

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.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

4 EMERGENCY VERHICLE LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

PROJECT NO. BP14.R002  
HAYWOOD COUNTY  
STATION: 12+82.90 -L188-

SHEET 2 OF 8

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

NO. 1

BY: [Signature]

DATE: 03/2024

NO. 2

BY: [Signature]

DATE: 08/2025

NO. 3

BY: [Signature]

DATE: 03/2024

NO. 4

BY: [Signature]

DATE: 08/2025

SHEET NO. C2-2  
TOTAL SHEETS 8

RS&H

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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>LL</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	1.01	--	1.75	1.28	1	TOP SLAB	3.13	1.01	1	TOP SLAB	7.67	
	HL-93 (OPERATING)	N/A		1.30	--	1.35	1.65	1	TOP SLAB	3.13	1.30	1	TOP SLAB	7.67	
	HS-20 (INVENTORY)	36.000	2	1.10	39.60	1.75	1.40	1	TOP SLAB	3.13	1.10	1	TOP SLAB	7.67	
	HS-20 (OPERATING)	36.000		1.43	51.48	1.35	1.81	1	TOP SLAB	3.13	1.43	1	TOP SLAB	7.67	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SN5H		2.55	34.43	1.40	2.55	1	TOP SLAB	3.13	2.76	1	TOP SLAB	7.67	
		SNGARBS2		2.29	45.80	1.40	2.29	1	TOP SLAB	3.13	2.43	1	TOP SLAB	7.67	
		SNAGRIS2		2.45	53.90	1.40	2.45	1	TOP SLAB	3.13	2.58	1	BOTTOM SLAB	8.00	
		SNCOTTS3	3	1.32	35.97	1.40	1.82	1	TOP SLAB	3.13	1.32	1	TOP SLAB	7.67	
		SNAGGRS4		1.76	61.47	1.40	2.15	1	BOTTOM SLAB	8.00	1.76	1	TOP SLAB	7.67	
		SNS5A		1.60	56.88	1.40	2.10	1	BOTTOM SLAB	8.00	1.60	1	TOP SLAB	7.67	
		SNS6A		1.55	61.92	1.40	1.94	1	BOTTOM SLAB	8.00	1.55	1	TOP SLAB	7.67	
		SNS7B		1.55	65.10	1.40	1.93	1	BOTTOM SLAB	8.00	1.55	1	TOP SLAB	7.67	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3		2.37	78.21	1.40	2.45	1	TOP SLAB	3.13	2.37	1	TOP SLAB	7.67	
		TNT4A		1.62	53.58	1.40	2.17	1	TOP SLAB	3.13	1.62	1	TOP SLAB	7.67	
		TNT6A		1.60	66.56	1.40	2.20	1	BOTTOM SLAB	8.00	1.60	1	TOP SLAB	7.67	
		TNT7A		1.62	68.04	1.40	2.18	1	BOTTOM SLAB	8.00	1.62	1	TOP SLAB	7.67	
		TNT7B		1.56	65.52	1.40	2.03	1	BOTTOM SLAB	8.00	1.56	1	TOP SLAB	7.67	
		TNAGRIT4		1.55	66.65	1.40	1.89	1	BOTTOM SLAB	8.00	1.55	1	TOP SLAB	7.67	
		TNAGT5A		1.55	69.75	1.40	1.88	1	BOTTOM SLAB	8.00	1.55	1	TOP SLAB	7.67	
		TNAGT5B		1.65	74.25	1.40	1.87	1	BOTTOM SLAB	8.00	1.65	1	BOTTOM SLAB	8.00	
EMERGENCY VEHICLE (EV)	EV2	28.750		1.73	49.74	1.30	1.73	1	TOP SLAB	3.13	1.75	1	TOP SLAB	7.67	
	EV3	43.000	4	1.15	49.45	1.30	1.58	1	TOP SLAB	3.13	1.15	1	TOP SLAB	7.67	

BOX 1 BOX 2

LRFR SUMMARY

(LOOKING DOWNSTREAM)

DRAWN BY : N. CUANY DATE : 03/2024  
CHECKED BY : M. ACOSTA DATE : 03/2024  
DESIGN ENGINEER OF RECORD: M. ACOSTA DATE : 08/2025

8/8/2025  
\\rsandh.com\\files\\Transportation\\P\\1030014001.Div 14 Bridges.2016\\1030014001.R.173 430187.188.189.190\\Design\\Structures\\188\\CAD\\411.003.BP14.R002.SMU.CU.002.430188.dgn  
AcostaM