



LRFR BRIDGE LOAD RATING SUMMARY

SECTION 1 - GENERAL BRIDGE DATA						
(8) Asset ID 04604	Route Type Interstate	(27) Year Built 1965	(90) Date of Inspection 12/4/2019	(411) Date Rated 2/14/2020		
(9) Bridge Location SMI NW OF COLUMBIA		(7) Facility Carried I-20	(6) Feature Intersected/Route Crossing SALUDA RIVER			
(49) Length 659 ft.	(11) Milepost 62.754	(2) District 1	(3) County LEXINGTON	(22) Owner SCDOT	(418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) 7, 7, 6	
(43, 44, 45, & 46) Bridge Description Simple 9 Span PSG Bridge			(31) Design Load HS 20 + MOD.	(108) Existing Wearing Surface Type & Depth MONOLITHIC CONCRETE		
Rating Program & Version BrR 6.8.4 - AASHTO Engine		Rating Program & Version N/A		Rating Method LRFR	AASHTO Reference MBE 3rd Edition, 2018	
(58) Deck 7 Good	(59) Superstructure 7 Good	(60) Substructure 6 Satisfactory	(62) Culvert N N/A (NBI)	(113) Scour Critical 6 Calcs Not Made		

SECTION 2 - INVENTORY AND OPERATING LOAD RATINGS					
Rating Vehicle	Rating Level	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor
HL-93 Truck + Lane	Inventory	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.779
HL-93 Truck Train + Lane (90%)	Inventory	-	-	-	-
HL-93 Tandem + Lane	Inventory	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.890
HL-93 Truck + Lane	Operating	G14-G18	2.1	STRENGTH-I Concrete Shear	1.271
HL-93 Truck Train + Lane (90%)	Operating	-	-	-	-
HL-93 Tandem + Lane	Operating	G14-G18	2.1	STRENGTH-I Concrete Shear	1.531

This LRFR Load Rating is based on:

Design Plans
 Design Plans & Approved Shop Drawings
 Other (Please explain in Remarks)

As-Built Plans

SECTION 3 - BRIDGE LOAD RATING SUMMARY		
Controlling Legal Truck EV3	Load Posting Required? If Yes, complete Signing/Posting Form. No	Controlling Legal Load Rating Factor 0.632

SECTION 4 - REMARKS & SIGN/SEAL			
Load Rating Engineer Name: Sathvika Meenakshisundaram Company/Title: HDR / Bridge Engineer Date: 1/30/2020	Quality Control Engineer Name: William Johnson Company/Title: HDR / Bridge Engineer Date: 2/13/2020	<input checked="" type="checkbox"/> Structure is part of QA sample set. Quality Assurance Engineer Name: Kelly A. Ruppen Company/Title: Michael Baker Intenational / Bridge Engineer Date: 2/25/2020	
Remarks: 1. As-built plans 32.467.1 for the original structures and as-let plans 32.806.2 for the widening were used for the rating. 2. Traffic data was input into BrR using Directional % = 55% and Truck % = 18%. 3. Condition factor of 1.00 was used based on the Inspection Report dated 12/04/2019. 4. Spans 1-9 are all linked together under one superstructure definition in BrR. Results shown on the LRSF for Span 2 (i.e. controlling location 2.X) apply to all nine spans. 5. A load of 0.016 ksf was applied to bays 7 and 12 to account for the weight of SIP forms and the extra concrete per the site assessment performed 8/27/2019. 6. The weight of the USGS gaging station is negligible and was not included in the BrR model. 7. By inspection, the weight of 4-6" PVC utilities is greater than the 1-4" steel pipe. Only the weight of 4-6" PVC utilities was entered in the model. 8. A weight of 3.7 plf was assumed for each PVC utility. The weight of the utilities was distributed to two adjacent girders. 9. Controlling member G14-G18 also includes G2-G6. 10. Based on Dec 4, 2019 inspection report and Aug 27, 2019 site assessment, there is no measurable deterioration to warrant a Deteriorated Structure model in BrR.			

SECTION 5A - LEGAL & PERMIT RATINGS - AASHTO Legal Trucks								
(30) ADT Year 2017	(29) ADT 41850	(109) Truck % ADT 18	ADTT (ADT x Truck % ADT) 7533					
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)	
Modified AASHTO SC - Type 3	Legal	25	G14-G18	2.5	SERVICE-III PS Tensile Stress	1.095	27	
Modified AASHTO SC - Type 352	Legal	36.6	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.989	36	
AASHTO - Type 3-3	Legal	40	G14-G18	2.5	SERVICE-III PS Tensile Stress	1.068	42	
Lane Type Loading (Neg. M only)	Legal	40	-	-	-	-	N/A	
Lane Type Loading (Span > 200 ft)	Legal	40	-	-	-	-	N/A	
Modified AASHTO SC - Type 3	Permit	25	G14-G18	2.1	STRENGTH-II Concrete Shear	2.230	55	
Modified AASHTO SC - Type 352	Permit	36.6	G14-G18	2.1	STRENGTH-II Concrete Shear	1.763	64	
AASHTO - Type 3-3	Permit	40	G14-G18	2.1	STRENGTH-II Concrete Shear	1.895	75	
Lane Type Loading (Neg. M only)	Permit	40	-	-	-	-	N/A	
Lane Type Loading (Span > 200 ft)	Permit	40	-	-	-	-	N/A	



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SECTION 5B - LEGAL RATINGS - SC Specialized Hauling Vehicles (SHV) - Legal on Non-Interstate Only (Permit on Interstate)							
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC-SHV1A	Legal	32.5	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.795	25
SC-SHV1B	Legal	35	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.750	26
SC-SHV2A	Legal	33	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.796	26
SC-SHV2B	Legal	40	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.676	27
SC-SHV3A	Legal	42.5	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.828	35
SC-SHV3B	Legal	45	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.783	35

SECTION 5C - LEGAL RATINGS - Two Miscellaneous SHV & AASHTO SHV							
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC Representative School Bus	Legal	17.525	G14-G18	2.4	SERVICE-III PS Tensile Stress	1.595	27
SC-SU2	Legal	20	G14-G18	2.4	SERVICE-III PS Tensile Stress	1.364	27
SU4	Legal	27	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.985	26
SU5	Legal	31	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.889	27
SU6	Legal	34.75	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.799	27
SU7	Legal	38.75	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.731	28

SECTION 5D - LEGAL RATINGS - Emergency Vehicles (EV)							
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
EV2	Legal	28.75	G14-G18	2.4	SERVICE-III PS Tensile Stress	0.948	27
EV3	Legal	43	G14-G18	2.5	SERVICE-III PS Tensile Stress	0.632	27

SECTION 6 - PERMIT RATINGS - Specialized Hauling Vehicles (SHV), Standard Permit Vehicles & Typical Cranes							
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC-SHV1A	Permit	32.5	G14-G18	2.1	STRENGTH-II Concrete Shear	1.721	55
SC-SHV1B	Permit	35	G14-G18	2.1	STRENGTH-II Concrete Shear	1.618	56
SC-SHV2A	Permit	33	G14-G18	2.1	STRENGTH-II Concrete Shear	1.730	57
SC-SHV2B	Permit	40	G14-G18	2.1	STRENGTH-II Concrete Shear	1.460	58
SC-SHV3A	Permit	42.5	G14-G18	2.1	STRENGTH-II Concrete Shear	1.617	68
SC-SHV3B	Permit	45	G14-G18	2.1	STRENGTH-II Concrete Shear	1.531	68
SC Representative School Bus	Permit	17.525	G14-G18	2.1	STRENGTH-II Concrete Shear	3.049	53
SC-SU2	Permit	20	G14-G18	2.1	STRENGTH-II Concrete Shear	2.752	55
SU4	Permit	27	G14-G18	2.1	STRENGTH-II Concrete Shear	2.124	57
SU5	Permit	31	G14-G18	2.1	STRENGTH-II Concrete Shear	1.828	56
SU6	Permit	34.75	G14-G18	2.1	STRENGTH-II Concrete Shear	1.707	59
SU7	Permit	38.75	G14-G18	2.1	STRENGTH-II Concrete Shear	1.607	62
SC - 100k	Permit	50	G14-G18	2.1	STRENGTH-II Concrete Shear	1.435	71
SC - 120k	Permit	60	G14-G18	2.1	STRENGTH-II Concrete Shear	1.182	70
SC - 130k	Permit	65	G14-G18	2.1	STRENGTH-II Concrete Shear	1.143	74
SC Crane #544726	Permit	80	G14-G18	2.1	STRENGTH-II Concrete Shear	1.039	83
SC Crane #527568	Permit	88.85	G14-G18	2.1	STRENGTH-II Concrete Shear	1.015	90

Remarks (continued):

11. The original structure and the widened structure were assumed to act as a unit because both layers of reinforcing are shown across the interface between the original and widened deck and because there are intermediate diaphragms between the original and widened girders.
12. The original bridge deck is 6.5" with a 3" concrete overlay after 1/4" deck sacrifice. The typical widening bridge deck thickness is 7" which was used in the BrR Superstructure definition. Extra thickness of 2.25" was distributed equally to the original girders and applied as a non-composite member load.
13. Sacrificial wearing surface = 0" per LRGD Section 10.2.
14. A 1" haunch depth at CL bearing and 1.178" at midspan was assumed for the exterior widening girders. A 1.5" haunch depth at CL bearing and 1.572" at midspan was assumed for the interior widening girders. A 0.1875" haunch depth at CL bearing and 0" at midspan was assumed for the original girders.
15. The compressive strength for the original bridge deck is $f'_c = 3$ ksi. The compressive strength for the deck on widening is $f'_c = 4$ ksi. Conservatively, used $f'_c = 3$ ksi for deck concrete compressive strength for the entire bridge in the BrR model.
16. Also rated by LFR and results show that posting is not required.