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 × 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	1.00	--	1.75	1.43	1	TOP SLAB	3.45	1.00	1	TOP SLAB	6.67	
		HL-93 (OPERATING)	N/A		1.30	--	1.35	1.85	1	TOP SLAB	3.45	1.30	1	TOP SLAB	6.67	
		HS-20 (INVENTORY)	36.000	2	1.00	36.08	1.75	1.43	1	TOP SLAB	3.45	1.00	1	TOP SLAB	6.67	
		HS-20 (OPERATING)	36.000		1.30	46.77	1.35	1.85	1	TOP SLAB	3.45	1.30	1	TOP SLAB	6.67	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.82	24.58	1.40	2.60	1	TOP SLAB	3.26	1.82	1	TOP SLAB	6.67	
		SNGARBS2	20.000		1.71	34.10	1.40	2.44	1	TOP SLAB	3.26	1.71	1	TOP SLAB	6.67	
		SNAGRIS2	22.000		1.82	40.06	1.40	2.60	1	TOP SLAB	3.26	1.82	1	TOP SLAB	6.67	
		SNCOTTS3	27.250		1.28	35.00	1.40	1.81	1	BOTTOM SLAB	7.48	1.28	1	TOP SLAB	6.67	
		SNAGGRS4	34.925		1.38	48.12	1.40	1.77	1	BOTTOM SLAB	7.48	1.38	1	BOTTOM SLAB	6.85	
		SNS5A	35.550	3	1.20	42.49	1.40	1.63	1	BOTTOM SLAB	7.48	1.20	1	BOTTOM SLAB	6.85	
		SNS6A	39.950		1.25	49.96	1.40	1.61	1	BOTTOM SLAB	7.48	1.25	1	BOTTOM SLAB	6.85	
		SNS7B	42.000		1.25	52.52	1.40	1.61	1	BOTTOM SLAB	7.48	1.25	1	BOTTOM SLAB	6.85	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.67	55.18	1.40	2.21	1	BOTTOM SLAB	7.48	1.67	1	BOTTOM SLAB	6.85	
		TNT4A	33.075		1.44	47.79	1.40	1.82	1	BOTTOM SLAB	7.48	1.44	1	BOTTOM SLAB	6.85	
		TNT6A	41.600		1.41	58.68	1.40	1.79	1	BOTTOM SLAB	7.48	1.41	1	BOTTOM SLAB	6.85	
		TNT7A	42.000		1.47	61.58	1.40	1.99	1	BOTTOM SLAB	7.48	1.47	1	BOTTOM SLAB	6.85	
		TNT7B	42.000		1.26	52.74	1.40	1.62	1	BOTTOM SLAB	7.48	1.26	1	BOTTOM SLAB	6.85	
		TNAGRIT4	43.000		1.22	52.45	1.40	1.56	1	BOTTOM SLAB	7.48	1.22	1	BOTTOM SLAB	6.85	
		TNAGT5A	45.000		1.24	55.81	1.40	1.59	1	BOTTOM SLAB	7.48	1.24	1	BOTTOM SLAB	6.85	
		TNAGT5B	45.000		1.26	56.75	1.40	1.62	1	BOTTOM SLAB	7.48	1.26	1	BOTTOM SLAB	6.85	

LOAD FACTORS:

	LOAD TYPE	MAX FACTOR	MIN FACTOR
STRENGTH LIMIT STATE.	DC	1.25	0.90
	DW	1.50	0.65
	EV	1.30	0.90
DESIGN LOAD RATING FACTORS	EH	1.35	0.90
	ES	1.35	0.90
	LS	1.75	0.00
	WA	1.00	0.00

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.
LRFR RATING APPLIES TO RIGHT EXTENSION ONLY.

COMMENTS:

1. THIS LRFR RATING APLLIES TO THE RIGHT EXTENSION ONLY.
2.
3.
4.

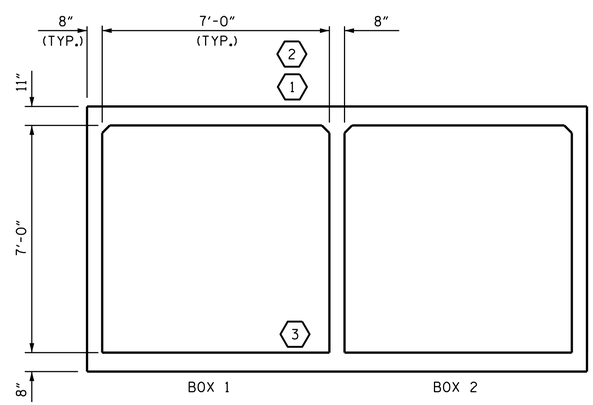
(#) CONTROLLING LOAD RATING

(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-2519B

MITCHELL COUNTY

STATION: 327+50.47 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHECK, JR.

8/27/2014 Marshall G. Check, Jr.
B5490E0EBAA3B405...

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-71
1			3					TOTAL SHEETS
2			4					87

ASSEMBLED BY : M.A. LEBLANC DATE : 9/13
CHECKED BY : V. NGUYEN DATE : 10/13
DRAWN BY : WMC 7/11
CHECKED BY : GM 7/11
REV. 10/1/11 MAA/GM

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$