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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × 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	1.00	--	1.75	0.750	1.00	D	EL	67.50	1.00	1.21	F	I	14.00	1.30	0.891	1.19	F	EL	42.00	
		HL-93 (OPERATING)	N/A		1.29	--	1.35	0.750	1.29	I	EL	66.38	1.00	1.57	F	I	14.00	1.00	0.891	1.55	F	EL	42.00	
		HS-20 (INVENTORY)	36.00	2	1.00	36.000	1.75	0.750	1.00	I	I	66.38	1.00	1.00	M	I	66.38	1.30	0.731	1.33	F	I	42.00	
		HS-20 (OPERATING)	36.00		1.67	60.125	1.35	0.750	1.67	I	I	66.38	1.00	1.67	M	I	66.38	1.00	0.731	2.21	F	I	42.00	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.39	59.270	1.40	0.891	5.59	F	EL	42.00	1.00	5.34	F	I	14.00	1.30	0.891	4.39	F	EL	42.00	
		SNGARBS2	20.000		3.10	62.000	1.40	0.891	3.95	F	EL	42.00	1.00	3.73	F	I	14.00	1.30	0.891	3.10	F	EL	42.00	
		SNAGRIS2	22.000		2.87	63.140	1.40	0.891	3.65	F	EL	42.00	1.00	3.44	F	I	14.00	1.30	0.891	2.87	F	EL	42.00	
		SNCOTTS3	27.250		2.19	59.680	1.40	0.891	2.79	F	EL	42.00	1.00	2.66	F	I	14.00	1.30	0.891	2.19	F	EL	42.00	
		SNAGGRS4	34.925		1.78	62.170	1.40	0.891	2.26	F	EL	42.00	1.00	2.16	F	I	14.00	1.30	0.891	1.78	F	EL	42.00	
		SNS5A	35.550		1.75	62.210	1.40	0.891	2.23	F	EL	42.00	1.00	2.17	F	I	14.00	1.30	0.891	1.75	F	EL	42.00	
		SNS6A	39.950		1.58	63.120	1.40	0.891	2.02	F	EL	42.00	1.00	1.96	F	I	14.00	1.30	0.891	1.58	F	EL	42.00	
		SNS7B	42.000		1.51	63.420	1.40	0.891	1.92	F	EL	42.00	1.00	1.90	F	I	14.00	1.30	0.891	1.51	F	EL	42.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.96	64.680	1.40	0.750	2.46	D	EL	67.50	1.00	2.35	F	I	14.00	1.30	0.891	1.96	F	EL	42.00	
		TNT4A	33.075		1.92	63.500	1.40	0.891	2.44	F	EL	42.00	1.00	2.31	F	I	14.00	1.30	0.891	1.92	F	EL	42.00	
		TNT6A	41.600		1.56	64.900	1.40	0.891	1.99	F	EL	42.00	1.00	1.99	F	I	14.00	1.30	0.891	1.56	F	EL	42.00	
		TNT7A	42.000		1.56	65.520	1.40	0.891	1.98	F	EL	42.00	1.00	1.95	F	I	14.00	1.30	0.891	1.56	F	EL	42.00	
		TNT7B	42.000		1.55	65.100	1.40	0.891	1.98	F	EL	42.00	1.00	1.87	F	I	14.00	1.30	0.891	1.55	F	EL	42.00	
		TNAGRIT4	43.000		1.51	64.930	1.40	0.891	1.92	F	EL	42.00	1.00	1.82	F	I	14.00	1.30	0.891	1.51	F	EL	42.00	
		TNAGT5A	45.000		1.45	65.250	1.40	0.891	1.85	F	EL	42.00	1.00	1.78	F	I	14.00	1.30	0.891	1.45	F	EL	42.00	
		TNAGT5B	45.000	3	1.43	64.350	1.40	0.891	1.82	F	EL	42.00	1.00	1.73	F	I	14.00	1.30	0.891	1.43	F	EL	42.00	
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:

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

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

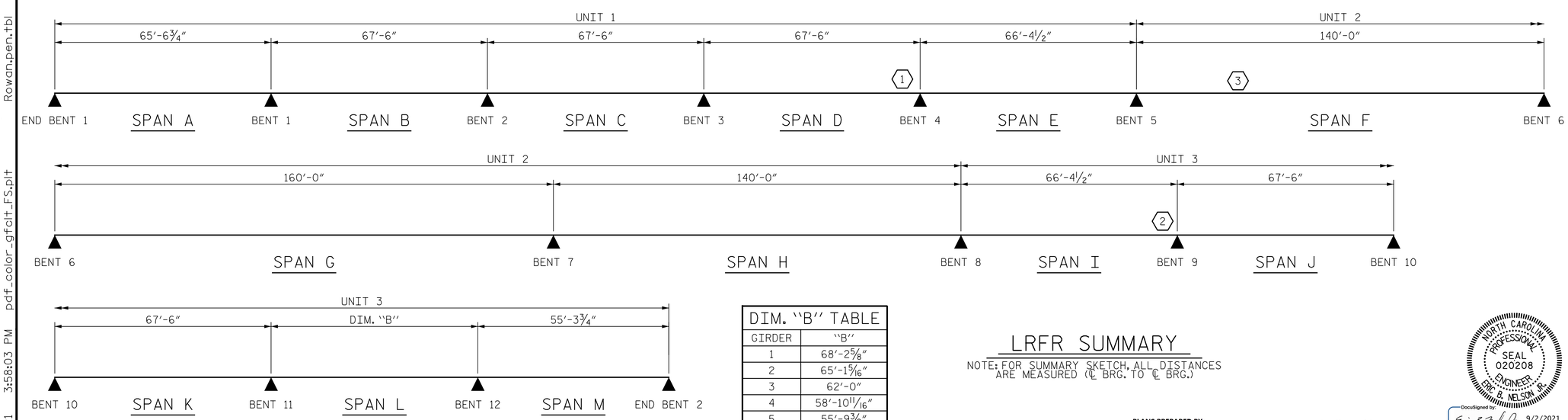
THE BRIDGE CAN ACCOMMODATE A WATER LINE UP TO 12 INCHES IN DIAMETER. HOWEVER, THE LOAD RATINGS REPORTED ON THIS SHEET DO NOT INCLUDE ANY EXTRA LOAD DUE TO A WATER LINE.

COMMENTS:

1. THE DESIGN RATING OF THIS BRIDGE UTILIZED LINE GIRDER ANALYSIS.
2. FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDER DESIGN DOES NOT INCLUDE FATIGUE-PRONE DETAILS.

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



DIM. "B" TABLE	
GIRDER	"B"
1	68'-2⅝"
2	65'-1 5/16"
3	62'-0"
4	58'-10 11/16"
5	55'-9⅜"

LRFR SUMMARY

NOTE: FOR SUMMARY SKETCH, ALL DISTANCES ARE MEASURED (℄ BRG. TO ℄ BRG.)

PROJECT NO. B-4626
STANLY, ROWAN AND DAVIDSON COUNTY
STATION: 45+22.65 -EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 020208 ENGINEER ERIC B. NELSON

DocuSigned by: Eric B. Nelson 9/2/2021
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-9
1			3			TOTAL SHEETS
2			4			125

PLANS PREPARED BY:
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DRAWN BY : T. FORD DATE : 04/2021
CHECKED BY : R. FISHER DATE : 05/2021
DESIGN ENGINEER OF RECORD: R. NELSON DATE : 05/2021

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