

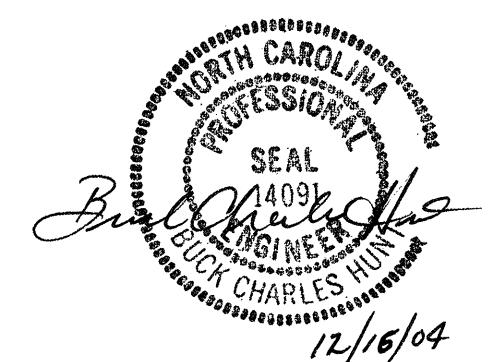
INDEX			
STR. NO.	STATION	DESCRIPTION	SHEETS
1	194+76.101 -L-	TRIPLE 3.0m X 3.4m RCBC (LEFT EXTENSION)	C-1 THRU C-9
2	200+25.352 -L-	DOUBLE 2.4m X 1.8m RCBC (LEFT EXTENSION) DOUBLE 2.4m X 2.1m RCBC (RIGHT EXTENSION)	C-10 THRU C-17A
3	234+68.377 -L-	DOUBLE 2.4m X 2.1m RCBC (RIGHT EXTENSION)	C-18 THRU C-23

PROJECT NO. R-967CC
STANLY COUNTY
 STATION: _____

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

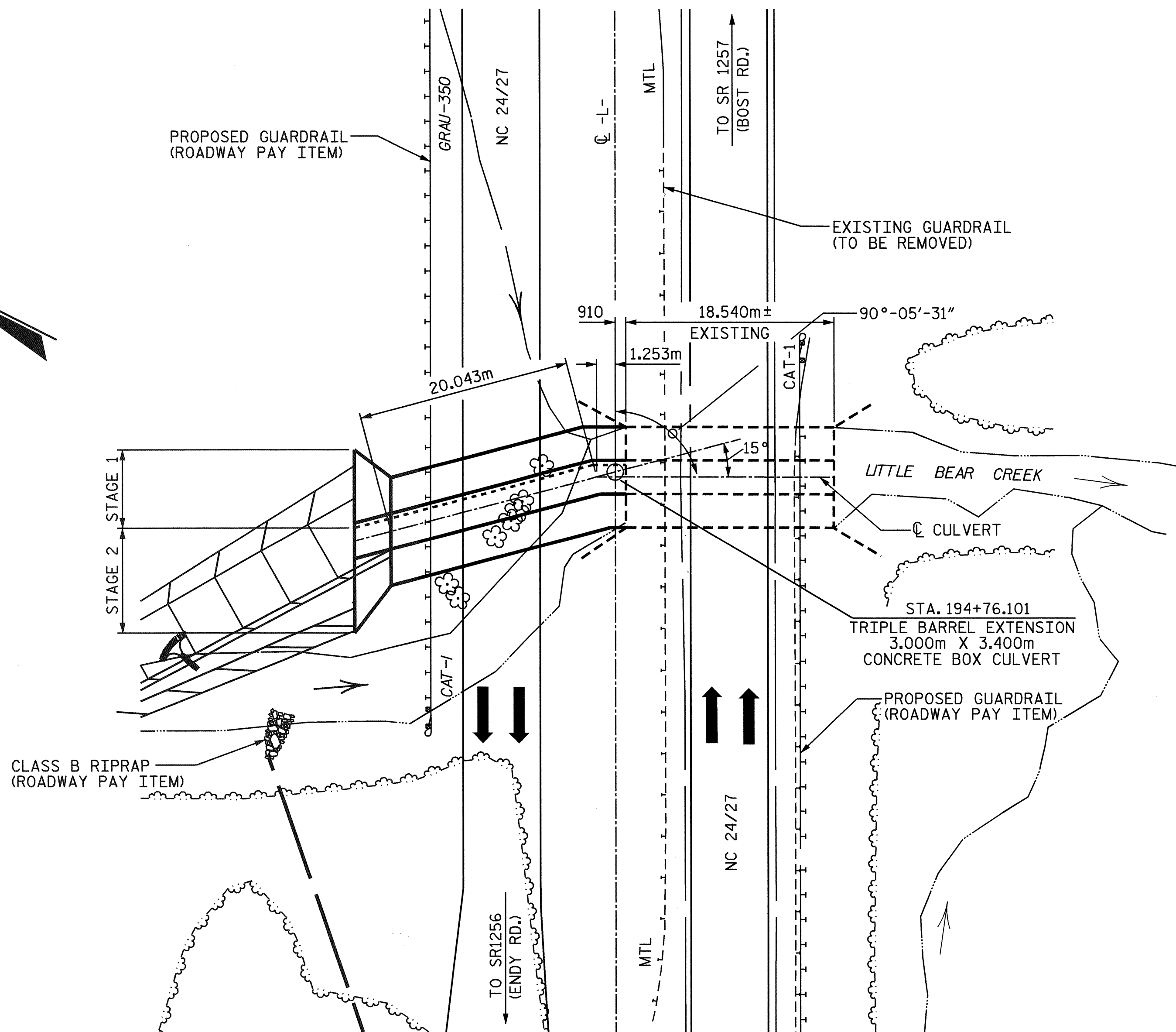
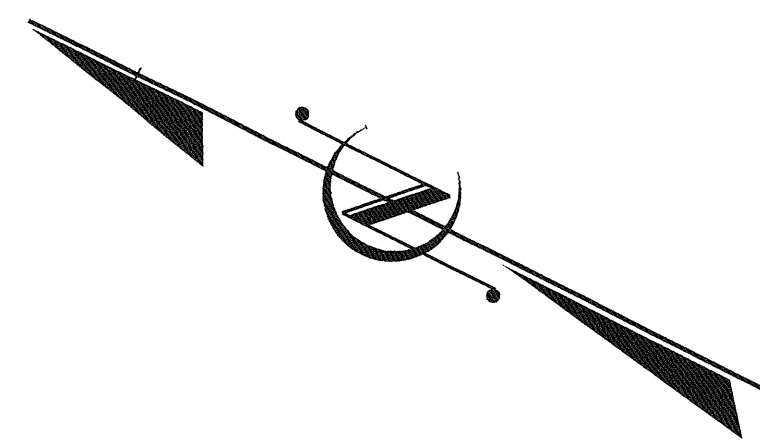
INDEX SHEET

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



DRAWN BY : B. C. HUNT DATE : 12/1/03
 CHECKED BY : _____ DATE : _____

BENCH MARK IS #30-RR SPIKE IN BASE OF TELEPHONE POLE AT 30.0m RIGHT OF STA. 183+82.900 -BL-, EL. 154.817, DATUM 29



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

GRADE DATA

GRADE POINT ELEV. @ STA. 194+76.101 -L- = 132.495
 BED ELEV. @ STA. 194+76.101 -L- = 127.020
 ROADWAY SLOPES = 2:1

HYDRAULIC DATA

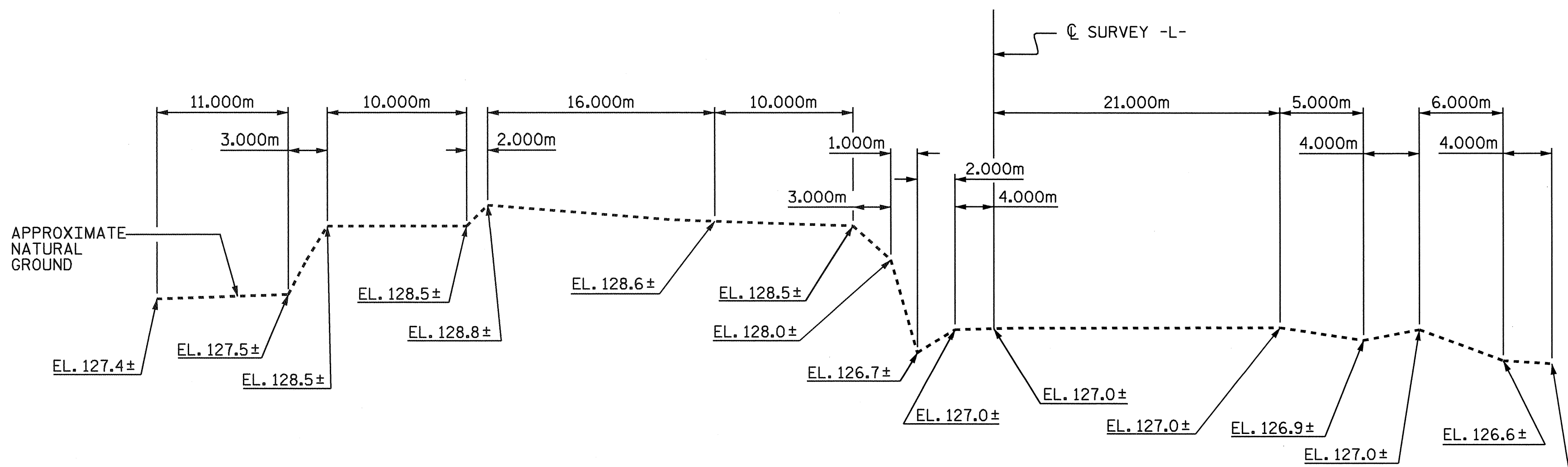
DESIGN DISCHARGE = 59.0 m³/s
 FREQUENCY OF DESIGN FLOOD = 50 YRS.
 DESIGN HIGH WATER ELEVATION = 131.160
 DRAINAGE AREA = 18.1 SQ. Km
 BASIC DISCHARGE (Q100) = 71.0 m³/s
 BASIC HIGH WATER ELEVATION = 131.520

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 90.0 m³/s
 FREQUENCY OF OVERTOPPING FLOOD = 200+ YRS.
 OVERTOPPING FLOOD ELEVATION = 132.040

NOTES

- ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.
 DESIGN FILL-----2.090m
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 ALL ELEVATIONS ARE IN METERS.
 76mm Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 CONCRETE IN CULVERT STAGE 1 & STAGE 2 TO BE POURED IN THE FOLLOWING ORDER :
- STAGE 1 :
1. NORTH WING FOOTING, APRON AND FLOOR SLAB INCLUDING 4" OF BOTH VERTICAL WALLS OF NORTHERNMOST BARREL.
 2. THE REMAINING PORTIONS OF THE WALLS, NORTHERN DEBRIS DEFLECTOR AND WING FULL HEIGHT.
- STAGE 2 :
1. SOUTH WING FOOTING, APRON AND FLOOR SLAB INCLUDING 4" OF REMAINING VERTICAL WALLS OF SOUTHERNMOST BARRELS.
 2. THE REMAINING PORTIONS OF THE WALLS, SOUTHERN DEBRIS DEFLECTOR AND WING FULL HEIGHT.
 3. ROOF SLAB AND HEADWALL.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
 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 AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
 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.
 IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 10.3 MPa.
 DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SNSM.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 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.
 NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.



PROFILE ALONG CULVERT

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE	
STAGE 1	67.4 m ³
STAGE 2	147.3 m ³
TOTAL	214.7 m³
REINFORCING STEEL	
STAGE 1	8193 Kg
STAGE 2	17902 Kg
TOTAL	26095 Kg
FOUNDATION CONDITIONING MATERIAL	
STAGE 1	69 M. TONS
STAGE 2	111 M. TONS
TOTAL	180 M. TONS
CULVERT EXCAVATION	LUMP SUM

PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 1 OF 9 STRUCTURE # C36

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**TRIPLE
 3.000m X 3.400m
 CONCRETE BOX CULVERT
 LEFT EXTENSION
 90°-05' SKEW**



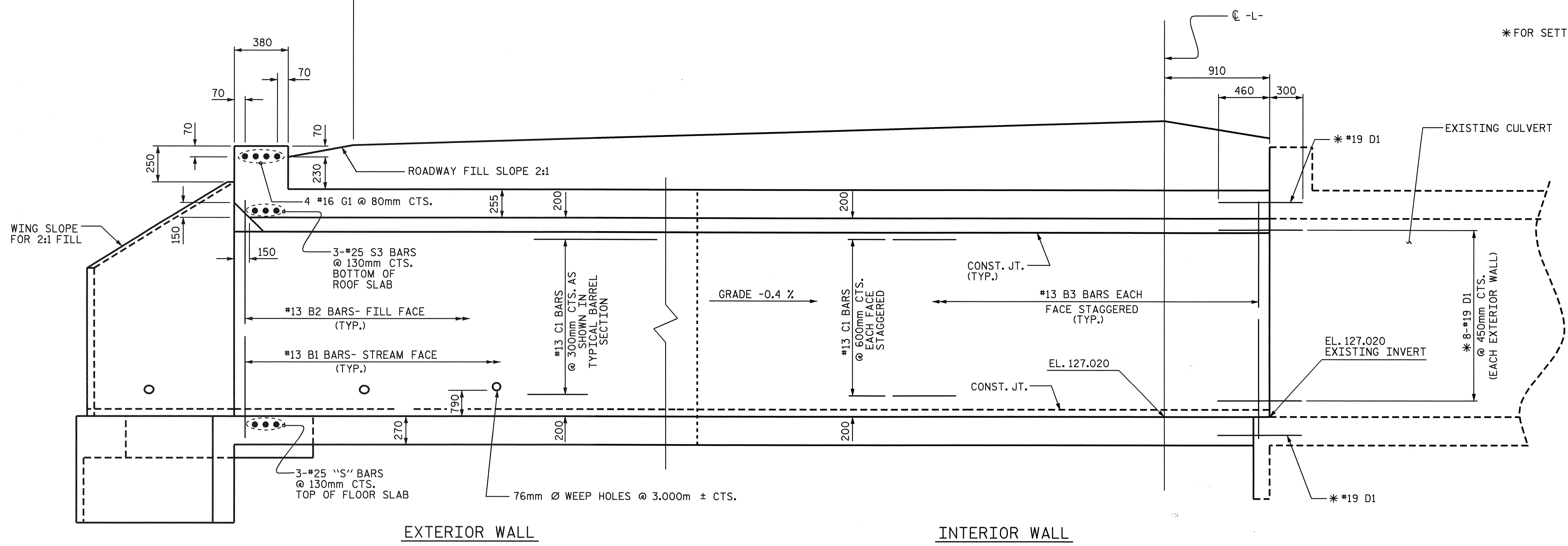
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS 23
2			4			

DRAWN BY: A. K. PATEL DATE: 2/03/04
 CHECKED BY: A. CHAN DATE: 3/10/04

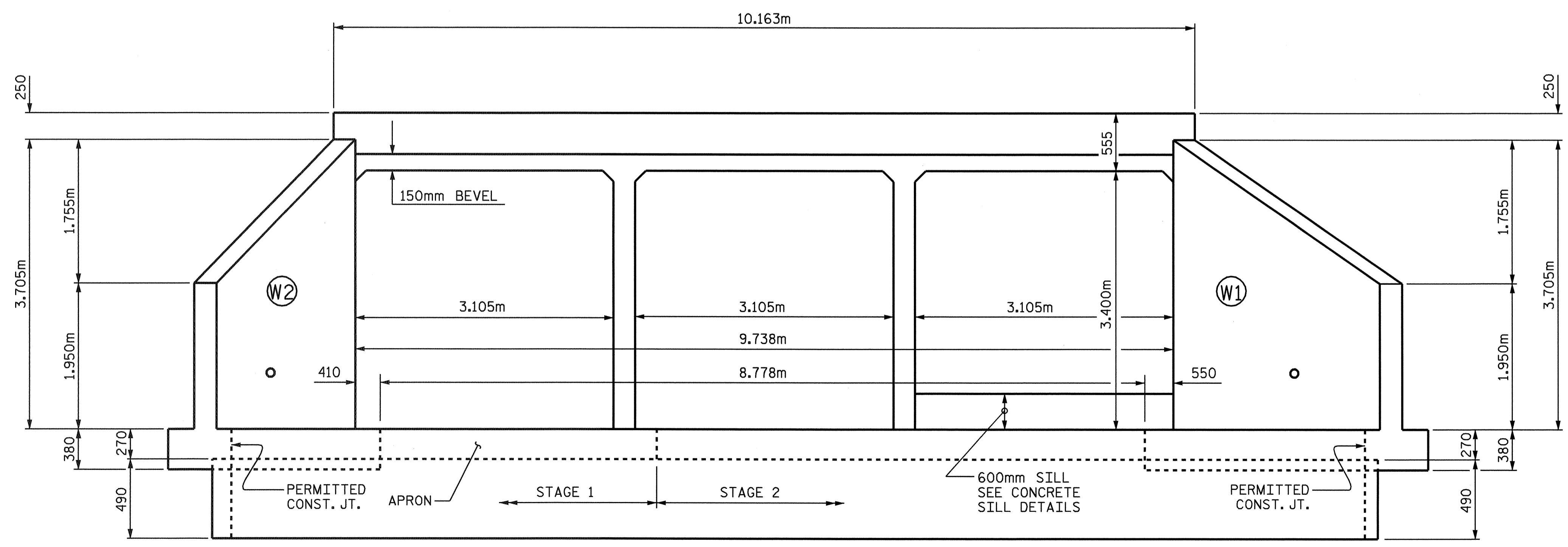
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SHOULDER TO C-L = 17.600m

* FOR SETTING OF DOWELS, SEE SHEET S-N



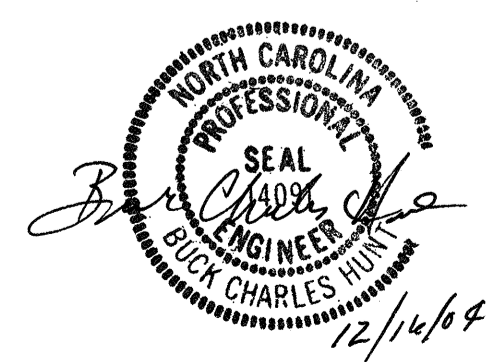
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW - INLET

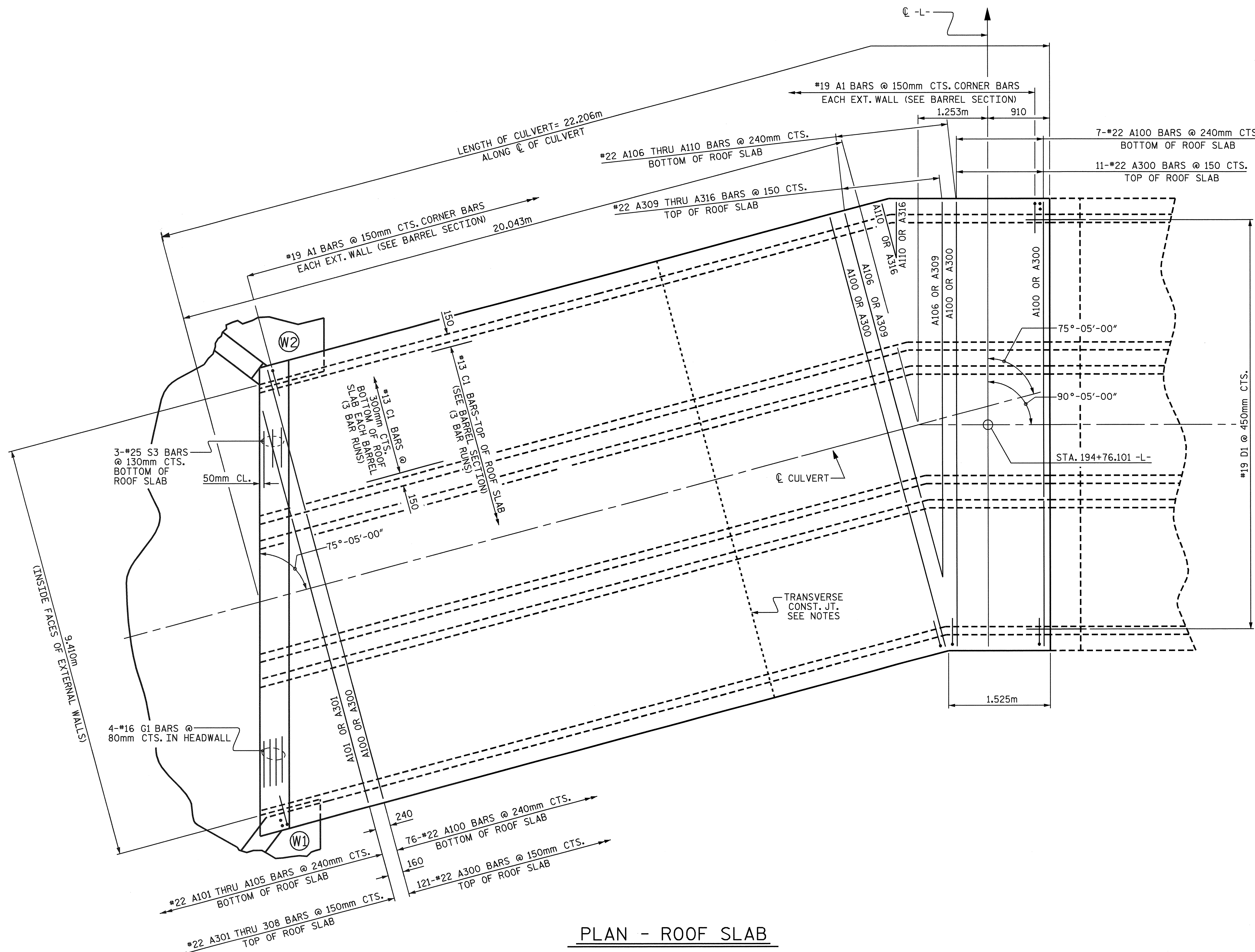
PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-
 SHEET 2 OF 9

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TRIPLE 3.000m X 3.400m CONCRETE BOX CULVERT LEFT EXTENSION 90°-05' SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. C-2 TOTAL SHEETS 23



DRAWN BY: A. K. PATEL DATE: 2-02-04
 CHECKED BY: A. CHAN DATE: 3-10-04

16-DEC-2004 07:40
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 Klayne

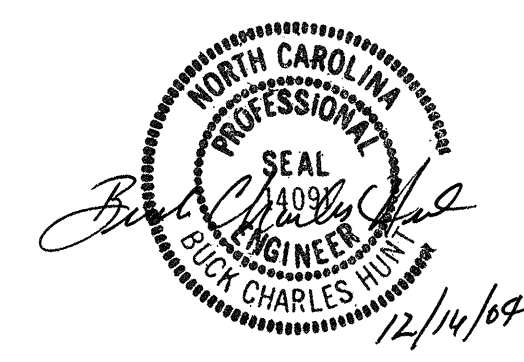


PLAN - ROOF SLAB

PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE
 3.000m X 3.400m
 CONCRETE BOX CULVERT
 90°-05' SKEW

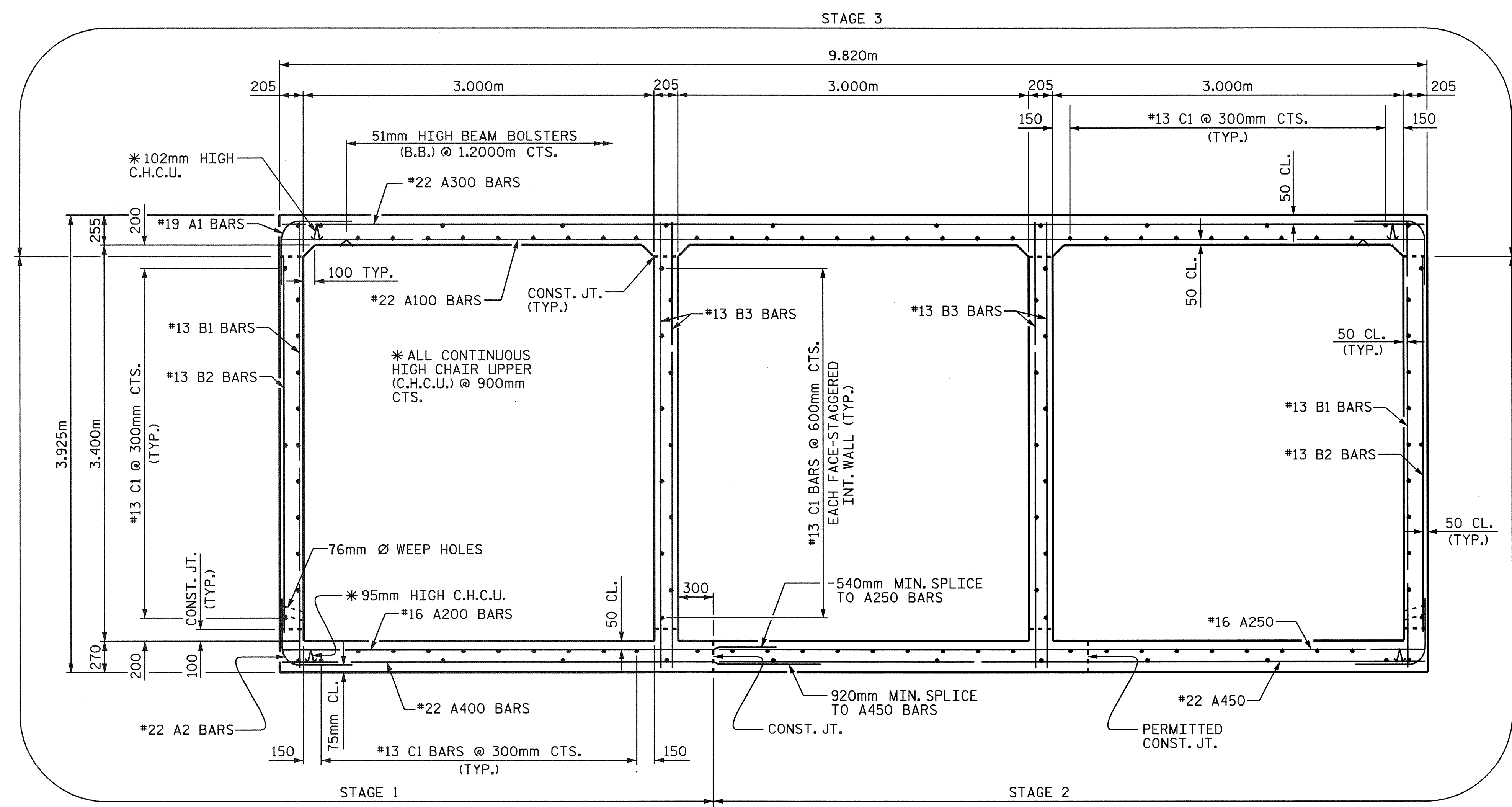
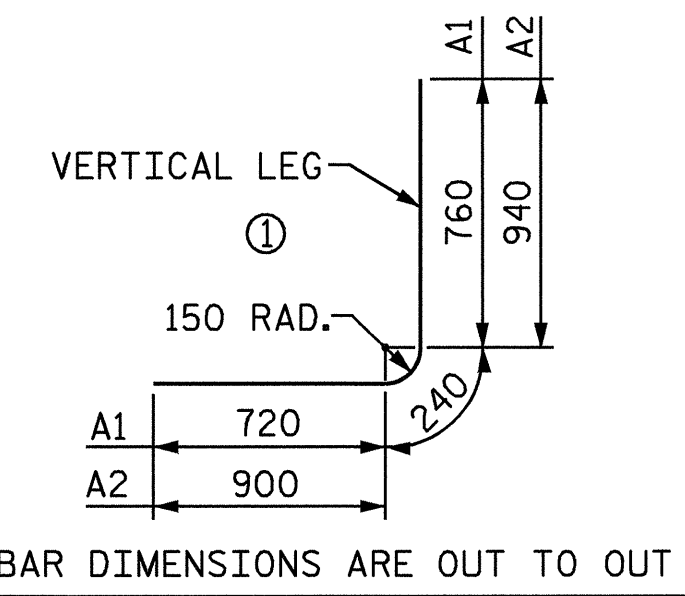


DRAWN BY: A. K. PATEL DATE: 1/30/04
 CHECKED BY: A. CHAN DATE: 3/10/04

16-DEC-2004 07:40
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 Klayne

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4	
1			3			TOTAL	23
2			4			SHEETS	

BAR TYPE		BILL OF MATERIAL - LEFT EXTENSION											
		STAGE 1-QUANTITIES					STAGE 2-QUANTITIES					TOTAL STRUCTURE QUANTITIES	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	STAGE 1:	
A1	148	19	1	1720	569	A1	148	19	1	1720	569	CLASS A CONCRETE	
A2	148	22	1	2080	936	A2	148	22	1	2080	936	BARREL @ 2.355 C.M./M. 52.2 m ³	
A200	132	16	STR	4260	873	A100	83	22	STR	9720	2454	WING 7.7 m ³	
A201	2	16	STR	3060	9	A101	2	22	STR	7920	48	DEBRIS DEFLECTOR, ETC. 7.5 m ³	
A202	2	16	STR	1880	6	A102	2	22	STR	6120	37	TOTAL 67.4 m ³	
A203	1	16	STR	1280	2	A103	2	22	STR	4340	26	REINFORCING STEEL	
A204	2	16	STR	4160	13	A104	2	22	STR	2540	15	BARREL 7265 Kg	
A205	2	16	STR	2940	9	A105	2	22	STR	760	5	WING 316 Kg	
A206	2	16	STR	1720	5	A106	2	22	STR	8140	50	DEBRIS DEFLECTOR, ETC. 612 Kg	
A207	1	16	STR	840	1	A107	2	22	STR	6300	38	TOTAL 8193 Kg	
A400	140	22	STR	4640	1976	A108	2	22	STR	4480	27	FOUNDATION COND. MAT'L 69 M. TONS	
A401	2	22	STR	3520	21	A109	2	22	STR	2640	16	STAGE 2:	
A402	2	22	STR	2400	15	A110	2	22	STR	800	5	CLASS A CONCRETE	
A403	2	22	STR	1280	8	A250	129	16	STR	6000	1201	BARREL @ 5.619 C.M./M. 124.9 m ³	
A404	2	22	STR	4100	25	A251	2	16	STR	4940	15	WING, HEADWALL, ETC. 11.6 m ³	
A405	2	22	STR	2960	18	A252	2	16	STR	3740	12	DEBRIS DEFLECTOR, ETC. 10.2 m ³	
A406	2	22	STR	1820	11	A253	2	16	STR	2540	8	SILL 0.6 m ³	
A407	2	22	STR	660	4	A254	2	16	STR	1360	4	TOTAL 147.3 m ³	
B1	74	13	STR	3820	281	A255	1	16	STR	760	1	REINFORCING STEEL	
B2	148	13	STR	3200	471	A256	2	16	STR	5320	17	BARREL 16753 Kg	
B3	262	13	STR	3820	995	A257	2	16	STR	4100	13	WING, HEADWALL, ETC. 404 Kg	
C1	114	13	STR	7840	888	A258	2	16	STR	2880	9	DEBRIS DEFLECTOR, ETC. 745 Kg	
D1	17	19	STR	760	29	A259	2	16	STR	1660	5	TOTAL 17902 Kg	
D2	17	19	STR	900	34	A300	132	22	STR	9720	3903	FOUNDATION COND. MAT'L 111 M. TONS	
S1	3	25	STR	5560	66	A301	2	22	STR	8600	52	STAGE 1 TOTAL 7265 Kg	
						A302	2	22	STR	7480	46		
						A303	2	22	STR	6360	39		
						A304	2	22	STR	5240	32		
						A305	2	22	STR	4120	25		
						A306	2	22	STR	3000	18		
						A307	2	22	STR	1880	11		
						A308	2	22	STR	760	5		
						A309	2	22	STR	8680	53		
						A310	2	22	STR	7540	46		
						A311	2	22	STR	6380	39		
						A312	2	22	STR	5240	32		
						A313	2	22	STR	4100	25		
						A314	2	22	STR	2940	18		
						A315	2	22	STR	1800	11		
						A316	2	22	STR	660	4		
						A450	138	22	STR	6000	2519		
						A451	2	22	STR	5240	32		
						A452	2	22	STR	4120	25		
						A453	2	22	STR	3000	18		
						A454	2	22	STR	1880	11		
						A455	2	22	STR	760	5		
						A456	2	22	STR	4960	30		
						A457	2	22	STR	3820	23		
						A458	2	22	STR	2680	16		
						A459	2	22	STR	1520	9		
						B1	74	13	STR	3820	281		
						B2	148	13	STR	3200	471		
						B3	262	13	STR	3820	995		
						C1	264	13	STR	7840	2057		
						D1	41	19	STR	760	70		
						D2	24	19	STR	900	48		
						D3	10	19	STR	740	17		
						G1	4	16	STR	10060	62		
						S2	3	25	STR	6220	74		
						S3	3	25	STR	10060	120		
						STAGE 2 TOTAL 16753 Kg							



SPLICE LENGTHS CHART:

BAR	SIZE	SPLICE LENGTH
A200	16	540
A400	22	920
B1	13	540
B3	13	540
C1	13	590
S1	25	1680

PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE
 3.000m X 3.400m
 CONCRETE BOX CULVERT
 90°-05' SKEW

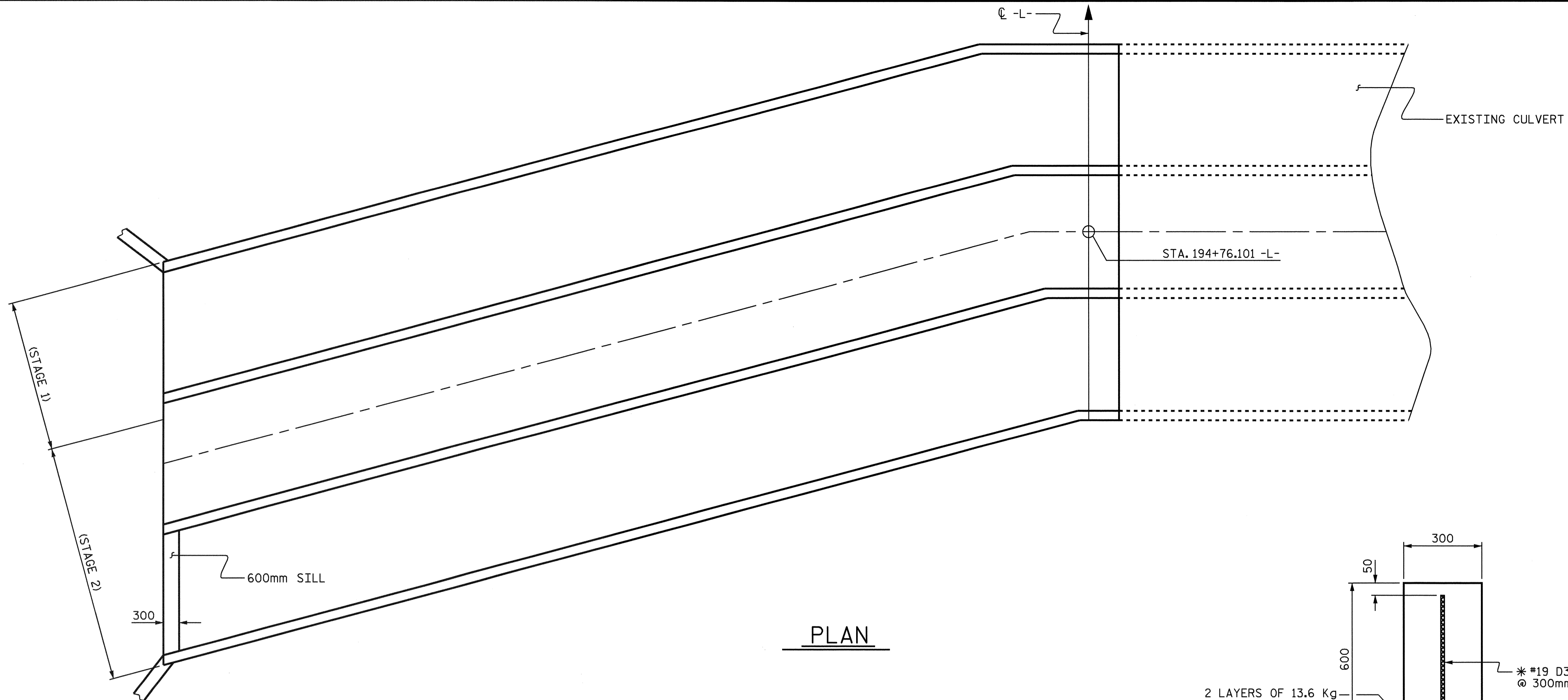
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			C-5
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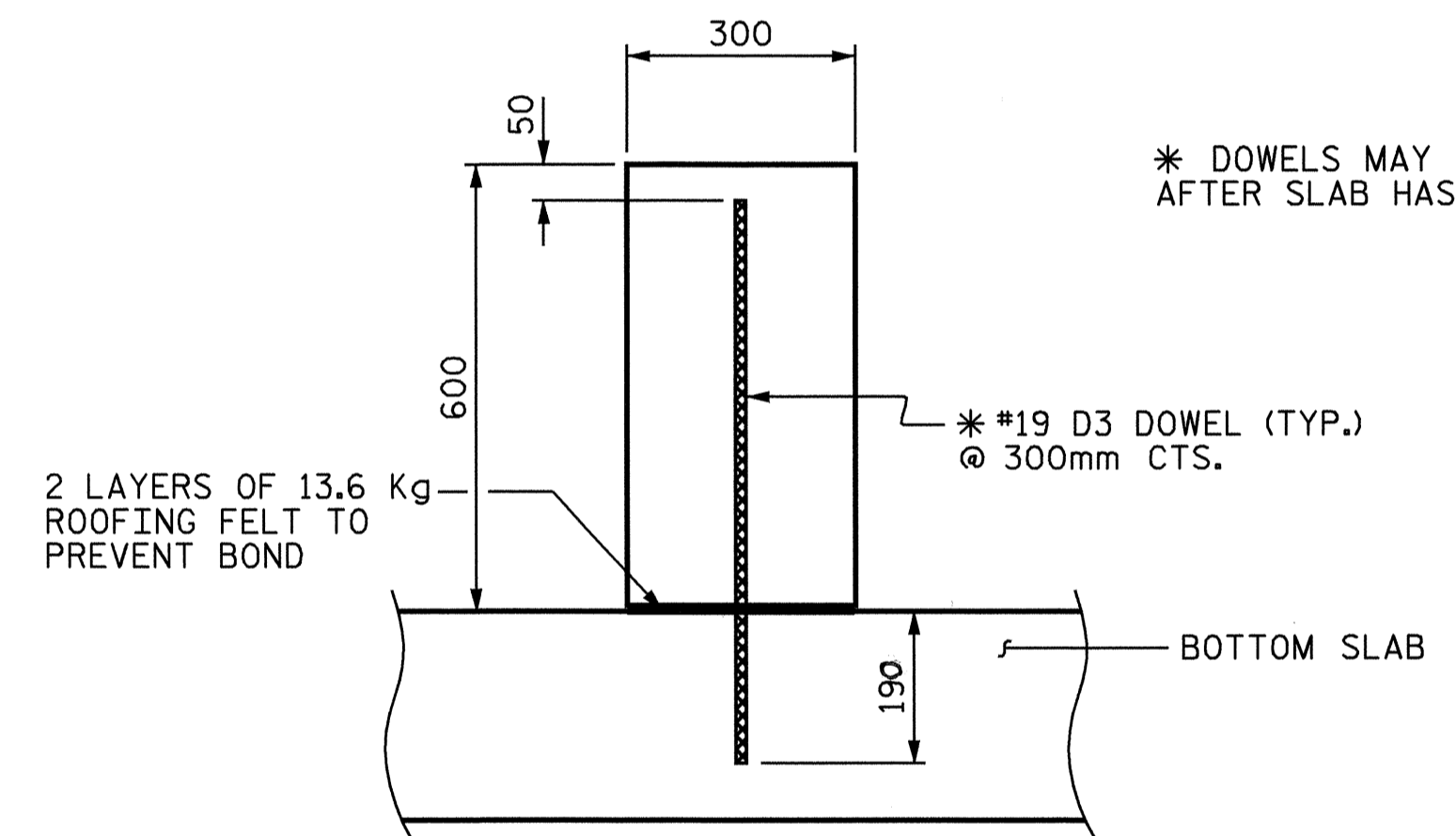
DRAWN BY: A. K. PATEL DATE: 1/30/04
 CHECKED BY: A. CHAN DATE: 3/10/04

RIGHT ANGLE SECTION OF BARREL
 THERE ARE 126 "C" BARS IN SECTION OF BARREL.

16-DEC-2004 07:40
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 klayne

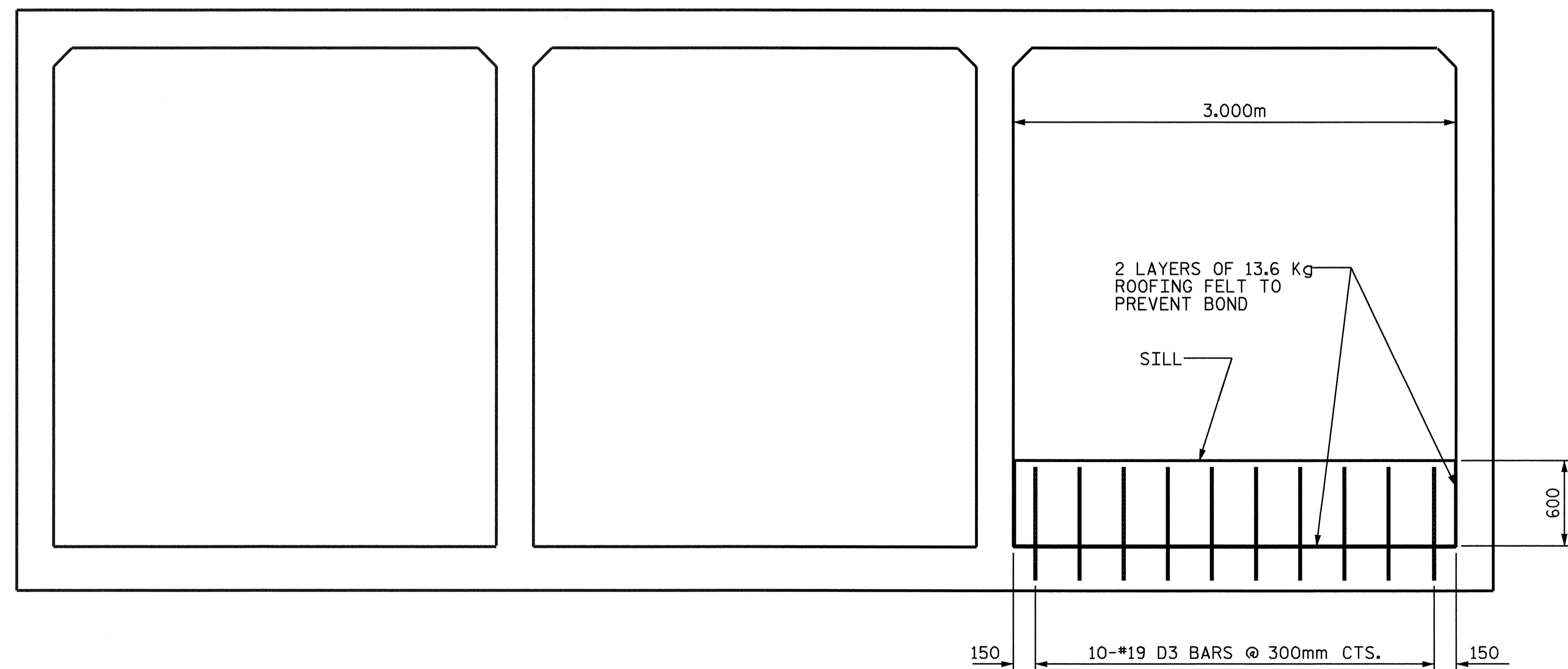


PLAN



SECTION THROUGH 600mm HIGH SILL

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



ELEVATION VIEW- INLET
CULVERT SILL DETAILS

PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONCRETE SILL
 DETAILS



DRAWN BY : A. K. PATEL DATE : 2/02/04
 CHECKED BY : A. CHAN DATE : 3/10/04

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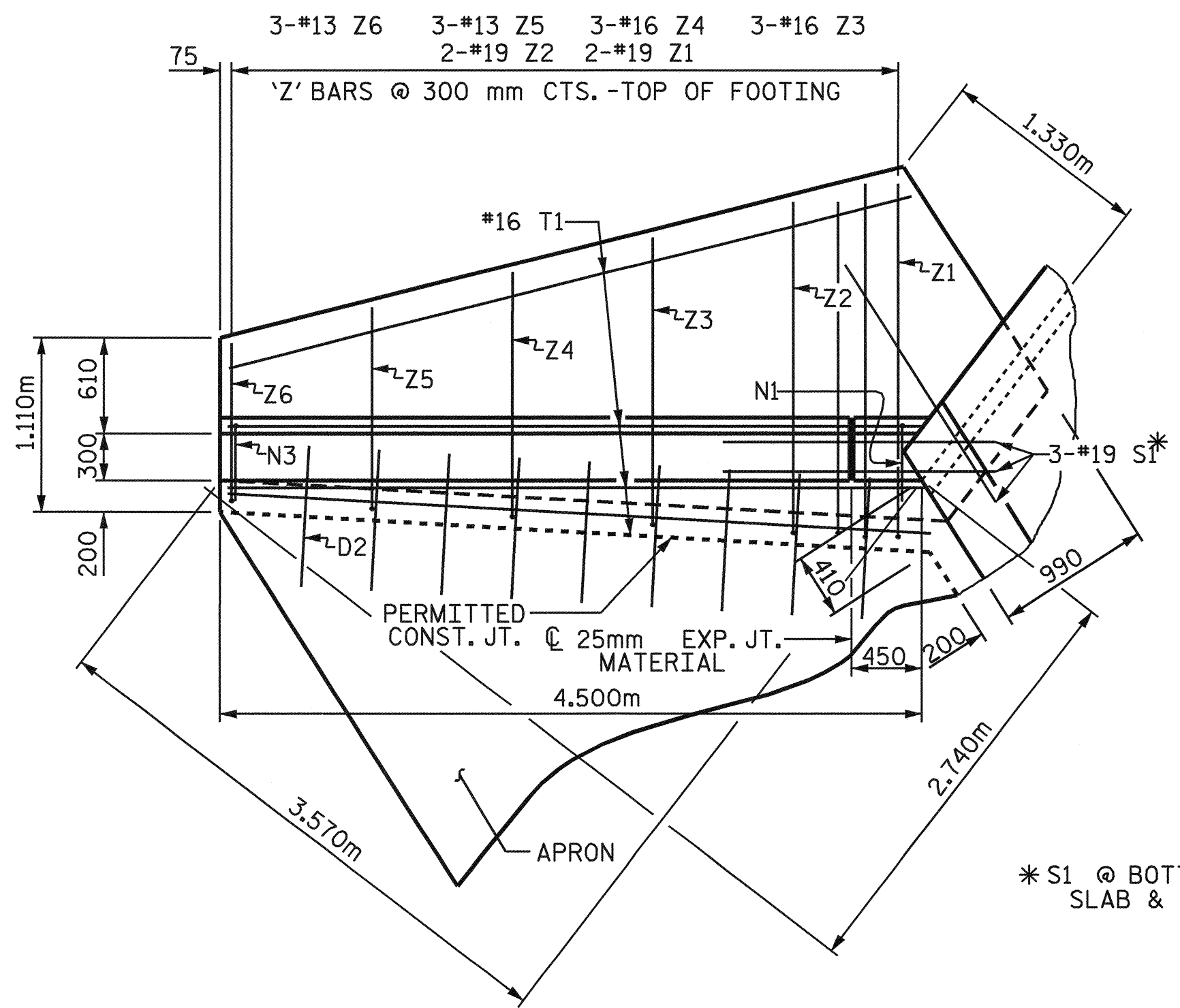
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS 23
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BILL OF MATERIAL INLET WINGS

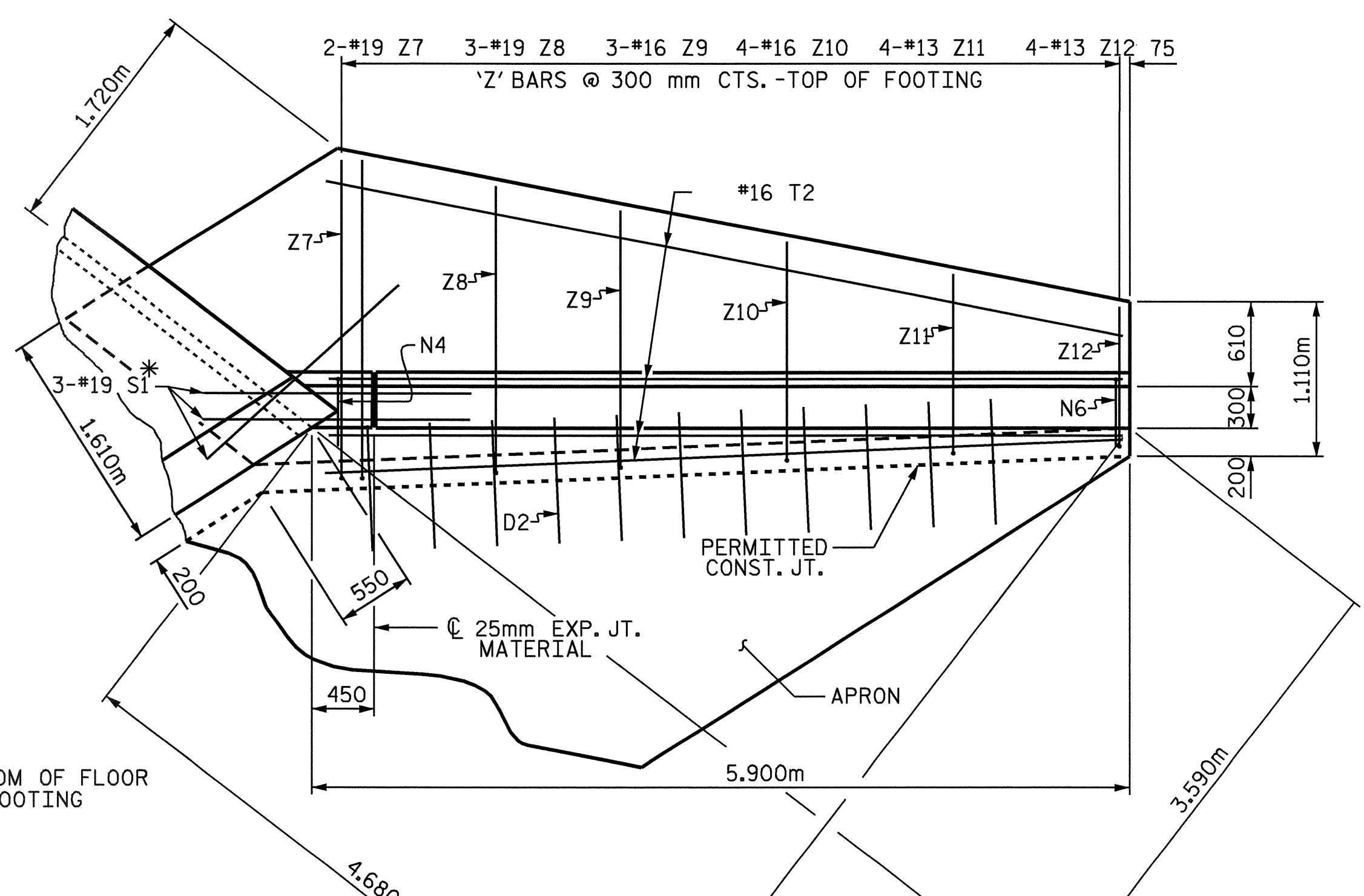
STAGE 1 (LEFT SIDE WING)						STAGE 2 (RIGHT SIDE WING)					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	8	13	STR	3940	31	H7	8	13	STR	5340	42
H2	2	13	STR	3860	8	H8	2	13	STR	5260	10
H3	2	13	STR	2720	5	H9	2	13	STR	3780	8
H4	2	13	STR	1600	3	H10	2	13	STR	2300	5
H5	18	13	1	980	18	H11	18	13	2	980	18
H6	5	13	STR	4220	21	H12	5	13	STR	5560	28
N1	7	19	3	2060	32	N4	8	19	3	2060	37
N2	3	16	3	2060	10	N5	8	16	3	2060	26
N3	6	13	3	2060	12	N6	4	13	3	2060	8
S1	3	19	STR	1800	12	S1	3	19	STR	1800	12
T1	4	16	STR	4500	28	T2	4	16	STR	5900	37
V1	2	16	STR	3440	11	V9	2	16	STR	3460	11
V2	2	16	STR	3260	10	V10	3	16	STR	3180	15
V3	6	13	STR	2900	17	V11	3	16	STR	2920	14
V4	6	13	STR	2540	15	V12	8	13	STR	2540	20
V5	6	13	STR	2180	13	V13	8	13	STR	2180	17
V6	6	13	STR	1820	11	V14	8	13	STR	1820	14
V7	2	13	STR	3440	7	V15	2	13	STR	3460	7
V8	2	13	STR	3260	6	V16	3	13	STR	3180	9
Z1	2	19	4	2460	11	V17	3	13	STR	2920	9
Z2	2	19	4	2320	10	Z7	2	19	4	2480	11
Z3	3	16	4	2020	9	Z8	3	19	4	2260	15
Z4	3	16	4	1760	8	Z9	3	16	4	2040	9
Z5	3	13	4	1460	4	Z10	4	16	4	1760	11
Z6	3	13	4	1180	4	Z11	4	13	4	1460	6
						Z12	4	13	4	1180	5

REINFORCING STEEL FOR WING 316 kg
 CLASS A CONCRETE 7.7 m³
 1 WING TOTAL 7.7 m³

REINFORCING STEEL FOR WING 404 kg
 CLASS A CONCRETE 10.4 m³
 1 WING 1.2 m³
 1 HEADWALL TOTAL 11.6 m³



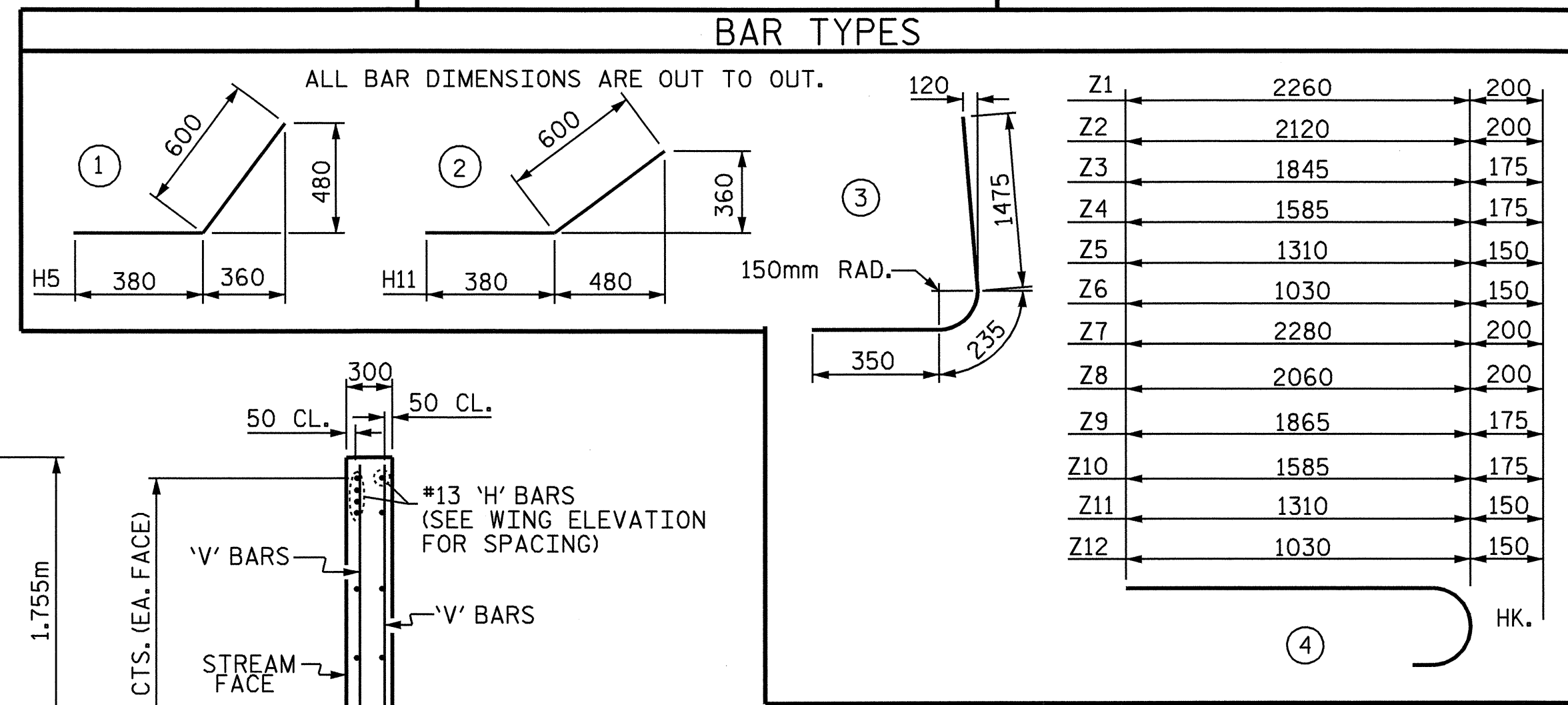
PLAN W2



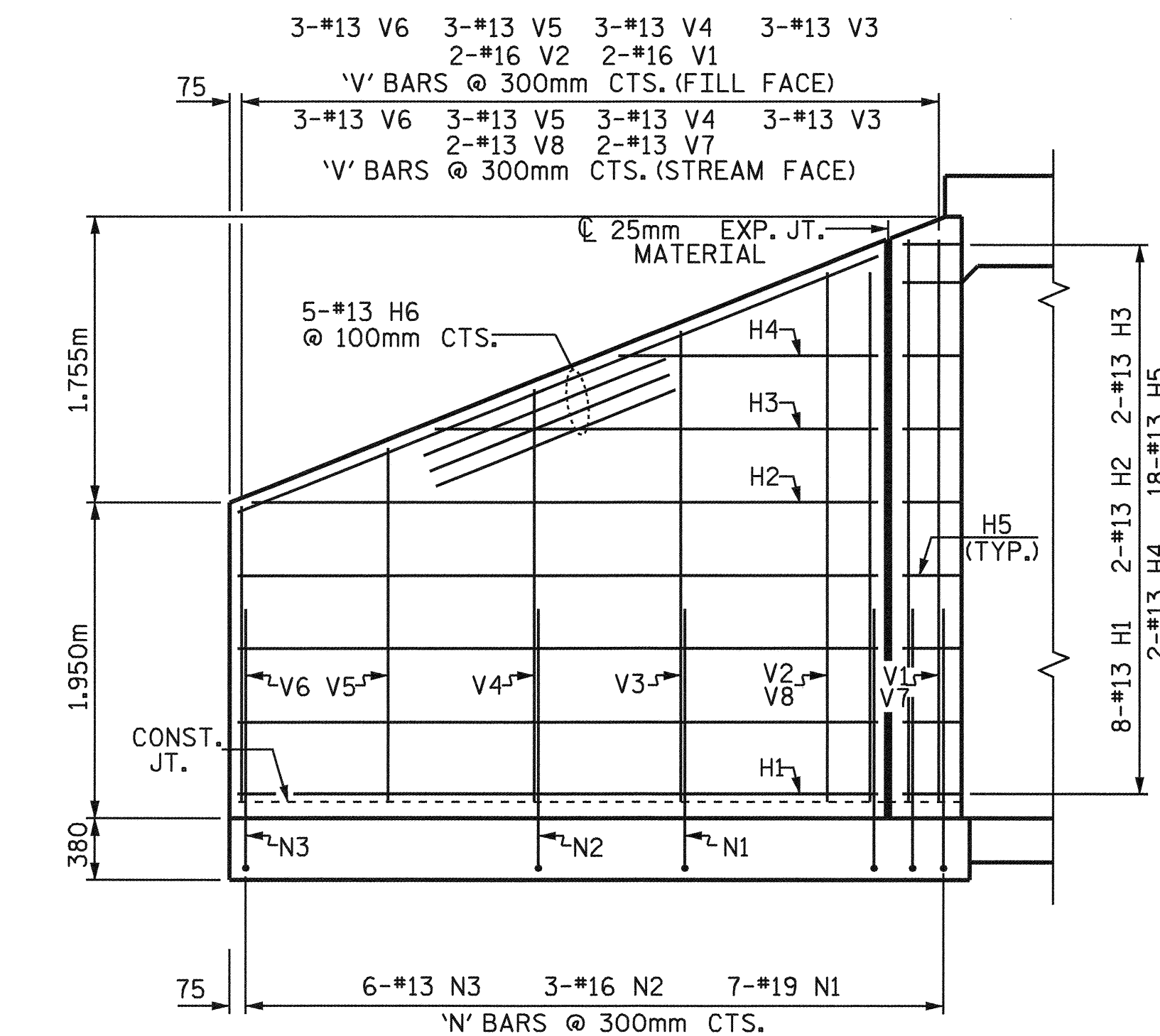
PLAN W1

* S1 @ BOTTOM OF FLOOR SLAB & FOOTING

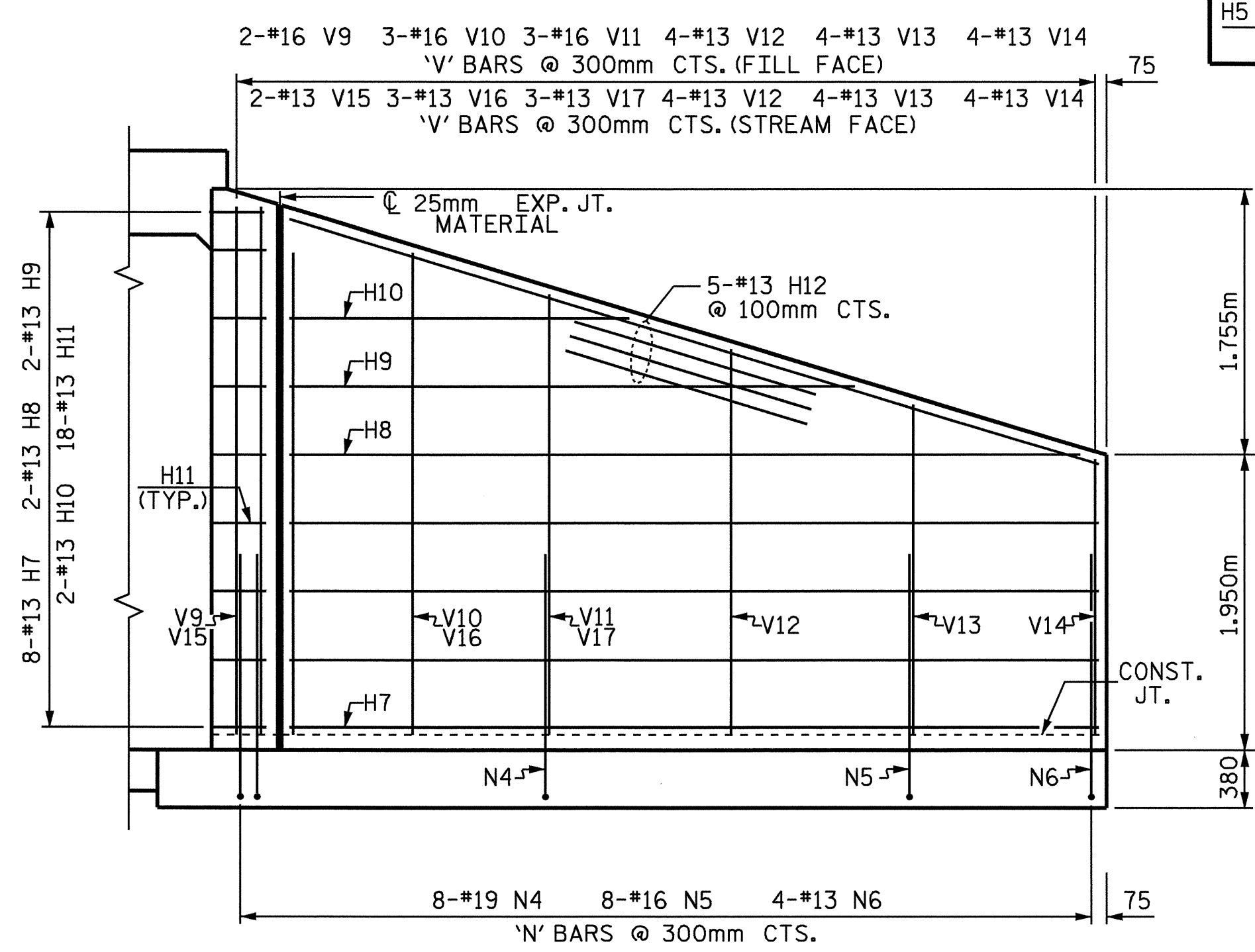
SEE APRON DETAILS FOR D2 SPACING.



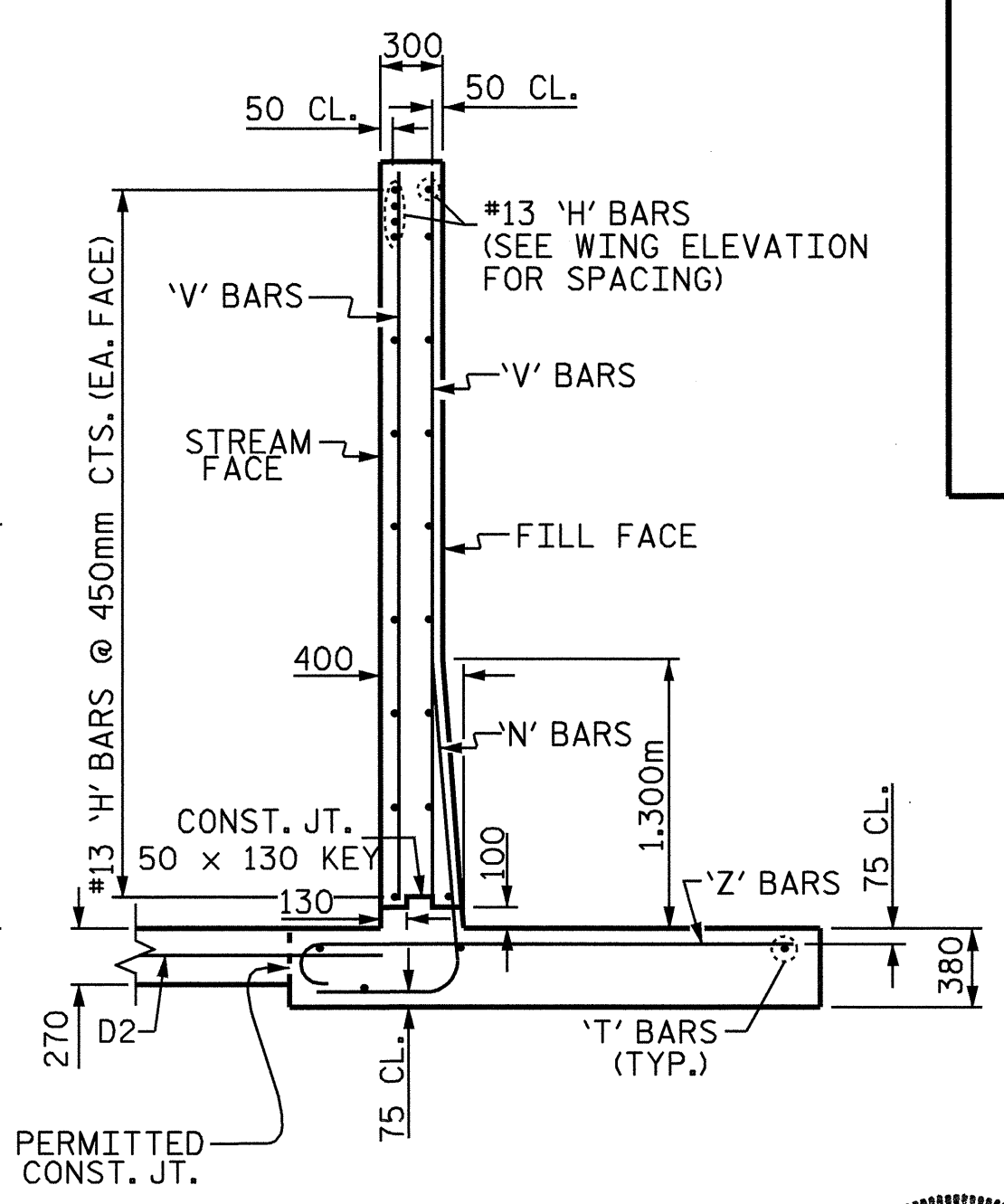
Z1	2260	200
Z2	2120	200
Z3	1845	175
Z4	1585	175
Z5	1310	150
Z6	1030	150
Z7	2280	200
Z8	2060	200
Z9	1865	175
Z10	1585	175
Z11	1310	150
Z12	1030	150



ELEVATION W2



ELEVATION W1

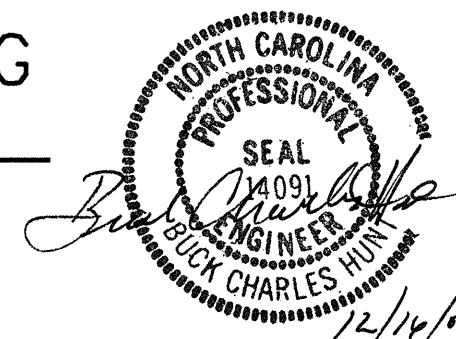


TYPICAL WING SECTION

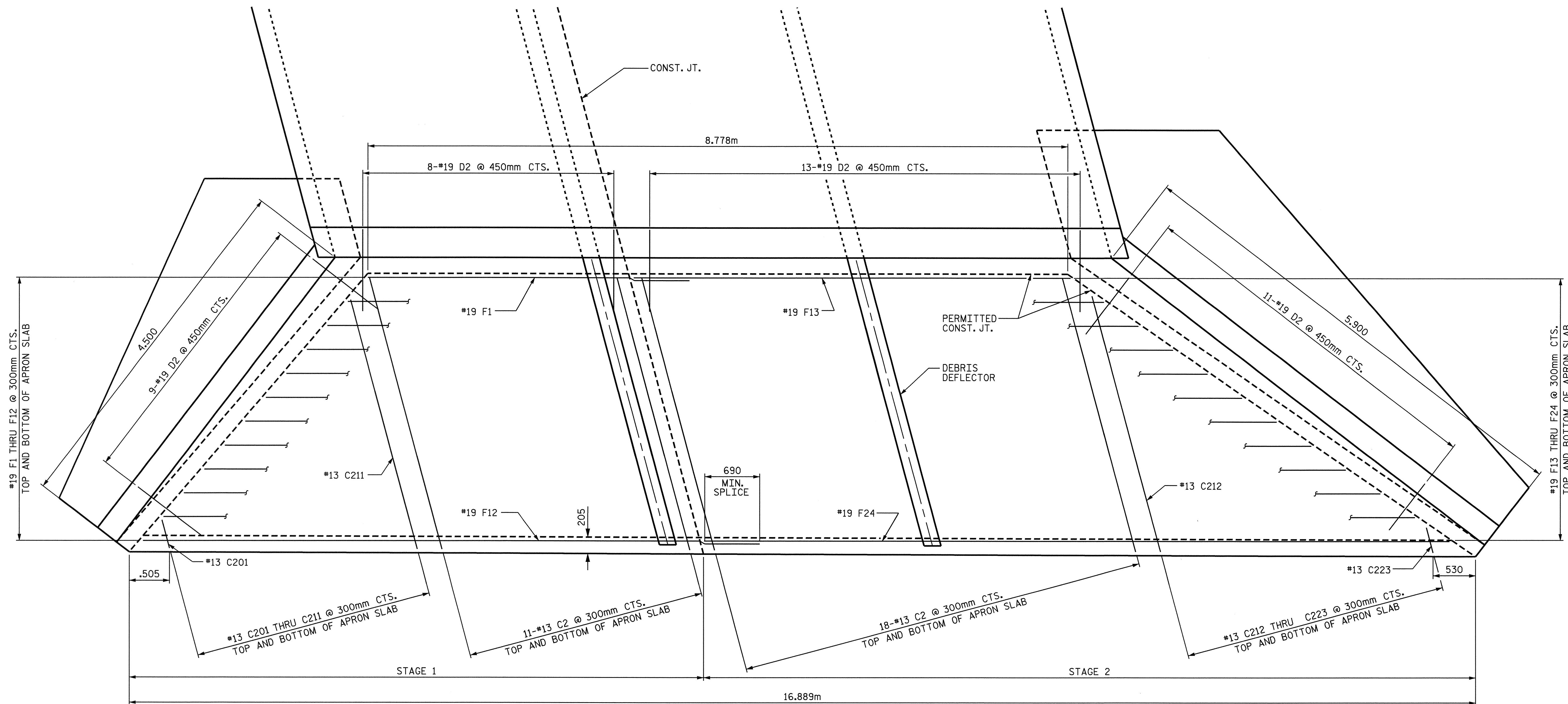
PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 7 OF 9
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD INLET WINGS FOR CONCRETE BOX CULVERT
 H = 3.400m SLOPE = 2 : 1
 75° SKEW

ASSEMBLED BY : A. K. PATEL DATE : 1-30-04
 CHECKED BY : A. CHAN DATE : 3-10-04
 DRAWN BY : FPP 06/97
 CHECKED BY : VAP 07/97



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7	
1			3			TOTAL SHEETS	
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PLAN - APRON SLAB
(LOOKING DOWNSTREAM)

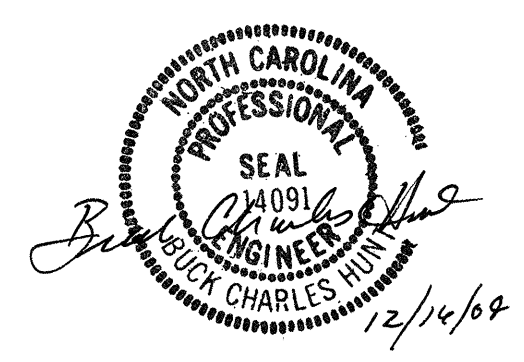
PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

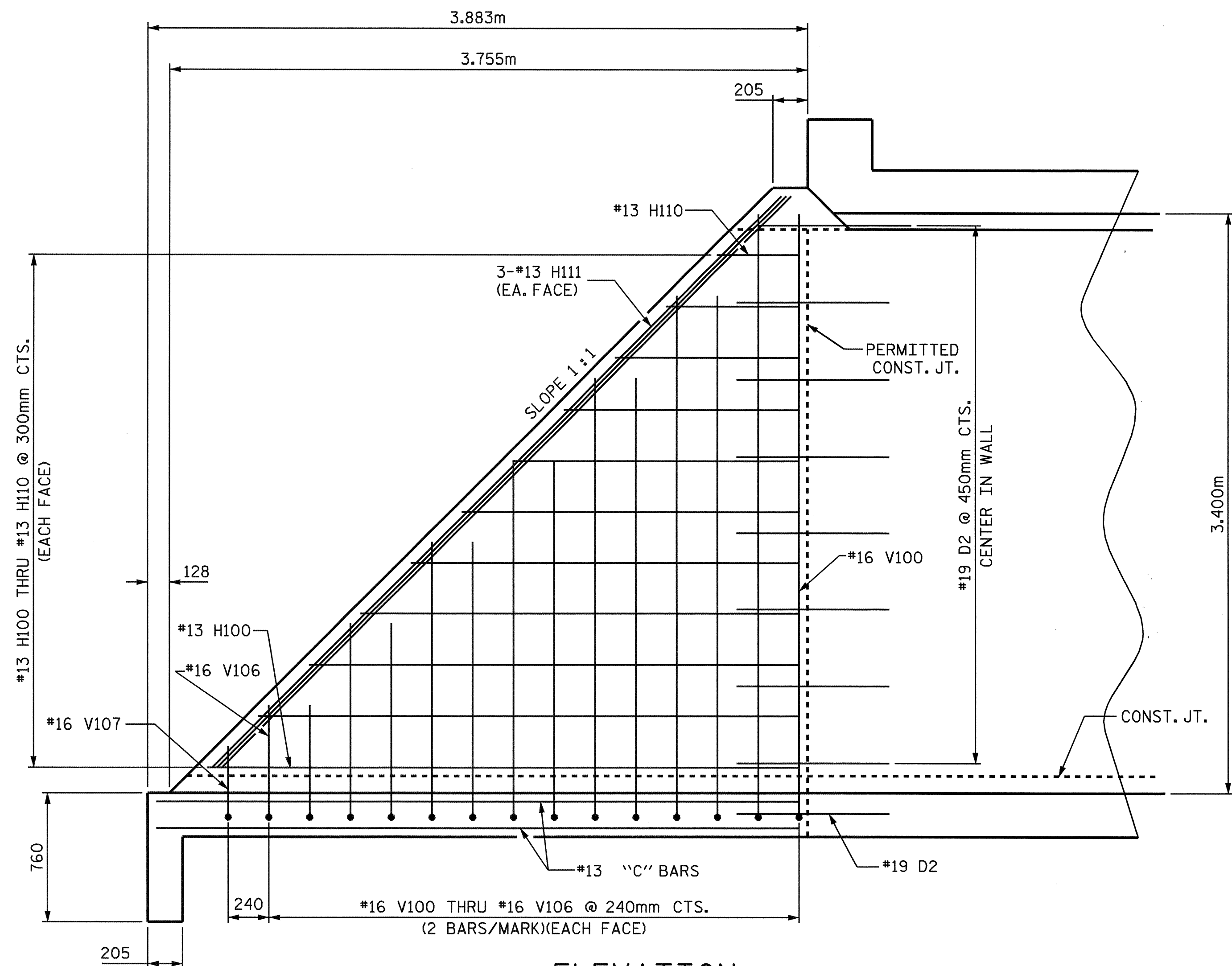
**APRON SLAB
 AND DEBRIS DEFLECTOR
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			23

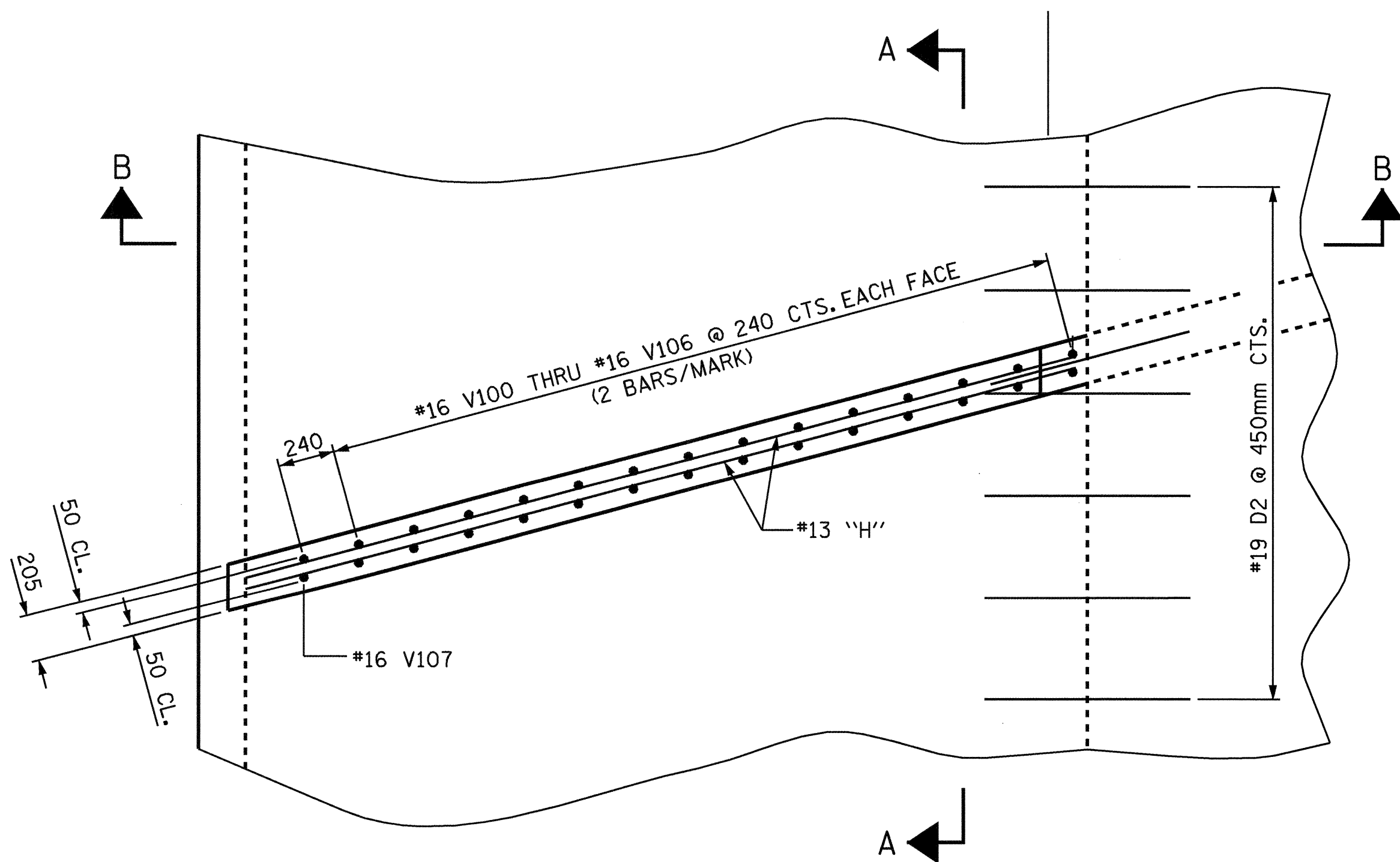


DRAWN BY: A. K. PATEL DATE: 2/02/04
 CHECKED BY: A. CHAN DATE: 3/10/04

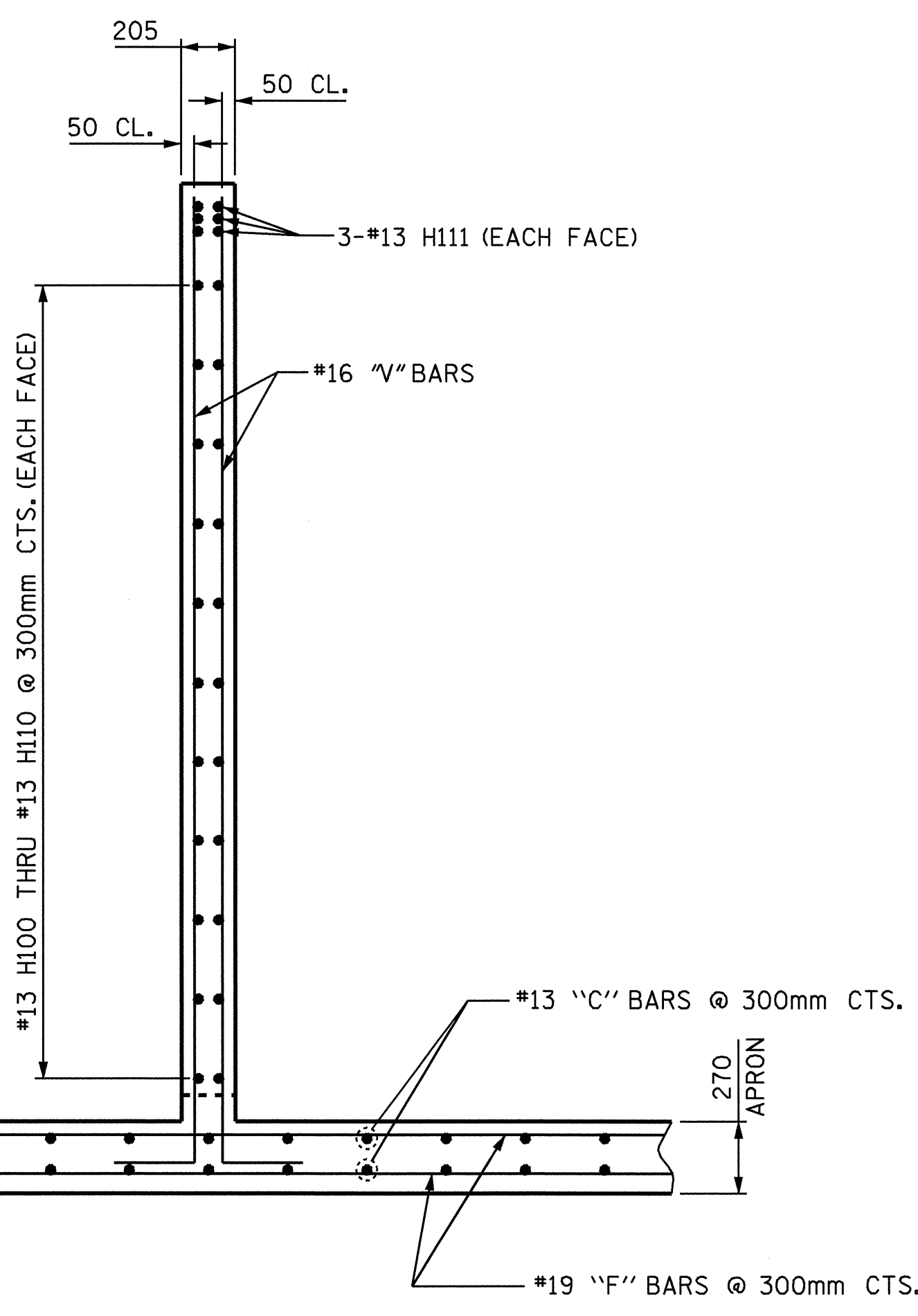
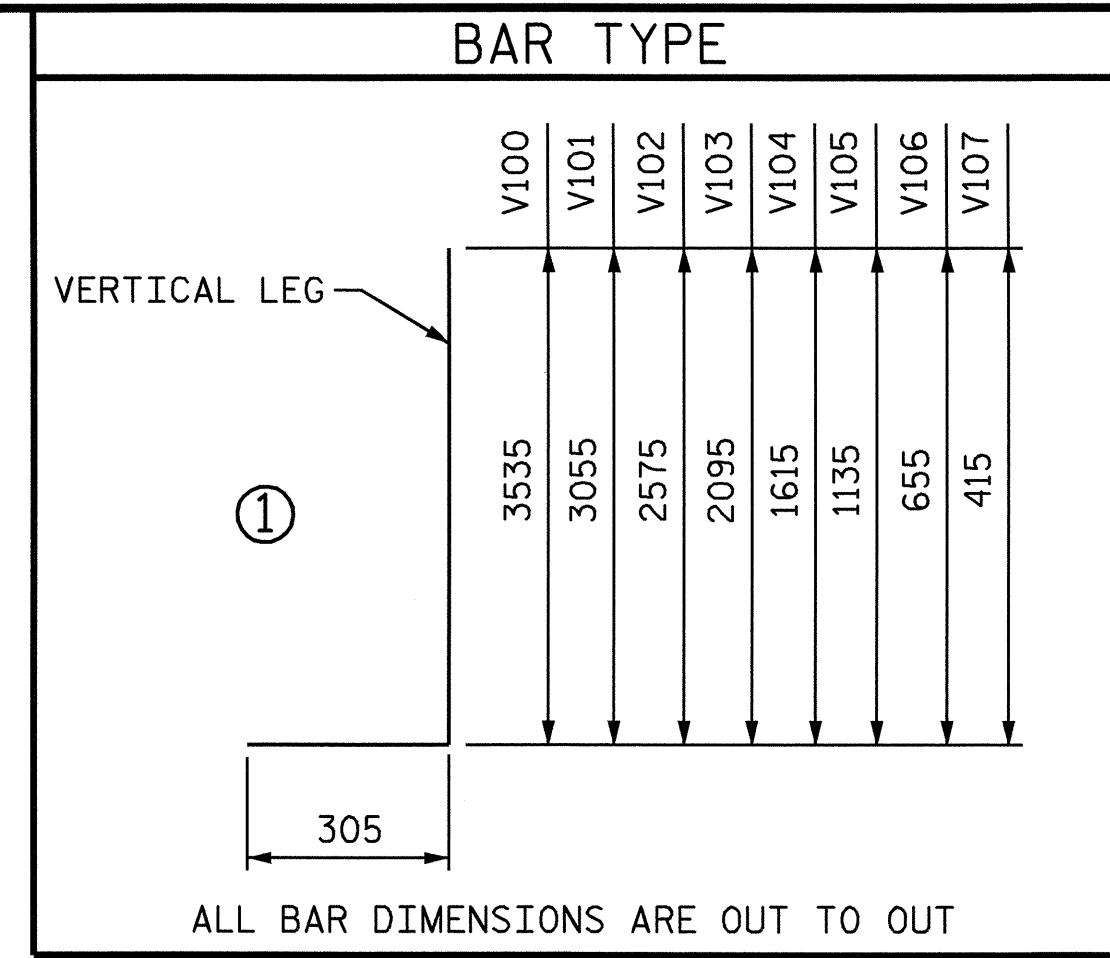
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 klayne



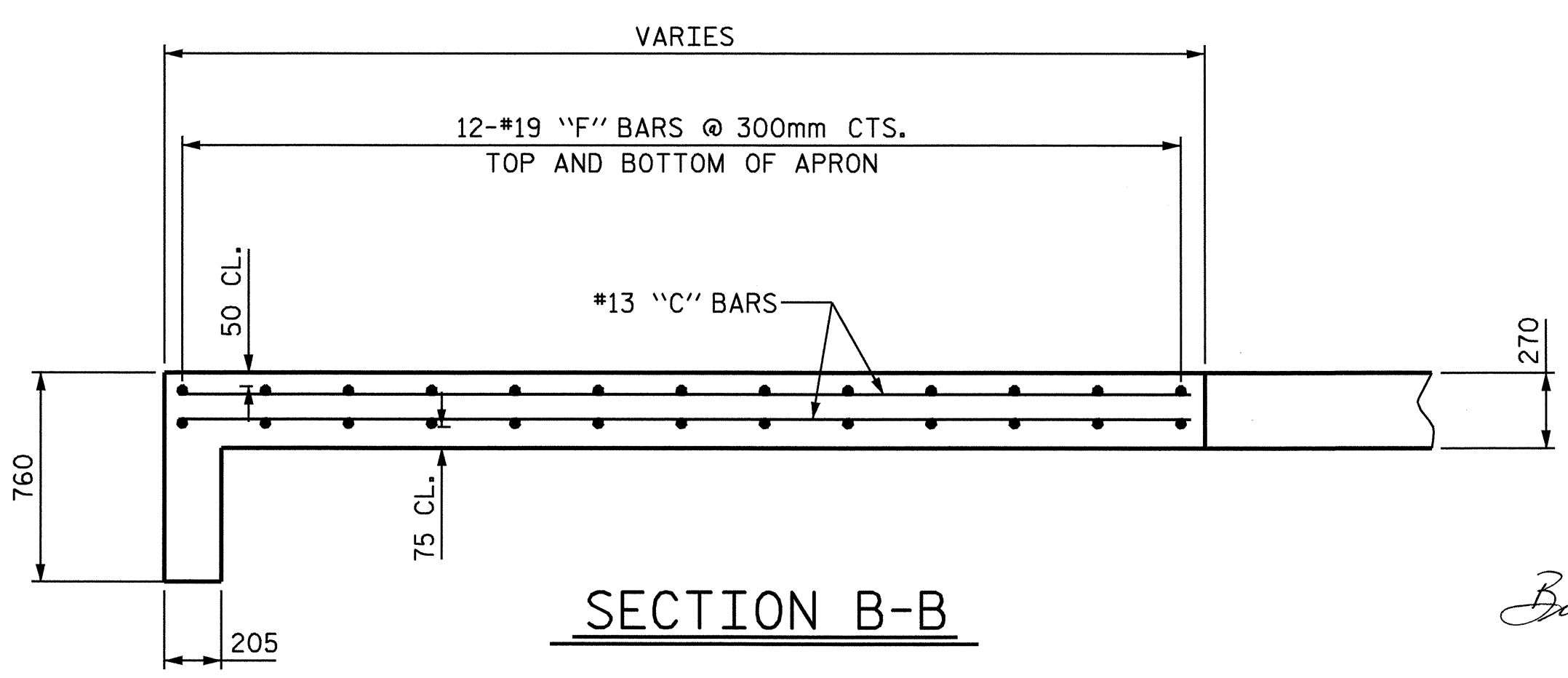
ELEVATION



PLAN



SECTION A-A

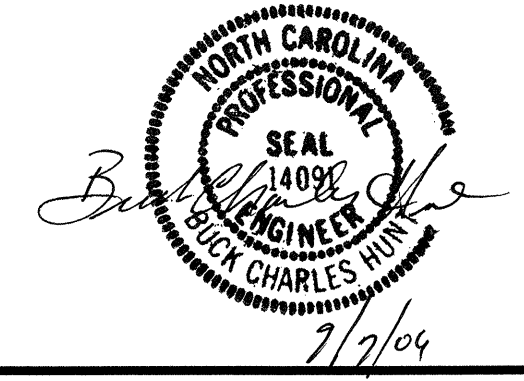


SECTION B-B

BILL OF MATERIAL - APRON AND DEBRIS DEFLECTORS											
STAGE 1 (NORTHERN SIDE)						STAGE 2 (SOUTHERN SIDE)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
C2	22	13	STR	3520	77	C2	36	13	STR	3520	126
C201	2	13	STR	360	1	C212	2	13	STR	3320	7
C202	2	13	STR	640	1	C213	2	13	STR	3040	6
C203	2	13	STR	940	2	C214	2	13	STR	2760	5
C204	2	13	STR	1220	2	C215	2	13	STR	2500	5
C205	2	13	STR	1500	3	C216	2	13	STR	2220	4
C206	2	13	STR	1800	4	C217	2	13	STR	1960	4
C207	2	13	STR	2080	4	C218	2	13	STR	1680	3
C208	2	13	STR	2360	5	C219	2	13	STR	1400	3
C209	2	13	STR	2660	5	C220	2	13	STR	1140	2
C210	2	13	STR	2940	6	C221	2	13	STR	860	2
C211	2	13	STR	3220	6	C222	2	13	STR	600	1
						C223	2	13	STR	320	1
F1	2	19	STR	4040	18	F13	2	19	STR	5480	24
F2	2	19	STR	4360	19	F14	2	19	STR	5820	26
F3	2	19	STR	4700	21	F15	2	19	STR	6160	28
F4	2	19	STR	5040	23	F16	2	19	STR	6520	29
F5	2	19	STR	5380	24	F17	2	19	STR	6880	31
F6	2	19	STR	5720	26	F18	2	19	STR	7220	32
F7	2	19	STR	6060	27	F19	2	19	STR	7580	34
F8	2	19	STR	6380	29	F20	2	19	STR	7940	35
F9	2	19	STR	6720	30	F21	2	19	STR	8280	37
F10	2	19	STR	7060	32	F22	2	19	STR	8640	39
F11	2	19	STR	7400	33	F23	2	19	STR	8980	40
F12	2	19	STR	7740	35	F24	2	19	STR	9340	42
H100	2	13	STR	3480	7	H100	2	13	STR	3480	7
H101	2	13	STR	3180	6	H101	2	13	STR	3180	6
H102	2	13	STR	2880	6	H102	2	13	STR	2880	6
H103	2	13	STR	2580	5	H103	2	13	STR	2580	5
H104	2	13	STR	2280	5	H104	2	13	STR	2280	5
H105	2	13	STR	1980	4	H105	2	13	STR	1980	4
H106	2	13	STR	1680	3	H106	2	13	STR	1680	3
H107	2	13	STR	1380	3	H107	2	13	STR	1380	3
H108	2	13	STR	1080	2	H108	2	13	STR	1080	2
H109	2	13	STR	780	2	H109	2	13	STR	780	2
H110	2	13	STR	480	1	H110	2	13	STR	480	1
H111	6	13	STR	4720	28	H111	6	13	STR	4720	28
V100	4	16	1	3840	24	V100	4	16	1	3840	24
V101	4	16	1	3360	21	V101	4	16	1	3360	21
V102	4	16	1	2880	18	V102	4	16	1	2880	18
V103	4	16	1	2400	15	V103	4	16	1	2400	15
V104	4	16	1	1920	12	V104	4	16	1	1920	12
V105	4	16	1	1440	9	V105	4	16	1	1440	9
V106	4	16	1	960	6	V106	4	16	1	960	6
V107	2	16	1	720	2	V107	2	16	1	720	2
REINFORCING STEEL FOR NORTHERN SIDE 612 kg						REINFORCING STEEL FOR SOUTHERN SIDE 745 kg 745					
CLASS A CONCRETE						CLASS A CONCRETE					
1 DEFLECTOR 1.6 m ³						1 DEFLECTOR 1.6 m ³					
APRON 5.2 m ³						APRON SLAB 7.6 m ³					
END CURTAIN WALL 0.7 m ³						END CURTAIN WALL 1.0 m ³					
TOTAL 7.5 m ³						TOTAL 10.2 m ³					

DRAWN BY : A. K. PATEL DATE : 2-02-04
 CHECKED BY : A. CHAN DATE : 3-10-04

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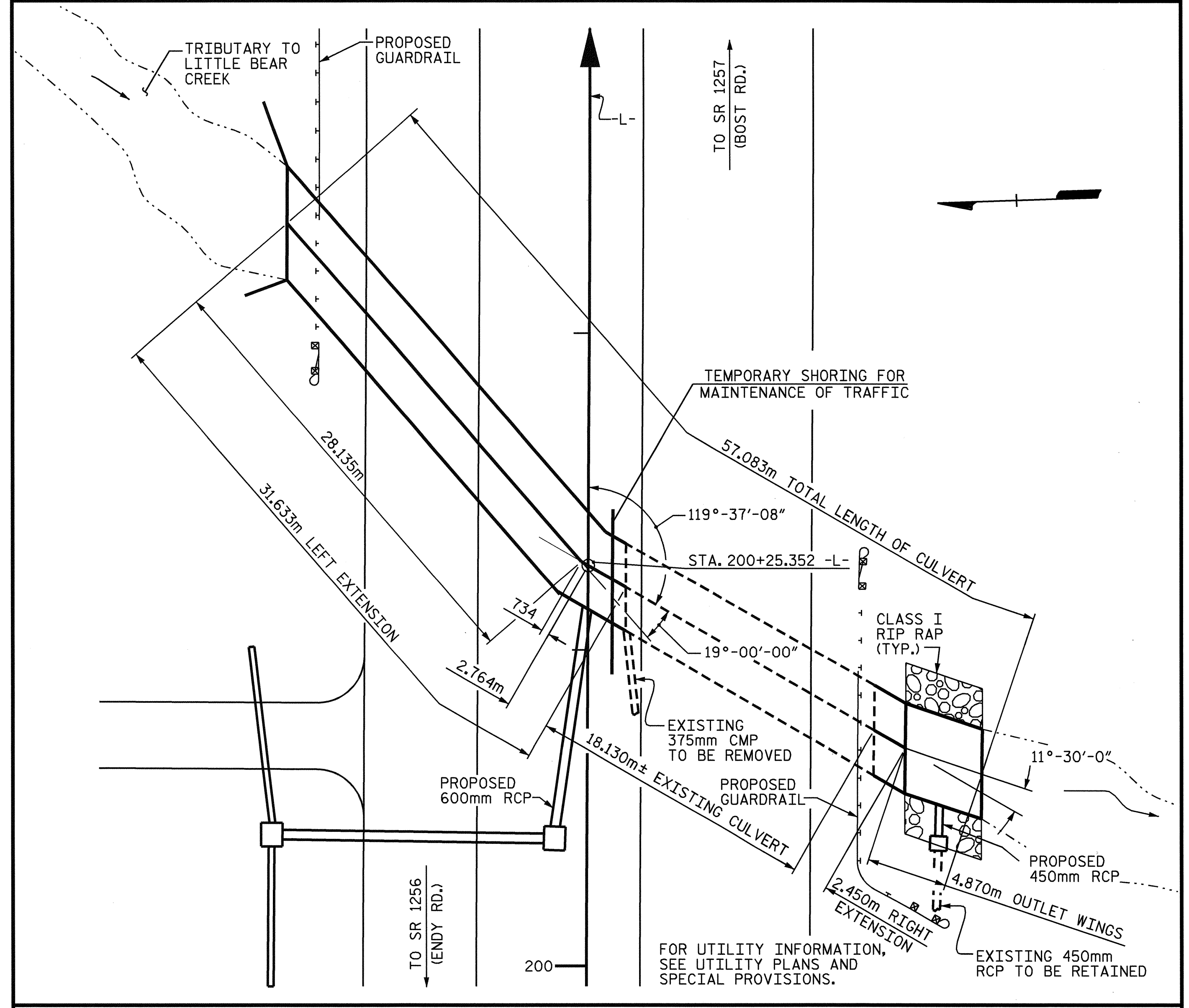
PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 194+76.101 -L-

SHEET 9 OF 9

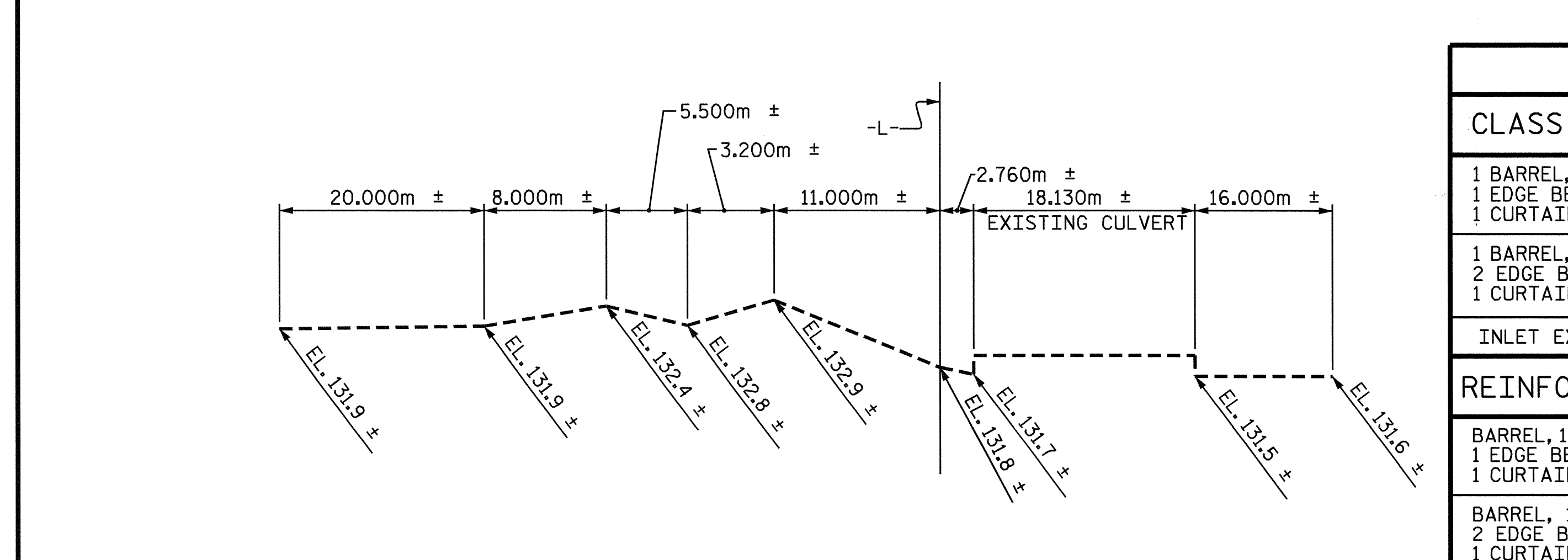
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 23

BENCH MARK : BM #30, RR SPIKE IN BASE OF TELE. POLE 30.0m RT. OF STA. 183+82.900 -BL- ELEV. 154.817 DATUM NGVD 29



LOCATION SKETCH



PROFILE ALONG CULVERT

ASSEMBLED BY : A.R.CHESSON DATE : 12-03
 CHECKED BY : M. K. BEARD DATE : 2-23-04
 DRAWN BY : EEM 6/97
 CHECKED BY : ARB 7/97

HYDRAULIC DATA

DESIGN DISCHARGE----- 18 m³/S
 FREQUENCY OF DESIGN FLOOD--- 50 YR.
 DESIGN HIGH WATER EL.----- 133.68
 DRAINAGE AREA----- 2.91 SQ. Km
 BASIC DISCHARGE (Q100)----- 23 m³/S
 BASIC HIGH WATER EL.----- 134.02

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE----- 35 m³/S
 FREQUENCY OF OVERTOPPING FLOOD--- 500± YR.
 OVERTOPPING FLOOD EL.----- 135.00

ROADWAY DATA

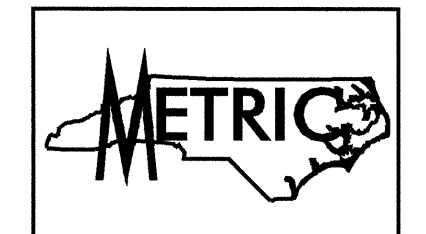
GRADE POINT ELEV. @ STA. 200+25.352 -L----- 135.300
 BED ELEV. @ STA. 200+25.352 -L----- 131.905
 ROADWAY FILL SLOPES----- 2 : 1

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

NOTES

ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.
 DESIGN FILL----- 610mm (LEFT) 580mm (RIGHT)
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
 76mm Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 CONCRETE IN CULVERT LEFT & RIGHT EXTENSION TO BE POURED IN THE FOLLOWING ORDER:
 LEFT EXTENSION:
 STAGE 1 :
 1. WEST WING FOOTING, FLOOR SLAB INCLUDING 4" OF BOTH VERTICAL WALLS OF WESTERN BARREL.
 2. THE REMAINING PORTIONS OF THE WALLS, WEST WING FULL HEIGHT.
 STAGE 2 :
 3. EAST WING FOOTING, FLOOR SLAB INCLUDING 4" OF REMAINING VERTICAL WALL OF EASTERN BARREL.
 4. THE REMAINING PORTION OF THE WALL, EAST WING FULL HEIGHT.
 STAGE 1 :
 5. ROOF SLAB AND HEADWALL OF LEFT EXTENSION.
 RIGHT EXTENSION:
 1. FLOOR SLAB AND APRON SLAB INCLUDING 4" OF ALL VERTICAL WALLS AND OUTER WING WALLS.
 2. THE REMAINING PORTION OF THE WALLS AND OUTER WING WALLS FULL HEIGHT.
 3. ROOF SLAB AND HEADWALL OF RIGHT EXTENSION.
 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.
 THE 600mm Ø AND 450mm Ø PIPES THRU THE SIDEWALL AND WING WALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR THE PIPES.
 AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
 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.
 DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SNSM.
 IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 10.3 MPa.
 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 ALL ELEVATIONS ARE IN METERS.
 AT THE CONTRACTOR'S OPTION THE VERTICAL CONSTRUCTION JOINT BETWEEN THE OUTLET WINGS AND THE BARREL MAY BE ELIMINATED AND THE "C" BARS IN THE BARREL MAY BE EXTENDED TO REPLACE THE "D" AND "H" BARS IN THE WINGS AND SLAB.
 NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
 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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

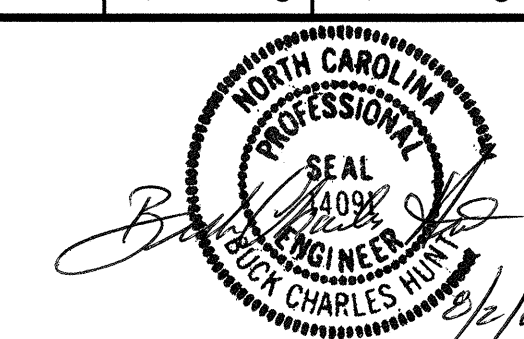
TOTAL STRUCTURE QUANTITIES					
CLASS A CONCRETE	LEFT EXTENSION		RIGHT EXTENSION		TOTAL
	STAGE I	STAGE II			
1 BARREL, 1 WING, 1 EDGE BEAM, & 1 CURTAIN WALL	47.2m ³		BARREL, 1 HEADWALL, 1 EDGE BEAM, & OUTLET WINGS		21.4m ³
1 BARREL, 1 WING, 1 HEADWALL, 2 EDGE BEAMS, & 1 CURTAIN WALL		82.8m ³			
INLET EXTENSION CONCRETE TOTAL			130.0m ³	OUTLET EXTENSION CONCRETE TOTAL	21.4m ³
					151.4m ³
REINFORCING STEEL	LEFT EXTENSION		RIGHT EXTENSION		TOTAL
	STAGE I	STAGE II			
BARREL, 1 WING, 1 EDGE BEAM, & 1 CURTAIN WALL	4,969 kg		BARREL, 1 HEADWALL, 1 EDGE BEAM, & OUTLET WINGS		2,520 kg
BARREL, 1 HEADWALL, 2 EDGE BEAMS, 1 WING, & 1 CURTAIN WALL		8,608 kg			
INLET EXTENSION REINFORCING STEEL			13,577 kg	OUTLET EXTENSION REINFORCING STEEL	2,520 kg
					16,097 kg
CULVERT EXCAVATION LUMP SUM					
FOUNDATION COND. MAT'L		143 METRIC TONS			
PLAIN RIP RAP CLASS I		46 METRIC TONS			
FILTER FABRIC FOR DRAINAGE		92 SQUARE METERS			



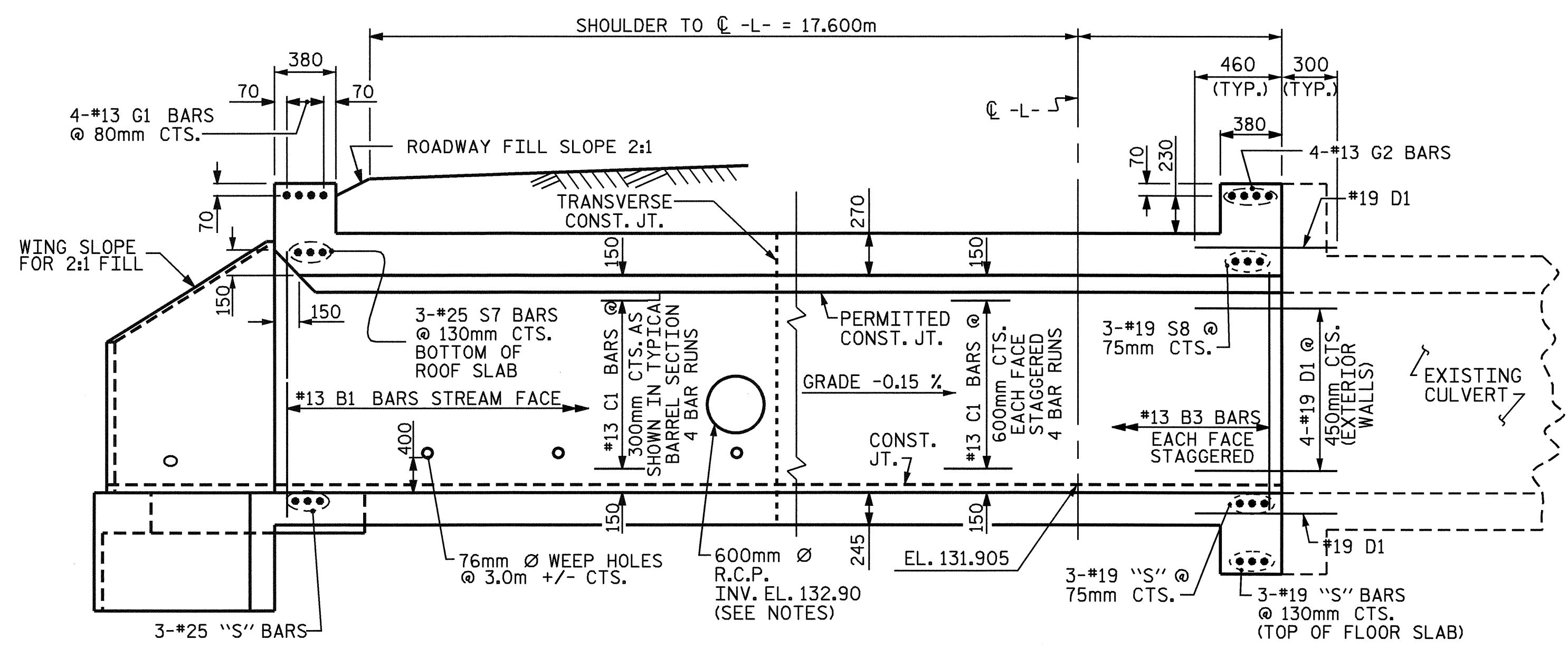
PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 200+25.352 -L-

SHEET 1 OF 9

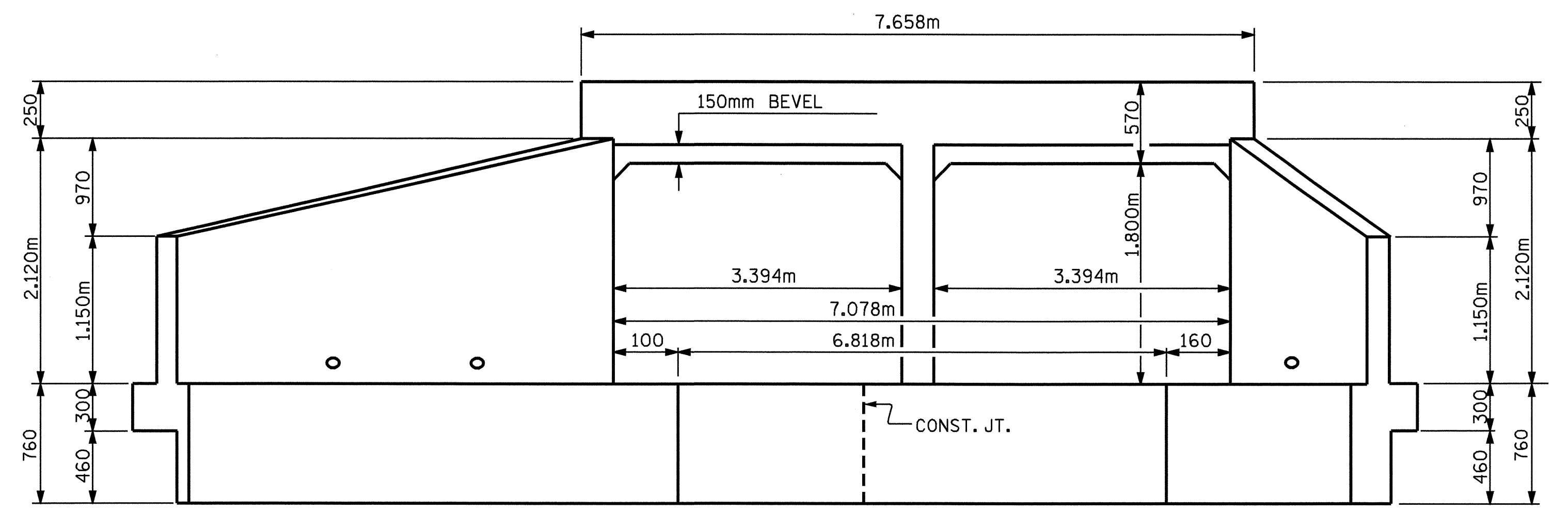
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DOUBLE 2.4m X 1.8m (LEFT EXTENSION)
 &
 DOUBLE 2.4m X 2.1m (RIGHT EXTENSION)
 CONCRETE BOX CULVERT
 119°-37'-08" SKEW



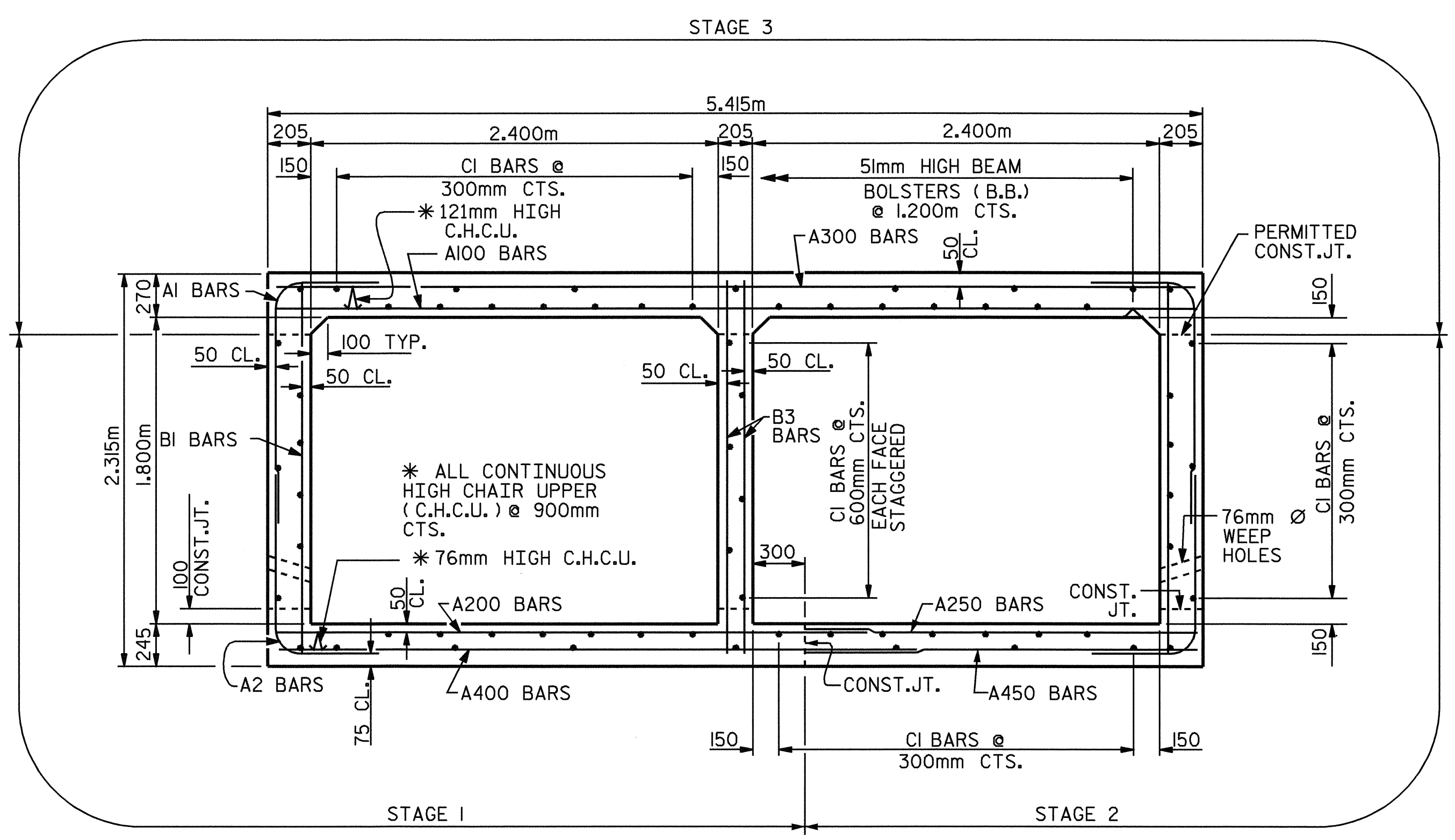
REVISIONS						SHEET NO. C-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			



EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY

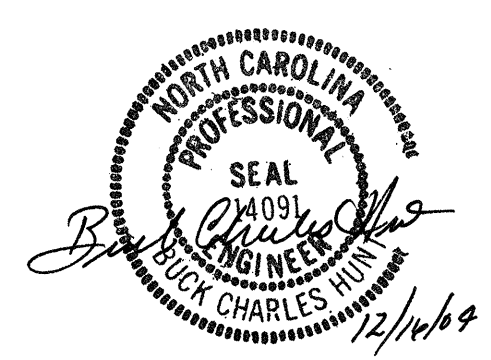


END ELEVATION NORMAL TO SKEW
 INLET END



RIGHT ANGLE SECTION OF BARREL
 THERE ARE 66 "C" BARS IN SECTION OF BARREL.
 LOOKING UPSTREAM

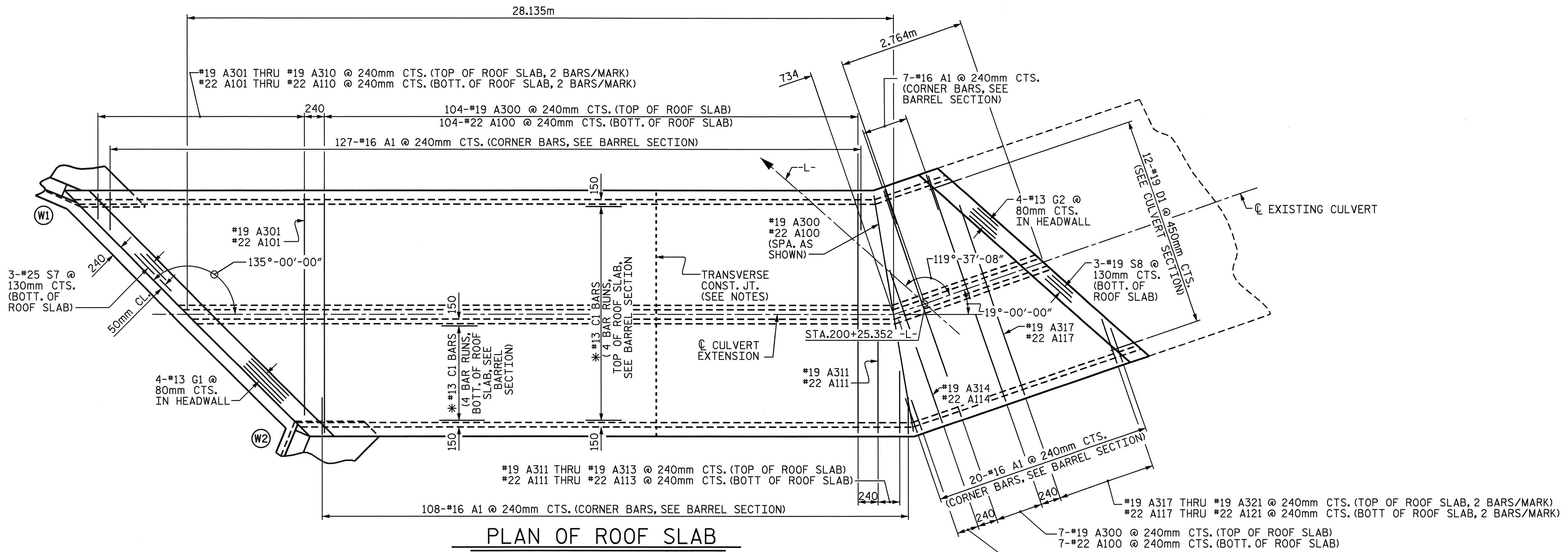
ASSEMBLED BY: A.R.CHESSON DATE: 2-04
 CHECKED BY: M.K.BEARD DATE: 2-23-04
 DRAWN BY: EEM 6/97
 CHECKED BY: ARB 7/97



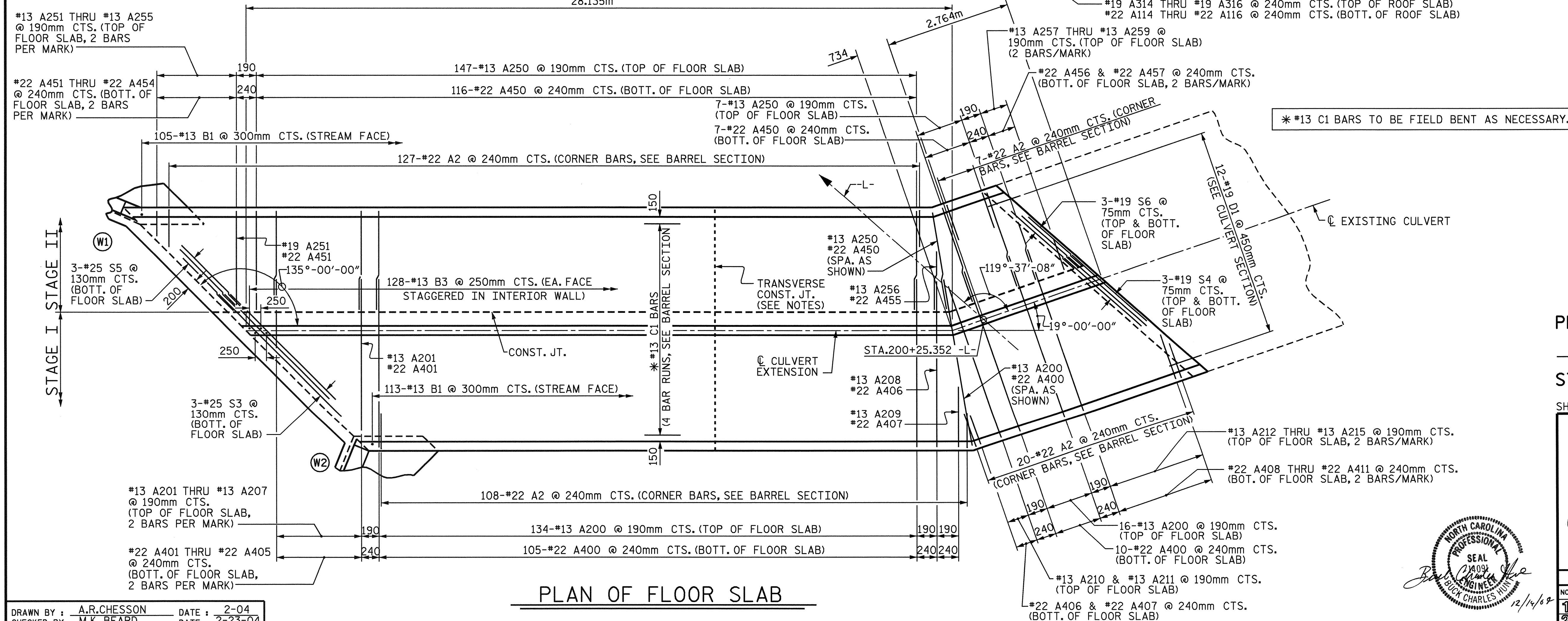
PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 200+25.352 -L-

SHEET 2 OF 9
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DOUBLE 2.4m X 1.8m
(LEFT EXTENSION)
CONCRETE BOX CULVERT
119°-37'-08" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-II
1			3			TOTALS
2			4			23



PLAN OF ROOF SLAB

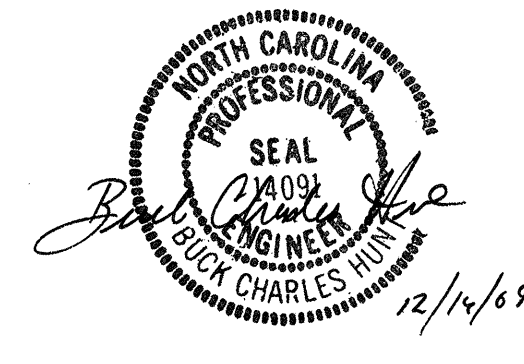


PLAN OF FLOOR SLAB

DRAWN BY : A.R.CHESSON DATE : 2-04
 CHECKED BY : M.K.BEARD DATE : 2-23-04

16-DEC-2004 07:44
 W:\squads\7\R0967cc\FINALP-1\R0967CC_sd.cu.02.dgn
 klayne

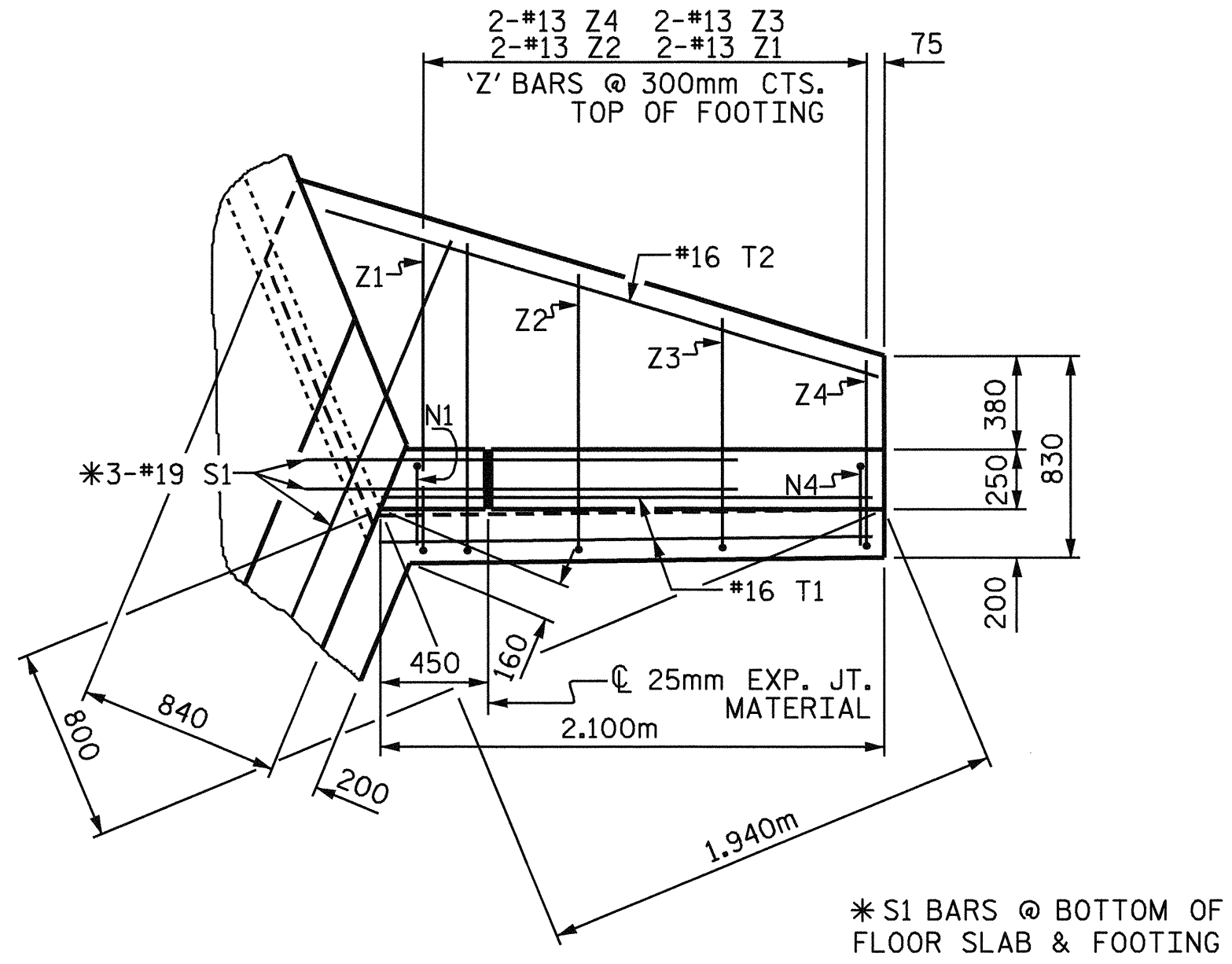
* #13 C1 BARS TO BE FIELD BENT AS NECESSARY.



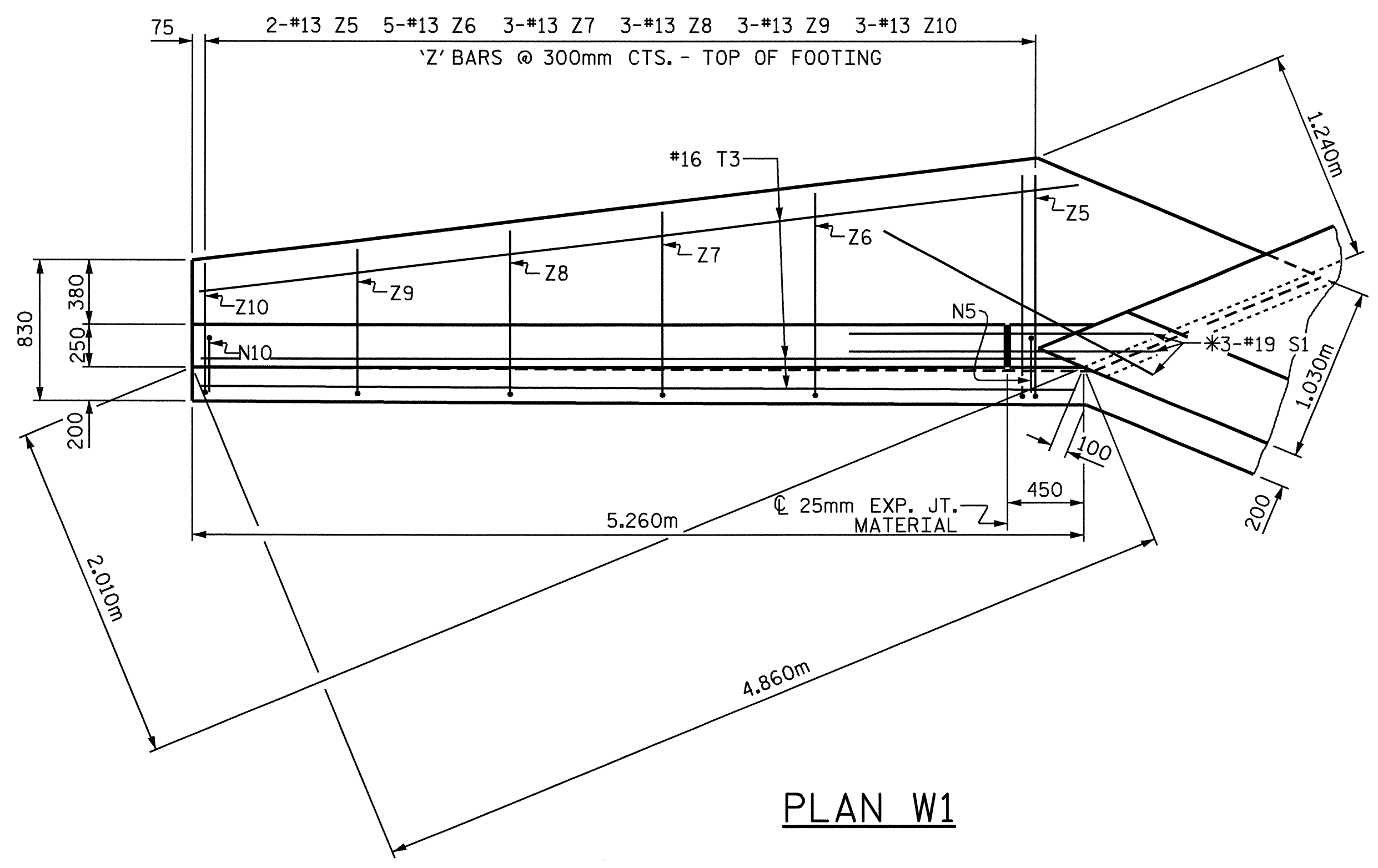
PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 200+25.352 -L-

SHEET 3 OF 9

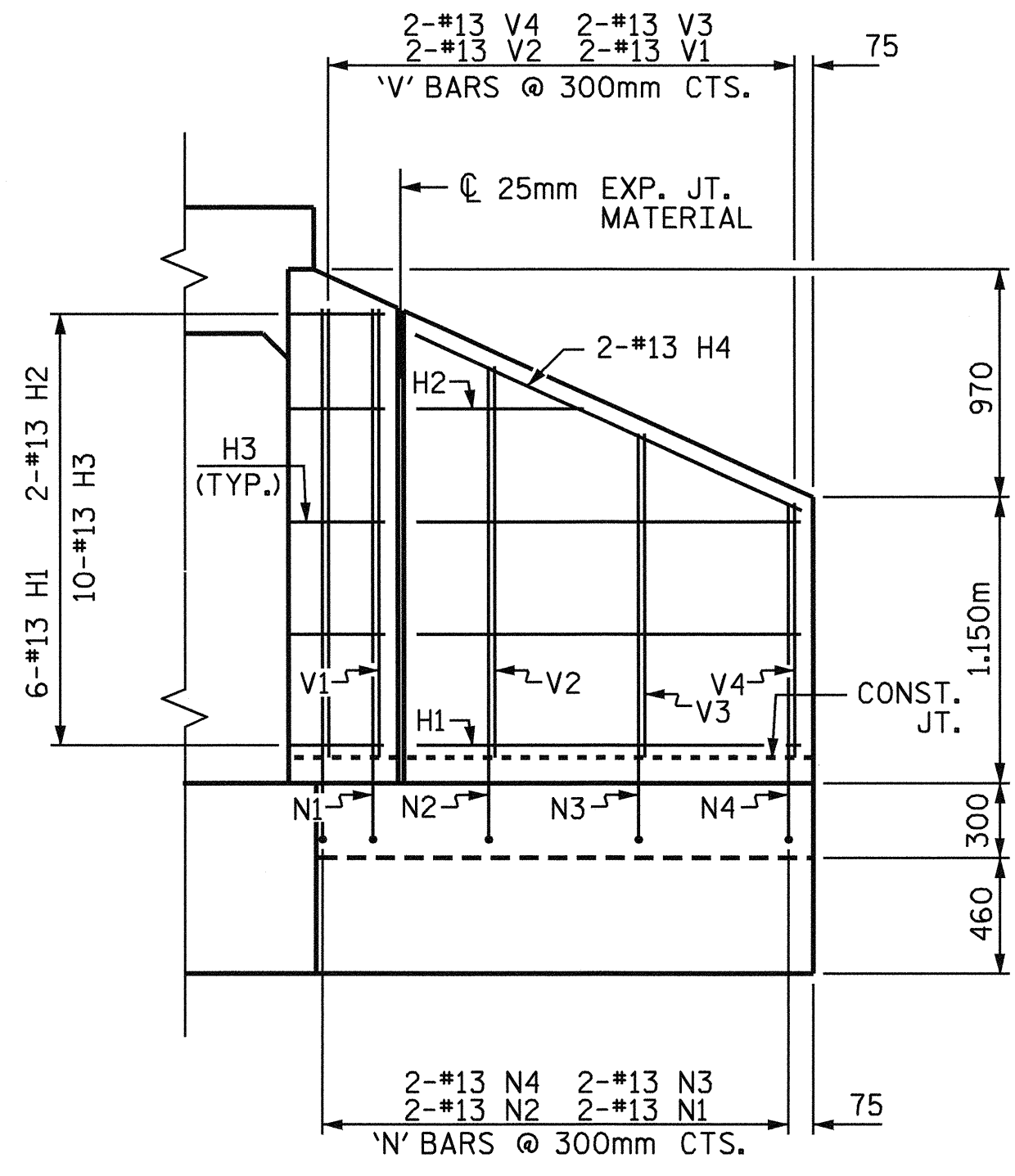
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
DOUBLE 2.4m X 1.8m (LEFT EXTENSION) CONCRETE BOX CULVERT 119°-37'-08" SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. C-12					TOTAL SHEETS 23



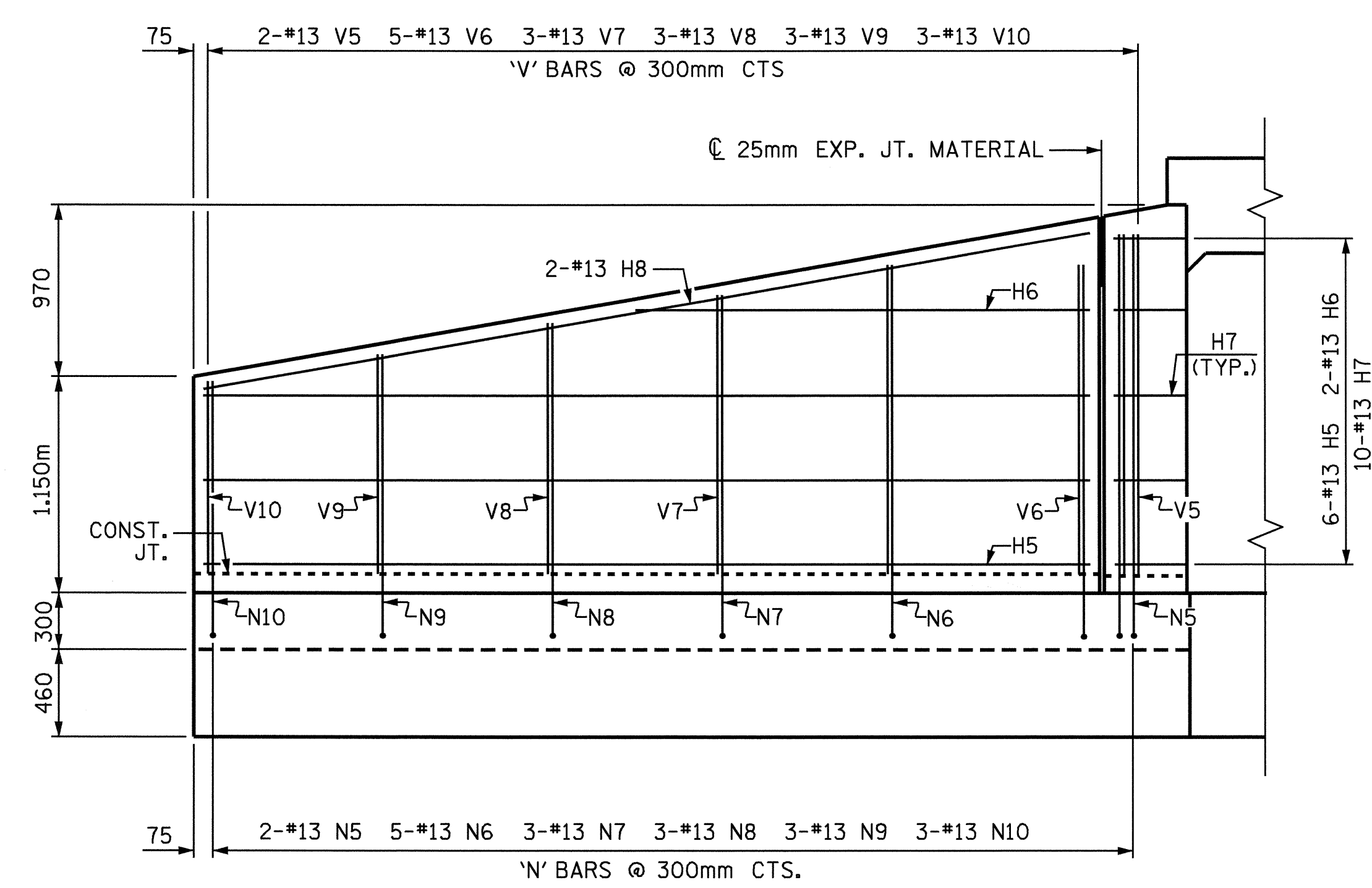
PLAN W2



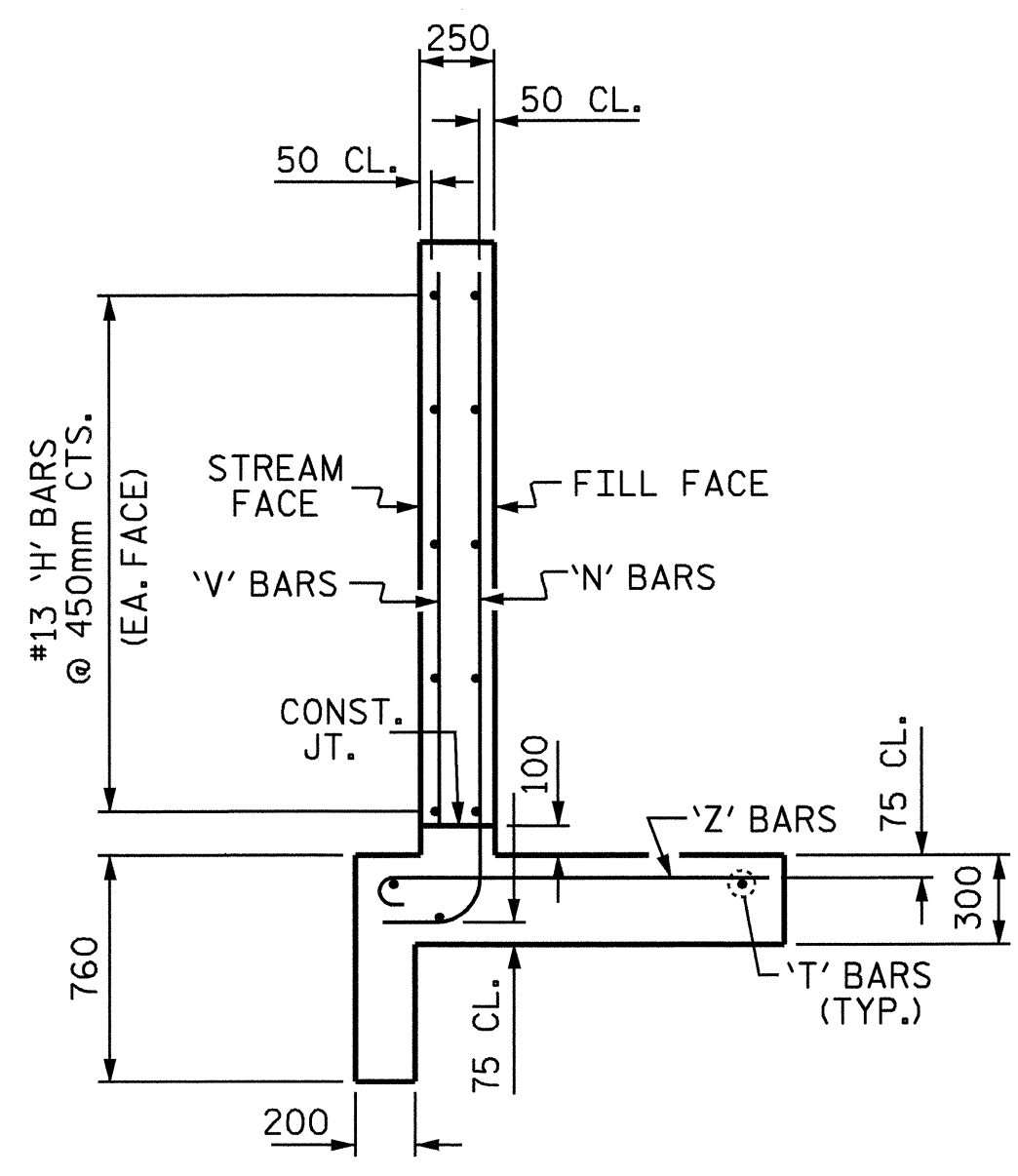
PLAN W1



ELEVATION W2



ELEVATION W1



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	6	13	STR	1540	9
H2	2	13	STR	720	1
H3	10	13	STR	980	10
H4	2	13	STR	1680	3
H5	6	13	STR	4700	28
H6	2	13	STR	2760	5
H7	10	13	STR	980	10
H8	2	13	STR	4760	9
N1	2	13	STR	2440	5
N2	2	13	STR	2220	4
N3	2	13	STR	1940	4
N4	2	13	STR	1660	3
N5	2	13	STR	2540	5
N6	2	13	STR	2320	12
N7	3	13	STR	2140	6
N8	3	13	STR	1980	6
N9	3	13	STR	1820	5
N10	3	13	STR	1660	5
S1	6	19	STR	1800	24
T1	2	16	STR	2100	7
T2	1	16	STR	2400	4
T3	3	16	STR	5260	24
V1	2	13	STR	1820	4
V2	2	13	STR	1600	7
V3	2	13	STR	1320	7
V4	2	13	STR	1040	2
V5	2	13	STR	1920	4
V6	5	13	STR	1700	8
V7	3	13	STR	1520	5
V8	3	13	STR	1360	4
V9	3	13	STR	1200	4
V10	3	13	STR	1040	3
Z1	2	13	STR	1820	4
Z2	2	13	STR	1600	7
Z3	2	13	STR	1320	7
Z4	2	13	STR	1040	2
Z5	2	13	STR	1920	4
Z6	2	13	STR	1700	8
Z7	3	13	STR	1520	5
Z8	3	13	STR	1360	4
Z9	3	13	STR	1200	4
Z10	3	13	STR	1040	3

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	13	STR	1540	9
H2	2	13	STR	720	1
H3	10	13	STR	980	10
H4	2	13	STR	1680	3
H5	6	13	STR	4700	28
H6	2	13	STR	2760	5
H7	10	13	STR	980	10
H8	2	13	STR	4760	9
N1	2	13	STR	2440	5
N2	2	13	STR	2220	4
N3	2	13	STR	1940	4
N4	2	13	STR	1660	3
N5	2	13	STR	2540	5
N6	2	13	STR	2320	12
N7	3	13	STR	2140	6
N8	3	13	STR	1980	6
N9	3	13	STR	1820	5
N10	3	13	STR	1660	5
S1	6	19	STR	1800	24
T1	2	16	STR	2100	7
T2	1	16	STR	2400	4
T3	3	16	STR	5260	24
V1	2	13	STR	1820	4
V2	2	13	STR	1600	7
V3	2	13	STR	1320	7
V4	2	13	STR	1040	2
V5	2	13	STR	1920	4
V6	5	13	STR	1700	8
V7	3	13	STR	1520	5
V8	3	13	STR	1360	4
V9	3	13	STR	1200	4
V10	3	13	STR	1040	3
Z1	2	13	STR	1820	4
Z2	2	13	STR	1600	7
Z3	2	13	STR	1320	7
Z4	2	13	STR	1040	2
Z5	2	13	STR	1920	4
Z6	2	13	STR	1700	8
Z7	3	13	STR	1520	5
Z8	3	13	STR	1360	4
Z9	3	13	STR	1200	4
Z10	3	13	STR	1040	3

REINFORCING STEEL FOR 2 WING WALLS 260 kg

CLASS A CONCRETE

2 WINGS	6.4	m ³
1 HEADWALL	1.7	m ³
1 END CURTAIN WALL	0.3	m ³
TOTAL	8.4	m³

PROJECT NO. R-0967CC
 STANLY COUNTY
 STATION: 200+25.352 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD WINGS FOR
 CONCRETE BOX CULVERT
 (LEFT EXTENSION)

H=1.800m SLOPE=2:1
 135° SKEW

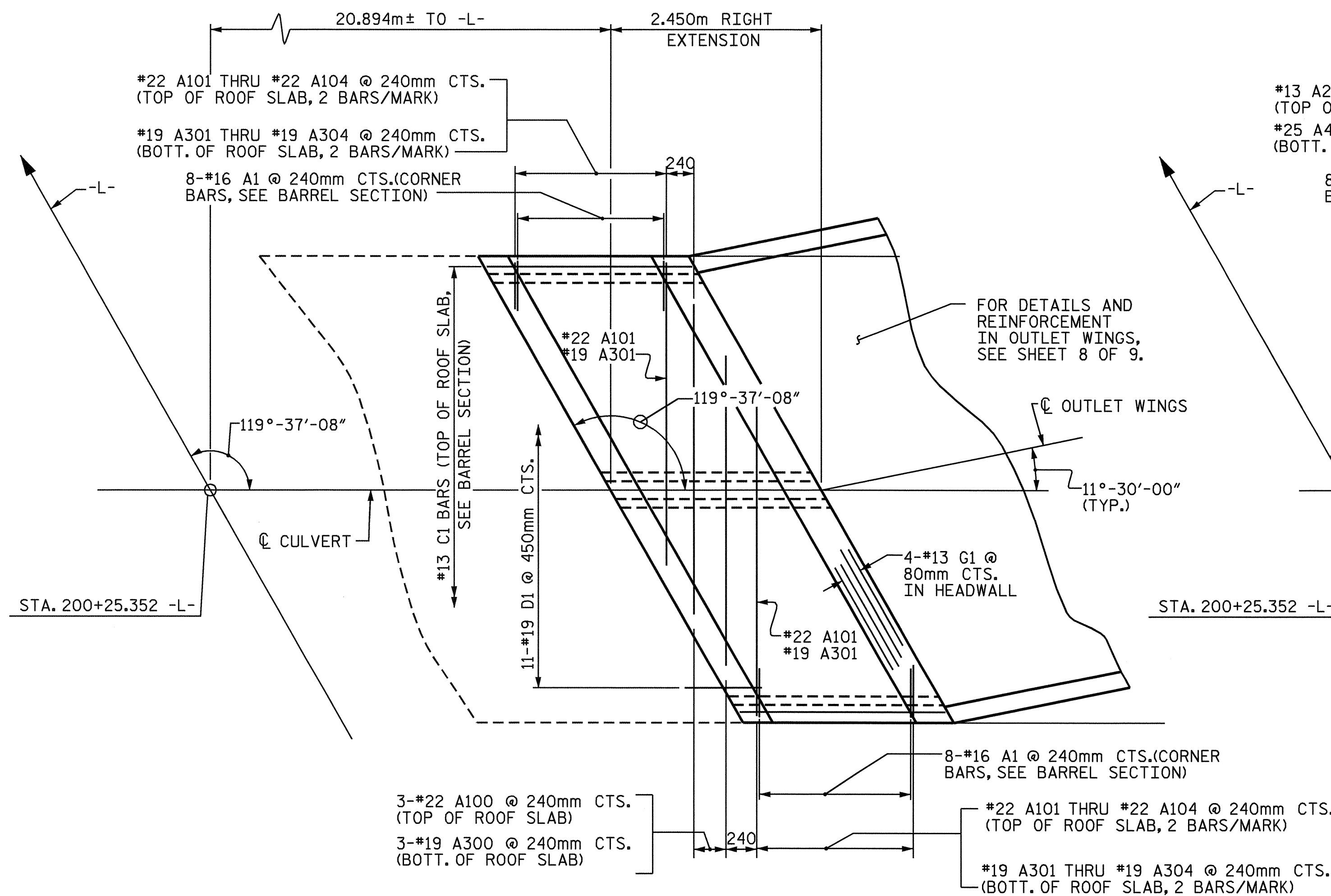


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-14	
1			3			TOTAL	23
2			4			SHEETS	23

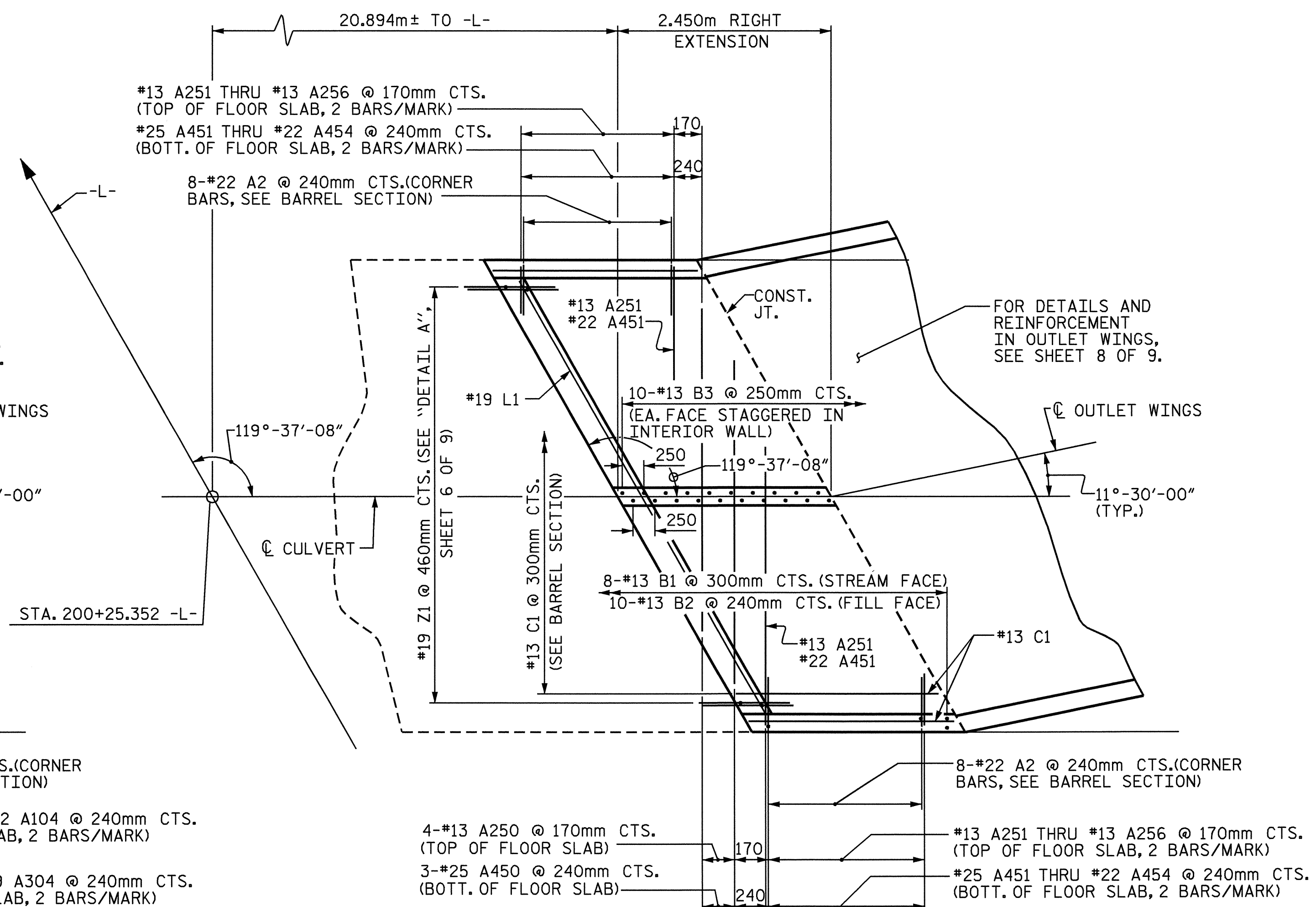
ASSEMBLED BY: A.R.CHESSON DATE: 12-03
 CHECKED BY: M.K.BEARD DATE: 2-23-04

DRAWN BY: JLR 7/97
 CHECKED BY: VAP 7/97

FOR WING ORIENTATION, SEE BARREL STANDARD SHEET.



PLAN OF ROOF SLAB



PLAN OF FLOOR SLAB

PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 200+25.352 -L-

SHEET 7 OF 9

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 2.4m X 2.1m
 CONCRETE BOX CULVERT
 (RIGHT EXTENSION)
 119°-37'-08" SKEW

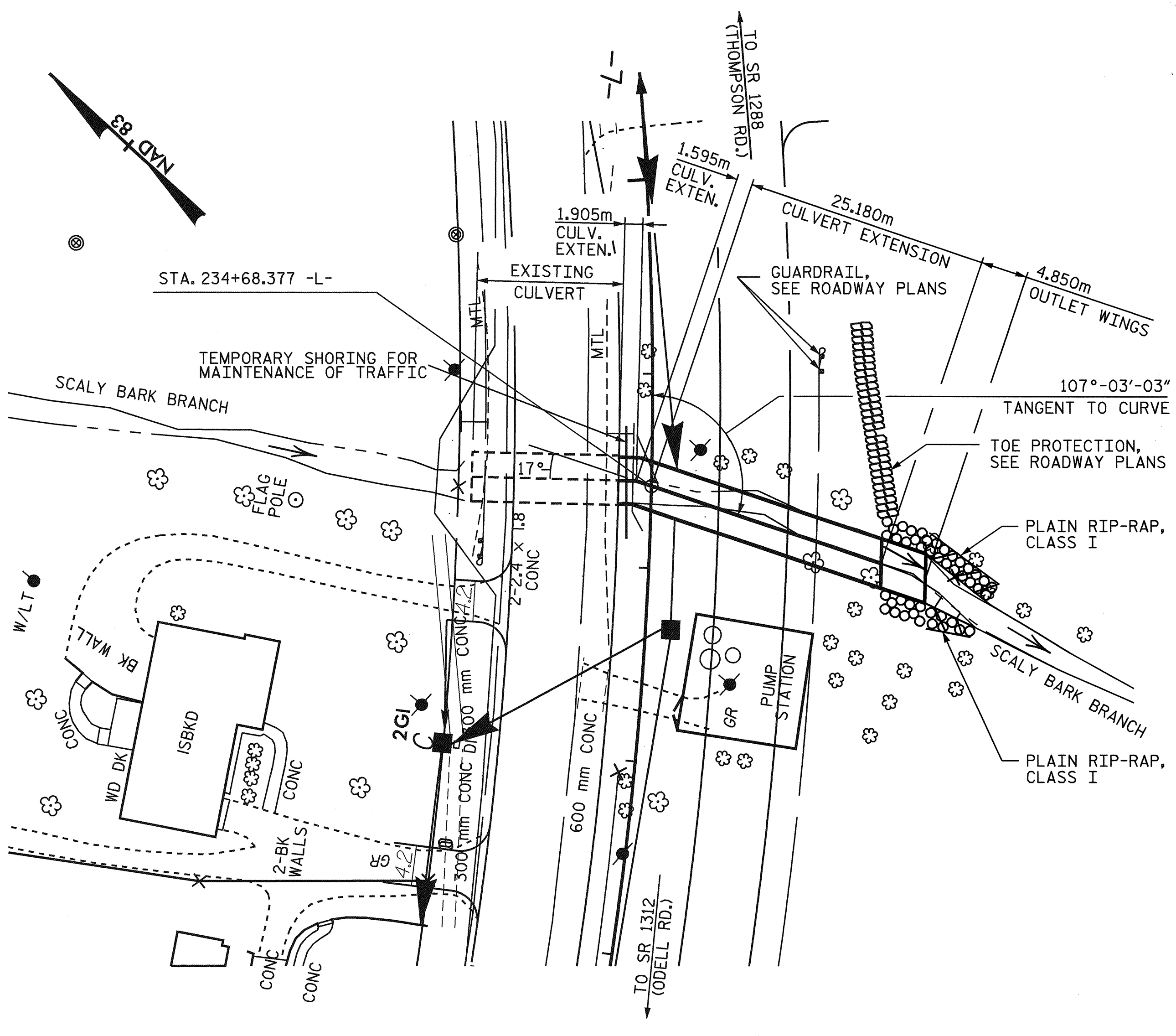


DRAWN BY: A.R.CHESSON DATE: 12-03
 CHECKED BY: M.K.BEARD DATE: 2-23-04

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 klayne

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			23
2			4			

B.M. 37 RR SPIKE IN BASE OF 1100mm OAK, LOCATED 78.600 RIGHT OF -BL- STA. 233+50.500, EL. 131.677



LOCATION SKETCH

NOTE: FOR UTILITY CONFLICTS, SEE UTILITY PLANS AND SPECIAL PROVISIONS

ROADWAY DATA

GRADE POINT EL. @ STA. 234+68.377-L- = 134.109
 BED ELEVATION @ STA. 234+68.377 -L- = 129.940
 ROADWAY SLOPES _____ = 2 : 1

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 18 m³/s
 FREQUENCY OF DESIGN FLOOD _____ = 50 YRS
 DESIGN HIGH WATER ELEVATION _____ = 132.140
 DRAINAGE AREA _____ = 2.74 Sq Km
 BASIC DISCHARGE (Q100) _____ = 22 m³/s
 BASIC HIGH WATER ELEVATION _____ = 132.430

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = > 34 m³/s
 FREQUENCY OF OVERTOPPING FLOOD _____ = 500 YRS +
 OVERTOPPING FLOOD ELEVATION _____ = 134.450

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE (CUBIC METERS)	STAGE 1	STAGE 2	TOTAL
BARREL & OUTLET WINGS	52.8	70.0	
HEADWALL, CURTAIN WALL & SILLS	1.9	2.0	
TOTAL	54.7	72.0	126.7
REINFORCING STEEL (KILOGRAMS)			
BARREL & OUTLET WINGS, ETC.	5,118	7,224	
TOTAL	5,118	7,224	12,342
FOUNDATION COND. MAT'L (METRIC TONS)	71	53	124
CULVERT EXCAVATION			LUMP SUM
PLAIN RIP-RAP, CLASS I (METRIC TONS)			53
FILTER FABRIC FOR DRAINAGE (SQ M)			57
PLAIN RIP-RAP, CLASS A (METRIC TONS)			65

NOTES

ASSUMED LIVE LOAD ----- MS18 OR ALTERNATE LOADING.
 DESIGN FILL - RIGHT EXTENSION = 3.29m
 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 FOR RIGHT EXTENSION :
 1. FLOOR SLAB (STAGE I) INCLUDING 100mm OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS (STAGE I) FULL HEIGHT.
 3. FLOOR SLAB (STAGE II) INCLUDING 100mm OF ALL VERTICAL WALLS.
 4. THE REMAINING PORTIONS OF THE WALLS AND WINGS (STAGE II) FULL HEIGHT.
 FOLLOWED BY ROOF AND HEADWALL
 THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
 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 21m. 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 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.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSION. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 10.3 MPa.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.

ALL ELEVATIONS ARE IN METERS.

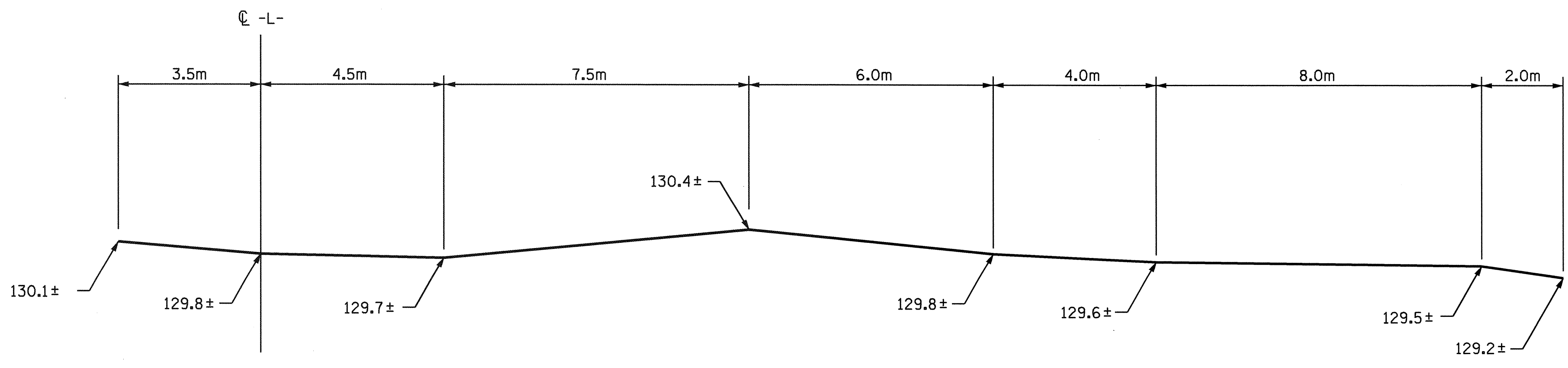
NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

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

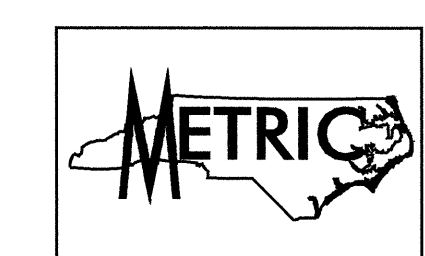
THE 750mm Ø & 450mm Ø PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.



PROFILE ALONG CULVERT



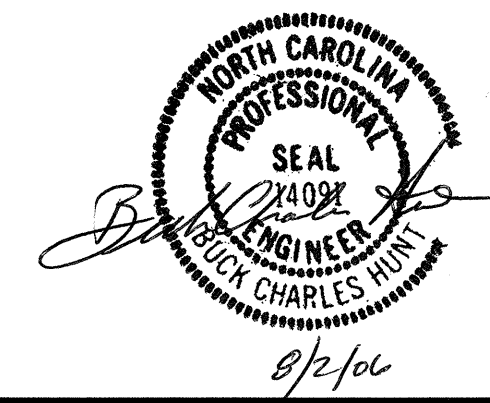
PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 234+68.377 -L-

SHEET 1 OF 6

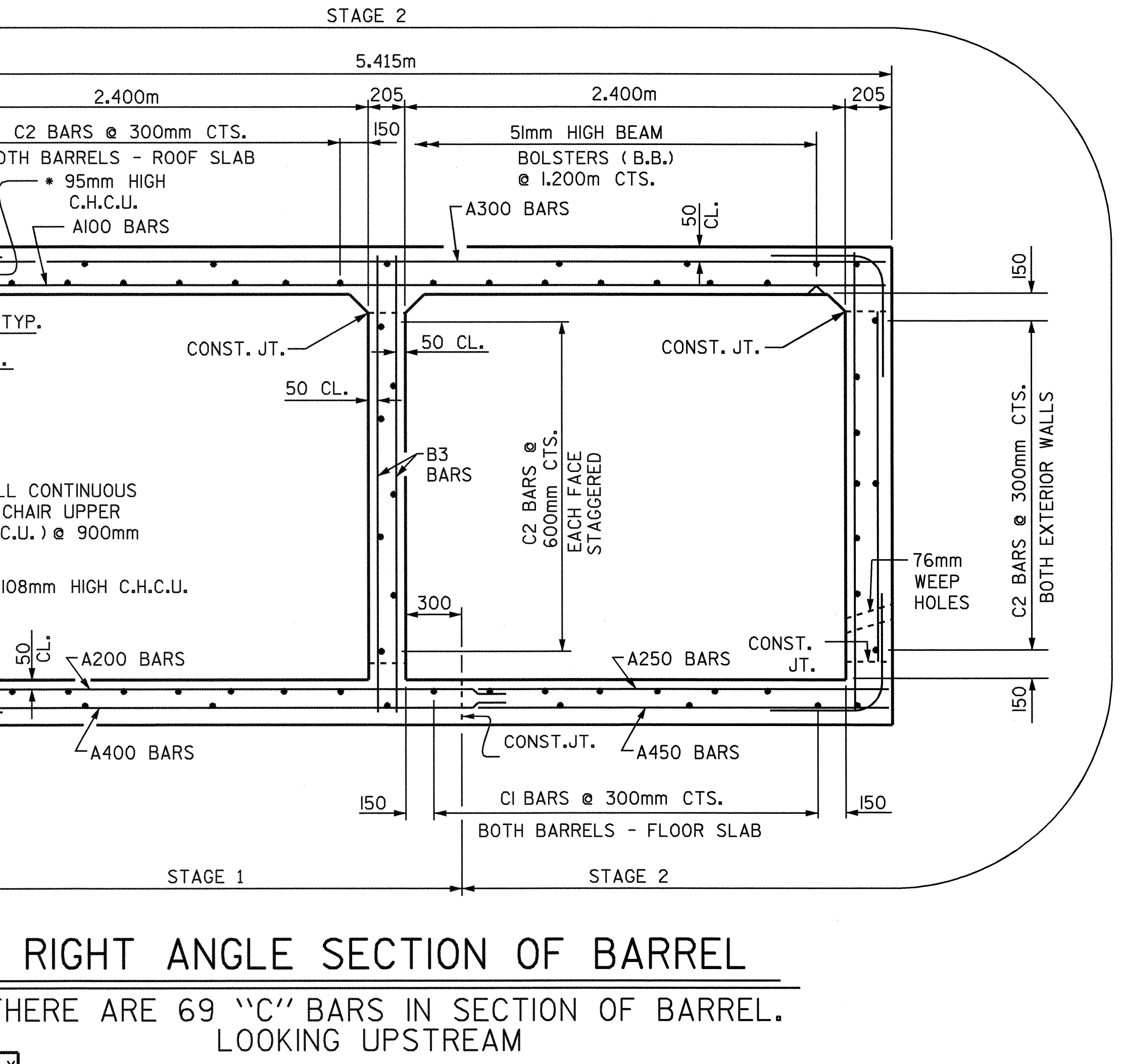
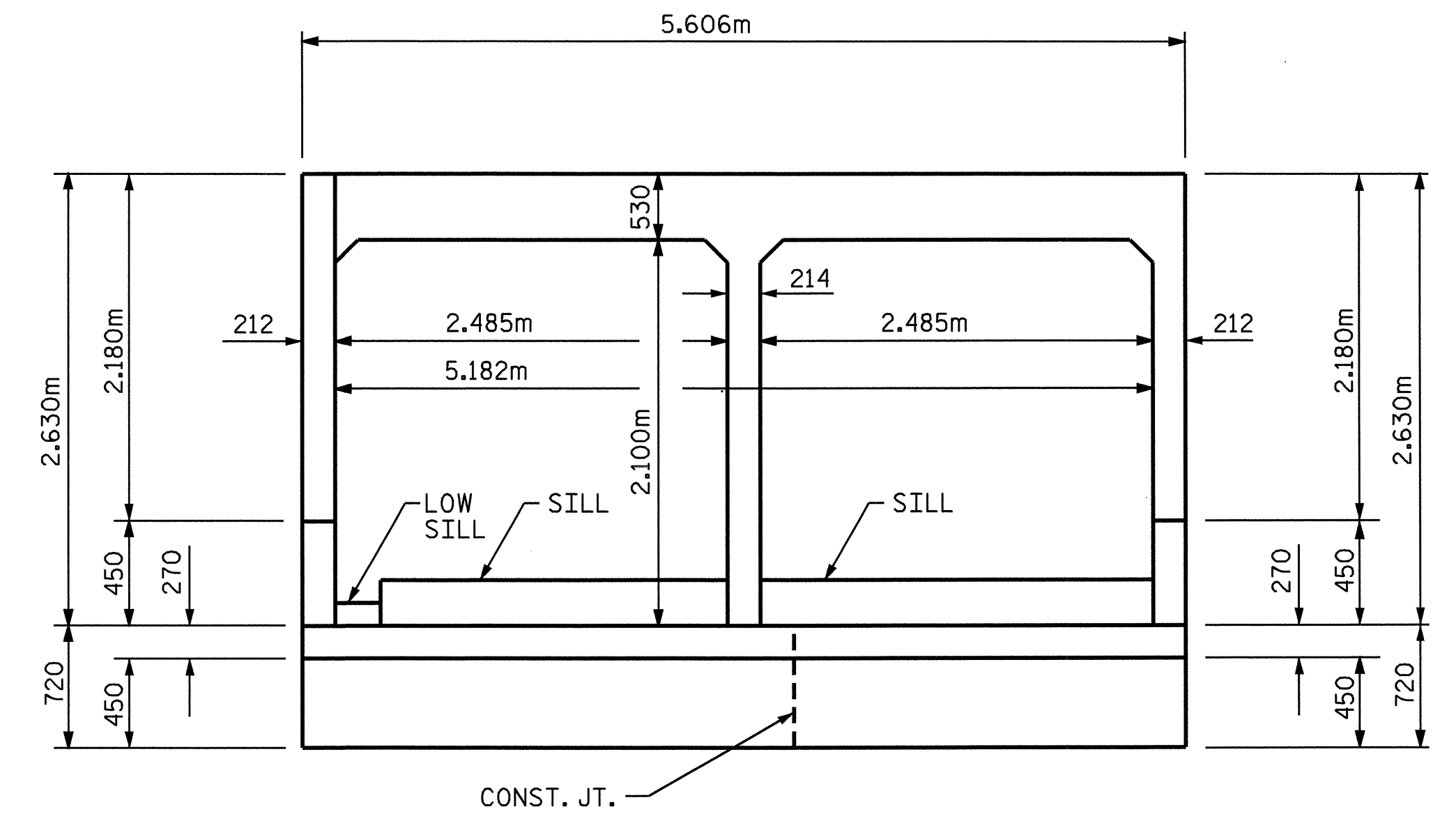
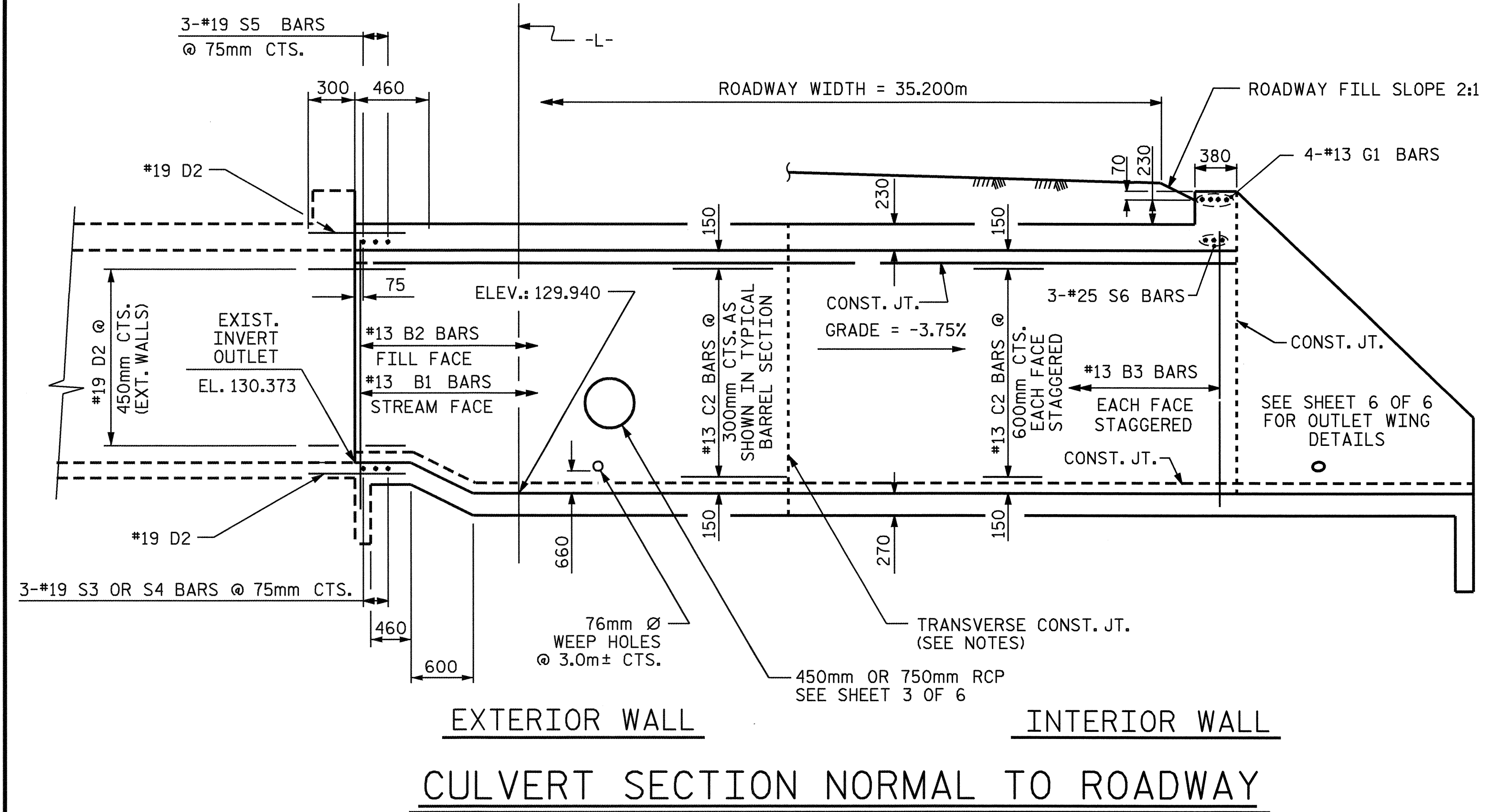
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**DOUBLE BARREL
 2.400m X 2.100m
 CONCRETE BOX CULVERT
 107°-03'-03" SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-18
1			3			TOTAL SHEETS 23
2			4			



DRAWN BY : R. L. CHESSON DATE : 2003 JULY
 CHECKED BY : A. R. CHESSON DATE : 9-03



PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 234+68.377 -L-

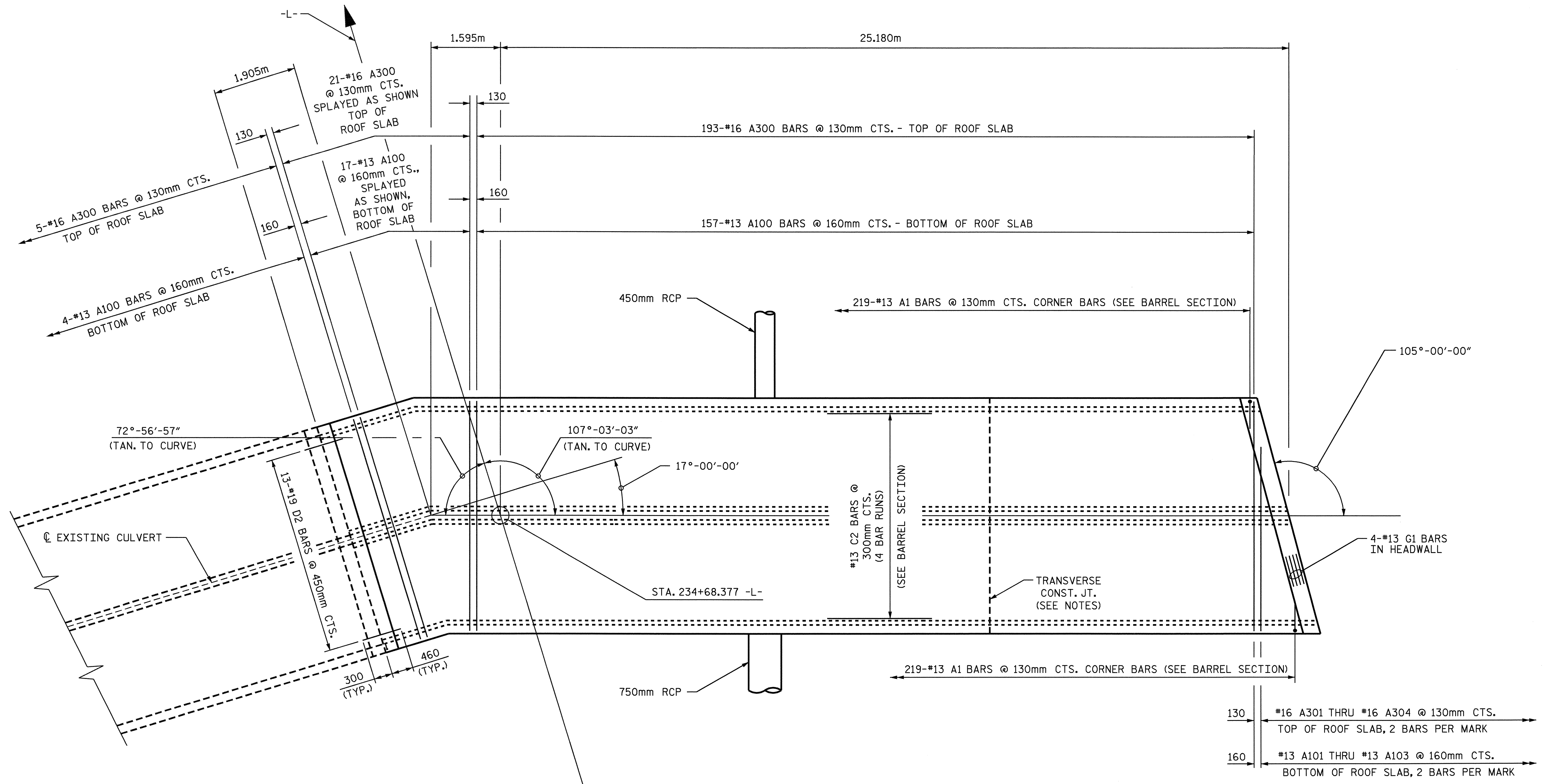
SHEET 2 OF 6
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DOUBLE BARREL
2.400m X 2.100m
CONCRETE BOX CULVERT
107°-03'-03" SKEW



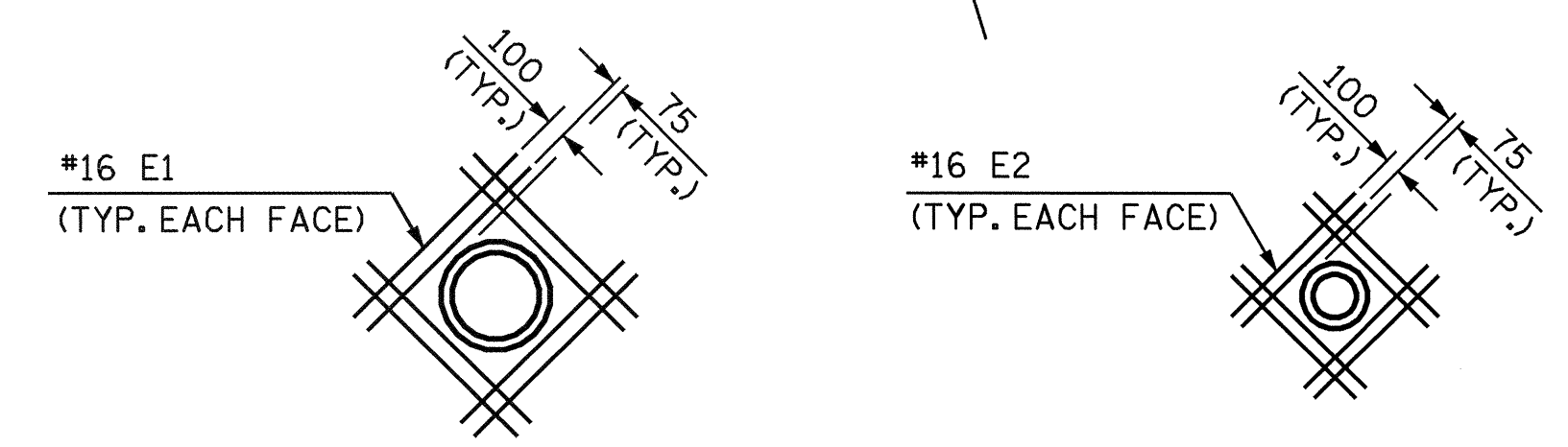
DRAWN BY: R. L. CHESSON DATE: 2003 JULY
 CHECKED BY: A. R. CHESSON DATE: 9-03

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

TOTAL SHEETS: **23**



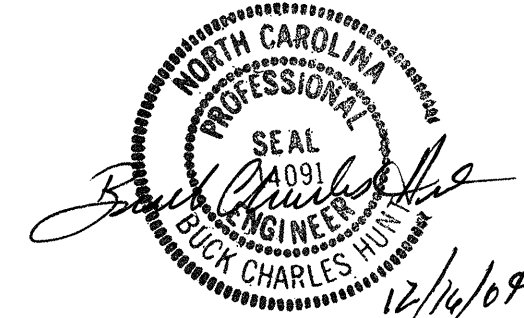
PLAN OF ROOF SLAB



REINFORCEMENT AROUND RCP IN WALLS

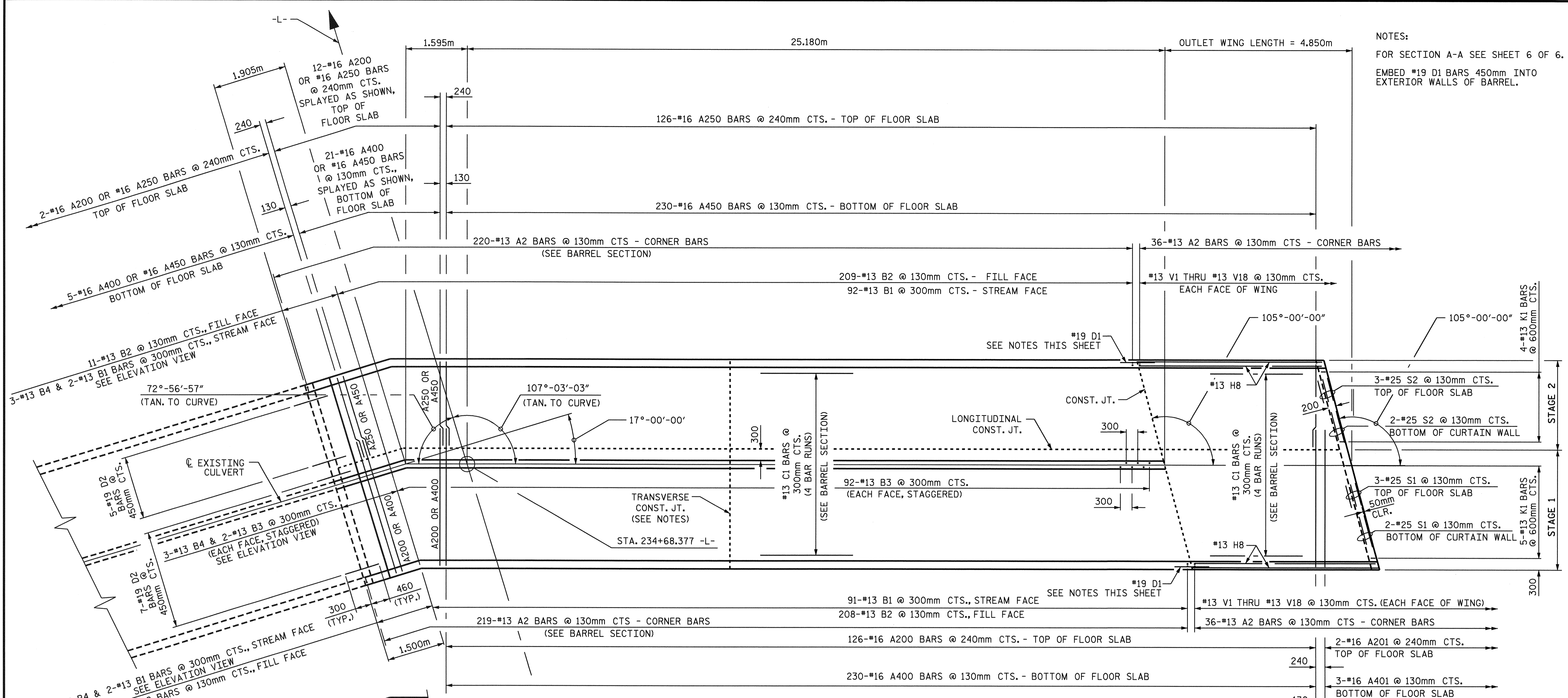
PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 234+68.377 -L-
 SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DOUBLE BARREL
 2.400m X 2.100m
CONCRETE BOX CULVERT
 107°-03'-03" SKEW



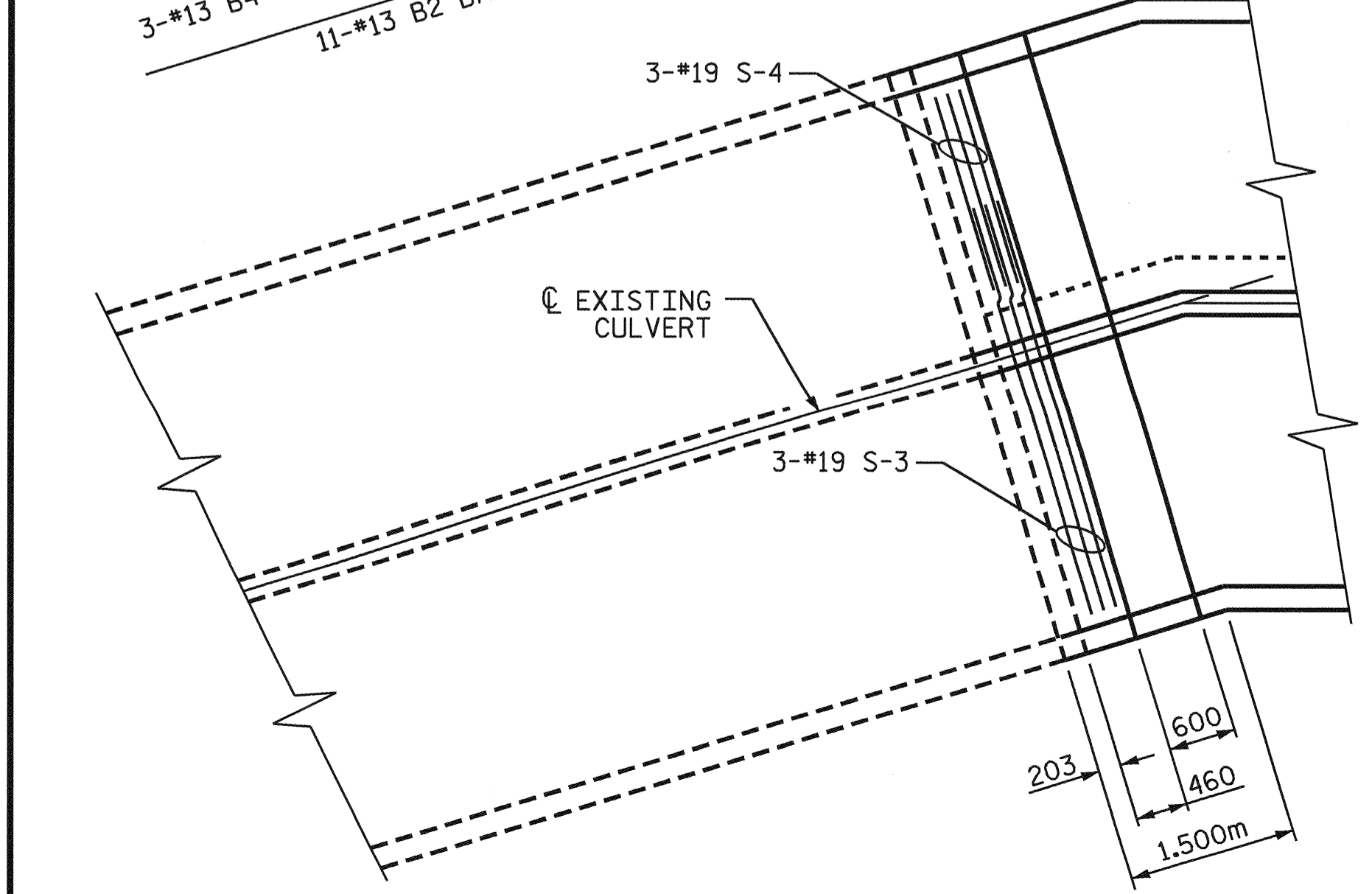
DRAWN BY : R. L. CHESSON DATE : 2003 JULY
 CHECKED BY : A. R. CHESSON DATE : 9-03

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-20	
1			3			TOTAL	23
2			4			SHEETS	

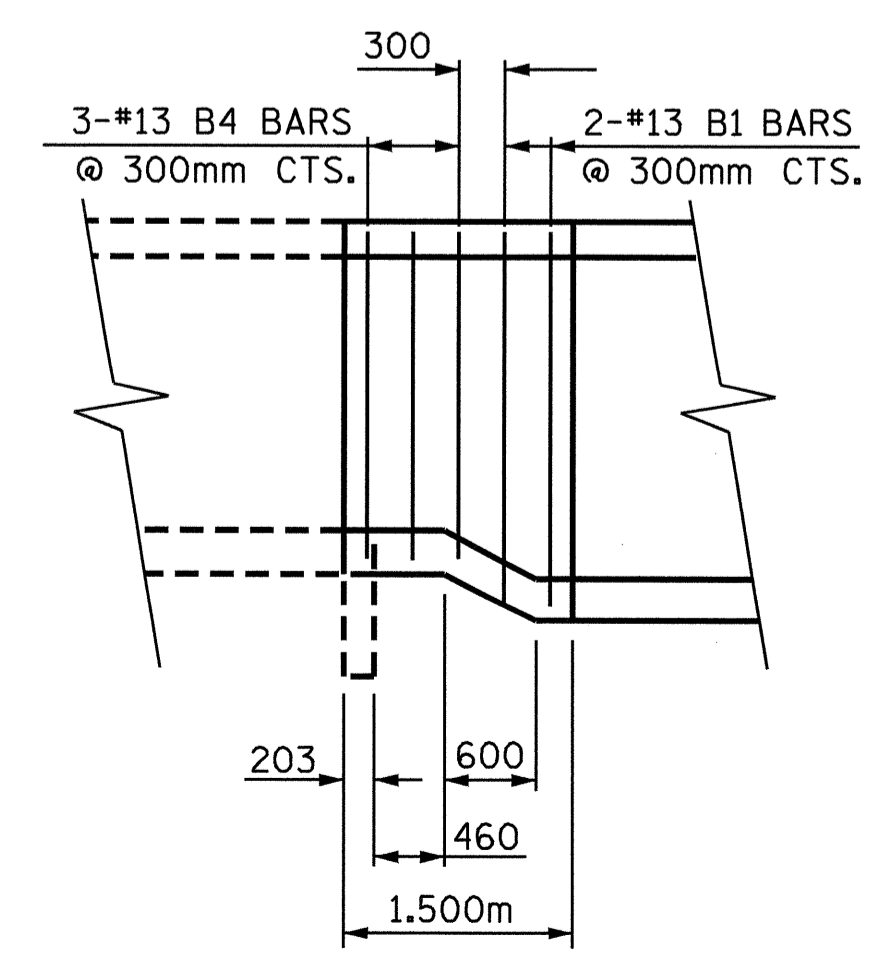


NOTES:
FOR SECTION A-A SEE SHEET 6 OF 6.
EMBED #19 D1 BARS 450mm INTO EXTERIOR WALLS OF BARREL.

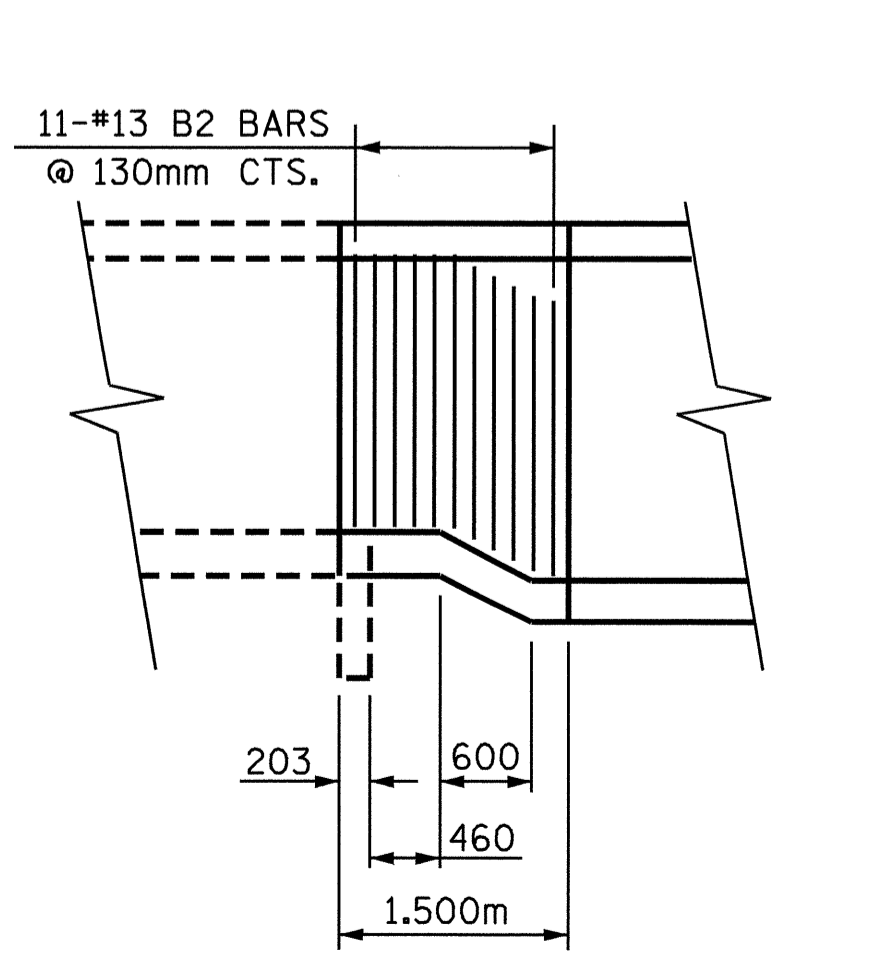
PLAN OF FLOOR & OUTLET WINGS



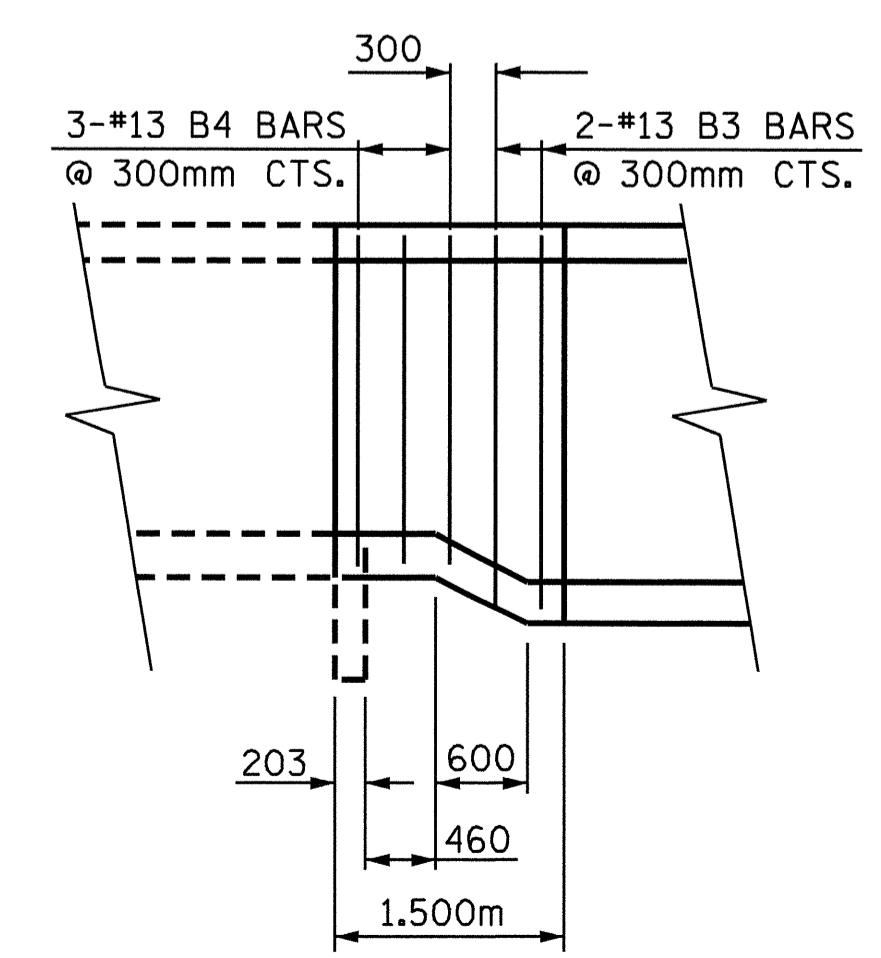
PARTIAL PLAN OF FLOOR



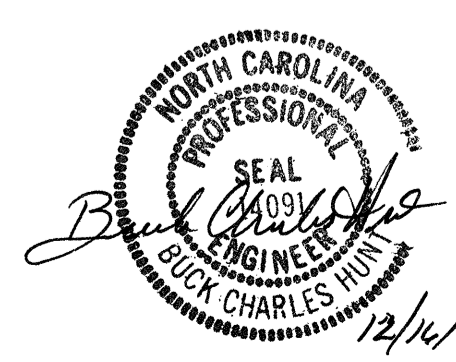
EXTERIOR WALL ELEVATION
STREAM FACE



EXTERIOR WALL ELEVATION
FILL FACE



INTERIOR WALL ELEVATION

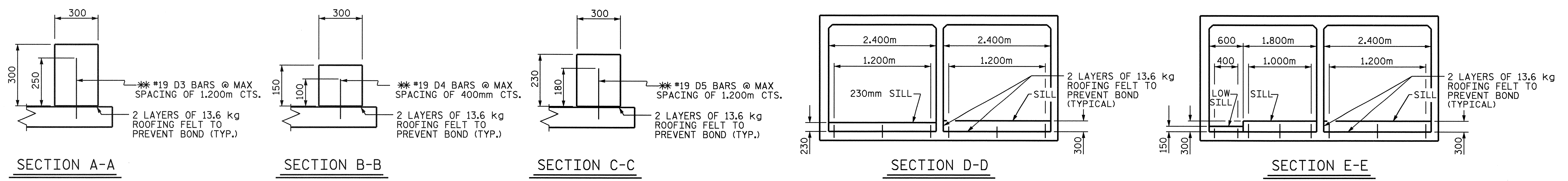


PROJECT NO. R-0967CC
STANLY COUNTY
STATION: 234+68.377 -L-
SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
DOUBLE BARREL
2.400m X 2.100m
CONCRETE BOX CULVERT
107°-03'-03" SKEW

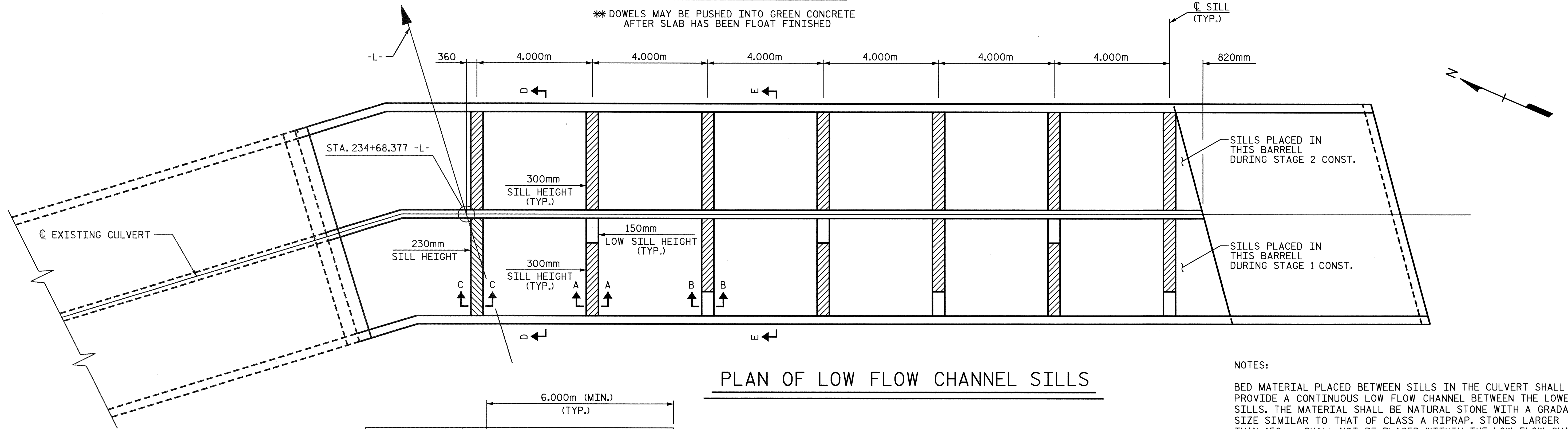
DRAWN BY: R. L. CHESSON DATE: 2003 JULY
CHECKED BY: A. R. CHESSON DATE: 9-03

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-21	
1			3			TOTAL SHEETS 23	
2			4				



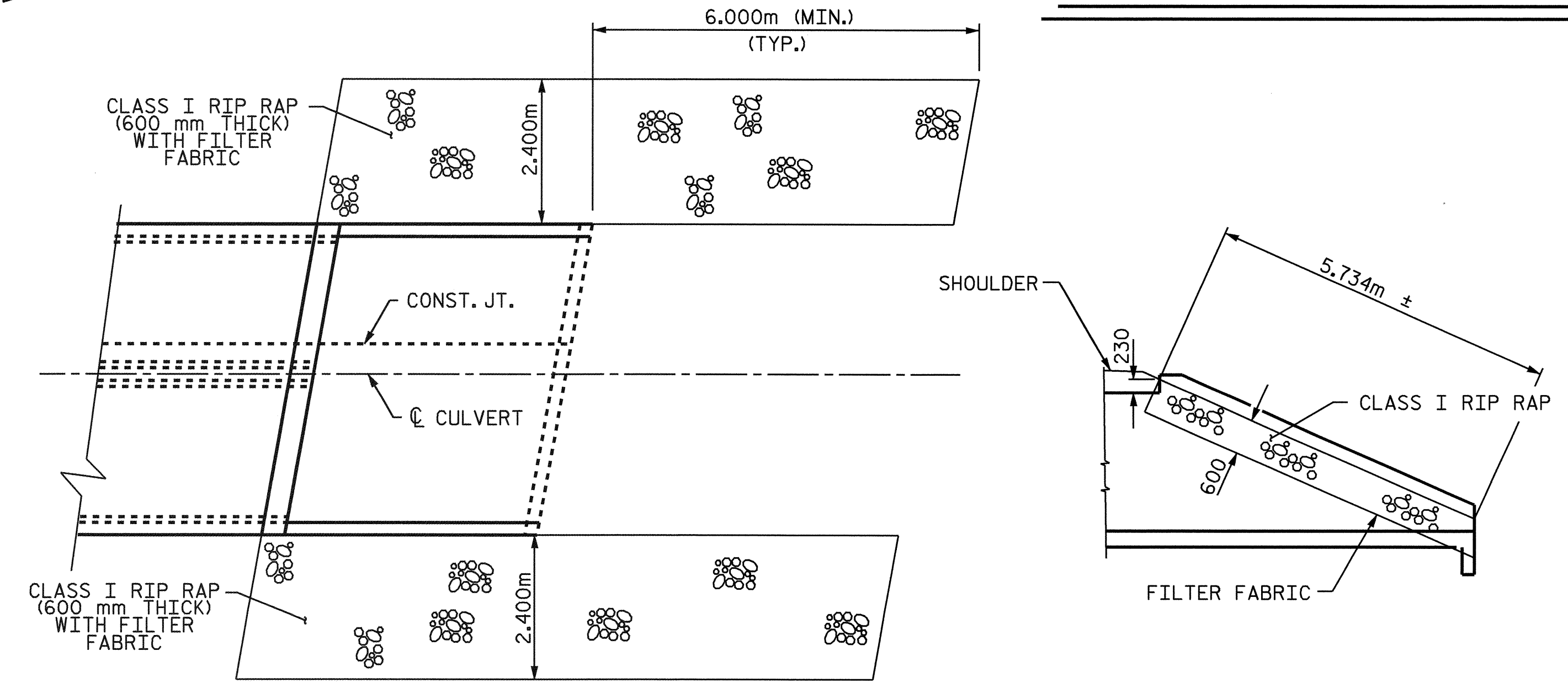
CHANNEL SILL DETAILS

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



PLAN OF LOW FLOW CHANNEL SILLS

NOTES:
BED MATERIAL PLACED BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS A RIPRAP. STONES LARGER THAN 150mm SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER.
THE 300mm x 300mm, 230mm x 300mm and 150mm x 300mm SILLS ARE TO BE CAST SEPARATE FROM THE FLOOR SLAB.



PLAN VIEW
ELEVATION VIEW
OUTLET WING RIP RAP DETAILS

PROJECT NO. R-0967CC
STANLY COUNTY
STATION: 234+68.377 -L-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
DOUBLE BARREL
2.400m X 2.100m
CONCRETE BOX CULVERT
107°-03'-03" SKEW



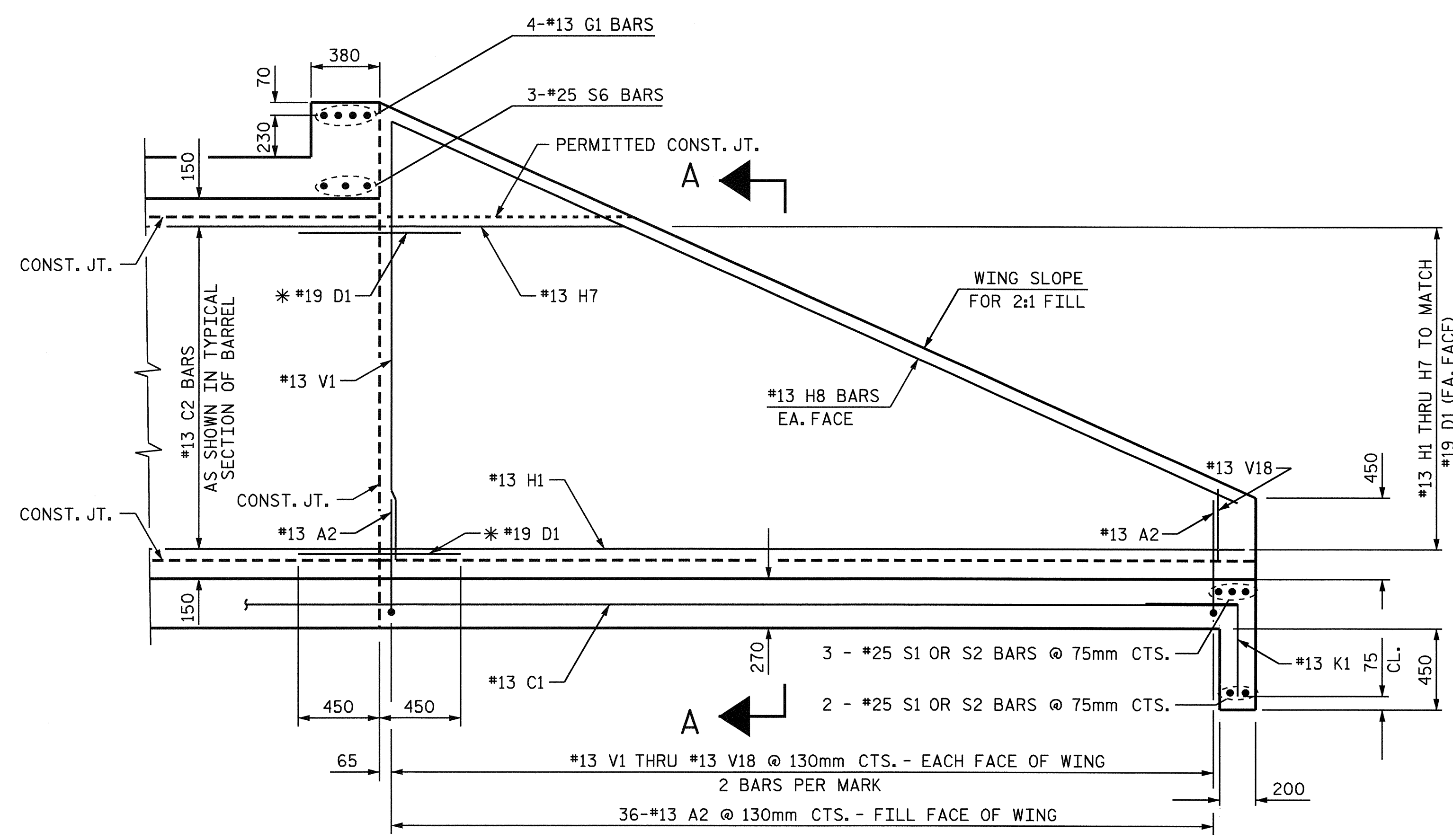
DRAWN BY: R. L. CHESSON DATE: 2003 JULY
CHECKED BY: A. R. CHESSON DATE: 9-03

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-22	
1			3			TOTAL	23
2			4			SHEETS	23

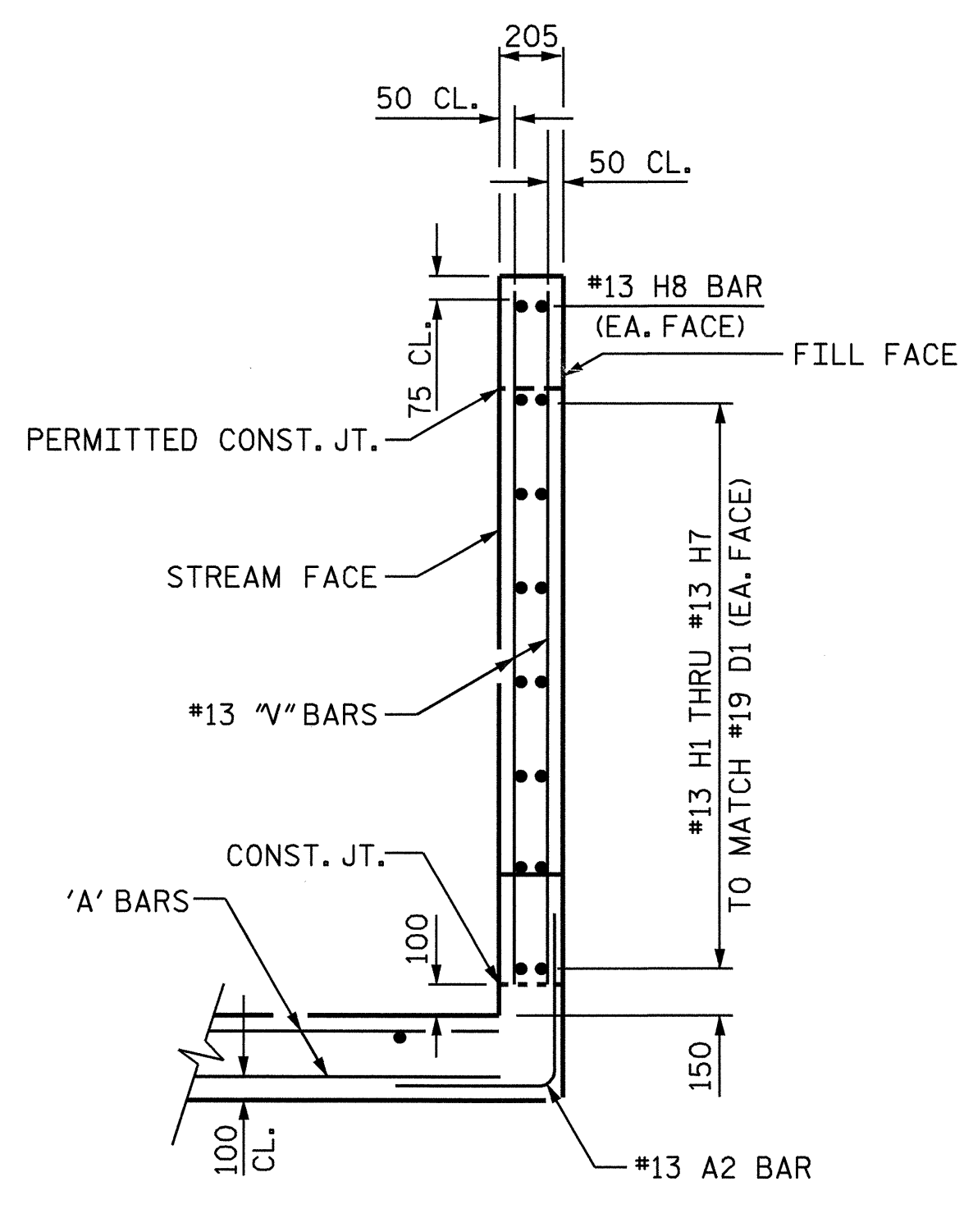
BAR TYPES	REINFORCING STEEL RIGHT EXTENSION STAGE I										REINFORCING STEEL RIGHT EXTENSION STAGE II													
	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT				
	A200	140	16	STR	3,660	795	K1	5	13	7	1,020	5	A100	178	13	STR	5,280	934	H1	2	13	STR	4,740	9
	A201	2	16	STR	2,280	7	S1	5	25	STR	4,680	93	A101	2	13	STR	4,020	8	H2	2	13	STR	4,600	9
	A400	256	16	STR	3,780	1,502	S3	3	19	STR	3,500	24	A102	2	13	STR	2,840	6	H3	2	13	STR	3,940	8
	A401	3	16	STR	4,280	20	V1	2	13	STR	2,380	5	A103	2	13	STR	1,640	3	H4	2	13	STR	3,280	7
	A1	219	13	6	1,425	310	V2	2	13	STR	2,280	5	A250	140	16	STR	2,200	478	H5	2	13	STR	2,600	5
	A2	255	13	6	1,465	371	V3	2	13	STR	2,160	4	A300	219	16	STR	5,280	1,795	H6	2	13	STR	1,940	4
	B1	93	13	STR	2,440	226	V4	2	13	STR	2,040	4	A301	2	16	STR	4,280	13	H7	2	13	STR	1,320	3
	B2	219	13	STR	1,880	409	V5	2	13	STR	1,920	4	A302	2	16	STR	3,320	10	H8	2	13	STR	5,140	10
	B3	94	13	STR	2,440	228	V6	2	13	STR	1,800	4	A303	2	16	STR	2,340	7	K1	4	13	7	1,020	4
	B4	6	13	STR	2,140	13	V7	2	13	STR	1,700	3	A304	2	16	STR	1,380	4	S2	5	25	STR	2,340	47
	C1	52	13	STR	8,820	456	V8	2	13	STR	1,580	3	A450	256	16	STR	2,200	874	S4	3	19	STR	2,300	15
	C2	60	13	STR	7,680	458	V9	2	13	STR	1,460	3	A1	220	13	6	1,425	312	S5	3	19	STR	5,400	36
	D1	8	19	STR	900	16	V10	2	13	STR	1,340	3	A2	256	13	6	1,465	373	S6	3	25	STR	5,500	66
	D2	12	19	STR	760	12	V11	2	13	STR	1,220	2	V1	2	13	STR	2,380	5	V1	2	13	STR	2,380	5
	D3	18	19	STR	440	18	V12	2	13	STR	1,100	2	V2	2	13	STR	2,280	5	V2	2	13	STR	2,280	5
	D4	12	19	STR	280	8	V13	2	13	STR	1,000	2	B1	94	13	STR	2,440	228	V3	2	13	STR	2,160	4
	D5	3	19	STR	360	2	V14	2	13	STR	880	2	B2	230	13	STR	1,880	411	V4	2	13	STR	2,040	4
	E1	16	16	STR	1,580	39	V15	2	13	STR	760	2	B4	3	13	STR	2,140	6	V5	2	13	STR	1,920	4
	H1	2	13	STR	4,740	9	V16	2	13	STR	640	1	C1	40	13	STR	8,820	351	V6	2	13	STR	1,800	4
	H2	2	13	STR	4,600	9	V17	2	13	STR	520	1	C2	124	13	STR	7,680	947	V7	2	13	STR	1,700	3
H3	2	13	STR	3,940	8	V18	2	13	STR	400	1	D1	8	19	STR	900	16	V8	2	13	STR	1,580	3	
H4	2	13	STR	3,280	7	TOTAL (Kg) = 5,118										V9	2	13	STR	1,460	3			
H5	2	13	STR	2,600	5	D2	12	19	STR	760	12	D2	24	19	STR	760	41	V10	2	13	STR	1,340	3	
H6	2	13	STR	1,940	4	D3	18	19	STR	440	18	D3	21	19	STR	440	21	V11	2	13	STR	1,220	2	
H7	2	13	STR	1,320	3	E2	16	16	STR	1,200	30	E2	16	16	STR	1,200	30	V12	2	13	STR	1,100	2	
H8	2	13	STR	5,140	10	G1	4	13	STR	5,500	22	G1	4	13	STR	5,500	22	V13	2	13	STR	1,000	2	
										TOTAL (Kg) = 7,224														

SPLICE LENGTHS CHART

BAR SIZE	SPLICE LENGTH
A200 #16	540
A400 #16	670
B1 #13	540
B3 #13	540
C1 #13	590
C2 #13	590
"S" #20	1500



ELEVATION-OUTLET WING



SECTION A-A

PROJECT NO. R-0967CC
STANLY COUNTY
 STATION: 234+68.377 -L-
 SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DOUBLE BARREL
2.400m X 2.100m
CONCRETE BOX CULVERT
107°-03'-03" SKEW



DRAWN BY : R. L. CHESSON DATE : 2003 JULY
 CHECKED BY : A. R. CHESSON DATE : 9-03

* PLACE D1 BARS TO MATCH C2 BARS IN EXTERIOR WALLS OF BARREL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-23	
1			3			TOTAL SHEETS	23
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 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.

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