

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	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						
						MOMENT			SHEAR			MOMENT												
						LIVE-LOAD FACTORS (γ _{LL})	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)	LIVE-LOAD FACTORS (γ _{LL})		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.14	--	1.75	--	1.14	B	4	125.23	--	1.20	B	2	203.81	1.30	--	1.79	B	4	125.23	--	
	HL-93 (OPERATING)	N/A		1.48	--	1.35	--	1.48	B	4	125.23	--	1.56	B	2	203.81	1.00	--	2.33	B	4	125.23	--	
	HS-20 (INVENTORY)	36.00	②	1.91	68.76	1.75	--	1.91	B	4	125.23	--	4.66	B	3	206.28	1.30	--	3.00	B	4	125.23	--	
	HS-20 (OPERATING)	36.00		2.48	89.13	1.35	--	2.48	B	4	125.23	--	6.04	B	3	206.28	1.00	--	3.90	B	4	125.23	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.05	54.68	1.40	--	4.05	B	1	0.00	--	4.47	B	2	203.81	1.30	--	5.38	B	1	0.00	--
		SNGARBS2	20.000		3.12	62.40	1.40	--	3.12	B	1	0.00	--	3.46	B	3	206.28	1.30	--	4.15	B	1	0.00	--
		SNAGRIS2	22.000		2.91	64.02	1.40	--	2.91	B	1	0.00	--	3.27	B	3	206.28	1.30	--	3.87	B	1	0.00	--
		SNCOTTS3	27.250		2.33	63.49	1.40	--	2.48	B	1	0.00	--	2.33	B	3	206.28	1.30	--	3.28	B	1	0.00	--
		SNAGGRS4	34.925		2.05	71.60	1.40	--	2.05	B	1	0.00	--	2.05	B	3	206.28	1.30	--	2.71	B	1	0.00	--
		SNS5A	35.550		1.97	70.03	1.40	--	2.04	B	1	0.00	--	1.97	B	2	203.81	1.30	--	2.70	B	1	0.00	--
		SNS6A	39.950		1.80	71.91	1.40	--	1.88	B	1	0.00	--	1.80	B	2	203.81	1.30	--	2.49	B	1	0.00	--
	SNS7B	42.000		1.83	76.86	1.40	--	1.83	B	1	0.00	--	1.83	B	2	203.81	1.30	--	2.42	B	1	0.00	--	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.16	71.28	1.40	--	2.16	B	1	0.00	--	2.50	B	3	206.28	1.30	--	2.85	B	1	0.00	--
		TNT4A	33.075		2.18	72.10	1.40	--	2.18	B	1	0.00	--	2.18	B	3	206.28	1.30	--	2.89	B	1	0.00	--
		TNT6A	41.600		1.86	77.38	1.40	--	1.86	B	1	0.00	--	1.94	B	2	203.81	1.30	--	2.46	B	1	0.00	--
		TNT7A	42.000		1.86	78.12	1.40	--	1.87	B	1	0.00	--	1.86	B	2	203.81	1.30	--	2.48	B	1	0.00	--
		TNT7B	42.000		1.87	78.54	1.40	--	1.87	B	1	0.00	--	1.94	B	2	203.81	1.30	--	2.48	B	1	0.00	--
		TNAGRIT4	43.000		1.76	75.68	1.40	--	1.76	B	1	0.00	--	1.86	B	2	203.81	1.30	--	2.32	B	1	0.00	--
TNAGT5A		45.000	③	1.71	76.95	1.40	--	1.71	B	1	0.00	--	1.86	B	2	203.81	1.30	--	2.26	B	1	0.00	--	
TNAGT5B	45.000	③	1.71	76.95	1.40	--	1.71	B	1	0.00	--	1.78	B	2	203.81	1.30	--	2.26	B	1	0.00	--		
FATIGUE	HL-93 (INVENTORY)	γ _{LL} =0.75		--																				

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:

1. MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.
 2. ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.
 3. COMMENTS:
1. THE ORIGINAL DESIGN AND RATING OF THIS BRIDGE WAS BASED ON AN INFLUENCE SURFACE ANALYSIS. LIVE LOAD DISTRIBUTION FACTORS WERE NOT USED AND ARE NOT PROVIDED.
 2. DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.
 3. FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDER DESIGN DOES NOT INCLUDE FATIGUE-PRONE DETAILS.
 4. LARSA 4D VERSION 8.00 r8101 WAS USED FOR INFLUENCE SURFACE ANALYSIS.
 5. AS APPLICABLE FOR THIS UNIT, LEGAL LOAD RATING INCLUDES CONSIDERATION OF THE FOLLOWING (PER AASHTO MANUAL FOR BRIDGE EVALUATION, 3RD ED., 2018, 6A.4.4.2.1a):
 - 100% OF ONE LEGAL LOAD VEHICLE WITH NO LANE LOAD
 - 75% OF ONE LEGAL LOAD VEHICLE WITH 0.200 KLF LANE LOAD
 - 75% OF TWO LEGAL LOAD VEHICLES SEPARATED BY 30 FEET WITH 0.200 KLF LANE LOAD (NEGATIVE MOMENT ONLY)

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

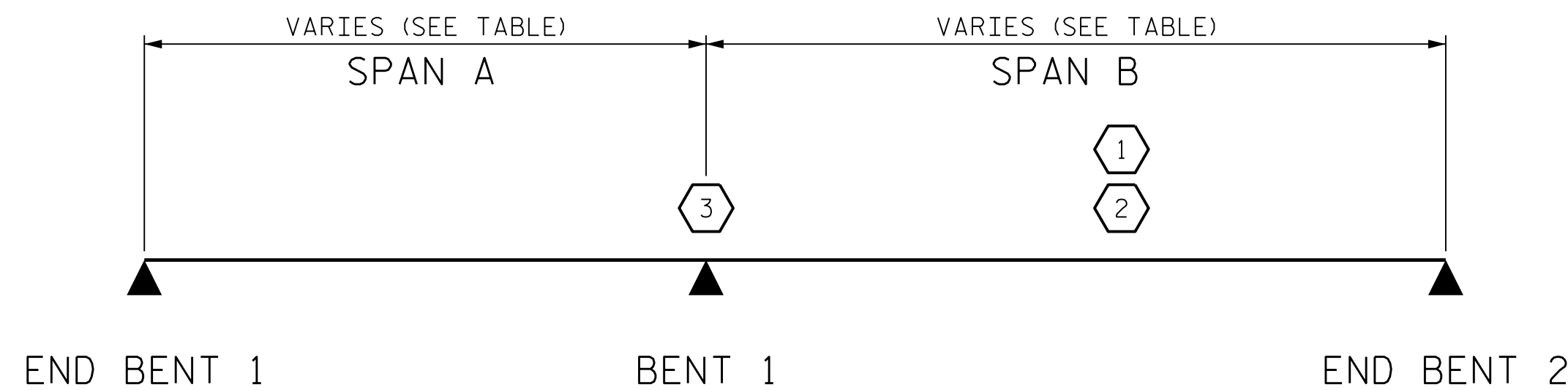
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

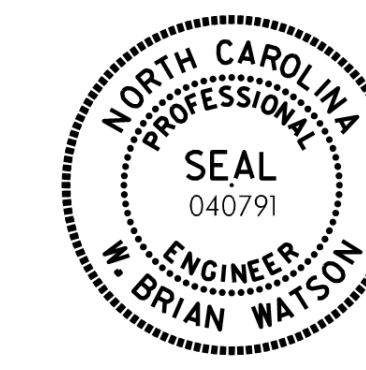
GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE EXTERIOR GIRDER TO THE LEFT OF -Y1RT-



C BRG - C BRG SPAN LENGTHS		
GIRDER	SPAN A	SPAN B
1	147'-4 ³ / ₄ "	201'-3 ³ / ₈ "
2	142'-8 ¹ / ₂ "	203'-9 ¹¹ / ₁₆ "
3	138'-1 ⁹ / ₁₆ "	206'-3 ³ / ₈ "
4	133'-7 ⁷ / ₈ "	208'-8 ⁹ / ₁₆ "

LRFR SUMMARY

PROJECT NO. B-3186/B-5898
HAYWOOD COUNTY
 STATION: 27+54.43 -Y1RT-



W. Brian Watson 1/24/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**LRFR SUMMARY FOR
STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)**

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--

SHEET NO. S02-05
TOTAL SHEETS 48



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

PLOT DRIVER: NCDOT_STRUCTURE_DEFAULT_PLOTTER.plt
 USER: PPETERSO
 DATE: 1/24/2022
 TIME: 1:24:54 PM
 FILE: ... \402_020_B3186-B5898_SMLD_005_430168.dgn

DES BY: <u>S. NIFONG</u>	DATE: <u>06/21</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>06/21</u>
DES CHK: <u>B. WATSON</u>	DATE: <u>07/21</u>	CHK BY: <u>B. WATSON</u>	DATE: <u>07/21</u>