

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
							LIVE-LOAD, FACTORS (γ _{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	1	2.26	--	1.75	2.26	1	BOTT. SLAB	1.83	5.25	1	BOTT. SLAB	0.87	
		HL-93 (OPERATING)	N/A		2.93	--	1.35	2.93	1	BOTT. SLAB	1.83	6.80	1	BOTT. SLAB	0.87	
		HS-20 (INVENTORY)	36.000	2	2.92	105.12	1.75	2.92	1	BOTT. SLAB	1.83	6.40	1	EXT. WALL	0.86	
		HS-20 (OPERATING)	36.000		3.78	136.08	1.35	3.78	1	BOTT. SLAB	1.83	8.30	1	EXT. WALL	0.86	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.05	54.68	1.40	4.05	1	BOTT. SLAB	0.33	7.98	1	EXT. WALL	0.86	
		SNGARBS2	20.000		3.85	77.00	1.40	3.85	1	BOTT. SLAB	1.83	7.99	1	EXT. WALL	0.86	
		SNAGRIS2	22.000		4.05	89.10	1.40	4.05	1	BOTT. SLAB	0.33	7.98	1	EXT. WALL	0.86	
		SNCOTTS3	27.250	3	3.50	95.38	1.40	3.50	1	BOTT. SLAB	1.83	8.01	1	EXT. WALL	0.86	
		SNAGGRS4	34.925		4.05	141.45	1.40	4.05	1	BOTT. SLAB	0.33	8.09	1	EXT. WALL	0.86	
		SNS5A	35.550		4.05	143.98	1.40	4.05	1	BOTT. SLAB	0.33	8.08	1	EXT. WALL	0.86	
		SNS6A	39.950		4.05	161.80	1.40	4.05	1	BOTT. SLAB	0.33	8.06	1	EXT. WALL	0.86	
		SNS7B	42.000		4.05	170.10	1.40	4.05	1	BOTT. SLAB	0.33	8.06	1	EXT. WALL	0.86	
	TRUCK TRACTOR SEMI-TRAILER (TTSI)	TNAGRIT3	33.000		4.05	133.65	1.40	4.05	1	BOTT. SLAB	0.33	7.98	1	EXT. WALL	0.86	
		TNT4A	33.075		4.05	133.95	1.40	4.05	1	BOTT. SLAB	0.33	7.99	1	EXT. WALL	0.86	
		TNT6A	41.600		4.05	168.48	1.40	4.05	1	BOTT. SLAB	0.33	8.09	1	EXT. WALL	0.86	
		TNT7A	42.000		4.05	170.10	1.40	4.05	1	BOTT. SLAB	0.33	8.07	1	EXT. WALL	0.86	
		TNT7B	42.000		4.05	170.10	1.40	4.05	1	BOTT. SLAB	0.33	8.06	1	EXT. WALL	0.86	
		TNAGRIT4	43.000		4.05	174.15	1.40	4.05	1	BOTT. SLAB	0.33	7.99	1	EXT. WALL	0.86	
TNAGT5A		45.000		4.05	182.25	1.40	4.05	1	BOTT. SLAB	0.33	7.99	1	EXT. WALL	0.86		
TNAGT5B		45.000		4.05	182.25	1.40	4.05	1	BOTT. SLAB	0.33	7.99	1	EXT. WALL	0.86		
EMERGENCY VEHICLE (EV)		EV2	28.750	4	2.91	83.66	1.30	2.91	1	BOTT. SLAB	1.83	6.75	1	BOTT. SLAB	0.33	
		EV3	43.000		3.04	130.72	1.30	3.04	1	BOTT. SLAB	1.83	7.05	1	BOTT. SLAB	0.33	

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	--

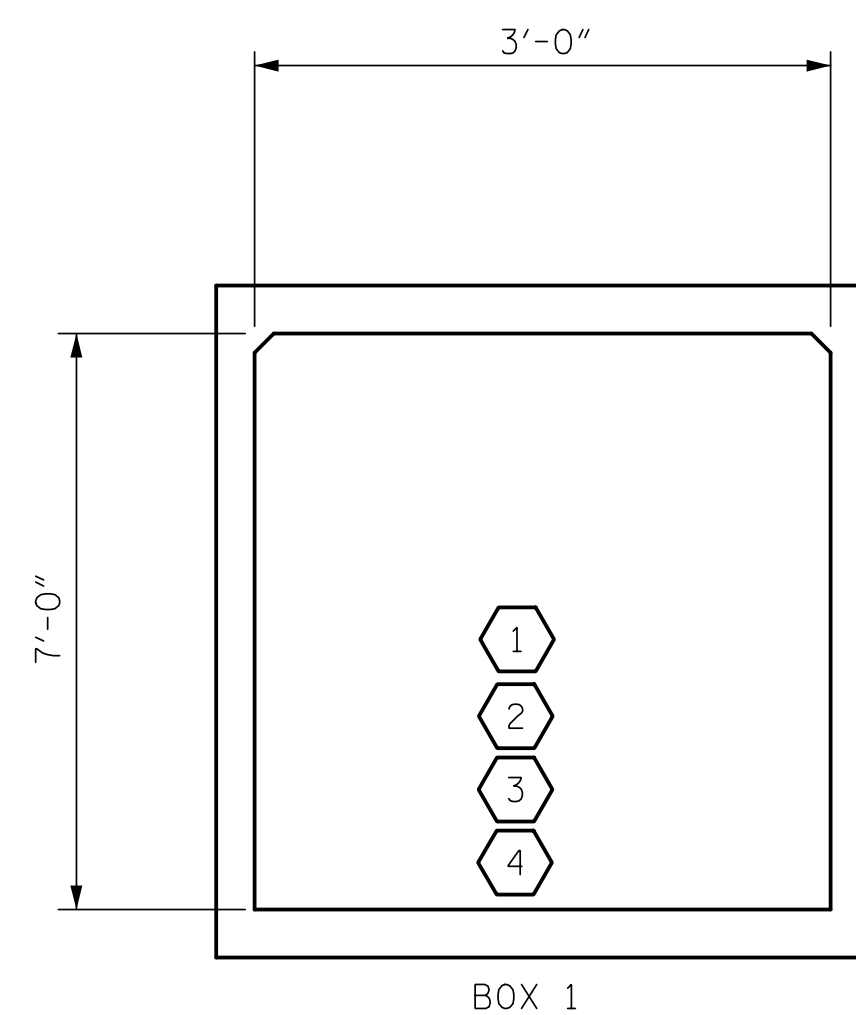
RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

- 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



(LOOKING DOWNSTREAM)

PROJECT NO. R-5739
NORTHAMPTON COUNTY
 STATION: 38+74.00 -L-

SHEET 2 OF 10

 MICHAEL G. BECK, JR. Professional Engineer State No. 20125 7/23/2025	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC) LEFT EXTENSION																									
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED																										
 TGS ENGINEERS 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORE LICENSE NO. 00375	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">REVISIONS</th> <th style="text-align: center;">SHEET NO.</th> </tr> <tr> <th style="width: 10%;">NO.</th> <th style="width: 10%;">BY:</th> <th style="width: 10%;">DATE:</th> <th style="width: 10%;">NO.</th> <th style="width: 10%;">BY:</th> <th style="width: 10%;">DATE:</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td></td> <td></td> <td style="text-align: center;">3</td> <td></td> <td></td> <td rowspan="2" style="text-align: center; vertical-align: middle;">C1-2 TOTAL SHEETS 10</td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td style="text-align: center;">4</td> <td></td> <td></td> </tr> </tbody> </table>	REVISIONS				SHEET NO.	NO.	BY:	DATE:	NO.	BY:	DATE:		1			3			C1-2 TOTAL SHEETS 10	2			4		
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STR. #1

STD. NO. LRFR5