11'-8"	62
H2	#4	STR	11'-0"	15
H3	#4	STR	7'-6"	10
H4	#4	STR	3'-3"	35
H5	#4	STR	12'-8"	42
H6	#4	STR	21'-8"	145
H7	#4	STR	17'-11"	24
H8	#4	STR	10'-6"	14
H9	#4	STR	3'-1"	4
H10	#4	STR	3'-3"	35
H11	#4	STR	21'-9"	73
N1	#6	STR	13'-4"	60
N2	#6	STR	12'-0"	54
N3	#5	STR	10'-8"	45
N4	#4	STR	9'-5"	25
N5	#4	STR	8'-2"	22
N6	#6	STR	13'-4"	80
N7	#6	STR	12'-9"	77
N8	#6	STR	11'-11"	89
N9	#5	STR	11'-0"	69
N10	#5	STR	10'-1"	63
N11	#4	STR	9'-2"	37
S1	#6	STR	6'-0"	54
T1	#5	STR	13'-6"	42
T2	#5	STR	22'-9"	71
V1	#4	STR	10'-11"	15
V2	#4	STR	9'-7"	13
V3	#4	STR	8'-3"	11
V4	#4	STR	7'-0"	9
V5	#4	STR	5'-9"	8
V6	#4	STR	11'-0"	22
V7	#4	STR	10'-4"	14
V8	#4	STR	9'-5"	19
V9	#4	STR	8'-6"	17
V10	#4	STR	7'-7"	15
V11	#4	STR	6'-8"	13
Z1	#4	STR	7'-4"	33
Z2	#4	STR	6'-6"	20
Z3	#4	STR	5'-7"	23
Z4	#4	STR	4'-8"	19
Z5	#4	STR	3'-7"	10
Z6	#4	STR	7'-2"	32
Z7	#4	STR	6'-10"	41
Z8	#4	STR	6'-0"	54
Z9	#4	STR	5'-2"	32
Z10	#4	STR	4'-4"	17
Z11	#4	STR	3'-7"	14

REINFORCING STEEL FOR 2 WINGS 1,698 LBS.

CLASS A CONCRETE

2 WINGS	25.4 CY
2 HEADWALLS	3.5 CY
1 END CURTAIN WALL	1.5 CY
<b>TOTAL</b>	<b>30.4 CY</b>



PROJECT NO. U-3447  
 MECKLENBURG COUNTY  
 STATION: 44+29.00 -L-

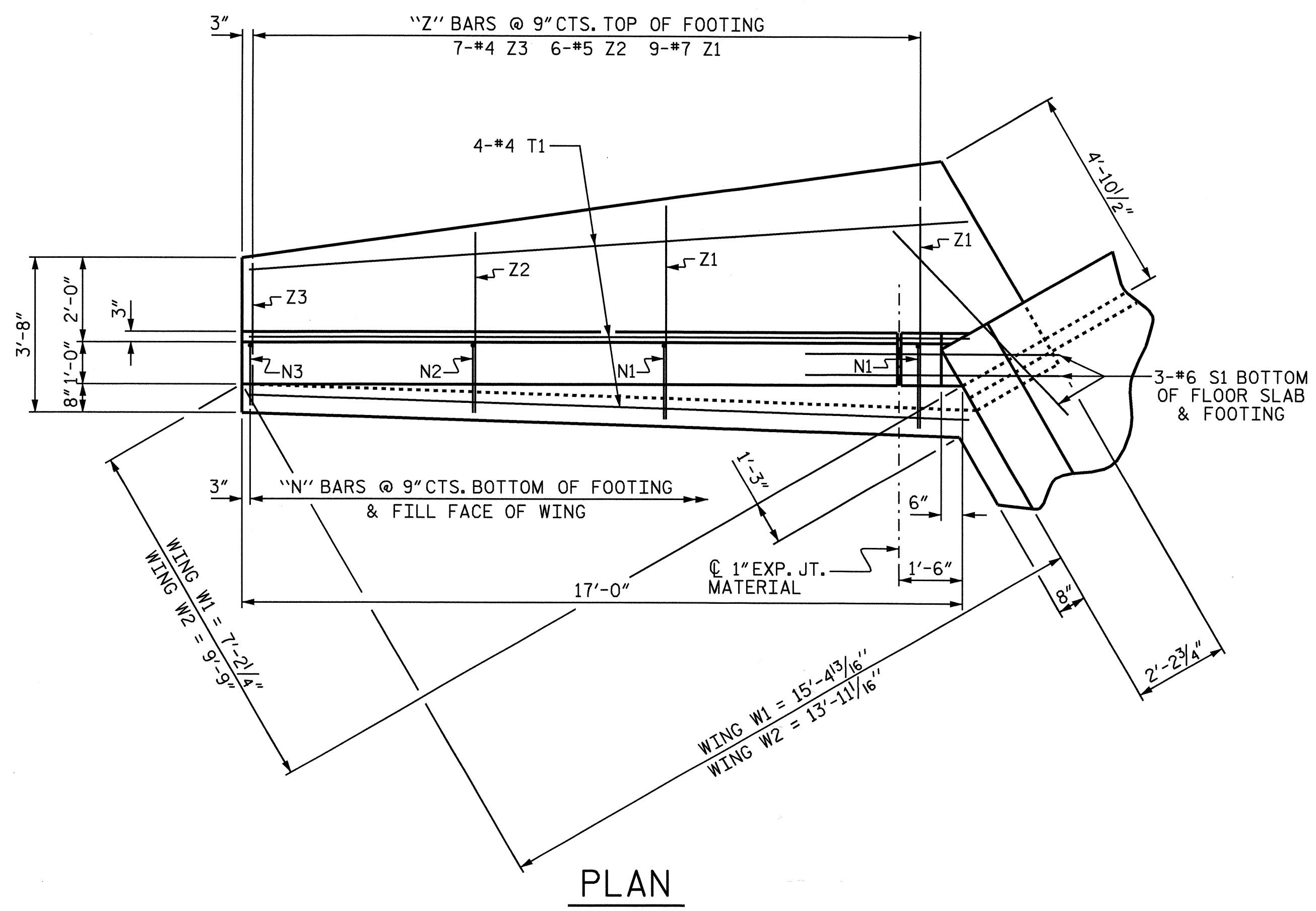
SHEET 10 OF 11

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**OUTLET WINGS FOR CONCRETE BOX CULVERT**  
 H = 11'-0" SLOPE = 2:1  
 57° SKEW

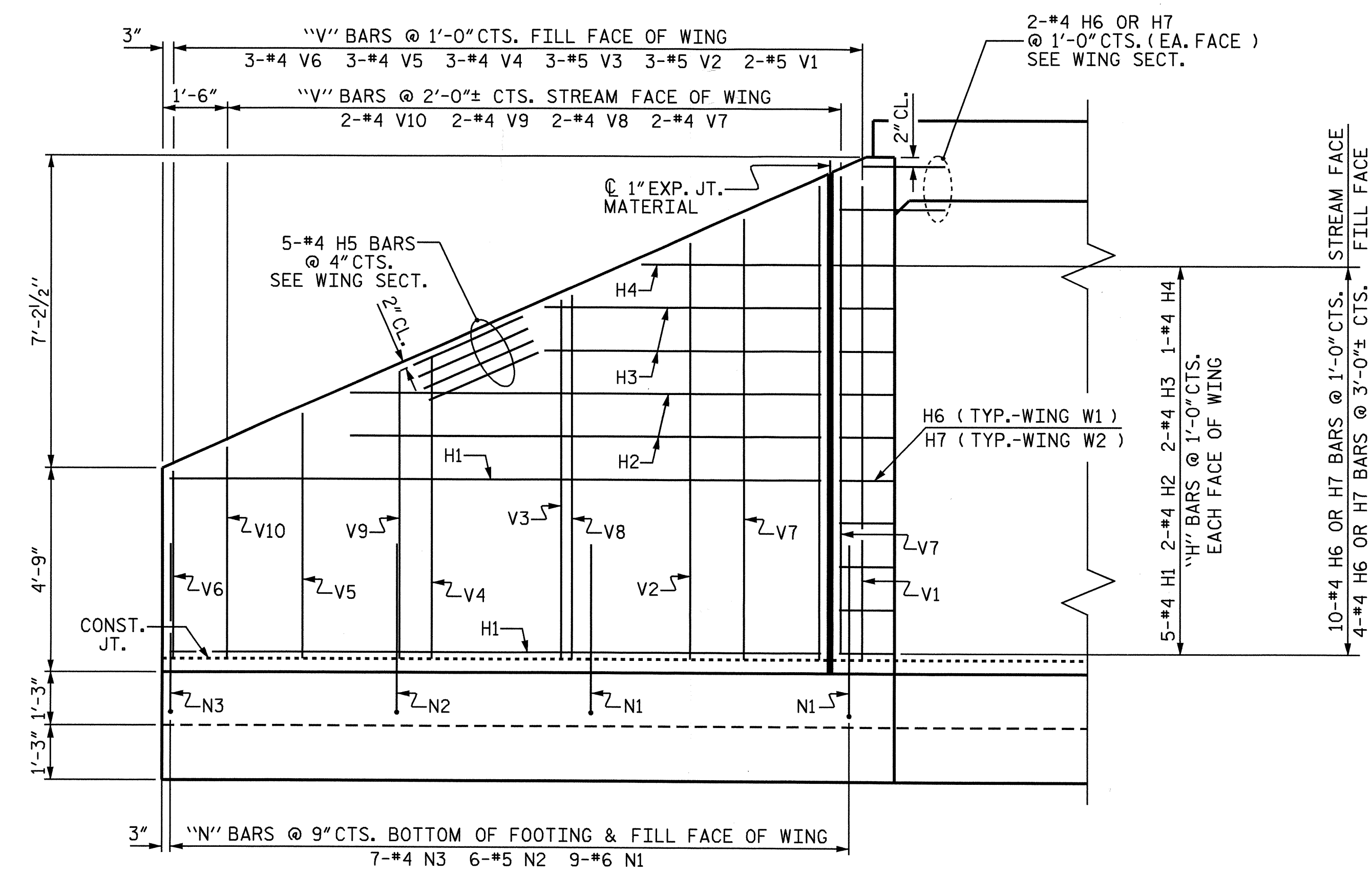
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-10	
1			3			TOTAL SHEETS	
2			4			11	

DRAWN BY: MIKE BRITT DATE: 10-12-05  
 CHECKED BY: T.J. BEACH DATE: 10-18-05

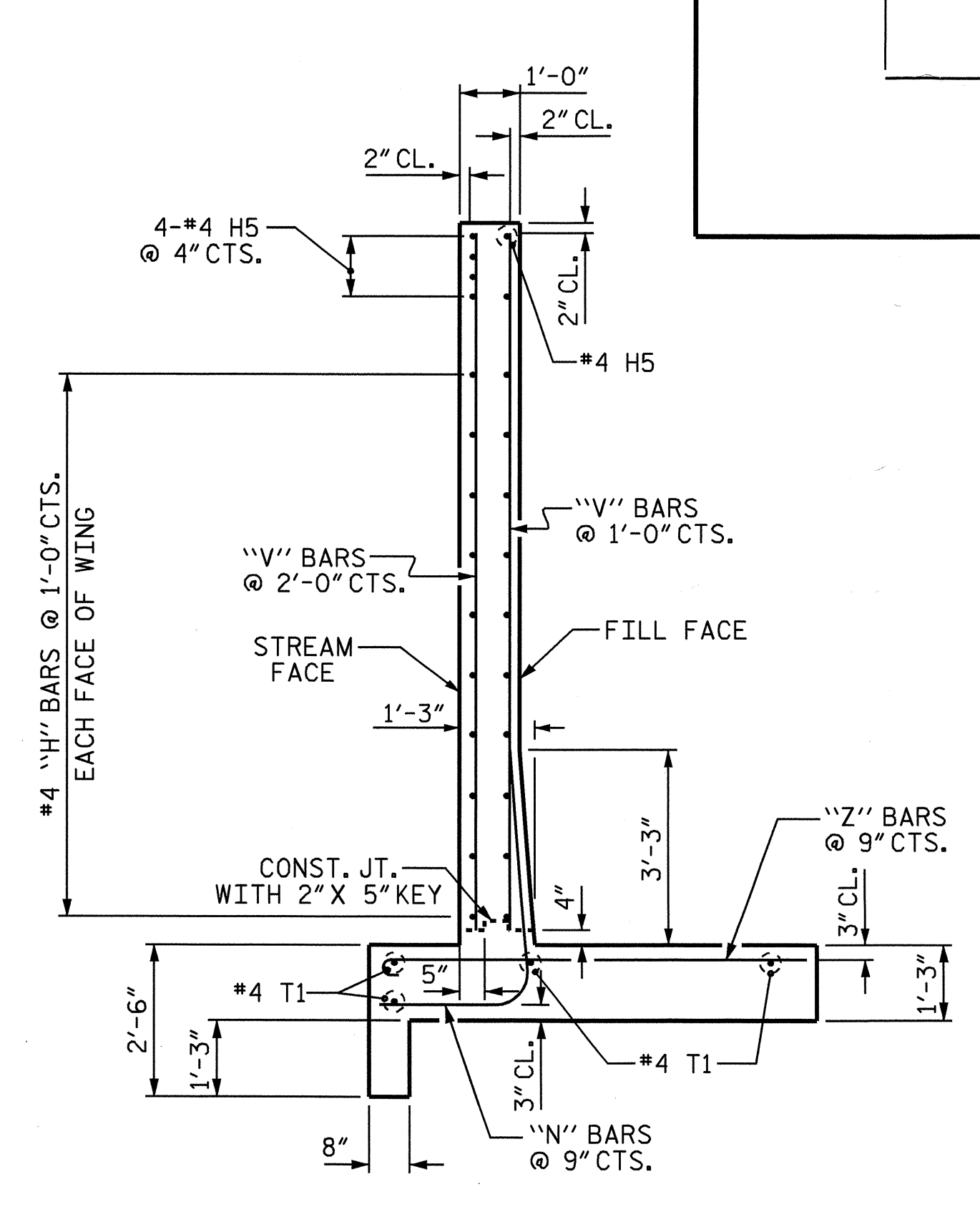




PLAN

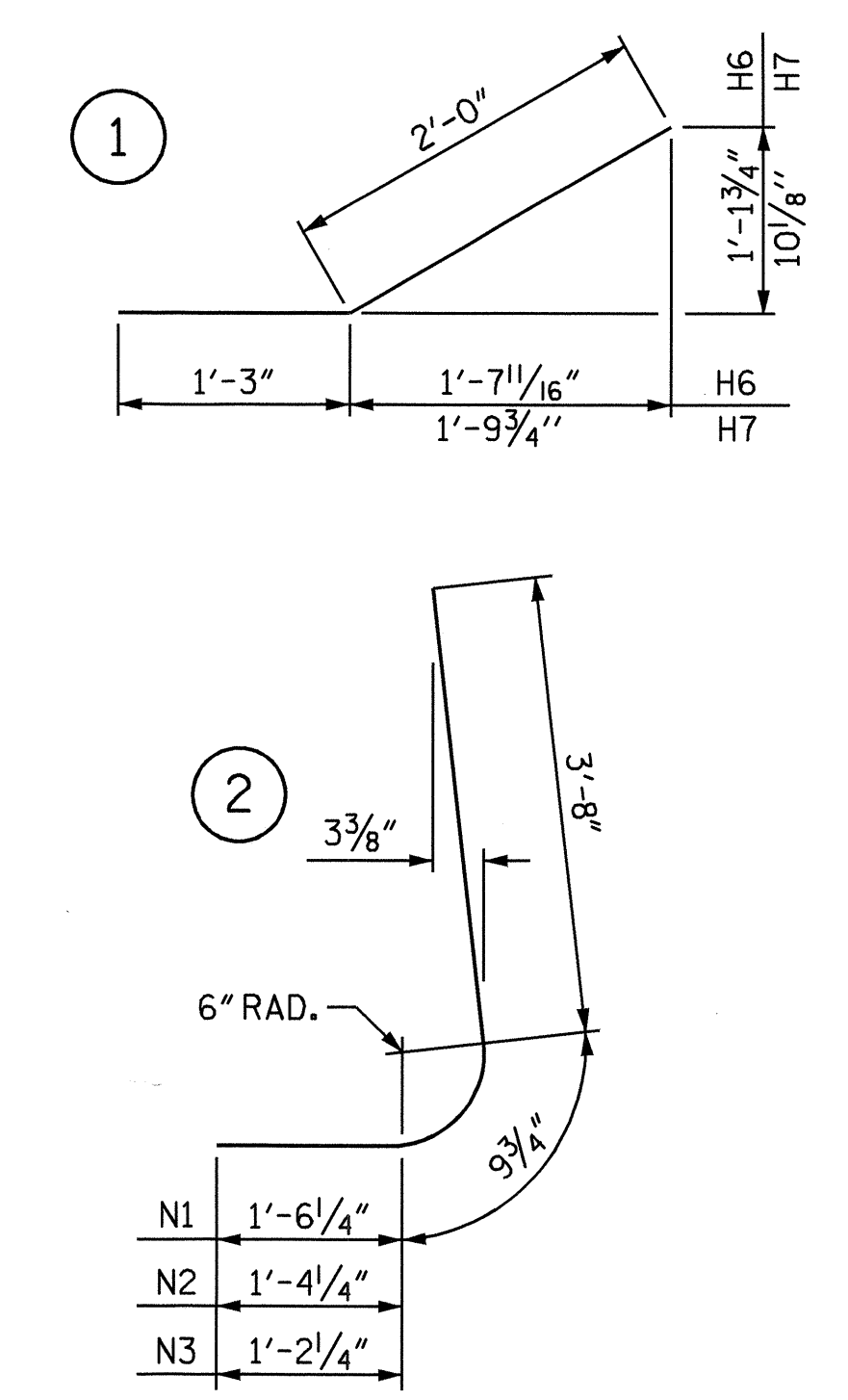


ELEVATION



TYPICAL WING SECTION

BAR TYPES  
ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL  
FOR INLET WINGS W1 & W2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	20	#4	STR	15'-1"	202
H2	8	#4	STR	10'-10"	58
H3	8	#4	STR	6'-4"	34
H4	4	#4	STR	4'-1"	11
H5	10	#4	STR	16'-0"	107
H6	18	#4	1	3'-3"	39
H7	18	#4	1	3'-3"	39
N1	18	#6	2	6'-0"	162
N2	12	#5	2	5'-10"	73
N3	14	#4	2	5'-8"	53
S1	6	#6	STR	6'-0"	54
T1	8	#4	STR	17'-0"	91
V1	4	#5	STR	11'-3"	47
V2	6	#5	STR	9'-4"	58
V3	6	#5	STR	8'-1"	51
V4	6	#4	STR	6'-9"	27
V5	6	#4	STR	5'-5"	22
V6	6	#4	STR	4'-2"	17
V7	4	#4	STR	10'-0"	27
V8	4	#4	STR	8'-3"	22
V9	4	#4	STR	6'-6"	17
V10	4	#4	STR	4'-9"	13
Z1	18	#7	3	5'-10"	215
Z2	12	#5	3	4'-10"	60
Z3	14	#4	3	3'-10"	36

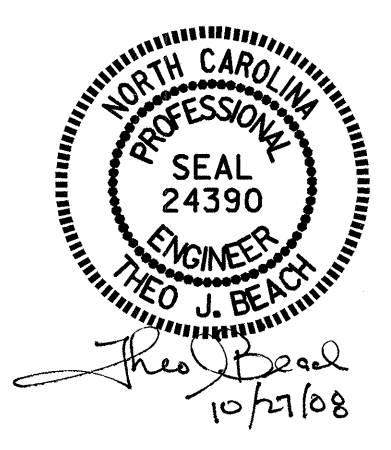
REINFORCING STEEL FOR 2 WINGS 1,535 LBS

CLASS A CONCRETE

2 WINGS	20.4 CY
1 HEADWALL	1.1 CY
1 END CURTAIN WALL	1.3 CY
TOTAL	22.8 CY

DRAWN BY: MIKE BRITT DATE: 10-6-05  
CHECKED BY: T.J. BEACH DATE: 10-18-05

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PROJECT NO. U-3447  
MECKLENBURG COUNTY  
STATION: 44+29.00 -L-

SHEET 11 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

INLET WINGS  
FOR  
CONCRETE BOX CULVERT  
H = 11'-0" SLOPE = 2:1  
95° SKEW

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

TOTAL SHEETS 11

