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	4.93	--	1.75	9.59	1	BOT CORNER WALL	6.55	4.93	1	EXTERIOR WALL	0.98	
		HL-93 (OPERATING)	N/A		6.39	--	1.35	12.44	1	BOT CORNER WALL	6.55	6.39	1	EXTERIOR WALL	0.98	
		HS-20 (INVENTORY)	36.00	2	4.93	177.50	1.75	9.59	1	BOT CORNER WALL	6.55	4.93	1	EXTERIOR WALL	0.98	
		HS-20 (OPERATING)	36.00		6.39	230.09	1.35	12.44	1	BOT CORNER WALL	6.55	6.39	1	EXTERIOR WALL	0.98	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50	3	6.15	82.98	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNGARBS2	20.00		6.15	122.93	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNAGRIS2	22.00		6.15	135.22	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNCOTTS3	27.25		6.15	167.49	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNAGGRS4	34.93		6.15	214.67	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNS5A	35.55		6.15	218.51	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNS6A	39.95		6.15	245.55	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		SNS7B	42.00		6.15	258.15	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		6.15	202.83	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNT4A	33.08		6.15	203.30	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNT6A	41.60		6.15	255.69	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNT7A	42.00		6.15	258.15	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNT7B	42.00		6.15	258.15	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNAGRIT4	43.00		6.15	264.30	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNAGT5A	45.00		6.15	276.59	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	
		TNAGT5B	45.00		6.15	276.59	1.40	11.98	1	BOT CORNER WALL	6.55	6.15	1	EXTERIOR WALL	0.98	

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.

COMMENTS:

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

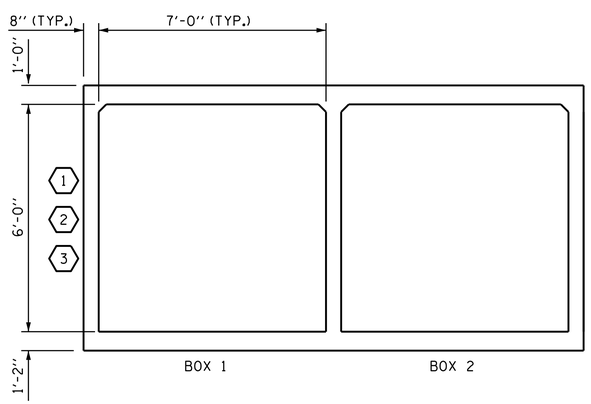
(#) CONTROLLING LOAD RATING

(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: 345+98.42 -L-

SHEET 6 OF 6

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.

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-77
1			3					TOTAL SHEETS
2			4					87

ASSEMBLED BY : V.X. NGUYEN	DATE : 6-4-13		
CHECKED BY : M.E. POOLE	DATE : 8/2013		
DRAWN BY : WMC 7/11	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 7/11			

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

STR. #13