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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	1.42	--	1.75	0.897	2.01	A	EXT.	89.61	1.082	1.42	A	INT.	8.96	1.30	0.897	1.50	A	EXT.	89.61	
		HL-93 (OPERATING)	N/A	--	1.95	--	1.35	0.897	2.82	A	EXT.	89.61	1.082	1.99	A	INT.	8.96	1.00	0.897	1.95	A	EXT.	89.61	
		HS-20 (INVENTORY)	36.000	2	1.92	69.120	1.75	0.897	2.80	A	EXT.	89.61	1.082	1.92	A	INT.	8.96	1.30	0.897	2.48	A	EXT.	89.61	
		HS-20 (OPERATING)	36.000	--	2.37	85.320	1.35	0.897	3.46	A	EXT.	89.61	1.082	2.37	A	INT.	8.96	1.00	0.897	3.22	A	EXT.	89.61	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	5.85	78.975	1.40	0.897	8.36	A	EXT.	89.61	1.082	5.85	A	INT.	8.96	1.30	0.897	6.22	A	EXT.	89.61	
		SNGARBS2	20.000	--	4.02	80.400	1.40	0.897	5.85	A	EXT.	89.61	1.082	4.02	A	INT.	8.96	1.30	0.897	4.36	A	EXT.	89.61	
		SNAGRIS2	22.000	--	3.68	80.960	1.40	0.897	5.40	A	EXT.	89.61	1.082	3.68	A	INT.	8.96	1.30	0.897	4.02	A	EXT.	89.61	
		SNSCOTTS3	27.250	--	2.90	79.025	1.40	0.897	4.15	A	EXT.	89.61	1.082	2.90	A	INT.	8.96	1.30	0.897	3.09	A	EXT.	89.61	
		SNAGGRS4	34.925	--	2.32	81.026	1.40	0.897	3.32	A	EXT.	89.61	1.082	2.32	A	INT.	8.96	1.30	0.897	2.47	A	EXT.	89.61	
		SNS5A	35.550	--	2.30	81.765	1.40	0.897	3.26	A	EXT.	89.61	1.082	2.30	A	INT.	8.96	1.30	0.897	2.43	A	EXT.	89.61	
		SNS6A	39.950	--	2.07	82.697	1.40	0.897	2.93	A	EXT.	89.61	1.082	2.07	A	INT.	8.96	1.30	0.897	2.18	A	EXT.	89.61	
		SNS7B	42.000	--	1.99	83.580	1.40	0.897	2.79	A	EXT.	89.61	1.082	1.99	A	INT.	8.96	1.30	0.897	2.08	A	EXT.	89.61	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	2.49	82.170	1.40	0.897	3.56	A	EXT.	89.61	1.082	2.49	A	INT.	8.96	1.30	0.897	2.65	A	EXT.	89.61	
		TNT4A	33.075	--	2.46	81.365	1.40	0.897	3.56	A	EXT.	89.61	1.082	2.46	A	INT.	8.96	1.30	0.897	2.65	A	EXT.	89.61	
		TNT6A	41.600	--	2.04	84.864	1.40	0.897	2.86	A	EXT.	89.61	1.082	2.04	A	INT.	8.96	1.30	0.897	2.13	A	EXT.	89.61	
		TNT7A	42.000	--	2.02	84.840	1.40	0.897	2.85	A	EXT.	89.61	1.082	2.02	A	INT.	8.96	1.30	0.897	2.12	A	EXT.	89.61	
		TNT7B	42.000	--	1.97	82.740	1.40	0.897	2.88	A	EXT.	89.61	1.082	1.97	A	INT.	8.96	1.30	0.897	2.14	A	EXT.	89.61	
		TNAGRIT4	43.000	--	1.92	82.560	1.40	0.897	2.79	A	EXT.	89.61	1.082	1.92	A	INT.	8.96	1.30	0.897	2.08	A	EXT.	89.61	
		TNAGT5A	45.000	--	1.86	83.700	1.40	0.897	2.65	A	EXT.	89.61	1.082	1.86	A	INT.	8.96	1.30	0.897	1.97	A	EXT.	89.61	
		TNAGT5B	45.000	3	1.83	82.350	1.40	0.897	2.64	A	EXT.	89.61	1.082	1.83	A	INT.	8.96	1.30	0.897	1.97	A	EXT.	89.61	
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) ✱✱

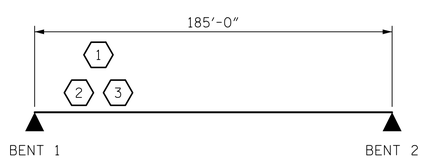
(2) DESIGN LOAD RATING (HS-20) ✱✱

(3) LEGAL LOAD RATING ✱✱

✱✱ SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

INT. - INTERIOR GIRDER
EXT. - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. R-2519B
YANCEY/MITCHELL COUNTY
STATION: 247+87.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)
(RIGHT LANE)

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8/21/2014
NORTH CAROLINA PROFESSIONAL SEAL 039173 ENGINEER MATTHEW K. TOM
DocuSigned by: Matthew K. Tom
D89BF488282747E...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-166
1			3			TOTAL SHEETS
2			4			194

STD. NO. LRFR3

STR. #6

ASSEMBLED BY :	M. K. TOM	DATE :	3/18/13
CHECKED BY :	R. L. WHITCHER	DATE :	6/4/13
DESIGNED BY :	M. K. TOM	DATE :	3/18/13
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM	
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM	

8/20/2014
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