

LOAD AND RESISTANCE FACTOR RATING (LRFR) STEEL GIRDERS (W 12 X 65)

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⚡	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ LL)	MOMENT				SHEAR				LIVE-LOAD FACTORS (γ LL)	MOMENT								
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)							
DESIGN LOAD	HL-93 (INVENTORY)	N/A	⚡1	1.19	-	1.75	0.348	1.19	A	I	13.9	0.348	3.16	A	I	25.0	1.30	0.348	1.29	A	I	13.9		
	HL-93 (OPERATING)	N/A		1.55	-	1.35	0.348	1.55	A	I	13.9	0.348	4.09	A	I	25.0	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	⚡2	1.54	55.44	1.75	0.348	1.54	A	I	13.9	0.348	3.16	A	I	25.0	1.30	0.348	1.67	A	I	13.9		
	HS-20 (OPERATING)	36.000		1.99	71.64	1.35	0.348	1.99	A	I	13.9	0.348	4.10	A	I	25.0	N/A	-	-	-	-	-		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.93	39.56	1.40	0.348	3.27	A	I	13.9	0.348	8.22	A	I	25.0	1.30	0.348	2.93	A	I	13.9	
		SNGARBS2	20.000		2.75	55.00	1.40	0.348	3.06	A	I	13.9	0.348	6.47	A	I	25.0	1.30	0.348	2.75	A	I	13.9	
		SNAGRIS2	22.000		2.93	64.46	1.40	0.348	3.27	A	I	13.9	0.348	6.28	A	I	25.0	1.30	0.348	2.93	A	I	13.9	
		SNCOTTS3	27.250		1.47	40.06	1.40	0.348	1.63	A	I	13.9	0.348	4.18	A	I	25.0	1.30	0.348	1.47	A	I	13.9	
		SNAGGRS4	34.925		1.43	49.94	1.40	0.348	1.59	A	I	13.9	0.348	3.93	A	I	25.0	1.30	0.348	1.43	A	I	13.9	
		SNS5A	35.550		1.38	49.06	1.40	0.348	1.54	A	I	13.9	0.348	4.14	A	I	25.0	1.30	0.348	1.38	A	I	13.9	
		SNS6A	39.950		1.30	51.94	1.40	0.348	1.45	A	I	13.9	0.348	3.91	A	I	25.0	1.30	0.348	1.30	A	I	13.9	
		SNS7B	42.000	⚡3	1.27	53.34	1.40	0.348	1.41	A	I	13.9	0.348	3.97	A	I	25.0	1.30	0.348	1.27	A	I	13.9	
	TRUCK/TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.76	1.40	0.348	1.91	A	I	13.9	0.348	4.70	A	I	25.0	1.30	0.348	1.72	A	I	13.9	
		TNT4A	33.075		1.60	52.92	1.40	0.348	1.78	A	I	13.9	0.348	4.37	A	I	25.0	1.30	0.348	1.60	A	I	13.9	
		TNT6A	41.600		1.47	61.15	1.40	0.348	1.63	A	I	13.9	0.348	4.16	A	I	25.0	1.30	0.348	1.47	A	I	13.9	
		TNT7A	42.000		1.52	63.84	1.40	0.348	1.69	A	I	13.9	0.348	4.05	A	I	25.0	1.30	0.348	1.52	A	I	13.9	
		TNT7B	42.000		1.41	59.22	1.40	0.348	1.57	A	I	13.9	0.348	3.93	A	I	25.0	1.30	0.348	1.41	A	I	13.9	
		TNAGRIT4	43.000		1.47	63.21	1.40	0.348	1.64	A	I	13.9	0.348	3.87	A	I	25.0	1.30	0.348	1.47	A	I	13.9	
		TNAGT5A	45.000		1.44	64.80	1.40	0.348	1.60	A	I	13.9	0.348	4.03	A	I	25.0	1.30	0.348	1.44	A	I	13.9	
		TNAGT5B	45.000		1.42	63.90	1.40	0.348	1.59	A	I	13.9	0.348	3.60	A	I	25.0	1.30	0.348	1.42	A	I	13.9	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.39	68.71	1.30	0.348	2.39	A	I	13.9	0.348	5.18	A	I	25.0	N.A.	-	-	-	-	-		
	EV3	43.000	⚡4	1.50	64.50	1.30	0.348	1.50	A	I	13.9	0.348	3.54	A	I	25.0	N.A.	-	-	-	-	-		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ DC	γ DW
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:
1.
2.
3.
4.

⚡# CONTROLLING LOAD RATING

⚡1 DESIGN LOAD RATING (HL-93)

⚡2 DESIGN LOAD RATING (HS-20)

⚡3 LEGAL LOAD RATING **

⚡4 EMERGENCY VEHICLE LOAD RATING

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

27'-8 7/8"
(BRG. TO BRG.)

⚡4
⚡3
⚡2
⚡1

26'-10 1/2"
(BRG. TO BRG.)

END BENT 1 BENT 1 END BENT 2

LRFR SUMMARY

PROJECT NO.: 18314.1044073

HAYWOOD COUNTY

STATION: 12+13.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
30FT STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

RK&K

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SEAL
15825
BRUCE D. KLAPPENBACH
ENGINEER

12/15/2025

REVISIONS				SHEET NO. S-6 TOTAL SHEETS 21		
NO.	BY:	DATE:	NO.		BY:	DATE:
1			3			
2			4			

DRAWN BY : B. H. GONFA DATE : JUL 2025

CHECKED BY : B. D. KLAPPENBACH DATE : JUL 2025

DESIGN ENGINEER OF RECORD: B. D. KLAPPENBACH DATE : JUL 2025