

**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	1.08	--	1.75	1.08	1	BOTTOM SLAB	5.33	1.19	1	TOP SLAB	0.81		
	HL-93 (OPERATING)	N/A		1.40	--	1.35	1.40	1	BOTTOM SLAB	5.33	1.54	1	TOP SLAB	0.81		
	HS-20 (INVENTORY)	36.000	②	1.52	54.85	1.75	1.52	1	BOTTOM SLAB	5.33	1.56	1	TOP SLAB	0.81		
	HS-20 (OPERATING)	36.000		1.98	71.10	1.35	1.98	1	BOTTOM SLAB	5.33	2.02	1	TOP SLAB	0.81		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.78	37.48	1.40	2.78	1	BOTTOM SLAB	5.33	2.82	1	TOP SLAB	0.81		
		SNGARBS2	20.000		2.60	52.01	1.40	2.60	1	BOTTOM SLAB	5.33	2.64	1	TOP SLAB	0.81	
		SNAGRIS2	22.000		2.78	61.08	1.40	2.78	1	BOTTOM SLAB	5.33	2.82	1	TOP SLAB	0.81	
		SNCOTTS3	27.250	③	1.36	36.95	1.40	1.36	1	BOTTOM SLAB	5.33	1.48	1	TOP SLAB	0.81	
		SNAGGRS4	34.925		1.46	51.04	1.40	1.46	1	BOTTOM SLAB	5.33	1.59	1	BOTTOM SLAB	0.87	
		SNS5A	35.550		1.46	51.94	1.40	1.46	1	BOTTOM SLAB	5.33	1.59	1	BOTTOM SLAB	0.87	
		SNS6A	39.950		1.46	58.37	1.40	1.46	1	BOTTOM SLAB	5.33	1.59	1	BOTTOM SLAB	0.87	
		SNS7B	42.000		1.46	61.37	1.40	1.46	1	BOTTOM SLAB	5.33	1.59	1	BOTTOM SLAB	0.87	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.39	78.89	1.40	2.39	1	BOTTOM SLAB	5.33	2.56	1	BOTTOM SLAB	0.87	
		TNT4A	33.075		1.62	53.55	1.40	1.62	1	BOTTOM SLAB	5.33	1.76	1	TOP SLAB	0.81	
		TNT6A	41.600		1.43	59.55	1.40	1.43	1	BOTTOM SLAB	5.33	1.56	1	BOTTOM SLAB	0.87	
		TNT7A	42.000		1.55	65.02	1.40	1.55	1	BOTTOM SLAB	5.33	1.69	1	BOTTOM SLAB	0.87	
		TNT7B	42.000		1.47	61.55	1.40	1.47	1	BOTTOM SLAB	5.33	1.59	1	BOTTOM SLAB	0.87	
		TNAGRIT4	43.000		1.54	66.35	1.40	1.54	1	BOTTOM SLAB	5.33	1.68	1	TOP SLAB	0.81	
		TNAGT5A	45.000		1.58	71.00	1.40	1.58	1	BOTTOM SLAB	5.33	1.72	1	TOP SLAB	0.81	
		TNAGT5B	45.000		1.62	72.86	1.40	1.62	1	BOTTOM SLAB	5.33	1.76	1	TOP SLAB	0.81	

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	--

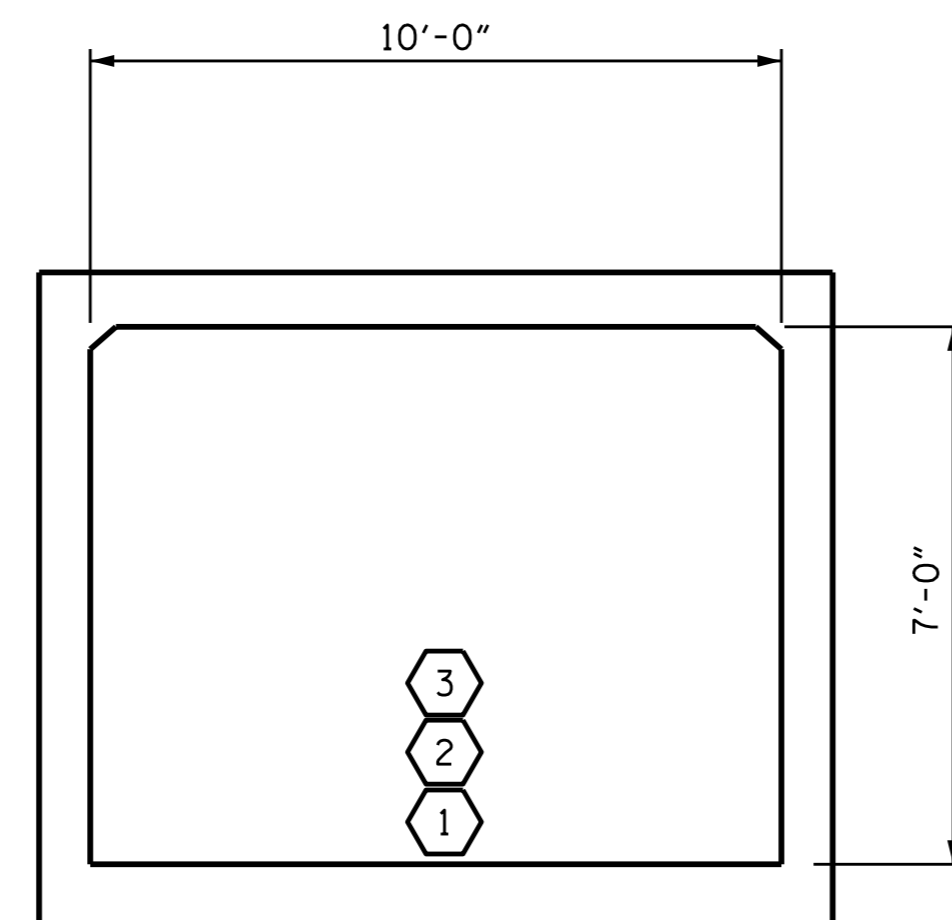
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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

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

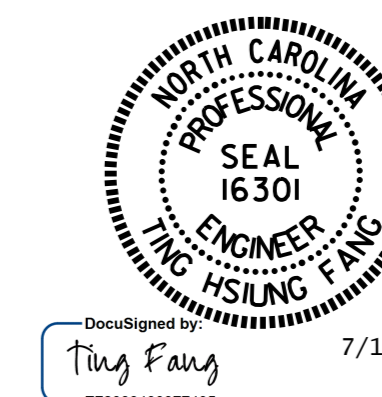


LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. U-2524D
GUILFORD COUNTY
 STATION: 1+26.46 -SPBY8-

SHEET 7 OF 7



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

REVISIONS						SHEET NO. C-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 34
2			4			

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

ASSEMBLED BY : P. K. NEWTON	DATE : 7/8/16
CHECKED BY : T. H. FANG	DATE : 7/11/16
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : CM 7/11	