

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	1.26	--	1.75	1.95	1	TOP SLAB	4.667	1.26	2	TOP SLAB	0.333	.
	HL-93 (OPERATING)	N/A	.	1.63	--	1.35	2.52	1	TOP SLAB	4.667	1.63	2	TOP SLAB	0.333	
	HS-20 (INVENTORY)	36.000	②	1.32	47:52	1.75	2.03	1	TOP SLAB	4.667	1.32	2	TOP SLAB	0.333	
	HS-20 (OPERATING)	36.000	.	1.71	61:56	1.35	2.63	1	TOP SLAB	4.667	1.71	2	TOP SLAB	0.333	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	.	2.43	32:81	1.40	3.66	1	TOP SLAB	4.667	2.43	2	TOP SLAB	0.333	
		SNGARBS2	.	2.26	45:20	1.40	3.25	1	BOTTOM SLAB	0.333	2.26	2	TOP SLAB	0.333	
		SNAGRIS2	.	2.37	52:14	1.40	3.08	1	BOTTOM SLAB	0.333	2.37	2	TOP SLAB	0.333	
		SNCOTTS3	.	1.45	39:51	1.40	2.27	1	TOP SLAB	4.667	1.45	2	TOP SLAB	0.333	
		SNAGGRS4	.	1.75	61:12	1.40	2.02	1	BOTTOM SLAB	0.333	1.75	2	TOP SLAB	0.333	
		SNS5A	.	1.63	57:95	1.40	2.05	1	BOTTOM SLAB	0.333	1.63	2	TOP SLAB	0.333	
		SNS6A	.	1.60	63:92	1.40	2.08	1	BOTTOM SLAB	0.333	1.60	2	TOP SLAB	0.333	
		SNS7B	.	1.60	67:20	1.40	2.00	1	BOTTOM SLAB	0.333	1.60	2	TOP SLAB	0.333	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	.	1.94	64:02	1.40	2.23	1	BOTTOM SLAB	0.333	1.94	2	BOTTOM SLAB	0.333	
		TNT4A	.	1.65	54:57	1.40	2.34	1	BOTTOM SLAB	0.333	1.65	2	TOP SLAB	0.333	
		TNT6A	.	1.60	66:56	1.40	2.07	1	BOTTOM SLAB	0.333	1.60	2	TOP SLAB	0.333	
		TNT7A	.	1.61	67:62	1.40	2.02	1	BOTTOM SLAB	0.333	1.61	2	TOP SLAB	0.333	
		TNT7B	.	1.64	68:88	1.40	2.11	1	BOTTOM SLAB	0.333	1.64	2	TOP SLAB	0.333	
		TNAGRIT4	.	1.60	68:80	1.40	2.01	1	BOTTOM SLAB	0.333	1.60	2	TOP SLAB	0.333	
TNAGT5A	.	1.60	72:00	1.40	2.09	1	BOTTOM SLAB	0.333	1.60	2	TOP SLAB	0.333			
TNAGT5B	.	1.54	69:30	1.40	1.79	1	BOTTOM SLAB	0.333	1.54	2	BOTTOM SLAB	0.333			

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.

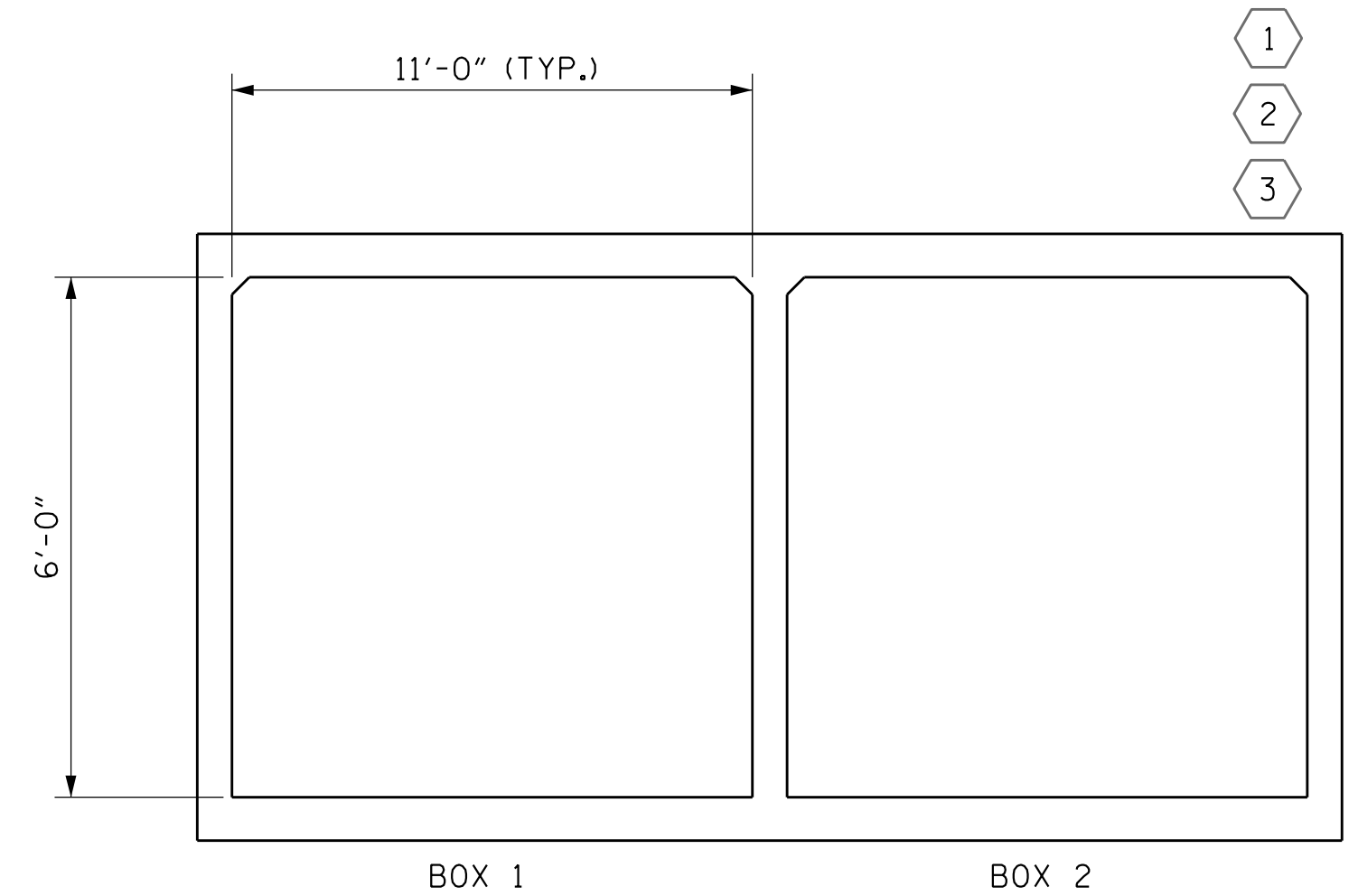
CONTROLLING LOAD RATING

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. R-5819
COLUMBUS COUNTY
 STATION: 65+70.00 -Y7-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

PLANS PREPARED BY:

NV5

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PROFESSIONAL ENGINEER

Kevin Austin

KEVIN AUSTIN

4/11/2022

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			C-2
2			4			7

ASSEMBLED BY : JAP	DATE : 2/22
CHECKED BY : LKA	DATE : 2/22
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THG