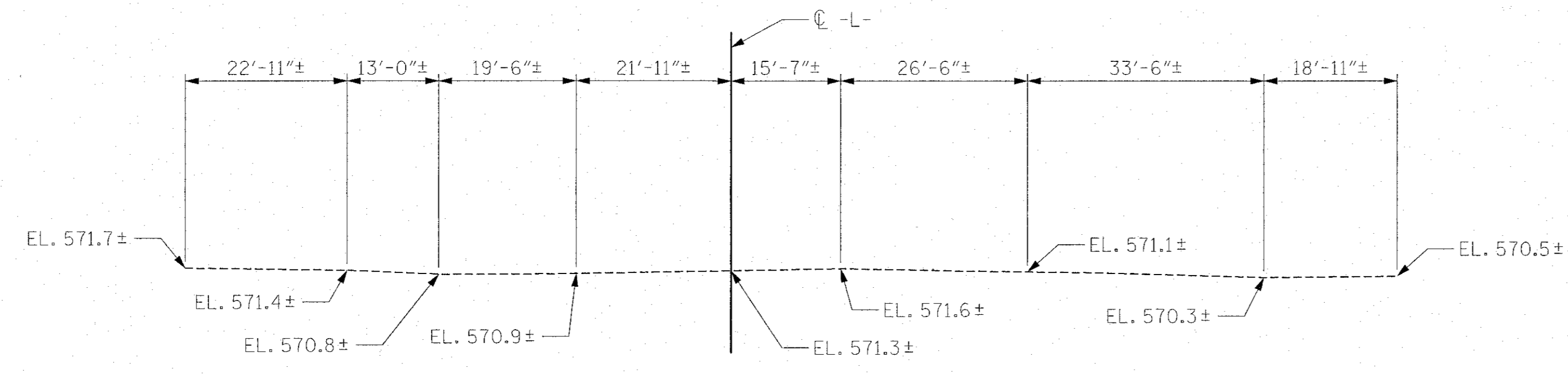


NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**LOCATION SKETCH**

GRADE POINT ELEVATION @ 12+68.00 -L- = 586.21  
 BED ELEVATION @ 12+68.00 -L- = 570.30  
 ROADWAY SLOPES = 2:1



**PROFILE ALONG CULVERT**

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.  
 DESIGN FILL-----7.95 FT.  
 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. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.  
 THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.  
 DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.  
 AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.  
 TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. 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 WILL 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.

**HYDROGRAPHIC DATA**

DESIGN DISCHARGE ..... = 900 CFS  
 FREQUENCY OF DESIGN FLOOD ..... = 50 YRS.  
 DESIGN HIGH WATER ELEVATION ..... = 577.7 FT.  
 DRAINAGE AREA ..... = 1.60 SQ. MI.  
 BASE DISCHARGE (Q100) ..... = 1000 CFS  
 BASE HIGH WATER ELEVATION ..... = 577.99 FT.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE ..... = 2680 CFS  
 FREQUENCY OF OVERTOPPING FLOOD ..... = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION ..... = 586.4 FT.

**-L- PROFILE DATA**

PVI STA. 12+25.00 -L-  
 PVI EL. = 586.00  
 VC = 150.00  
 g1 = -0.5360%  
 g2 = +0.4080%

**NOTES**

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN (1 @ 36'-0") WITH REINFORCED CONCRETE DECK AND THROUGH GIRDERS AND A CLEAR ROADWAY WIDTH OF 20'-0" ON REINFORCED CONCRETE ABUTMENTS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS TO NOT 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.  
 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 THE DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.  
 FOR CULVERT DIVERSION 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 THE EXPANSION JOINT.  
 EXCAVATE 1 FT. BELOW CULVERT AND FOOTINGS AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.  
 SCOUR PROTECTIONS ARE REQUIRED AT BOTH INLET AND OUTLET OF THE CULVERT. DO NOT PLACE RIP RAP ABOVE THE STREAM BED.  
 BED MATERIAL SHALL BE EXCAVATED AND STOCKPILED DURING INSTALLATION OF THE CULVERTS AND SILLS. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. 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.  
 THE SCOUR CRITICAL ELEVATIONS ARE THE AS-BUILT BOTTOM OF BOX CULVERT ELEVATIONS. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.  
 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.  
 THE ENTIRE QUANTITY OF THE PAY ITEM FOUNDATION EXCAVATION AND 100 TONS OF THE PAY ITEM FOUNDATION CONDITIONING MATERIAL HAS BEEN INCLUDED AS A CONTINGENCY TO BE USED AS DIRECTED BY THE ENGINEER IF SOFT MATERIALS ARE ENCOUNTERED AT OR BELOW THE ANTICIPATED FOUNDATION BEARING ELEVATION.

TOTAL STRUCTURE QUANTITIES			
CLASS A CONCRETE			
BARREL @	3.346	CY/FT	244.8 C.Y.
SILLS			5.7 C.Y.
WING ETC.			25.7 C.Y.
TOTAL			276.2 C.Y.
REINFORCING STEEL			
BARREL			49,292 LBS.
WINGS ETC.			1,249 LBS.
TOTAL			50,541 LBS.
FOUNDATION EXCAVATION			50 C.Y.
CULVERT EXCAVATION			LUMP SUM
FOUNDATION CONDITIONING MATERIAL			284 TONS
REMOVAL OF EXISTING STRUCTURE			LUMP SUM

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

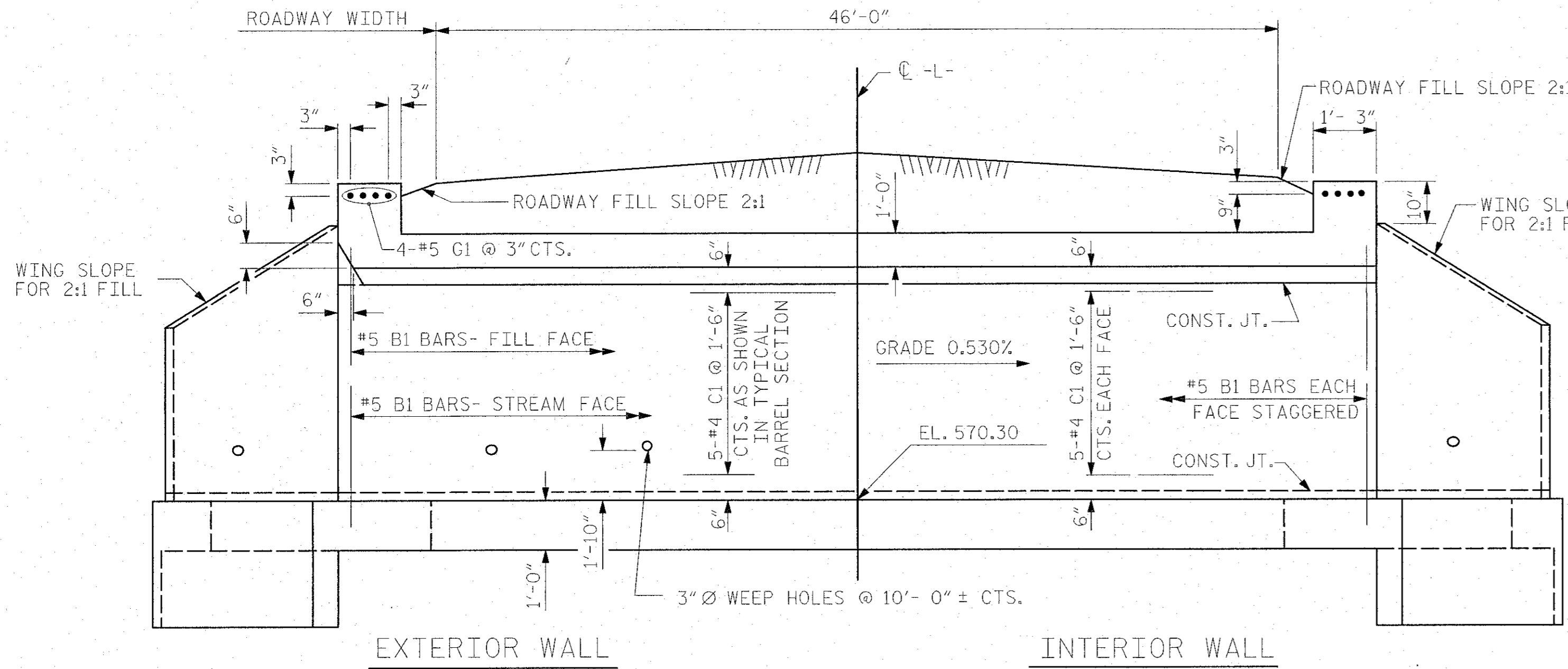
PROJECT NO. 17BP.9.R.5  
STOKES COUNTY  
 STATION: 12+68.00 -L-  
 SHEET 1 OF 6 REPLACES BRIDGE NO. 58

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BARREL STANDARD  
 TRIPLE 11 FT. X 7 FT.  
 CONCRETE BOX CULVERT**

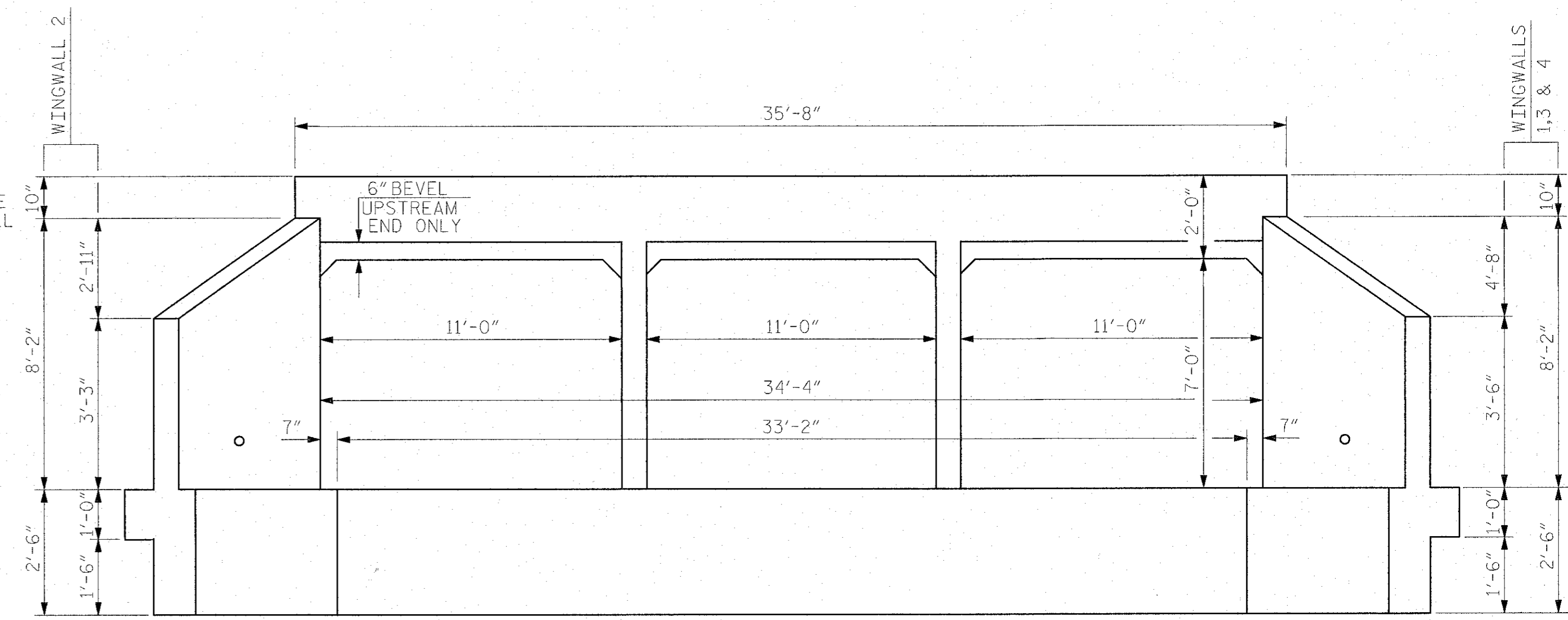
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ASSEMBLED BY : J.S. ISRAELNAM	DATE : 10/14	SPECIAL
CHECKED BY : P.A. de PAOLI	DATE : 10/14	
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/14	STANDARD
DRAWN BY : J. E. MANGUM	DATE : 10/25/89	
CHECKED BY : A.R. BISSETTE	DATE : 10/11/89	

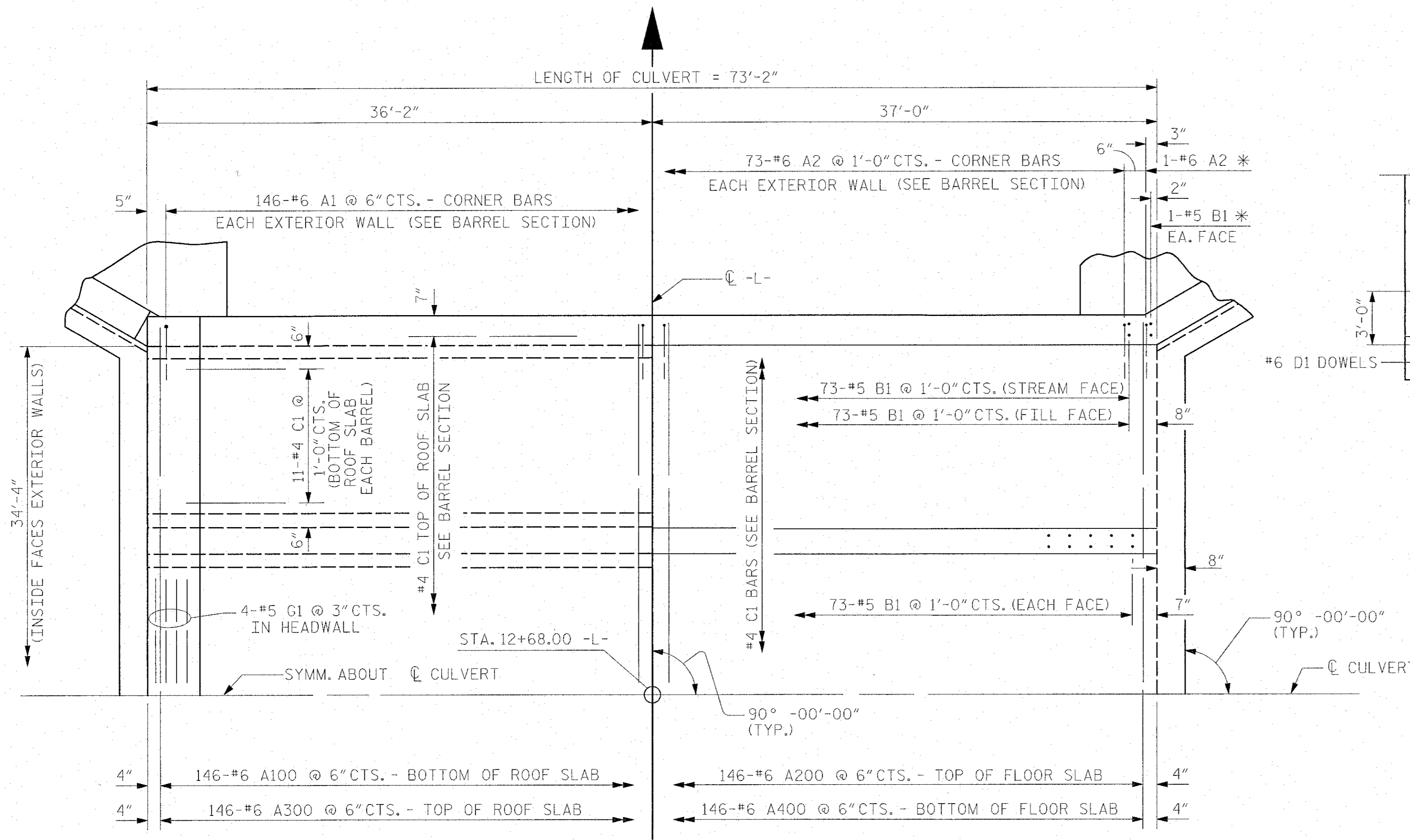
<b>MI ENGINEERING</b> 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671	REVISIONS				SHEET NO. <b>C-1</b> TOTAL SHEETS <b>6</b>	
	NO.	BY:	DATE:	NO.		BY:
	1		3			
	2		4			



CULVERT SECTION NORMAL TO ROADWAY

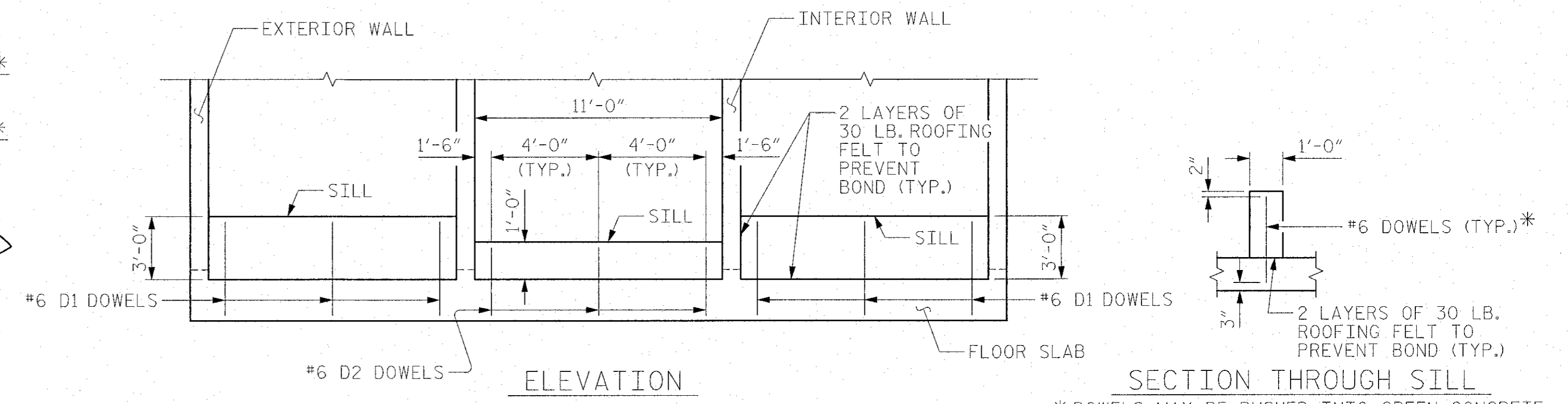


END ELEVATION

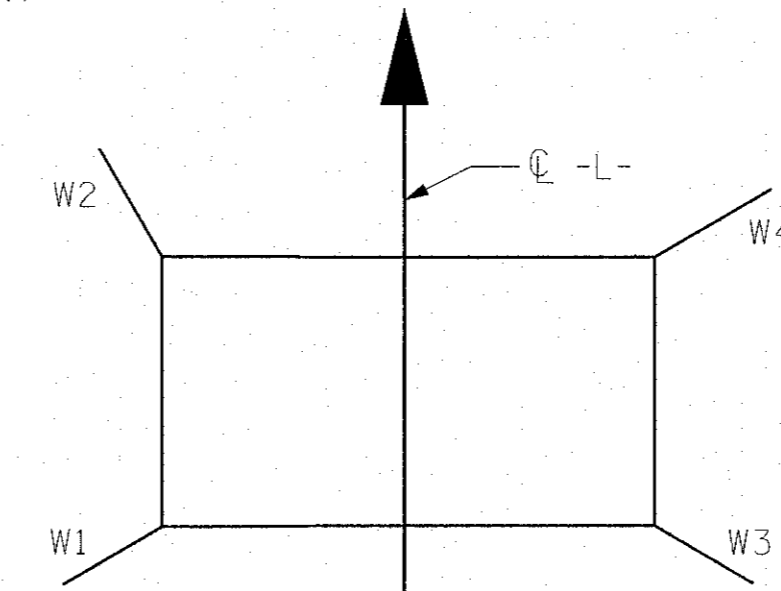


PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB



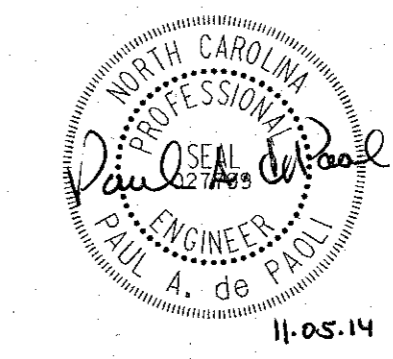
CULVERT SILL DETAILS (LOOKING DOWNSTREAM)



WING KEY

PROJECT NO. 17BP.9.R.5  
 STOKES COUNTY  
 STATION: 12+68.00 -L-

SHEET 2 OF 6  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 BARREL STANDARD  
 TRIPLE 11 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW



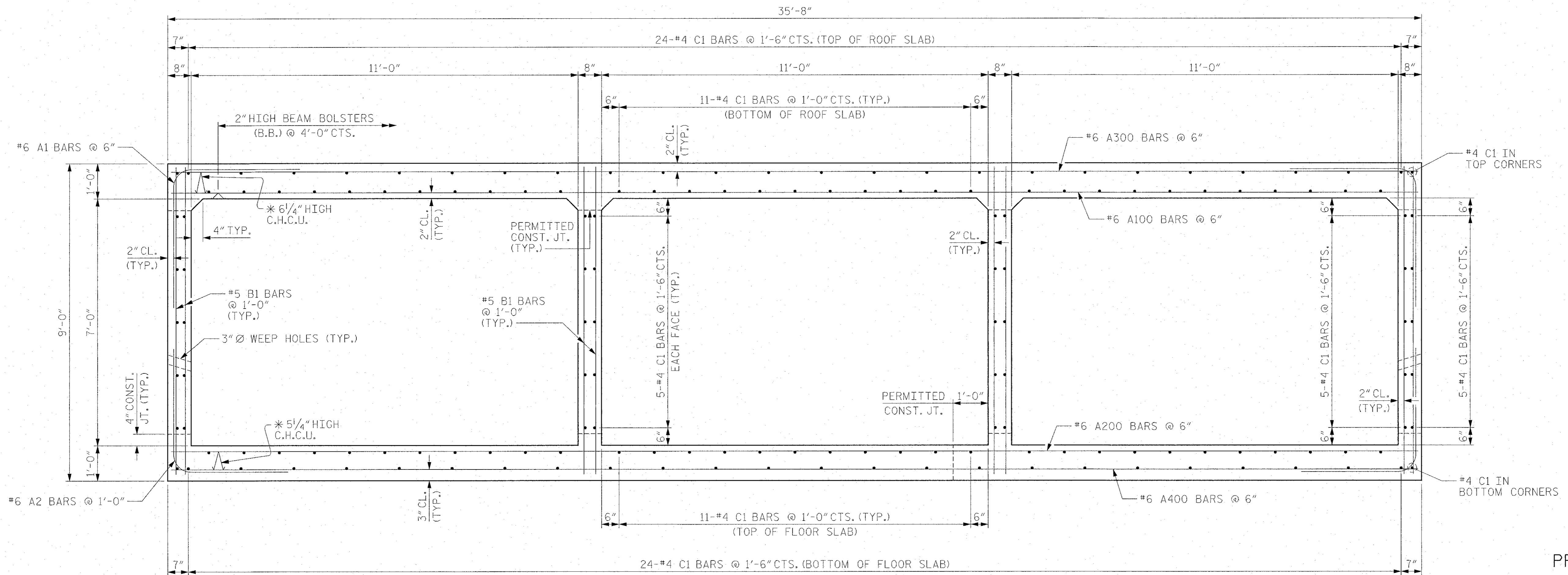
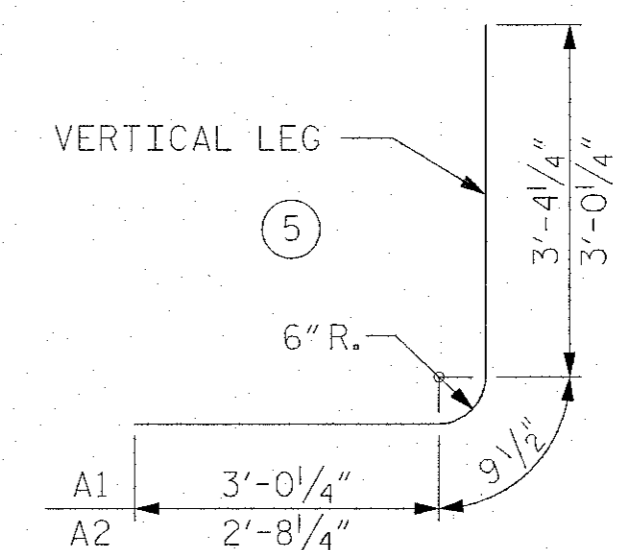
MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671		REVISIONS		SHEET NO. C-2	
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2			4		

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 ASSEMBLED BY : J.S. ISRAELNAM DATE : 10/14  
 CHECKED BY : P.A. de PAOLI DATE : 10/14  
 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/14  
 DRAWN BY : JOEL JOHNSON DATE : MAR 1971  
 CHECKED BY : GARY BROOME DATE : MAR 1971

SPECIAL  
 STANDARD

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A300	#6	2'-9"
A400	#6	2'-9"
C1	#4	1'-9"

BAR TYPES		BILL OF MATERIAL				
ALL BAR DIMENSIONS ARE OUT TO OUT.						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	292	6	5	7'-2"	3,143	
A2	148	6	5	6'-6"	1,445	
A100	146	6	STR	35'-4"	7,748	
A200	146	6	STR	35'-4"	7,748	
A300	146	6	STR	35'-4"	7,748	
A400	146	6	STR	35'-4"	7,748	
B1	588	5	STR	8'-7"	5,264	
C1	474	4	STR	25'-6"	8,074	
D1	12	6	STR	3'-7"	65	
D2	6	6	STR	1'-7"	14	
G1	8	5	STR	35'-4"	295	
REINFORCING STEEL					49,292 LBS	



**RIGHT ANGLE SECTION OF BARREL**

THERE ARE 158 "C" BARS IN SECTION OF BARREL.  
 \* ALL CONTINUOUS HIGH CHAIR UPPERS (C.H.C.U.) @ 3'-0" CTS.

PROJECT NO. 17BP.9.R.5  
STOKES COUNTY  
 STATION: 12+68.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TRIPLE 11 FT. X 7 FT.  
 CONCRETE BOX CULVERT**

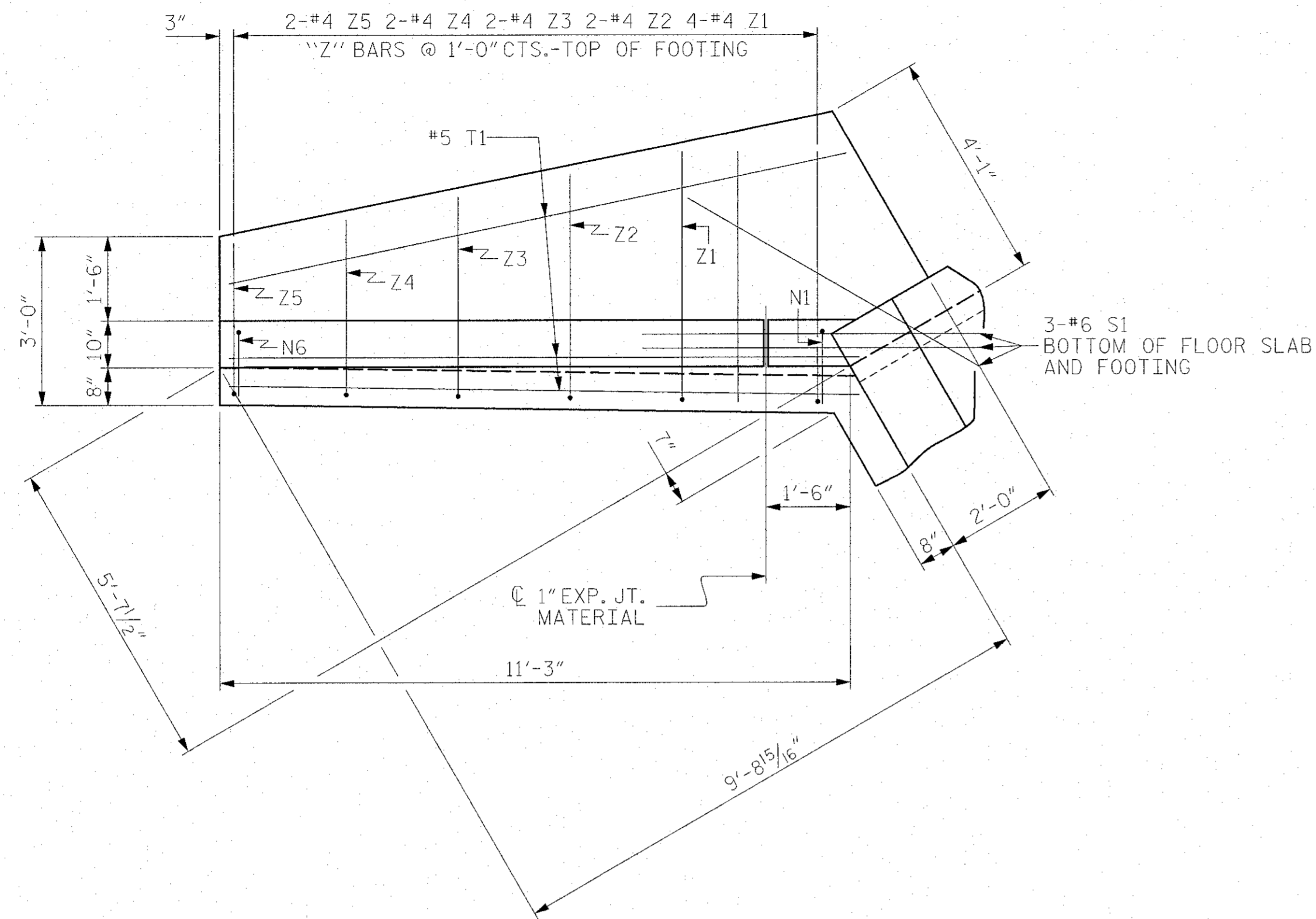


**MI ENGINEERING**  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

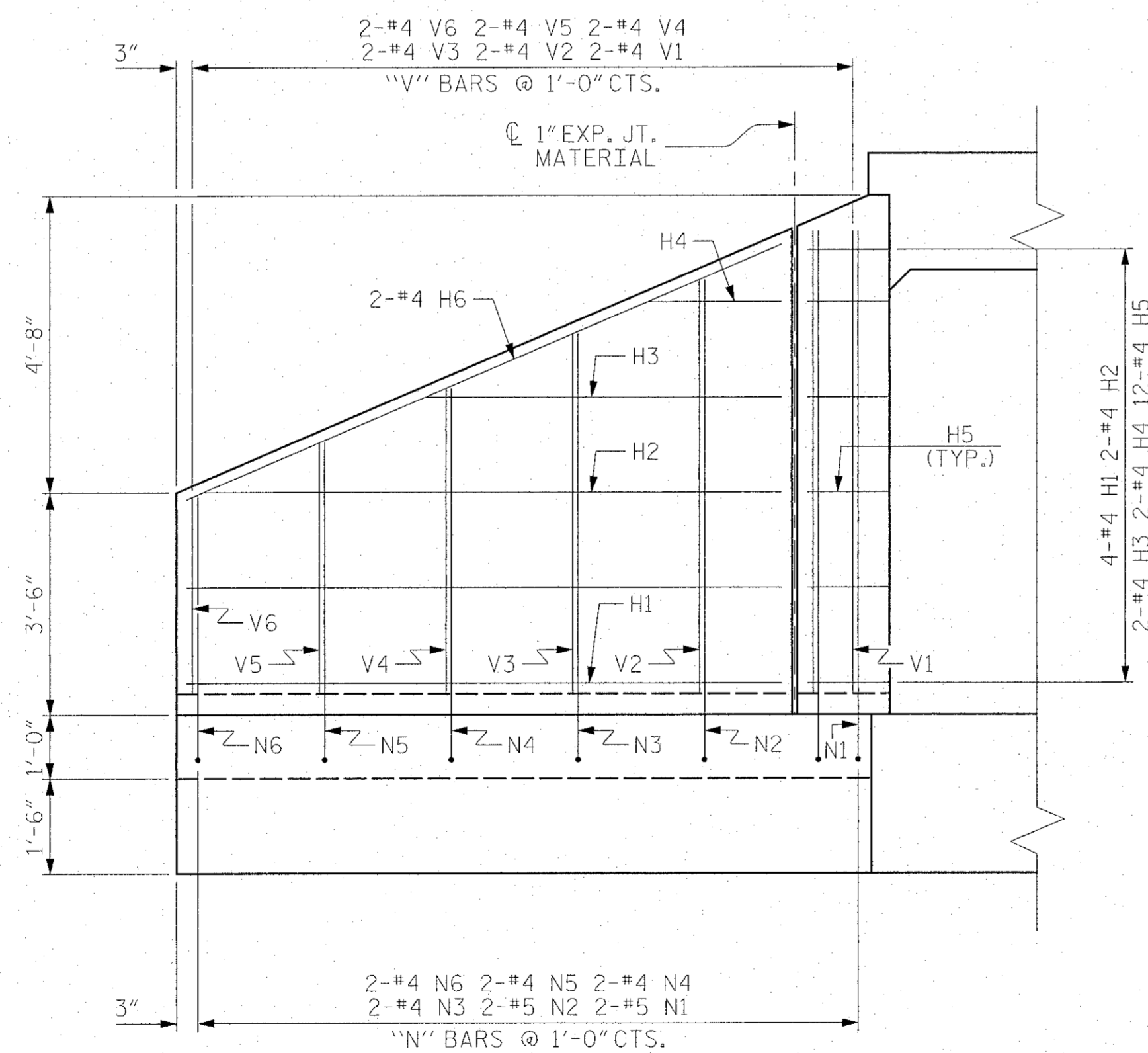
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2			4			6

DRAWN BY : J.S. ISRAELNAIM	DATE : 10/14
CHECKED BY : P.A. de PAOLI	DATE : 10/14
DESIGN ENGINEER OF RECORD : P.A. de PAOLI	DATE : 10/14

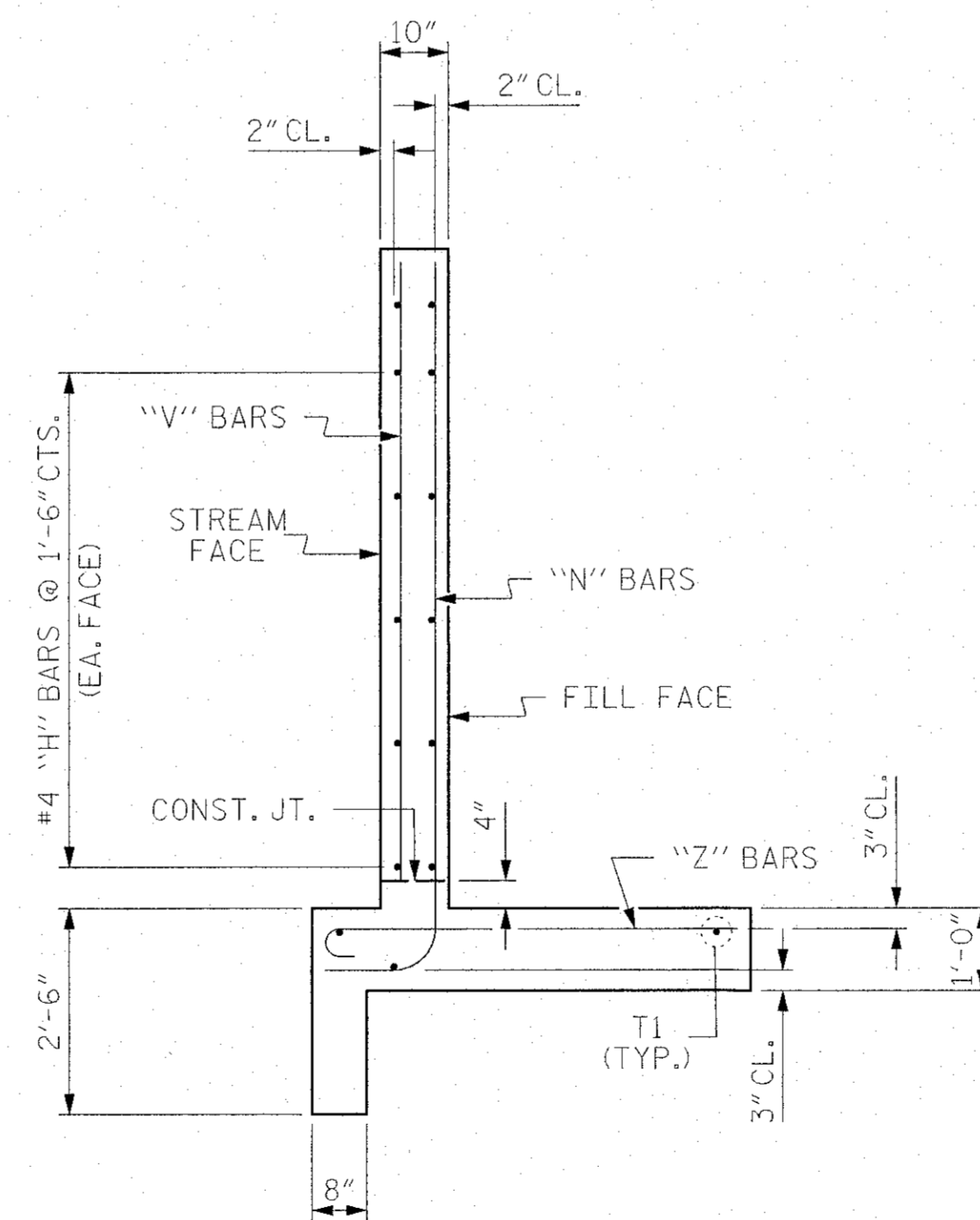
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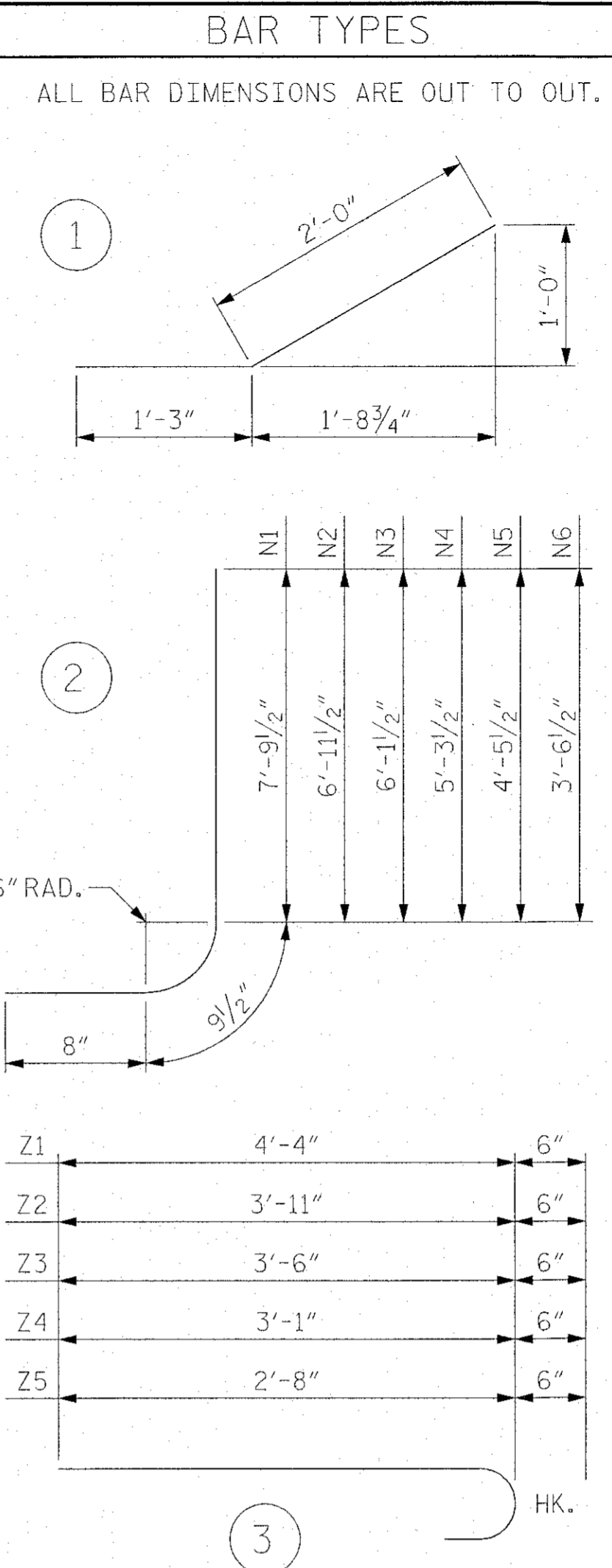
PLAN



ELEVATION



TYPICAL WING SECTION

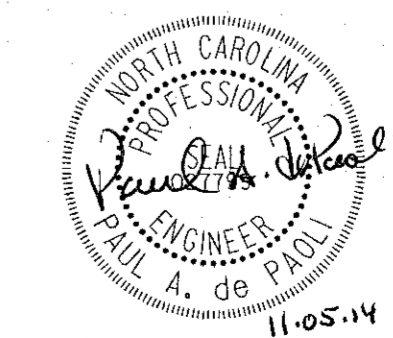


BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	9'-4"	75
H2	6	#4	STR	9'-0"	36
H3	6	#4	STR	5'-6"	22
H4	6	#4	STR	2'-0"	8
H5	36	#4	1	3'-3"	78
H6	6	#4	STR	10'-2"	41
N1	6	#5	2	9'-3"	58
N2	6	#5	2	8'-5"	53
N3	6	#4	2	7'-7"	30
N4	6	#4	2	6'-9"	27
N5	6	#4	2	5'-11"	24
N6	6	#4	2	5'-0"	20
S1	9	#6	STR	6'-0"	81
T1	9	#5	STR	11'-3"	106
V1	6	#4	STR	7'-3"	29
V2	6	#4	STR	6'-6"	26
V3	6	#4	STR	5'-7"	22
V4	6	#4	STR	4'-9"	19
V5	6	#4	STR	3'-11"	16
V6	6	#4	STR	3'-0"	12
Z1	12	#4	3	4'-10"	39
Z2	6	#4	3	4'-5"	18
Z3	6	#4	3	4'-0"	16
Z4	6	#4	3	3'-7"	14
Z5	6	#4	3	3'-2"	13

TOTAL REINFORCING STEEL FOR 3 WINGS 883 LBS

CLASS A CONCRETE	
3 WINGS	12.9 CY
2 HEADWALLS	3.3 CY
2 END CURTAIN WALLS	4.1 CY
<b>TOTAL</b>	<b>20.3 CY</b>

PROJECT NO. 17BP.9.R.5  
 STOKES COUNTY  
 STATION: 12+68.00 -L-  
 SHEET 4 OF 6



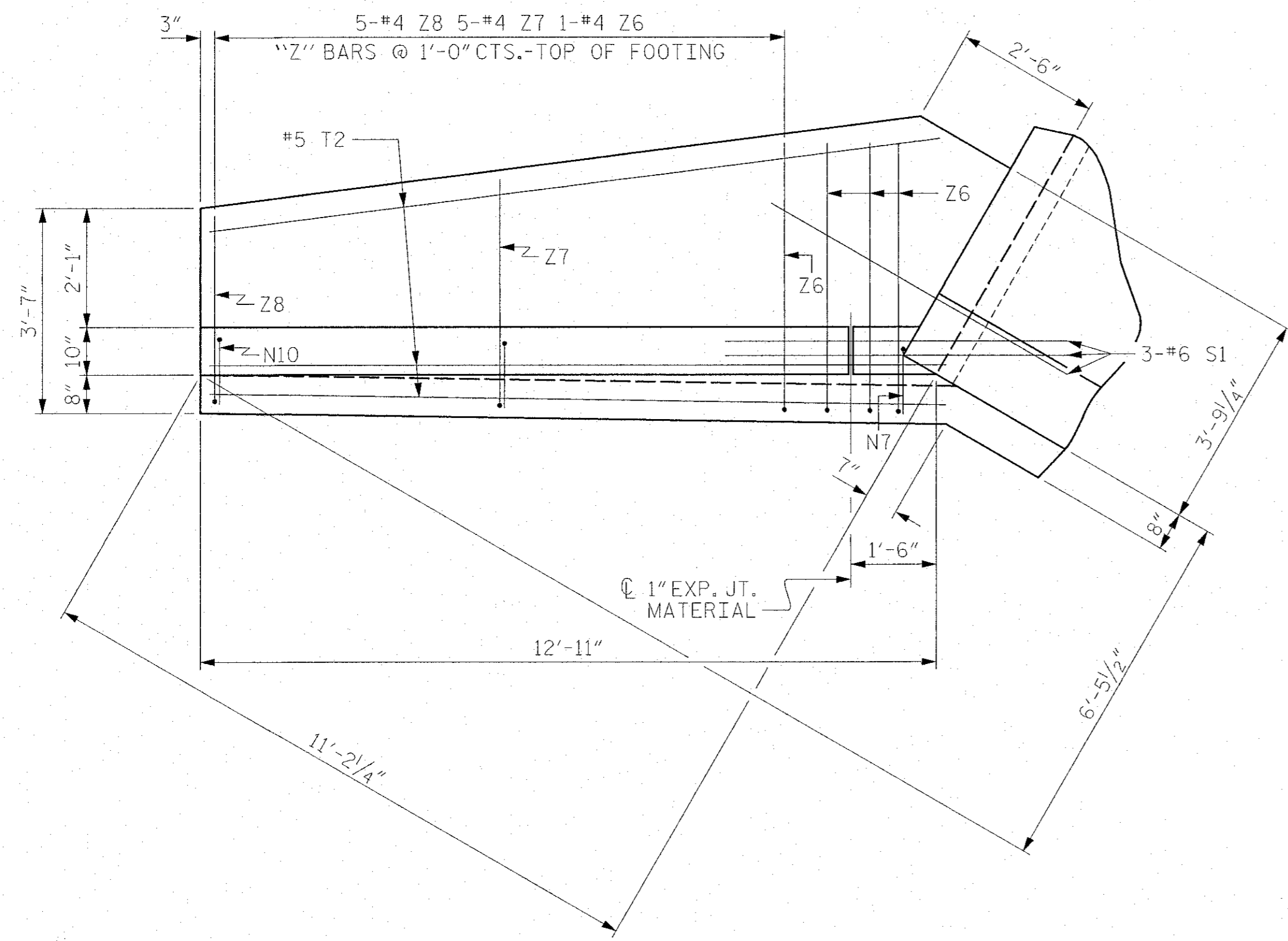
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**WING WALL 1, 3, & 4**

**MI ENGINEERING**  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

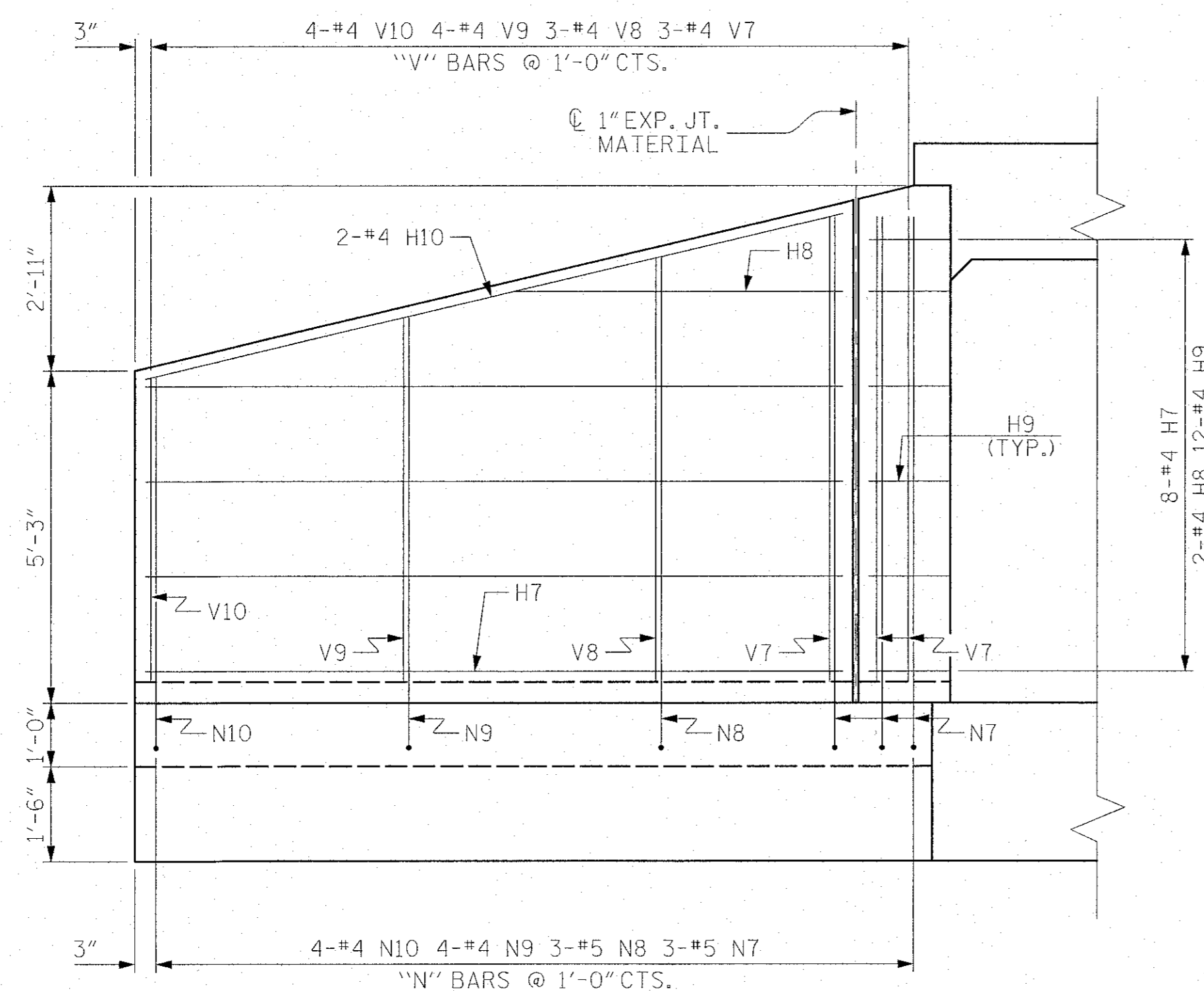
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-4	
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DRAWN BY : J.S. ISRAELNAIM DATE : 10/14  
 CHECKED BY : P.A. de PAOLI DATE : 10/14  
 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/14

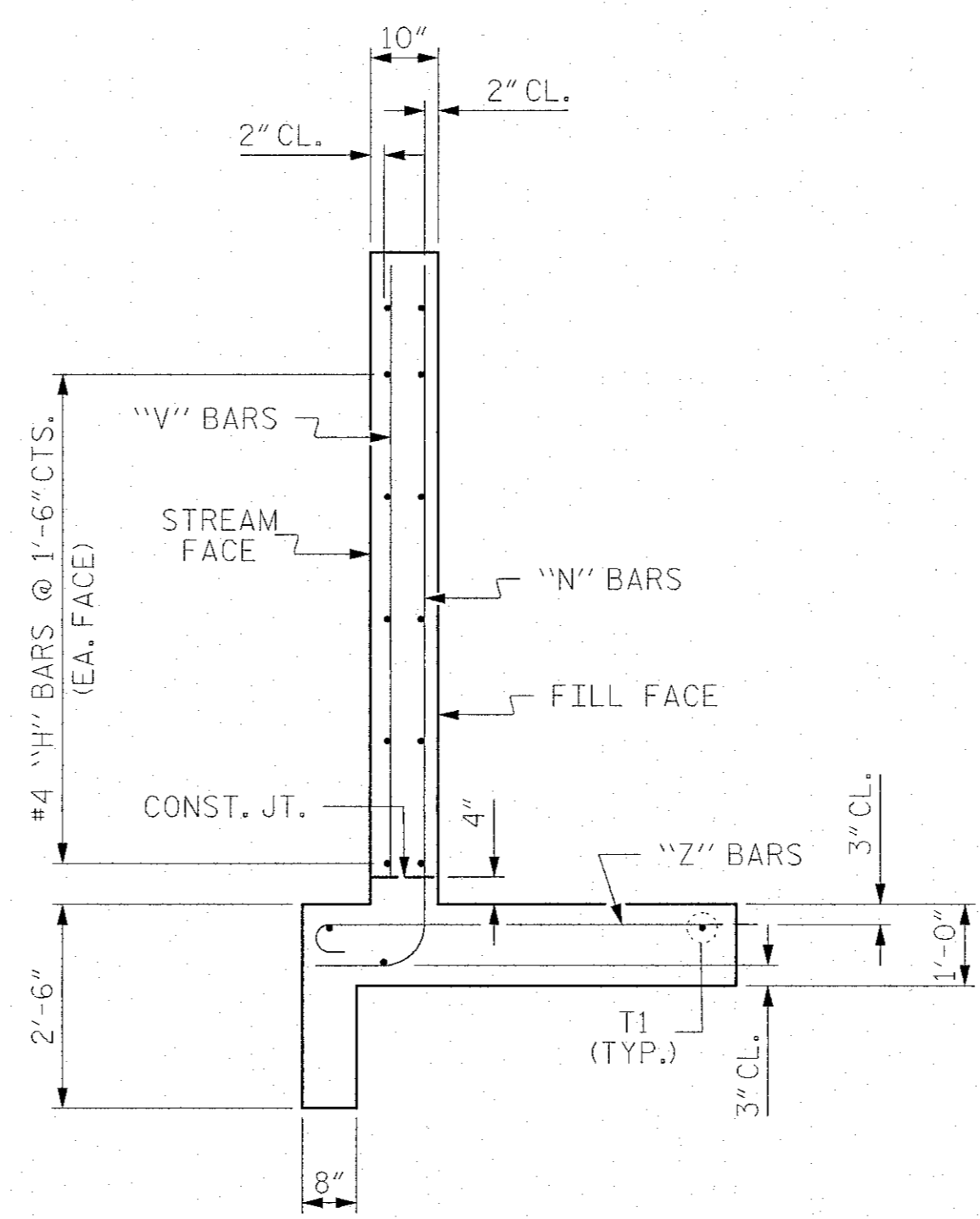
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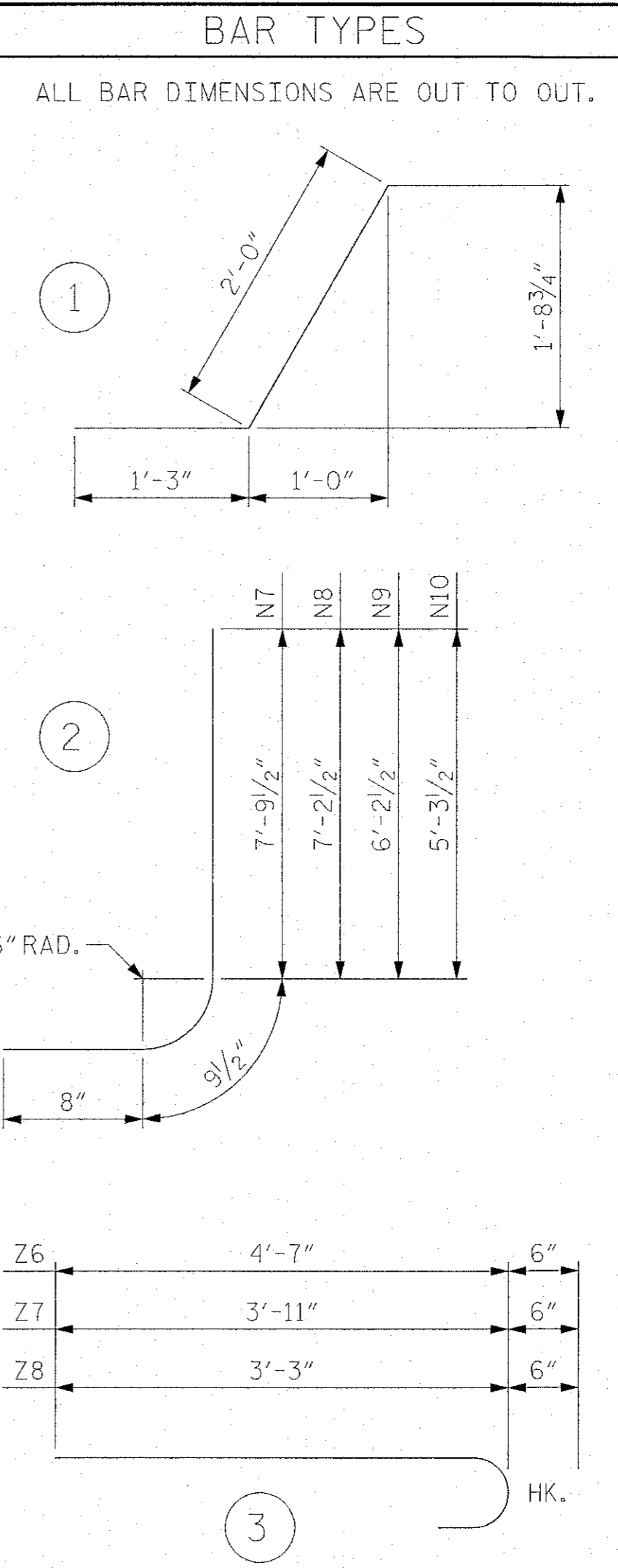
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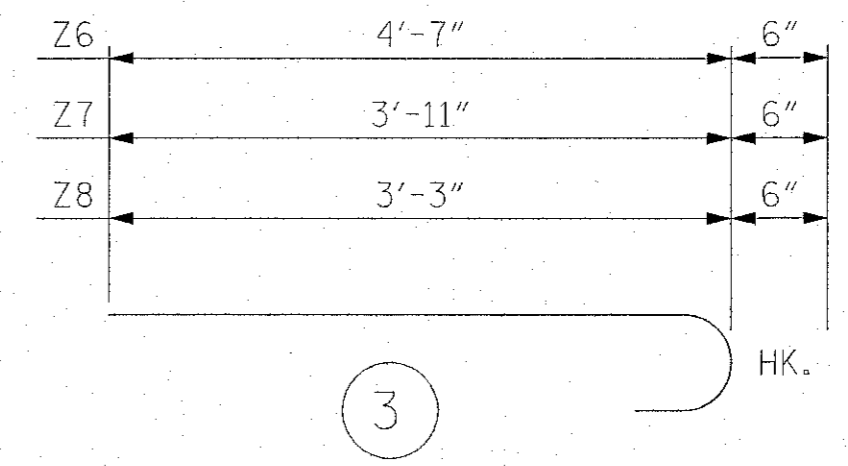
ELEVATION



TYPICAL WING SECTION



BILL OF MATERIAL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H7	8	#4	STR	11'-0"	59
H8	2	#4	STR	5'-1"	7
H9	12	#4	1	3'-3"	26
H10	2	#4	STR	11'-4"	15
N7	3	#5	2	9'-3"	29
N8	3	#5	2	8'-8"	27
N9	4	#4	2	7'-8"	20
N10	4	#4	2	6'-9"	18
S1	3	#6	STR	6'-0"	27
T2	3	#5	STR	12'-11"	40
V7	3	#4	STR	7'-4"	15
V8	3	#4	STR	6'-8"	13
V9	4	#4	STR	5'-8"	15
V10	4	#4	STR	4'-9"	13
Z6	4	#4	3	5'-1"	14
Z7	5	#4	3	4'-5"	15
Z8	5	#4	3	3'-9"	13
REINFORCING STEEL					366 LBS
CLASS A CONCRETE 1 WING					5.4 CY



PROJECT NO. 17BP.9.R.5  
 STOKES COUNTY  
 STATION: 12+68.00 -L-  
 SHEET 5 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

WING WALL 2



MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. C-5  
 TOTAL SHEETS 6

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DRAWN BY : J.S. ISRAELNAIM DATE : 10/14  
 CHECKED BY : P.A. de PAOLI DATE : 10/14  
 DESIGN ENGINEER OF RECORD : P.A. de PAOLI DATE : 10/14

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		
						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	1.72	--	1.75	3.67	1	TOP SLAB	11.00	1.72	1	BOTTOM SLAB	11.00		
	HL-93 (OPERATING)	N/A		2.24	--	1.35	4.76	1	TOP SLAB	11.00	2.24	1	BOTTOM SLAB	11.00		
	HS-20 (INVENTORY)	36.000	②	1.72	61.92	1.75	3.67	1	TOP SLAB	11.00	1.72	1	BOTTOM SLAB	11.00		
	HS-20 (OPERATING)	36.000		2.24	80.64	1.35	4.76	1	TOP SLAB	11.00	2.24	1	BOTTOM SLAB	11.00		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.02	54.27	1.40	7.94	1	EXTERIOR WALL	7.00	4.02	1	TOP SLAB	11.00	
		SNGARBS2	20.000		3.61	72.20	1.40	6.55	1	EXTERIOR WALL	0.00	3.61	1	TOP SLAB	11.00	
		SNAGRIS2	22.000		3.42	75.24	1.40	6.22	1	EXTERIOR WALL	0.00	3.42	1	BOTTOM SLAB	11.00	
		SNCOTTS3	27.250		2.08	56.68	1.40	4.45	1	EXTERIOR WALL	7.00	2.08	1	TOP SLAB	11.00	
		SNAGGRS4	34.925		2.17	75.79	1.40	4.47	1	EXTERIOR WALL	0.00	2.17	1	BOTTOM SLAB	11.00	
		SNS5A	35.550		2.12	75.37	1.40	4.52	1	BOTTOM SLAB	11.00	2.12	1	TOP SLAB	11.00	
		SNS6A	39.950		1.93	77.10	1.40	4.27	1	BOTTOM SLAB	11.00	1.93	1	BOTTOM SLAB	11.00	
		SNS7B	42.000		1.89	79.38	1.40	4.06	1	BOTTOM SLAB	11.00	1.89	1	BOTTOM SLAB	11.00	
	TRUCK TRACTOR SEMI-TRAILER (T/S)	TNAGRIT3	33.000		2.32	76.56	1.40	4.95	1	EXTERIOR WALL	0.00	2.32	1	BOTTOM SLAB	11.00	
		TNT4A	33.075		2.30	76.07	1.40	5.01	1	EXTERIOR WALL	0.00	2.30	1	BOTTOM SLAB	11.00	
		TNT6A	41.600		1.96	81.54	1.40	4.17	1	BOTTOM SLAB	11.00	1.96	1	BOTTOM SLAB	11.00	
		TNT7A	42.000		1.93	81.06	1.40	4.29	1	BOTTOM SLAB	11.00	1.93	1	BOTTOM SLAB	11.00	
		TNT7B	42.000		1.92	80.64	1.40	4.25	2	BOTTOM SLAB	0.00	1.92	1	BOTTOM SLAB	11.00	
		TNAGRIT4	43.000		1.79	76.97	1.40	4.08	1	BOTTOM SLAB	11.00	1.79	1	BOTTOM SLAB	11.00	
TNAGT5A	45.000		1.72	77.40	1.40	3.79	1	BOTTOM SLAB	11.00	1.72	1	BOTTOM SLAB	11.00			
TNAGT5B	45.000		③	1.70	76.50	1.40	3.78	1	BOTTOM SLAB	11.00	1.70	1	BOTTOM SLAB	11.00		

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	--

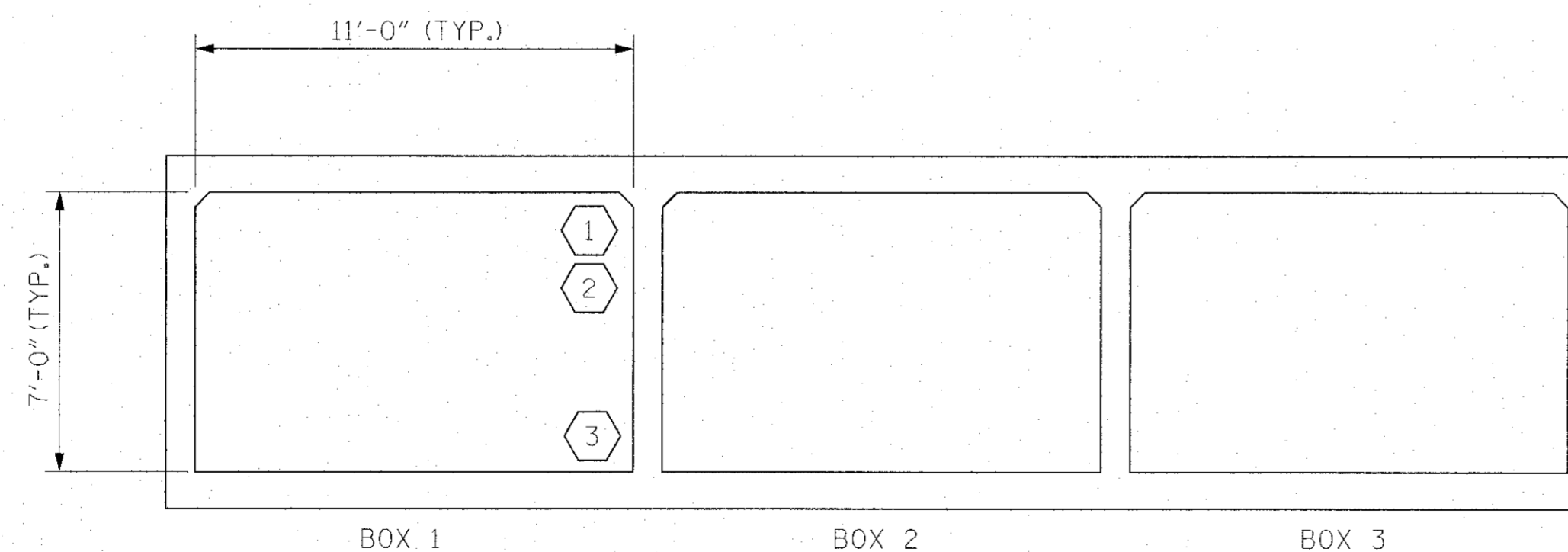
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1. VERTICAL ELEMENTS ARE REFERENCED STARTING AT THE BOTTOM.

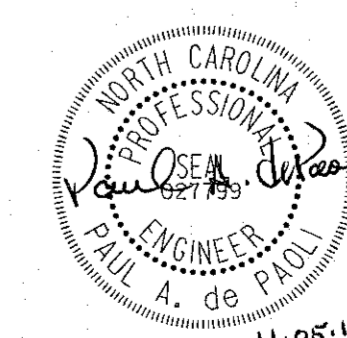
①	CONTROLLING LOAD RATING
②	DESIGN LOAD RATING (HL-93)
③	DESIGN LOAD RATING (HS-20)
④	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



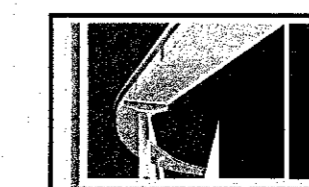
LRFR SUMMARY  
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.9.R.5  
STOKES COUNTY  
STATION: 12+68.00 -L-

SHEET 6 OF 6



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



MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			6

11/5/2014 3:16:01 PM User: blanning  
 File: P:\NC Projects\M2002 - Div 09 Low Impact Bridge Replacement\_RK&A\M2002.02\_2\_Stokes 58 RCBC\17BP9R5\Structur\17BP9R5\_SD\_CU6\_58.dgn

ASSEMBLED BY: J.S. ISRAELNAIM	DATE: 10/14
CHECKED BY: P.A. de PAOLI	DATE: 10/14
DESIGN ENGINEER OF RECORD: P.A. de PAOLI	DATE: 10/14
DRAWN BY: HMC	7/11
CHECKED BY: GM	7/11
REV. 10/1/11	MAA/GM

## 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