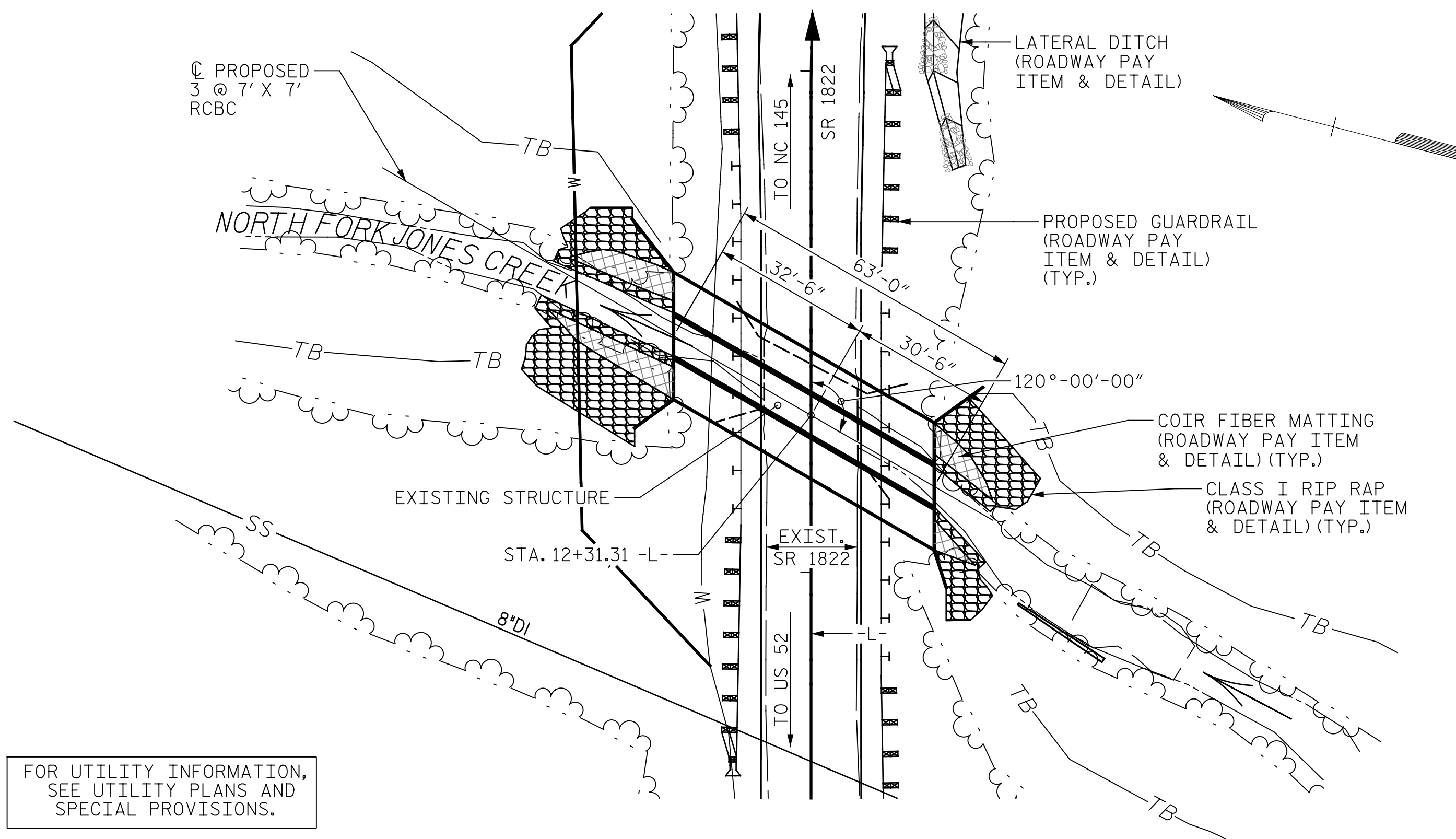


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numbers appear on each page, on the dates appearing  
with their signature on that page.**

**This file or an individual page  
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BENCH MARK : NCDOT LS CONTROL PT. "BL-1" 20.37' RIGHT OF STA. 10+09.47 -L- EL. 283.72



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**LOCATION SKETCH**

**HYDRAULIC DATA**

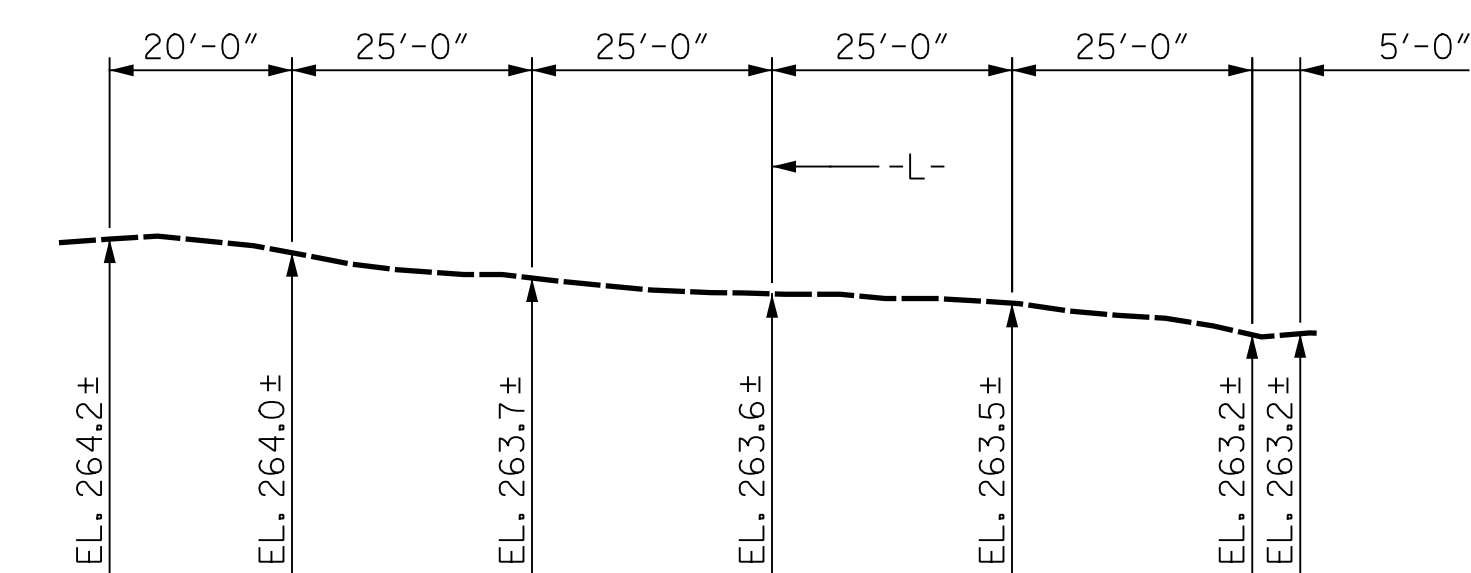
DESIGN DISCHARGE = 600 C.F.S.  
 FREQUENCY OF DESIGN FLOOD = 25 YRS.  
 DESIGN HIGH WATER ELEVATION = 268.0  
 DRAINAGE AREA = 1.21 SQ. MI.  
 BASE DISCHARGE (Q100) = 850 C.F.S.  
 BASE HIGH WATER ELEVATION = 270.5

**OVERTOPPING FLOOD DATA**

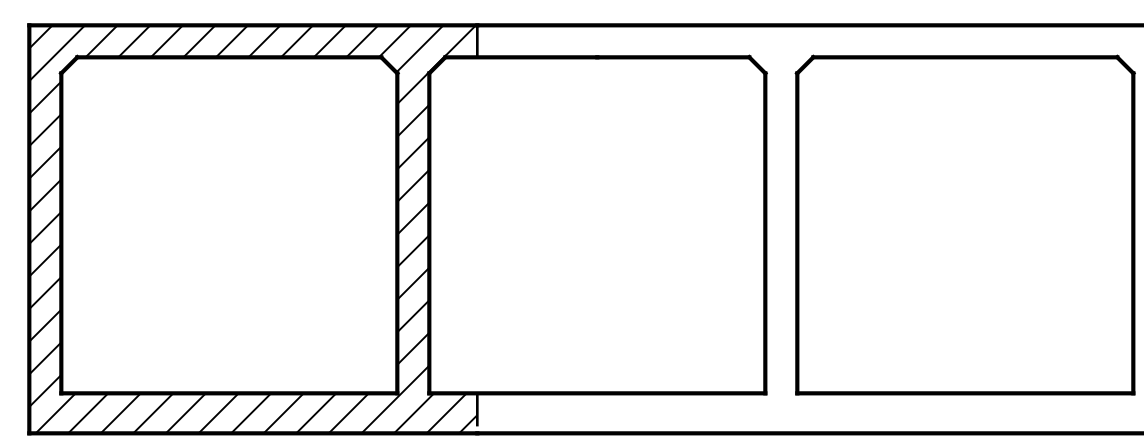
OVERTOPPING DISCHARGE = 1300 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION = 274.80

**GRADE DATA**

GRADE POINT ELEV. @ STA. 12+31.31 -L- = 274.93  
 BED ELEV. @ STA. 12+31.31 = 261.23  
 ROADWAY FILL SLOPES = 2:1



**PROFILE ALONG CULVERT**



**CONSTRUCTION PHASING**

(LOOKING DOWNSTREAM)

- PHASE I CONSTRUCTION
- PHASE II CONSTRUCTION

**NOTES**

ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.  
 THIS CULVERT IS LOCATED IN SEISMIC ZONE 1.  
 DESIGN FILL-----4'-9" MINIMUM AND 6'-11" MAXIMUM  
 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:  
 1. PHASE I 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.  
 3. PHASE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.  
 4. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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

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

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

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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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.

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.

THE EXISTING 1 SPAN STRUCTURE (1 @ 16'-10") WITH A CLEAR ROADWAY WIDTH OF 19.1' ON A TIMBER DECK WITH 10 LINES OF 5X12" TIMBER JOISTS ON A SUBSTRUCTURE CONSISTING OF YOUNG MASONRY ABUTMENTS AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

BACKFILL WITH SELECT MATERIAL, CLASS II MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.

EXCAVATE AT LEAST 1 FOOT BELOW BOTTOM OF CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORD WITH ARTICLE 414-4 OF THE STANDARD PROVISION.

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT BARRELS. UPON COMPLETION OF THE PROPOSED CULVERT, THE MATERIAL SHALL BE PLACED IN THE CENTER BARREL TO A DEPTH OF 1'-0" AND IN THE OUTER BARRELS BETWEEN SILLS TO A DEPTH OF 2'-0". BED MATERIAL MAY BE SUPPLEMENTED WITH CLASS I RIP RAP IF SUITABLE MATERIAL IS NOT AVAILABLE IN SUFFICIENT QUANTITIES.

THE ENTIRE COST OF WORK REQUIRED TO PLACE THE EXCAVATED MATERIAL OR SUPPLEMENTAL MATERIAL SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE REQUIRED BEARING CAPACITY (FACTORED RESISTANCE) AT THE BASE OF THE CULVERT IS 1.5 TSF. THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

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

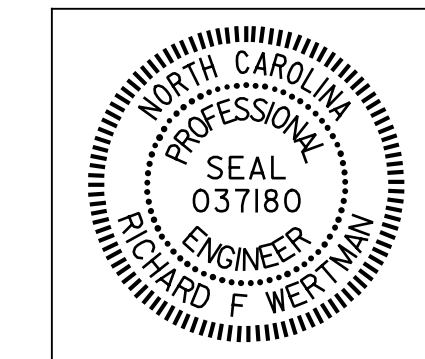
**TOTAL STRUCTURE QUANTITIES**

CLASS A CONCRETE	
BARREL @ 2.019 CY/FT	127.2 C.Y.
WINGS, ETC.	27.8 C.Y.
<b>TOTAL</b>	<b>155.0 C.Y.</b>
REINFORCING STEEL	
BARREL	20507 LBS.
WINGS, ETC.	1321 LBS.
<b>TOTAL</b>	<b>21828 LBS.</b>
CULVERT EXCAVATION *	LUMP SUM
FOUNDATION COND. MAT'L.	105 TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM

\* INCLUDES CLASS II SELECT BACKFILL

PROJECT NO. 17BP.10.R.13  
ANSON COUNTY  
 STATION: 12+31.31 -L-

SHEET 1 OF 7 REPLACES BR. #52



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TRIPLE 7 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 120° SKEW

DRAWN BY : J.A. BOYER DATE : 04-09-17  
 CHECKED BY : R.F. WERTMAN DATE : 04-10-17  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 04-10-17

PLANS PREPARED BY:  
  
 Excellence Delivered As Promised

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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



## 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 <sub>L1</sub> )	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	1.22	--	1.75	1.68	1	EXTERIOR WALL	6.67	1.22	1	BOTTOM SLAB	6.45	1	
	HL-93 (OPERATING)	N/A		1.58	--	1.35	2.18	1	EXTERIOR WALL	6.67	1.58	1	BOTTOM SLAB	6.45	1	
	HS-20 (INVENTORY)	36,000	②	2.00	72.00	1.75	2.01	1	EXTERIOR WALL	6.67	2.00	1	TOP SLAB	6.20	1	
	HS-20 (OPERATING)	36,000		2.59	93.33	1.35	2.61	1	EXTERIOR WALL	6.67	2.59	1	TOP SLAB	6.20	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		3.13	42.26	1.40	3.13	1	EXTERIOR WALL	6.67	3.27	1	TOP SLAB	6.20	1
		SNGARBS2	20,000		2.94	58.80	1.40	2.94	1	EXTERIOR WALL	6.67	3.04	1	TOP SLAB	6.20	1
		SNAGRIS2	22,000		3.13	68.86	1.40	3.13	1	EXTERIOR WALL	6.67	3.20	1	TOP SLAB	6.20	1
		SNCOTTS3	27,250	③	1.73	47.14	1.40	2.27	1	EXTERIOR WALL	6.67	1.73	1	BOTTOM SLAB	6.45	1
		SNAGGRS4	34,925		1.95	68.10	1.40	2.36	1	BOTTOM SLAB	7.00	1.95	1	BOTTOM SLAB	6.45	1
		SNS5A	35,550		2.28	81.05	1.40	2.66	1	BOTTOM SLAB	7.00	2.28	1	BOTTOM SLAB	6.45	1
		SNS6A	39,950		2.42	96.68	1.40	2.82	1	BOTTOM SLAB	7.00	2.42	1	BOTTOM SLAB	6.45	1
		SNS7B	42,000		2.53	106.26	1.40	2.94	1	BOTTOM SLAB	7.00	2.53	1	BOTTOM SLAB	6.45	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		2.50	82.50	1.40	3.01	1	BOTTOM SLAB	7.00	2.50	1	TOP SLAB	6.20	1
		TNT4A	33,075		2.03	67.14	1.40	2.66	1	EXTERIOR WALL	6.67	2.03	1	BOTTOM SLAB	6.45	1
		TNT6A	41,600		2.10	87.36	1.40	2.55	1	BOTTOM SLAB	7.00	2.10	1	BOTTOM SLAB	6.45	1
		TNT7A	42,000		2.30	96.60	1.40	2.79	1	BOTTOM SLAB	7.00	2.30	1	BOTTOM SLAB	6.45	1
		TNT7B	42,000		2.29	96.18	1.40	2.67	1	BOTTOM SLAB	7.00	2.29	1	BOTTOM SLAB	6.45	1
		TNAGRIT4	43,000		2.04	87.72	1.40	2.56	1	BOTTOM SLAB	7.00	2.04	1	BOTTOM SLAB	6.45	1
TNAGT5A	45,000		2.05	92.25	1.40	2.56	1	BOTTOM SLAB	7.00	2.05	1	BOTTOM SLAB	6.45	1		
TNAGT5B	45,000		2.03	91.35	1.40	2.46	1	BOTTOM SLAB	7.00	2.03	1	BOTTOM SLAB	6.45	1		

**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	--

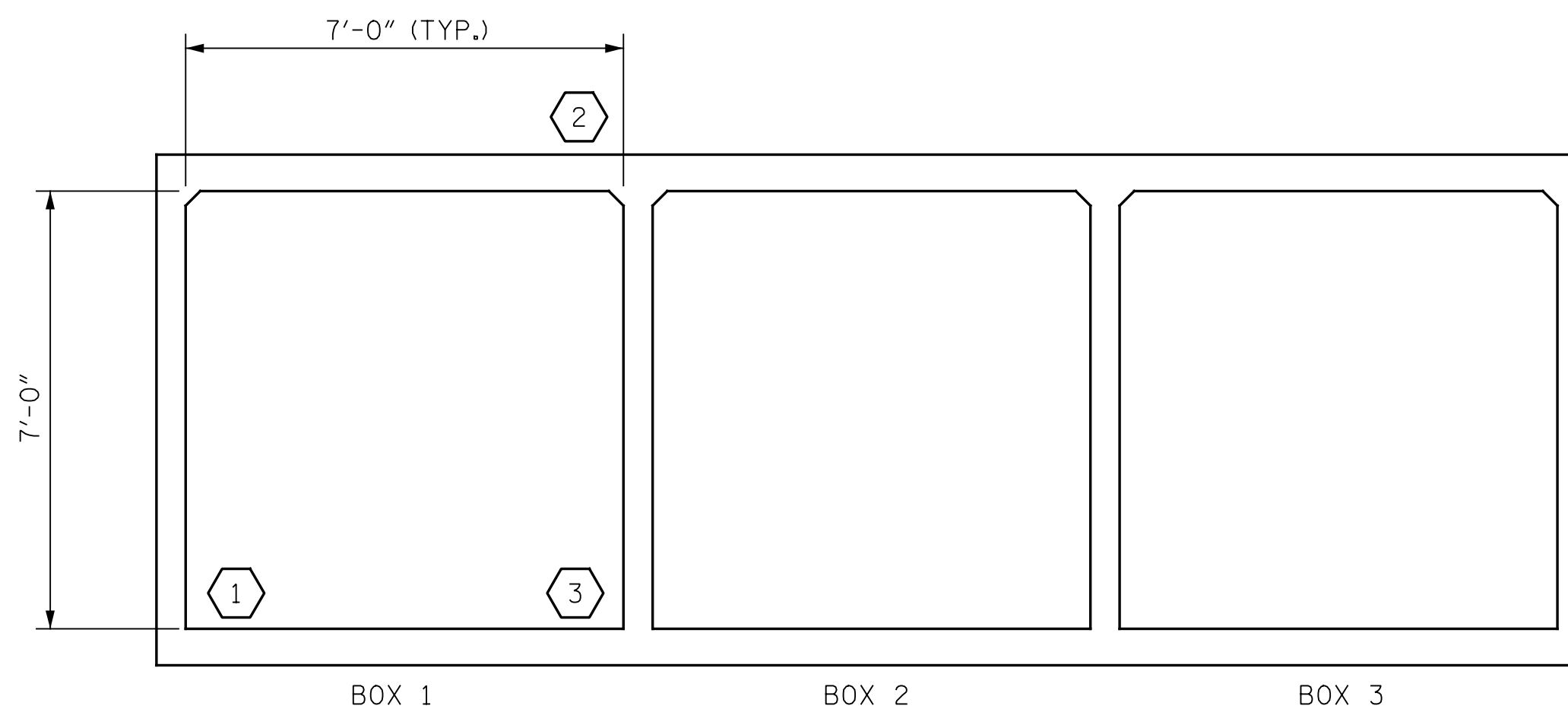
**NOTE:**

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

**COMMENTS:**

1. BOX STRUCTURE IS SYMMETRICAL, THEREFORE BOX 1 RATINGS SIMILAR TO BOX 3.

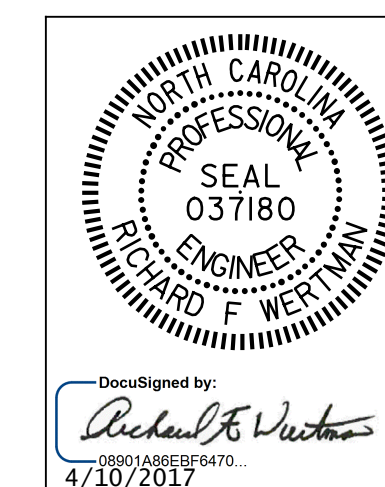
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE



**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.10.R.13  
ANSON COUNTY  
STATION: 12+31.31 -L-

SHEET 2 OF 7



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
REINFORCED CONCRETE  
BOX CULVERTS  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : J.M. KEPICH	DATE : 4/09/12
CHECKED BY : R.F. WERTMAN	DATE : 5/29/12
DRAWN BY : WMC 7/11	REV. 10/1/11
CHECKED BY : GM 7/11	MAA/GM

PLANS PREPARED BY:

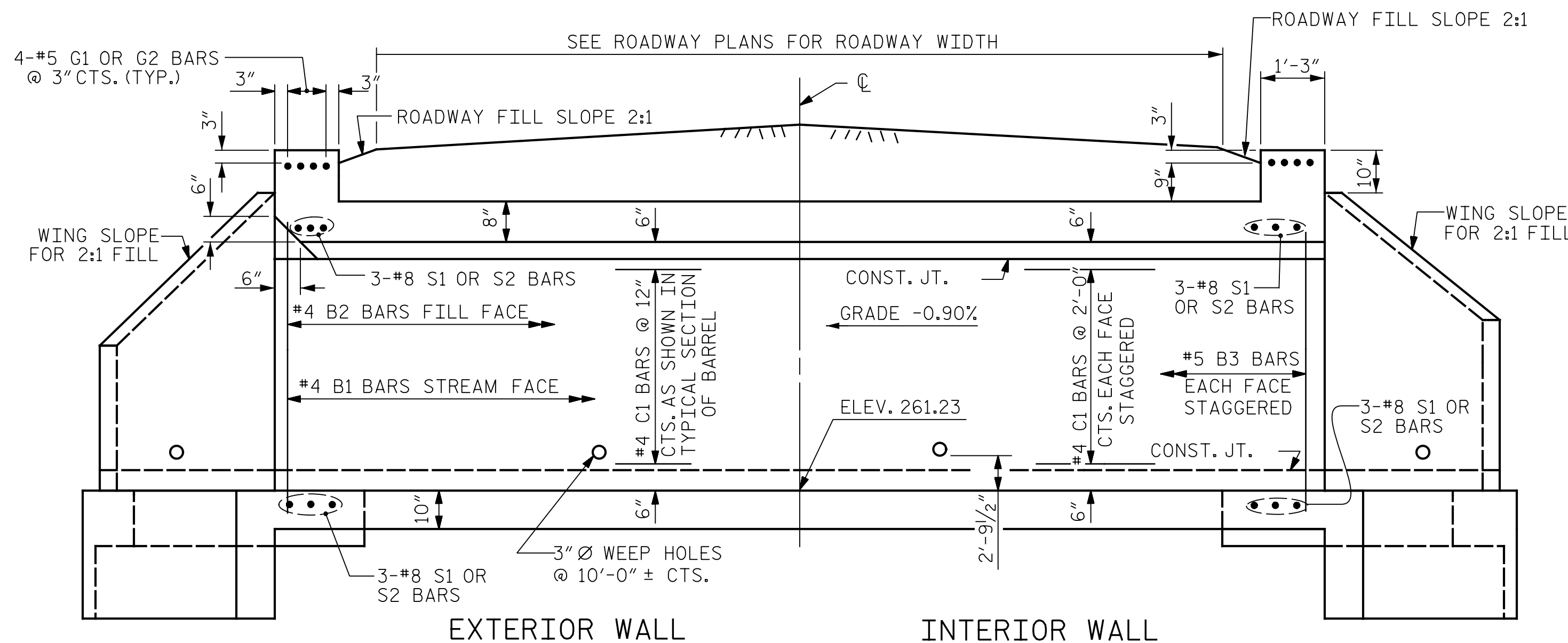
**Gannett Fleming**  
Excellence Delivered *As Promised*

2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

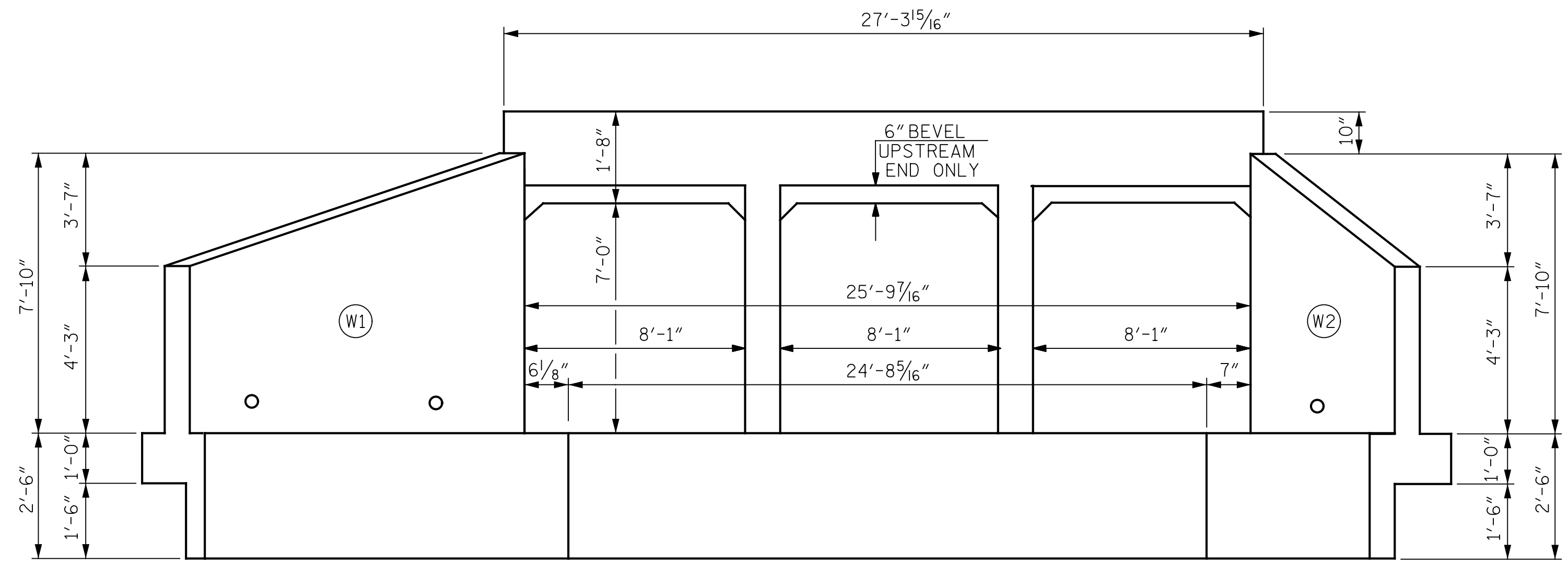
THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

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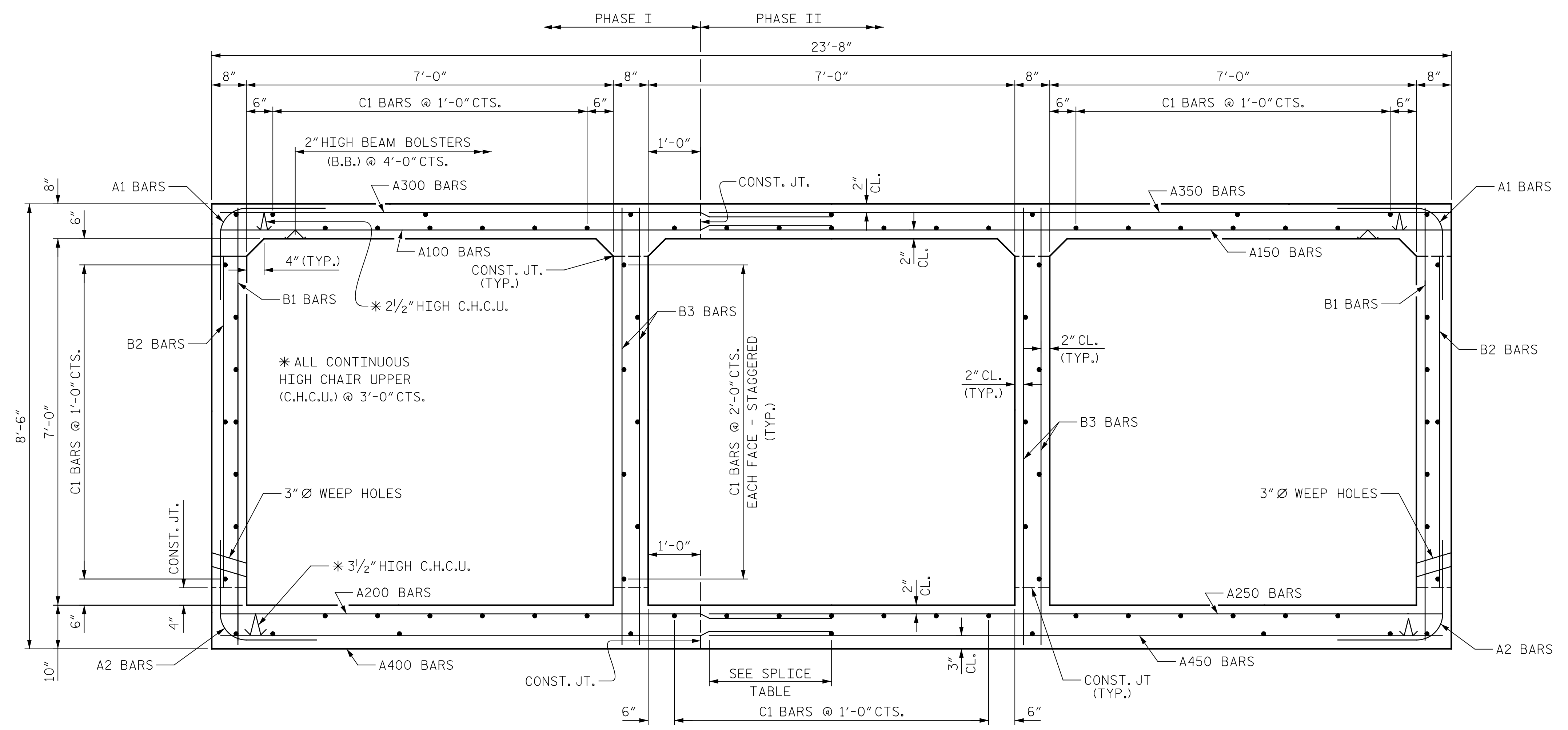
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			7



EXTERIOR WALL INTERIOR WALL  
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION-NORMAL TO SKEW

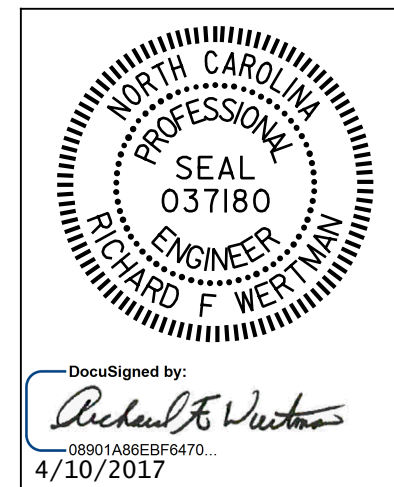


RIGHT ANGLE SECTION OF BARREL

THERE ARE 86 "C" BARS IN SECTION OF BARREL. (LOOKING DOWNSTREAM)

PROJECT NO. 17BP.10.R.13  
ANSON COUNTY  
STATION: 12+31.31 -L-  
SHEET 3 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
TRIPLE 7 FT. X 7 FT.  
CONCRETE BOX CULVERT  
120° SKEW



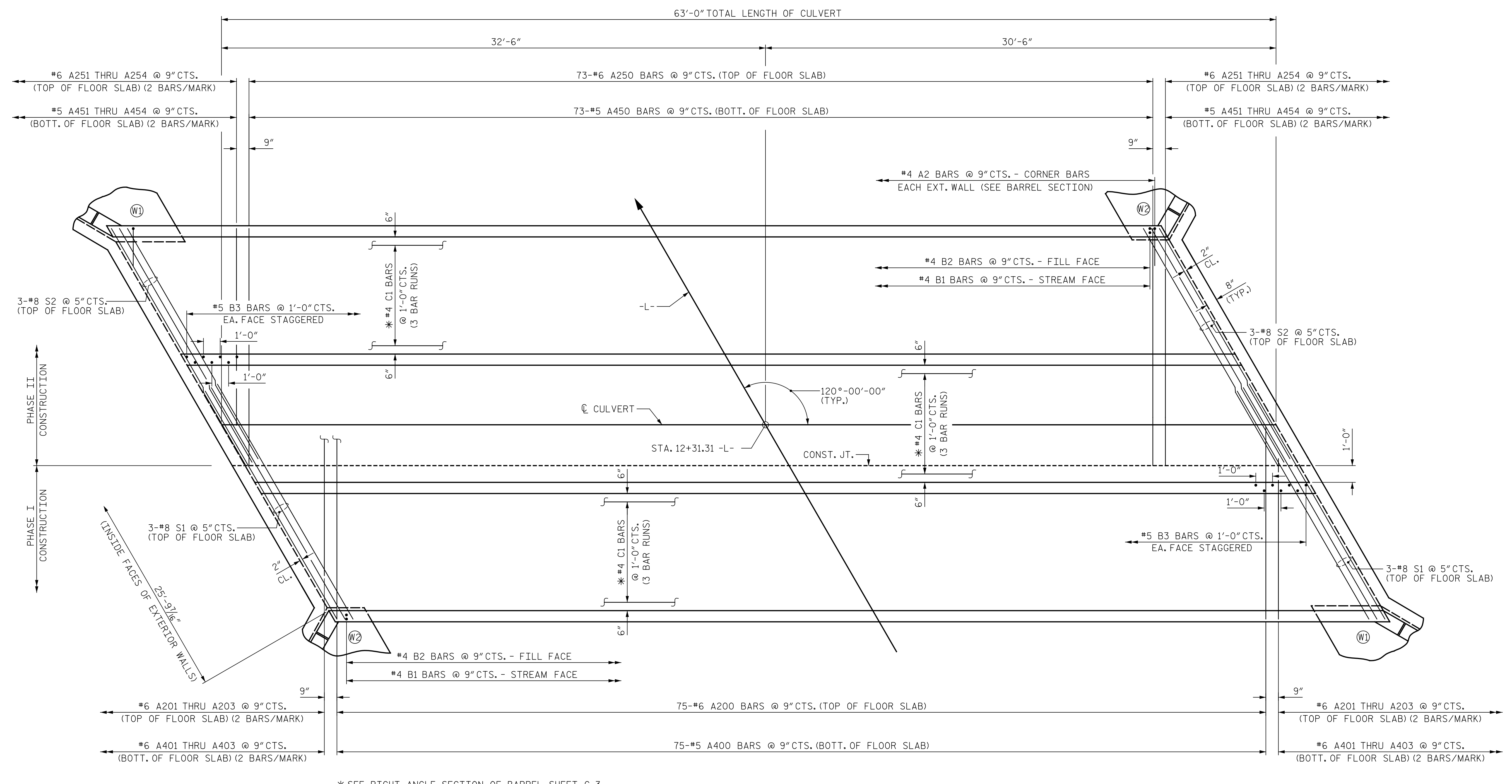
DRAWN BY : J.M. KEPICH DATE : 04-09-12  
CHECKED BY : R.F. WERTMAN DATE : 05-26-12  
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 04-10-17

PLANS PREPARED BY:  
**Gannett Fleming**  
2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
NC Lic. No. F-0270

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1			3			TOTAL SHEETS
2			4			7





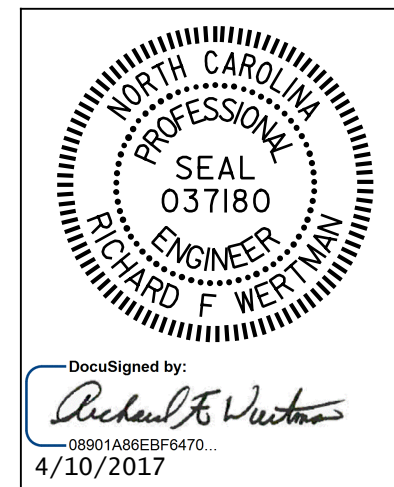
PLAN - FLOOR SLAB

PROJECT NO. 17BP.10.R.13  
ANSON COUNTY  
 STATION: 12+31.31 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

TRIPLE 7 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 120° SKEW



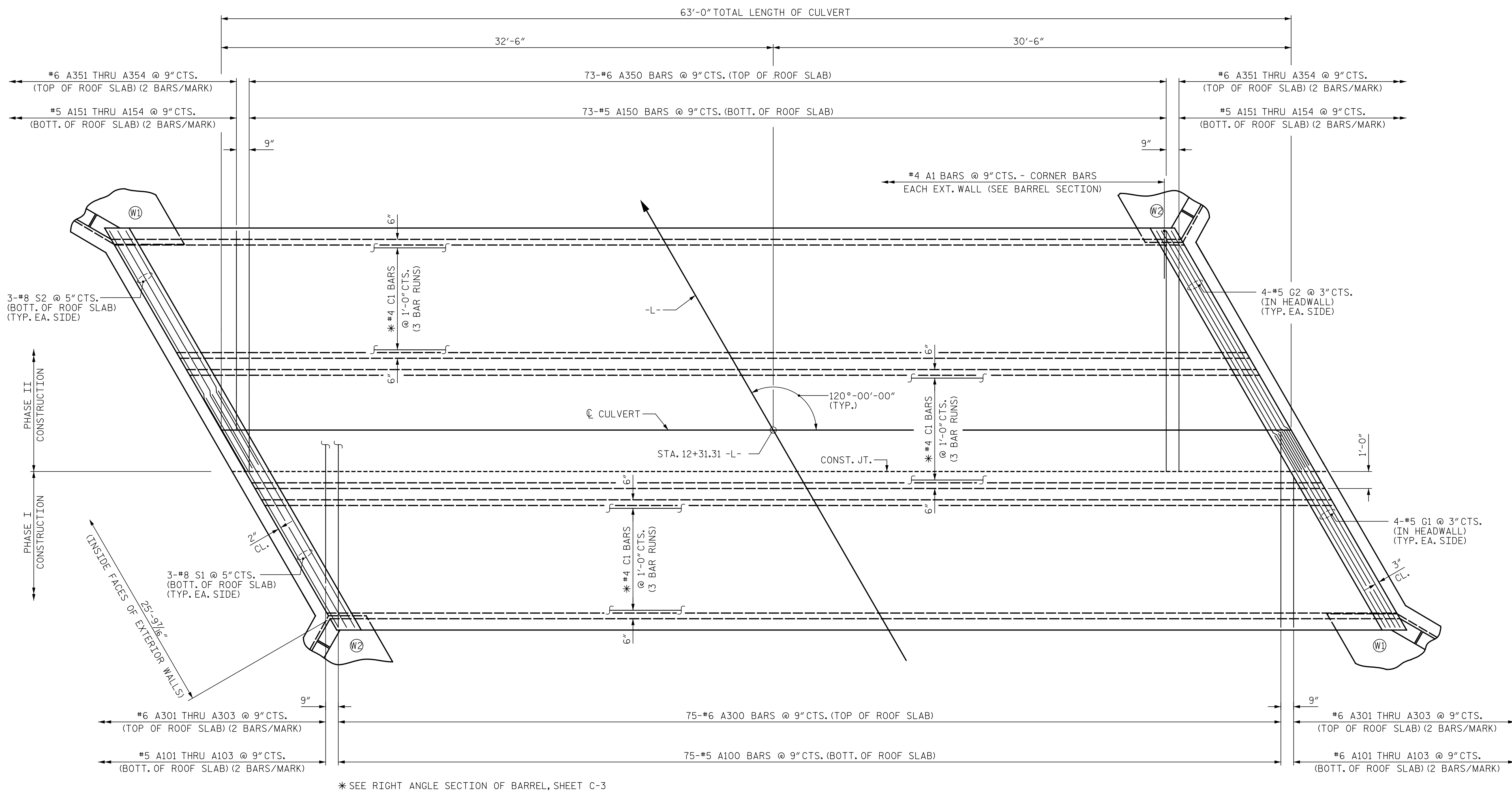
DRAWN BY : J.M. KEPICH DATE : 04-09-12  
 CHECKED BY : R.F. WERTMAN DATE : 05-30-12  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 04-10-17

PLANS PREPARED BY:  
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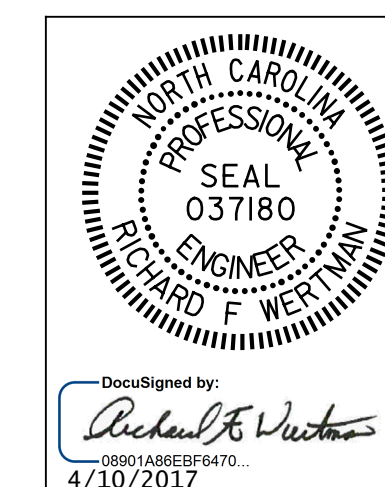
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			7



PLAN - ROOF SLAB

PROJECT NO. 17BP.10.R.13  
ANSON COUNTY  
 STATION: 12+31.31 -L-

SHEET 5 OF 7



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TRIPLE 7 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 120° SKEW

DRAWN BY : J.M. KEPICH DATE : 04-09-12  
 CHECKED BY : R.F. WERTMAN DATE : 05-30-12  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 04-10-17

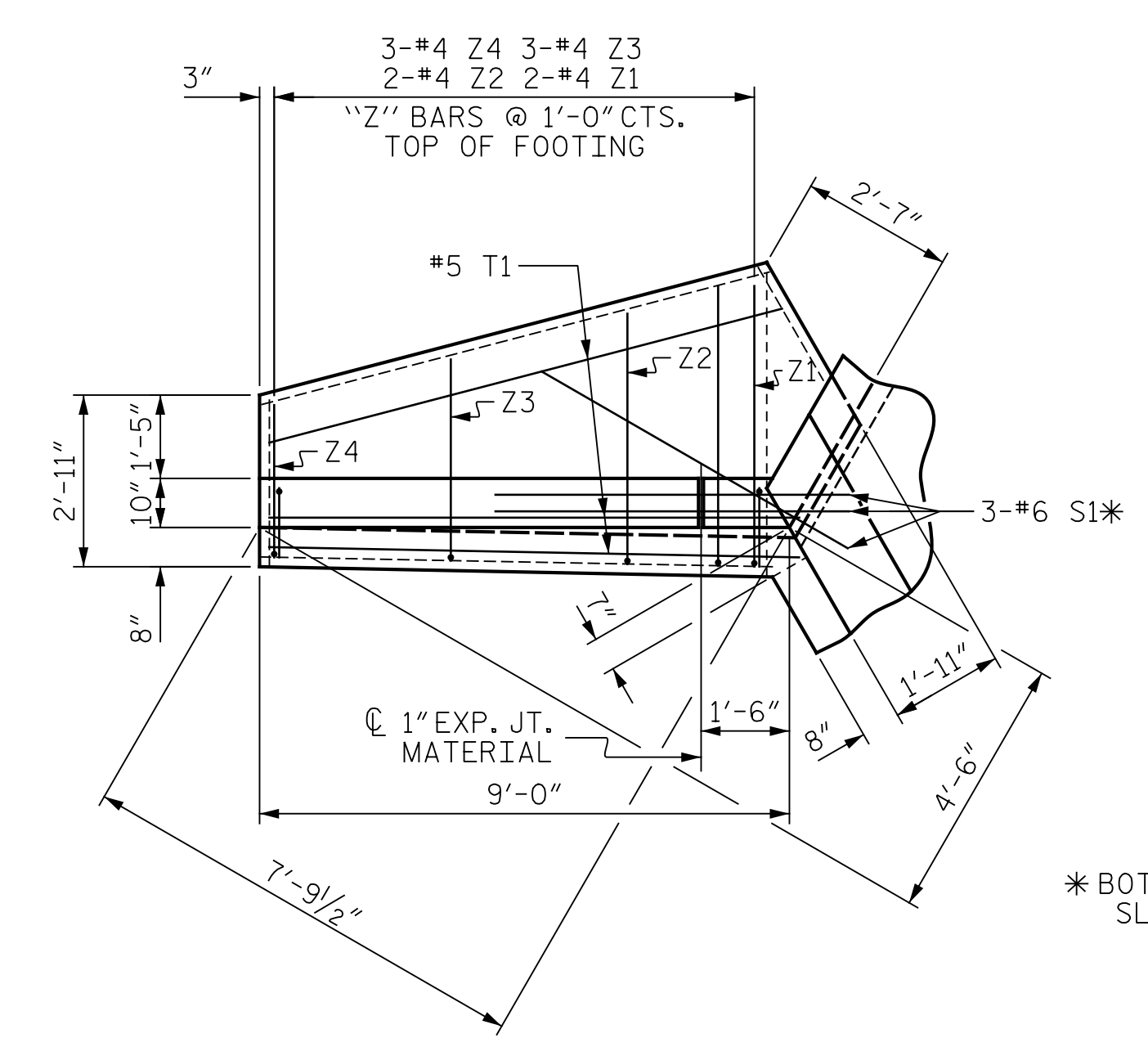
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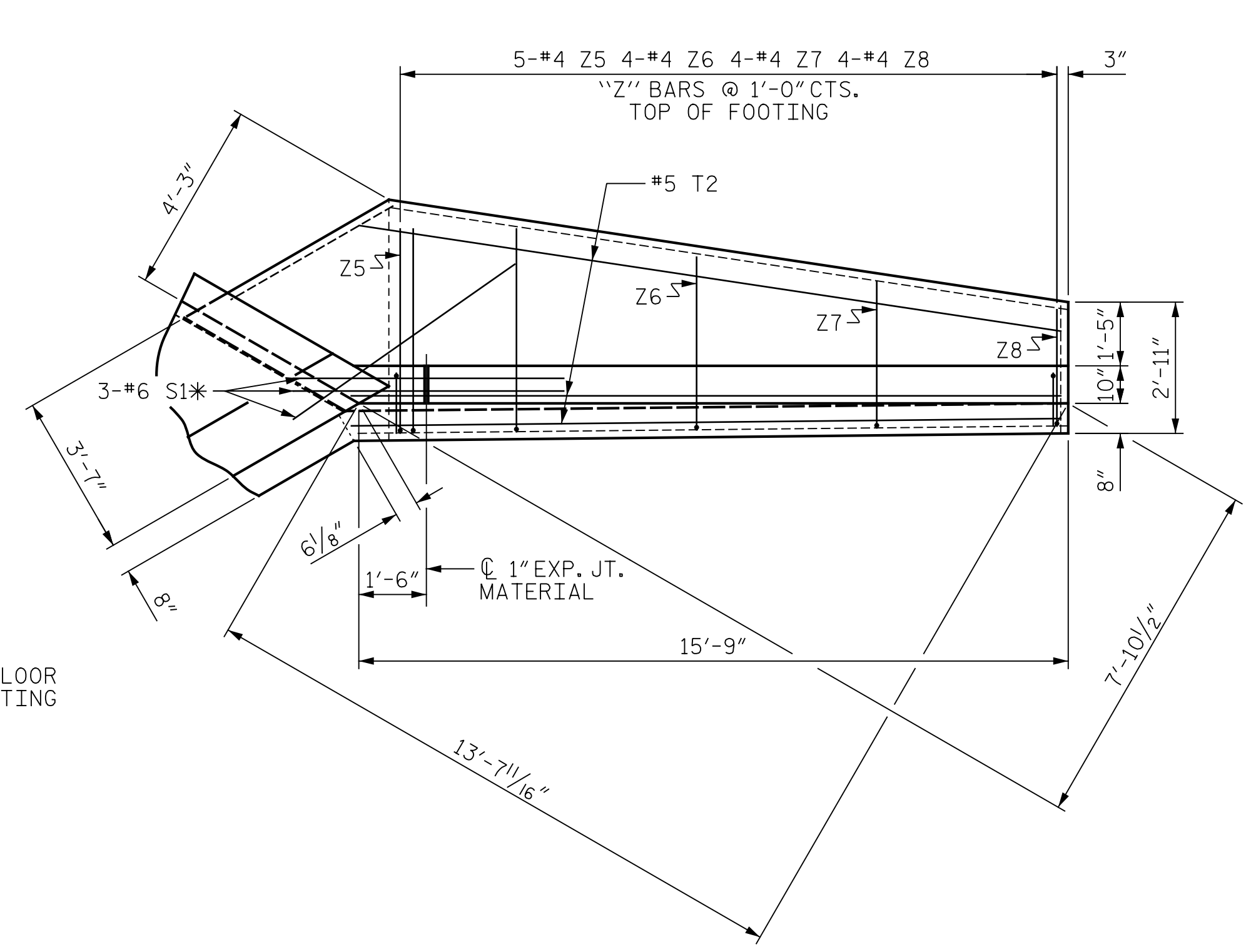
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			7



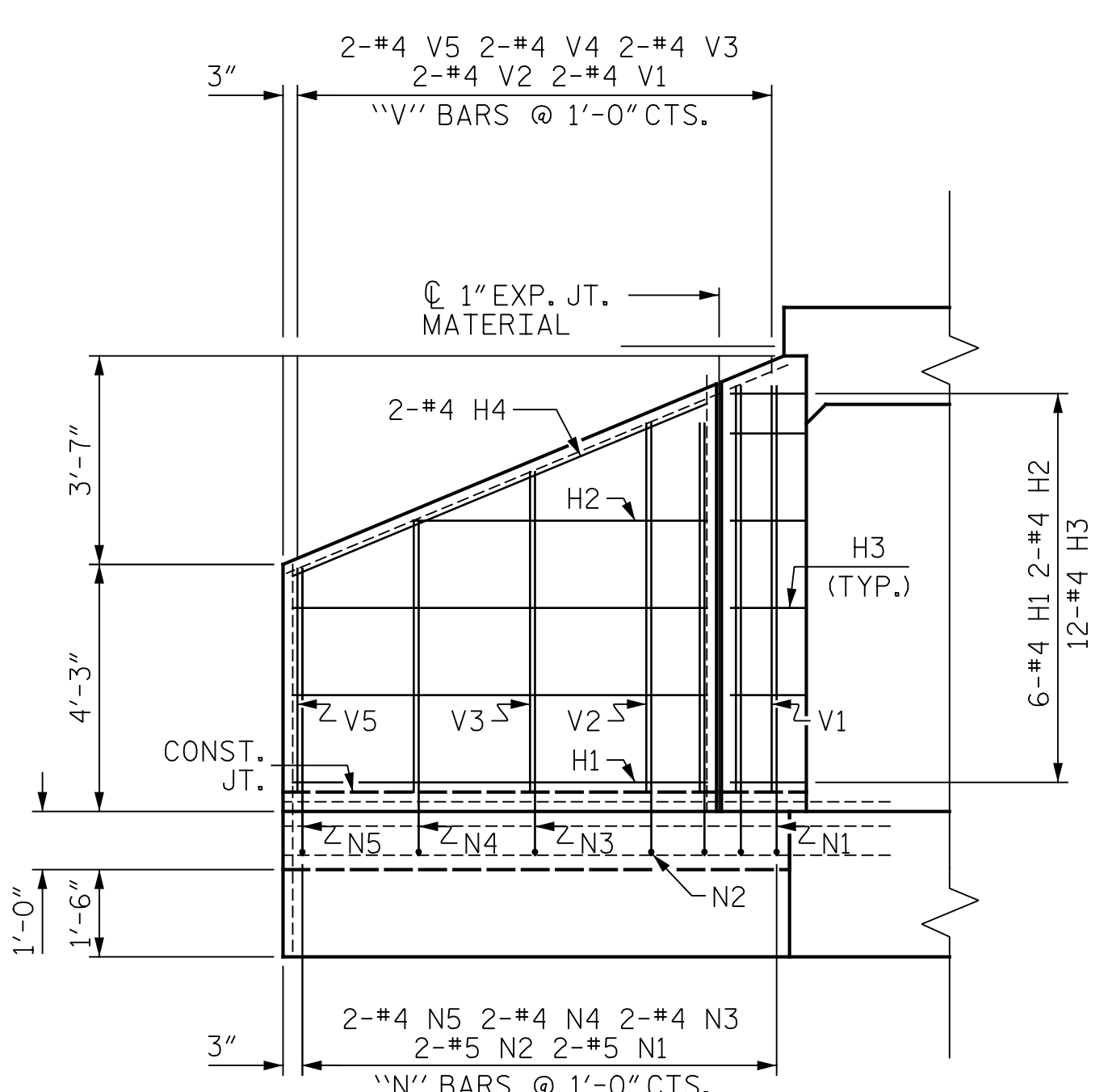




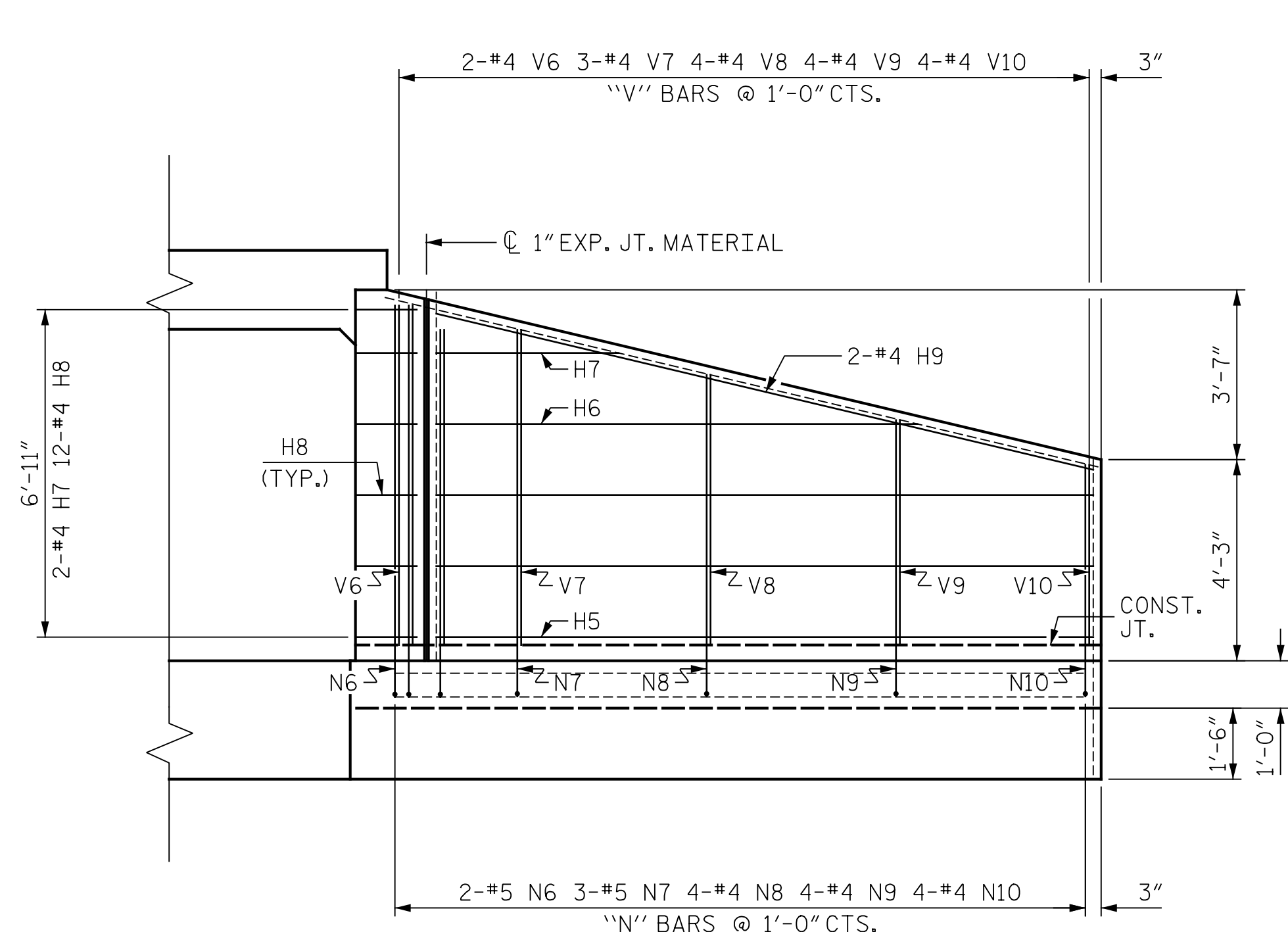
PLAN W2



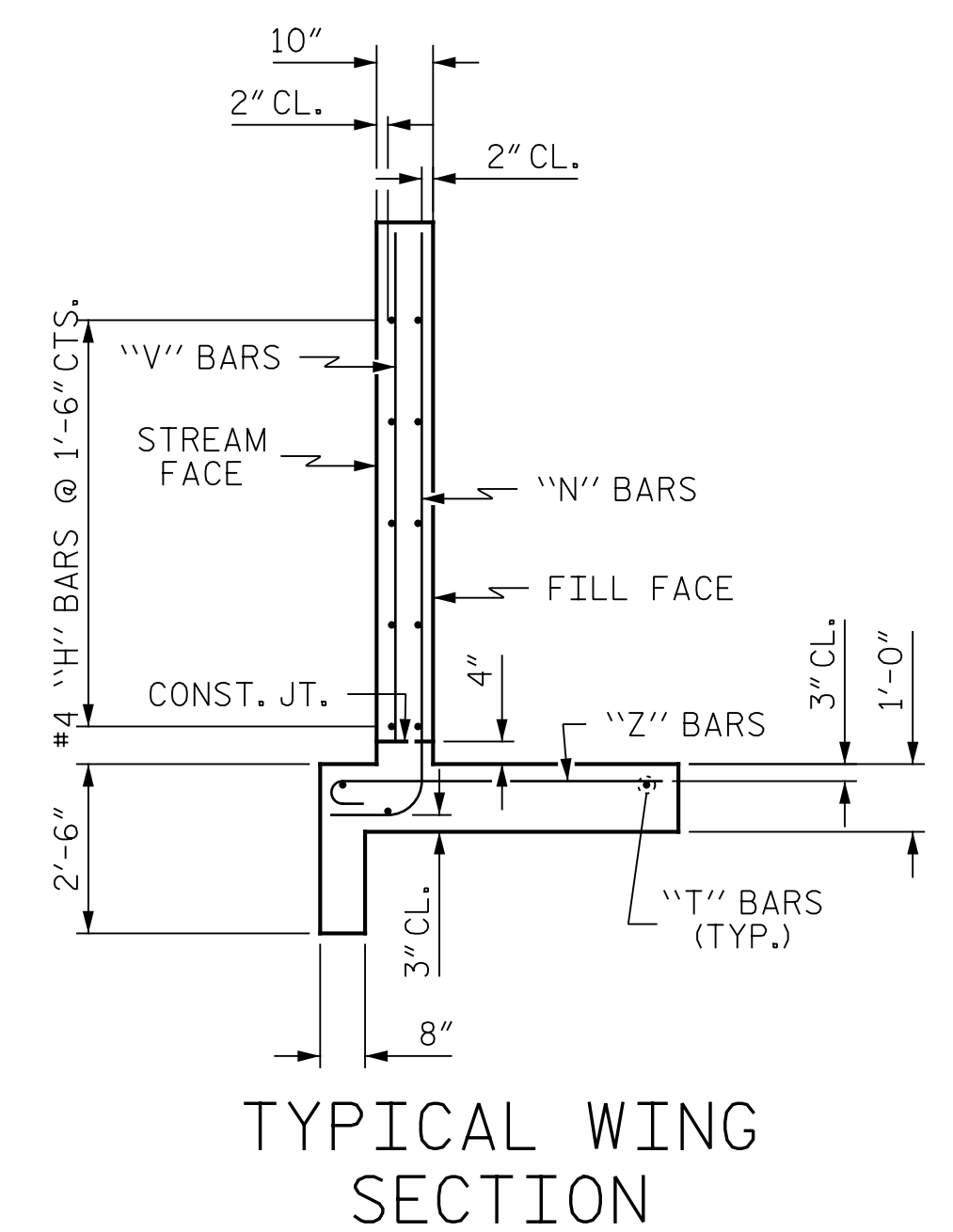
PLAN W1



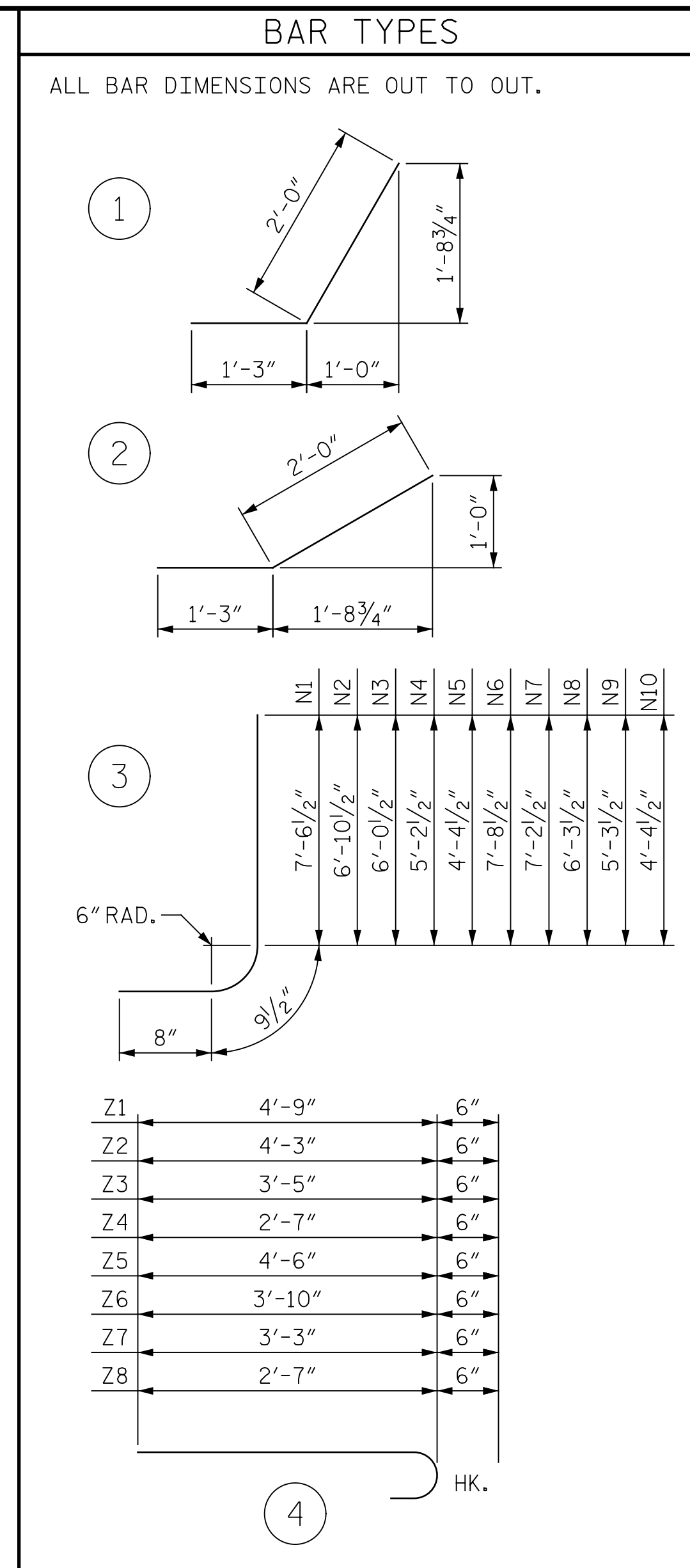
ELEVATION W2



ELEVATION W1

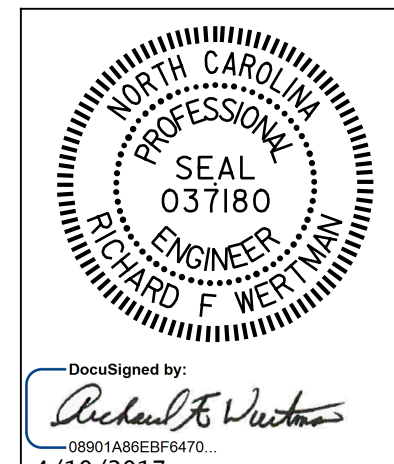


TYPICAL WING SECTION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	7'-1"	57
H2	4	#4	STR	5'-0"	14
H3	24	#4	1	3'-3"	52
H4	4	#4	STR	7'-8"	21
H5	12	#4	STR	13'-10"	111
H6	4	#4	STR	10'-2"	28
H7	4	#4	STR	3'-10"	11
H8	24	#4	2	3'-3"	52
H9	4	#4	STR	14'-3"	38
N1	4	#5	3	9'-0"	38
N2	4	#5	3	8'-4"	35
N3	4	#4	3	7'-6"	20
N4	4	#4	3	6'-8"	18
N5	4	#4	3	5'-10"	16
N6	4	#5	3	9'-2"	39
N7	6	#5	3	8'-8"	55
N8	8	#4	3	7'-9"	42
N9	8	#4	3	6'-9"	37
N10	8	#4	3	5'-10"	31
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	9'-0"	56
T2	6	#5	STR	15'-9"	99
V1	4	#4	STR	6'-11"	19
V2	4	#4	STR	6'-4"	17
V3	4	#4	STR	5'-6"	15
V4	4	#4	STR	4'-8"	12
V5	4	#4	STR	3'-10"	10
V6	4	#4	STR	7'-2"	20
V7	6	#4	STR	6'-8"	27
V8	8	#4	STR	5'-8"	31
V9	8	#4	STR	4'-9"	25
V10	8	#4	STR	3'-9"	20
Z1	4	#4	4	5'-3"	14
Z2	4	#4	4	4'-9"	13
Z3	6	#4	4	3'-11"	16
Z4	6	#4	4	3'-1"	12
Z5	10	#4	4	5'-0"	33
Z6	8	#4	4	4'-4"	23
Z7	8	#4	4	3'-9"	20
Z8	8	#4	4	3'-1"	16
REINFORCING STEEL FOR 4 WINGS					1321 LBS
CLASS A CONCRETE					
4 WINGS					19.8 CY
2 HEADWALLS					2.5 CY
2 END CURTAIN WALLS					3.1 CY
4 SILLS					2.4 CY
TOTAL					27.8 CY

PROJECT NO. 17BP.10.R.13  
 ANSON COUNTY  
 STATION: 12+31.31 -L-  
 SHEET 7 OF 7



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD WINGS FOR CONCRETE BOX CULVERT**  
 H = 7'-0" SLOPE = 2:1  
 60° OR 120° SKEW

ASSEMBLED BY: J.M. KEPICH DATE: 4/09/12  
 CHECKED BY: R.F. WERTMAN DATE: 5/30/12  
 DRAWN BY: CCJ 11/99  
 CHECKED BY: RWW 03/00

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road Suite 102 Raleigh, NC 27607-3073 (919) 420-7660 INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TOTAL SHEETS: 7



## 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 2012 "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 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. 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.  
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.  
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990