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 $\gamma_{(LL)}$	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	1.10	--	1.75	2.43	1	Top Slab	3.90	1.10	1	Top Slab	7.73	
		HL-93 (OPERATING)	N/A		1.43	--	1.35	3.16	1	Top Slab	3.90	1.43	1	Top Slab	7.73	
		HS-20 (INVENTORY)	36.000	2	1.35	48.69	1.75	3.19	1	Bot Corner Wall	8.43	1.35	1	Top Slab	7.73	
		HS-20 (OPERATING)	36.000		1.75	63.11	1.35	4.14	1	Bot Corner Wall	8.43	1.75	1	Top Slab	7.73	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.17	42.80	1.40	4.37	1	Bot Corner Wall	8.43	3.17	1	Top Slab	7.73	
		SNGARBS2	20.000		2.52	50.34	1.40	4.29	1	Bot Corner Wall	8.43	2.52	1	Top Slab	7.73	
		SNAGRIS2	22.000		2.44	53.79	1.40	4.29	1	Bot Corner Wall	8.43	2.44	1	Top Slab	7.73	
		SNCOTTS3	27.250		1.38	37.63	1.40	3.04	1	Top Slab	3.90	1.38	1	Top Slab	7.73	
		SNAGGRS4	34.925		1.34	46.95	1.40	2.95	1	Top Slab	3.90	1.34	1	Top Slab	7.73	
		SNS5A	35.550		1.23	43.85	1.40	2.86	1	Top Slab	3.90	1.23	1	Top Slab	7.73	
		SNS6A	39.950		1.25	49.86	1.40	2.98	1	Top Slab	3.90	1.25	1	Top Slab	7.73	
		SNS7B	42.000	3	1.22	51.18	1.40	2.92	1	Top Slab	3.90	1.22	1	Top Slab	7.73	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.56	51.46	1.40	3.73	1	Top Slab	3.90	1.56	1	Top Slab	7.73	
		TNT4A	33.075		1.54	51.06	1.40	3.64	1	Top Slab	3.90	1.54	1	Top Slab	7.73	
		TNT6A	41.600		1.33	55.22	1.40	3.15	1	Top Slab	3.90	1.33	1	Top Slab	7.73	
		TNT7A	42.000		1.47	61.58	1.40	3.59	1	Top Slab	3.90	1.47	1	Top Slab	7.73	
		TNT7B	42.000		1.31	54.97	1.40	3.18	1	Top Slab	3.90	1.31	1	Top Slab	7.73	
		TNAGRIT4	43.000		1.28	55.13	1.40	3.46	1	Top Slab	3.90	1.28	1	Top Slab	7.73	
		TNAGT5A	45.000		1.31	58.84	1.40	3.54	1	Top Slab	3.90	1.31	1	Top Slab	7.73	
		TNAGT5B	45.000		1.29	58.21	1.40	3.46	1	Top Slab	3.90	1.29	1	Top Slab	7.73	

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.

COMMENTS:

1. THIS LRFR RATING APPLIES TO LEFT EXTENSION ONLY.

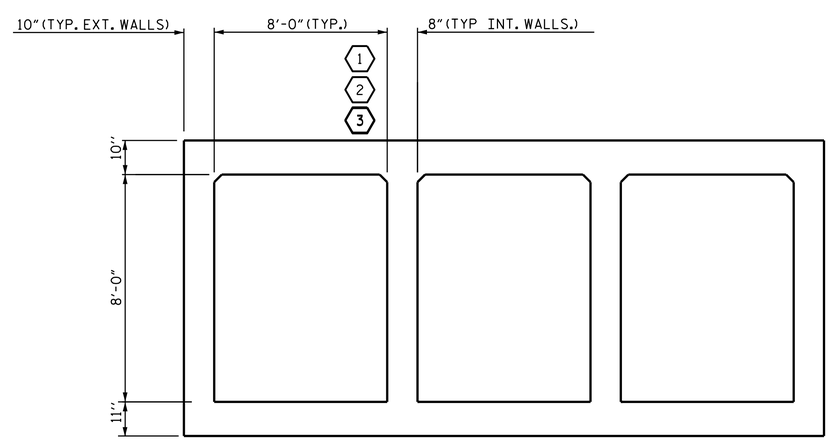
(#) CONTROLLING LOAD RATING

(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: 319+76.16 -L-

SHEET 13 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-53
1			3			TOTAL SHEETS
2			4			87

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

8/27/2014 Marshall G. Cheek, Jr.

DRAWN BY : M.A. LEBLANC DATE : 10/13
CHECKED BY : B.C. HUNT DATE : 10/13
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 10/13

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

STR. #10