

## 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>L1</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	1.07	--	1.75	1.07	1	TOP SLAB	5.38	1.25	1	TOP SLAB	0.75		
	HL-93 (OPERATING)	N/A		1.39	--	1.35	1.39	1	TOP SLAB	5.38	1.62	1	TOP SLAB	0.75		
	HS-20 (INVENTORY)	36,000	②	1.16	41.76	1.75	1.16	1	TOP SLAB	5.38	1.38	1	TOP SLAB	0.75		
	HS-20 (OPERATING)	36,000		1.50	54.00	1.35	1.50	1	TOP SLAB	5.38	1.79	1	TOP SLAB	0.75		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		2.11	28.49	1.40	2.11	1	TOP SLAB	5.38	2.95	1	TOP SLAB	0.75	
		SNGARBS2	20,000		1.97	39.40	1.40	1.97	1	TOP SLAB	5.38	2.69	1	TOP SLAB	0.75	
		SNAGRIS2	22,000		2.11	46.42	1.40	2.11	1	TOP SLAB	5.38	2.95	1	TOP SLAB	0.75	
		SNCOTTS3	27,250	③	1.47	40.06	1.40	1.51	1	TOP SLAB	5.38	1.47	1	TOP SLAB	0.75	
		SNAGGRS4	34,925		1.47	51.34	1.40	1.47	1	BOTTOM SLAB	5.38	2.09	1	BOTTOM SLAB	0.75	
		SNS5A	35,550		1.55	55.10	1.40	1.55	1	BOTTOM SLAB	5.38	1.87	1	TOP SLAB	0.75	
		SNS6A	39,950		1.54	61.52	1.40	1.54	1	BOTTOM SLAB	5.38	1.87	1	TOP SLAB	0.75	
		SNS7B	42,000		1.55	65.10	1.40	1.55	1	BOTTOM SLAB	5.38	1.88	1	TOP SLAB	0.75	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.94	64.02	1.40	1.94	1	BOTTOM SLAB	5.38	2.71	1	BOTTOM SLAB	0.75	
		TNT4A	33,075		1.80	59.54	1.40	1.80	1	TOP SLAB	5.38	1.89	1	TOP SLAB	0.75	
		TNT6A	41,600		1.56	64.90	1.40	1.56	1	BOTTOM SLAB	5.38	1.93	1	TOP SLAB	0.75	
		TNT7A	42,000		1.68	70.56	1.40	1.68	1	BOTTOM SLAB	5.38	1.95	1	TOP SLAB	0.75	
		TNT7B	42,000		1.55	65.10	1.40	1.55	1	BOTTOM SLAB	5.38	1.88	1	TOP SLAB	0.75	
		TNAGRIT4	43,000		1.80	77.40	1.40	1.80	1	TOP SLAB	5.38	1.89	1	TOP SLAB	0.75	
		TNAGT5A	45,000		1.81	81.45	1.40	1.81	1	BOTTOM SLAB	5.38	1.94	1	TOP SLAB	0.75	
TNAGT5B	45,000		1.80	81.00	1.40	1.80	1	TOP SLAB	5.38	1.89	1	TOP SLAB	0.75			

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	--

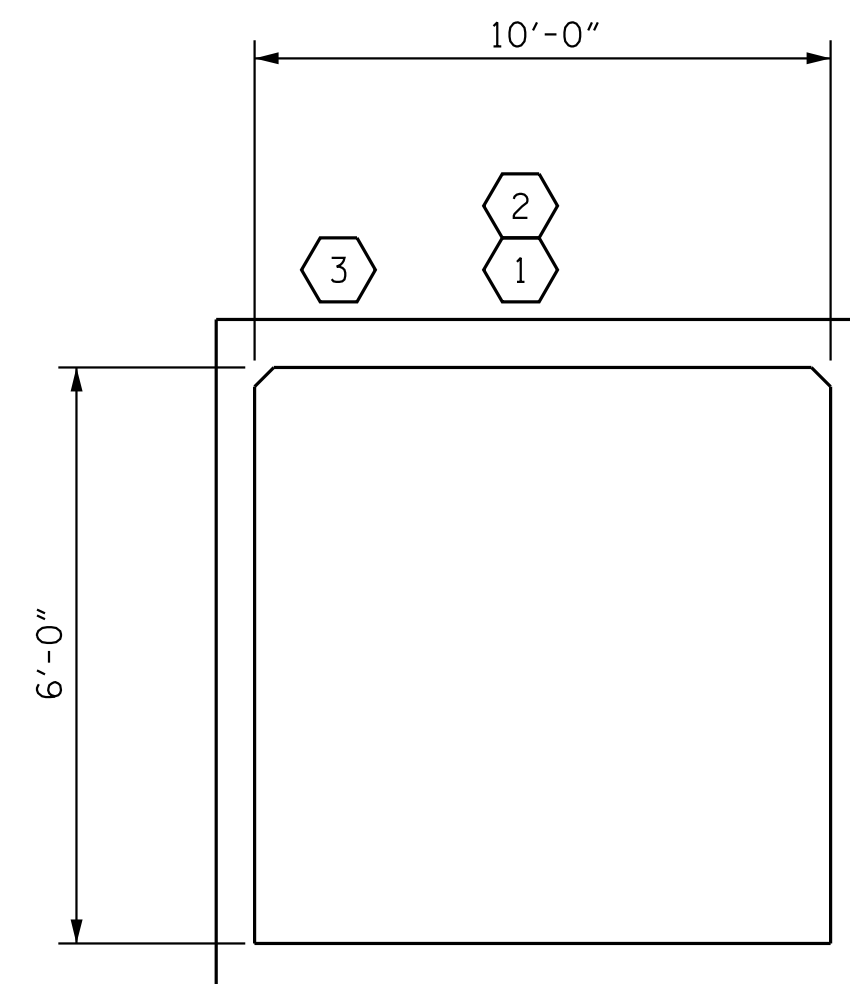
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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

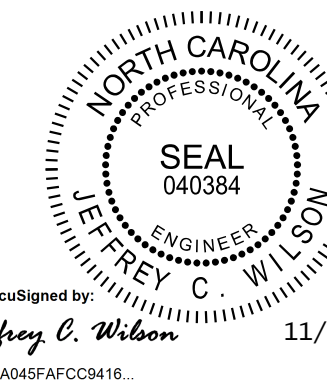
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE



**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. U-5724  
WAYNE COUNTY  
 STATION: 44+87.00 -Y2-

SHEET 8 OF 8



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-8
1			3			TOTAL SHEETS
2			4			8

**Kimley»Horn**  
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 Raleigh, NC 27601-1772  
 Phone (919) 677-2000 NC LICENSE # F-0102

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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ASSEMBLED BY : J.J. KIMBLE	DATE : 11/19
CHECKED BY : J.C. WILSON	DATE : 11/19
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THC

STD. NO. LRFR5