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
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.16	--	1.75	0.8048	1.16	A	E	77.3	1.1730	1.35	B	I	14.5	1.30	0.8048	1.60	A	E	77.3	
		HL-93 (OPERATING)	N/A		1.50	--	1.35	0.8048	1.50	A	E	77.3	1.1730	1.74	B	I	14.5	1.00	0.8048	2.08	A	E	77.3	
		HS-20 (INVENTORY)	36.00	2	1.73	62.31	1.75	0.8084	1.73	A	E	77.3	1.1730	2.12	B	I	14.5	1.30	0.8084	2.41	A	E	77.3	
		HS-20 (OPERATING)	36.00		2.25	81.00	1.35	0.8084	2.25	A	E	77.3	1.1730	2.76	B	I	14.5	1.00	0.8084	3.13	A	E	77.3	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.30	71.55	1.40	0.8084	5.30	A	E	77.3	1.1730	6.58	B	I	145.3	1.30	0.8084	5.87	A	E	77.3	
		SNGARBS2	20.000		3.80	76.00	1.40	0.8084	3.80	A	E	77.3	1.1730	4.60	B	I	145.3	1.30	0.8084	4.22	A	E	77.3	
		SNAGRIS2	22.000		3.50	77.00	1.40	0.8084	3.50	A	E	77.3	1.1730	4.20	B	I	145.3	1.30	0.8084	3.88	A	E	77.3	
		SNCOTTS3	27.250		2.63	71.67	1.40	0.8084	2.63	A	E	77.3	1.1730	3.42	B	I	145.3	1.30	0.8084	2.92	A	E	77.3	
		SNAGGRS4	34.925		2.15	75.09	1.40	0.8084	2.15	A	E	77.3	1.1730	2.74	B	I	14.5	1.30	0.8084	2.39	A	E	77.3	
		SNS5A	35.550		2.11	75.01	1.40	0.8084	2.11	A	E	77.3	1.1730	2.72	B	I	14.5	1.30	0.8084	2.34	A	E	77.3	
		SNS6A	39.950		1.90	75.91	1.40	0.8084	1.90	A	E	77.3	1.1730	2.41	B	I	14.5	1.30	0.8084	2.11	A	E	77.3	
		SNS7B	42.000		1.82	76.44	1.40	0.8084	1.82	A	E	77.3	1.1730	2.34	B	I	14.5	1.30	0.8084	2.02	A	E	77.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.31	76.23	1.40	0.8084	2.31	A	E	77.3	1.1730	3.00	B	I	14.5	1.30	0.8084	2.56	A	E	77.3	
		TNT4A	33.075		2.33	77.06	1.40	0.8084	2.33	A	E	77.3	1.1730	2.89	B	I	14.5	1.30	0.8084	2.58	A	E	77.3	
		TNT6A	41.600		1.87	77.79	1.40	0.8084	1.87	A	E	77.3	1.1730	2.39	B	I	14.5	1.30	0.8084	2.07	A	E	77.3	
		TNT7A	42.000		1.86	78.12	1.40	0.8084	1.86	A	E	77.3	1.1730	2.39	B	I	14.5	1.30	0.8084	2.07	A	E	77.3	
		TNT7B	42.000		1.89	79.38	1.40	0.8084	1.89	A	E	77.3	1.1730	2.35	B	I	14.5	1.30	0.8084	2.10	A	E	77.3	
		TNAGRIT4	43.000		1.82	78.26	1.40	0.8084	1.82	A	E	77.3	1.1730	2.25	B	I	14.5	1.30	0.8084	2.02	A	E	77.3	
		TNAGT5A	45.000	3	1.73	77.85	1.40	0.8084	1.73	A	E	77.3	1.1730	2.23	B	I	14.5	1.30	0.8084	1.92	A	E	77.3	
		TNAGT5B	45.000	3	1.73	77.85	1.40	0.8084	1.73	A	E	77.3	1.1730	2.20	B	I	14.5	1.30	0.8084	1.92	A	E	77.3	
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.

COMMENTS:

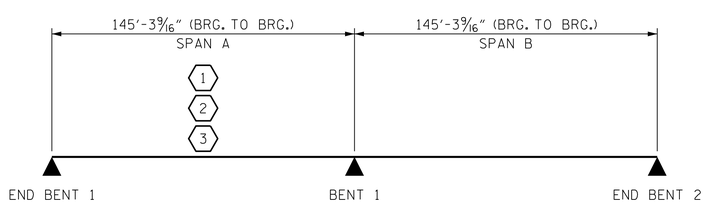
1.
2.
3.
4.

(#) 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



LRFR SUMMARY

PROJECT NO. W-5107
JOHNSTON COUNTY
STATION: 33+45.98 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 027799 ENGINEER ALLYSON K. ORR
11/26/2014

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

SHEET NO. S-4
TOTAL SHEETS 70

STD. NO. LRFR3

ASSEMBLED BY: B.E. ATKINSON DATE: 10/14
CHECKED BY : A.K. ORR DATE: 10/14
DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 11/14
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

11/25/2014
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Filename: P:\NC Bridges\MI2005 - W-5107 Johnston Co\MI2005.01_Site 1\Structures\401_020_S01_W5107_SMU_LRFR.dgn