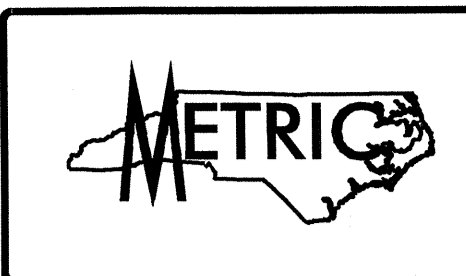
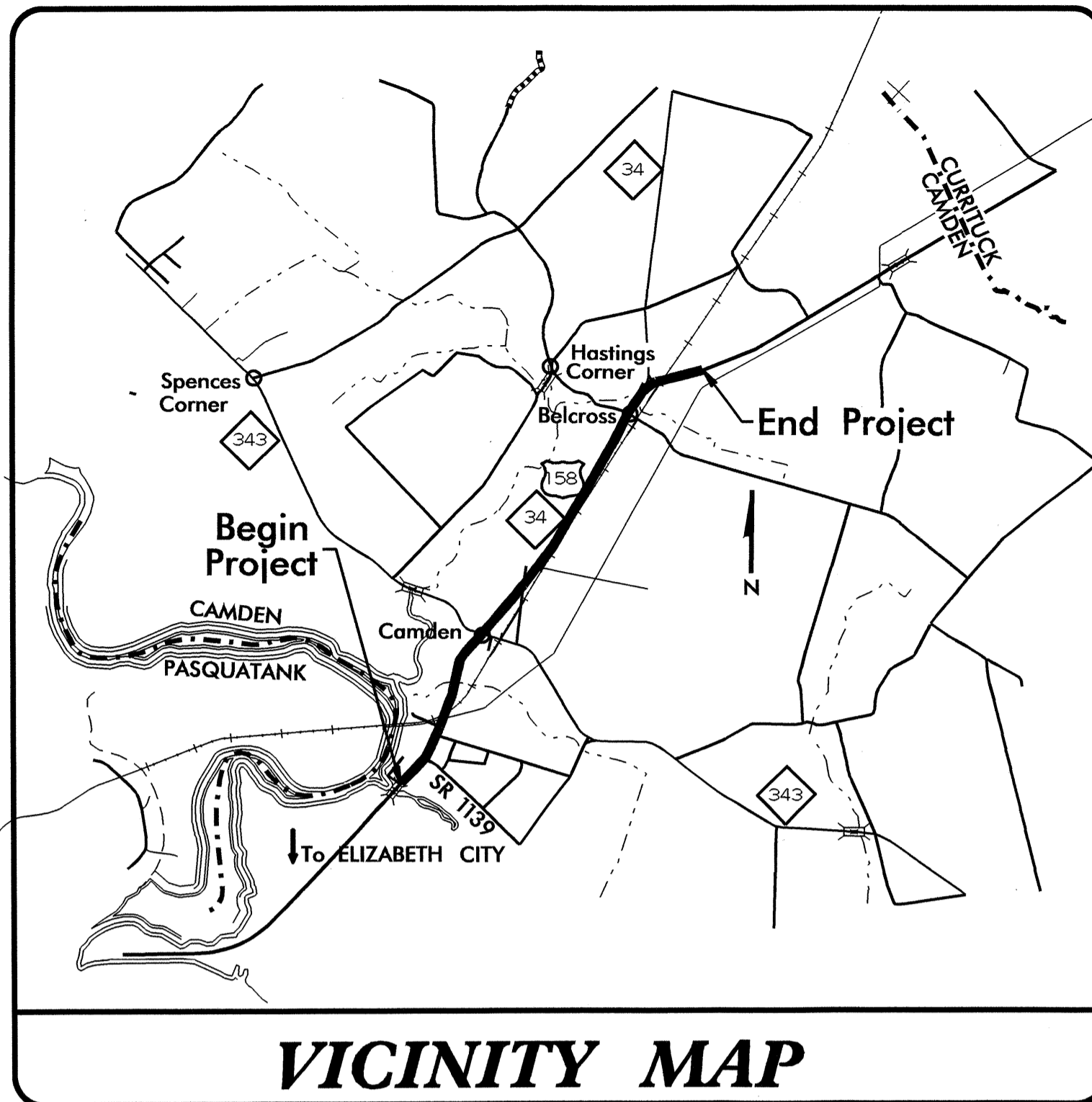
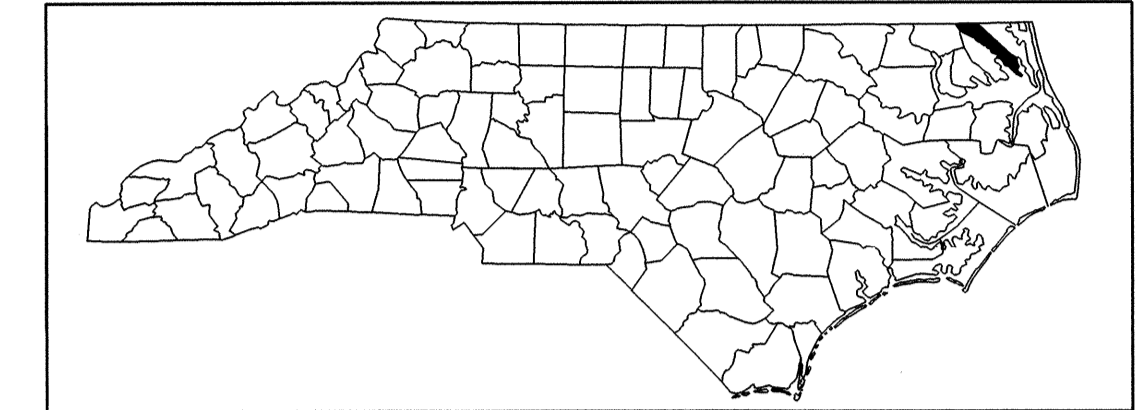


CONTRACT: C202914 TIP PROJECT: R-2414B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



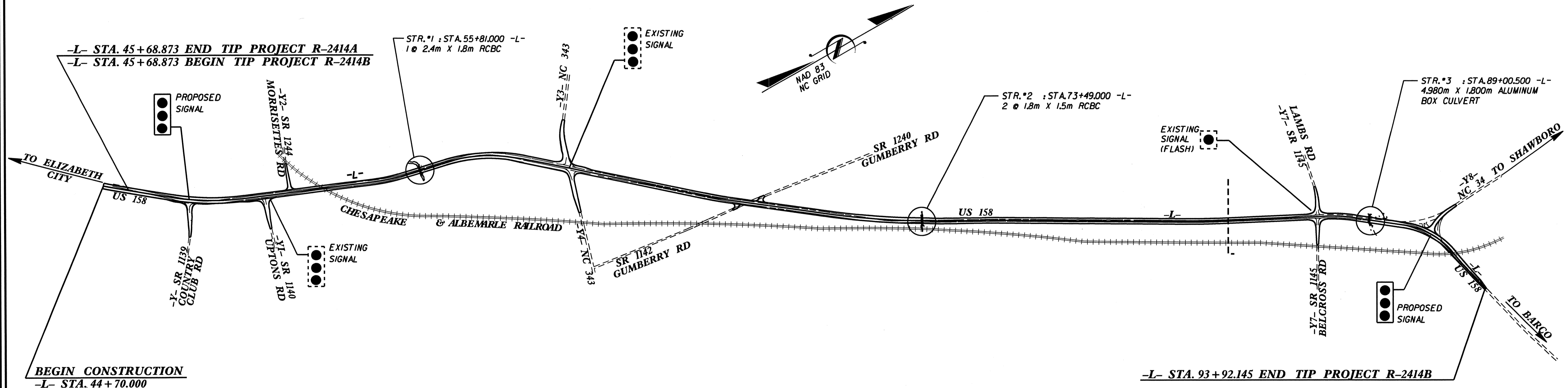
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2414B		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34430.1.1	STP-158(2)	PE	
34430.2.5		RW & UTIL.	
34430.3.3		CONST.	



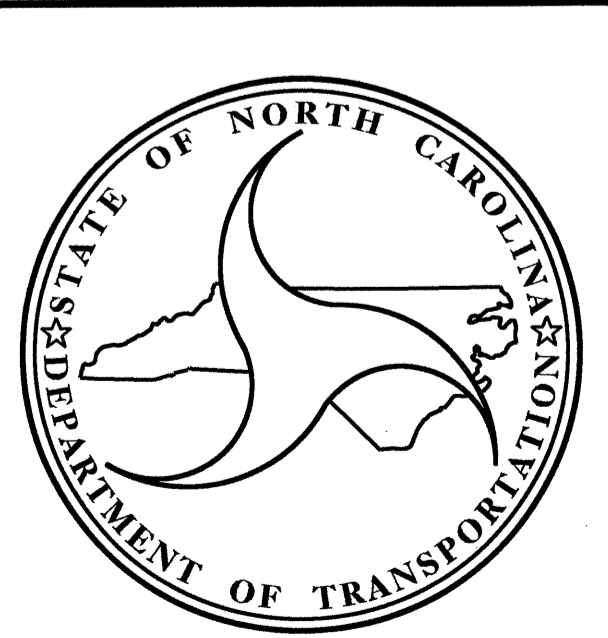
CAMDEN COUNTY

LOCATION: US 158 FROM NORTH OF SR 1257 (HAVENWOOD DRIVE) TO EAST OF NC 34 IN BELCROSS

TYPE OF WORK: WIDENING, GRADING, DRAINAGE, PAVING, CURB & GUTTER, SIGNALS & STRUCTURES



CULVERTS



DESIGN DATA

ADT 2009 =	26,000
ADT 2029 =	41,500
DHV =	12 %
D =	60 %
T =	6 % *
V =	80 KMH

* (TTST 2 % + DUAL 4 %)

FUNC. CLASS. = ARTERIAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2414B =	4.823 KM
TOTAL LENGTH OF TIP PROJECT R-2414B =	4.823 KM

Prepared in the Office of:

DIVISION OF HIGHWAYS
1000 BIRCH RIDGE DR. RALEIGH, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE: MARCH 20, 2012	N. N. BULLOCK, PE PROJECT ENGINEER
	D. R. CALHOUN, PE PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

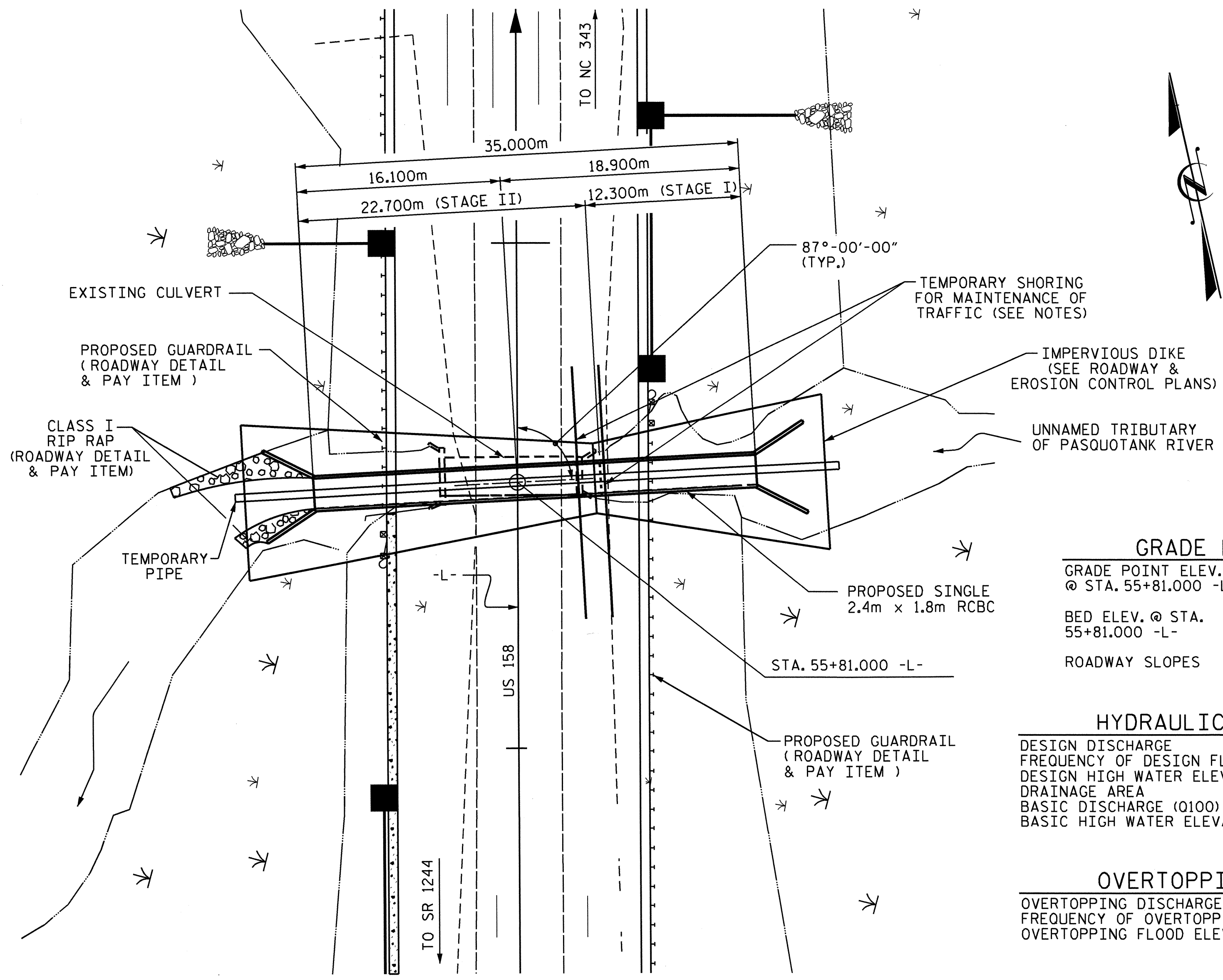
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR

DATE

18 NOV 2011 14:27
R:\ST\loc\ur\65\12414b\Final Plans\R2414b_s.d_1.sh.dgn
del



GRADE DATA

GRADE POINT ELEV. @ STA. 55+81.000 -L-	= 2.250
BED ELEV. @ STA. 55+81.000 -L-	= -0.745
ROADWAY SLOPES	= 3 : 1

HYDRAULIC DATA

DESIGN DISCHARGE	= 11.7 m ³ /s
FREQUENCY OF DESIGN FLOOD	= 50 yr.
DESIGN HIGH WATER ELEVATION	= 1.580
DRAINAGE AREA	= 3.63 sq.km
BASIC DISCHARGE (Q100)	= 14.9 m ³ /s
BASIC HIGH WATER ELEVATION	= 2.010

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 16.2 m ³ /s
FREQUENCY OF OVERTOPPING FLOOD	= 100+ yr.
OVERTOPPING FLOOD ELEVATION	= 2.232

TOTAL STRUCTURE QUANTITIES (STAGE I)

CLASS A CONCRETE	
BARREL	32.9 m ³
WINGS ETC.	10.0 m ³
TOTAL	42.9 m ³
FOUNDATION COND. MAT'L	24 m. tons
EPOXY COATED REINFORCING STEEL	
BARREL	3877 kg
WINGS ETC.	522 kg
TOTAL	4399 kg
203mm TIP DIAMETER TREATED TIMBER PILES	NO. : 16 320.0m
PILE REDRIVES	NO. : 8

TOTAL STRUCTURE QUANTITIES (STAGE II)

CLASS A CONCRETE	
BARREL	60.7 m ³
WINGS ETC.	10.0 m ³
TOTAL	70.7 m ³
FOUNDATION COND. MAT'L	44 m. tons
EPOXY COATED REINFORCING STEEL	
BARREL	7269 kg
WINGS ETC.	522 kg
TOTAL	7791 kg
203mm TIP DIAMETER TREATED TIMBER PILES	NO. : 24 480.0m
PILE REDRIVES	NO. : 12

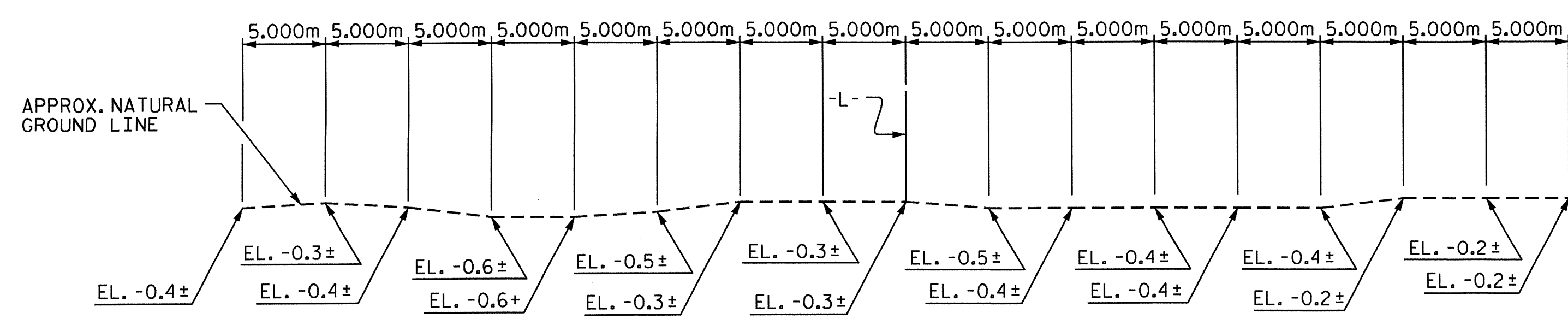
TOTAL BILL OF MATERIAL

CLASS A CONCRETE	
STAGE I	42.9 m ³
STAGE II	70.7 m ³
TOTAL	113.6 m ³
EPOXY COATED REINFORCING STEEL	
STAGE I	4399 kg
STAGE II	7791 kg
TOTAL	12190 kg
FOUNDATION COND. MAT'L	
STAGE I	24 m. tons
STAGE II	44 m. tons
TOTAL	68 m. tons
TREATED TIMBER PILES	NO. : 40 800.0m
PDA TESTING	2
PDA ASSISTANCE	2
PILE REDRIVES	20
CULVERT EXCAVATION	LUMP SUM

NOTES :

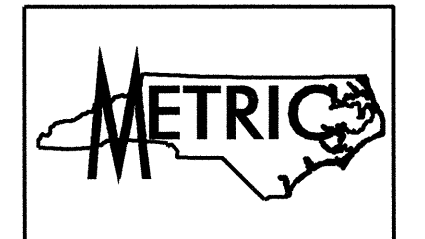
- ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE IN METERS.
- DESIGN FILL -----1.210m.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 76mm Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 - (STAGE I AND II)
 - 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 100mm 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.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 21.0m. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 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 EXISTING 2.38m x 1.09m CULVERT WITH A 11.06m LENGTH AND A 250mm TOP SLAB AND LOCATED AT THE PROPOSED CULVERT SITE SHALL BE REMOVED. PAYMENT FOR REMOVAL OF CULVERT WILL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 900mm STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- 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.
- BACKFILL TO ORIGINAL GROUND ELEVATIONS INSIDE THE IMPERVIOUS DIKE AFTER CONSTRUCTION OF THE CULVERT.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.
LOCATION SKETCH



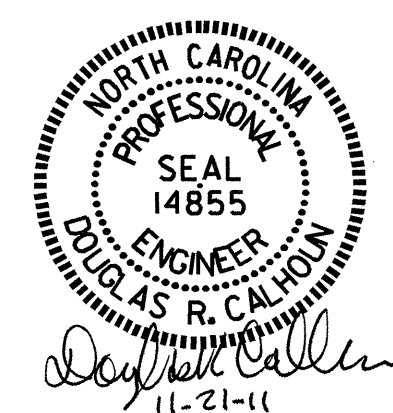
PROFILE ALONG CULVERT

DRAWN BY : B.N. GRADY DATE : 8/12/10
CHECKED BY : J.L. WALTON DATE : 8/16/10



PROJECT NO. R-2414B
CAMDEN COUNTY
STATION: 55+81.000 -L-

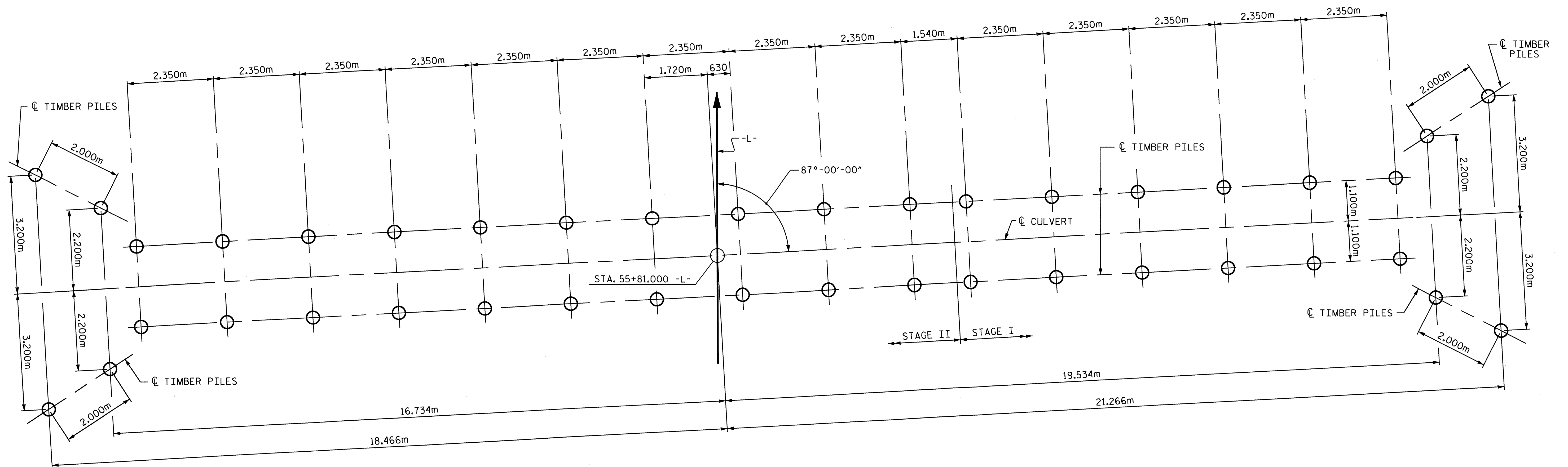
SHEET 1 OF 7



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**BARREL STANDARD
SINGLE 2.400m X 1.800m
CONCRETE BOX CULVERT
90° SKEW**

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



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES)

FOUNDATION NOTES:

DRIVE PILES TO A REQUIRED BEARING CAPACITY OF 360 KN PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES IS 180 KN PER PILE.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED FOR BOTH STAGE 1 AND STAGE 2 CONSTRUCTION. FOR PILE DRIVING ANALYZER, SEE SPECIAL PROVISIONS.

TREATED TIMBER PILES SHALL HAVE A MINIMUM DIAMETER OF 203mm AS MEASURED 900mm FROM THE PILE TIP.

SPLICE TIMBER PILES AS SHOWN ON THE PLANS. ONLY ONE SPLICE IS ALLOWED PER PILE.

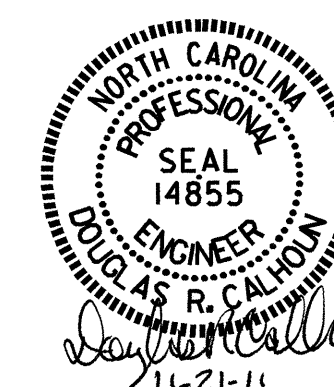
TIMBER PILES SHALL BE MADE OF TREATED SOUTHERN YELLOW PINE. PILES SHALL BE TREATED TO A MINIMUM RETENTION OF 40 KG/M³ OF CCA AND SHALL MEET ALL THE REQUIREMENTS OF AWPA STANDARD C3.

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 55+81.000 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

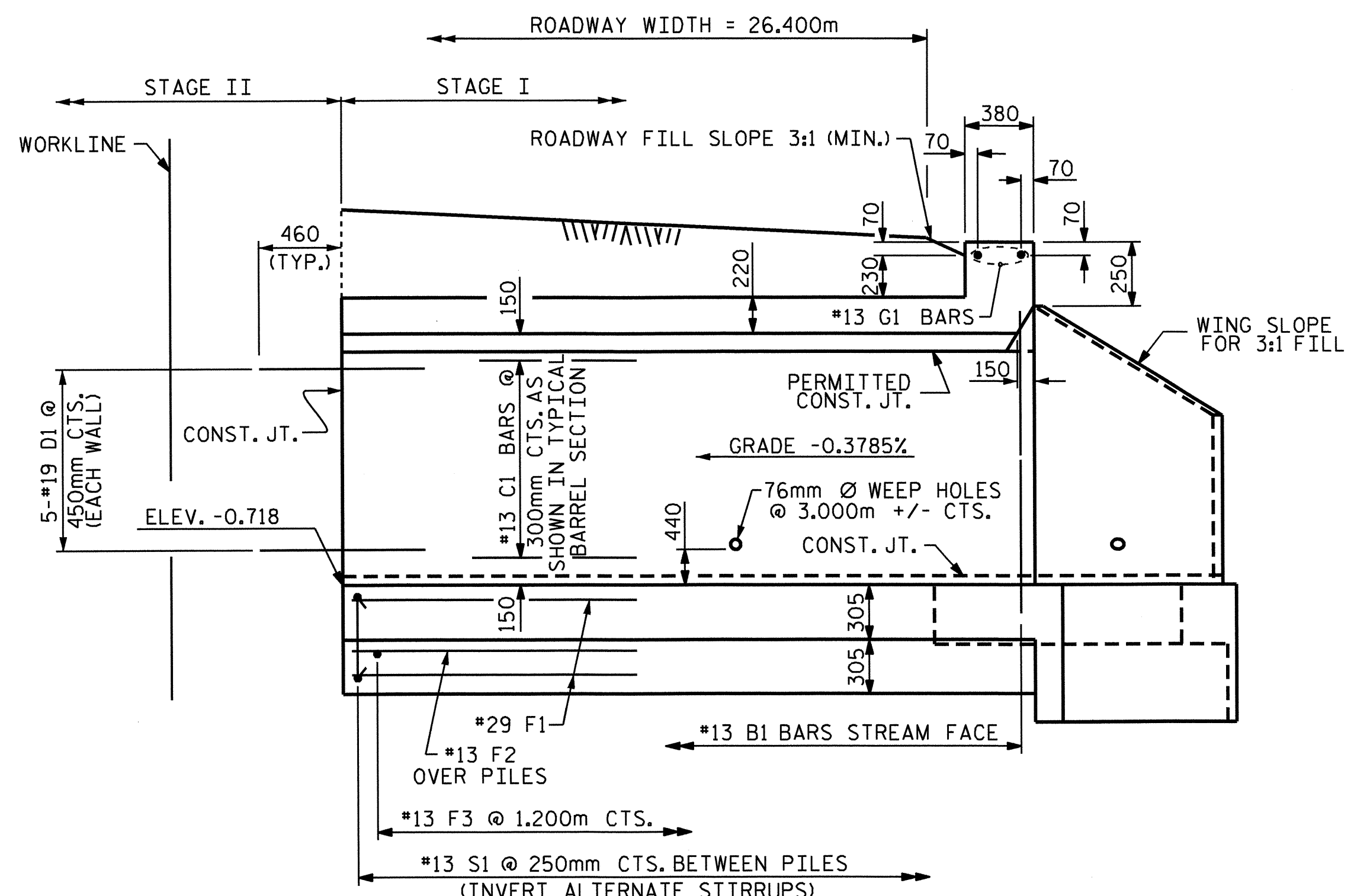
FOUNDATION LAYOUT



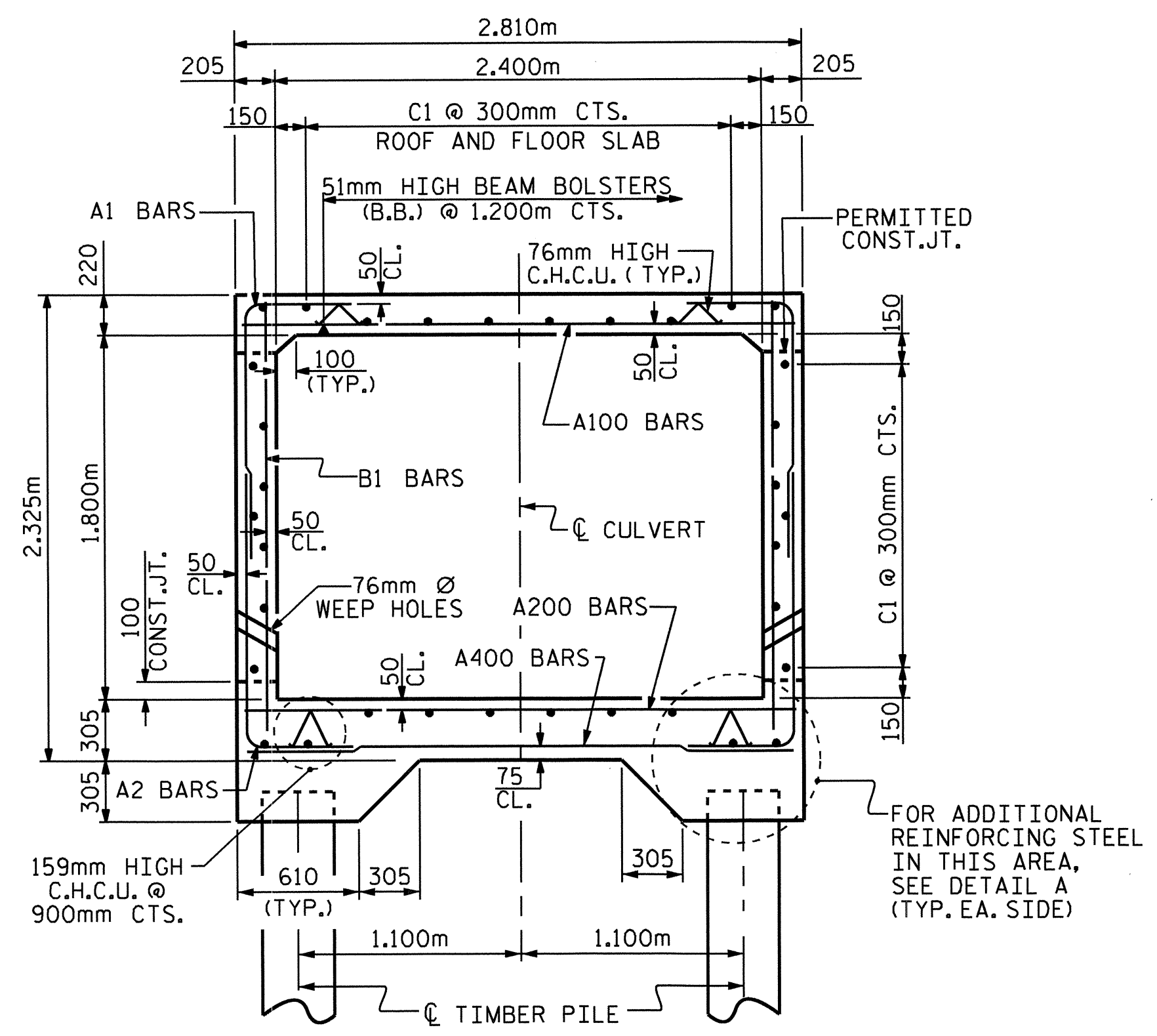
DRAWN BY : B.N. GRADY DATE : 8/12/10
 CHECKED BY : J.L. WALTON DATE : 8/16/10

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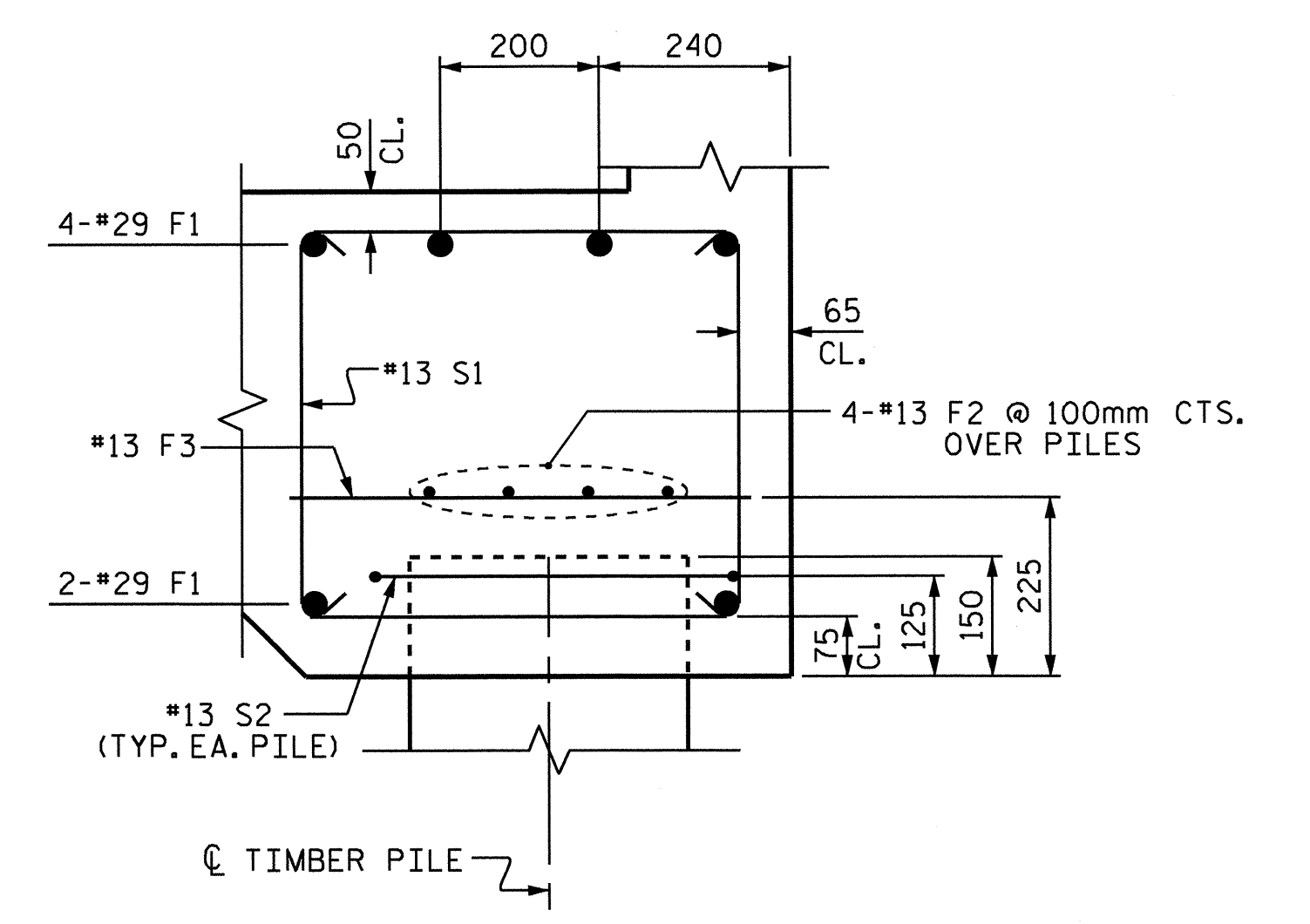
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			C-2
2			4			17



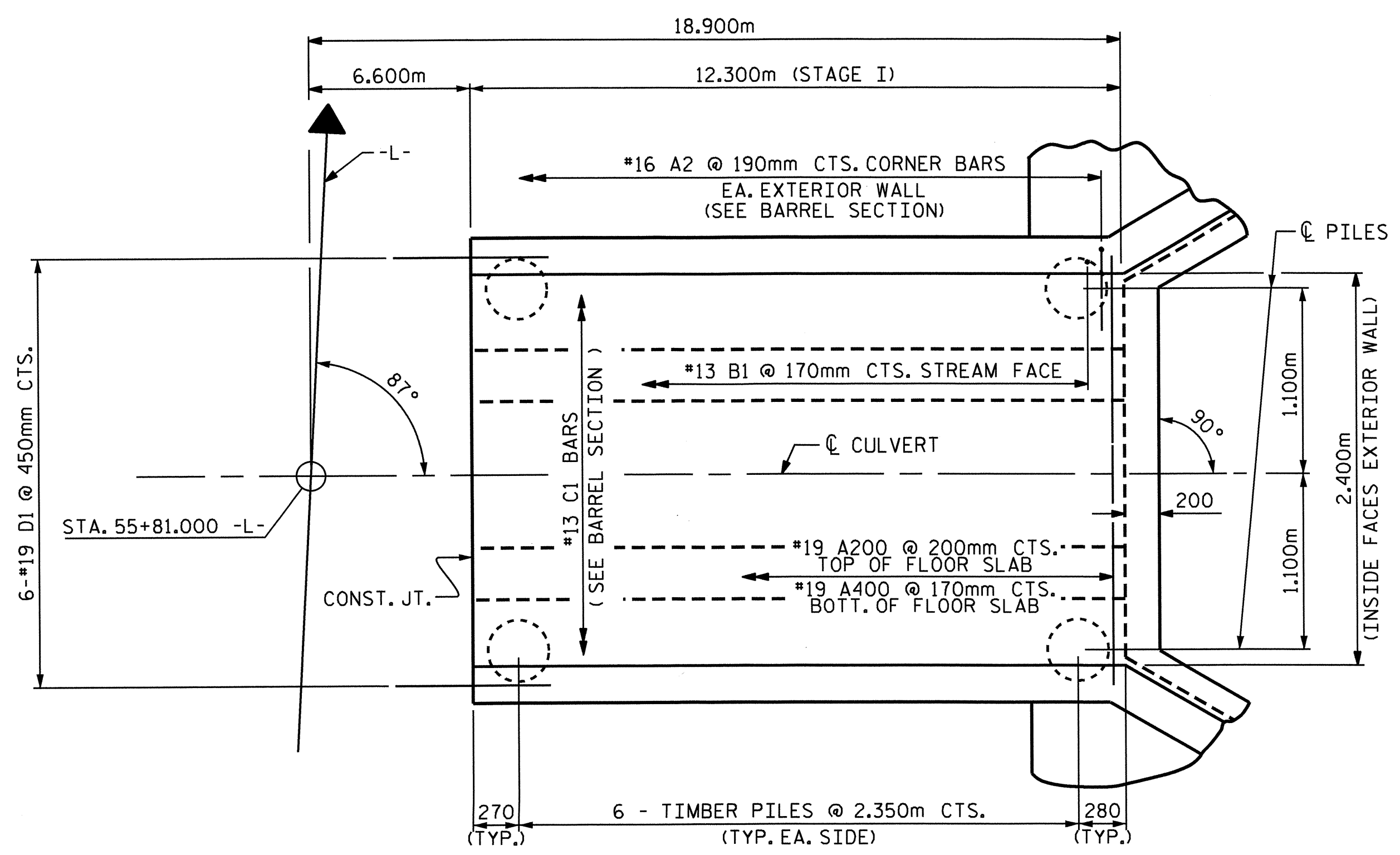
CULVERT SECTION NORMAL TO ROADWAY
(PILES NOT SHOWN FOR CLARITY)



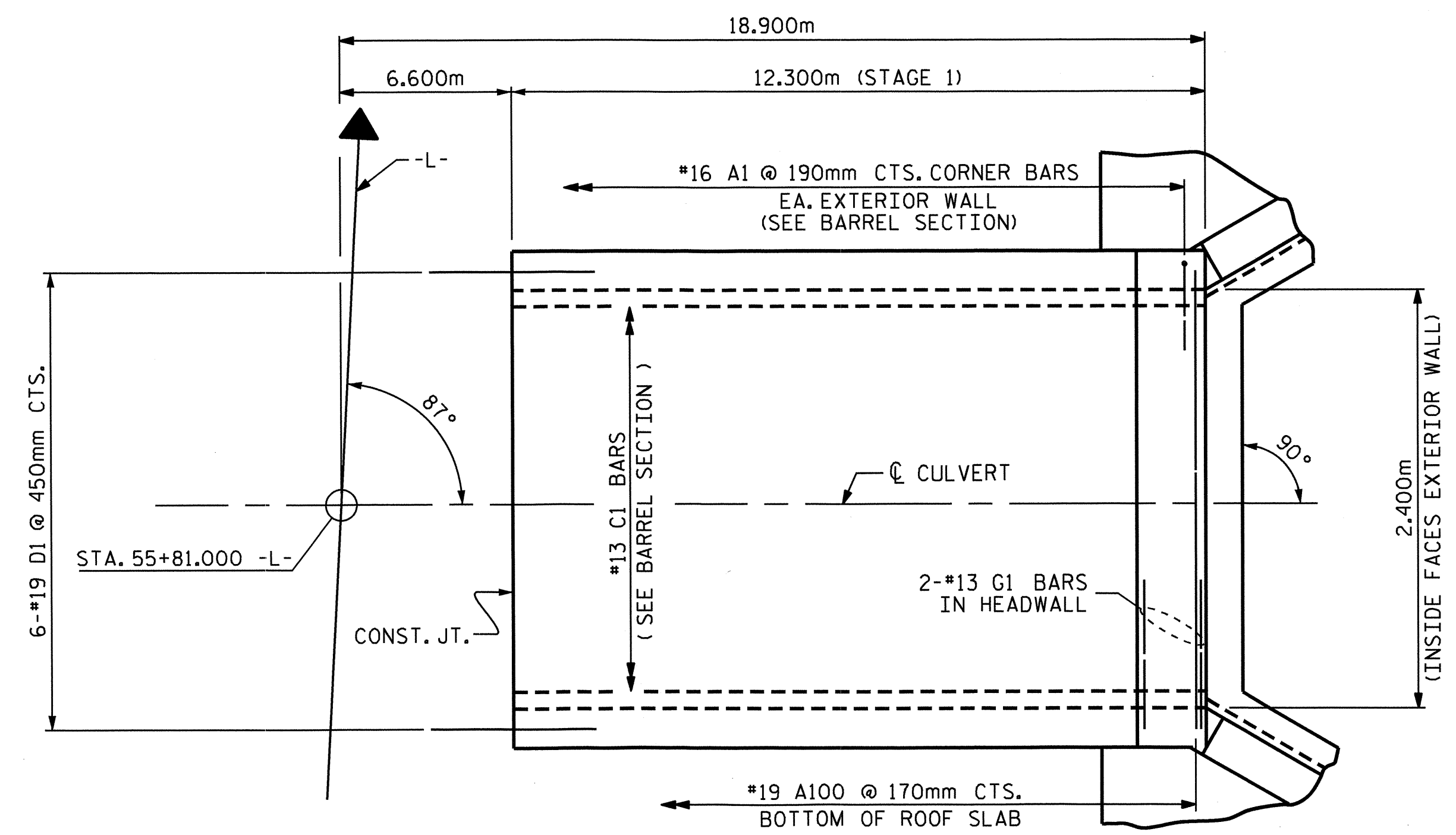
RIGHT ANGLE SECTION OF BARREL
THERE ARE 34 "C" BARS IN SECTION OF BARREL



DETAIL A



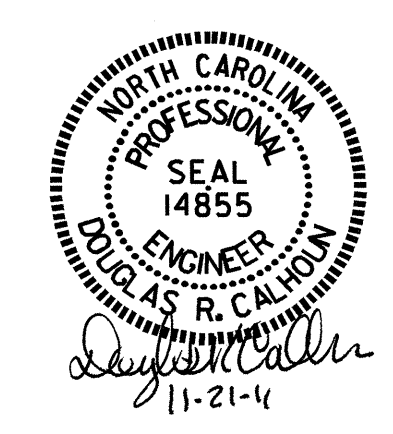
PART PLAN - FLOOR SLAB



PART PLAN - ROOF SLAB

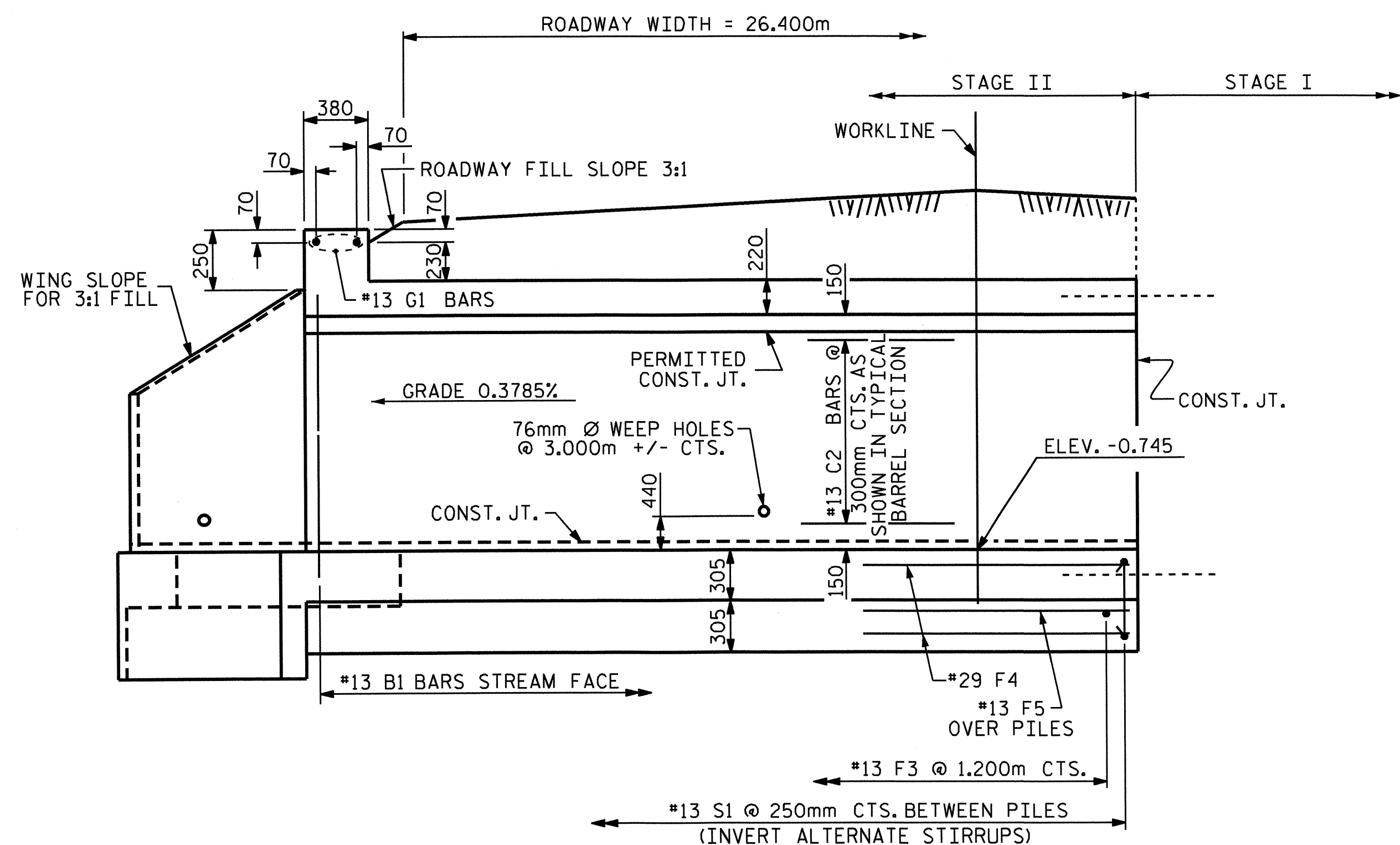
PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 55+81.000 -L-

SHEET 3 OF 7
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**BARREL STANDARD
 SINGLE 2.400m X 1.800m
 CONCRETE BOX CULVERT
 90° SKEW (STAGE I)**

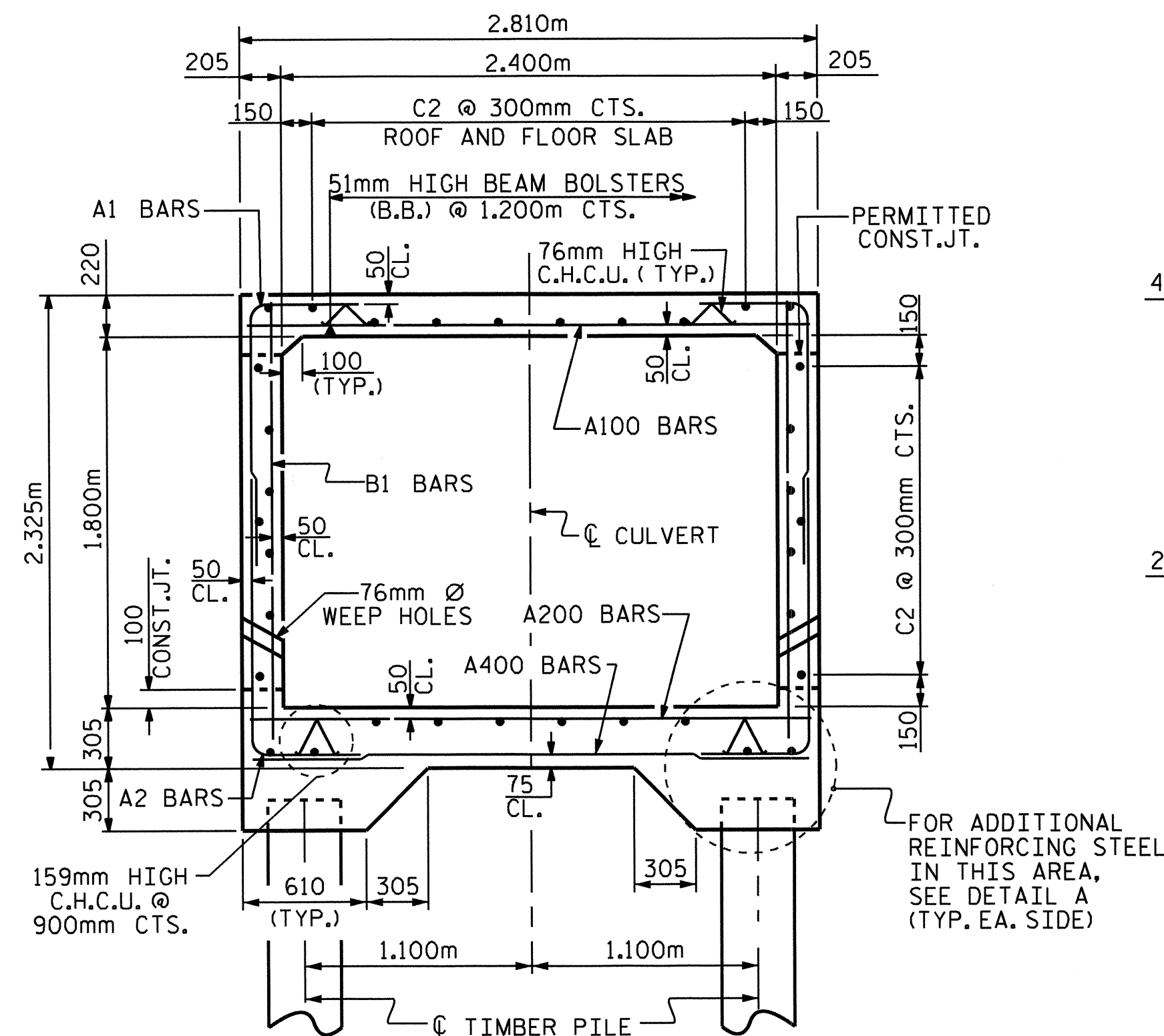


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3	
1			3			TOTAL SHEETS	17
2			4				

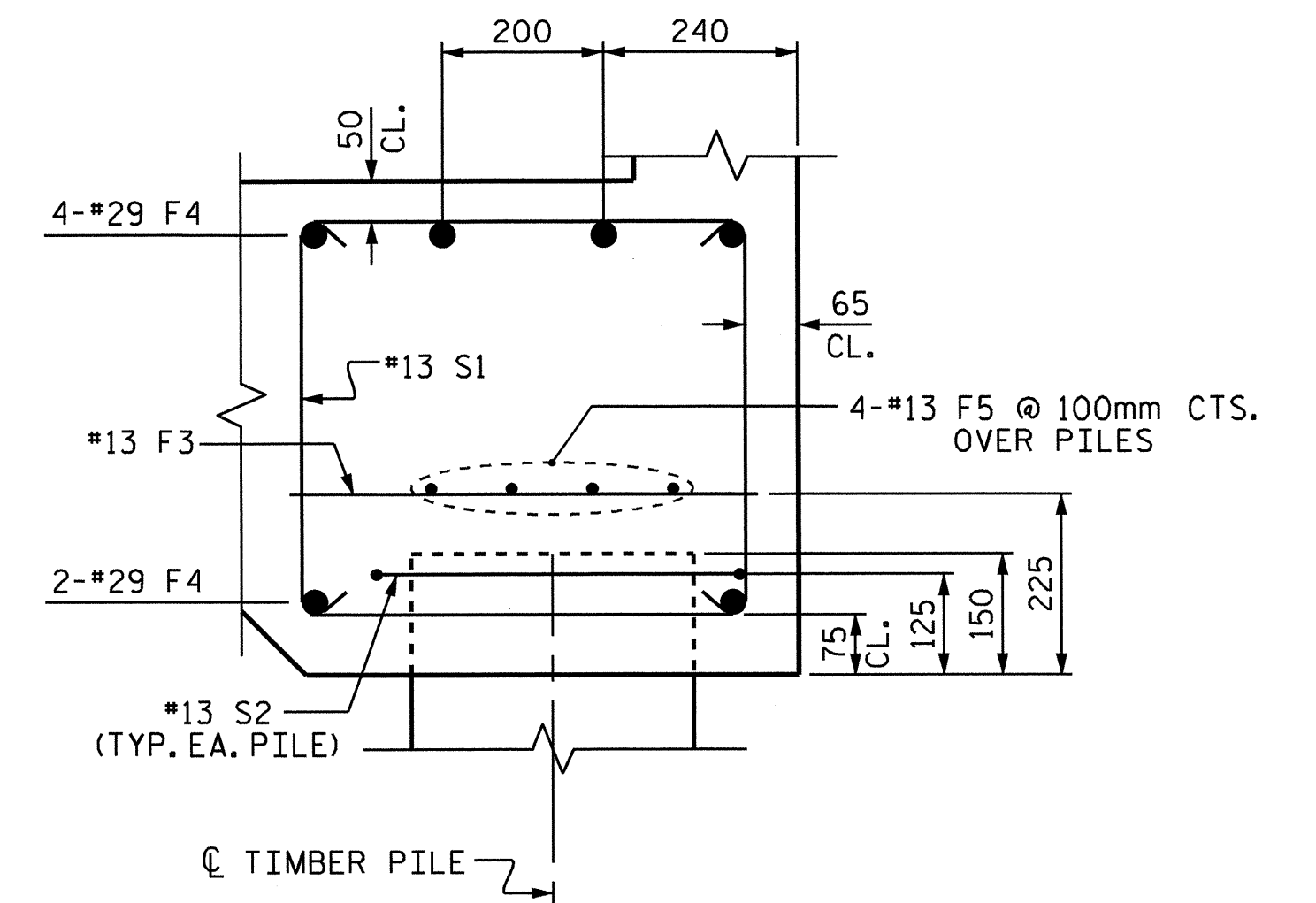
ASSEMBLED BY : B.N. GRADY	DATE : 7/2/10
CHECKED BY : J.L. WALTON	DATE : 8/18/10
DRAWN BY : EEM 6/97	
CHECKED BY : ARB 7/97	



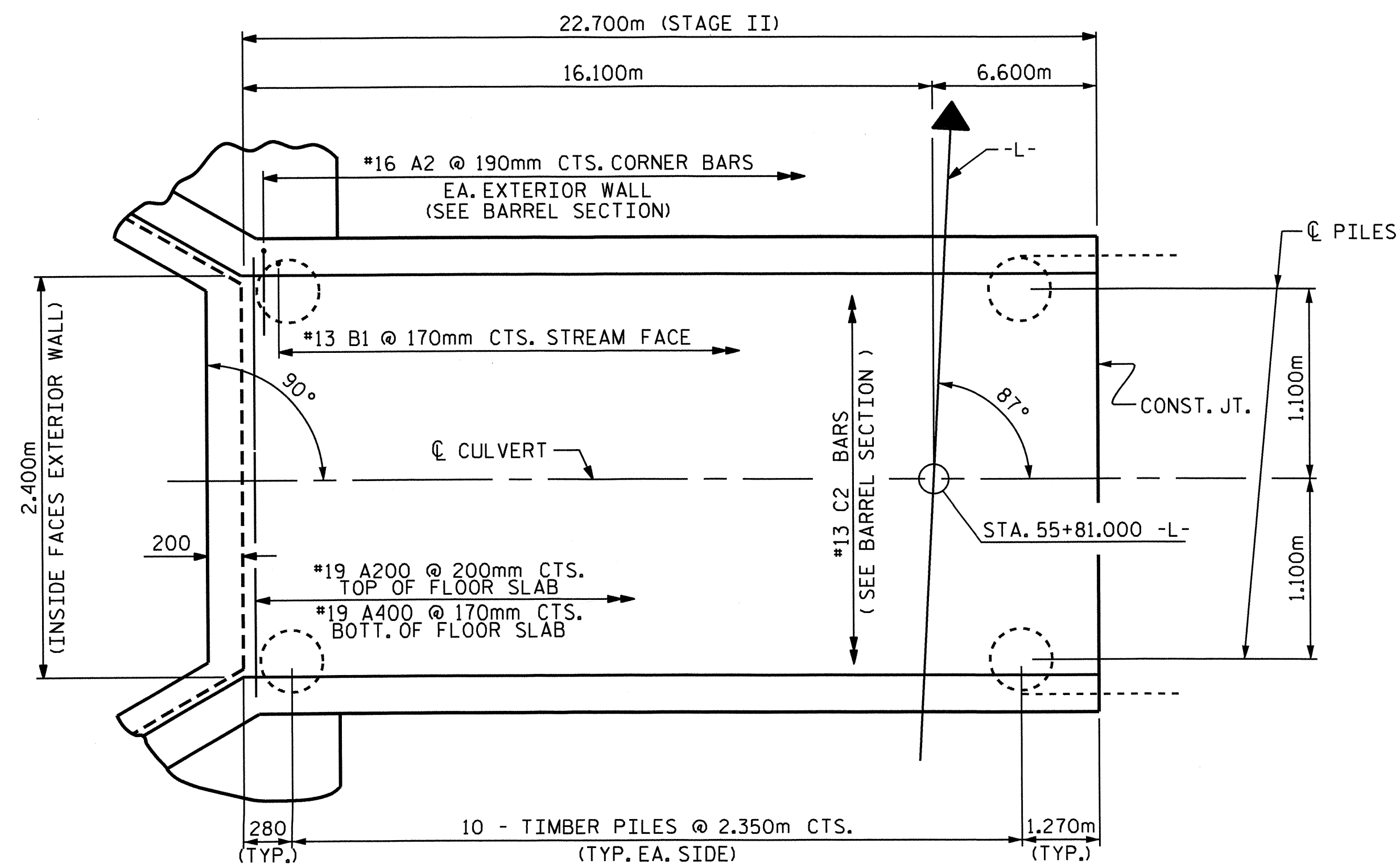
CULVERT SECTION NORMAL TO ROADWAY
(PILES NOT SHOWN FOR CLARITY)



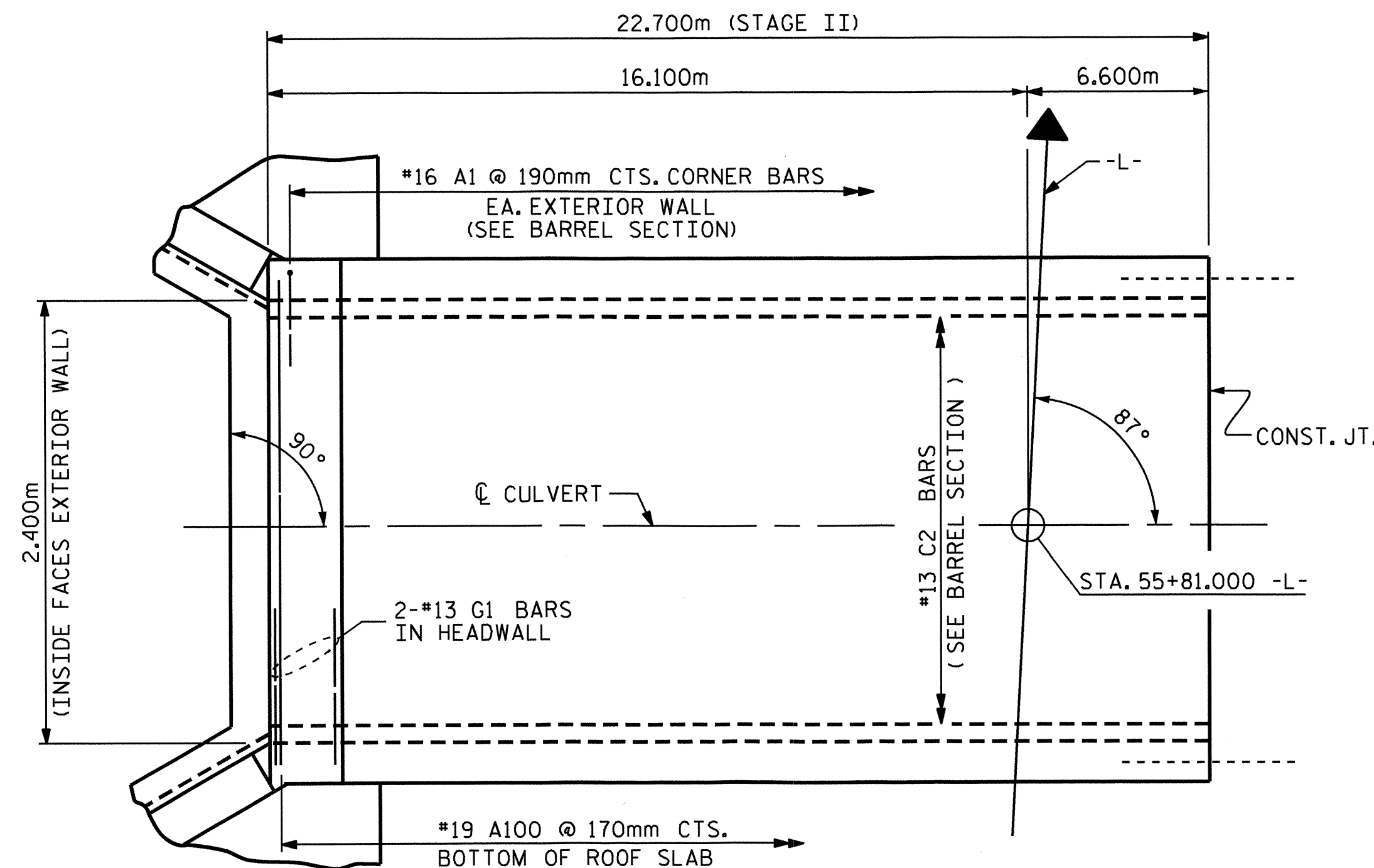
RIGHT ANGLE SECTION OF BARREL
THERE ARE 34 "C" BARS IN SECTION OF BARREL



DETAIL A



PART PLAN - FLOOR SLAB



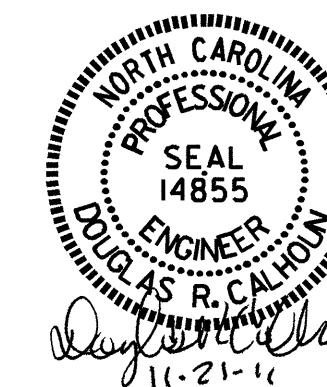
PART PLAN - ROOF SLAB

PROJECT NO. R-2414B
CAMDEN COUNTY
STATION: 55+81.000 -L-

SHEET 4 OF 7

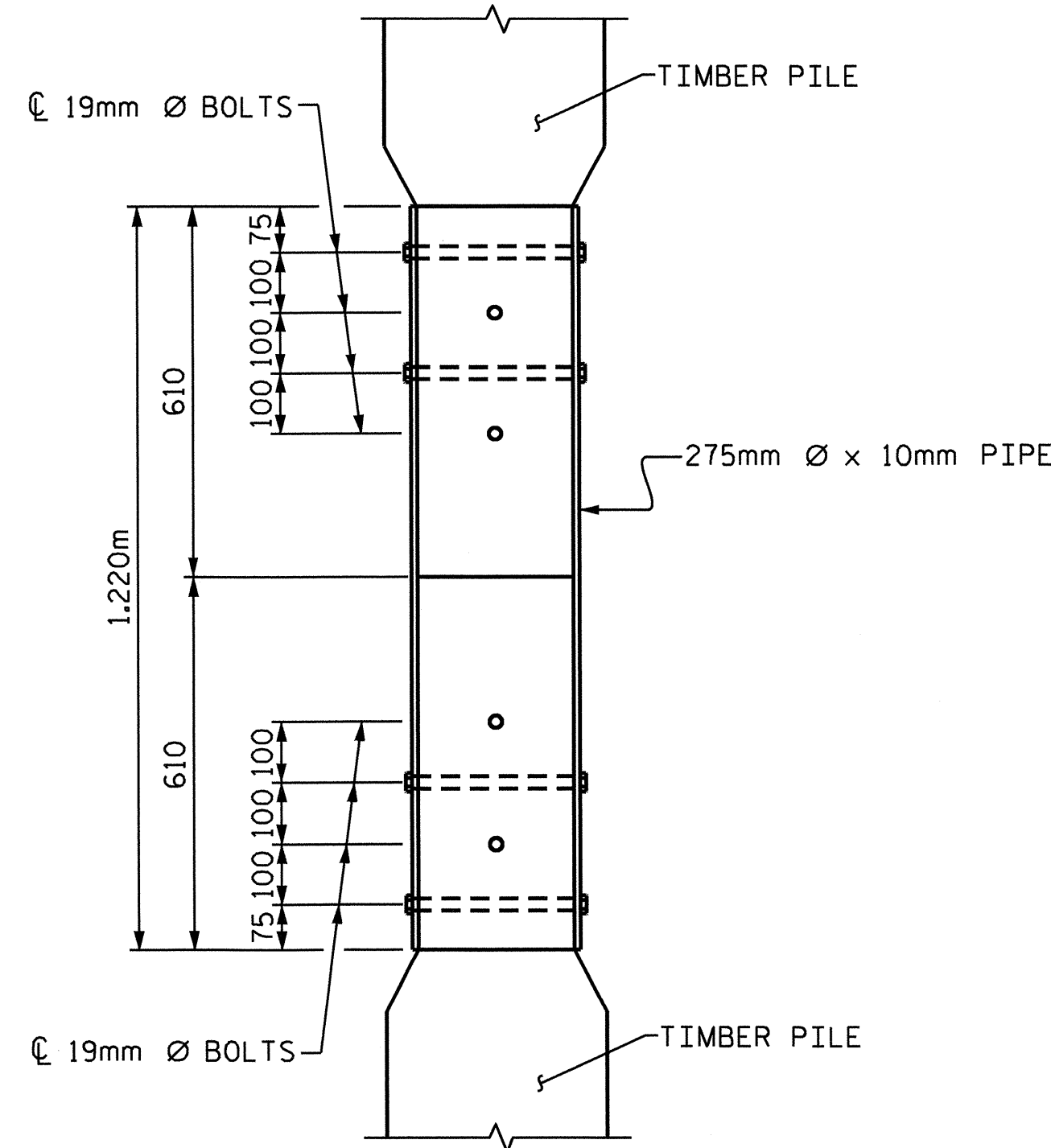
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
SINGLE 2.400m X 1.800m
CONCRETE BOX CULVERT
90° SKEW (STAGE II)



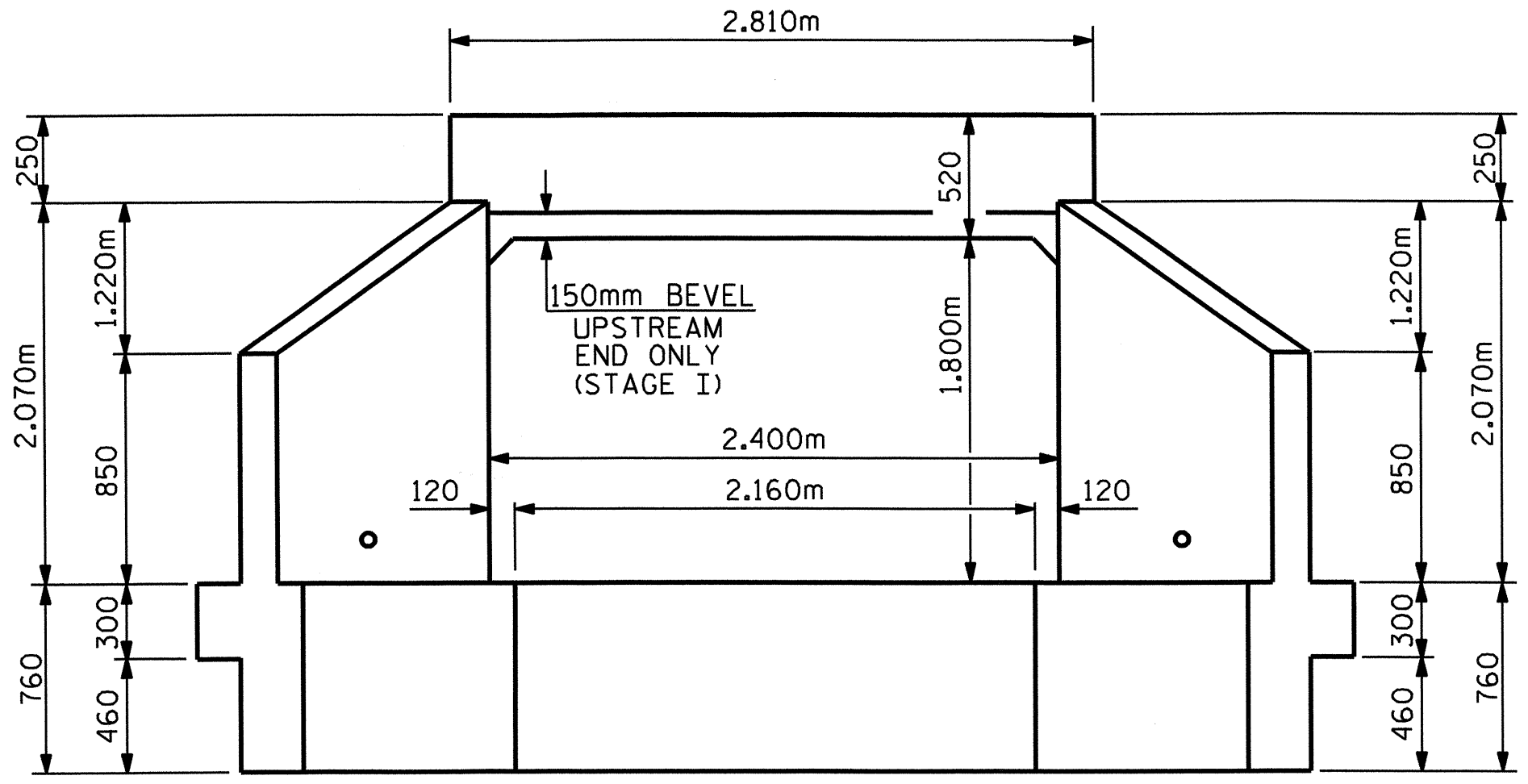
ASSEMBLED BY : B.N. GRADY DATE : 7/2/10
CHECKED BY : J.L. WALTON DATE : 8/18/10
DRAWN BY : EEM 6/97
CHECKED BY : ARB 7/97

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

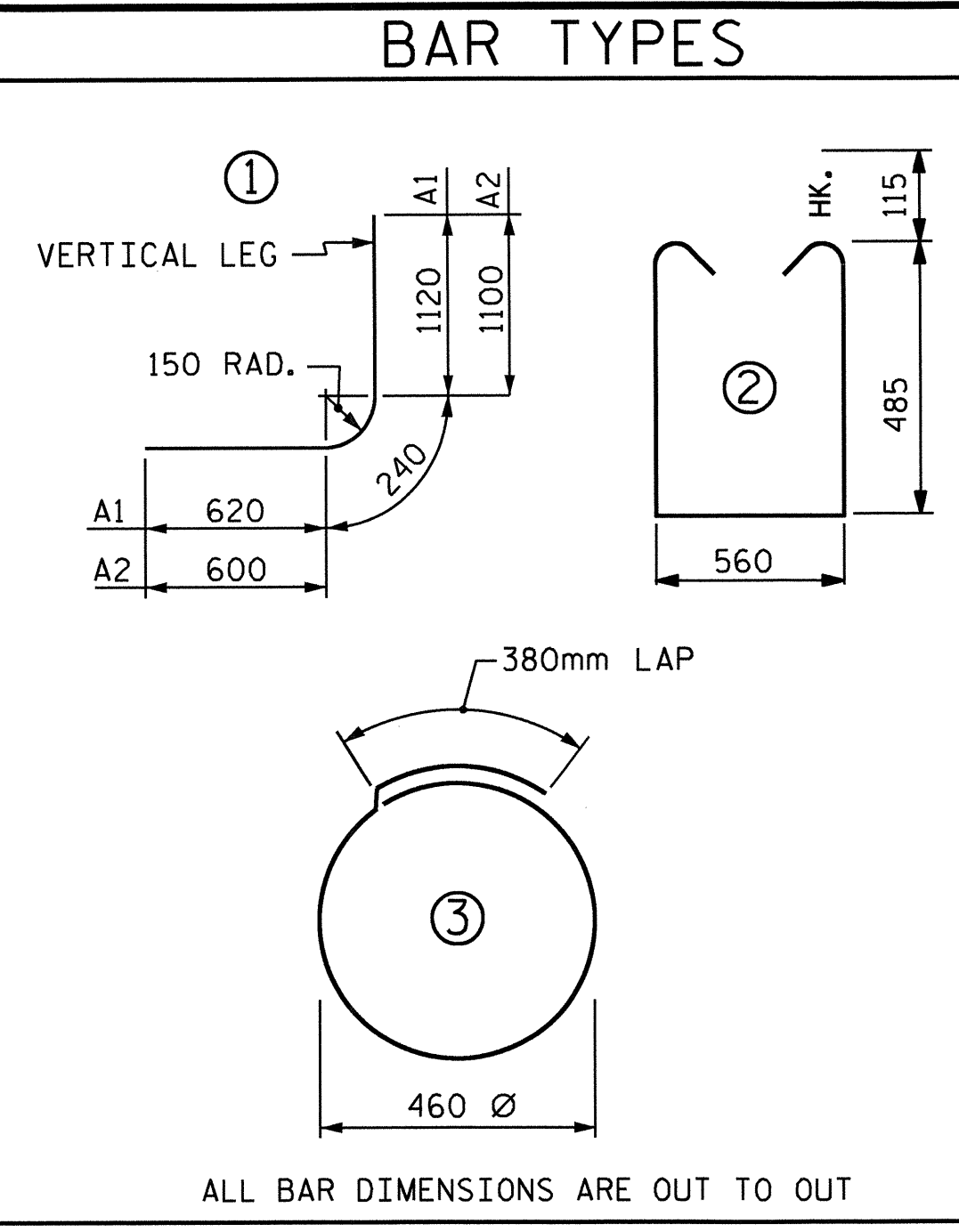


TIMBER PILE SPICE

NOTES: ENDS OF PILES AT SPLICE LOCATION SHALL HAVE A MINIMUM DIAMETER OF 255mm.
 DIAMETER OF HOLES THRU TIMBER PILES SHALL BE 2mm LESS THAN BOLT DIAMETER FOR TIGHT FIT.
 THE TOP OF THE PILE SPLICE SHALL BE DRIVEN A MINIMUM OF 2.50m BELOW GROUND.
 PIPES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

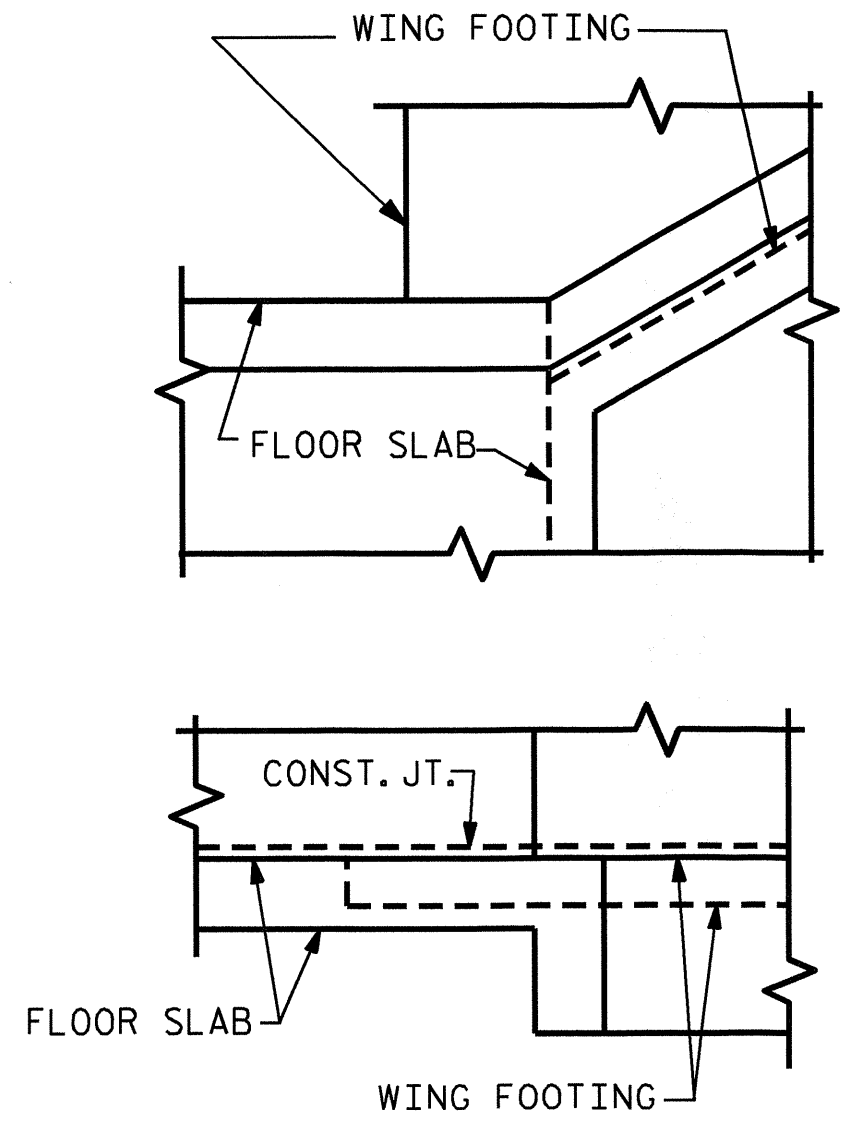


END ELEVATION - NORMAL TO SKEW



SPLICE LENGTH CHART		
BAR	SIZE	LENGTH
C1, C2, F2, F5	#13	720
F4	#29	3260

BILL OF MATERIAL						BILL OF MATERIAL					
STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	130	#16	1	1980	399	*A1	238	#16	1	1980	731
*A2	130	#16	1	1940	391	*A2	238	#16	1	1940	717
*A100	72	#19	STR	2700	434	*A100	133	#19	STR	2700	803
*A200	62	#19	STR	2700	374	*A200	114	#19	STR	2700	688
*A400	72	#19	STR	2700	434	*A400	133	#19	STR	2700	803
*B1	144	#13	STR	2220	318	*B1	266	#13	STR	2220	587
*C1	68	#13	STR	6460	437	*C2	102	#13	STR	8020	813
*D1	22	#19	STR	920	45	*F3	38	#13	STR	580	22
*F1	12	#29	STR	12200	741	*F4	24	#29	STR	12940	1571
*F2	16	#13	STR	6460	103	*F5	24	#13	STR	8020	191
*F3	22	#13	STR	580	13	*G1	2	#13	STR	2700	5
*G1	2	#13	STR	2700	5	*S1	172	#13	2	1760	301
*S1	92	#13	2	1760	161	*S2	20	#13	3	1840	37
*S2	12	#13	3	1840	22						
* EPOXY COATED REINFORCING STEEL					3877 kg.	* EPOXY COATED REINFORCING STEEL					7269 kg.
CLASS A CONCRETE						CLASS A CONCRETE					
BARREL					32.9 m ³	BARREL					60.7 m ³



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

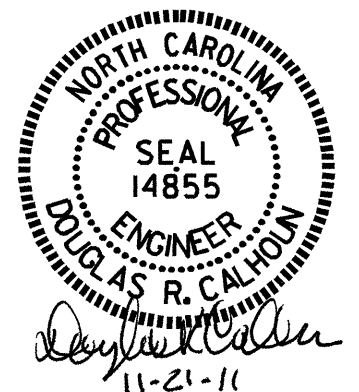
PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 55+81.000 -L-

SHEET 5 OF 7

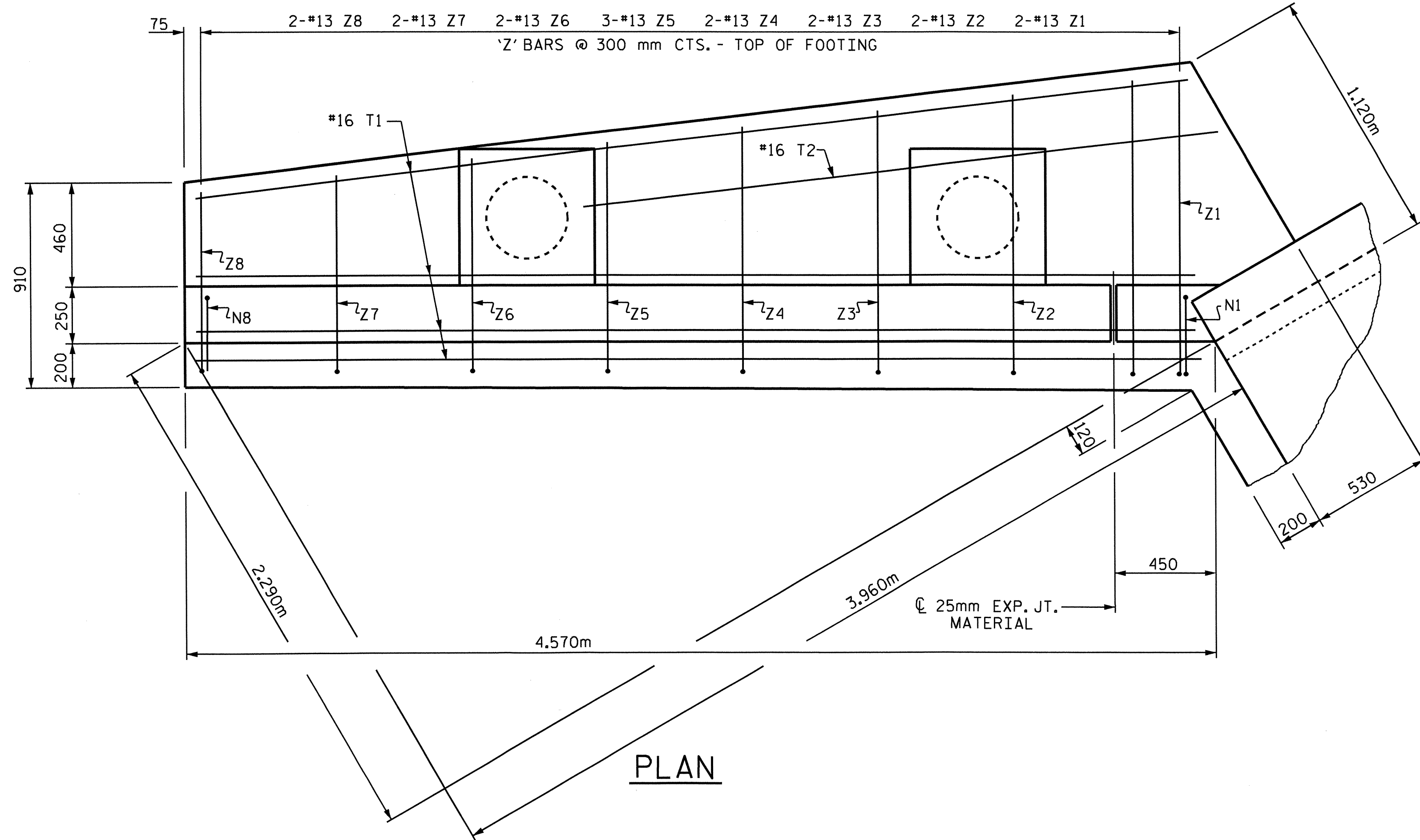
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BARREL STANDARD
 SINGLE 2.400m X 1.800m
 CONCRETE BOX CULVERT
 90° SKEW

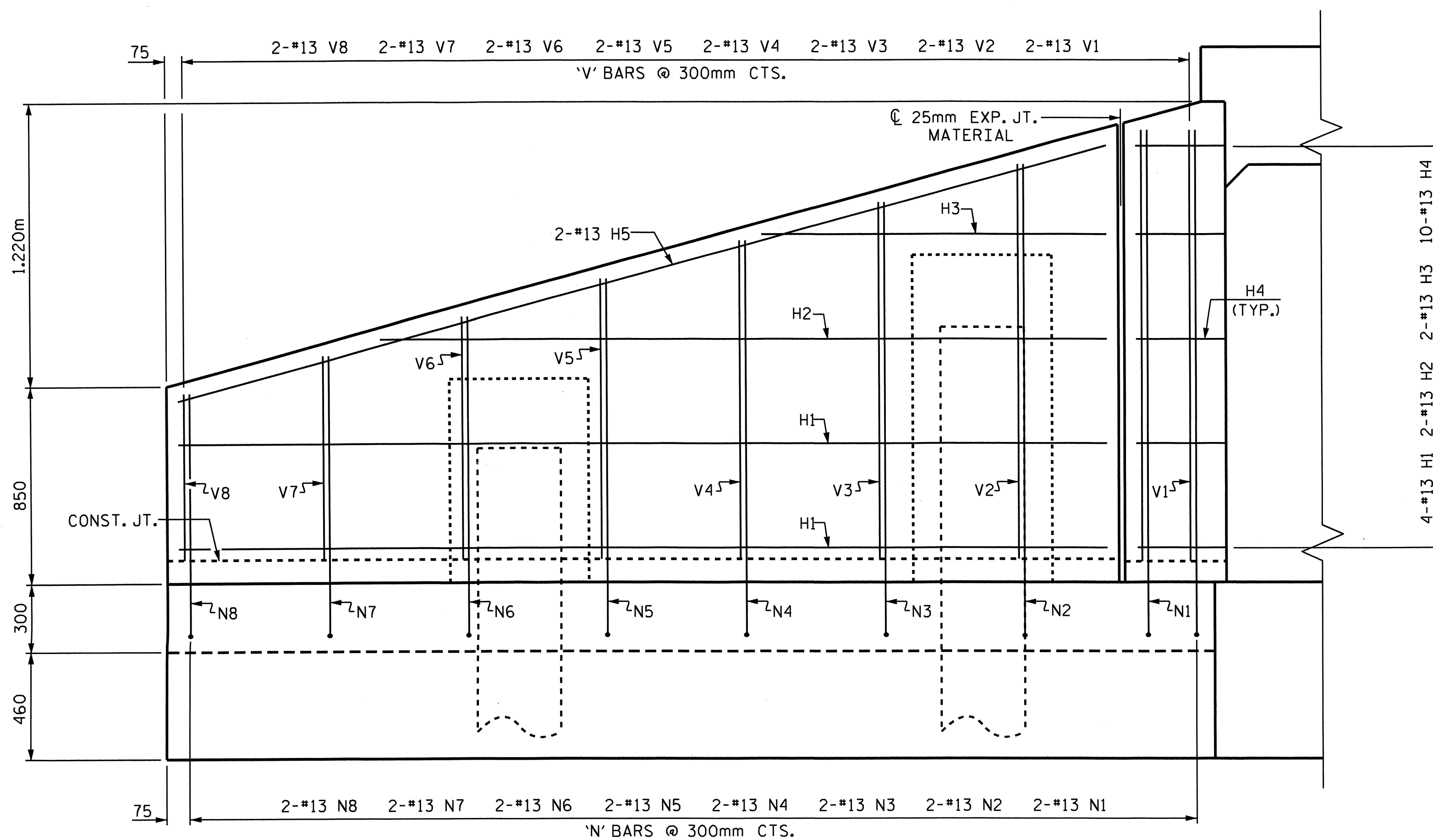
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5	
1			3			TOTAL SHEETS	17
2			4				



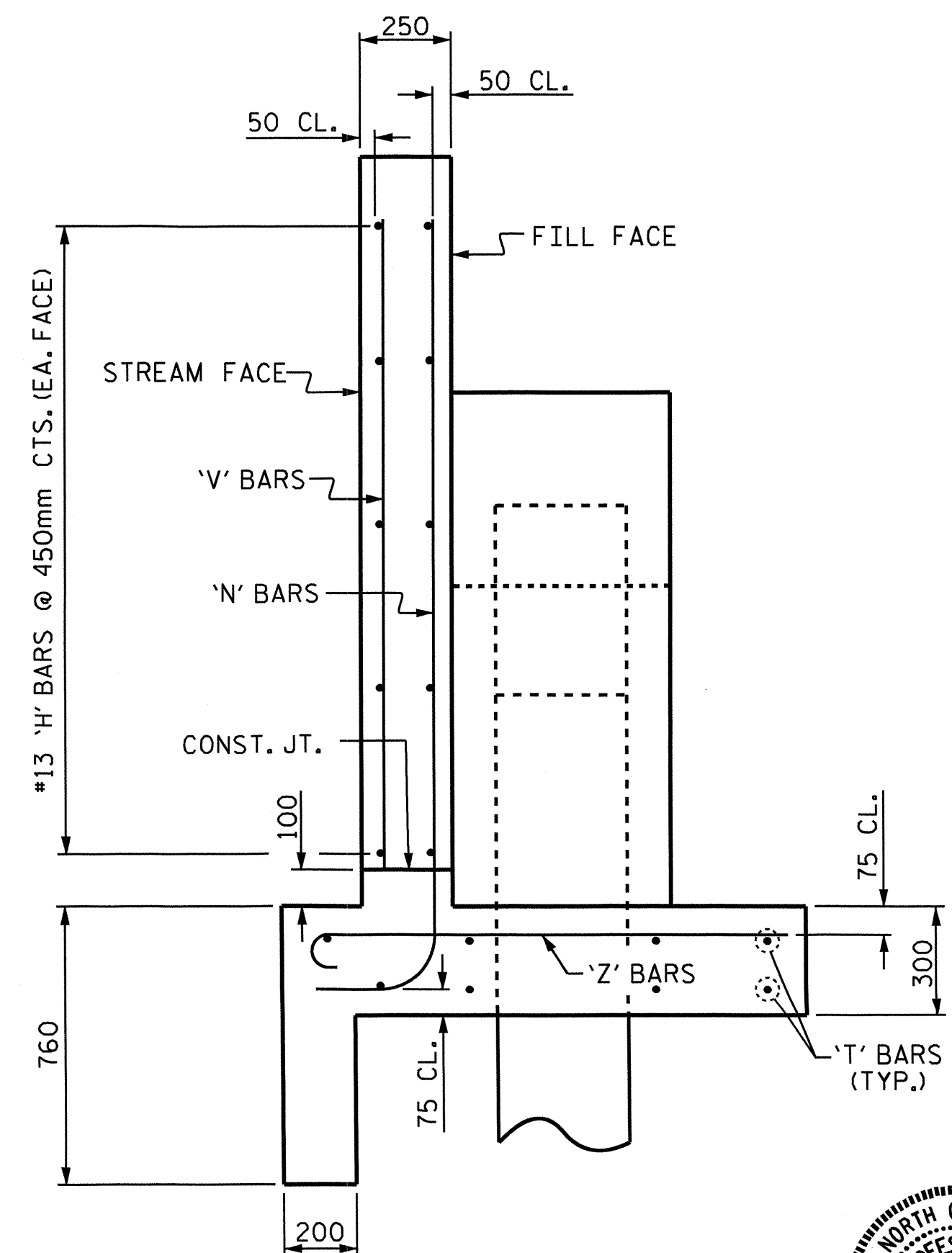
DRAWN BY: B.N. GRADY DATE: 7/2/10
 CHECKED BY: J.L. WALTON DATE: 8/18/10



NOTE: FOR ADDITIONAL DIMENSIONS AND REINFORCING STEEL IN THE PILE CAPS, SEE SHEET 7 OF 7.



ELEVATION

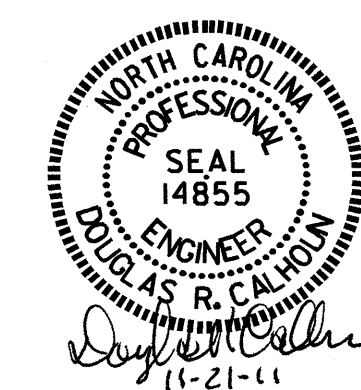


TYPICAL WING SECTION

PROJECT NO. R-2414B
 CAMDEN COUNTY
 STATION: 55+81.000 -L-

SHEET 6 OF 7

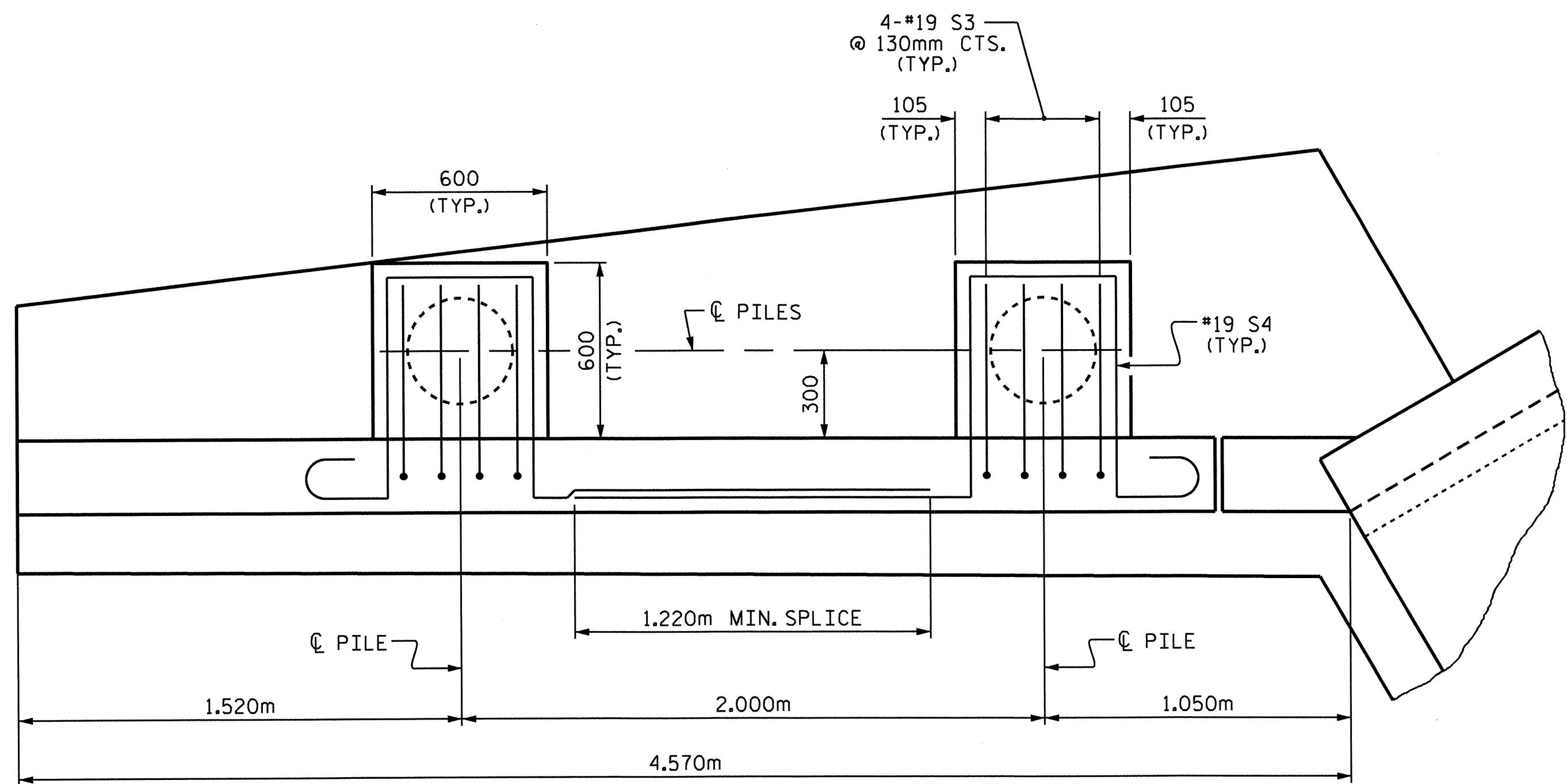
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS FOR
 CONCRETE BOX CULVERT
 H = 1.800m SLOPE = 3 : 1
 90° SKEW



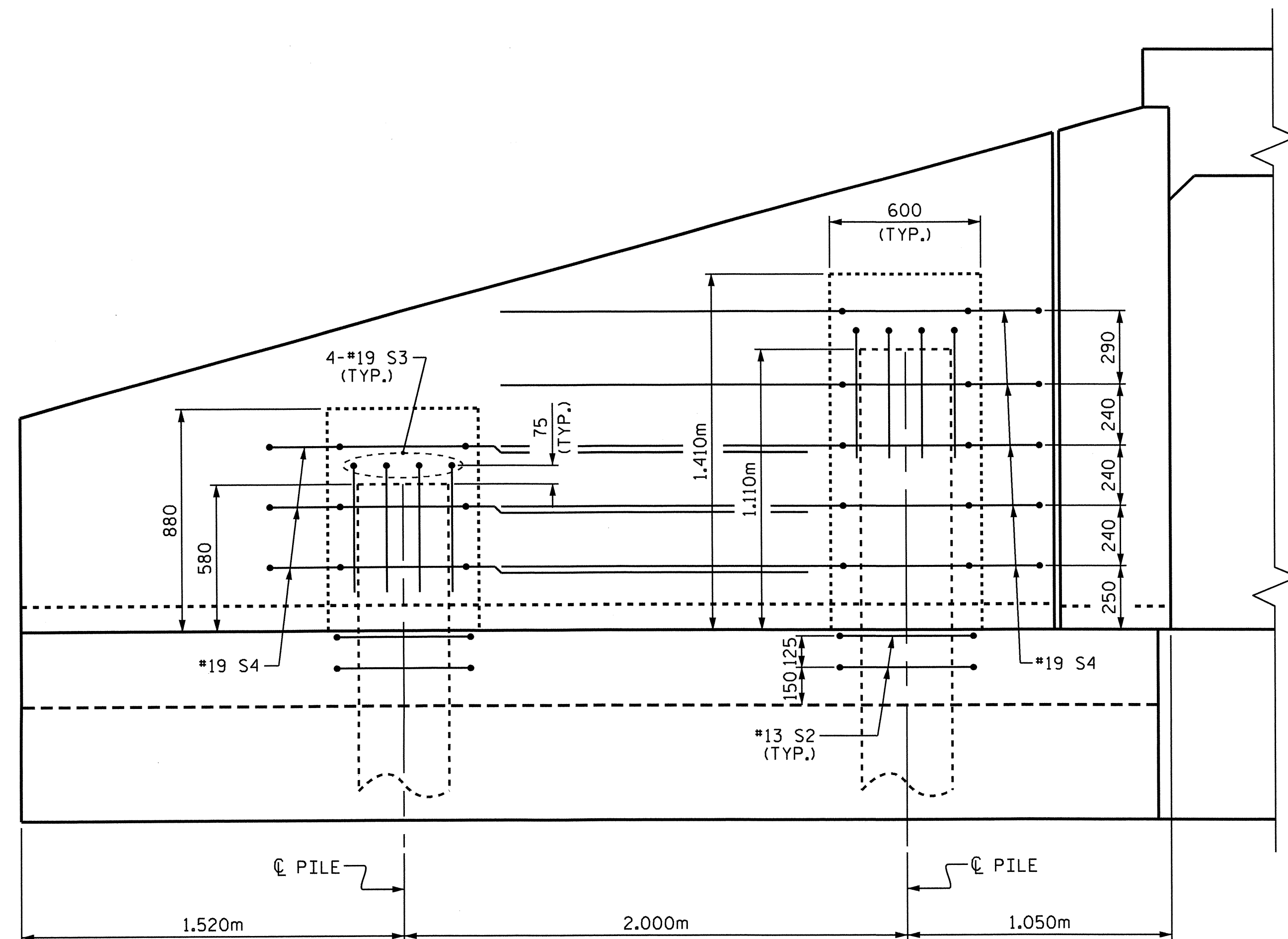
ASSEMBLED BY : B.N. GRADY DATE : 7/2/10
 CHECKED BY : J.L. WALTON DATE : 8/18/10
 DRAWN BY : KJA 06/97
 CHECKED BY : VAP 06/97

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

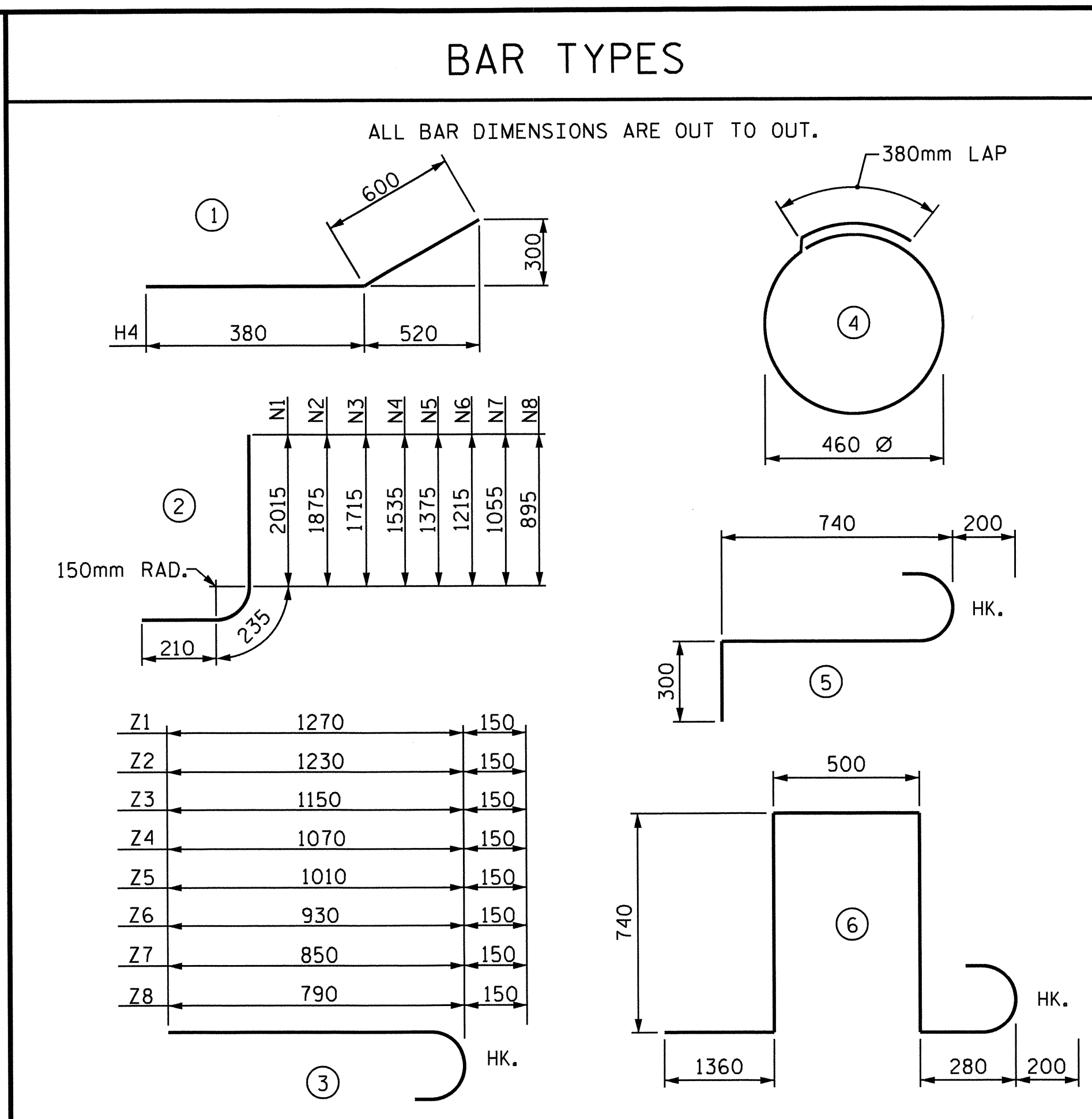
TOTAL SHEETS 17



PLAN



ELEVATION



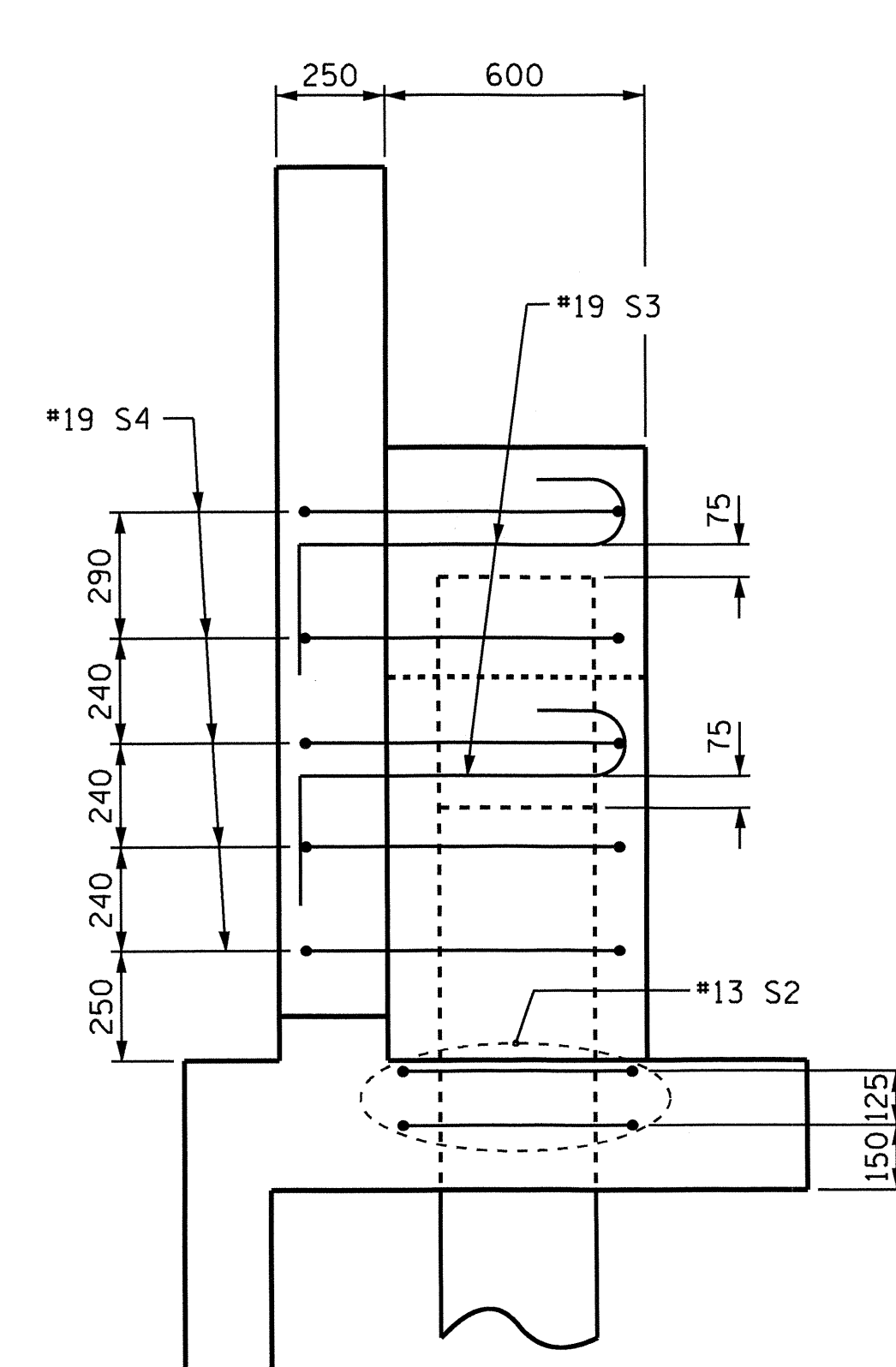
BAR TYPES

BILL OF MATERIAL					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
* H1	16	13	STR	4000	64
* H2	8	13	STR	3120	25
* H3	8	13	STR	1480	12
* H4	40	13	1	980	39
* H5	8	13	STR	4140	33
* N1	8	13	2	2460	20
* N2	8	13	2	2320	18
* N3	8	13	2	2160	17
* N4	8	13	2	1980	16
* N5	8	13	2	1820	14
* N6	8	13	2	1660	13
* N7	8	13	2	1500	12
* N8	8	13	2	1340	11
* S2	16	13	4	1840	29
* S3	32	19	5	1240	89
* S4	32	19	6	3820	273
* T1	24	16	STR	4460	166
* T2	8	16	STR	2820	35
* V1	8	13	STR	1840	15
* V2	8	13	STR	1700	14
* V3	8	13	STR	1520	12
* V4	8	13	STR	1360	11
* V5	8	13	STR	1200	10
* V6	8	13	STR	1040	8
* V7	8	13	STR	880	7
* V8	8	13	STR	720	6
* Z1	8	13	3	1420	11
* Z2	8	13	3	1380	11
* Z3	8	13	3	1300	10
* Z4	8	13	3	1220	10
* Z5	8	13	3	1160	9
* Z6	8	13	3	1080	9
* Z7	8	13	3	1000	8
* Z8	8	13	3	940	7

* EPOXY COATED REINFORCING STEEL IN 4 WINGS 1044 kg

CLASS A CONCRETE

4 WINGS	18.7	m ³
2 HEADWALLS	0.6	m ³
2 END CURTAIN WALLS	0.7	m ³
TOTAL	20.0	m³



TYPICAL WING SECTION

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 55+81.000 -L-

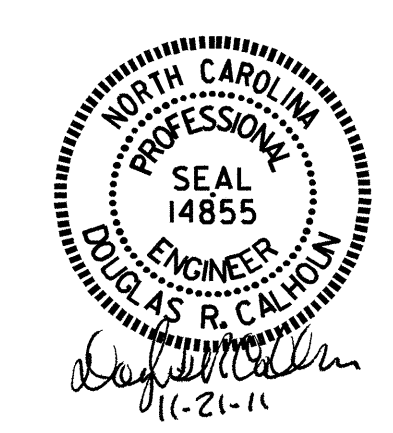
SHEET 7 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

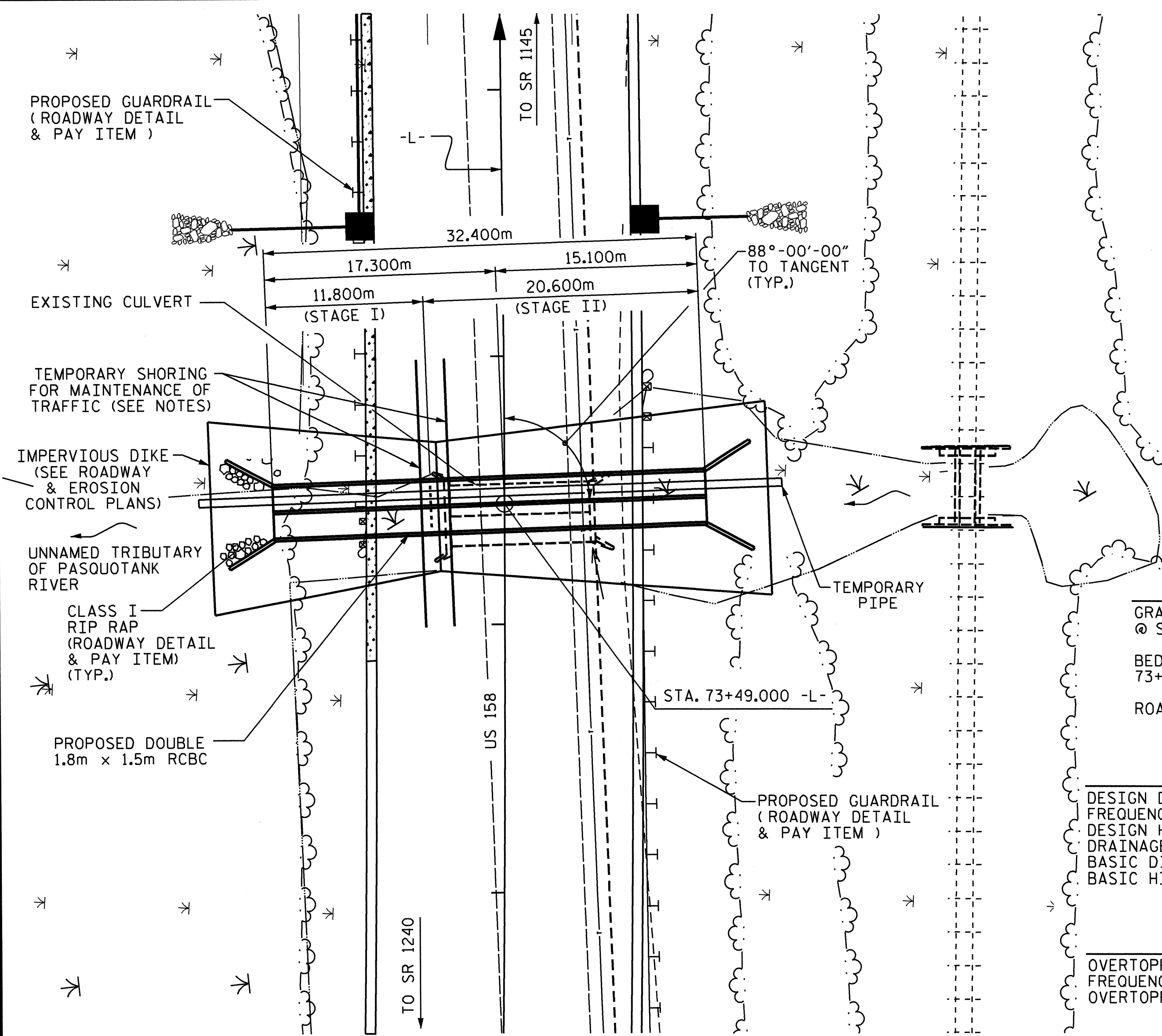
WINGS FOR CONCRETE BOX CULVERT
 H = 1.800m SLOPE = 3 : 1
 90° SKEW

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

TOTAL SHEETS 17



ASSEMBLED BY : B.N. GRADY DATE : 7/2/10
 CHECKED BY : J.L. WALTON DATE : 8/18/10
 DRAWN BY : KJA 06/97
 CHECKED BY : VAP 06/97



GRADE DATA

GRADE POINT ELEV. @ STA. 73+49.000 -L-	= 2.103
BED ELEV. @ STA. 73+49.000 -L-	= -0.447
ROADWAY SLOPES	= 3 : 1

HYDRAULIC DATA

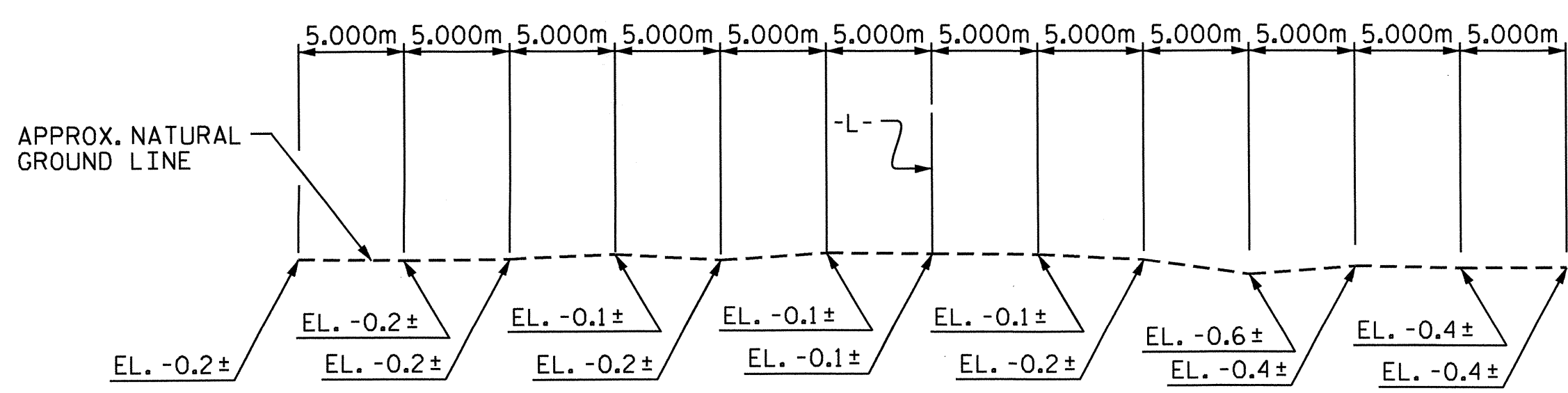
DESIGN DISCHARGE	= 12.5 m ³ /s
FREQUENCY OF DESIGN FLOOD	= 50 yr.
DESIGN HIGH WATER ELEVATION	= 1.270
DRAINAGE AREA	= 4.07 sq.km
BASIC DISCHARGE (Q100)	= 16.0 m ³ /s
BASIC HIGH WATER ELEVATION	= 1.550

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 18.3 m ³ /s
FREQUENCY OF OVERTOPPING FLOOD	= 100+ yr.
OVERTOPPING FLOOD ELEVATION	= 1.820

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG CULVERT

DRAWN BY : B.N. GRADY DATE : 8/12/10
 CHECKED BY : J.L. WALTON DATE : 8/20/10

TOTAL STRUCTURE QUANTITIES (STAGE I)

CLASS A CONCRETE	
BARREL	48.2 m ³
WINGS ETC.	8.9 m ³
TOTAL	57.1 m ³
FOUNDATION COND. MAT'L	34 m. tons
EPOXY COATED REINFORCING STEEL	
BARREL	4547 kg
WINGS ETC.	456 kg
TOTAL	5003 kg
203mm TIP DIAMETER TREATED TIMBER PILES	NO. : 23 506.0m
PILE REDRIVES	NO. : 12

TOTAL STRUCTURE QUANTITIES (STAGE II)

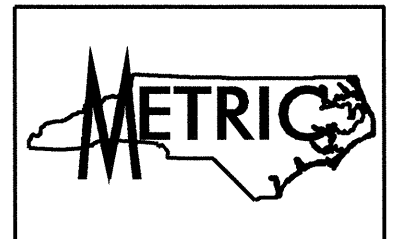
CLASS A CONCRETE	
BARREL	84.2 m ³
WINGS ETC.	8.8 m ³
TOTAL	93.0 m ³
FOUNDATION COND. MAT'L	59 m. tons
EPOXY COATED REINFORCING STEEL	
BARREL	8122 kg
WINGS ETC.	455 kg
TOTAL	8577 kg
203mm TIP DIAMETER TREATED TIMBER PILES	NO. : 36 792.0m
PILE REDRIVES	NO. : 18

TOTAL BILL OF MATERIAL

CLASS A CONCRETE	
STAGE I	57.1 m ³
STAGE II	93.0 m ³
TOTAL	150.1 m ³
EPOXY COATED REINFORCING STEEL	
STAGE I	5003 kg
STAGE II	8577 kg
TOTAL	13580 kg
FOUNDATION COND. MAT'L	
STAGE I	34 m. tons
STAGE II	59 m. tons
TOTAL	93 m. tons
TREATED TIMBER PILES	NO. : 59 1298.0m
PDA TESTING	2
PDA ASSISTANCE	2
PILE REDRIVES	30
CULVERT EXCAVATION	LUMP SUM

NOTES :

- ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE IN METERS.
- DESIGN FILL -----1.060m.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 76mm Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER: (STAGE I AND II)
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 100mm 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.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 21.0m. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 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 EXISTING 3.78m x 1.13m CULVERT WITH A 10.04m LENGTH AND AN UNKNOWN TOP SLAB THICKNESS AND LOCATED AT THE PROPOSED CULVERT SITE SHALL BE REMOVED. PAYMENT FOR REMOVAL OF CULVERT WILL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 900mm STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- 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.
- BACKFILL TO ORIGINAL GROUND ELEVATIONS INSIDE THE IMPERVIOUS DIKE AFTER CONSTRUCTION OF THE CULVERT.



PROJECT NO. R-2414B
 CAMDEN COUNTY
 STATION: 73+49.000 -L-

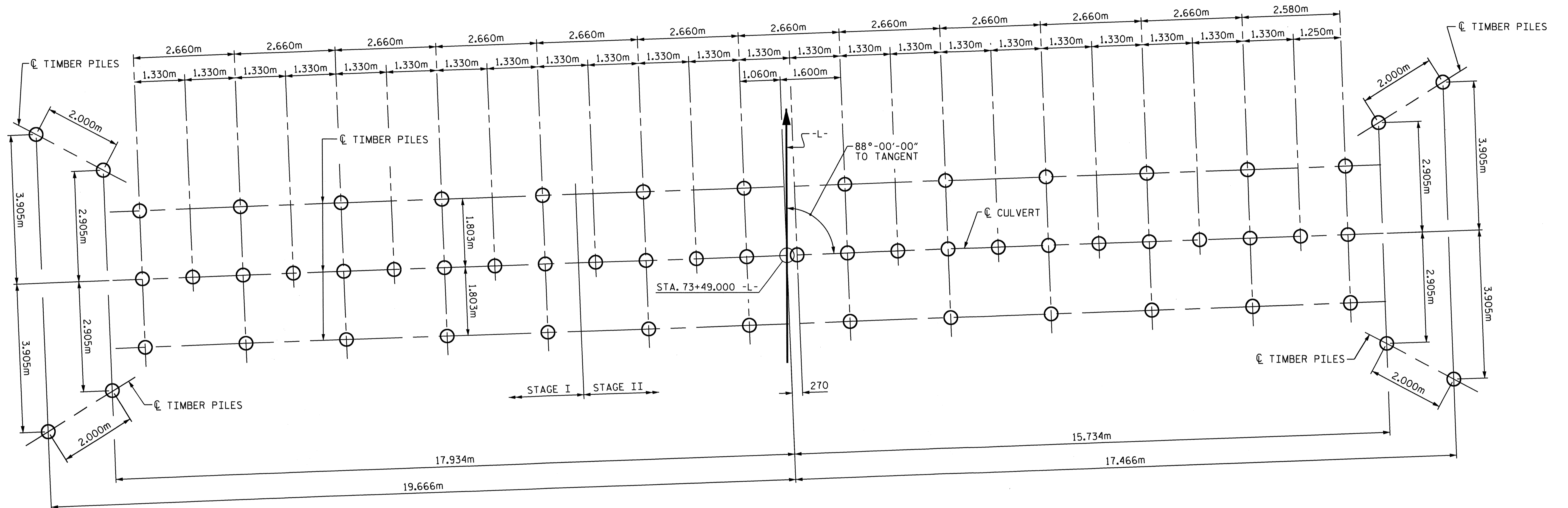
SHEET 1 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BARREL STANDARD
 DOUBLE 1.800m X 1.500m
 CONCRETE BOX CULVERT
 90° SKEW

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





FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES)

FOUNDATION NOTES:

DRIVE PILES TO A REQUIRED BEARING CAPACITY OF 360 kN PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES IS 180 kN PER PILE.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED FOR BOTH STAGE 1 AND STAGE 2 CONSTRUCTION. FOR PILE DRIVING ANALYZER, SEE SPECIAL PROVISIONS.

TREATED TIMBER PILES SHALL HAVE A MINIMUM DIAMETER OF 203mm AS MEASURED 900mm FROM THE PILE TIP.

SPLICE TIMBER PILES AS SHOWN ON THE PLANS. ONLY ONE SPLICE IS ALLOWED PER PILE.

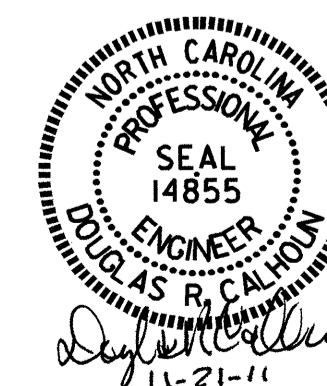
TIMBER PILES SHALL BE MADE OF TREATED SOUTHERN YELLOW PINE. PILES SHALL BE TREATED TO A MINIMUM RETENTION OF 40 KG/M³ OF CCA AND SHALL MEET ALL THE REQUIREMENTS OF AWPA STANDARD C3.

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 73+49.000 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

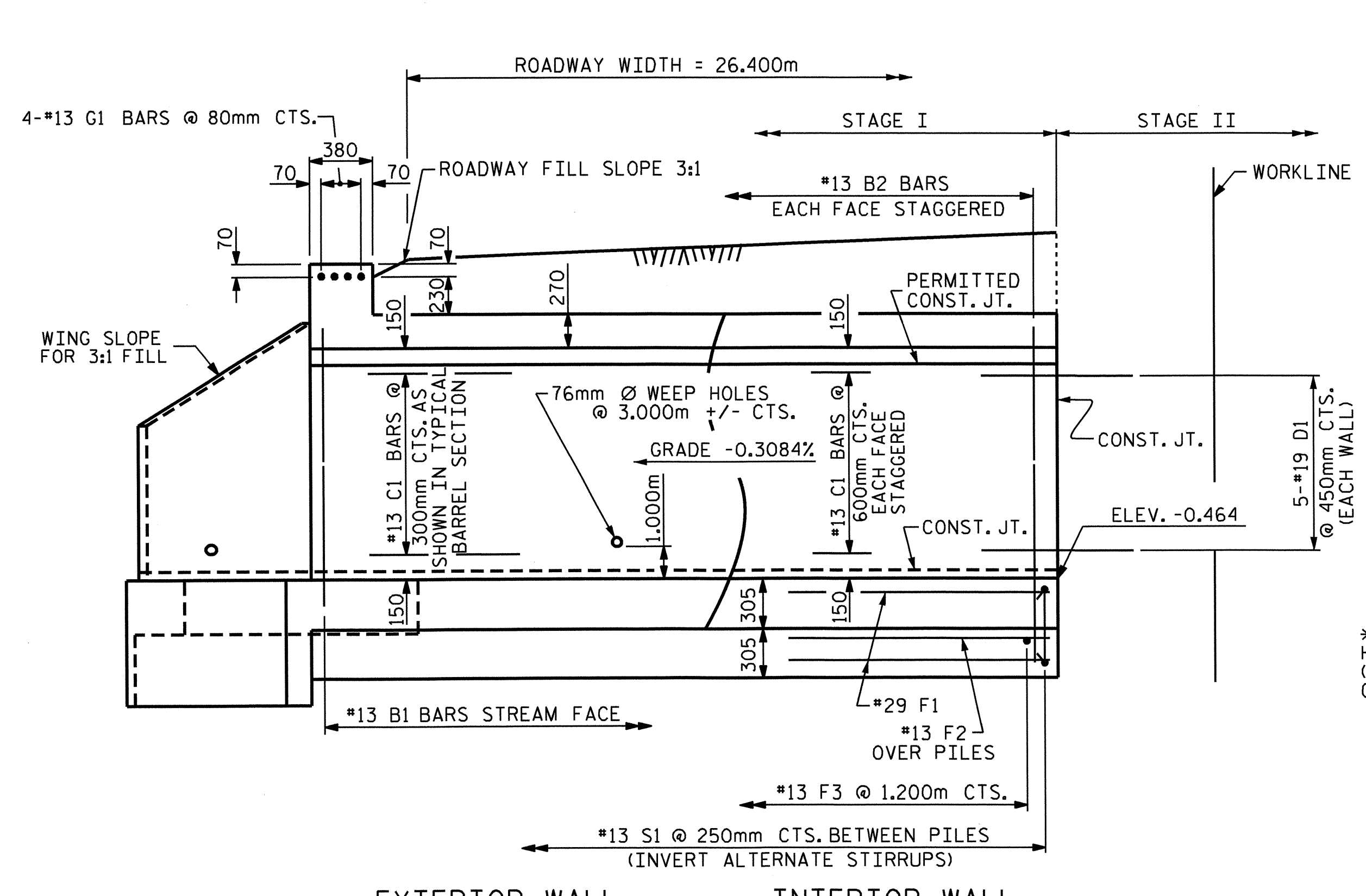
FOUNDATION LAYOUT



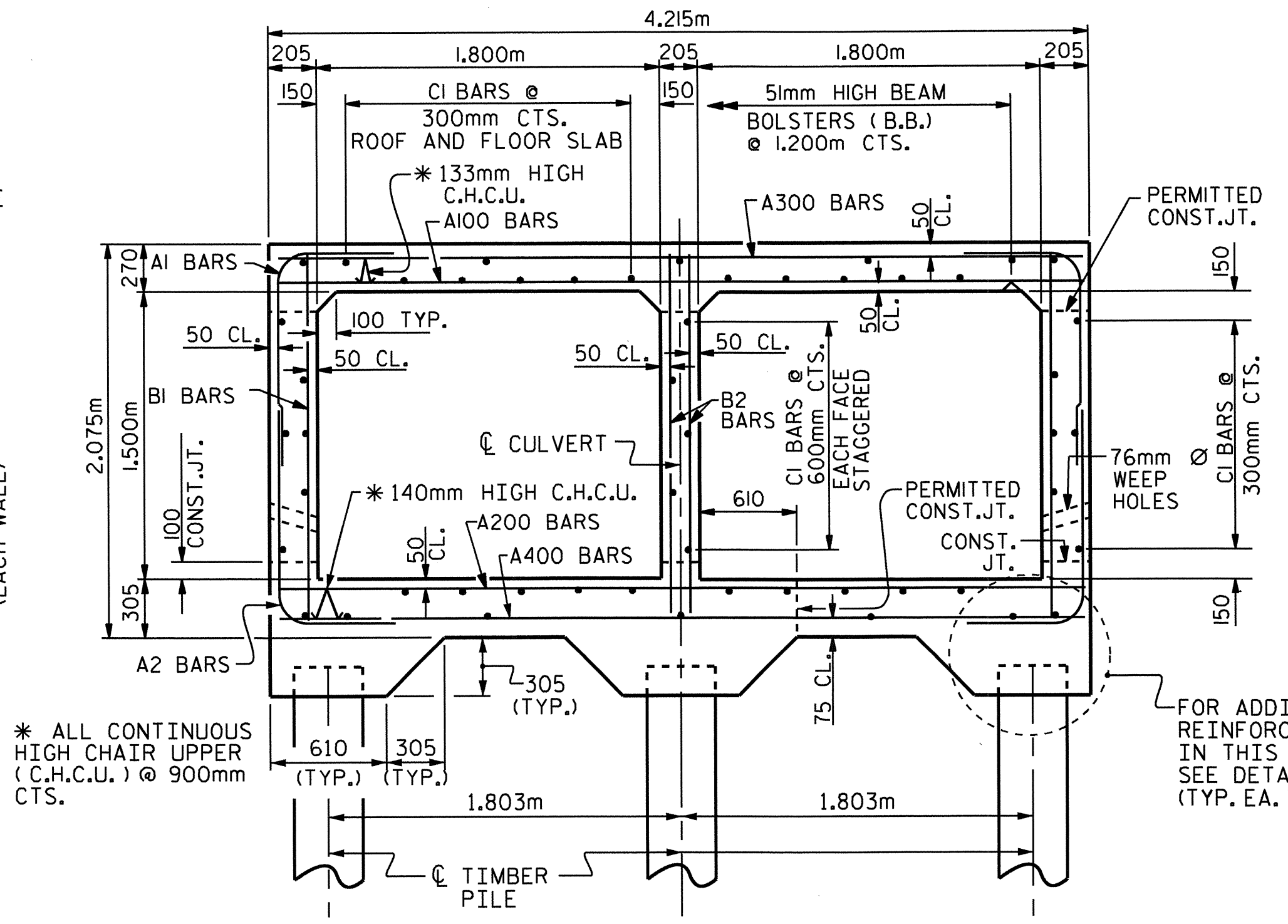
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9	
1			3			TOTAL SHEETS	17
2			4				

DRAWN BY : B.N. GRADY DATE : 8/12/10
 CHECKED BY : J.L. WALTON DATE : 8/20/10

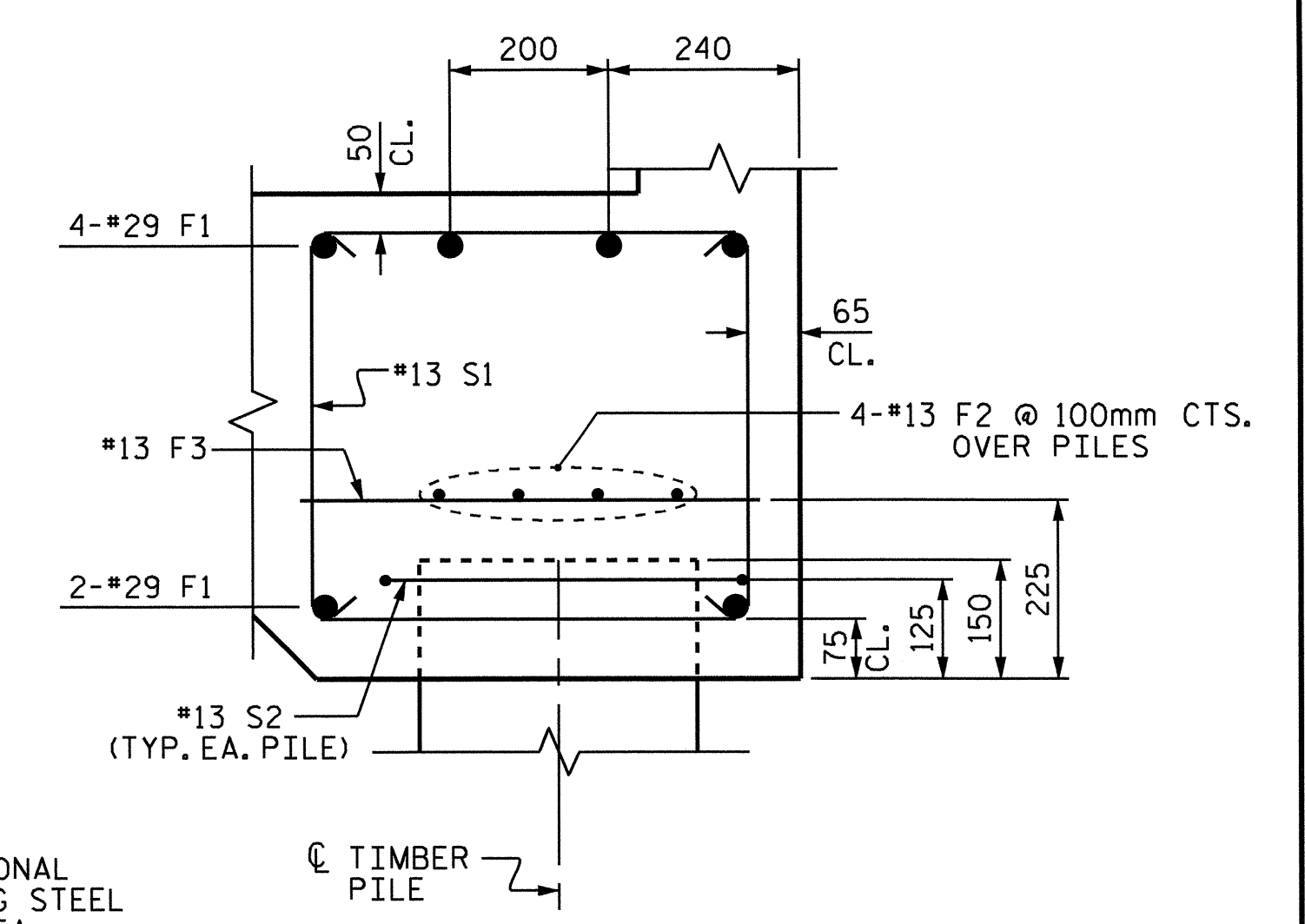
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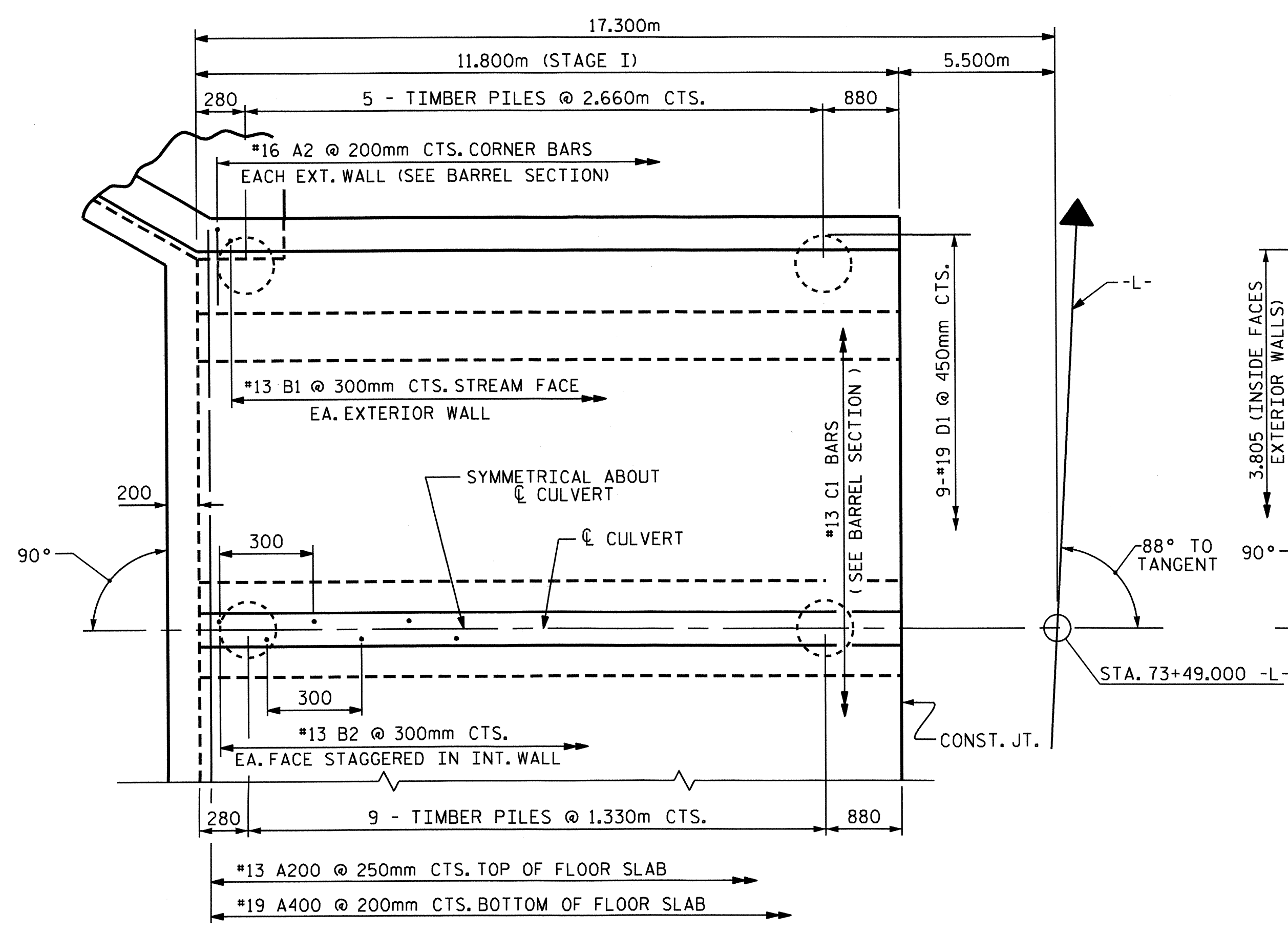
EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY



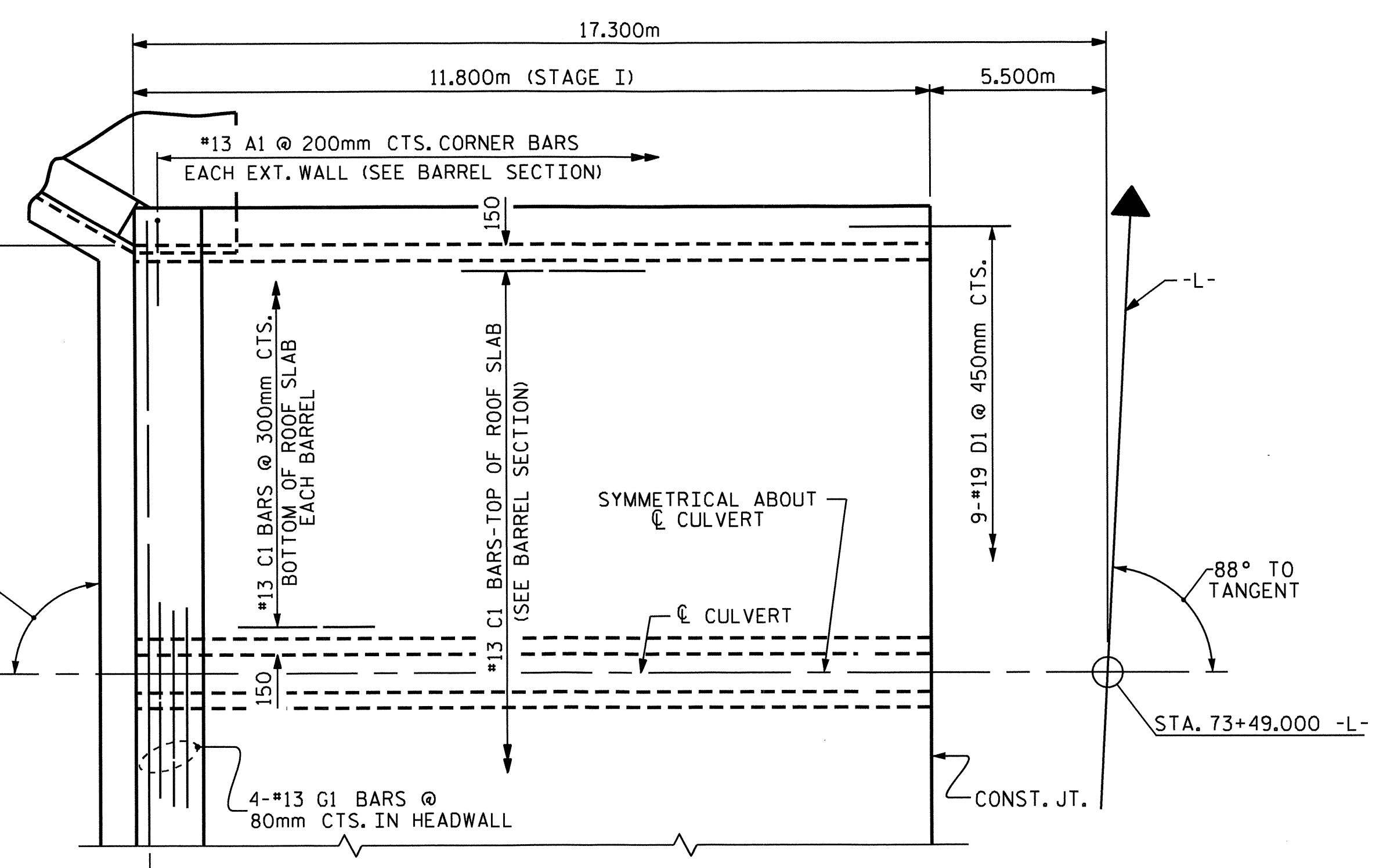
RIGHT ANGLE SECTION OF BARREL
 THERE ARE 51 "C" BARS IN SECTION OF BARREL



DETAIL A



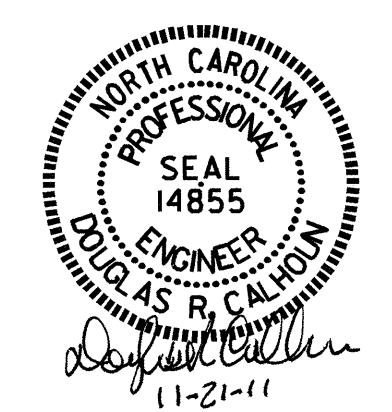
PART PLAN - FLOOR SLAB



PART PLAN - ROOF SLAB

PROJECT NO. R-2414B
 CAMDEN COUNTY
 STATION: 73+49.000 -L-
 SHEET 3 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BARREL STANDARD DOUBLE 1.800m X 1.500m CONCRETE BOX CULVERT 90° SKEW (STAGE I)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. C-10
					TOTAL SHEETS 17

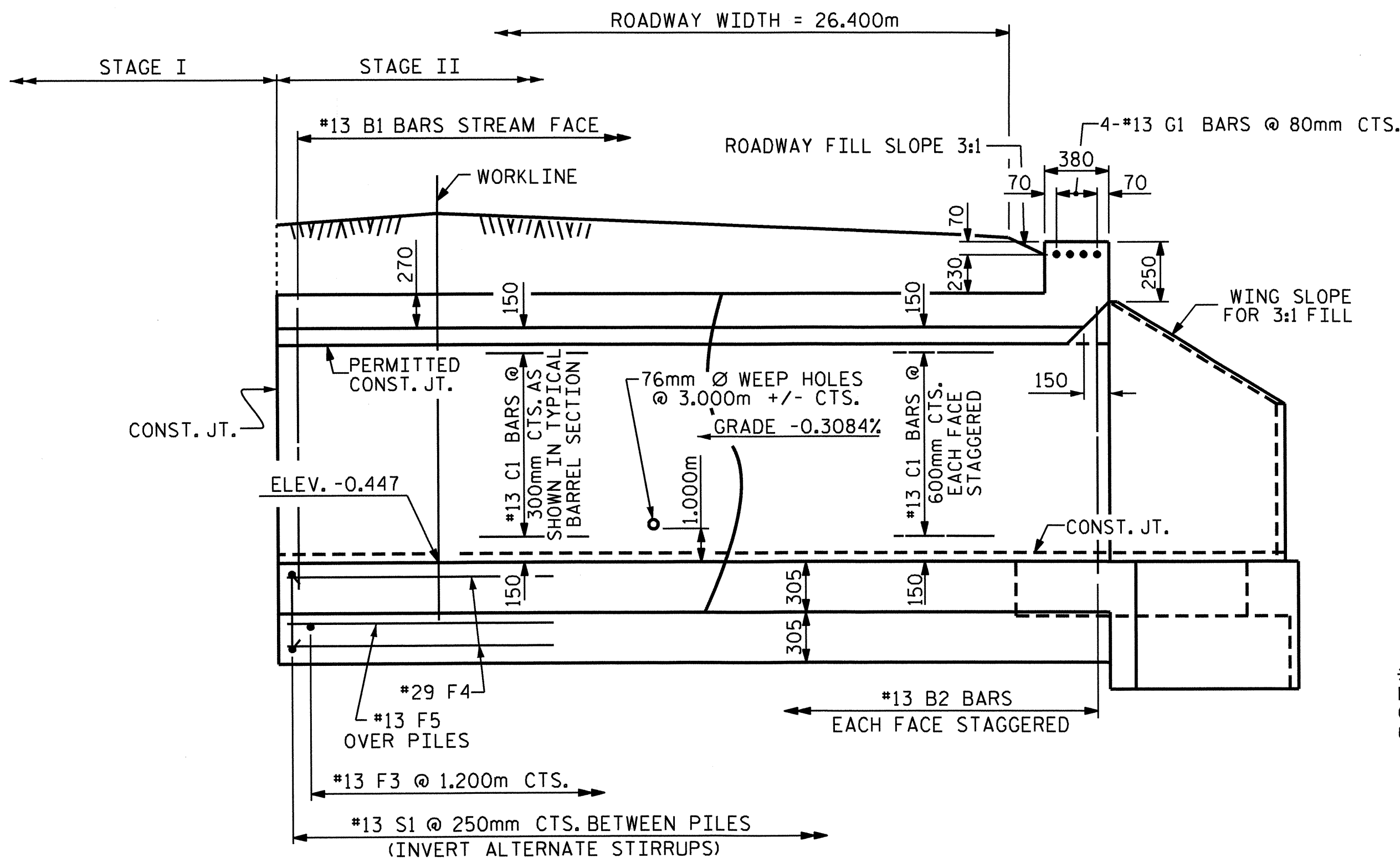


ASSEMBLED BY : B.N. GRADY DATE : 7/9/10
 CHECKED BY : J.L. WALTON DATE : 8/20/10
 DRAWN BY : EEM 6/97
 CHECKED BY : ARB 7/97

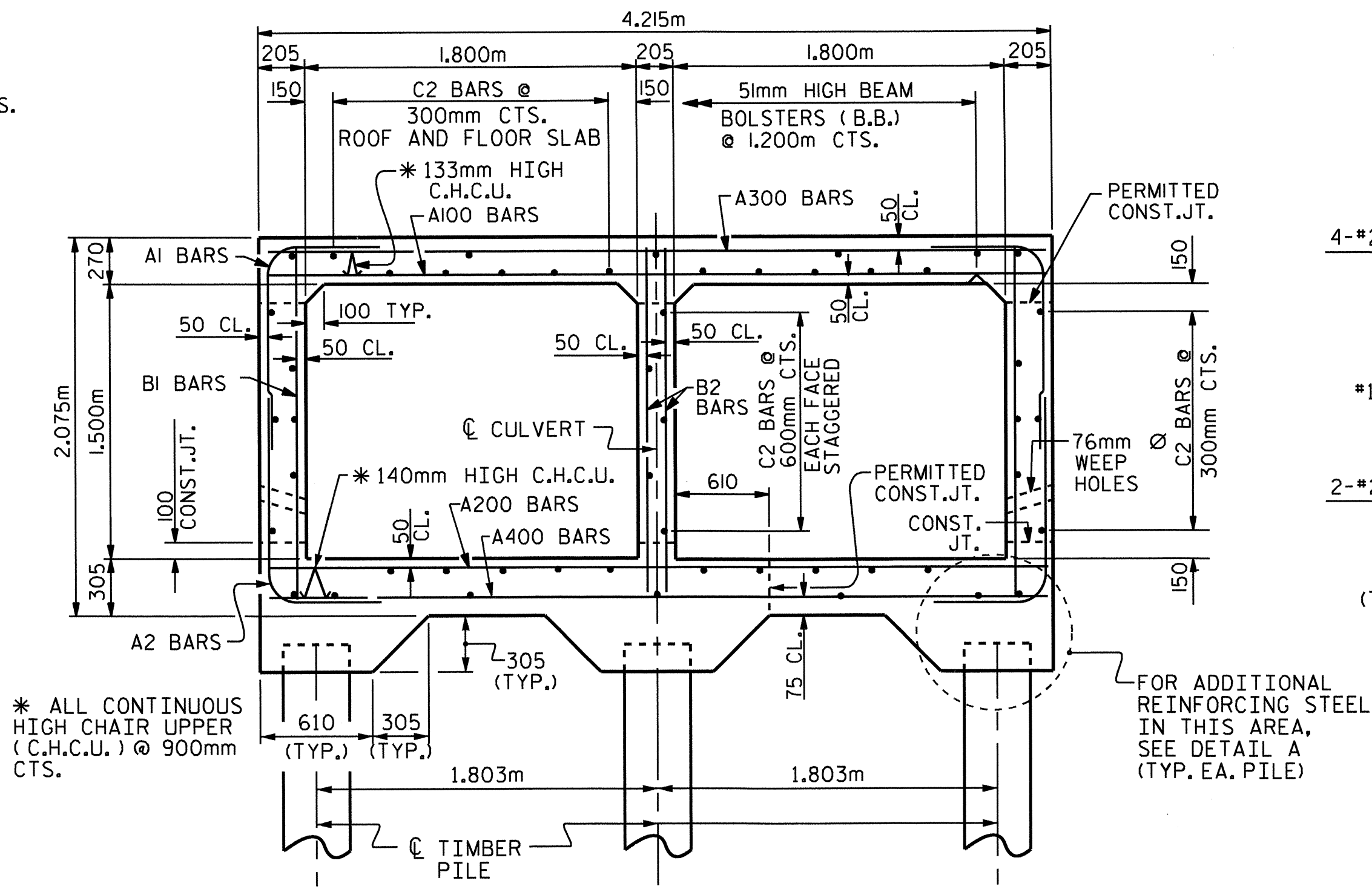
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STD. No. CB290sm

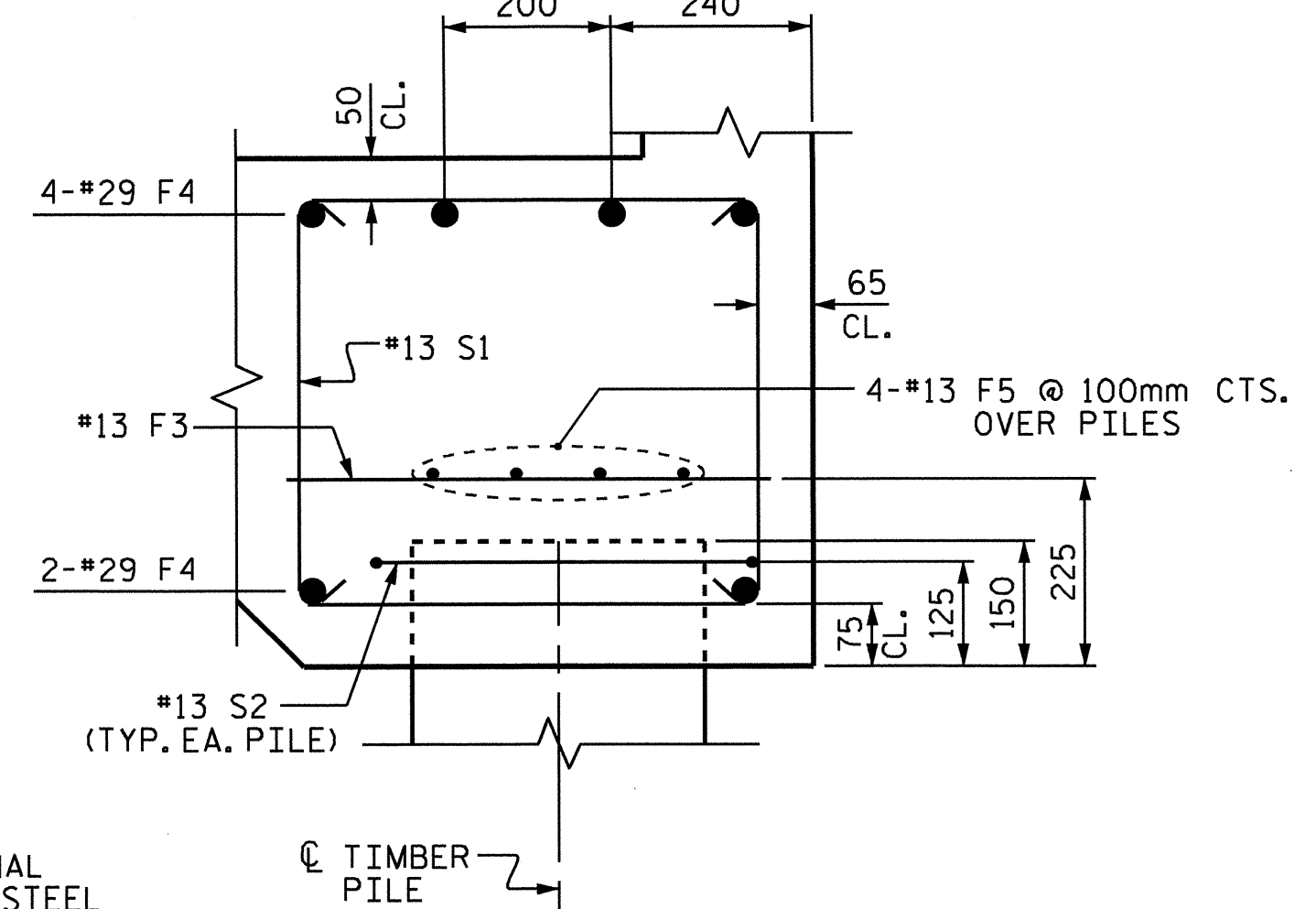
STR. #2



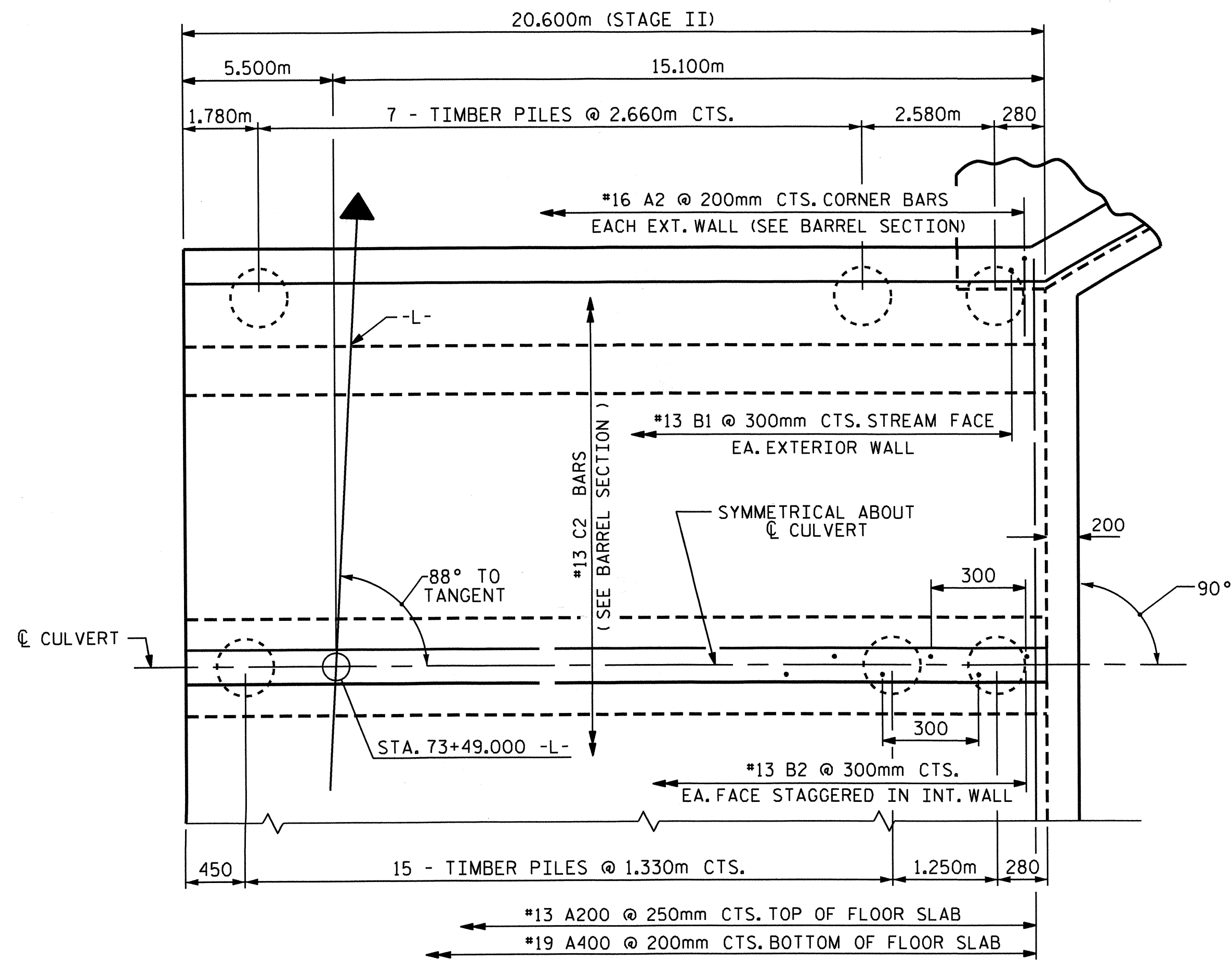
EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY



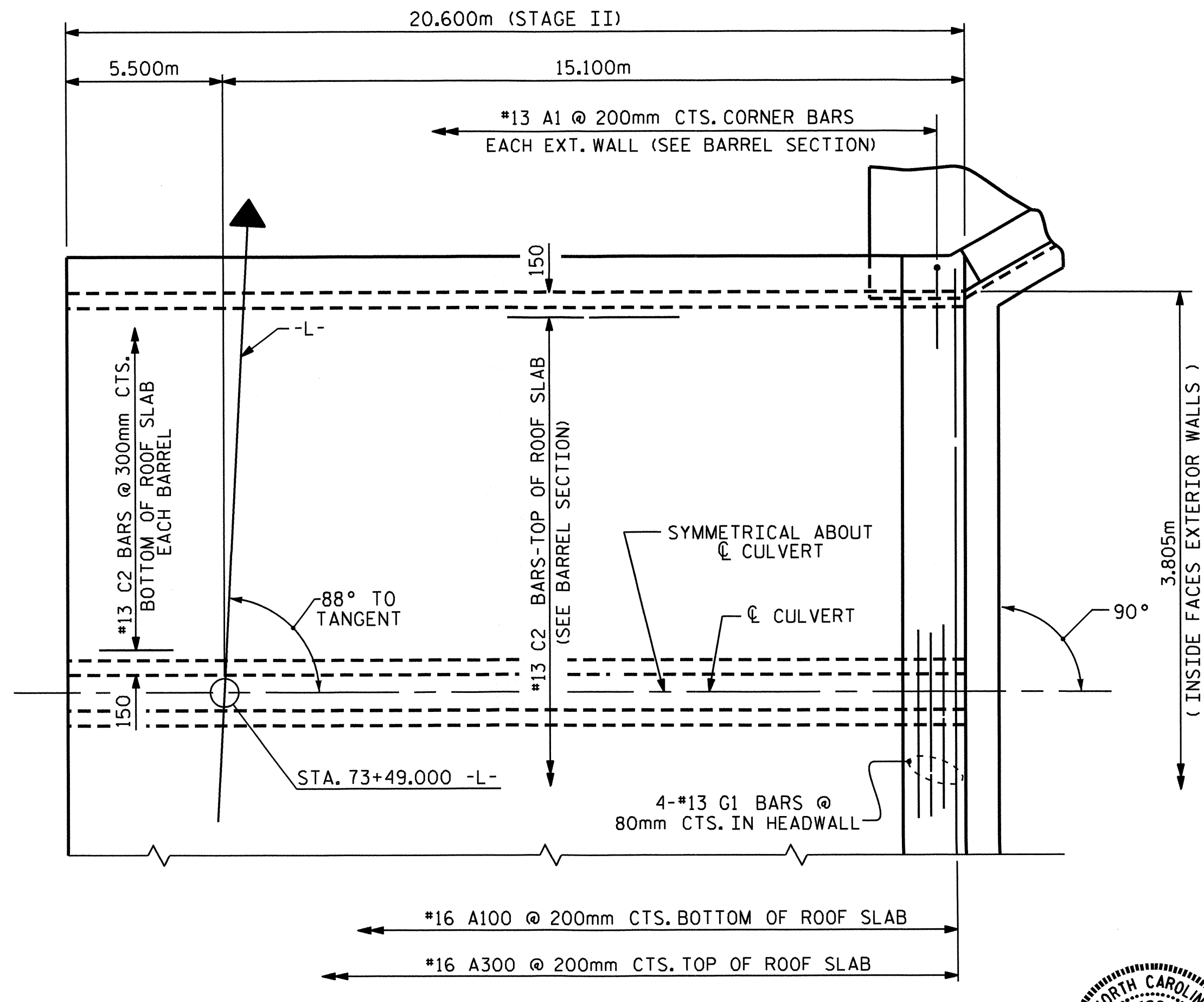
RIGHT ANGLE SECTION OF BARREL
 THERE ARE 51 "C" BARS IN SECTION OF BARREL



DETAIL A



PART PLAN - FLOOR SLAB



PART PLAN - ROOF SLAB

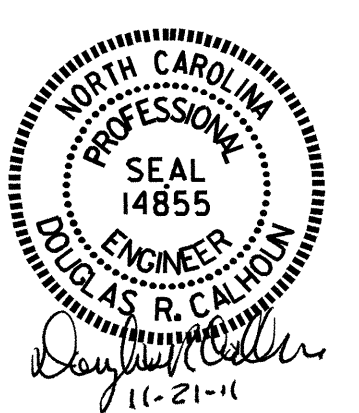
PROJECT NO. R-2414B
 CAMDEN COUNTY
 STATION: 73+49.000 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

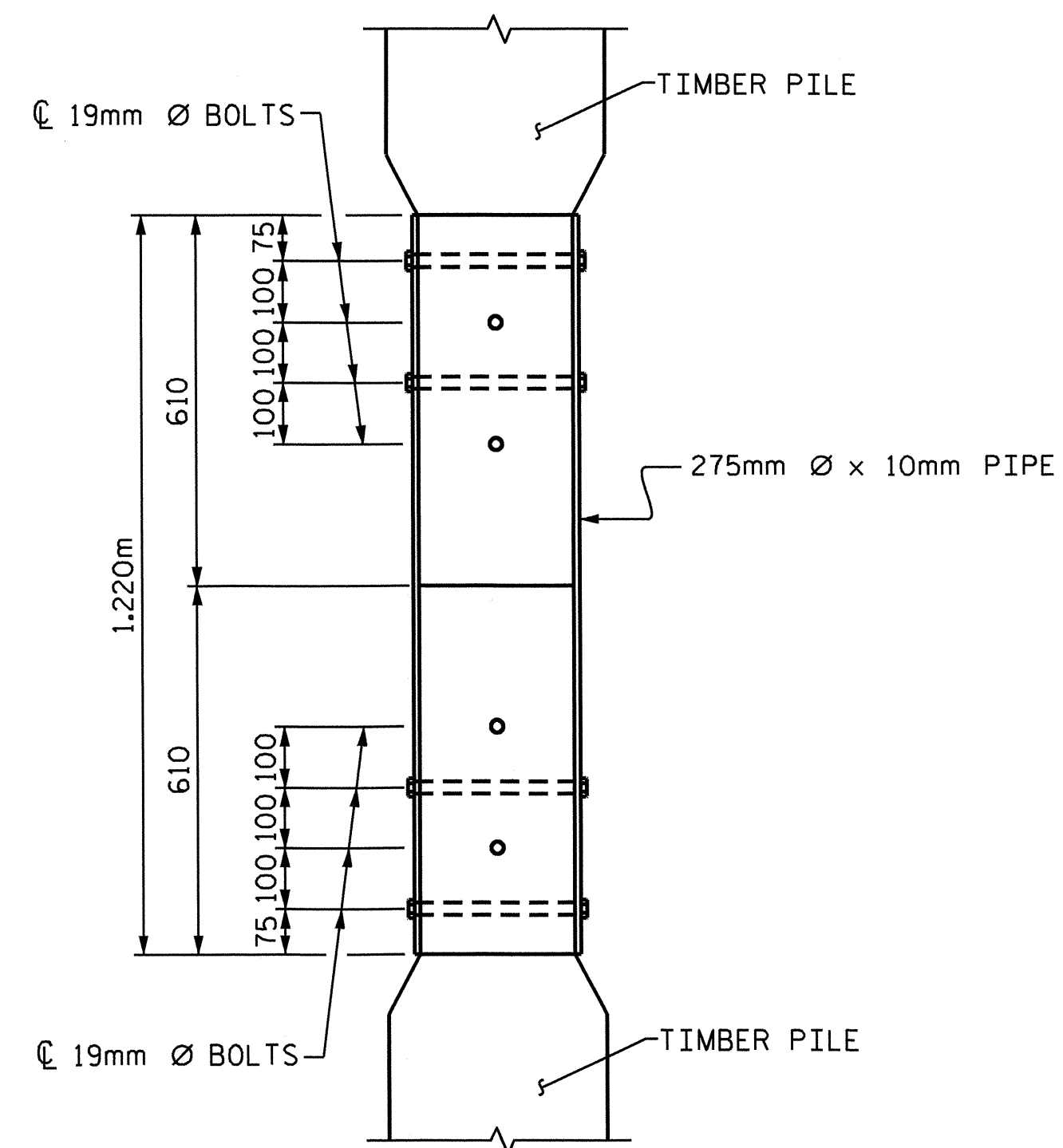
**BARREL STANDARD
 DOUBLE 1.800m X 1.500m
 CONCRETE BOX CULVERT
 90° SKEW (STAGE II)**

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



ASSEMBLED BY : B.N. GRADY DATE : 7/9/10
 CHECKED BY : J.L. WALTON DATE : 8/23/10
 DRAWN BY : EEM 6/97
 CHECKED BY : ARB 7/97

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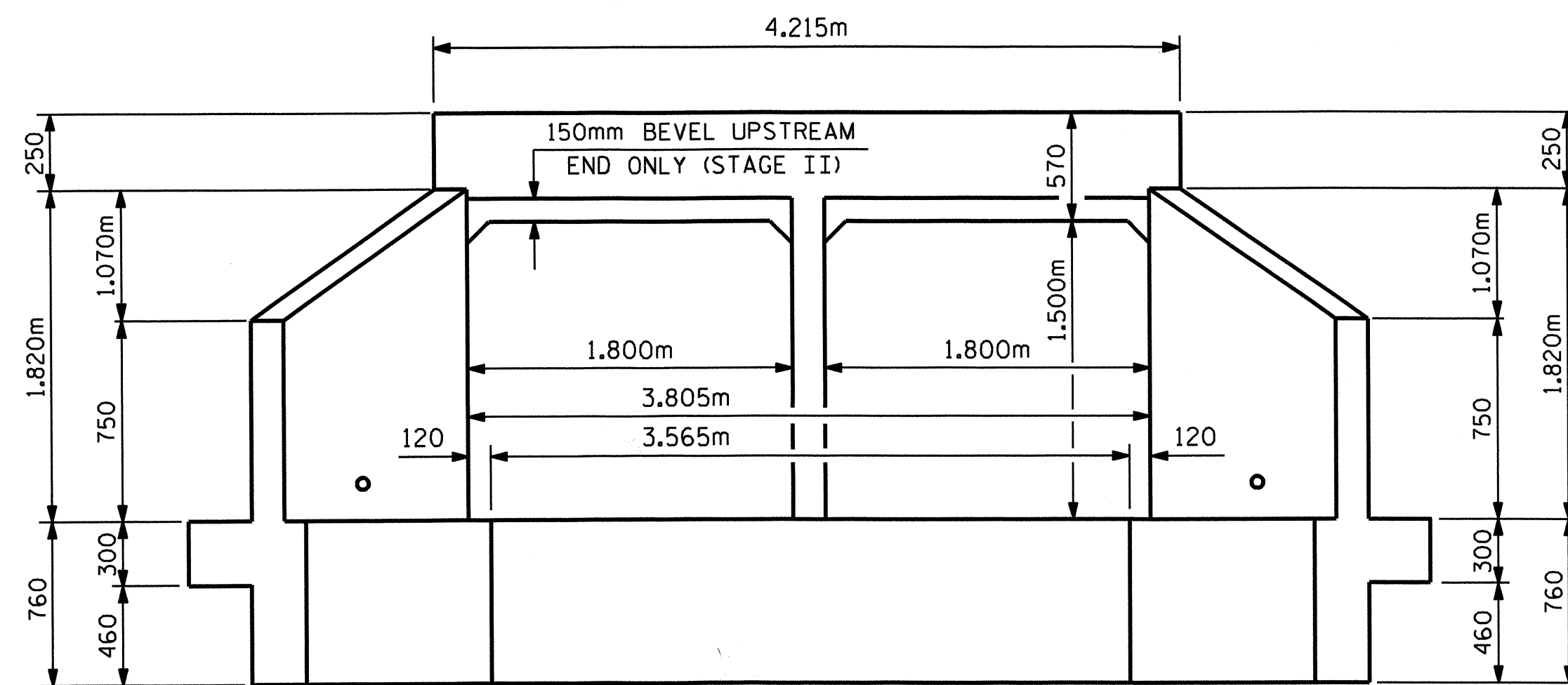
TIMBER PILE SPICE

NOTES: ENDS OF PILES AT SPLICE LOCATION SHALL HAVE A MINIMUM DIAMETER OF 255mm.

DIAMETER OF HOLES THRU TIMBER PILES SHALL BE 2mm LESS THAN BOLT DIAMETER FOR TIGHT FIT.

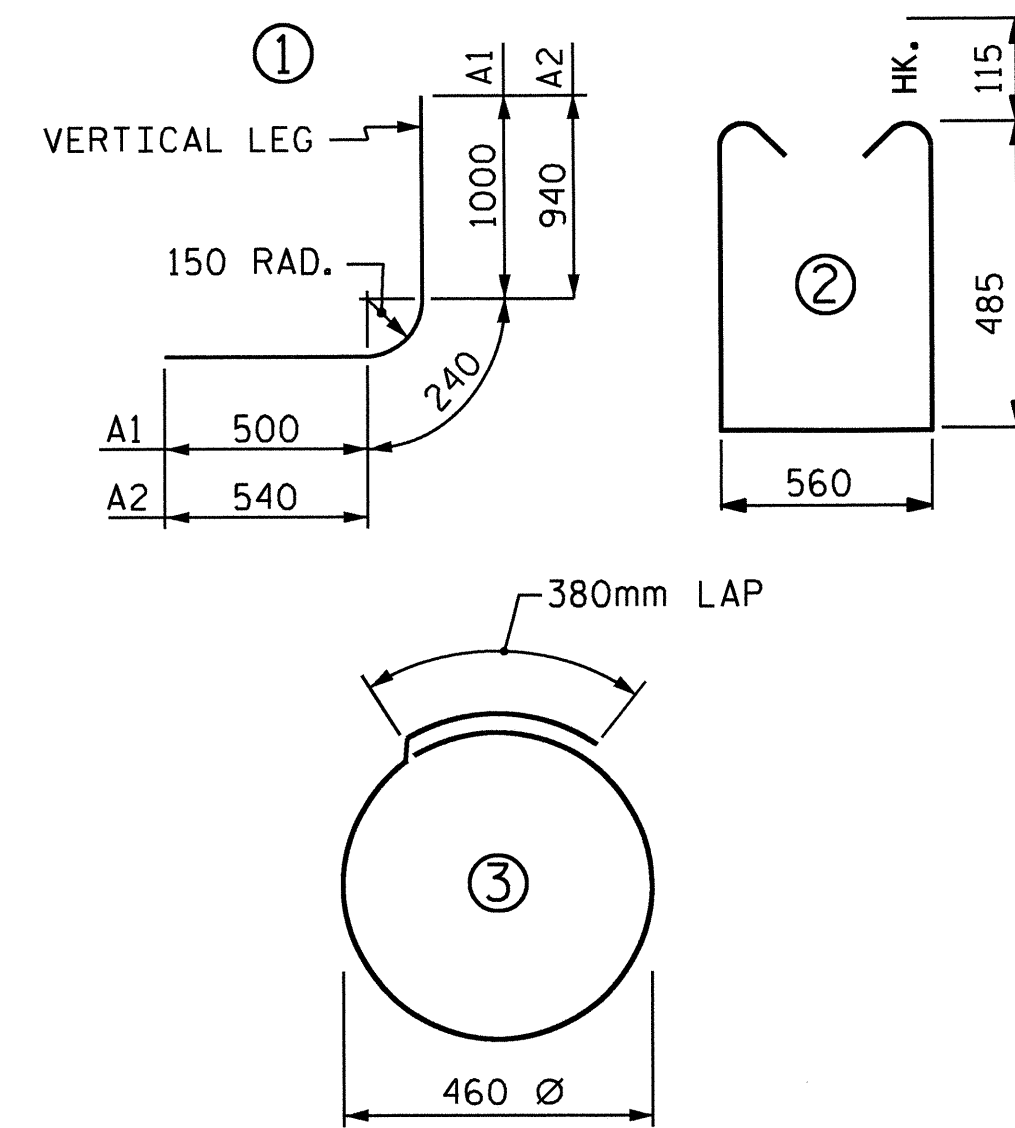
THE TOP OF THE PILE SPLICE SHALL BE DRIVEN A MINIMUM OF 2.50m BELOW GROUND.

PIPES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.



END ELEVATION NORMAL TO SKEW

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

BAR	SIZE	LENGTH
C1, C2, F2, F5	#13	720
F4	#29	3260

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	118	#13	1	1740	204
*A2	118	#16	1	1720	315
*A100	59	#16	STR	4100	375
*A200	47	#13	STR	4100	192
*A300	59	#16	STR	4100	375
*A400	59	#19	STR	4100	541
*B1	80	#13	STR	1960	156
*B2	79	#13	STR	1960	154
*C1	102	#13	STR	6220	631
*D1	33	#19	STR	920	68
*F1	18	#29	STR	11700	1066
*F2	24	#13	STR	6220	148
*F3	30	#13	STR	580	17
*G1	4	#13	STR	4100	16
*S1	145	#13	2	1760	254
*S2	19	#13	3	1840	35

* EPOXY COATED REINFORCING STEEL 4547 kg.

CLASS A CONCRETE 48.2 m³

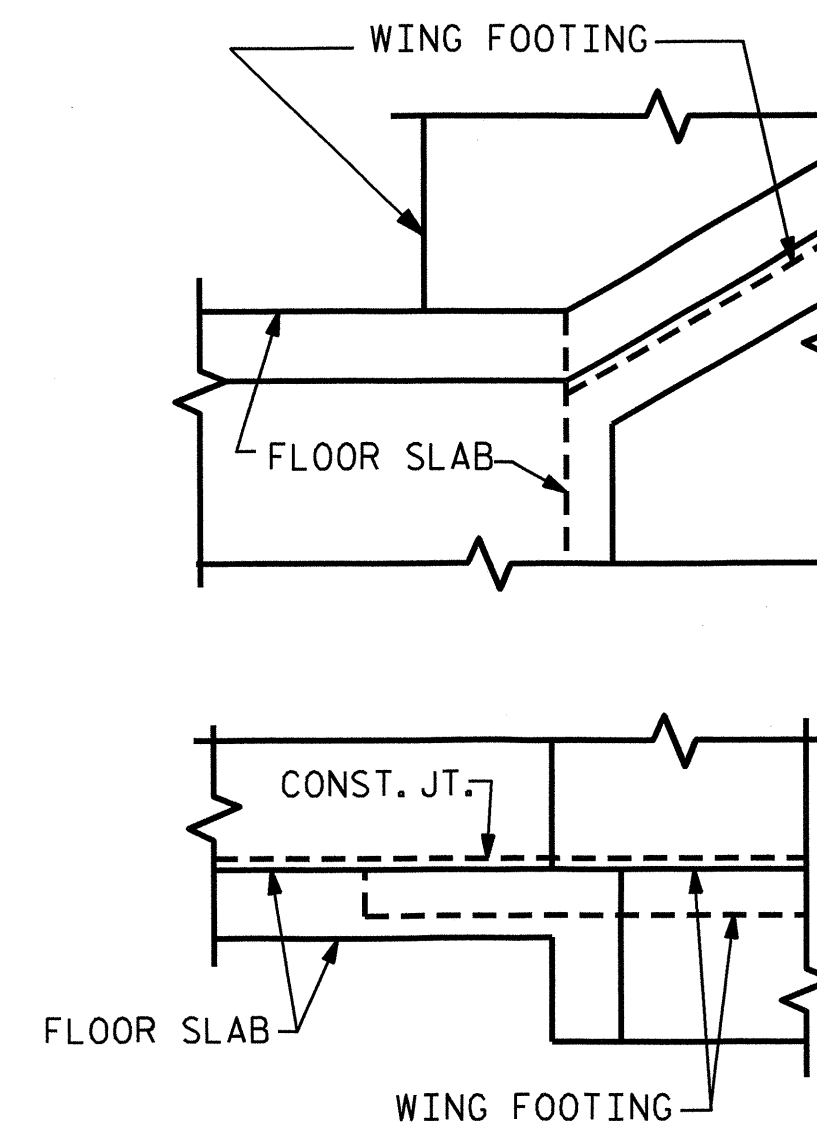
BILL OF MATERIAL

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	206	#13	1	1740	356
*A2	206	#16	1	1720	550
*A100	103	#16	STR	4100	655
*A200	83	#13	STR	4100	338
*A300	103	#16	STR	4100	655
*A400	103	#19	STR	4100	944
*B1	138	#13	STR	1960	269
*B2	137	#13	STR	1960	267
*C2	153	#13	STR	7320	1113
*F3	54	#13	STR	580	31
*F4	36	#29	STR	11880	2164
*F5	36	#13	STR	7320	262
*G1	4	#13	STR	4100	16
*S1	253	#13	2	1760	443
*S2	32	#13	3	1840	59

* EPOXY COATED REINFORCING STEEL 8122 kg.

CLASS A CONCRETE 84.2 m³

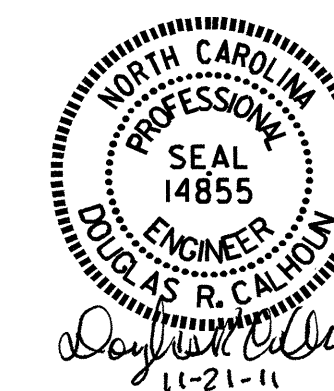


CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 73+49.000 -L-

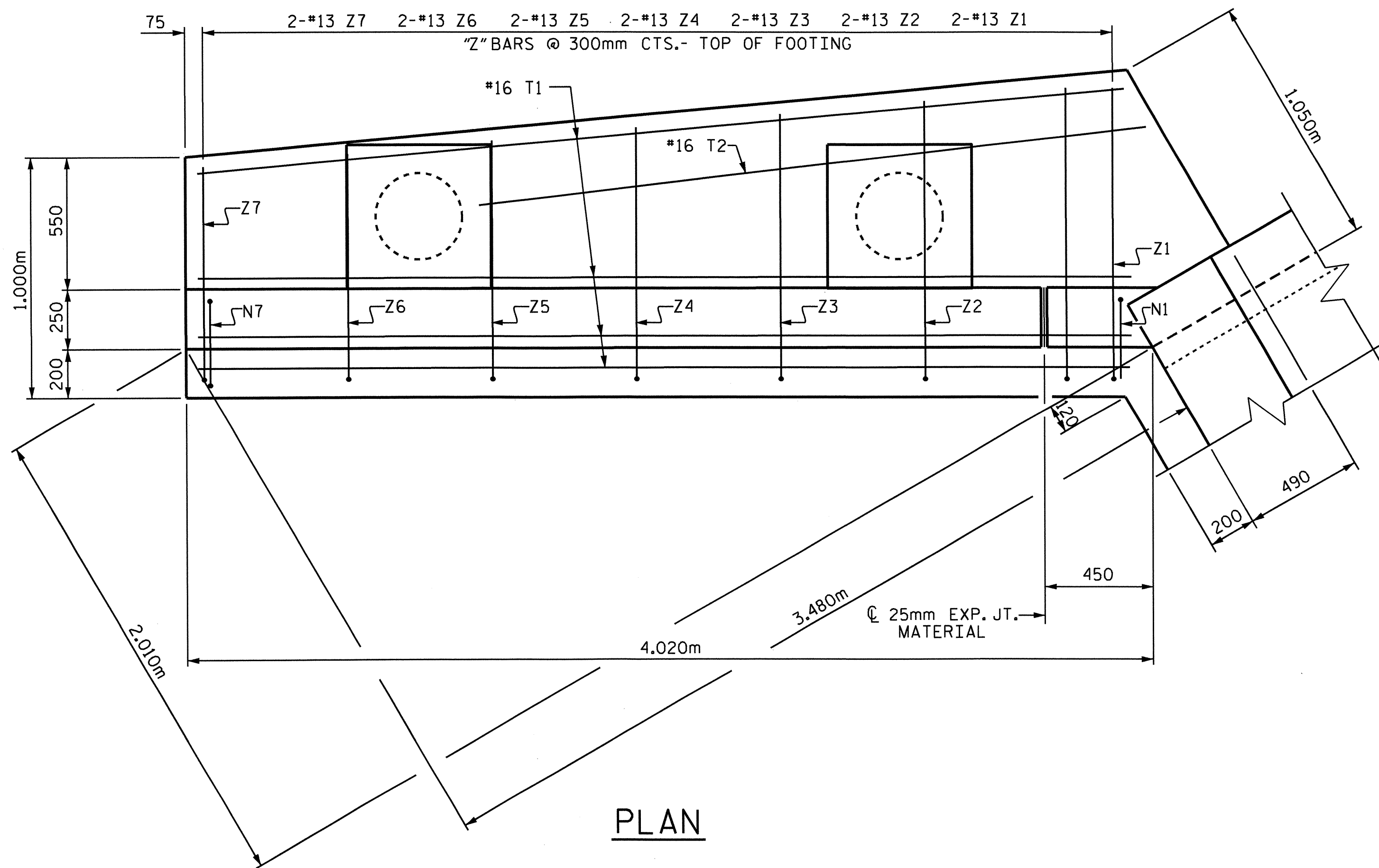
SHEET 5 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BARREL STANDARD
 DOUBLE 1.800m X 1.500m
 CONCRETE BOX CULVERT
 90° SKEW



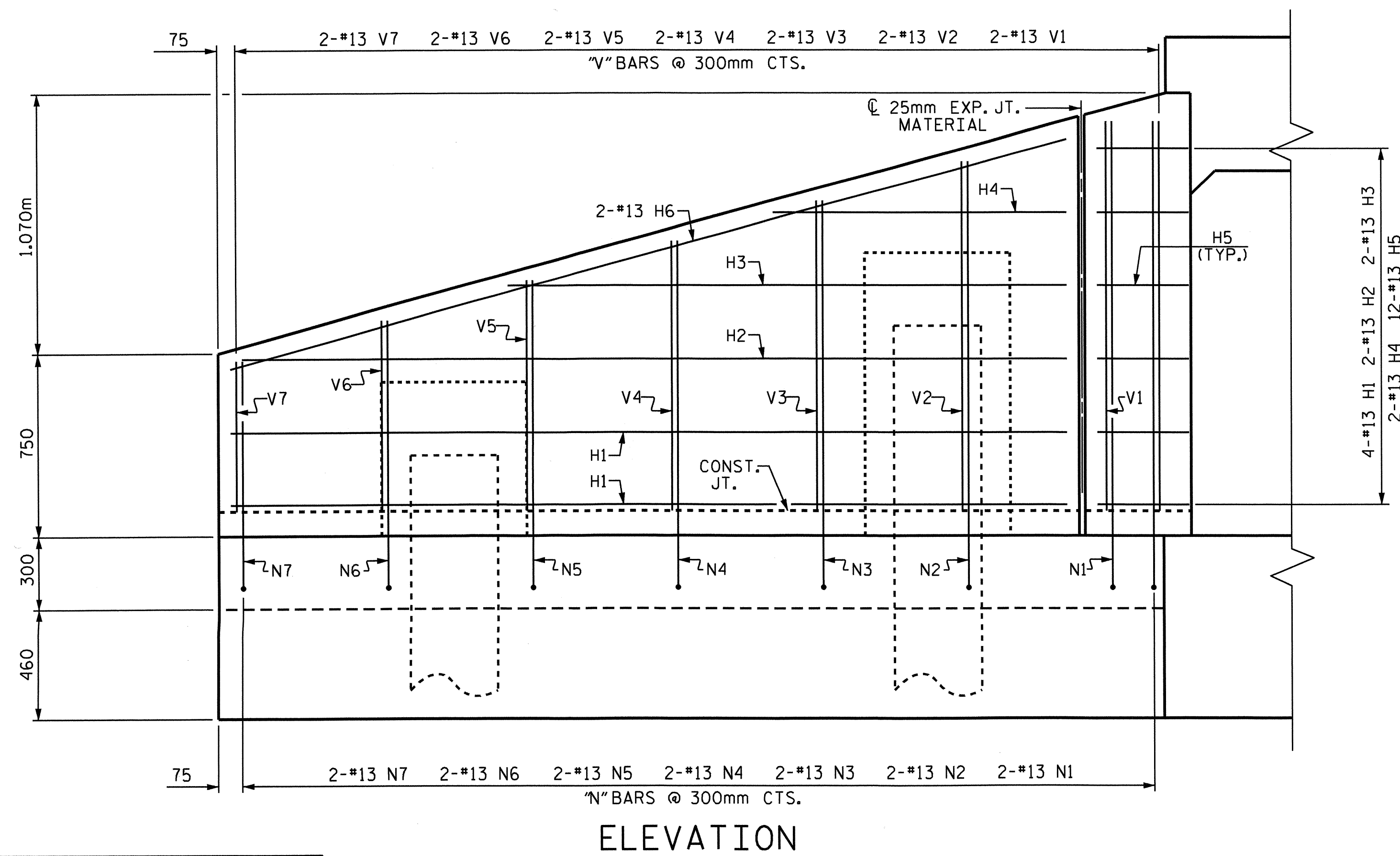
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-12	
1			3			TOTAL SHEETS	17
2			4				

DRAWN BY : B.N. GRADY DATE : 7/9/10
 CHECKED BY : J.L. WALTON DATE : 8/23/10

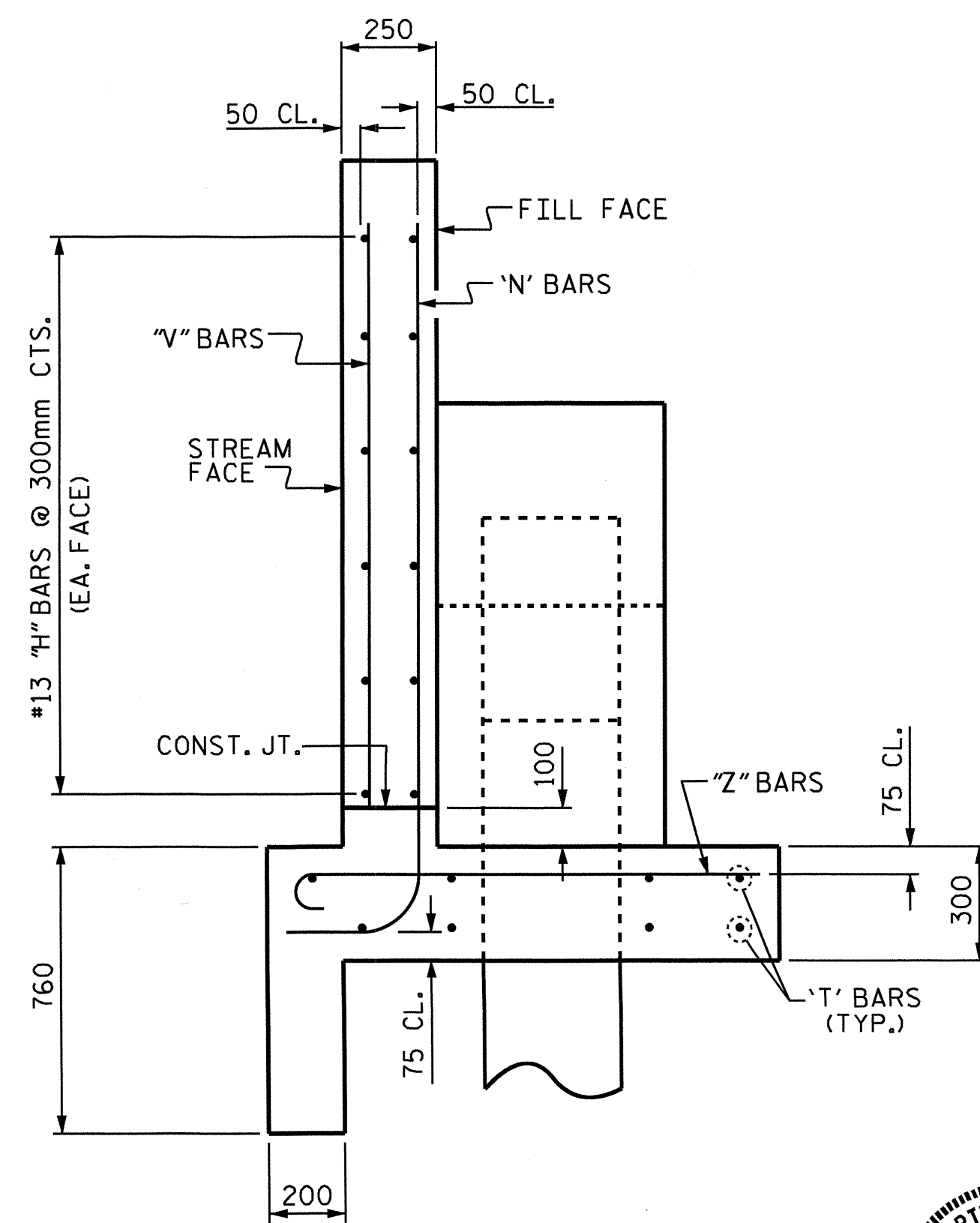


PLAN

NOTE: FOR ADDITIONAL DIMENSIONS AND REINFORCING STEEL IN THE PILE CAPS, SEE SHEET 7 OF 7.



ELEVATION



TYPICAL WING SECTION



PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 73+49.000 -L-
 SHEET 6 OF 7

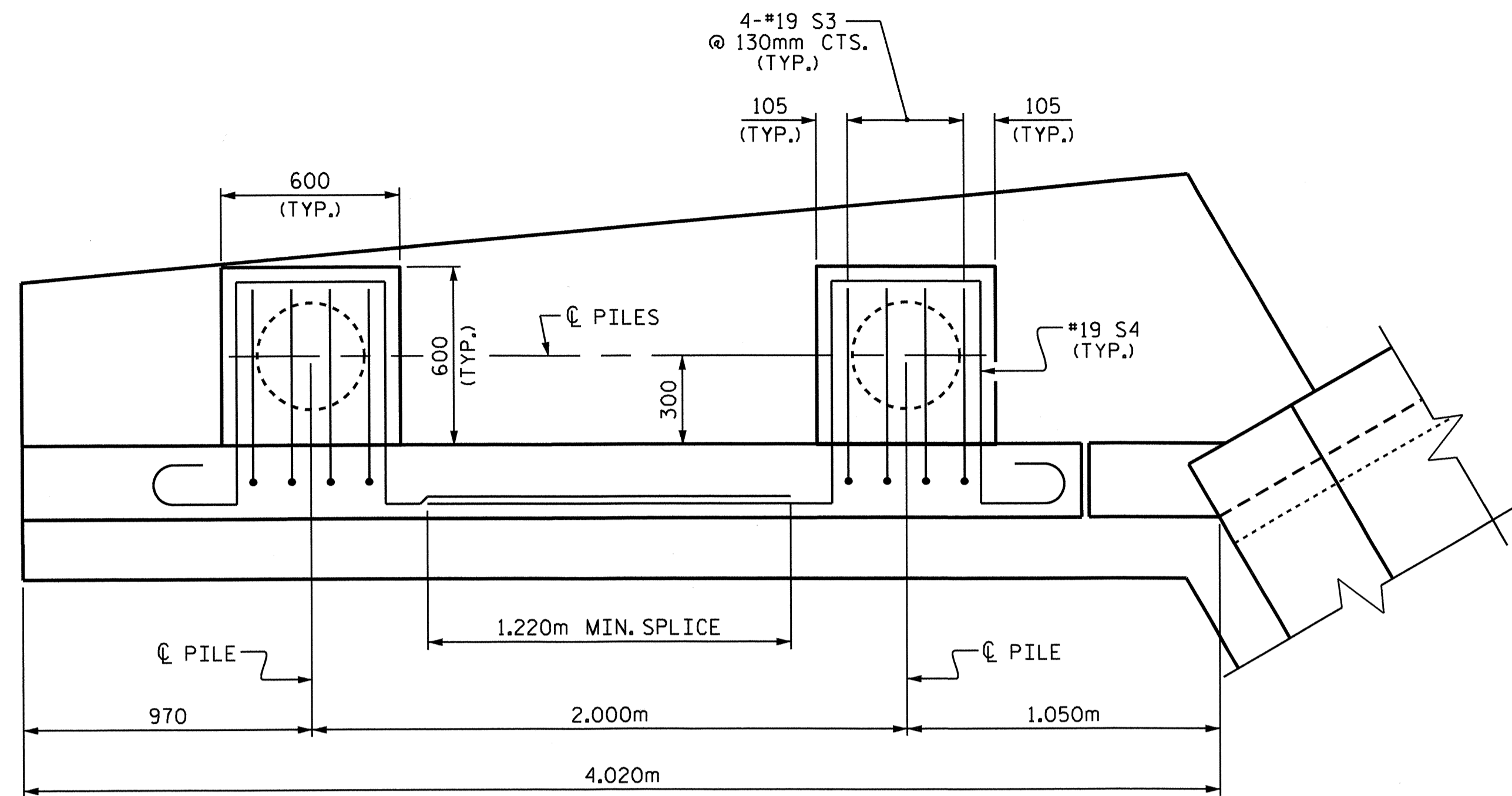
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS FOR
 CONCRETE BOX CULVERT
 H = 1.500m SLOPE = 3 : 1
 90° SKEW

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

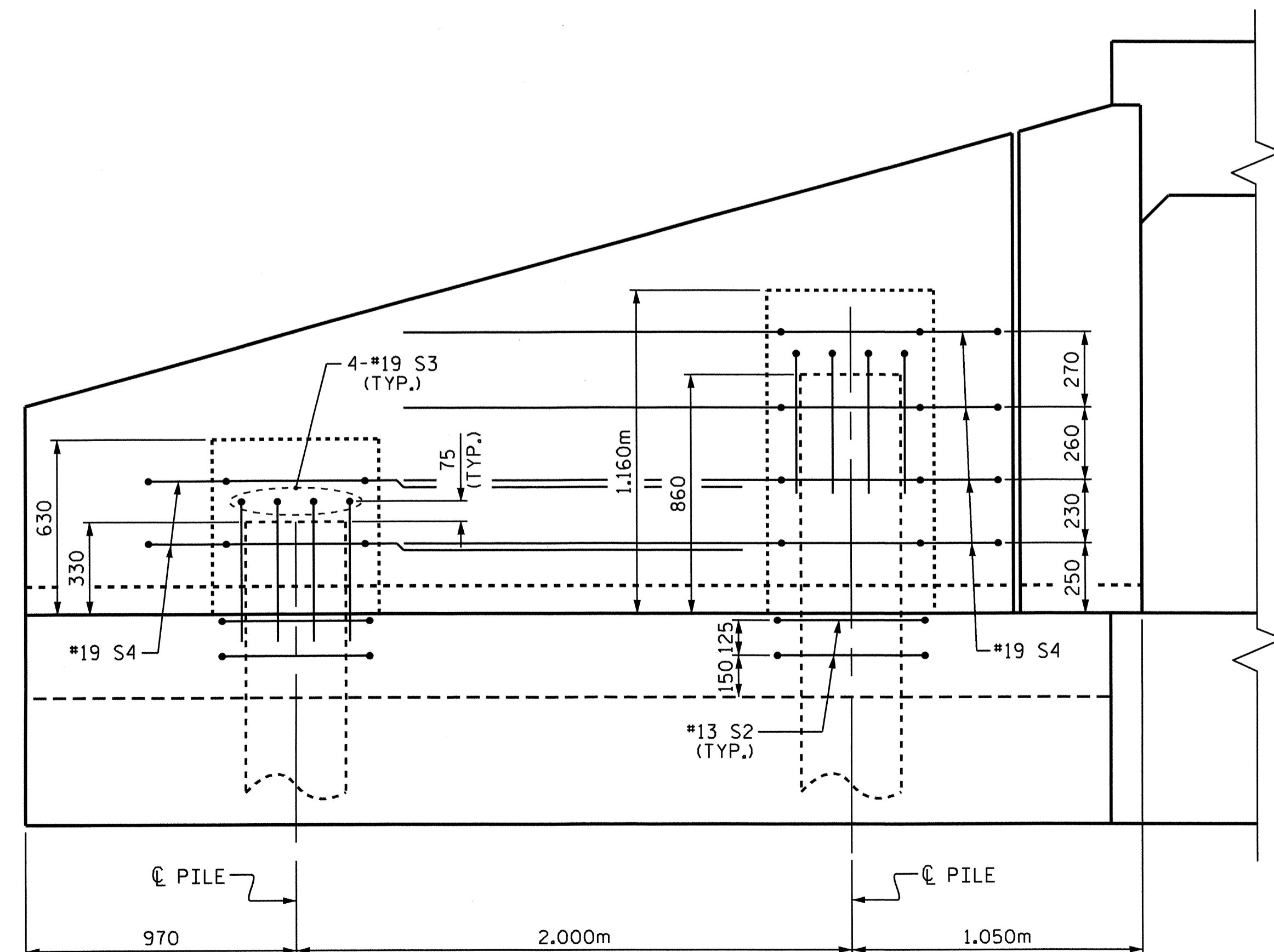
C-13
TOTAL SHEETS 17

ASSEMBLED BY : B.N. GRADY	DATE : 7/9/10
CHECKED BY : J.L. WALTON	DATE : 8/23/10
DRAWN BY : FPP 05/97	
CHECKED BY : VAP 05/97	

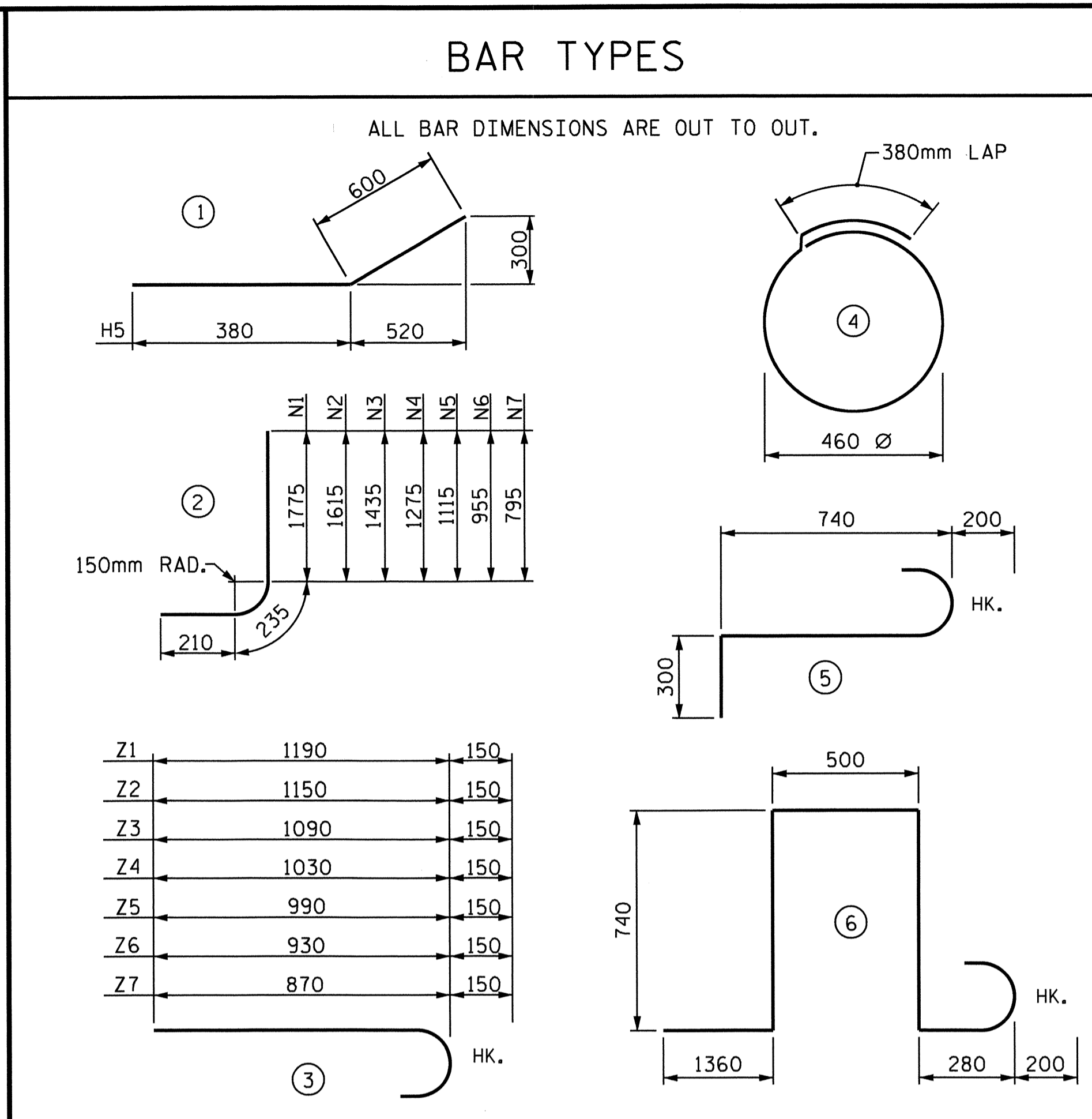
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PLAN



ELEVATION



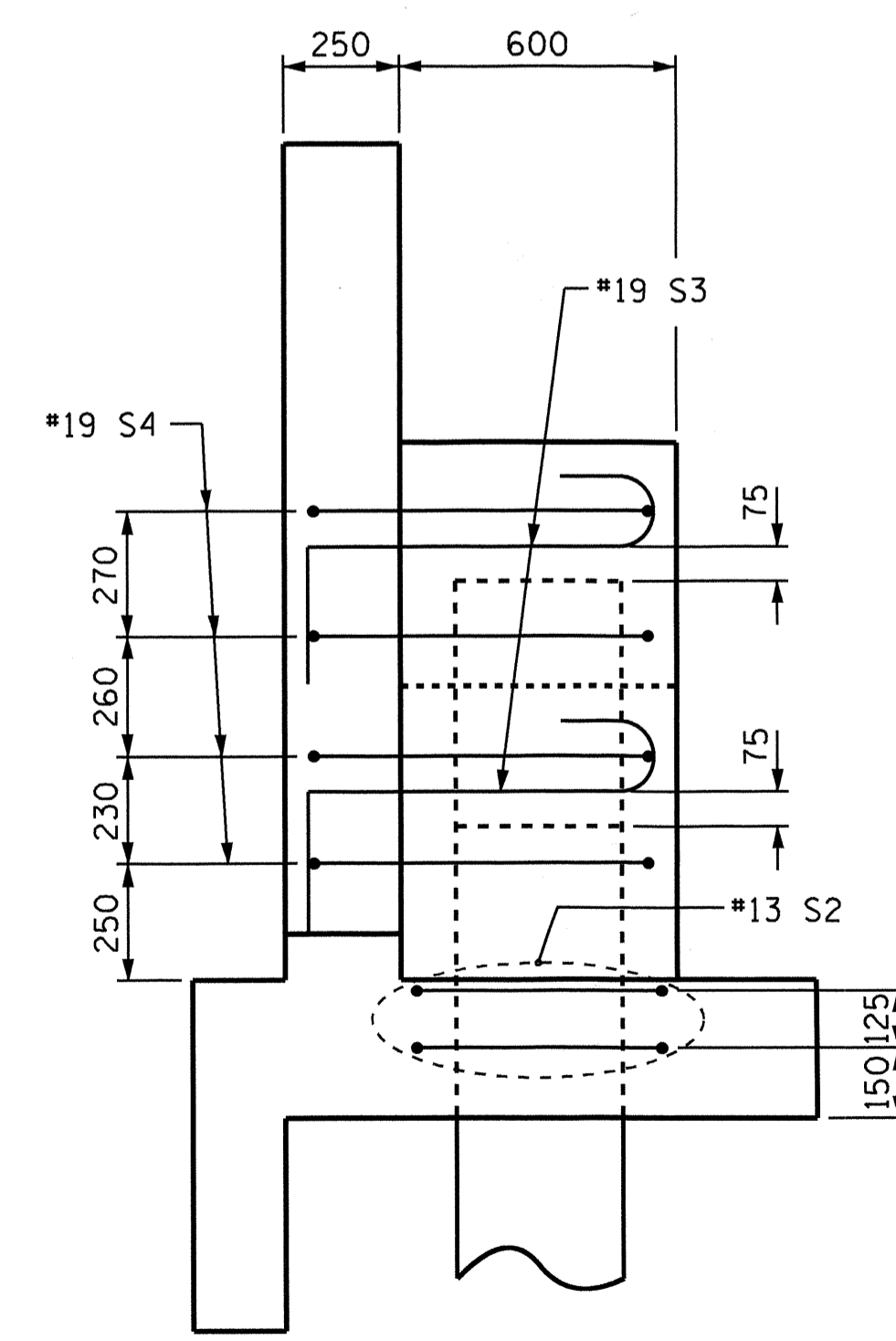
BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*H1	16	13	STR	3440	55
*H2	8	13	STR	3400	27
*H3	8	13	STR	2300	18
*H4	8	13	STR	1200	10
*H5	48	13	1	980	47
*H6	8	13	STR	3580	28
*N1	8	13	2	2220	18
*N2	8	13	2	2060	16
*N3	8	13	2	1880	15
*N4	8	13	2	1720	14
*N5	8	13	2	1560	12
*N6	8	13	2	1400	11
*N7	8	13	2	1240	10
*S2	16	13	4	1840	29
*S3	32	19	5	1240	89
*S4	24	19	6	3820	205
*T1	24	16	STR	3880	145
*T2	8	16	STR	2780	35
*V1	8	13	STR	1600	13
*V2	8	13	STR	1420	11
*V3	8	13	STR	1260	10
*V4	8	13	STR	1100	9
*V5	8	13	STR	940	7
*V6	8	13	STR	780	6
*V7	8	13	STR	620	5
*Z1	8	13	3	1340	11
*Z2	8	13	3	1300	10
*Z3	8	13	3	1240	10
*Z4	8	13	3	1180	9
*Z5	8	13	3	1140	9
*Z6	8	13	3	1080	9
*Z7	8	13	3	1020	8

* EPOXY COATED REINFORCING STEEL IN 4 WINGS 911 kg

CLASS A CONCRETE

4 WINGS	15.6	m ³
2 HEADWALLS	1.0	m ³
2 END CURTAIN WALLS	1.1	m ³
TOTAL	17.7	m³

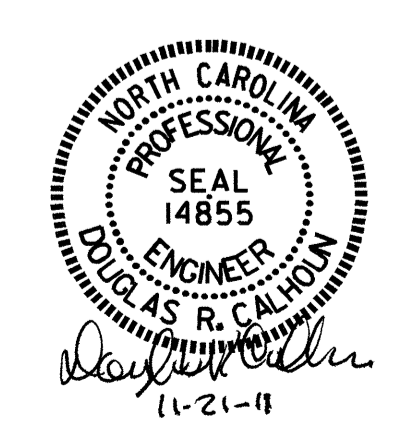


TYPICAL WING SECTION

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 73+49.000 -L-
 SHEET 7 OF 7

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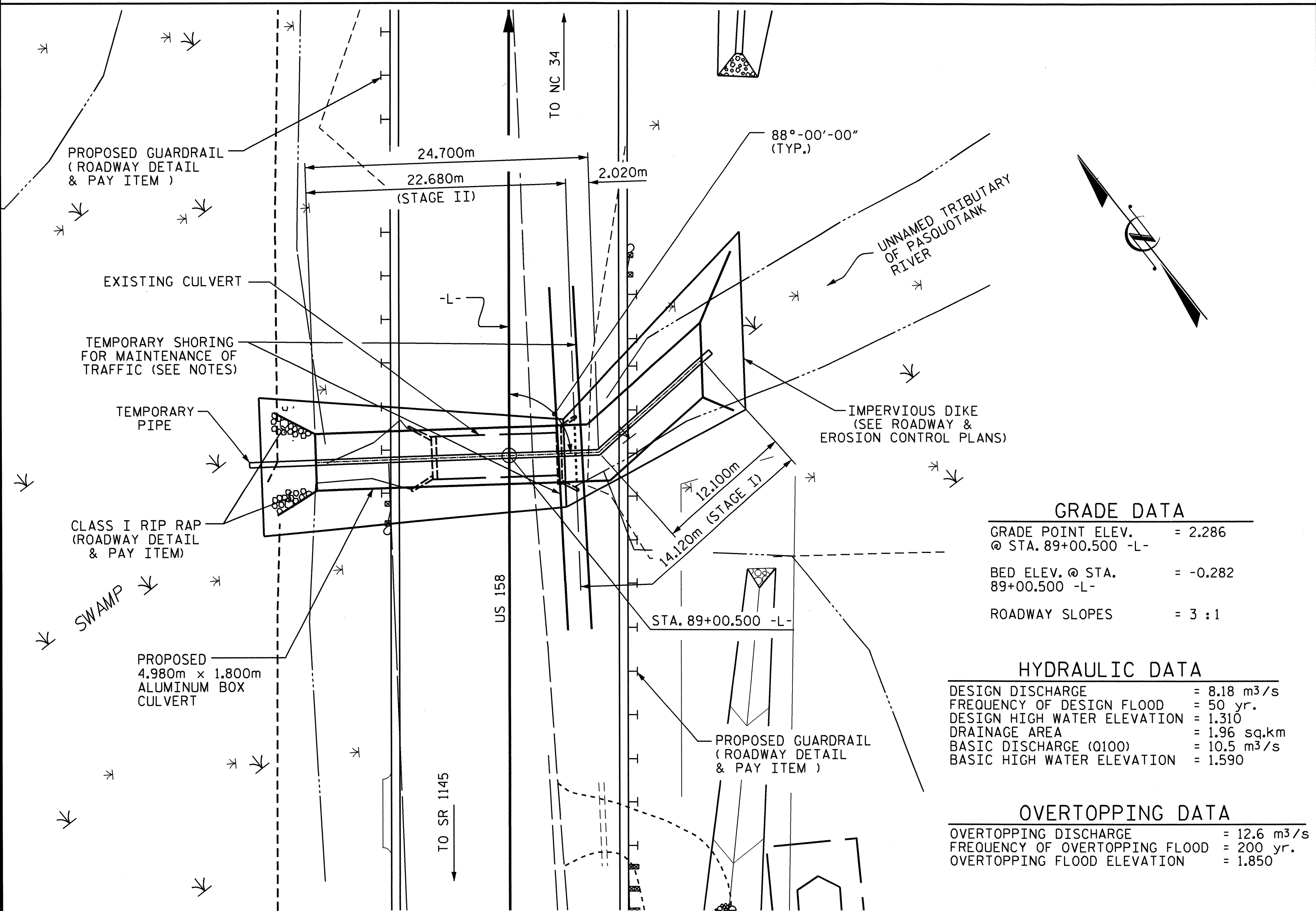
**WINGS FOR
 CONCRETE BOX CULVERT**
 H = 1.500m SLOPE = 3 : 1
 90° SKEW



ASSEMBLED BY : B.N. GRADY DATE : 7/9/10
 CHECKED BY : J.L. WALTON DATE : 8/23/10
 DRAWN BY : FPP 05/97
 CHECKED BY : VAP 05/97

REVISIONS				SHEET NO.
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2			4	17

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GRADE DATA

GRADE POINT ELEV. @ STA. 89+00.500 -L-	= 2.286
BED ELEV. @ STA. 89+00.500 -L-	= -0.282
ROADWAY SLOPES	= 3 : 1

HYDRAULIC DATA

DESIGN DISCHARGE	= 8.18 m ³ /s
FREQUENCY OF DESIGN FLOOD	= 50 yr.
DESIGN HIGH WATER ELEVATION	= 1.310
DRAINAGE AREA	= 1.96 sq.km
BASIC DISCHARGE (Q100)	= 10.5 m ³ /s
BASIC HIGH WATER ELEVATION	= 1.590

OVERTOPPING DATA

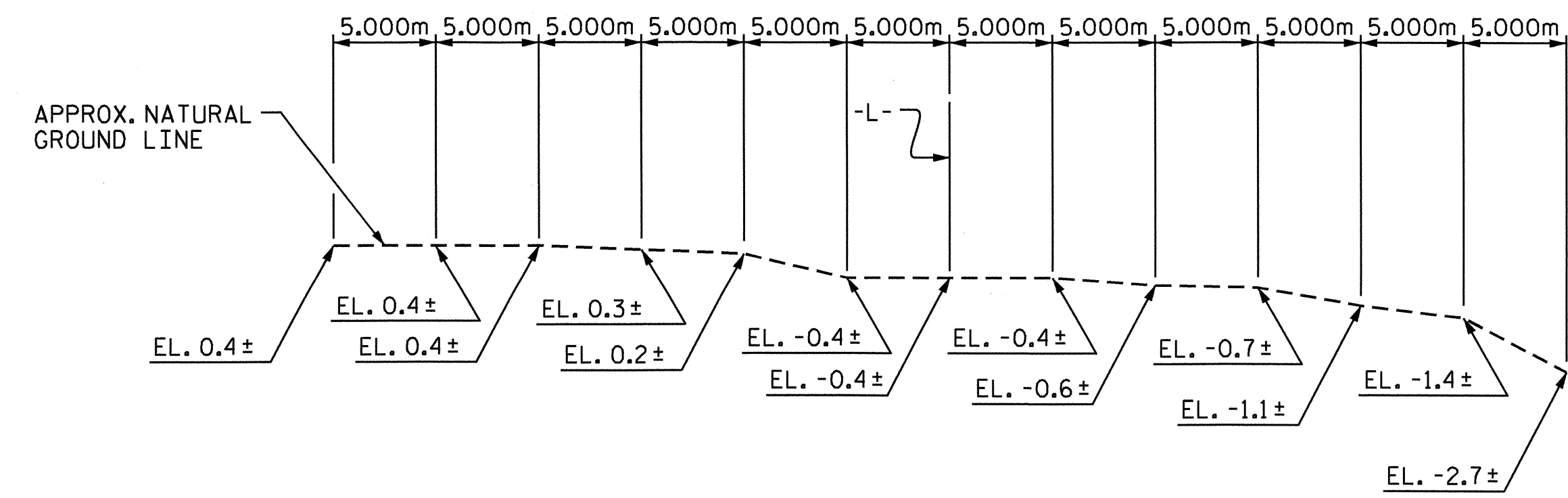
OVERTOPPING DISCHARGE	= 12.6 m ³ /s
FREQUENCY OF OVERTOPPING FLOOD	= 200 yr.
OVERTOPPING FLOOD ELEVATION	= 1.850

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD -----MS22.5 OR ALTERNATE LOADING.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE IN METERS.
- CULVERT IS TO BE DESIGNED FOR A MINIMUM FILL DEPTH OF 1.07m AND A MAXIMUM FILL DEPTH OF 1.51m.
- 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.
- FOR ALUMINUM BOX CULVERT AND FOUNDATIONS, SEE SPECIAL PROVISIONS FOR ALUMINUM BOX CULVERT.
- ALL MATERIALS SHALL MEET THE REQUIREMENTS OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2006.
- THE DETAILS SHOWN ARE FOR GENERAL LAYOUT ONLY. THE SUPPLIER SHALL PROVIDE DESIGNS AND DETAILS FOR REVIEW AND APPROVAL THAT MEET THE REQUIREMENTS OF AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS, SECTION 12, AND ARE SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER.
- UNLESS OTHERWISE INDICATED, THE SUPPLIER SHALL DESIGN, DETAIL, AND FURNISH ALL STRUCTURAL ELEMENTS AND HARDWARE.
- GUARDRAIL POST LOCATIONS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER TO ENSURE ADEQUATE COVER FOR INSTALLATION.
- THE EXISTING 3.05m x 1.58m CULVERT WITH A 11.22m LENGTH AND A 460mm TOP SLAB AND LOCATED AT THE PROPOSED CULVERT SITE SHALL BE REMOVED. PAYMENT FOR REMOVAL OF CULVERT WILL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, 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.
- DO NOT BEGIN STAGE 1 OR STAGE 2 CULVERT CONSTRUCTION INCLUDING THE IMPERVIOUS DIKES FOR CULVERT UNTIL AFTER THE ROADWAY WAITING PERIOD IS COMPLETE. SEE ROADWAY PLANS FOR DETAILS.
- THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE IMPERVIOUS DIKE MAY NOT BE REQUIRED AROUND THE ENTIRE PERIMETER OF THE CULVERT. THE IMPERVIOUS DIKE SHALL BE REQUIRED AT THE OUTLET AND INLET OF THE CULVERT AND ANY OTHER IMPERVIOUS DIKE SHALL BE AT THE DIRECTION OF THE ENGINEER.
- FOR FOUNDATION MATERIAL, SEE SPECIAL PROVISIONS.
- FOR CULVERT BACKFILL, SEE SPECIAL PROVISIONS.



PROFILE ALONG CULVERT

TOTAL STRUCTURE QUANTITIES	
ALUMINUM BOX CULVERT	----- LUMP SUM
CULVERT EXCAVATION	----- LUMP SUM
FOUNDATION MATERIAL	----- 106 m. tons
CULVERT BACKFILL	----- 519 m. tons

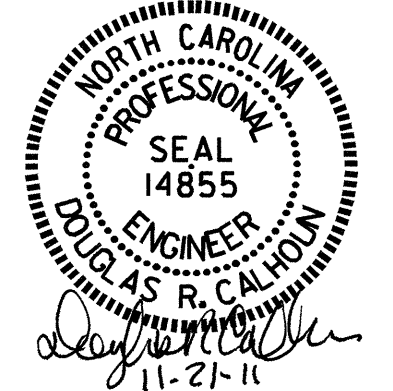


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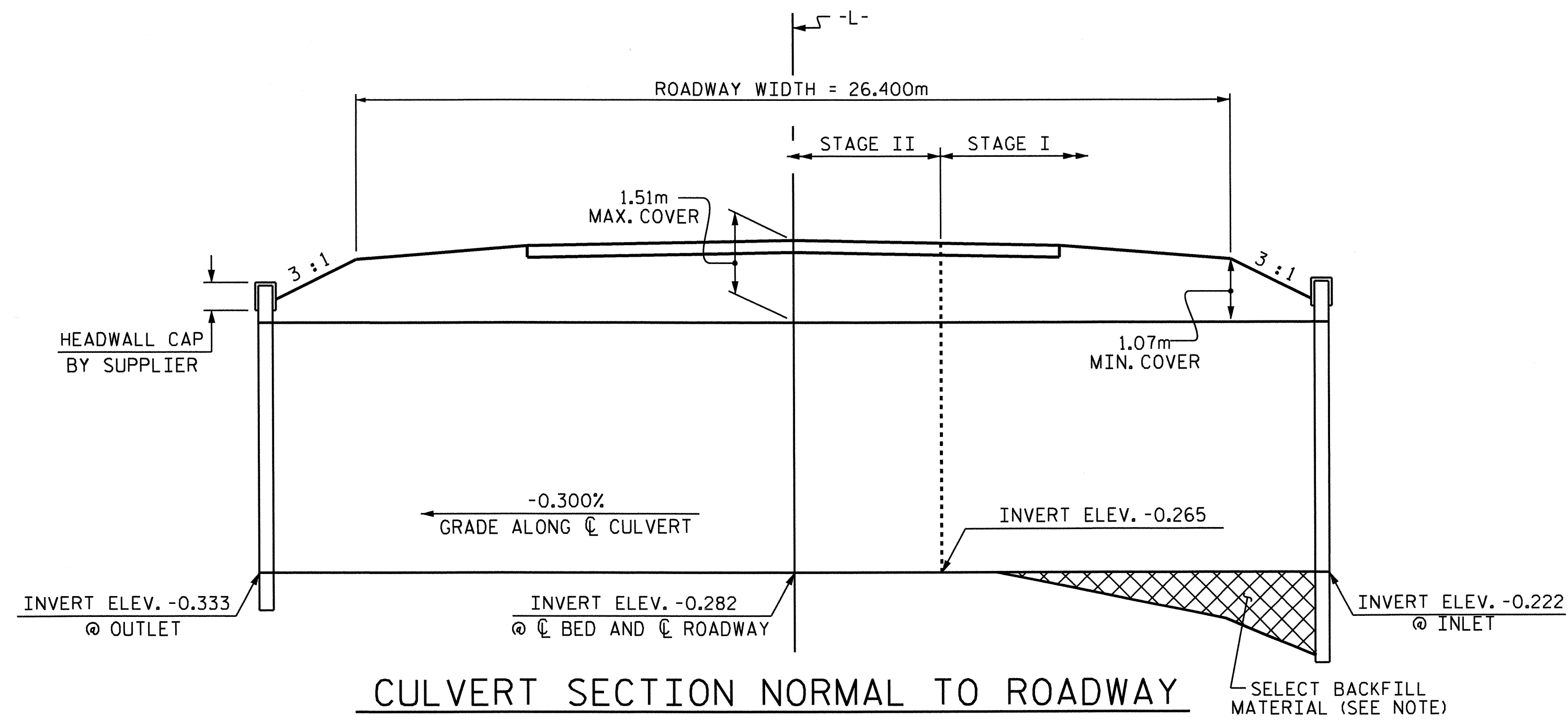
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE 4.980m x 1.800m
 ALUMINUM BOX CULVERT

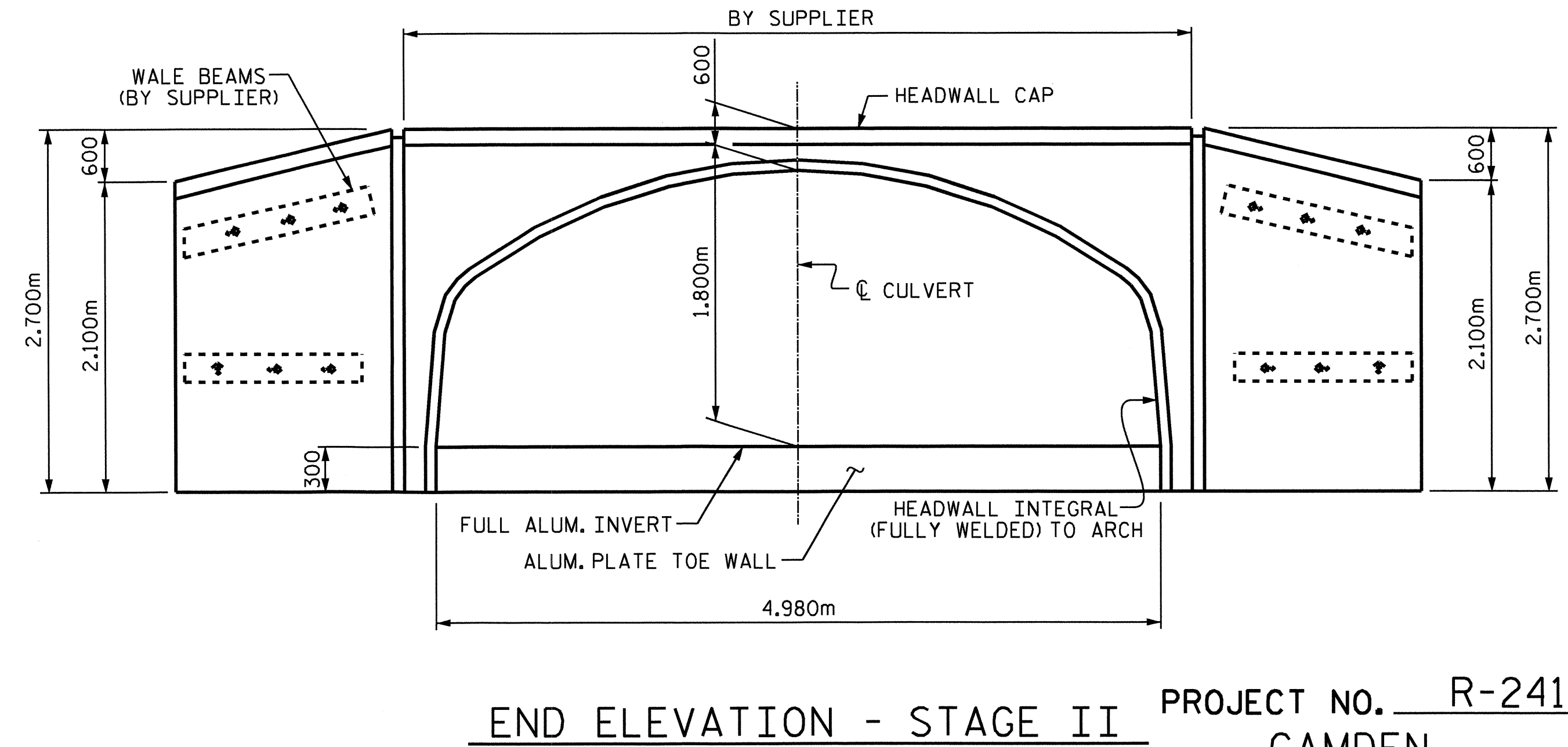
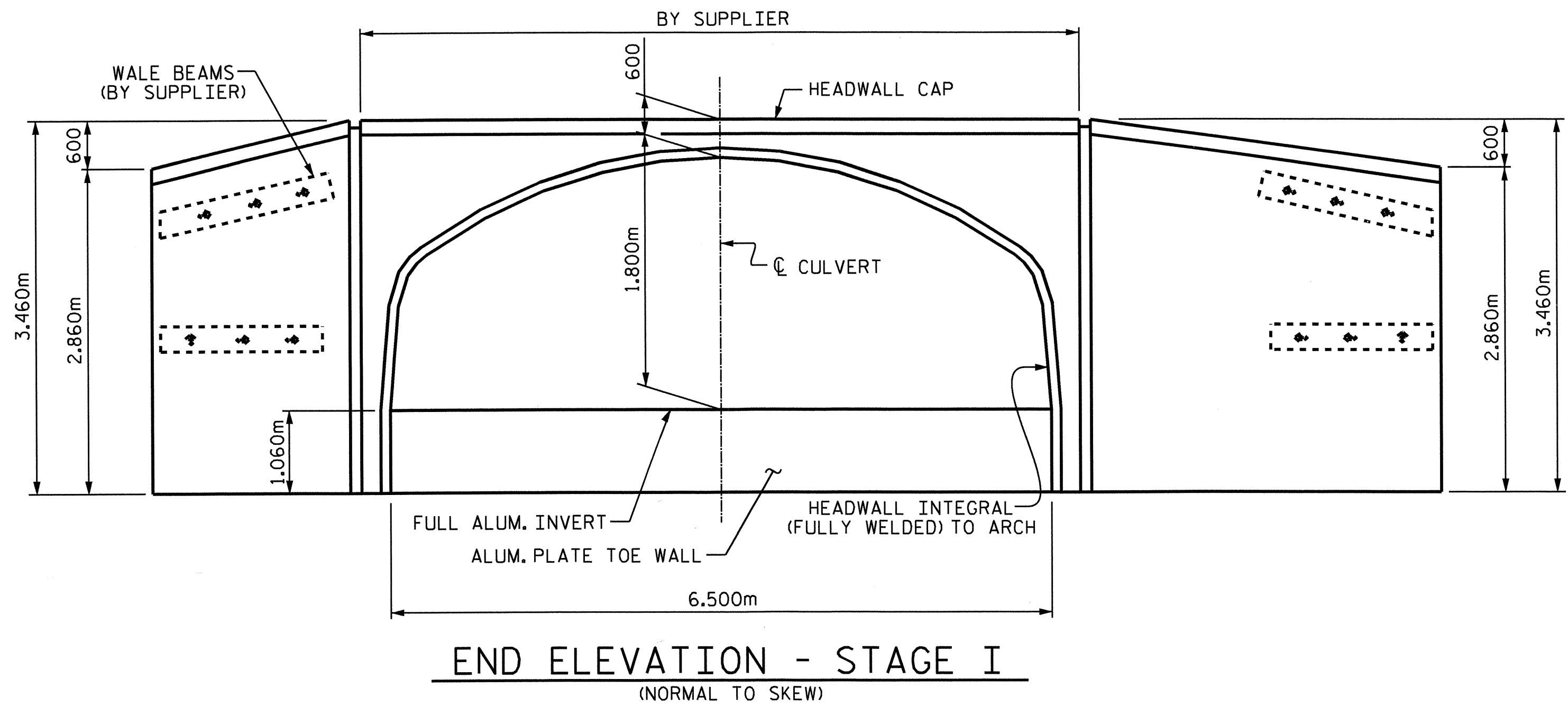


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DRAWN BY : B.N. GRADY DATE : 11/5/10
 CHECKED BY : D.R. CALHOUN DATE : 11/8/10



NOTE: PAYMENT FOR THE SELECT BACKFILL MATERIAL WILL BE INCLUDED IN THE VARIOUS PAY ITEMS.

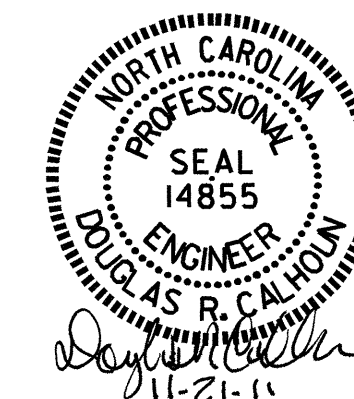


PROJECT NO. R-2414B
 CAMDEN COUNTY
 STATION: 89+00.500 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE 4.980m x 1.800m
 ALUMINUM BOX CULVERT

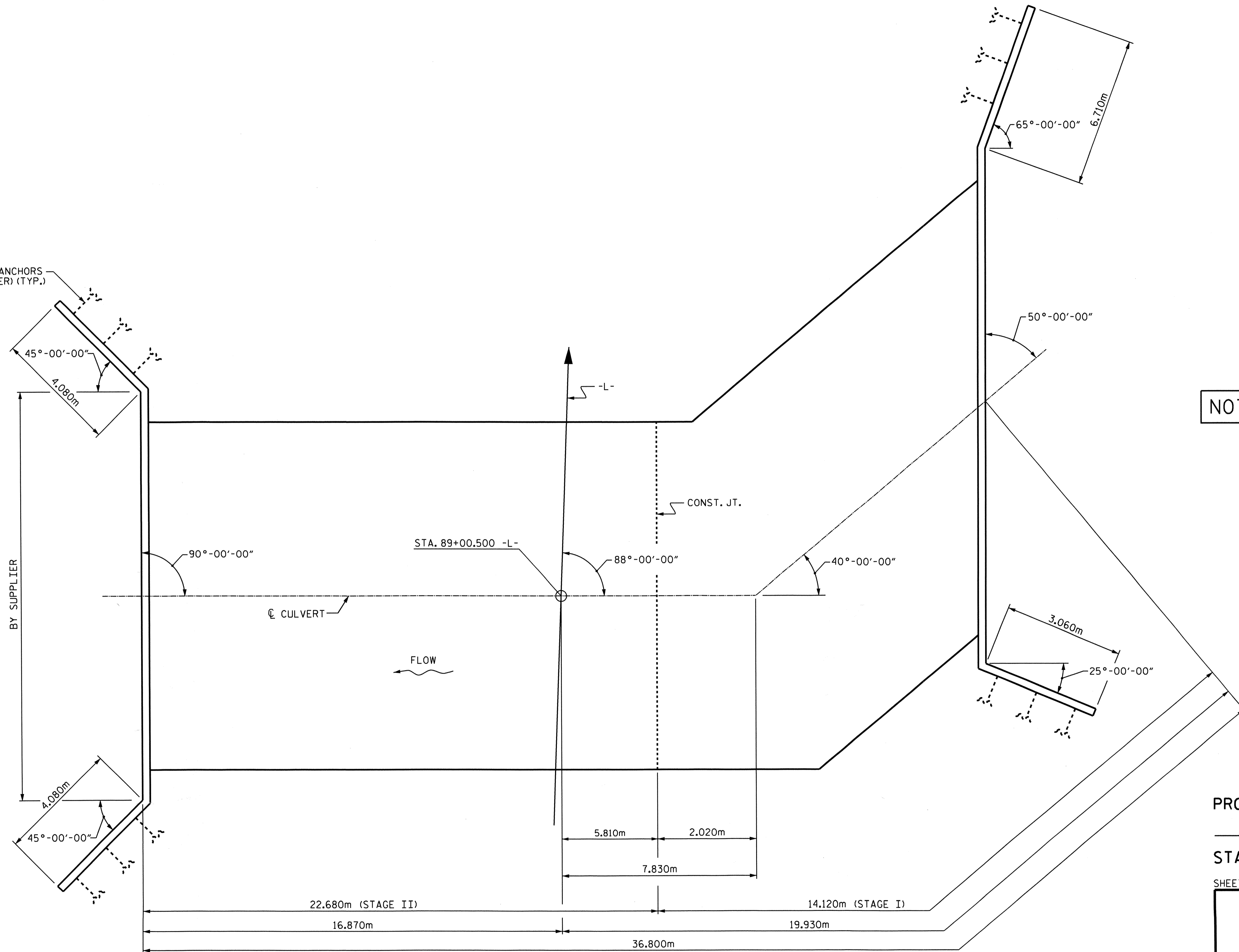


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WINGWALL ANCHORS
(BY SUPPLIER) (TYP.)



NOT TO SCALE

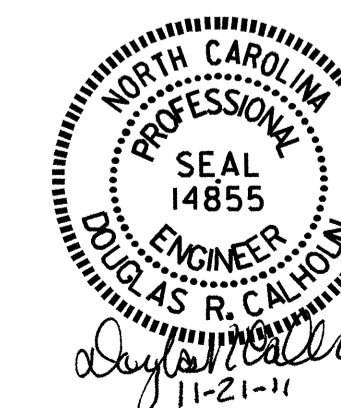
PLAN VIEW

PROJECT NO. R-2414B
CAMDEN COUNTY
 STATION: 89+00.500 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE 4.980m x 1.800m
 ALUMINUM BOX CULVERT



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2			4				

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 250	--	140 MPa
- AASHTO M270 GRADE 345W	--	190 MPa
- AASHTO M270 GRADE 345	--	190 MPa
REINFORCING STEEL IN TENSION		
GRADE 420	--	165 MPa
CONCRETE IN COMPRESSION	-----	8.3 MPa
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	12 MPa
COMPRESSION PERPENDICULAR TO GRAIN		
OF TIMBER	-----	2.6 MPa
EQUIVALENT FLUID PRESSURE OF EARTH	-----	480 kg/m ³
		(MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; 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 19mm WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 38mm RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 6mm 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 6mm 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 300mm INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 22.23mm Ø SHEAR STUDS FOR THE 19.05mm Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 22.23mm Ø STUDS ALONG THE BEAM AS SHOWN FOR 19.05mm Ø STUDS BASED ON THE RATIO OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 610mm.

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 8mm IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 50mm 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 1072-1.1.

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 2mm 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.

METRIC

JANUARY, 1990