

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	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			
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT					SHEAR					LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.11	--	1.75	0.91	1.26	A	EL	65.29	0.97	1.36	A	EL	25.69	0.80	0.91	1.11	A	EL	65.29		
	HL-93 (OPERATING)	N/A		1.64	--	1.35	0.91	1.64	A	EL	65.29	1.11	1.81	A	I	24.66	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.64	59.040	1.75	0.91	1.85	A	EL	65.29	1.11	1.9	A	I	24.66	0.80	0.91	1.64	A	EL	65.29		
	HS-20 (OPERATING)	36.000		2.42	87.120	1.35	0.91	2.42	A	EL	65.29	1.11	2.52	A	I	24.66	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		4.01	54.135	1.40	0.91	5.66	A	EL	65.29	1.11	6.18	A	I	24.66	0.80	0.91	4.01	A	EL	65.29	
		SNGARBS2	20,000		2.85	57.000	1.40	0.91	4.03	A	EL	65.29	1.11	4.27	A	I	24.66	0.80	0.91	2.85	A	EL	65.29	
		SNAGRIS2	22,000		2.64	58.080	1.40	0.91	3.74	A	EL	65.29	1.11	3.93	A	I	24.66	0.80	0.91	2.64	A	EL	65.29	
		SNCOTTS3	27,250		1.98	53.955	1.40	0.91	2.8	A	EL	65.29	1.11	3.01	A	I	24.66	0.80	0.91	1.98	A	EL	65.29	
		SNAGGRS4	34,925		1.61	56.229	1.40	0.91	2.27	A	EL	65.29	1.11	2.42	A	I	24.66	0.80	0.91	1.61	A	EL	65.29	
		SNS5A	35,550		1.58	56.169	1.40	0.91	2.23	A	EL	65.29	1.11	2.42	A	I	24.66	0.80	0.91	1.58	A	EL	65.29	
		SNS6A	39,950		1.43	57.129	1.40	0.91	2.02	A	EL	65.29	1.11	2.17	A	I	24.66	0.80	0.91	1.43	A	EL	65.29	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.73	57.090	1.40	0.91	2.45	A	EL	65.29	1.11	2.63	A	I	24.66	0.80	0.91	1.73	A	EL	65.29	
		TNT4A	33,075		1.74	57.551	1.40	0.91	2.46	A	EL	65.29	1.11	2.59	A	I	24.66	0.80	0.91	1.74	A	EL	65.29	
		TNT6A	41,600		1.40	58.240	1.40	0.91	1.98	A	EL	65.29	1.11	2.2	A	I	24.66	0.80	0.91	1.4	A	EL	65.29	
		TNT7A	42,000		1.40	58.800	1.40	0.91	1.98	A	EL	65.29	1.11	2.16	A	I	24.66	0.80	0.91	1.4	A	EL	65.29	
		TNT7B	42,000		1.42	59.640	1.40	0.91	2.01	A	EL	65.29	1.11	2.07	A	I	24.66	0.80	0.91	1.42	A	EL	65.29	
		TNAGRIT4	43,000		1.37	58.910	1.40	0.91	1.94	A	EL	65.29	1.11	2.01	A	I	24.66	0.80	0.91	1.37	A	EL	65.29	
		TNAGT5A	45,000		1.30	58,500	1.40	0.91	1.84	A	EL	65.29	1.11	1.97	A	I	24.66	0.80	0.91	1.3	A	EL	65.29	
TNAGT5B	45,000	③	1.29	58.050	1.40	0.91	1.83	A	EL	65.29	1.11	1.91	A	I	24.66	0.80	0.91	1.29	A	EL	65.29			

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. TRANSFORMING ALL PRESTRESSING TENDONS.  
 2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.  
 3. GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.  
 4. GIRDERS LOAD RATED AS SIMPLE SPAN.  
 5. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE. SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.

③ 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

		CL BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG.
EXTERIOR GIRDER (EL) SPAN A	$\Phi V_n$ (KIPS)	548	512	378	326	277	282	277	326	378	512	548
	$\Phi M_n$ (KIP-FT)	----	15289	16437	16941	17126	17126	17126	16941	16437	15289	----
INTERIOR GIRDER (I) SPAN A	$\Phi V_n$ (KIPS)	549	517	389	378	321	330	321	378	389	517	549
	$\Phi M_n$ (KIP-FT)	----	15454	16723	17392	17680	17680	17680	17392	16723	15454	----

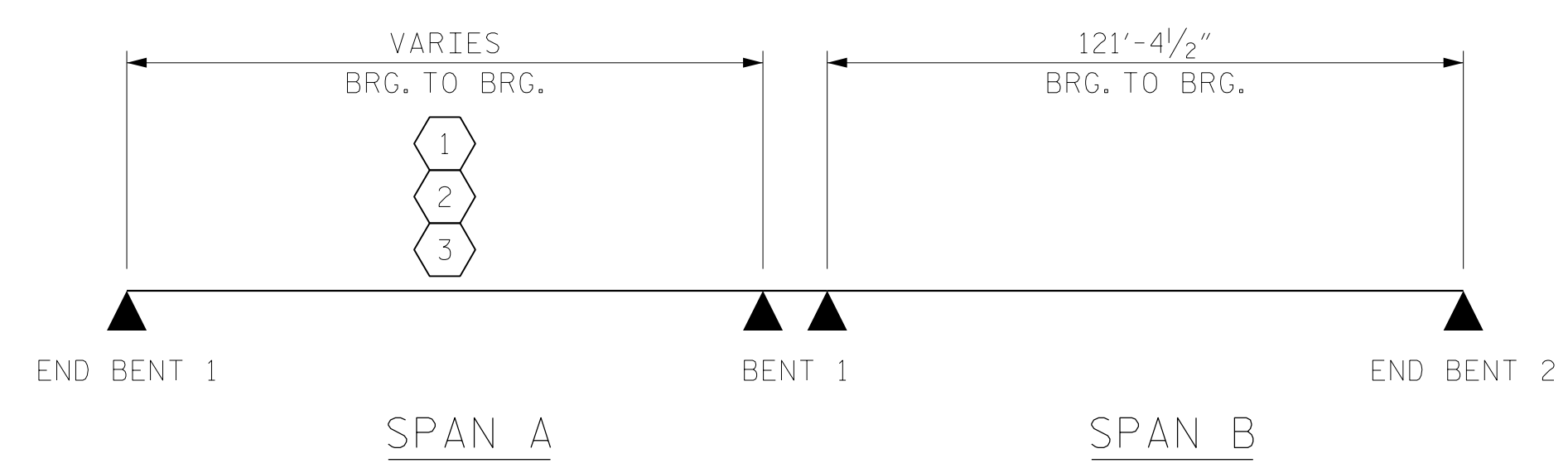
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	63.00	71.50
AREA	IN <sup>2</sup>	955.60	1748.40
I <sub>xx</sub>	IN <sup>4</sup>	530,313	1,235,785
Y <sub>cg</sub>	IN	27.96	42.86
SELF WT.	PLF	1037.10	2006.60
EFF. WIDTH	IN	---	109.50

SECTION PROPERTIES PROVIDED AT MIDSPAN

	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	63.00	71.50
AREA	IN <sup>2</sup>	995.60	1896.90
I <sub>xx</sub>	IN <sup>4</sup>	530,313	1,318,108
Y <sub>cg</sub>	IN	27.96	44.77
SELF WT.	PLF	1037.10	2214.70
EFF. WIDTH	IN	---	133.00

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. U-5798A  
CUMBERLAND COUNTY  
 STATION: 76+80.00 -L-



LRFR SUMMARY

DRAWN BY : MRA DATE : 04/2020  
 CHECKED BY : MKO DATE : 04/2021  
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H Architects-Engineers-Planners, Inc.  
 8521 Six Forks Road, Suite 400  
 919-926-4100 FAX 919-846-9080  
 www.rsandh.com  
 North Carolina License No. 5073-F5403-C28

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-4
2			4			TOTAL SHEETS 43