

## 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 (γ <sub>LL</sub> )	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	1.23	--	1.75	1.29	1	EXTERIOR WALL	0.50	1.23	1	TOP SLAB	1.02		
	HL-93 (OPERATING)	N/A		1.60	--	1.35	1.67	1	EXTERIOR WALL	0.50	1.60	1	TOP SLAB	1.02		
	HS-20 (INVENTORY)	36.000	2	1.29	46.440	1.75	1.29	1	EXTERIOR WALL	0.50	1.29	1	TOP SLAB	1.02		
	HS-20 (OPERATING)	36.000		1.67	60.120	1.35	1.67	1	EXTERIOR WALL	0.50	1.67	1	TOP SLAB	1.02		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		1.72	23.220	1.40	1.72	1	EXTERIOR WALL	0.50	1.90	1	EXTERIOR WALL	0.98		
		SNGARBS2	20,000		1.73	34.600	1.40	1.73	1	EXTERIOR WALL	0.50	1.91	1	EXTERIOR WALL	0.98	
		SNAGRIS2	22,000		1.72	37.840	1.40	1.72	1	EXTERIOR WALL	0.50	1.93	1	EXTERIOR WALL	0.98	
		SNCOTTS3	27,250		1.53	41.693	1.40	1.61	1	EXTERIOR WALL	0.50	1.53	1	TOP SLAB	1.02	
		SNAGGRS4	34,925		1.55	54.134	1.40	1.65	1	EXTERIOR WALL	0.50	1.55	1	TOP SLAB	1.02	
		SNS5A	35,550		1.68	59.724	1.40	1.68	1	EXTERIOR WALL	0.50	1.75	1	TOP SLAB	1.02	
		SNS6A	39,950		1.58	63.121	1.40	1.65	1	EXTERIOR WALL	0.50	1.58	1	TOP SLAB	1.02	
	SNS7B	42,000	3	1.51	63.420	1.40	1.62	1	EXTERIOR WALL	0.50	1.51	1	TOP SLAB	1.02		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.58	52.140	1.40	1.58	1	EXTERIOR WALL	0.50	1.86	1	EXTERIOR WALL	0.98	
		TNT4A	33,075		1.61	53.251	1.40	1.61	1	EXTERIOR WALL	0.50	1.77	1	TOP SLAB	1.02	
		TNT6A	41,600		1.59	66.144	1.40	1.71	1	EXTERIOR WALL	0.50	1.59	1	TOP SLAB	1.02	
		TNT7A	42,000		1.69	70.980	1.40	1.69	1	EXTERIOR WALL	0.50	1.70	1	TOP SLAB	1.02	
		TNT7B	42,000		1.56	65.520	1.40	1.66	1	EXTERIOR WALL	0.50	1.56	1	TOP SLAB	1.02	
		TNAGRIT4	43,000		1.59	68.370	1.40	1.59	1	EXTERIOR WALL	0.50	1.71	1	TOP SLAB	1.02	
TNAGT5A		45,000		1.62	72.900	1.40	1.62	1	EXTERIOR WALL	0.50	1.67	1	TOP SLAB	1.02		
TNAGT5B	45,000		1.53	68.850	1.40	1.53	1	TOP SLAB	0.29	1.62	1	TOP SLAB	1.02			

LOAD 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	--

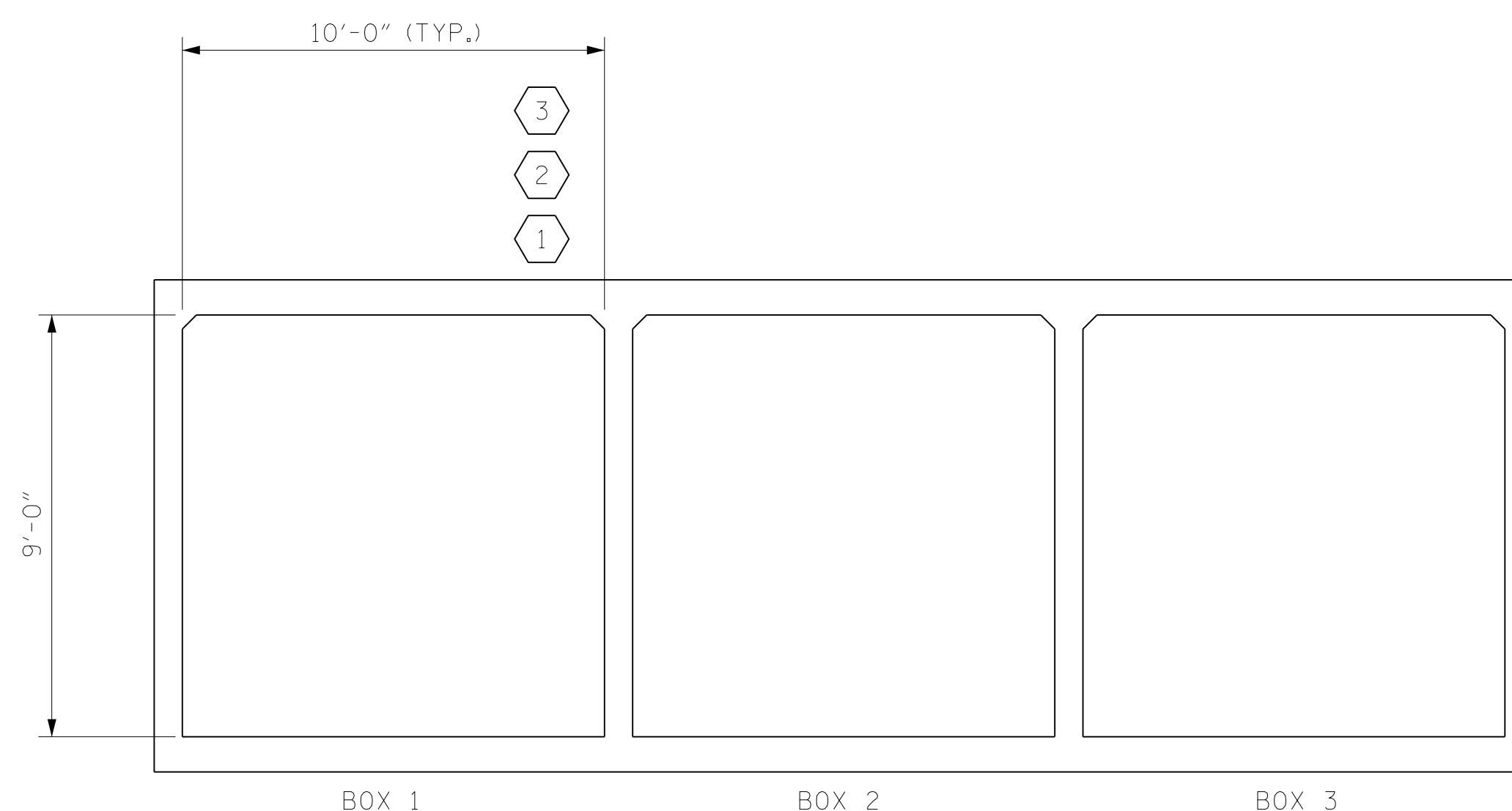
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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

#	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. R-5799  
TRANSYLVANIA COUNTY  
 STATION: 17+47.31 -Y2-

SHEET 10 OF 10

ASSEMBLED BY : TWL	DATE : 08/2020
CHECKED BY : MRA	DATE : 04/2023
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/1/11 MAA/THC

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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:	C-10
1			3			TOTAL SHEETS
2			4			10