



LRFR BRIDGE LOAD RATING SUMMARY

SECTION 1 - GENERAL BRIDGE DATA					
(8) Asset ID 07586	Route Type Secondary road	(27) Year Built 1982	(90) Date of Inspection 11/2018	(411) Date Rated 5/15/2020	
(9) Bridge Location 6 MI NW OF COLUMBIA		(7) Facility Carried S-32-36	(6) Feature Intersected/Route Crossing I-26		
(49) Length 354 ft.	(11) Milepost 0.098	(2) District 1	(3) County LEXINGTON	(22) Owner SCDOT	(418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) 6,7,6
(43, 44, 45, & 46) Bridge Description Simple 4 Span SS Bridge			(31) Design Load H-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, w/ 2019 Interims
(58) Deck 6 Satisfactory	(59) Superstructure 7 Good	(60) Substructure 6 Satisfactory	(62) Culvert N N/A (NBI)	(113) Scour Critical N Not Over Waterway	

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	G6	2.5	STRENGTH-I Steel Flexure Stress	0.784
HL-93 Truck Train + Lane (90%)	Inventory	-	-	-	-
HL-93 Tandem + Lane	Inventory	G6	2.5	STRENGTH-I Steel Flexure Stress	0.930
HL-93 Truck + Lane	Operating	G6	2.5	STRENGTH-I Steel Flexure Stress	1.016
HL-93 Truck Train + Lane (90%)	Operating	-	-	-	-
HL-93 Tandem + Lane	Operating	G6	2.5	STRENGTH-I Steel Flexure Stress	1.206

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	Load Posting Required? If Yes, complete Signing/Posting Form.	Controlling Legal Load Rating Factor
EV3	No	0.963

SECTION 4 - REMARKS & SIGN/SEAL		
Load Rating Engineer	Quality Control Engineer	<input type="checkbox"/> Structure is part of QA sample set. Quality Assurance Engineer
Name: Karl Hartline	Name: Colt Wise	Name:
Company/Title: HDR	Company/Title: HDR	Company/Title:
Date: 2/5/2020	Date: 4/3/2020	Date:
<p>Remarks:</p> <ol style="list-style-type: none"> As-Built plans 32.704.1 used for the rating Traffic data was input into BrR using Directional % = 55% and Truck % = 12%. Condition factor of 1.00 was used based on the Inspection Report dated 11/2018. Spans 1 & 4 are linked together under one superstructure definition in BrR. Results shown on the LRSF for Span 1 (i.e. controlling location 1.X) apply to both spans. Spans 2 & 3 are linked together under one superstructure definition in BrR. Results shown on the LRSF for Span 2 (i.e. controlling location 2.X) apply to both spans. The controlling location represents the span number and controlling point (i.e. controlling location 1.x for Span 1, 2.x for Span 2, etc.). Based on September 25, 2019 site assessment report, there is no measureable deterioration to warrant a deteriorated structure model in BrR. Additional 5% (Span 1 and 4) and 10% (Span 2 and 3) of self-load was applied to all steel girders to account for welds, bolts, etc. A load of 0.016 ksf was applied to account for the weight of SIP forms and the extra concrete. 		

The ADTT value listed below is to be used to establish Legal and Permit γ_{LL} factors.

SECTION 5A - LEGAL & PERMIT RATINGS - AASHTO Legal Trucks							
(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)				
2017	21500	3	645				
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
Modified AASHTO SC - Type 3	Legal	25	G7	1.5	SERVICE-II Steel Flexure Stress	1.677	41
Modified AASHTO SC - Type 3S2	Legal	36.6	G6	2.8	STRENGTH-I Steel Flexure Stress	1.660	60
AASHTO - Type 3-3	Legal	40	G6	2.8	STRENGTH-I Steel Flexure Stress	1.646	65
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	G7	1.5	SERVICE-II Steel Flexure Stress	2.615	65
Modified AASHTO SC - Type 3S2	Permit	36.6	G6	2.8	STRENGTH-II Steel Flexure Stress	1.964	71
AASHTO - Type 3-3	Permit	40	G6	2.8	STRENGTH-II Steel Flexure Stress	1.948	77
Lane Type Loading (Neg. M only)	Permit	40	-	-	-	-	N/A
Lane Type Loading (Span > 200 ft)	Permit	40	-	-	-	-	N/A



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Rating Program & Version BrR 6.8.4 - AASHTO Engine			Rating Program & Version N/A			Rating Method LRFR	AASHTO Reference MBE 3rd Edition, w/ 2019 Interims
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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	G7	1.5	SERVICE-II Steel Flexure Stress	1.176	38
SC-SHV1B	Legal	35	G7	1.5	SERVICE-II Steel Flexure Stress	1.119	39
SC-SHV2A	Legal	33	G7	1.5	SERVICE-II Steel Flexure Stress	1.189	39
SC-SHV2B	Legal	40	G7	1.5	SERVICE-II Steel Flexure Stress	1.028	41
SC-SHV3A	Legal	42.5	G6	2.8	STRENGTH-I Steel Flexure Stress	1.441	61
SC-SHV3B	Legal	45	G6	2.8	STRENGTH-I Steel Flexure Stress	1.364	61

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	G7	1.8	SERVICE-II Steel Flexure Stress	2.490	43
SC-SU2	Legal	20	G7	1.8	SERVICE-II Steel Flexure Stress	2.120	42
SU4	Legal	27	G7	1.5	SERVICE-II Steel Flexure Stress	1.481	39
SU5	Legal	31	G7	1.5	SERVICE-II Steel Flexure Stress	1.373	42
SU6	Legal	34.75	G7	1.5	SERVICE-II Steel Flexure Stress	1.234	42
SU7	Legal	38.75	G7	1.5	SERVICE-II Steel Flexure Stress	1.144	44

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	G7	1.8	SERVICE-II Steel Flexure Stress	1.473	42
EV3	Legal	43	G7	1.5	SERVICE-II Steel Flexure Stress	0.963	41

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	G7	1.5	SERVICE-II Steel Flexure Stress	1.834	59
SC-SHV1B	Permit	35	G7	1.5	SERVICE-II Steel Flexure Stress	1.746	61
SC-SHV2A	Permit	33	G7	1.5	SERVICE-II Steel Flexure Stress	1.855	61
SC-SHV2B	Permit	40	G7	1.5	SERVICE-II Steel Flexure Stress	1.604	64
SC-SHV3A	Permit	42.5	G6	2.8	STRENGTH-II Steel Flexure Stress	1.846	78
SC-SHV3B	Permit	45	G6	2.8	STRENGTH-II Steel Flexure Stress	1.746	78
SC Representative School Bus	Permit	17.525	G6	2.8	STRENGTH-II Steel Flexure Stress	3.657	64
SC-SU2	Permit	20	G7	1.8	SERVICE-II Steel Flexure Stress	3.307	66
SU4	Permit	27	G7	1.5	SERVICE-II Steel Flexure Stress	2.310	62
SU5	Permit	31	G7	1.5	SERVICE-II Steel Flexure Stress	2.142	66
SU6	Permit	34.75	G7	1.5	SERVICE-II Steel Flexure Stress	1.925	66
SU7	Permit	38.75	G7	1.5	SERVICE-II Steel Flexure Stress	1.785	69
SC - 100k	Permit	50	G6	2.8	STRENGTH-II Steel Flexure Stress	1.595	79
SC - 120k	Permit	60	G6	2.8	STRENGTH-II Steel Flexure Stress	1.319	79
SC - 130k	Permit	65	G6	2.8	STRENGTH-II Steel Flexure Stress	1.245	80
SC Crane #544726	Permit	80	G6	2.5	STRENGTH-II Steel Flexure Stress	1.088	87
SC Crane #527568	Permit	88.85	G6	2.5	STRENGTH-II Steel Flexure Stress	0.989	87

Remarks:

10. Overhead sign not shown in plans. Dimensions and location based on Site Assessment dated 9/25/2019. Load input into BrR as a point load and applied to first three girders as composite load. Assumed 20 psf of sign area for weight.
11. Sacrificial wearing surface = 0" per LRGD section 11.2.1.1
12. Transverse geometry is considered symmetric about the centerline of bridge. Since longitudinal deck joint does not transfer shear, left side is modeled as a separate unit from the right side. G1 - G6 represent the left side (westbound), and G7 - G12 represent the right side (eastbound).
13. Exterior girders of end spans have a tapered web section at the interior bents. As a result, this girder was modeled as a plate girder.
14. Steel bearing stiffeners in Spans 1 & 4 were assumed to be 5.5" wide.
15. Also rated by LFR and results show that posting is not required.