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	1.53	--	1.75	1.53	1	Exterior Wall	6.23	1.53	1	Top Slab	7.82	
		HL-93 (OPERATING)	N/A		1.99	--	1.35	1.99	1	Exterior Wall	6.23	1.99	1	Top Slab	7.82	
		HS-20 (INVENTORY)	36.000	2	1.53	55.16	1.75	1.53	1	Exterior Wall	6.23	1.75	1	Exterior Wall	10.82	
		HS-20 (OPERATING)	36.000		1.99	71.50	1.35	1.99	1	Exterior Wall	6.23	2.27	1	Exterior Wall	10.82	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.91	25.74	1.40	1.91	1	Exterior Wall	6.23	2.23	1	Exterior Wall	10.82	
		SNGARBS2	20.000		1.91	38.14	1.40	1.91	1	Exterior Wall	6.23	2.22	1	Exterior Wall	10.82	
		SNAGRIS2	22.000		1.91	41.95	1.40	1.91	1	Exterior Wall	6.23	2.23	1	Exterior Wall	10.82	
		SNCOTTS3	27.250		1.91	51.96	1.40	1.91	1	Exterior Wall	6.23	1.91	1	Top Slab	7.82	
		SNAGGRS4	34.925		1.83	63.99	1.40	1.91	1	Exterior Wall	6.23	1.83	1	Top Slab	7.82	
		SNS5A	35.550		1.68	59.74	1.40	1.91	1	Exterior Wall	6.23	1.68	1	Top Slab	7.82	
		SNS6A	39.950		1.70	68.11	1.40	1.91	1	Exterior Wall	6.23	1.70	1	Top Slab	7.82	
		SNS7B	42.000	3	1.67	70.03	1.40	1.91	1	Exterior Wall	6.23	1.67	1	Top Slab	7.82	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.91	62.93	1.40	1.91	1	Exterior Wall	6.23	2.16	1	Top Slab	7.82	
		TNT4A	33.075		1.91	63.07	1.40	1.91	1	Exterior Wall	6.23	2.13	1	Top Slab	7.82	
		TNT6A	41.600		1.81	75.43	1.40	1.91	1	Exterior Wall	6.23	1.81	1	Top Slab	7.82	
		TNT7A	42.000		1.91	80.09	1.40	1.91	1	Exterior Wall	6.23	2.03	1	Top Slab	7.82	
		TNT7B	42.000		1.79	75.02	1.40	1.91	1	Exterior Wall	6.23	1.79	1	Top Slab	7.82	
		TNAGRIT4	43.000		1.75	75.10	1.40	1.91	1	Exterior Wall	6.23	1.75	1	Top Slab	7.82	
		TNAGT5A	45.000		1.77	79.79	1.40	1.91	1	Exterior Wall	6.23	1.77	1	Top Slab	7.82	
		TNAGT5B	45.000		1.76	79.41	1.40	1.91	1	Exterior Wall	6.23	1.76	1	Top Slab	7.82	

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.

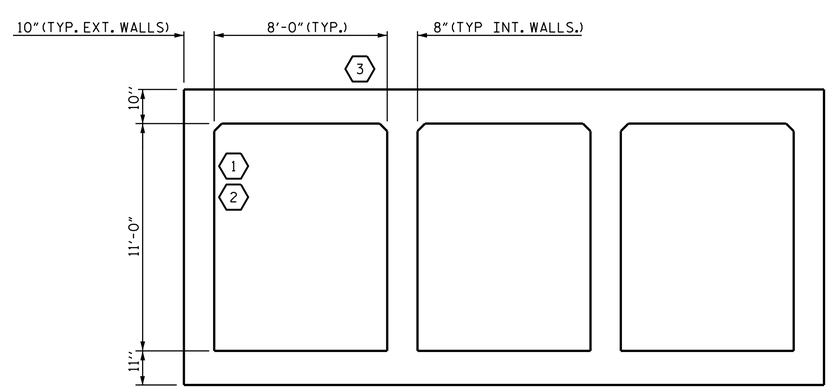
(#) CONTROLLING LOAD RATING

(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 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-47
1			3			TOTAL SHEETS
2			4			87

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

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

DocuSign Envelope ID: 6549D6EBAA3B405...

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