



### LRFR BRIDGE LOAD RATING SUMMARY

SECTION 1 - GENERAL BRIDGE DATA					
(8) Asset ID 03022	Route Type Interstate	(27) Year Built 1959	(90) Date of Inspection 11/2019	(411) Date Rated 5/15/2020	
(9) Bridge Location 4 MI W OF COLUMBIA		(7) Facility Carried I-26	(6) Feature Intersected/Route Crossing SALUDA RIVER		
(49) Length 702 ft.	(11) Milepost 108.259	(2) District 1	(3) County LEXINGTON	(22) Owner SCDOT	(418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) 7, 6, 7
(43, 44, 45, & 46) Bridge Description Simple 10 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, w/ 2019 Interims
(58) Deck 7 Good	(59) Superstructure 6 Satisfactory	(60) Substructure 7 Good	(62) Culvert N N/A (NBI)	(113) Scour Critical 5 Stable, w/in Footing	

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	G2	1.9	STRENGTH-I Concrete Shear	0.689
HL-93 Truck Train + Lane (90%)	Inventory	-	-	-	-
HL-93 Tandem + Lane	Inventory	G2	1.9	STRENGTH-I Concrete Shear	0.827
HL-93 Truck + Lane	Operating	G2	1.9	STRENGTH-I Concrete Shear	0.893
HL-93 Truck Train + Lane (90%)	Operating	-	-	-	-
HL-93 Tandem + Lane	Operating	G2	1.9	STRENGTH-I Concrete Shear	1.072

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	0.919

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: Nitesh Sangam	Name: William Johnson	Name:	
Company/Title: HDR/Bridge Engineer	Company/Title: HDR	Company/Title:	
Date: 4/8/2020	Date: 5/13/2020	Date:	
<p>Remarks:</p> <ol style="list-style-type: none"> <li>As-built plans 3240.253, widening As-built plans 3240.378.3, &amp; bridge rehab plans 3240.378.10 were 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 11/2019.</li> <li>Spans 1-10 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 all ten spans.</li> <li>A load of 0.016-ksf was applied to account for the weight of SIP forms and the extra concrete in all bays except bay 10 per the site assessment dated 08/26/2019.</li> <li>Site assessment dated 08/26/2019, identified two 3" galvanized metal pipes running along eastbound side of the bridge, and six 6" PVC between girders 9 &amp; 10. Assumed weight of 3-in metal pipe is 9-plf per pipe. Assumed weight of 6-in PVC is 18-plf based on PVC pipe weight, filled with water.</li> <li>The original and widening structures were assumed to act as a unit because the decks are connected by reinforcing bars.</li> </ol>			

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	94100	12	11292				
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
Modified AASHTO SC - Type 3	Legal	25	G2	1.9	STRENGTH-I Concrete Shear	1.425	35
Modified AASHTO SC - Type 3S2	Legal	36.6	G2	1.9	STRENGTH-I Concrete Shear	1.188	43
AASHTO - Type 3-3	Legal	40	G2	1.9	STRENGTH-I Concrete Shear	1.288	51
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	G2	1.9	STRENGTH-II Concrete Shear	1.531	38
Modified AASHTO SC - Type 3S2	Permit	36.6	G2	1.9	STRENGTH-II Concrete Shear	1.231	45
AASHTO - Type 3-3	Permit	40	G2	1.9	STRENGTH-II Concrete Shear	1.334	53
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	G2	1.9	STRENGTH-I Concrete Shear	1.057	34
SC-SHV1B	Legal	35	G2	1.9	STRENGTH-I Concrete Shear	0.994	34
SC-SHV2A	Legal	33	G2	1.9	STRENGTH-I Concrete Shear	1.063	35
SC-SHV2B	Legal	40	G2	1.9	STRENGTH-I Concrete Shear	0.898	35
SC-SHV3A	Legal	42.5	G2	1.9	STRENGTH-I Concrete Shear	1.043	44
SC-SHV3B	Legal	45	G2	1.9	STRENGTH-I Concrete Shear	0.988	44

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	G2	1.9	STRENGTH-I Concrete Shear	2.038	35
SC-SU2	Legal	20	G2	1.9	STRENGTH-I Concrete Shear	1.758	35
SU4	Legal	27	G2	1.9	STRENGTH-I Concrete Shear	1.306	35
SU5	Legal	31	G2	1.9	STRENGTH-I Concrete Shear	1.169	36
SU6	Legal	34.75	G2	1.9	STRENGTH-I Concrete Shear	1.094	38
SU7	Legal	38.75	G2	1.9	STRENGTH-I Concrete Shear	1.031	39

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	G2	1.9	STRENGTH-I Concrete Shear	1.363	39
EV3	Legal	43	G2	1.9	STRENGTH-I Concrete Shear	0.919	39

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	G2	1.9	STRENGTH-II Concrete Shear	1.179	38
SC-SHV1B	Permit	35	G2	1.9	STRENGTH-II Concrete Shear	1.109	38
SC-SHV2A	Permit	33	G2	1.9	STRENGTH-II Concrete Shear	1.186	39
SC-SHV2B	Permit	40	G2	1.9	STRENGTH-II Concrete Shear	1.002	40
SC-SHV3A	Permit	42.5	G2	1.9	STRENGTH-II Concrete Shear	1.120	47
SC-SHV3B	Permit	45	G2	1.9	STRENGTH-II Concrete Shear	1.061	47
SC Representative School Bus	Permit	17.525	G2	1.9	STRENGTH-II Concrete Shear	2.111	36
SC-SU2	Permit	20	G2	1.9	STRENGTH-II Concrete Shear	1.888	37
SU4	Permit	27	G2	1.9	STRENGTH-II Concrete Shear	1.456	39
SU5	Permit	31	G2	1.9	STRENGTH-II Concrete Shear	1.255	38
SU6	Permit	34.75	G2	1.9	STRENGTH-II Concrete Shear	1.175	40
SU7	Permit	38.75	G2	1.9	STRENGTH-II Concrete Shear	1.108	42
SC - 100k	Permit	50	G2	1.9	STRENGTH-II Concrete Shear	0.996	49
SC - 120k	Permit	60	G2	1.9	STRENGTH-II Concrete Shear	0.820	49
SC - 130k	Permit	65	G2	1.9	STRENGTH-II Concrete Shear	0.795	51
SC Crane #544726	Permit	80	G2	1.9	STRENGTH-II Concrete Shear	0.725	58
SC Crane #527568	Permit	88.85	G2	1.9	STRENGTH-II Concrete Shear	0.712	63

Remarks:

- One BrR model with both the original and widening girders are modeled in the same span configuration. Bearing to bearing length of original girders is 68.5833-ft and for widening girders is 67.52083. Beam projection for original girders is 5-inches and for widening girders is 10.9375-inches. For simplicity, the widening girders bearing to bearing length is considered 68.5833-ft and the beam projection is changed to 4.5625-inches.
- Based on the 11/2019 inspection report & 08/26/2019 site assessment, there is no measurable deterioration to warrant a deteriorated structure model in BrR.
- A 0.5" haunch depth was assumed at midspan.
- Sacrificial wearing surface = 0" per LRGD section 10.2.
- Also rated by LFR and results show that posting is not required.
- Dimensions of the rehab parapet and median barrier were assumed to be same as the details from widening plans.
- Concrete strength on the rehab plans are assumed to be same as widening plans.