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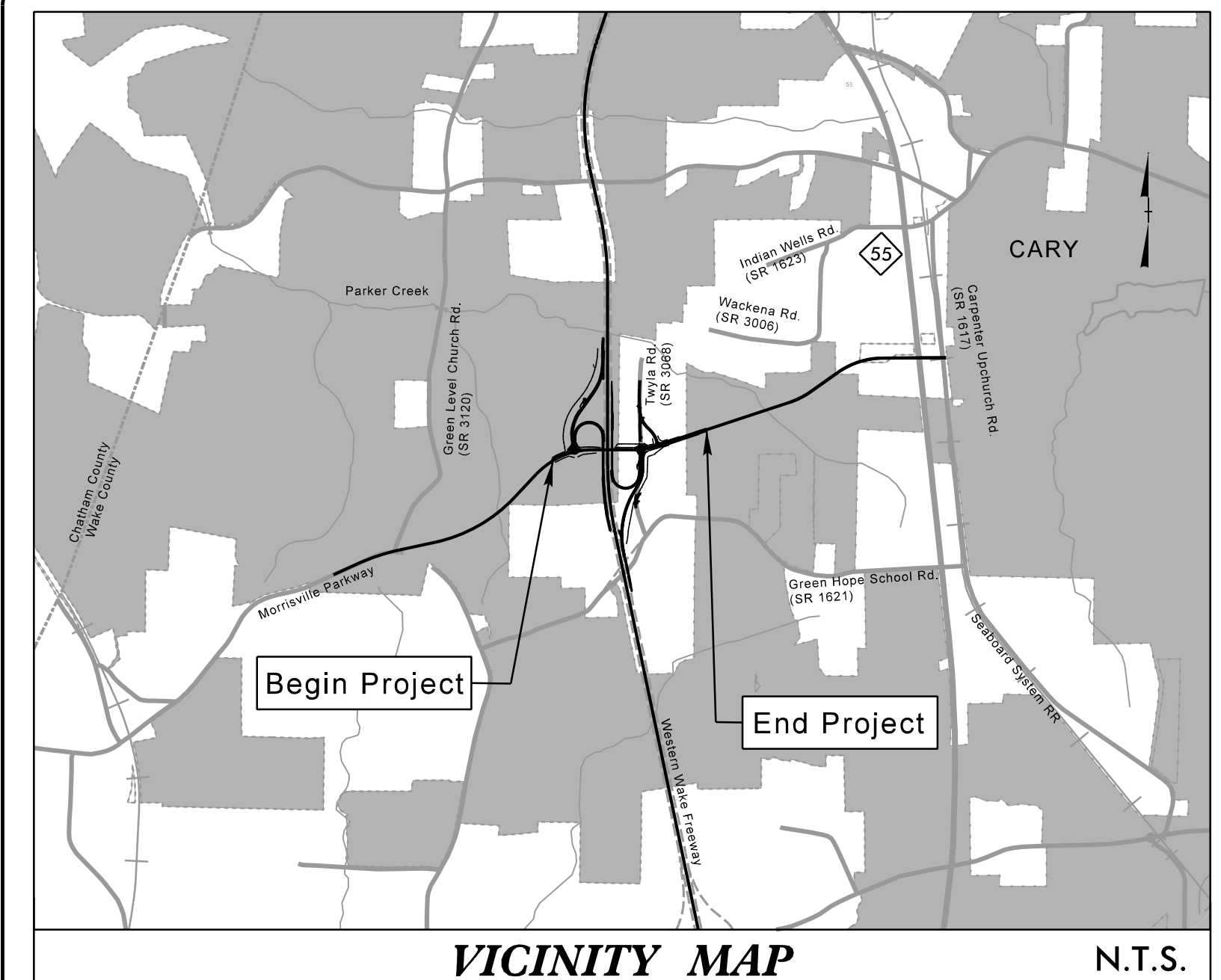
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09_08/09

TIP PROJECT: U-5315 A&B

CONTRACT: C203991



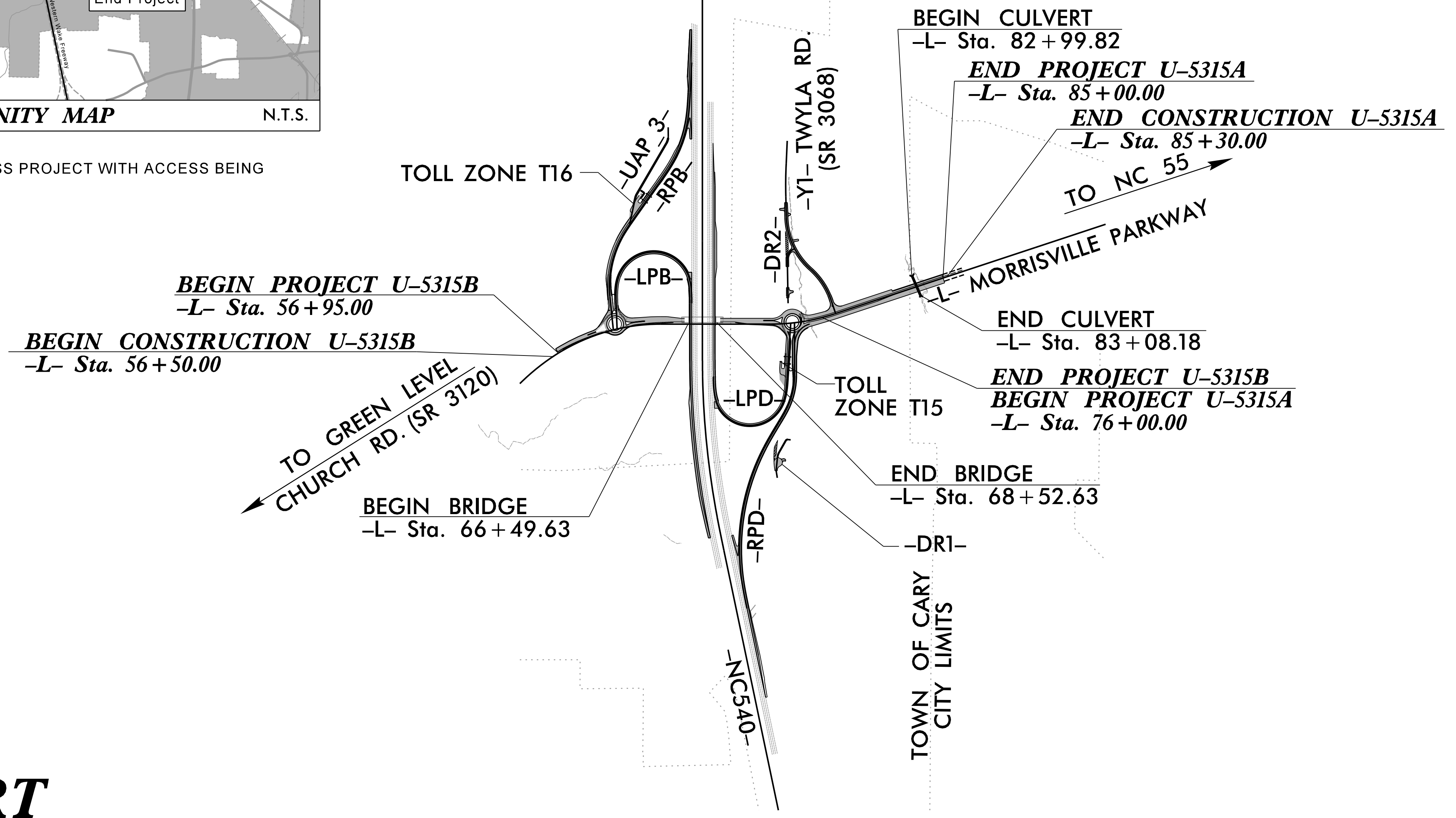
NOTES:
1. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

**LOCATION: MORRISVILLE PARKWAY EXTENSION AND NC 540 INTERCHANGE
FROM WEST OF HIGHCROFT DRIVE TO EAST OF MILLS PARK DRIVE IN CARY**
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT,
SIGNING, AND TOLL INFRASTRUCTURE**

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	U-5315A/U-5315B			
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION		
U-5315A	45429.1.F2	STPDA-0503(19)	PE	
U-5315A	45429.2.2	STPDA-0540(38)	RW, UTILITIES	
U-5315B	45429.1.F3	STPDA-0503(19)	PE	
U-5315B	45429.2.3	STPDA-0540(39)	RW, UTILITIES	
U-5315A&B	45429.3.3	STPDA-0540(39)	CONST.	
U-5315B	45429.5.TA1		TURNPIKE CONST.	
U-5315B	45429.5.TA3		TURNPIKE ROW	



CULVERT

DESIGN DATA

ADT 2017	=	11,850
ADT 2037	=	23,005
K	=	12 %
D	=	60 %
T	=	4 % *
V	=	50 MPH
* (TTST 1% + DUALS 3%)		
FUNC. CLASS = MAJOR THOROUGHFARE / URBAN ARTERIAL		

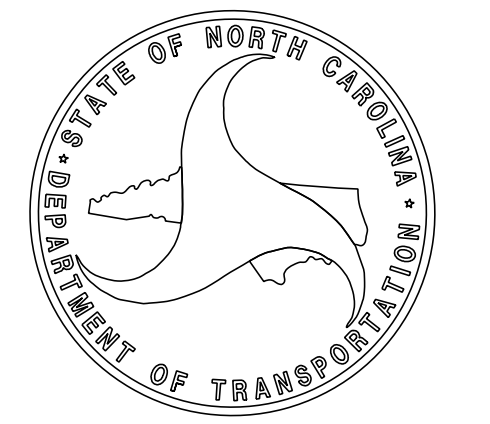
PROJECT LENGTH

LENGTH OF PROJECT U-5315B	0.322 mi
LENGTH OF PROJECT U-5315A	0.170 mi
TOTAL LENGTH	0.492 mi

PREPARED IN THE OFFICE OF:
RK&K RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. E-0112

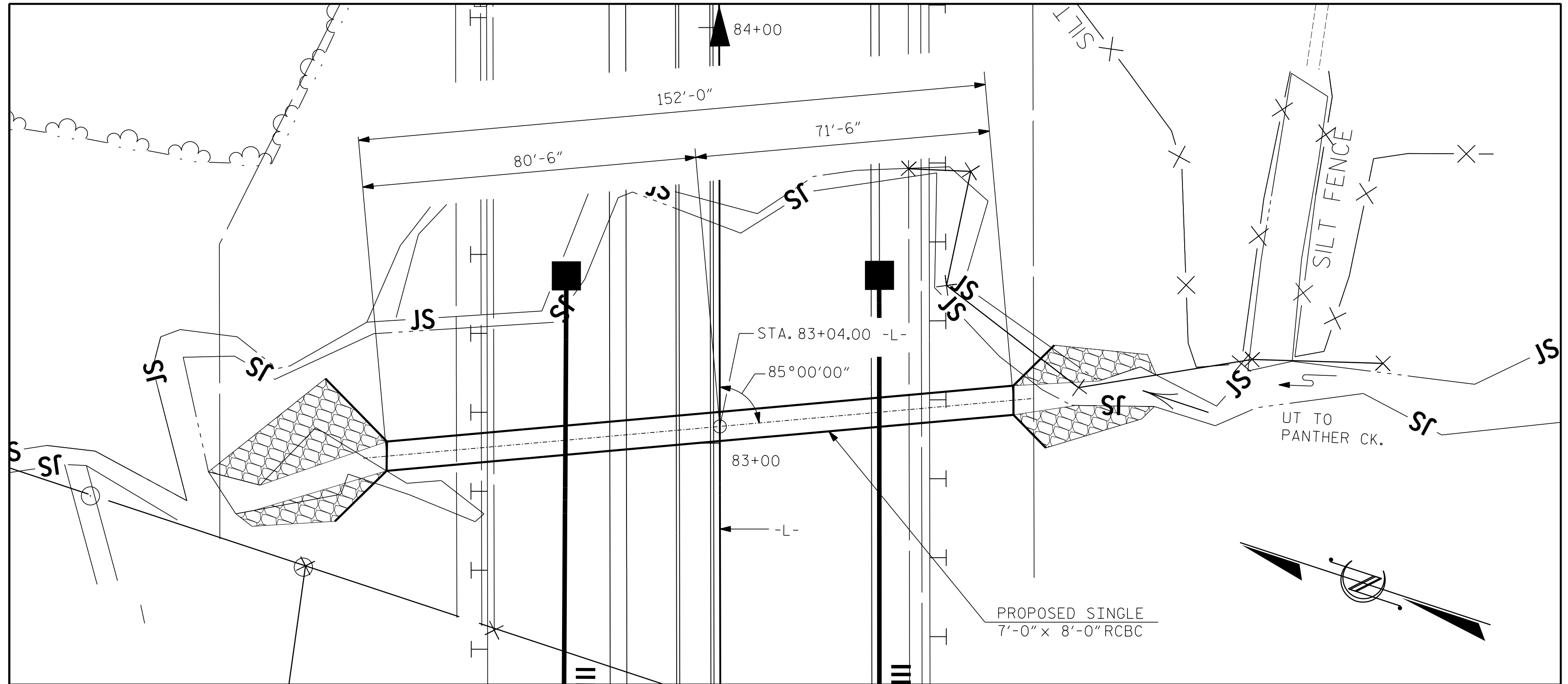
FOR NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS	STEPHEN ROBERTS, P.E. PROJECT ENGINEER
RIGHT OF WAY DATE: NOVEMBER 20, 2015	
LETTING DATE: DECEMBER 19, 2017	BRUCE KLAPPENBACH, P.E. PROJECT DESIGN ENGINEER
NCDOT CONTACT: MOHAMMED E. MAHJOUR SPECIAL DESIGN PROJECT ENGINEER ROADWAY DESIGN UNIT	



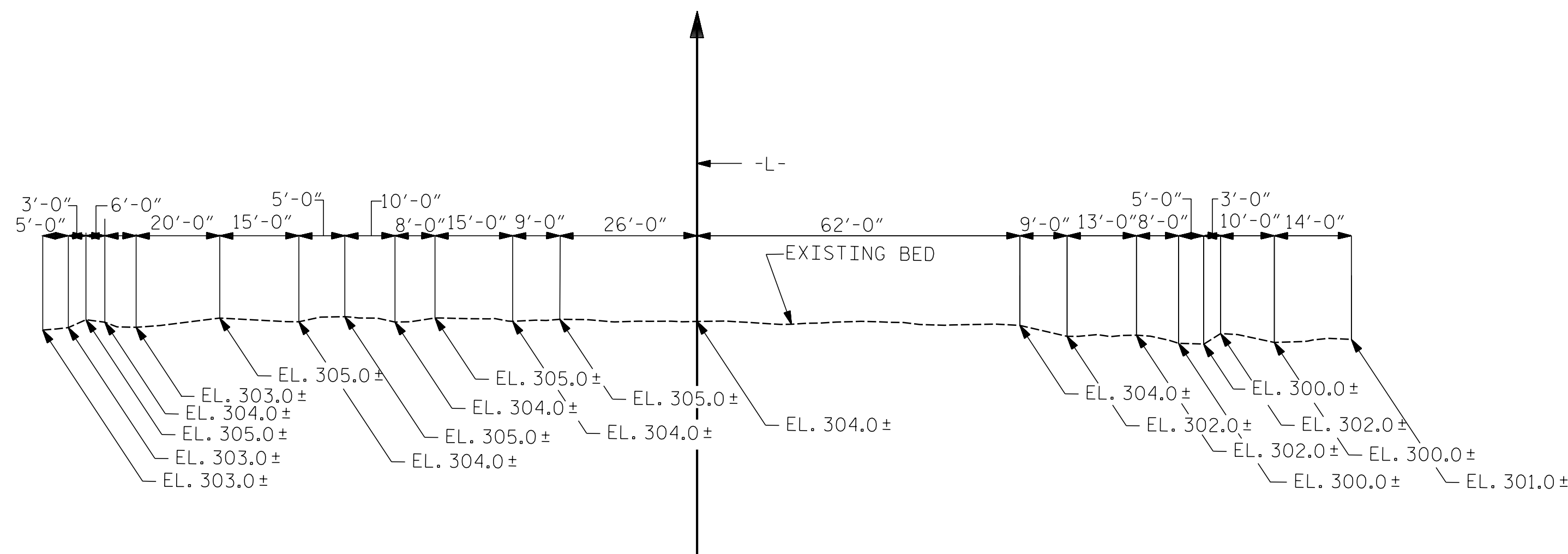
11/10/2017 R:\Structures\Culvert\Drawings\Final\U5315_sfr_tsh.dgn bklappenbach

BENCH MARK: CTRL PT#23 -L- STA. 83+88.99 14.23' RIGHT, NAIL N 749682 E 2033532 ELEV. 308.95



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS
 GRADE POINT ELEVATION @ STA. 83+04.00-L- = 319.53
 BED ELEVATION @ STA. 83+04.00 = 300.35
 ROADWAY SLOPES = 2:1



PROFILE ALONG CULVERT

NOTES:

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL-----10.9'
- 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.
- 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 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.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WINGS COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- AT THE CONTRACTORS 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 IN 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.

HYDRAULIC DATA

DESIGN DISCHARGE-----290 C.F.S.
 FREQUENCY OF DESIGN FLOOD-----50 YR.
 DESIGN HIGH WATER ELEVATION-----308.6 FT.
 DRAINAGE AREA-----55.3 ACRES
 BASE DISCHARGE (Q100)-----330 C.F.S.
 BASE HIGH WATER ELEVATION-----309.12 FT.

OVERTOPPING FLOOD DATA

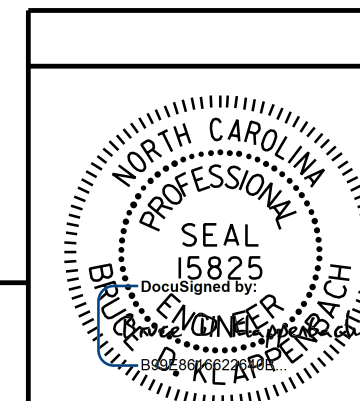
OVERTOPPING DISCHARGE-----900 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD-----500 + YR
 OVERTOPPING FLOOD ELEVATION-----319.8 FT.

PROJECT NO. U-5315A&B
 WAKE COUNTY
 STATION: 83+04.00 -L-

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @	1.01 CY/FT	153.9 C.Y.
BAFFLES		2.3 C.Y.
WING ETC.		25.6 C.Y.
TOTAL		181.8 C.Y.
REINFORCING STEEL		
BARREL		35,480 LBS.
WINGS ETC.		1,547 LBS.
TOTAL		37,027 LBS.
CULVERT EXCAVATION		LUMP SUM
FOUNDATION CONDITIONING MATERIAL		135 TONS

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NC 27609-3960 (919) 878-9560
 NC LICENSE NUMBER: F-0112

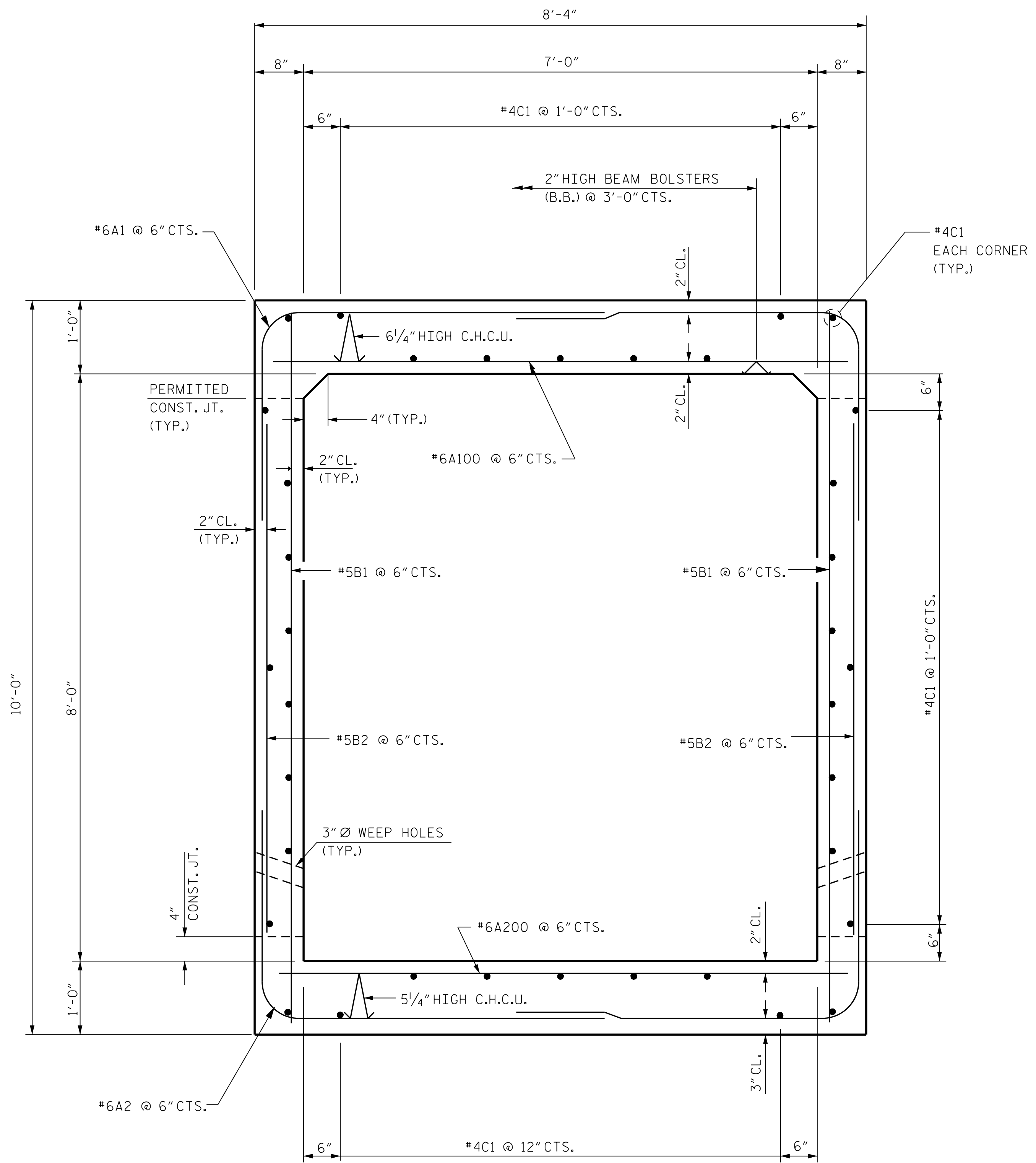


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 7 FT. W x 8 FT. H
 CONCRETE BOX CULVERT
 85° SKEW

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 DRAWN BY : F.D. WEEDEN DATE : OCT. 2016
 CHECKED BY : B.D. KLAPPENBACH DATE : OCT. 2016
 DESIGN ENGINEER OF RECORD : B.D. KLAPPENBACH DATE : OCT. 2016

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RIGHT ANGLE SECTION OF BARREL

THERE ARE 36 "C" BARS IN SECTION OF BARREL.

BAR TYPE

VERTICAL LEG
 6" RAD.
 9 1/2" (TYP.)
 4'-2" (A1)
 4'-2" (A2)

DIMENSIONS ARE OUT TO OUT

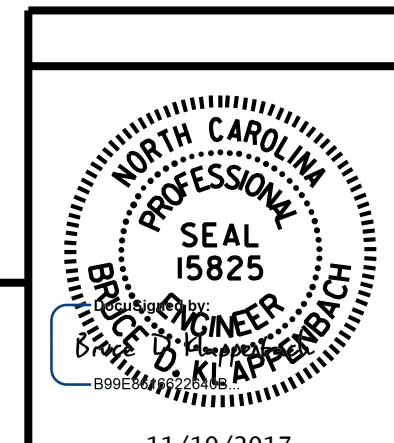
SPLICE LENGTHS

BAR	SIZE	SPLICE LENGTHS
C1	#4	1'-11"
B1	#4	1'-11"

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	608	#6	1	7'-4"	6697
A2	608	#6	1	7'-4"	6697
A100	302	#6	STR.	8'-0"	3629
A101	2	#6	STR.	4'-9"	14
A200	302	#6	STR.	8'-0"	3629
A201	2	#6	STR.	4'-9"	14
B1	606	#5	STR.	9'-6"	6005
B2	606	#5	STR.	7'-3"	4582
C1	216	#4	STR.	26'-9"	3860
D1	12	#6	STR.	2'-7"	47
D2	12	#6	STR.	1'-7"	29
G1	4	#4	STR.	8'-0"	21
S1	12	#8	STR.	8'-0"	256
REINFORCING STEEL				35,480 LBS.	

PROJECT NO. U-5315A&B
 WAKE COUNTY
 STATION: 83+04.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE BARREL
 7 FT. X 8 FT.
 CONCRETE BOX CULVERT
 85° SKEW

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NC 27609-3960 (919) 878-9560
 NC LICENSE NUMBER: F-0112

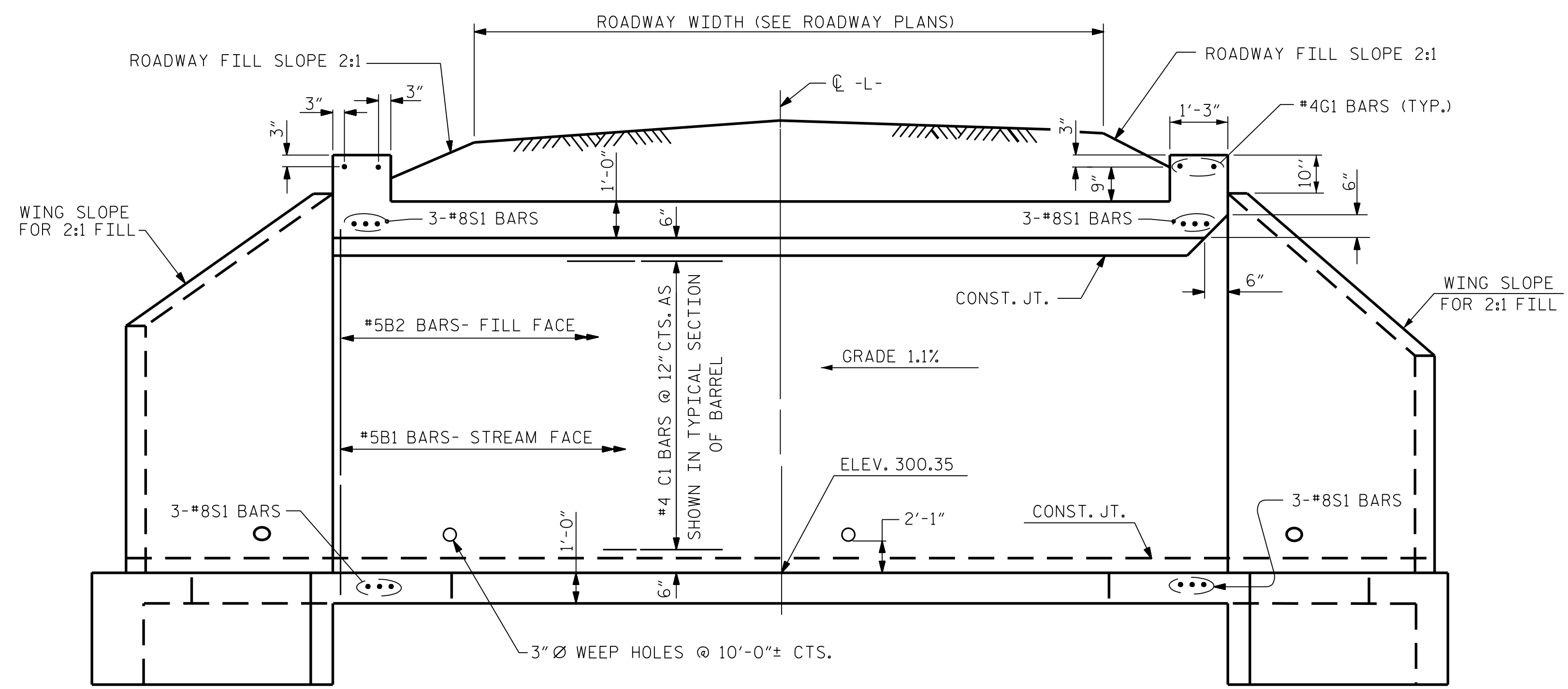
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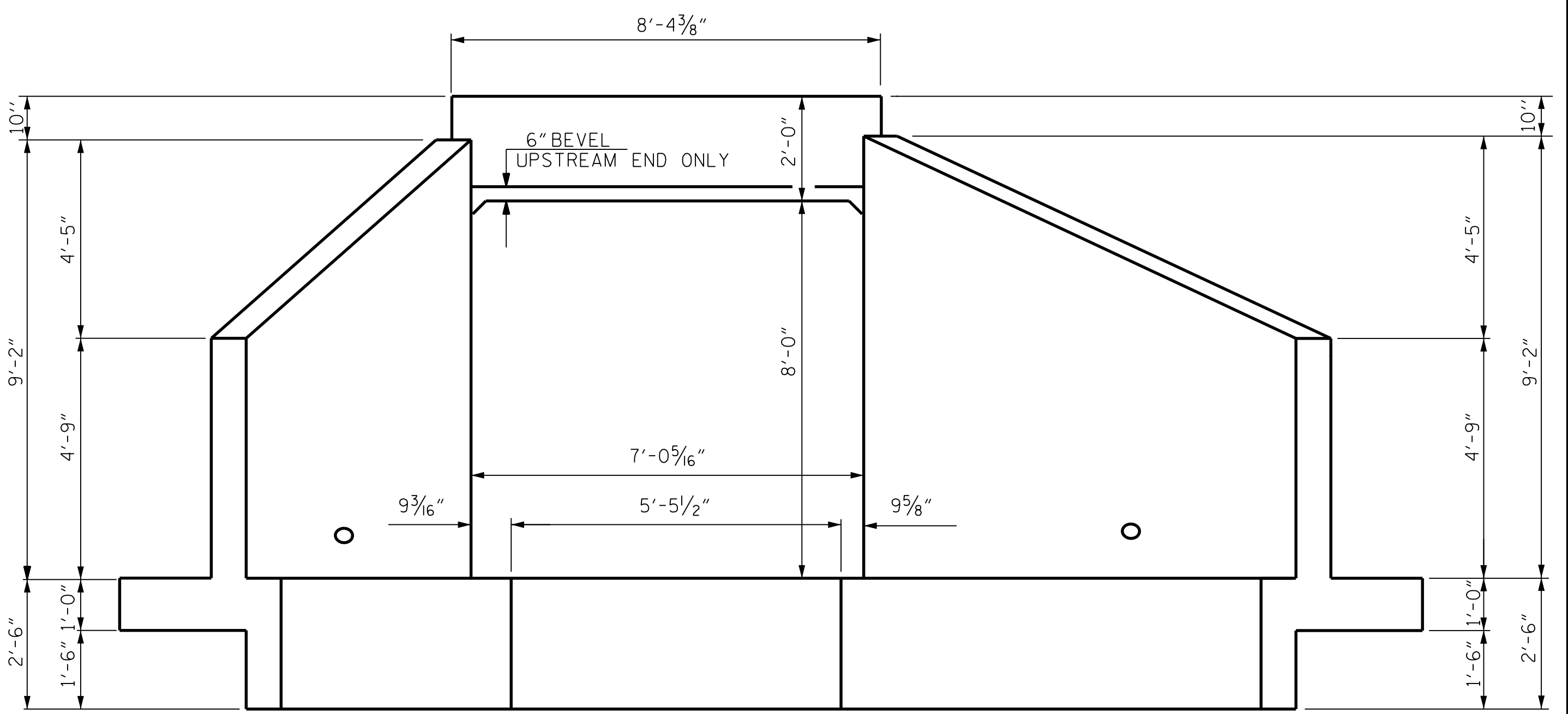
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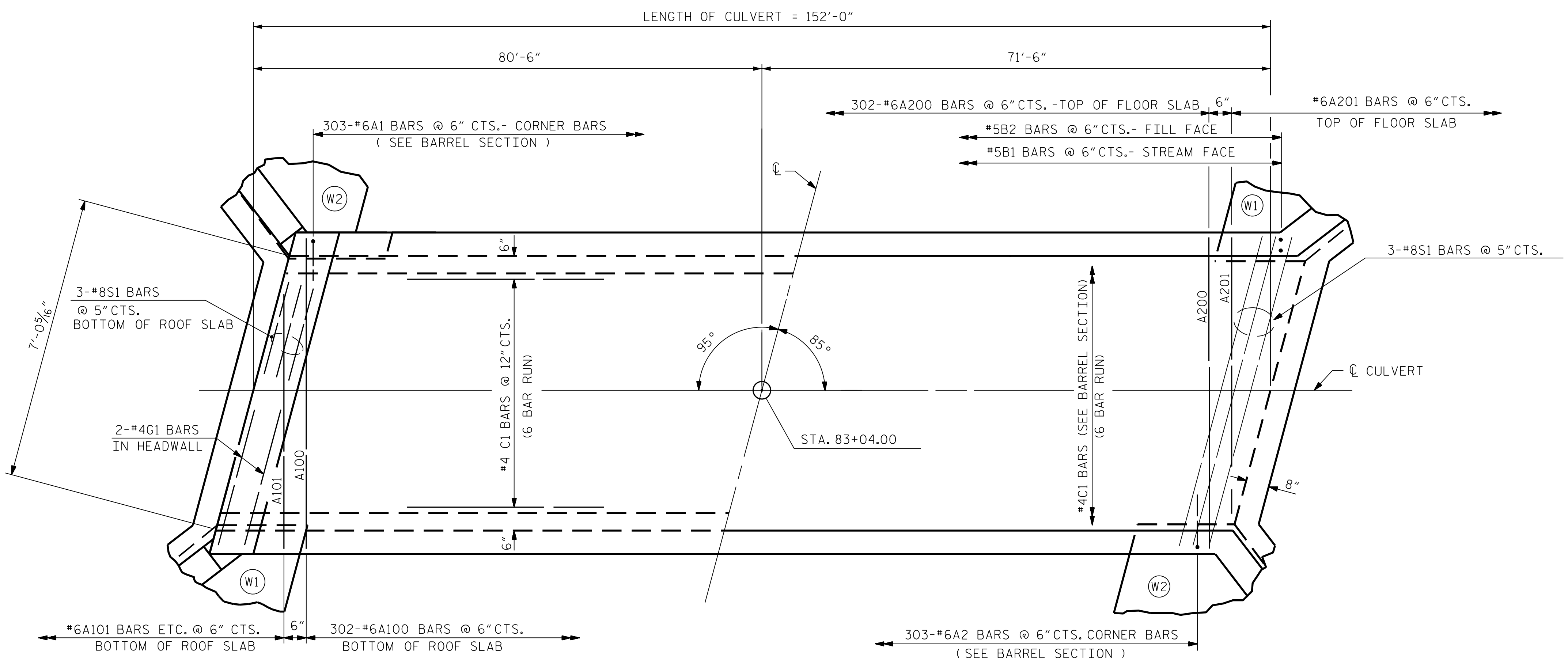
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CULVERT SECTION NORMAL TO ROADWAY



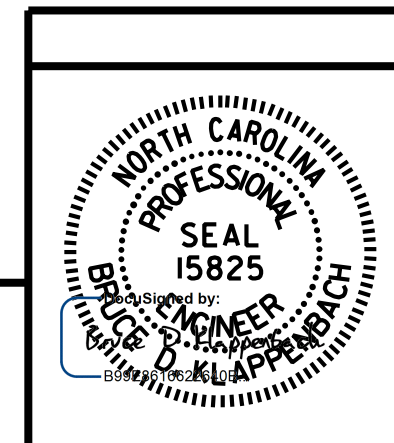
END ELEVATION NORMAL TO SKEW



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

PROJECT NO. U-5315A&B
WAKE COUNTY
 STATION: 83+04.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BARREL STANDARD
 SINGLE 7 FT. W X 8 FT. H
 CONCRETE BOX CULVERT
 85° SKEW

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 900 RIDGEFIELD DRIVE SUITE 350
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 NC LICENSE NUMBER: F-0112

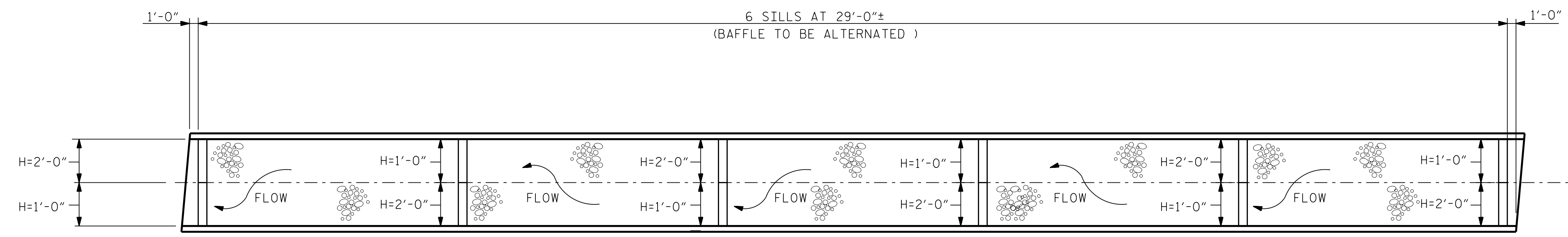
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BAFFLE PLAN

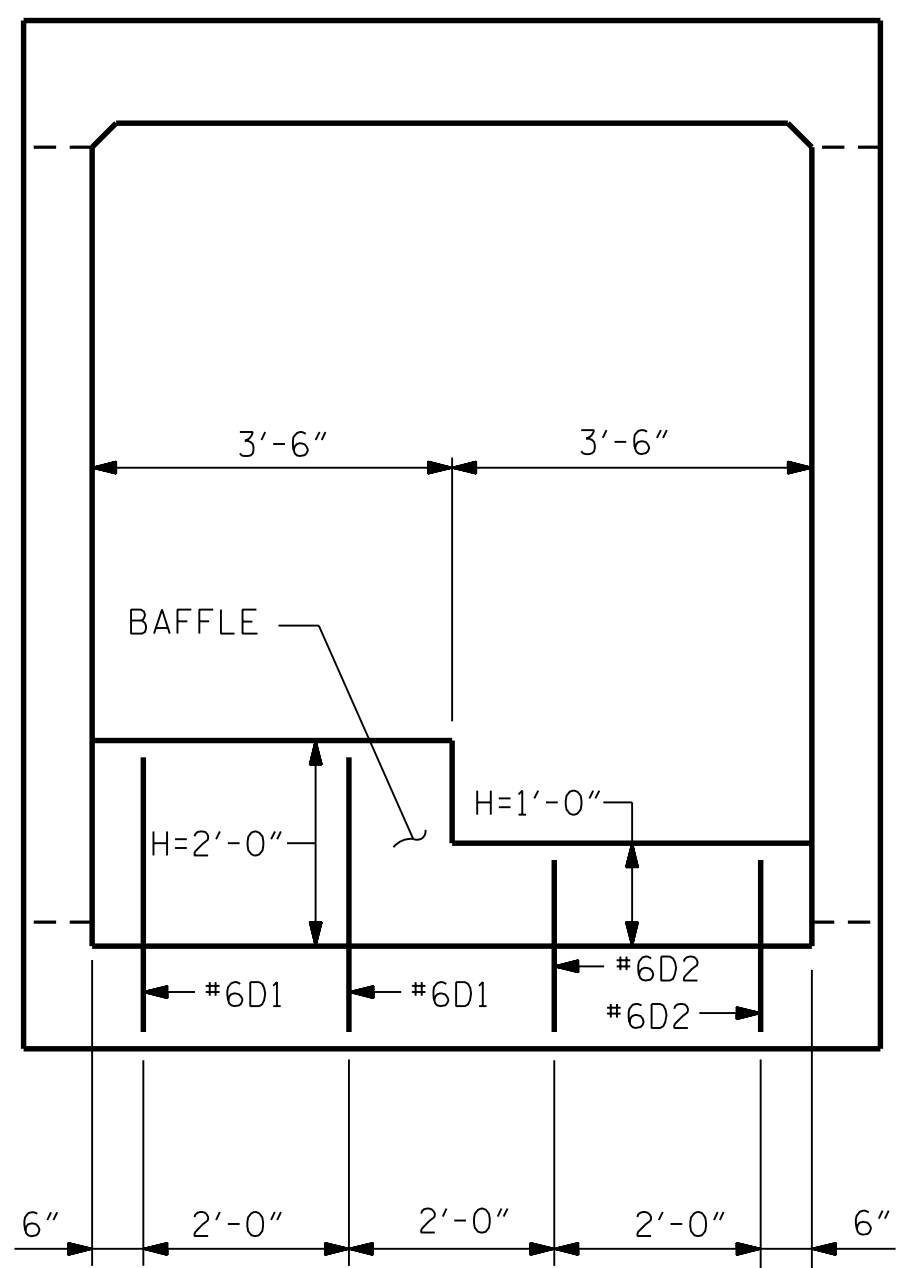
NOTES:

NATIVE MATERIAL BETWEEN SILLS / BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM AT THE PROJECT SITE DURING 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 BED MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS, 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.

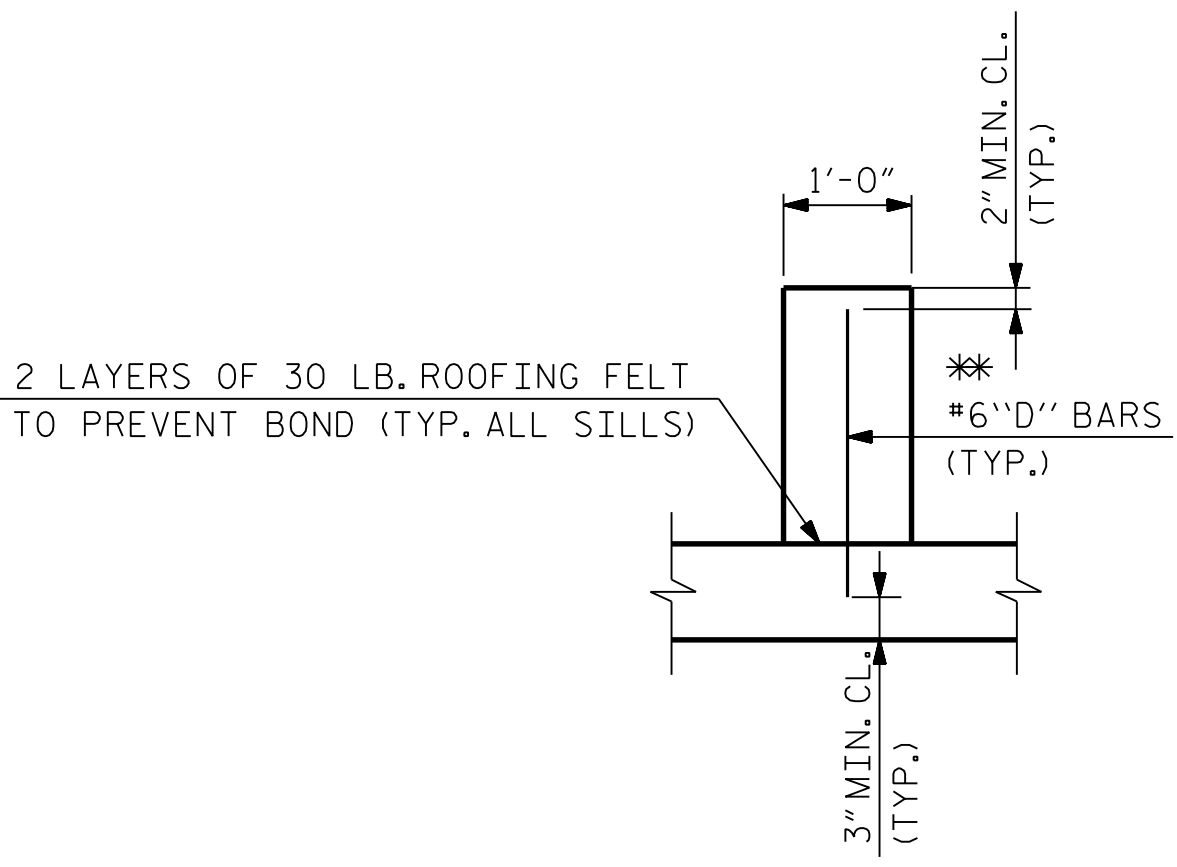
TOP OF LOW FLOW BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

DO NOT SET ELEVATION OF HIGH SILLS / BAFFLES ABOVE BANK FULL.

NUMBER OF SILLS/BAFFLES DETERMINED BY THE ENGINEER.



BAFFLE ELEVATION
(LOOKING DOWNSTREAM)



BAFFLE SECTIONS

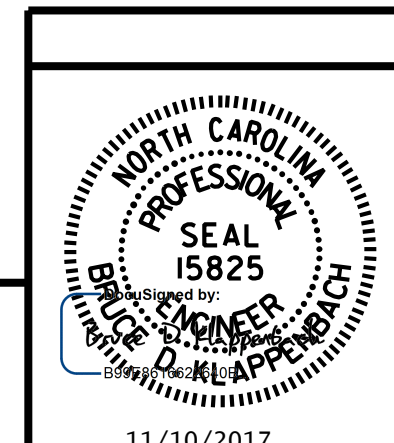
2 LAYERS OF 30 LB. ROOFING FELT TO PREVENT BOND (TYP. ALL SILLS)

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

PROJECT NO. U-5315A&B
WAKE COUNTY
 STATION: 83+04.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE
 7 FT. W X 8 FT. H
 BOX CULVERT
 SILL DETAILS



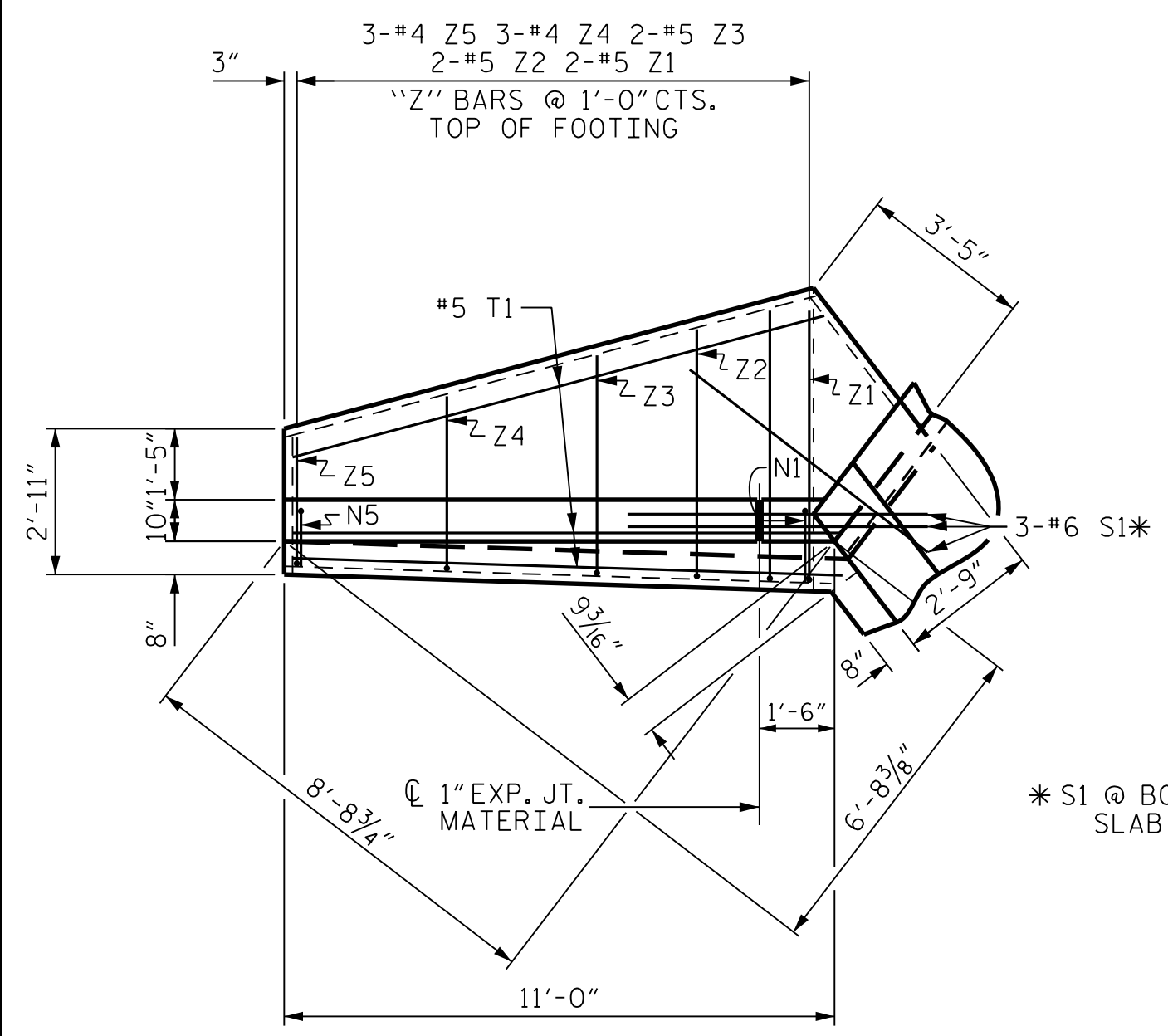
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NC 27609-3960 (919) 878-9560
 NC LICENSE NUMBER: F-0112

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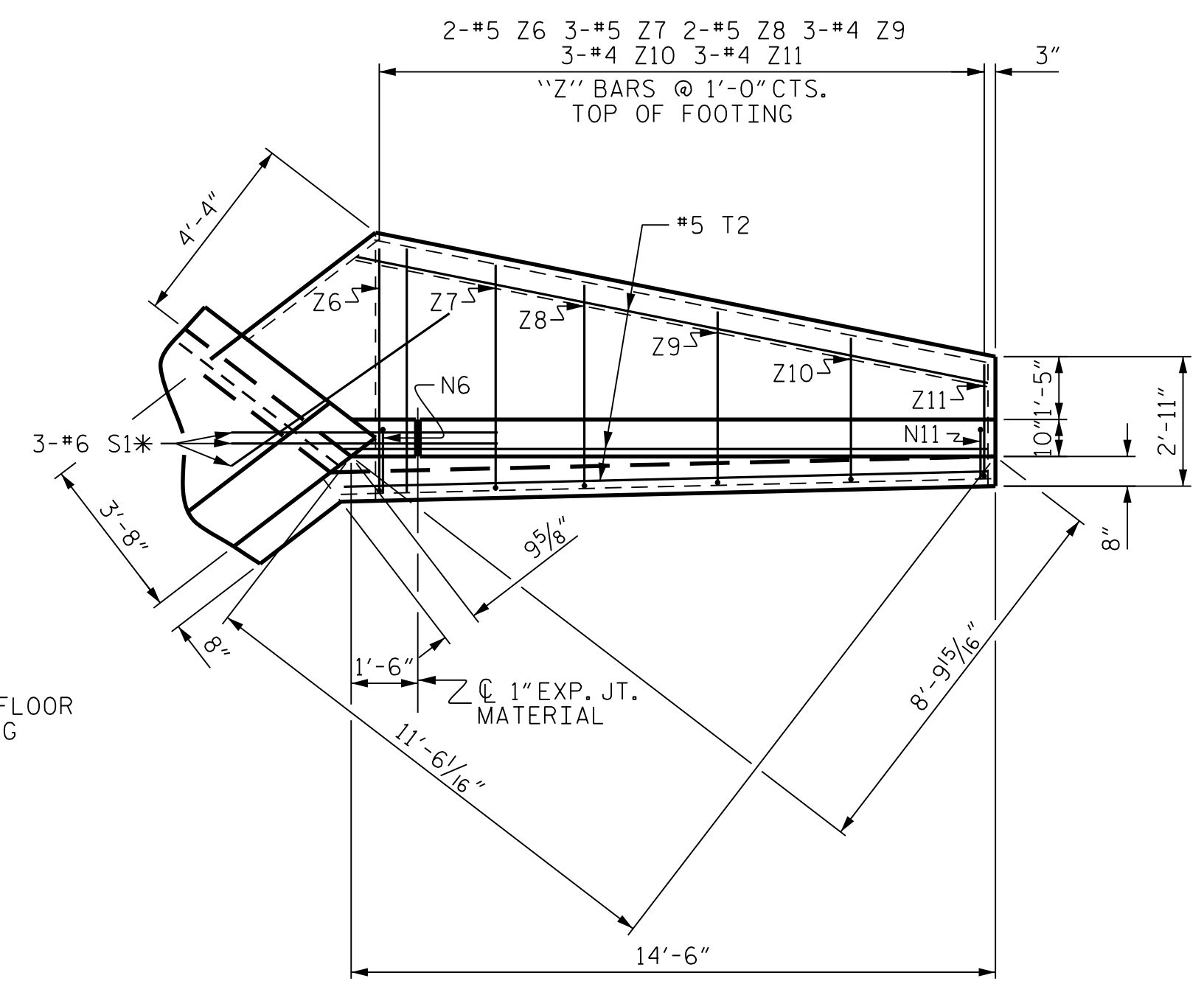
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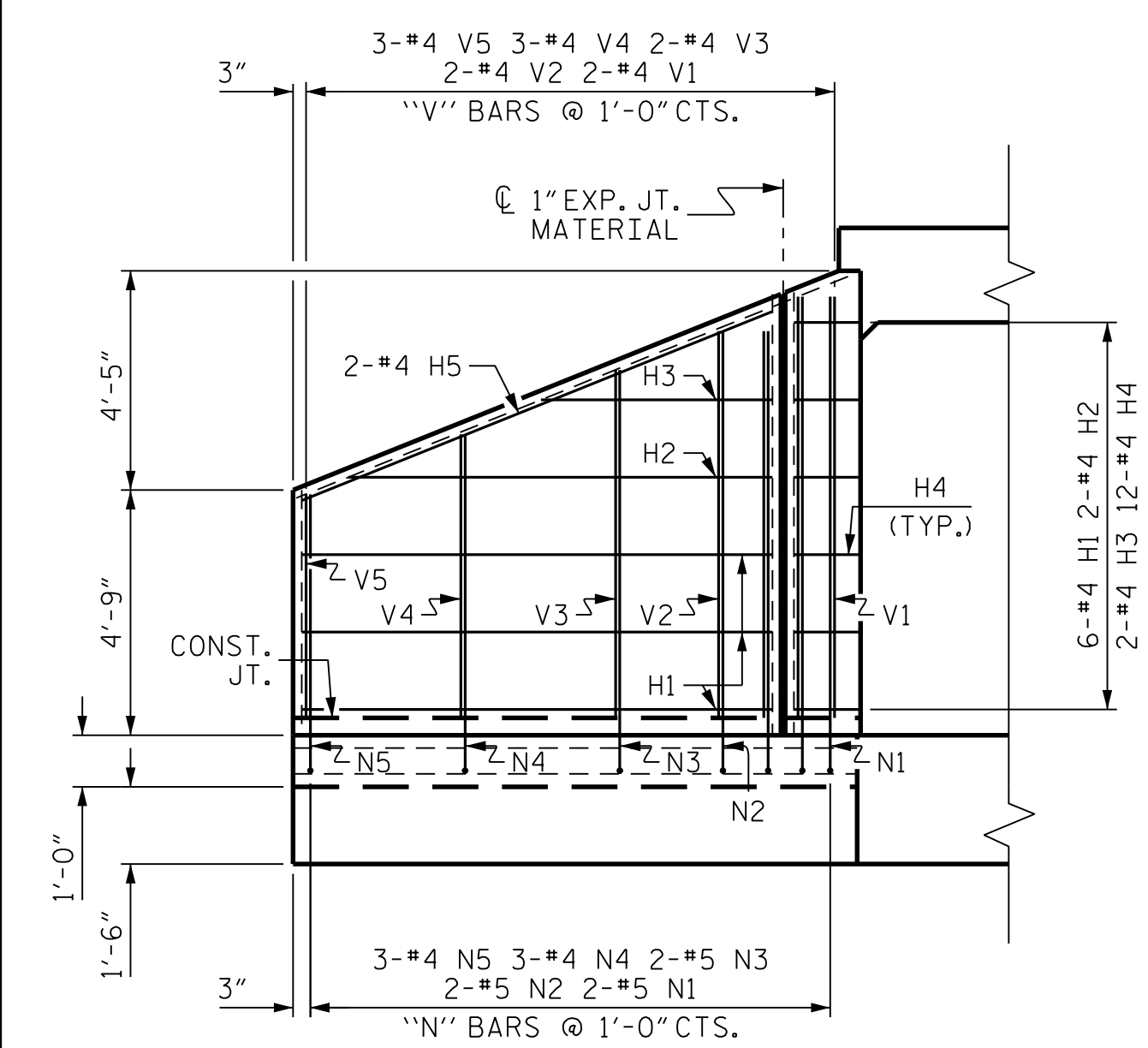
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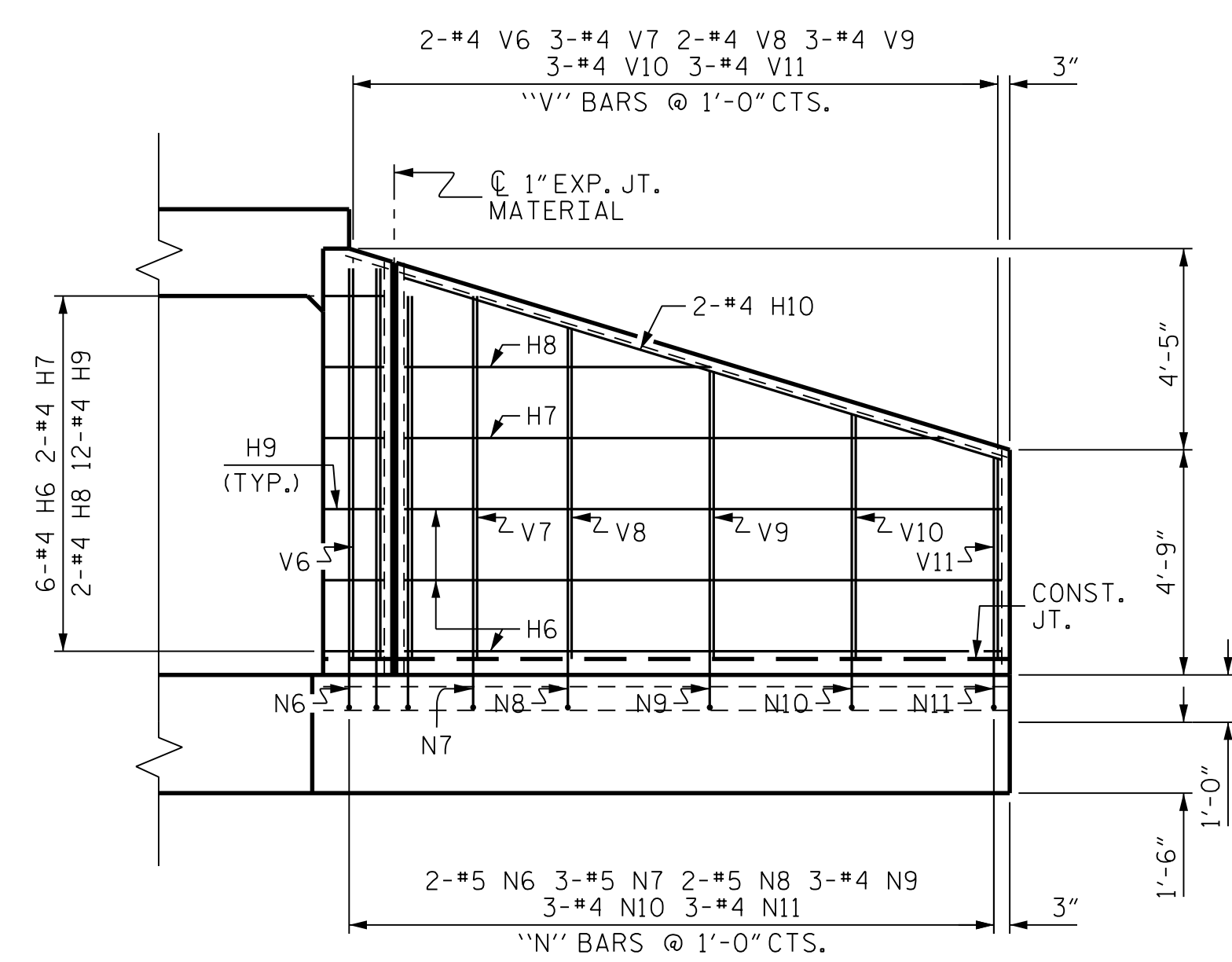
PLAN W2



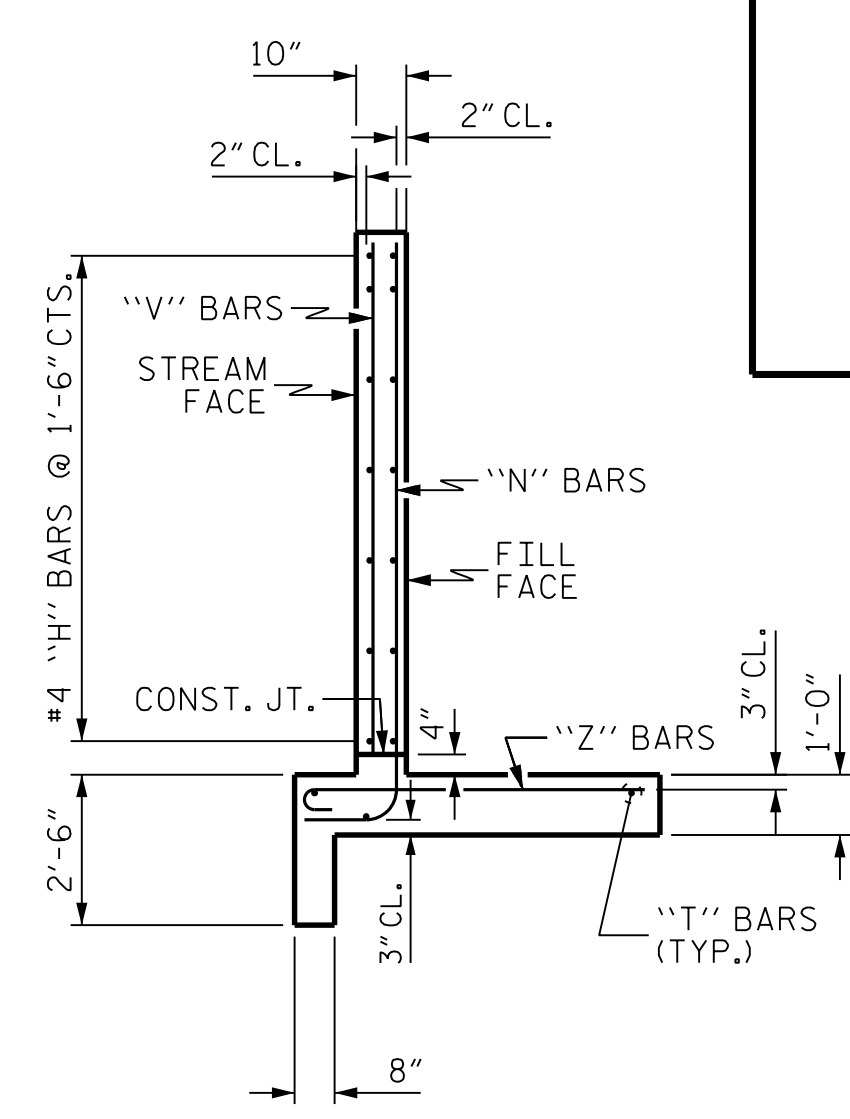
PLAN W1



ELEVATION W2



ELEVATION W1



TYPICAL WING SECTION

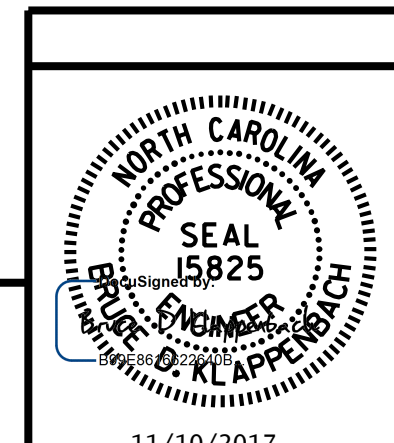
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	9'-1"	73
H2	4	#4	STR	8'-2"	22
H3	4	#4	STR	4'-5"	12
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	9'-10"	26
H6	12	#4	STR	12'-7"	101
H7	4	#4	STR	11'-4"	30
H8	4	#4	STR	6'-5"	17
H9	24	#4	2	3'-3"	52
H10	4	#4	STR	13'-2"	35
N1	4	#5	3	10'-2"	42
N2	4	#5	3	9'-7"	40
N3	4	#5	3	8'-9"	37
N4	6	#4	3	7'-7"	30
N5	6	#4	3	6'-4"	25
N6	4	#5	3	10'-3"	43
N7	6	#5	3	9'-8"	60
N8	4	#5	3	9'-1"	38
N9	6	#4	3	8'-2"	33
N10	6	#4	3	7'-3"	29
N11	6	#4	3	6'-4"	25
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	11'-0"	69
T2	6	#5	STR	14'-6"	91
V1	4	#4	STR	8'-2"	22
V2	4	#4	STR	7'-6"	20
V3	4	#4	STR	6'-9"	18
V4	6	#4	STR	5'-6"	22
V5	6	#4	STR	4'-4"	17
V6	4	#4	STR	8'-3"	22
V7	6	#4	STR	7'-8"	31
V8	4	#4	STR	7'-0"	19
V9	6	#4	STR	6'-1"	24
V10	6	#4	STR	5'-2"	21
V11	6	#4	STR	4'-3"	17
Z1	4	#5	4	6'-0"	25
Z2	4	#5	4	5'-7"	23
Z3	4	#5	4	5'-0"	21
Z4	6	#4	4	4'-0"	16
Z5	6	#4	4	3'-1"	12
Z6	4	#5	4	6'-1"	25
Z7	6	#5	4	5'-8"	35
Z8	4	#5	4	5'-2"	22
Z9	6	#4	4	4'-5"	18
Z10	6	#4	4	3'-9"	15
Z11	6	#4	4	3'-1"	12
REINFORCING STEEL FOR 4 WINGS				1547 LBS	
CLASS A CONCRETE					
4 WINGS				22.6 CY	
2 HEADWALLS				0.7 CY	
2 END CURTAIN WALLS				2.3 CY	
TOTAL				25.6 CY	

PROJECT NO. U-5315A&B
 WAKE COUNTY
 STATION: 83+04.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 2:1
 85° SKEW



RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NC 27609-3960 (919) 878-9560
 NC LICENSE NUMBER: F-0112

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SHEET NO.
 CU-5
 TOTAL SHEETS
 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 (LL)	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		N/A	N/A	1.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
	HL-93 (OPERATING)	N/A		N/A	N/A	1.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
	HS-20 (INVENTORY)	36.000		N/A	N/A	1.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
	HS-20 (OPERATING)	36.000		N/A	N/A	1.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNGARBS2	20.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNAGRIS2	22.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNCOTTS3	27.250		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNAGRS4	34.925		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNS5A	35.550		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNS6A	39.950		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		SNS7B	42.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		TNT4A	33.075		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		TNT6A	41.600		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		TNT7A	42.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		TNT7B	42.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
		TNAGRIT4	43.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1
PERMANENT LOADS	TNAGT5A	45.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	
	TNAGT5B	45.000		N/A	N/A	1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	
PERMANENT LOADS		N/A	4	1.43	N/A	N/A	1.43	1	EXT. WALL	0.8	2.08	1	BOTTOM SLAB	0.8	2

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:

- EFFECTS OF LIVE LOAD MAY BE NEGLECTED ACCORDING TO AASHTO FRFD 3.6.1.2.6 (DESIGN FILL = 10.9')
- CULVERTS WITH DEEP FILLS SHOULD BE EXCAVATED FOR THE EFFECTS OF PERMANENT LOADS ONLY ACCORDING TO "THE MANUAL FOR BRIDGE EVALUATION 6A.5.12.10.3A".

CONTROLLING LOAD RATING

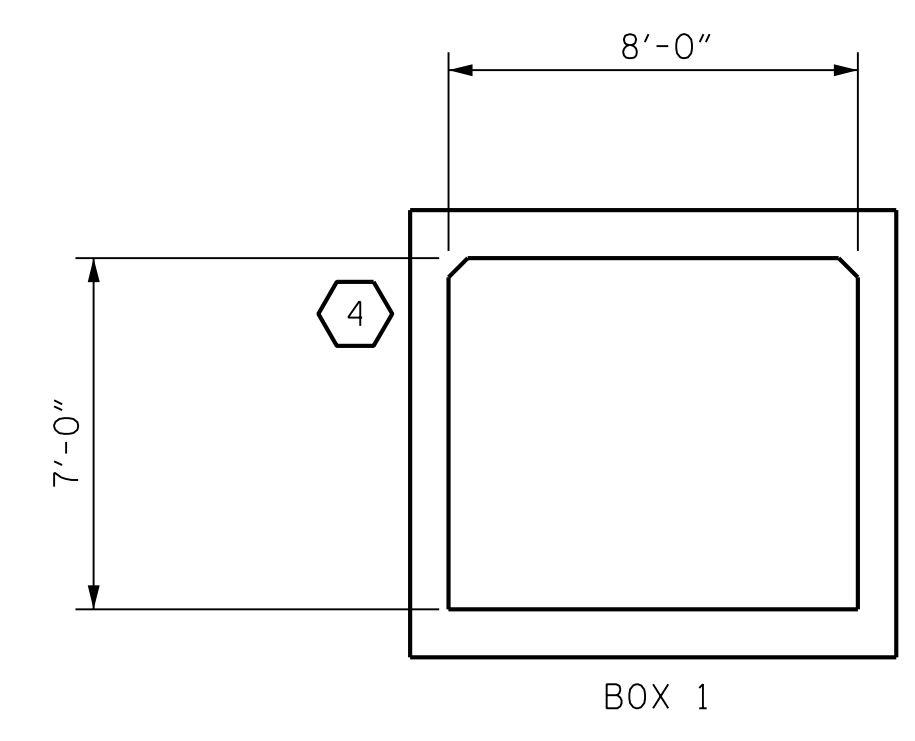
1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

4 PERMANENT LOAD RATING

** SEE CHART FOR VEHICLE TYPE

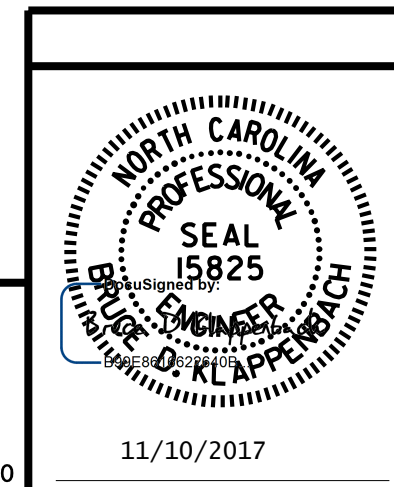


LRFR SUMMARY

PROJECT NO. U-5315A&B
WAKE COUNTY
 STATION: 83+04.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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



RK&K

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NC LICENSE NUMBER: F-0112

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

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 CHECKED BY : B.D. KLAPPENBACH DATE : OCT. 2016
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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 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

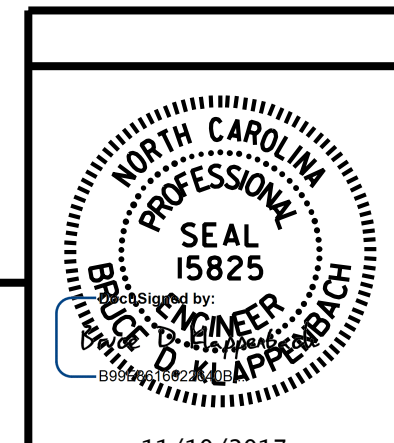
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE 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.

PROJECT NO. U-5315A&B
WAKE COUNTY
 STATION: 83+04.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
STANDARD NOTES	
REVISIONS	
NO.	SHEET NO.
BY:	CU-7
DATE:	TOTAL SHEETS
1	7
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