

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_{LL})	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	1.06	--	1.75	1.53	1	TOP SLAB	5.00	1.06	1	BOTTOM SLAB	10.95		
	HL-93 (OPERATING)	N/A		1.38	--	1.35	1.98	1	TOP SLAB	5.00	1.38	1	BOTTOM SLAB	10.95		
	HS-20 (INVENTORY)	36,000	②	1.21	43.56	1.75	1.70	1	TOP SLAB	5.00	1.21	1	BOTTOM SLAB	10.95		
	HS-20 (OPERATING)	36,000		1.57	56.52	1.35	2.20	1	TOP SLAB	5.00	1.57	1	BOTTOM SLAB	10.95		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		3.09	41.72	1.40	3.09	1	TOP SLAB	5.00	3.58	1	BOTTOM SLAB	10.95	
		SNGARBS2	20,000		2.42	48.40	1.40	2.89	1	TOP SLAB	5.00	2.42	1	BOTTOM SLAB	10.95	
		SNAGRIS2	22,000		2.21	48.62	1.40	3.09	1	TOP SLAB	5.00	2.21	1	BOTTOM SLAB	10.95	
		SNCOTTS3	27,250		1.64	44.69	1.40	2.01	1	TOP SLAB	5.00	1.64	1	TOP SLAB	10.50	
		SNAGGRS4	34,925		1.39	48.55	1.40	2.14	1	BOTTOM SLAB	11.67	1.39	1	BOTTOM SLAB	10.95	
		SNS5A	35,550		1.37	48.70	1.40	2.02	1	BOTTOM SLAB	11.67	1.37	1	BOTTOM SLAB	10.95	
		SNS6A	39,950		1.37	54.73	1.40	2.01	1	BOTTOM SLAB	11.67	1.37	1	BOTTOM SLAB	10.95	
		SNS7B	42,000		1.28	53.76	1.40	1.92	1	BOTTOM SLAB	11.67	1.28	1	BOTTOM SLAB	10.95	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.48	48.84	1.40	2.22	1	BOTTOM SLAB	11.67	1.48	1	BOTTOM SLAB	10.95	
		TNT4A	33,075		1.47	48.62	1.40	2.23	1	BOTTOM SLAB	11.67	1.47	1	BOTTOM SLAB	10.95	
		TNT6A	41,600		1.37	56.99	1.40	2.03	1	BOTTOM SLAB	11.67	1.37	1	BOTTOM SLAB	10.95	
		TNT7A	42,000		1.28	53.76	1.40	1.91	1	BOTTOM SLAB	11.67	1.28	1	BOTTOM SLAB	10.95	
		TNT7B	42,000		1.40	58.80	1.40	2.06	1	BOTTOM SLAB	11.67	1.40	1	BOTTOM SLAB	10.95	
		TNAGRIT4	43,000	③	1.14	49.02	1.40	1.77	1	BOTTOM SLAB	11.67	1.14	1	BOTTOM SLAB	10.95	
TNAGT5A	45,000		1.27	57.15	1.40	1.95	1	BOTTOM SLAB	11.67	1.27	1	BOTTOM SLAB	10.95			
TNAGT5B	45,000		1.16	52.20	1.40	1.74	1	BOTTOM SLAB	11.67	1.16	1	BOTTOM SLAB	10.95			

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	--

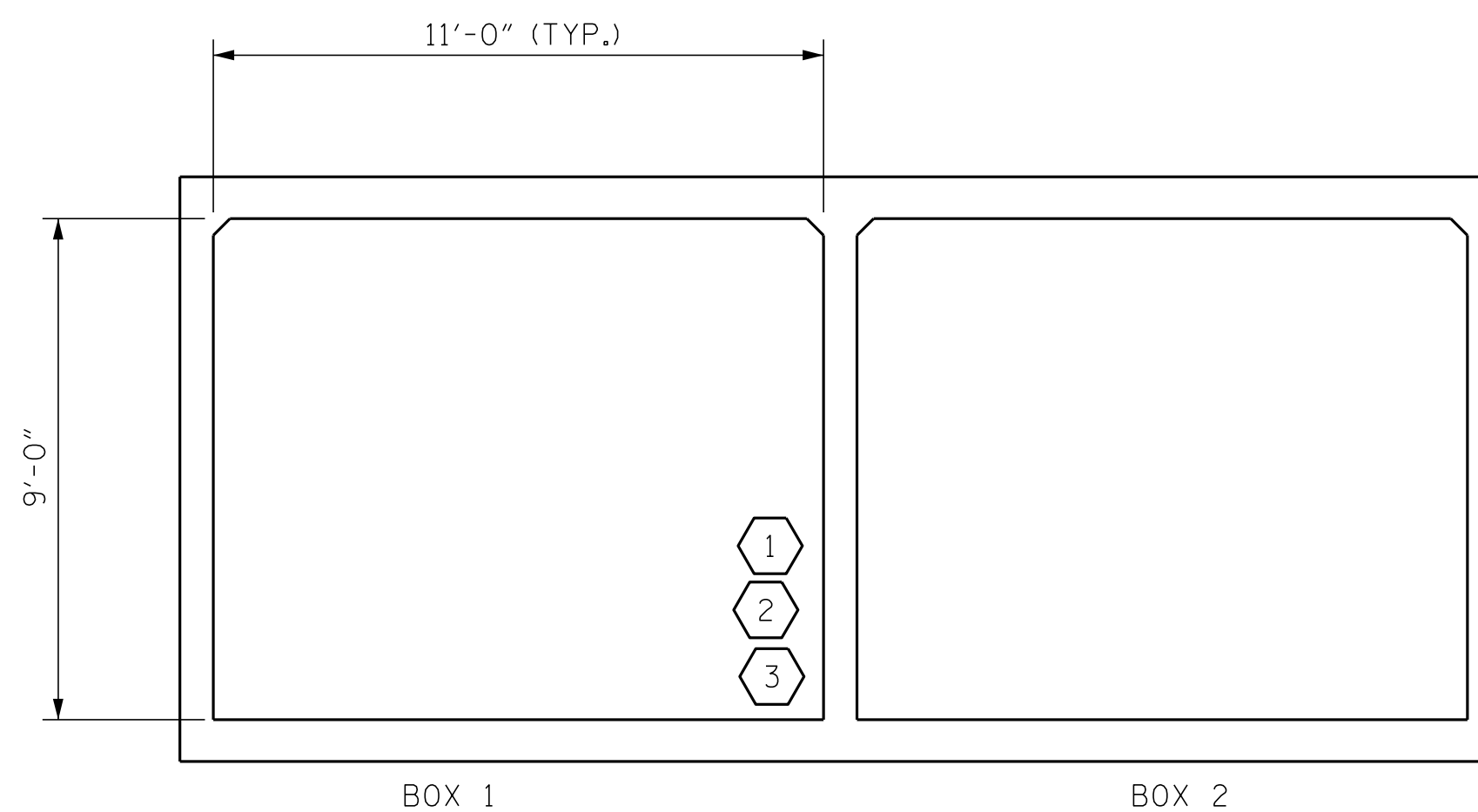
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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

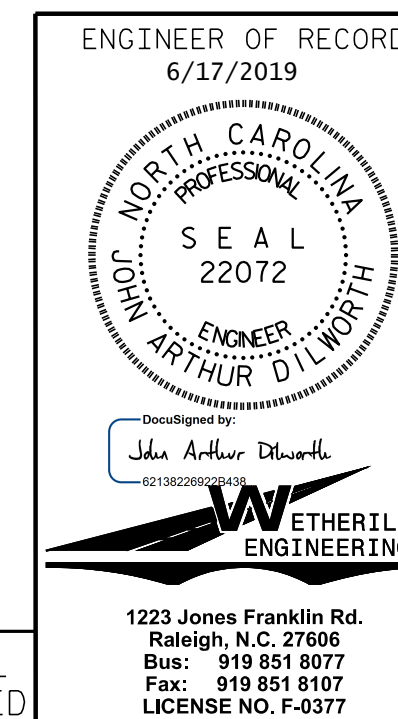
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. U-5888
HAYWOOD COUNTY
STATION: 14+99.00 -Y4-

SHEET 2 OF 11



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:	C2
1			3			TOTAL SHEETS
2			4			11

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : B.C. HUNT	DATE : 11-2018
CHECKED BY : J. DILWORTH	DATE : 1-2019
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	REV. 12/17 MAA/THC