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)	1.03	--	1.75	1.026	1.76	O/P	ER	74.8	1.044	1.28	P	I	29.51	0.80	1.026	1.03	O/P	ER	74.8	1,2,3
		HL-93 (OPERATING)	N/A		1.68	--	1.35	1.026	2.28	O/P	ER	74.8	1.044	1.68	P	I	29.51	N/A	--	--	--	--	--	1,2,3
		HS-20 (INVENTORY)	36.000	(2)	1.61	58.0	1.75	1.026	2.74	O/P	ER	74.8	1.044	1.95	P	I	29.51	0.80	1.026	1.61	O/P	ER	74.8	1,2,3
		HS-20 (OPERATING)	36.000		2.57	92.5	1.35	1.026	3.56	O/P	ER	74.8	1.044	2.57	P	I	29.51	N/A	--	--	--	--	--	1,2,3
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.99	53.9	1.40	1.026	8.49	O/P	ER	74.8	1.044	6.51	P	I	29.51	0.80	1.026	3.99	O/P	ER	74.8	1,2,3
		SNGARBS2	20.000		2.82	56.4	1.40	1.026	6.00	O/P	ER	74.8	1.044	4.44	P	I	29.51	0.80	1.026	2.82	O/P	ER	74.8	1,2,3
		SNAGRIS2	22.000		2.61	57.4	1.40	1.026	5.55	O/P	ER	74.8	1.044	4.06	P	I	29.51	0.80	1.026	2.61	O/P	ER	74.8	1,2,3
		SNCOTTS3	27.250		1.98	54.0	1.40	1.026	4.22	O/P	ER	74.8	1.044	3.24	P	I	44.61	0.80	1.026	1.98	O/P	ER	74.8	1,2,3
		SNAGGRS4	34.925		1.59	55.5	1.40	1.026	3.39	O/P	ER	74.8	1.044	2.59	P	I	29.51	0.80	1.026	1.59	O/P	ER	74.8	1,2,3
		SNS5A	35.550		1.56	55.5	1.40	1.026	3.33	O/P	ER	74.8	1.044	2.53	P	I	29.51	0.80	1.026	1.56	O/P	ER	74.8	1,2,3
		SNS6A	39.950		1.41	56.3	1.40	1.026	3.00	O/P	ER	74.8	1.044	2.26	P	I	29.51	0.80	1.026	1.41	O/P	ER	74.8	1,2,3
		SNS7B	42.000		1.34	56.3	1.40	1.026	2.86	O/P	ER	74.8	1.044	2.14	P	I	29.51	0.80	1.026	1.34	O/P	ER	74.8	1,2,3
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.71	56.4	1.40	1.026	3.65	O/P	ER	74.8	1.044	2.81	P	I	29.51	0.80	1.026	1.71	O/P	ER	74.8	1,2,3
		TNT4A	33.075		1.71	56.6	1.40	1.026	3.65	O/P	ER	74.8	1.044	2.69	P	I	29.51	0.80	1.026	1.71	O/P	ER	74.8	1,2,3
		TNT6A	41.600		1.38	57.4	1.40	1.026	2.94	O/P	ER	74.8	1.044	2.20	P	I	29.51	0.80	1.026	1.38	O/P	ER	74.8	1,2,3
		TNT7A	42.000		1.37	57.5	1.40	1.026	2.93	O/P	ER	74.8	1.044	2.26	P	I	29.51	0.80	1.026	1.37	O/P	ER	74.8	1,2,3
		TNT7B	42.000		1.39	58.4	1.40	1.026	2.97	O/P	ER	74.8	1.044	2.16	P	I	29.51	0.80	1.026	1.39	O/P	ER	74.8	1,2,3
		TNAGRIT4	43.000		1.35	58.1	1.40	1.026	2.87	O/P	ER	74.8	1.044	2.08	P	I	29.51	0.80	1.026	1.35	O/P	ER	74.8	1,2,3
		TNAGT5A	45.000		1.28	57.6	1.40	1.026	2.72	O/P	ER	74.8	1.044	2.01	P	I	29.51	0.80	1.026	1.28	O/P	ER	74.8	1,2,3
		TNAGT5B	45.000	(3)	1.27	57.2	1.40	1.026	2.71	O/P	ER	74.8	1.044	1.97	P	I	29.51	0.80	1.026	1.27	O/P	ER	74.8	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:

1. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.
   GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE LOAD AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.
2. 6½" AVERAGE HAUNCH ASSUMED FOR SPANS N, O AND P.
   3¼" AVERAGE HAUNCH ASSUMED FOR SPANS Q THROUGH Y.
   HAUNCH CONCRETE IS NOT INCLUDED IN SECTION PROPERTIES.
   IN SPANS N, O AND P ONLY, 2½" OF HAUNCH IN INCLUDED IN THE ECCENTRICITY OF THE DECK.
3. Ec, GIRDER = 6,062 Ksi (FINAL, ALL SPANS)
   Ec, DECK = 3,834 Ksi
   Eps = 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

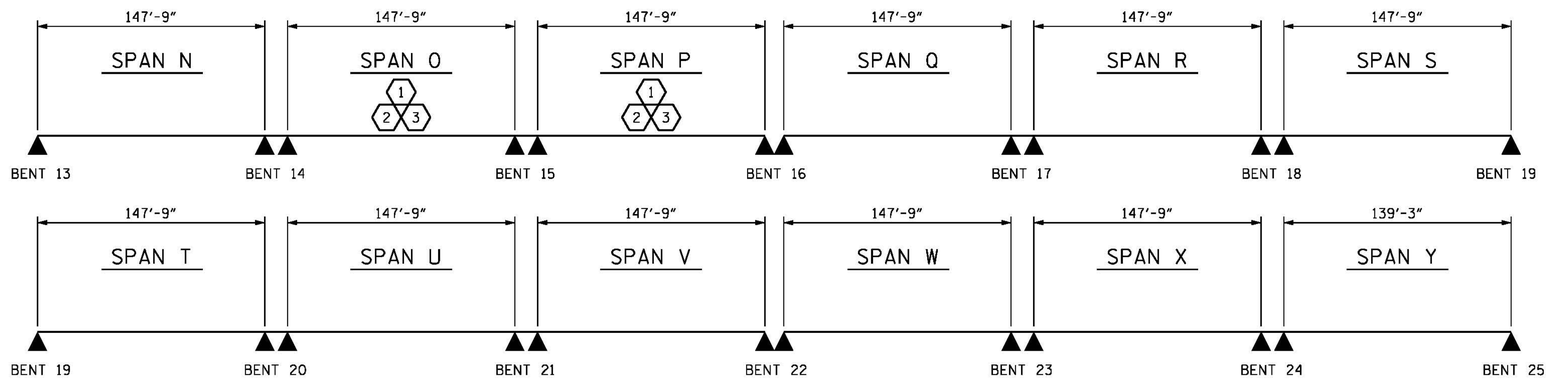
GIRDER LOCATION

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

TABLE OF SECTION RESISTANCES (SPAN P)												
		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)	ΦVn (KIPS)	1328	1084	472	387	378	371	377	373	449	1056	1258
	ΦMn (KIP-FT)	--	23066	27799	27799	26857	26969	26857	26689	27799	23066	--
EXTERIOR GIRDER (EL, ER)	ΦVn (KIPS)	1326	1072	471	384	374	366	372	367	443	1037	1257
	ΦMn (KIP-FT)	--	23372	27565	26424	26592	26704	26592	26424	27565	23372	--

SECTION DATA (SPANS N, O AND P):

INTERIOR COMPOSITE Ixx = 2,001,316 IN^4
INTERIOR COMPOSITE y_b = 54.45 IN.
EXTERIOR COMPOSITE Ixx = 1,938,329 IN^4
EXTERIOR COMPOSITE y_b = 53.31 IN.
COMPOSITE SECTION PROPERTIES ARE TRANSFORMED TO EQUIVALENT GIRDER CONCRETE USING Ec = 6062 KSI
STRAND AREA NOT INCLUDED IN SECTION PROPERTIES.
y_b MEASURED FROM BOTTOM OF GIRDER



LRFR SUMMARY

SPAN LENGTHS ARE BEARING TO BEARING MEASURED ALONG -L2-

PROJECT NO. B-4929
PENDER COUNTY
STATION: 38+13.81 -L2-

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

NORTH CAROLINA PROFESSIONAL SEAL 032967 ENGINEER JASON R. DOUGHTY
5/12/16
DocuSigned by: Jason R Doughty 00F1C86448274F7...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
F.I.B. 78" FOR UNITS 5, 6, 7 AND 8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			278

STD. NO. LRFR1

DESIGNED BY: E. DAVIS	DATE: MAR 2016	DRAWN BY: MAA 1/08
DRAWN BY: K. WHITE	DATE: MAR 2016	CHECKED BY: GM/DI 2/08
CHECKED BY: B. LOFLIN	DATE: MAR 2016	REV. 11/12/08RR MAA/GM
DESIGN ENGINEER OF RECORD: J. DOUGHTY	DATE: MAY 2016	REV. 10/1/11 MAA/GM

5/9/2016
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