

TIP PROJECT: U-3613B

CONTRACT: C201700

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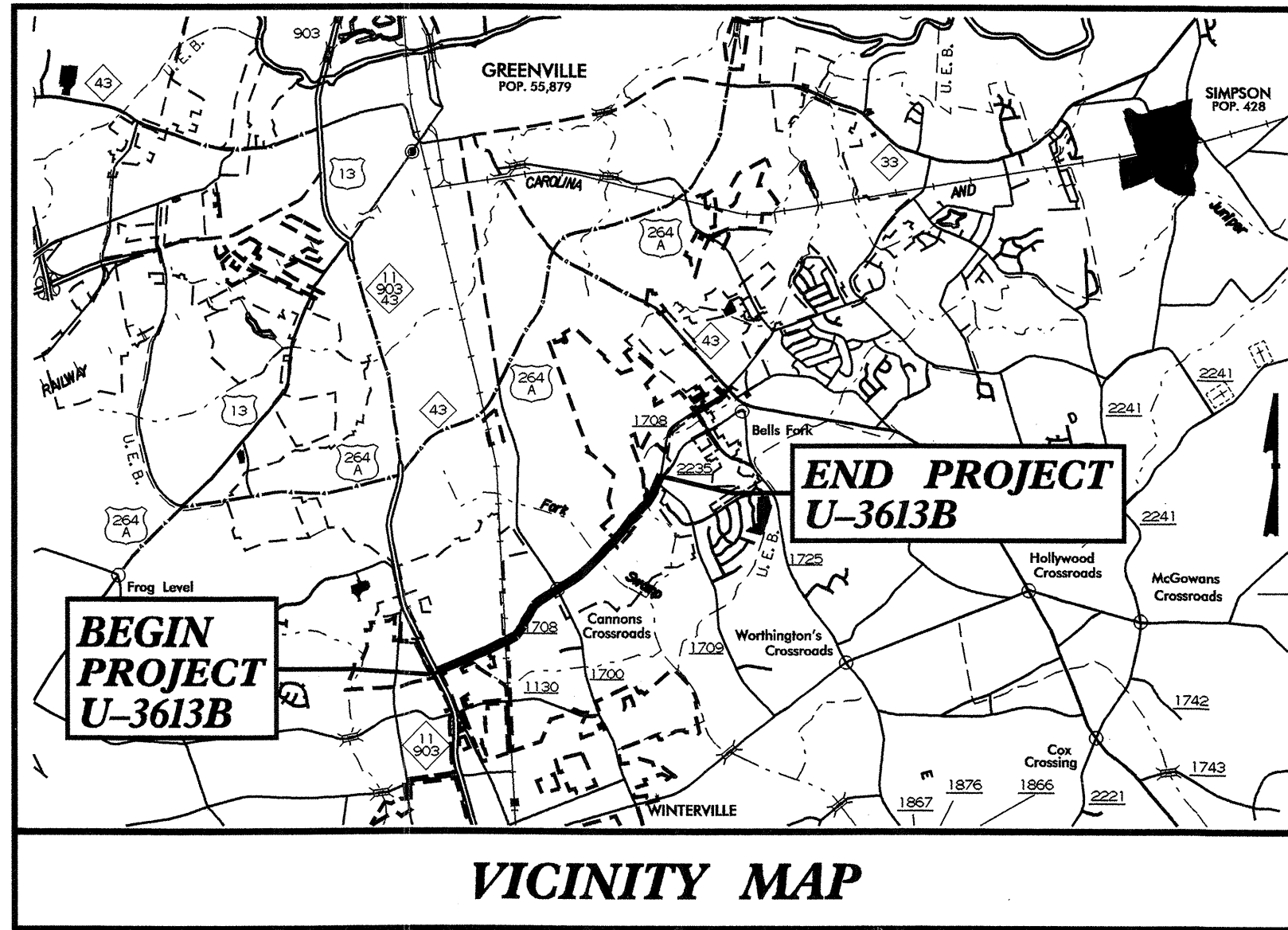
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

LOCATION: GREENVILLE - SR 1708 (FIRE TOWER ROAD) FROM WEST OF
NC 11-903 TO EAST OF SR 1709 (COREY RD).

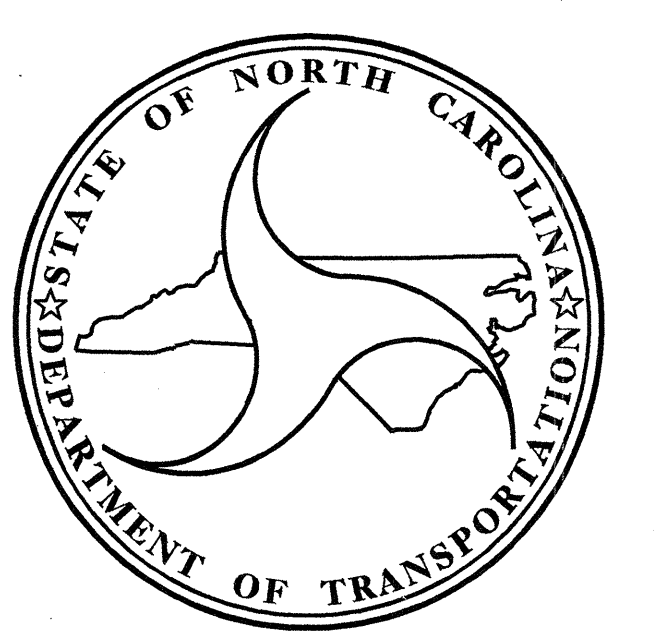
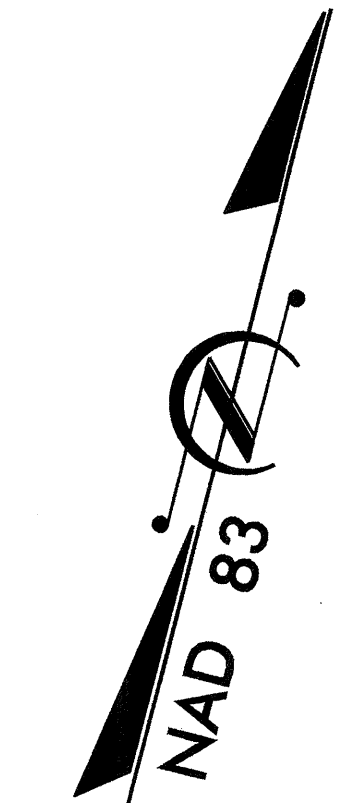
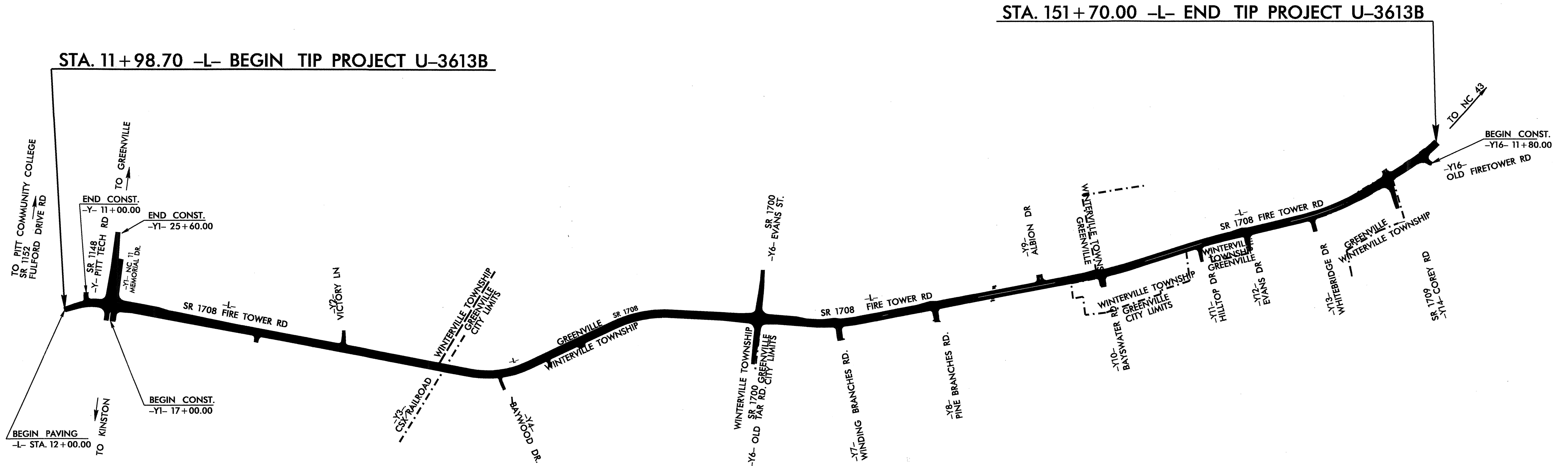
TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER,
CULVERT, RETAINING WALLS, GUARDRAIL AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3613B		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34961.1.2	MA-STP-1708(1)	PE	
34961.2.2	STP-1708(3)	RW, UTIL.	
34961.3.3	STP-1708(5)	CONST.	



VICINITY MAP

STRUCTURES



DESIGN DATA

ADT 2006 =	28,908
ADT 2030 =	42,200
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
* TTST 1 %	DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3613B =	2.646 mi.
TOTAL LENGTH OF TIP PROJECT U-3613B =	2.646 mi.

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

LETTING DATE:
December 19, 2006

B.C. HUNT, P.E.
PROJECT ENGINEER

T.G. PAYNE, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

Gregory R. Perfetti
5.5.06

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

DATE

10-MAR-2006 14:15
C:\STRUCTURE\U3613B\Final\U3613B.scd.TSH.01.dgn
R:\p\re

NOTES

ASSUMED LIVE LOAD, HS20-44 ALTERNATE LOADING.

FOR OTHER STANDARD DATA AND NOTES SEE STANDARD NOTES SHEET.

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

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

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

THE CONCRETE FOR THE PRECAST UNITS SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 5000 P.S.I.. THE CONCRETE FOR THE HEADWALLS, LEVELING PAD, WINGS AND END CURTAIN WALLS SHALL BE CLASS "A" CONCRETE AS PER THE STANDARD SPECIFICATIONS.

CAST-IN-PLACE CONCRETE SHALL BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS, AND CURTAIN WALL.
2. HEADWALLS, WING WALLS.

THE CONTRACTOR MAY CHOOSE TO CONSTRUCT A CAST-IN-PLACE CULVERT IN ACCORDANCE WITH THE INCLUDED PLANS AT NO ADDITIONAL COST. THE CONTRACT REQUIREMENTS WITH RESPECT TO CONSTRUCTION STAGING AND TIME SHALL BE SATISFIED REGARDLESS OF WHETHER A PRECAST OR CAST-IN-PLACE CULVERT IS CONSTRUCTED.

WHEN ANY PRECAST UNIT IS DAMAGED DURING HANDLING, THE ENGINEER AT HIS DISCRETION SHALL REJECT THE UNIT AS BEING UNFIT FOR INSTALLATION AND THE CONTRACTOR SHALL REMOVE SUCH REJECTED UNIT FROM THE PROJECT. MINOR DAMAGE TO THE UNIT MAY BE REPAIRED BY THE CONTRACTOR WHEN PERMITTED BY THE ENGINEER.

CARE SHALL BE TAKEN DURING BACKFILL AND COMPACTION OPERATION TO MAINTAIN ALIGNMENT AND PREVENT DAMAGE TO THE JOINTS. UNITS WHICH BECOME MISALIGNED, SHOW EXCESSIVE SETTLEMENT, OR HAVE OTHERWISE BEEN DAMAGED BY THE CONTRACTOR'S OPERATION SHALL AT THE DISCRETION OF THE ENGINEER BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT OF TRANSPORTATION.

CONCRETE CHAMFERS ON EXTERIOR LONGITUDINAL EDGES OF THE PRECAST UNITS MAY BE AS PER THE FABRICATORS RECOMMENDATION, HOWEVER ALL WORKMANSHIP SHALL PROVIDE CONCRETE COVER OVER THE WELDED WIRE FABRIC AS SPECIFIED ON THE PLANS AND THE CONCRETE CHAMFERS CHOSEN SHALL IN NO WAY FUNCTIONALLY LESSEN THE DESIGN SHOWN ON THE PLANS.

DESIGN EARTH COVER = 2.42'

FOR PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

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 SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC ROADWAY PLANS.

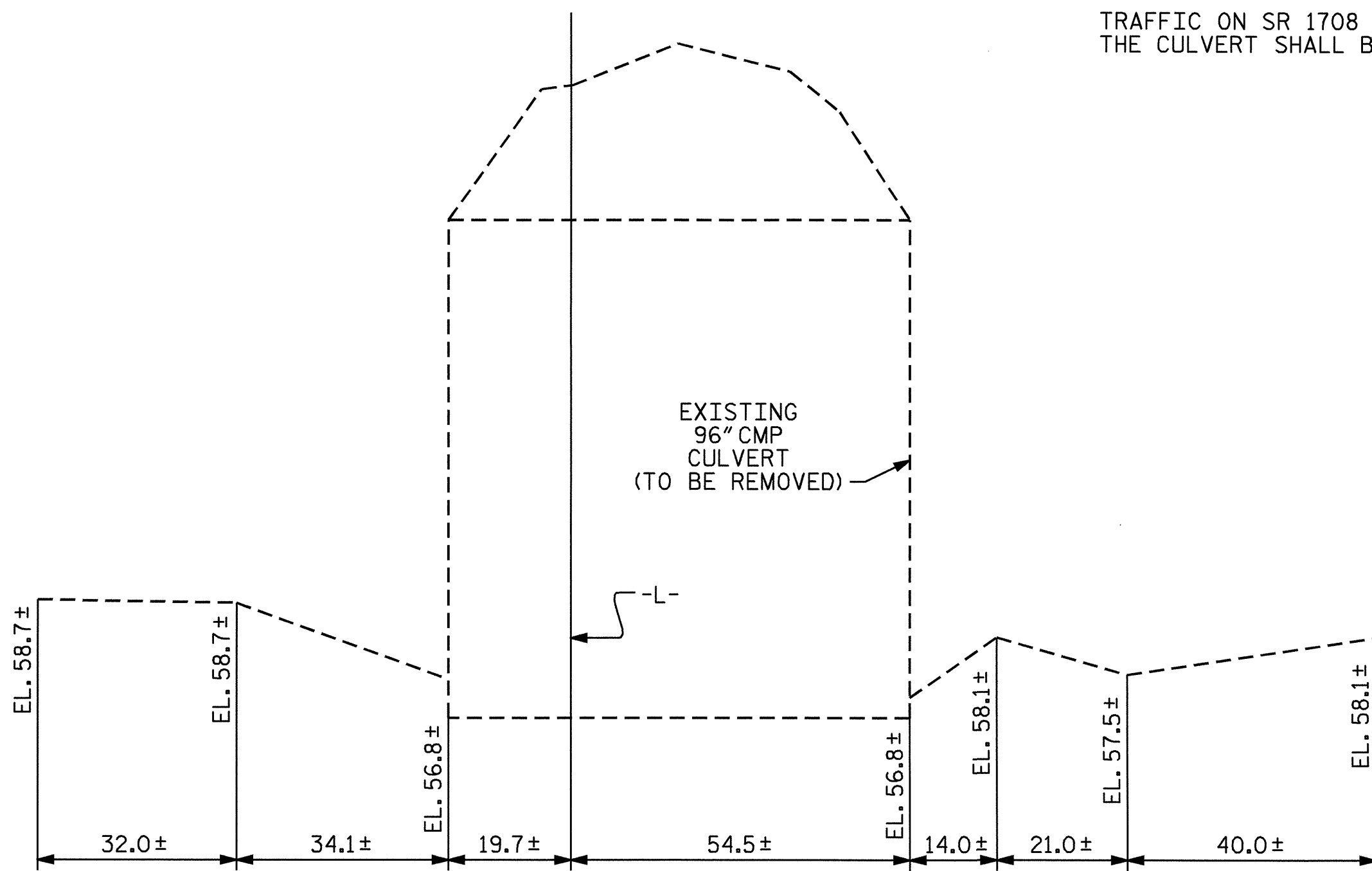
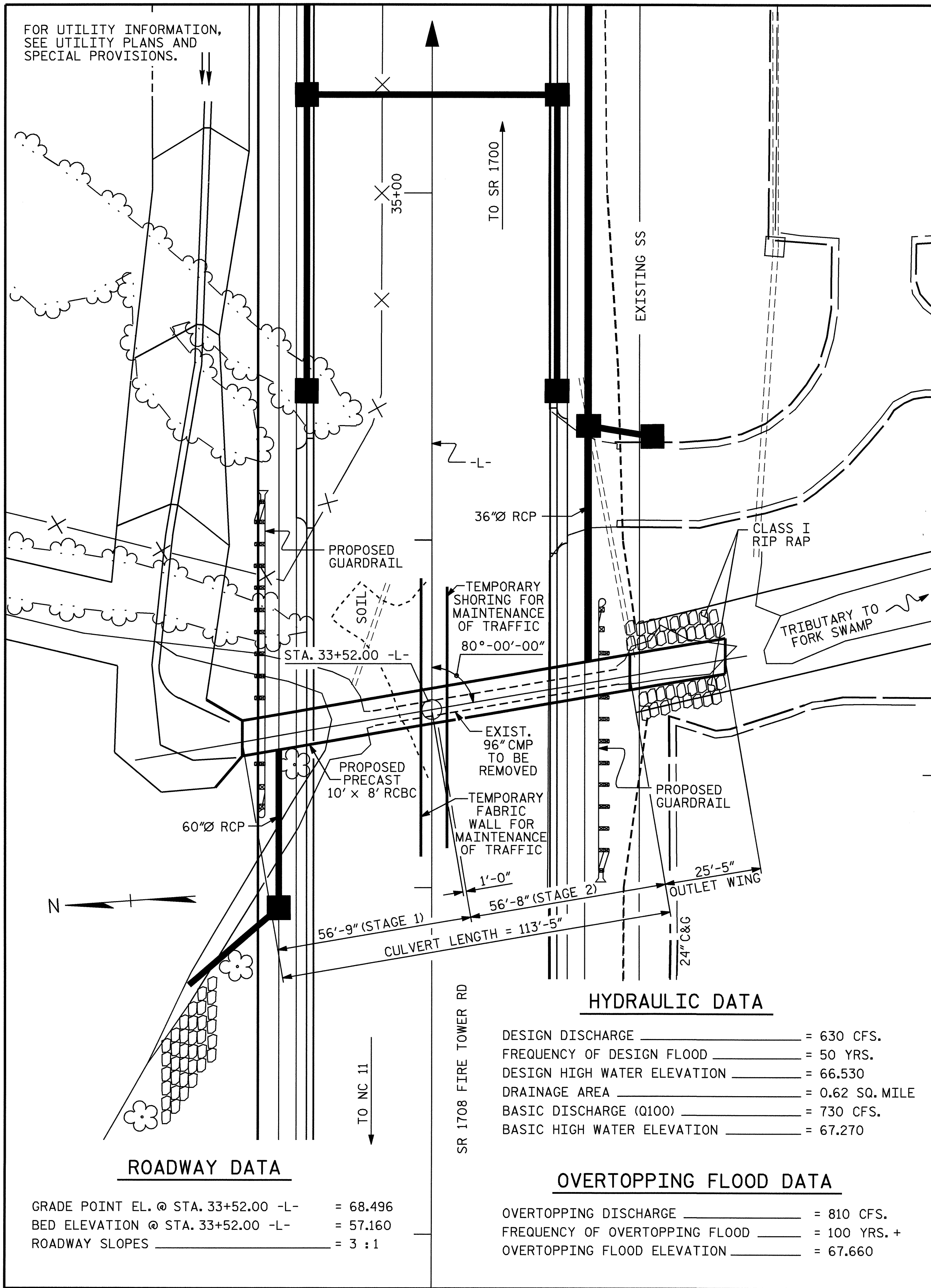
FOR LIMITS OF TEMPORARY FABRIC WALL FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY FABRIC WALL FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE COST OF REMOVAL AND DISPOSAL OF THE EXISTING PIPE CULVERT SHALL BE PAID FOR IN THE CULVERT EXCAVATION PAY ITEM.

TRAFFIC ON SR 1708 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN STAGES AS SHOWN ON THE PLANS.

TOTAL STRUCTURE QUANTITIES

	STAGE 1	STAGE 2	TOTAL
PRECAST REINFORCED CONCRETE BOX CULVERT @ STA. 33+52.00-L-	LUMP SUM	LUMP SUM	LUMP SUM
CULVERT EXCAVATION	LUMP SUM	LUMP SUM	LUMP SUM
FOUNDATION CONDITIONING MATERIAL BOX CULVERT (TONS)	46	66	112
PLAIN RIP RAP, CLASS I (2'-0" THICK) (TONS)			56
FILTER FABRIC FOR DRAINAGE...(SQ. YDS.)			63



PROJECT NO. U-3613B
PITT COUNTY
STATION 33+52.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST SINGLE
10'-0" x 8'-0"
CONCRETE BOX CULVERT
80° SKEW

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			12
2			4			

STD. NO. CB21A

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 630 CFS.
FREQUENCY OF DESIGN FLOOD _____ = 50 YRS.
DESIGN HIGH WATER ELEVATION _____ = 66.530
DRAINAGE AREA _____ = 0.62 SQ. MILE
BASIC DISCHARGE (Q100) _____ = 730 CFS.
BASIC HIGH WATER ELEVATION _____ = 67.270

OVERTOPPING FLOOD DATA

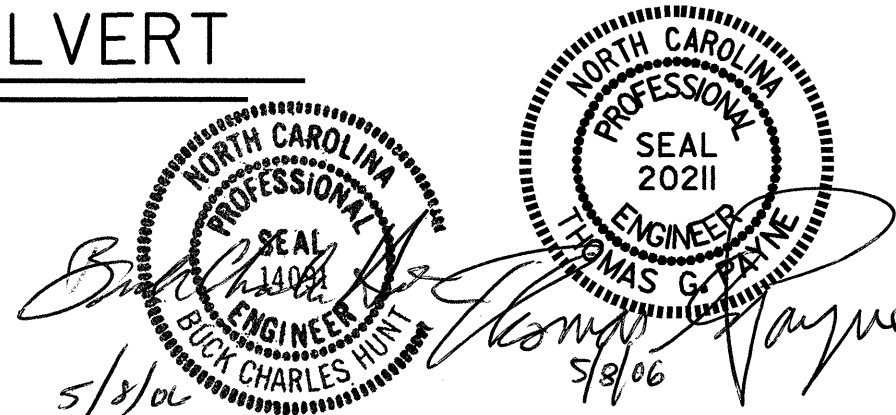
OVERTOPPING DISCHARGE _____ = 810 CFS.
FREQUENCY OF OVERTOPPING FLOOD _____ = 100 YRS. +
OVERTOPPING FLOOD ELEVATION _____ = 67.660

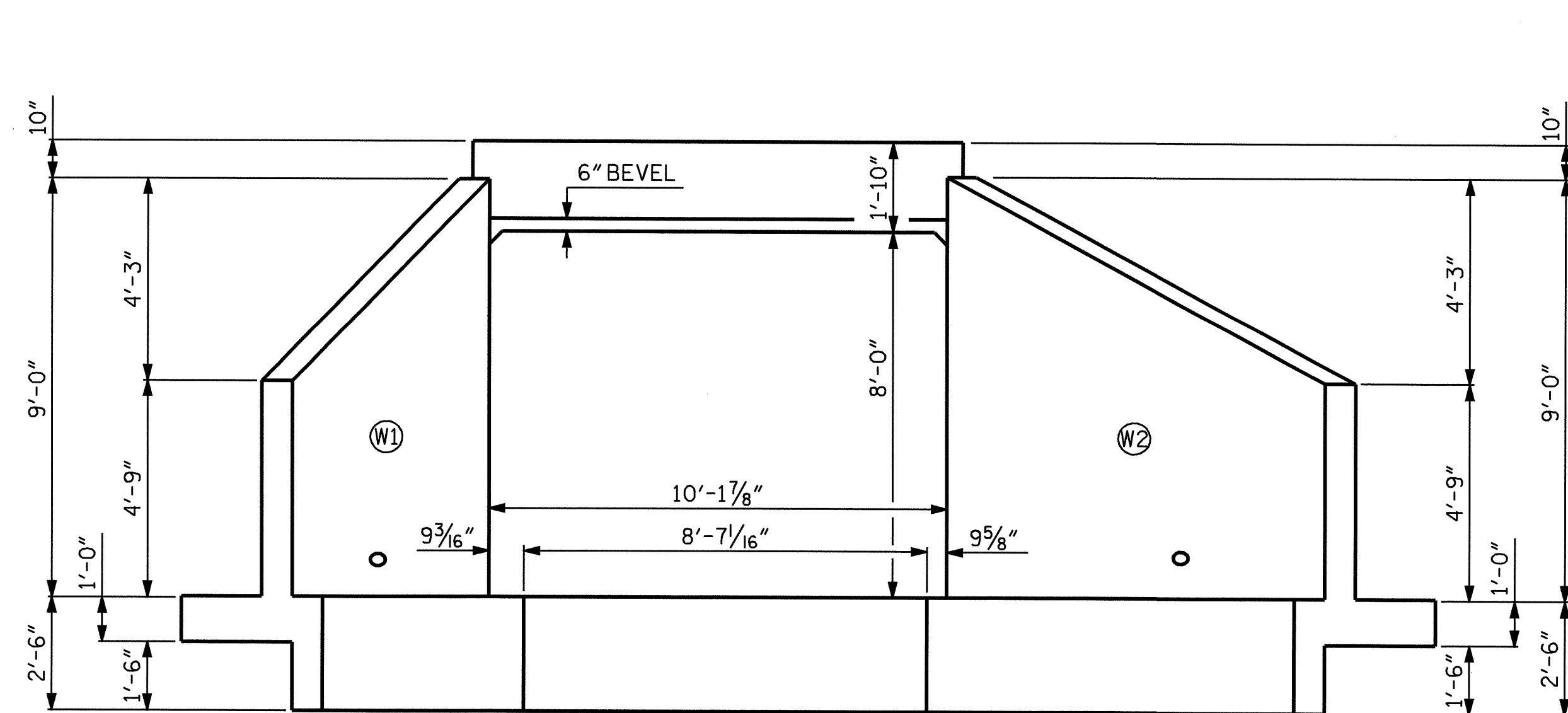
ROADWAY DATA

GRADE POINT EL. @ STA. 33+52.00 -L- = 68.496
BED ELEVATION @ STA. 33+52.00 -L- = 57.160
ROADWAY SLOPES _____ = 3 : 1

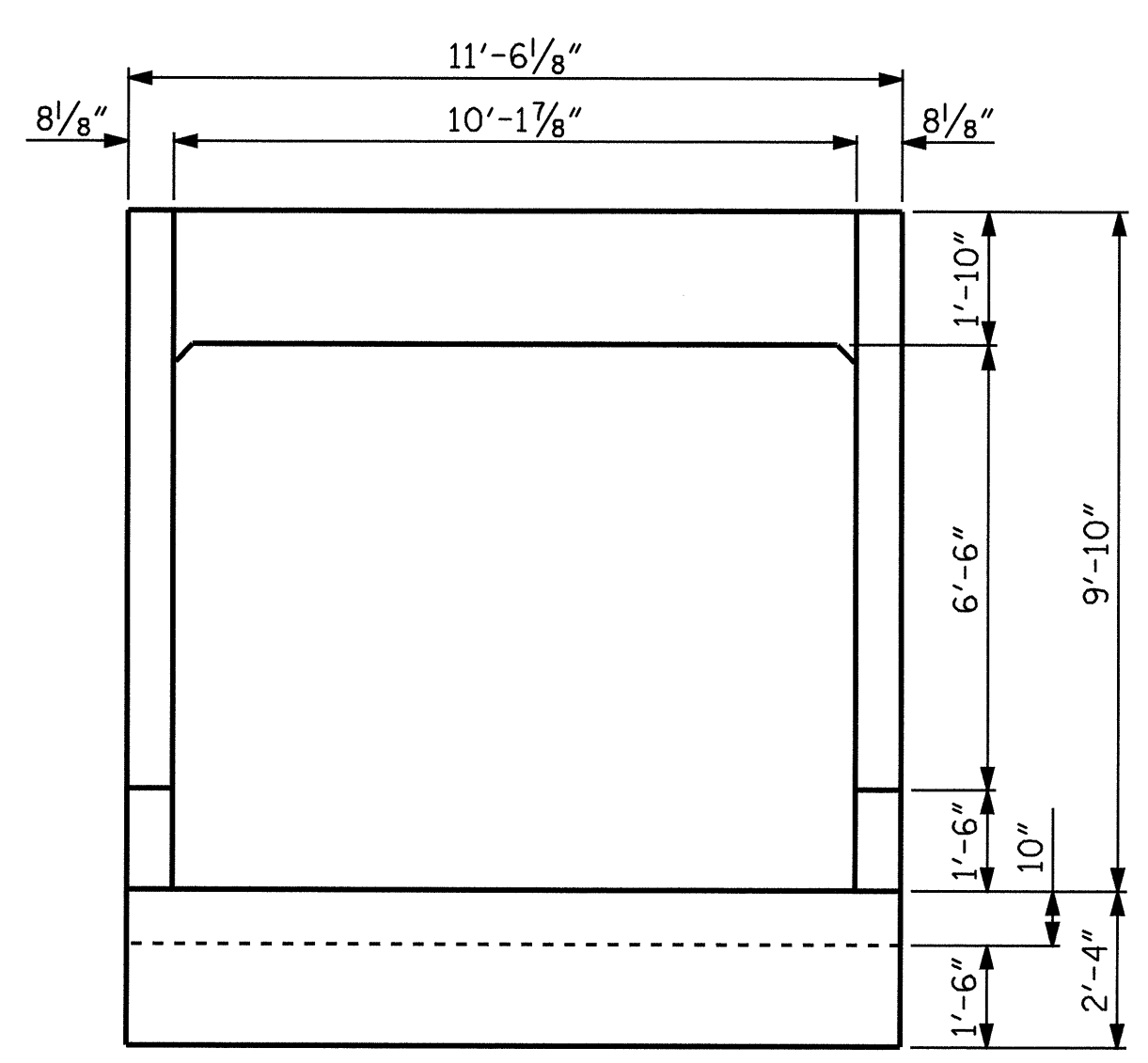
LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

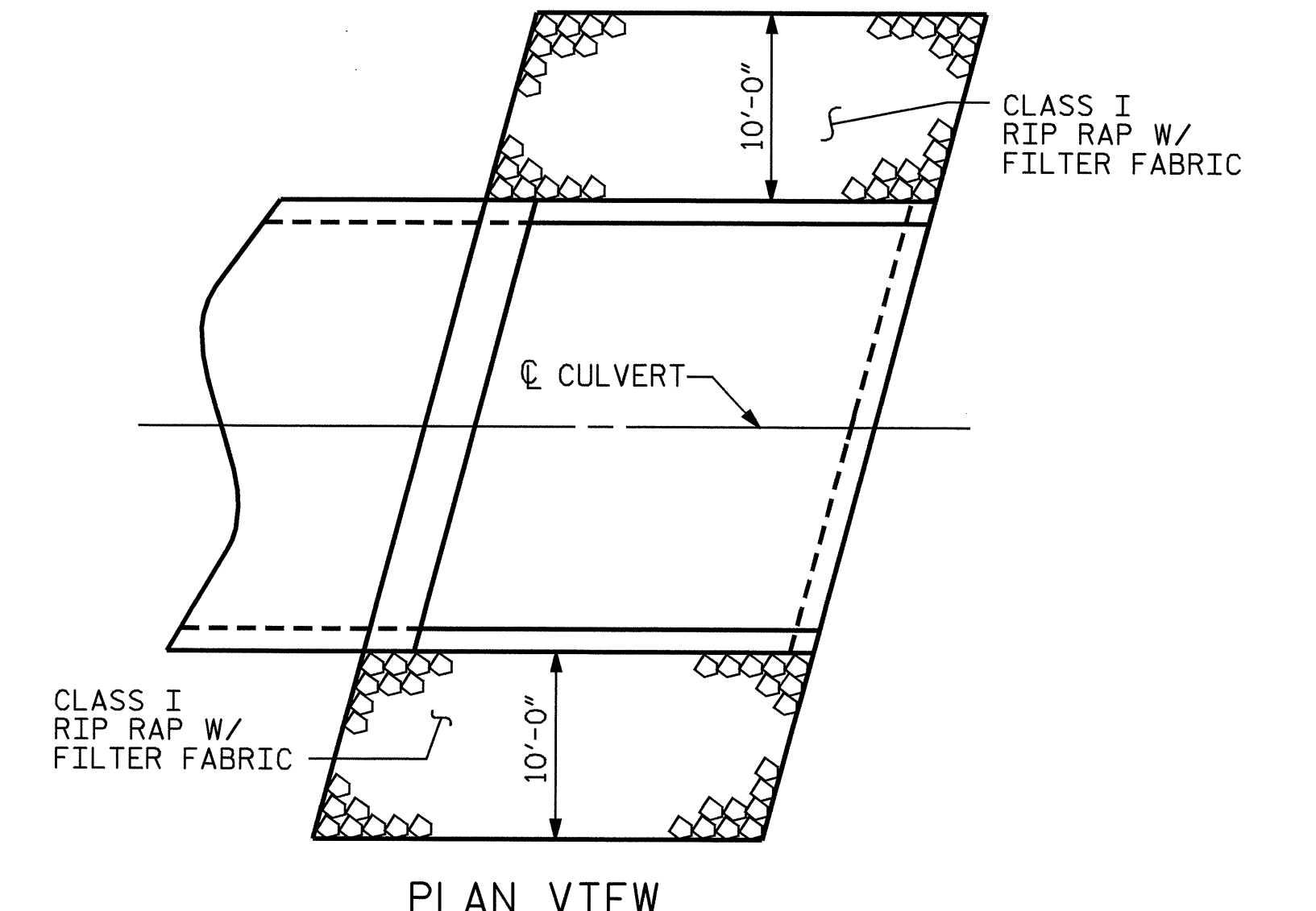




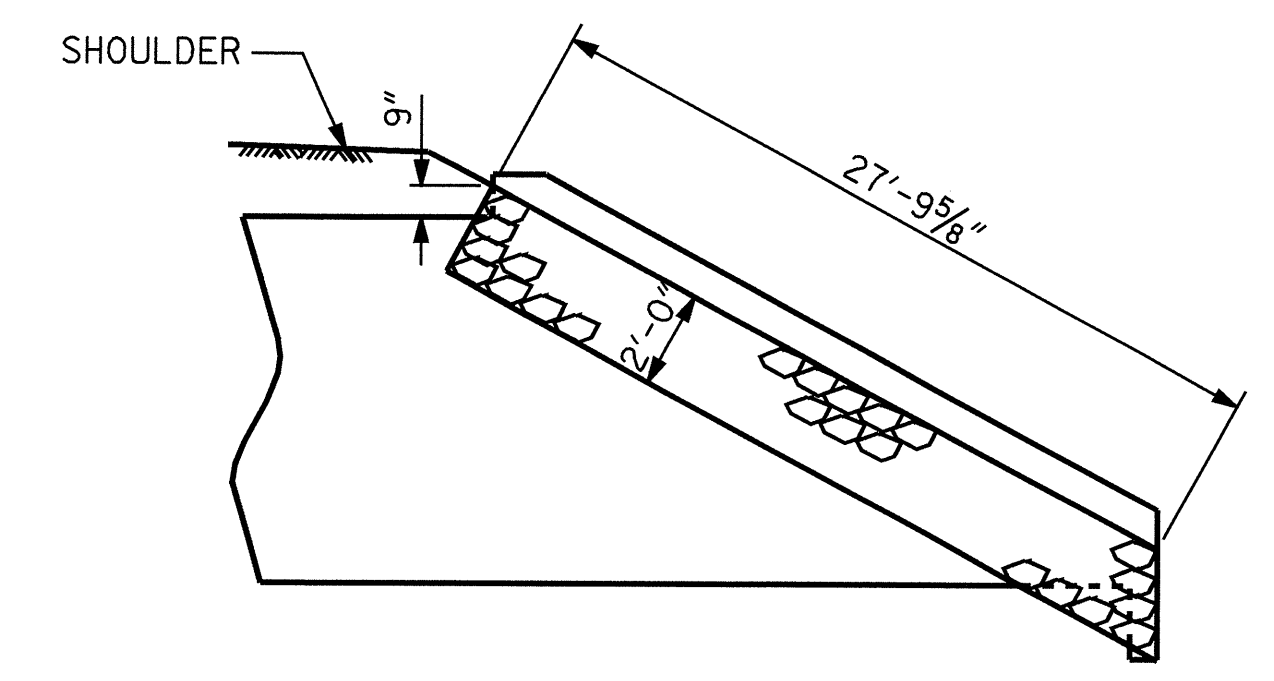
END ELEVATION NORMAL TO SKEW
(INLET END)



END ELEVATION NORMAL TO SKEW
(OUTLET END)

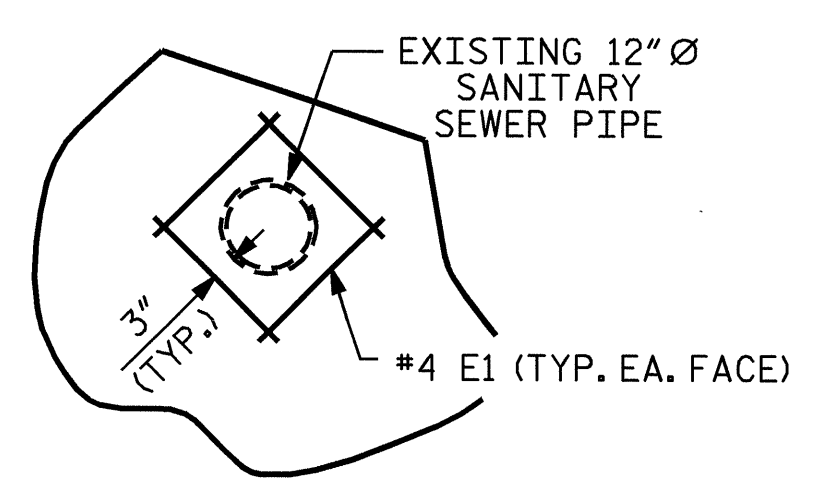


PLAN VIEW

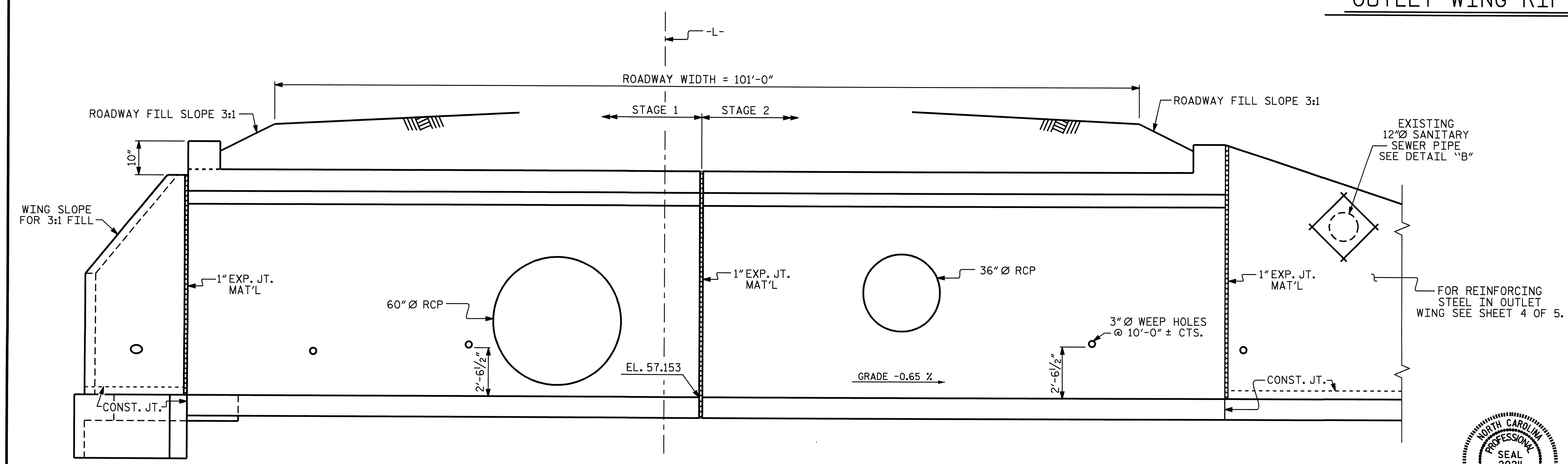


ELEVATION VIEW

OUTLET WING RIP RAP DETAILS



DETAIL "B"

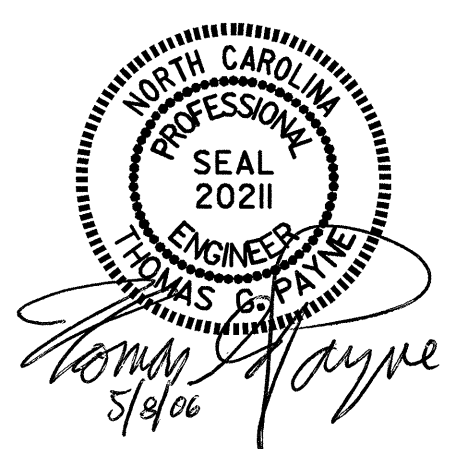


CULVERT SECTION NORMAL TO ROADWAY

THE 36" Ø RCP AND THE 60" Ø RCP THRU THE SIDEWALL OF THE CULVERT ARE TO BE LOCATED BY THE PRECAST CULVERT FABRICATOR.

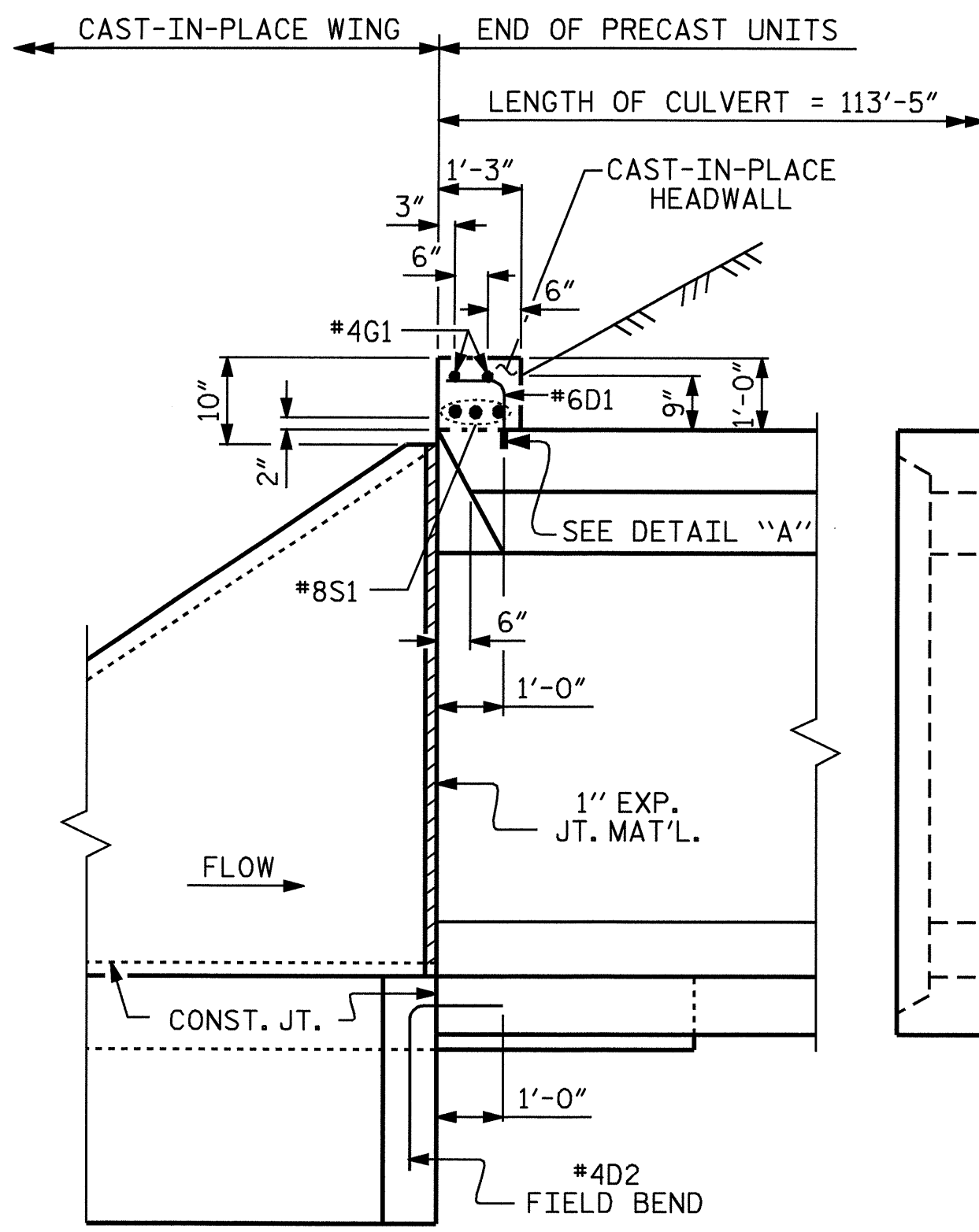
PROJECT NO. U-3613B
PITT COUNTY
 STATION: 33+52.00-L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**PRECAST SINGLE
 10'-0" X 8'-0"
 CONCRETE BOX CULVERT**



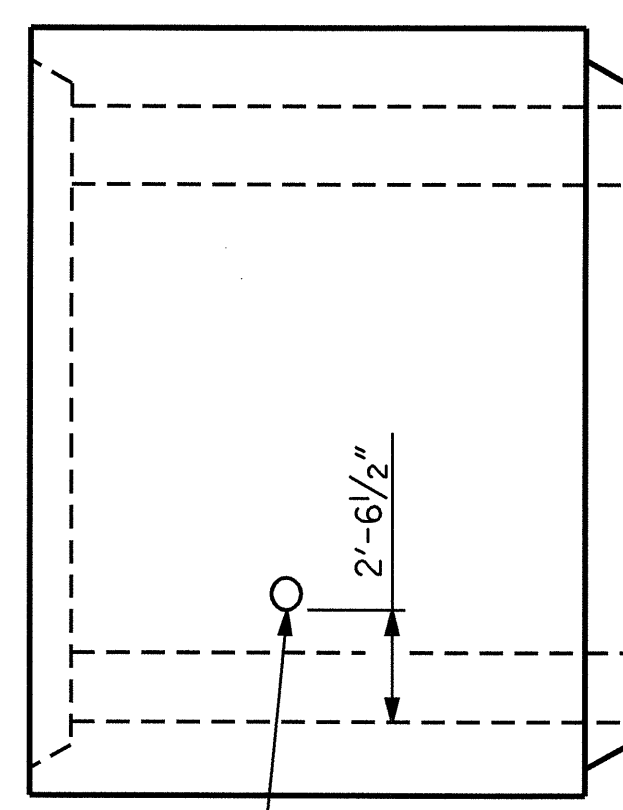
DRAWN BY: S.H. SOCKWELL DATE: 11/14/05
 CHECKED BY: K.D. LAYNE DATE: 11/18/05

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



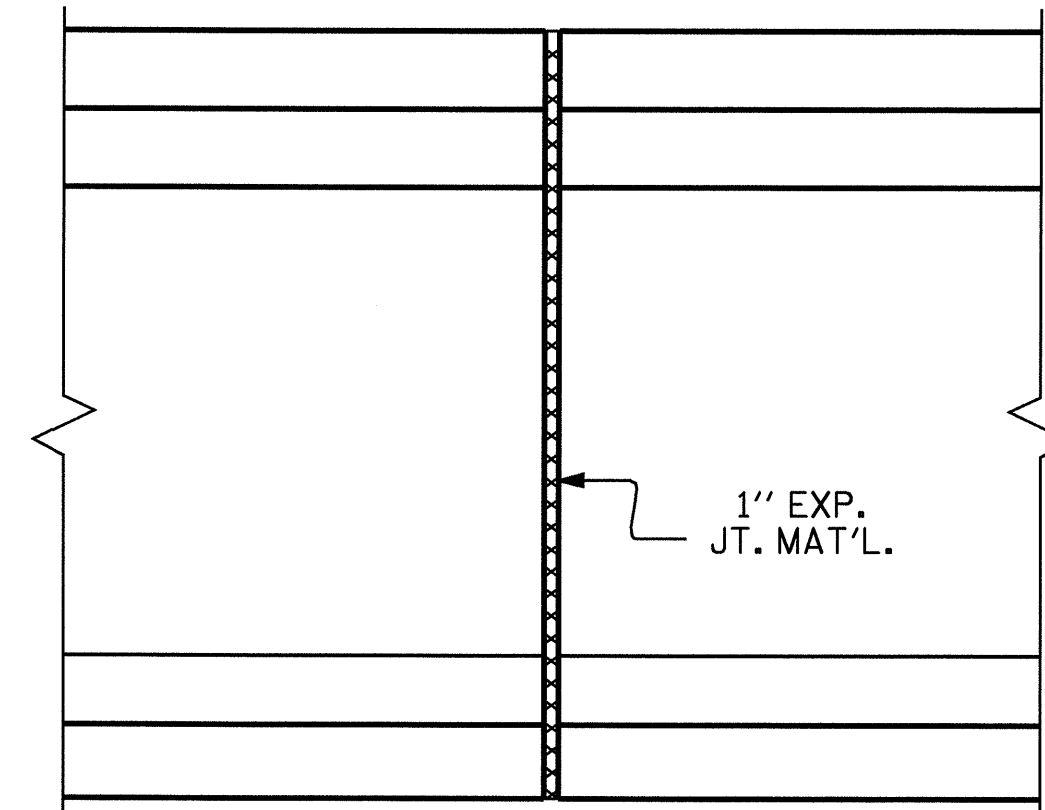
SECTION B-B

(SHOWING INLET END UNIT)
NOTE: NO END UNIT SHALL BE LESS THAN 3'-0"

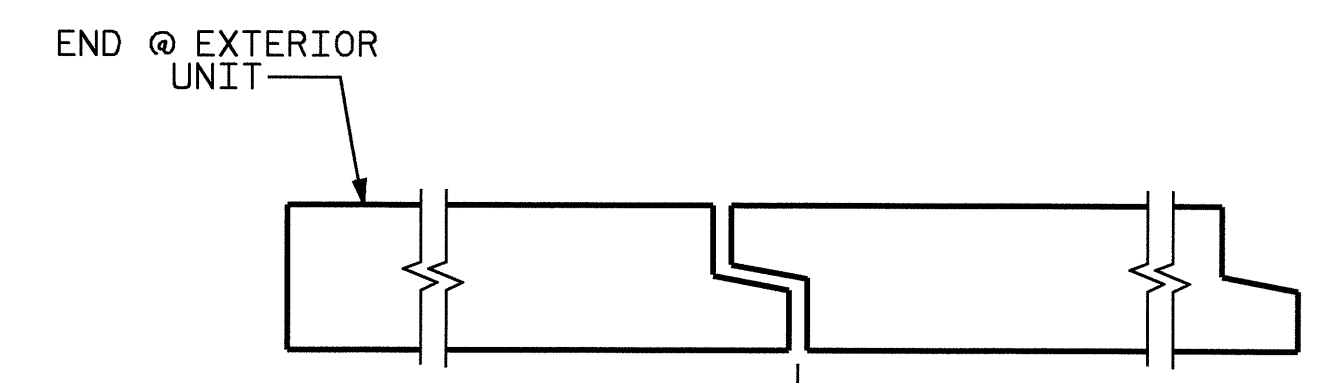
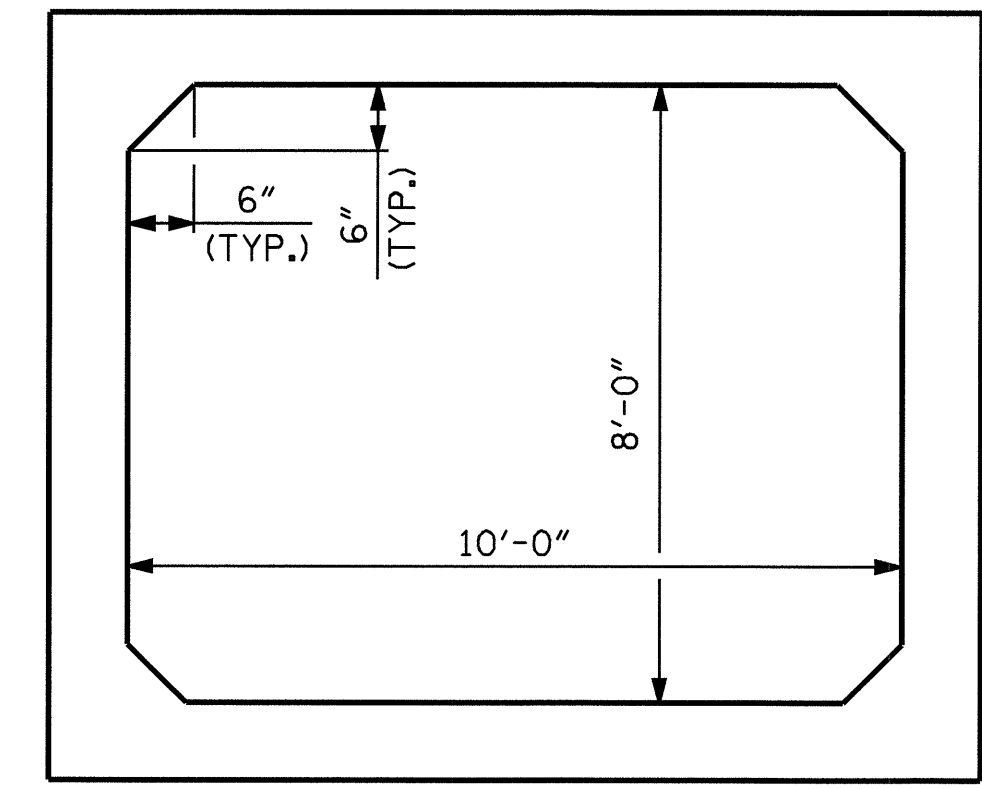


TYPICAL PRECAST UNIT

(INTERIOR UNIT SHOWN)



TYPICAL SECTION



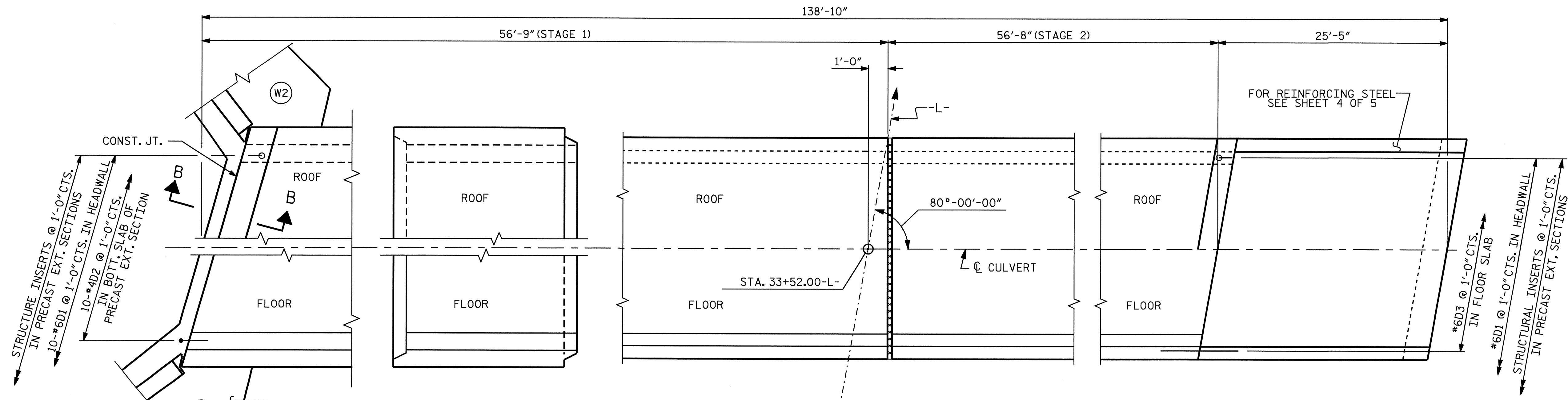
SECTION THRU TOP OF SLAB

(BOTTOM SLAB JOINT SIMILAR)

DETAIL A

** RICHMOND STRUCTURAL CONNECTION INSERTS
3/4" TYPE EC-2, 2 STRUT OR EQUAL;
LENGTH = 4 1/2", INSERT WIDTH = 2",
DIA. = 3/4". NO. REQUIRED 20

ELEVATION



PLAN-END UNIT

TYPICAL PRECAST UNIT

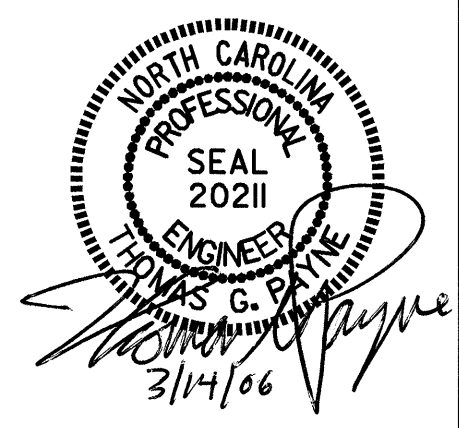
(INTERIOR UNIT SHOWN)

PLAN-END UNIT

PROJECT NO. U-3613B
PITT COUNTY
STATION: 33+52.00-L-

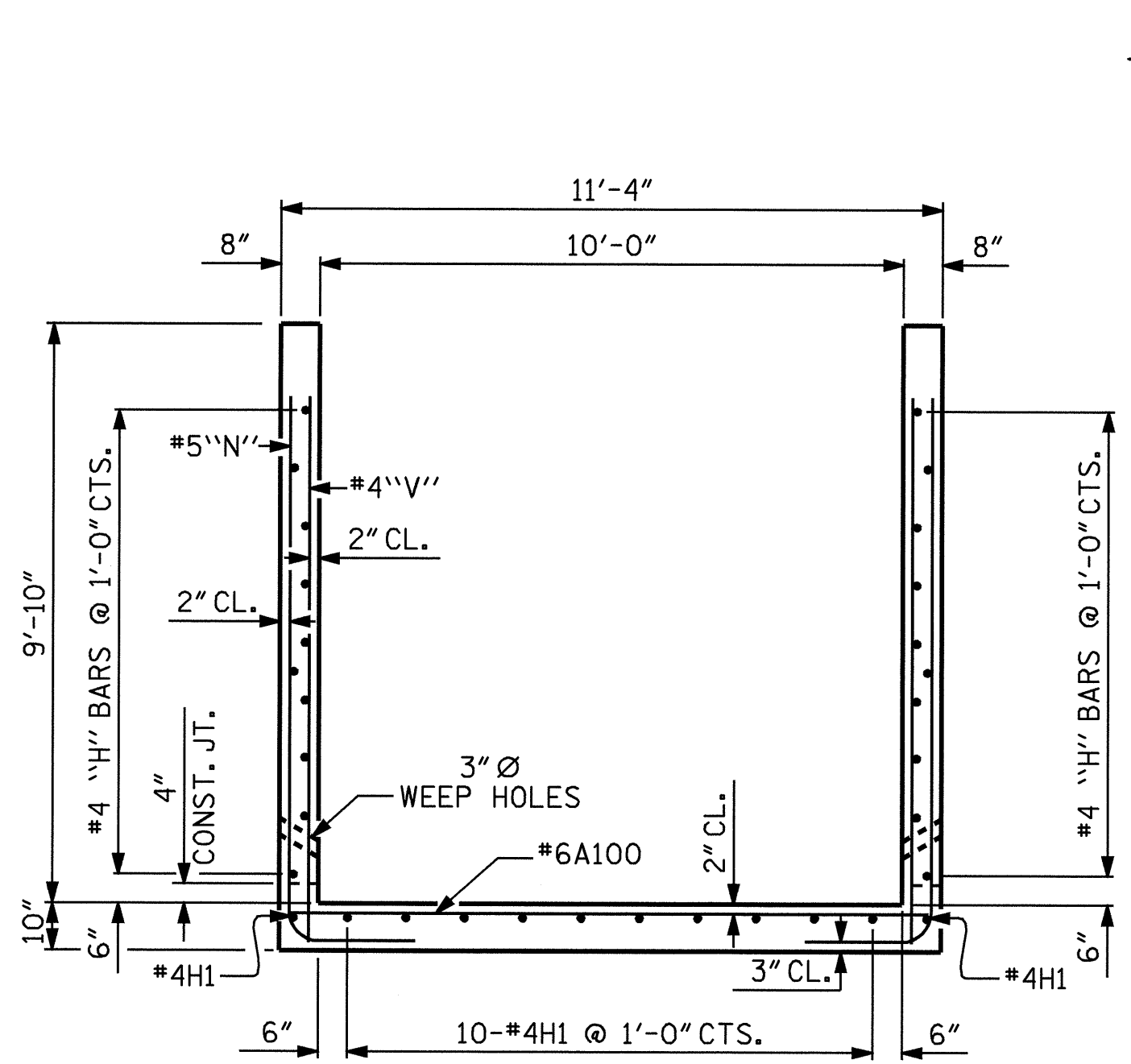
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**PRECAST SINGLE
10'-0" X 8'-0"
CONCRETE BOX CULVERT**

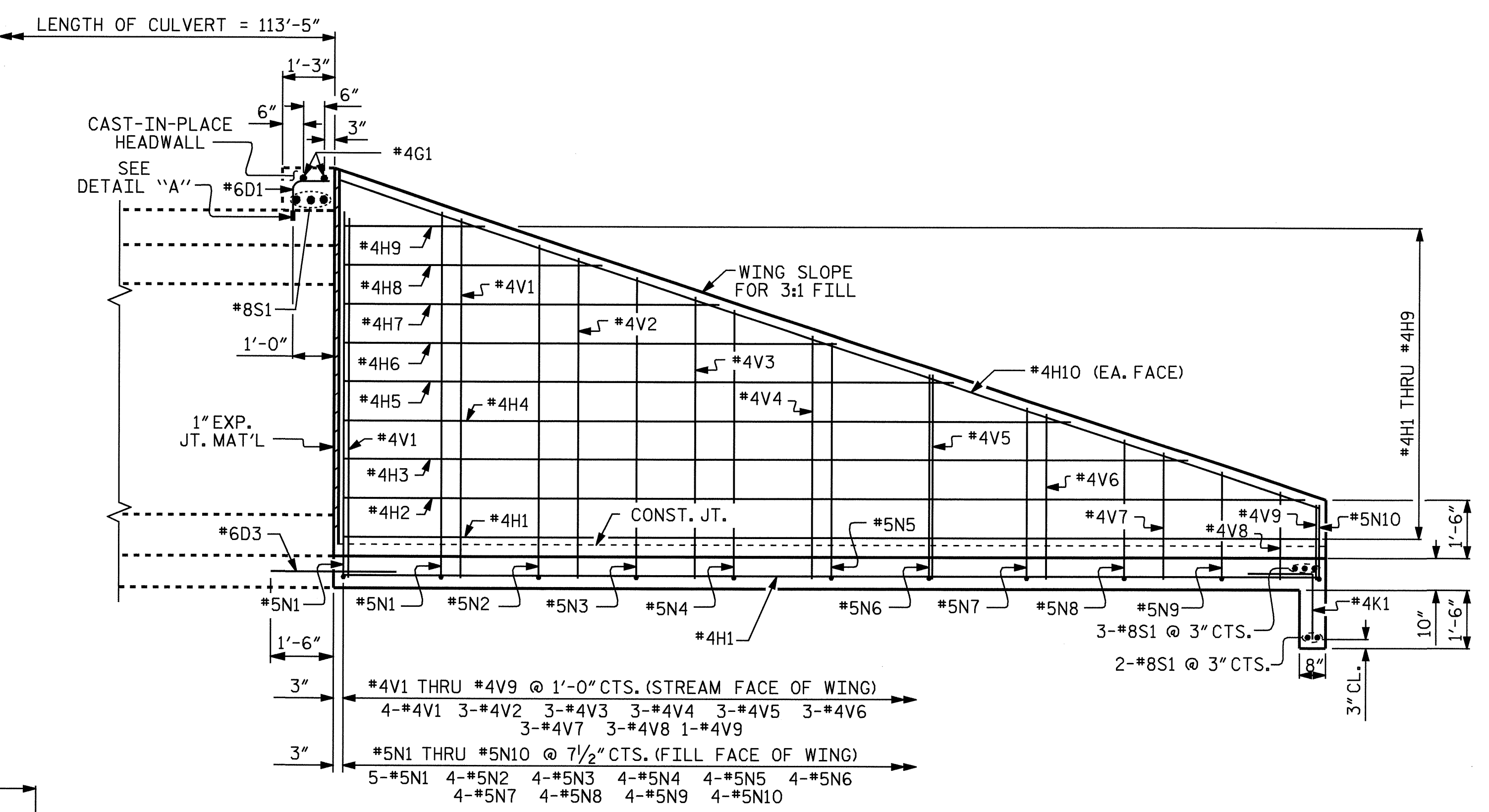


DRAWN BY: S.H. SOCKWELL DATE: 11/14/05
CHECKED BY: K.D. LAYNE DATE: 11/18/05

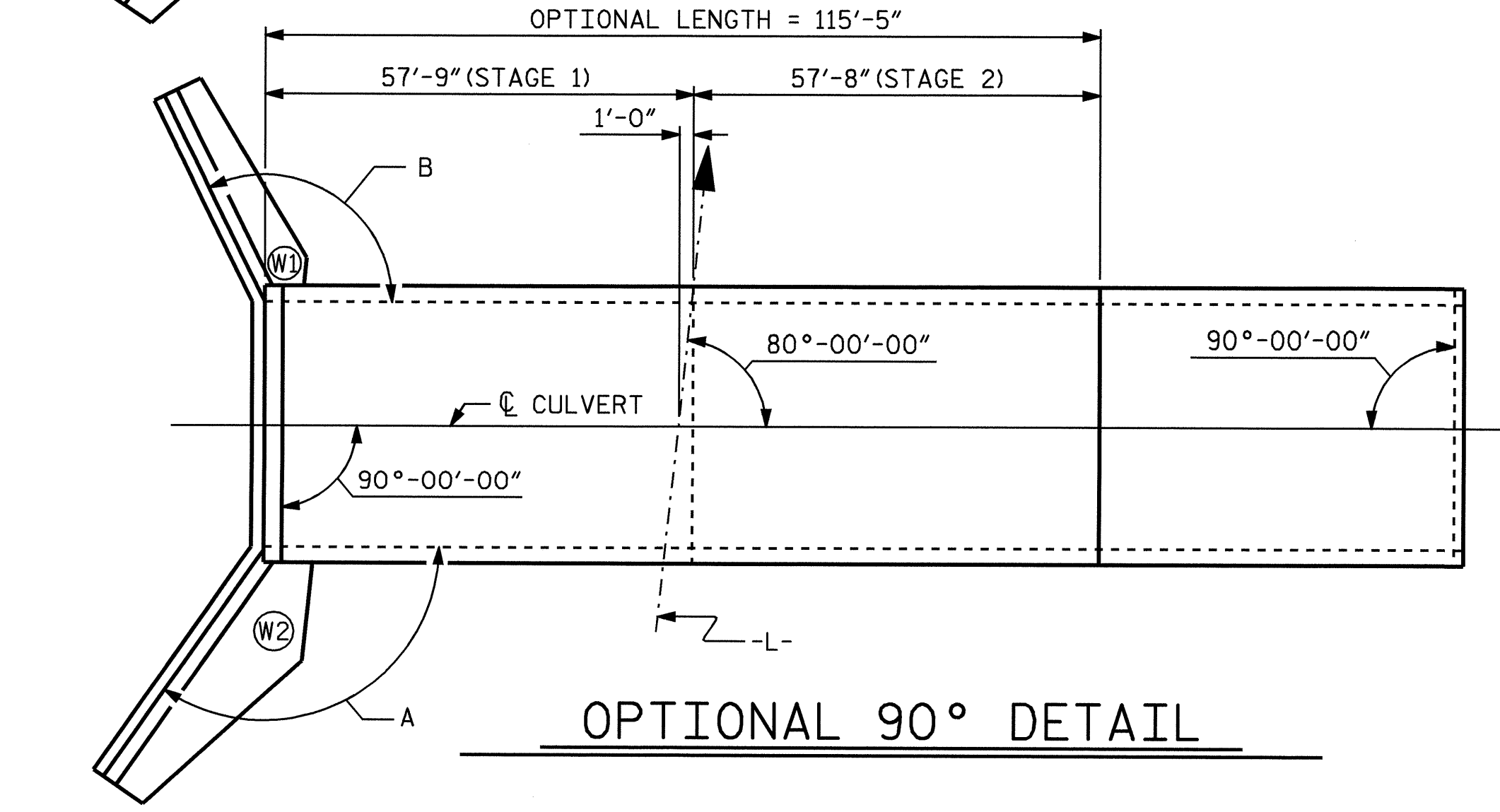
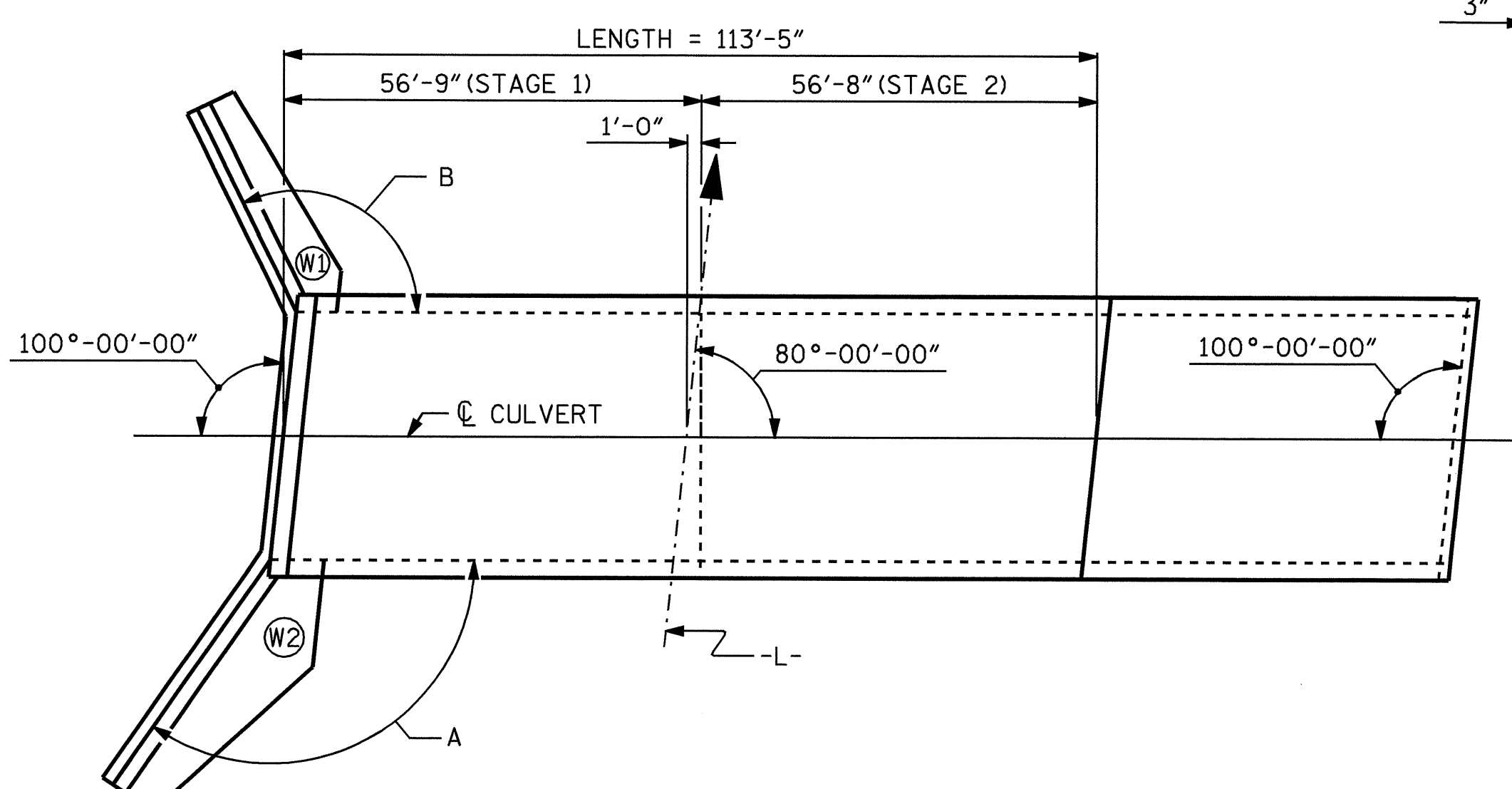
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			12



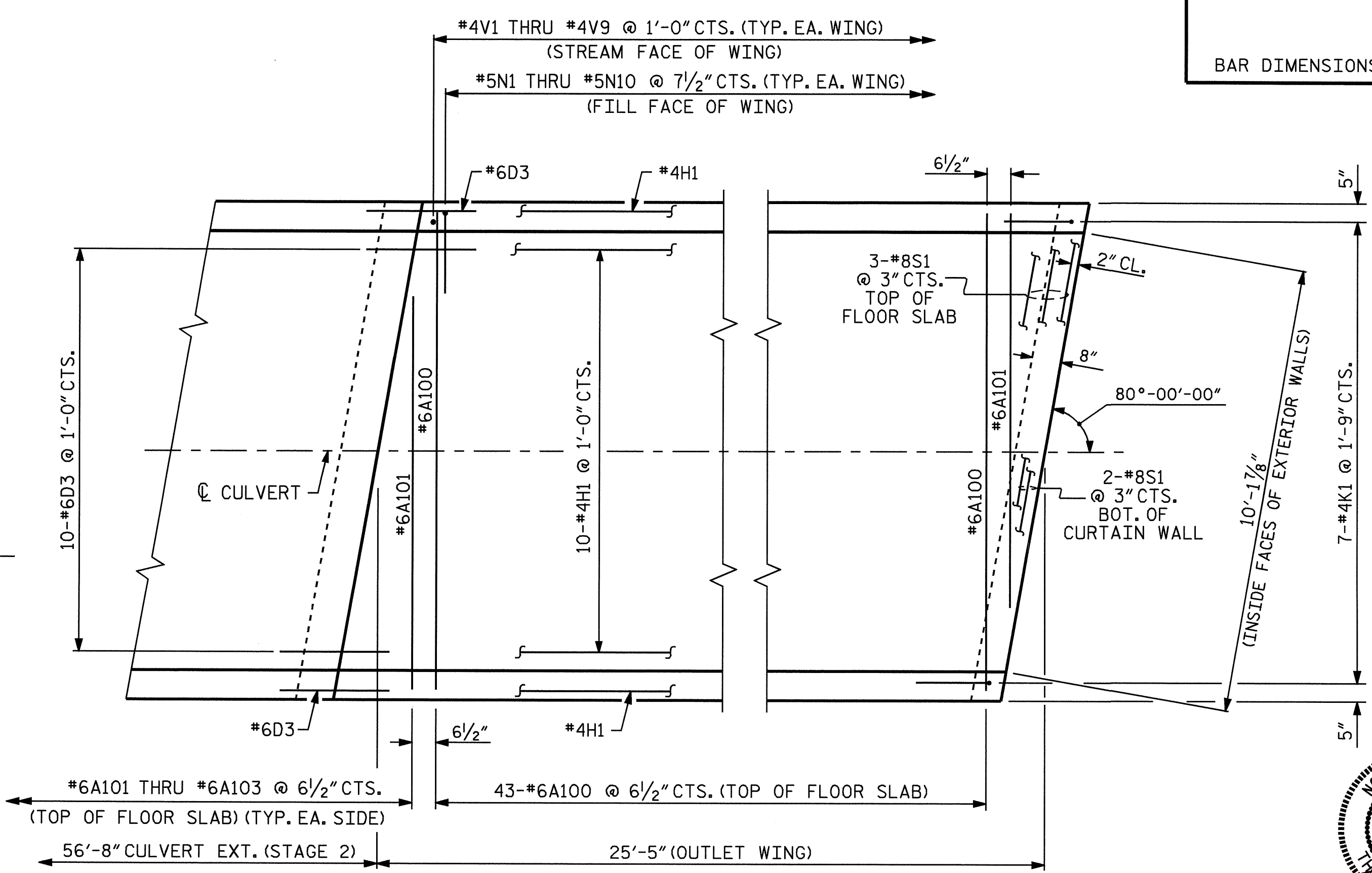
RIGHT ANGLE SECTION
(OUTLET WING)



ELEVATION
(OUTLET WING)



OPTIONAL 90° DETAIL



PLAN
(OUTLET WING)

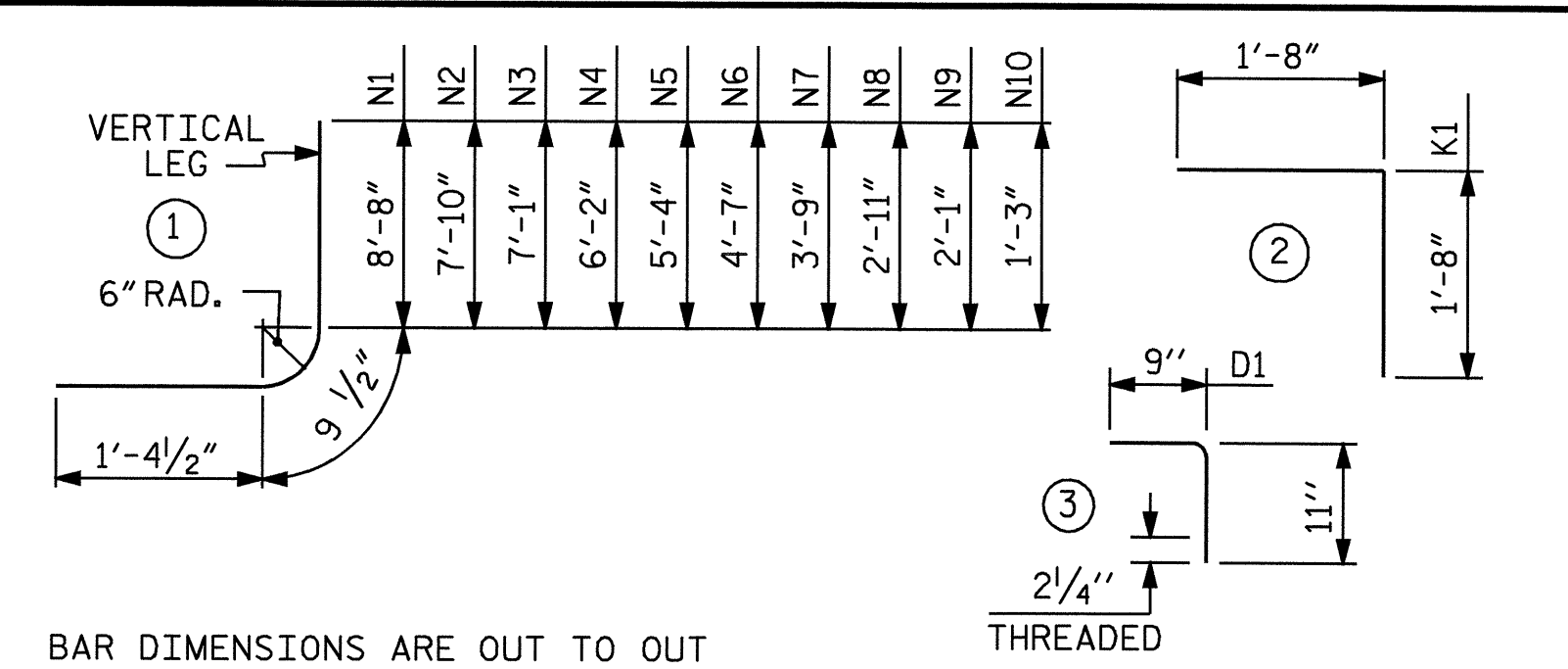
REINFORCING STEEL						REINFORCING STEEL					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
A100	43	6	STR	10-11	705	N3	8	5	1	9-3	77
A101	2	6	STR	9-0	27	N4	8	5	1	8-4	70
A102	2	6	STR	5-11	18	N5	8	5	1	7-6	63
A103	2	6	STR	2-10	9	N6	8	5	1	6-9	56
						N7	8	5	1	5-11	49
D1	20	6	3	1-8	50	N8	8	5	1	5-1	42
D2	10	4	STR	3-4	22	N9	8	5	1	4-3	35
D3	12	6	STR	3-0	54	N10	8	5	1	3-5	29
E1	8	4	STR	2-2	12	V1	8	4	STR.	9-0	48
						V2	6	4	STR.	8-1	32
G1	4	4	STR	11-2	30	V3	6	4	STR.	7-0	28
H1	14	4	STR	25-1	235	V4	6	4	STR.	6-0	24
H2	2	4	STR	24-8	33	V5	6	4	STR.	5-1	20
H3	2	4	STR	21-8	29	V6	6	4	STR.	4-1	16
H4	2	4	STR	18-8	25	V7	6	4	STR.	3-1	12
H5	4	4	STR	15-8	42	V8	6	4	STR.	2-1	8
H6	2	4	STR	12-8	17	V9	2	4	STR.	1-10	2
H7	2	4	STR	9-8	13	S1	11	8	STR.	11-2	328
H8	2	4	STR	6-8	9						
H9	2	4	STR	3-8	5						
H10	4	4	STR	26-5	71						
K1	7	4	2	3-4	16						
N1	10	5	1	10-10	113						
N2	8	5	1	10-0	83						

REINFORCING STEEL (LBS.) = 2,557

CLASS A CONCRETE

OUTLET WINGS	(Cu. Yds.) =	16.1
1 HEADWALL	(Cu. Yds.) =	.5
TOTAL	(Cu. Yds.) =	16.6

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-3613B
PITT COUNTY
 STATION: 33+52.00 -L-

SHEET 4 OF 5

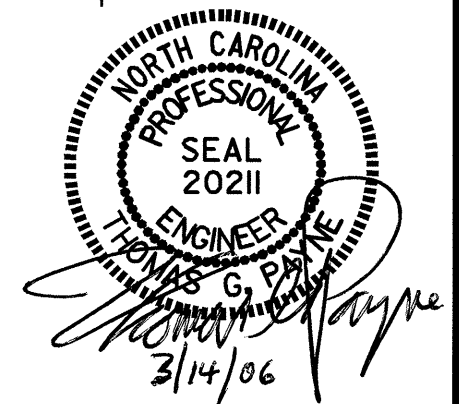
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

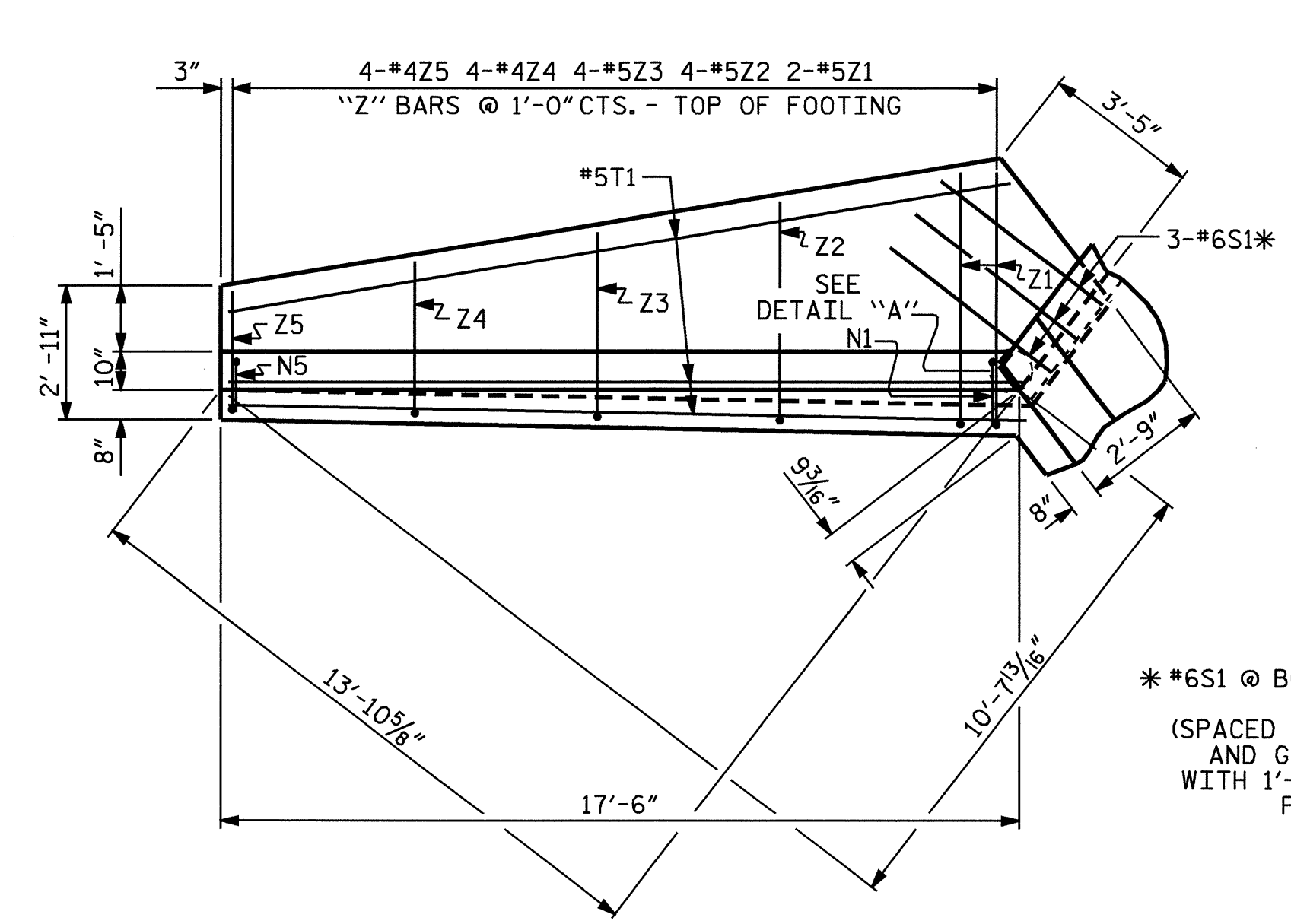
**PRECAST SINGLE
 10'-0" X 8'-0"
 CONCRETE BOX CULVERT**

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

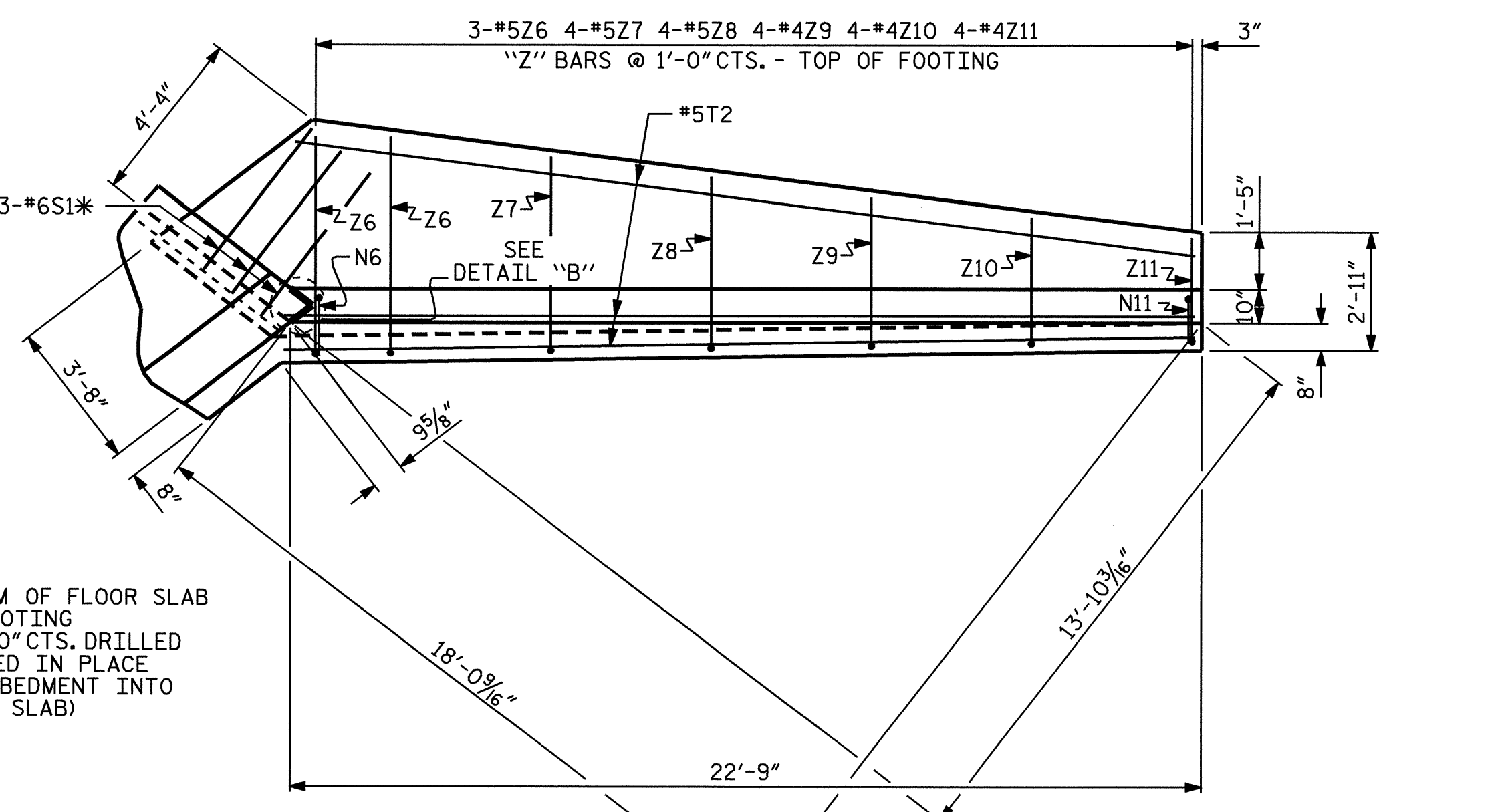
DRAWN BY: S.H. SOCKWELL DATE: 11/14/05
 CHECKED BY: K.D. LAYNE DATE: 11/18/05

10-MAR-2006 14:15
 E:\Structure\3613b\Final\U3613B.ed.Precast_CU.dgn
 Klayne



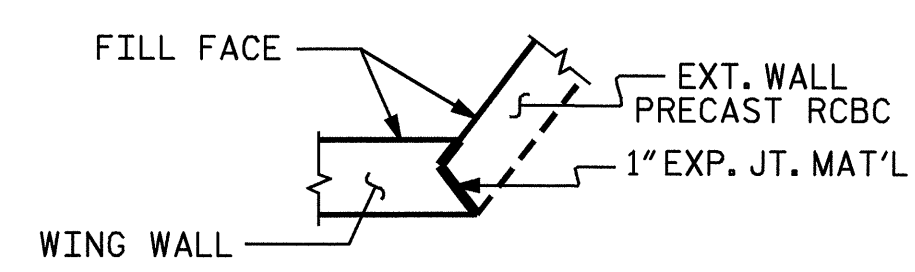


PLAN W1

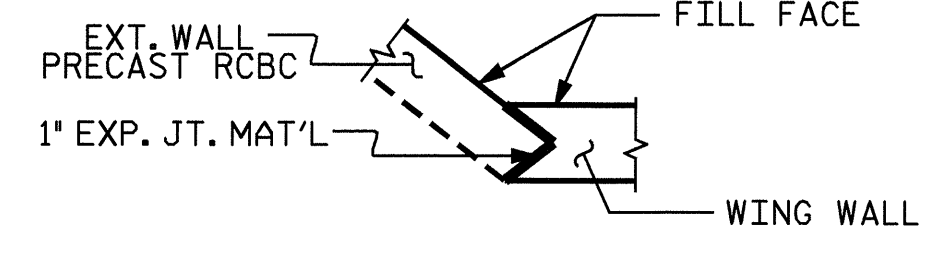


PLAN W2

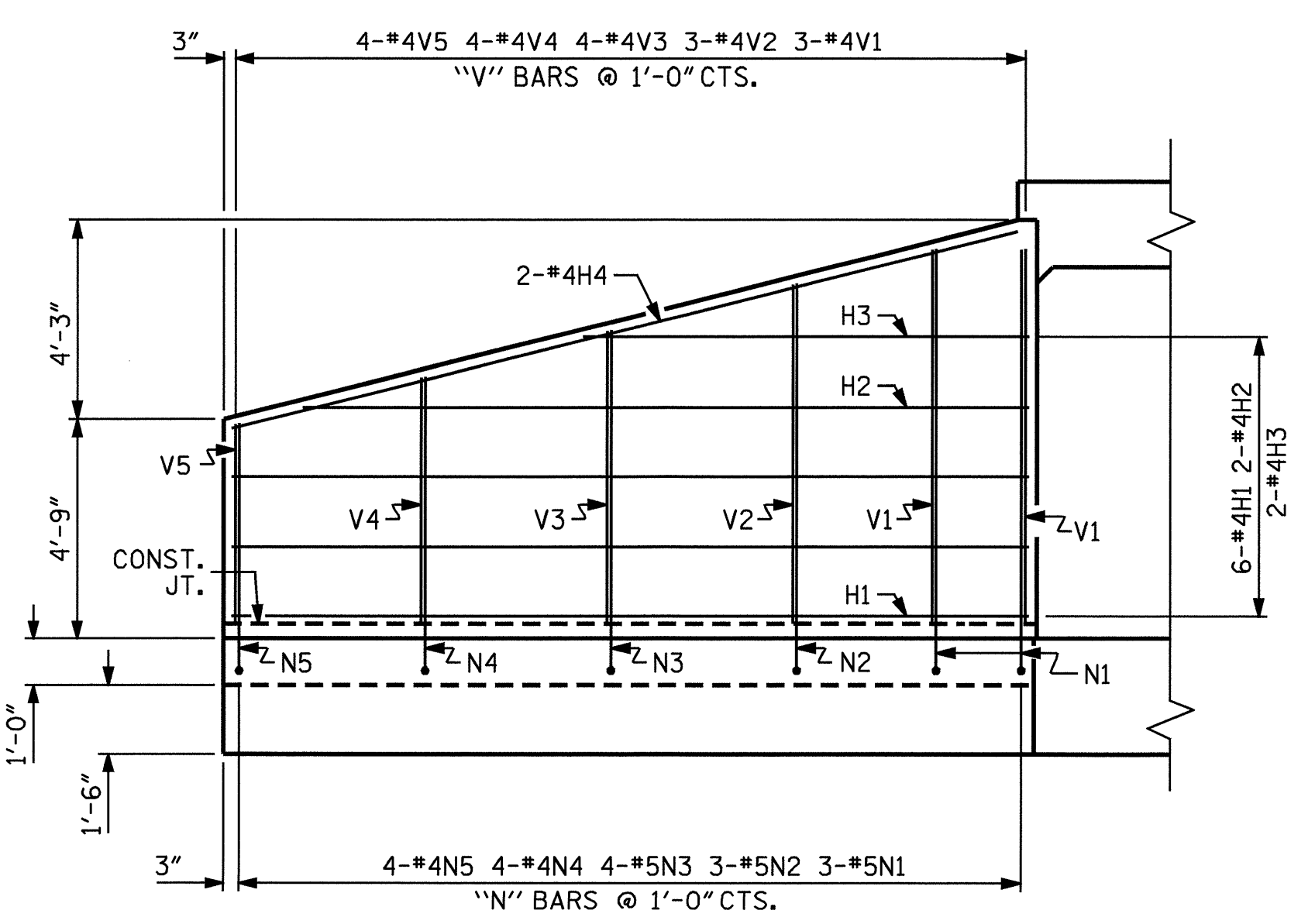
*#6S1 @ BOTTOM OF FLOOR SLAB & FOOTING (SPACED @ 1'-0" CTS. DRILLED AND GROUTED IN PLACE WITH 1'-0" EMBEDMENT INTO FLOOR SLAB)



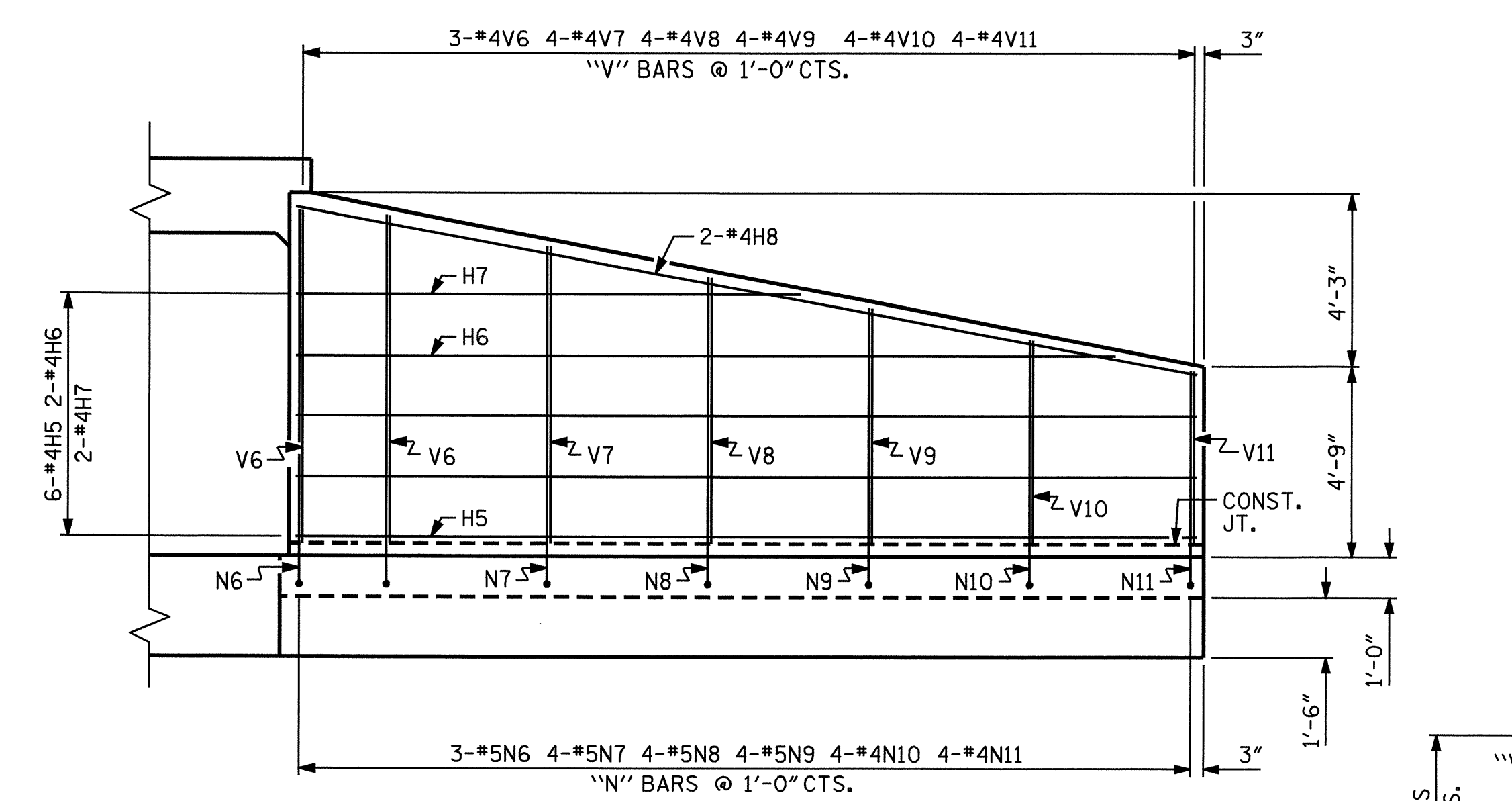
DETAIL "A"



DETAIL "B"



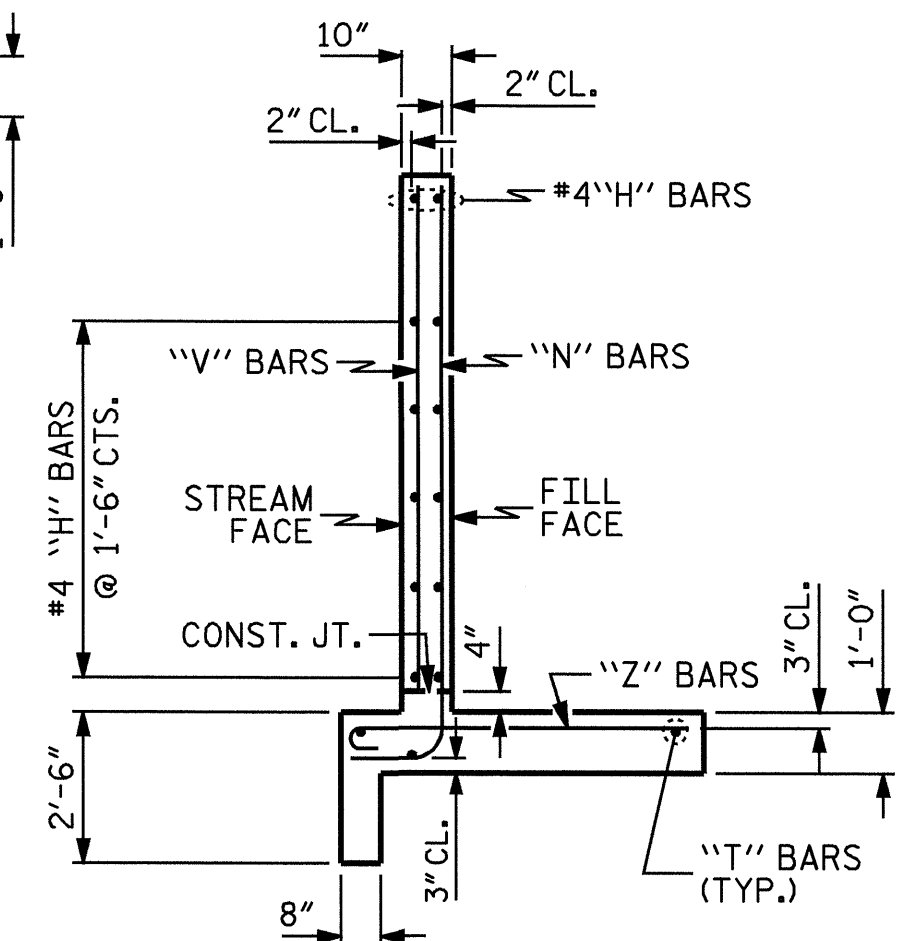
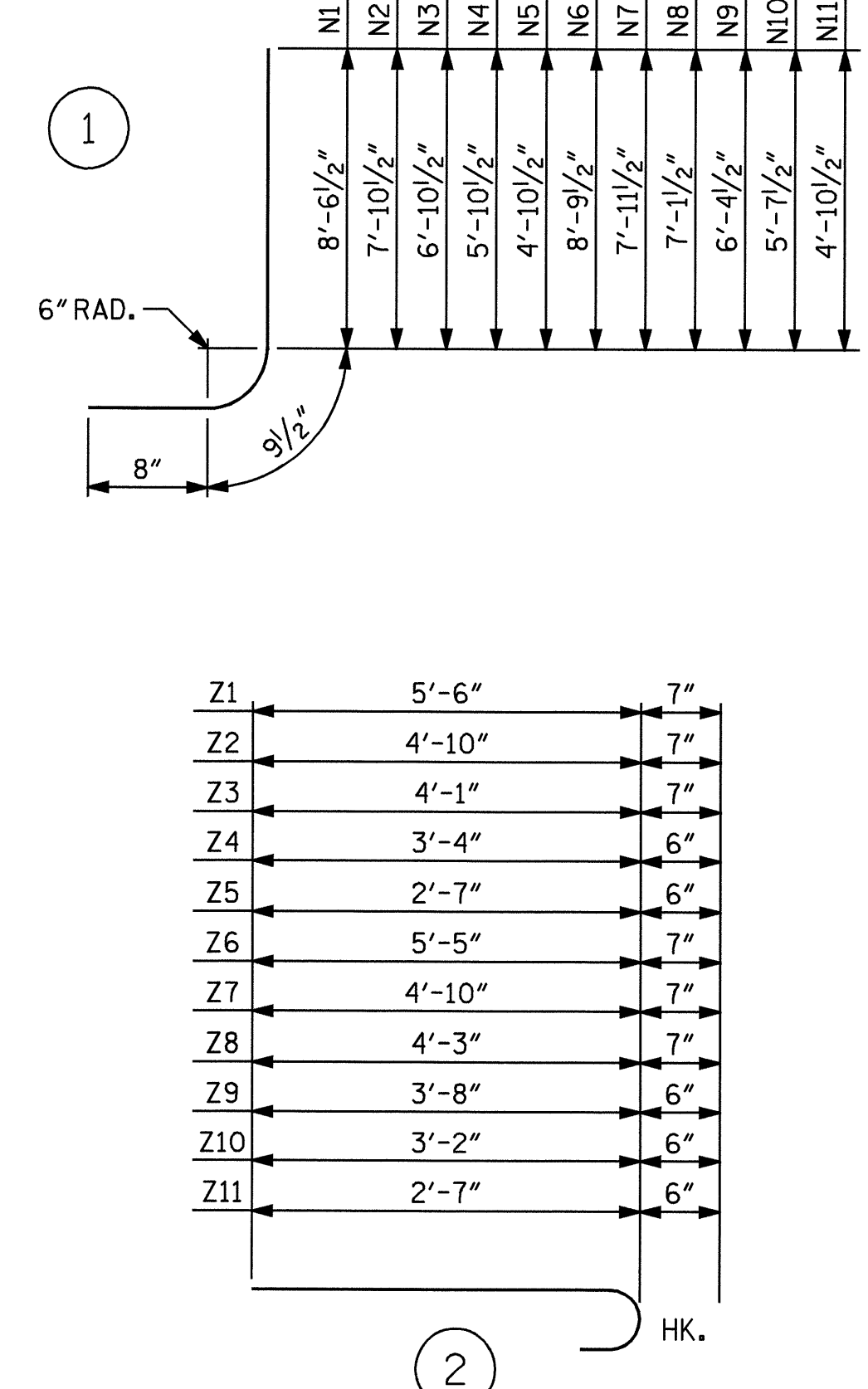
ELEVATION W1



ELEVATION W2

INLET WINGS

BAR TYPES		BILL OF MATERIAL				
ALL BAR DIMENSIONS ARE OUT TO OUT.						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	6	#4	STR	17'-2"	69	
H2	2	#4	STR	15'-8"	21	
H3	2	#4	STR	9'-7"	13	
H4	2	#4	STR	17'-8"	24	
H5	6	#4	STR	22'-5"	90	
H6	2	#4	STR	20'-5"	27	
H7	2	#4	STR	12'-7"	17	
H8	2	#4	STR	22'-9"	30	
N1	3	#5	1	10'-0"	31	
N2	3	#5	1	9'-4"	29	
N3	4	#5	1	8'-4"	35	
N4	4	#4	1	7'-4"	20	
N5	4	#4	1	6'-4"	17	
N6	3	#5	1	10'-3"	32	
N7	4	#5	1	9'-5"	39	
N8	4	#5	1	8'-7"	36	
N9	4	#5	1	7'-10"	33	
N10	4	#4	1	7'-1"	19	
N11	4	#4	1	6'-4"	17	
S1	6	#6	STR	4'-5"	40	
T1	3	#5	STR	17'-6"	55	
T2	3	#5	STR	22'-9"	71	
V1	3	#4	STR	8'-0"	16	
V2	3	#4	STR	7'-3"	15	
V3	4	#4	STR	6'-3"	17	
V4	4	#4	STR	5'-3"	14	
V5	4	#4	STR	4'-3"	11	
V6	3	#4	STR	8'-1"	16	
V7	4	#4	STR	7'-4"	20	
V8	4	#4	STR	6'-7"	18	
V9	4	#4	STR	5'-9"	15	
V10	4	#4	STR	5'-0"	13	
V11	4	#4	STR	4'-3"	11	
Z1	2	#5	2	6'-1"	13	
Z2	4	#5	2	5'-5"	23	
Z3	4	#5	2	4'-8"	19	
Z4	4	#4	2	3'-10"	10	
Z5	4	#4	2	3'-1"	8	
Z6	3	#5	2	6'-0"	19	
Z7	4	#5	2	5'-5"	23	
Z8	4	#5	2	4'-10"	20	
Z9	4	#4	2	4'-2"	11	
Z10	4	#4	2	3'-8"	10	
Z11	4	#4	2	3'-1"	8	
REINFORCING STEEL FOR 2 WINGS				1,095	LBS	
CLASS A CONCRETE						
2 WINGS				17.1	CY	
1 HEADWALL				0.5	CY	
1 END CURTAIN WALL				0.5	CY	
TOTAL				18.1	CY	



TYPICAL WING SECTION

PROJECT NO. U-3613B
 PITT COUNTY
 STATION 33+52.00 -L-

SHEET 5 OF 5

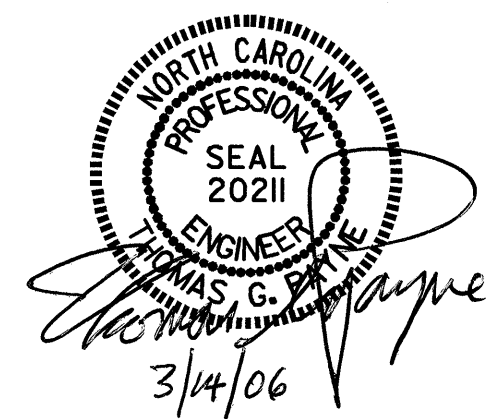
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR PRECAST
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 3:1
 80° SKEW

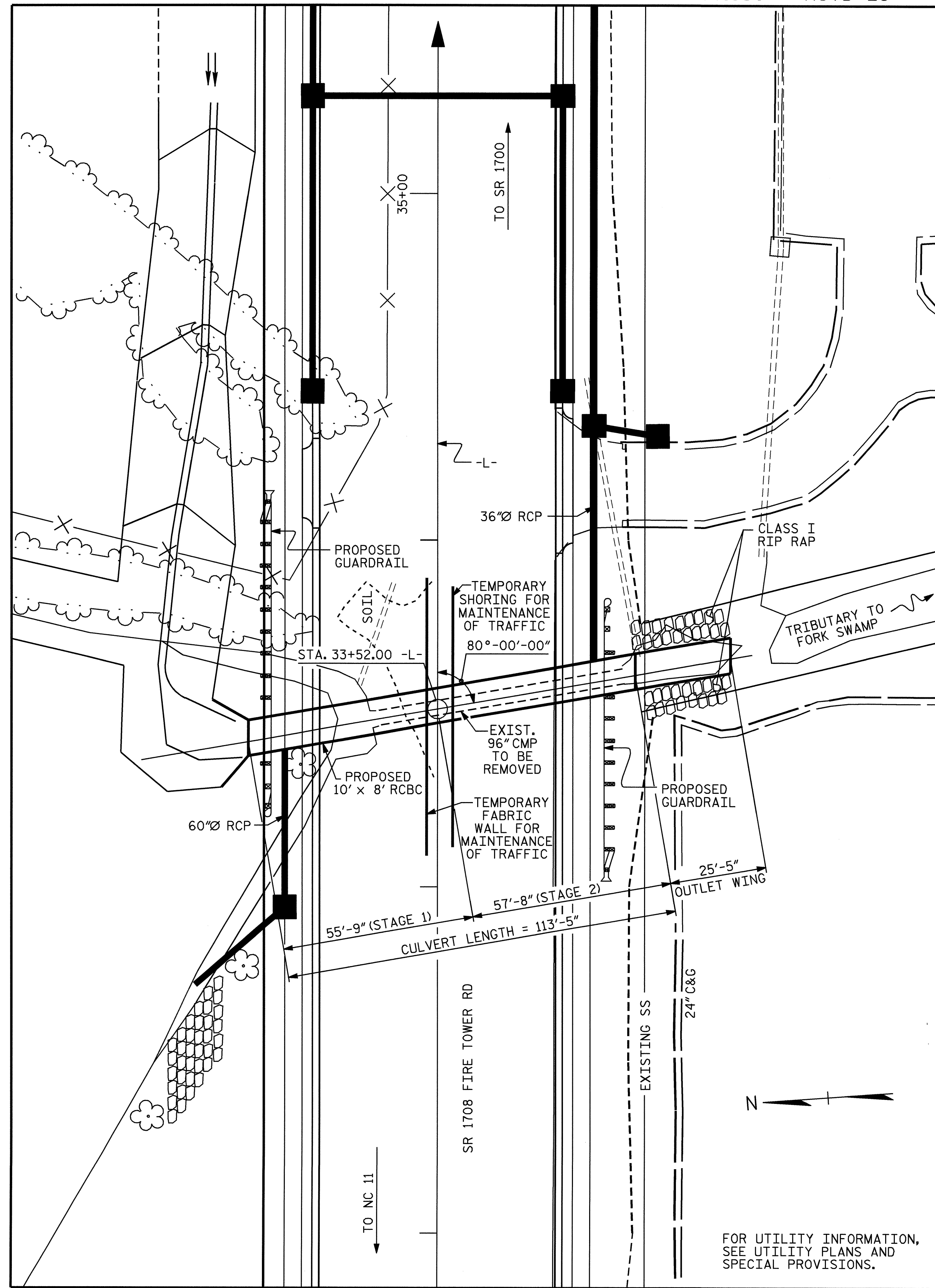
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NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TOTAL SHEETS 12

DRAWN BY: S.H. SOCKWELL DATE: 11-14-05
 CHECKED BY: K.D. LAYNE DATE: 11-18-05



BM - REBAR AND CAP 229.03' RT. OF STA. 31+11 -L- EL. = 67.930 NGVD 29



LOCATION SKETCH

ROADWAY DATA

GRADE POINT EL. @ STA. 33+52.00 -L- = 68.496
 BED ELEVATION @ STA. 33+52.00 -L- = 57.160
 ROADWAY SLOPES _____ = 3 : 1

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 630 CFS.
 FREQUENCY OF DESIGN FLOOD _____ = 50 YRS.
 DESIGN HIGH WATER ELEVATION _____ = 66.530
 DRAINAGE AREA _____ = 0.62 SQ. MILE
 BASIC DISCHARGE (Q100) _____ = 730 CFS.
 BASIC HIGH WATER ELEVATION _____ = 67.270

OVERTOPPING FLOOD DATA

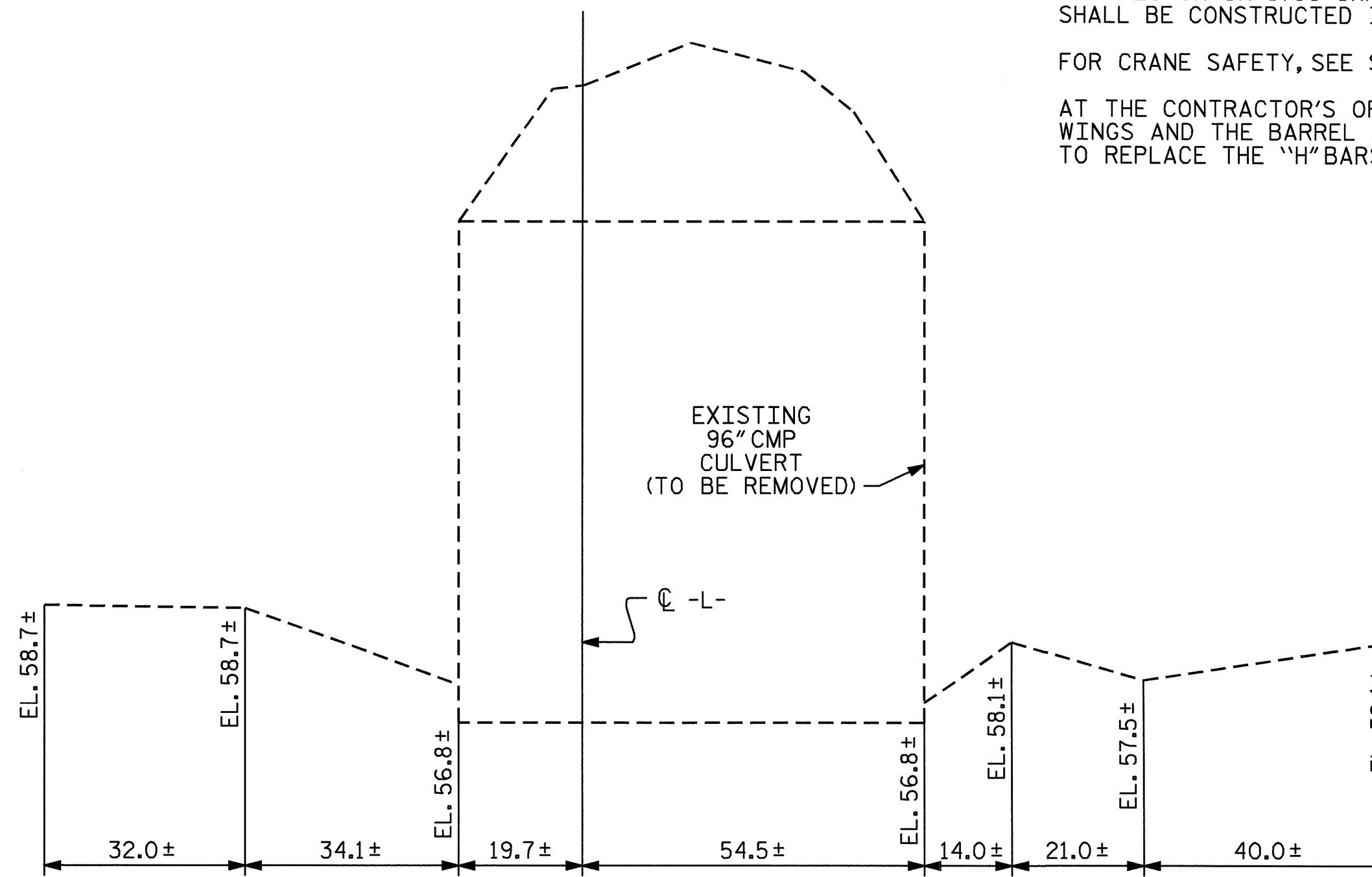
OVERTOPPING DISCHARGE _____ = 810 CFS.
 FREQUENCY OF OVERTOPPING FLOOD _____ = 100 YRS. +
 OVERTOPPING FLOOD ELEVATION _____ = 67.660

TOTAL STRUCTURE QUANTITIES

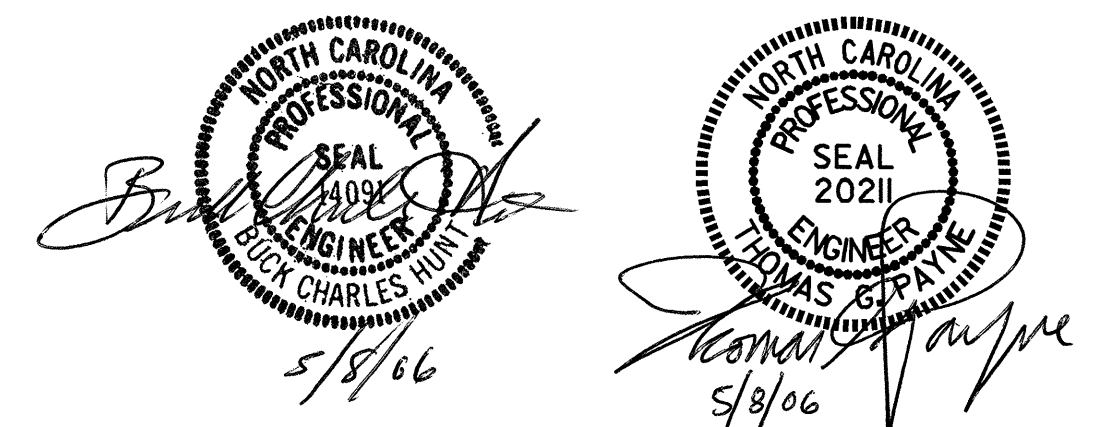
	STAGE 1	STAGE 2	TOTAL
CLASS A CONCRETE (C.Y.)			
BARREL @ 1.134 CY/FT =	63.2	65.4	
INLET WINGS, HEADWALL, 2 EDGE BEAMS & CURTAIN WALL =	19.0	0.0	
OUTLET WINGS, HEADWALL, 2 EDGE BEAMS & CURTAIN WALL =	0.0	17.5	
TOTAL =	82.2	82.9	165.1
REINFORCING STEEL (Lbs)			
BARREL =	9,228	0	
BARREL & OUTLET WINGS =	0	11,794	
INLET WINGS =	1,134	0	
TOTAL =	10,362	11,794	22,156
FOUNDATION COND. MAT'L (TONS)	46	66	112
CULVERT EXCAVATION =			LUMP SUM
PLAIN RIP RAP, CLASS I, (2'-0" THICK) (TONS) =			56
FILTER FABRIC FOR DRAINAGE (SQ. YDS.) =			63

NOTES

- ASSUMED LIVE LOAD ----- HS20-44 OR ALTERNATE LOADING.
- DESIGN FILL = 3.25'
- 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 TO BE POURED FOR STAGE 1 AND 2 IN THE FOLLOWING ORDER:
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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 FOR 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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- 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 LIMITS OF TEMPORARY FABRIC WALL FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY FABRIC WALL FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- THE COST OF REMOVAL AND DISPOSAL OF THE EXISTING PIPE CULVERT SHALL BE PAID FOR IN THE CULVERT EXCAVATION PAY ITEM.
- THE 60" Ø AND 36" Ø RCP PIPES THROUGH THE SIDEWALLS OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPES.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- TRAFFIC ON SR 1708 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN STAGES AS SHOWN ON THE PLANS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- 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 EXTENDED TO REPLACE THE "H" BARS IN THE WINGS.



PROFILE ALONG Q CULVERT



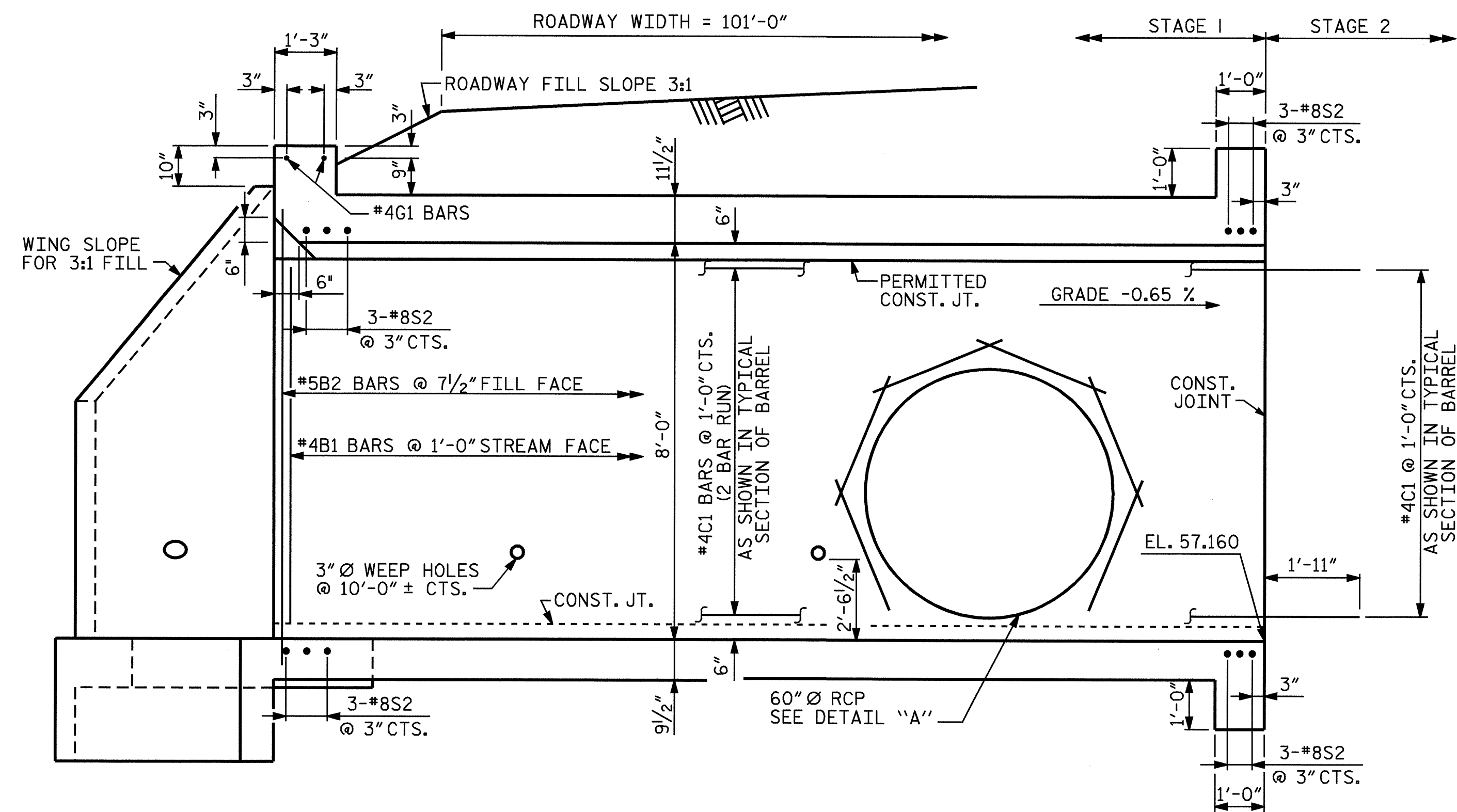
PROJECT NO. U-3613B
 PITT COUNTY
 STATION 33+52.00 -L-

SHEET 1 OF 7
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 OPTIONAL SINGLE
 10'-0" x 8'-0"
 CAST-IN-PLACE
 CONCRETE BOX CULVERT
 80° SKEW

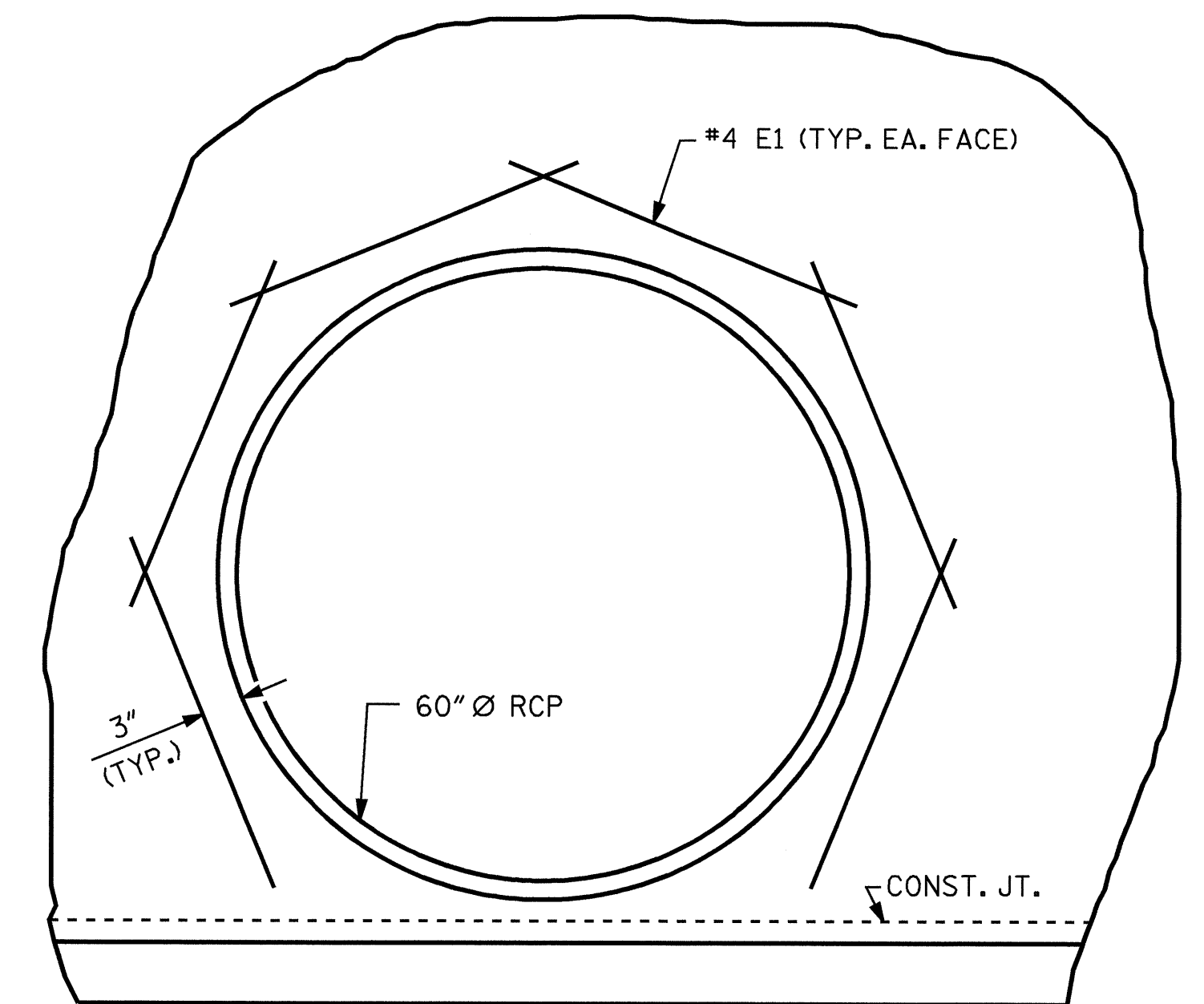
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2			4			12

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DRAWN BY: KEITH D. LAYNE DATE: 7-25-02
 CHECKED BY: A. R. CHESSON DATE: 8-1-03

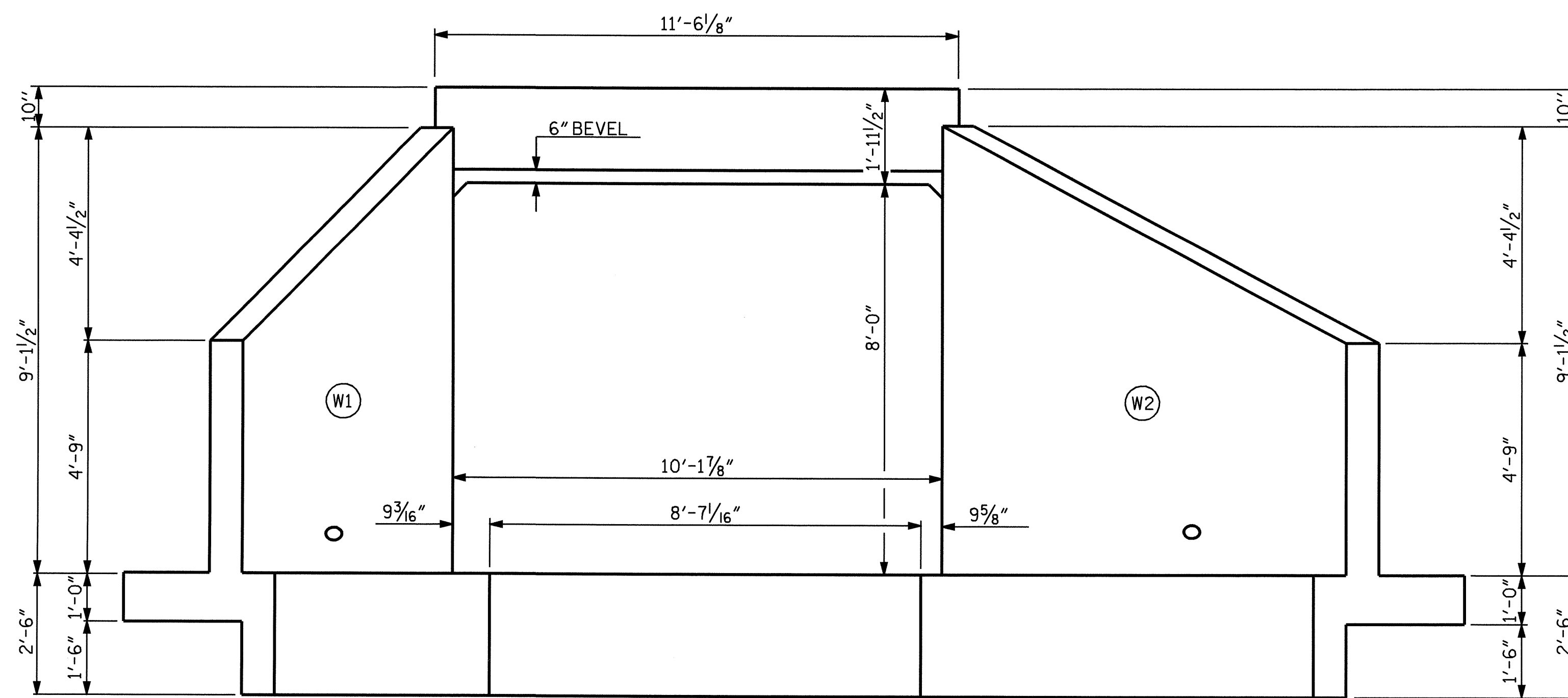


CULVERT SECTION NORMAL TO ROADWAY



DETAIL "A"

THE 60" Ø RCP THRU THE SIDEWALL OF THE CULVERT IS TO BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR PIPE. THE AREA IS TO BE REINFORCED WITH ADDITIONAL BARS (E1) AS SHOWN.



END ELEVATION NORMAL TO SKEW
INLET END

PROJECT NO. U-3613B
PITT COUNTY
 STATION 33+52.00 -L-

SHEET 2 OF 7

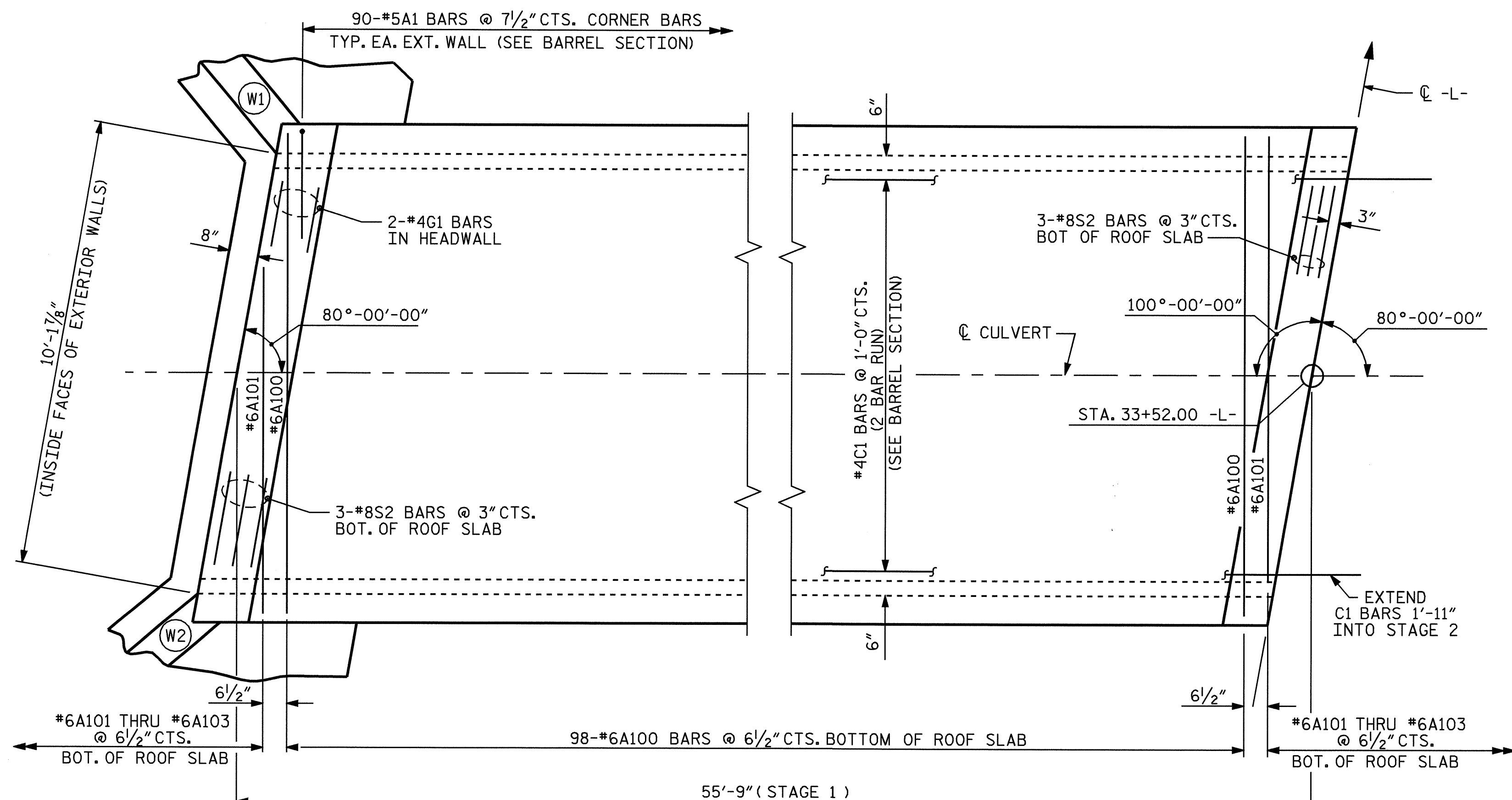
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 OPTIONAL SINGLE
 10'-0" x 8'-0"
 CAST-IN-PLACE
 CONCRETE BOX CULVERT
 80°-00'-00" SKEW
 STAGE I



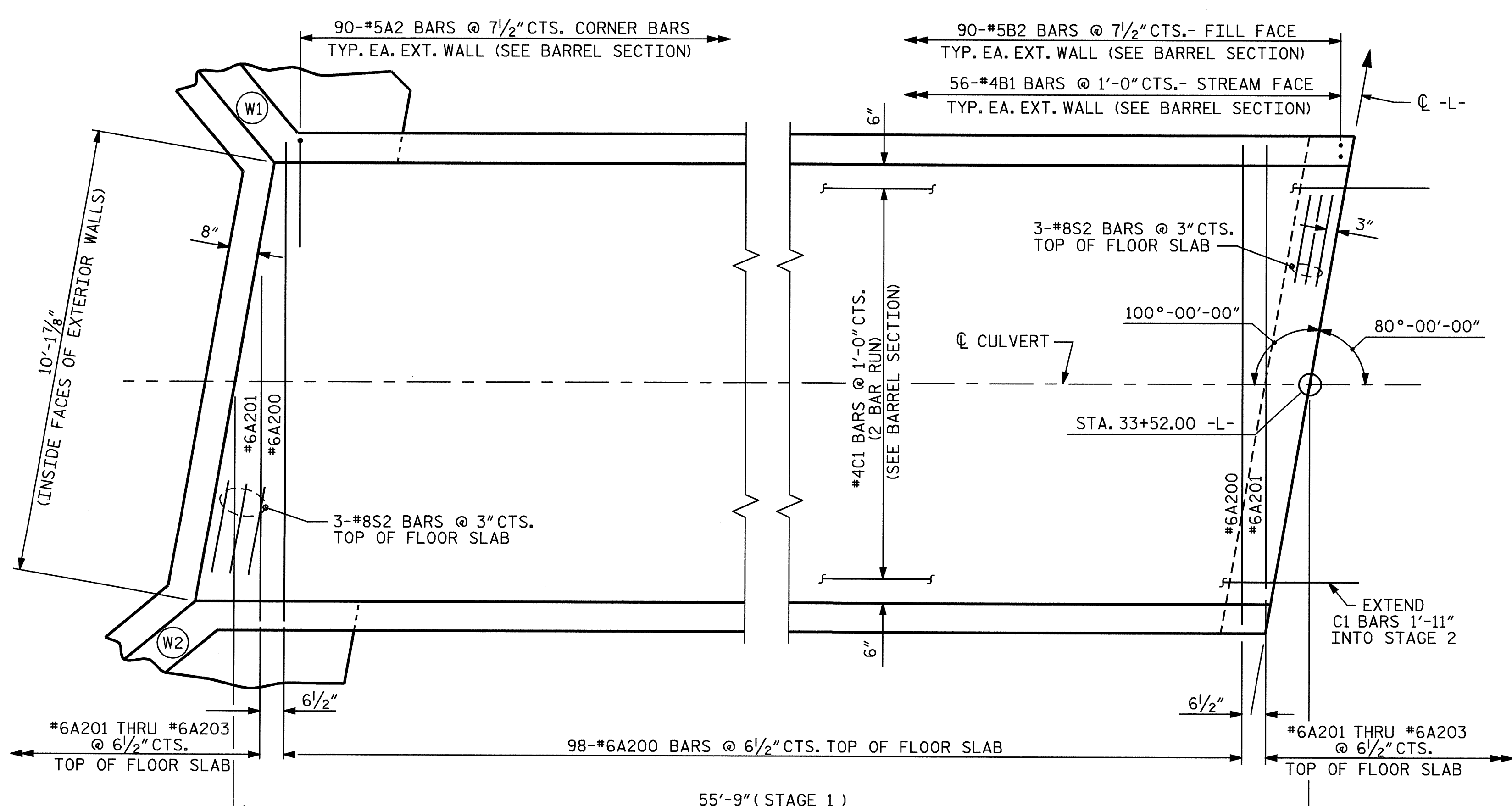
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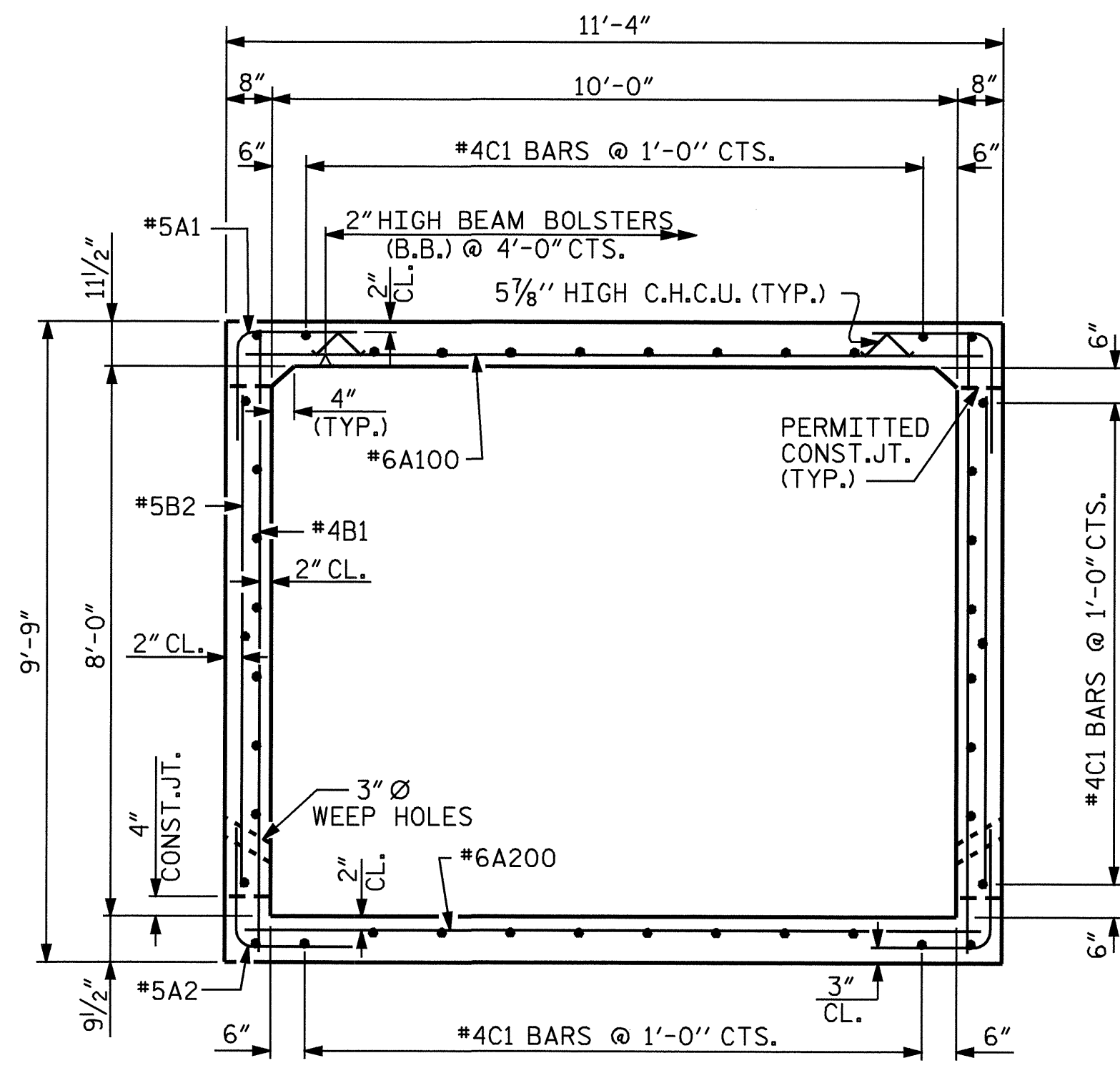
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 CHECKED BY: A. R. CHESSON DATE: 8-1-03



PLAN - ROOF SLAB

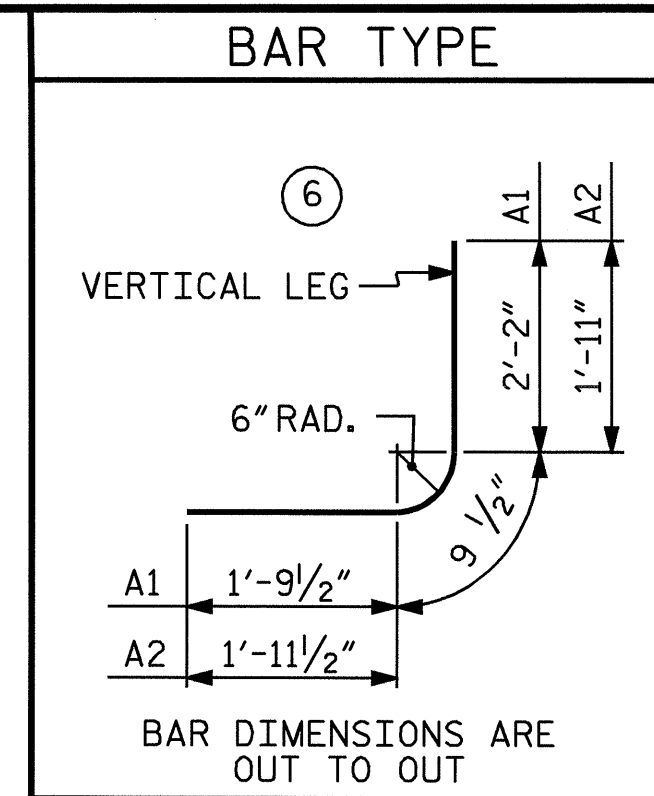


PLAN - FLOOR SLAB



RIGHT ANGLE SECTION OF BARREL
THERE ARE 42 "C" BARS IN SECTION OF BARREL

BAR TYPE		REINFORCING STEEL STAGE 1				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
A100	98	6	STR	10'-11"	1,607	
A101	2	6	STR	9'-1"	27	
A102	2	6	STR	6'-0"	18	
A103	2	6	STR	2'-11"	9	
A200	98	6	STR	10'-11"	1,607	
A201	2	6	STR	9'-1"	27	
A202	2	6	STR	6'-0"	18	
A203	2	6	STR	2'-11"	9	
A1	180	5	6	4'-9"	892	
A2	180	5	6	4'-8"	876	
B1	112	4	STR	9'-3"	692	
B2	180	5	STR	7'-4"	1,377	
C1	84	4	STR	29'-9"	1,669	
E1	12	4	STR	3'-4"	27	
G1	2	4	STR	11'-2"	15	
S2	12	8	STR	11'-2"	358	
					TOTAL (LBS.) = 9,228	

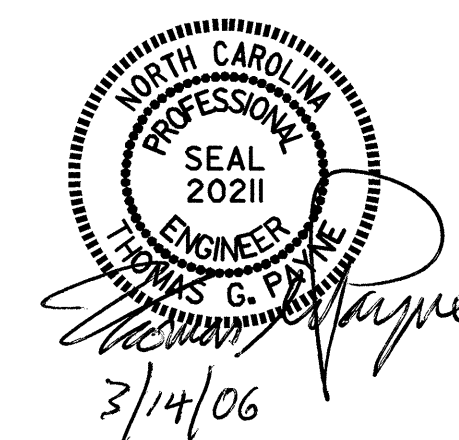


SPLICE LENGTHS CHART		
BAR SIZE	SPlice LENGTH	
B1 #4	1'-9"	
C1 #4	1'-11"	

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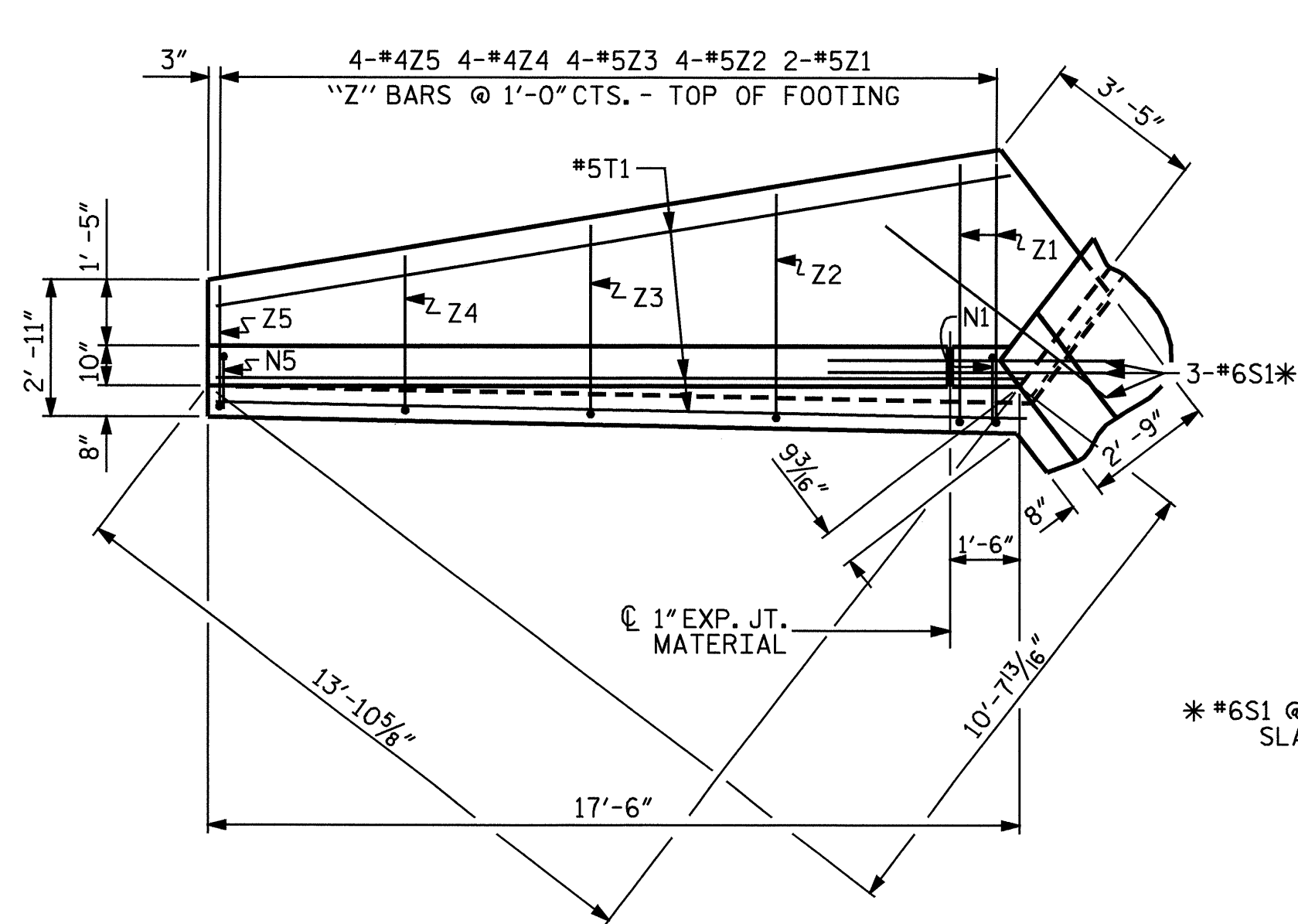
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CHECKED BY: A. R. CHESSON DATE: 8-1-03

PROJECT NO. U-3613B
PITT COUNTY
STATION 33+52.00 -L-
SHEET 3 OF 7

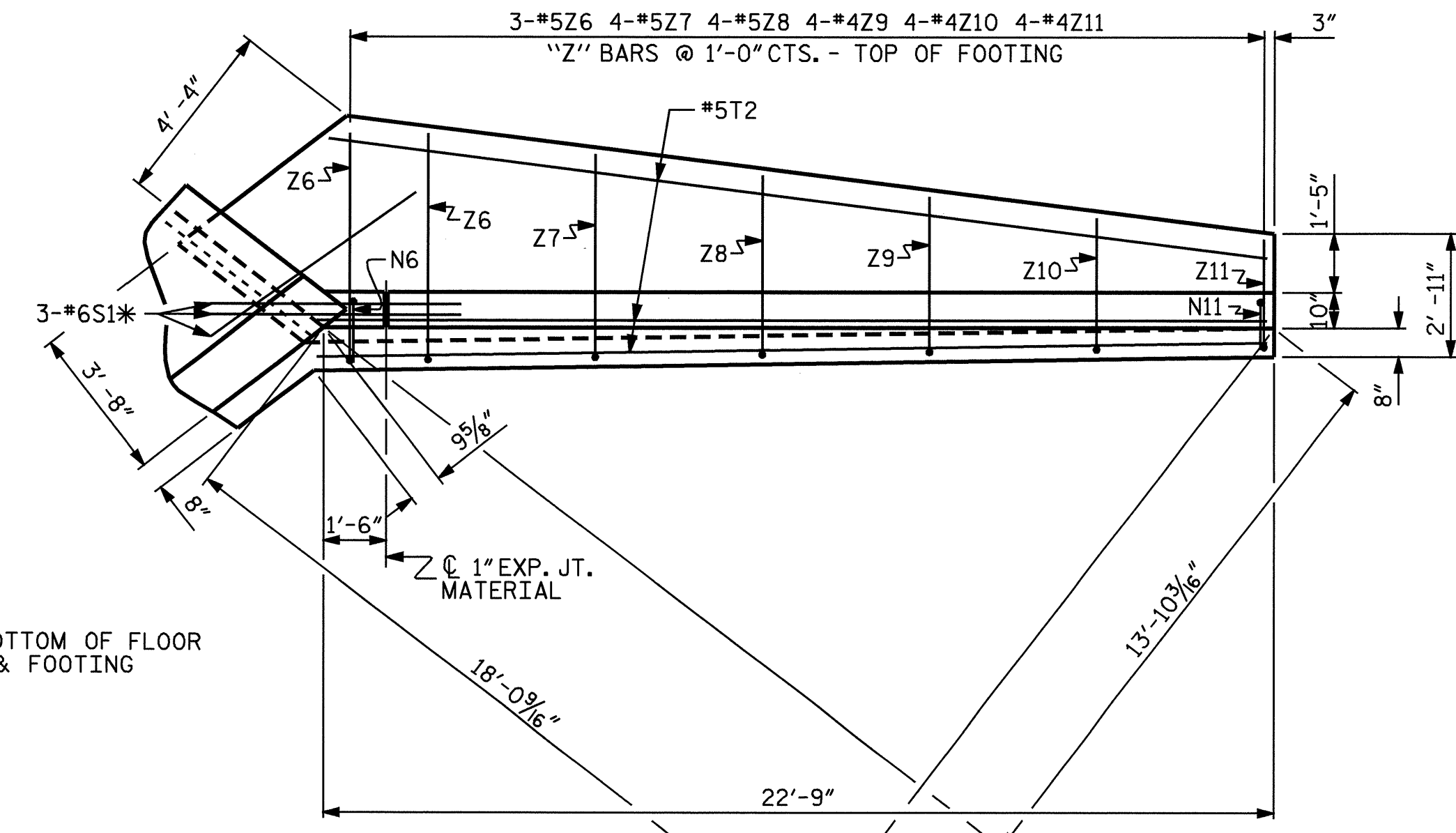


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
OPTIONAL SINGLE 10'-0" x 8'-0" CAST-IN-PLACE CONCRETE BOX CULVERT 80°-00'-00" SKEW STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

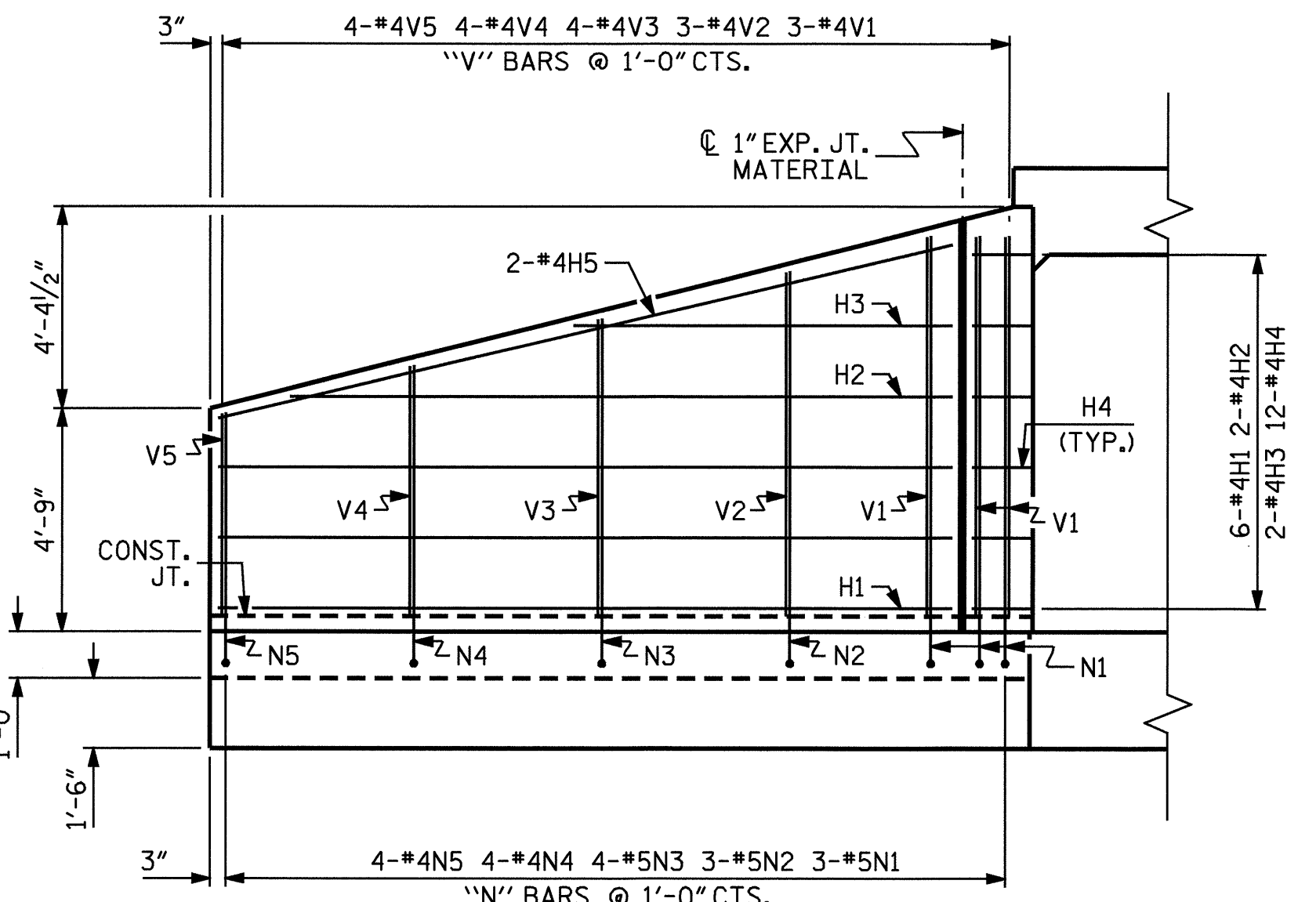
SHEET NO. C-8
TOTAL SHEETS 12



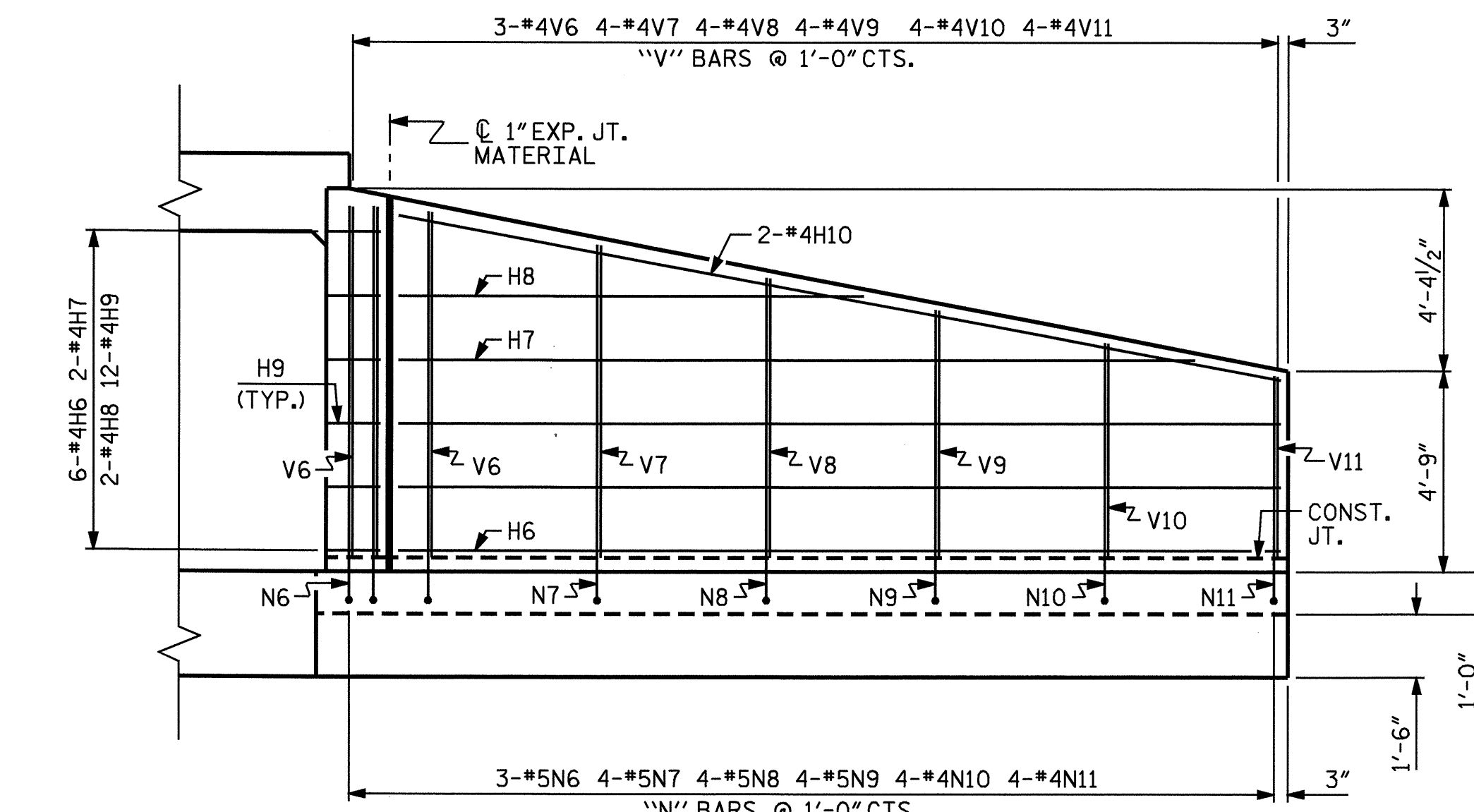
PLAN W1



PLAN W2



ELEVATION W1



ELEVATION W2

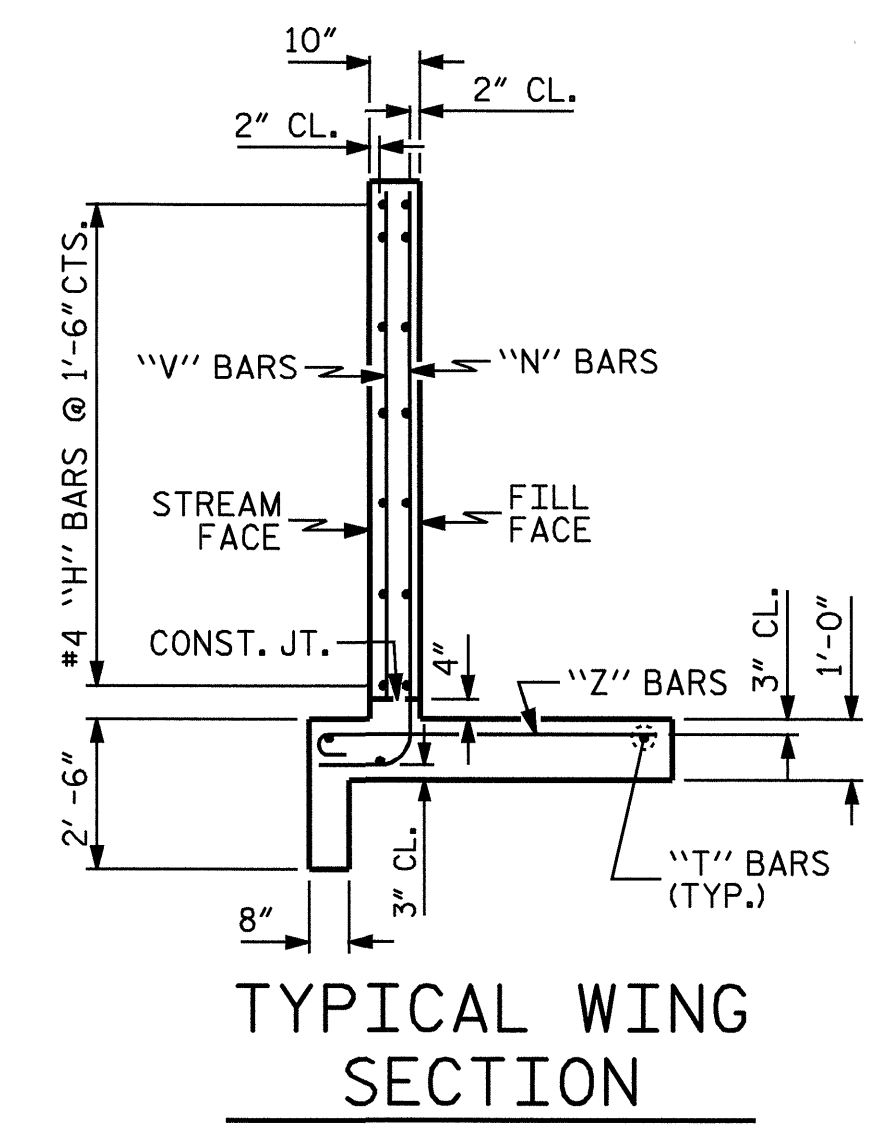
INLET WINGS

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	6	#4 STR	15'-7"	62	
H2	2	#4 STR	14'-1"	19	
H3	2	#4 STR	8'-0"	11	
H4	12	#4 STR	3'-3"	26	
H5	2	#4 STR	16'-1"	21	
H6	6	#4 STR	20'-10"	83	
H7	2	#4 STR	18'-10"	25	
H8	2	#4 STR	11'-0"	15	
H9	12	#4 STR	3'-3"	26	
H10	2	#4 STR	21'-2"	28	
N1	3	#5	10'-0"	31	
N2	3	#5	9'-4"	29	
N3	4	#5	8'-4"	35	
N4	4	#4	7'-4"	20	
N5	4	#4	6'-4"	17	
N6	3	#5	10'-3"	32	
N7	4	#5	9'-5"	39	
N8	4	#5	8'-7"	36	
N9	4	#5	7'-10"	33	
N10	4	#4	7'-1"	19	
N11	4	#4	6'-4"	17	
S1	6	#6 STR	6'-0"	54	
T1	3	#5 STR	17'-6"	55	
T2	3	#5 STR	22'-9"	71	
V1	3	#4 STR	8'-0"	16	
V2	3	#4 STR	7'-3"	15	
V3	4	#4 STR	6'-3"	17	
V4	4	#4 STR	5'-3"	14	
V5	4	#4 STR	4'-3"	11	
V6	3	#4 STR	8'-1"	16	
V7	4	#4 STR	7'-4"	20	
V8	4	#4 STR	6'-7"	18	
V9	4	#4 STR	5'-9"	15	
V10	4	#4 STR	5'-0"	13	
V11	4	#4 STR	4'-3"	11	
Z1	2	#5	6'-1"	13	
Z2	4	#5	4	5'-5"	23
Z3	4	#5	4	4'-8"	19
Z4	4	#4	4	3'-10"	10
Z5	4	#4	4	3'-1"	8
Z6	3	#5	4	6'-0"	19
Z7	4	#5	4	5'-5"	23
Z8	4	#5	4	4'-10"	20
Z9	4	#4	4	4'-2"	11
Z10	4	#4	4	3'-8"	10
Z11	4	#4	4	3'-1"	8
REINFORCING STEEL FOR 2 WINGS				1,134 LBS	
CLASS A CONCRETE					
2 WINGS				17.1 CY	
1 HEADWALL				0.5 CY	
2 EDGE BEAM				0.9 CY	
1 END CURTAIN WALL				0.5 CY	
TOTAL				19.0 CY	



TYPICAL WING SECTION

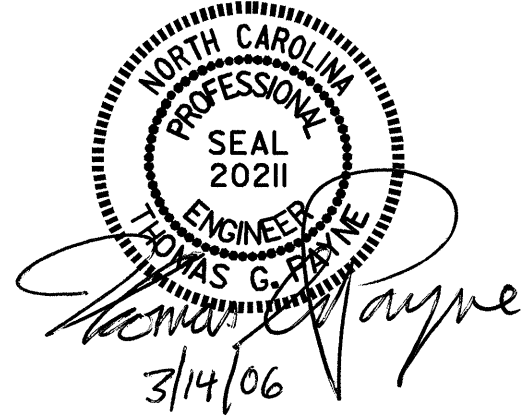
PROJECT NO. U-3613B
 COUNTY PITT
 STATION 33+52.00 -L-
 SHEET 4 OF 7

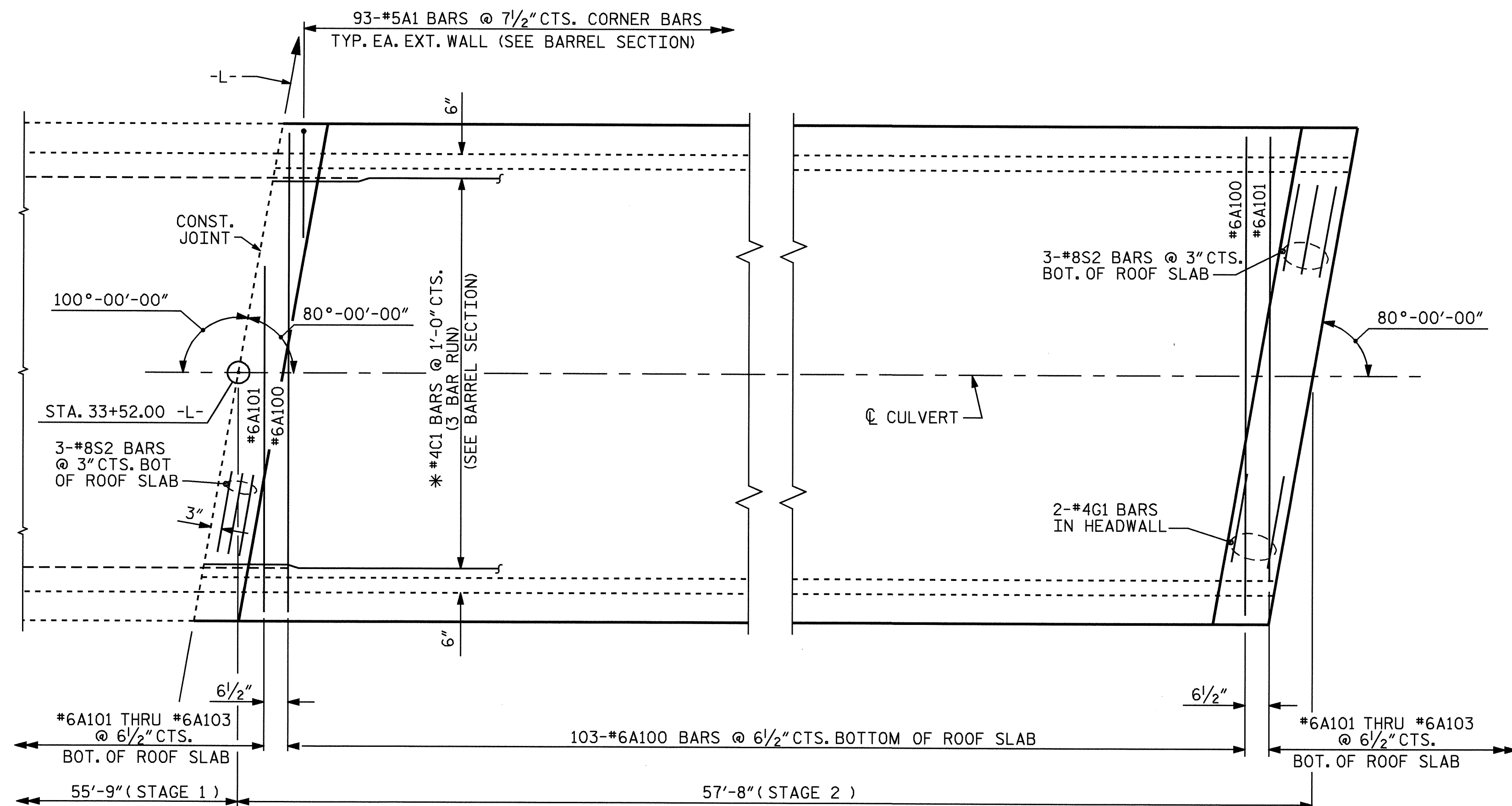
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**WINGS FOR OPTIONAL
 CAST-IN-PLACE
 CONCRETE BOX CULVERT**
 H = 8'-0" SLOPE = 3:1
 80° SKEW
 STAGE 1

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

TOTAL SHEETS 12

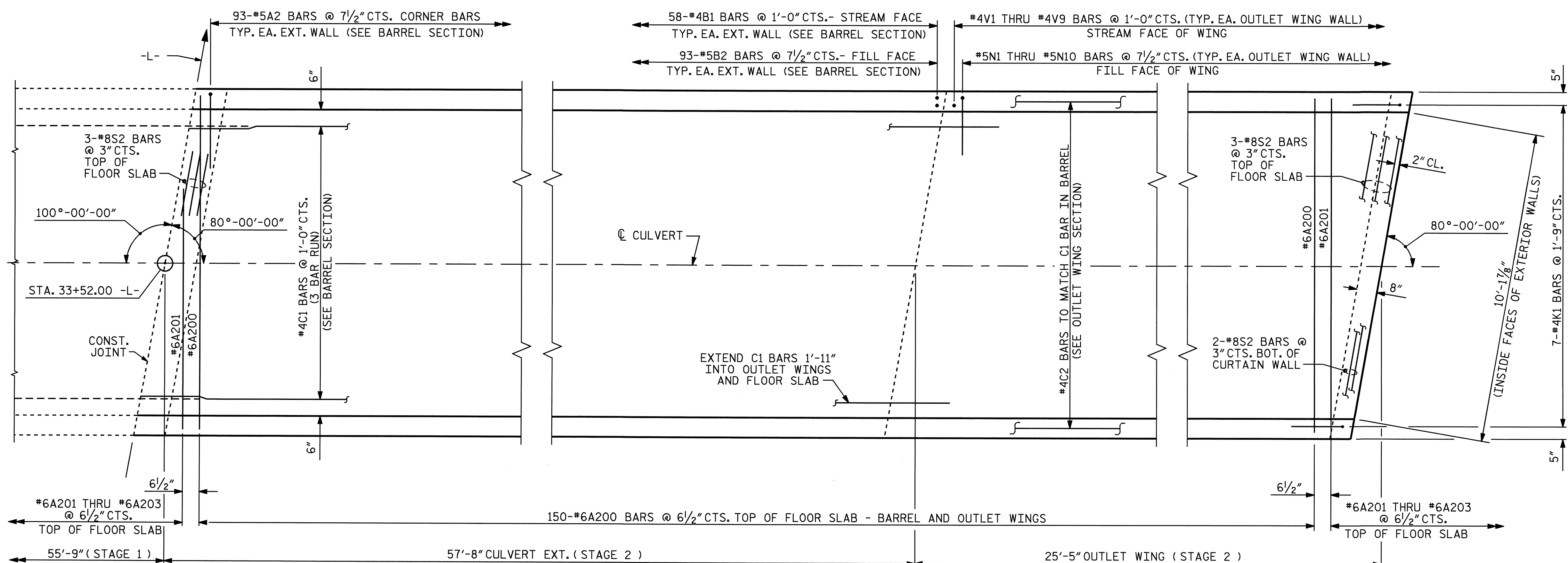
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 CHECKED BY: A. R. CHESSON DATE: 8-1-03



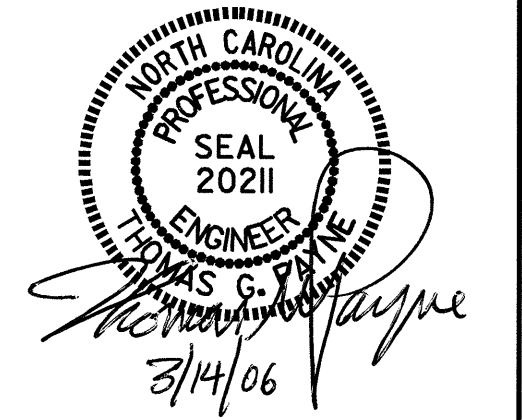


*#4C1 BAR IN ROOF SLAB TO END AT HEADWALL WITH 2" CLEAR, BAR SPLICES SHALL BE ADJUSTED.

PLAN - ROOF SLAB



PLAN - FLOOR SLAB



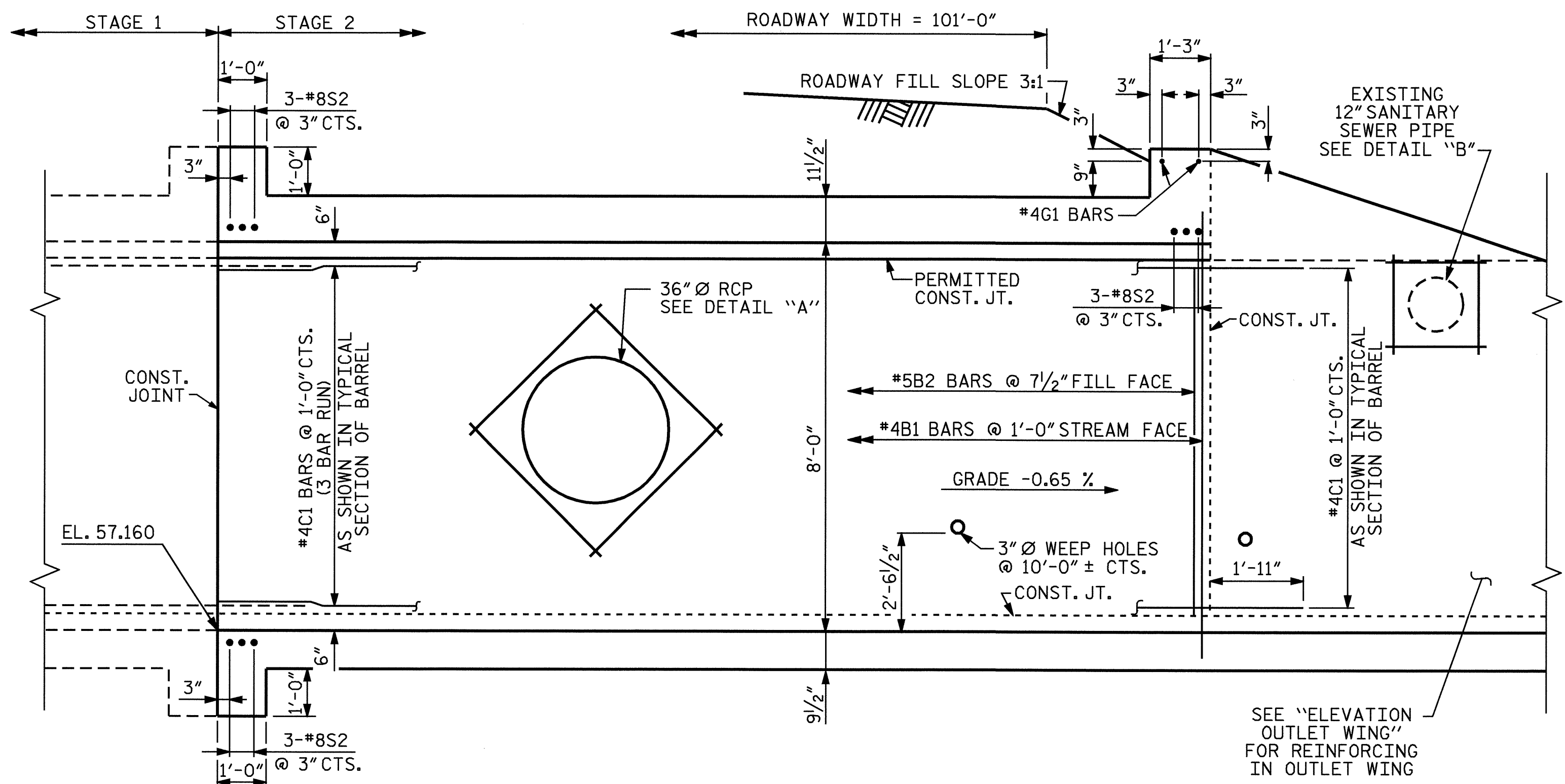
PROJECT NO. U-3613B
 PITT COUNTY
 STATION 33+52.00 -L-

SHEET 5 OF 7
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 OPTIONAL SINGLE
 10'-0" X 8'-0"
 CAST-IN-PLACE
 CONCRETE BOX CULVERT
 80°-00'-00" SKEW
 STAGE 2

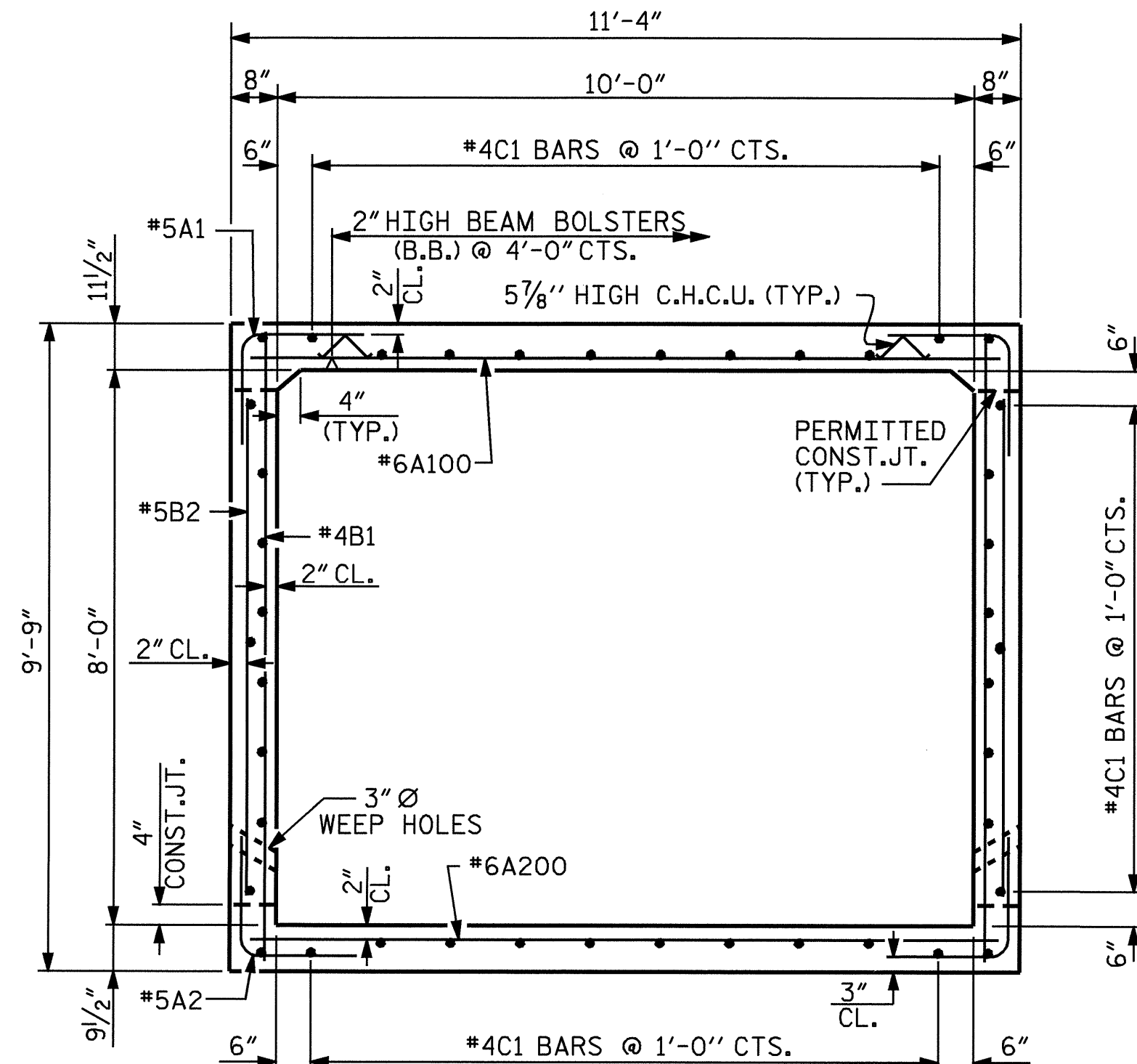
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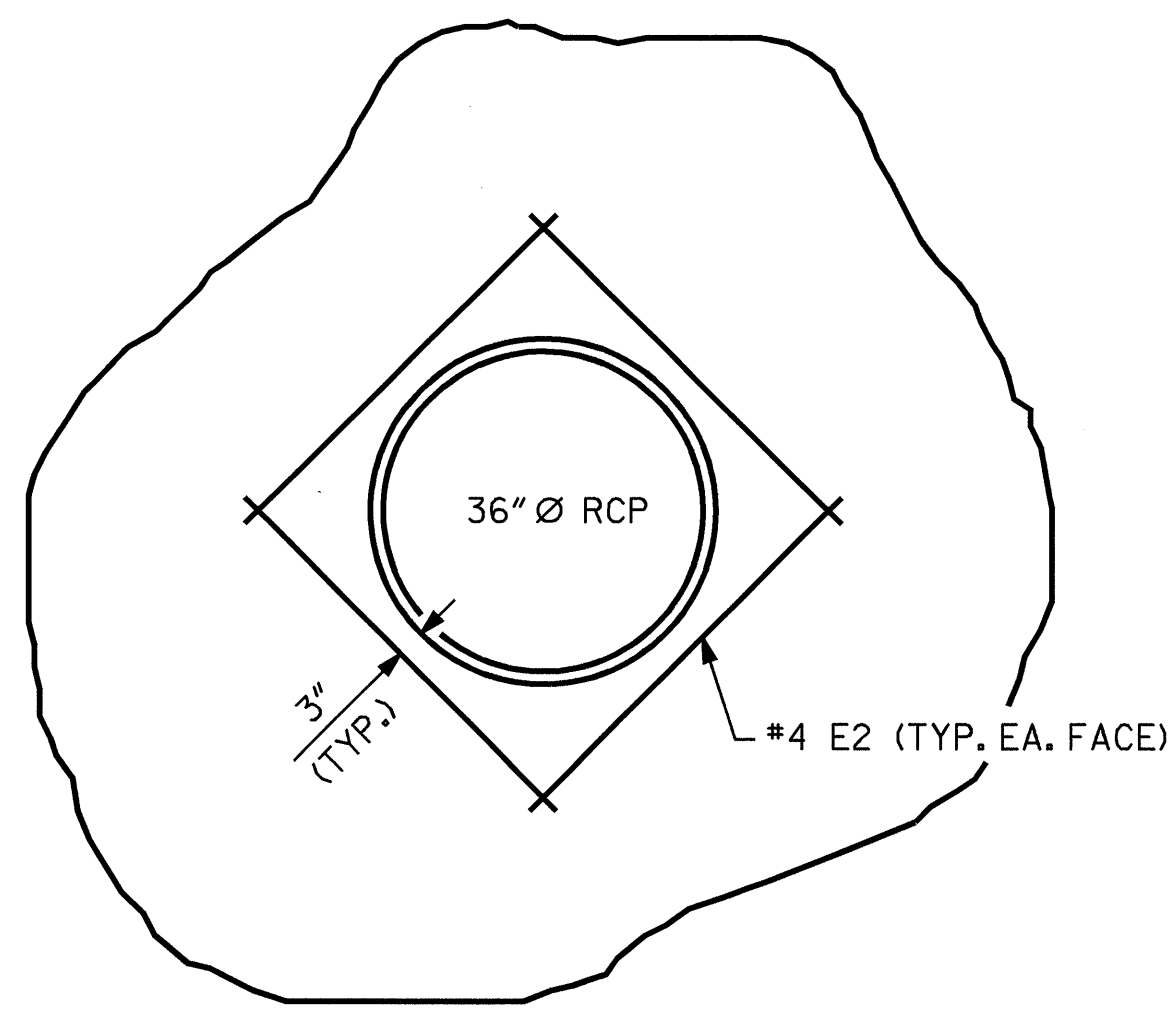
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CULVERT SECTION NORMAL TO ROADWAY

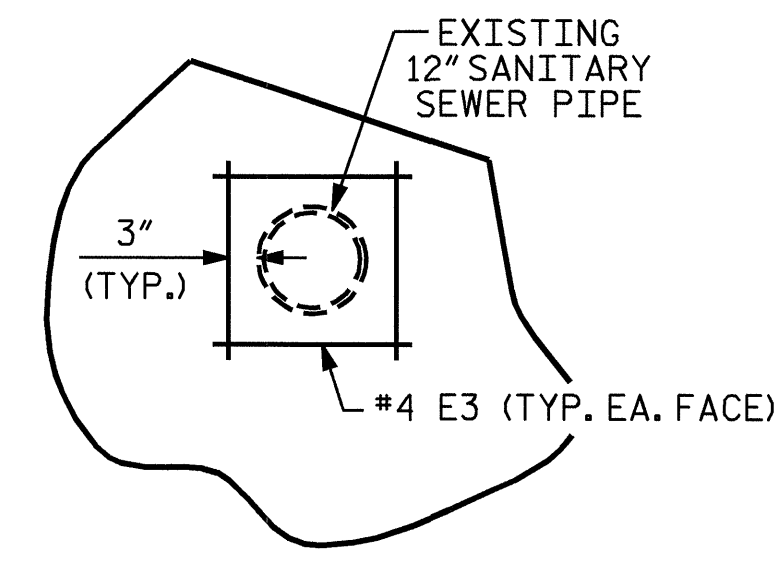


RIGHT ANGLE SECTION OF BARREL
THERE ARE 42 "C" BARS IN SECTION OF BARREL



DETAIL "A"

THE 36" Ø RCP THRU THE SIDEWALL OF THE CULVERT IS TO BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR PIPE. THE AREA IS TO BE REINFORCED WITH ADDITIONAL BARS (E2) AS SHOWN.



DETAIL "B"

THE REINFORCING STEEL SHALL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR THE EXISTING 12" DI PIPE. THE AREA IS TO BE REINFORCED WITH ADDITIONAL BARS (E3) AS SHOWN.

BAR TYPES				REINFORCING STEEL (STAGE 2)							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	103	6	STR	10-11	1,689	K1	7	4	7	3- 4	16
A101	2	6	STR	9- 1	27	N1	10	5	6	11- 0	115
A102	2	6	STR	6- 0	18	N2	8	5	6	10- 2	85
A103	2	6	STR	2-11	9	N3	8	5	6	9- 5	79
A200	150	6	STR	10-11	2,460	N4	8	5	6	8- 6	71
A201	2	6	STR	9- 1	27	N5	8	5	6	7- 8	64
A202	2	6	STR	6- 0	18	N6	8	5	6	6-11	58
A203	2	6	STR	2-11	9	N7	8	5	6	6- 1	51
A1	186	5	5	4- 9	921	N8	8	5	6	5- 3	44
A2	186	5	5	4- 8	905	N9	8	5	6	4- 5	37
B1	116	4	STR	9- 3	717	N10	8	5	6	3- 7	30
B2	186	5	STR	7- 4	1,423	V1	8	4	STR	9- 2	49
C1	126	4	STR	21- 1	1,775	V2	6	4	STR	8- 3	33
C2	12	4	STR	25- 3	202	V3	6	4	STR	7- 2	29
E2	8	4	STR	4- 4	23	V4	6	4	STR	6- 2	25
E3	8	4	STR	2- 2	12	V5	6	4	STR	5- 3	21
G1	2	4	STR	11- 2	15	V6	6	4	STR	4- 3	17
H1	2	4	STR	25- 3	34	V7	6	4	STR	3- 3	13
H2	2	4	STR	24-10	33	V8	6	4	STR	2- 3	9
H3	2	4	STR	21-10	29	V9	2	4	STR	1-11	3
H4	2	4	STR	18-10	25	S2	14	8	STR	11- 2	417
H5	4	4	STR	15-10	42						
H6	2	4	STR	12-10	17						
H7	2	4	STR	9-10	13						
H8	2	4	STR	6-10	9						
H9	2	4	STR	3-10	5						
H10	4	4	STR	26- 5	71						
REINFORCING STEEL (LBS.) =											11,794

BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS CHART

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

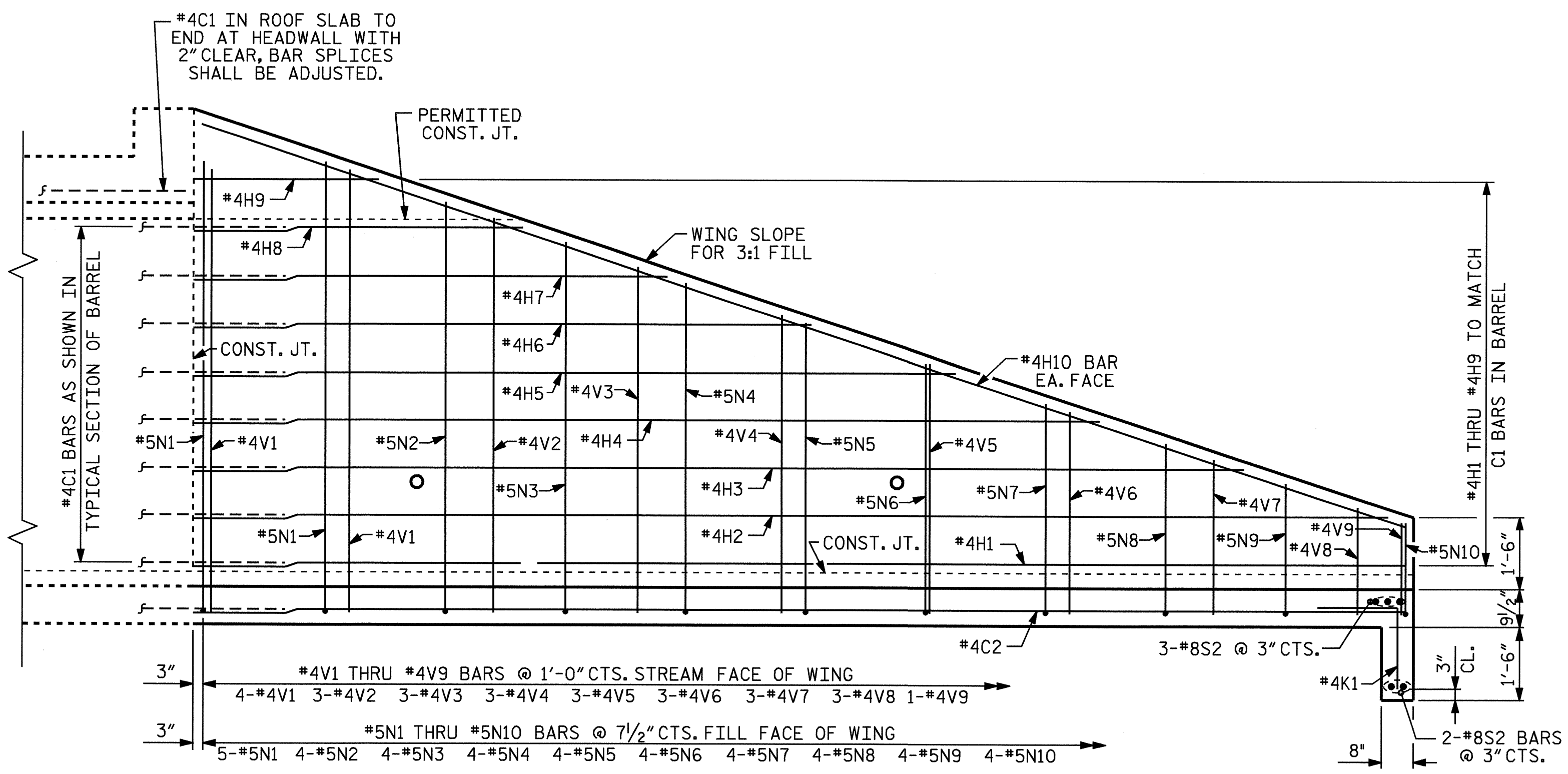
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 Klayne

DRAWN BY: KEITH D. LAYNE DATE: 7-25-02
 CHECKED BY: A. R. CHESSON DATE: 8-1-03

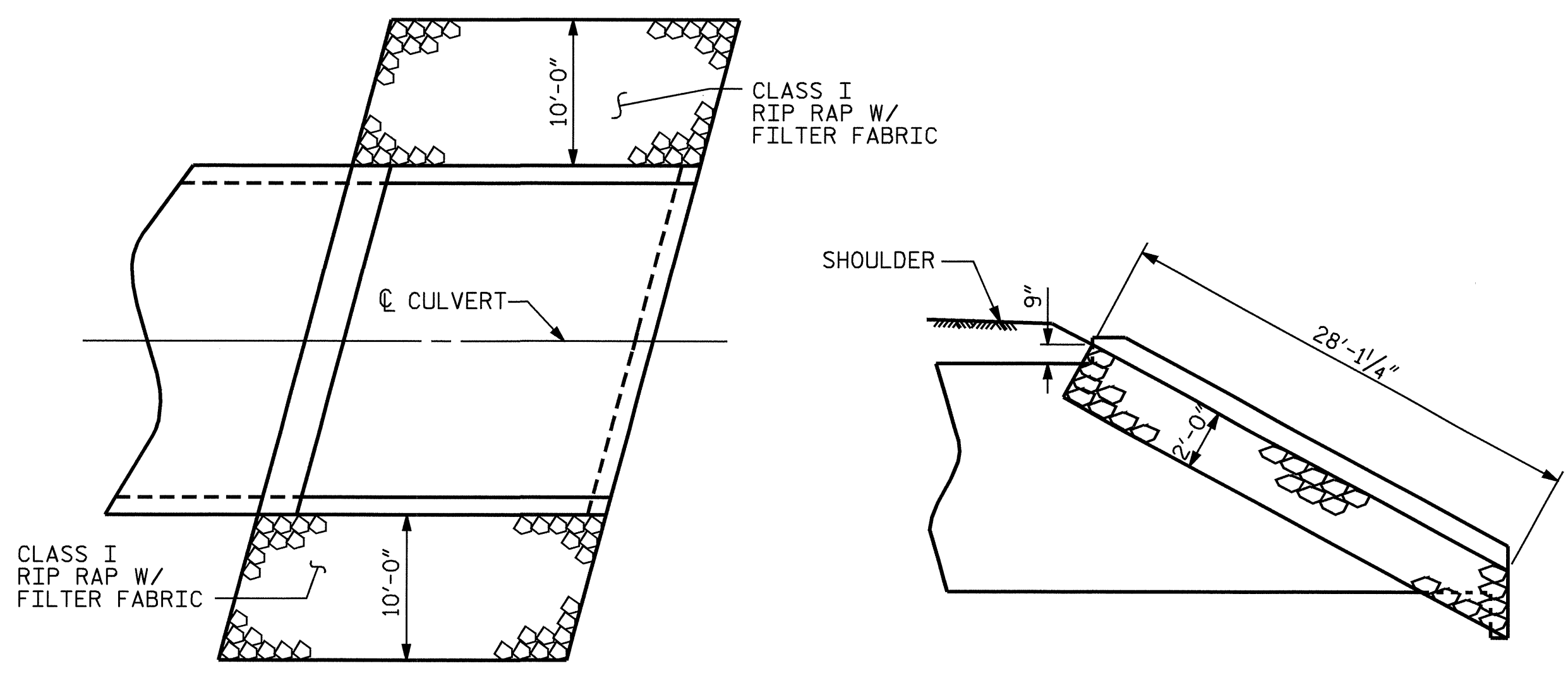
PROJECT NO. U-3613B
PITT COUNTY
 STATION 33+52.00 -L-
 SHEET 6 OF 7

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 2021
 ENGINEER
 THOMAS B. PAINE
 3/4/06

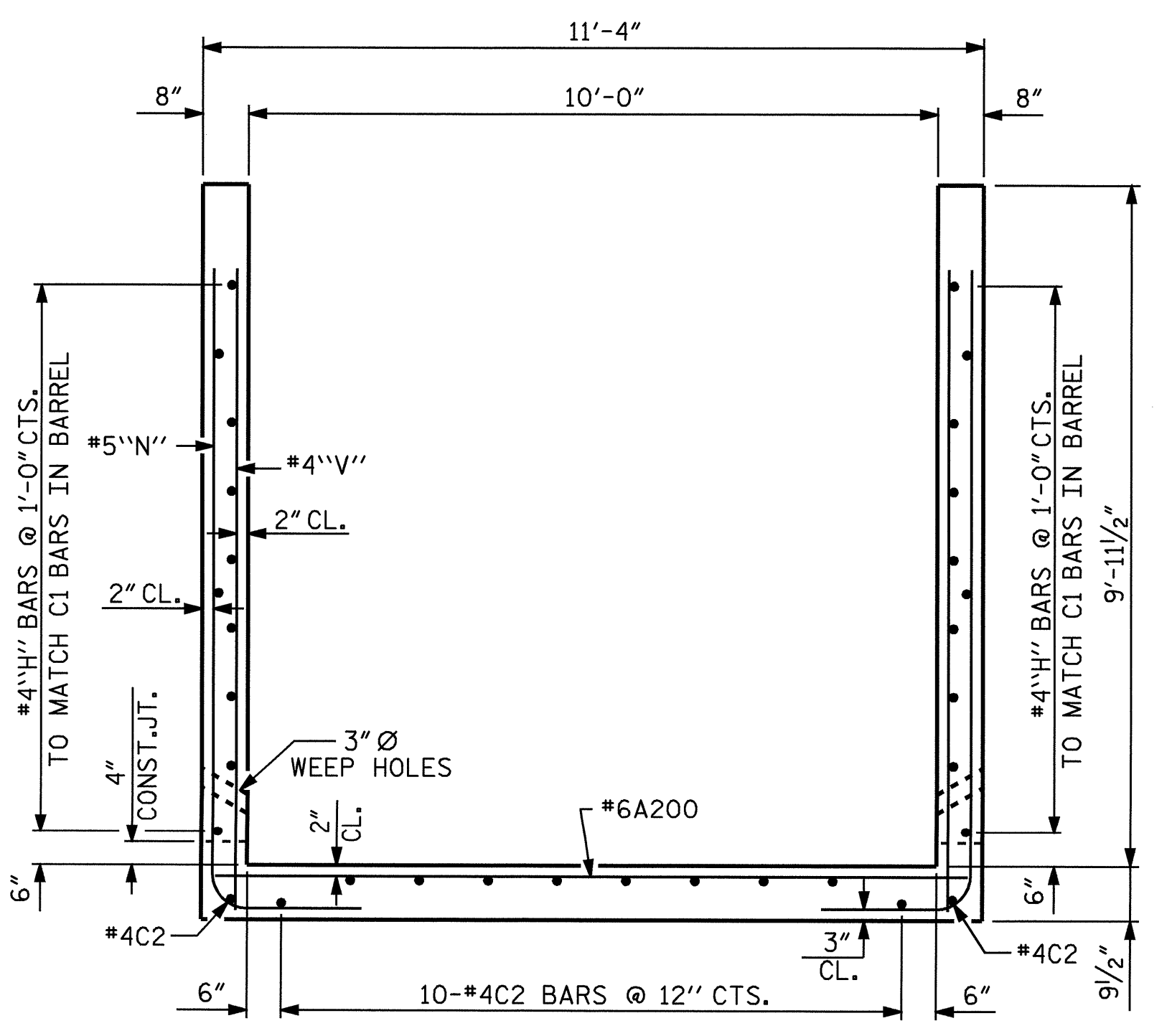
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
OPTIONAL SINGLE 10'-0" X 8'-0" CAST-IN-PLACE CONCRETE BOX CULVERT 80°-00'-00" SKEW					
STAGE 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					C-11
					TOTAL SHEETS 12



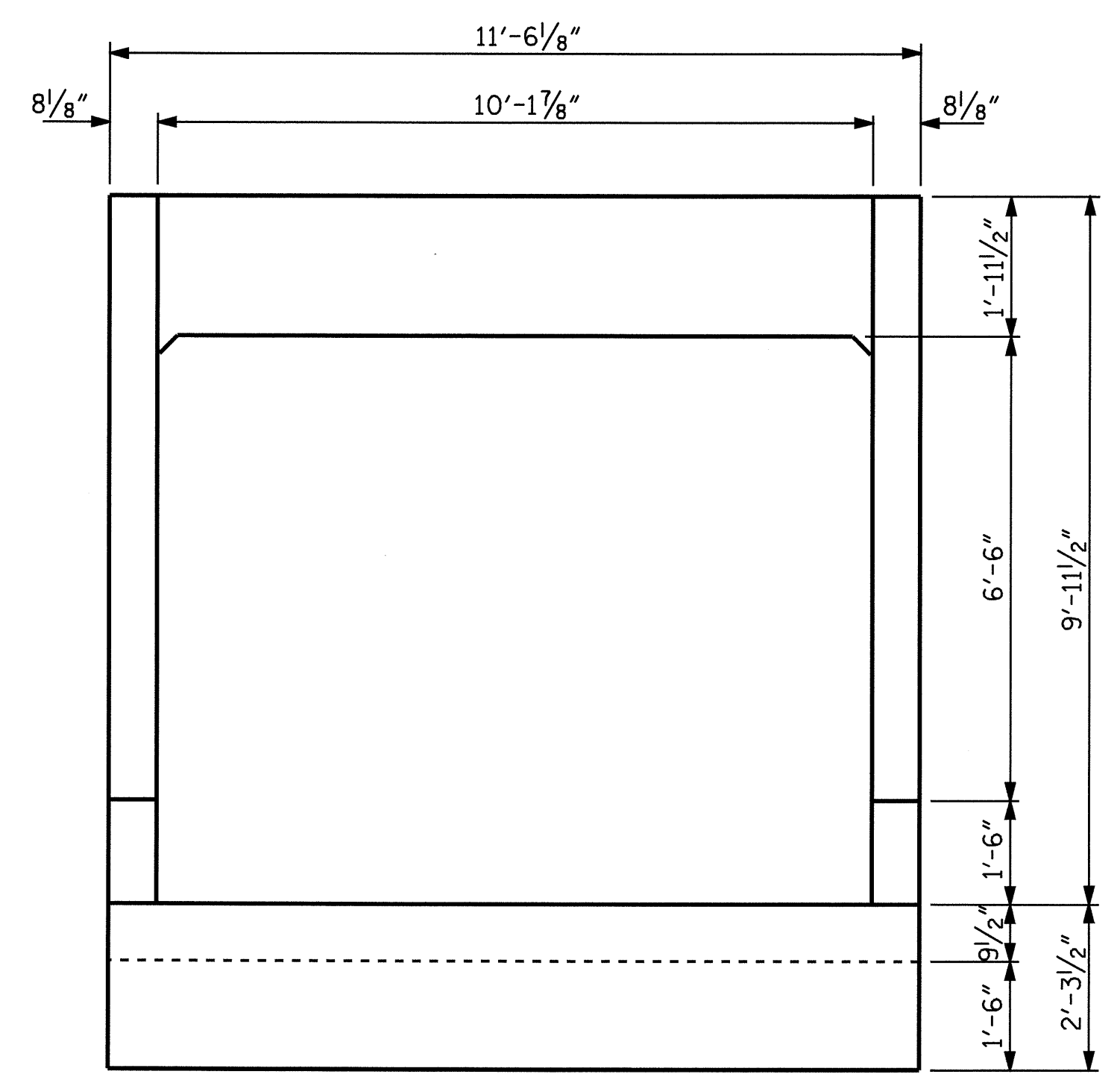
ELEVATION - OUTLET WING
(EXISTING 12" SANITARY SEWER PIPE NOT SHOWN FOR CLARITY)



PLAN VIEW
ELEVATION VIEW
OUTLET WING RIP RAP DETAILS



RIGHT ANGLE SECTION OF OUTLET WING
#4\"/>

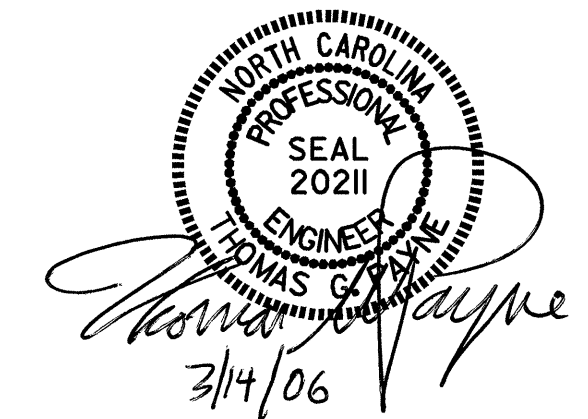


END ELEVATION NORMAL TO SKEW
OUTLET END

NOTE: SEE SHEET 6 OF 7 FOR REINFORCING STEEL SCHEDULE.

PROJECT NO. U-3613B
PITT COUNTY
STATION 33+52.00 -L-
SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
OPTIONAL SINGLE
10'-0" x 8'-0"
CAST-IN-PLACE
CONCRETE BOX CULVERT
80°-00'-00" SKEW
STAGE 2

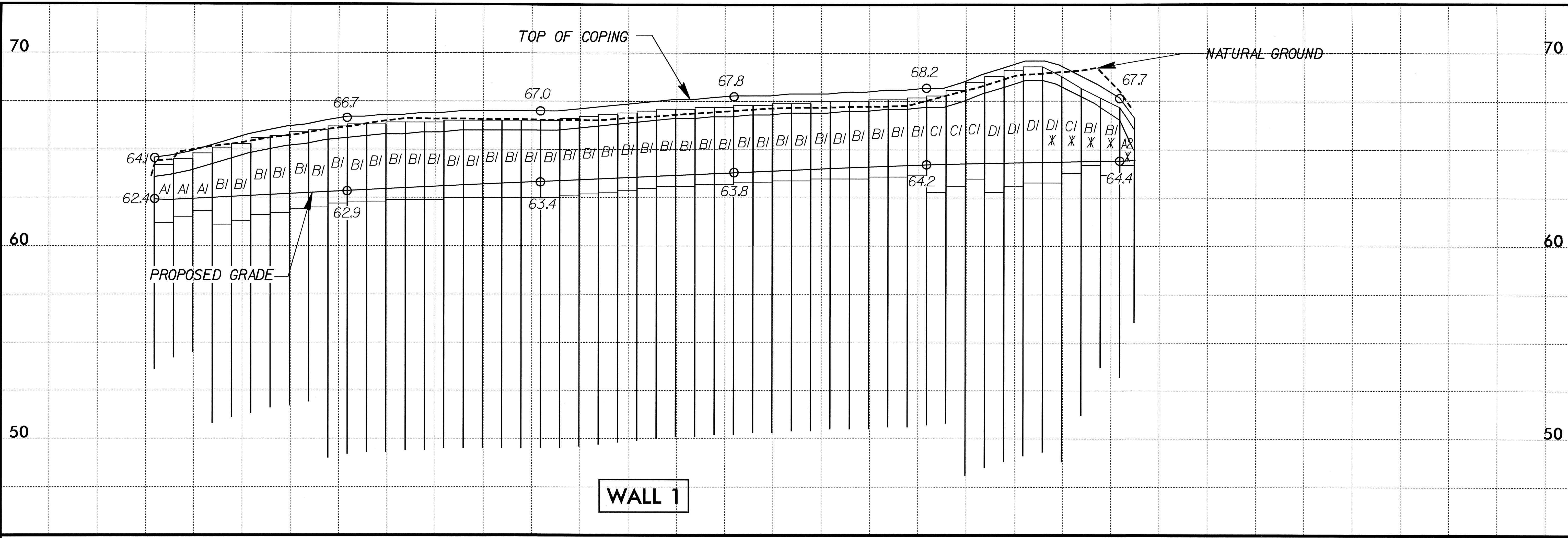


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 12

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DRAWN BY: KEITH D. LAYNE DATE: 7-25-02
CHECKED BY: A. R. CHESSON DATE: 8-1-03



WALL 1

10

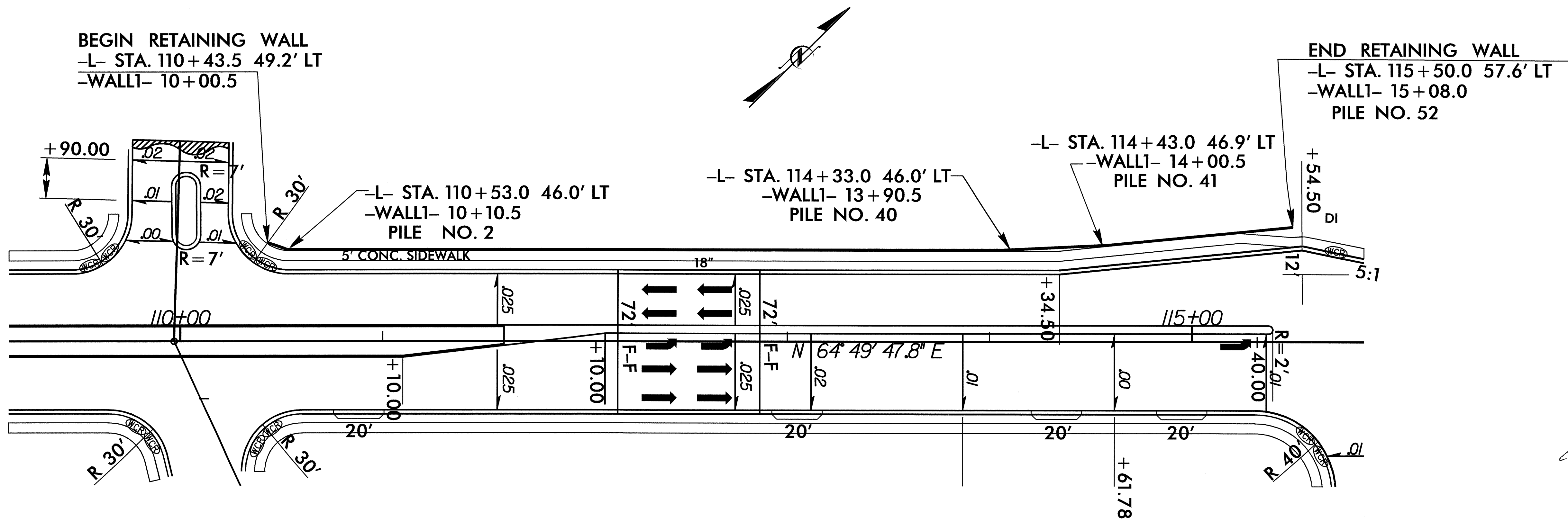
11

12

13

14

15

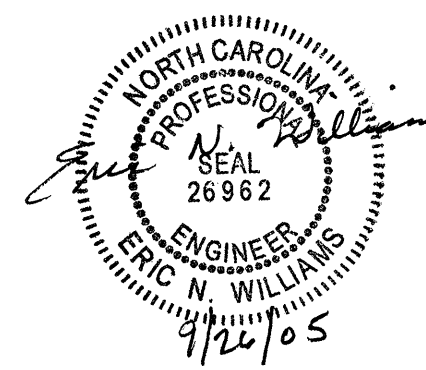


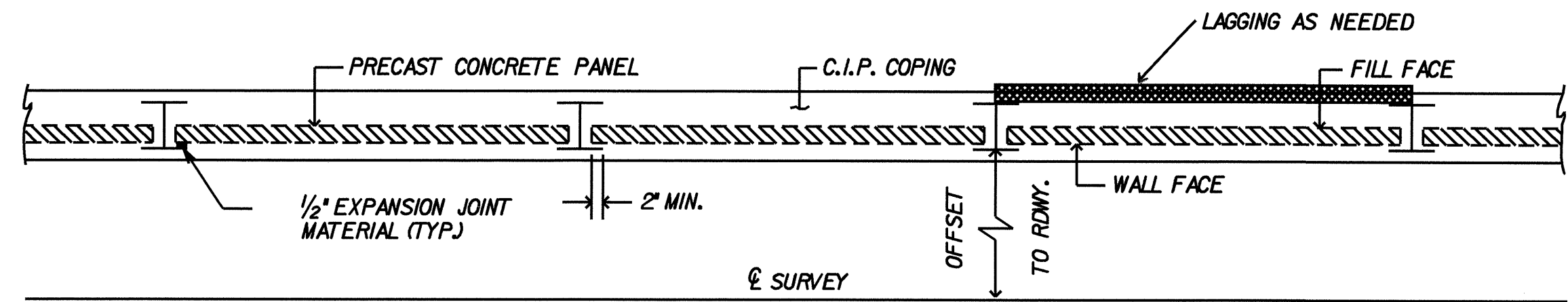
PROJECT U-3613B
 COUNTY PITT
 STATION 10+00.50 TO 15+08.00 -WALL 1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

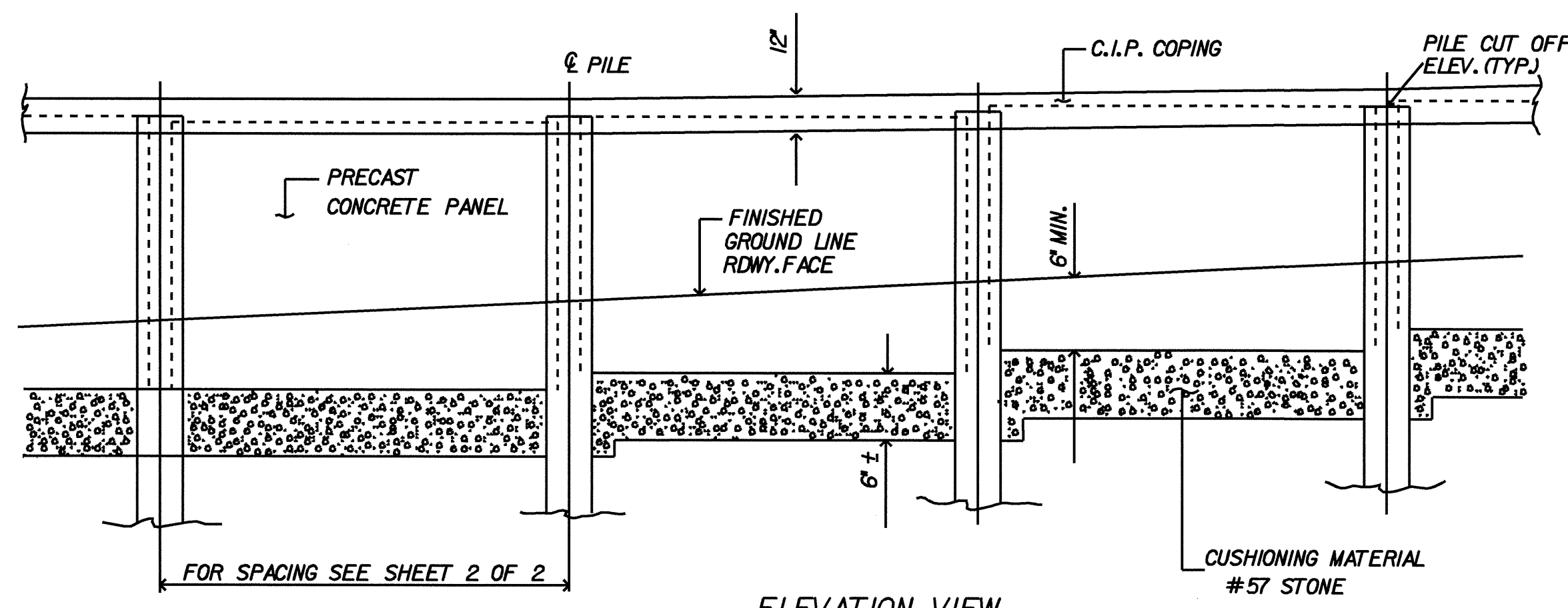
WALL 1
PILE/PANEL WALL

DRAWN BY TTW DATE 09/05
 DESIGNED BY ENW DATE 09/05
 CHECKED BY JRB SHEET W-1 OF 5

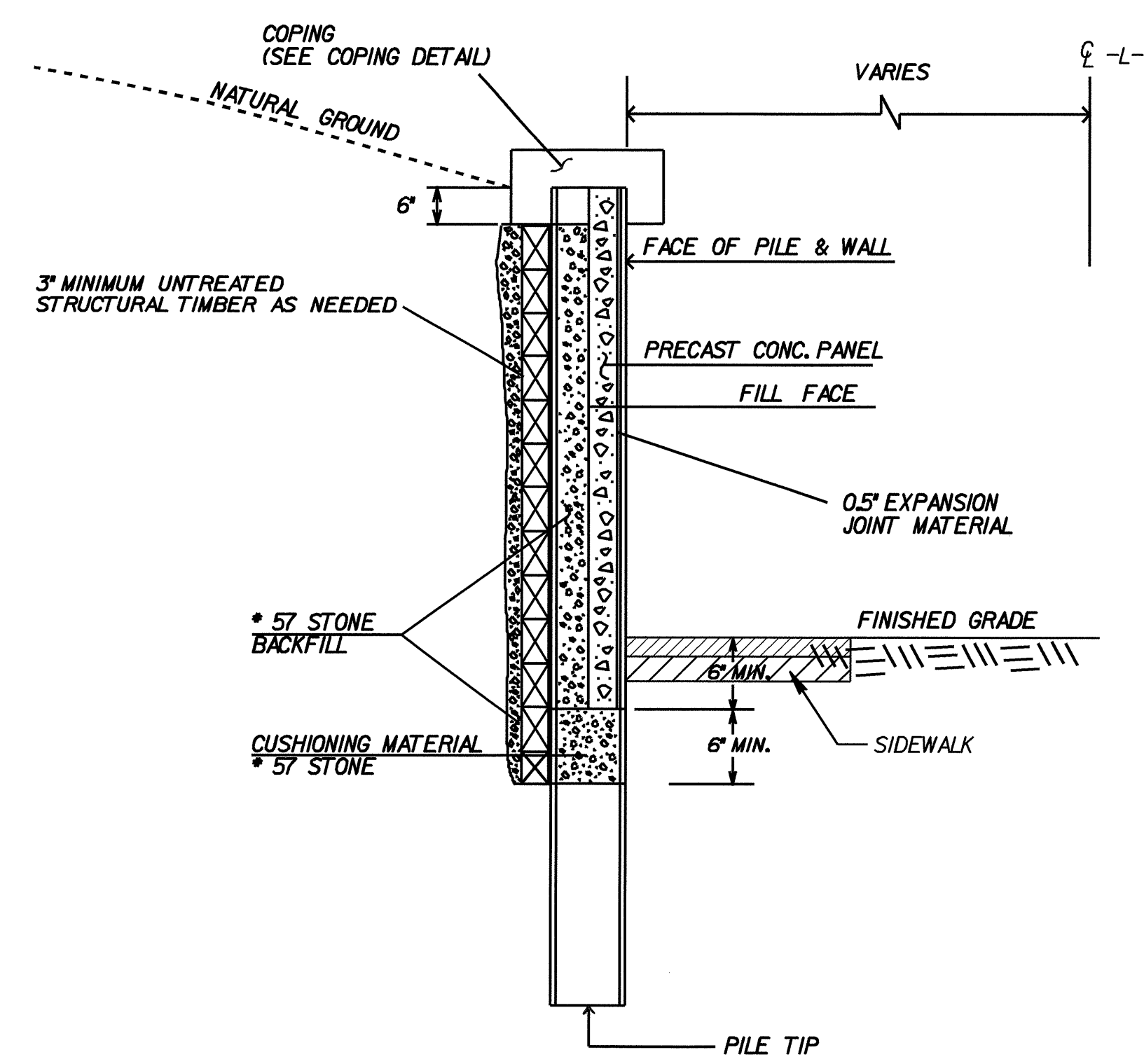




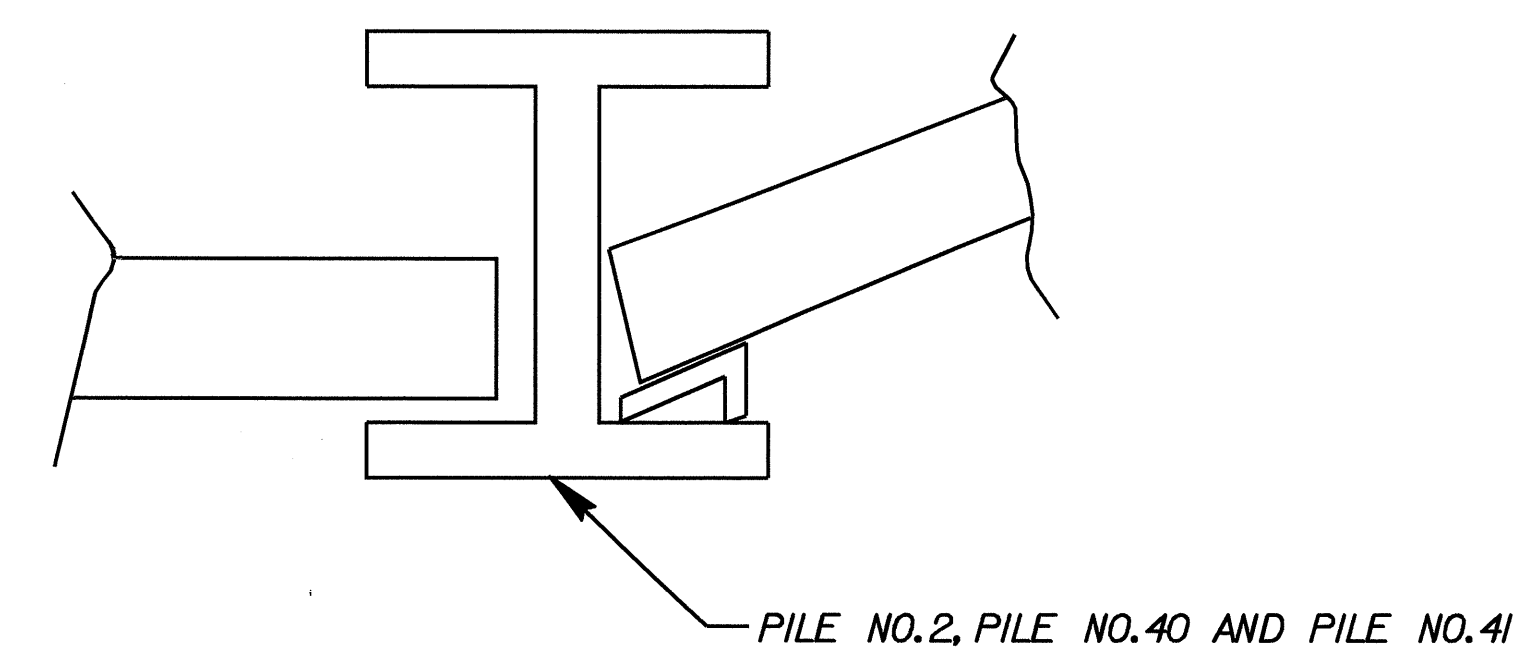
PLAN VIEW
N.T.S.



ELEVATION VIEW
N.T.S.



TYPICAL SECTION
N.T.S.



N.T.S.

PILE ELEVATIONS AND PANEL TYPES

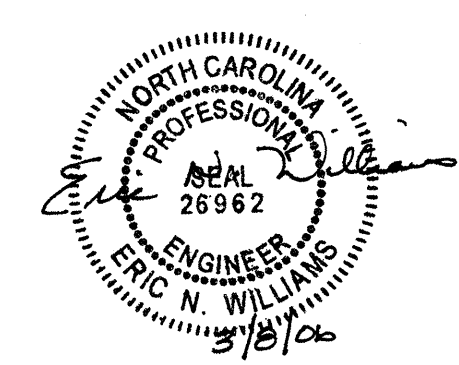
WALL NO. 1 PILE STATION	PILE NO.	PILE SIZE	PILE SPACE	PILE LENGTH	CUTOFF ELEV	PANEL TYPE
10+00.5	1	HP 12X53		10	63.6	
10+10.5	2	HP 12X53	10	10	64.3	A1
10+20.5	3	HP 12X53	10	10	64.5	A1
10+30.5	4	HP 12X53	10	14	64.8	A1
10+40.5	5	HP 12X53	10	14	65.1	B1
10+50.5	6	HP 12X53	10	14	65.3	B1
10+60.5	7	HP 12X53	10	14	65.6	B1
10+70.5	8	HP 12X53	10	14	65.7	B1
10+80.5	9	HP 12X53	10	14	65.9	B1
10+90.5	10	HP 12X53	10	17	66.0	B1
11+00.5	11	HP 12X53	10	17	66.2	B1
11+10.5	12	HP 12X53	10	17	66.3	B1
11+20.5	13	HP 12X53	10	17	66.3	B1
11+30.5	14	HP 12X53	10	17	66.4	B1
11+40.5	15	HP 12X53	10	17	66.4	B1
11+50.5	16	HP 12X53	10	17	66.5	B1
11+60.5	17	HP 12X53	10	17	66.5	B1
11+70.5	18	HP 12X53	10	17	66.5	B1
11+80.5	19	HP 12X53	10	17	66.5	B1
11+90.5	20	HP 12X53	10	17	66.5	B1
12+00.5	21	HP 12X53	10	17	66.5	B1
12+10.5	22	HP 12X53	10	17	66.5	B1
12+20.5	23	HP 12X53	10	17	66.6	B1
12+30.5	24	HP 12X53	10	17	66.7	B1
12+40.5	25	HP 12X53	10	17	66.8	B1
12+50.5	26	HP 12X53	10	17	66.9	B1
12+60.5	27	HP 12X53	10	17	67.0	B1
12+70.5	28	HP 12X53	10	17	67.1	B1
12+80.5	29	HP 12X53	10	17	67.1	B1
12+90.5	30	HP 12X53	10	17	67.2	B1
13+00.5	31	HP 12X53	10	17	67.3	B1
13+10.5	32	HP 12X53	10	17	67.3	B1
13+20.5	33	HP 12X53	10	17	67.3	B1
13+30.5	34	HP 12X53	10	17	67.4	B1
13+40.5	35	HP 12X53	10	17	67.4	B1
13+50.5	36	HP 12X53	10	17	67.5	B1
13+60.5	37	HP 12X53	10	17	67.5	B1
13+70.5	38	HP 12X53	10	17	67.6	B1
13+80.5	39	HP 12X53	10	17	67.6	B1
13+90.5	40	HP 12X53	10	17	67.6	B1
14+00.5	41	HP 12X53	10	17	67.7	B1
14+10.5	42	HP 12X53	10	17	67.8	C1
14+20.5	43	HP 12X53	10	20	68.1	C1
14+30.5	44	HP 12X53	10	20	68.5	C1
14+40.5	45	HP 12X53	10	20	68.8	D1
14+50.5	46	HP 12X53	10	20	69.1	D1
14+60.5	47	HP 12X53	10	20	69.3	D1
14+70.5	48	HP 12X53	10	20	68.7	D1*
14+80.5	49	HP 12X53	10	17	68.2	C1*
14+90.5	50	HP 12X53	10	14	67.7	B1*
15+00.5	51	HP 12X53	10	14	67.2	B1*
15+08	52	HP 12X53	7.5	10	66.1	A2*

* DENOTES SPECIAL PANELS. SEE EXAMPLE BLOCKED OUT PRECAST PANEL DETAIL AND NOTES.

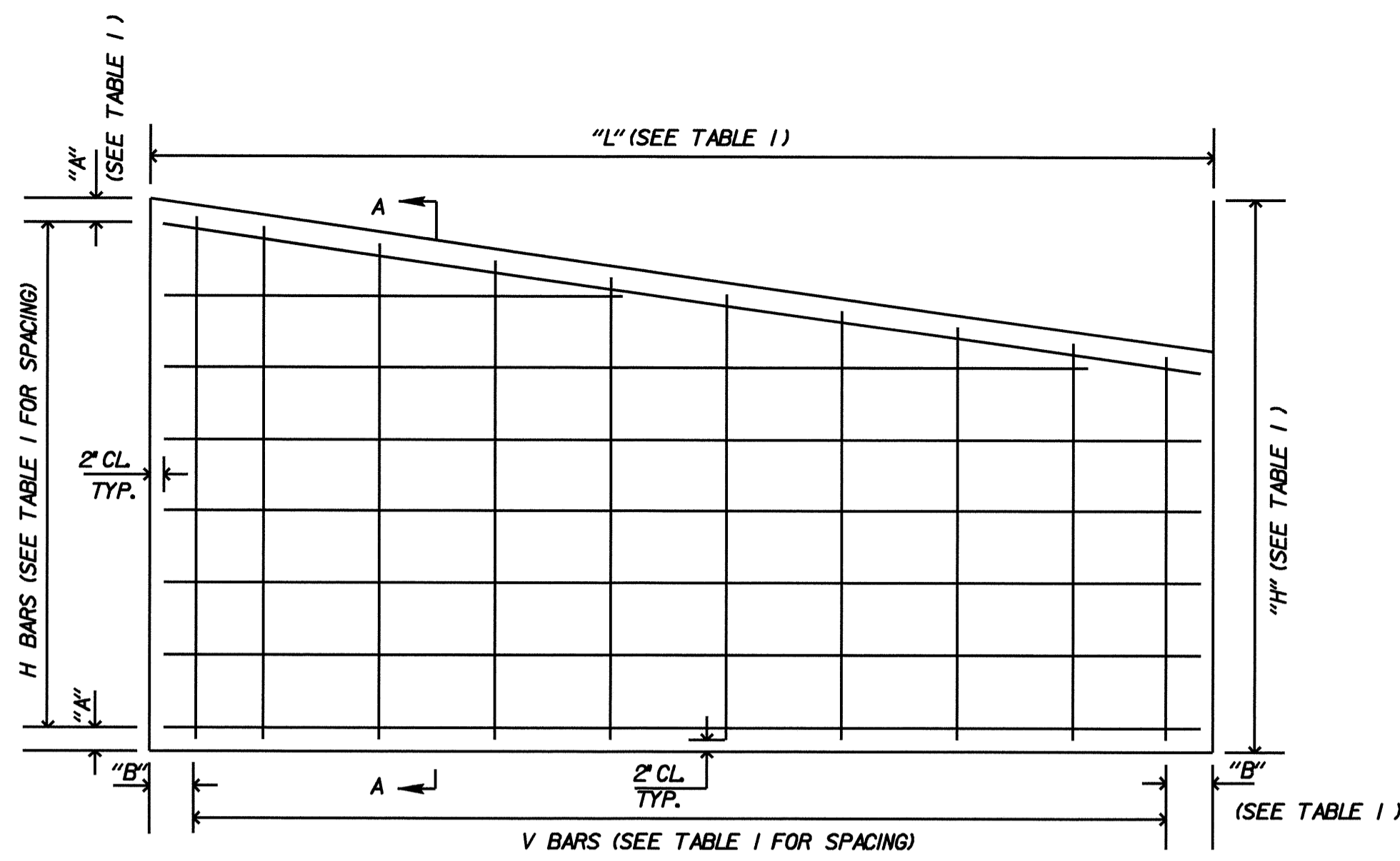
NOTES:

- PILES SHALL BE INSTALLED TO THE CUT OFF ELEVATIONS AND LENGTHS SHOWN ON THE PLANS.
- USE ASTM A572 GRADE 50 STEEL PILES WITH THE ADDITION OF 0.2% MINIMUM COPPER.
- SPLICING OF PILES IS NOT ALLOWED.
- THE TOP OF THE INSTALLED PILES SHALL BE WITHIN 2 INCH OF THEIR PLAN LOCATION IN ANY DIRECTION.
- CONCRETE PANELS SHALL HAVE A MINIMUM BEARING DISTANCE OF 2 INCH ON THE PILE FLANGE. 1/2 INCH THICK EXPANSION JOINT MATERIAL SHALL BE PLACED BETWEEN THE CONCRETE PANELS AND PILE FLANGES FOR THE WIDTH OF THE BEARING SURFACE.
- THE CONCRETE PANELS SHALL HAVE A DARK GRAY EXPOSED AGGREGATE FACE. SEE SPECIAL PROVISIONS FOR COLOR, TEXTURE AND AGGREGATE REQUIREMENTS.
- CONCRETE PANELS SHALL BE HELD SECURELY AGAINST PILES UNTIL BACKFILL IS PLACED. BACKFILL SHALL BE BROUGHT UP UNIFORMLY.
- BACKFILL MATERIAL, BOTH CUSHIONING MATERIAL AND BACKFILL BEHIND PANELS, SHALL BE COMPACTED AS REQUIRED BY THE ENGINEER. THE STONE SHALL BE RODDED AND SPREAD IN ORDER TO FILL ALL VOIDS AND INSURE MAXIMUM DENSITY. FLUSHING THE STONE WITH WATER TO AID COMPACTION WILL NOT BE ALLOWED.
- BACKFILLING SHALL BE COMPLETED PRIOR TO FORMING THE COPING.
- TOP OF COPING TO BE ADJUSTED BY ENGINEER TO GIVE A UNIFORM APPEARANCE.
- CONSTRUCTION JOINTS IN COPING ARE PERMITTED AT LOCATIONS WHERE COPING CHANGES SLOPE AND AT 90 FOOT CENTERS. EXPANSION JOINTS ARE NOT PERMITTED.
- BLOCK OUT ONE OF THE A2 PANELS TO PROVIDE A 10:1 (H:V) SLOPE AT THE TOP OF THE PANEL MEASURED FROM LEFT BACK FACE DOWNWARD TO RIGHT BACK FACE.
- BLOCK OUT ONE OF THE D1 PANELS, ONE OF THE C1 PANELS AND TWO OF THE B1 PANELS TO PROVIDE A 20:1 (H:V) SLOPE AT THE TOP OF THE PANEL MEASURED FROM LEFT BACK FACE DOWNWARD TO RIGHT BACK FACE.
- THE RESIDENT ENGINEER SHALL VERIFY THE LOCATION OF DRAINAGE STRUCTURES AND UTILITIES PRIOR TO INSTALLING PILES. THE LAYOUT OF THE WALL MAY NEED TO BE ADJUSTED TO AVOID UNANTICIPATED INTERFERENCE.
- CONSTRUCTION SEQUENCE:
 - DRIVE HP 12 x 53 STEEL PILES TO THE LENGTHS SHOWN ON THE PLAN.
 - EXCAVATION TO INSTALL THE PANELS OR LAGGING SHALL BE VERTICAL, HAVE A MAXIMUM LIFT HEIGHT OF 4 FEET AND BE LIMITED IN EXTENT TO ONLY WHAT IS NECESSARY.
 - TIMBER LAGGING IS NEEDED ONLY TO MEET OSHA REQUIREMENTS FOR SAFE EXCAVATION HEIGHTS. IF CUT IS LESS THAN 4 FEET HIGH, LAGGING IS NOT REQUIRED.
 - THE LAGGING SHALL HAVE A MINIMUM BEARING DISTANCE OF 3 INCHES ON THE PILE FLANGE.
 - UNTREATED STRUCTURAL TIMBERS SHALL BE A MINIMUM OF 3 INCHES THICK AND SHALL CONFORM TO THE APPLICABLE PARTS OF SECTIONS 445 AND 1082 OF THE STANDARD SPECIFICATIONS.
 - PLACE BACKFILL BEHIND THE LAGGING IMMEDIATELY AFTER INSTALLATION.
 - WHERE PRACTICAL, THE TOP FEW PIECES OF LAGGING SHALL BE REMOVED PRIOR TO BACKFILLING BEHIND PANELS. ALL OTHER LAGGING SHALL BE LEFT IN PLACE.
 - THE CONTRACTOR MAY ELECT TO USE AN ALTERNATIVE METHOD OF PROVIDING A SAFE EXCAVATION. HOWEVER, THE ALTERNATE METHOD MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- PILE/PANEL WALL MUST BE BUILT BEFORE PLACING ANY FILL MATERIAL BEHIND THE WALL.
- PILES SHALL BE PAINTED BLACK FROM THE TOP OF THE PILE DOWN TO 12 INCHES BELOW GRADE.
- FOR PILE/PANEL WALL, SEE SPECIAL PROVISIONS.
- CONTINUOUS MONITORING WILL BE REQUIRED DURING THE INITIAL STAGES OF PILE INSTALLATION FOR THE PILE/PANEL WALL AT ADJACENT STRUCTURES/PROPERTIES. SEE CONTROL OF VIBRATION SPECIAL PROVISIONS.

PROJECT U-3613B
PITT COUNTY
STATION 10+00.50 TO 15+08.00 -WALL 1-

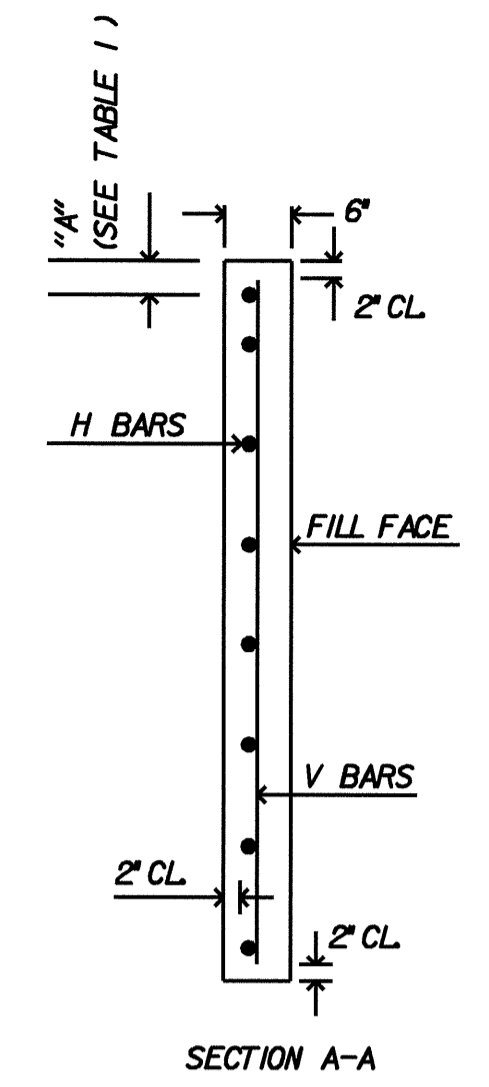


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
WALL 1
PILE/PANEL WALL
DRAWN BY TTW DATE 09/05
DESIGNED BY ENW DATE 09/05
CHECKED BY JRB SHEET W-2 OF 5

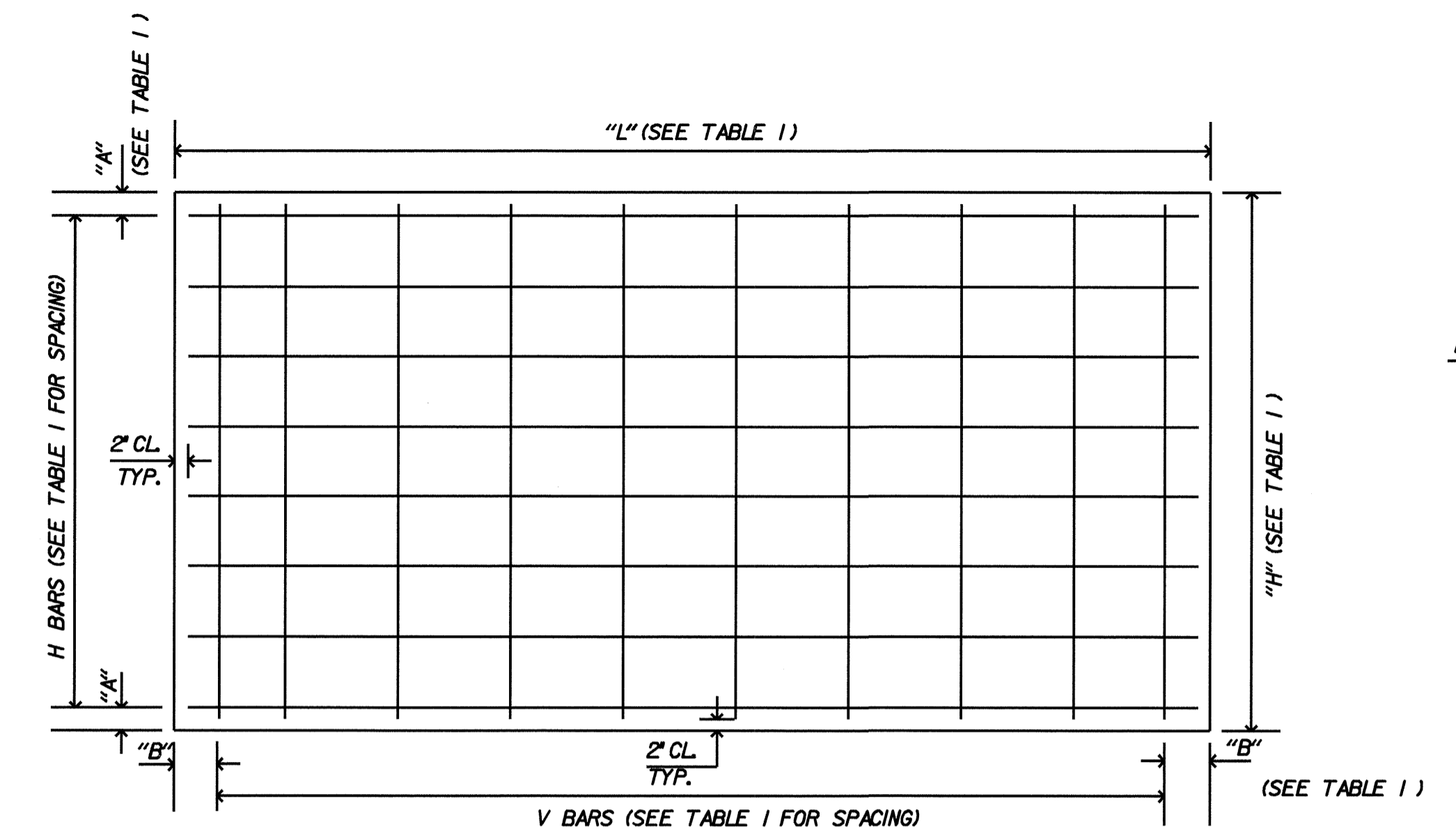


EXAMPLE BLOCKED OUT PRECAST PANEL DETAIL
(FRONT FACE OF WALL)

N.T.S.



SECTION A-A



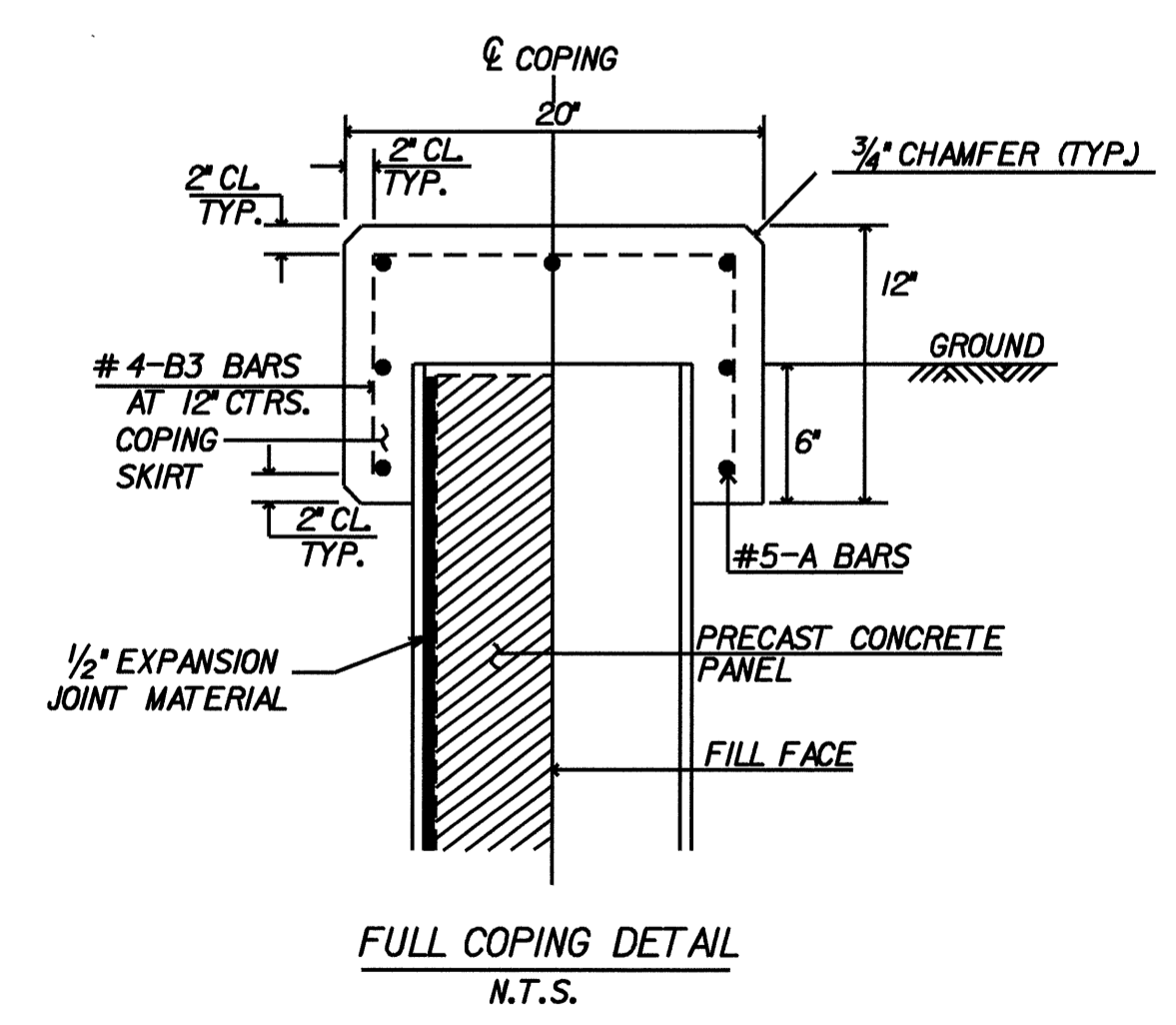
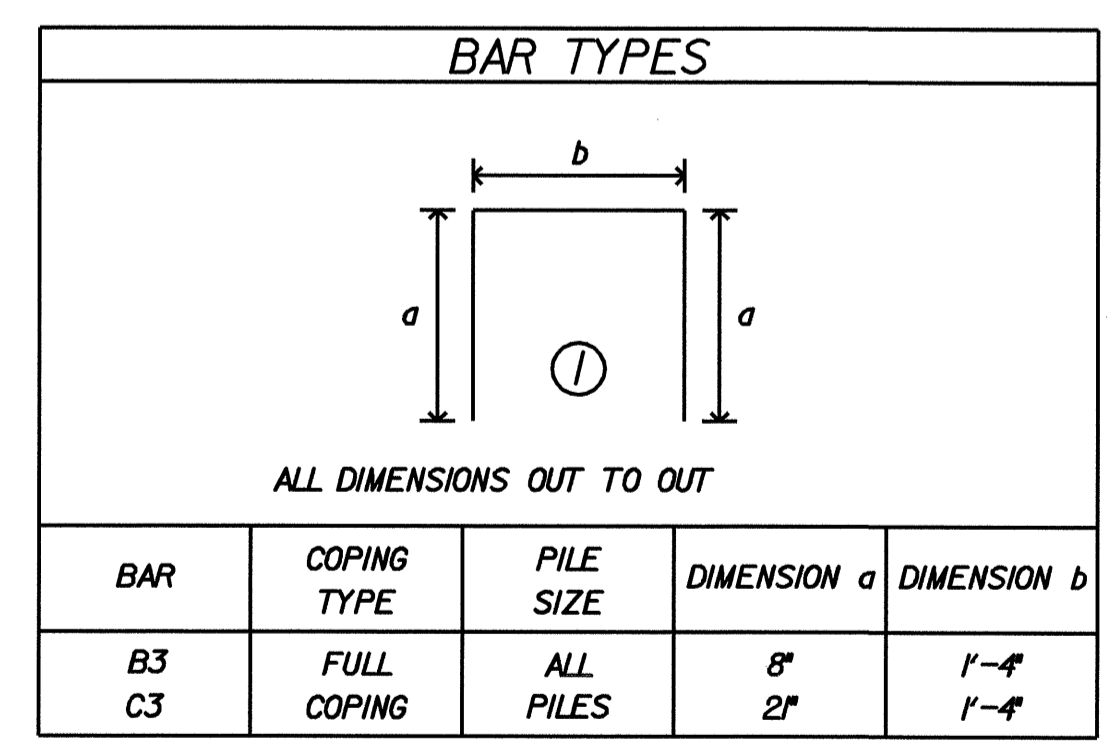
TYPICAL PRECAST PANEL DETAIL

N.T.S.

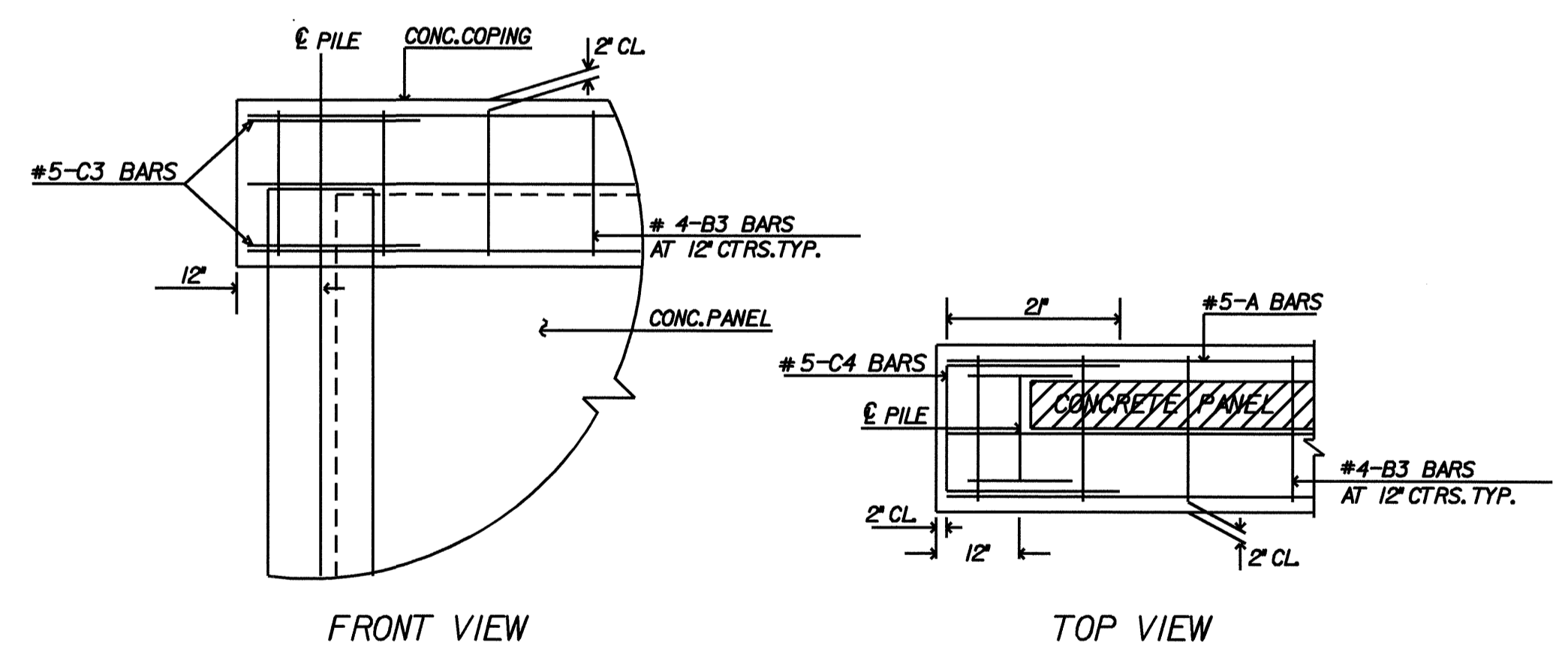
TABLE 1 PRECAST PANELS										
PANEL TYPE	NO. REQ'D	'H'	'L'	BAR TYPES				'A'	'B'	CONC. CUBIC YARDS PER PANEL
				HORIZONTAL NO/PER PANEL	SPACING C-C	VERTICAL NO/PER PANEL	SPACING C-C			
A1	3	3'	9'-8"	6-H1	6"	19-V1	6"	3'	3'	0.528
B1	39	4'	9'-8"	8-H1	6"	19-V2	6"	3'	3'	0.704
C1	4	5'	9'-8"	10-H1	6"	19-V3	6"	3'	3'	0.880
D1	4	6'	9'-8"	17-H1	6"	19-V4	6"	4'	3'	1.060
A2	1	3'	7'-0"	6-H2	6"	14-V1	6"	3'	3'	0.369

BILL OF MATERIALS

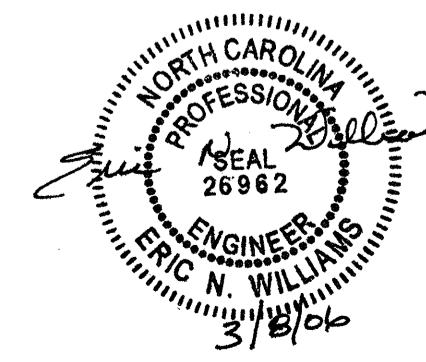
PRECAST CONCRETE PANELS					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT (LB)
H1	438	#4	STR	9'-2"	2742
H2	6	#4	STR	6'-8"	91
V1	71	#4	STR	2'-8"	139
V2	741	#4	STR	3'-8"	1856
V3	76	#4	STR	4'-8"	242
V4	72	#4	STR	5'-8"	294
REINFORCING STEEL CLASS 'A' CONCRETE				LBS	5364
				CUBIC YARDS	38
C.I.P. COPING					
A	77	#5	STR	VAR	3926
B3	508	#4	1	2'-8"	925
C3	4	#5	1	4'-10"	21
REINFORCING STEEL (COPING) CLASS 'A' CONCRETE (COPING)				LBS	4929
				CUBIC YARDS	30
ESTIMATED QUANTITIES					
C.I.P. COPING		LINEAR FEET	510		
*57 STONE BACKFILL		CUBIC YARDS	113		
3' TIMBER LAGGING		FBM	6020		
PRECAST CONCRETE PANEL TYPE 'A1'		NO.	3		
PRECAST CONCRETE PANEL TYPE 'B1'		NO.	39		
PRECAST CONCRETE PANEL TYPE 'C1'		NO.	4		
PRECAST CONCRETE PANEL TYPE 'D1'		NO.	4		
PRECAST CONCRETE PANEL TYPE 'A2'		NO.	1		
HP 12X53 STEEL PILES		NO. = 52 LF =	850		
PILE/PANEL RETAINING WALL		2007 SQ. FT.			
VIBRATION MONITORING		LUMP SUM			



FULL COPING DETAIL
N.T.S.

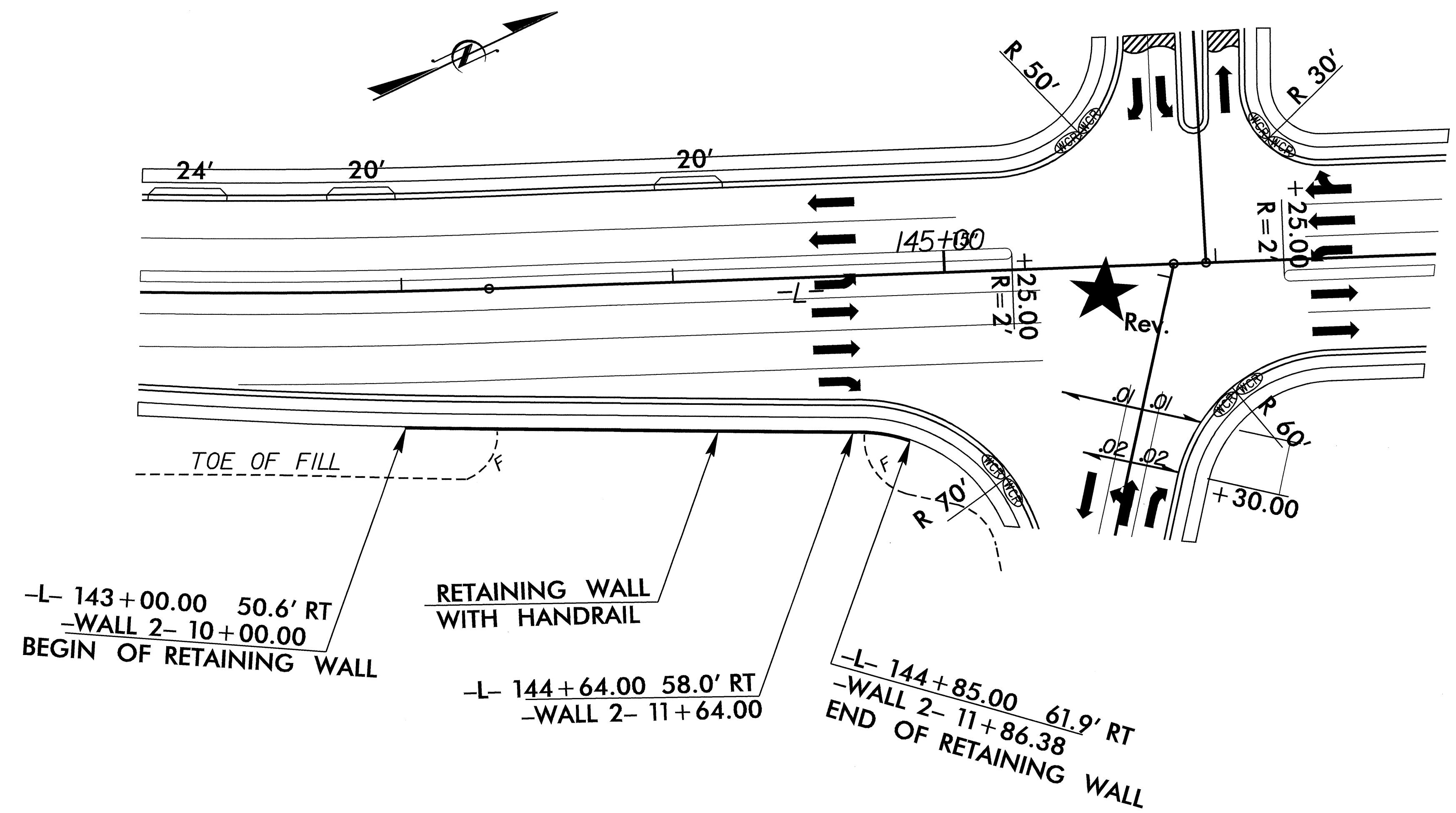
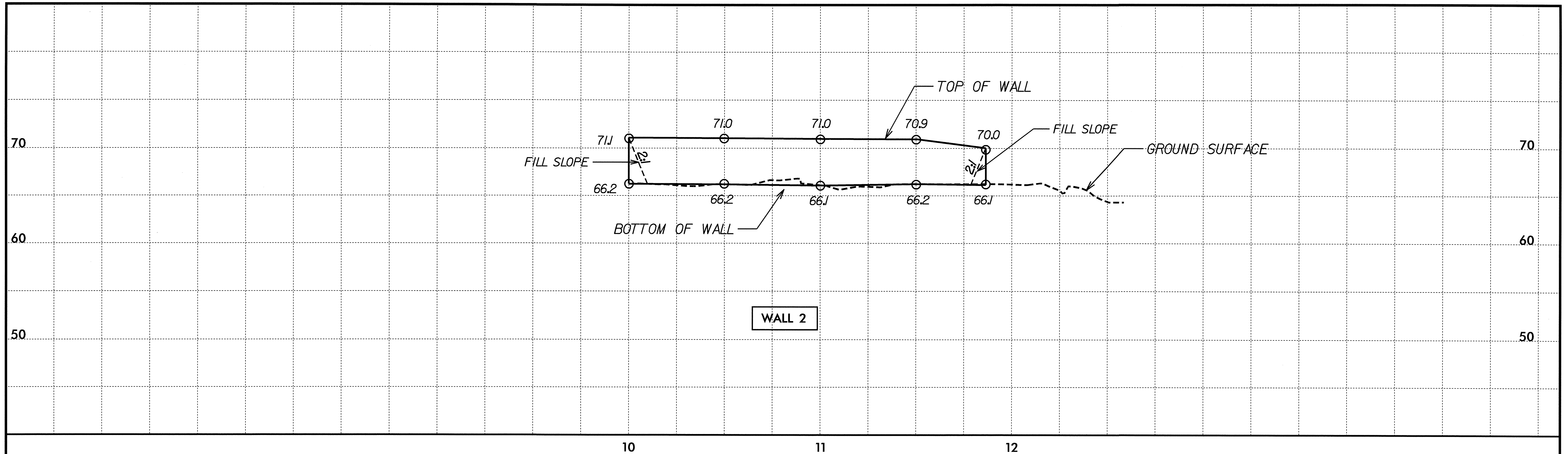


END OF COPING DETAIL
N.T.S.



PROJECT U-3613B
PITT COUNTY
STATION 10+00.50 TO 15+08.00 -WALL 1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALPHAH
WALL 1
PILE/PANEL WALL
DRAWN BY TTW DATE 09/05
DESIGNED BY ENW DATE 09/05
CHECKED BY JRB SHEET W-3 OF 5

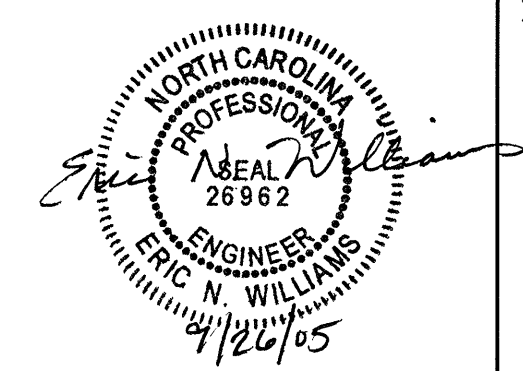


-L- 143+00.00 50.6' RT
 -WALL 2- 10+00.00
 BEGIN OF RETAINING WALL

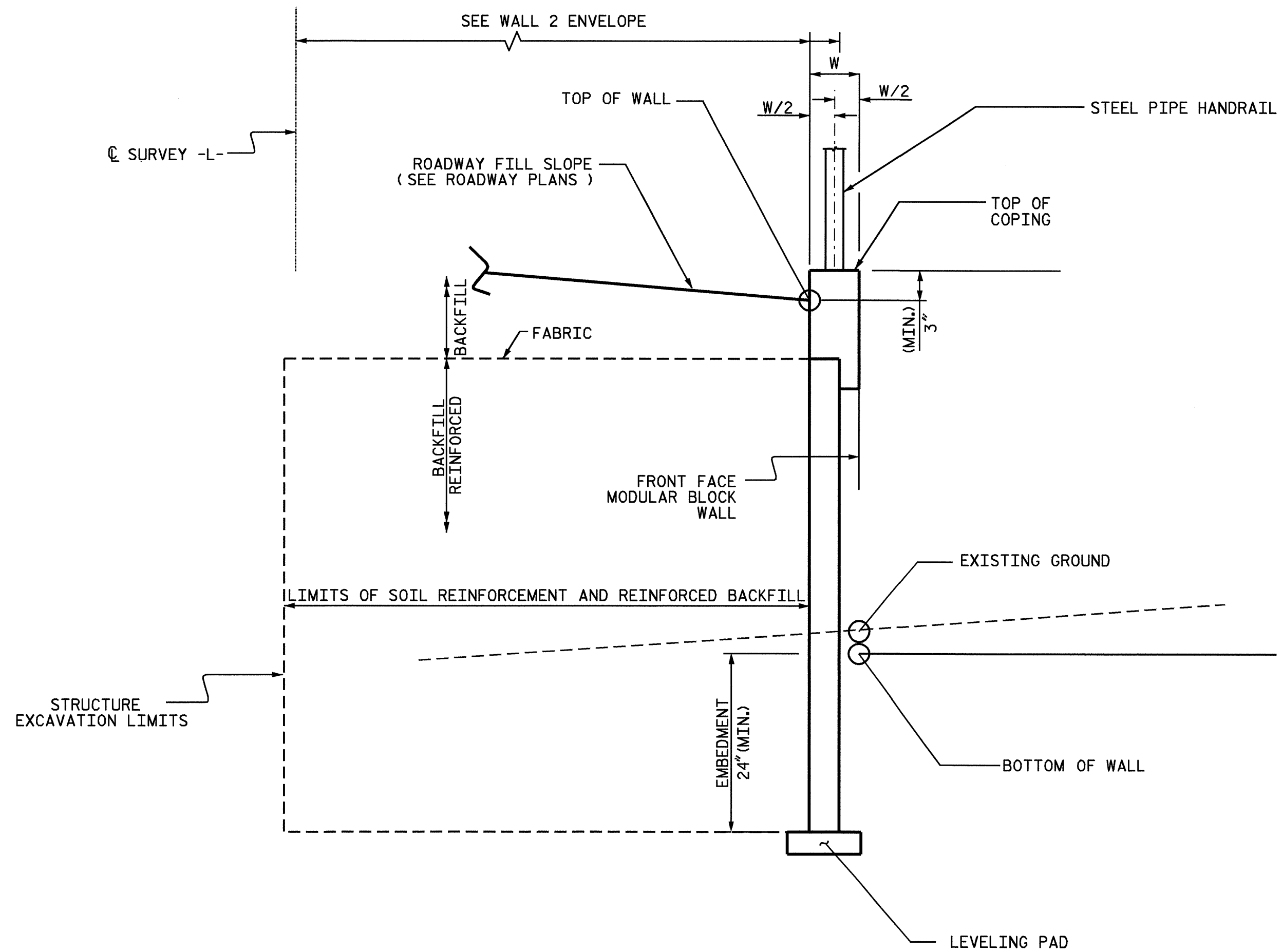
RETAINING WALL
 WITH HANDRAIL
 -L- 144+64.00 58.0' RT
 -WALL 2- 11+64.00

-L- 144+85.00 61.9' RT
 -WALL 2- 11+86.38
 END OF RETAINING WALL

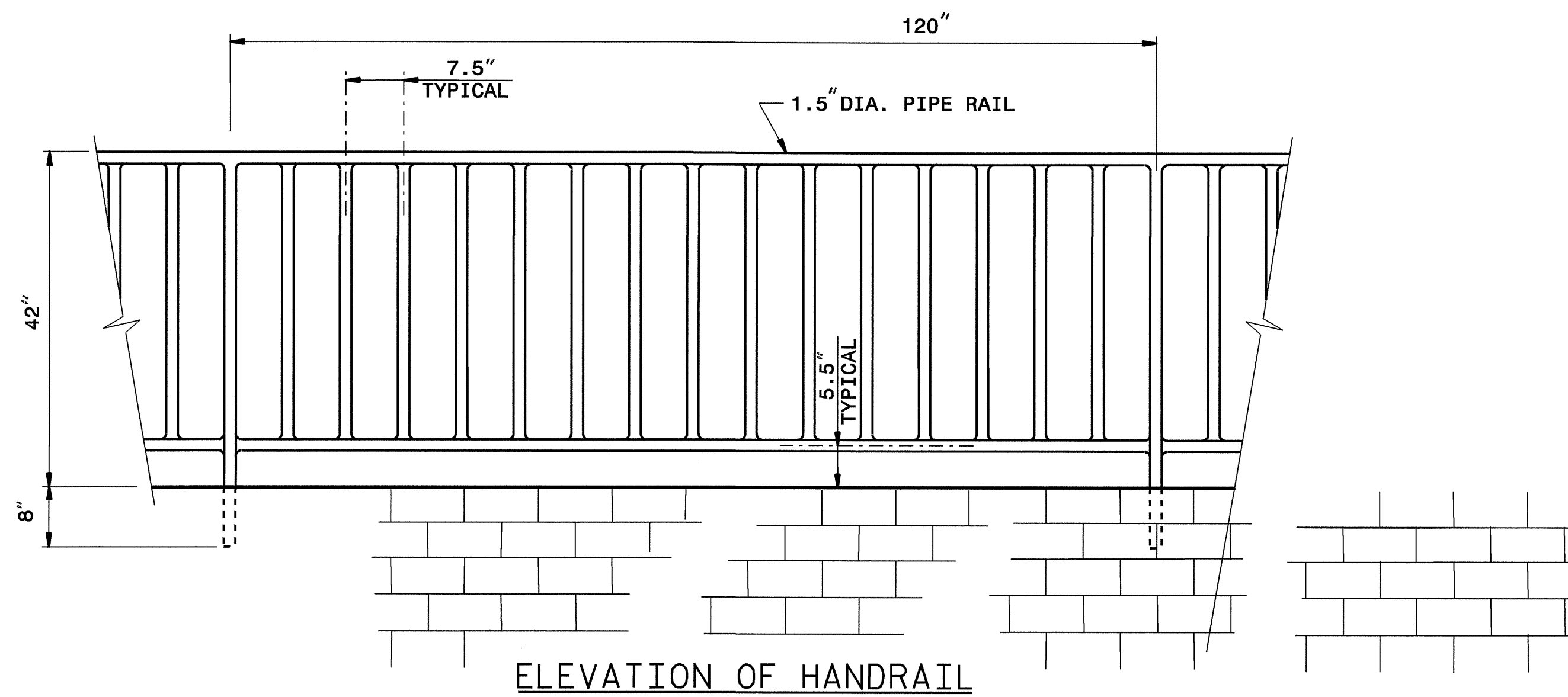
PROJECT U-3613B
 PITT COUNTY
 STATION 10+00.00 TO 11+86.38 -WALL 2-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**WALL 2
 MODULAR BLOCK
 WALL**
 DRAWN BY TTW DATE 09/05
 DESIGNED BY ENW DATE 09/05
 CHECKED BY JRB SHEET W-4 OF 5



TYPICAL SECTION



ELEVATION OF HANDRAIL

NOTES

PROPRIETARY RETAINING WALL DESIGN CALCULATIONS AND PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS FOR MODULAR BLOCK RETAINING WALL.

MODULAR BLOCK RETAINING WALL SHALL BE DESIGNED TO MEET ALL THE CRITERIA OF THE LATEST VERSION OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND ITS INTERIMS.

THE SERVICE LIFE OF THE RETAINING WALL SHALL BE 75 YEARS.

ALL WALL BACKFILL MATERIAL WITHIN THE REINFORCED ZONE SHALL BE #57 WASHED CRUSHED STONE WITH STEEL REINFORCEMENT OR CLASS III MATERIAL WITH EXTENSIBLE REINFORCEMENT.

FOR DESIGN, USE AN ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF AND THE FOLLOWING STRENGTH PARAMETERS:

- CLASS III BACKFILL: $\phi = 32^\circ$, $c = 0$, UNIT WEIGHT = 120 PCF
- #57 STONE BACKFILL: $\phi = 34^\circ$, $c = 0$, UNIT WEIGHT = 105 PCF
- ALL OTHER EARTH MATERIAL AROUND WALL: $\phi = 30^\circ$, $c = 0$, UNIT WEIGHT = 120 PCF

THE RETAINING WALL SHALL HAVE A MINIMUM WALL EMBEDMENT DEPTH OF 24in BELOW THE FINAL GRADE LINE.

THE LEVELING PAD SHALL BE CAST-IN-PLACE AND MADE CONTINUOUS AT STEPS.

USE CAP BLOCK COPING AS SUPPLIED BY THE WALL MANUFACTURER.

TOP OF WALL COPING SHALL BE A MINIMUM OF 3in ABOVE THE FINISHED GRADE TO AVOID SPILLOVER.

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

ALL ELEVATIONS ARE IN FEET.

FOR MODULAR BLOCK RETAINING WALL, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

PROPOSED STEEL PIPE RAIL SHALL BE CONSTRUCTED OF 1.5in DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53 AS SHOWN ON DETAILS IN PLANS. PIPE RAIL SHALL BE EMBEDDED 8in INTO PROPOSED WALL WITH CHEMICAL OR CONCRETE GROUT ANCHORING SYSTEM AS DIRECTED BY THE ENGINEER. GALVANIZING SHALL BE DONE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD ROADWAY SPECIFICATIONS.

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.

THE PROPOSED RAILING SHALL BE PRE-MEASURED AND CENTERED ON TOP OF WALL FOR POST SPACINGS. A ROTARY DRILL SHALL BE USED FOR DRILLING THE HOLES. NO IMPACT DRILLS SHALL BE ALLOWED, TO ELIMINATE ANY POSSIBILITY OF STRUCTURAL DAMAGES TO THE PROPOSED WALL.

ALL DESIGN IS A RECOMMENDED GUIDE TO THIS PIPE RAIL APPLICATION. FINAL ENGINEERING JUDGEMENT SHALL BE AT THE DISCRETION OF THE ENGINEER.

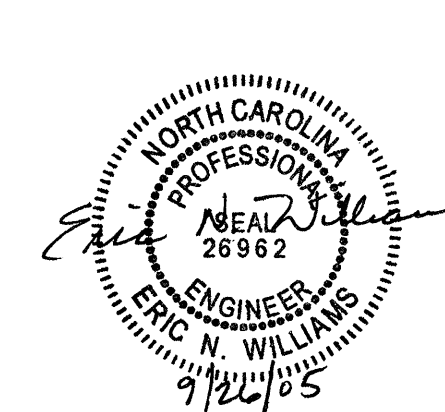
PAINTING SHALL BE DONE IN ACCORDANCE WITH SECTION 442 OF THE ROADWAY SPECIFICATIONS.

VERIFY SOIL BEARING PRESSURE BEFORE WALL CONSTRUCTION.

COLOR OF MODULAR BLOCK SHOULD CLOSELY MATCH THE ADJACENT CHURCH BUILDING.

BILL OF MATERIAL	
MODULAR BLOCK RETAINING WALL	LUMP SUM

PROJECT U-3613B
PITT COUNTY
 STATION 10+00.00 TO 11+86.38 -WALL 2-



STATES OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**WALL 2
 MODULAR BLOCK
 WALL**
 DRAWN BY TTW DATE 09/05
 DESIGNED BY ENW DATE 09/05
 CHECKED BY JRB SHEET W-5 OF 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

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