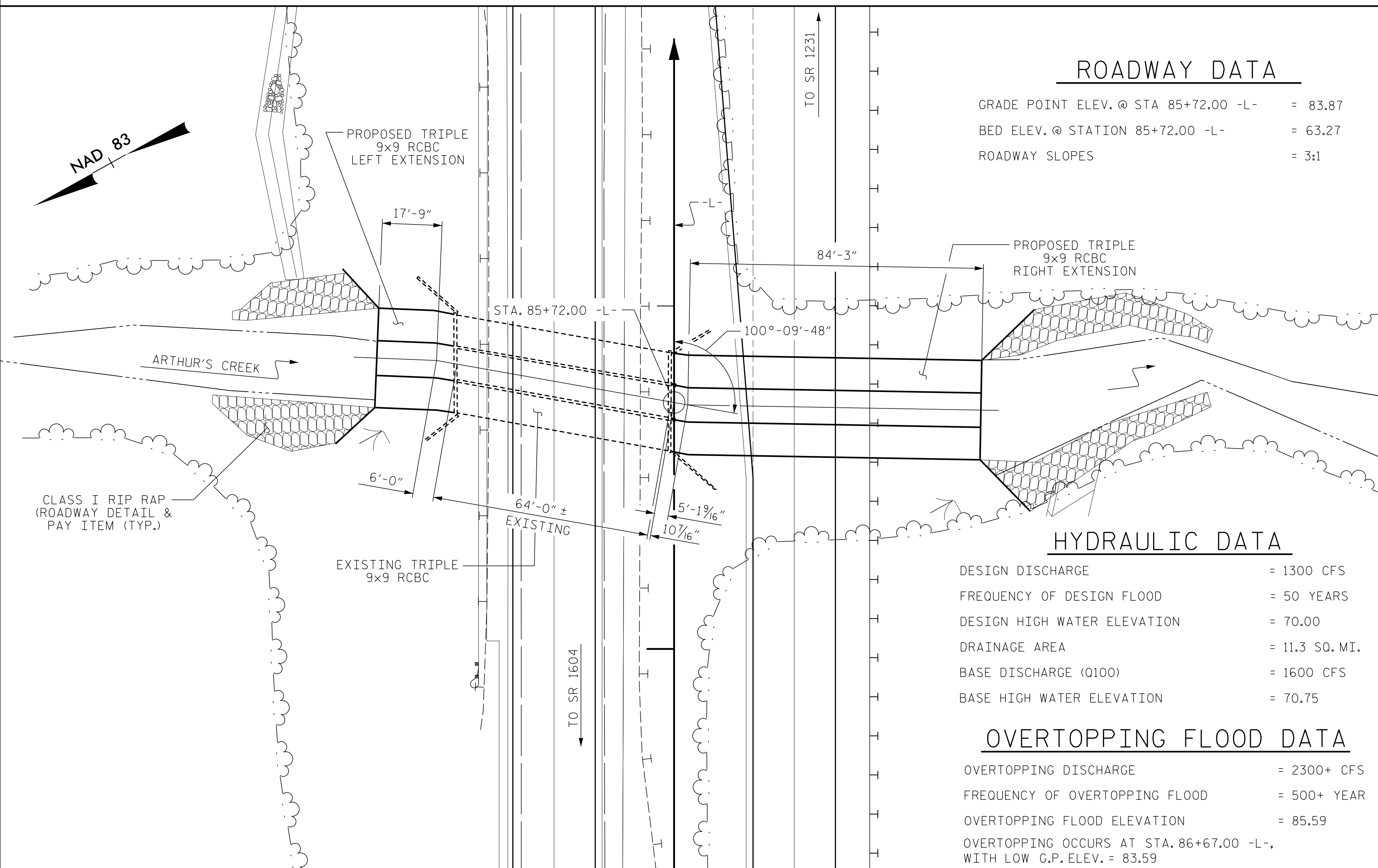


BM #2 RR SPIKE IN 24" PINE, STA. 74+28.00 -L-, 81.00' LT., EL. 87.35 (N 989026; E 2412995)



ROADWAY DATA

GRADE POINT ELEV. @ STA 85+72.00 -L- = 83.87
 BED ELEV. @ STATION 85+72.00 -L- = 63.27
 ROADWAY SLOPES = 3:1

HYDRAULIC DATA

DESIGN DISCHARGE = 1300 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YEARS
 DESIGN HIGH WATER ELEVATION = 70.00
 DRAINAGE AREA = 11.3 SQ. MI.
 BASE DISCHARGE (Q100) = 1600 CFS
 BASE HIGH WATER ELEVATION = 70.75

OVERTOPPING FLOOD DATA

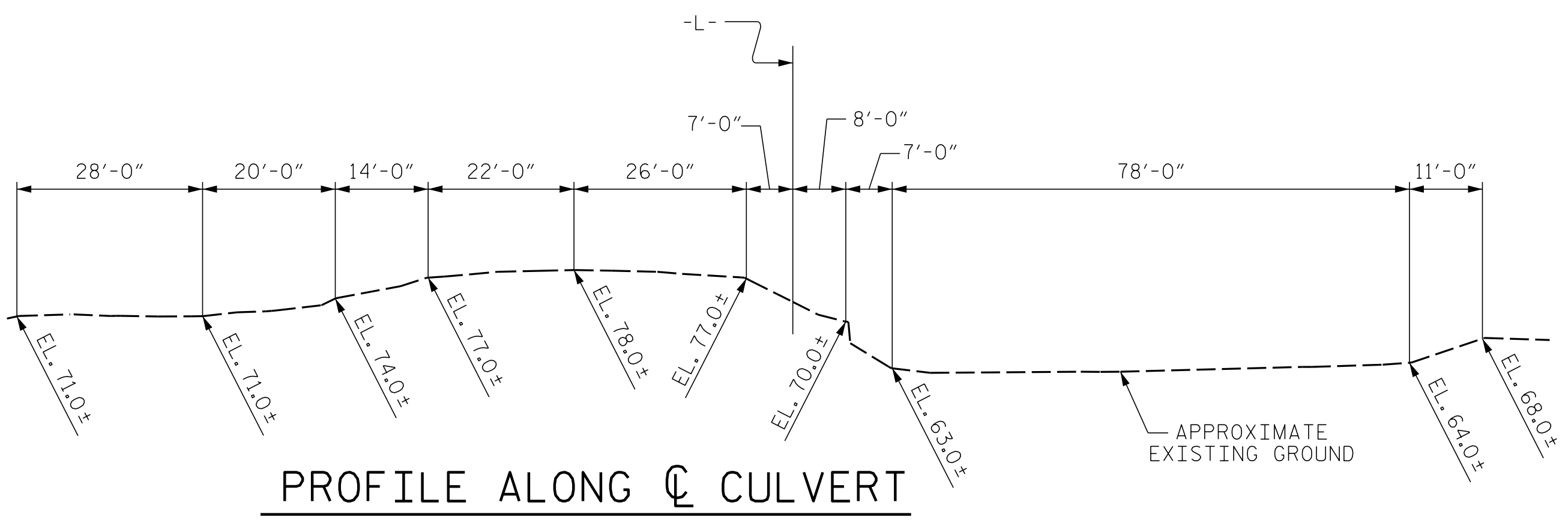
OVERTOPPING DISCHARGE = 2300+ CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YEAR
 OVERTOPPING FLOOD ELEVATION = 85.59
 OVERTOPPING OCCURS AT STA. 86+67.00 -L-, WITH LOW G.P. ELEV. = 83.59

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

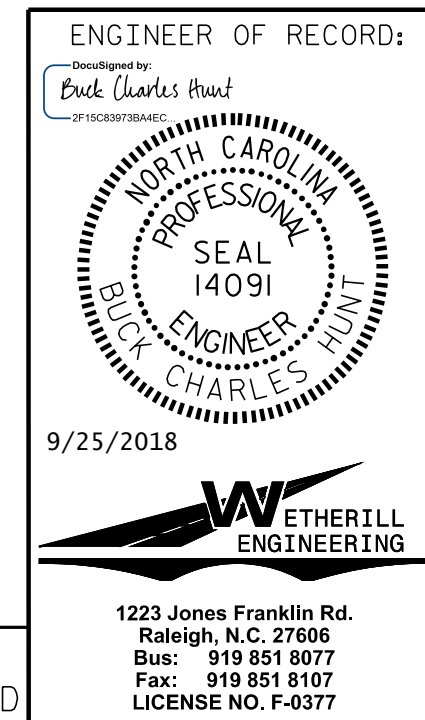
- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL TO BOT. OF TOP SLAB----- 11.80 FT. MAX., 8.58 FT. MIN.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 STAGE I
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.
 STAGE II
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF 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 ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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.
- THE EXISTING STRUCTURE CONSISTING OF A 3 @ 9'x9' REINFORCED CONCRETE BOX CULVERT 64' LONG SHALL BE RETAINED AND EXTENDED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.
- FOR CULVERT DIVERSIONS DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF 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.
- NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
- 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 1500 PSI.
- 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 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.



PROFILE ALONG CULVERT

TOTAL BILL OF MATERIAL					
MATERIAL	ELEMENT	STAGE I LEFT EXT.	STAGE I RIGHT EXT.	STAGE II LEFT EXT.	STAGE II RIGHT EXT.
CLASS A CONCRETE (CU. YDS.)	BARREL	34.5	130.9	40.7	154.9
	HEADWALLS	----	----	1.4	1.4
	CURTAIN WALLS	1.2	1.7	0.4	0.6
	EDGE BEAMS	0.8	0.8	1.5	1.5
	WINGS	10.2	10.8	10.2	10.8
TOTAL	46.7	144.2	54.2	169.2	
REINFORCING STEEL (LBS.)	BARREL	5,712	19,627	6,162	21,492
	WINGS	653	653	653	652
	TOTAL	6,365	20,280	6,815	22,144
FOUNDATION COND. MAT'L (TONS)		35	135	15	55
	TOTAL		240		
CULVERT EXCAVATION		LUMP SUM			

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 1 OF 10 CULVERT No. 650031



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BARREL STANDARD TRIPLE 9 FT. X 9 FT. CONCRETE BOX CULVERT

AUGUST 1989

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

TOTAL SHEETS 10

ASSEMBLED BY : D. HODGE DATE : 6/18
 CHECKED BY : B.C. HUNT DATE : 8/18
 DRAWN BY : R.W. WRIGHT DATE : OCT. 1989
 CHECKED BY : A.R. BISSETTE DATE : OCT. 1989

SPECIAL
STANDARD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{L1})	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (FT)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.34	--	1.75	1.50	1	BOTTOM SLAB	8.67	1.34	1	BOTTOM SLAB	8.03		
	HL-93 (OPERATING)	N/A		1.74	--	1.35	1.95	1	BOTTOM SLAB	8.67	1.74	1	BOTTOM SLAB	8.03		
	HS-20 (INVENTORY)	36,000	②	1.77	63.72	1.75	1.98	1	BOTTOM SLAB	8.67	1.77	1	BOTTOM SLAB	8.03		
	HS-20 (OPERATING)	36,000		2.29	82.44	1.35	2.57	1	BOTTOM SLAB	8.67	2.29	1	BOTTOM SLAB	8.03		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		2.50	33.75	1.40	4.41	1	TOP SLAB	4.22	2.50	1	EXTERIOR WALL	8.50	
		SNGARBS2	20,000		2.50	50.00	1.40	3.88	1	BOTTOM SLAB	10.33	2.50	1	EXTERIOR WALL	8.50	
		SNAGRIS2	22,000		2.51	55.22	1.40	3.57	1	BOTTOM SLAB	8.67	2.51	1	EXTERIOR WALL	8.50	
		SNCOTTS3	27,250		2.18	59.41	1.40	2.27	1	TOP SLAB	8.67	2.18	1	TOP SLAB	8.03	
		SNAGGRS4	34,925		1.86	64.96	1.40	2.18	2	TOP SLAB	9.42	1.86	1	TOP SLAB	8.03	
		SNS5A	35,550		1.91	67.90	1.40	2.25	1	TOP SLAB	8.67	1.91	1	TOP SLAB	8.03	
		SNS6A	39,950		1.80	71.91	1.40	2.00	1	TOP SLAB	8.67	1.80	1	TOP SLAB	8.03	
		SNS7B	42,000		1.76	73.92	1.40	1.95	1	TOP SLAB	8.67	1.76	1	TOP SLAB	8.03	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		2.11	69.63	1.40	2.48	1	BOTTOM SLAB	8.67	2.11	1	TOP SLAB	8.03	
		TNT4A	33,075		2.11	69.79	1.40	2.37	1	TOP SLAB	8.67	2.11	1	TOP SLAB	8.03	
		TNT6A	41,600		2.01	83.62	1.40	2.10	1	TOP SLAB	8.67	2.01	1	TOP SLAB	8.03	
		TNT7A	42,000		1.94	81.48	1.40	2.11	1	BOTTOM SLAB	8.67	1.94	1	BOTTOM SLAB	8.03	
		TNT7B	42,000		1.91	80.22	1.40	2.20	1	BOTTOM SLAB	8.67	1.91	1	TOP SLAB	8.03	
		TNAGRIT4	43,000		1.75	75.25	1.40	2.04	1	TOP SLAB	8.67	1.75	1	TOP SLAB	8.03	
TNAGT5A	45,000		1.84	82.80	1.40	2.04	1	TOP SLAB	8.67	1.84	1	TOP SLAB	8.03			
TNAGT5B	45,000		③	1.59	71.55	1.40	1.81	1	TOP SLAB	8.67	1.59	1	TOP SLAB	8.03		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

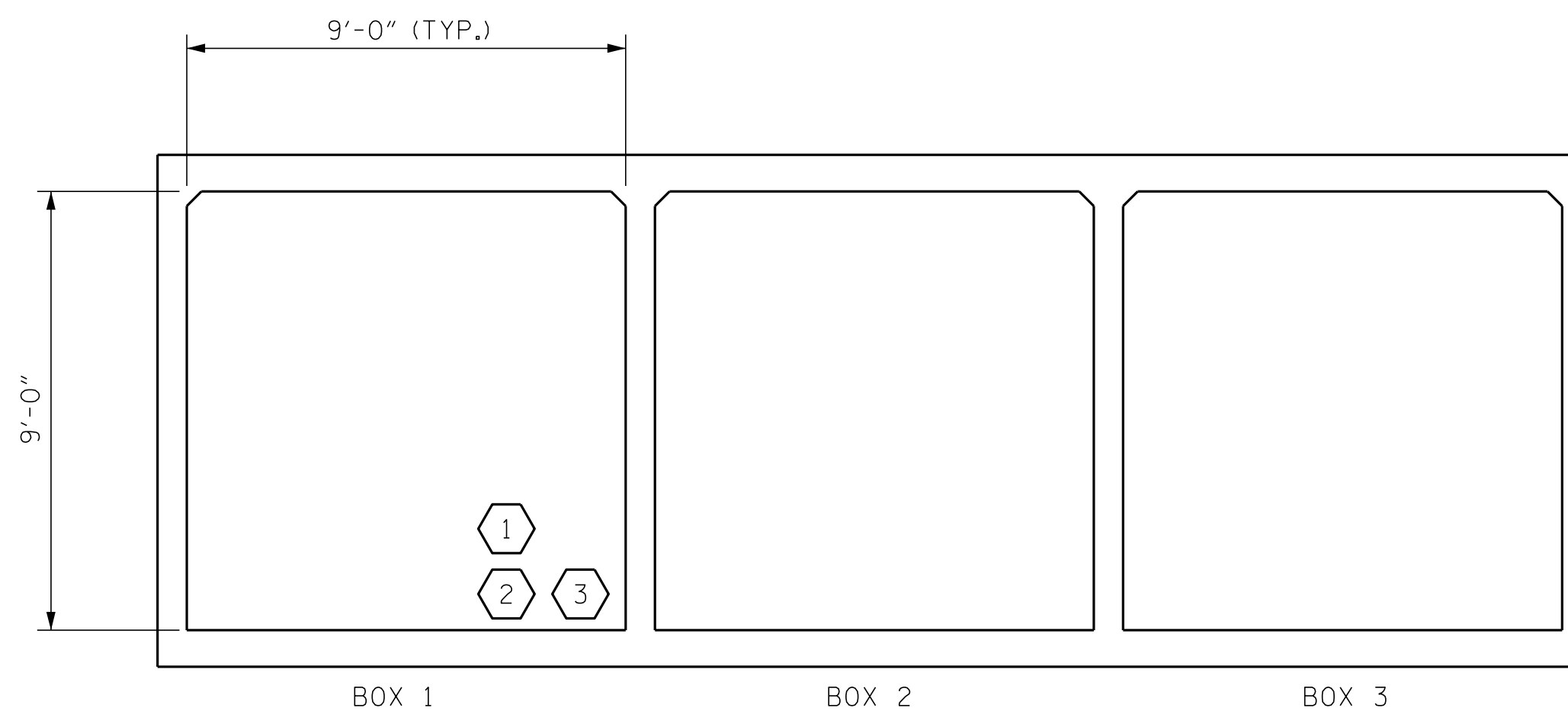
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. R-2582A
 NORTHAMPTON COUNTY
STATION: 85+72.00 -L-

SHEET 2 OF 10

ASSEMBLED BY : D. HODGE	DATE : 7/18
CHECKED BY : B.C. HUNT	DATE : 8/18
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THC

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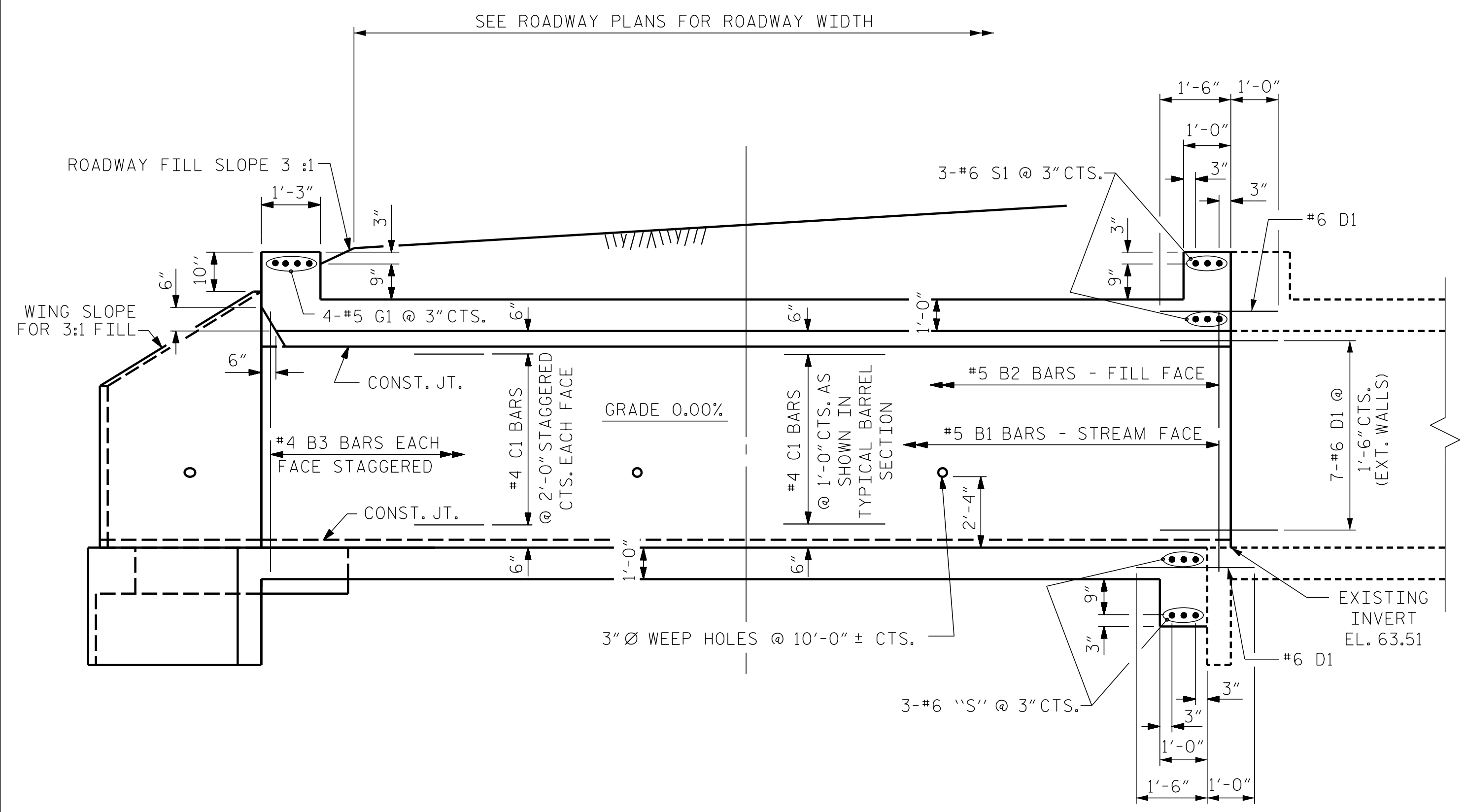
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UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD:
Book Charles Hood
NORTH CAROLINA PROFESSIONAL SEAL 14091
BUBB WETHERILL
CHARLES HUNTER
9/25/2018
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

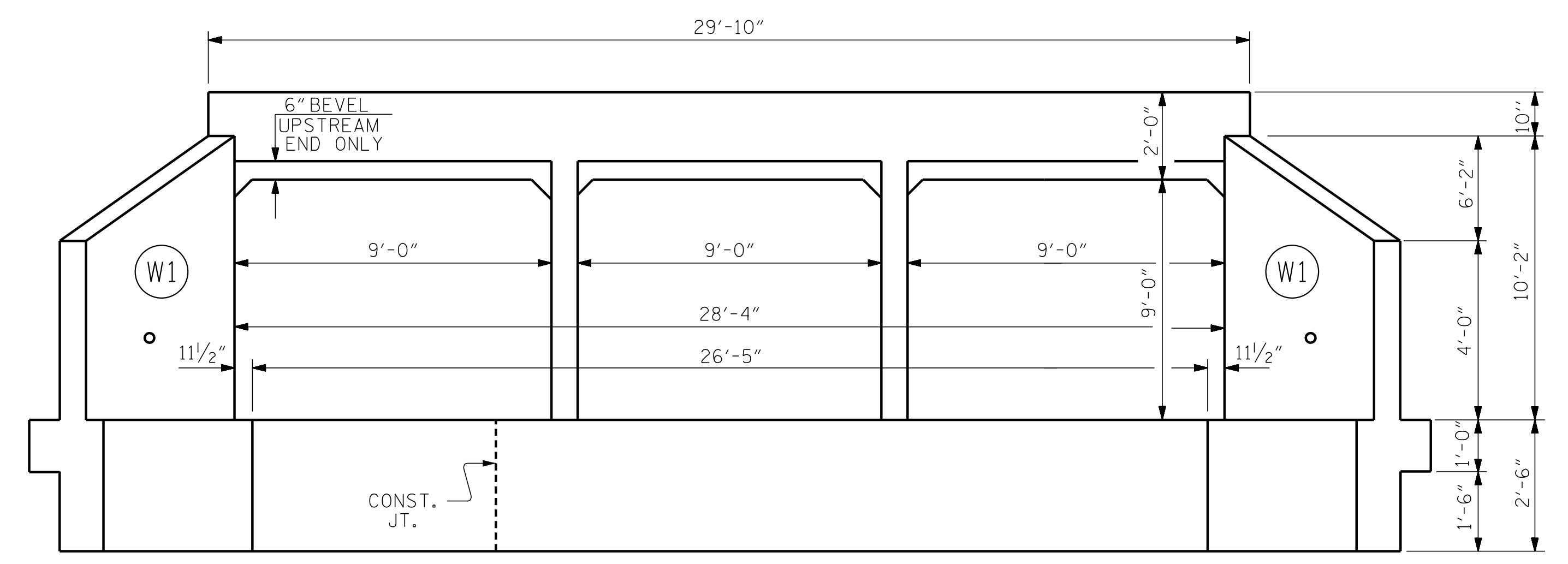
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. C1-2 TOTAL SHEETS 10

STD. NO. LRFR5

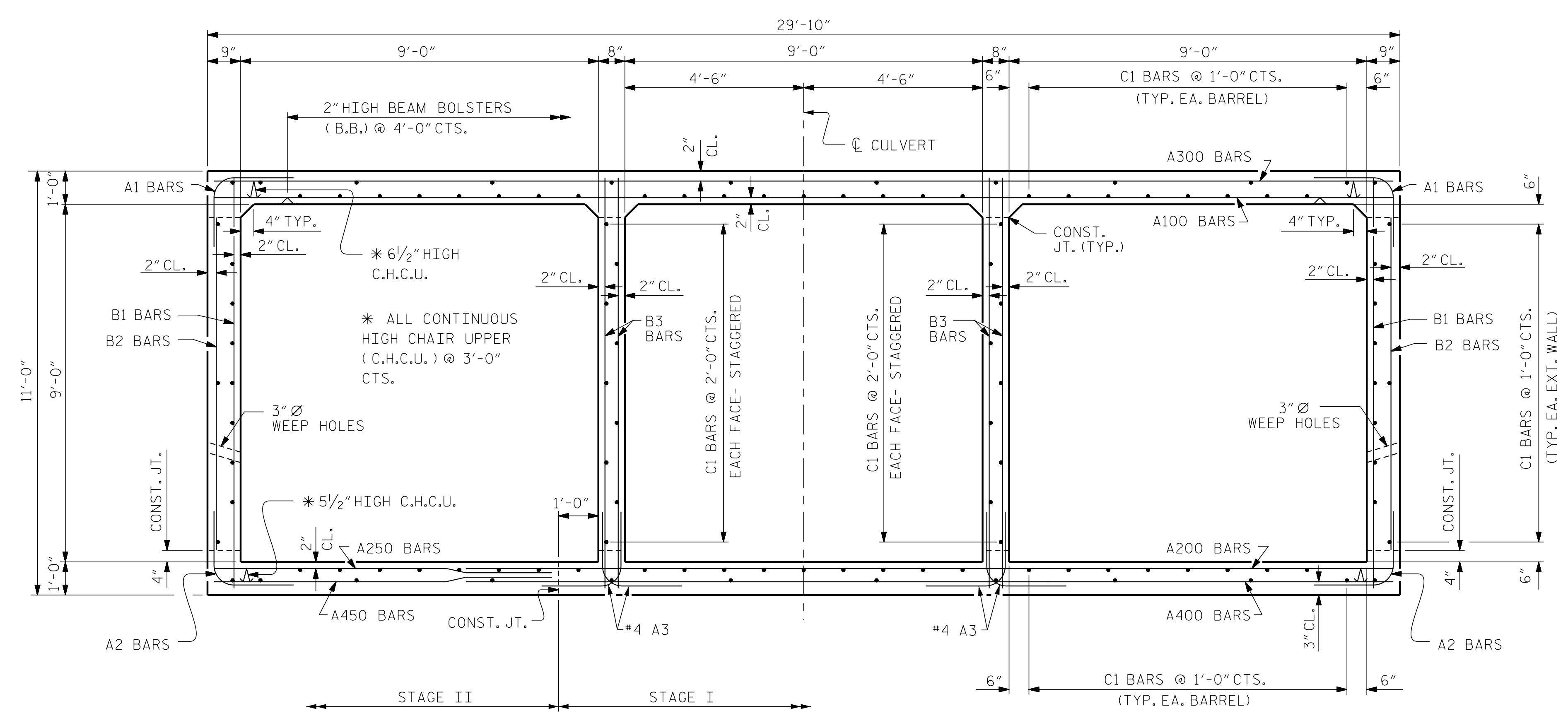
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INTERIOR WALL
EXTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY



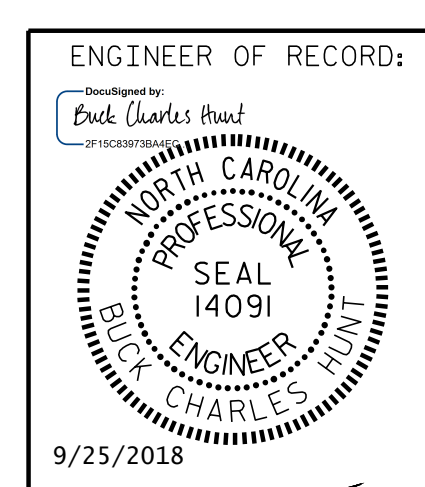
END ELEVATION
(LOOKING DOWNSTREAM)



RIGHT ANGLE SECTION OF BARREL
LOOKING DOWNSTREAM

THERE ARE 112 "C" BARS IN SECTION OF BARREL.

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
STATION: 85+72.00 -L-
SHEET 3 OF 10



1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

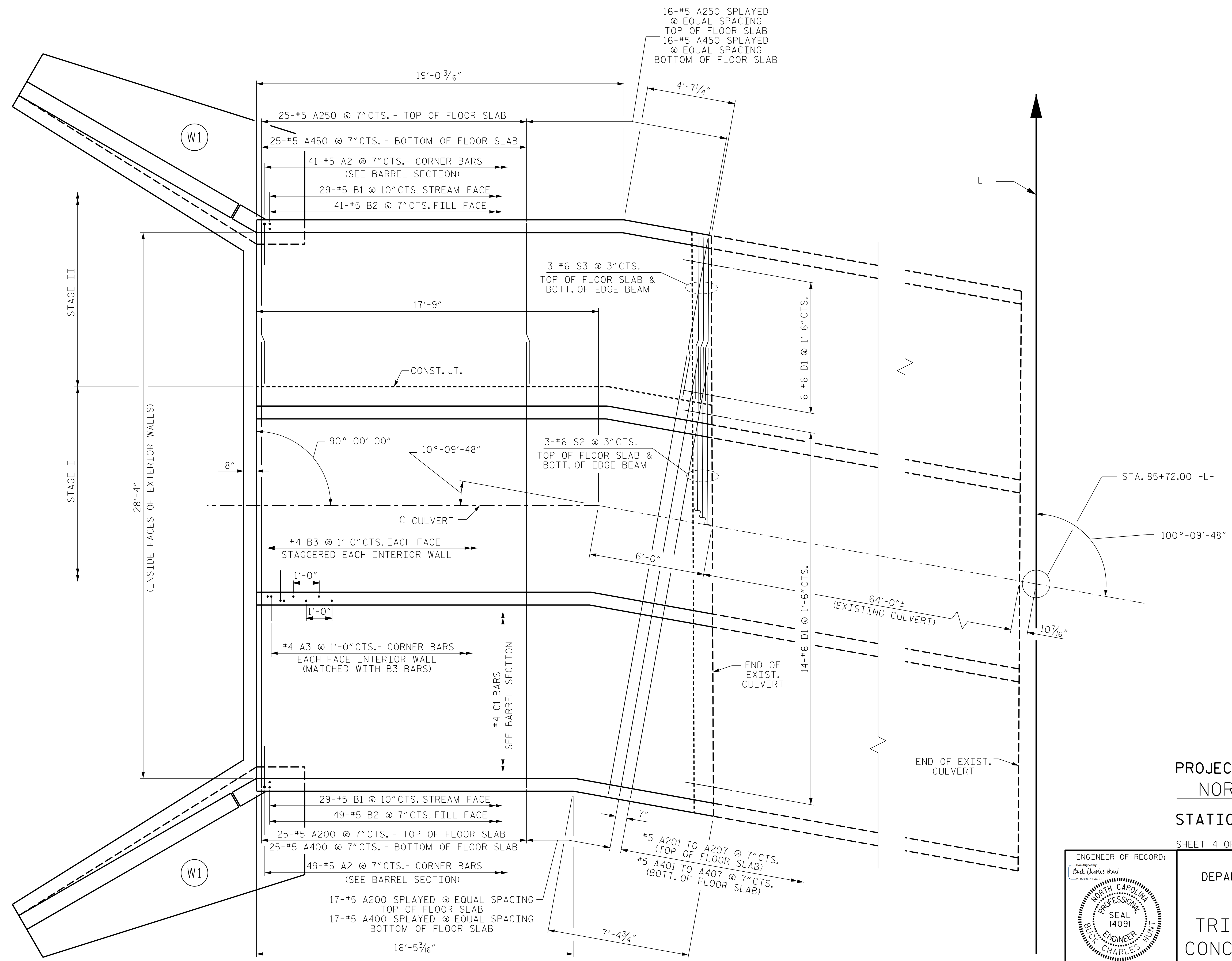
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**TRIPLE 9 FT. X 9 FT.
CONCRETE BOX CULVERT
(LEFT EXTENSION)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-3
1			3			TOTAL SHEETS
2			4			10

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DRAWN BY: D. HODGE DATE: 7/18
CHECKED BY: B.C. HUNT DATE: 8/18



PLAN - FLOOR SLAB

NOTE: C1 BARS TO BE FIELD BENT AS NECESSARY

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 4 OF 10

ENGINEER OF RECORD:
End Charles Road

 9/25/2018

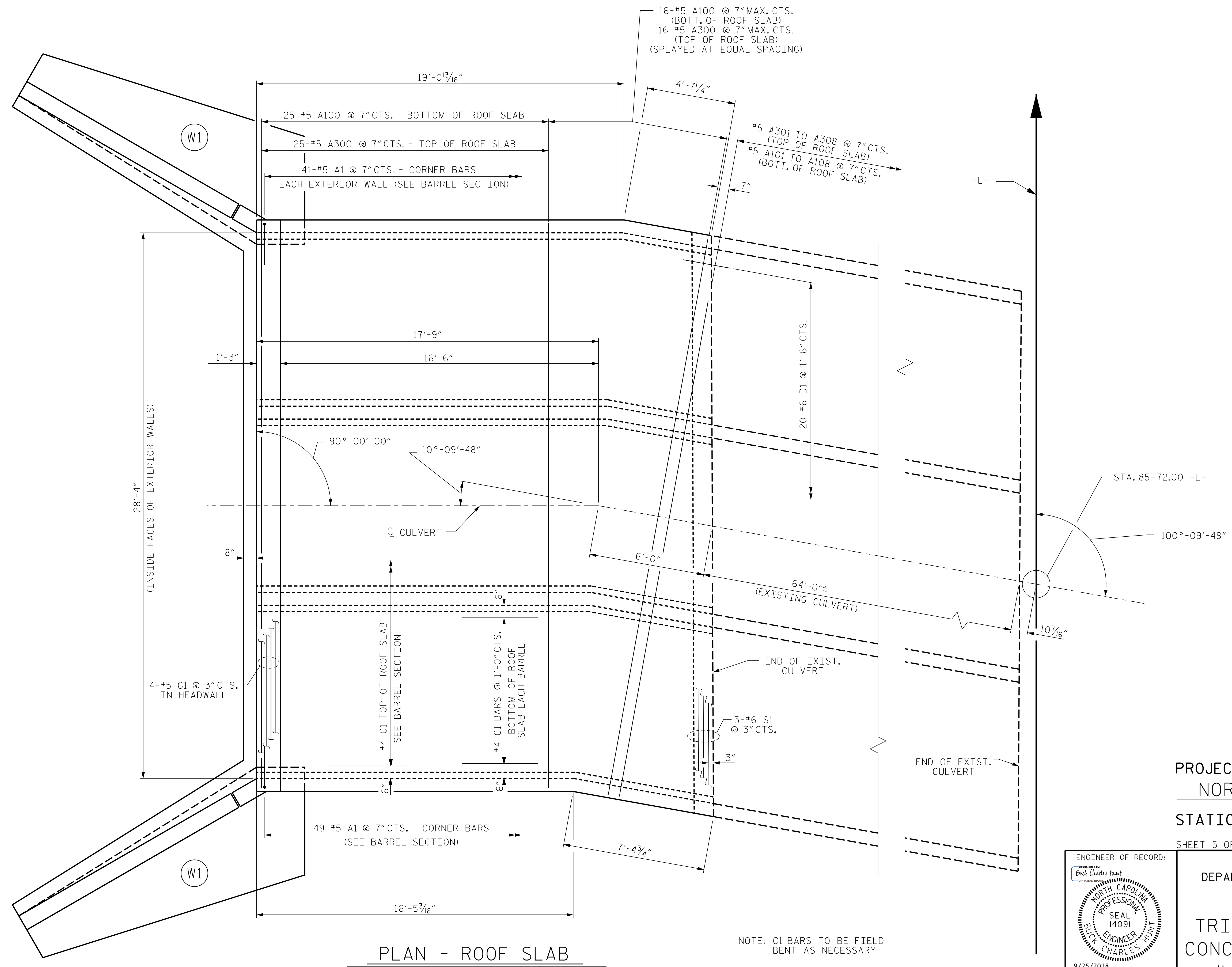
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TRIPLE 9 FT. x 9 FT. CONCRETE BOX CULVERT (LEFT EXTENSION)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. C1-4					TOTAL SHEETS 10

DRAWN BY : D. HODGE DATE : 7/18
 CHECKED BY : B.C. HUNT DATE : 8/18

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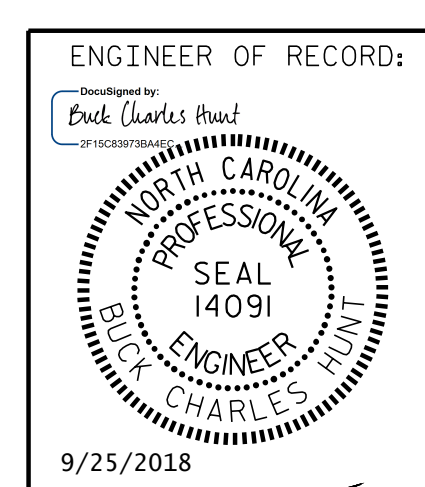
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PLAN - ROOF SLAB

NOTE: C1 BARS TO BE FIELD BENT AS NECESSARY

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 5 OF 10



1223 Jones Franklin Rd.
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 LICENSE NO. F-0377

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

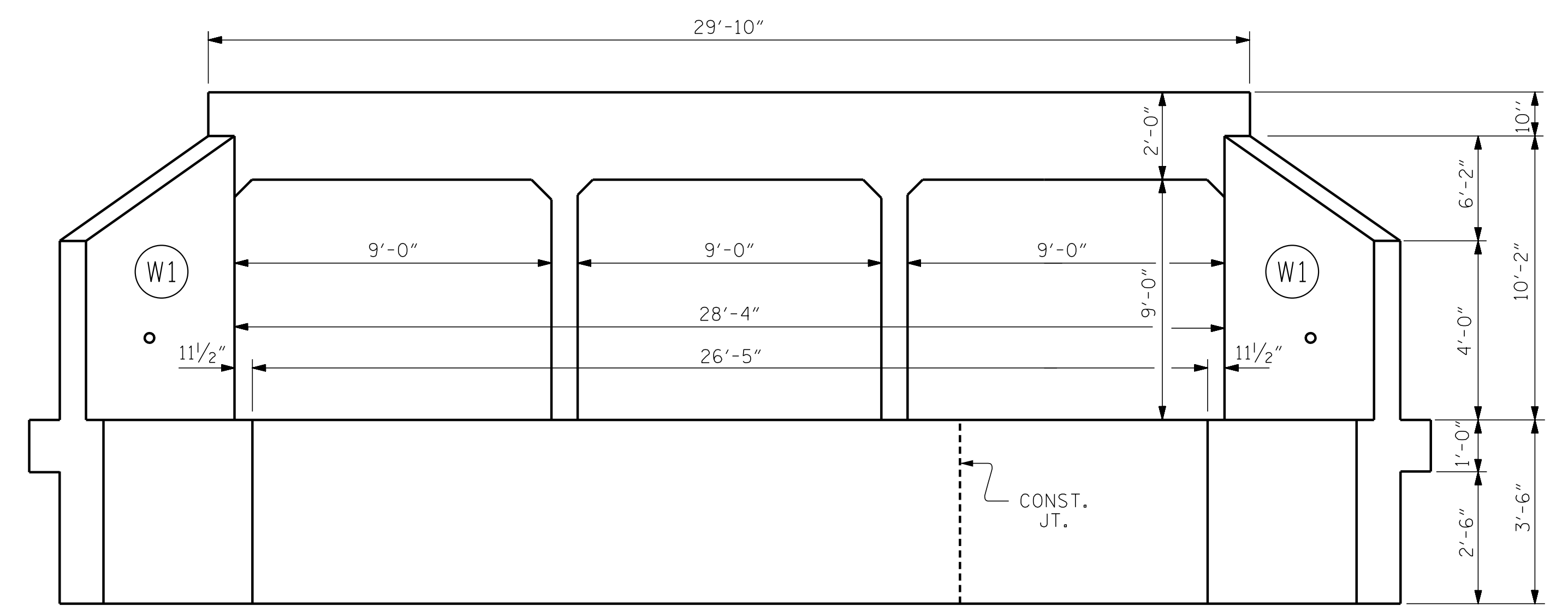
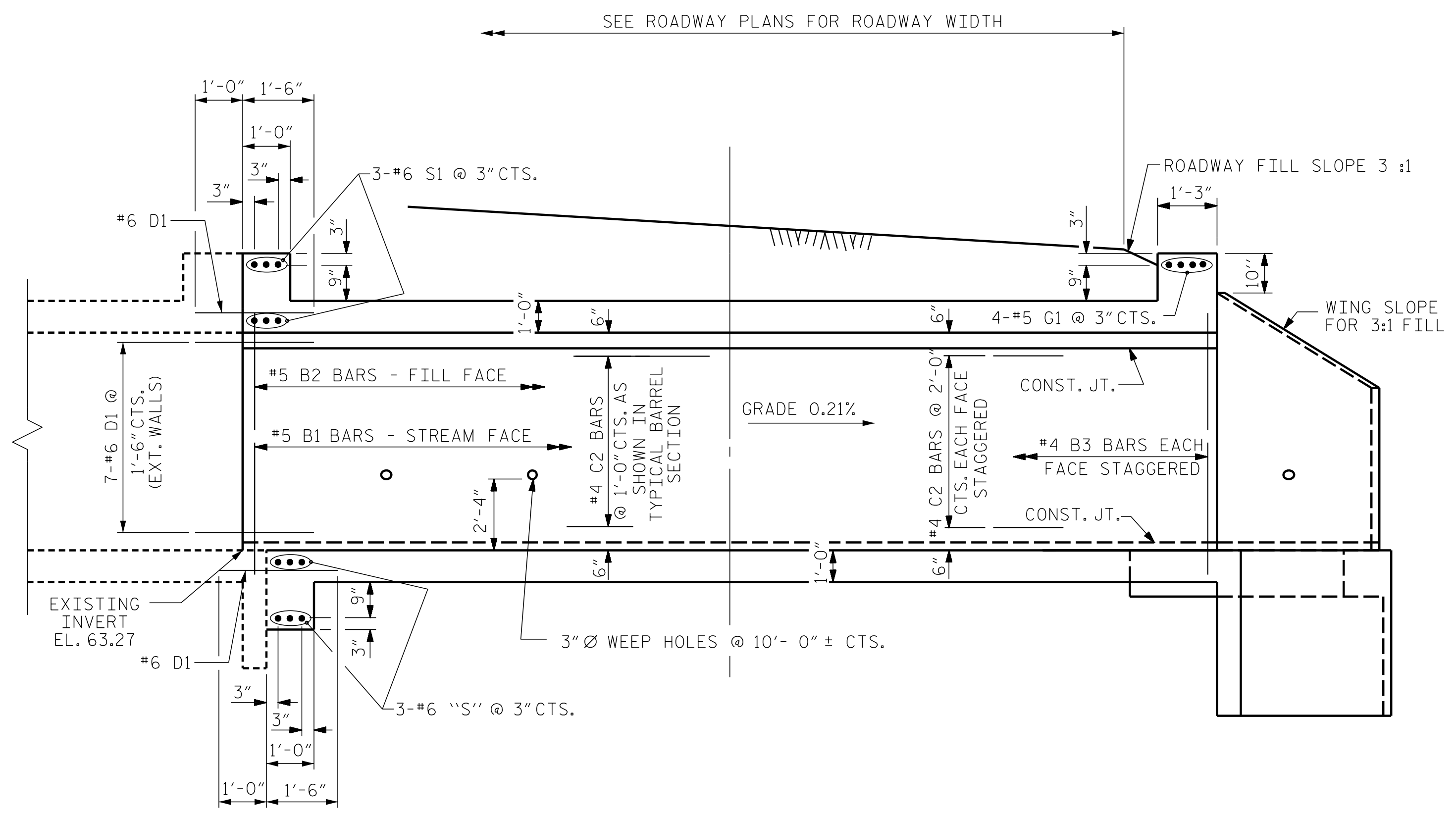
TRIPLE 9 FT. x 9 FT.
 CONCRETE BOX CULVERT
 (LEFT EXTENSION)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-5
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2			4			10

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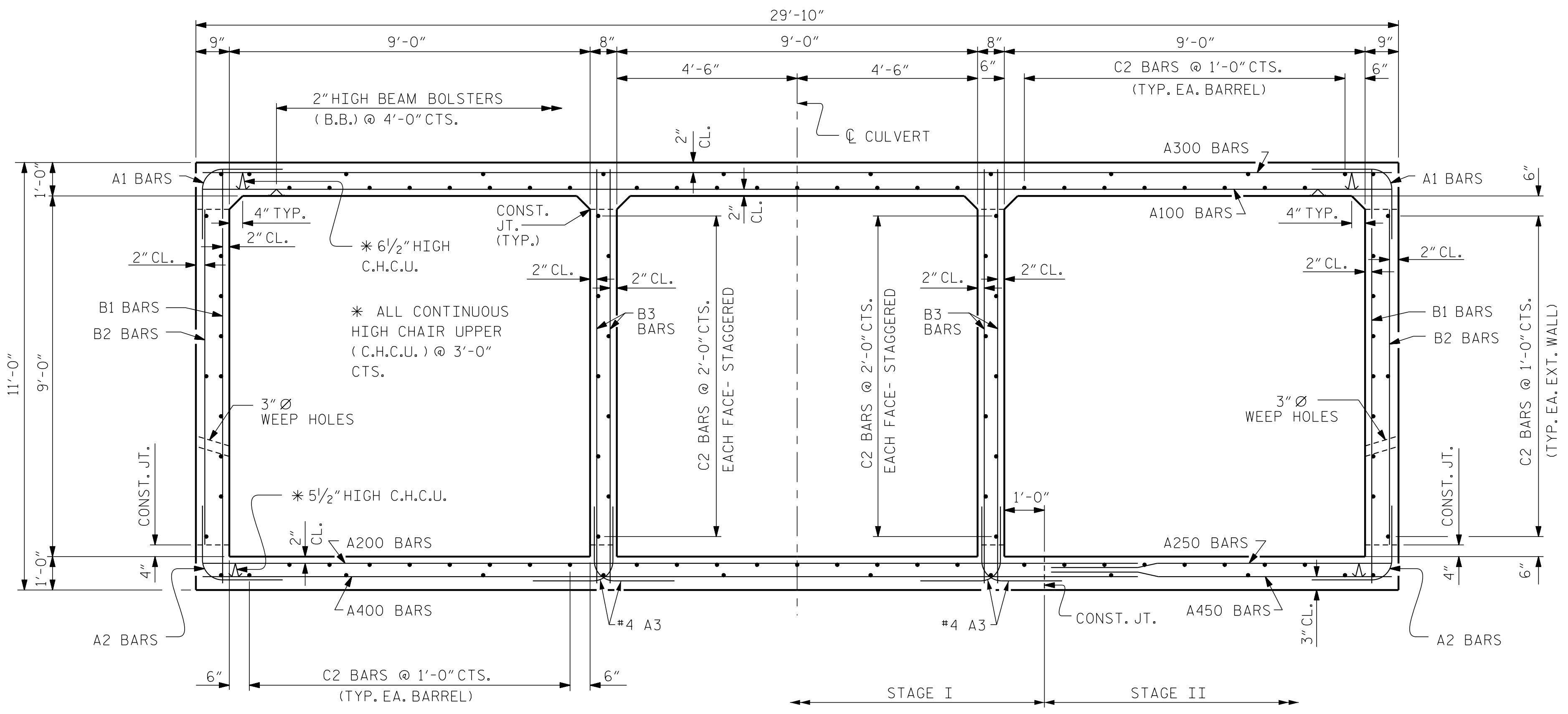
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DRAWN BY : D. HODGE DATE : 7/18
 CHECKED BY : B.C. HUNT DATE : 8/18



END ELEVATION
(LOOKING UPSTREAM)

EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY



RIGHT ANGLE SECTION OF BARREL
LOOKING UPSTREAM

THERE ARE 112 "C" BARS IN SECTION OF BARREL.

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
STATION: 85+72.00 -L-
SHEET 6 OF 10

ENGINEER OF RECORD:
End Charles Hunt
NORTH CAROLINA PROFESSIONAL SEAL 14091
BUCK CHARLES HUNT
9/25/2018
ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

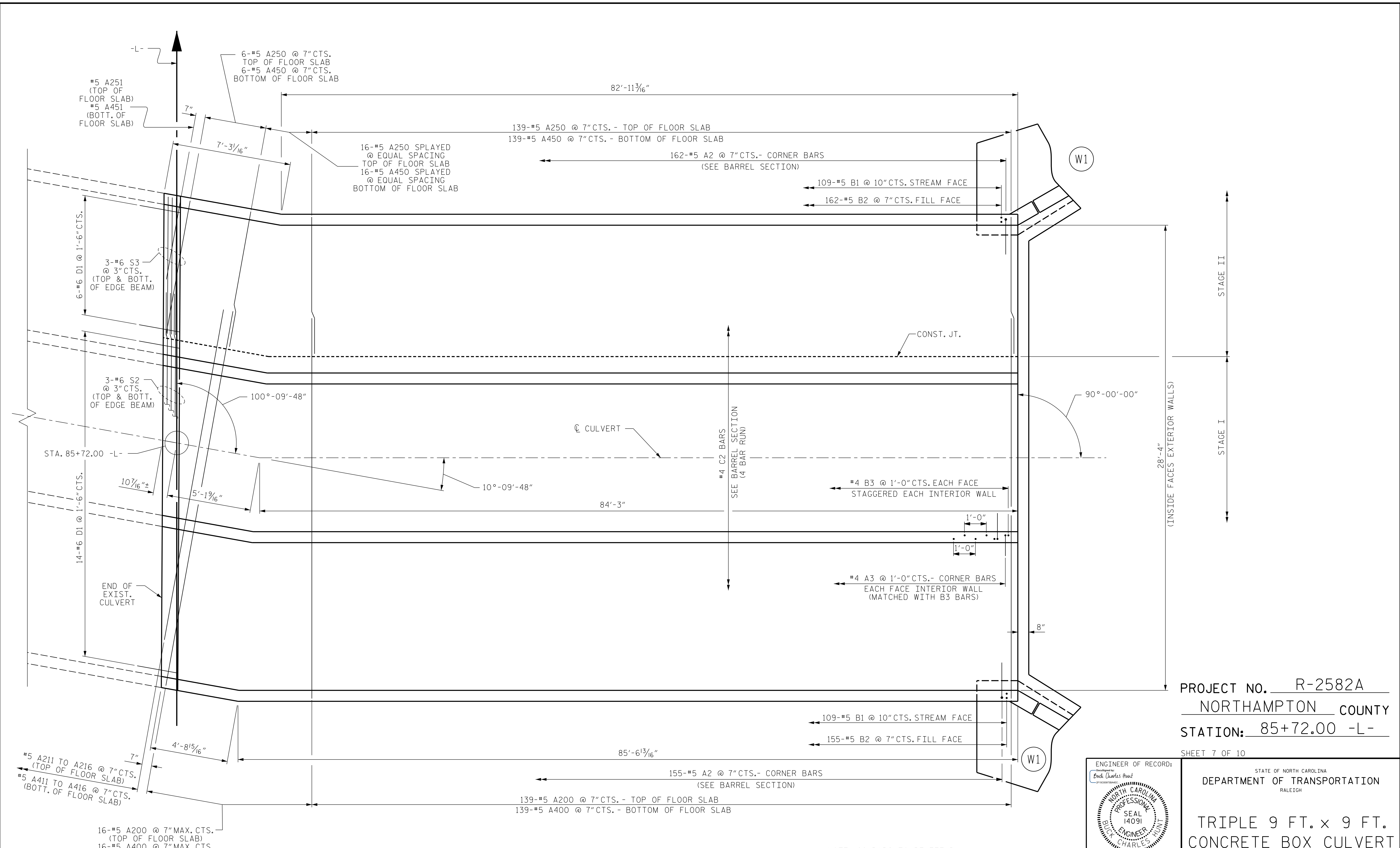
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TRIPLE 9 FT. X 9 FT. CONCRETE BOX CULVERT (RIGHT EXTENSION)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. C1-6					TOTAL SHEETS 10

DRAWN BY: D. HODGE DATE: 7/18
CHECKED BY: B.C. HUNT DATE: 8/18

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 9/25/2018 11:25:19 AM



PLAN - FLOOR SLAB

NOTE: C2 BARS TO BE FIELD BENT AS NECESSARY

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 7 OF 10

ENGINEER OF RECORD:
 Buck Charles Hunt
 NORTH CAROLINA PROFESSIONAL SEAL
 14091
 BUCK CHARLES HUNT
 9/25/2018
 WETHERILL ENGINEERING

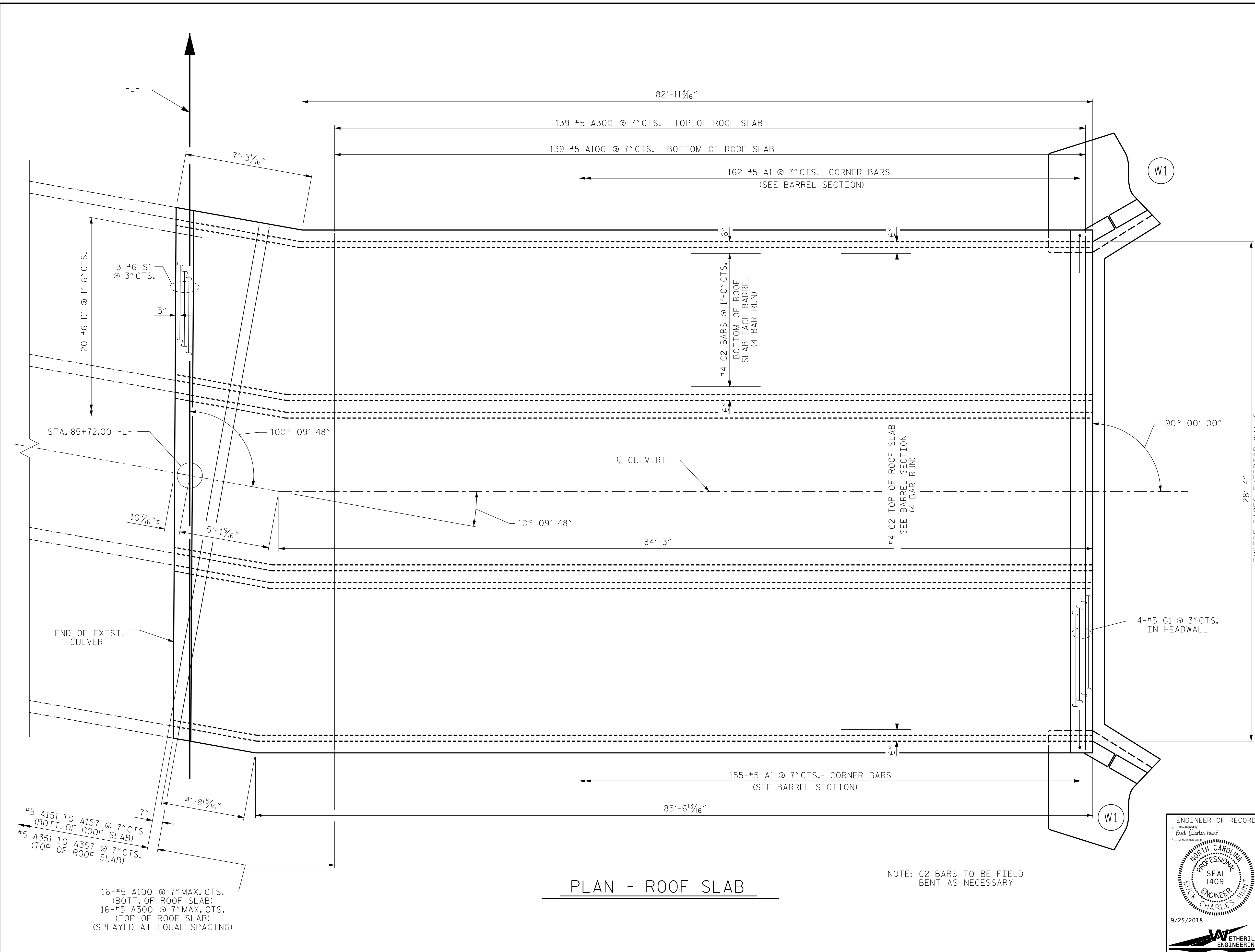
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 9 FT. x 9 FT.
 CONCRETE BOX CULVERT
 (RIGHT EXTENSION)

DRAWN BY: D. HODGE DATE: 7/18
 CHECKED BY: B.C. HUNT DATE: 8/18

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-7	
1			3			TOTAL SHEETS	
2			4			10	

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PLAN - ROOF SLAB

NOTE: C2 BARS TO BE FIELD BENT AS NECESSARY

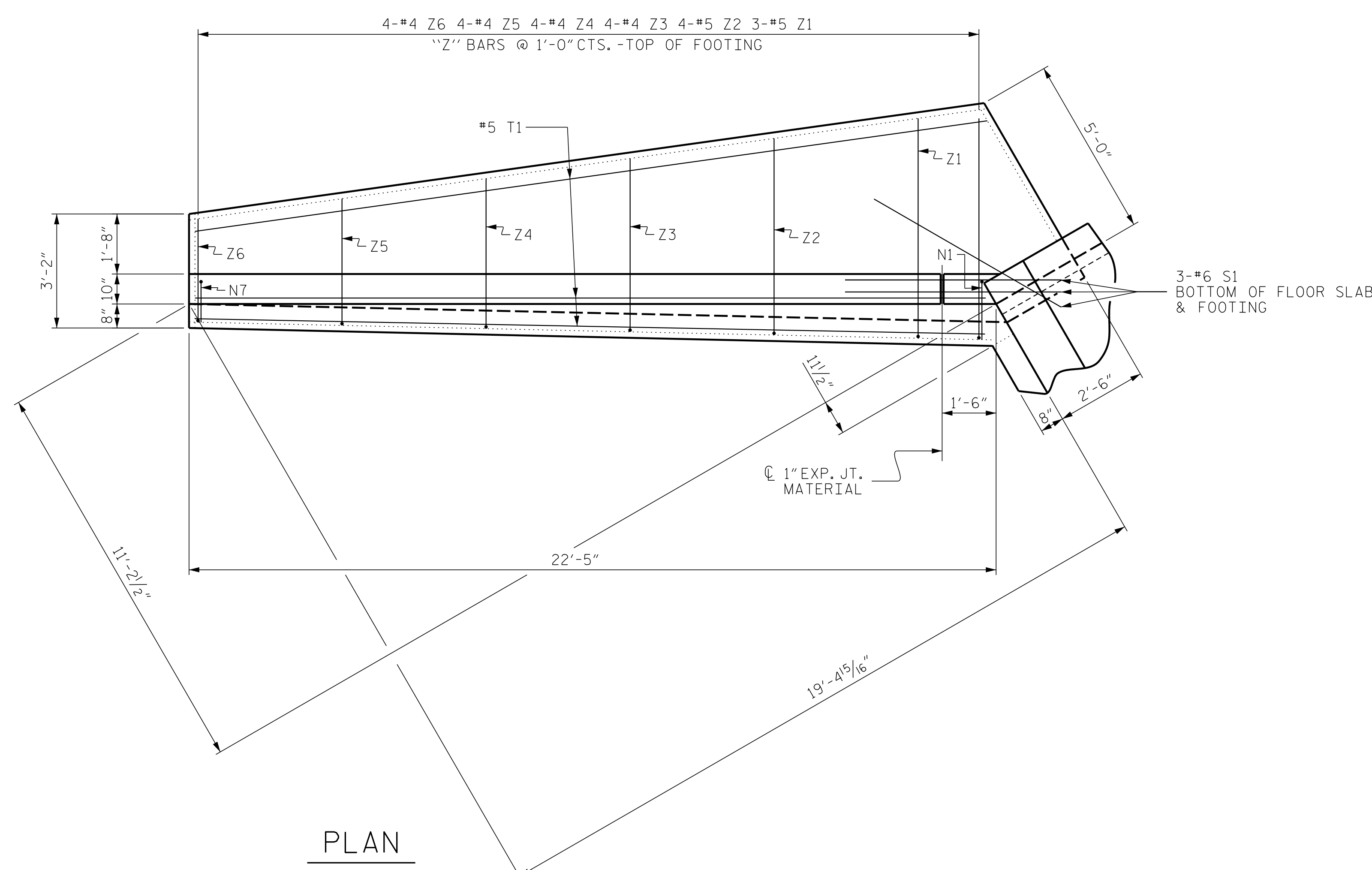
PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 8 OF 10

ENGINEER OF RECORD:
Ende Charles Hunt
 PROFESSIONAL SEAL
 14091
 BUCK CHARLES HUNT
 9/25/2018
 WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

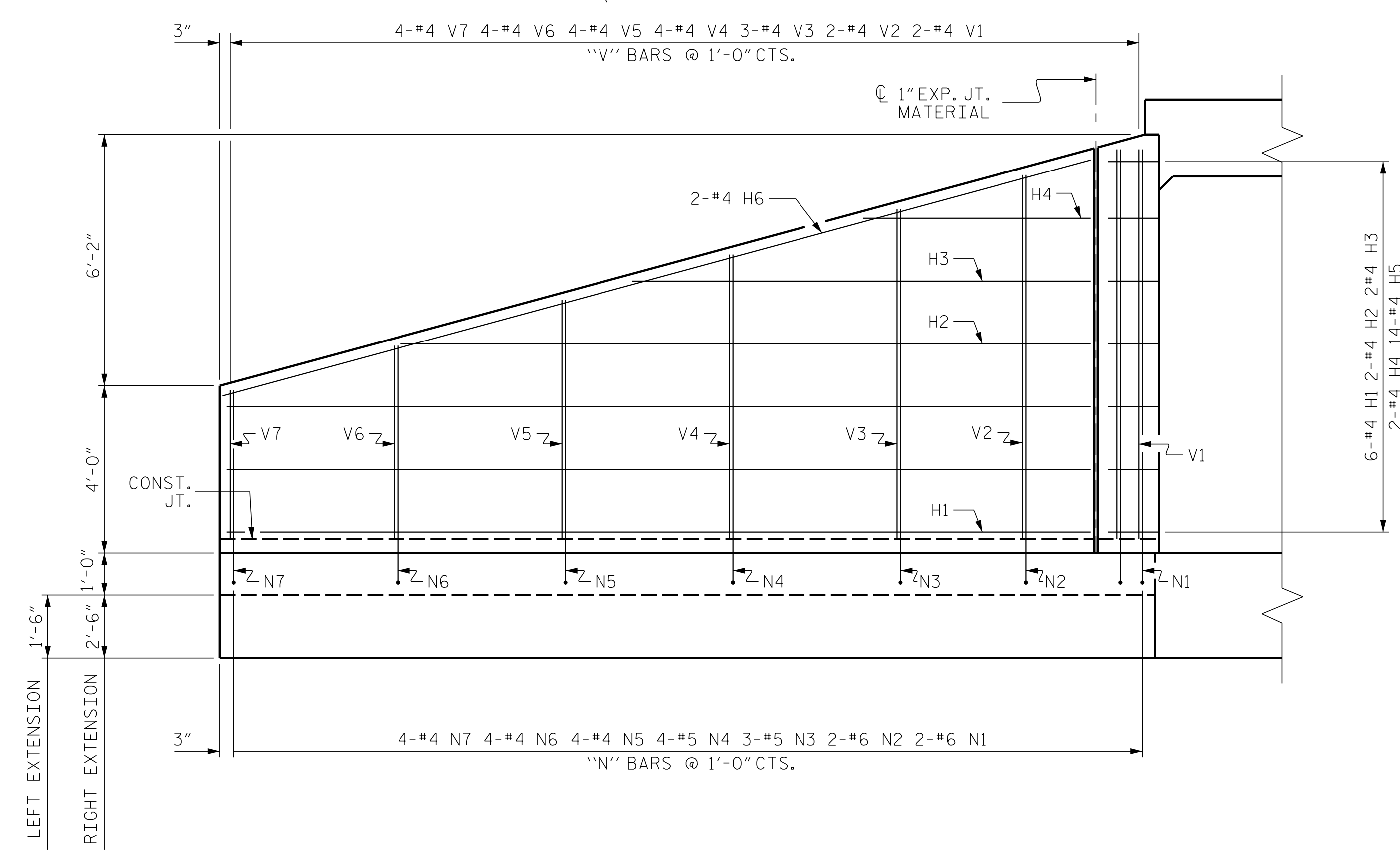
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TRIPLE 9 FT. x 9 FT. CONCRETE BOX CULVERT (RIGHT EXTENSION)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. C1-8					TOTAL SHEETS 10

DRAWN BY: D. HODGE DATE: 7/18
 CHECKED BY: B.C. HUNT DATE: 8/18

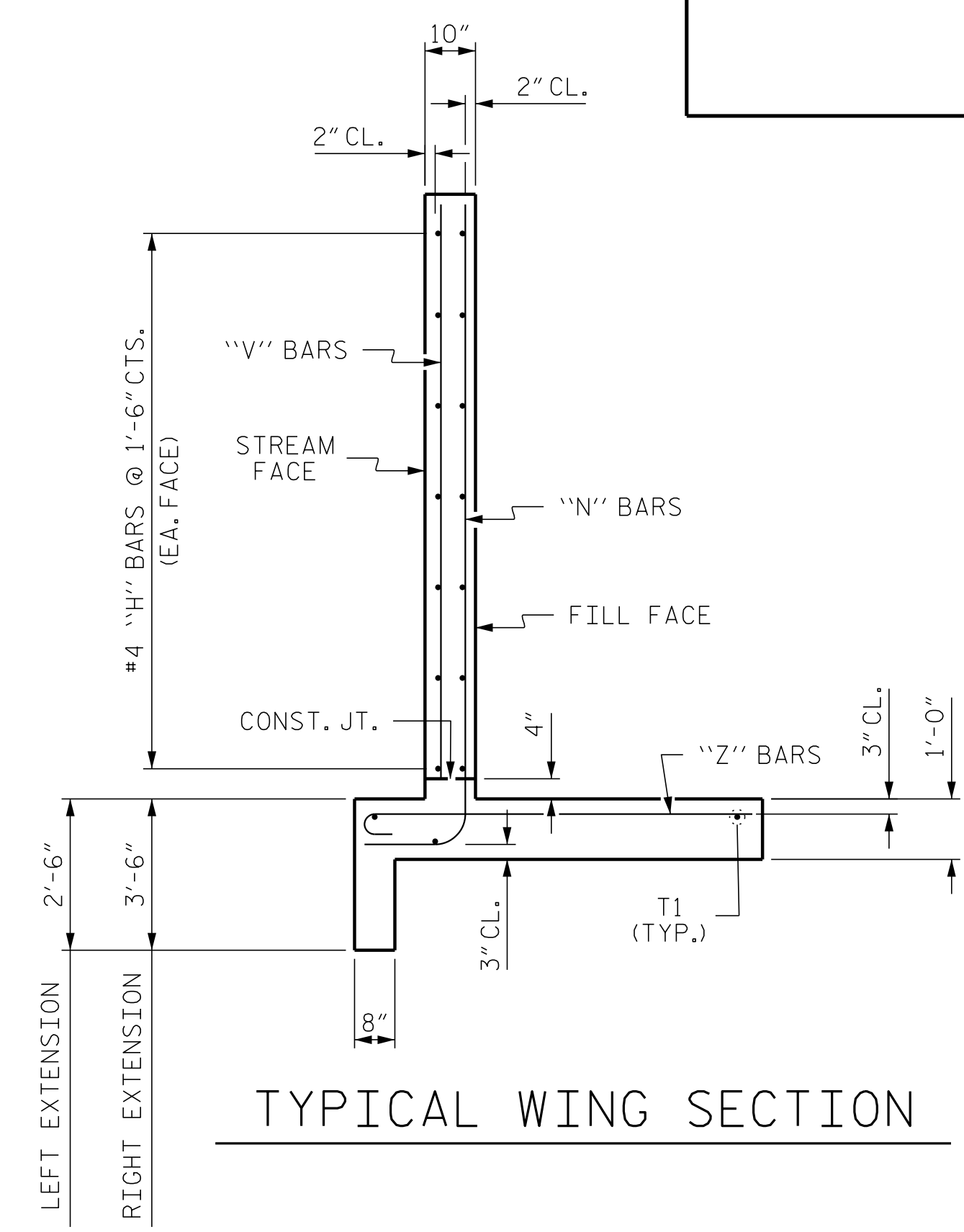
DOCUMENT NOT CONSIDERED FINAL
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PLAN



ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

Z1	6'-1"	7"
Z2	5'-5"	7"
Z3	4'-9"	6"
Z4	4'-2"	6"
Z5	3'-6"	6"
Z6	2'-10"	6"

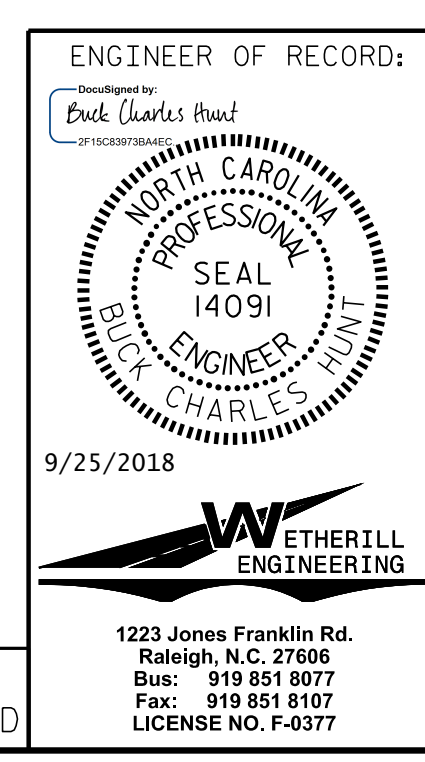
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	#4	STR	19'-10"	318
H2	8	#4	STR	16'-5"	88
H3	8	#4	STR	10'-11"	58
H4	8	#4	STR	5'-5"	29
H5	56	#4	1	3'-3"	122
H6	8	#4	STR	21'-5"	114
N1	8	#6	2	11'-4"	136
N2	8	#6	2	10'-10"	130
N3	12	#5	2	10'-0"	125
N4	16	#5	2	8'-11"	149
N5	16	#4	2	7'-10"	84
N6	16	#4	2	6'-8"	71
N7	16	#4	2	5'-7"	60
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	21'-11"	274
V1	8	#4	STR	9'-2"	49
V2	8	#4	STR	8'-8"	46
V3	12	#4	STR	7'-10"	63
V4	16	#4	STR	6'-9"	72
V5	16	#4	STR	5'-8"	61
V6	16	#4	STR	4'-7"	49
V7	16	#4	STR	3'-6"	37
Z1	12	#5	3	6'-8"	83
Z2	16	#5	3	6'-0"	100
Z3	16	#4	3	5'-3"	56
Z4	16	#4	3	4'-8"	50
Z5	16	#4	3	4'-0"	43
Z6	16	#4	3	3'-4"	36

REINFORCING STEEL FOR 4 WINGS 2,611 LBS

CLASS A CONCRETE FOR 4 WINGS 42.0 CY

PROJECT NO. R-2582A
 NORTHAMPTON COUNTY
 STATION: 85+72.00 -L-
 SHEET 10 OF 10



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 9'-0" SLOPE = 3:1
 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-10
1			3			TOTAL SHEETS 10
2			4			

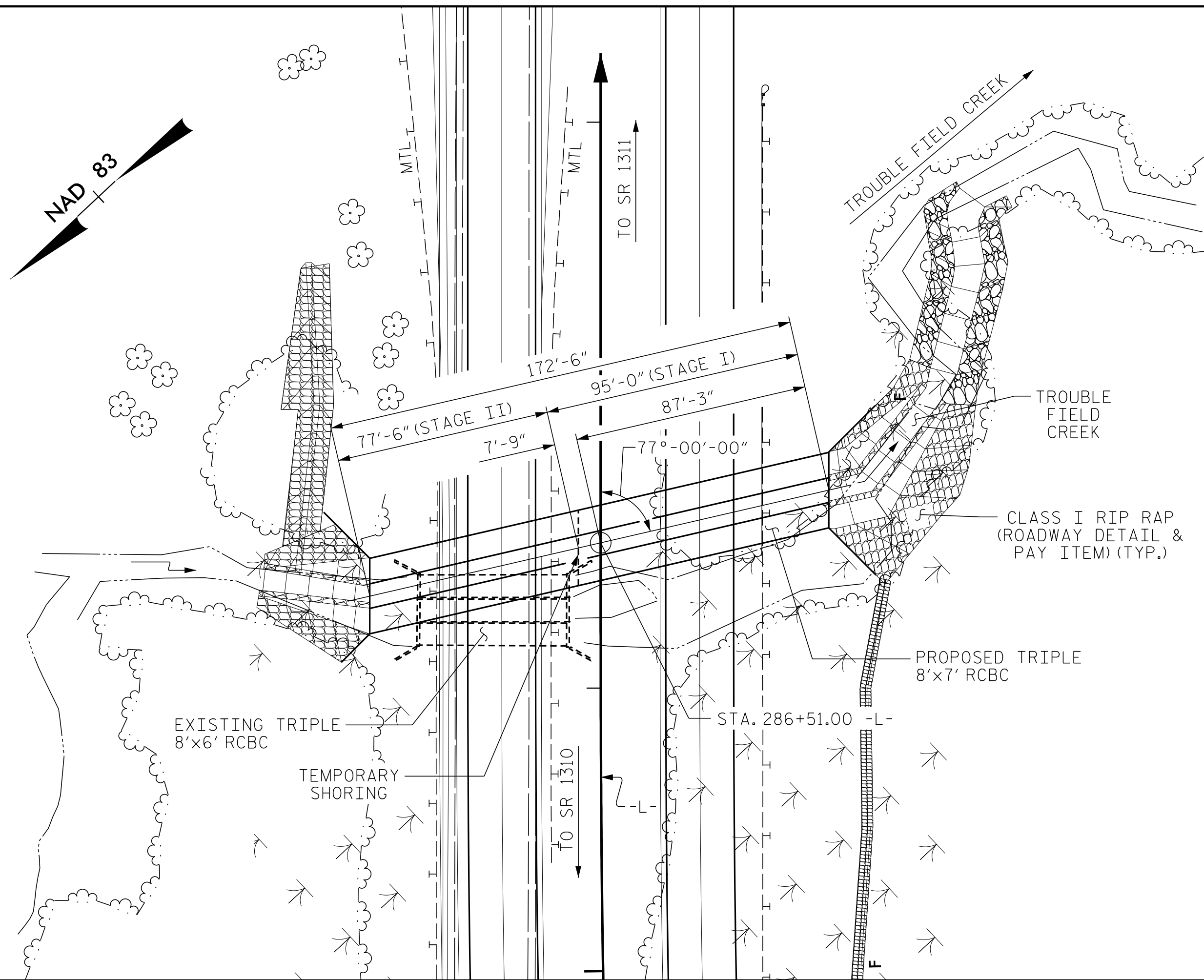
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DRAWN BY: D. HODGE DATE: 7/18
 CHECKED BY: B.C. HUNT DATE: 8/18

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BM #6 RR SPIKE IN 36" HICKORY, STA. 277+97.00 -L-, 99.00' LT., EL. 79.42 (N 981867; E 2428712)



ROADWAY DATA

GRADE POINT ELEV. @ STA 286+51.00 -L- = 87.28
 BED ELEV. @ STATION 286+51.00 -L- = 70.73
 ROADWAY SLOPES = 3:1

HYDRAULIC DATA

DESIGN DISCHARGE = 650 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YEARS
 DESIGN HIGH WATER ELEVATION = 77.00
 DRAINAGE AREA = 3.4 SQ. MI.
 BASE DISCHARGE (Q100) = 800 CFS
 BASE HIGH WATER ELEVATION = 77.36

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 2600+ CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YEAR
 OVERTOPPING FLOOD ELEVATION = 86.89
 PROPOSED OVERTOPPING OCCURS AT STA. 285+35.00 -L-, WITH LOW G.P. ELEV. = 86.89

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES CONTINUED:

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 ASBESTOS ASSESSMENT FOR CULVERT DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

NOTES:

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.

DESIGN FILL TO BOTT. OF TOP SLAB----- 9.9 FT. MAX., 6.4 FT. MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

STAGE I

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

STAGE II

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND 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 ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

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 SHALL BE PAID FOR BY THE CONTRACTOR.

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.

THE EXISTING STRUCTURE CONSISTING OF A 3 @ 8'x6' REINFORCED CONCRETE BOX CULVERT 54' LONG SHALL BE REMOVED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

FOR CULVERT DIVERSIONS DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF EXPANSION JOINT.

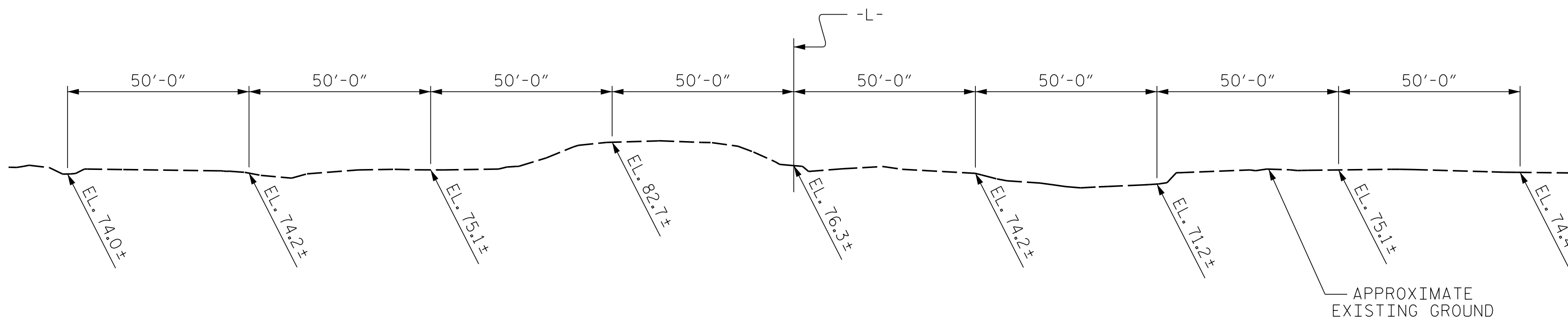
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT EXCAVATION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. CLASS B RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS. COST OF BACKFILLING THE CULVERT SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

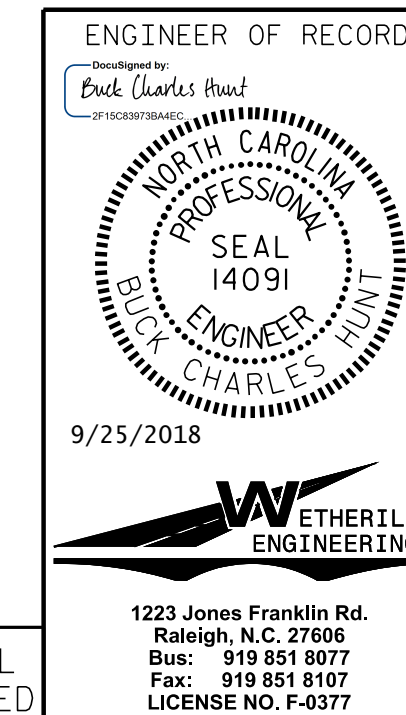


PROFILE ALONG CULVERT

TOTAL BILL OF MATERIAL			
MATERIAL	ELEMENT	STAGE I	STAGE II
CLASS A CONCRETE (CU. YDS.)	BARREL	223.2	182.1
	HEADWALLS	1.3	1.3
	CURTAIN WALLS	1.6	1.6
	EDGE BEAMS	2.1	2.1
	WINGS	14.0	14.0
	SILLS	1.2	1.2
	TOTAL	243.4	202.3
TOTAL		445.7	
REINFORCING STEEL (LBS.)	BARREL	32,791	26,728
	WINGS	907	906
	TOTAL	33,698	27,634
TOTAL		61,332	
FOUNDATION COND. MAT'L (TONS)		180	145
	TOTAL	325	
CULVERT EXCAVATION		LUMP SUM	
REMOVAL OF EXISTING STRUCTURE		LUMP SUM	
ASBESTOS ASSESSMENT		LUMP SUM	

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-

SHEET 1 OF 9 REPLACES CULVERT No. 650005



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**BARREL STANDARD
 TRIPLE 8 FT. X 7 FT.
 CONCRETE BOX CULVERT**

REVISIONS

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

SHEET NO.
 C2-1
 TOTAL SHEETS
 9

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{L1})	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (FT)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.26	--	1.75	1.26	1	TOP SLAB	8.67	1.26	1	TOP SLAB	8.07		
	HL-93 (OPERATING)	N/A		1.63	--	1.35	1.63	1	TOP SLAB	8.67	1.65	1	TOP SLAB	8.07		
	HS-20 (INVENTORY)	36,000	②	1.43	51.48	1.75	1.59	1	TOP SLAB	3.80	1.43	1	TOP SLAB	8.07		
	HS-20 (OPERATING)	36,000		1.86	66.96	1.35	2.06	1	TOP SLAB	3.80	1.86	1	TOP SLAB	8.07		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		2.49	33.62	1.40	2.77	1	TOP SLAB	3.80	2.49	1	TOP SLAB	8.07	
		SNGARBS2	20,000		2.34	46.80	1.40	2.60	1	TOP SLAB	3.80	2.34	1	TOP SLAB	8.07	
		SNAGRIS2	22,000		2.47	54.34	1.40	2.75	1	TOP SLAB	3.80	2.47	1	TOP SLAB	8.07	
		SNCOTTS3	27,250		1.66	45.24	1.40	1.73	1	TOP SLAB	8.67	1.66	1	TOP SLAB	8.07	
		SNAGGRS4	34,925		1.51	52.74	1.40	1.74	1	TOP SLAB	8.67	1.51	1	TOP SLAB	8.07	
		SNS5A	35,550		1.54	54.75	1.40	1.76	1	TOP SLAB	8.67	1.54	1	TOP SLAB	8.07	
		SNS6A	39,950		1.48	59.13	1.40	1.50	1	TOP SLAB	8.67	1.48	1	TOP SLAB	8.07	
		SNS7B	42,000		1.48	62.16	1.40	1.48	1	TOP SLAB	8.67	1.48	1	TOP SLAB	8.07	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.94	64.02	1.40	2.13	1	TOP SLAB	8.67	1.94	1	TOP SLAB	8.07	
		TNT4A	33,075		1.84	60.86	1.40	1.91	1	TOP SLAB	8.67	1.84	1	TOP SLAB	8.07	
		TNT6A	41,600		1.58	65.73	1.40	1.71	1	TOP SLAB	8.67	1.58	1	TOP SLAB	8.07	
		TNT7A	42,000		1.71	71.82	1.40	1.86	1	TOP SLAB	8.67	1.71	1	TOP SLAB	8.07	
		TNT7B	42,000		1.53	64.26	1.40	1.64	1	TOP SLAB	8.67	1.53	1	TOP SLAB	8.07	
		TNAGRIT4	43,000		1.61	69.23	1.40	1.74	1	TOP SLAB	8.67	1.61	1	TOP SLAB	8.07	
TNAGT5A	45,000		1.64	73.80	1.40	1.84	1	TOP SLAB	8.67	1.64	1	TOP SLAB	8.07			
TNAGT5B	45,000		③	1.47	66.15	1.40	1.62	1	TOP SLAB	8.67	1.47	1	TOP SLAB	8.07		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

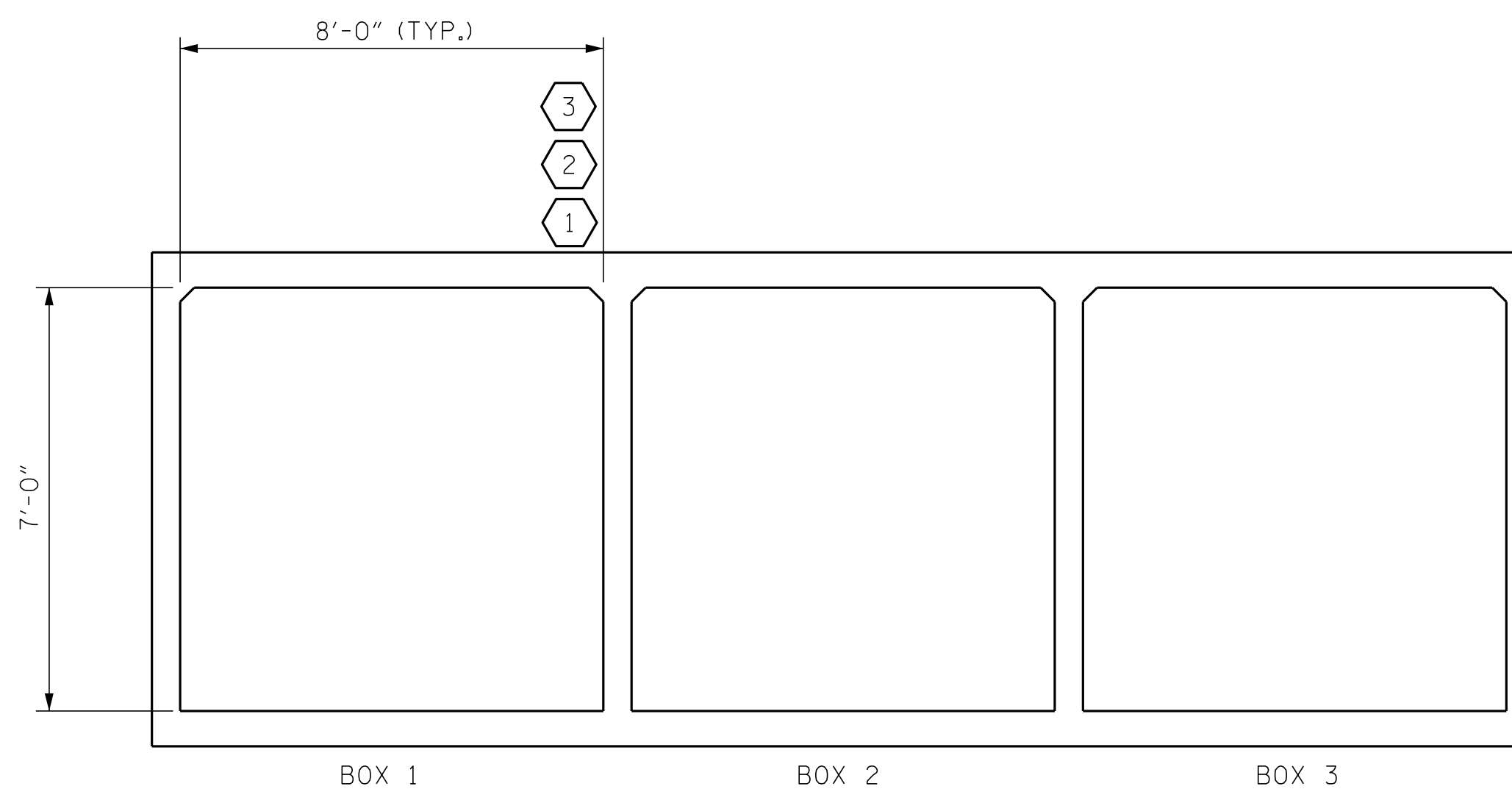
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-

SHEET 2 OF 9

ENGINEER OF RECORD:
Book Charles Hunt
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 14091
 BUCK CHARLES HUNT
 9/25/2018

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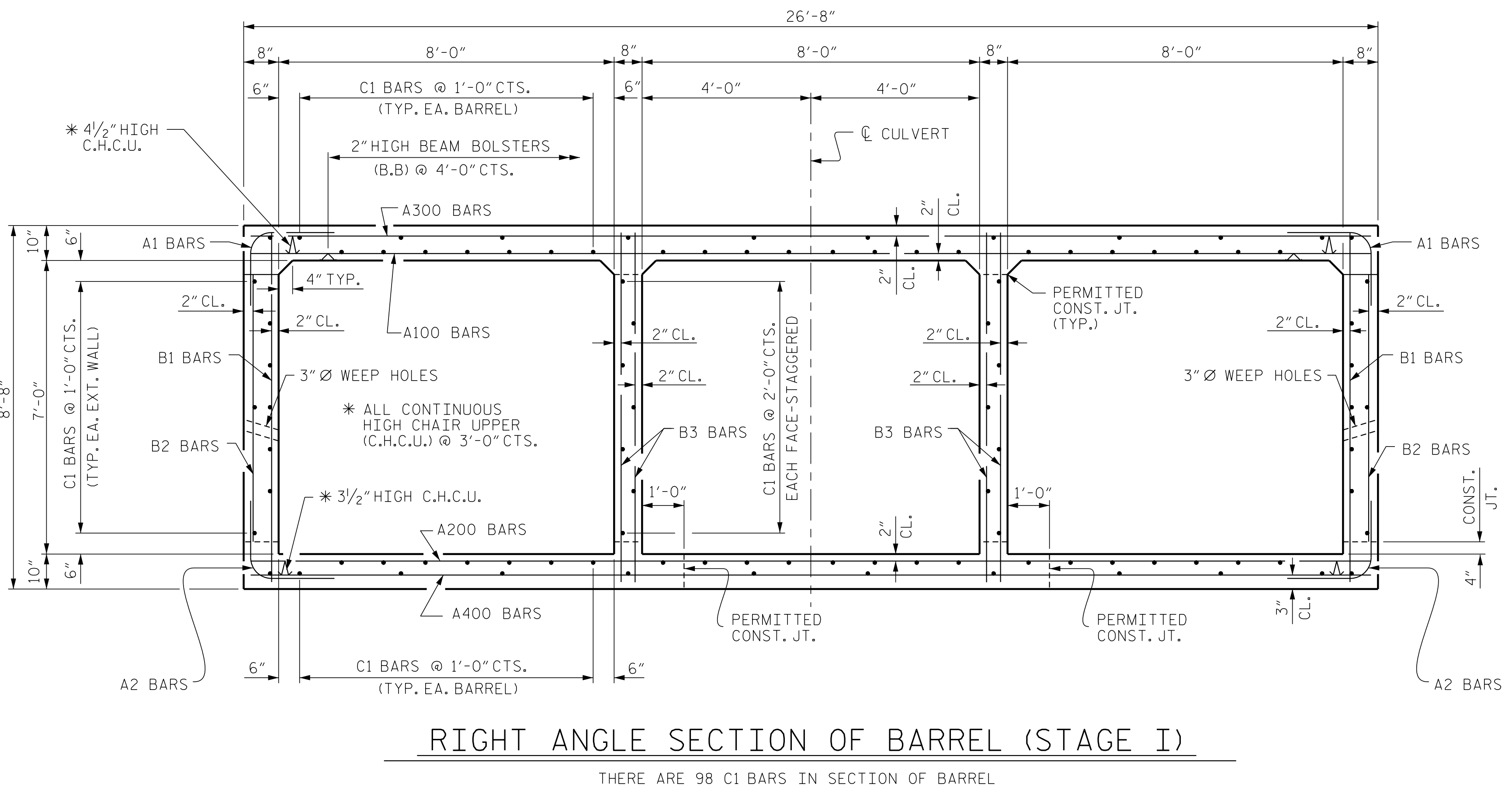
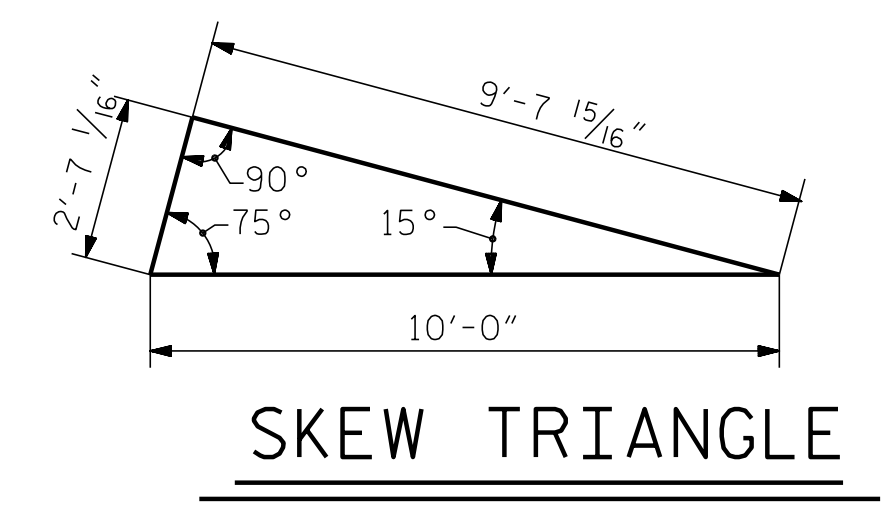
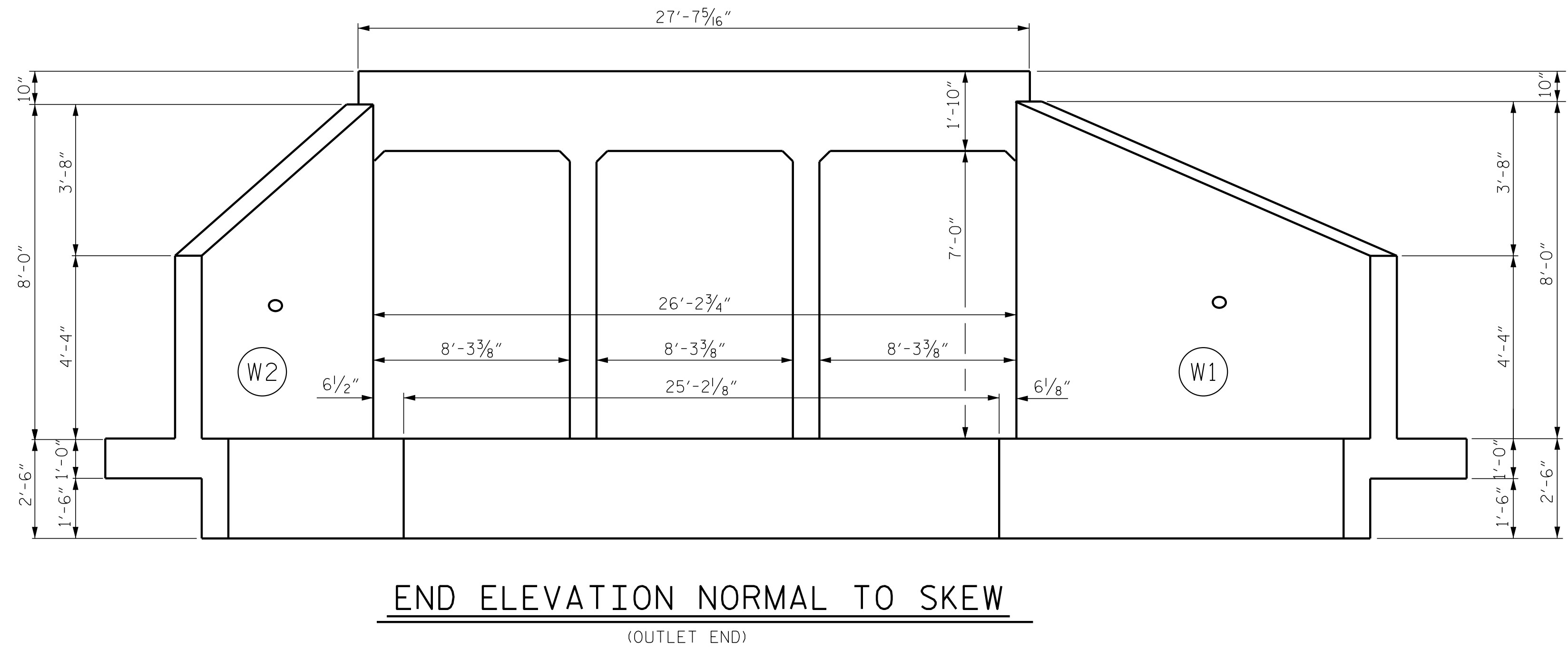
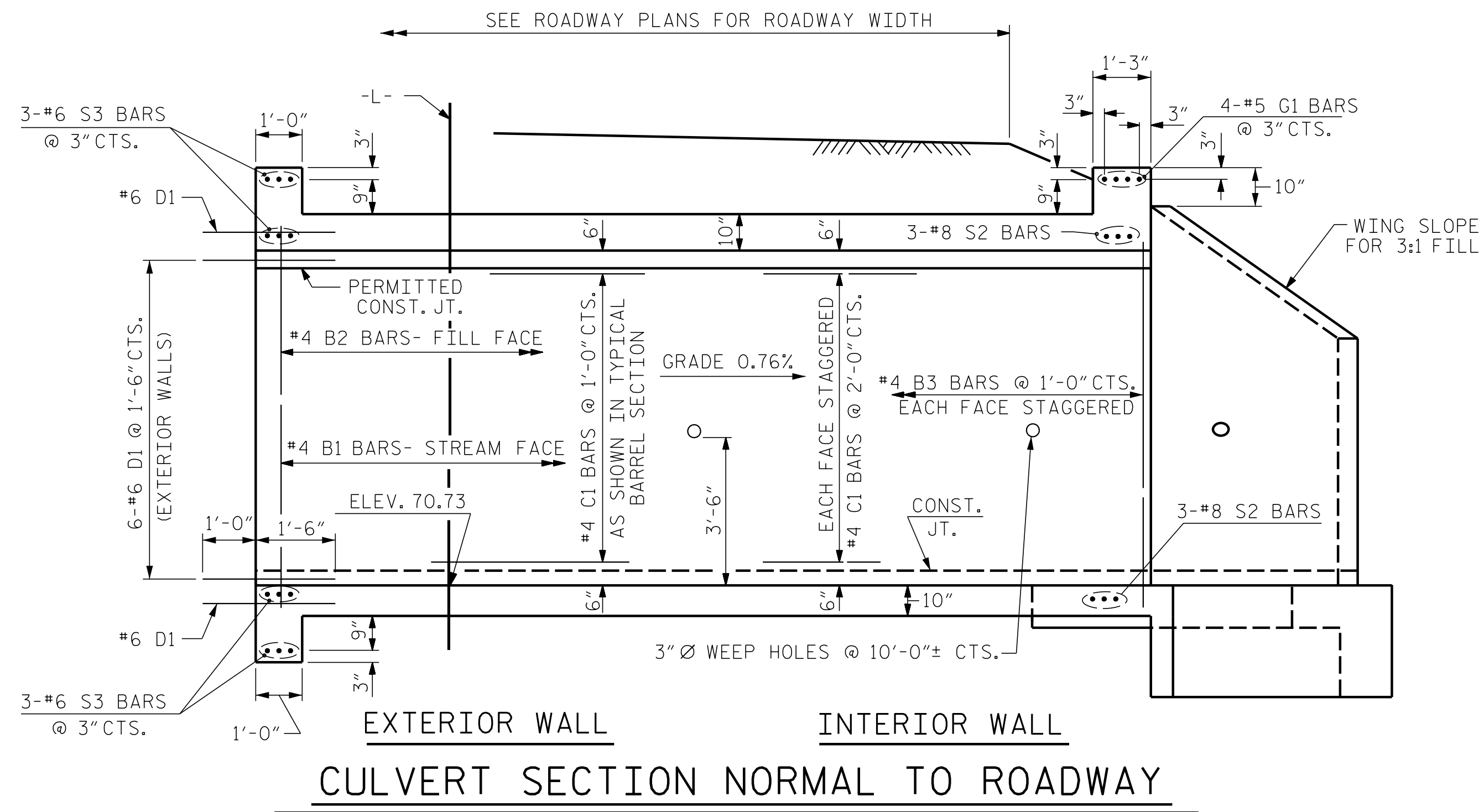
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-2
1			3			TOTAL SHEETS 9
2			4			

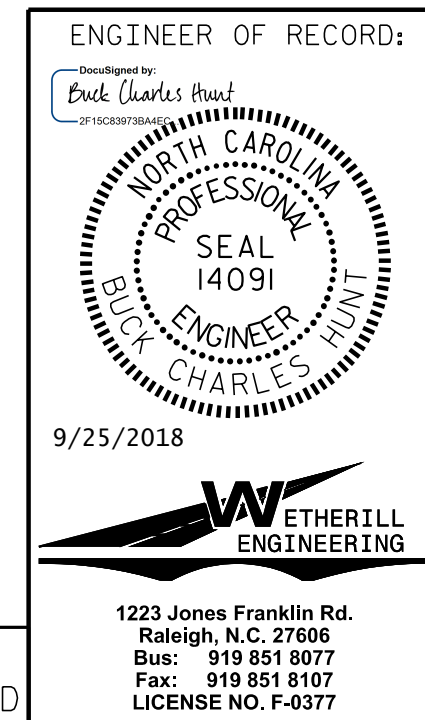
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ASSEMBLED BY : D. HODGE	DATE : 6/18
CHECKED BY : B.C. HUNT	DATE : 8/18
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THC



RIGHT ANGLE SECTION OF BARREL (STAGE I)
THERE ARE 98 C1 BARS IN SECTION OF BARREL

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
STATION: 286+51.00 -L-
SHEET 3 OF 9



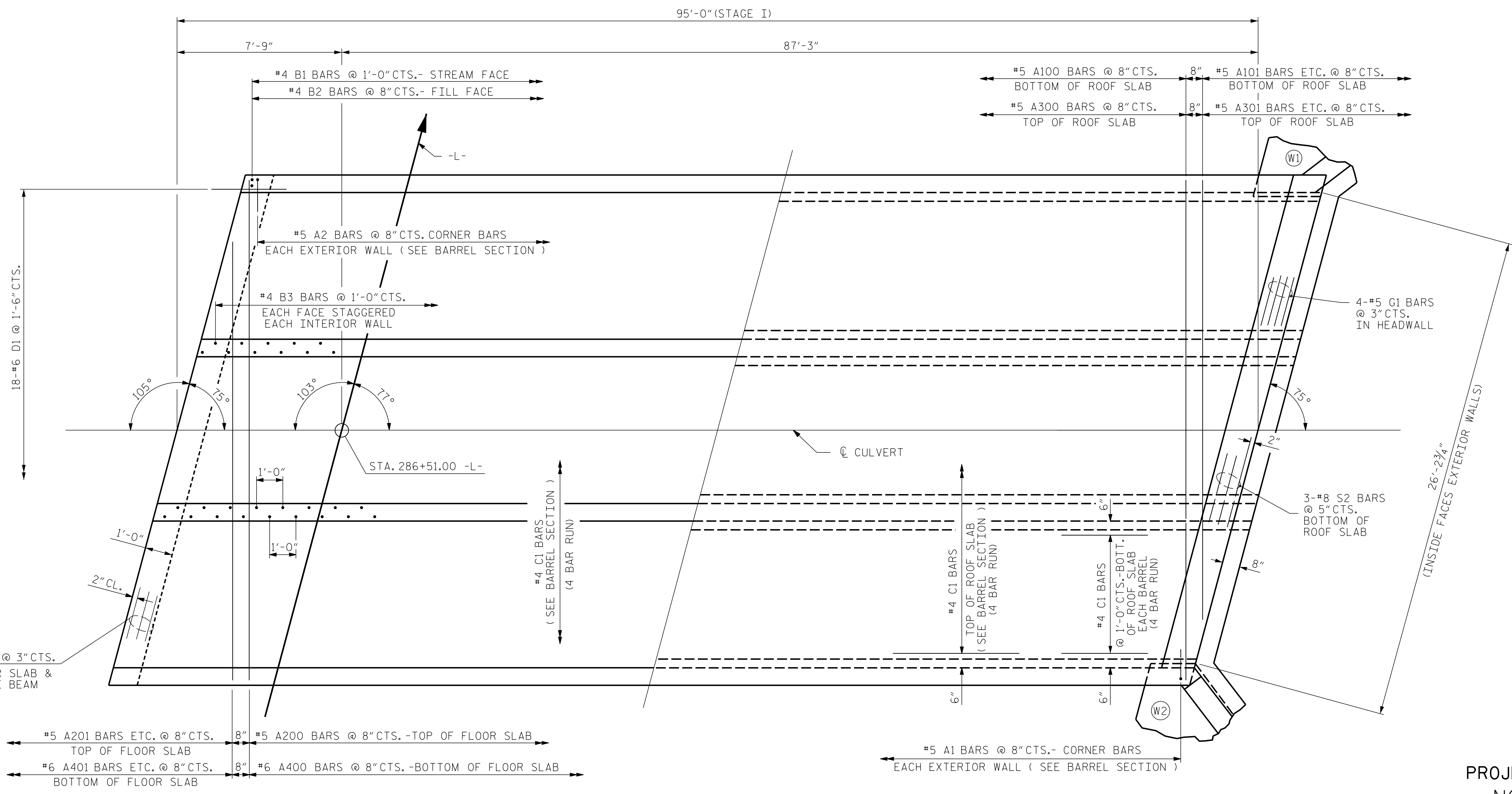
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BARREL STANDARD TRIPLE 8 FT. X 7 FT. CONCRETE BOX CULVERT (STAGE I)	
REVISIONS	
NO.	BY: DATE:
1	3
2	4
SHEET NO. C2-3 TOTAL SHEETS 9	

REVISIONS BY: M.M. CHECKED BY: B.W. DATE: 6/18/18
 DRAWN BY: R.F. HOLMES DATE: NOV. 19/17
 CHECKED BY: J.A. JOHNSON DATE: NOV. 19/17
 REDRAWN 06-16-89 BY: R.W.W. 1-BY: A.R.B.
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ASSEMBLED BY: D. HODGE	DATE: 6/18	SPECIAL
CHECKED BY: B.C. HUNT	DATE: 8/18	
DRAWN BY: R.F. HOLMES	DATE: NOV. 19/17	STANDARD
CHECKED BY: J.A. JOHNSON	DATE: NOV. 19/17	

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PART PLAN - FLOOR SLAB

PART PLAN - ROOF SLAB

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-

SHEET 4 OF 9

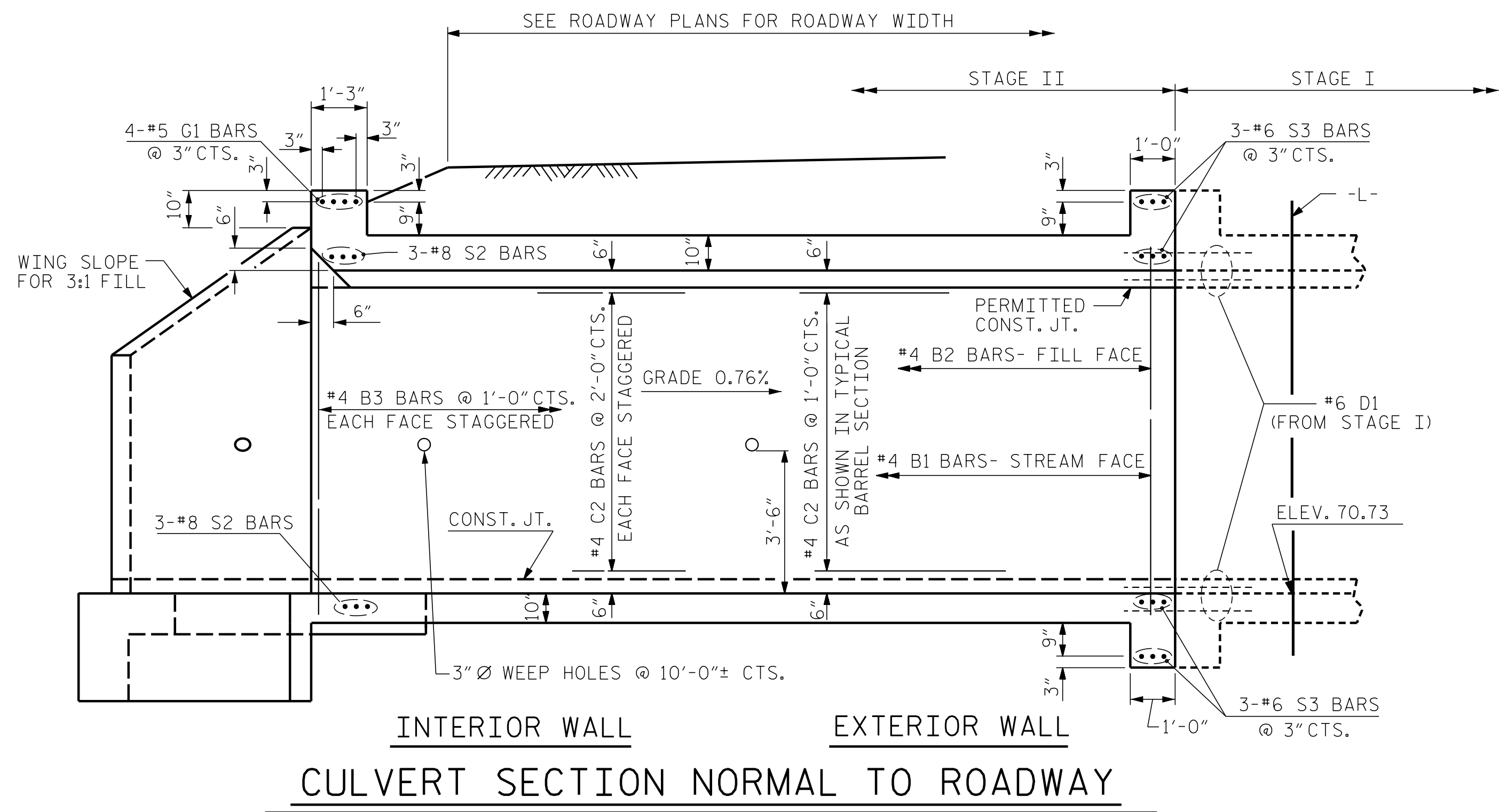
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 CHECKED BY : B.C. HUNT DATE : 8/18

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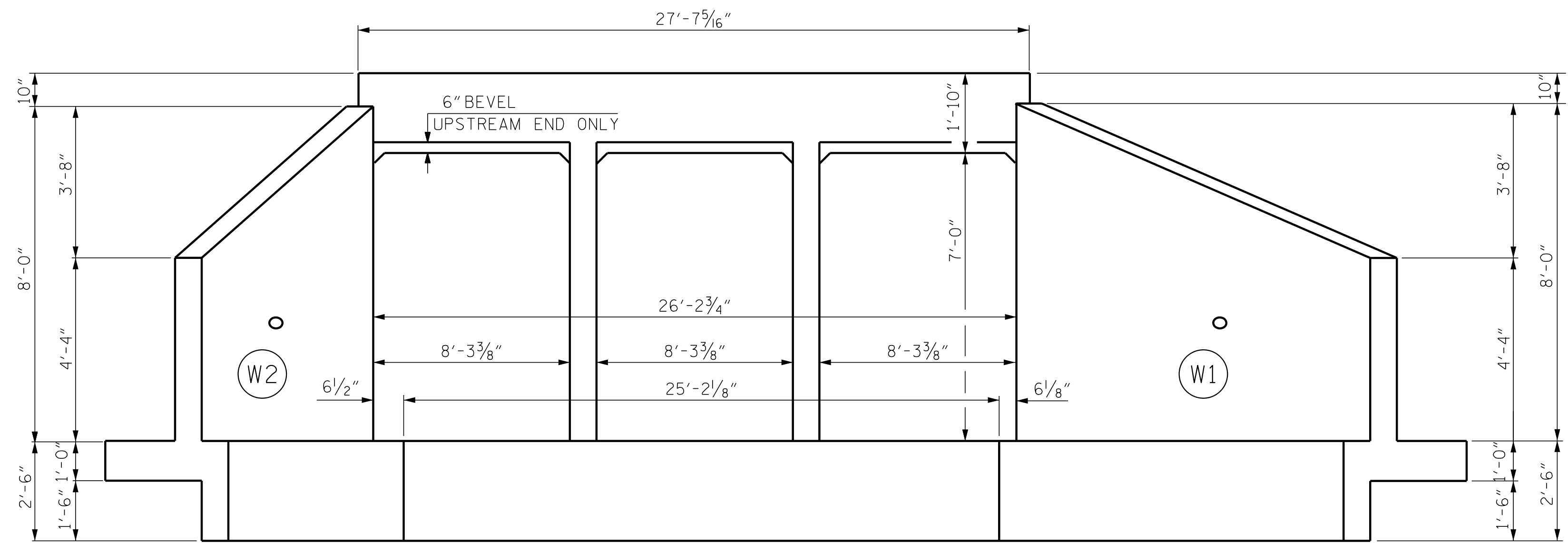
ENGINEER OF RECORD:
Buck Charles Hunt
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 14091
 BUCK CHARLES HUNT
 9/25/2018

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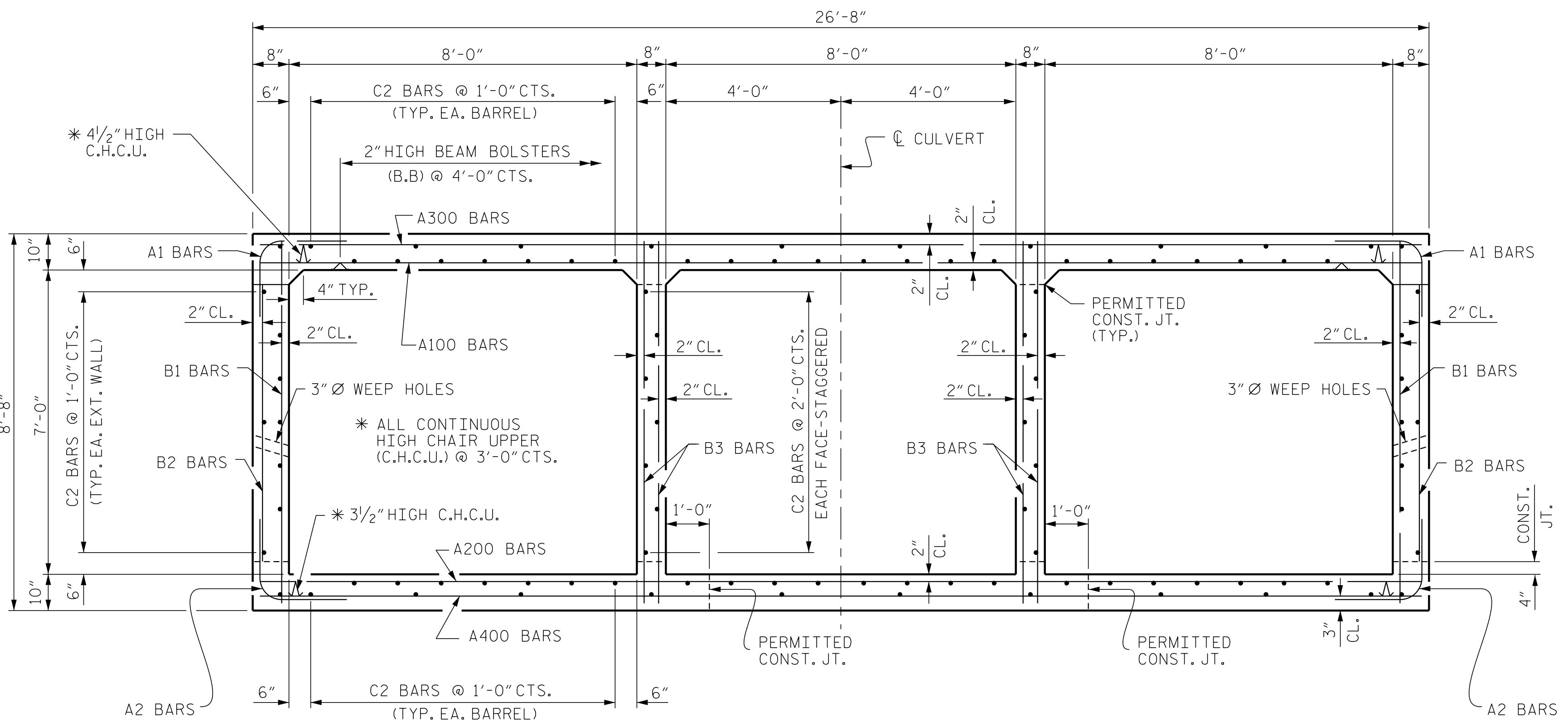
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
TRIPLE 8 FT. X 7 FT. CONCRETE BOX CULVERT (STAGE I)					
REVISIONS					
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TOTAL SHEETS					9



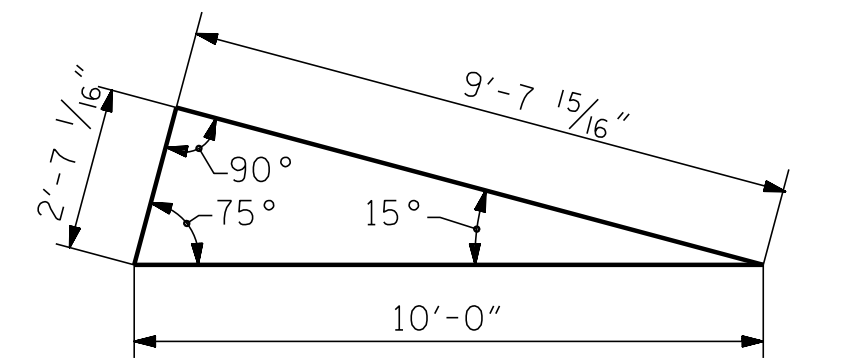
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW
(INLET END)



RIGHT ANGLE SECTION OF BARREL (STAGE II)
THERE ARE 98 C2 BARS IN SECTION OF BARREL



SKEW TRIANGLE

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-
 SHEET 5 OF 9

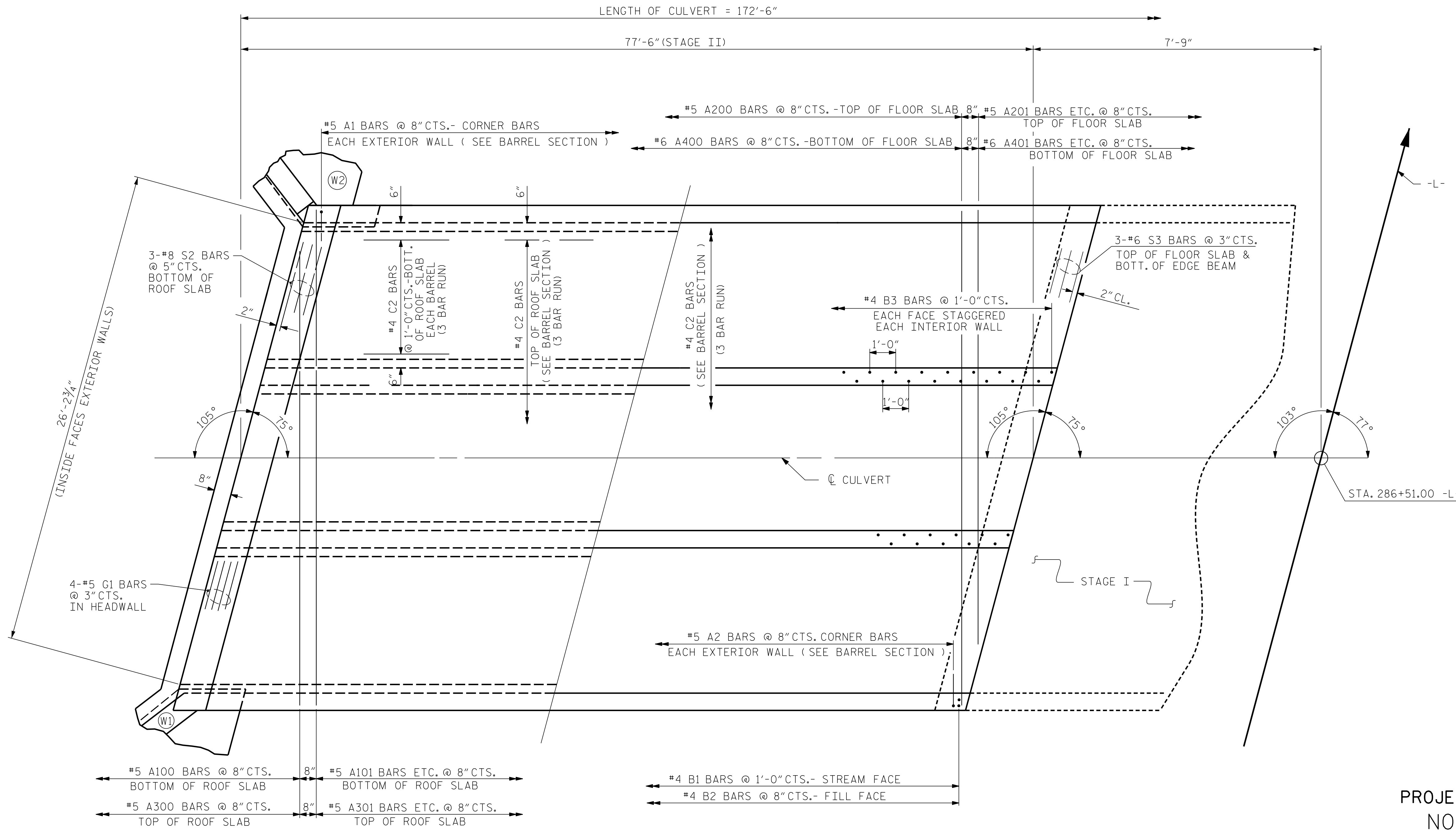


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BARREL STANDARD TRIPLE 8 FT. X 7 FT. CONCRETE BOX CULVERT 75° SKEW (STAGE II)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. C2-5					TOTAL SHEETS 9

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 REVISION 06-16-89 BY R.W.W. 1-BY A.R.B.
 REVISION 06-16-89 BY R.W.W. 1-BY A.R.B.
 REVISION 06-16-89 BY R.W.W. 1-BY A.R.B.

ASSEMBLED BY: <u>D. HODGE</u>	DATE: <u>6/18</u>	SPECIAL
CHECKED BY: <u>B.C. HUNT</u>	DATE: <u>8/18</u>	
DRAWN BY: <u>R.F. HOLMES</u>	DATE: <u>NOV. 1971</u>	STANDARD
CHECKED BY: <u>J.A. JOHNSON</u>	DATE: <u>NOV. 1971</u>	

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PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-

SHEET 6 OF 9

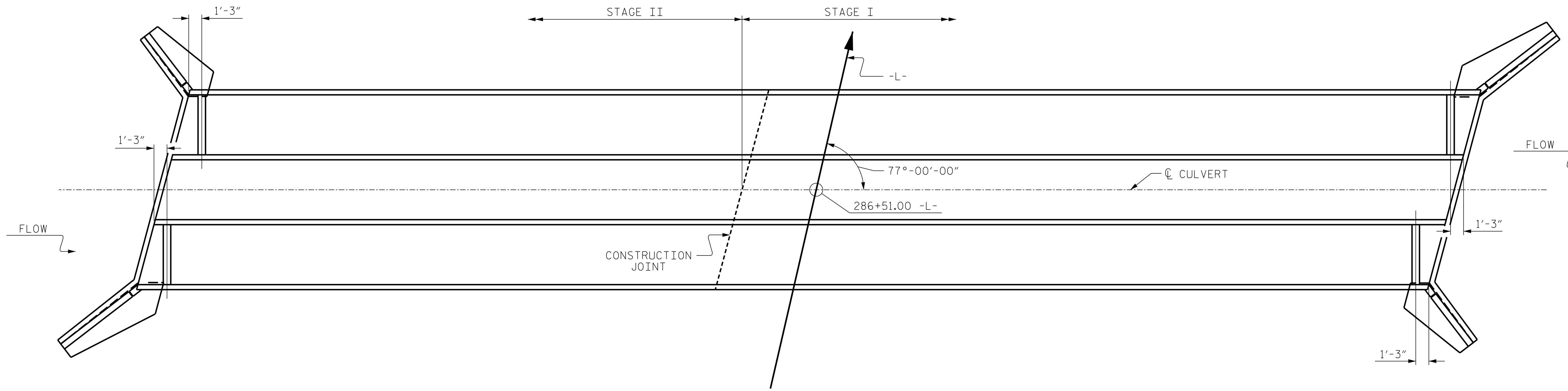
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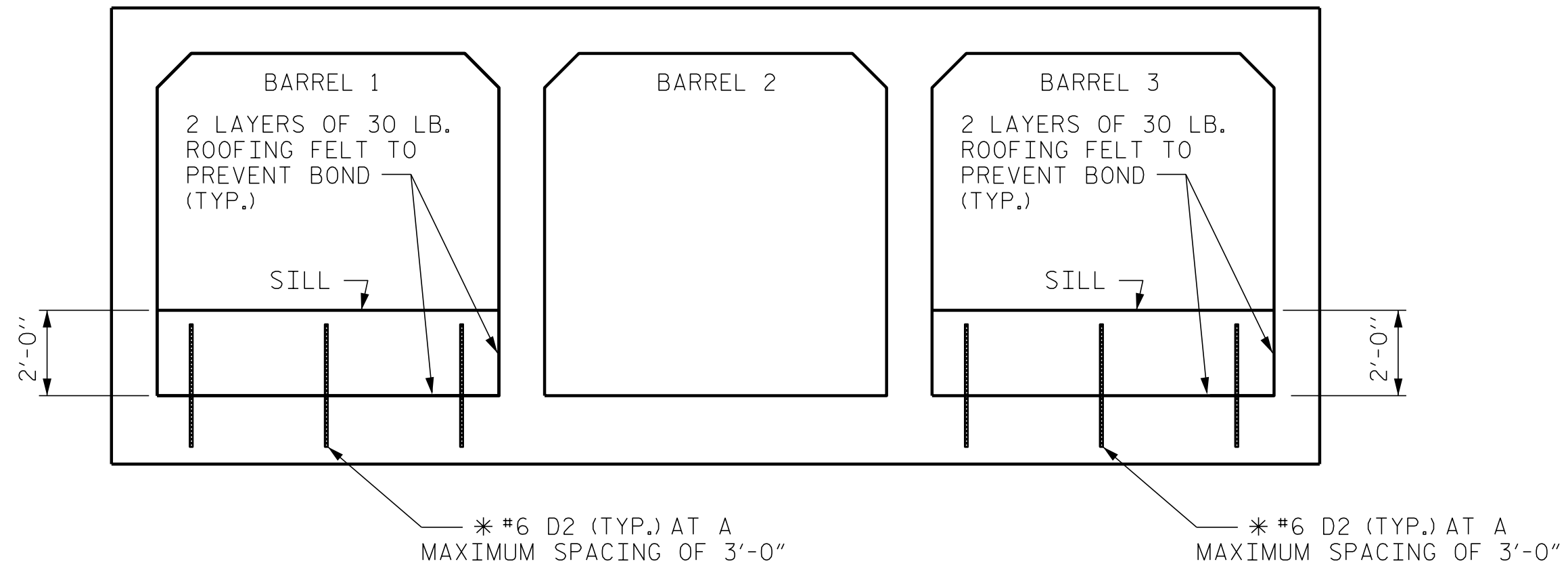
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ENGINEER OF RECORD:
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 BUCK CHARLES HUNT
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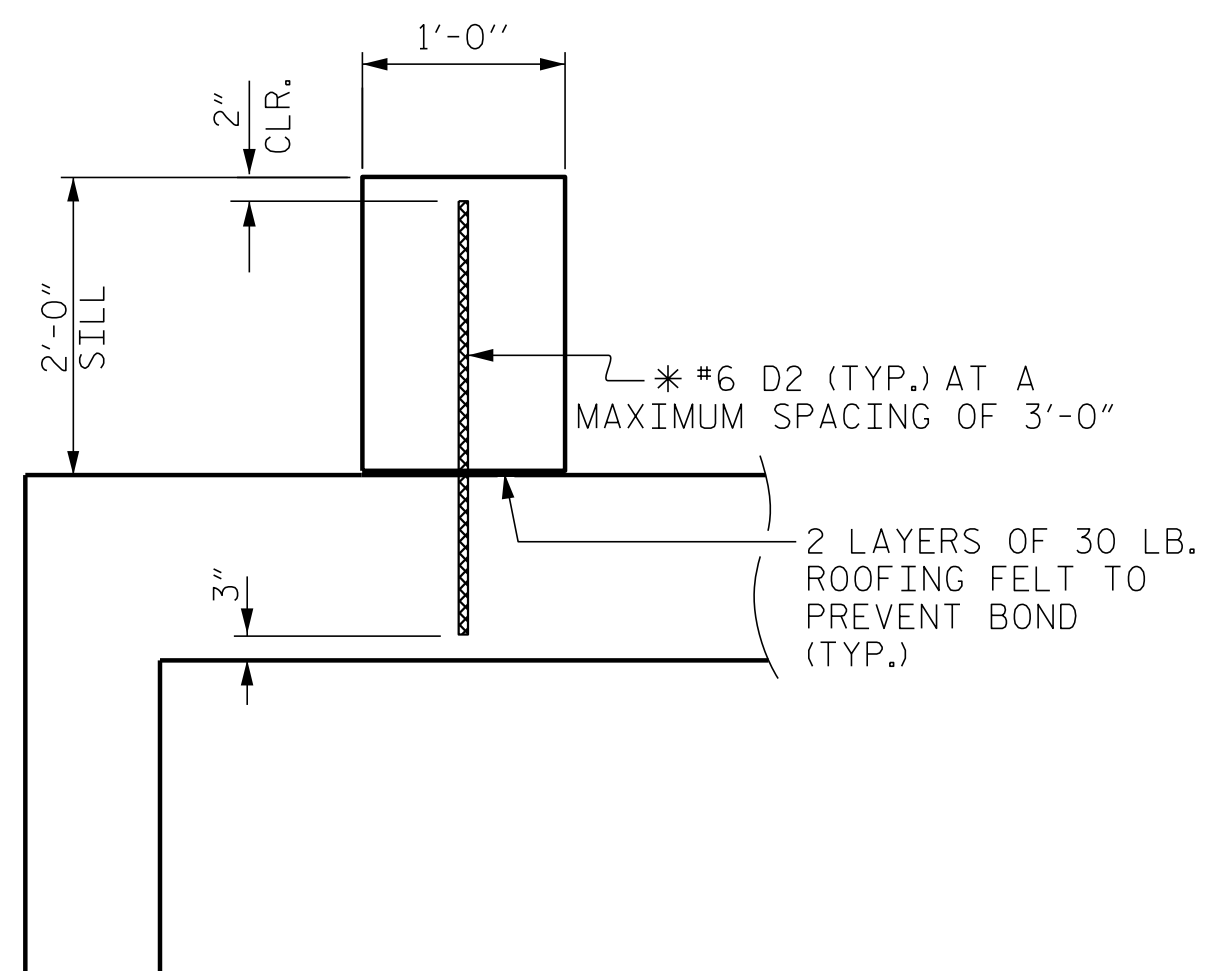
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TRIPLE 8 FT. X 7 FT. CONCRETE BOX CULVERT (STAGE II)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					C2-6
TOTAL SHEETS					9



PLAN - SILL LOCATION
SHOWING PLACEMENT OF SILLS



INLET ELEVATION
LOOKING DOWNSTREAM



SECTION THROUGH SILL
* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

PROJECT NO. R-2582A
NORTHAMPTON COUNTY
STATION: 286+51.00 -L-

SHEET 7 OF 9

CULVERT SILL DETAILS

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DRAWN BY: D. HODGE DATE: 6/18
CHECKED BY: B.C. HUNT DATE: 8/18

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ENGINEER OF RECORD:

 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

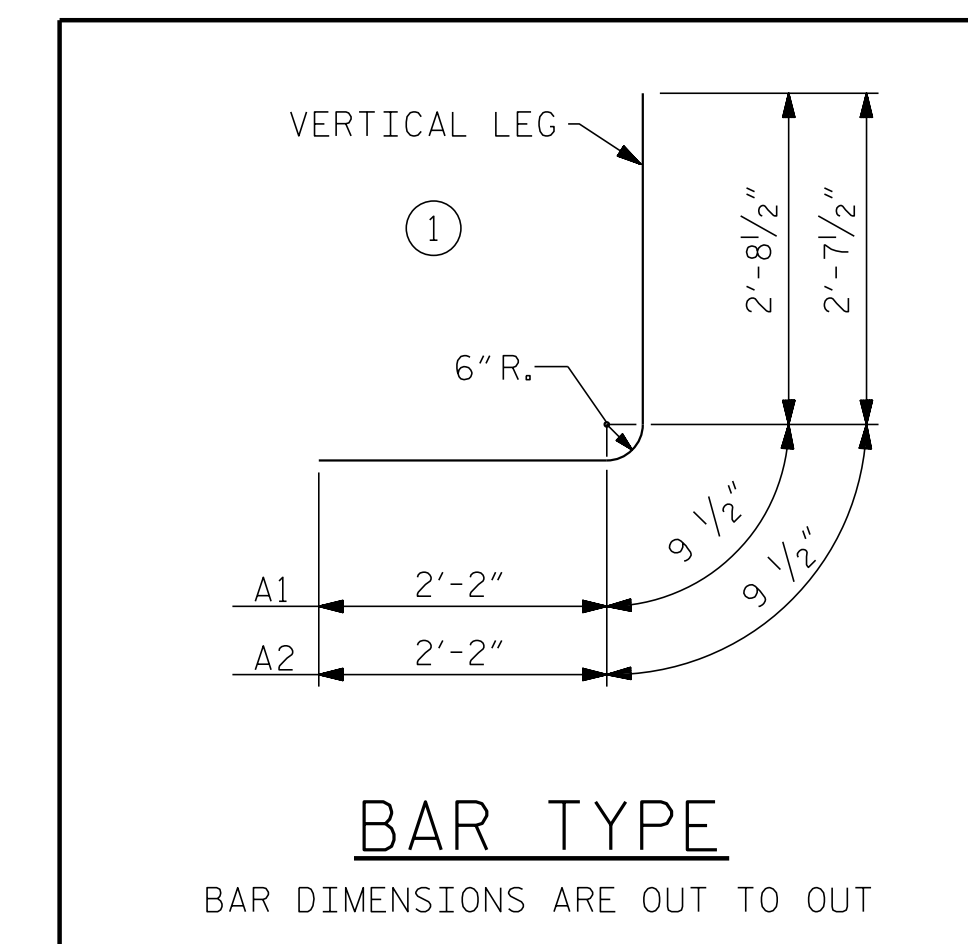
**TRIPLE 8 FT. X 7 FT.
 CONCRETE BOX CULVERT
 77° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-7
1			3			TOTAL SHEETS
2			4			9

BARREL REINFORCING STEEL

STAGE I												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		
A1	282	5	1	5'-8"	1667	A400	132	6	6	STR	26'-4"	5221	A1	230	5	1	5'-8"	1359	A400	106	6	6	STR	26'-4"	4193
A2	282	5	1	5'-7"	1642	A401	2	6	6	STR	24'-4"	73	A2	230	5	1	5'-7"	1339	A401	2	6	6	STR	24'-4"	73
						A402	2	6	6	STR	21'-10"	66							A402	2	6	6	STR	21'-10"	66
A100	132	5	STR	26'-4"	3625	A403	2	6	6	STR	19'-4"	58	A100	106	5	STR	26'-4"	2911	A403	2	6	6	STR	19'-4"	58
A101	2	5	STR	24'-4"	51	A404	2	6	6	STR	16'-10"	51	A101	2	5	STR	24'-4"	51	A404	2	6	6	STR	16'-10"	51
A102	2	5	STR	21'-10"	46	A405	2	6	6	STR	14'-4"	43	A102	2	5	STR	21'-10"	46	A405	2	6	6	STR	14'-4"	43
A103	2	5	STR	19'-4"	40	A406	2	6	6	STR	11'-10"	36	A103	2	5	STR	19'-4"	40	A406	2	6	6	STR	11'-10"	36
A104	2	5	STR	16'-10"	35	A407	2	6	6	STR	9'-4"	28	A104	2	5	STR	16'-10"	35	A407	2	6	6	STR	9'-4"	28
A105	2	5	STR	14'-4"	30	A408	2	6	6	STR	6'-11"	21	A105	2	5	STR	14'-4"	30	A408	2	6	6	STR	6'-11"	21
A106	2	5	STR	11'-10"	25	A409	2	6	6	STR	4'-5"	13	A106	2	5	STR	11'-10"	25	A409	2	6	6	STR	4'-5"	13
A107	2	5	STR	9'-4"	19							A107	2	5	STR	9'-4"	19								
A108	2	5	STR	6'-11"	14	B1	192	4	STR	8'-3"	1058	A108	2	5	STR	6'-11"	14	B1	156	4	STR	8'-3"	860		
A109	2	5	STR	4'-5"	9	B2	282	4	STR	6'-4"	1193	A109	2	5	STR	4'-5"	9	B2	230	4	STR	6'-4"	973		
						B3	382	4	STR	8'-3"	2105							B3	310	4	STR	8'-3"	1708		
A200	132	5	STR	26'-4"	3625							A200	106	5	STR	26'-4"	2911								
A201	2	5	STR	24'-4"	51	C1	392	4	STR	25'-2"	6590	A201	2	5	STR	24'-4"	51	C2	294	4	STR	27'-0"	5303		
A202	2	5	STR	21'-10"	46							A202	2	5	STR	21'-10"	46								
A203	2	5	STR	19'-4"	40	D1	48	6	STR	2'-6"	180	A203	2	5	STR	19'-4"	40	D2	6	6	STR	2'-5"	22		
A204	2	5	STR	16'-10"	35	D2	6	6	STR	2'-5"	22	A204	2	5	STR	16'-10"	35								
A205	2	5	STR	14'-4"	30							A205	2	5	STR	14'-4"	30	G1	4	5	STR	27'-3"	114		
A206	2	5	STR	11'-10"	25	G1	4	5	STR	27'-3"	114	A206	2	5	STR	11'-10"	25								
A207	2	5	STR	9'-4"	19							A207	2	5	STR	9'-4"	19	S2	6	8	STR	27'-3"	437		
A208	2	5	STR	6'-11"	14	S2	6	8	STR	27'-3"	437	A208	2	5	STR	6'-11"	14	S3	12	6	STR	27'-3"	491		
A209	2	5	STR	4'-5"	9	S3	12	6	STR	27'-3"	491	A209	2	5	STR	4'-5"	9								
A300	132	5	STR	26'-4"	3625							A300	106	5	STR	26'-4"	2911								
A301	2	5	STR	24'-4"	51							A301	2	5	STR	24'-4"	51								
A302	2	5	STR	21'-10"	46							A302	2	5	STR	21'-10"	46								
A303	2	5	STR	19'-4"	40							A303	2	5	STR	19'-4"	40								
A304	2	5	STR	16'-10"	35							A304	2	5	STR	16'-10"	35								
A305	2	5	STR	14'-4"	30							A305	2	5	STR	14'-4"	30								
A306	2	5	STR	11'-10"	25							A306	2	5	STR	11'-10"	25								
A307	2	5	STR	9'-4"	19							A307	2	5	STR	9'-4"	19								
A308	2	5	STR	6'-11"	14							A308	2	5	STR	6'-11"	14								
A309	2	5	STR	4'-5"	9							A309	2	5	STR	4'-5"	9								
REINFORCING STEEL												REINFORCING STEEL													
32,791 LBS												26,728 LBS													

BAR	SIZE	SPLICE LENGTH
A200	#5	2'-2"
A400	#6	2'-9"
"B"	#4	1'-9"
"C"	#4	1'-11"



PROJECT NO. R-2582A
NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-

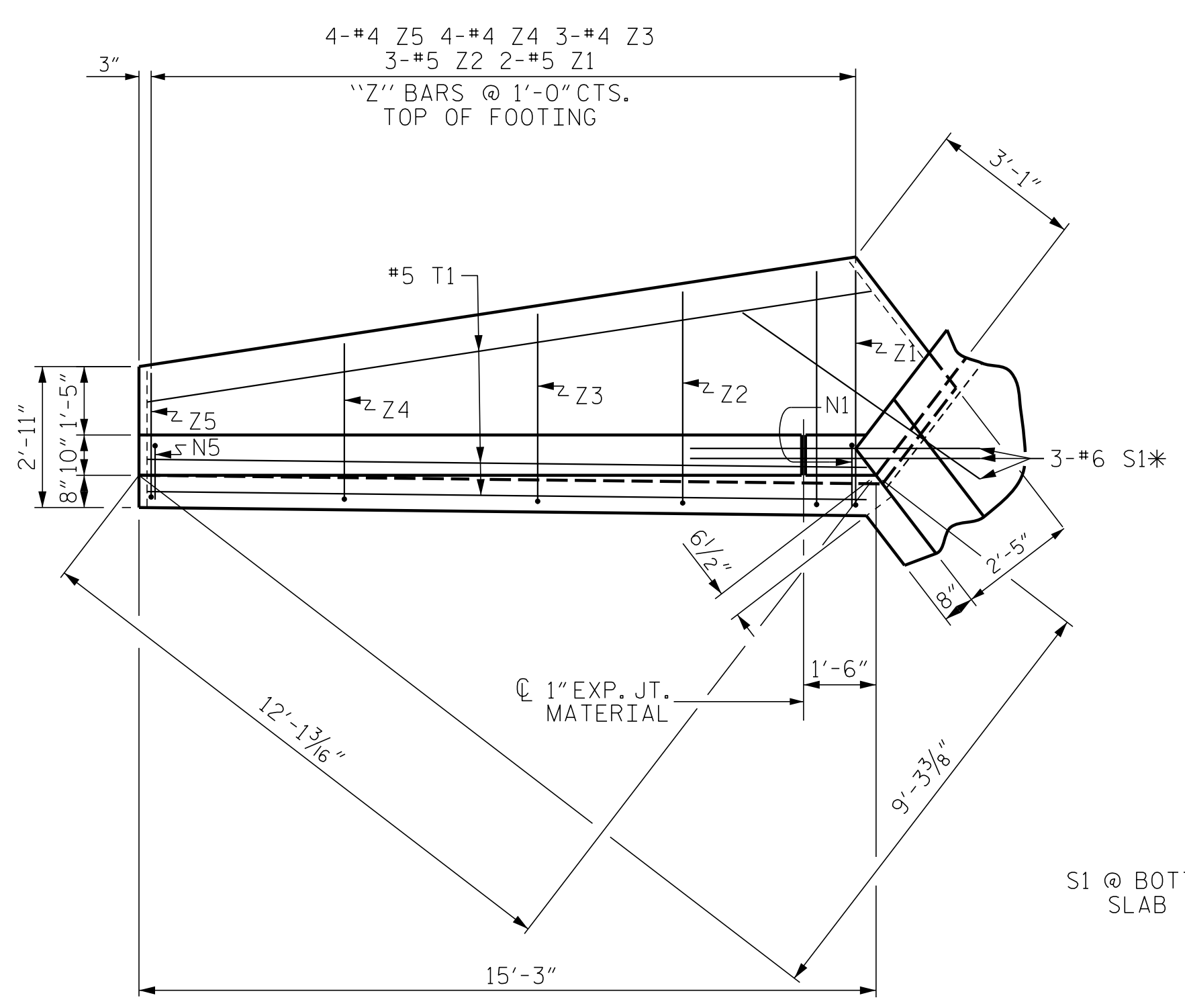
SHEET 8 OF 9

ENGINEER OF RECORD: 9/25/2018 1223 Jones Franklin Rd. Raleigh, N.C. 27606 Bus: 919 851 8077 Fax: 919 851 8107 LICENSE NO. F-0377	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH <h2 style="margin: 0;">TRIPLE 8 FT. X 7 FT. CONCRETE BOX CULVERT</h2>																		
REVISIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4			SHEET NO. C2-8 TOTAL SHEETS 9
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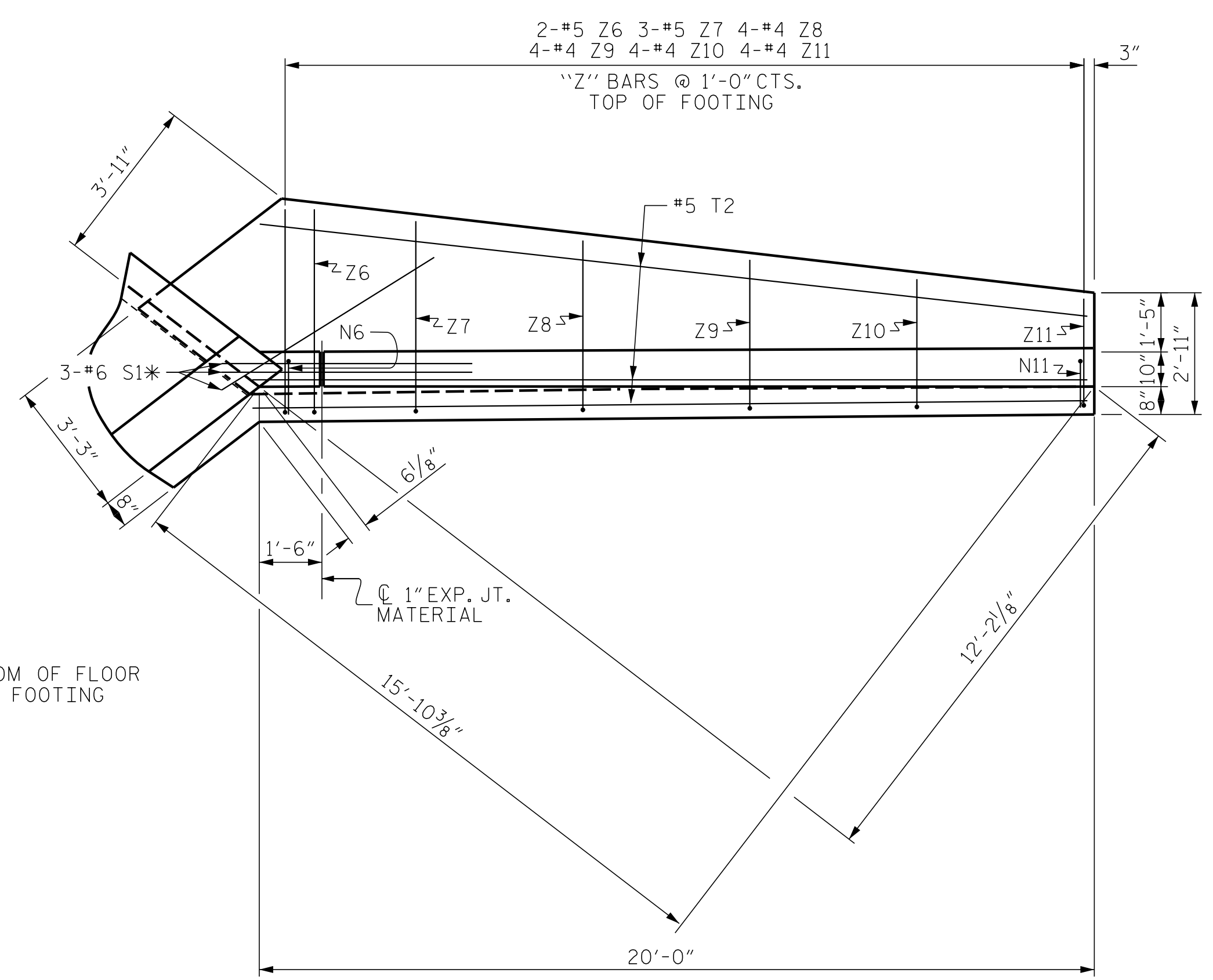
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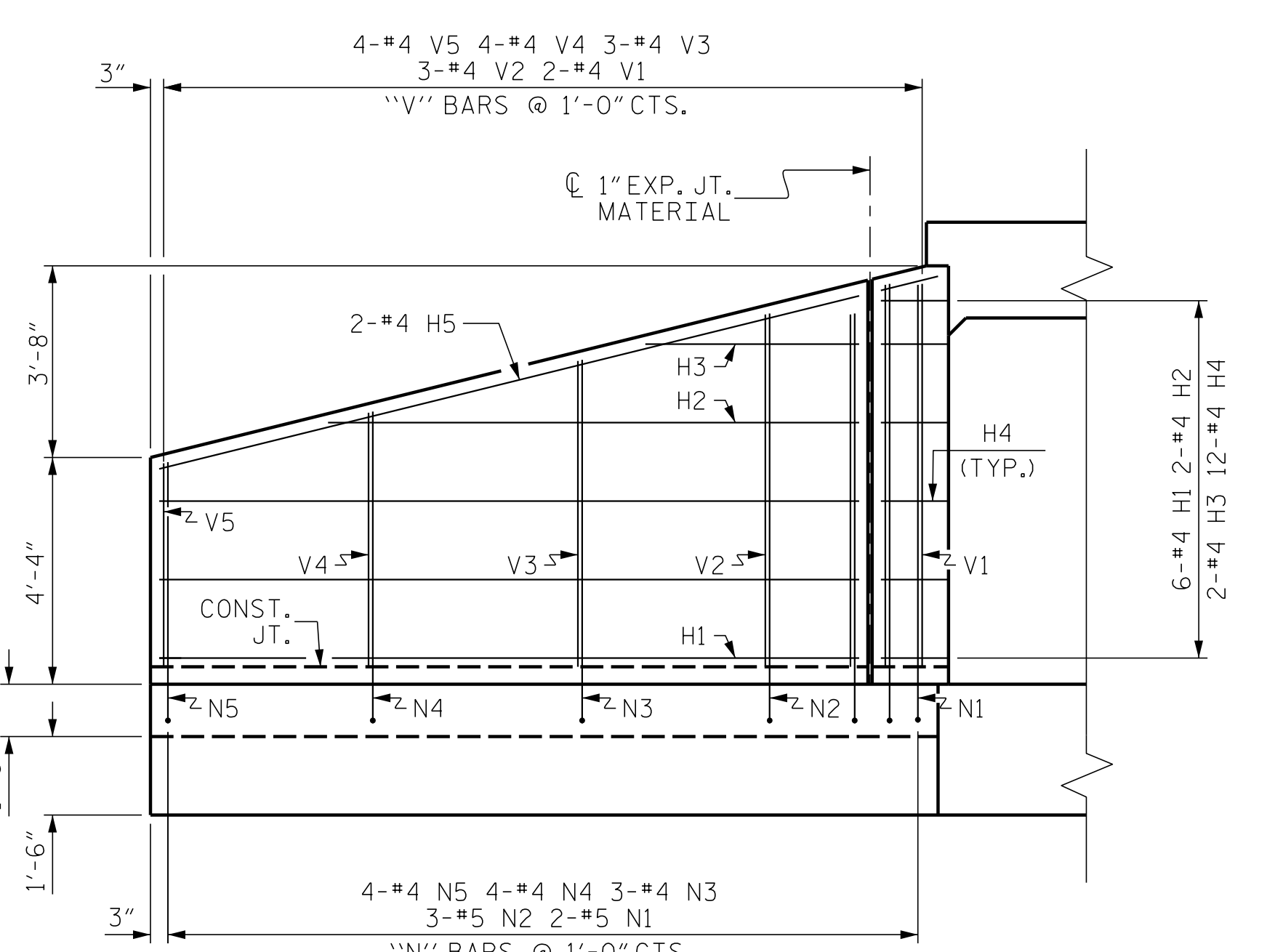
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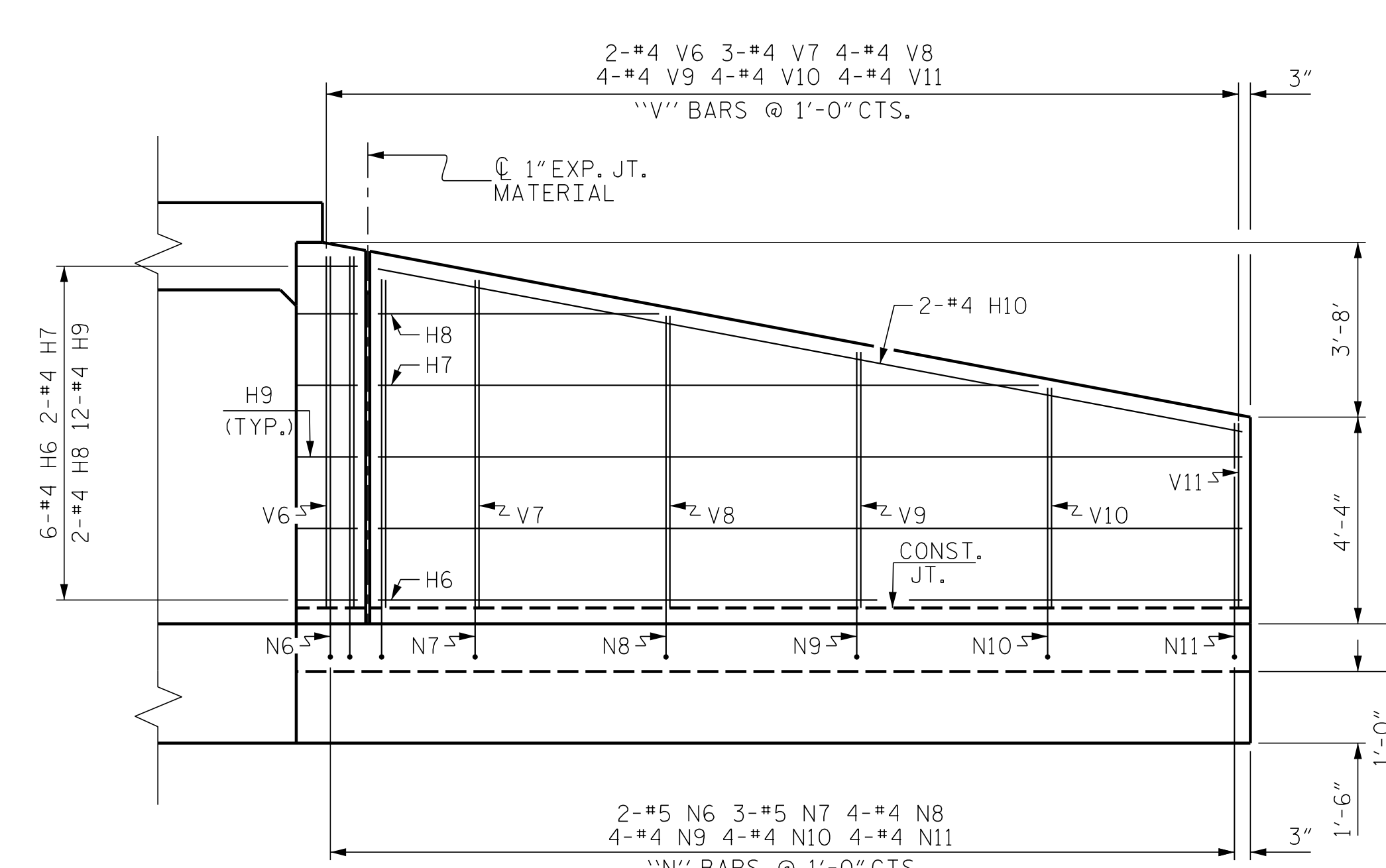
PLAN W2



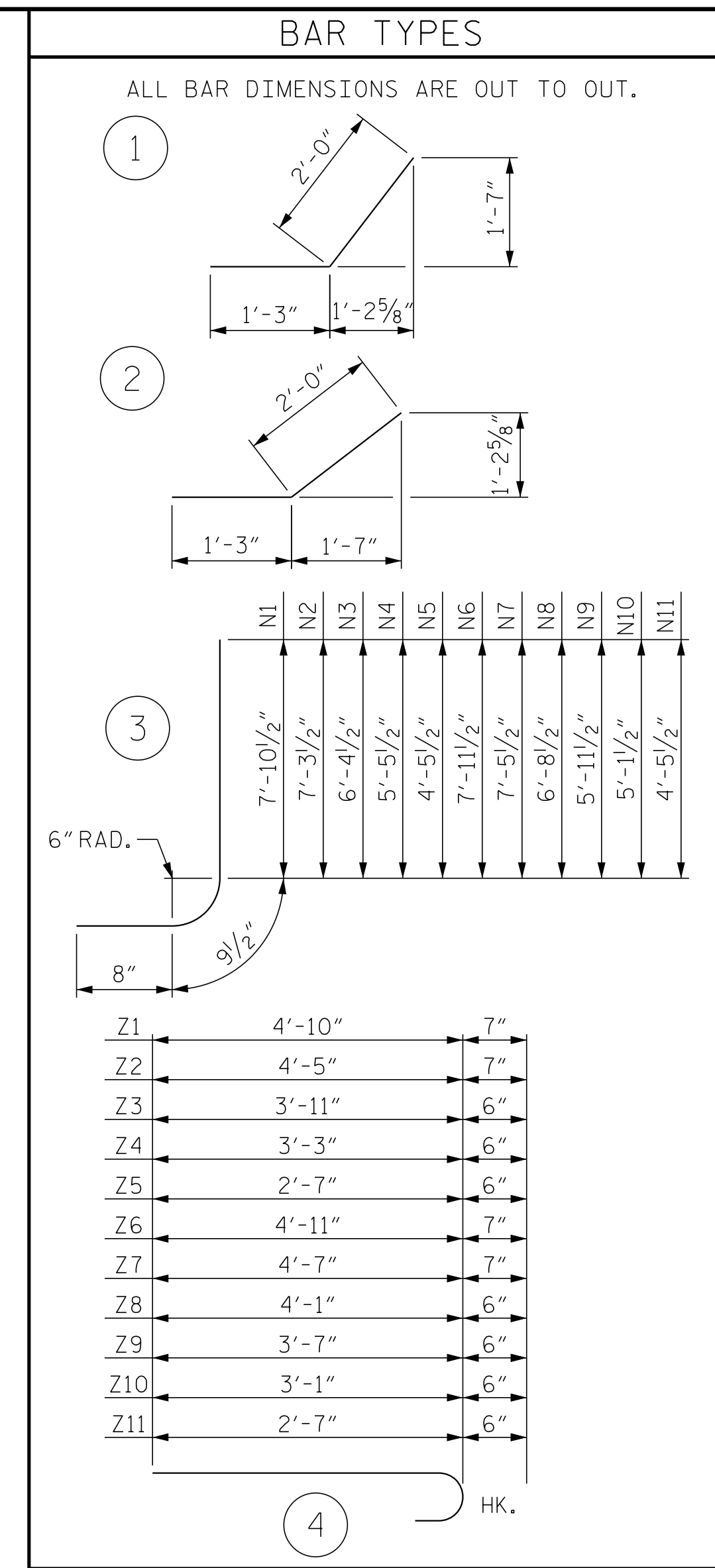
PLAN W1



ELEVATION W2

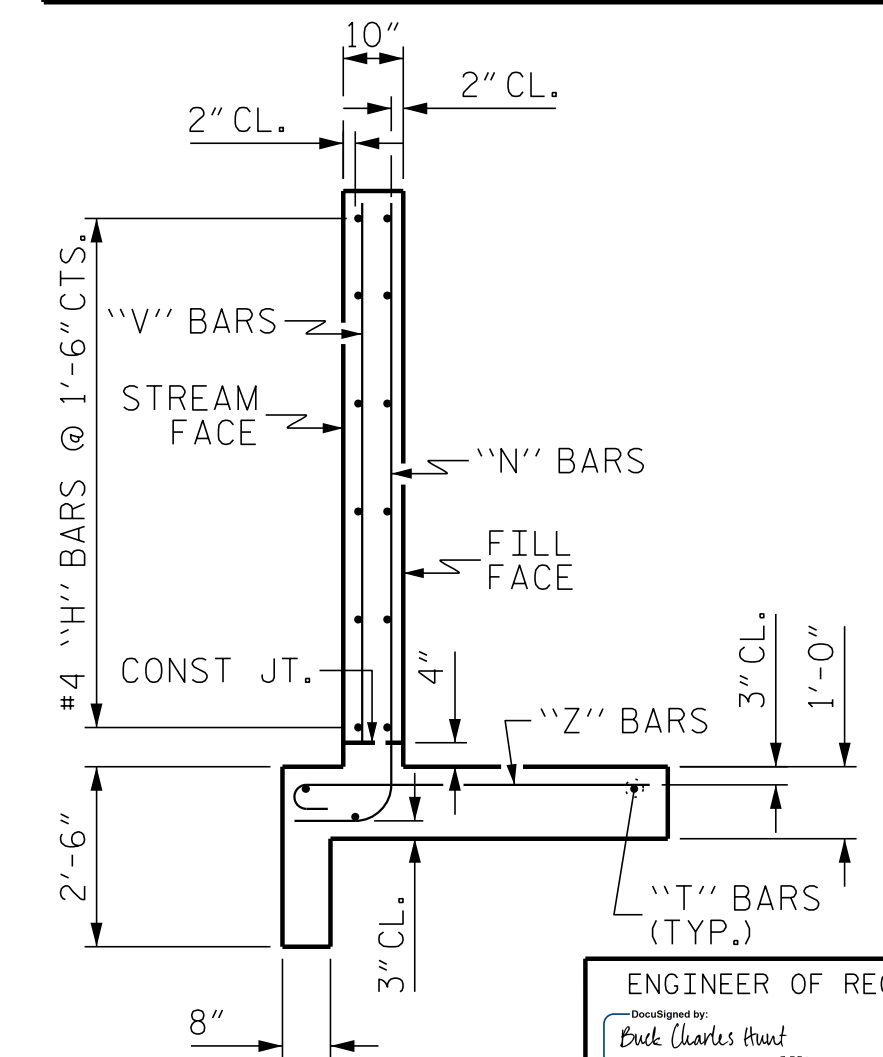


ELEVATION W1



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	13'-4"	107
H2	4	#4	STR	10'-1"	27
H3	4	#4	STR	4'-1"	11
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	13'-9"	37
H6	12	#4	STR	18'-1"	145
H7	4	#4	STR	13'-10"	37
H8	4	#4	STR	5'-10"	16
H9	24	#4	2	3'-3"	52
H10	4	#4	STR	18'-5"	49
N1	4	#5	3	9'-4"	39
N2	6	#5	3	8'-9"	55
N3	6	#4	3	7'-10"	31
N4	8	#4	3	6'-11"	37
N5	8	#4	3	5'-11"	32
N6	4	#5	3	9'-5"	39
N7	6	#5	3	8'-11"	56
N8	8	#4	3	8'-2"	44
N9	8	#4	3	7'-5"	40
N10	8	#4	3	6'-7"	35
N11	8	#4	3	5'-11"	32
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	15'-3"	95
T2	6	#5	STR	20'-0"	125
V1	4	#4	STR	7'-3"	19
V2	6	#4	STR	6'-8"	27
V3	6	#4	STR	5'-10"	23
V4	8	#4	STR	4'-10"	26
V5	8	#4	STR	3'-10"	20
V6	4	#4	STR	7'-4"	20
V7	6	#4	STR	6'-10"	27
V8	8	#4	STR	6'-1"	33
V9	8	#4	STR	5'-4"	29
V10	8	#4	STR	4'-7"	24
V11	8	#4	STR	3'-10"	20
Z1	4	#5	4	5'-5"	23
Z2	6	#5	4	5'-0"	31
Z3	6	#4	4	4'-5"	18
Z4	8	#4	4	3'-9"	20
Z5	8	#4	4	3'-1"	16
Z6	4	#5	4	5'-6"	23
Z7	6	#5	4	5'-2"	32
Z8	8	#4	4	4'-7"	24
Z9	8	#4	4	4'-1"	22
Z10	8	#4	4	3'-7"	19
Z11	8	#4	4	3'-1"	16

REINFORCING STEEL FOR 4 WINGS 1,813 LBS
 CLASS A CONCRETE FOR 4 WINGS 28.0 CY



TYPICAL WING SECTION

PROJECT NO. R-2582A
 NORTHAMPTON COUNTY
 STATION: 286+51.00 -L-
 SHEET 9 OF 9

ENGINEER OF RECORD:
 Buck Charles Hunt
 NORTH CAROLINA PROFESSIONAL SEAL 14091
 BUCK CHARLES HUNT
 9/25/2018
 WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. C2-9
 TOTAL SHEETS 9

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DRAWN BY: D. HODGE DATE: 7/18
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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 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$ " 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. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN