

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		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ _{LL})	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	1.27	--	1.75	1.39	1	EXTERIOR WALL	0.38	1.27	1	TOP SLAB	0.85		
	HL-93 (OPERATING)	N/A		1.64	--	1.35	1.80	1	EXTERIOR WALL	0.38	1.64	1	TOP SLAB	0.85		
	HS-20 (INVENTORY)	36.000	②	1.32	47.52	1.75	1.43	1	EXTERIOR WALL	0.38	1.32	1	TOP SLAB	0.85		
	HS-20 (OPERATING)	36.000		1.71	61.56	1.35	1.86	1	EXTERIOR WALL	0.38	1.71	1	TOP SLAB	0.85		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.58	34.83	1.40	2.78	1	TOP SLAB	5.25	2.58	1	TOP SLAB	0.85		
		SNGARBS2	20.000		2.41	48.2	1.40	2.60	1	TOP SLAB	5.25	2.41	1	TOP SLAB	0.85	
		SNAGRIS2	22.000		2.58	56.76	1.40	2.78	1	TOP SLAB	5.25	2.58	1	TOP SLAB	0.85	
		SNCOTTS3	27.250	③	1.58	43.06	1.40	1.67	1	EXTERIOR WALL	0.38	1.58	1	TOP SLAB	0.85	
		SNAGGRS4	34.925		1.79	62.52	1.40	1.86	1	EXTERIOR WALL	0.38	1.79	1	BOTTOM SLAB	0.85	
		SNS5A	35.550		1.79	63.63	1.40	1.83	1	EXTERIOR WALL	0.38	1.79	1	BOTTOM SLAB	0.85	
		SNS6A	39.950		1.79	71.51	1.40	1.83	1	EXTERIOR WALL	0.38	1.79	1	BOTTOM SLAB	0.85	
		SNS7B	42.000		1.79	75.18	1.40	1.83	1	EXTERIOR WALL	0.38	1.79	1	BOTTOM SLAB	0.85	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.58	85.14	1.40	2.78	1	TOP SLAB	0.38	2.58	1	TOP SLAB	0.85	
		TNT4A	33.075		1.88	62.18	1.40	1.90	1	EXTERIOR WALL	0.38	1.88	1	TOP SLAB	0.85	
		TNT6A	41.600		1.88	78.21	1.40	1.90	1	EXTERIOR WALL	0.38	1.88	1	TOP SLAB	0.85	
		TNT7A	42.000		1.88	78.96	1.40	1.90	1	EXTERIOR WALL	0.38	1.88	1	TOP SLAB	0.85	
		TNT7B	42.000		1.88	78.96	1.40	1.90	1	EXTERIOR WALL	0.38	1.88	1	TOP SLAB	0.85	
		TNAGRIT4	43.000		1.80	77.40	1.40	1.84	1	EXTERIOR WALL	0.38	1.80	1	BOTTOM SLAB	0.85	
TNAGT5A	45.000		1.88	84.60	1.40	1.88	1	EXTERIOR WALL	0.38	1.88	1	TOP SLAB	0.85			
TNAGT5B	45.000		1.79	80.55	1.40	1.83	1	EXTERIOR WALL	0.38	1.79	1	BOTTOM SLAB	0.85			

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.

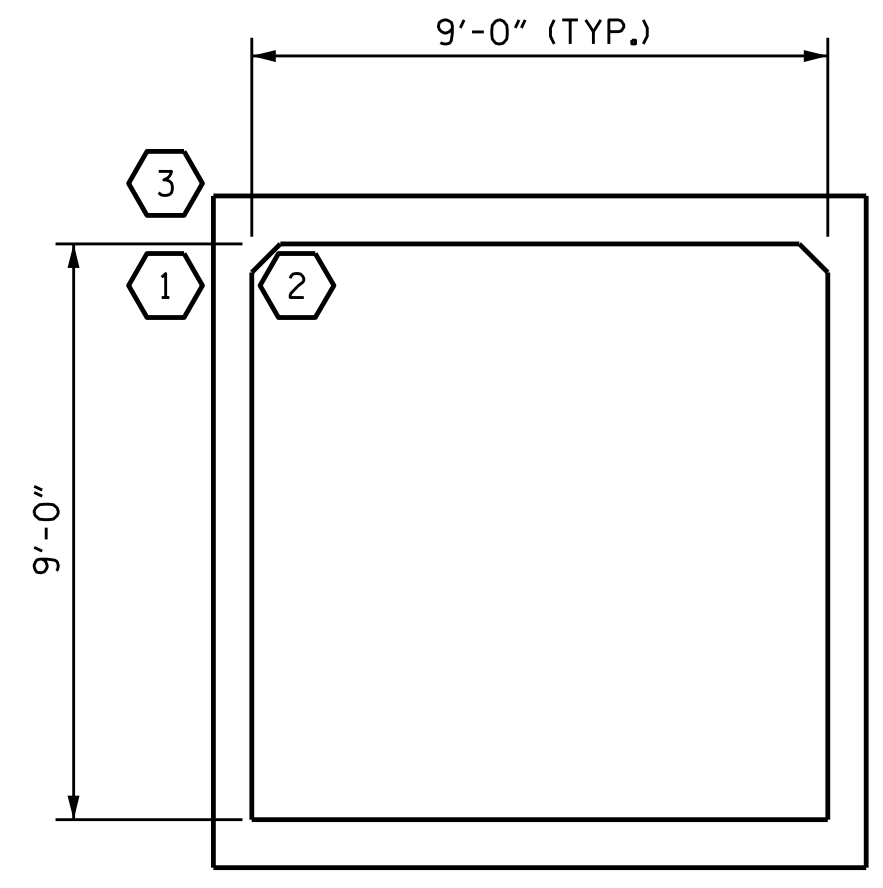
CONTROLLING LOAD RATING

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. B-5825
YADKIN/FORSYTH COUNTY
 STATION: 46+80.60 -L-

SHEET 2 OF 7

4/14/2020

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C1-2
2			4			TOTAL SHEETS 13

TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

ASSEMBLED BY : ZCS	DATE : 10/19
CHECKED BY : MGC	DATE : 10/19
DRAWN BY : WMC	7/11
CHECKED BY : GM	7/11
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC