

**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	1.88	--	1.75	1.88	1	TOP CORNER WALL	0.85	1.93	1	EXTERIOR WALL	10.14		
	HL-93 (OPERATING)	N/A		2.44	--	1.35	2.44	1	TOP CORNER WALL	0.85	2.50	1	EXTERIOR WALL	10.14		
	HS-20 (INVENTORY)	36.00	②	1.88	67.74	1.75	1.88	1	TOP CORNER WALL	0.85	1.93	1	EXTERIOR WALL	10.14		
	HS-20 (OPERATING)	36.00		2.44	87.81	1.35	2.44	1	TOP CORNER WALL	0.85	2.50	1	EXTERIOR WALL	10.14		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50	③	2.35	31.75	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNGARBS2	20.00		2.35	47.04	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNAGRIS2	22.00		2.35	51.75	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNCOTTS3	27.25		2.35	64.09	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNAGGRS4	34.93		2.35	82.15	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNS5A	35.55		2.35	83.62	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNS6A	39.95		2.35	93.96	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		SNS7B	42.00		2.35	98.79	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		2.35	77.62	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		TNT4A	33.08		2.35	77.79	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		TNT6A	41.60		2.35	97.85	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		TNT7A	42.00		2.35	98.79	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		TNT7B	42.00		2.35	98.79	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
		TNAGRIT4	43.00		2.35	101.14	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14	
TNAGT5A	45.00		2.35	105.84	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14			
TNAGT5B	45.00		2.35	105.84	1.40	2.35	1	TOP CORNER WALL	0.85	2.41	1	EXTERIOR WALL	10.14			

**LOAD FACTORS:**

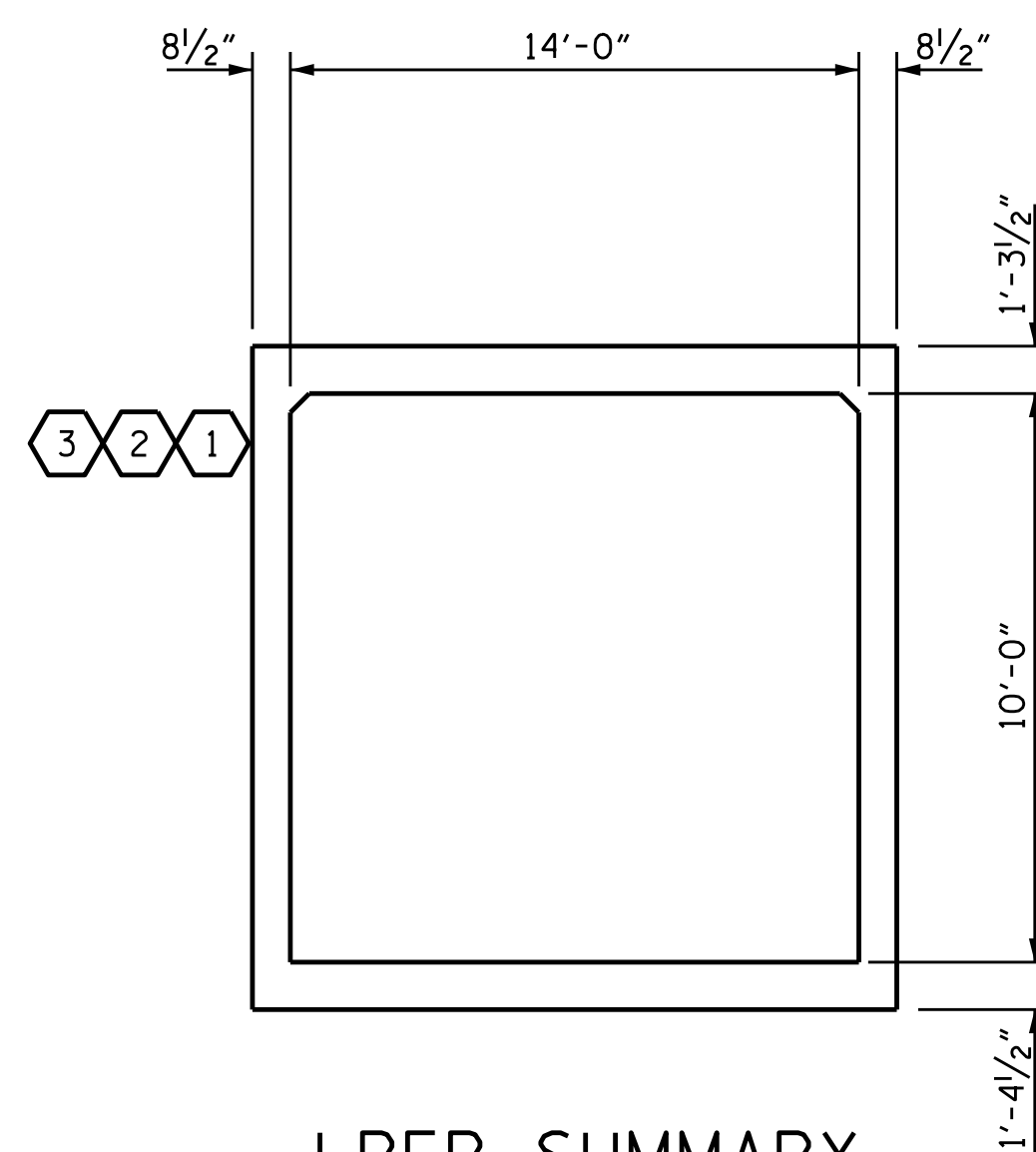
DESIGN LOAD RATING FACTORS

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	

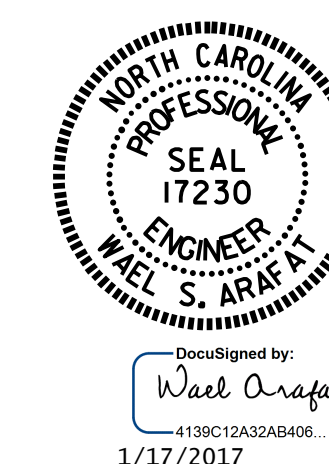


**LRFR SUMMARY**

(LOOKING DOWNSTREAM)

PROJECT NO. I-5000  
GASTON COUNTY  
 STATION: 31+64.31 -RPD

SHEET 2 OF 4



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

ASSEMBLED BY :	H. T. BARBOUR	DATE :	8-19-16
CHECKED BY :	H. B. DESAI	DATE :	10-3-16
DRAWN BY :	WMC	7/11	REV. 10/1/11
CHECKED BY :	GM	7/11	MAA/GM

DESIGN ENGINEER OF RECORD:  
O. PUIGSERVER DATE : 10-31-16

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

C-9  
 TOTAL SHEETS  
 26