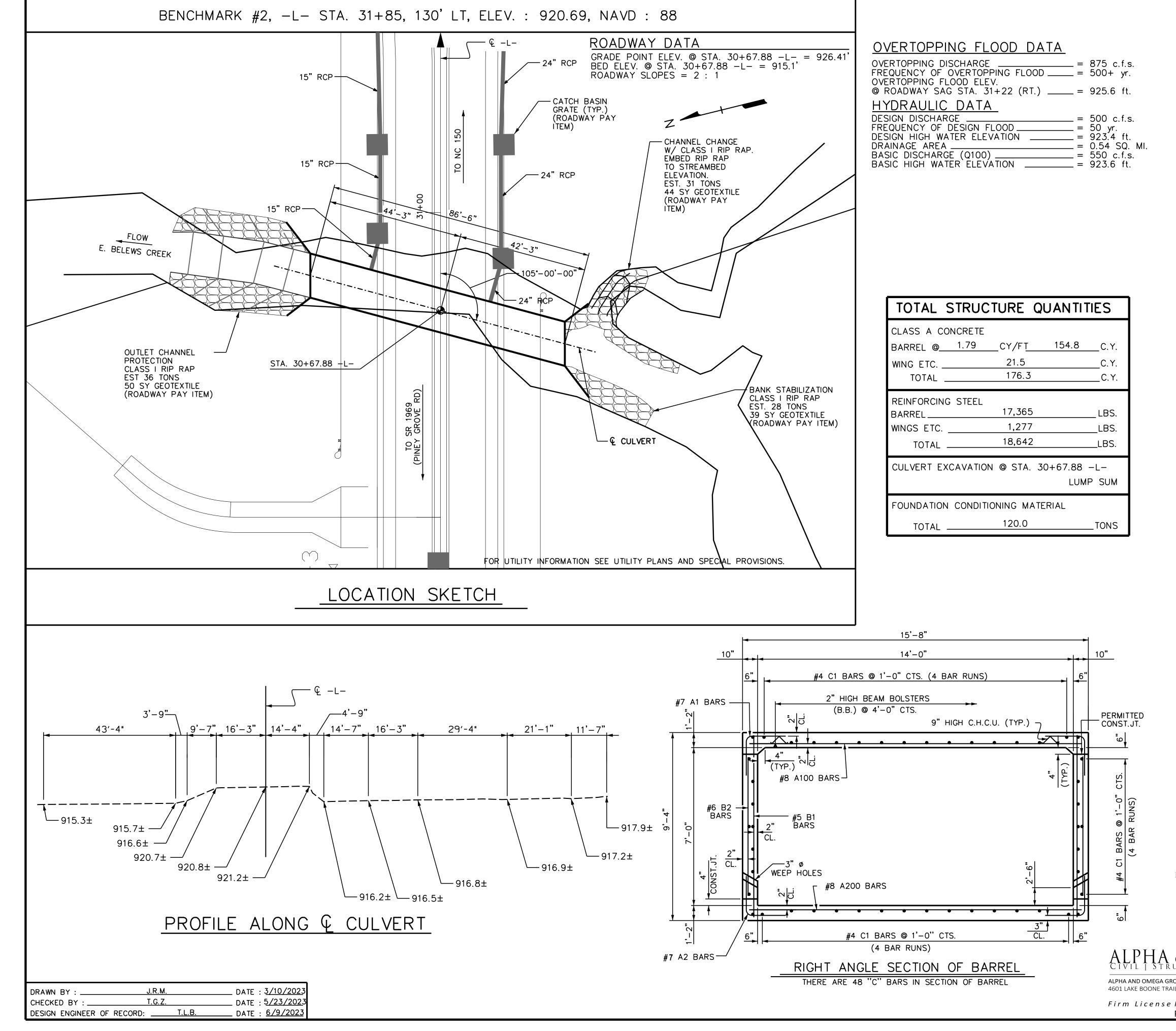




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OVERTOPPING DISCHARGE FREQUENCY OF OVERTOPPING FLOOD OVERTOPPING FLOOD ELEV. @ ROADWAY SAG STA. 31+22 (RT.)	- =	500+ yr.
HYDRAULIC DATA DESIGN DISCHARGE FREQUENCY OF DESIGN FLOOD DESIGN HIGH WATER ELEVATION DRAINAGE AREA BASIC DISCHARGE (Q100) BASIC HIGH WATER ELEVATION	- =	50 yr. 923.4 ft. 0.54 SQ. MI.

TOTAL STRUC	CTURE C	UANTI1	TIES
CLASS A CONCRETE BARREL @ WING ETC TOTAL	CY/FT 21.5		C.Y.
REINFORCING STEEL BARREL WINGS ETC TOTAL	17,365 1,277		LBS. LBS. LBS.
CULVERT EXCAVATIO	ON © STA		-L- P SUM
FOUNDATION CONDI-	TIONING MAT 120.0		_TONS

NOTES

ASSUMED LIVE LOAD -----HL93 OR ALTERNATE LOADING.

MAX DESIGN FILL = 3.99'

MIN DESIGN FILL = 3.37

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" ~ 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.

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.

FOR SUBMITAL 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.

FOR UTILITY INFORMATION, SEE UTILITY PLANS.

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

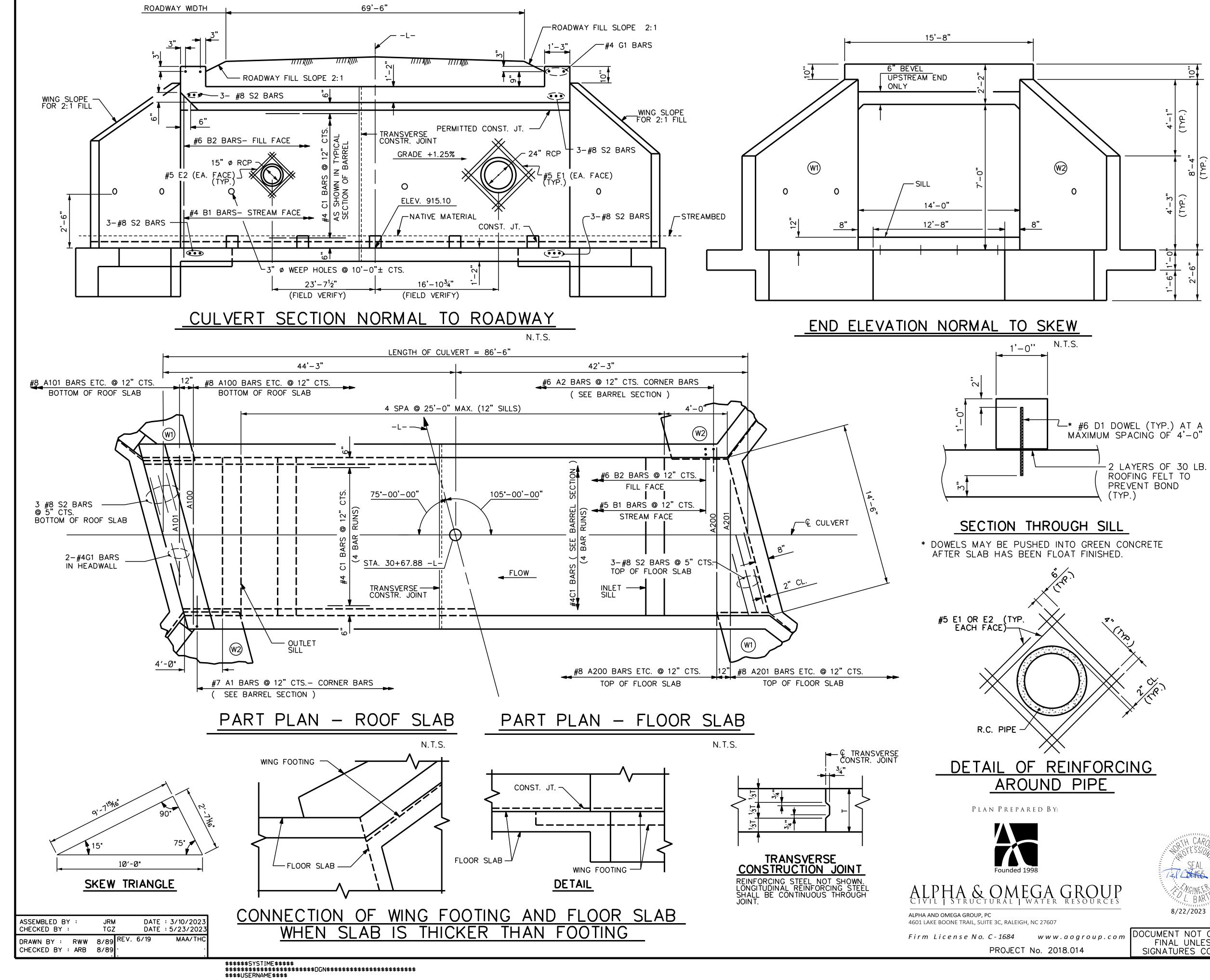
THE 15", AND 24" DIA. PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

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.

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.

NATIVE BED MATERIAL PLACED BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS I RIP RAP. STONES LARGER THAN 8 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER.

SEAL SEAL NGINEER NGINEER 8/22/2023	PROJE(STATIO	FORS` N: <u>3</u>	YTH	CO	UNTY
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED PLAN PREPARED BY:	SINC	artment GLE 1	RALEIGH	NSPORTA X 7	
DUP, PC L, SUITE 3C, RALEIGH, NC 27607 PROJECT No. 2018.014	№. вү: 1 2		IONS NO. ВҮ: 3	DATE:	SHEET NO. S1-01 TOTAL SHEETS 04

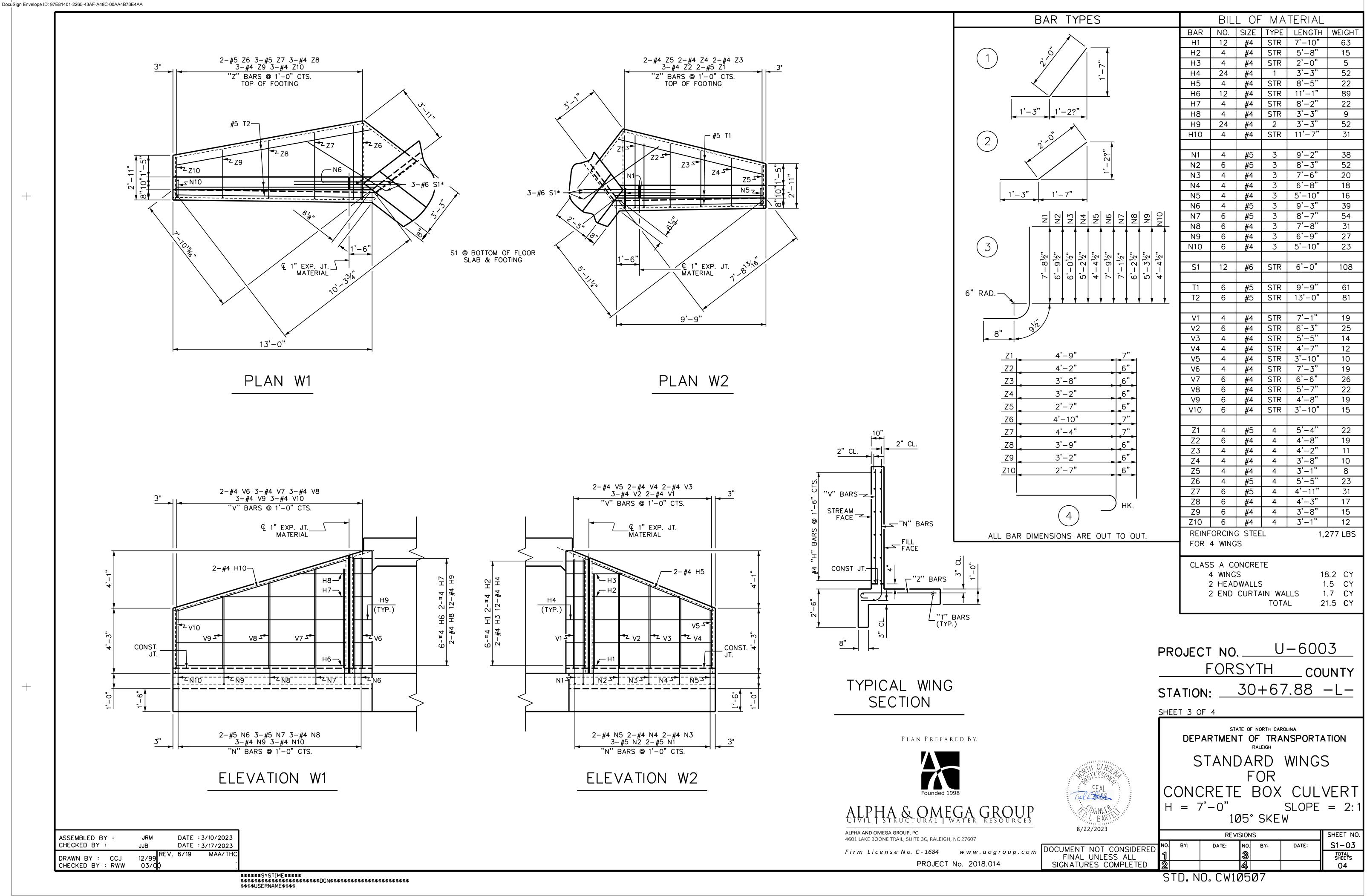


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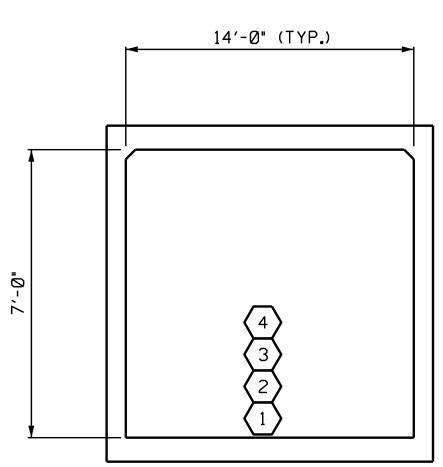
1	DOWEL	(TYF	р.) А ⁻	ΓА
JM	SPACI	NG O)F 4'-	-0"

- 2 LAYERS OF 30 LB. (ROOFING FELT TO PREVENT BOND (TYP.)	$4'-5^{1}2''$
SILL EEN CONCRETE ISHED.	BAR TYPE DIMENSIONS ARE OUT TO OUT.
	BAR SIZE SPLICE LENGTH B1 #4 1'-10" C1 #4 2'-5"
2 THP.	PROJECT NO. <u>U-6003</u> FORSYTH COUNTY
<u>ORCING</u> PE	<u>FORSTIN</u> COUNTY STATION: <u>30+67.88 -L-</u> SHEET 2 OF 4
	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH
SEAL	BARREL STANDARD SINGLE 14 FT. X 7 FT. CONCRETE BOX CULVERT 105° SKEW
DUP RCES 8/22/2023	REVISIONS SHEET NO.
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. BT: DATE: ST=02 1 3 TOTAL SHEETS 2 4 04
	STD.NO.CB105_1

	BIL	L OF	MA	TERIAL	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	87	# 7	1	10'-2"	1808
A2	87	<i>"</i> #7	1	10'-2"	1808
A100	83	#8	STR	15'-3"	3380
A101	2	#8	STR	11'-7"	62
A102	2	#8	STR	7'-10"	42
A103	4	#8	STR	4'-1"	44
A200	83	#8	STR	15'-3"	3380
A201	2	#8	STR	11'-7"	62
A202	2	#8	STR	7'–10"	42
A203	4	#8	STR	4'-1"	44
B1	174	#5	STR	8'-10"	1602
B2	174	#6	STR	6'-4"	1650
C1	192	#4	STR	22'-10"	2929
D1	20	#6	STR	1'-8"	75
E 4	10		<u> CTD</u>	<u>, ' -, ''</u>	70
E1	16	#5 "E	STR	4'-7" 3'-8"	76
E2	16	#5	STR	3-8	61
G1	4		STR	15'-10"	42
GI	4	#4	211	13 - 10	42
S2	6	#8	STR	15'-10"	254
		<i></i>	0.11	10 10	201
ΤΟΤΑΙ	REIN	FORCIN	IG STEI	EL 17,3	65 LBS
VER	TICAL	LEG — ① 6" R.		4'-11" A1	



			SUMM							OR RATIN Crete B(
										STRENGTH	I LIMI	T STA	Υ Ε			
										MOMENT				SHEAR		
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	LIVE-LOAD FACTORS (Y _{LL})	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)	
		HL-93 (INVENTORY)	N/A	$\langle 1 \rangle$	1.09		1.75	1.09	1	MBS	7	2.07	1	BEW	0	
DESIGN		HL-93 (OPERATING)	N/A		1.42		1.35	1.42	1	MBS	7	2.69	1	BEW	0	
LOAD RATING		HS-20 (INVENTORY)	36.000	2	1.62	58.30	1.75	1.62	1	MBS	7	2.95	1	BEW	0	
		HS-20 (OPERATING)	36.000		2.20	75.57	1.35	2.20	1	MBS	7	2.95	1	BEW	Ø	
		SNSH	13.500		2.62	35.35	1.40	2.62	1	MBS	7	4.52	1	BEW	Ø	
		SNGARBS2	20.000		2.45	49.63	1.40	2.45	1	MBS	7	4.23	1	BEW	Ø	
		SNAGRIS2	22.000		2.62	57 . 61	1.40	2.62	1	MBS	7	4.51	1	BEW	Ø	
	(SV)	SNCOTTS3	27.250		1.31	35.69	1.40	1.31	1	MBS	7	2.42	1	BEW	Ø	
	шΥ	SNAGGRS4	34.925		1.34	46.89	1.40	1.34	1	MBS	7	2.59	1	BEW	Ø	
	SINGLE VEHICLE (SV) SV) SV) SV) SV) SV)	SNS5A	35.550		1.32	46.77	1.40	1.32	1	MBS	7	2.47	1	BEW	Ø	
		SNS6A	39.950	3	1.26	50.25	1.40	1.26	1	MBS	7	2.41	1	BEW	0	
LEGAL LOAD	SINGLE VEHICL (SV) SV SV SV	SNS7B	42.000	3	1.26	52.83	1.40	1.26	1	MBS	7	2.41	1	BEW	0	
RATING	LER	TNAGRIT3	33.000		1.70	56.20	1.40	1.70	1	MBS	7	3.20	1	BEW	0	
	TRAII	TNT4A	33.075		1.56	51.55	1.40	1.56	1	MBS	7	2.88	1	BEW	0	
	Ξ	TNT6A	41.600		1.43	59.49	1.40	1.43	1	MBS	7	2.64	1	BEW	0	
	ST)	TNT7A	42.000		1.51	63.25	1.40	1.51	1	MBS	7	2.76	1	BEW	0	
	CTOR (TTS	TNT7B	42.000		1.33	55.84	1.40	1.33	1	MBS	7	2 . 57	1	BEW	Ø	
	TRAC	TNAGRIT4	43.000		1.48	63.80	1.40	1.48	1	MBS	7	2.81	1	BEW	0	
	TRUCK	TNAGT5A	45.000		1.48	66.79	1.40	1.48	1	MBS	7	2.82	1	BEW	Ø	
	TRI	TNAGT5B	45.000		1.36	61.28	1.40	1.36	1	MBS	7	2.51	1	BEW	Ø	
EMERGE		EV2	28.750		1.72	49.43	1.40	1.72	1	MBS	7		1	BEW	0	
VEHICLE	(EV)	EV3	43.000	$\langle 4 \rangle$	1.06	45.41	1.40	1.06	1	MBS	7		1	BEW	0	ĺ



ASSEMBLED BY : CHECKED BY :	JRN JJB	I DATE DATE	: 3/10/2023 : 3/17/2023
DRAWN BY : WMC CHECKED BY : GM	7/11 7/11	REV. 10/1/11 REV. 12/17 REV. 04/23	MAA/GM MAA/THG BNB/AA

BOX 1

LRFR SUMMARY

(LOOKING DOWNSTREAM)

PLAN PREPARED BY:



ALPHA & OMEGA GROUND

ALPHA AND OMEGA GROUP, PC 4601 LAKE BOONE TRAIL, SUITE 3C, RALEIGH, NC 27607

Firm License No. C-1684 www.aogroup. PROJECT No. 2018.014

LOAD FACTORS:

DESIGN LUAD RATING FALTUR					
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				

DESIGN LOAD RATING FACTORS

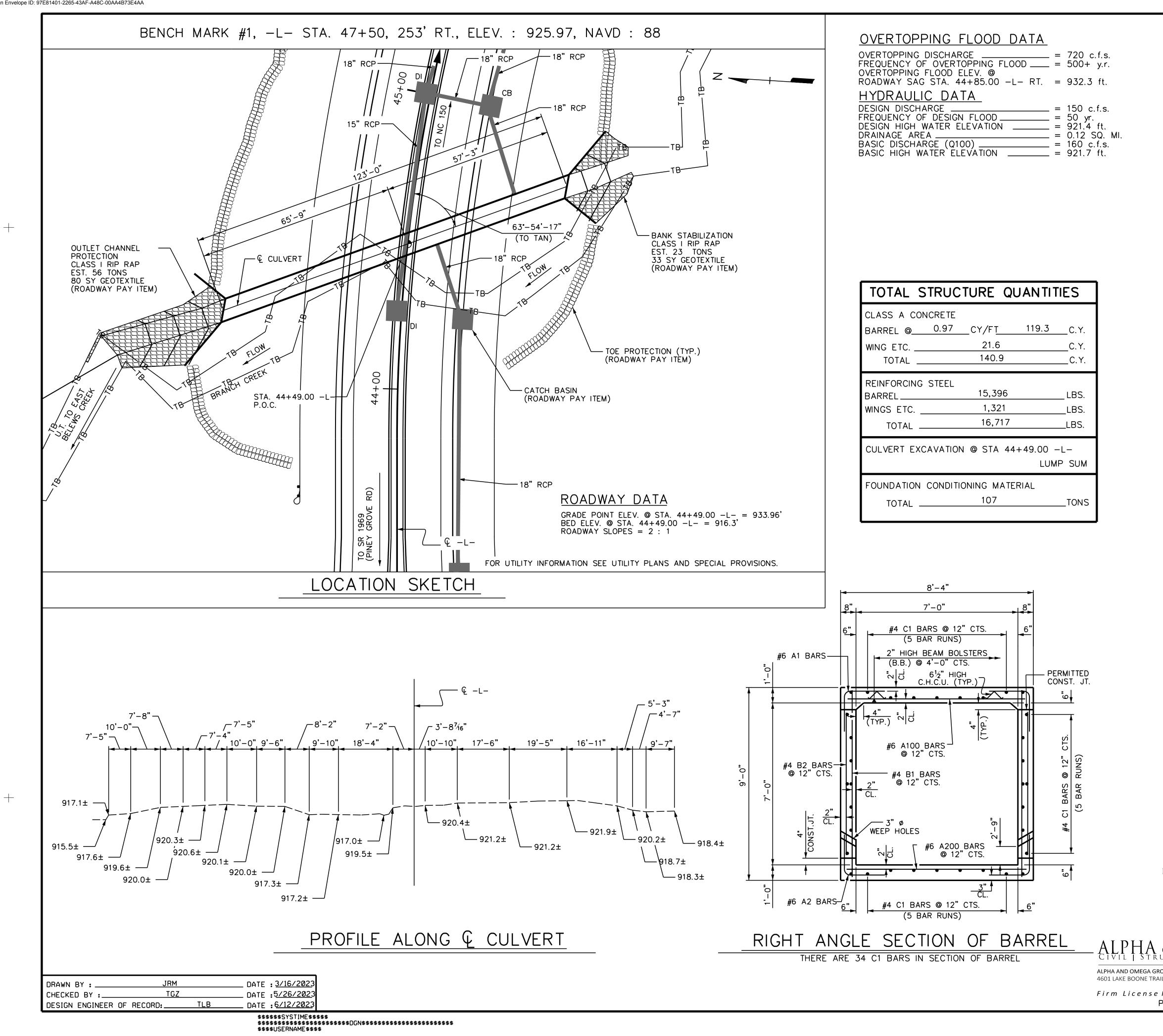
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

- 1.
- 2.
- 3.
- 4.
- (#) CONTROLLING LOAD RATING 1 DESIGN LOAD RATING (HL-93) 2 DESIGN LOAD RATING (HS-20) 3 LEGAL LOAD RATING • • 4 EMERGENCY VEHICLE LOAD RATING * * * * SEE CHART FOR VEHICLE TYPE CULVERT LOCATION MBS - MIDDLE BOTTOM SLAB BEW - BOTTOM EXTERIOR WALL TEW - TOP OF EXTERIOR WALL

		PROJE(F STATIO	ORSY N: <u>30</u>	/TH		UNTY L—
		DEP	STATE ARTMENT	e of north car OF TRA raleigh		TION
	SEAL	REIN		CULV	ONCF ERTS	RETE
U P C E S	8/22/2023	(NO	N—INTE		E TRAF	,
			REVIS	1	DATE	SHEET NO.
. c o m	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. BY: 1 2		NO. BY: 3 4	DATE:	S1-04 TOTAL SHEETS 04
			S	TD. NO	LRFR	5



Firm License

NOTES

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

MAX DESIGN FILL = 11.92'

MIN DESIGN FILL = 9.15'

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.

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.

FOR SUBMITAL 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.

FOR UTILITY INFORMATION, SEE UTILITY PLANS.

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

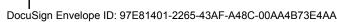
THE 18" DIA. PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

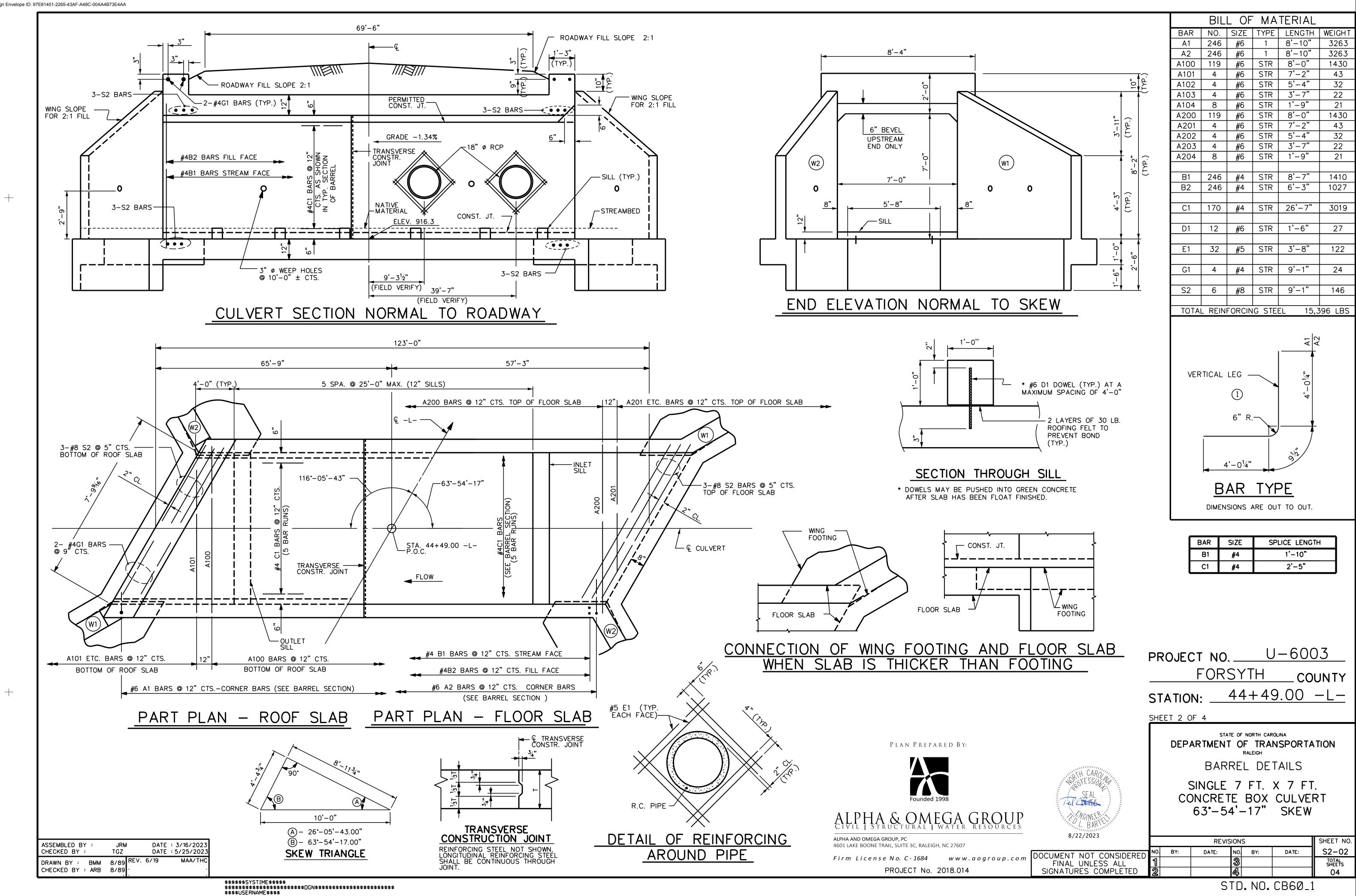
A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

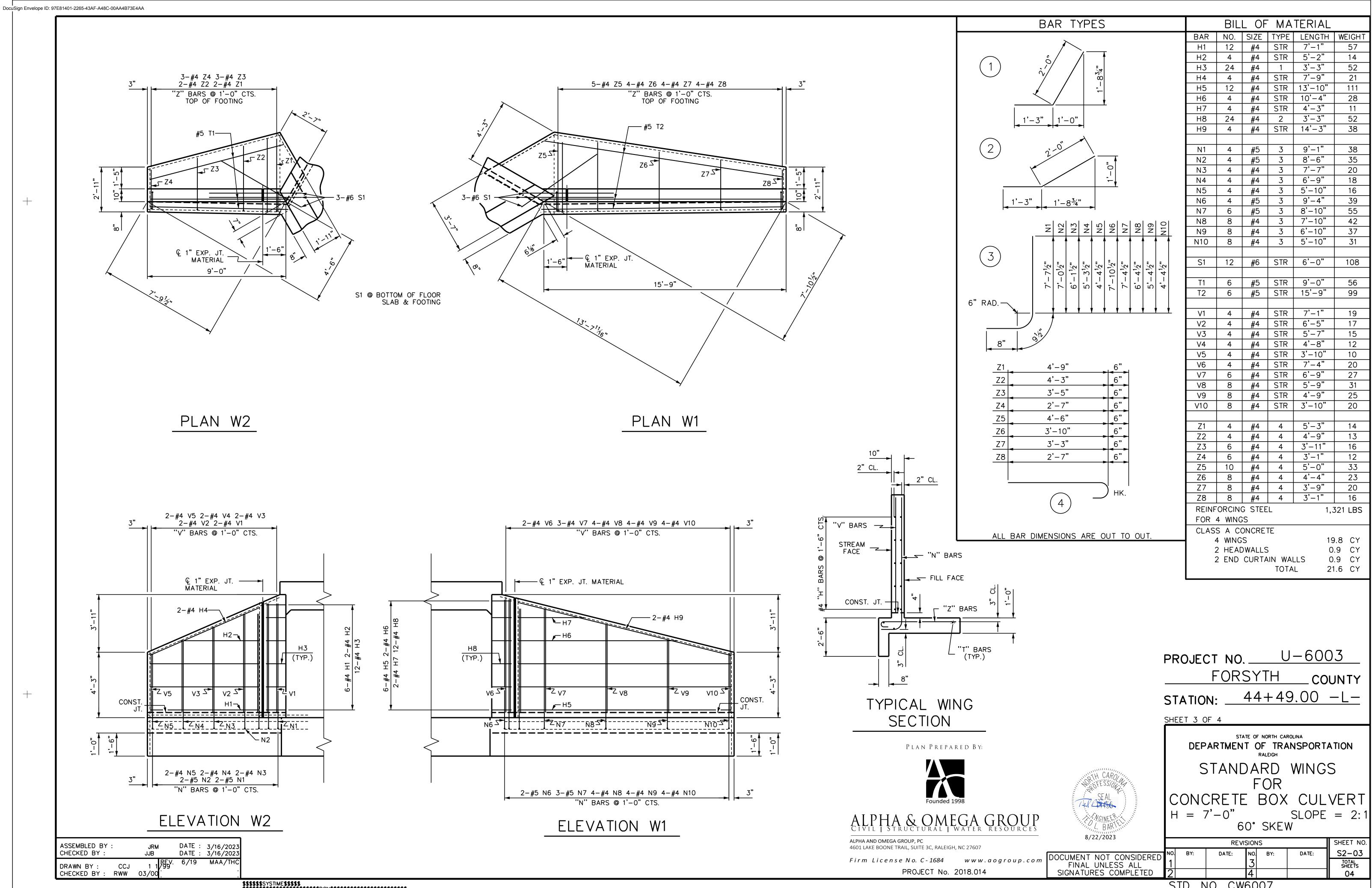
THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

NATIVE BED MATERIAL PLACED BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS I RIP RAP. STONES LARGER THAN 8 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER.

SEAL THE COMPSE	PROJECT NO. <u>U-6003</u> FORSYTH COUNTY STATION: <u>44+49.00</u> -L-
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED PLAN PREPARED BY: Founded 1998	DEPARTMENT OF TRANSPORTATION RALEIGH BARREL STANDARD SINGLE 7 FT. X 7 FT. CONCRETE BOX CULVERT
DUP, PC	REVISIONS SHEET NO.
L, SUITE 3C, RALEIGH, NC 27607 No. C - 1684 www.aogroup.com	NO. BY: DATE: NO. BY: DATE: S2-01 1 3 3 TOTAL SHEETS
PROJECT No. 2018.014	2 4 04
STD. N	0. CB221A

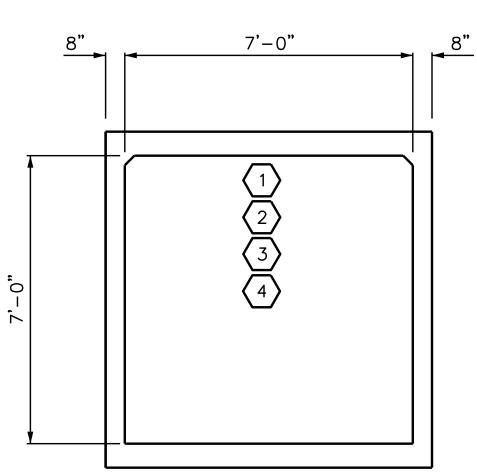






STD. NO. CW6007

DESIGN LOAD RATING HS- HS- HS- HS- SNS SNS SNS SNS SNS SNS SNS SNS SNS S	비–93 (INVENTORY) H–93 (OPERATING) H–93 (OPERATING) H–20 (INVENTORY) H–20 (OPERATING) SNSH SNGARBS2	(M) (SNOL) N/A N/A 36.000 36.000 13.500	CONTROLLING	V/N V/N (RF) (RF)	A/N N/A N/A	Z Z Z LIVE-LOAD V V V FACTORS (GL)	V Z Z RATING FACTOR	ON XOB 1 1	MOMENT	ZZZDISTANCE FROM V V ELEFT END OF ELEMENT (ft)	Z Z RATING FACTOR	ON XOG 1	SHEAR	Z DISTANCE FROM LEFT END OF ELEMENT (ft)	COMMENT NIIMBER
LEGAL LOAD RATING LOAD RATING LOAD RATING LEGAL LOAD RATING LEGAL LOAD RATING HL- HL- HS- SNS SNS SNS SNS SNS SNS SNS SNS SNS S	HL-93 (INVENTORY) HL-93 (OPERATING) HS-20 (INVENTORY) HS-20 (OPERATING) SNSH	HOIN N/A N/A 36.000 36.000 13.500	CONTROLLING CONTROLLING	A/N (RF) V/V RATING F V/V	× = SNOL N/A N/A N/A	Z Z LIVE-LOAD	A RATING F		TOP SLAB	Z DISTANCE	Z RATING FAC			DISTANCE LEFT END ELEMENT	
DESIGN LOAD RATING HS- HS- HS- HS- SNS SNS SNS SNS SNS SNS SNS SNS SNS S	HL-93 (OPERATING) HS-20 (INVENTORY) HS-20 (OPERATING) SNSH	N/A 36.000 36.000 13.500		N/A N/A N/A	N/A N/A	N/A	N/A	1			•	1	EXTERIOR WALL		
LOAD RATING HS- HS- HS- SNS SNS SNS SNS SNS SNS SNS SNS SNS S	HS-20 (INVENTORY) HS-20 (OPERATING) SNSH	36.000 36.000 13.500	2	N/A N/A	N/A			1	TOP SLAB	N/A				177	L
RATING HS- HS- HS- SNS SNS SNS SNS SNS SNS SNS SNS SNS S	HS-20 (OPERATING) SNSH	36.000 13.500	2	N/A		N/A	N/A					1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING LEGAL LOAD RATING SNS SNS SNS SNS SNS SNS SNS SNS SNS S	SNSH	13.500		•	N/A			1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING						N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING HIGH LOAD RATING HIGH HIGH HIGH HIGH HIGH HIGH HIGH H	SNGARBS2			N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING		20.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING	SNAGRIS2	22.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING LOAD RATING	SNCOTTS3	27.250		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL SNS LOAD RATING HATING TNA	SNAGGRS4	34.925		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LEGAL SNS LOAD RATING HATING TNA	SNS5A	35.550		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
LOAD RATING X TNA	SNS6A	39.950	3	N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
RATING TNA	SNS7B	42.000	3	N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
TNT MI- TKAIL	INAGRIT3	33.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
	INT4A	33.075		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
	INT6A	41.600		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
	ΓΝΤ7Α	42.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
TITSI (TTSI TNT TNT TNT	INT7B	42.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
TNA TNA	INAGRIT4	43.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
	INAGT5A	45.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	
Ĕ TNA	INAGT5B	45.000		N/A	N/A	N/A	N/A	1	TOP SLAB	N/A	N/A	1	EXTERIOR WALL	N/A	



ASSEMBLED BY : CHECKED BY :	JRM JJB		: 3/16/2023 : 3/16/2023
DRAWN BY : WMC CHECKED BY : GM	7/11 7/11	REV. 10/1/11 REV. 12/17 REV. 04/23	MAA/GM MAA/THG BNB/AA

+

BOX 1



(LOOKING DOWNSTREAM)

PLAN PREPARED BY:



ALPHA AND OMEGA GROUP, PC 4601 LAKE BOONE TRAIL, SUITE 3C, RALEIGH, NC 27607

Firm License No. C-1684 www.aogroup.com PROJECT No. 2018.014

LOAD FACTORS:

DESIGN LUAD RATING FACTORS				
LOAD TYPE	MAX FACTOR	MIN FACTOR		
DC	1.25	0.90		
DW	1.50	0.65		
EV	1.30	0.90		
ЕН	1.35	0.90		
ES	1.35	0.90		
LS	1.75			
WA	1.00			

DESIGN LOAD RATING FACTORS

NOTE:

- 1. RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.
- 2. LRFD 3.6.1.2.6a AND MBE 6A.5.12.10.3a NO LIVE LOADS APPLIED DUE TO DEPTH OF FILL.

COMMENTS:

- 1.

- 4

(#) CONTROLLING LOAD RATING

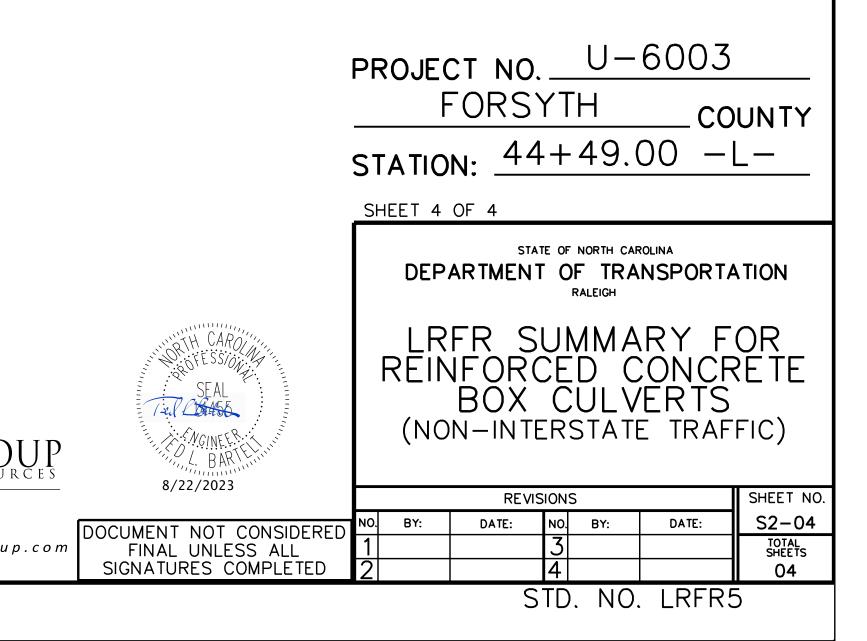
1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING * *

4 EMERGENCY VEHICLE LOAD RATING * *

• • SEE CHART FOR VEHICLE TYPE



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 SO.IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS.PER SQ.IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS.PER SQ.IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS.PER CU.FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 11/2" 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.

STANDARD NOTES

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE $\frac{7}{8}$ " Ø SHEAR STUDS FOR THE $\frac{3}{4}$ " 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 $\frac{1}{16}$ " Ø STUDS ALONG THE BEAM, AS SHOWN FOR $\frac{3}{4}$ " Ø STUDS BASED ON THE RATIO OF 3 - $\frac{1}{16}$ " Ø STUDS FOR 4 - 🔏 Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-O".

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.

ENGLISH JANUARY, 1990

STD. NO. SN