

LOAD FACTORS:

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

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 (FF)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (FF)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.06	-	1.75	0.85	1.44	A	I	39.38	1.07	1.06	A	I	23.34	0.80	0.85	1.16	A	I	39.38		
	HL-93 (OPERATING)	N/A		1.86	-	1.35	0.85	1.86	A	I	39.38	1.07	2.41	A	I	31.36	N/A	-	-	-	-	-	-	
	HS-20 (INVENTORY)	36.000	②	1.55	55.800	1.75	0.85	1.91	A	I	39.38	1.07	1.91	A	I	23.34	0.80	0.85	1.55	A	I	39.38		
	HS-20 (OPERATING)	36.000		2.48	89.280	1.35	0.85	2.48	A	I	39.38	1.07	2.99	A	I	23.34	N/A	-	-	-	-	-	-	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		3.56	48.060	1.40	0.85	5.50	A	I	39.38	1.07	6.89	A	I	23.34	0.80	0.85	3.56	A	I	39.38	
		SNGARBS2	20,000		2.62	52.400	1.40	0.85	4.05	A	I	39.38	1.07	4.90	A	I	23.34	0.80	0.85	2.62	A	I	39.38	
		SNAGRIS2	22,000		2.47	54.340	1.40	0.85	3.82	A	I	39.38	1.07	4.56	A	I	23.34	0.80	0.85	2.47	A	I	39.38	
		SNCOTTS3	27,250		1.77	48.233	1.40	0.85	2.73	A	I	39.38	1.07	3.37	A	I	23.34	0.80	0.85	1.77	A	I	39.38	
		SNAGGRS4	34,925		1.47	51.340	1.40	0.85	2.27	A	I	39.38	1.07	2.81	A	I	23.34	0.80	0.85	1.47	A	I	39.38	
		SNS5A	35,550		1.43	50.837	1.40	0.85	2.22	A	I	39.38	1.07	2.86	A	I	23.34	0.80	0.85	1.43	A	I	39.38	
		SNS6A	39,950		1.31	52.335	1.40	0.85	2.03	A	I	39.38	1.07	2.62	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		SNS7B	42,000		1.25	52.500	1.40	0.85	1.93	A	I	39.38	1.07	2.58	A	I	23.34	0.80	0.85	1.25	A	I	39.38	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.60	52.800	1.40	0.85	2.47	A	I	39.38	1.07	3.13	A	I	23.34	0.80	0.85	1.60	A	I	39.38	
		TNT4A	33,075		1.61	53.251	1.40	0.85	2.48	A	I	39.38	1.07	3.03	A	I	23.34	0.80	0.85	1.61	A	I	39.38	
		TNT6A	41,600		1.31	54.496	1.40	0.85	2.02	A	I	39.38	1.07	2.79	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		TNT7A	42,000		1.31	55.020	1.40	0.85	2.03	A	I	39.38	1.07	2.68	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		TNT7B	42,000		1.35	56.700	1.40	0.85	2.09	A	I	39.38	1.07	2.51	A	I	23.34	0.80	0.85	1.35	A	I	39.38	
		TNAGRIT4	43,000		1.29	55.470	1.40	0.85	2.00	A	I	39.38	1.07	2.33	A	I	31.36	0.80	0.85	1.29	A	I	39.38	
		TNAGT5A	45,000		1.22	54,900	1.40	0.85	1.88	A	I	39.38	1.07	2.39	A	I	31.36	0.80	0.85	1.22	A	I	39.38	
		TNAGT5B	45,000	③	1.21	54,450	1.40	0.85	1.86	A	I	39.38	1.07	1.94	A	I	23.34	0.80	0.85	1.21	A	I	39.38	

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:

- TRANSFORMING ALL PRESTRESSING TENDONS.
- GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE AND SHEAR.
- FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE, SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.
- GIRDERS LOAD RATED AS SIMPLE SPAN.
- MINIMUM RATING FACTOR FOR EACH VEHICLE IS EQUAL FOR SPANS A AND B.

① 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

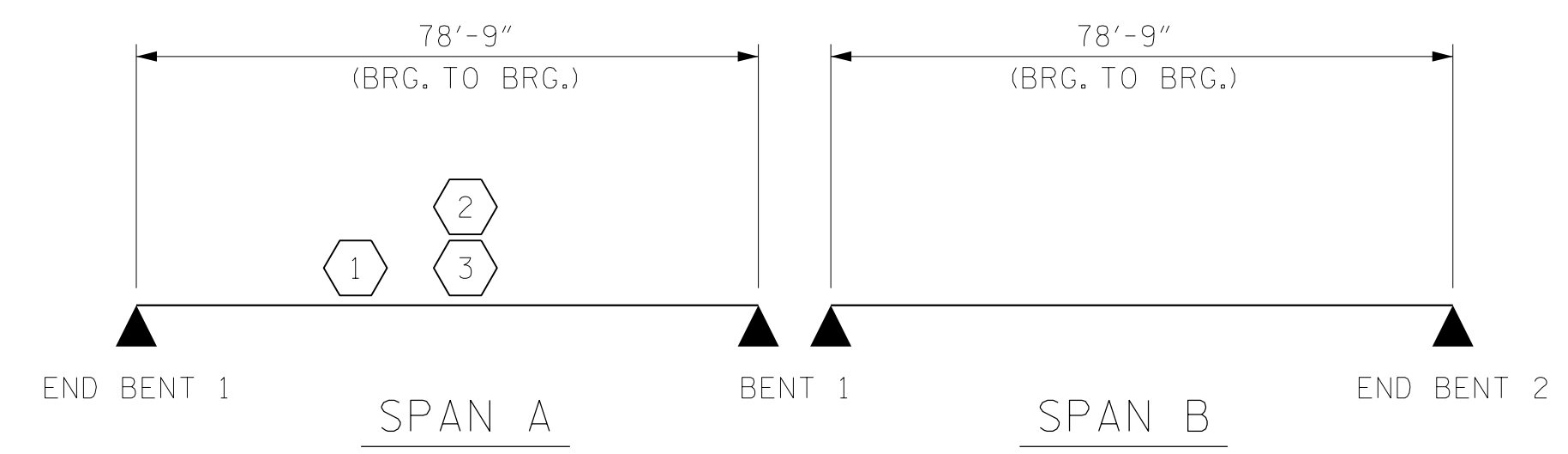
I - INTERIOR GIRDER
 E - EXTERIOR GIRDER

		CL BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG.
EXTERIOR GIRDER (E) SPAN A	ϕV_n (KIPS)	587	544	526	252	219	238	219	252	526	544	587
	ϕM_n (KIP-FT)	----	5285	6964	7263	7263	7263	7263	7263	6964	5285	----
INTERIOR GIRDER (I) SPAN A	ϕV_n (KIPS)	587	542	526	199	180	192	180	199	526	542	587
	ϕM_n (KIP-FT)	----	5323	7070	7383	7383	7383	7383	7383	7070	5323	----

SPAN A - INTERIOR			
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	54.00	63.00
AREA	IN ²	826.90	1886.30
I _{xx}	IN ⁴	269,164	825,510
Y _{cg}	IN	24.03	43.46
SELF WT.	PLF	821.90	2059.4
EFF. WIDTH	IN	---	132.00

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 30+67.66 -Y4-



LRFR SUMMARY

DRAWN BY : MRA DATE : 08/2019
 CHECKED BY : JMR DATE : 09/2019
 DESIGN ENGINEER OF RECORD: JMR DATE : 10/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S2-4
SUPERSTRUCTURE LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)						TOTAL SHEETS 37
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			