

## 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 (γ <sub>L</sub> )	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	4.21	--	1.75	4.21	1	TOP SLAB	4.17	12.28	1	TOP SLAB	2.31		
	HL-93 (OPERATING)	N/A		5.46	--	1.35	5.46	1	TOP SLAB	4.17	15.91	1	TOP SLAB	2.31		
	HS-20 (INVENTORY)	36.000	②	4.21	151.56	1.75	4.21	1	TOP SLAB	4.17	12.28	1	TOP SLAB	2.31		
	HS-20 (OPERATING)	36.000		5.46	196.56	1.35	5.46	1	TOP SLAB	4.17	15.91	1	TOP SLAB	2.31		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		20.13	271.76	1.40	20.13	1	TOP SLAB	4.17	58.24	1	TOP SLAB	2.31	
		SNGARBS2	20.000		13.61	272.20	1.40	13.61	1	TOP SLAB	4.17	39.38	1	TOP SLAB	2.31	
		SNAGRIS2	22.000		12.38	272.36	1.40	12.38	1	TOP SLAB	4.17	35.82	1	TOP SLAB	2.31	
		SNCOTTS3	27.250		9.97	271.68	1.40	9.97	1	TOP SLAB	4.17	28.86	1	TOP SLAB	2.31	
		SNAGGRS4	34.925		7.80	272.42	1.40	7.80	1	TOP SLAB	4.17	22.60	1	TOP SLAB	2.31	
		SNS5A	35.550		7.65	271.96	1.40	7.65	1	TOP SLAB	4.17	22.19	1	TOP SLAB	2.31	
		SNS6A	39.950		6.83	272.86	1.40	6.83	1	TOP SLAB	4.17	19.94	1	TOP SLAB	2.31	
		SNS7B	42.000		6.49	272.58	1.40	6.49	1	TOP SLAB	4.17	18.91	1	TOP SLAB	2.31	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		8.26	272.58	1.40	8.26	1	TOP SLAB	4.17	23.97	1	TOP SLAB	2.31	
		TNT4A	33.075		8.23	272.21	1.40	8.23	1	TOP SLAB	4.17	24.02	1	TOP SLAB	2.31	
		TNT6A	41.600		6.58	273.73	1.40	6.58	1	TOP SLAB	4.17	19.29	1	TOP SLAB	2.31	
		TNT7A	42.000		6.67	280.14	1.40	6.67	1	TOP SLAB	4.17	19.51	1	TOP SLAB	2.31	
		TNT7B	42.000		6.67	280.14	1.40	6.67	1	TOP SLAB	4.17	19.84	1	TOP SLAB	2.31	
		TNAGRIT4	43.000		6.33	272.19	1.40	6.33	1	TOP SLAB	4.17	18.49	1	TOP SLAB	2.31	
TNAGT5A	45.000		6.07	273.15	1.40	6.07	1	TOP SLAB	4.17	17.83	1	TOP SLAB	2.31			
TNAGT5B	45.000		③	6.06	272.70	1.40	6.06	1	TOP SLAB	4.17	17.59	1	TOP SLAB	2.31		

**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:**

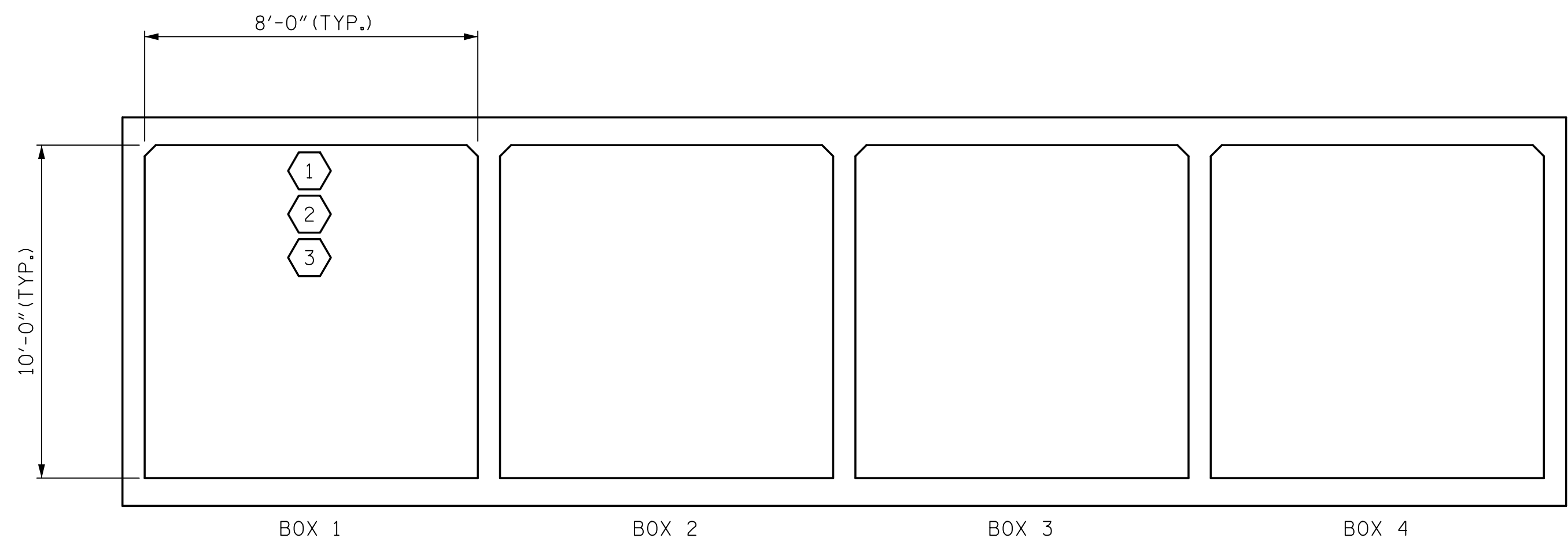
# CONTROLLING LOAD RATING

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)

ASSEMBLED BY : J.S. HOBSON	DATE :03/07/19
CHECKED BY : J.A. LEE	DATE :04/03/19
DRAWN BY : WMC 7/II	REV. 10/1/II MAA/GM
CHECKED BY : GM 7/II	

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ENGINEER  
Jack Hobson, S. HOBSON  
4/16/2020

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

PROJECT NO. R-4707  
GUILFORD COUNTY  
STATION: 46+07.79 -Y-

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-02
1			3			TOTAL SHEETS 9
2			4			