

ROADWAY DATA

GRADE POINT ELEV. @ STA. 46+10.00 -L- = 147.323
 BED ELEV. @ STA. 46+10.0 -L- = 128.940
 ROADWAY SLOPES = 2:1

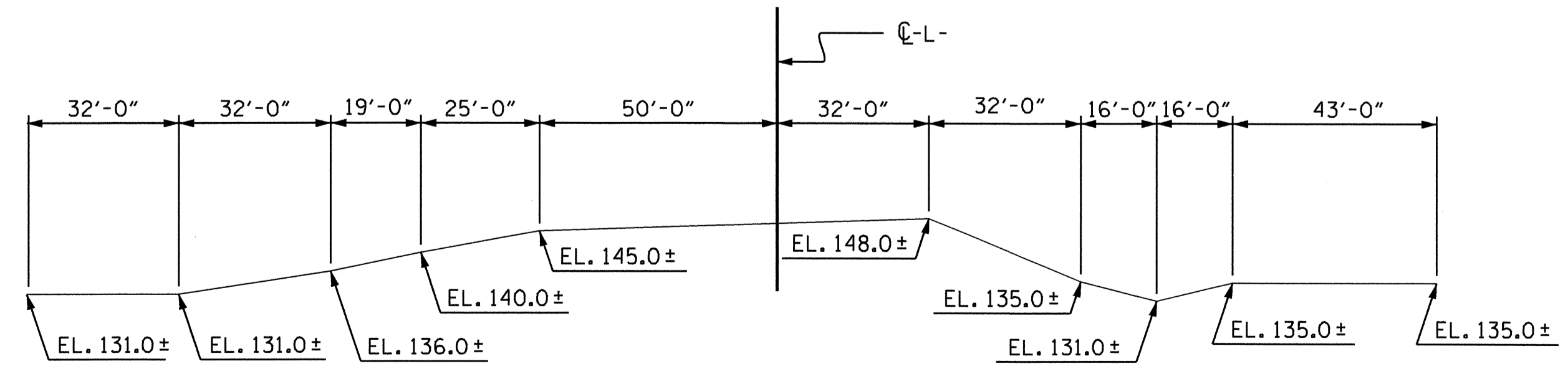
OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE 950 CFS
 FREQUENCY OF OVERTOPPING FLOOD 500 YRS+
 OVERTOPPING FLOOD ELEVATION EL. 149.900

HYDRAULIC DATA

DESIGN DISCHARGE 450 CFS
 FREQUENCY OF DESIGN FLOOD 50 YRS
 DESIGN HIGH WATER ELEVATION EL. 139.050
 DRAINAGE AREA 0.72 SQ. MILES
 BASIC DISCHARGE (Q100) 520 CFS
 BASIC HIGH WATER ELEVATION EL. 140.100

LOCATION SKETCH



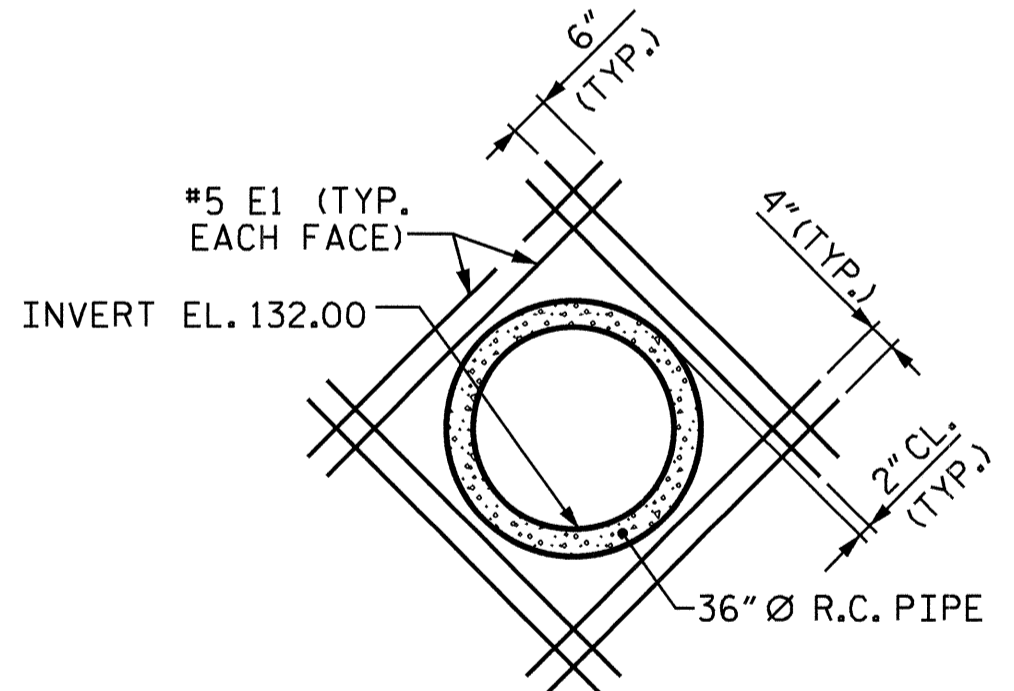
PROFILE ALONG CULVERT

DRAWN BY : B. GREEN (SHS) DATE : JUN. 2005
 CHECKED BY : D.A. DAVENPORT DATE : 01/09

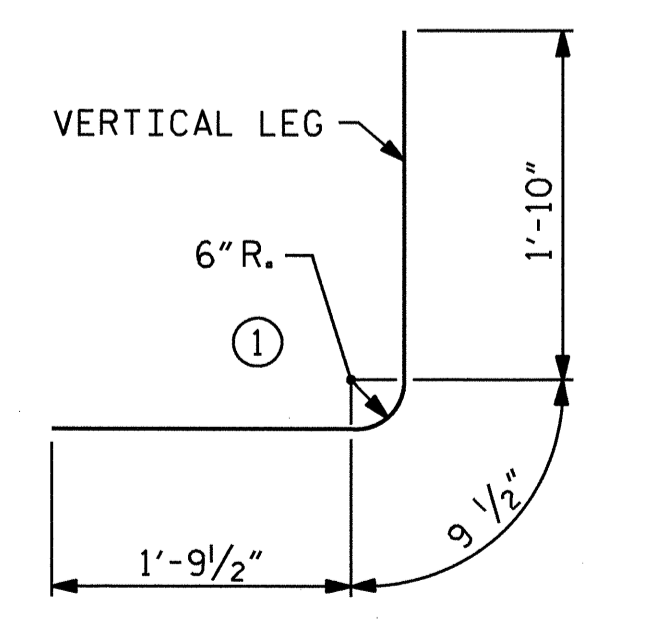
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TOTAL STRUCTURE QUANTITIES

STAGE I- CLASS A CONCRETE	
BARREL @ 0.874 CY/FT	121.7 C.Y.
2 WINGS ETC.	17.4 C.Y.
SUB TOTAL	139.1 C.Y.
STAGE I- REINFORCING STEEL	
BARREL	18408 LBS.
WINGS ETC.	977 LBS.
SUB TOTAL	19385 LBS.
STAGE II- CLASS A CONCRETE	
BARREL @ 0.874 CY/FT	123.2 C.Y.
2 WINGS ETC.	17.5 C.Y.
SUB TOTAL	140.7 C.Y.
STAGE II- REINFORCING STEEL	
BARREL	18533 LBS.
WINGS ETC.	938 LBS.
SUB TOTAL	19471 LBS.
STAGE III- CLASS A CONCRETE	
BARREL @ 0.874 CY/FT	14.6 C.Y.
STAGE III- REINFORCING STEEL	
BARREL	2506 LBS.
TOTAL CLASS A CONCRETE	
	294.4 C.Y.
TOTAL REINFORCING STEEL	
	41362 LBS.
CULVERT EXCAVATION	
	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	
STAGE I	79 TONS
STAGE II	79 TONS
STAGE III	10 TONS
TOTAL	168 TONS



DETAIL OF REINFORCING AROUND 36" Ø PIPE



BAR TYPE
 DIMENSIONS ARE OUT TO OUT

NOTES

ASSUMED LIVE LOAD ----- HS20-44 OR ALTERNATE LOADING.
 DESIGN FILL----- 12.25'
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 CONCRETE IN CULVERT STAGES TO BE POURED IN THE FOLLOWING ORDER:
 STAGE I-
 1. WING 1 AND WING 3 PART A FOOTING; FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS, WING 1 AND WING 3 PART A FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL.
 3. WING 3 PART B.
 STAGE II-
 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 HEADWALL.
 STAGE III-
 1. FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS FOLLOWED BY ROOF SLAB.
 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 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.
 NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
 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.
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE "EROSION CONTROL PLANS."
 THE 36" Ø PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.
 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 LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC SEE ROADWAY PLANS.
 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 60" CMP SHALL BE REMOVED IN STAGES. SEE EROSION CONTROL PLANS FOR CONSTRUCTION SEQUENCE.

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
B1	#4	1'-9"
C1	#4	1'-11"
C2	#4	1'-11"
C3	#4	1'-11"

PROJECT NO. U-3849
 CUMBERLAND COUNTY
 STATION: 46+10.00-L-

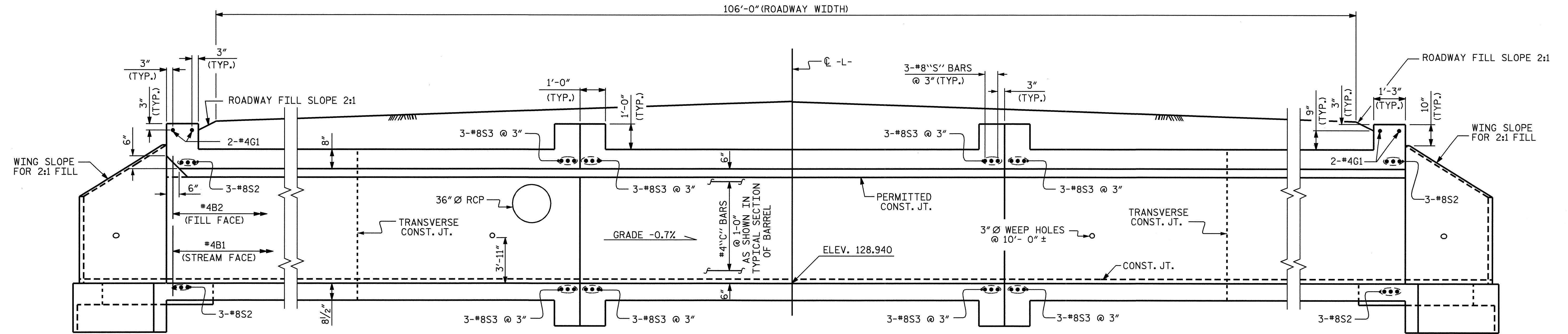
SHEET 1 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

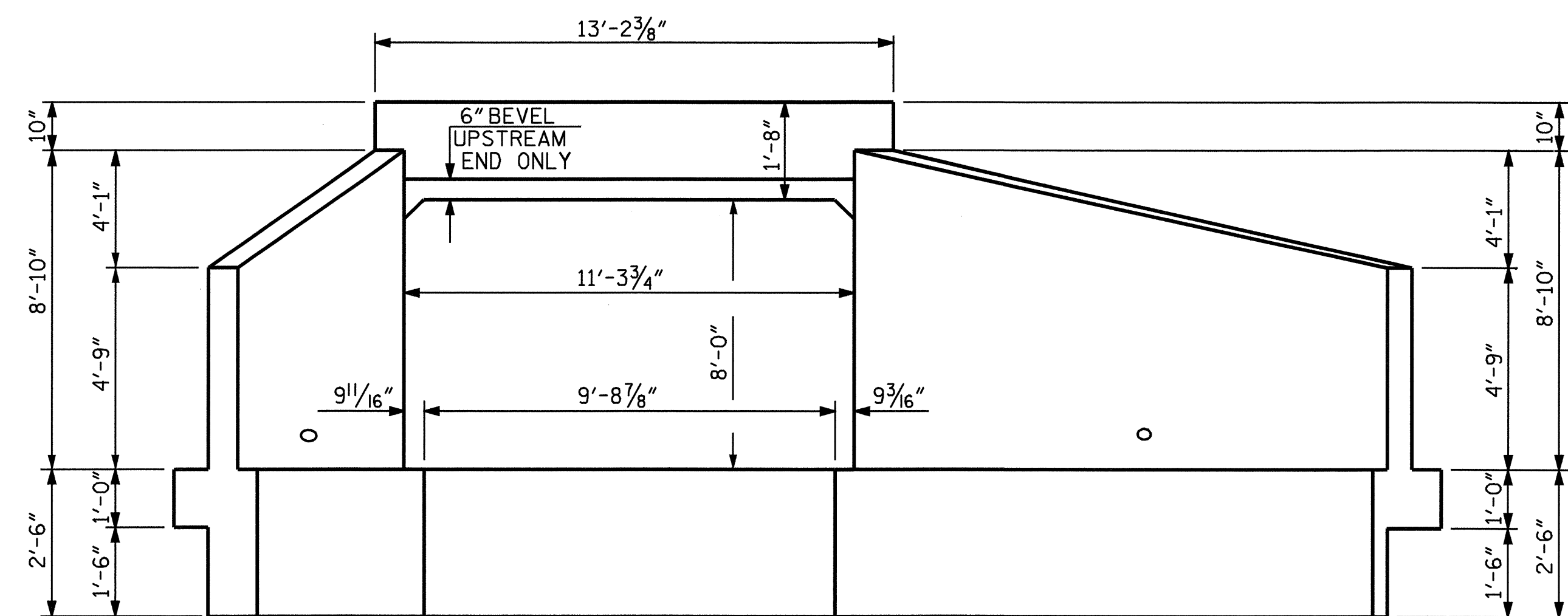
SINGLE 8 FT. X 8 FT.
 CONCRETE BOX CULVERT

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

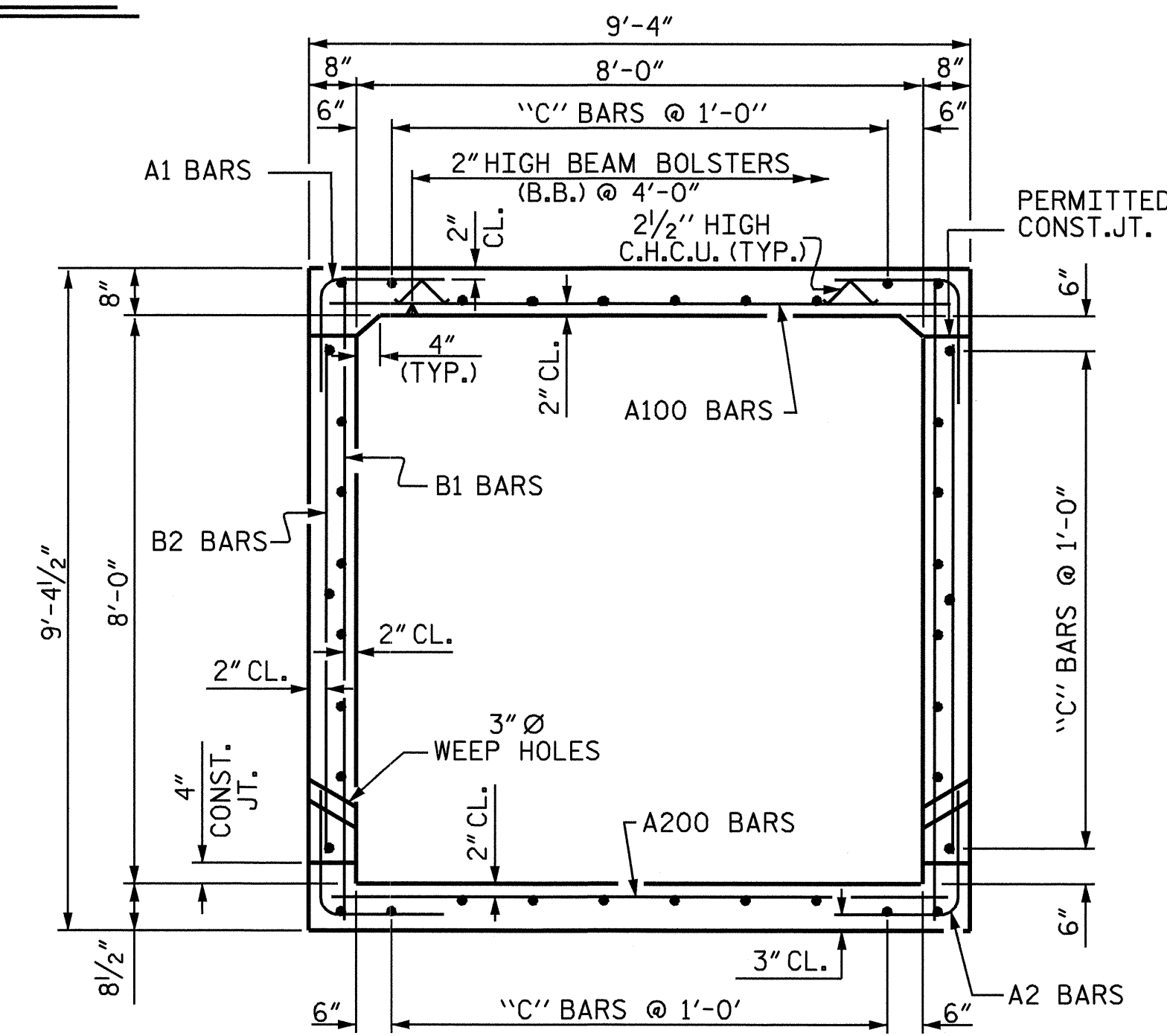
Professional Engineer Seal for D. A. Davenport, License No. 10730, State of North Carolina. The seal is circular and contains the text 'NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 10730 D. A. DAVENPORT'.



CULVERT SECTION NORMAL TO ROADWAY

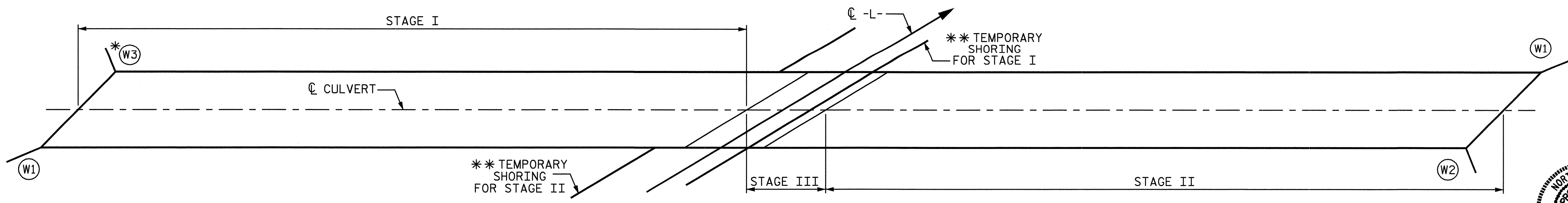


END ELEVATION NORMAL TO SKEW



RIGHT ANGLE SECTION OF BARREL

THERE ARE 38 "C" BARS IN SECTION OF BARREL

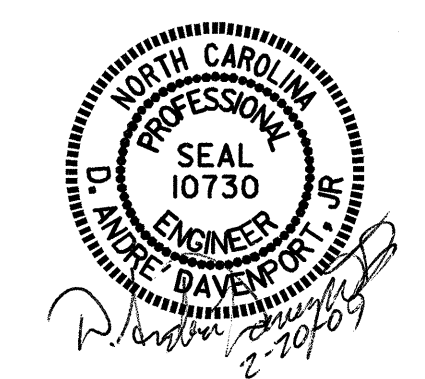


CONSTRUCTION SEQUENCE

* SEE STAGING NOTES FOR CONSTRUCTION SEQUENCE
 ** TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC (SEE NOTES)

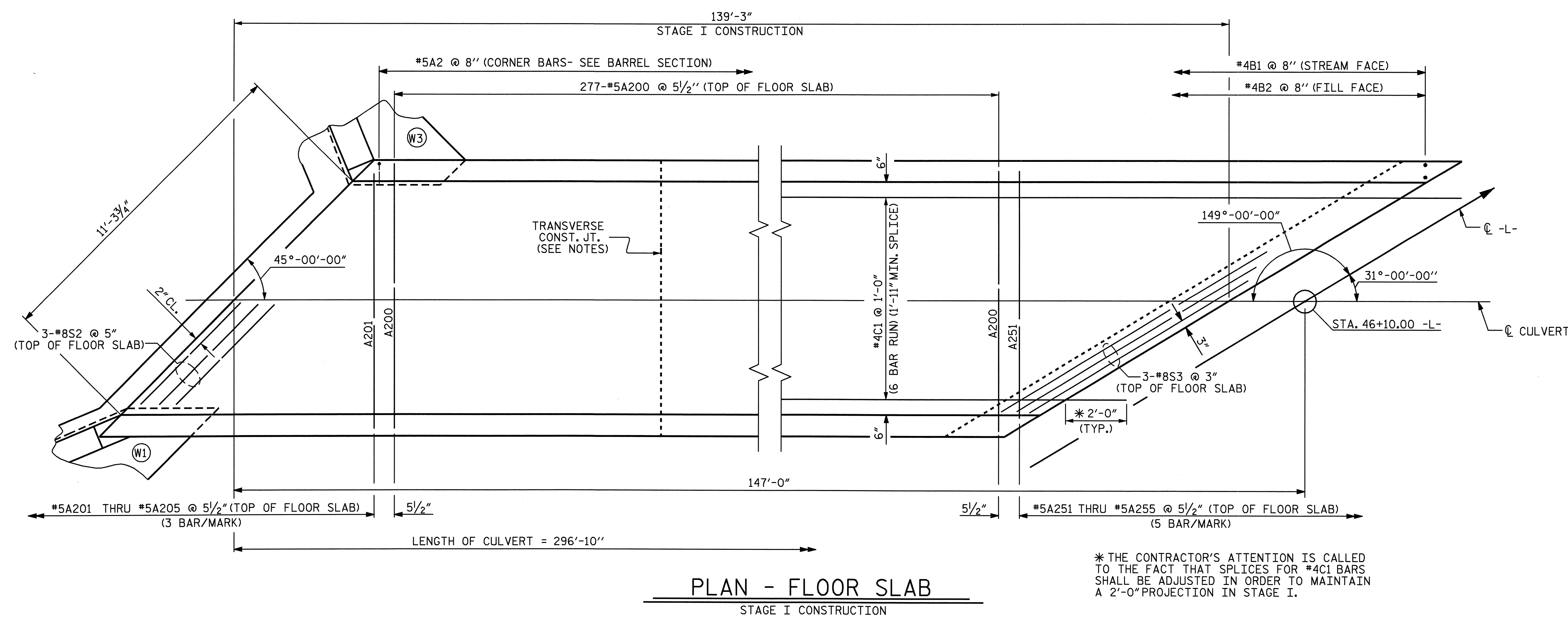
PROJECT NO. U-3849
CUMBERLAND COUNTY
 STATION: 46+10.00-L-
 SHEET 2 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SINGLE 8 FT. X 8 FT. CONCRETE BOX CULVERT 45° SKEW						C-2
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	7
1			3			
2			4			



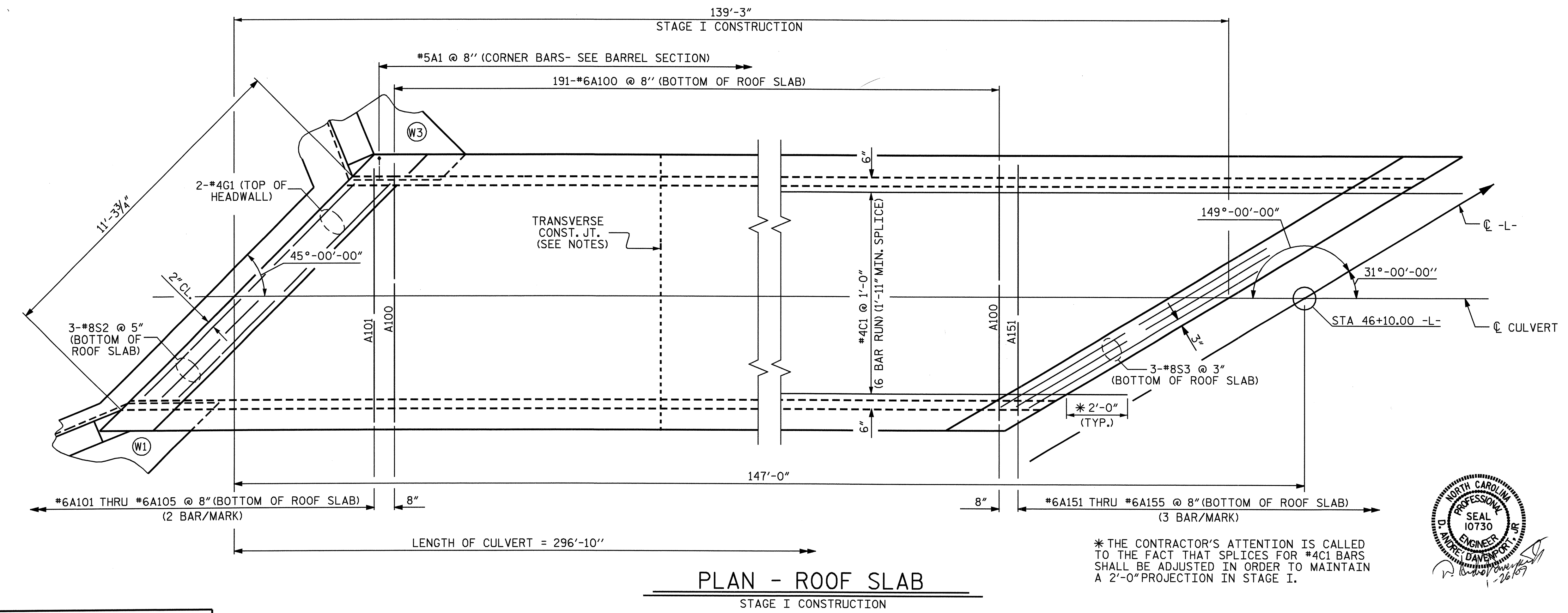
REVISED 8-28-92 BY E.L.R. CHECKED BY G.R.P.
 REVISED 8-22-89 BY A.R.B. CHECKED BY C.R.K.
 REDRAWN 8-22-89
 REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.

ASSEMBLED BY: BRANDON L. GREEN DATE: JUN. 2005
 CHECKED BY: D.A. DAVENPORT DATE: 01/09



PLAN - FLOOR SLAB
 STAGE I CONSTRUCTION

* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT SPLICES FOR #4C1 BARS SHALL BE ADJUSTED IN ORDER TO MAINTAIN A 2'-0" PROJECTION IN STAGE I.



PLAN - ROOF SLAB
 STAGE I CONSTRUCTION

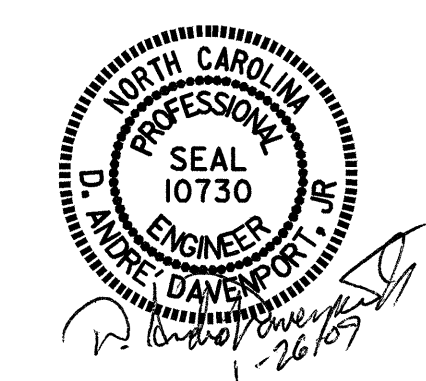
* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT SPLICES FOR #4C1 BARS SHALL BE ADJUSTED IN ORDER TO MAINTAIN A 2'-0" PROJECTION IN STAGE I.

BILL OF MATERIAL

STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	418	#5	1	4'-5"	1926
A2	418	#5	1	4'-5"	1926
A100	191	#6	STR	8'-11"	2558
A101	2	#6	STR	7'-6"	23
A102	2	#6	STR	6'-2"	19
A103	2	#6	STR	4'-10"	15
A104	2	#6	STR	3'-6"	11
A105	2	#6	STR	2'-2"	7
A151	3	#6	STR	7'-8"	35
A152	3	#6	STR	6'-6"	29
A153	3	#6	STR	5'-3"	24
A154	3	#6	STR	4'-1"	18
A155	3	#6	STR	2'-11"	13
A200	277	#5	STR	8'-11"	2576
A201	3	#5	STR	7'-6"	23
A202	3	#5	STR	6'-1"	19
A203	3	#5	STR	4'-9"	15
A204	3	#5	STR	3'-4"	10
A205	3	#5	STR	2'-0"	6
A251	5	#5	STR	7'-6"	39
A252	5	#5	STR	6'-2"	32
A253	5	#5	STR	4'-9"	25
A254	5	#5	STR	3'-5"	18
A255	5	#5	STR	2'-0"	10
B1	418	#4	STR	8'-10"	2466
B2	418	#4	STR	7'-4"	2048
C1	228	#4	STR	25'-9"	3922
E1	16	#5	STR	5'-9"	96
G1	2	#4	STR	12'-8"	17
S2	6	#8	STR	12'-8"	203
S3	6	#8	STR	17'-5"	279
REINFORCING STEEL					= 18408 LBS

PROJECT NO. U-3849
CUMBERLAND COUNTY
 STATION: 46+10.00-L-
 SHEET 3 OF 7

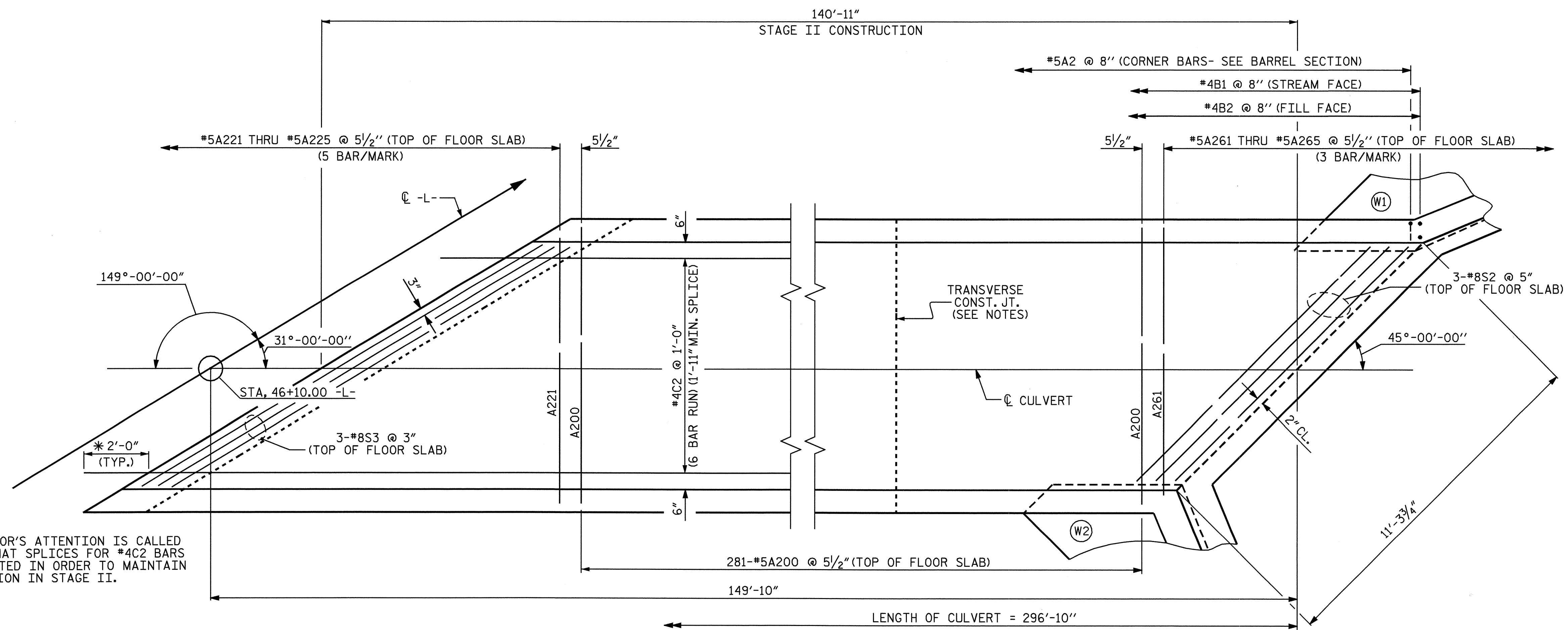
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 8 FT. X 8 FT.
 CONCRETE BOX CULVERT
 45° SKEW



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

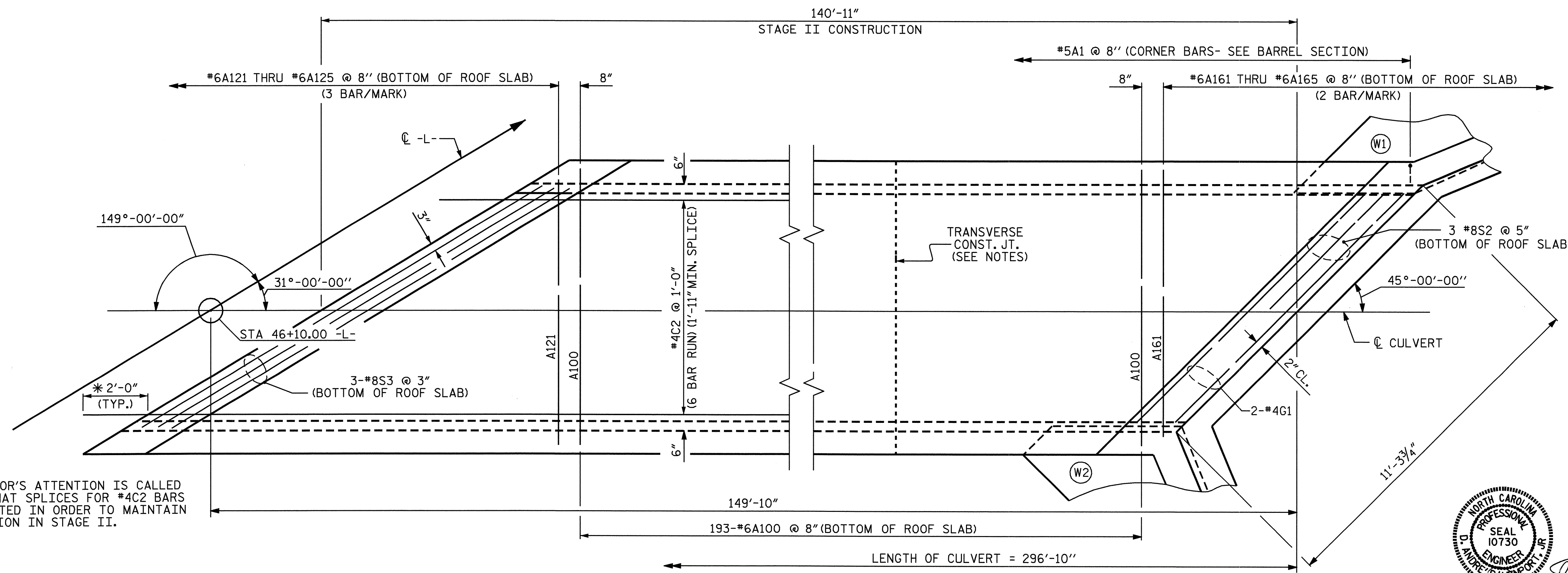
REVISED 8-28-92 BY E.L.R. CHECKED BY C.R.P.
 REVISED 8-22-89 BY A.R.B. CHECKED BY C.R.K.
 REDRAWN 8-22-89
 REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.

ASSEMBLED BY : BRANDON L. GREEN DATE : JUN. 2005
 CHECKED BY : D.A. DAVENPORT DATE : 01/09



PLAN - FLOOR SLAB
 STAGE II CONSTRUCTION

* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT SPLICES FOR *4C2 BARS SHALL BE ADJUSTED IN ORDER TO MAINTAIN A 2'-0" PROJECTION IN STAGE II.



PLAN - ROOF SLAB
 STAGE II CONSTRUCTION

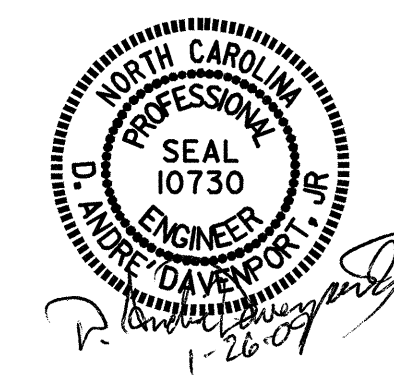
* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT SPLICES FOR *4C2 BARS SHALL BE ADJUSTED IN ORDER TO MAINTAIN A 2'-0" PROJECTION IN STAGE II.

BILL OF MATERIAL					
STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	424	#5	1	4'-5"	1953
A2	424	#5	1	4'-5"	1953
A100	193	#6	STR	8'-11"	2585
A121	3	#6	STR	7'-8"	35
A122	3	#6	STR	6'-6"	29
A123	3	#6	STR	5'-3"	24
A124	3	#6	STR	4'-1"	18
A125	3	#6	STR	2'-11"	13
A161	2	#6	STR	7'-6"	23
A162	2	#6	STR	6'-2"	19
A163	2	#6	STR	4'-10"	15
A164	2	#6	STR	3'-6"	11
A165	2	#6	STR	2'-2"	7
A200	281	#5	STR	8'-11"	2613
A221	5	#5	STR	7'-6"	39
A222	5	#5	STR	6'-2"	32
A223	5	#5	STR	4'-9"	25
A224	5	#5	STR	3'-5"	18
A225	5	#5	STR	2'-0"	10
A261	3	#5	STR	7'-6"	23
A262	3	#5	STR	6'-1"	19
A263	3	#5	STR	4'-9"	15
A264	3	#5	STR	3'-4"	10
A265	3	#5	STR	2'-0"	6
B1	424	#4	STR	8'-10"	2502
B2	424	#4	STR	7'-4"	2077
C2	228	#4	STR	26'-0"	3960
G1	2	#4	STR	12'-8"	17
S2	6	#8	STR	12'-8"	203
S3	6	#8	STR	17'-5"	279
REINFORCING STEEL					= 18533 LBS

PROJECT NO. U-3849
CUMBERLAND COUNTY
 STATION: 46+10.00-L-
 SHEET 4 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE 8 FT. X 8 FT.
 CONCRETE BOX CULVERT
 45° SKEW

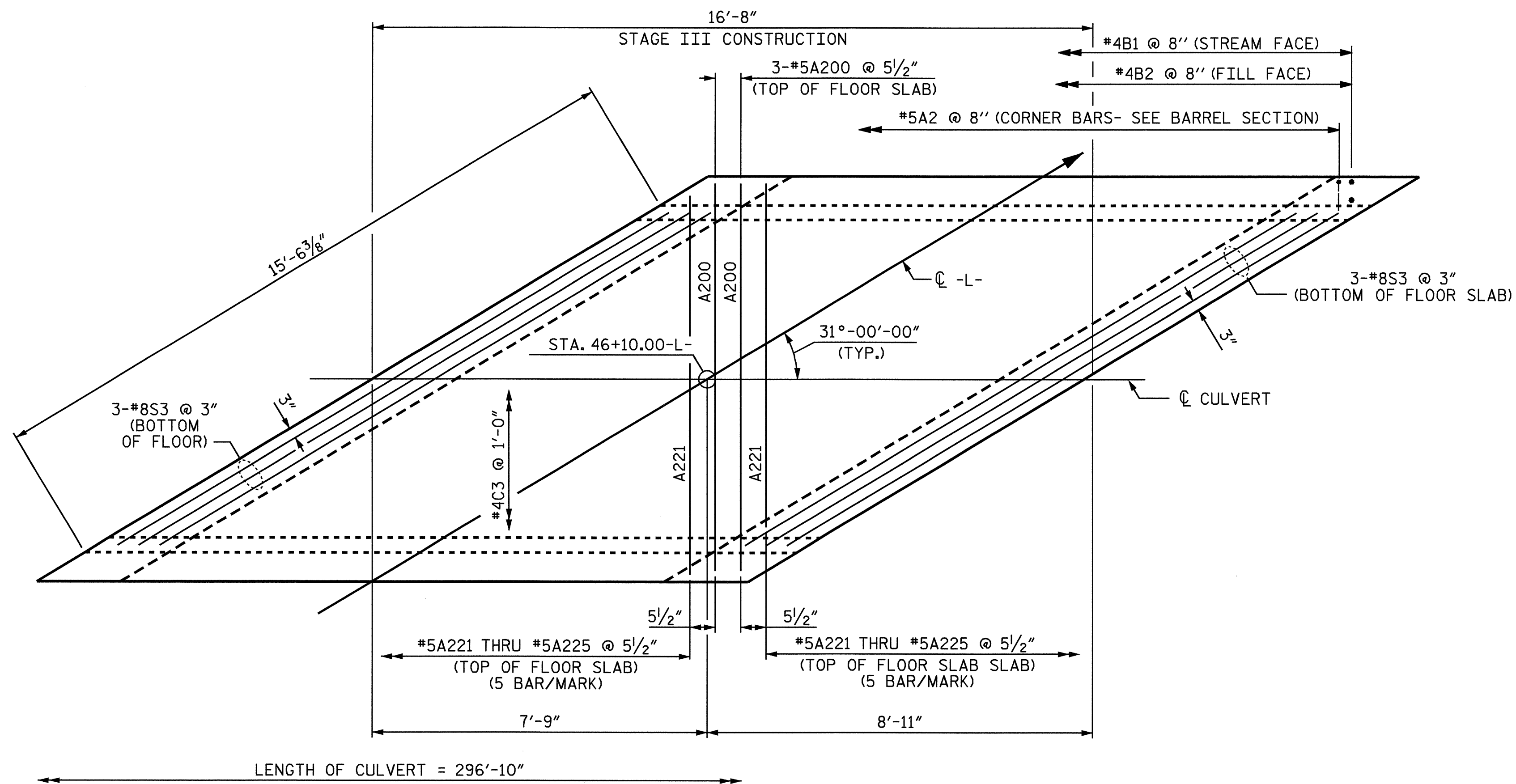


REVISED 6-28-92 BY E.L.R. CHECKED BY G.R.P.
 REVISED 6-22-89 BY A.R.B. CHECKED BY C.R.K.
 REDRAWN 8-22-89
 REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.

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

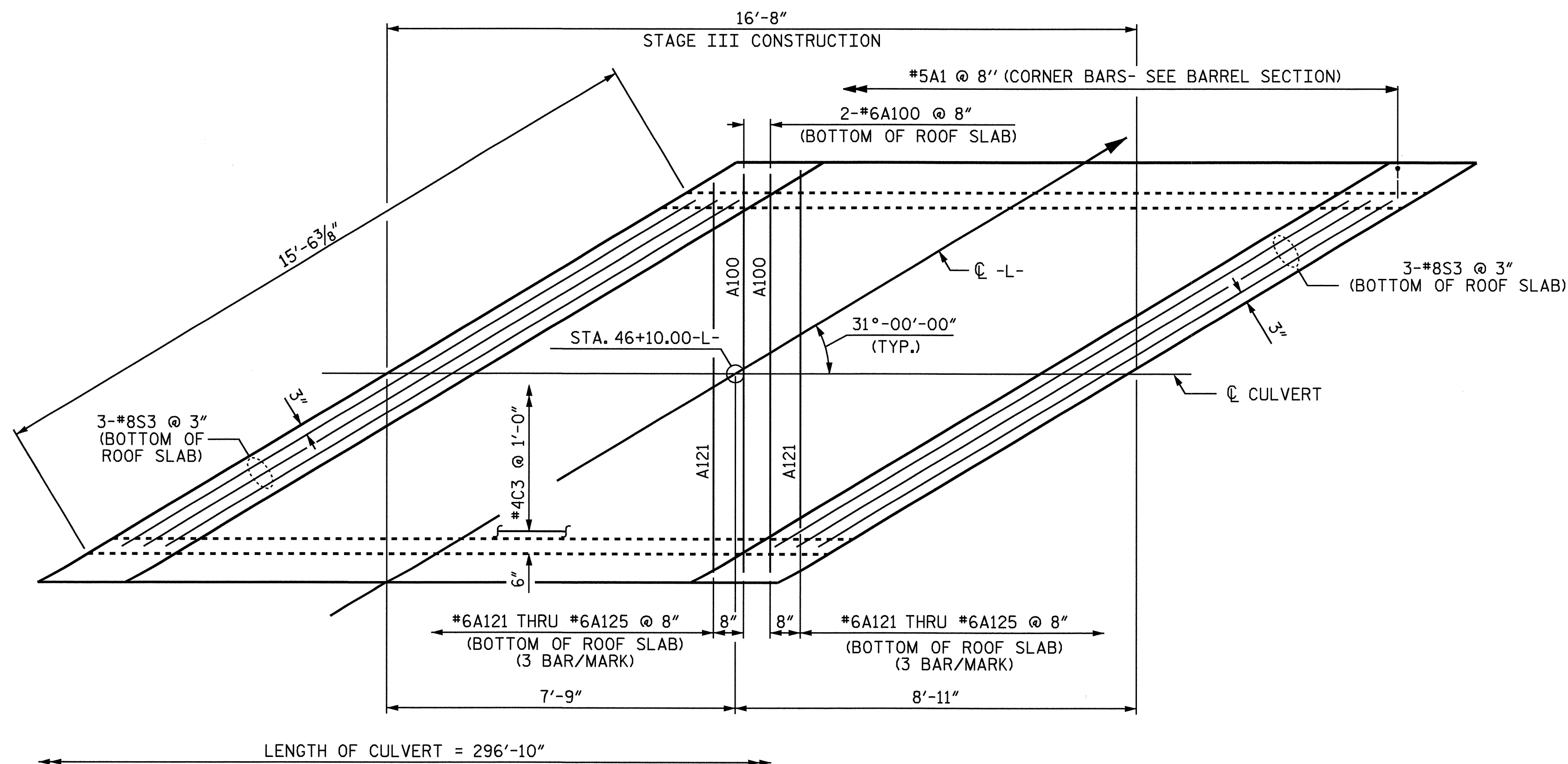
BILL OF MATERIAL

STAGE III					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	50	#5	1	4'-5"	230
A2	50	#5	1	4'-5"	230
A100	2	#6	STR	8'-11"	27
A121	6	#6	STR	7'-8"	69
A122	6	#6	STR	6'-6"	59
A123	6	#6	STR	5'-3"	47
A124	6	#6	STR	4'-1"	37
A125	6	#6	STR	2'-11"	26
A200	3	#5	STR	8'-11"	28
A221	10	#5	STR	7'-6"	78
A222	10	#5	STR	6'-2"	64
A223	10	#5	STR	4'-9"	50
A224	10	#5	STR	3'-5"	36
A225	10	#5	STR	2'-0"	21
B1	50	#4	STR	8'-10"	295
B2	50	#4	STR	7'-4"	245
C3	38	#4	STR	16'-0"	406
S3	12	#8	STR	17'-5"	558
REINFORCING STEEL					= 2506 LBS



PLAN - FLOOR SLAB

STAGE III CONSTRUCTION



PLAN - ROOF SLAB

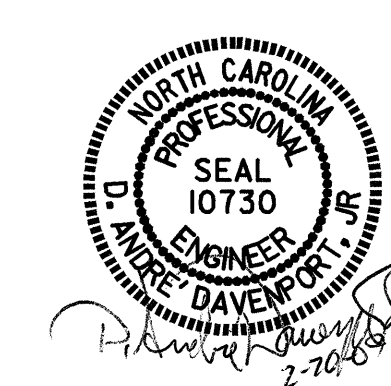
STAGE III CONSTRUCTION

PROJECT NO. U-3849
CUMBERLAND COUNTY
 STATION: 46+10.00-L-

SHEET 5 OF 7

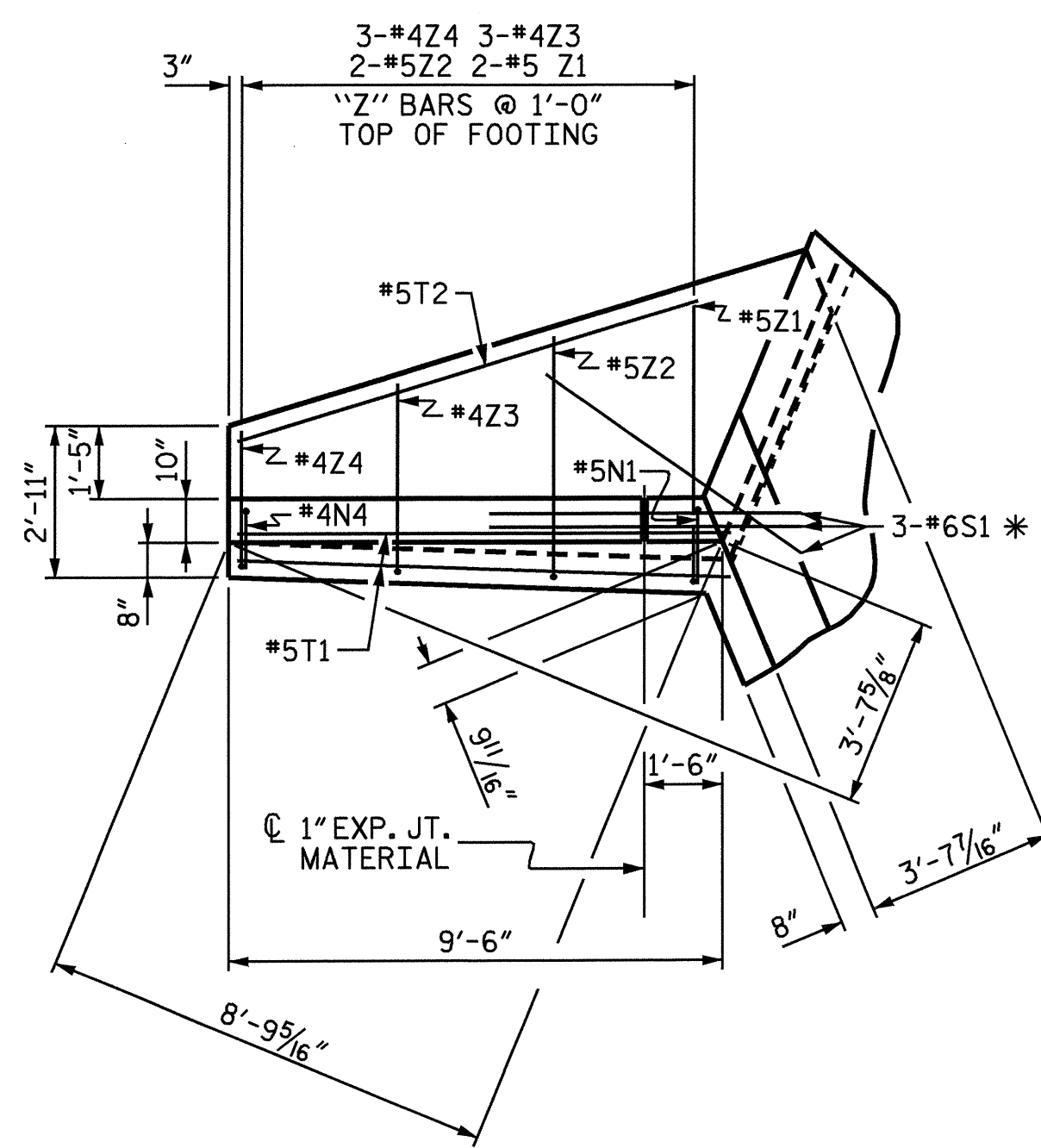
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SINGLE 8 FT. X 8 FT.
 CONCRETE BOX CULVERT
 45° SKEW**

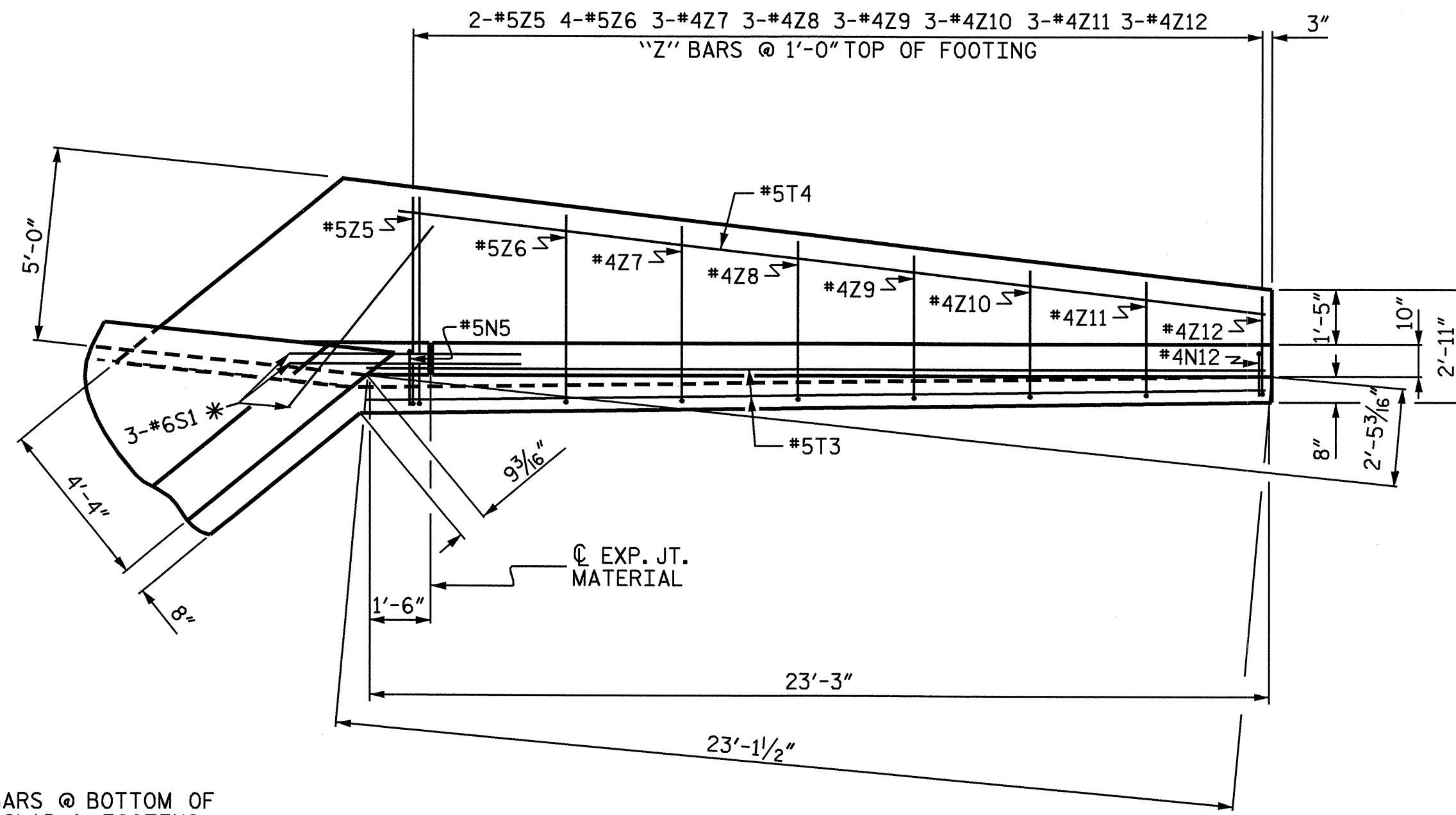


DRAWN BY: BRANDON GREEN DATE: JUN. 2005
 CHECKED BY: D.A. DAVENPORT DATE: 01/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			7

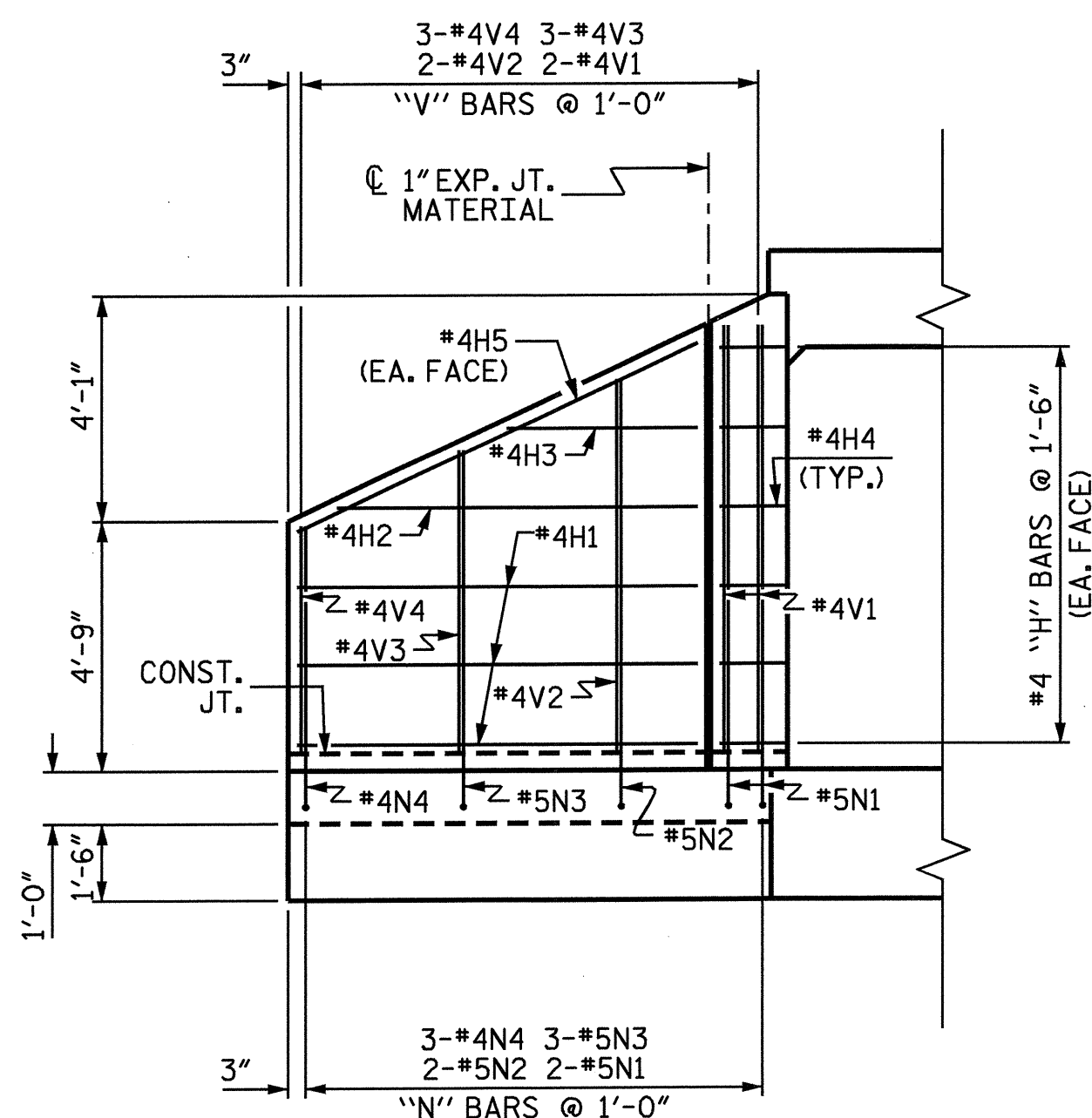


PLAN W2

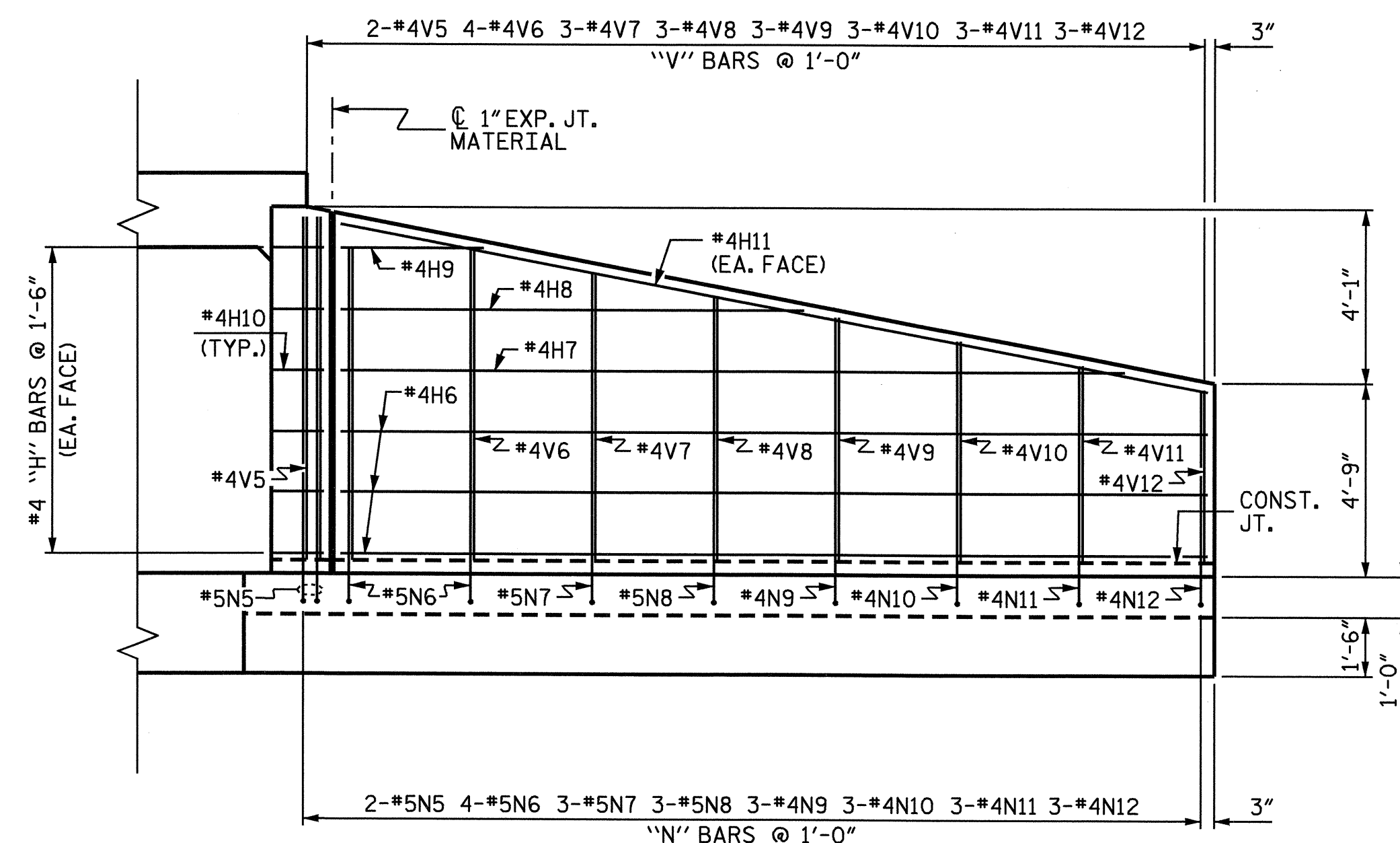


PLAN W1

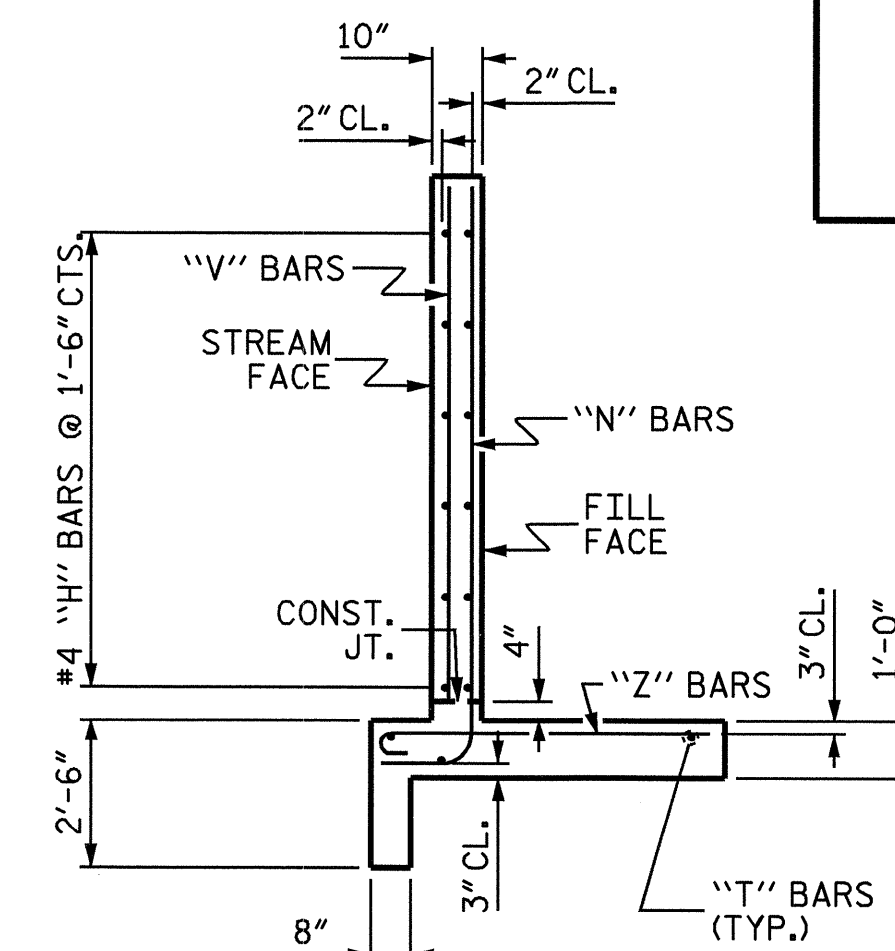
*#6S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING



ELEVATION W2



ELEVATION W1



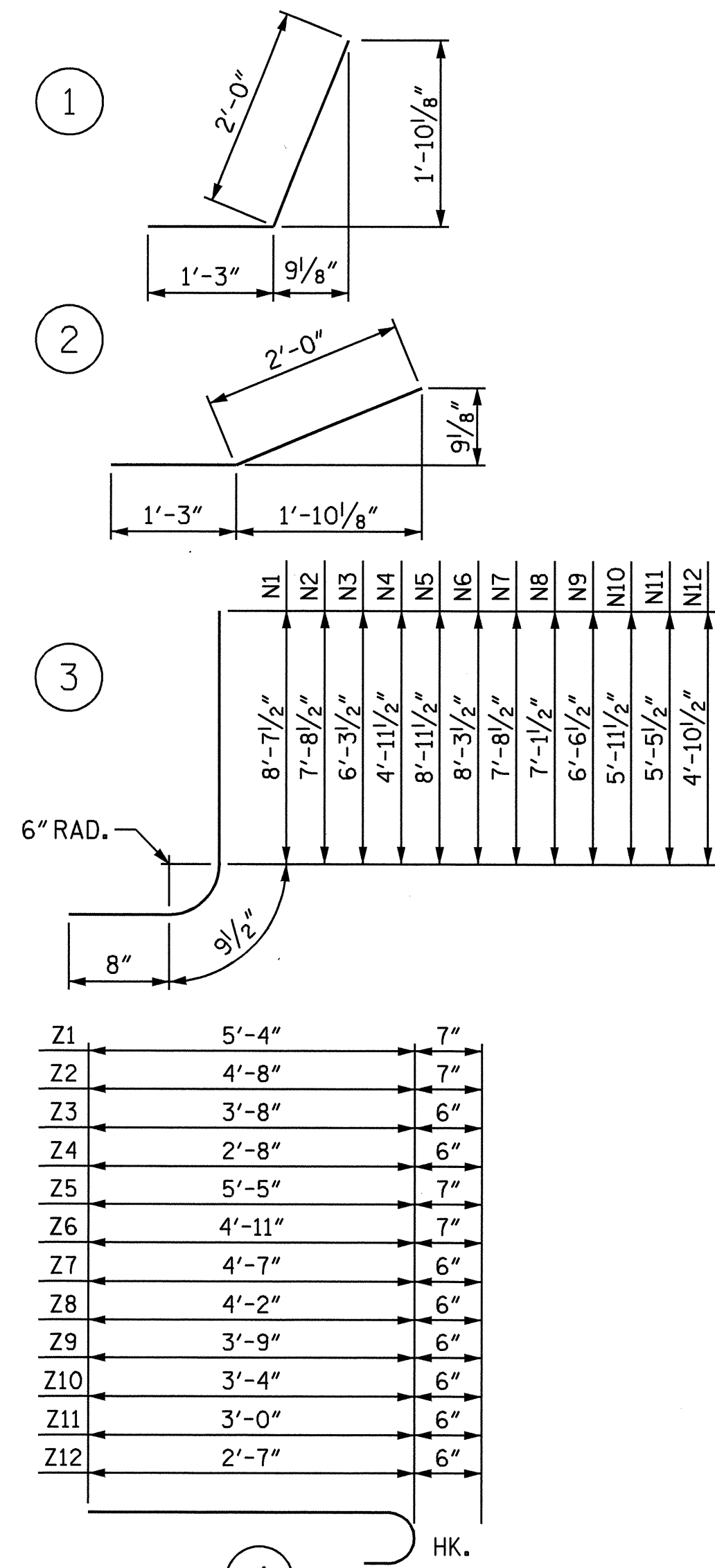
TYPICAL WING SECTION

CLASS A CONCRETE	
4 WINGS	29.1 CY
2 HEADWALLS	1.2 CY
2 END CURTAIN WALLS	1.2 CY
4 EDGE BEAMS	3.4 CY
TOTAL	34.9 CY

REINFORCING STEEL FOR 4 WINGS

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4 STR	7'-7"	61
H2	4	#4 STR	6'-10"	18
H3	4	#4 STR	3'-7"	10
H4	24	#4	1	52
H5	4	#4 STR	8'-5"	22
H6	12	#4 STR	21'-4"	171
H7	4	#4 STR	19'-4"	52
H8	4	#4 STR	11'-5"	31
H9	4	#4 STR	3'-6"	9
H10	24	#4	2	52
H11	4	#4 STR	21'-9"	58
N1	4	#5	3	42
N2	4	#5	3	38
N3	6	#5	3	48
N4	6	#4	3	26
N5	4	#5	3	43
N6	8	#5	3	81
N7	6	#5	3	57
N8	6	#5	3	54
N9	6	#4	3	32
N10	6	#4	3	30
N11	6	#4	3	28
N12	6	#4	3	25
S1	15	#6 STR	6'-0"	135
T1	2	#5 STR	9'-6"	20
T2	1	#5 STR	9'-3"	10
T3	4	#5 STR	23'-3"	97
T4	2	#5 STR	22'-7"	47
T5	2	#5 STR	4'-8"	10
T6	1	#5 STR	5'-10"	6
T7	2	#5 STR	7'-7"	16
T8	1	#5 STR	8'-2"	9
V1	4	#4 STR	8'-1"	22
V2	4	#4 STR	7'-1"	19
V3	6	#4 STR	5'-9"	23
V4	6	#4 STR	4'-4"	17
V5	4	#4 STR	8'-5"	22
V6	8	#4 STR	7'-8"	41
V7	6	#4 STR	7'-1"	28
V8	6	#4 STR	6'-6"	26
V9	6	#4 STR	6'-0"	24
V10	6	#4 STR	5'-5"	22
V11	6	#4 STR	4'-10"	19
V12	6	#4 STR	4'-3"	17
Z1	4	#5	4	25
Z2	4	#5	4	22
Z3	6	#4	4	17
Z4	6	#4	4	13
Z5	4	#5	4	25
Z6	8	#5	4	46
Z7	6	#4	4	20
Z8	6	#4	4	19
Z9	6	#4	4	17
Z10	6	#4	4	15
Z11	6	#4	4	14
Z12	6	#4	4	12
TOTAL				1915 LBS

PROJECT NO. U-3849
 CUMBERLAND COUNTY
 STATION: 46+10.00 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 2:1
 45° SKEW

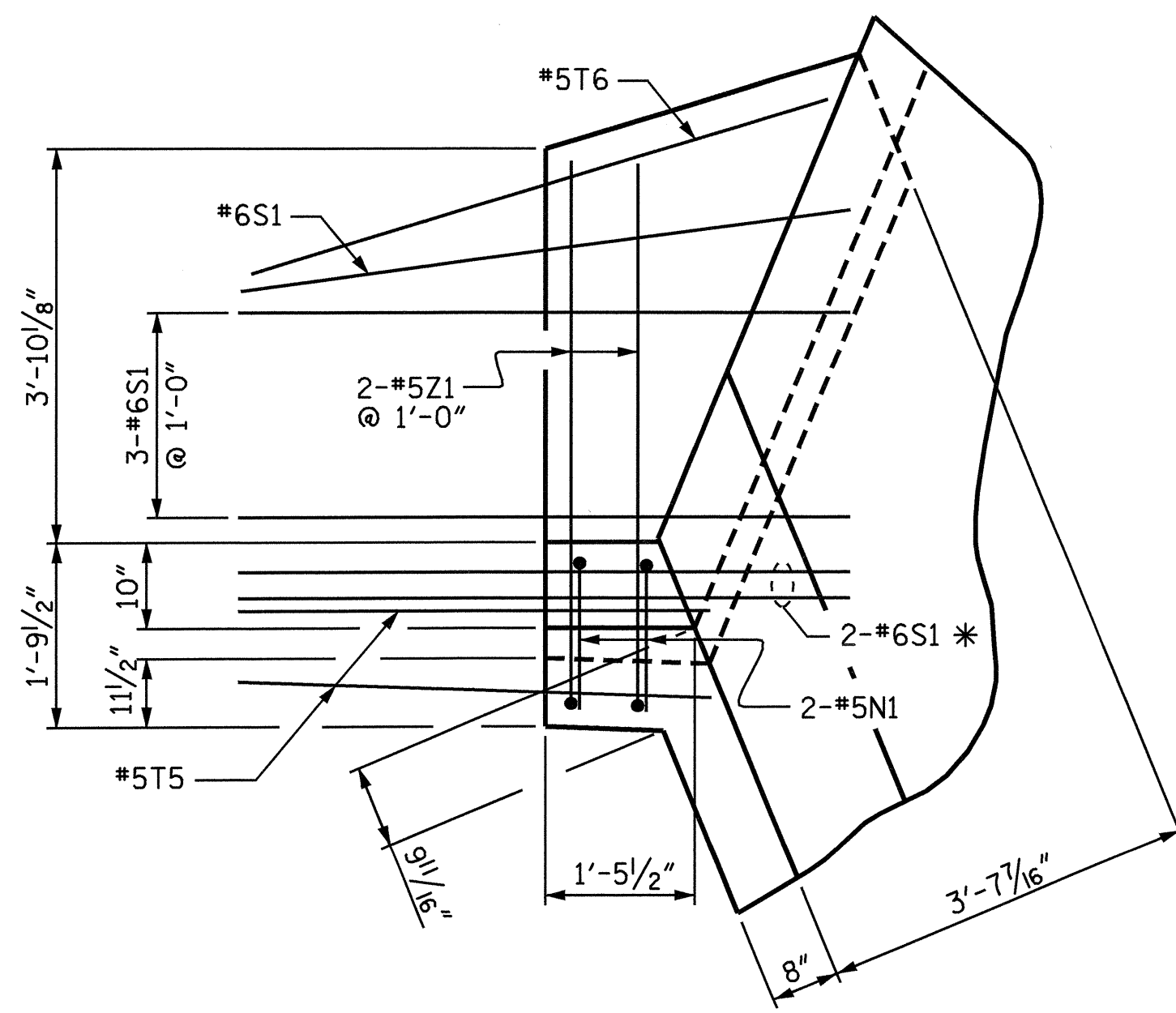


ASSEMBLED BY : BRANDON L. GREEN DATE : JUN 2005
 CHECKED BY : D.A. DAVENPORT DATE :01/09
 DRAWN BY : CCJ 01/00
 CHECKED BY : RWW 03/00

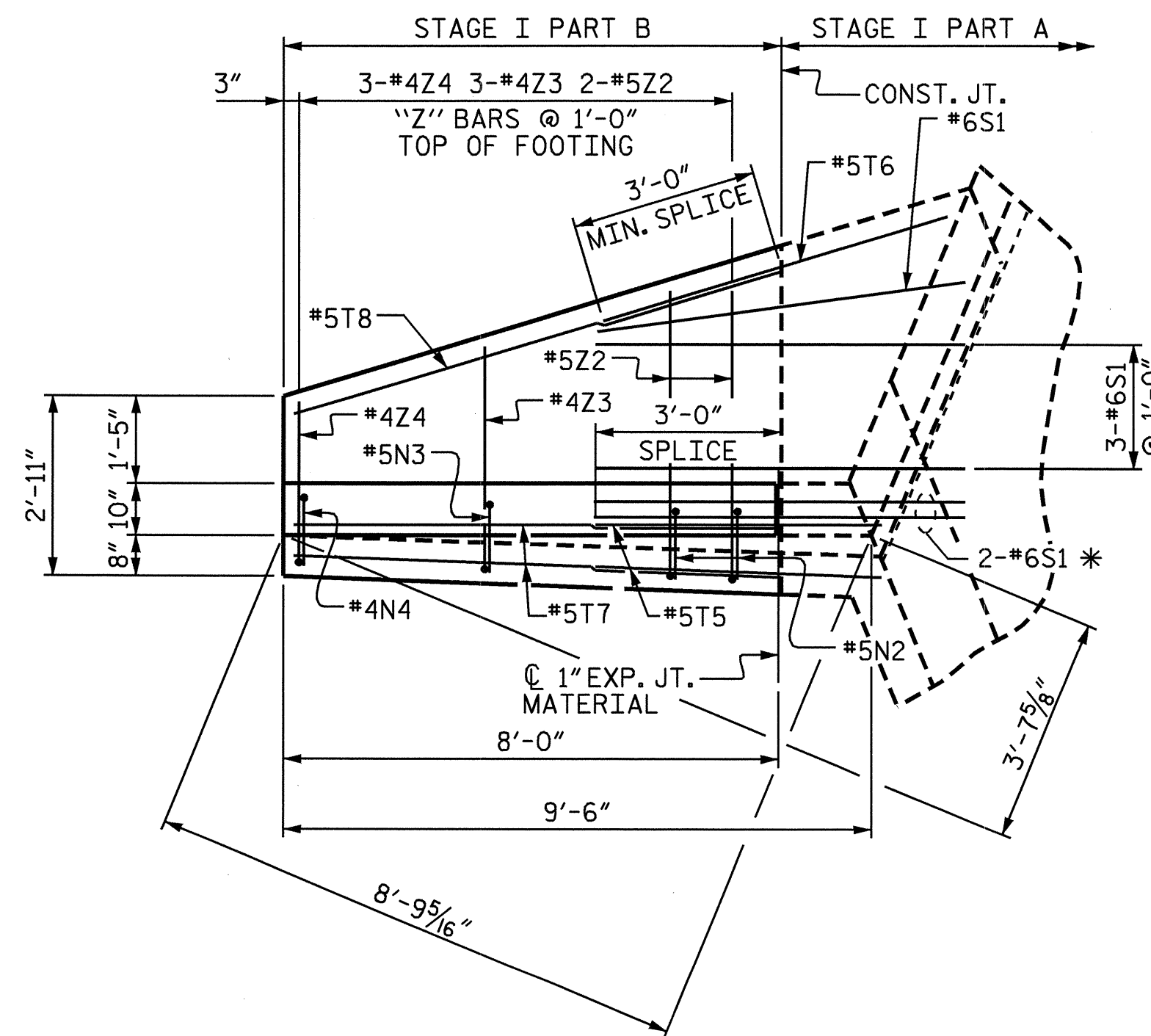
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TOTAL SHEETS 7

STD. NO. CW4508



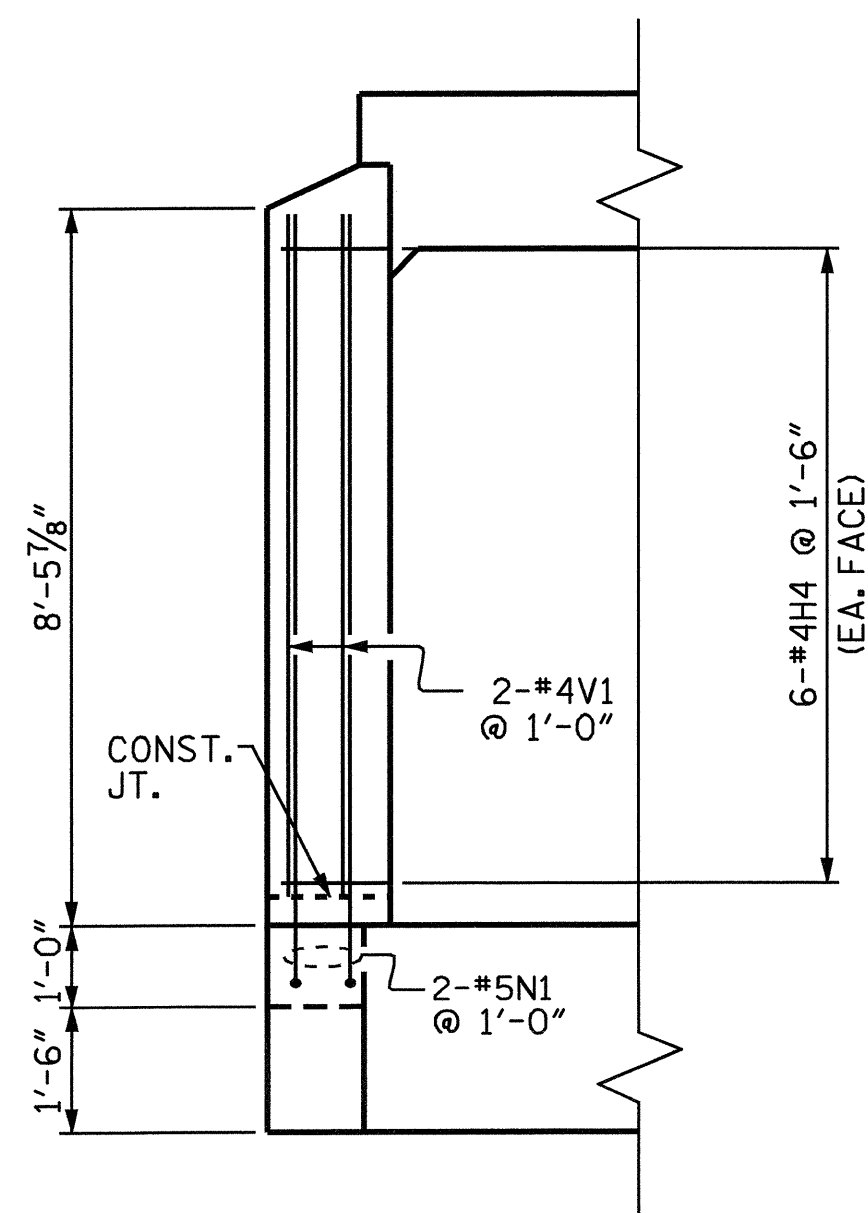
PLAN W3 (STAGE I PART A)



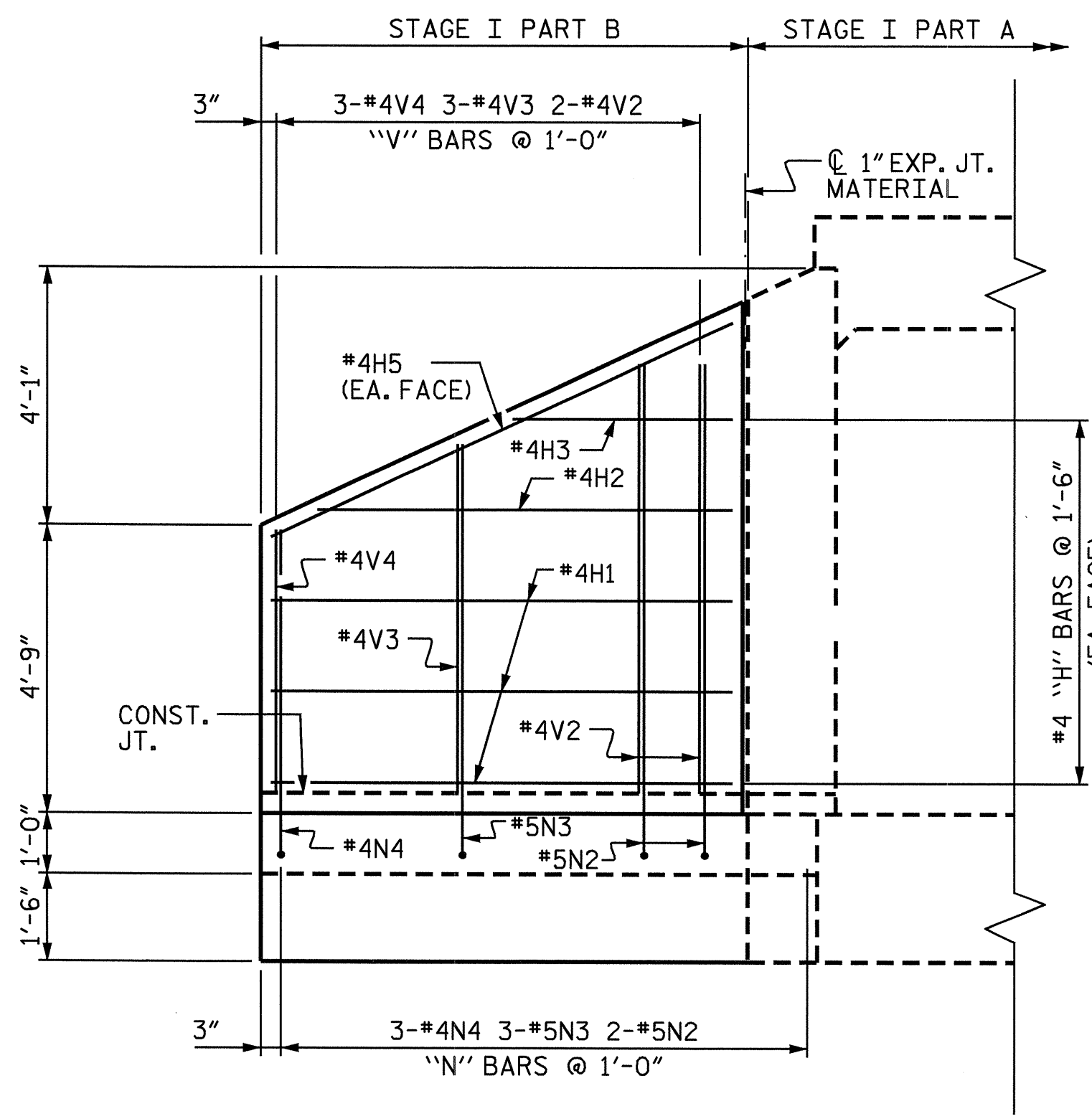
PLAN W3 (STAGE I PART B)

* #6S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

* #6S1 BARS SHALL PROJECT 3'-0" INTO STAGE I PART B



ELEVATION W3 (STAGE 1 PART A)



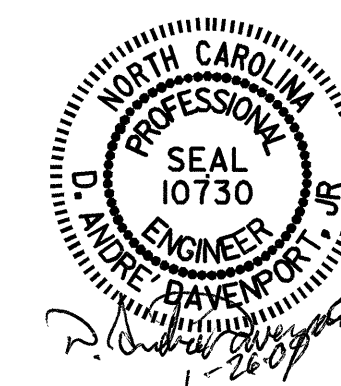
ELEVATION W3 (STAGE 1 PART B)

PROJECT NO. U-3849
CUMBERLAND COUNTY
 STATION: 46+10.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WING W3



DRAWN BY: C.R. YARBROUGH DATE: 01/09
 CHECKED BY: D.A. DAVENPORT DATE: 01/09

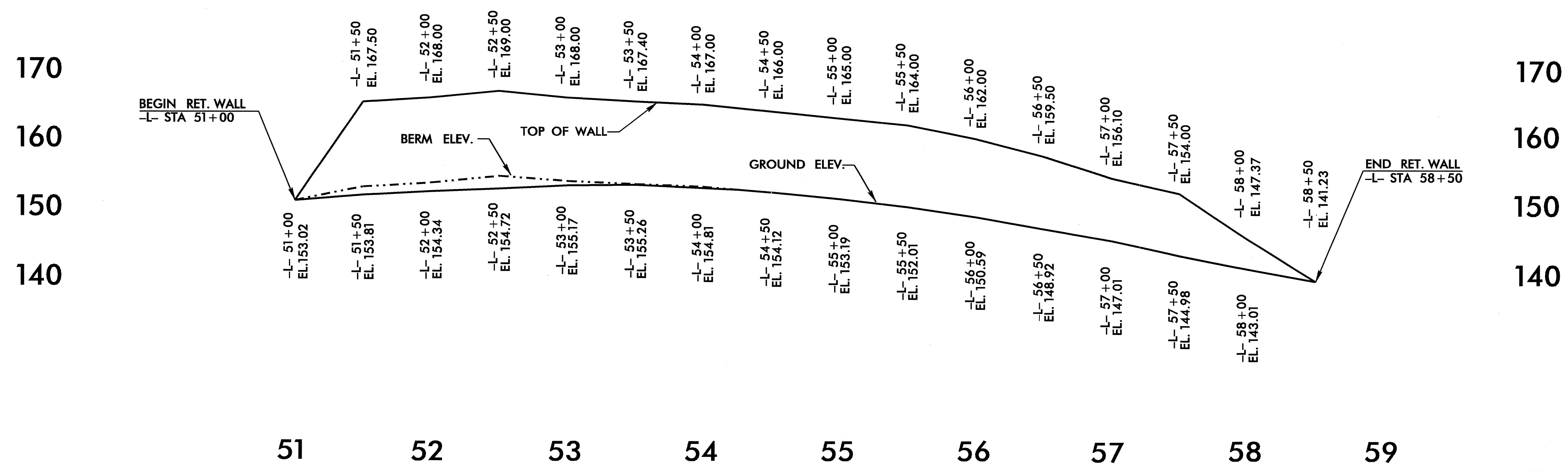
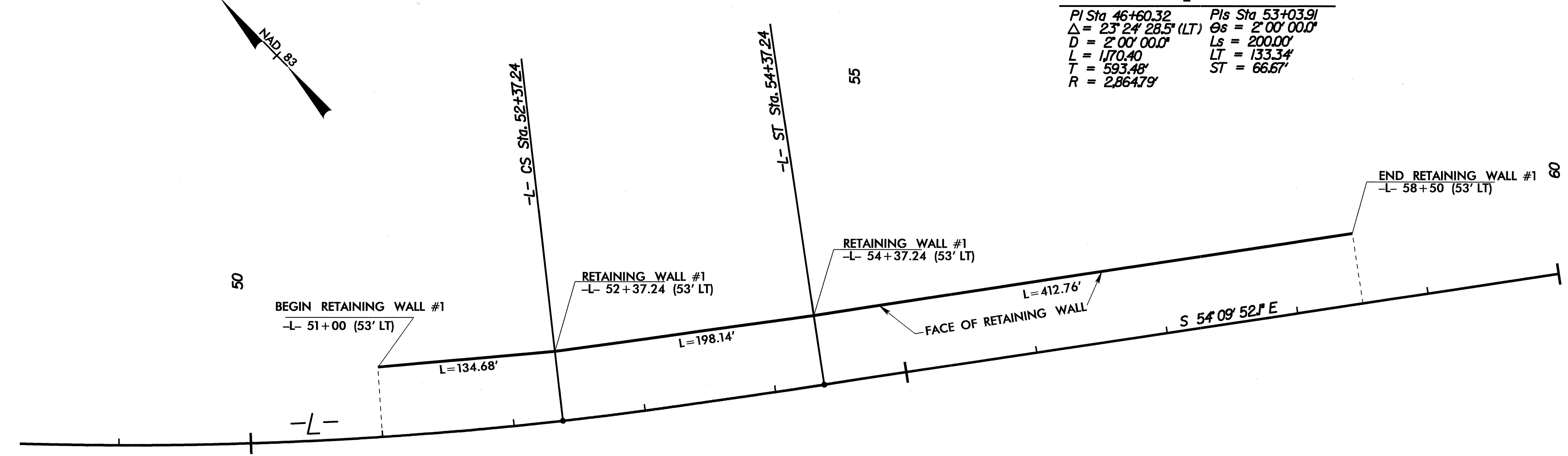
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			7



David L. Teague 2/20/09
SIGNATURE DATE

-L-
PI Sta 46+60.32 Pls Sta 53+03.91
Δ = 23° 24' 28.5" (LT) θs = 2° 00' 00.0"
D = 2° 00' 00.0" Ls = 200.00'
L = 170.40 LT = 133.34'
T = 593.48' ST = 66.67'
R = 2,864.79'



PROJECT NO.: U-3849 (34994.1.1)
 CUMBERLAND COUNTY
 STATION: 51+00 TO 58+50 -L-
 SHEET 1 OF 4

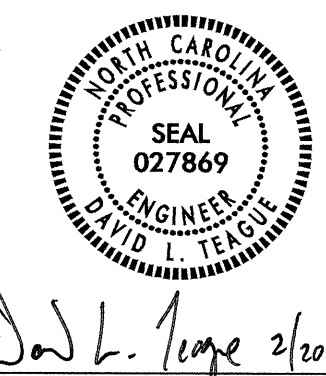
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

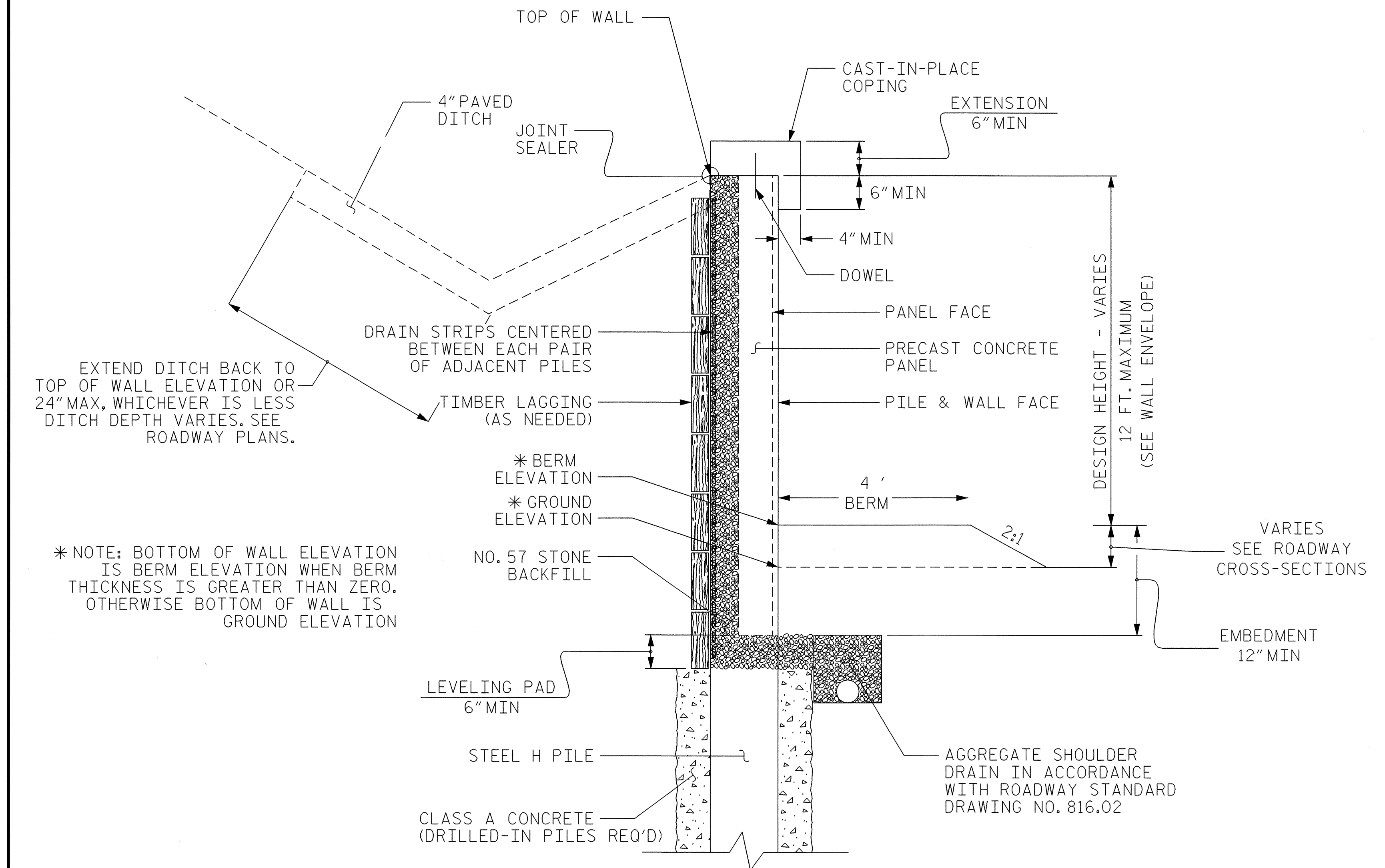
RETAINING WALL #1
 SOLDIER PILE RETAINING WALL
 PLAN VIEW AND PROFILE

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

PREPARED BY: D. TEAGUE	DATE: 11/08
REVIEWED BY: E. WILLIAMS	DATE: 11/08



David L. Teague 2/20/09
SIGNATURE DATE



* NOTE: BOTTOM OF WALL ELEVATION IS BERM ELEVATION WHEN BERM THICKNESS IS GREATER THAN ZERO. OTHERWISE BOTTOM OF WALL IS GROUND ELEVATION

RETAINING WALL #1
TYPICAL SECTION

*SEE ROADWAY TYPICAL SECTIONS FOR FINISHED GRADE DETAILS.

NOTES ON PLANS

- FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALL SPECIAL PROVISION.
- USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS FOR RETAINING WALL NO.1.
- BEFORE BEGINNING SOLDIER PILE WALL DESIGN FOR RETAINING WALL NO.1, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO.1 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN TOP OF WALL ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).
- DESIGN RETAINING WALL NO.1 FOR THE FOLLOWING:
 - MINIMUM SERVICE LIFE = 75 YEARS
 - IN-SITU ASSUMED MATERIAL PARAMETERS:
 - UNIT WEIGHT = 120 PCF
 - FRICTION ANGLE = 30 DEGREES
 - COHESION = 0 PSF
- DESIGN RETAINING WALL NO.1 TO ACCOUNT FOR INSTALLATION OF 24" WATER LINE IN FRONT OF WALL. WATER LINE WILL BE INSTALLED AFTER WALL CONSTRUCTION. SEE UTILITY PLANS FOR WATER LINE LOCATION.

SOLDIER PILE RETAINING WALLS 7607 SQ. FT.

PROJECT NO.: U-3849 (34994.1.1)
CUMBERLAND COUNTY
STATION: 51+00 TO 58+50 -L-
SHEET 2 OF 4

PREPARED BY: D. TEAGUE DATE: 11/08
REVIEWED BY: E. WILLIAMS DATE: 11/08

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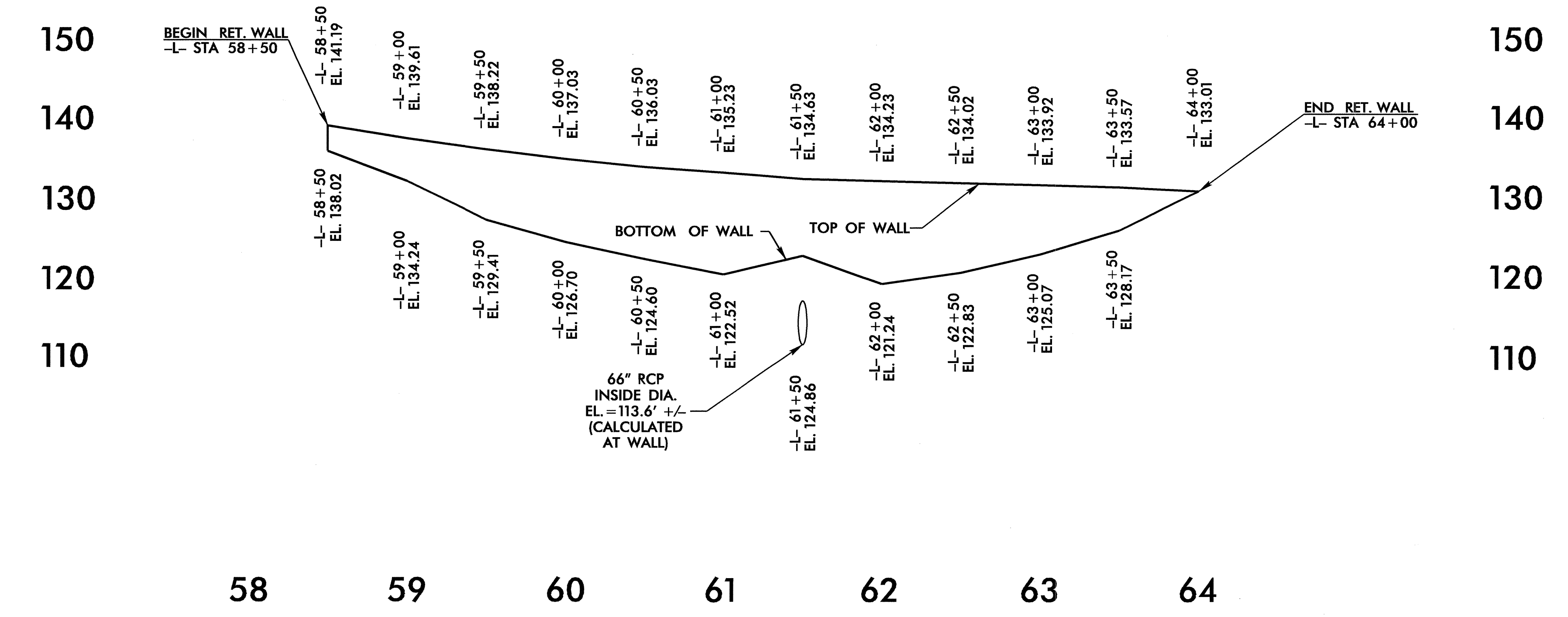
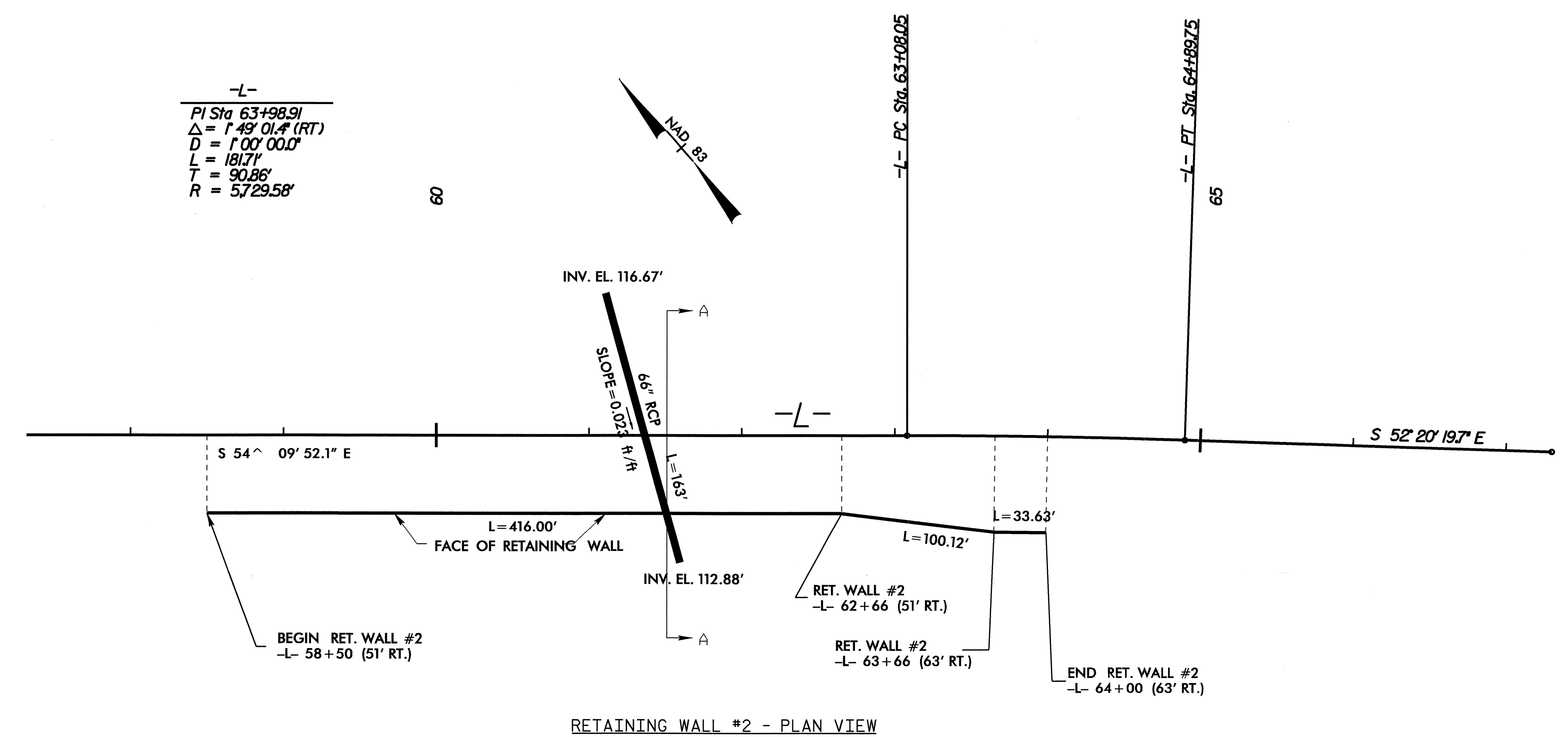
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

RETAINING WALL #1
SOLDIER PILE RETAINING WALL
TYPICAL SECTION AND NOTES



David L. Teague 2/20/09
SIGNATURE DATE



PROJECT NO.: U-3849 (34994.1.1)
 CUMBERLAND COUNTY
 STATION: 58+50 TO 64+00 -L-
 SHEET 3 OF 4

PREPARED BY: D. TEAGUE DATE: 11/08
 REVIEWED BY: E. WILLIAMS DATE: 11/08

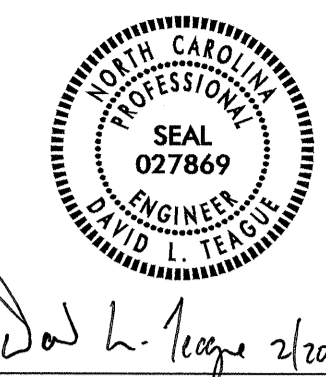
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

RETAINING WALL #2
 MSE RETAINING WALL
 PLAN VIEW AND PROFILE



David L. Teague 2/20/09
SIGNATURE DATE

NOTES

1. FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.
2. FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
3. CONCRETE BARRIER RAIL COPING WITH A MOMENT SLAB IS REQUIRED FOR RETAINING WALL NO. 2 AS SHOWN. NO SEPARATE PAYMENT WILL BE MADE FOR CONCRETE BARRIER RAIL COPING WITH MOMENT SLAB. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE MSE RETAINING WALL.
4. DO NOT USE STANDARD SIZE NO. 2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO. 2.
5. DO NOT USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR RETAINING WALL NO. 2.
6. A FENCE OR HANDRAIL IS REQUIRED ON TOP OF RETAINING WALL NO. 2 AS SHOWN. USE SLEEVES IN ACCORDANCE WITH SECTION 866 OF THE STANDARD SPECIFICATIONS FOR POSTS OR SUBMIT POST ANCHOR PLATE DETAILS TO THE ENGINEER FOR APPROVAL. NO SEPARATE PAYMENT WILL BE MADE FOR FENCE OR HANDRAIL. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE MSE RETAINING WALL.
7. BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 2, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.
8. DESIGN RETAINING WALL NO. 2 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN TOP OF WALL ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

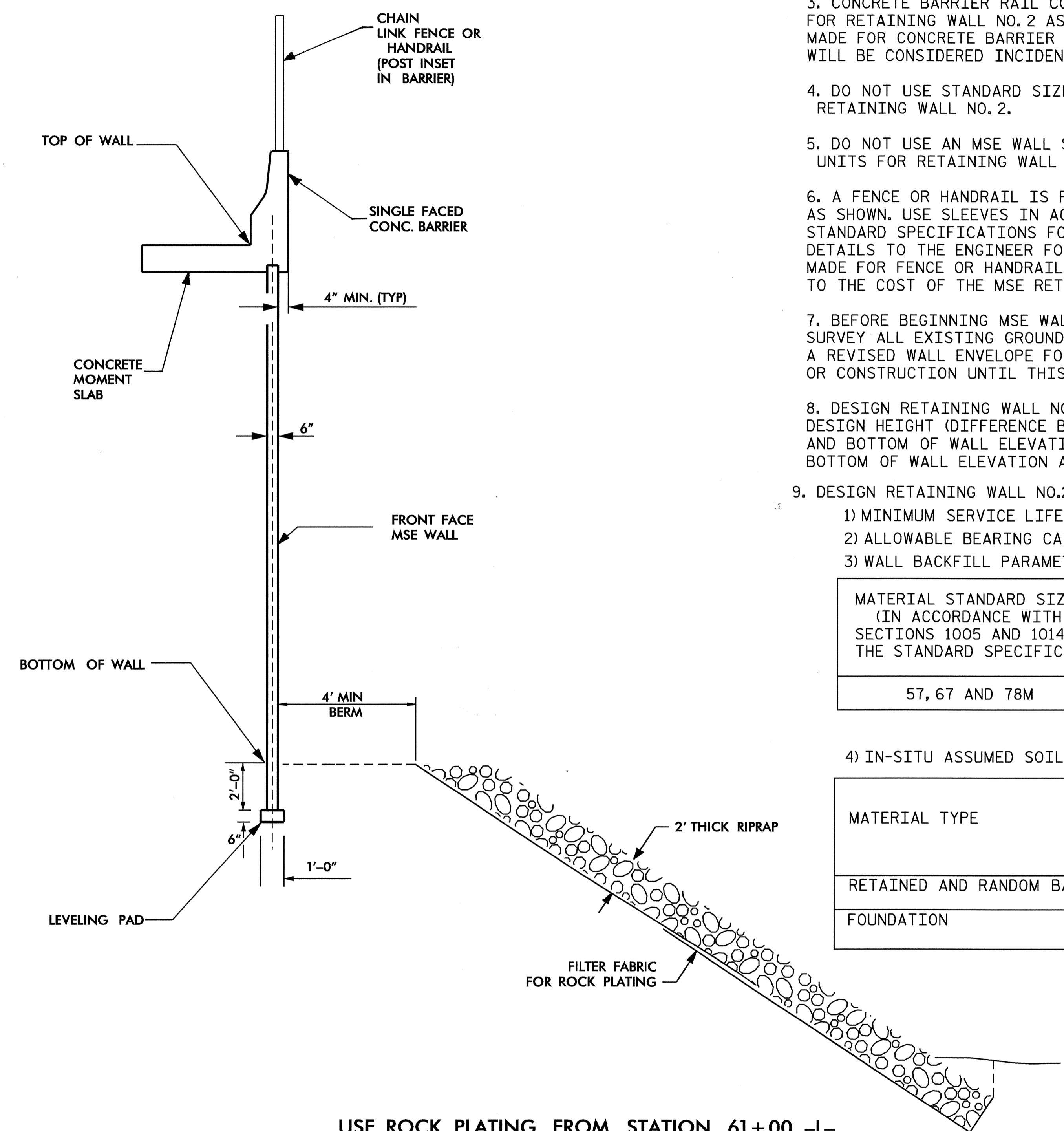
10. DESIGN RETAINING WALL NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
11. TEMPORARY SHORING MAY BE REQUIRED FOR RETAINING WALL NO. 2. IN ACCORDANCE WITH THE TEMPORARY SHORING SPECIAL PROVISION. SEE ROADWAY PLANS.
12. THE MINIMUM REINFORCEMENT RATIO SHALL BE 1.2:1 (L:H) TO SATISFY EXTERNAL STABILITY.

9. DESIGN RETAINING WALL NO.2 FOR THE FOLLOWING:
- 1) MINIMUM SERVICE LIFE = 100 YEARS
 - 2) ALLOWABLE BEARING CAPACITY = 2000 PSF
 - 3) WALL BACKFILL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION PSF
57, 67 AND 78M	110	38	0

- 4) IN-SITU ASSUMED SOIL MATERIAL PARAMETERES:

MATERIAL TYPE	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION (c) PSF
RETAINED AND RANDOM BACKFILL	120	30	0
FOUNDATION	120	30	0



MSE RETAINING WALLS 4921.75 SQ. FT.

USE ROCK PLATING FROM STATION 61+00 -L- TO STATION 62+00 -L-. SEE ROCK PLATING DETAIL. OTHERWISE, SEE ROADWAY PLANS FOR SIDE SLOPES.

TYPICAL SECTION A-A

PROJECT NO.: U-3849 (34994.1.1)
CUMBERLAND COUNTY
STATION: 58+50 TO 64+00 -L-
SHEET 4 OF 4

PREPARED BY: D. TEAGUE DATE: 11/08
REVIEWED BY: E. WILLIAMS DATE: 11/08

GEOTECHNICAL ENGINEERING UNIT

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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. FINIS 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

STD. NO. SN