



# LRFR BRIDGE LOAD RATING SUMMARY

Version 1.0

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SECTION 1 - GENERAL BRIDGE DATA					
(8) Asset ID 07586		(27) Year Built 1982		(90) Date of Inspection 11/2018	
(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	
Name: Karl Hartline		Name: Colt Wise	
Company/Title: HDR		Company/Title: HDR	
Date: 2/5/2020		Date: 4/3/2020	
<p>Remarks:</p> <ol style="list-style-type: none"> <li>As-Built plans 32.704.1 used for the rating</li> <li>Traffic data was input into BrR using Directional % = 55% and Truck % = 12%.</li> <li>Condition factor of 1.00 was used based on the Inspection Report dated 11/2018.</li> <li>Spans 1 &amp; 4 are linked together under one superstructure definition in BrR. Results shown on the LRSF for Span (i.e. controlling location 1.X) apply to both spans.</li> <li>Spans 2 &amp; 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.</li> <li>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.).</li> <li>Based on September 25, 2019 site assessment report, there is no measureable deterioration to warrant a deteriorated structure model in BrR.</li> <li>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.</li> <li>A load of 0.016 ksf was applied to account for the weight of SIP forms and the extra concrete.</li> </ol>		<p><input type="checkbox"/> Structure is part of QA sample set.</p> <p>Quality Assurance Engineer</p> <p>No. 37520</p> <p>CHARLES M RICCARDI</p> <p>5/15/2020</p>	

The ADTT value listed below is to be used to establish Legal and Permit  $\gamma_{LL}$  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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SECTION 1 (PAGE 2) - 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 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:

- 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.
- Sacrificial wearing surface = 0" per LRGD section 11.2.1.1
- 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).
- 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.
- Steel bearing stiffeners in Spans 1 & 4 were assumed to be 5.5" wide.
- Also rated by LFR and results show that posting is not required.