

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	1.06	--	1.75	1.06	1	TOP SLAB	4.11	1.13	1	TOP SLAB	8.67		
	HL-93 (OPERATING)	N/A		1.38	--	1.35	1.38	1	TOP SLAB	4.11	1.46	1	TOP SLAB	8.67		
	HS-20 (INVENTORY)	36.000	②	1.10	39.42	1.75	1.10	1	TOP SLAB	4.11	1.26	1	TOP SLAB	8.67		
	HS-20 (OPERATING)	36.000		1.42	51.10	1.35	1.42	1	TOP SLAB	4.11	1.64	1	TOP SLAB	8.67		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.00	27.02	1.40	2.00	1	TOP SLAB	4.11	2.30	1	TOP SLAB	8.67		
		SNGARBS2	20.000		1.87	37.48	1.40	1.87	1	TOP SLAB	4.11	2.15	1	TOP SLAB	8.67	
		SNAGRIS2	22.000		2.00	44.03	1.40	2.00	1	TOP SLAB	4.11	2.30	1	TOP SLAB	8.67	
		SNCOTTS3	27.250	③	1.33	36.24	1.40	1.33	1	TOP SLAB	4.11	1.41	1	TOP SLAB	8.67	
		SNAGGRS4	34.925		1.58	55.35	1.40	1.73	1	TOP SLAB	4.35	1.58	1	BOTTOM SLAB	8.73	
		SNS5A	35.550		1.57	55.78	1.40	1.62	1	TOP SLAB	4.11	1.57	1	TOP SLAB	8.67	
		SNS6A	39.950		1.48	58.96	1.40	1.62	1	TOP SLAB	4.11	1.48	1	BOTTOM SLAB	8.73	
		SNS7B	42.000		1.53	64.37	1.40	1.69	1	TOP SLAB	3.87	1.53	1	BOTTOM SLAB	8.73	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.98	65.36	1.40	2.00	1	TOP SLAB	4.11	1.98	1	BOTTOM SLAB	8.73	
		TNT4A	33.075		1.60	52.78	1.40	1.60	1	TOP SLAB	4.11	1.68	1	TOP SLAB	8.67	
		TNT6A	41.600		1.63	67.77	1.40	1.63	1	TOP SLAB	4.11	1.63	1	TOP SLAB	8.67	
		TNT7A	42.000		1.63	68.33	1.40	1.66	1	TOP SLAB	4.11	1.63	1	TOP SLAB	8.67	
		TNT7B	42.000		1.60	67.02	1.40	1.60	1	TOP SLAB	4.11	1.68	1	TOP SLAB	8.67	
		TNAGRIT4	43.000		1.52	65.47	1.40	1.52	1	TOP SLAB	4.11	1.57	1	BOTTOM SLAB	8.73	
		TNAGT5A	45.000		1.41	63.43	1.40	1.56	1	TOP SLAB	4.11	1.41	1	BOTTOM SLAB	8.73	
		TNAGT5B	45.000		1.33	59.89	1.40	1.60	1	TOP SLAB	4.11	1.33	1	BOTTOM SLAB	8.73	

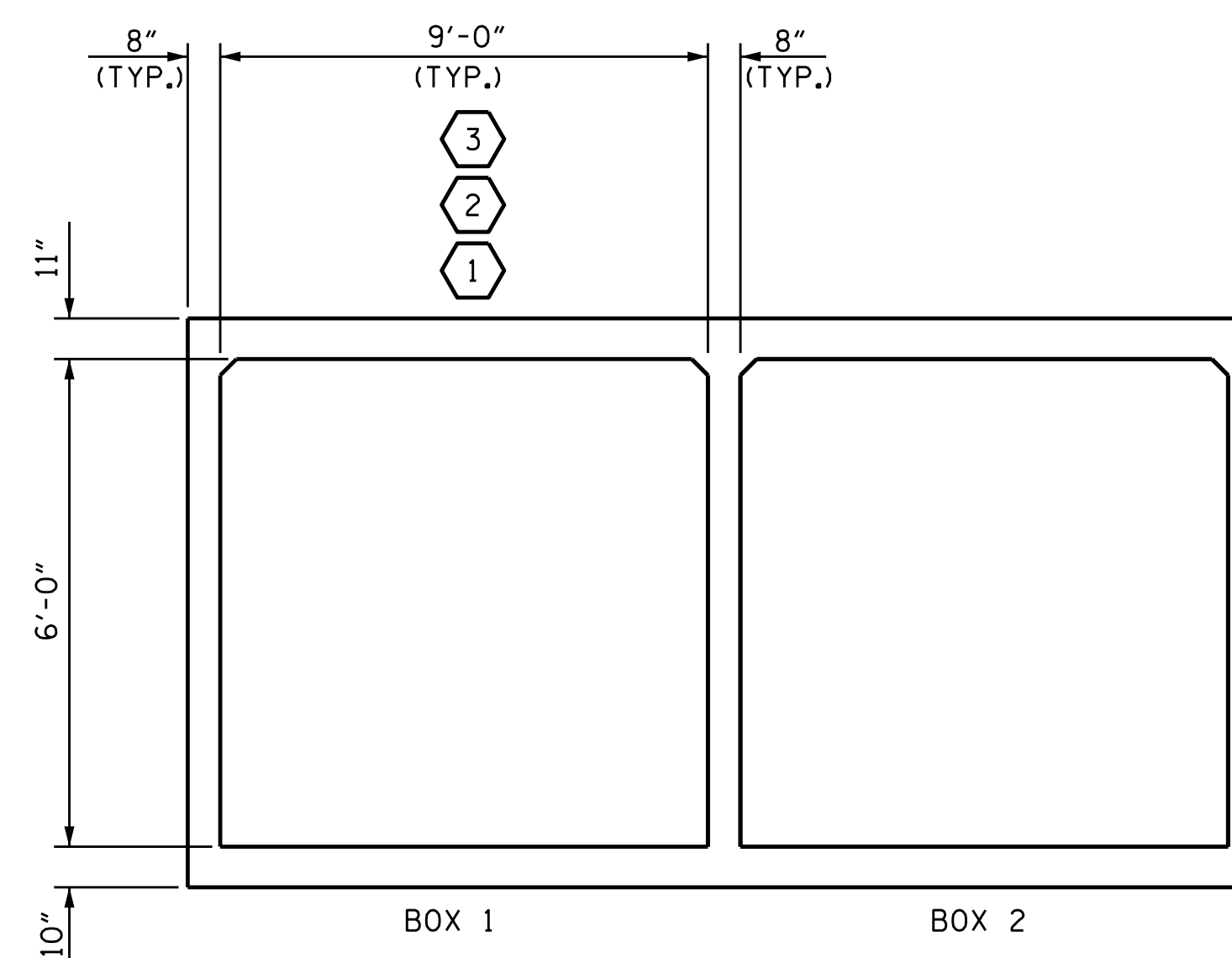
LOAD FACTORS:

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	

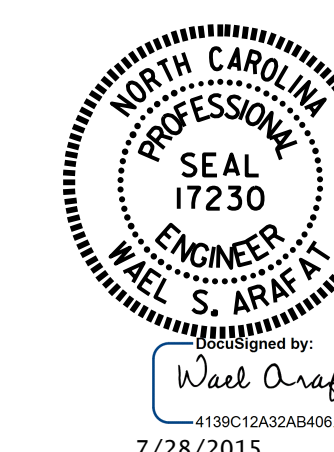


LRFR SUMMARY

(LOOKING UPSTREAM)

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 66+11.00 -L-

SHEET 9 OF 9



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:	C-9
1			3			TOTAL SHEETS
2			4			20

STR. #2

STD. NO. LRFR5

ASSEMBLED BY : V.X. NGUYEN DATE : 5-11-15
 CHECKED BY : H.T. BARBOUR DATE : 5-15
 DRAWN BY : WMC 7/II REV. 10/1/II MAA/GM
 CHECKED BY : CM 7/II

24-JUL-2015 14:03
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