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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 (%LL)	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (±)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (±)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.090	--	1.75	1.12	1 & 2	TOP SLAB	4.20'	1.09	1 & 2	TOP SLAB	9.04'		
	HL-93 (OPERATING)	N/A		1.420	--	1.35	1.45	1 & 2	TOP SLAB	4.20'	1.42	1 & 2	TOP SLAB	9.04'		
	HS-20 (INVENTORY)	36.000	②	1.210	43.560	1.75	1.21	1 & 2	TOP SLAB	4.20'	1.27	1 & 2	TOP SLAB	9.04'		
	HS-20 (OPERATING)	36.000		1.570	56.520	1.35	1.57	1 & 2	TOP SLAB	4.20'	1.65	1 & 2	TOP SLAB	9.04'		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.110	28.485	1.40	2.36	1 & 2	TOP SLAB	4.20'	2.11	1 & 2	TOP SLAB	9.04'		
		SNGARBS2	20.000		1.980	39.600	1.40	2.21	1 & 2	TOP SLAB	4.20'	1.98	1 & 2	TOP SLAB	9.04'	
		SNAGRIS2	22.000		2.110	46.420	1.40	2.36	1 & 2	TOP SLAB	4.20'	2.11	1 & 2	TOP SLAB	9.04'	
		SNCOTTS3	27.250	③	1.550	42.238	1.40	1.55	1 & 2	TOP SLAB	4.20'	1.56	1 & 2	BOTTOM SLAB	9.04'	
		SNAGGRS4	34.925		2.050	71.596	1.40	2.05	1 & 2	TOP SLAB	4.20'	2.05	1 & 2	BOTTOM SLAB	9.04'	
		SNS5A	35.550		1.850	65.768	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		SNS6A	39.950		1.850	73.908	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		SNS7B	42.000		1.850	77.700	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.110	69.630	1.40	2.36	1 & 2	TOP SLAB	4.20'	2.11	1 & 2	TOP SLAB	9.04'	
		TNT4A	33.075		1.850	61.189	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		TNT6A	41.600		1.850	76.960	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		TNT7A	42.000		1.850	77.700	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		TNT7B	42.000		1.850	77.700	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'	
		TNAGRIT4	43.000		1.770	76.110	1.40	1.77	1 & 2	TOP SLAB	4.20'	1.77	1 & 2	BOTTOM SLAB	9.04'	
TNACT5A	45.000		1.770	79.650	1.40	1.77	1 & 2	TOP SLAB	4.20'	1.77	1 & 2	BOTTOM SLAB	9.04'			
TNACT5B	45.000		1.850	83.250	1.40	1.85	1 & 2	TOP SLAB	4.20'	1.85	1 & 2	BOTTOM SLAB	9.04'			

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	--

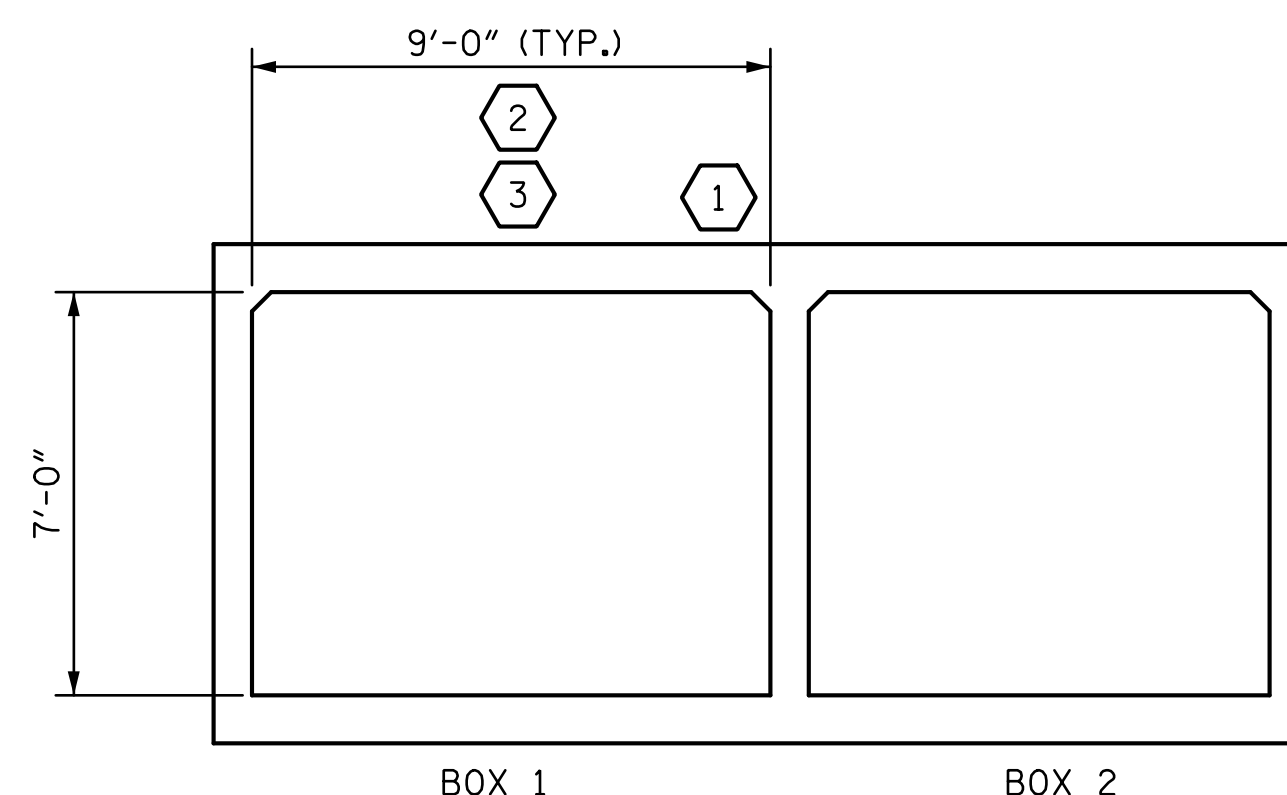
NOTE:

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. U-4751

NEW HANOVER COUNTY

STATION: 117+49.00 -L-

SHEET 2 OF 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)																		
		REVISIONS	SHEET NO. C1-2																	
	STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
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2			4																	

DRAWN BY : <u>BMC</u> DATE : <u>4-17</u>	DESIGN ENGINEER OF RECORD: <u>B. CURRY</u> DATE : <u>4-17</u>	
CHECKED BY : <u>JWJ</u> DATE : <u>5-17</u>		