

**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 (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	4.39	--	1.75	7.14	1	BOT. CORNER WALL	7.75	4.39	1	EXTERIOR WALL	7.15		
	HL-93 (OPERATING)	N/A		5.69	--	1.35	9.26	1	BOT. CORNER WALL	7.75	5.69	1	EXTERIOR WALL	7.15		
	HS-20 (INVENTORY)	36.00	②	4.39	158.03	1.75	7.14	1	BOT. CORNER WALL	7.75	4.39	1	EXTERIOR WALL	7.15		
	HS-20 (OPERATING)	36.00		5.69	204.86	1.35	9.26	1	BOT. CORNER WALL	7.75	5.69	1	EXTERIOR WALL	7.15		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50	③	5.49	74.08	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNGARBS2	20.00		5.49	109.74	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNAGRIS2	22.00		5.49	120.72	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNCOTTS3	27.25		5.49	149.53	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNAGGRS4	34.93		5.49	191.64	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNS5A	35.55		5.49	195.07	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNS6A	39.95		5.49	219.21	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		SNS7B	42.00		5.49	230.46	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		5.49	181.08	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNT4A	33.08		5.49	181.49	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNT6A	41.60		5.49	228.27	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNT7A	42.00		5.49	230.46	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNT7B	42.00		5.49	230.46	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNAGRIT4	43.00		5.49	235.95	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNAGT5A	45.00		5.49	246.93	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	
		TNAGT5B	45.00		5.49	246.93	1.40	8.93	1	BOT. CORNER WALL	7.75	5.49	1	EXTERIOR WALL	7.15	

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	0.00
WA	1.00	0.00

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

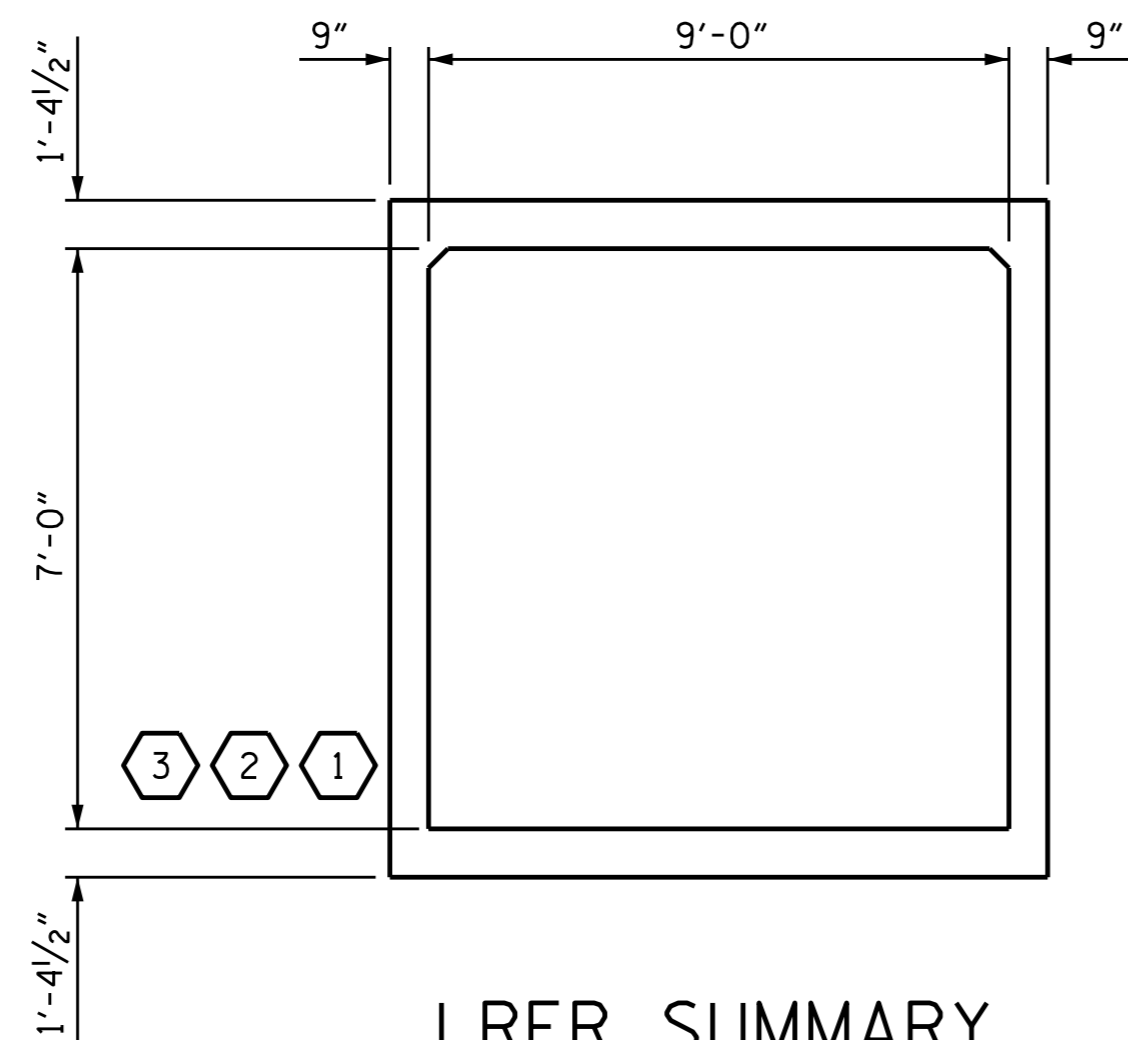
CONTROLLING LOAD RATING

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. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 16+10.00 -LPC- /
16+87.00 -RPC-
 SHEET 5 OF 5



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-20
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : M.K. BEARD DATE : 3/6/15
 CHECKED BY : H.T. BARBOUR DATE : 3/2015
 DRAWN BY : WMC 7/11 REV. 10/1/11 MAA/GM
 CHECKED BY : GM 7/11

DESIGN ENGINEER OF RECORD:
J.P. MCCARTHA DATE : 4/14/15