

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III 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	1.06	--	1.75	0.985	1.71	M	ER	70.1	1.044	1.19	M	I	27.61	0.80	0.985	1.06	M	ER	70.1	1,2,3	
	HL-93 (OPERATING)	N/A		1.57	--	1.35	0.985	2.22	M	ER	70.1	1.044	1.57	M	I	27.61	N/A	--	--	--	--	--	--	1,2,3
	HS-20 (INVENTORY)	36.000	②	1.63	58.7	1.75	0.985	2.61	M	ER	70.1	1.044	1.78	M	I	27.61	0.80	0.985	1.63	M	ER	70.1	1,2,3	
	HS-20 (OPERATING)	36.000		2.35	84.6	1.35	0.985	3.38	M	ER	70.1	1.044	2.35	M	I	27.61	N/A	--	--	--	--	--	--	1,2,3
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.00	54.0	1.40	0.985	8.03	M	ER	70.1	1.044	6.13	M	I	41.77	0.80	0.985	4.00	M	ER	70.1	1,2,3
		SNGARBS2	20.000		2.83	56.6	1.40	0.985	5.69	M	ER	70.1	1.044	4.20	M	I	41.77	0.80	0.985	2.83	M	ER	70.1	1,2,3
		SNAGRIS2	22.000		2.63	57.9	1.40	0.985	5.27	M	ER	70.1	1.044	3.85	M	I	41.77	0.80	0.985	2.63	M	ER	70.1	1,2,3
		SNCOTTS3	27.250		1.99	54.2	1.40	0.985	3.99	M	ER	70.1	1.044	3.11	M	I	27.61	0.80	0.985	1.99	M	ER	70.1	1,2,3
		SNAGRS4	34.925		1.60	55.9	1.40	0.985	3.22	M	ER	70.1	1.044	2.36	M	I	27.61	0.80	0.985	1.60	M	ER	70.1	1,2,3
		SNS5A	35.550		1.57	55.8	1.40	0.985	3.15	M	ER	70.1	1.044	2.31	M	I	27.61	0.80	0.985	1.57	M	ER	70.1	1,2,3
		SNS6A	39.950		1.42	56.7	1.40	0.985	2.85	M	ER	70.1	1.044	2.07	M	I	27.61	0.80	0.985	1.42	M	ER	70.1	1,2,3
		SNS7B	42.000		1.35	56.7	1.40	0.985	2.71	M	ER	70.1	1.044	1.99	M	I	27.61	0.80	0.985	1.35	M	ER	70.1	1,2,3
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.8	1.40	0.985	3.46	M	ER	70.1	1.044	2.57	M	I	27.61	0.80	0.985	1.72	M	ER	70.1	1,2,3
		TNT4A	33.075		1.73	57.2	1.40	0.985	3.46	M	ER	70.1	1.044	2.45	M	I	27.61	0.80	0.985	1.73	M	ER	70.1	1,2,3
		TNT6A	41.600		1.39	57.8	1.40	0.985	2.79	M	ER	70.1	1.044	2.05	M	I	27.61	0.80	0.985	1.39	M	ER	70.1	1,2,3
		TNT7A	42.000		1.39	58.4	1.40	0.985	2.78	M	ER	70.1	1.044	2.06	M	I	27.61	0.80	0.985	1.39	M	ER	70.1	1,2,3
		TNT7B	42.000		1.41	59.2	1.40	0.985	2.83	M	ER	70.1	1.044	1.97	M	I	27.61	0.80	0.985	1.41	M	ER	70.1	1,2,3
		TNAGRIT4	43.000		1.36	58.5	1.40	0.985	2.73	M	ER	70.1	1.044	1.89	M	I	27.61	0.80	0.985	1.36	M	ER	70.1	1,2,3
TNAGT5A	45.000		1.29	58.1	1.40	0.985	2.59	M	ER	70.1	1.044	1.84	M	I	27.61	0.80	0.985	1.29	M	ER	70.1	1,2,3		
TNAGT5B	45.000		③	1.28	57.6	1.40	0.985	2.58	M	ER	70.1	1.044	1.80	M	I	27.61	0.80	0.985	1.28	M	ER	70.1	1,2,3	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

- GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE. GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE LOAD AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.
- 3" AVERAGE HAUNCH ASSUMED FOR SPANS D-F AND J. 3 3/4" AVERAGE HAUNCH ASSUMED FOR SPANS K-M AND Z. CONCRETE IS NOT INCLUDED IN SECTION PROPERTIES.
- E_c, GIRDER = 6,062 Ksi (FINAL, ALL SPANS)
E_c, DECK = 3,834 Ksi
E_{ps} = 28,500 Ksi

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

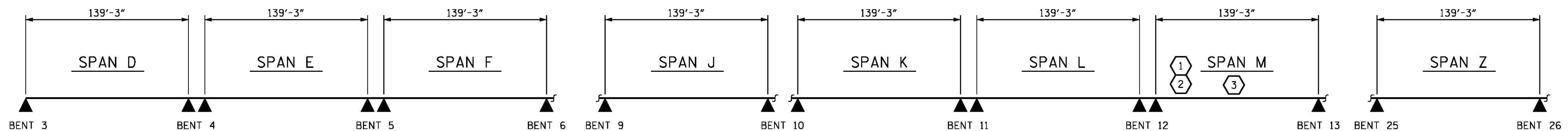
② DESIGN LOAD RATING (HS-20)

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. B-4929
PENDER COUNTY
 STATION: 38+13.81 -L2-

TABLE OF SECTION RESISTANCES (SPAN M)												
		CL BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG.
INTERIOR GIRDER (I)	φV _n (KIPS)	1194	979	431	353	345	338	343	340	408	954	1138
	φM _n (KIP-FT)	--	19140	23684	22764	22900	22991	22900	22764	23684	19140	--
EXTERIOR GIRDER (EL, ER)	φV _n (KIPS)	1193	977	429	349	339	332	337	334	403	946	1137
	φM _n (KIP-FT)	--	18956	23405	22494	22630	22721	22630	22494	23405	18956	--

SECTION DATA (ALL SPANS):

INTERIOR COMPOSITE I_{xx} = 1,586,384 IN⁴
 INTERIOR COMPOSITE y_b = 49.88 IN.
 EXTERIOR COMPOSITE I_{xx} = 1,513,470 IN⁴
 EXTERIOR COMPOSITE y_b = 48.34 IN.
 COMPOSITE SECTION PROPERTIES ARE TRANSFORMED TO EQUIVALENT GIRDER CONCRETE USING E_c = 6062 KSI
 STRAND AREA NOT INCLUDED IN SECTION PROPERTIES.
 y_b MEASURED FROM BOTTOM OF GIRDER

PARSONS BRINCKERHOFF
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 LICENSE NO. F-0165

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 032967
 JASON R. DOUGHTY

5/12/16
 Jason R. Doughty

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 F.I.B. 72" FOR UNITS 2, 4 AND 9
 AND SPAN J

SHEET NO. **S-29**

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

TOTAL SHEETS 278

DESIGNED BY: E. DAVIS DATE: MAR 2016
 DRAWN BY: M. HOBBS DATE: MAR 2016
 CHECKED BY: J. BORUTA DATE: APR 2016
 DESIGN ENGINEER OF RECORD: J. DOUGHTY DATE: MAY 2016

DRAWN BY: MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY: GM/DI 2/08 REV. 10/11/11 MAA/GM

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