

**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	1.06	--	1.75	1.63	1	EXTERIOR WALL	0.33	1.06	1	EXTERIOR WALL	0.33		
	HL-93 (OPERATING)	N/A		1.37	--	1.35	2.12	1	EXTERIOR WALL	0.33	1.37	1	EXTERIOR WALL	0.33		
	HS-20 (INVENTORY)	36.000	②	1.06	38.16	1.75	1.65	1	EXTERIOR WALL	0.33	1.06	1	EXTERIOR WALL	0.33		
	HS-20 (OPERATING)	36.000		1.37	49.32	1.35	2.14	1	EXTERIOR WALL	0.33	1.37	1	EXTERIOR WALL	0.33		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.35	18.23	1.40	2.19	1	EXTERIOR WALL	0.33	1.35	1	EXTERIOR WALL	0.33	
		SNGARBS2	20.000		1.34	26.80	1.40	2.15	1	EXTERIOR WALL	0.33	1.34	1	EXTERIOR WALL	0.33	
		SNAGRIS2	22.000		1.34	29.48	1.40	2.13	1	EXTERIOR WALL	0.33	1.34	1	EXTERIOR WALL	0.33	
		SNCOTTS3	27.250		1.32	35.97	1.40	2.04	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		SNAGGRS4	34.925		1.32	46.10	1.40	2.05	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		SNS5A	35.550		1.32	46.93	1.40	2.04	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		SNS6A	39.950		1.32	52.73	1.40	2.02	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		SNS7B	42.000		1.32	55.44	1.40	2.03	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.32	43.56	1.40	2.04	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		TNT4A	33.075		1.32	43.66	1.40	2.04	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		TNT6A	41.600		1.31	54.50	1.40	2.01	1	EXTERIOR WALL	0.33	1.31	1	EXTERIOR WALL	0.33	
		TNT7A	42.000		1.32	55.44	1.40	2.02	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33	
		TNT7B	42.000		1.31	55.02	1.40	2.01	1	EXTERIOR WALL	0.33	1.31	1	EXTERIOR WALL	0.33	
		TNAGRIT4	43.000		1.31	56.33	1.40	2.00	1	EXTERIOR WALL	0.33	1.31	1	EXTERIOR WALL	0.33	
TNAGT5A	45.000		1.32	59.40	1.40	2.03	1	EXTERIOR WALL	0.33	1.32	1	EXTERIOR WALL	0.33			
TNAGT5B	45.000	③	1.31	58.95	1.40	1.99	1	EXTERIOR WALL	0.33	1.31	1	EXTERIOR WALL	0.33			

**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	--

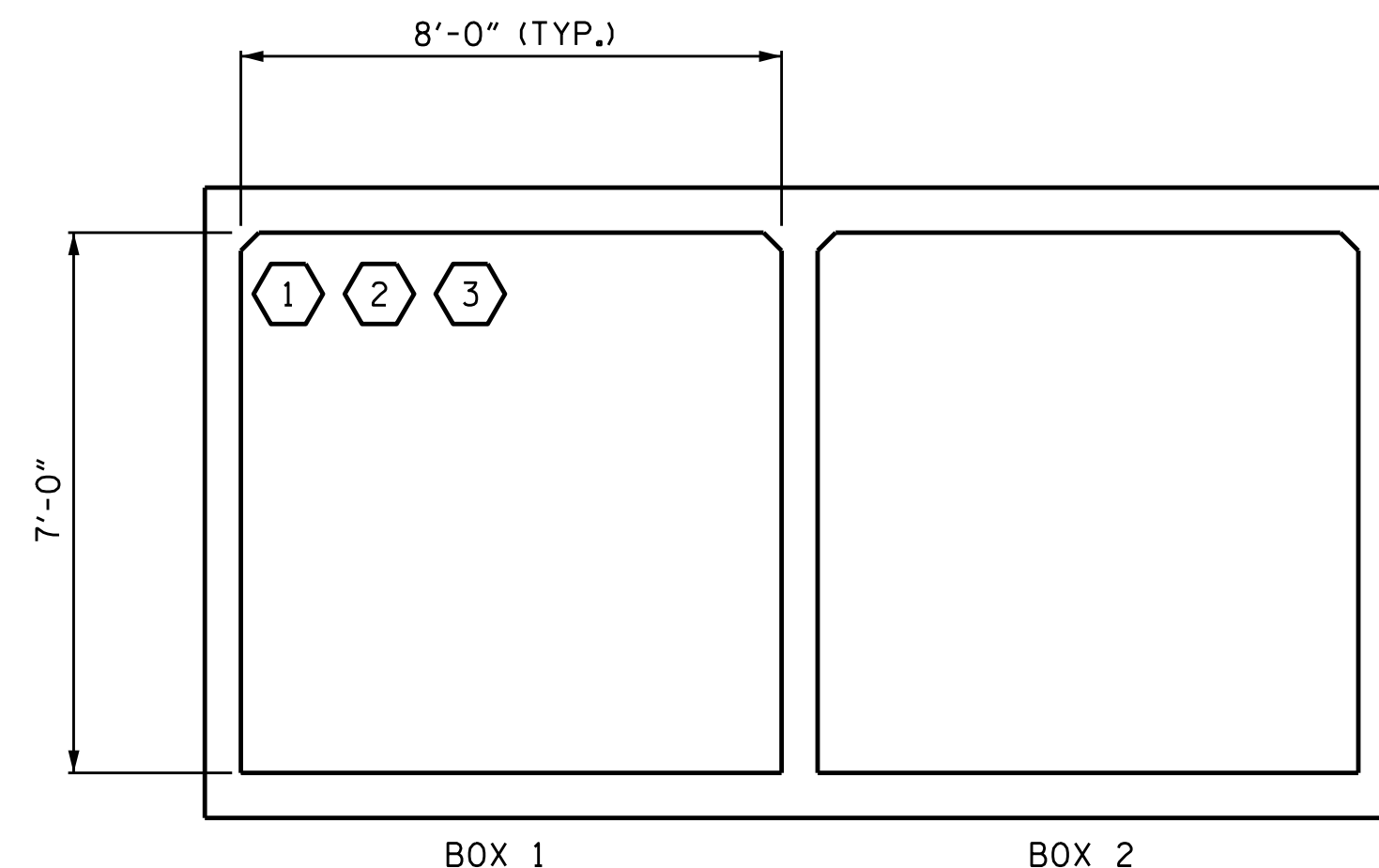
**NOTE:**

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

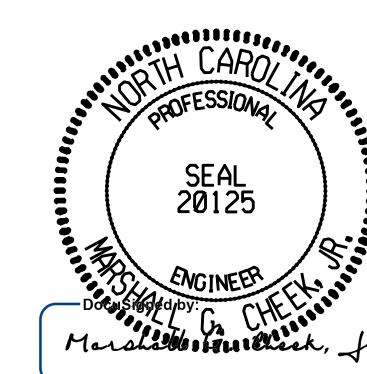
①	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. I-5987A  
ROBESON COUNTY  
 STATION: 24+79.00 -Y3-

SHEET 2 OF 10



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
706 HILLSBOROUGH STREET  
SUITE 200  
RALEIGH, NC 27603  
PH (919) 773-8887  
CORP. LICENSE NO.: C-0275

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:	C14-2
1			3			TOTAL SHEETS
2			4			10

ASSEMBLED BY : STM	DATE : 10/21
CHECKED BY : MGC	DATE : 12/21
DRAWN BY : WMC	7/11
CHECKED BY : GM	7/11
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC