

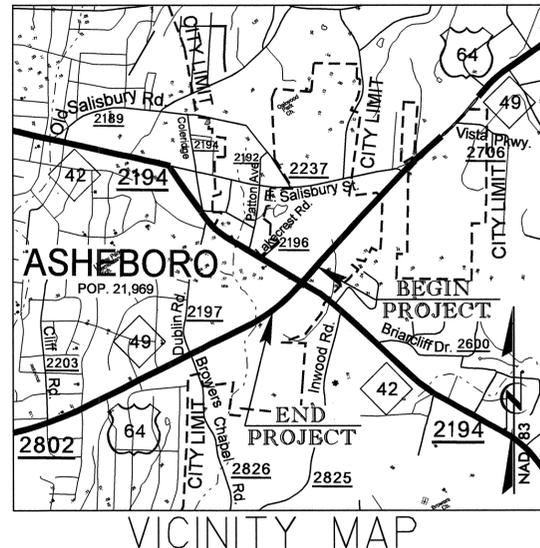
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3401		
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
34935.1.1	NHF-64(58)	PE	
34935.2.1	NHF-64(58)	R/W, UTILITIES	
34935.3.1	NHF-64(98)	CONSTRUCTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

LOCATION: INTERSECTION AT US 64/NC 49 AND NC 42 IN ASHEBORO

TYPE OF WORK: GRADING, PAVING, DRAINAGE, WIDENING, CULVERT, AND RETAINING WALLS

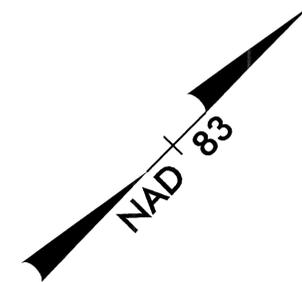
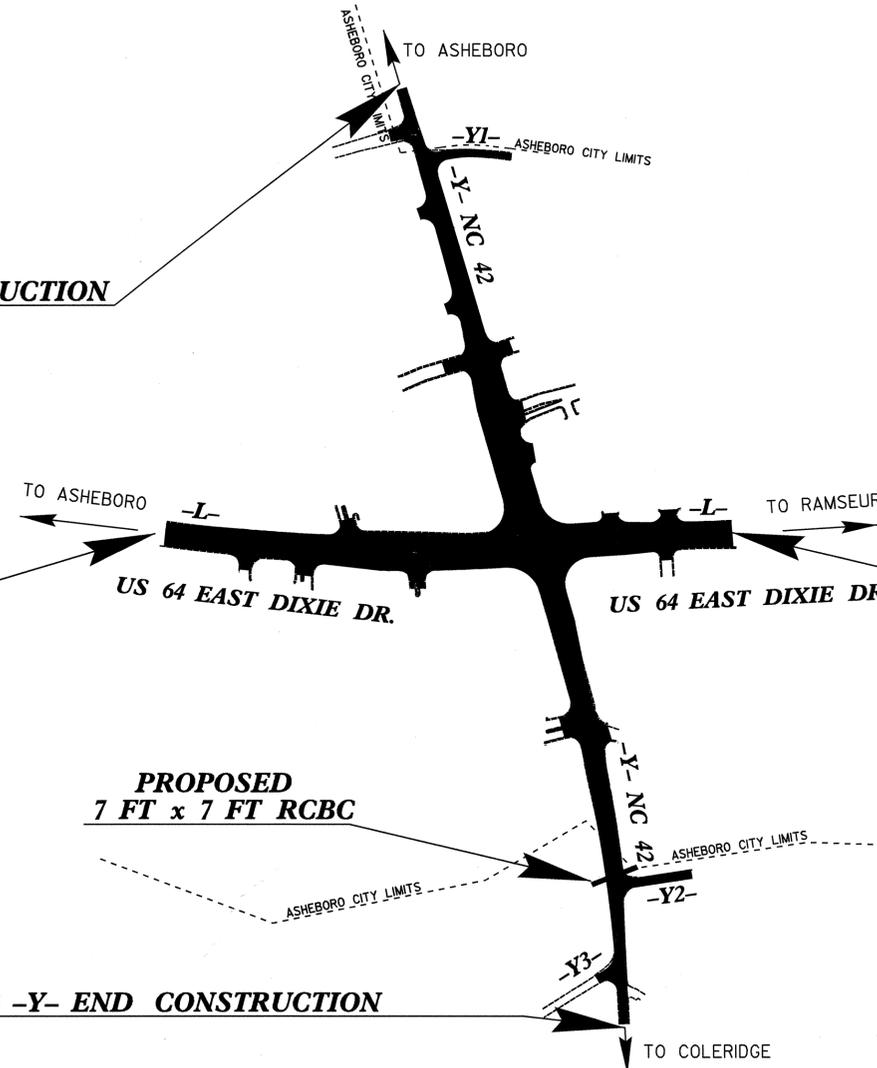


STA. 5+00.00 -Y- BEGIN CONSTRUCTION

STA. 9+00.00 -L- BEGIN TIP PROJECT U-3401

STA. 24+21.00 -L- END TIP PROJECT U-3401

STA. 36+00.00 -Y- END CONSTRUCTION



CULVERT & WALLS



DESIGN DATA	
ADT 2004 =	18,000
ADT 2025 =	32,900
DHV =	10 %
D =	55 %
T =	10 % *
V =	45 MPH
* TTST 6%	DUAL 4%

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT U-3401	= 0.288 MI
TOTAL LENGTH ROADWAY TIP PROJECT U-3401	= 0.288 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 15, 2007

R. M. GIROLAMI, PE
PROJECT ENGINEER

L. E. SUTTON, PE
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
1000 Birch Ridge Dr.
Raleigh NC, 27610

Gregory R. Peretti
4.10.07

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

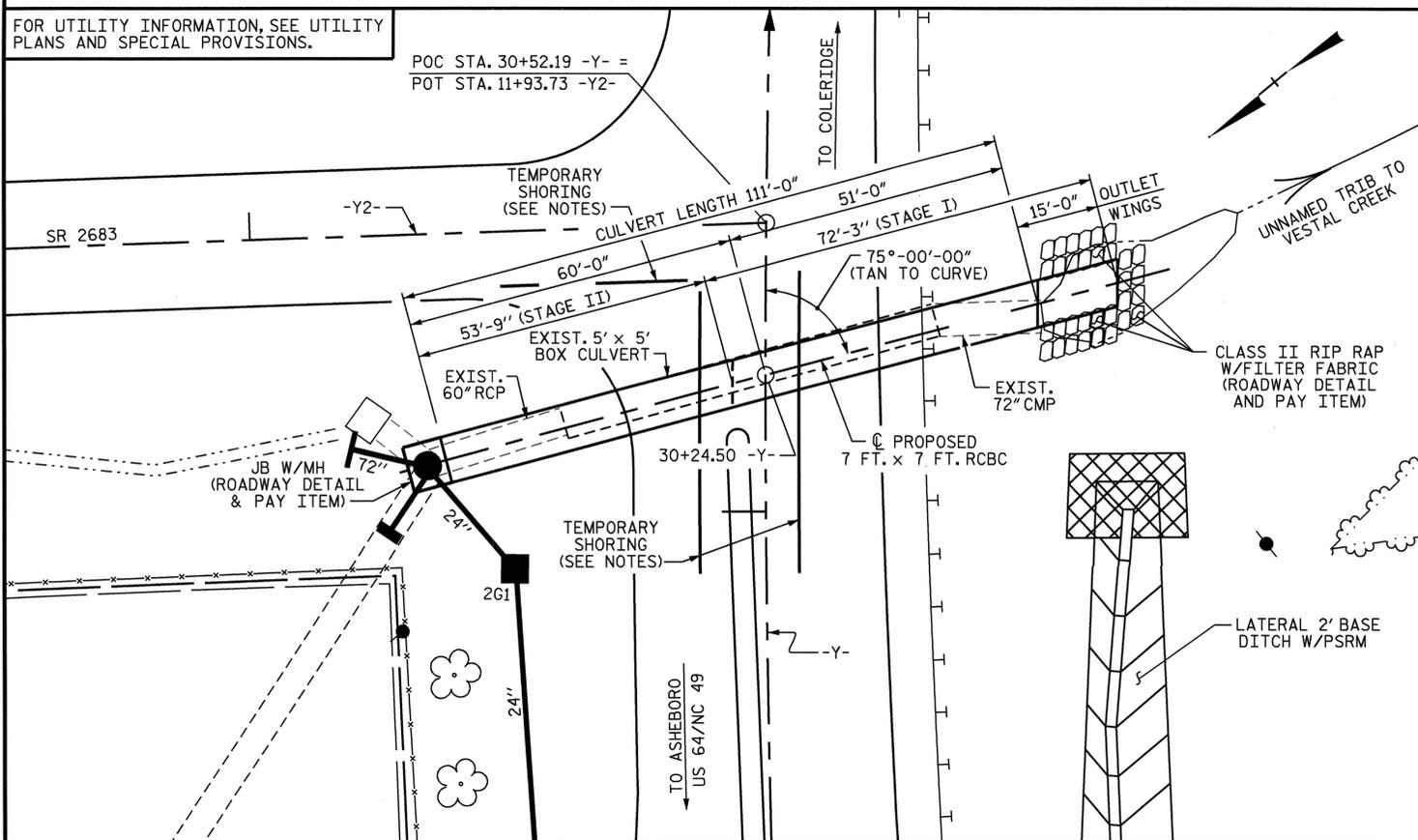
DATE

28-MAR-2007 10:20 R:\Structures\scd\way\Microstation\U3401.scd.TSH.01.dgn

TIP PROJECT: U-3401

CONTRACT: C201276

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 540 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 780.3
DRAINAGE AREA	= 0.24 MI. ²
BASIC DISCHARGE (Q100)	= 600 CFS
BASIC HIGH WATER ELEVATION	= 780.9

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 970 CFS.
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 787.1

ROADWAY DATA

GRADE POINT ELEV. @ STA. 30+24.50 -Y-	= 786.512
BED ELEV. @ STA. 30+24.50 -Y-	= 770.210
ROADWAY SLOPES	= 2:1 (LT.)
	= 4:1 (RT.)

NOTES

ASSUMED LIVE LOAD HS20 OR ALTERNATE LOADING.
FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
DESIGN FILL = 9.6'.

FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.
3" DIA. WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERT STAGES TO BE POURED IN THE FOLLOWING ORDER:

1. STAGE I FLOOR SLAB AND OUTLET WING APRON INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF STAGE I WALLS AND OUTLET WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, EDGE BEAMS AND HEADWALL.
3. STAGE II FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
4. THE REMAINING PORTIONS OF STAGE II WALLS FULL HEIGHT FOLLOWED BY ROOF SLAB, EDGE BEAMS AND HEADWALL.

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.

AT THE CONTRACTOR'S OPTION THE VERTICAL CONSTRUCTION JOINT BETWEEN THE OUTLET WINGS AND THE BARREL MAY BE ELIMINATED AND THE "C" BARS IN THE BARREL MAY BE EXTENDED TO REPLACE THE "D" AND "H" BARS IN THE WINGS.

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 SAMPLE 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.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

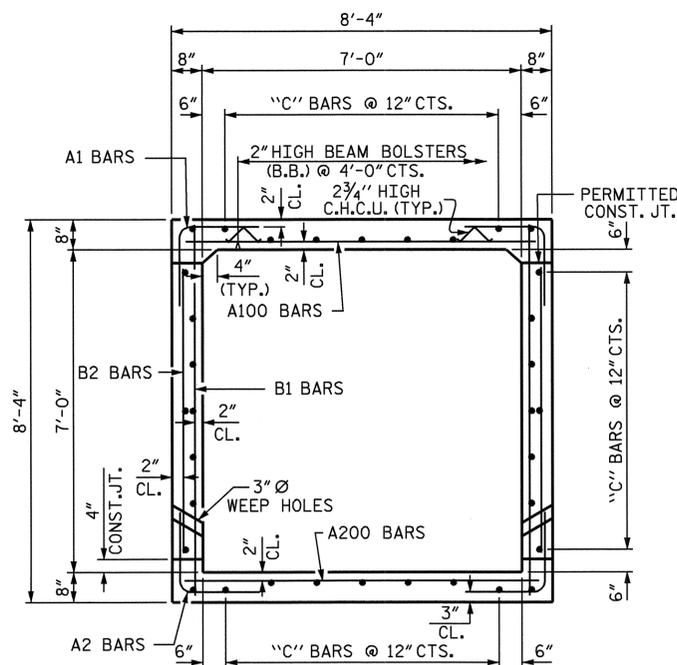
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE EXISTING 5' x 5' BOX CULVERT, 60" RCP, AND 72" CMP SHALL BE REMOVED.

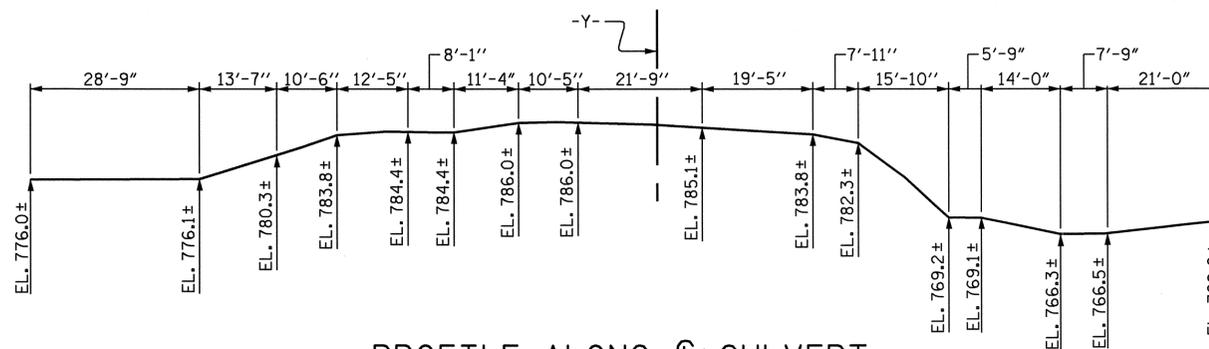
TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L.	74.1 TONS
CLASS A CONCRETE	
BARREL @ 0.761 CY/FT	84.5 C.Y.
APRON & CURTAIN WALL	4.0 C.Y.
OUTLET WINGS	3.5 C.Y.
HEADWALL & EDGE BEAMS	2.0 C.Y.
TOTAL	94.0 C.Y.
REINFORCING STEEL	
BARREL/APRON	11,233 LBS.
OUTLET WINGS, ETC.	451 LBS.
TOTAL	11,684 LBS.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 34 "C" BARS IN SECTION OF BARREL



PROFILE ALONG CULVERT

DRAWN BY : A.S. CALLAWAY DATE : 1/11/05
CHECKED BY : B.N. BARODAWALA DATE : 1/27/05



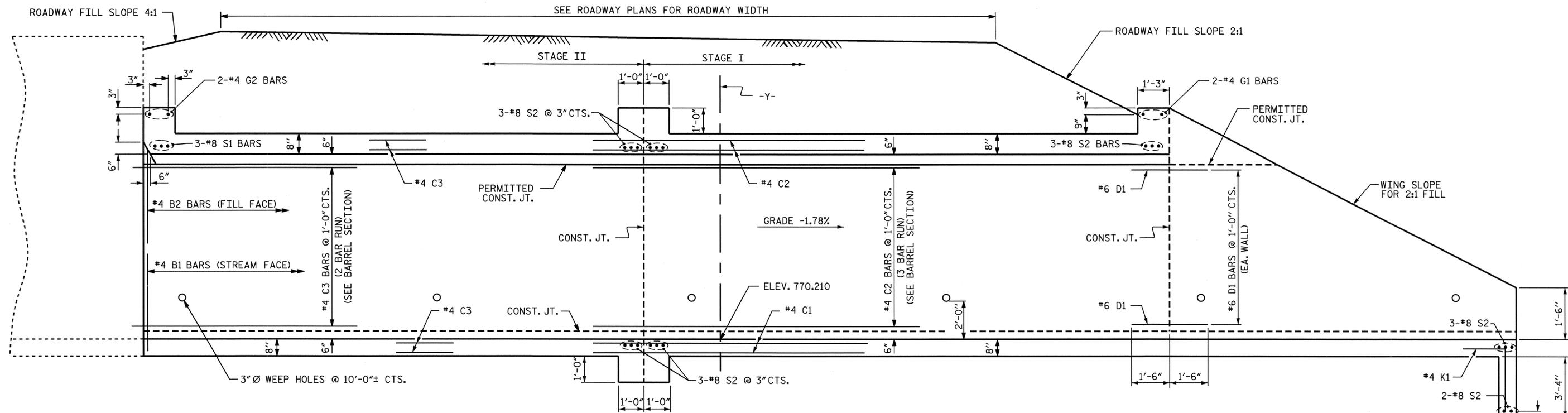
PROJECT NO. U-3401
RANDOLPH COUNTY
STATION: 30+24.50 -Y-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SINGLE 7 FT. x 7 FT.
CONCRETE BOX CULVERT

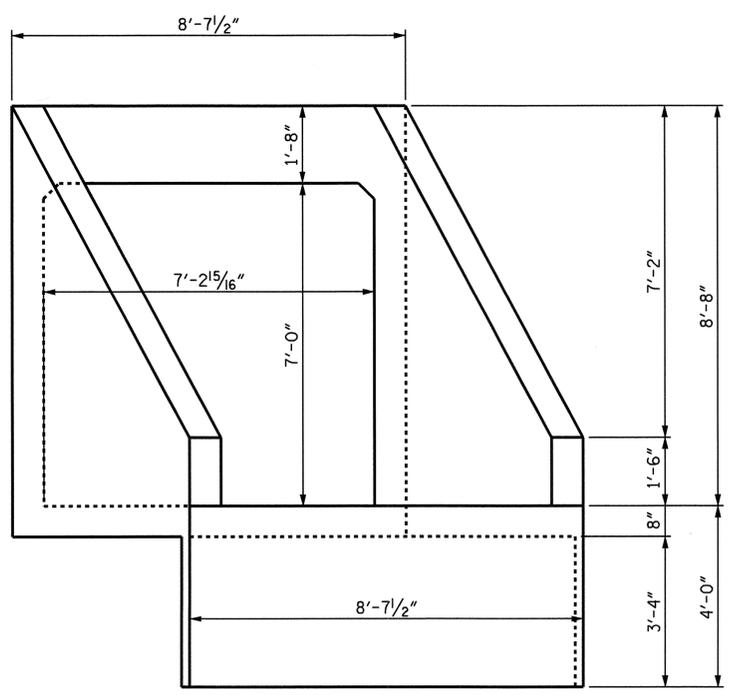
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C-1
2			4			TOTAL SHEETS: 4



JUNCTION BOX
FOR JUNCTION BOX
DETAILS, SEE ROADWAY PLANS.

CULVERT SECTION NORMAL TO ROADWAY

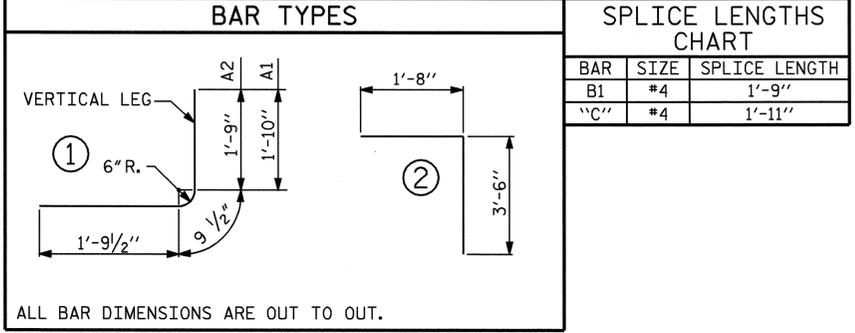
OUTLET WING
FOR OUTLET WING DETAILS AND
REINFORCING STEEL, SEE SHEET 4 OF 4.



END ELEVATION - NORMAL TO SKEW

BILL OF MATERIAL													
STAGE I						STAGE II							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
A100	102	#4	STR	7'-11"	539	A100	98	#4	STR	7'-11"	518		
A101	4	#4	STR	3'-5"	9	A101	2	#4	STR	3'-5"	5		
A200	112	#5	STR	7'-11"	925	A200	85	#5	STR	7'-11"	702		
A201	4	#5	STR	2'-9"	11	A201	2	#5	STR	2'-9"	6		
A1	146	#5	1	4'-5"	673	A1	136	#5	1	4'-5"	626		
A2	184	#5	1	4'-4"	832	A2	136	#5	1	4'-4"	615		
B1	116	#4	STR	7'-10"	607	B1	108	#4	STR	7'-10"	565		
B2	146	#4	STR	6'-4"	618	B2	136	#4	STR	6'-4"	575		
C1	27	#4	STR	26'-0"	469	C3	68	#4	STR	28'-0"	1272		
C2	75	#4	STR	21'-0"	1052	G2	2	#4	STR	8'-0"	11		
D1	16	#6	STR	3'-0"	72	S1	3	#8	STR	7'-11"	63		
G1	2	#4	STR	8'-3"	11	S2	6	#8	STR	8'-3"	132		
K1	5	#4	2	5'-2"	17								
S2	14	#8	STR	8'-3"	308								
REINFORCING STEEL					LBS.	6143	REINFORCING STEEL					LBS.	5090

STRUCTURE QUANTITIES			
STAGE I		STAGE II	
CLASS A CONCRETE			
BARREL @ 0.761 CY/FT	43.6 C.Y.	BARREL @ 0.761 CY/FT	40.9 C.Y.
APRON & CURTAIN WALL	4.0 C.Y.	HEADWALL & EDGE BEAMS	1.0 C.Y.
OUTLET WINGS	3.5 C.Y.		
HEADWALL & EDGE BEAMS	1.0 C.Y.	TOTAL	41.9 C.Y.
TOTAL	52.1 C.Y.	REINFORCING STEEL	
REINFORCING STEEL			
BARREL/APRON	6,143 LBS.	BARREL	5,090 LBS.
OUTLET WINGS, ETC.	451 LBS.	TOTAL	5,090 LBS.
TOTAL	6,594 LBS.	FOUNDATION COND. MAT'L.	
FOUNDATION COND. MAT'L.	42.5 TONS		31.6 TONS



ALL BAR DIMENSIONS ARE OUT TO OUT.

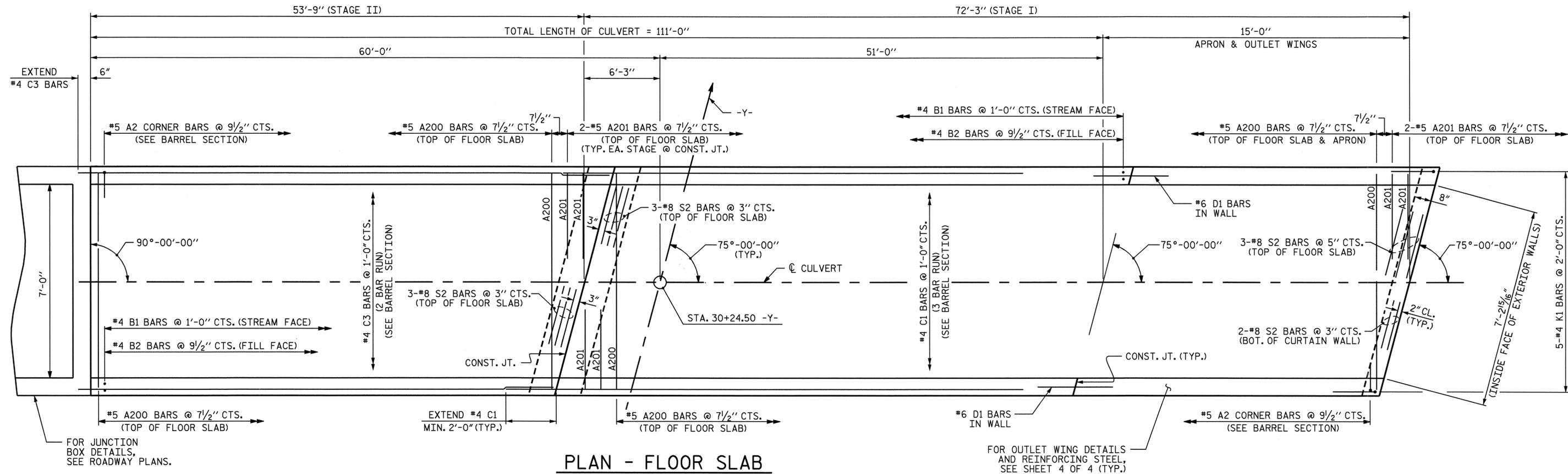
DRAWN BY : A.S. CALLAWAY DATE : 1/12/05
CHECKED BY : B.N. BARODAWALA DATE : 1/27/05

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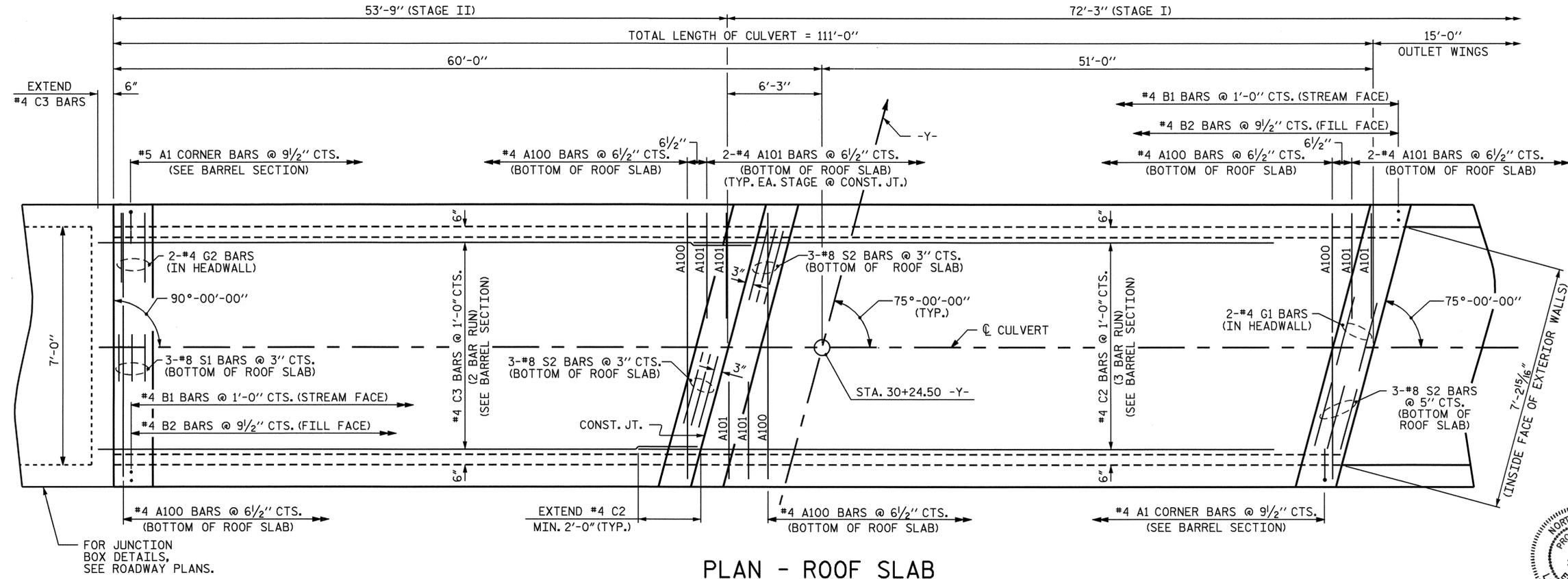


PROJECT NO. U-3401
RANDOLPH COUNTY
STATION: 30+24.50 -Y-
SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SINGLE 7 FT. X 7 FT. CONCRETE BOX CULVERT 75° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					C-2
					TOTAL SHEETS
					4



PLAN - FLOOR SLAB



PLAN - ROOF SLAB

PROJECT NO. U-3401
RANDOLPH COUNTY
 STATION: 30+24.50 -Y-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 7 FT. X 7 FT.
 CONCRETE BOX CULVERT
 75° SKEW



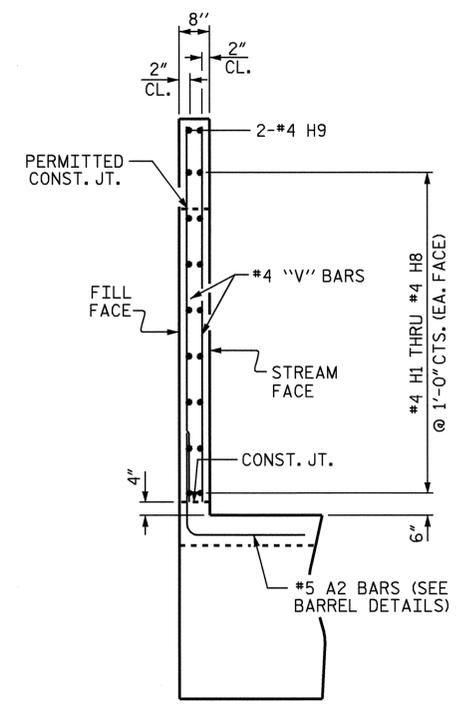
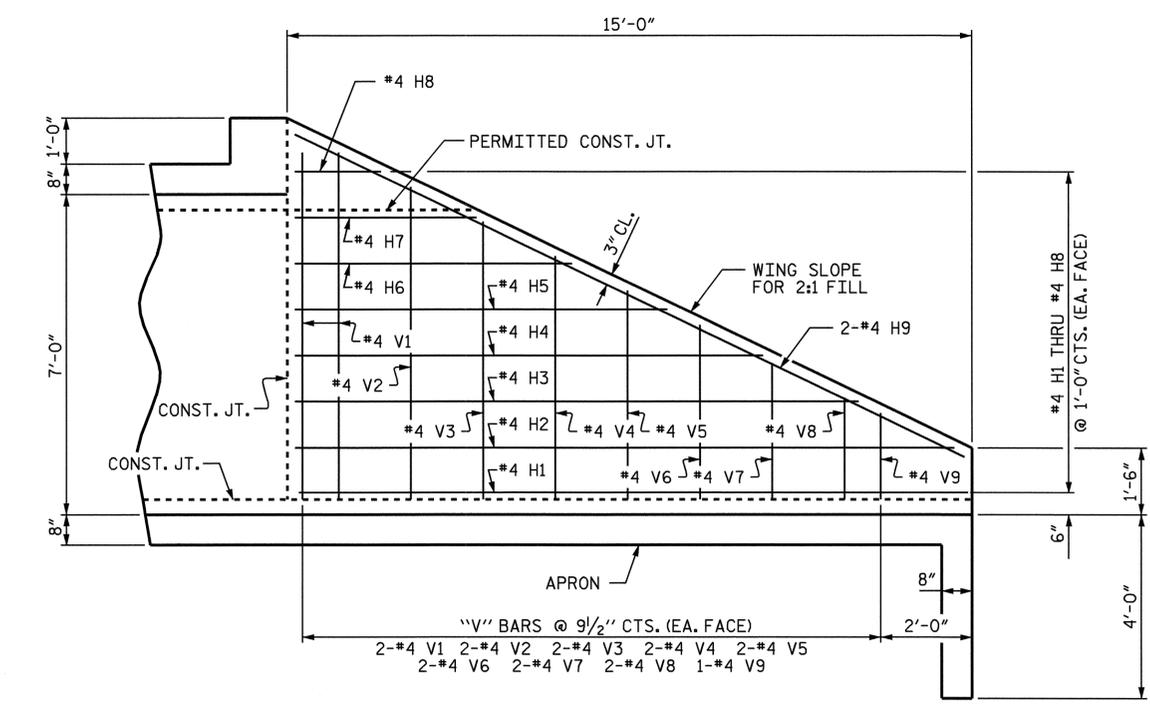
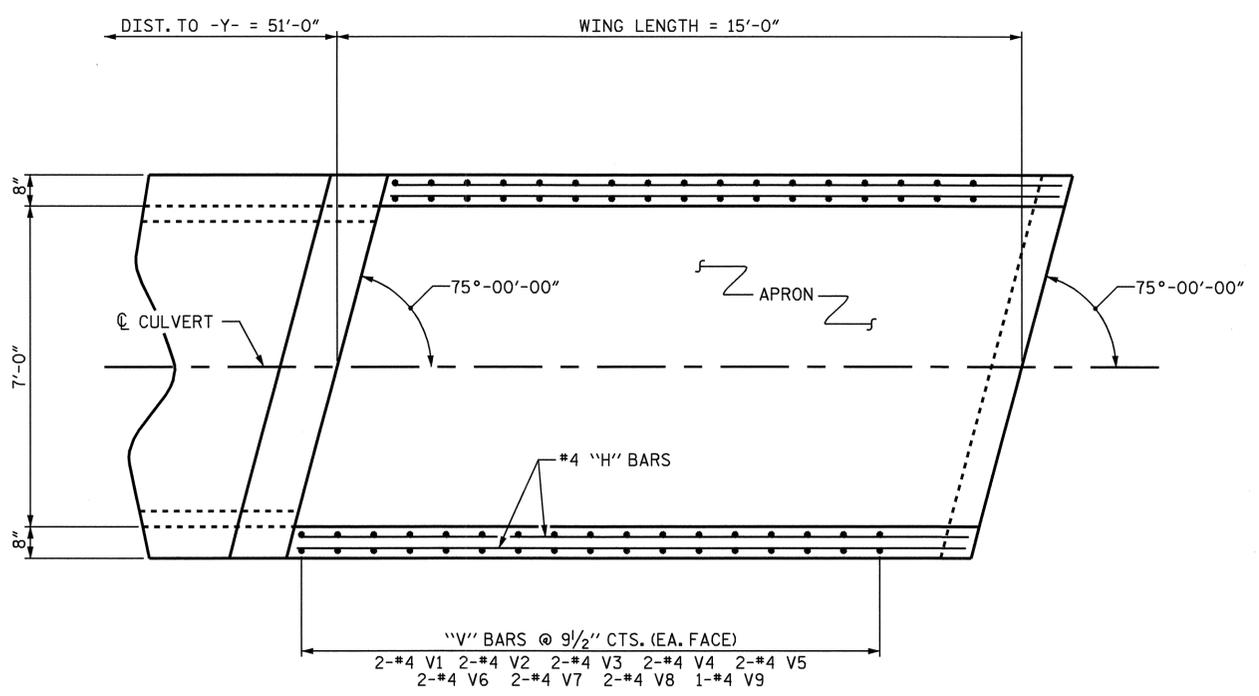
DRAWN BY: A.S. CALLAWAY DATE: 1/12/05
 CHECKED BY: B.N. BARODAWALA DATE: 1/27/05

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

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	4	#4	STR	14'-8"	39
H2	4	#4	STR	14'-5"	39
H3	4	#4	STR	12'-4"	33
H4	4	#4	STR	10'-3"	27
H5	4	#4	STR	8'-2"	22
H6	4	#4	STR	6'-0"	16
H7	4	#4	STR	3'-11"	10
H8	4	#4	STR	1'-10"	5
H9	4	#4	STR	16'-3"	43
V1	8	#4	STR	7'-7"	41
V2	8	#4	STR	6'-10"	37
V3	8	#4	STR	6'-1"	33
V4	8	#4	STR	5'-4"	29
V5	8	#4	STR	4'-7"	24
V6	8	#4	STR	3'-10"	20
V7	8	#4	STR	3'-0"	16
V8	8	#4	STR	2'-3"	12
V9	4	#4	STR	1'-11"	5
REINFORCING STEEL FOR 2 WINGS				LBS.	451
CLASS A CONCRETE 2 WINGS				C.Y.	3.5

NOTES
 REINFORCING STEEL AND CONCRETE IN THE APRON AND END CURTAIN WALL ARE INCLUDED IN THE BILL OF MATERIAL FOR THE BARREL.
 THE VERTICAL LEG OF THE A2 BARS SHALL BE CUT OFF AS NECESSARY AT THE ENDS OF THE WINGS TO MATCH HEIGHT OF "V" BARS.



PROJECT NO. U-3401
RANDOLPH COUNTY
 STATION: 30+24.50 -Y-
 SHEET 4 OF 4

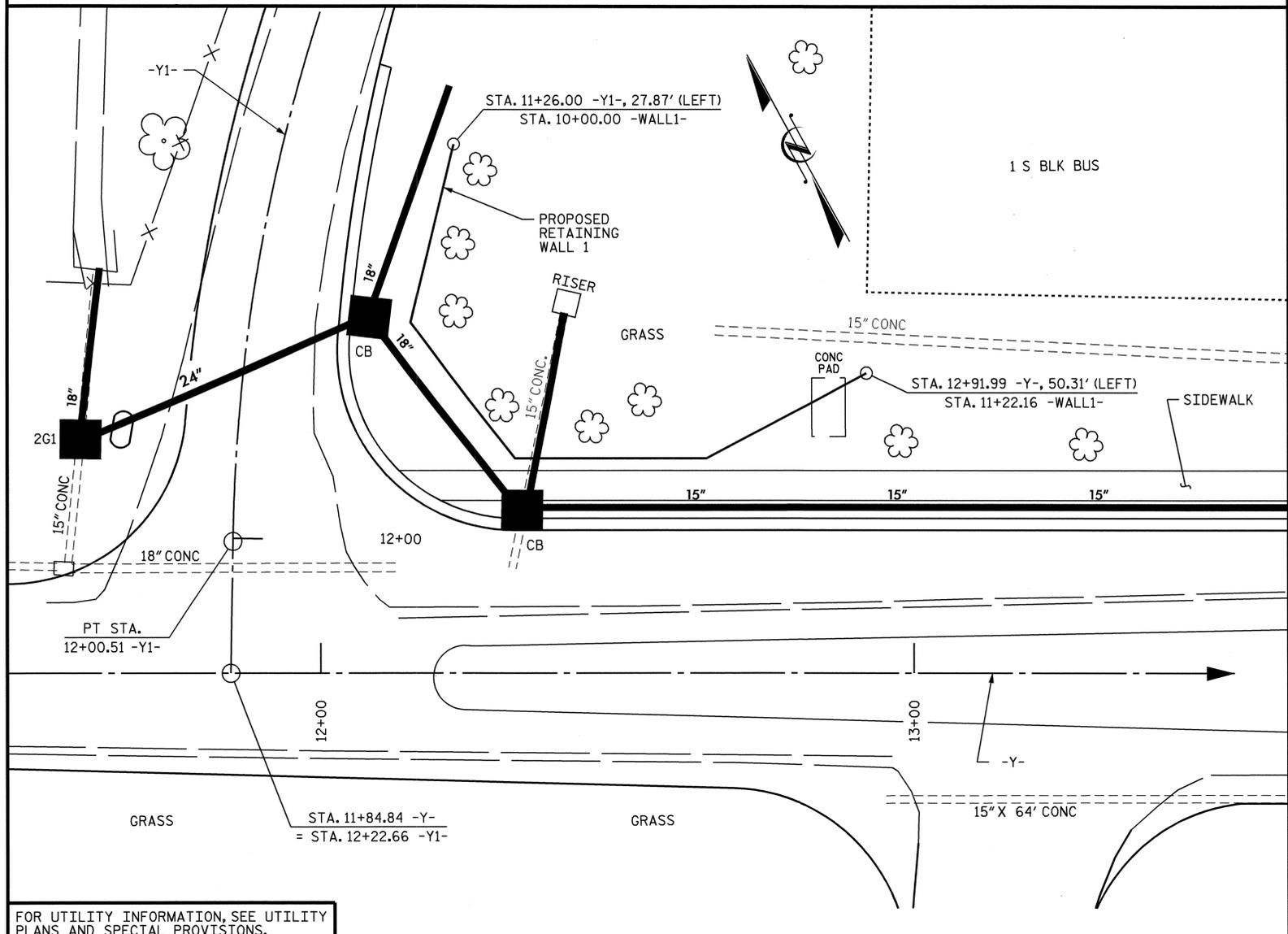
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
OUTLET WINGS FOR CONCRETE BOX CULVERT
 H = 7'-0" SLOPE = 2:1
 75° SKEW



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

DRAWN BY: A.S. CALLAWAY DATE: 1/12/05
 CHECKED BY: B.N. BARODAWALA DATE: 1/27/05

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FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

RETAINING WALL ELEVATIONS						
WALL ALIGNMENT STATION	REFERENCE STATION	OFFSET TO FACE OF WALL (FT.)	EXISTING GROUND ELEV.	TOP OF WALL ELEV.	BOTTOM OF WALL ELEV.	DESIGN WALL HEIGHT (FT.)
10+00.00	11+26.00 -Y1-	27.87	795.89	796.39	794.53	1.86
10+03.63	11+30.00 -Y1-	27.94	795.64	796.39	793.94	2.45
10+08.16	11+35.00 -Y1-	27.96	795.46	796.39	793.21	3.18
10+12.70	11+40.00 -Y1-	27.91	795.36	796.39	792.49	3.90
10+17.24	11+45.00 -Y1-	27.77	795.20	796.39	791.76	4.63
				795.72	791.76	3.96
10+21.78	11+50.00 -Y1-	27.56	794.90	795.72	791.03	4.69
10+26.33	11+55.00 -Y1-	27.28	794.64	795.72	790.30	5.42
10+30.89	11+60.00 -Y1-	26.92	794.52	795.72	789.58	6.14
10+38.70	12+20.00 -Y-	52.30	794.42	795.72	788.73	6.99
10+46.80	12+25.00 -Y-	45.92	794.32	795.72	788.72	7.00
10+54.91	12+30.00 -Y-	39.55	794.05	795.72	788.78	6.94
10+61.62	12+35.00 -Y-	36.00	794.13	795.72	788.87	6.85
10+66.62	12+40.00 -Y-	36.00	794.41	795.72	789.02	6.70
10+71.62	12+45.00 -Y-	36.00	794.54	795.72	789.17	6.55
10+76.62	12+50.00 -Y-	36.00	794.87	795.72	789.33	6.39
				796.50	789.33	7.17
10+81.62	12+55.00 -Y-	36.00	795.24	796.50	789.48	7.02
10+86.62	12+60.00 -Y-	36.00	795.65	796.50	789.63	6.87
				797.20	789.63	7.57
10+91.62	12+65.00 -Y-	36.00	796.12	797.20	789.79	7.41
10+97.28	12+70.00 -Y-	38.67	796.63	797.20	791.27	5.93
				798.50	791.27	7.23
11+02.94	12+75.00 -Y-	41.31	797.22	798.50	792.74	5.76
11+08.60	12+80.00 -Y-	43.96	797.78	798.50	794.21	4.29
				799.00	794.21	4.79
11+14.26	12+85.00 -Y-	46.61	798.05	799.00	795.68	3.32
11+19.91	12+90.00 -Y-	49.26	798.35	799.00	797.14	1.86
11+22.16	12+91.99 -Y-	50.31	798.17	799.00	797.19	1.81

ALL ELEVATIONS ARE SHOWN IN FEET. FOR DESIGN WALL HEIGHT AND WALL DETAILS, SEE SHEET 3 OF 3.

TOTAL BILL OF MATERIAL	
GRAVITY RETAINING WALLS	687 SQ. FT.

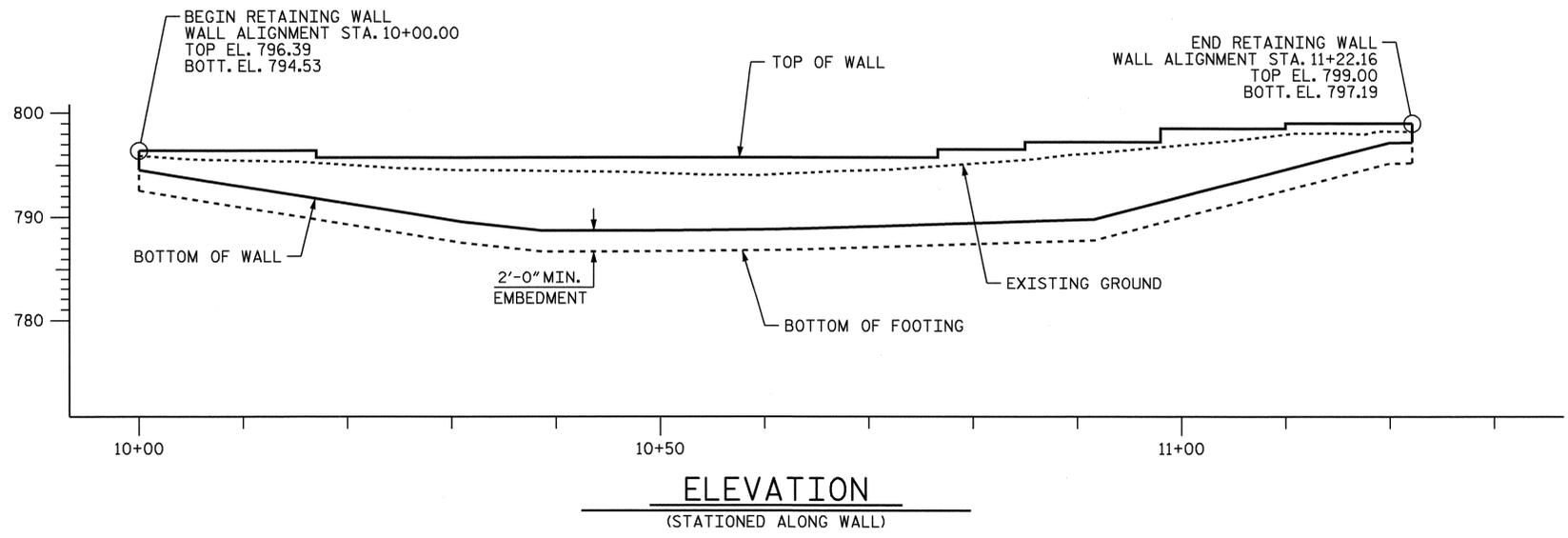
PROJECT NO. U-3401
 RANDOLPH COUNTY
 STATION: 11+26.00 -Y1-

SHEET 1 OF 3

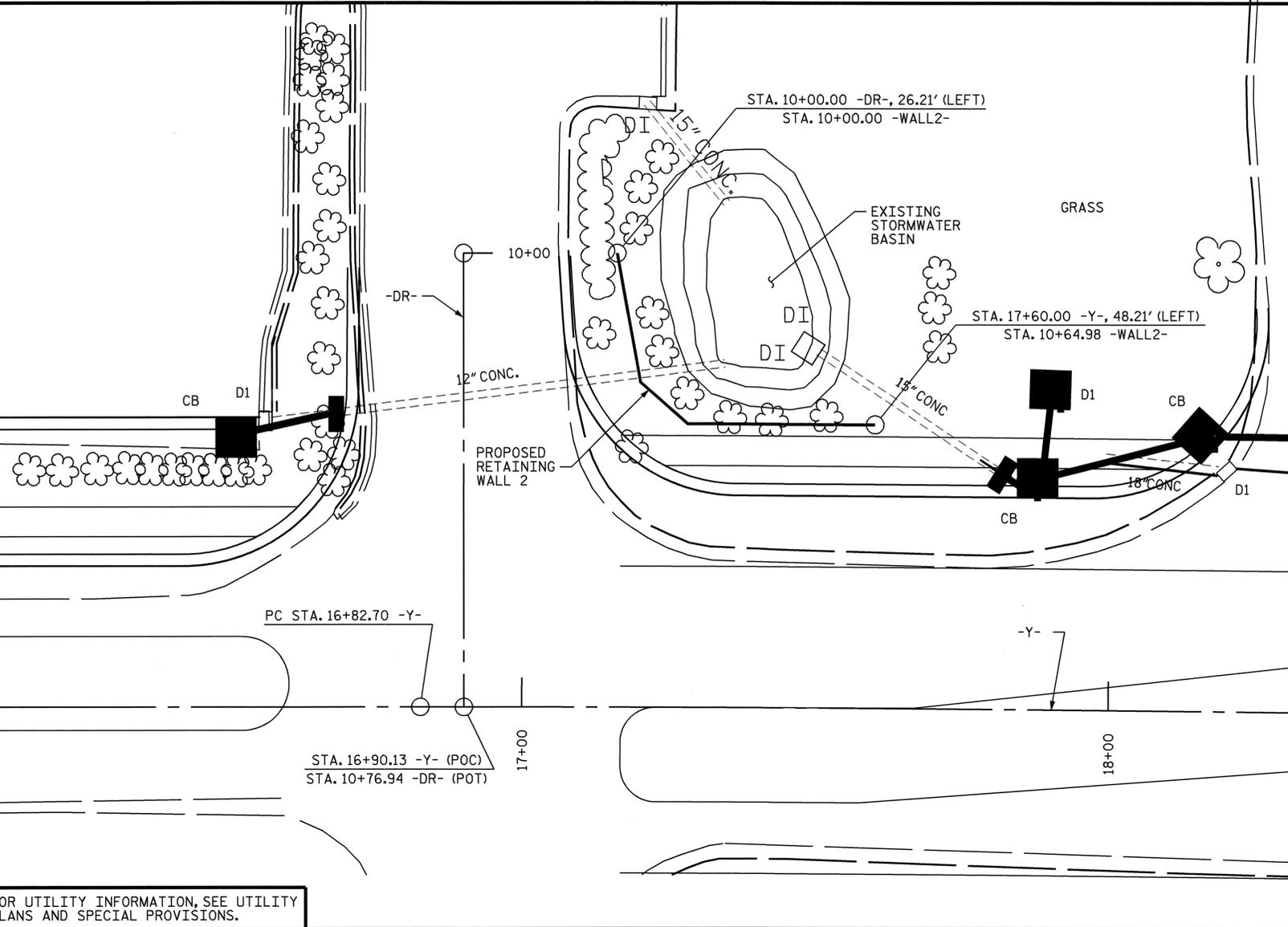
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GRAVITY RETAINING WALL

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



DRAWN BY: P.C. BREWER DATE: 5/24/06
 CHECKED BY: A.S. CALLAWAY DATE: 6/7/06



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

RETAINING WALL ELEVATIONS						
WALL ALIGNMENT STATION	REFERENCE STATION	OFFSET TO FACE OF WALL (FT.)	EXISTING GROUND ELEV.	TOP OF WALL ELEV.	BOTTOM OF WALL ELEV.	DESIGN WALL HEIGHT (FT.)
10+00.00	10+00.00 -DR-	26.21	799.09	800.00	798.42	1.58
10+05.08	10+05.00 -DR-	27.10	799.01	800.00	798.11	1.89
10+10.16	10+10.00 -DR-	28.00	799.09	800.00	797.75	2.25
10+15.24	10+15.00 -DR-	28.89	799.05	800.00	797.33	2.67
10+20.32	10+20.00 -DR-	29.78	798.87	800.00	796.85	3.15
10+26.95	10+25.00 -DR-	33.59	798.53	799.50	796.44	3.06
10+33.03	17+28.18 -Y-	50.75	798.64	799.50	795.39	4.11
10+34.85	17+30.00 -Y-	48.00	798.56	799.50	795.40	4.10
10+39.87	17+35.00 -Y-	48.00	798.59	799.50	795.45	4.05
10+44.90	17+40.00 -Y-	48.00	798.62	799.50	795.47	4.03
10+49.92	17+45.00 -Y-	48.00	798.67	799.50	795.49	4.01
10+54.94	17+50.00 -Y-	48.00	798.60	799.50	795.51	3.99
10+59.96	17+55.00 -Y-	48.00	798.43	799.50	795.53	3.97
10+64.98	17+60.00 -Y-	48.00	797.88	799.50	795.55	3.95

ALL ELEVATIONS ARE SHOWN IN FEET. FOR DESIGN WALL HEIGHT AND WALL DETAILS, SEE SHEET 3 OF 3.

TOTAL BILL OF MATERIAL

GRAVITY RETAINING WALLS	216 SQ. FT.
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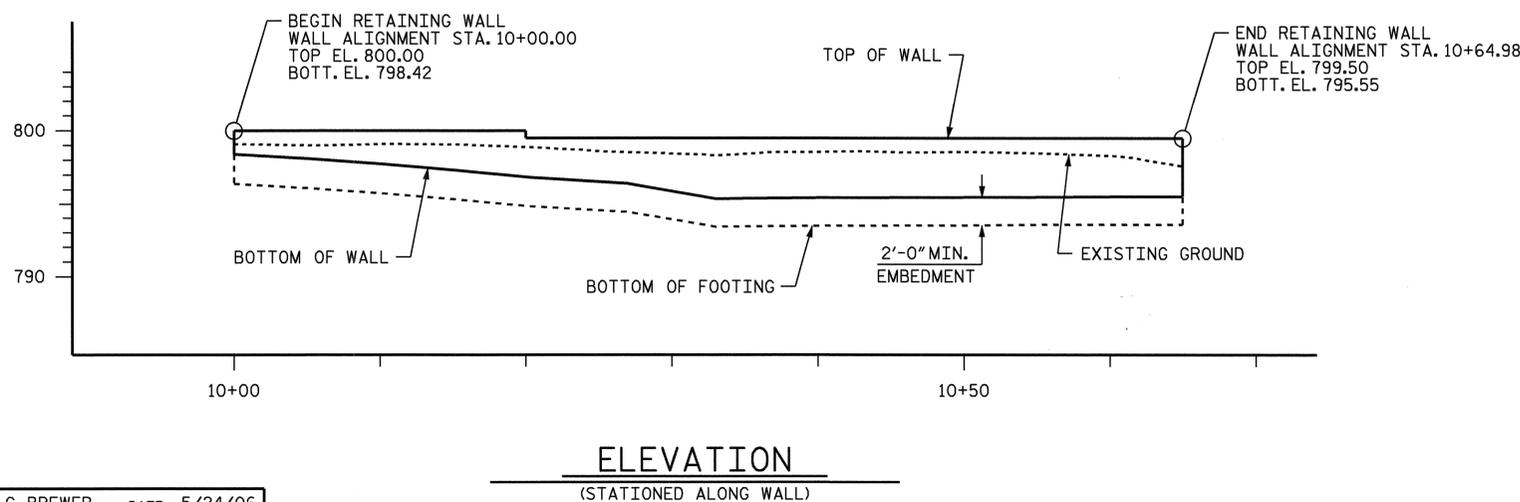
PROJECT NO. U-3401
RANDOLPH COUNTY
 STATION: 10+00.00 -DR-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GRAVITY RETAINING WALL

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



DRAWN BY: P.C. BREWER DATE: 5/24/06
 CHECKED BY: A.S. CALLAWAY DATE: 6/7/06

NOTES:

FOR GRAVITY RETAINING WALLS, SEE SECTION 453 OF THE STANDARD SPECIFICATIONS.

THE STANDARD GRAVITY RETAINING WALL IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 TOTAL UNIT WEIGHT = 120 PCF
 COHESION = 0 PSF
 FRICTION ANGLE = 35 DEGREES
 (GROUNDWATER WITHIN 5'-0" OF BOTTOM OF FOOTING)
 FRICTION ANGLE = 30 DEGREES
 (GROUNDWATER MORE THAN 5'-0" BELOW BOTTOM OF FOOTING)

DO NOT USE A STANDARD GRAVITY RETAINING WALL IF THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF FOOTING.

DO NOT USE A STANDARD GRAVITY RETAINING WALL WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE WALL.

DO NOT PLACE CONCRETE UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND CHECKING FOUNDATION MATERIAL FOR IN-SITU ASSUMED SOIL PARAMETERS.

USE CLASS "A" CONCRETE AND PROVIDE CLASS I SURFACE FINISH FOR ALL EXPOSED SURFACES.

PROVIDE 3" DIAMETER WEEP HOLES ON 10'-0" CENTERS ALONG WALL. SLOPE WEEP HOLES ON A 1" PER FOOT SLOPE THROUGH THE WALL SO THAT WATER DRAINS OUT OF THE FRONT OF THE WALL.

CONSTRUCT A HORIZONTAL DRAIN IN SUBDRAIN FINE AGGREGATE AT LEAST 1'-0" TALL AND 1'-0" WIDE TO CONNECT ALL STONE DRAINS.

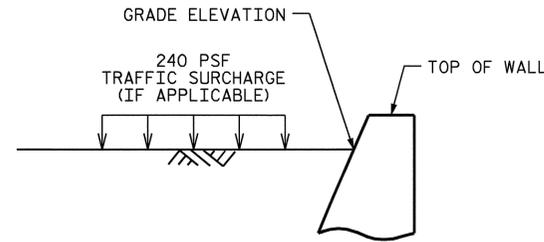
PROVIDE GROOVED CONTRACTION JOINTS EVERY 10'-0" AND EXPANSION JOINTS EVERY 30'-0" ALONG THE WALL.

DO NOT BACKFILL BEHIND WALL UNTIL CONCRETE DEVELOPS A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. COMPACT BACKFILL IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. PLACE BACKFILL WITHIN 3'-0" OF THE BACK OF THE WALL WITH HAND OPERATED EQUIPMENT. DO NOT OPERATE HEAVY EARTH MOVING EQUIPMENT WITHIN 10'-0" OF THE BACK OF WALL.

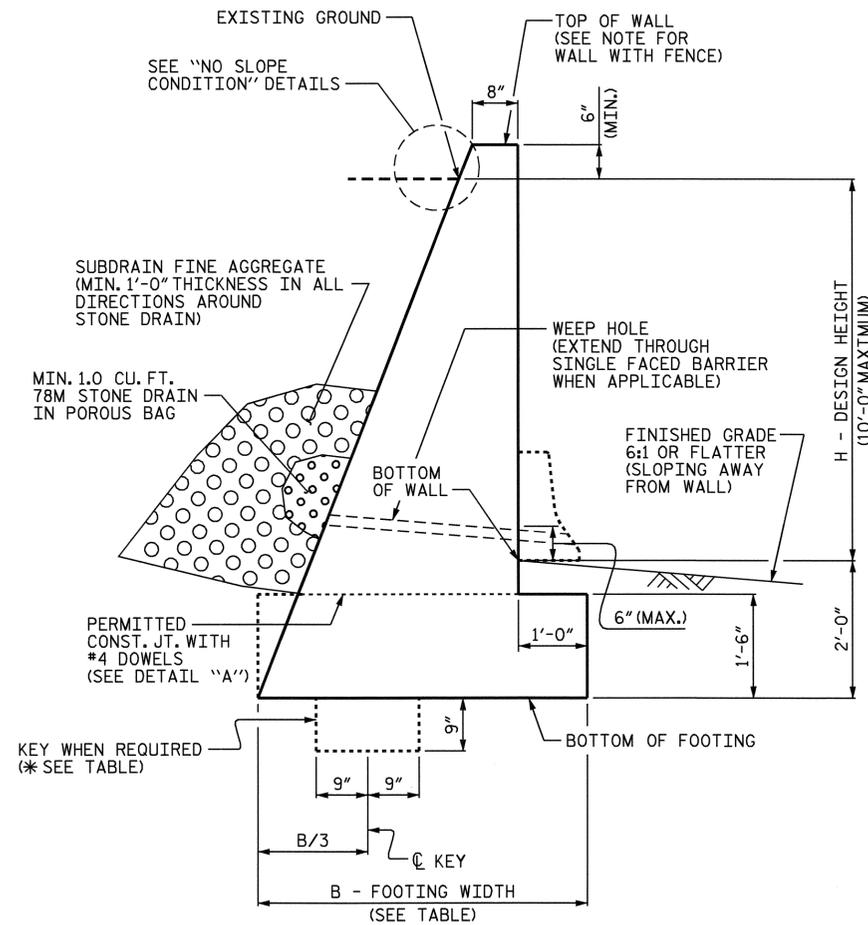
WHEN A CONSTRUCTION JOINT IS LOCATED AT THE BASE OF THE WALL, IN SECTION, PROVIDE A MINIMUM OF 3-#4 DOWELS AT AN EQUAL SPACING. SPACE ALL DOWELS AT 1'-6" CENTERS ALONG THE LENGTH OF THE WALL.

SEE PREVIOUS SHEETS FOR PLAN AND PROFILE VIEW (WALL ENVELOPE) AND PROPOSED ELEVATIONS FOR GRAVITY RETAINING WALLS.

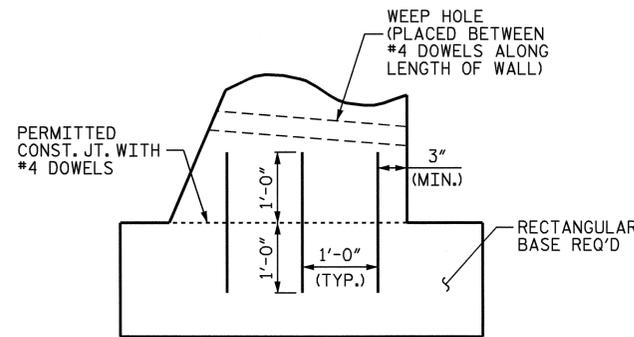
FOR WALL WITH FENCE, USE SLEEVES IN ACCORDANCE WITH SECTION 866 OF THE STANDARD SPECIFICATIONS FOR FENCE POSTS, OR SUBMIT FENCE POST ANCHOR PLATE DETAILS.



NO SLOPE CONDITION



TYPICAL SECTION



DETAIL "A"

H + 2 (ft)	< 6	6 - 9	> 9 - 12
NO SLOPE CONDITION WITHOUT TRAFFIC SURCHARGE	.60	.60	.60

B/(H + 2) RATIO

* KEY IS REQUIRED FOR SLOPE CONDITION OR NO SLOPE CONDITION WITH TRAFFIC SURCHARGE WHEN H + 2ft IS 6'-0" OR GREATER.

PROJECT NO. U-3401
RANDOLPH COUNTY
 STATION: _____

SHEET 3 OF 3

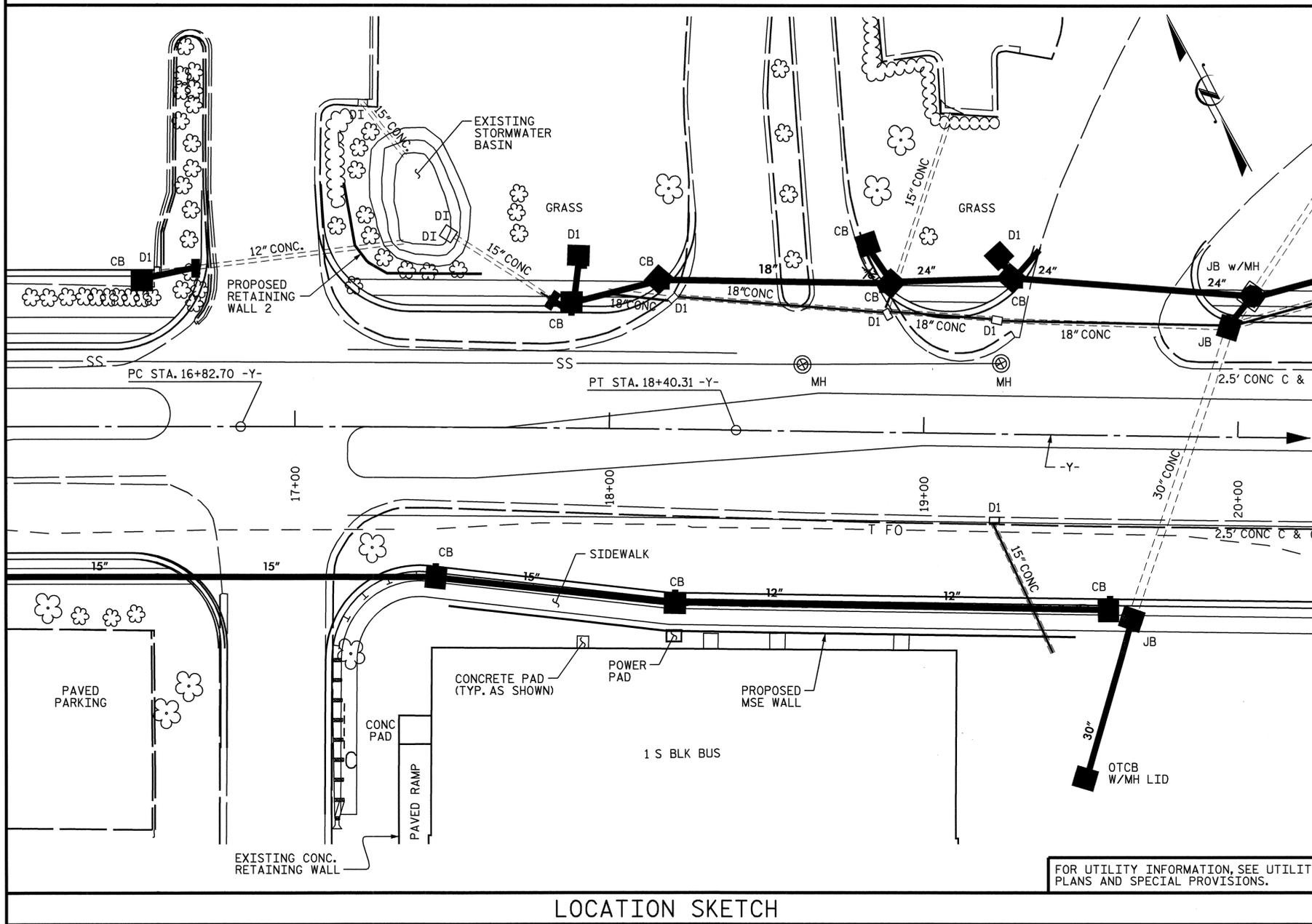
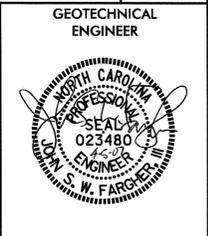


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD GRAVITY RETAINING WALL DETAILS

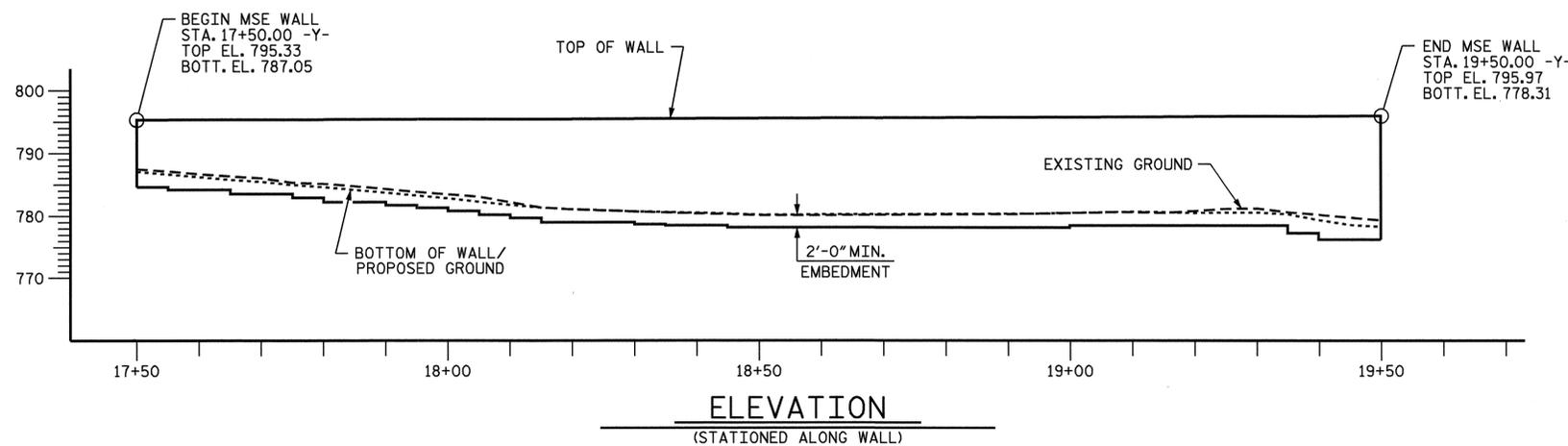
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	W-3
1			3			TOTAL SHEETS
2			4			5

ASSEMBLED BY : P.C. BREWER DATE : 5/24/06
 CHECKED BY : A.S. CALLAWAY DATE : 6/7/06
 DRAWN BY : KMM 12/05
 CHECKED BY : GM 5/06



MSE WALL ELEVATIONS						
WALL ALIGNMENT STATION	REFERENCE STATION	OFFSET TO FACE OF WALL (FT.)	EXISTING GROUND ELEV.	TOP OF WALL ELEV.	BOTTOM OF WALL ELEV.	* WALL HEIGHT (FT.)
17+50.00	17+50.00 -Y-	56.74	787.41	795.33	787.05	8.28
17+55.00	17+55.00 -Y-	57.28	787.07	795.34	786.62	8.72
17+60.01	17+60.00 -Y-	57.81	786.65	795.35	786.19	9.16
17+65.01	17+65.00 -Y-	58.34	786.30	795.36	785.77	9.59
17+70.01	17+70.00 -Y-	58.86	786.00	795.36	785.46	9.90
17+75.01	17+75.00 -Y-	59.39	785.30	795.37	784.95	10.42
17+80.02	17+80.00 -Y-	59.91	785.13	795.38	784.61	10.77
17+85.02	17+85.00 -Y-	60.43	784.74	795.39	784.16	11.23
17+90.02	17+90.00 -Y-	60.94	784.29	795.40	783.72	11.68
17+95.02	17+95.00 -Y-	61.46	783.84	795.41	783.27	12.14
18+00.02	18+00.00 -Y-	61.97	783.43	795.41	782.82	12.59
18+05.01	18+05.00 -Y-	62.48	783.04	795.42	782.25	13.17
18+10.01	18+10.00 -Y-	62.99	782.26	795.43	781.79	13.64
18+15.01	18+15.00 -Y-	63.50	781.36	795.44	781.33	14.11
18+20.00	18+20.00 -Y-	64.00	781.06	795.45	781.08	14.37
18+24.98	18+25.00 -Y-	64.00	780.90	795.46	780.92	14.54
18+29.95	18+30.00 -Y-	64.00	780.72	795.48	780.74	14.74
18+34.92	18+35.00 -Y-	64.00	780.57	795.50	780.64	14.86
18+39.89	18+40.00 -Y-	64.00	780.43	795.52	780.50	15.02
18+44.89	18+45.00 -Y-	64.00	780.29	795.54	780.36	15.18
18+49.89	18+50.00 -Y-	64.00	780.14	795.56	780.21	15.35
18+54.89	18+55.00 -Y-	64.00	780.11	795.58	780.18	15.40
18+59.89	18+60.00 -Y-	64.00	780.14	795.59	780.22	15.37
18+64.89	18+65.00 -Y-	64.00	780.16	795.61	780.24	15.37
18+69.89	18+70.00 -Y-	64.00	780.19	795.63	780.27	15.36
18+74.89	18+75.00 -Y-	64.00	780.21	795.65	780.29	15.36
18+79.89	18+80.00 -Y-	64.00	780.24	795.67	780.32	15.35
18+84.89	18+85.00 -Y-	64.00	780.26	795.69	780.34	15.35
18+89.89	18+90.00 -Y-	64.00	780.31	795.71	780.33	15.38
18+94.89	18+95.00 -Y-	64.00	780.40	795.73	780.38	15.35
18+99.89	19+00.00 -Y-	64.00	780.49	795.75	780.48	15.27
19+04.89	19+05.00 -Y-	64.00	780.59	795.77	780.58	15.19
19+09.89	19+10.00 -Y-	64.00	780.64	795.79	780.68	15.11
19+14.89	19+15.00 -Y-	64.00	780.53	795.81	780.62	15.19
19+19.89	19+20.00 -Y-	64.00	780.79	795.84	780.48	15.36
19+24.89	19+25.00 -Y-	64.00	781.15	795.86	780.56	15.30
19+29.89	19+30.00 -Y-	64.00	781.17	795.88	780.54	15.34
19+34.89	19+35.00 -Y-	64.00	780.59	795.90	780.27	15.63
19+39.89	19+40.00 -Y-	64.00	780.21	795.92	779.37	16.55
19+44.89	19+45.00 -Y-	64.00	779.76	795.94	778.60	17.34
19+49.89	19+50.00 -Y-	64.00	779.32	795.97	778.31	17.66

ALL ELEVATIONS ARE SHOWN IN FEET. FOR WALL DETAILS, SEE SHEET 2 OF 2.
 * ACTUAL MSE WALL HEIGHT IS DIFFERENT THAN THE DIFFERENCE BETWEEN TOP OF WALL ELEVATION AND THE PROPOSED GROUND AND BOTTOM OF WALL ELEVATION. SEE SECTION THRU WALL FOR DETAILS.



TOTAL BILL OF MATERIAL	
MSE RETAINING WALL	2792 SQ. FT.

PREPARED BY: E.J. SALVO DATE: 12/05/06
 REVIEWED BY: S.C. CLARK DATE: 12/11/06

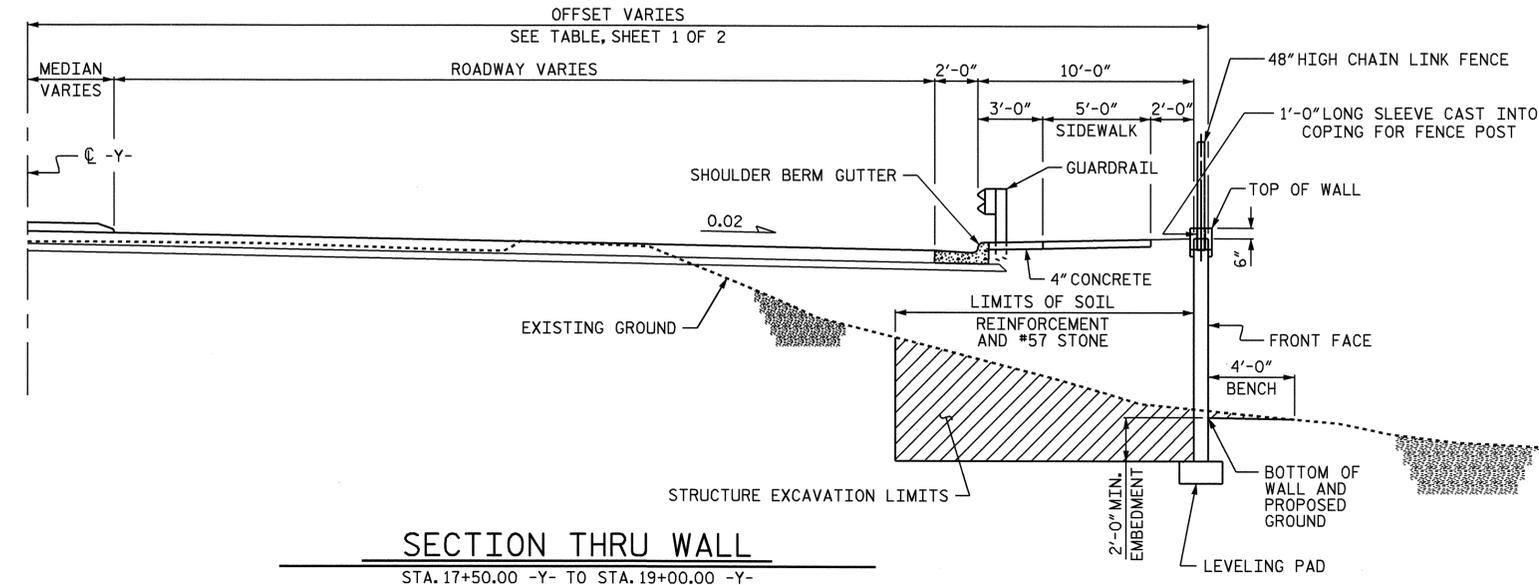
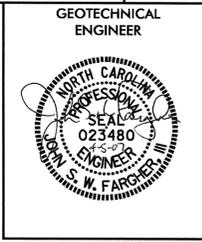
GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

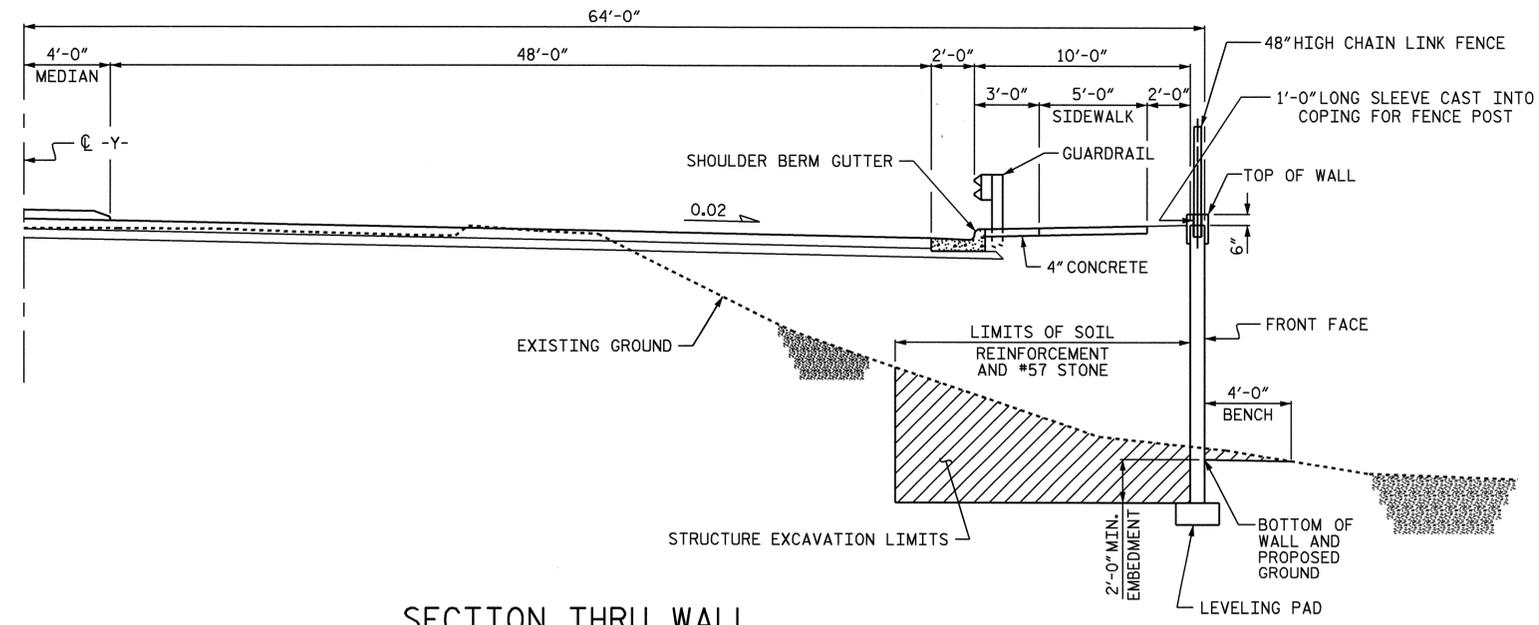
MSE RETAINING WALL DETAILS
RANDOLPH COUNTY

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

SHEET NO. W-4
 TOTAL SHEETS 5



SECTION THRU WALL
STA. 17+50.00 -Y- TO STA. 19+00.00 -Y-



SECTION THRU WALL
STA. 19+00.00 -Y- TO STA. 19+50.00 -Y-

NOTES

- SUBMIT COMPLETE WORKING DRAWINGS, ERECTION PLANS AND DESIGN CALCULATIONS FOR REVIEW AND APPROVAL PRIOR TO BEGINNING THE MSE WALL. SEE MSE RETAINING WALLS SPECIAL PROVISION.
- DESIGN THE MSE WALL TO MEET ALL THE CRITERIA OF THE LATEST VERSION OF THE AASHTO STANDARD SPECIFICATIONS (ALLOWABLE STRENGTH DESIGN) FOR HIGHWAY BRIDGES AND ITS INTERIMS.
- THE SERVICE LIFE OF THE MSE WALL SHALL BE 100 OR 75 YEARS.
- ALL BACKFILL MATERIAL WITHIN THE REINFORCED ZONE MUST BE #57 WASHED CRUSHED STONE, SEE SECTION 1005 OF THE STANDARD SPECIFICATIONS FOR #57 STONE.
- USE THE FOLLOWING MATERIAL PARAMETERS IN THE WALL DESIGN:
 - #57 STONE-UNIT WEIGHT = 105 PCF, $\phi = 34^\circ$, $C = 0$.
 - RETAINED MATERIAL-UNIT WEIGHT = 120 PCF, $\phi = 30^\circ$, $C = 0$
 - ALL OTHER EARTH MATERIAL AROUND WALL-UNIT WEIGHT = 120 PCF, $\phi = 30^\circ$, $C = 0$
 - ALLOWABLE BEARING PRESSURE = 1:2 TSF
- IN ELEVATION VIEW, SHOW THE TOP OF WALL (SOLID LINE), THE EXISTING GROUND LINE (LARGE DASHED LINE), THE PROPOSED GROUND LINE (SMALL DASHED LINE), AND THE BOTTOM OF WALL (SOLID LINE). SHOW ELEVATIONS FOR THE TOP OF WALL AT VERTICAL BREAK POINTS AND AT NO GREATER THAN 50 FOOT INTERVALS. SHOW FRONT FACE ELEVATION VIEW.
- CONCRETE COPING MUST BE CAST-IN-PLACE. TOP OF COPING ELEVATION SHALL BE A MINIMUM OF 6" ABOVE THE FINISHED GRADE TO AVOID SPILLOVER.
- SHOW A DETAIL FOR FABRIC AND SOIL ABOVE THE #57 STONE WHERE APPROPRIATE.
- SHOW THE LIMITS OF SOIL REINFORCEMENT AND THE #57 STONE.
- THE PANELS SHALL HAVE A PLAIN GRAY FINISH.
- A MINIMUM 4 FOOT BENCH IS REQUIRED IN FRONT OF THE WALL. GRADE BENCH TO CARRY WATER AWAY FROM THE WALL.
- SHOW ELEVATIONS FOR TOP OF LEVELING PAD.
- A MINIMUM PANEL EMBEDMENT OF 2 FEET BELOW THE PROPOSED GROUND LINE IS REQUIRED.
- SHOW THE REQUIRED BEARING PRESSURE OF THE WALL ON PLANS.
- DRAINAGE MUST BE AWAY FROM THE WALL AT THE TOP AND BOTTOM.
- SHOW DETAILS IN THE PLANS FOR SKEWING REINFORCING STRIPS OR MATS AROUND ANY OBSTRUCTIONS, SUCH AS GUARDRAILS, PAVED DITCHES, PAVEMENT STRUCTURES AND DRAINAGE STRUCTURES. SOIL REINFORCING MUST NOT BE IN CONTACT WITH ANY OBSTRUCTIONS.
- FINAL PLANS MUST BE ON REPRODUCIBLE SHEETS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA.
- THE LEVELING PAD SHALL BE CAST-IN-PLACE AND MADE CONTINUOUS AT STEPS.
- CONSTRUCT JOINTS IN THE COPING IN ACCORDANCE WITH ARTICLE 825-10 OF THE STANDARD SPECIFICATIONS. LOCATE JOINTS IN ALL EXPOSED FACES OF THE COPING, AT 10 FEET MAXIMUM CENTERS, TO COINCIDE WITH PANEL JOINTS. EVERY THIRD JOINT SHALL BE AN EXPANSION JOINT. STOP REINFORCING STEEL 2" EITHER SIDE OF EXPANSION JOINTS. OTHER JOINTS SHALL BE GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH.
- NOTE ON CONTRACTOR'S WORKING DRAWINGS: "VERIFY BEARING CAPACITY OF THE WALL FOUNDATION SOILS IN THE FIELD."
- ALL STRUCTURE EXCAVATION FOR THE CONSTRUCTION OF THE MSE RETAINING WALL WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE WALL.
- THE MODULAR BLOCK WALL MUST HAVE STEEL REINFORCEMENTS. EXTENSIBLE REINFORCEMENTS SUCH AS GEOGRID WILL NOT BE ACCEPTED.
- THE GROUNDWATER ELEVATION SHALL BE TAKEN AS THE EXISTING GROUND SURFACE ELEVATION.
- NOTE ON CONTRACTOR'S WORKING DRAWINGS: "DRIVE PILES BEFORE BUILDING WALL".
- ALL MATERIALS FOR THE CONSTRUCTION OF THE FENCE WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE MSE WALL.
- FOR CONSTRUCTION AND MATERIALS FOR CHAIN LINK FENCE, SEE 2006 STANDARD SPECIFICATIONS, SECTIONS 866 AND 1050.

PREPARED BY: E.J. SALVO	DATE: 12/05/06
REVIEWED BY: S.C. CLARK	DATE: 12/11/06

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE

WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL DETAILS
RANDOLPH COUNTY

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

W-5
TOTAL SHEETS
5

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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