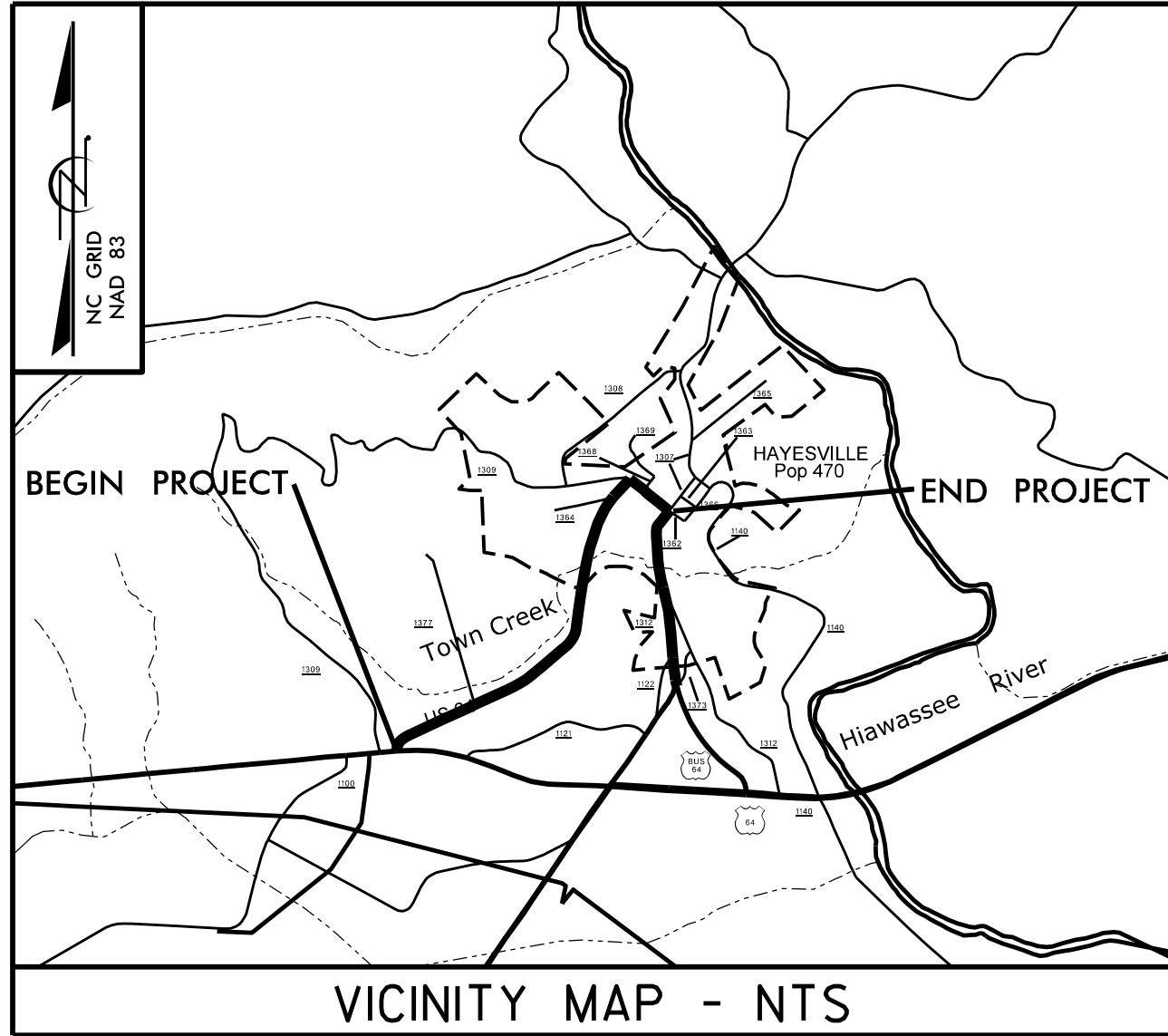


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wdcrUtcher

CONTRACT: C204836

PROJECT: R-5863



BEGIN PROJECT TIP R-5863
-L- POT STA. 10+30.00

TO GA / NC STATE LINE

-DW1-
-DW2-

US 64 BUS

RETAINING WALL #2

-DW6-
-DW7-
-DW4-

SR 1307

TEARHOUSE DR.

-DW3-

TOWN CREEK

-Y2-
CAMEO DR.

BEGIN CULVERT
-L- Sta. 51+13.45

HAYESVILLE CITY LIMITS

END CULVERT
-L- Sta. 51+39.15

RETAINING WALL #3

-Y4-
HICKORY ST.

SR 1307
HIWASSEE ST.

-Y5-

-Y7-
MAY ST.

-Y6-

HIWASSEE STREET

TO MAIN STREET

-Y8-
US 64 BUS.

END PROJECT TIP R-5863
-L- POT STA. 72+65.00

END CONSTRUCTION
-L- POT STA. 73+25.00

V&M
Vaughn & Melton
Consulting Engineers
Asheville, NC
Nor 11th Carolina
828-253-2796

☐ Boone, NC
828-355-9933

☐ Tri-Cities, TN
423-467-8401

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919-977-9455

☐ Charlotte, NC
704-357-0488

☐ Atlanta, GA
770-627-3590

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STRUCTURE

DESIGN DATA

ADT 2018 = 2400
ADT 2040 = 2448
T = 6%
V = 40 MPH
*TTST = 5% DUAL = 1%
FUNCT. CLASS =
MAJOR COLLECTOR
DESIGN SPEED 40 MPH (RURAL)
DESIGN SPEED 20 MPH (URBAN)
SUBREGIONAL CLASSIFICATION

PROJECT LENGTH

LENGTH ROADWAY PROJECT R-5863 = 1.176 MI
LENGTH OF STRUCTURE PROJECT R-5863 = 0.005 MI
TOTAL LENGTH OF PROJECT R-5863 = 1.181 MI

Prepared in the Office of:
VAUGHN & MELTON
4700 Falls of the Neuse Rd. Suite 100
Raleigh NC, 27609
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2024 STANDARD SPECIFICATIONS

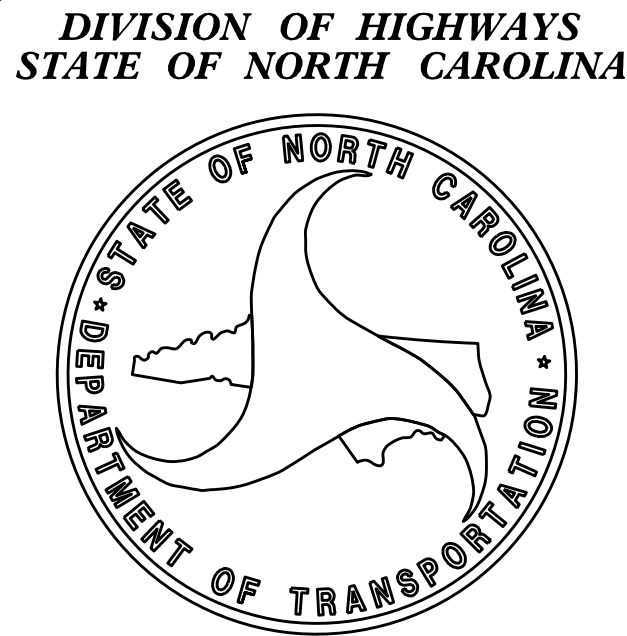
LETTING DATE:
SEPTEMBER 16, 2025

BRETT ABERNATHY, PE
PROJECT ENGINEER

PATRICK R. GALLAGHER, PE
PROJECT DESIGN ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

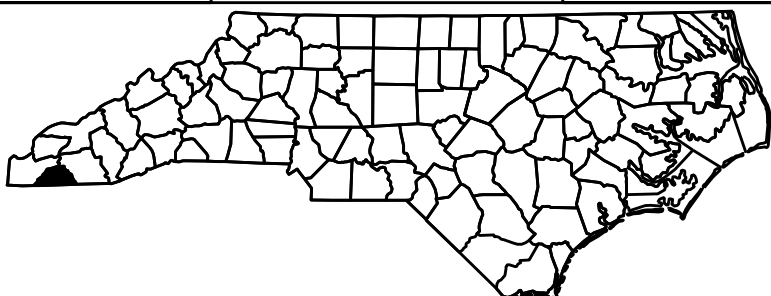


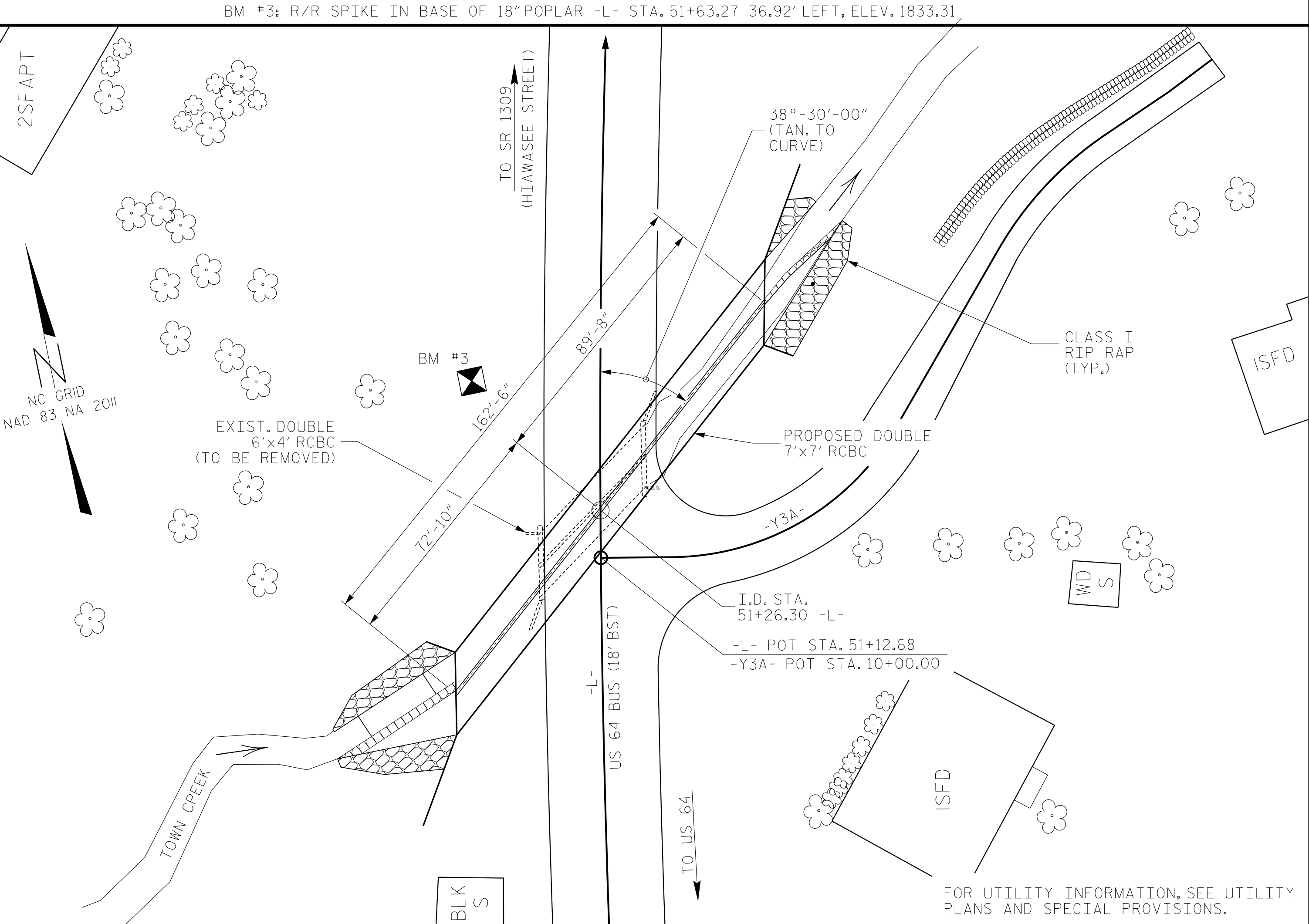
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLAY COUNTY

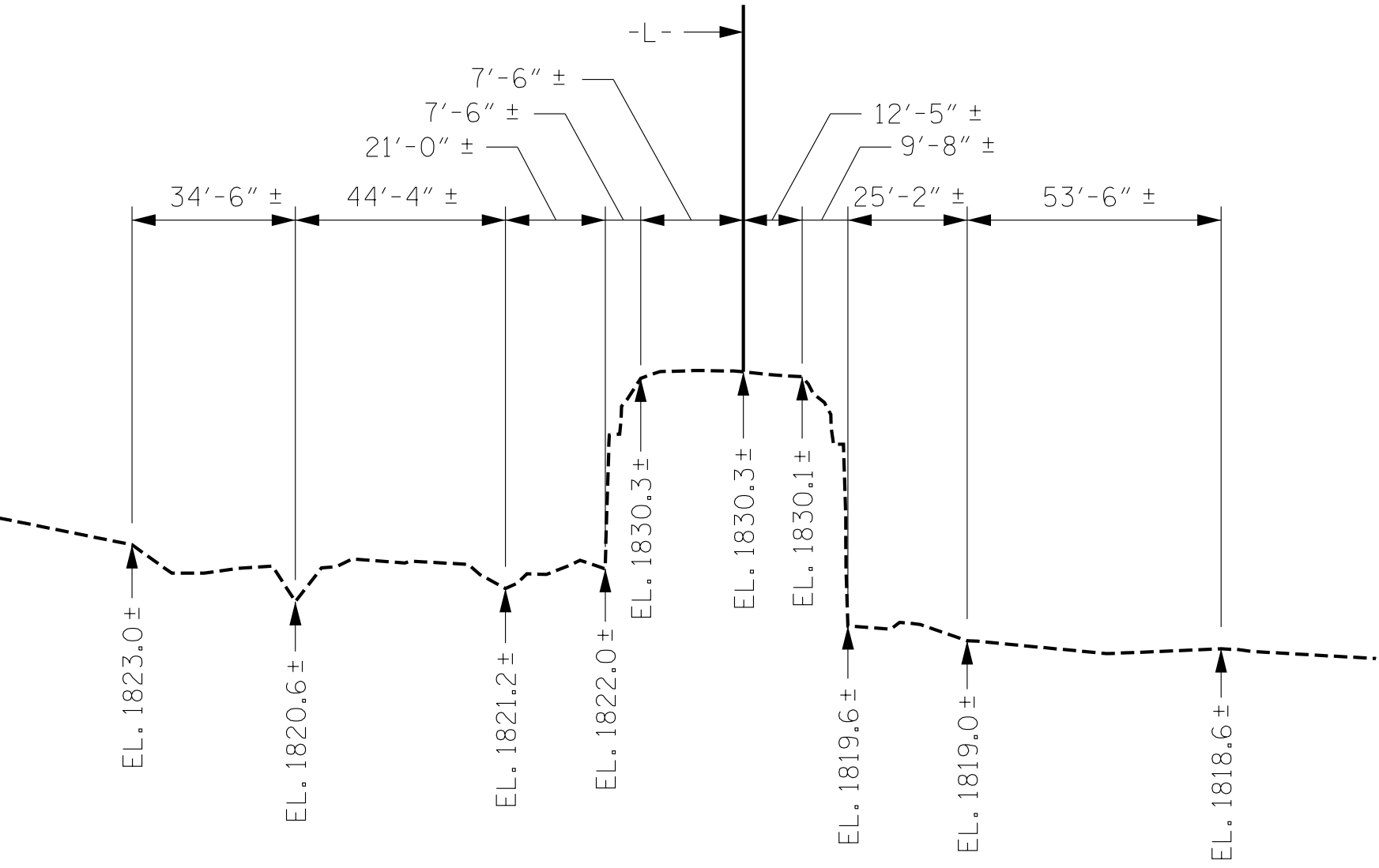
LOCATION: US 64 BUSINESS FROM US 64
TO SR 1307 (MAIN STREET)

TYPE OF WORK: GRADING, DRAINAGE, PAVING,
RETAINING WALLS AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5863		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47516.1.1	N/A	PE	
47516.2.1	N/A	R/W & UTILITIES	
47516.3.1	N/A	CONST.	
			



LOCATION SKETCH



PROFILE ALONG CULVERT

ROADWAY DATA

GRADE POINT ELEVATION @ STA. 51+26.30 -L- =1833.62'
BED ELEVATION @ STA. 51+26.30 -L- = 1819.09'
ROADWAY SLOPES 3:1

HYDRAULIC DATA

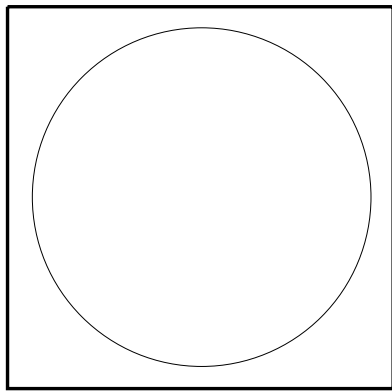
DESIGN DISCHARGE = 570 CFS
FREQUENCY OF DESIGN DISCHARGE = 50 YRS
DESIGN HIGH WATER ELEVATION = 1827.6 FT
DRAINAGE AREA = 0.91 SQ MI
BASE DISCHARGE (Q100) = 700 CFS
BASE HIGH WATER ELEVATION = 1828.5 FT

OVERTOPPING DATA

OVERTOPPING DISCHARGE * = 1110 (+) CFS
FREQUENCY OF OVERTOPPING = 500 (+) YRS
OVERTOPPING ELEVATION = 1833.5 FT

* OVERTOPPING OCCURS AT THE PROPOSED
SAG -L- STA. 50+93

I HEREBY CERTIFY
THAT THESE PLANS
ARE THE
AS-BUILT PLANS.



TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE LUMP SUM

CULVERT EXCAVATION LUMP SUM

FOUNDATION CONDITIONING MATERIAL 229 TONS

CLASS A CONCRETE

BARREL @ 1.72 CY/FT 279.6 C.Y.

WINGS, SILLS, ETC. 57.7 C.Y.

TOTAL 337.3 C.Y.

REINFORCING STEEL

BARREL 37,862 LBS.

WINGS ETC. 2,998 LBS.

TOTAL 40,860 LBS.

CLASS I RIP RAP (2'-0" THICK) 970 TONS

GEOTEXTILE FOR DRAINAGE 120 SY

GENERAL NOTES

DESIGN FILL----- 6.53' (MIN), 8.23' (MAX).

ASSUMED LIVE LOAD = HL- 93.

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.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALLS AND BOTH FACES OF INTERIOR 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.

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.

THE EXISTING DOUBLE 6' X 4' BARREL REINFORCED CONCRETE BOX CULVERT LOCATED AT THE PROPOSED SITE SHALL BE REMOVED.

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

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED BOX CULVERT IN LEIU OF THE CAST-IN-PLACE CULVERT SHOWN IN 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 BOX CULVERT, SEE SPECIAL PROVISIONS.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLAN.

PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L -

REPLACES STR. NO. EZ029

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
DOUBLE 7 FT. X 7 FT.
CONCRETE BOX CULVERT
38°-30' SKEW

REVISIONS

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

SHEET NO.

C-1

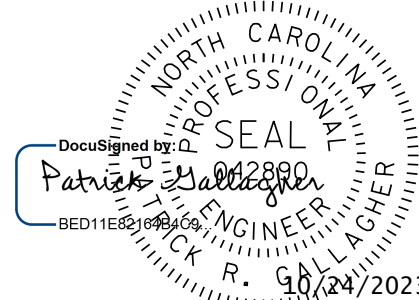
TOTAL

SHEETS

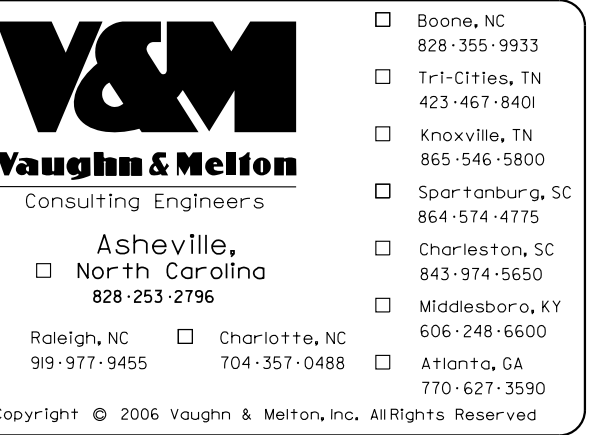
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CHKD. BY: PRG
DES. EGR. OF RECORD: PRG

DATE: 04/2023
DATE: 04/2023
DATE: 04/2023

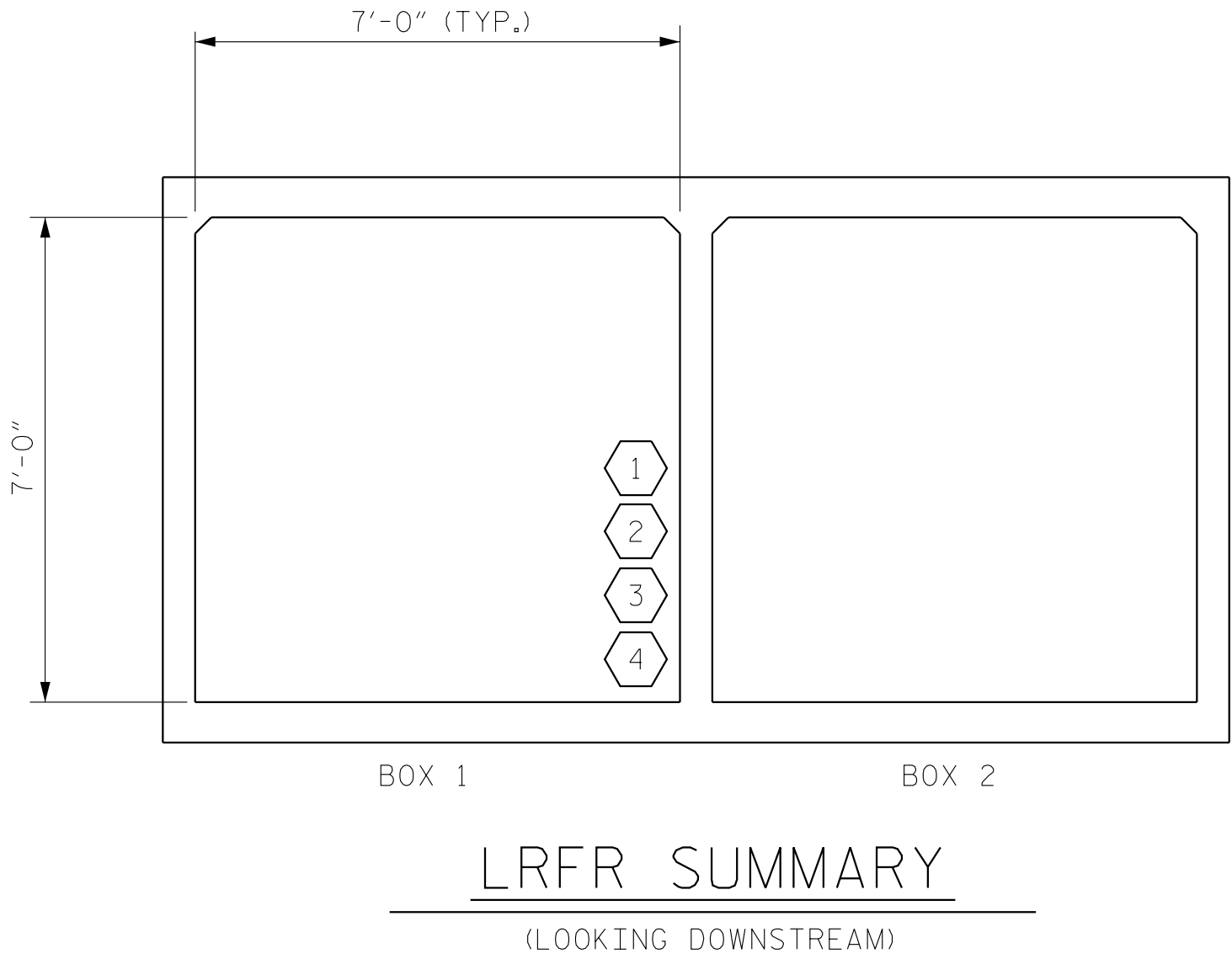


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SIGNATURES COMPLETED



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wdr:utcher

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
						γ_{LL} LIVE-LOAD, FACTORS	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	1.58	--	1.75	2.19	1	TOP SLAB	7.67	1.58	1	BOTTOM SLAB	7.67	
	HL-93 (OPERATING)	N/A		2.04	--	1.35	2.85	1	TOP SLAB	7.67	2.04	1	BOTTOM SLAB	7.67	
	HS-20 (INVENTORY)	36,000	2	1.79	64,440	1.75	2.35	1	TOP SLAB	7.67	1.79	1	BOTTOM SLAB	7.67	
	HS-20 (OPERATING)	36,000		2.33	83,880	1.35	3.05	1	TOP SLAB	7.67	2.33	1	BOTTOM SLAB	7.67	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		3.45	46,575	1.40	4.62	1	TOP SLAB	7.67	3.45	1	BOTTOM SLAB	7.67	
		SNGARBS2		3.23	64,600	1.40	4.32	1	TOP SLAB	7.67	3.23	1	BOTTOM SLAB	7.67	
		SNAGRIS2		3.45	75,900	1.40	4.62	1	TOP SLAB	7.67	3.45	1	BOTTOM SLAB	7.67	
		SNCOTTS3	3	2.04	55,590	1.40	2.88	1	TOP SLAB	7.67	2.04	1	BOTTOM SLAB	7.67	
		SNAGGRS4		2.69	93,948	1.40	3.79	1	TOP SLAB	7.67	2.69	1	BOTTOM SLAB	7.67	
		SNS5A		3.46	123,003	1.40	4.88	1	TOP SLAB	7.67	3.46	1	BOTTOM SLAB	7.67	
		SNS6A		3.33	133,034	1.40	4.63	1	TOP SLAB	7.67	3.33	1	BOTTOM SLAB	7.67	
		SNS7B		2.43	102,060	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3		3.07	101,310	1.40	4.47	1	TOP SLAB	7.67	3.07	1	BOTTOM SLAB	7.67	
		TNT4A		2.43	80,372	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
		TNT6A		2.43	101,088	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
		TNT7A		3.61	151,620	1.40	4.84	1	TOP SLAB	7.67	3.61	1	BOTTOM SLAB	7.67	
		TNT7B		2.43	102,060	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
		TNAGRIT4		2.43	104,490	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
		TNAGT5A		2.43	109,350	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
		TNAGT5B		2.43	109,350	1.40	3.43	1	TOP SLAB	7.67	2.43	1	BOTTOM SLAB	7.67	
EMERGENCY VEHICLE (EV)	EV2		2.31	66,413	1.30	3.03	1	TOP SLAB	7.67	2.31	1	BOTTOM SLAB	7.67		
	EV3		4	1.71	73,530	1.30	2.38	1	TOP SLAB	7.67	1.71	1	BOTTOM SLAB	7.67	



DRAWN BY : WMC	7/II	REV. 10/1/II	MAA/GM
CHECKED BY : GM	7/II	REV. 12/17	MAA/THC
		REV. 04/23	BNB/AAI

LOAD FACTORS:

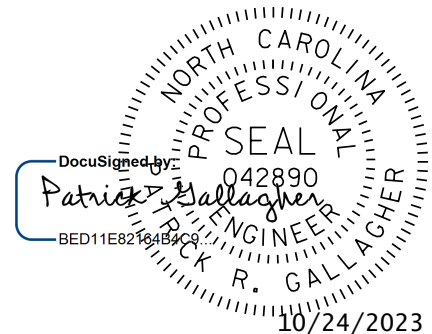
DESIGN LOAD RATING FACTORS

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.

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



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PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L -

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY

DOUBLE 7 FT. X 7 FT.
CONCRETE BOX CULVERT
38°-30' SKEW

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2	
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2			4			8	

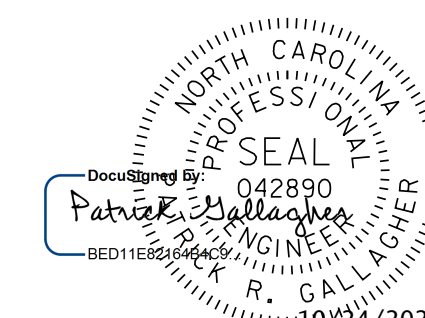
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CHKD. BY: PRG	DATE: 04/2023
DES. EGR. OF RECORD: PRG	DATE: 04/2023



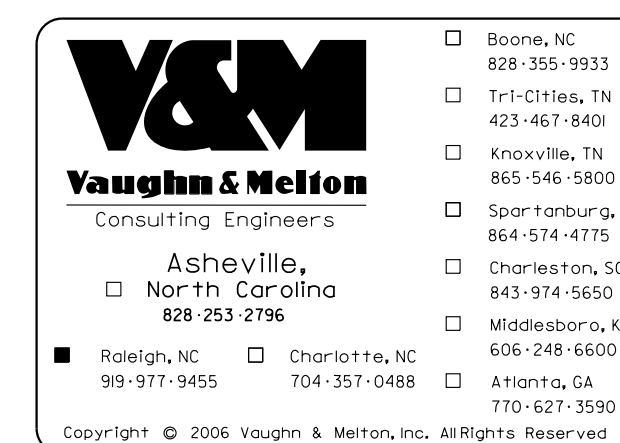
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C-3

STD. NO. CB45_2L

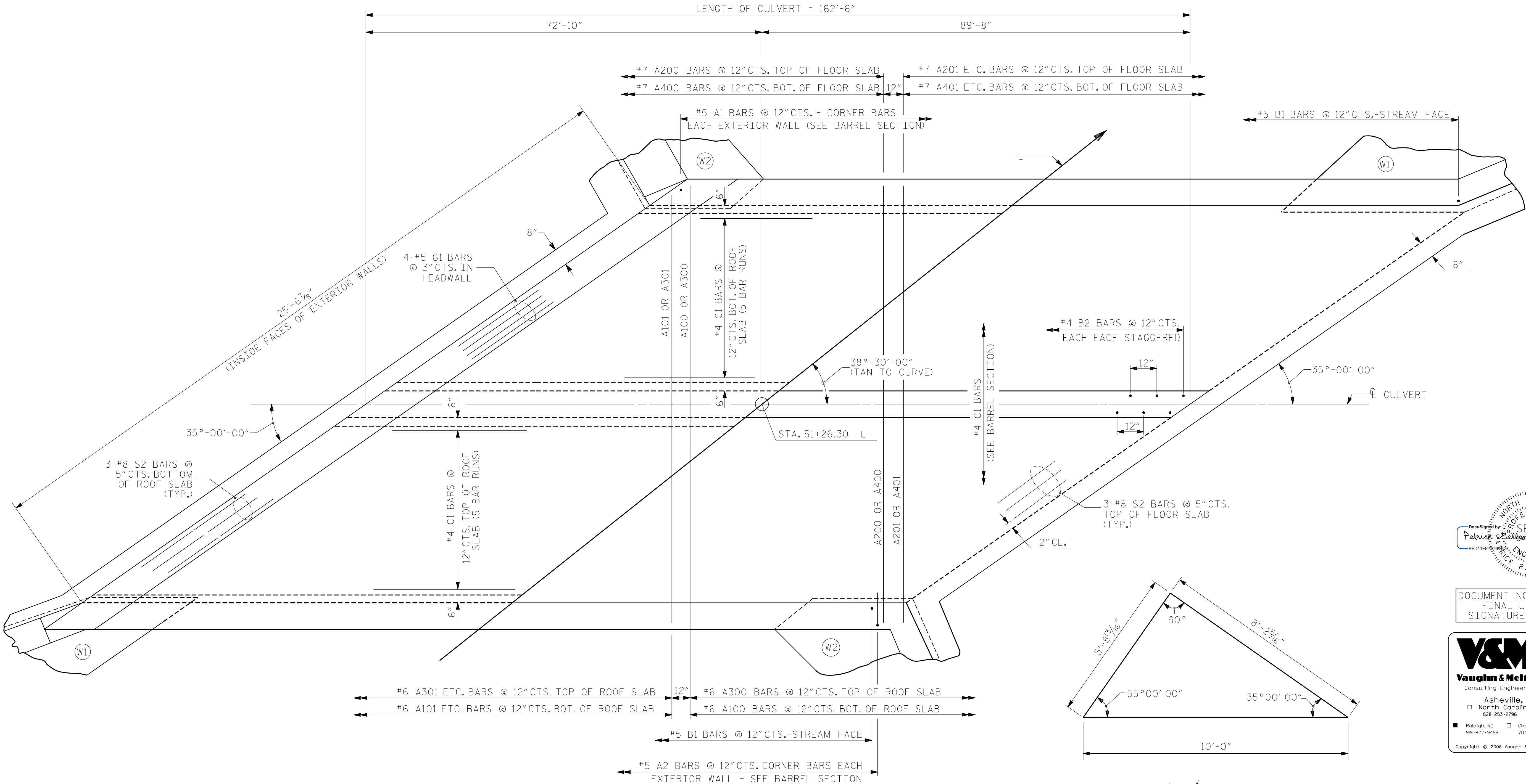


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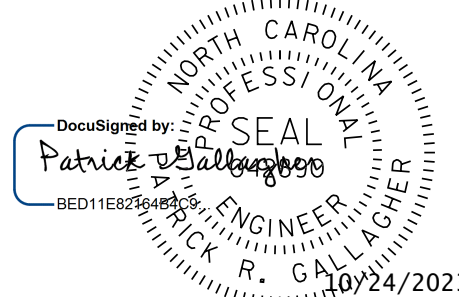
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DATE: 04/2023
DATE: 04/2023



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

SKIEW TRIANGLE



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PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD

DOUBLE 7 FT. X 7 FT.
CONCRETE BOX CULVERT
38°-30' SKEW

REVISIONS

DWN. BY: HL
CHKD. BY: PRG
DES. EGR. OF RECORD: PRG

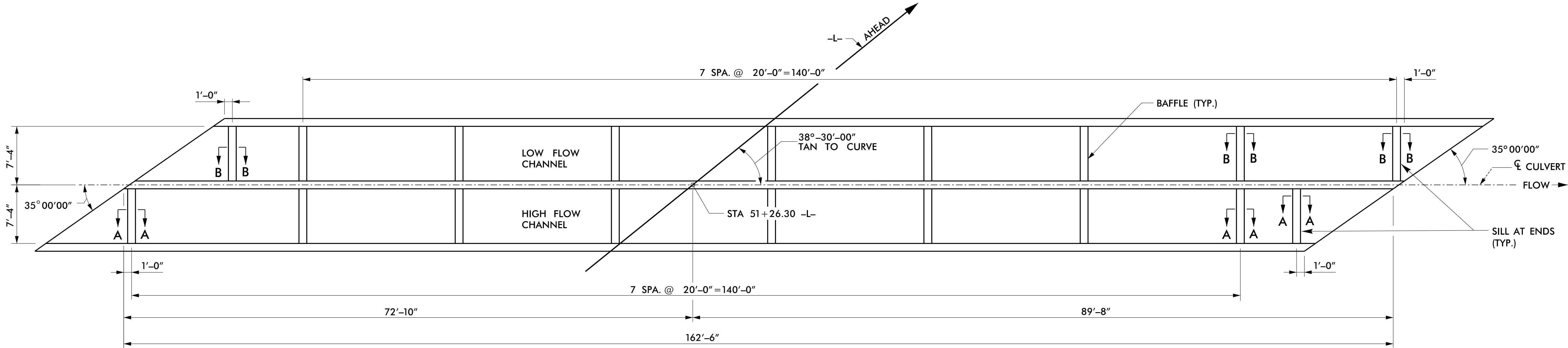
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DATE: 04/2023
DATE: 04/2023

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1			3		
2			4		

SHEET NO.
C-4
TOTAL
SHEETS
8

STD. NO. CB45-2L

DRAWN BY : COC 11/90
CHECKED BY : MAJ 11/90
REV. 6/19
MAA/THC



NOTES

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL.

RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED 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.

SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

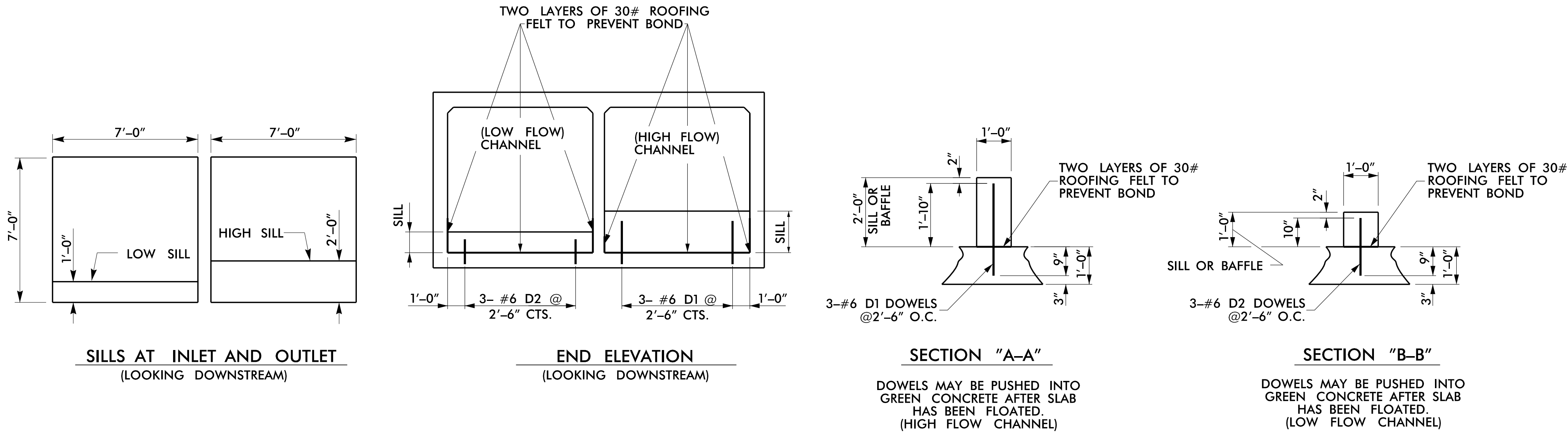
TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

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

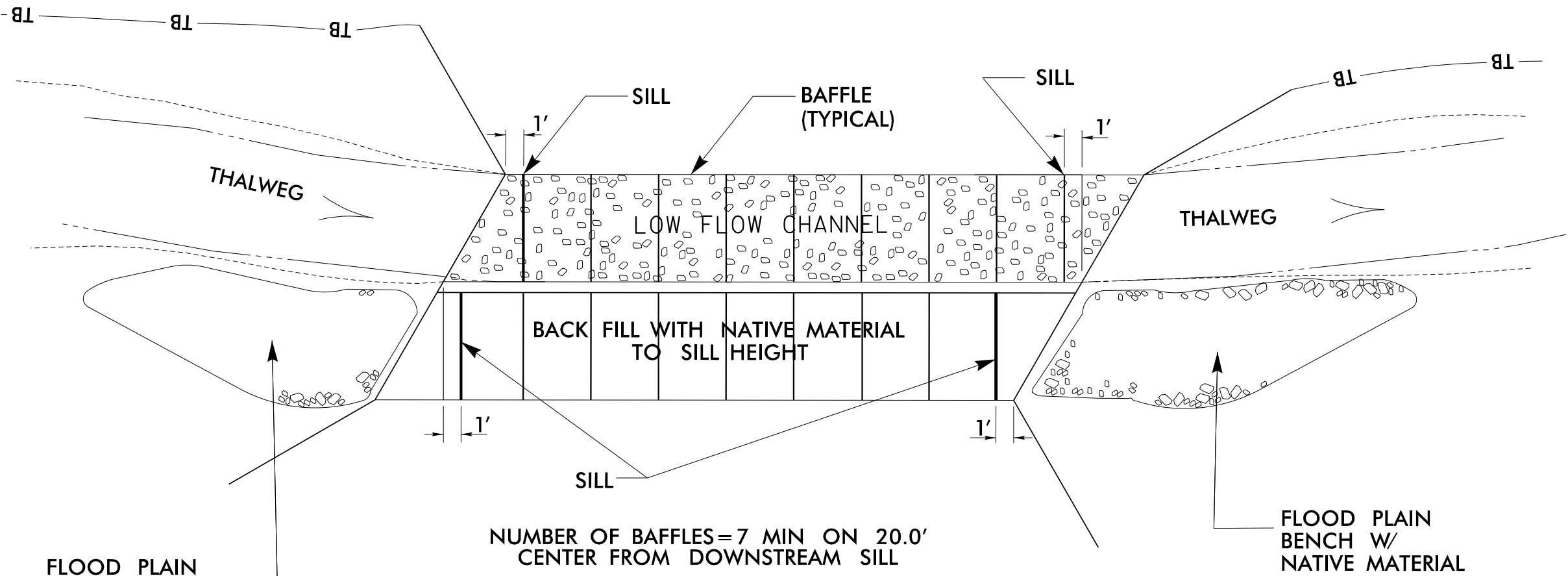
PAYMENT REQUIRED TO PLACE THE EXCAVATED MATERIAL OR SUPPLEMENT MATERIAL SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE ENTIRE COST OF THE WORK REQUIRED TO CONSTRCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

CULVERT SILL LAYOUT



SILL DETAILS



PLAN VIEW DETAIL

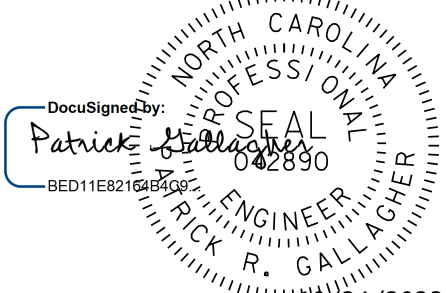
MULTI-BARREL CULVERT
LOW FLOW CHANNEL, SILLS,
AND FLOOD PLAIN BENCH

PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L -

V&M
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919-977-9455

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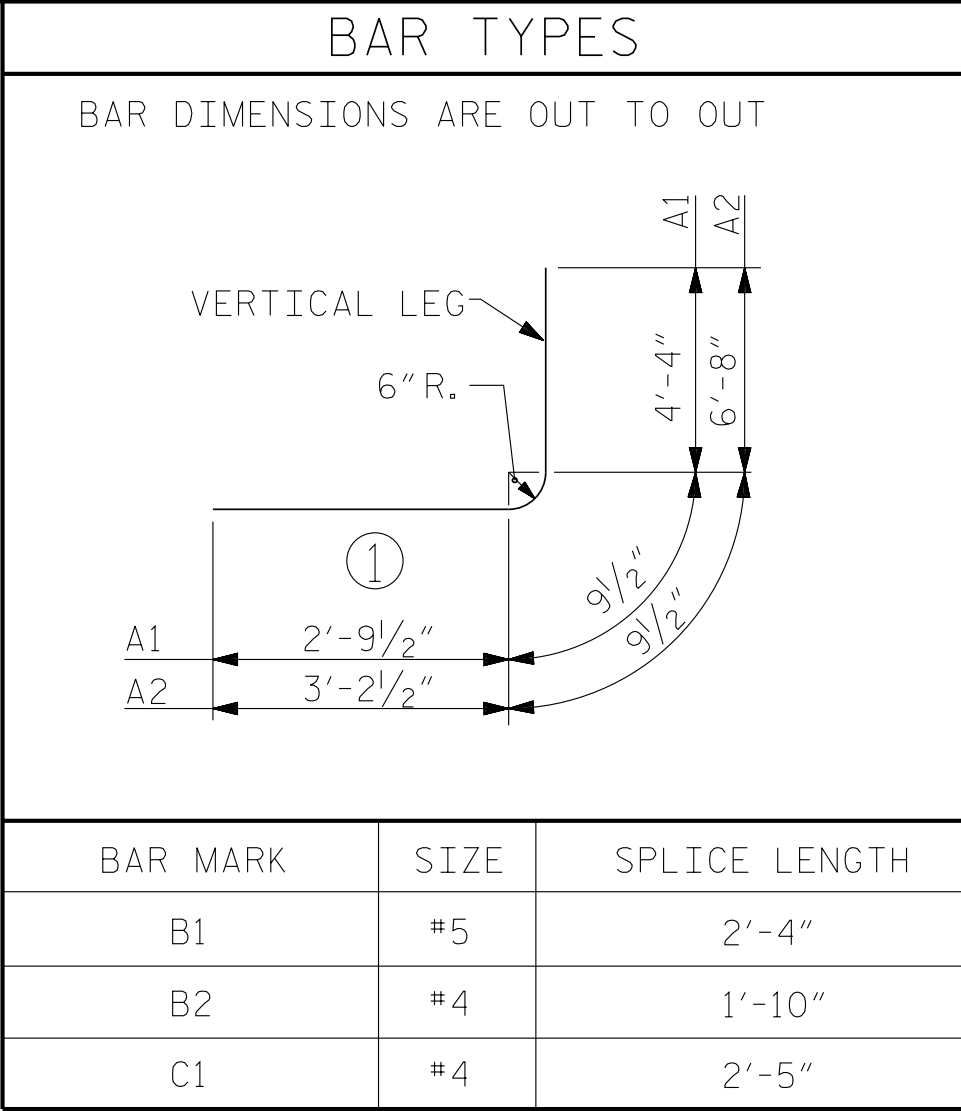


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DATE: 04/2023
DATE: 04/2023

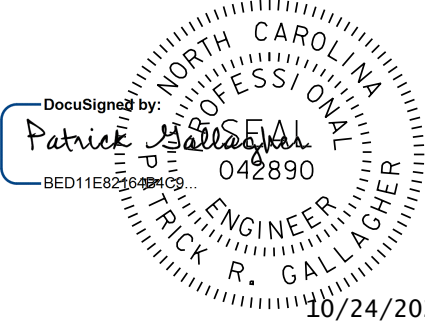
REVISIONS						SHEET NO. C-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 8
2			4			



BILL OF MATERIAL																			
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
A1	318	#5	1	7'-11"	2626	A208	2	#7	STR	10'-4"	42	A400	142	#7	STR	15'-8"	4547		
A2	318	#5	1	10'-8"	3538	A209	2	#7	STR	9'-7"	39	A401	2	#7	STR	15'-3"	62		
A100	140	#6	STR	15'-8"	3294	A210	2	#7	STR	8'-11"	36	A402	2	#7	STR	14'-6"	59		
	A101	2	#6	STR	15'-3"	46	A211	2	#7	STR	8'-2"	33	A403	2	#7	STR	13'-10"	57	
	A102	2	#6	STR	14'-6"	44	A212	2	#7	STR	7'-6"	31	A404	2	#7	STR	13'-2"	54	
	A103	2	#6	STR	13'-10"	42	A213	2	#7	STR	6'-10"	28	A405	2	#7	STR	12'-4"	50	
	A104	2	#6	STR	13'-2"	40	A214	2	#7	STR	6'-1"	25	A406	2	#7	STR	11'-9"	48	
	A105	2	#6	STR	12'-4"	37	A215	2	#7	STR	5'-5"	22	A407	2	#7	STR	11'-0"	45	
	A106	2	#6	STR	11'-9"	35	A216	2	#7	STR	4'-9"	19	A408	2	#7	STR	10'-4"	42	
	A107	2	#6	STR	11'-0"	33	A217	2	#7	STR	4'-0"	16	A409	2	#7	STR	9'-7"	39	
	A108	2	#6	STR	10'-4"	31	A218	2	#7	STR	3'-4"	14	A410	2	#7	STR	8'-11"	36	
	A109	2	#6	STR	9'-7"	29	A300	140	#6	STR	15'-8"	3294	A411	2	#7	STR	8'-2"	33	
A110	2	#6	STR	8'-11"	27	A301		2	#6	STR	15'-3"	46	A412	2	#7	STR	7'-6"	31	
A111	2	#6	STR	8'-2"	25	A302		2	#6	STR	14'-6"	44	A413	2	#7	STR	6'-10"	28	
A112	2	#6	STR	7'-6"	23	A303		2	#6	STR	13'-10"	42	A414	2	#7	STR	6'-1"	25	
A113	2	#6	STR	6'-10"	21	A304		2	#6	STR	13'-'-2"	40	A415	2	#7	STR	5'-5"	22	
A114	2	#6	STR	6'-1"	18	A305		2	#6	STR	12'-4"	37	A416	2	#7	STR	4'-9"	19	
A115	2	#6	STR	5'-5"	16	A306		2	#6	STR	11'-9"	35	A417	2	#7	STR	4'-0"	16	
A116	2	#6	STR	4'-9"	14	A307		2	#6	STR	11'-0"	33	A418	2	#7	STR	3'-4"	14	
A117	2	#6	STR	4'-0"	12	A308		2	#6	STR	10'-4"	31	B1	324	#5	STR	8'-7"	2901	
A118	2	#6	STR	3'-4"	10	A309		2	#6	STR	9'-7"	29		B2	324	#4	STR	8'-7"	1858
A200	142	#7	STR	15'-8"	4547	A310	2	#6	STR	8'-11"	27	C1	330	#4	STR	35'-0"	7715		
	A201	2	#7	STR	15'-3"	62	A311	2	#6	STR	8'-2"		25	D1	27	#4	STR	2'-7"	47
	A202	2	#7	STR	14'-6"	59	A312	2	#6	STR	7'-6"	23	D2		27	#4	STR	1'-7"	29
	A203	2	#7	STR	13'-10"	57	A313	2	#6	STR	6'-10"	21	G1	8	#5	STR	27'-3"	227	
	A204	2	#7	STR	13'-2"	54	A314	2	#6	STR	6'-1"	18		S2	12	#8	STR	27'-3"	873
	A205	2	#7	STR	12'-4"	50	A315	2	#6	STR	5'-5"	16							
	A206	2	#7	STR	11'-9"	48	A316	2	#6	STR	4'-9"	14							
	A207	2	#7	STR	11'-0"	45	A317	2	#6	STR	4'-0"	12							
						A318	2	#6	STR	3'-4"	10								

REINFORCING STEEL37,862 LBS.

CLASS A CONCRETE279.6 CU. YD.



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PROJECT NO. R-5863

CLAY COUNTY

STATION: 51+26.30 - L-

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CHKD. BY: PRG

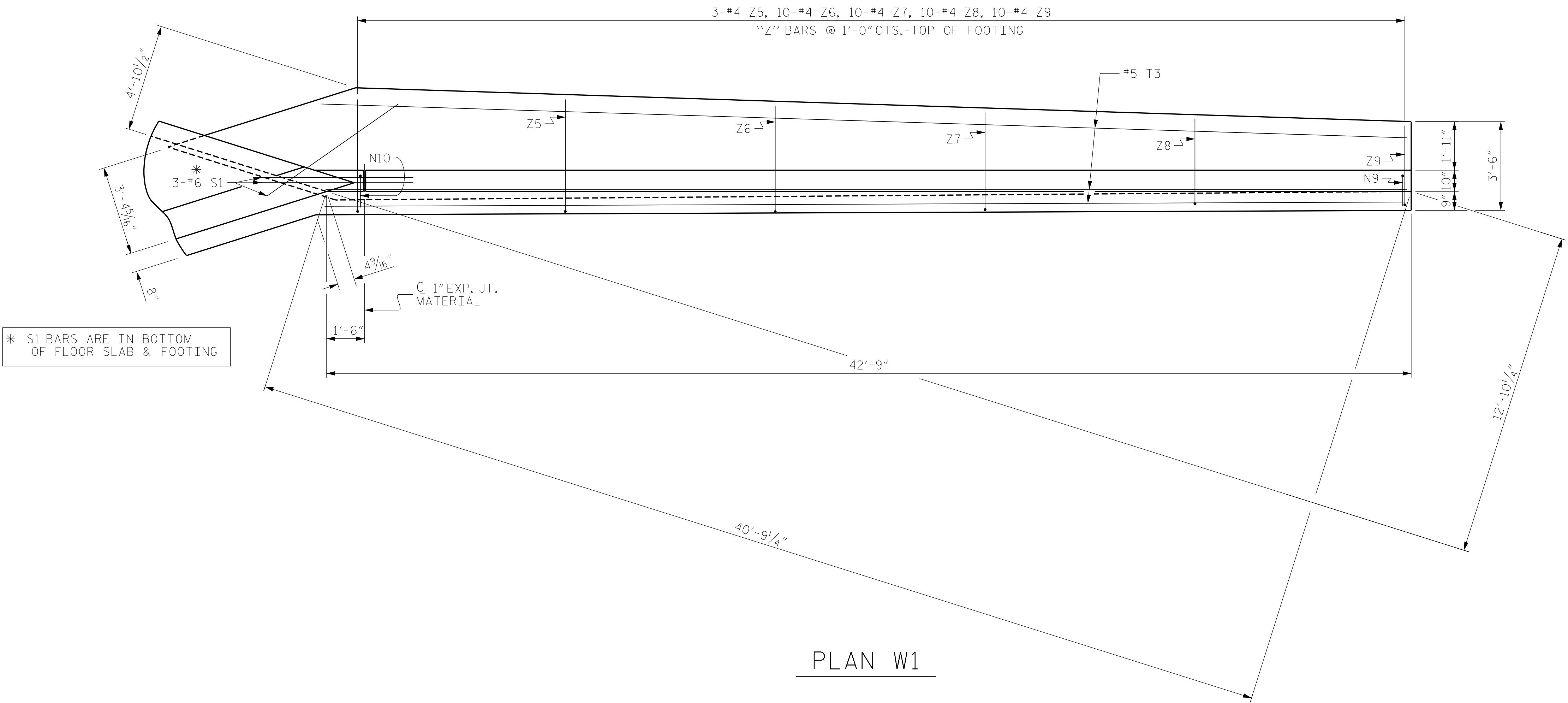
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DATE: 04/2023

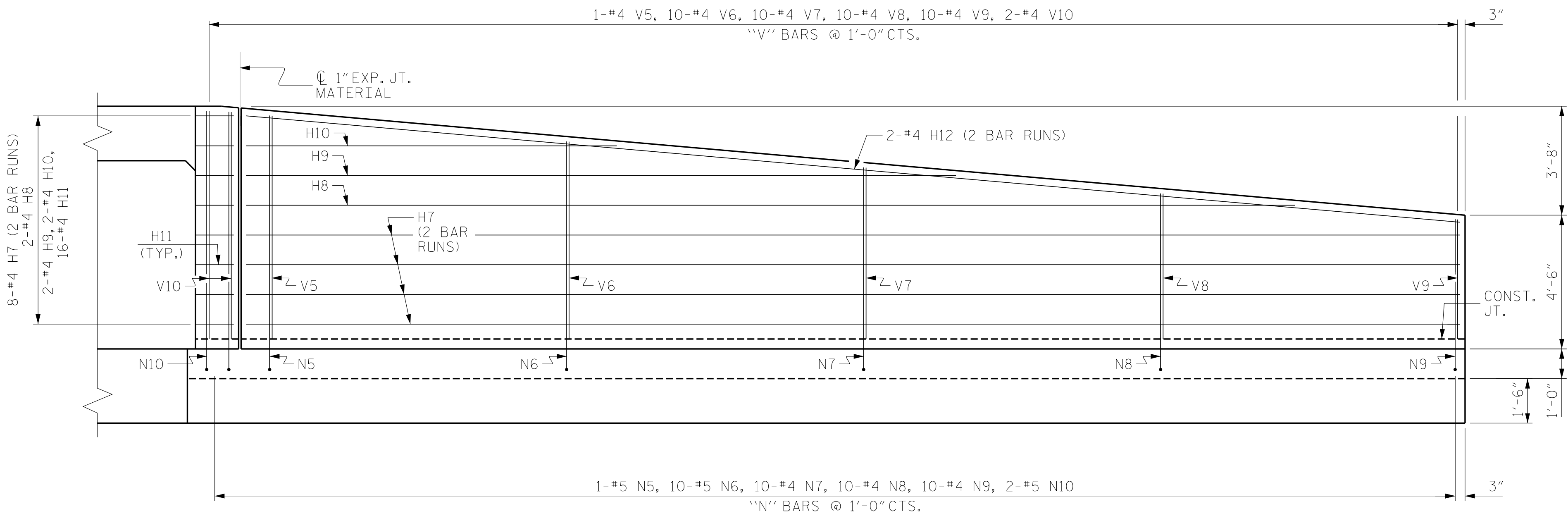
DATE: 04/2023

DATE: 04/2023

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C-6
2			4			TOTAL SHEETS 8

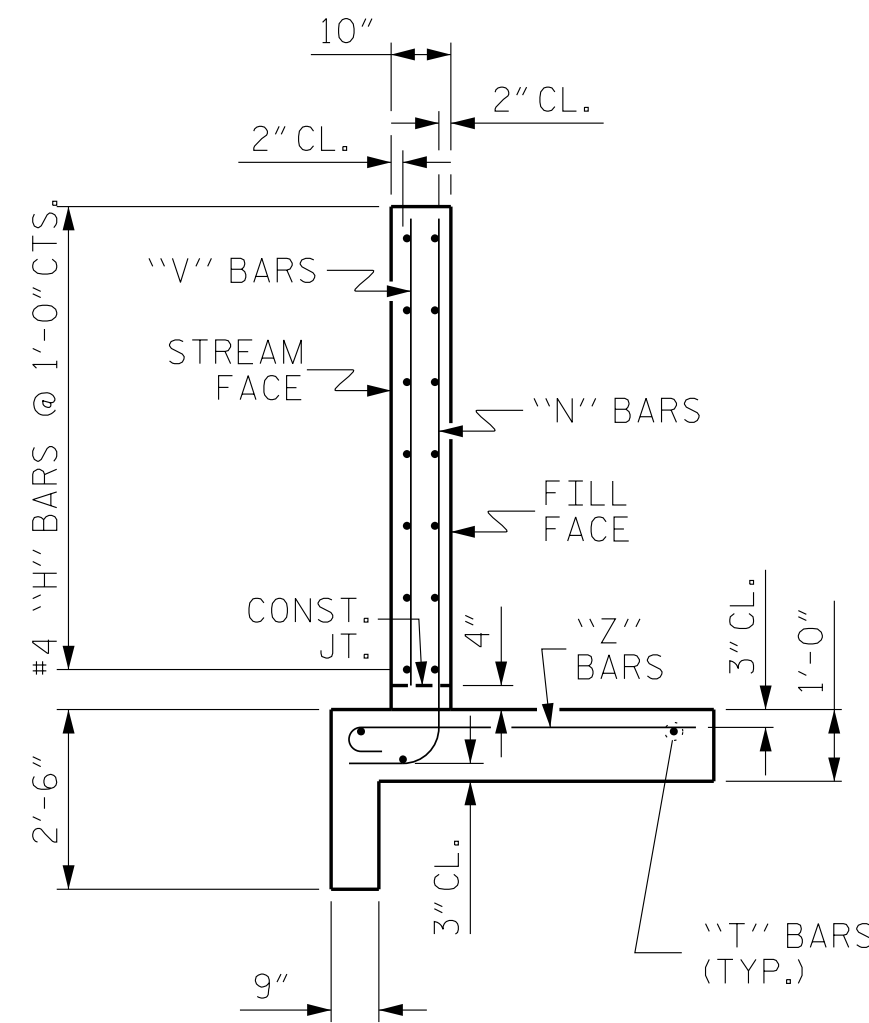


PLAN W1

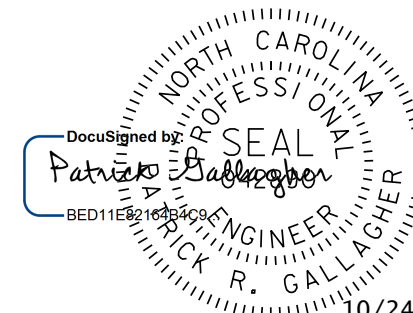


ELEVATION W1

H = 7'-0"
SLOPE = 3:1



WING SECTION



10/24/2023 | 7:07:03 AM PDT

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Charleston, SC
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Middleboro, KY
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PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

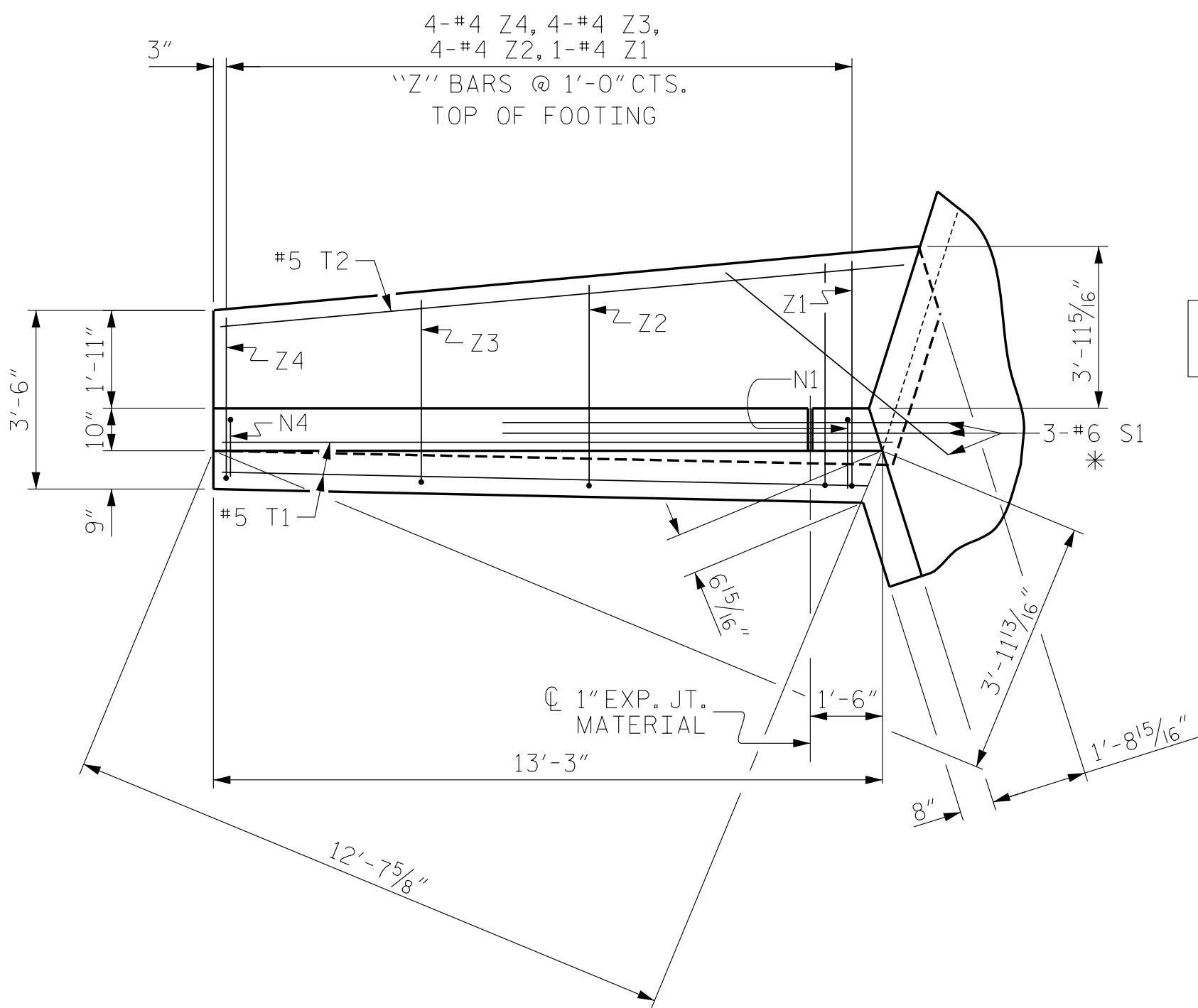
WING W1 DETAILS
DOUBLE 7 FT. X 7 FT.
CONCRETE BOX CULVERT
38°-30' SKEW

DWN. BY: HL
CHKD. BY: PRG
DES. EGR. OF RECORD: PRG
DATE: 04/2023
DATE: 04/2023
DATE: 04/2023

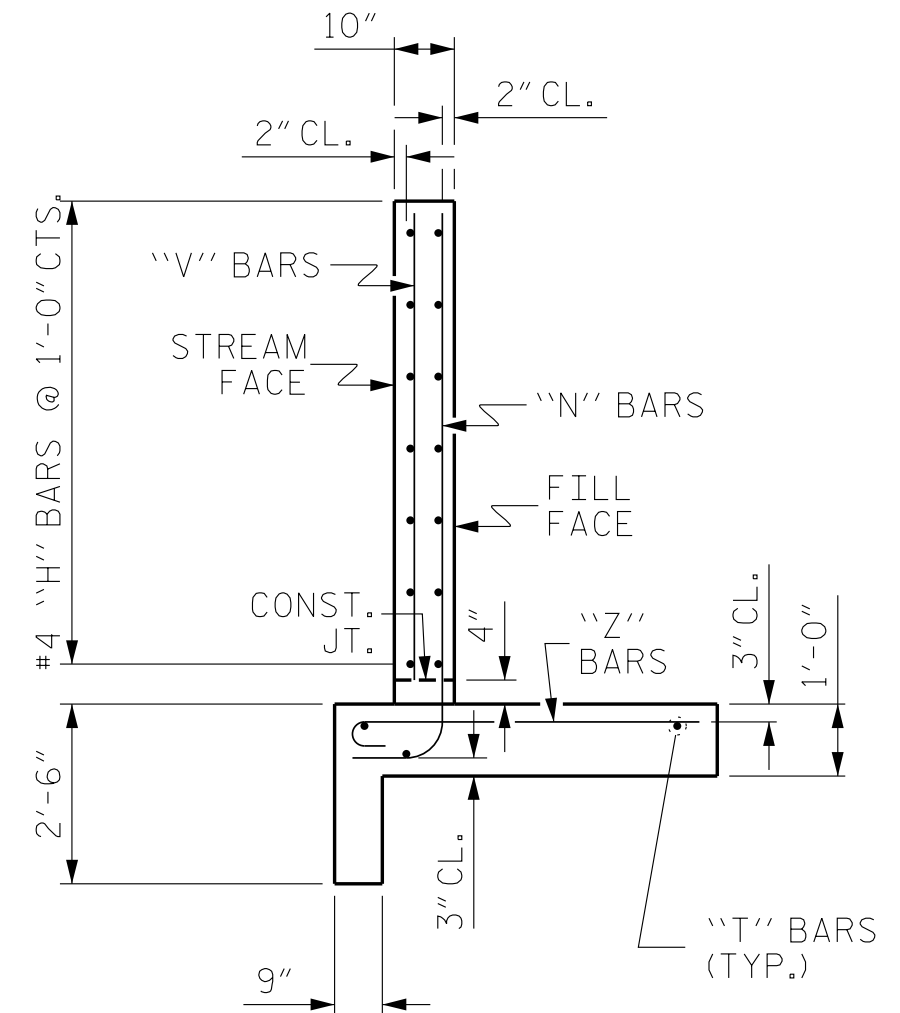
REVISIONS					
NO.	DATE:	BY:	NO.	DATE:	BY:
1			3		
2			4		

SHEET NO.
C-7
TOTAL
SHEETS
8

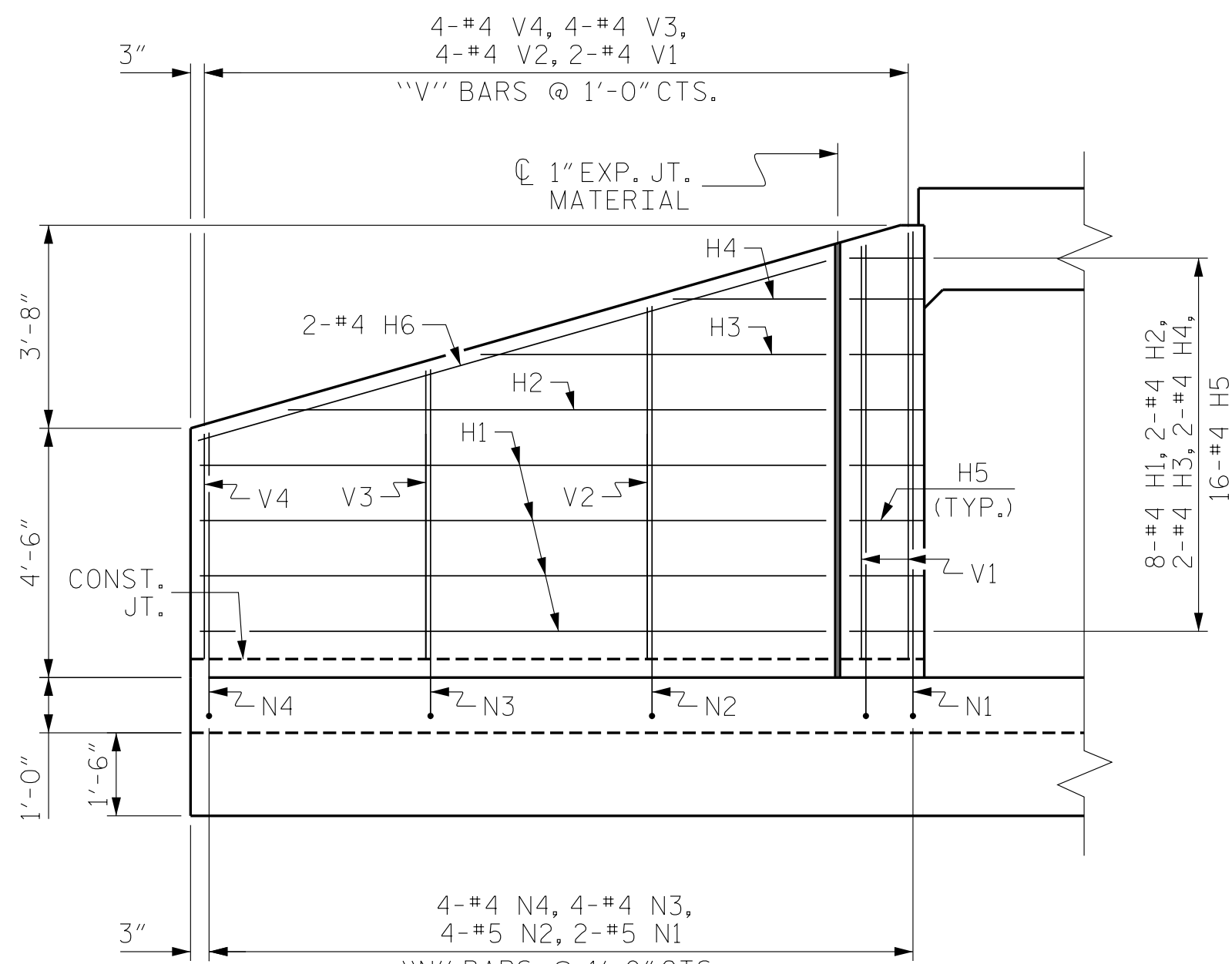
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wdr-utcher



PLAN W2



WING SECTION

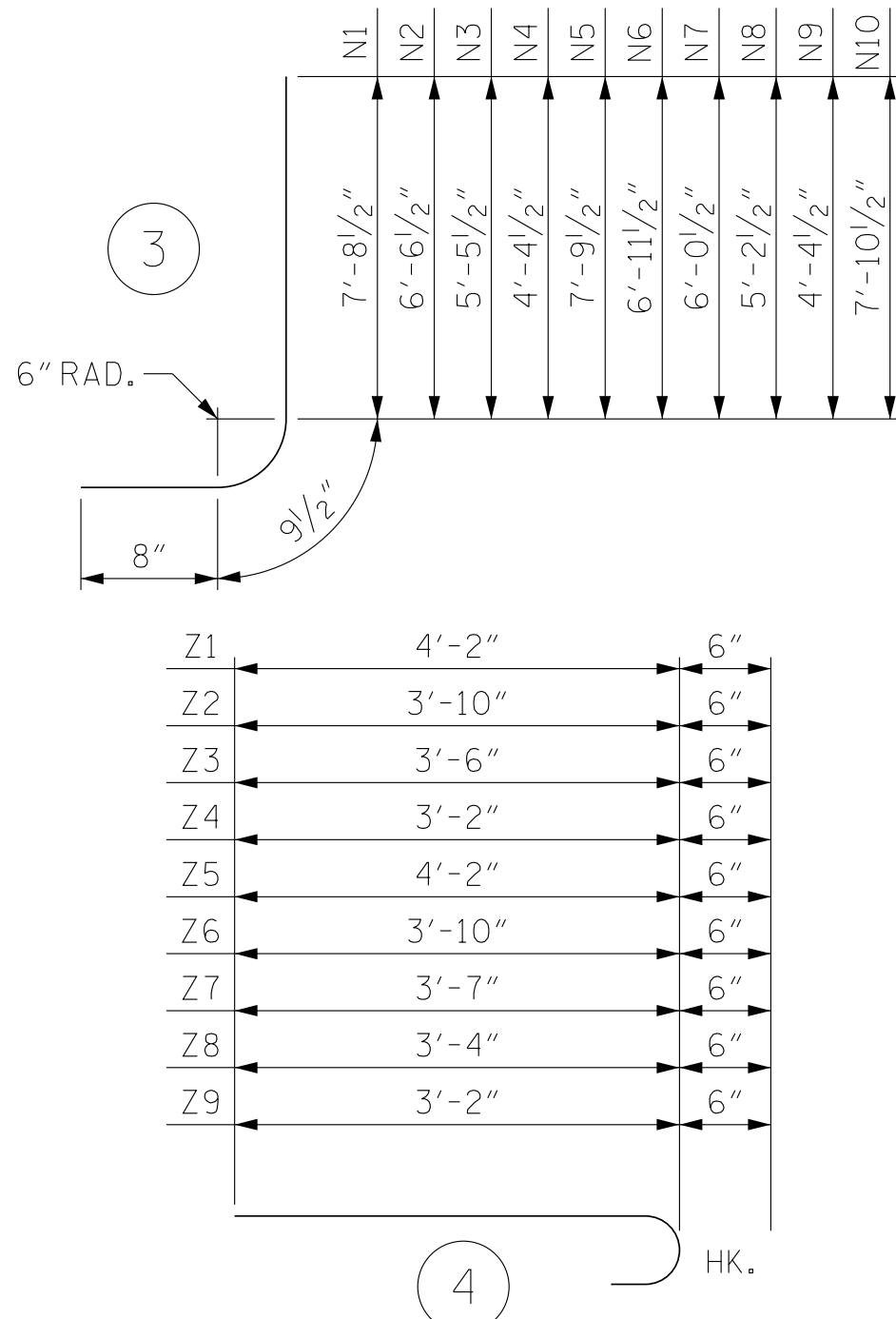
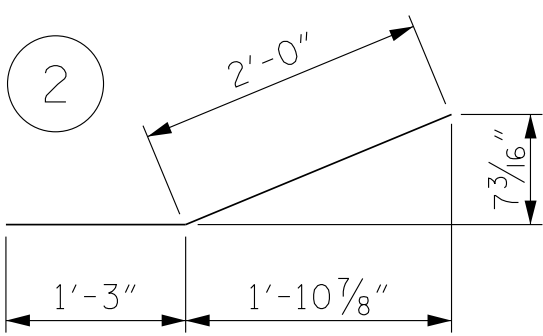
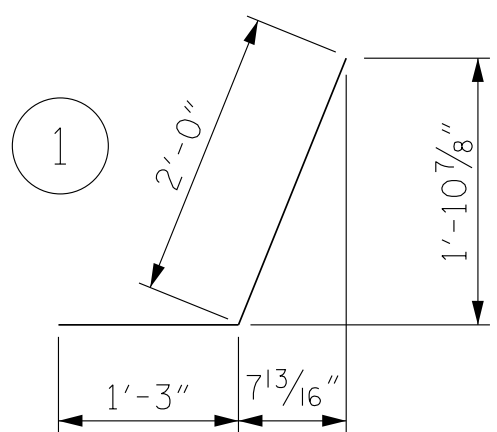


ELEVATION W2

* S1 BARS ARE IN BOTTOM OF FLOOR SLAB AND FOOTING.

H = 7'-0"
SLOPE = 3:1

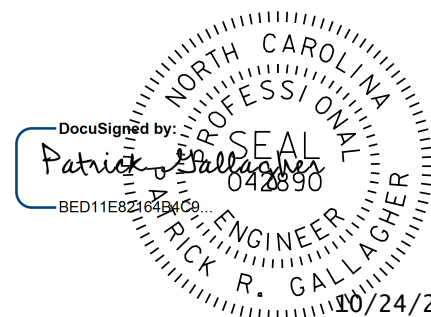
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SPLICE LENGTHS

BAR MARK	SIZE	SPLICE LENGTH
H7, H12	#4	2'-5"



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☐ Atlanta, GA
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BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	11'-4"	121
H2	4	#4	STR	10'-9"	29
H3	4	#4	STR	7'-1"	19
H4	4	#4	STR	3'-6"	9
H5	32	#4	1	3'-3"	69
H6	4	#4	STR	11'-9"	31
H7	32	#4	STR	21'-8"	463
H8	4	#4	STR	38'-3"	102
H9	4	#4	STR	27'-0"	72
H10	4	#4	STR	15'-8"	42
H11	32	#4	2	3'-3"	69
H12	8	#4	STR	21'-9"	116
N1	4	#5	3	9'-4"	39
N2	8	#5	3	8'-0"	67
N3	8	#4	3	6'-11"	37
N4	8	#4	3	5'-10"	31
N5	2	#5	3	9'-3"	19
N6	20	#5	3	8'-5"	176
N7	20	#4	3	7'-6"	100
N8	20	#4	3	6'-8"	89
N9	20	#4	3	5'-10"	78
N10	4	#5	3	9'-4"	39
S1	12	#6	STR	6'-0"	108
T1	4	#5	STR	13'-3"	55
T2	2	#5	STR	14'-0"	29
T3	6	#5	STR	42'-9"	268
V1	4	#4	STR	7'-4"	20
V2	8	#4	STR	6'-2"	33
V3	8	#4	STR	5'-1"	27
V4	8	#4	STR	4'-0"	21
V5	2	#4	STR	7'-5"	10
V6	20	#4	STR	6'-7"	88
V7	20	#4	STR	5'-8"	76
V8	20	#4	STR	4'-10"	65
V9	20	#4	STR	4'-0"	53
V10	4	#4	STR	7'-6"	20
Z1	4	#4	4	4'-8"	12
Z2	8	#4	4	4'-4"	23
Z3	8	#4	4	4'-0"	21
Z4	8	#4	4	3'-8"	20
Z5	6	#4	4	4'-8"	19
Z6	20	#4	4	4'-4"	58
Z7	20	#4	4	4'-1"	55
Z8	20	#4	4	3'-10"	51
Z9	20	#4	4	3'-8"	49

REINFORCING STEEL FOR 4 WINGS	2998 LBS
CLASS A CONCRETE	
4 WINGS	45.1 CY
2 HEADWALLS	2.6 CY
2 END CURTAIN WALLS	3.0 CY
18 SILLS	7.0 CY
TOTAL	57.7 CY

PROJECT NO. R-5863
CLAY COUNTY
STATION: 51+26.30 - L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING W2 DETAILS
DOUBLE 7 FT. X 7 FT.
CONCRETE BOX CULVERT
38°-30' SKEW

DWN. BY: HL
CHKD. BY: PRG
DES. EGR. OF RECORD: PRG
DATE: 04/2023
DATE: 04/2023
DATE: 04/2023

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

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE.....	SEE AASHTO
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 AASHTO
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 2024 "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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7⁄8" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7⁄8" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - 7⁄8" ∅ STUDS FOR 4 - ¾" ∅ 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" 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.