

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	1.55	--	1.75	1.63	1	TOP SLAB	4.33	1.55	1	BOTTOM SLAB	0.87		
	HL-93 (OPERATING)	N/A		2.01	--	1.35	2.11	1	TOP SLAB	4.33	2.01	1	BOTTOM SLAB	0.87		
	HS-20 (INVENTORY)	36.000	2	2.11	75.96	1.75	2.22	1	TOP SLAB	4.33	2.11	1	BOTTOM SLAB	0.87		
	HS-20 (OPERATING)	36.000		2.73	98.28	1.35	2.88	1	TOP SLAB	4.33	2.73	1	BOTTOM SLAB	0.87		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		3.73	50.36	1.40	3.73	1	EXTERIOR WALL	0.38	3.83	1	BOTTOM SLAB	0.87		
		SNGARBS2	20.000		3.58	71.60	1.40	3.60	1	EXTERIOR WALL	0.38	3.58	1	BOTTOM SLAB	0.87	
		SNAGRIS2	22.000		3.73	82.06	1.40	3.73	1	EXTERIOR WALL	0.38	3.83	1	BOTTOM SLAB	0.87	
		SNCOTTS3	27.250	3	2.04	55.59	1.40	2.04	1	TOP SLAB	4.33	2.18	1	BOTTOM SLAB	0.87	
		SNAGGRS4	34.925		2.23	77.88	1.40	2.35	1	TOP SLAB	4.33	2.23	1	BOTTOM SLAB	0.87	
		SNS5A	35.550		2.24	79.63	1.40	2.26	1	TOP SLAB	4.33	2.24	1	BOTTOM SLAB	0.87	
		SNS6A	39.950		2.20	87.89	1.40	2.26	1	TOP SLAB	4.33	2.20	1	BOTTOM SLAB	0.87	
		SNS7B	42.000		2.20	92.40	1.40	2.26	1	TOP SLAB	4.33	2.20	1	BOTTOM SLAB	0.87	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.73	123.09	1.40	3.73	1	EXTERIOR WALL	0.38	3.83	1	BOTTOM SLAB	0.87	
		TNT4A	33.075		2.42	80.04	1.40	2.42	1	TOP SLAB	4.33	2.60	1	BOTTOM SLAB	0.87	
		TNT6A	41.600		2.29	95.26	1.40	2.33	1	TOP SLAB	4.33	2.29	1	BOTTOM SLAB	0.87	
		TNT7A	42.000		2.38	99.96	1.40	2.38	1	TOP SLAB	4.33	2.44	1	BOTTOM SLAB	0.87	
		TNT7B	42.000		2.24	94.08	1.40	2.32	1	TOP SLAB	4.33	2.24	1	BOTTOM SLAB	0.87	
		TNAGRIT4	43.000		2.42	104.06	1.40	2.42	1	TOP SLAB	4.33	2.60	1	BOTTOM SLAB	0.87	
TNAGT5A	45.000		2.42	108.90	1.40	2.42	1	TOP SLAB	4.33	2.60	1	BOTTOM SLAB	0.87			
TNAGT5B	45.000		2.42	108.90	1.40	2.42	1	TOP SLAB	4.33	2.60	1	BOTTOM SLAB	0.87			

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.

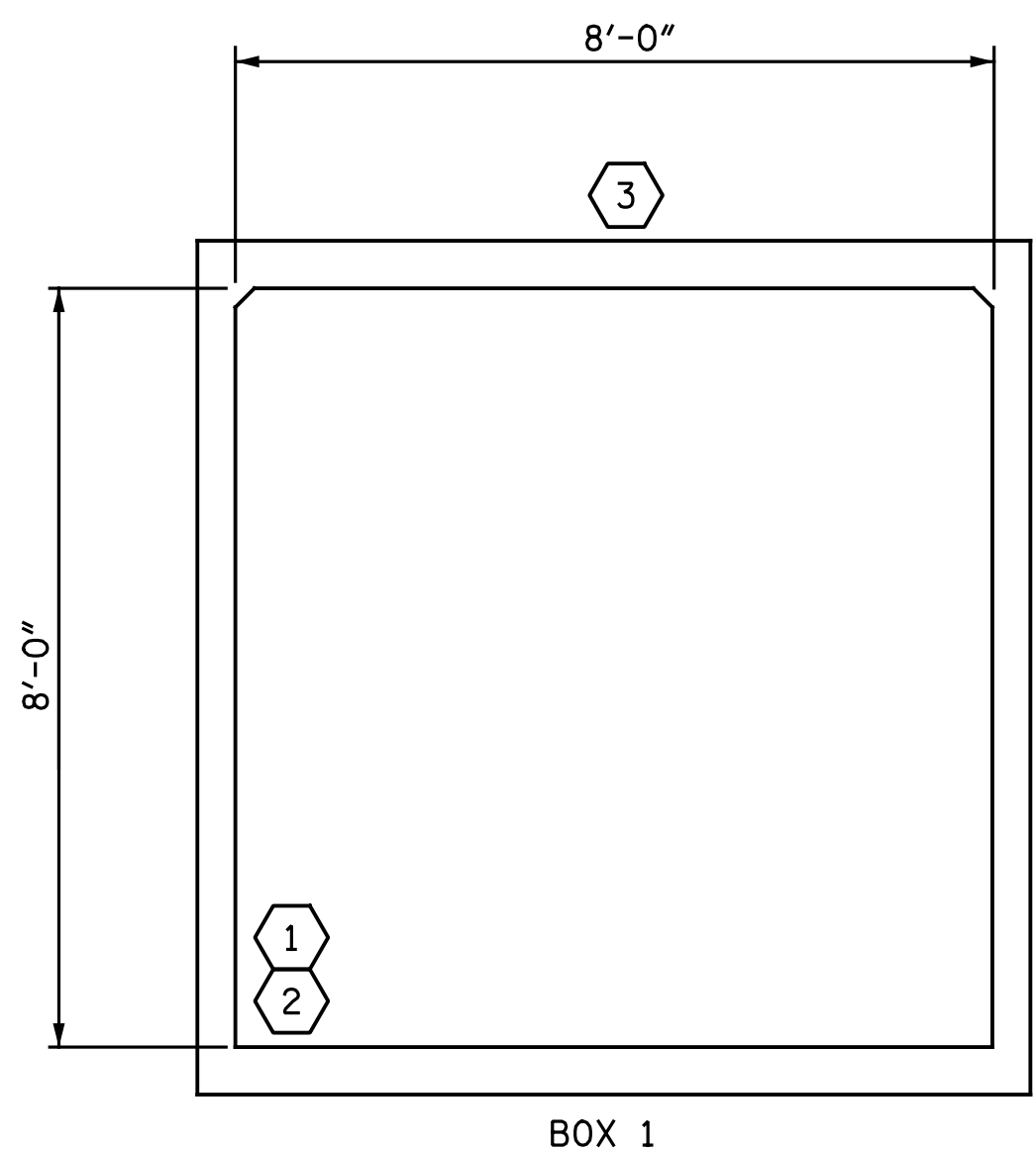
CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

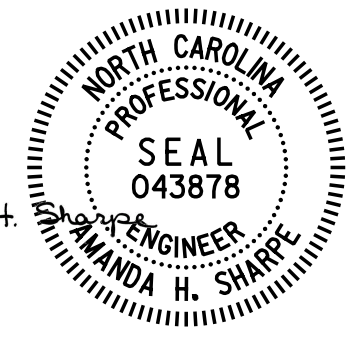
** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. I-5878
HARNETT COUNTY
 STATION: 15+47.41 -NBCD-

DocuSigned by:
Amanda H. Sharpe
 4108FF4E2E402
 4/10/2020



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

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	CI-6
1			3			TOTAL SHEETS
2			4			6

ASSEMBLED BY : N. B. SPEAKS	DATE : 1-31-20
CHECKED BY : A. H. SHARPE	DATE : 2-6-20
DRAWN BY : WMC 7/II	REV. 10/1/II MAA/GM
CHECKED BY : GM 7/II	REV. 12/17 MAA/THC