

**LOAD AND RESISTANCE FACTOR RATING (LRFR)  
SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS**

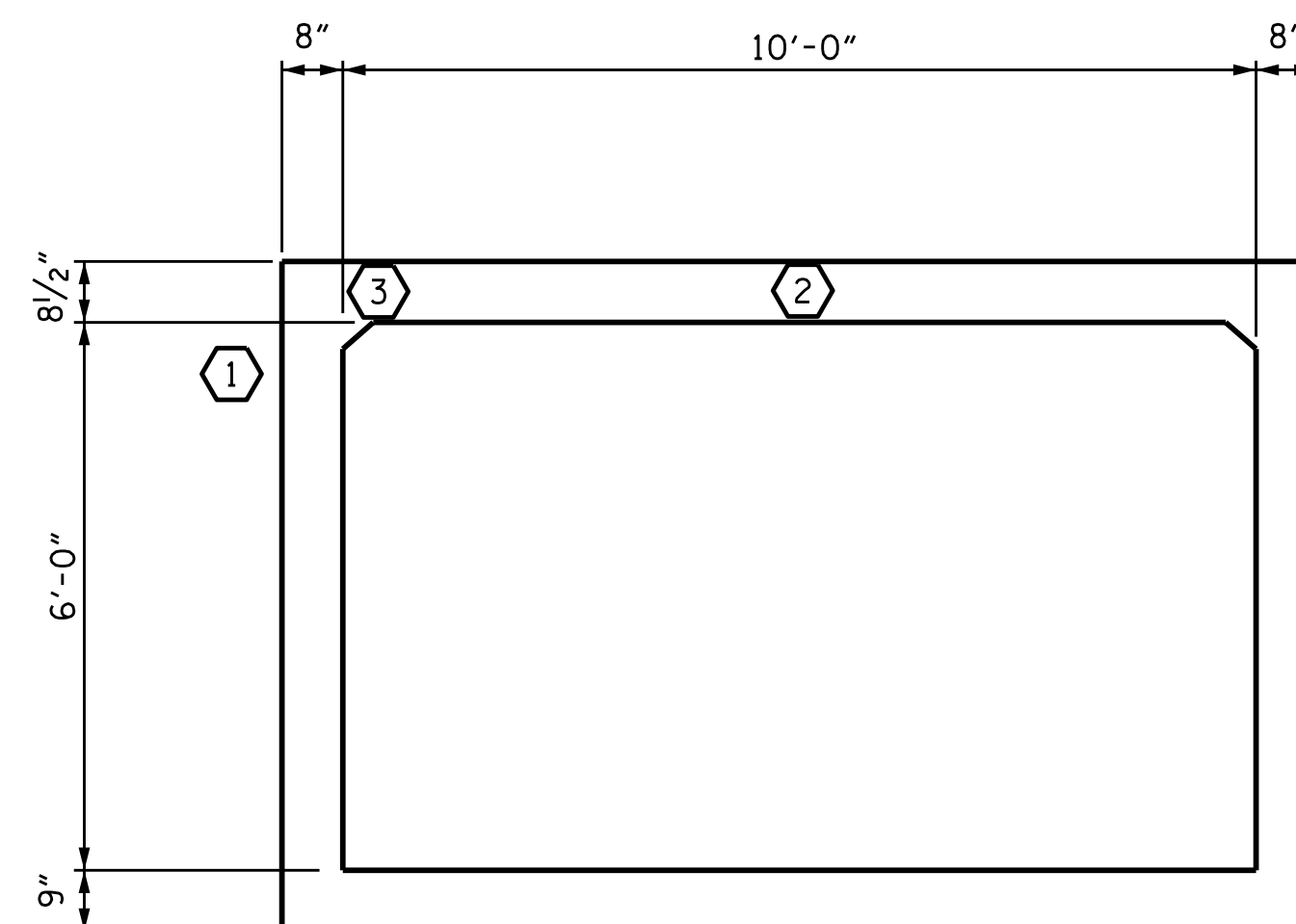
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.00	--	1.75	1.00	1	TOP CORNER WALL	0.67	1.00	1	TOP SLAB	0.84		
	HL-93 (OPERATING)	N/A		1.30	--	1.35	1.30	1	TOP CORNER WALL	0.67	1.30	1	TOP SLAB	0.84		
	HS-20 (INVENTORY)	36.000	②	1.08	39.00	1.75	1.08	1	TOP SLAB	5.33	1.18	1	TOP SLAB	0.84		
	HS-20 (OPERATING)	36.000		1.40	50.56	1.35	1.40	1	TOP SLAB	5.33	1.53	1	TOP SLAB	0.84		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.96	26.52	1.40	1.96	1	TOP SLAB	5.33	2.15	1	TOP SLAB	0.84	
		SNGARBS2	20.000		1.84	36.77	1.40	1.84	1	TOP SLAB	5.33	2.01	1	TOP SLAB	0.84	
		SNAGRIS2	22.000		1.96	43.22	1.40	1.96	1	TOP SLAB	5.33	2.15	1	TOP SLAB	0.84	
		SNCOTTS3	27.250	③	1.21	33.04	1.40	1.21	1	TOP CORNER WALL	0.67	1.26	1	TOP SLAB	0.84	
		SNAGGRS4	34.925		1.39	48.66	1.40	1.52	1	TOP CORNER WALL	0.67	1.39	1	BOTTOM SLAB	9.79	
		SNS5A	35.550		1.40	49.90	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
		SNS6A	39.950		1.40	56.08	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
		SNS7B	42.000		1.40	58.95	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
	TRUCK TRACTOR SEMI-TRAILER (TTS)	TNAGRIT3	33.000		1.96	64.83	1.40	1.96	1	TOP SLAB	5.33	2.12	1	BOTTOM SLAB	0.87	
		TNT4A	33.075		1.41	46.73	1.40	1.41	1	TOP CORNER WALL	0.67	1.50	1	TOP SLAB	0.84	
		TNT6A	41.600		1.40	58.29	1.40	1.41	1	TOP CORNER WALL	0.67	1.40	1	BOTTOM SLAB	9.79	
		TNT7A	42.000		1.41	59.39	1.40	1.41	1	TOP CORNER WALL	0.67	1.49	1	TOP SLAB	9.82	
		TNT7B	42.000		1.41	59.34	1.40	1.41	1	TOP CORNER WALL	0.67	1.45	1	BOTTOM SLAB	9.79	
		TNAGRIT4	43.000		1.36	58.27	1.40	1.36	1	TOP CORNER WALL	0.67	1.43	1	TOP SLAB	0.84	
TNAGT5A	45.000		1.39	62.47	1.40	1.39	1	TOP CORNER WALL	0.67	1.46	1	TOP SLAB	9.82			
TNAGT5B	45.000		1.41	63.63	1.40	1.41	1	TOP CORNER WALL	0.67	1.50	1	TOP SLAB	0.84			

**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	--

#	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-4753  
JACKSON COUNTY  
STATION: 168+42.00 -L-

SHEET 7 OF 7



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
REINFORCED CONCRETE  
BOX CULVERTS  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : E.C. PHELPS/V.X.N. DATE : 8-5-16  
CHECKED BY : H.T. BARBOUR DATE : 8-8-16

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

DESIGN ENGINEER OF RECORD:  
A.M. LEE DATE : 9-16

DocuSigned by:  
Wael Arafa 10/12/2016

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-14
1			3			TOTAL SHEETS
2			4			14

CULVERT #2