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	1.13	--	1.75	1.13	1	BOT. OF SLAB	9.83	1.31	1	TOP OF SLAB	9.57	
		HL-93 (OPERATING)	N/A		1.47	--	1.35	1.47				1.70				
		HS-20 (INVENTORY)	36.000	2	1.13	40.7	1.75	1.13				1.34				
		HS-20 (OPERATING)	36.000		1.47	52.9	1.35	1.47		BOT. OF SLAB	9.83	1.74				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.84	24.8	1.40	1.84		EXT. WALLS	0.00	2.47				
		SNGARBS2	20.000		1.77	35.4	1.40	1.77		EXT. WALLS	0.00	2.29				
		SNAGRIS2	22.000		1.84	40.5	1.40	1.84		EXT. WALLS	0.00	2.44		TOP OF SLAB	9.57	
		SNCOTTS3	27.250		1.77	48.2	1.40	1.77		BOT. OF SLAB	9.83	2.72		BOT. OF SLAB	9.51	
		SNAGGRS4	34.925		1.51	52.7	1.40	1.51	1			2.32	1			
		SNS5A	35.550		1.74	61.9	1.40	1.74				2.68				
		SNS6A	39.950		1.78	71.1	1.40	1.78				2.74				
		SNS7B	42.000		1.91	80.2	1.40	1.91		BOT. OF SLAB		2.95		BOT. OF SLAB	9.51	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.71	56.4	1.40	1.71		TOP OF SLAB		2.24		TOP OF SLAB	9.57	
		TNT4A	33.075		1.94	64.2	1.40	1.94		BOT. OF SLAB		2.99		BOT. OF SLAB	9.51	
		TNT6A	41.600		1.99	82.8	1.40	1.99				3.06				
		TNT7A	42.000		2.19	92.0	1.40	2.19				3.37				
		TNT7B	42.000		2.19	92.0	1.40	2.19				3.37				
		TNAGRIT4	43.000	3	1.49	64.1	1.40	1.49				2.30				
		TNAGT5A	45.000		1.63	73.4	1.40	1.63				2.51				
		TNAGT5B	45.000		1.63	73.4	1.40	1.63	1	BOT. OF SLAB	9.83	2.51	1	BOT. OF SLAB	9.51	

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.
2.
3.
4.

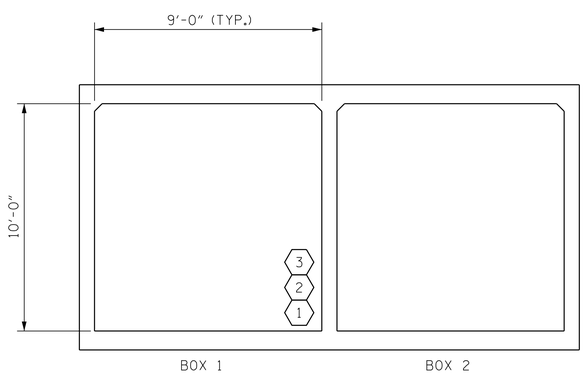
(#) CONTROLLING LOAD RATING

(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. 14SP.20221.1/.2

CLAY COUNTY

STATION: 21+97.70 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS

DocuSigned by: Hardy Willis CC287FCF0223461... 11/4/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-19
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : MAF DATE : 6/14
CHECKED BY : HLW DATE : 6/14

DRAWN BY : WMC 7/11
CHECKED BY : GM 7/11

REV. 10/1/11 MAA/GM

STD. NO. LRFR5