

**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						
						LIVE-LOAD FACTORS (%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)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.18	--	1.75	1.81	2	BOT SLAB	0.1	1.18	1	TOP SLAB	8		
	HL-93 (OPERATING)	N/A		1.52	--	1.35	2.34	2	BOT SLAB	0.1	1.52	1	TOP SLAB	8		
	HS-20 (INVENTORY)	36.000	2	1.33	47.88	1.75	1.81	2	BOT SLAB	0.1	1.33	2	BOT SLAB	0.1		
	HS-20 (OPERATING)	36.000		1.73	62.28	1.35	2.34	2	BOT SLAB	0.1	1.73	2	BOT SLAB	0.1		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.56	48.06	1.40	4.2	1	TOP SLAB	4	3.56	1	TOP SLAB	8	
		SNGARBS2	20.000		3.12	62.40	1.40	3.6	2	BOT SLAB	0.1	3.12	2	BOT SLAB	0.1	
		SNAGRIS2	22.000		2.84	62.48	1.40	3.33	2	BOT SLAB	0.1	2.84	2	BOT SLAB	0.1	
		SNCOTTS3	27.250		1.62	44.15	1.40	2.57	2	BOT SLAB	0.1	1.62	1	TOP SLAB	8	
		SNAGGRS4	34.925		1.75	61.12	1.40	2.7	2	BOT SLAB	0.1	1.75	2	BOT SLAB	0.1	
		SNS5A	35.550		1.95	69.32	1.40	2.45	1	BOT SLAB	8	1.95	2	BOT SLAB	0.1	
		SNS6A	39.950		1.71	68.31	1.40	2.23	2	BOT SLAB	0.1	1.71	2	BOT SLAB	0.1	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.81	92.73	1.40	3.45	2	BOT SLAB	0.1	2.81	2	BOT SLAB	0.1	
		TNT4A	33.075		2.08	68.80	1.40	2.67	2	BOT SLAB	0.1	2.08	1	TOP SLAB	8	
		TNT6A	41.600		1.91	79.46	1.40	2.43	2	BOT SLAB	0.1	1.91	2	BOT SLAB	0.1	
		TNT7A	42.000		1.84	77.28	1.40	2.35	2	BOT SLAB	0.1	1.84	2	BOT SLAB	0.1	
		TNT7B	42.000		2.02	84.84	1.40	2.49	2	BOT SLAB	0.1	2.02	1	TOP SLAB	8	
		TNAGRIT4	43.000		1.83	78.69	1.40	2.31	2	BOT SLAB	0.1	1.83	2	BOT SLAB	0.1	
		TNAGT5A	45.000		1.73	77.85	1.40	2.30	1	BOT SLAB	8	1.73	2	BOT SLAB	0.1	
TNAGT5B	45.000		3	1.27	57.15	1.40	1.86	2	BOT SLAB	0.1	1.27	2	BOT SLAB	0.1		

**LOAD FACTORS:**

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

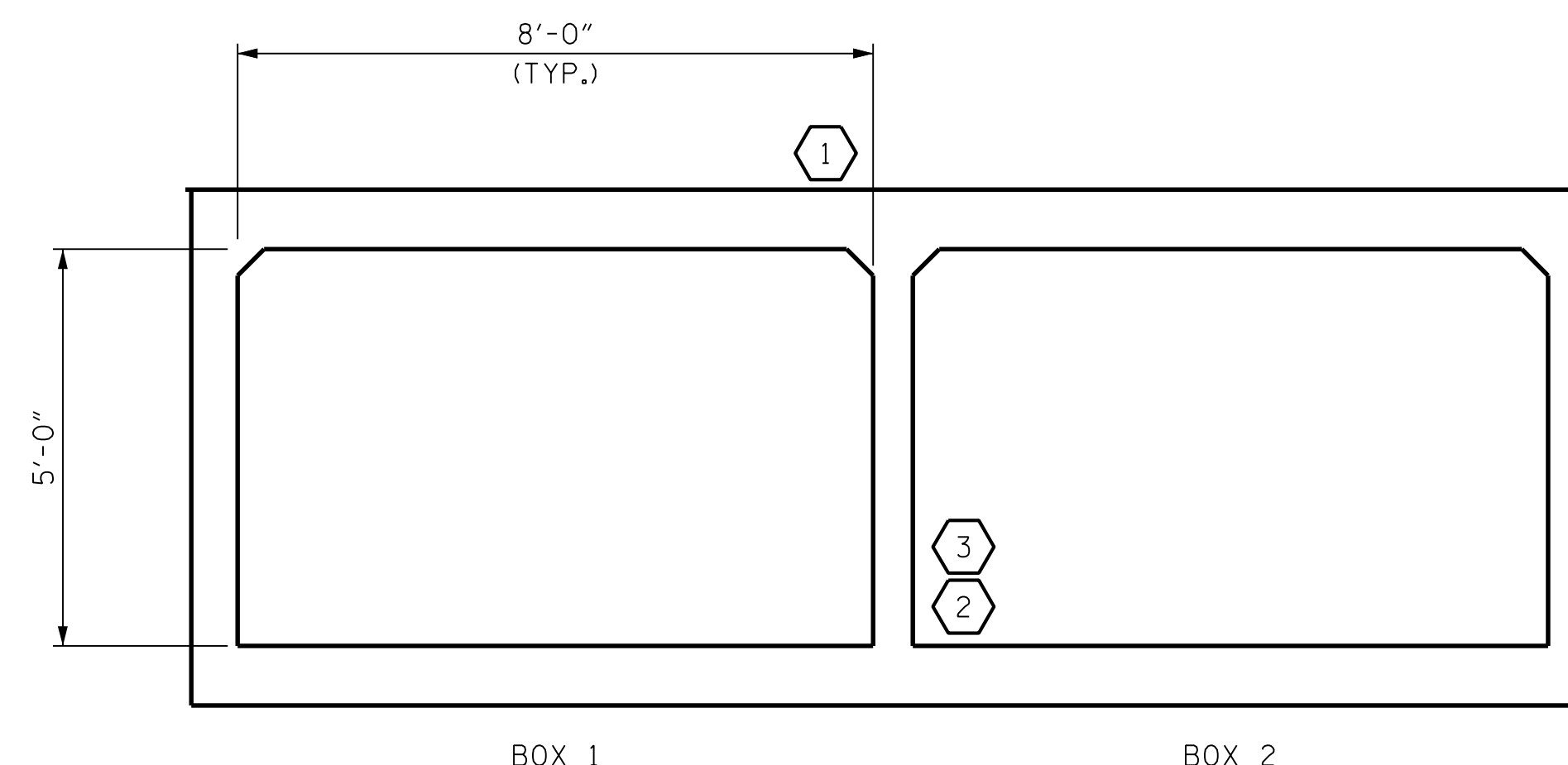
**NOTE:**

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

**COMMENTS:**

CULVERT RATING AT 17+30.70 -Y2-

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

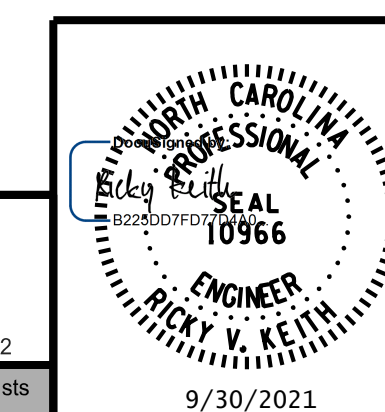


**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. I-5972  
JOHNSTON COUNTY  
 STATION: 17+30.70 -Y2-

SHEET 2 OF 6

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



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

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

9/30/2021 R:\Structures\DN\Culvert\Final\I5972\_SMU\_CU.1-2\_500410.dgn

DRAWN BY : J. BOXLEY DATE : JUL. 2021  
 CHECKED BY : A. L. STROUD DATE : JUL. 2021  
 DESIGN ENGINEER OF RECORD : R. V. KEITH DATE : JUL. 2021