



## ASR/LFR 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
(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 LFR		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 2A - INVENTORY RATINGS - Design Vehicles and AASHTO Legal Trucks							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
H-20	Truck	20	G14-G18	2.40	PS Tensile Stress - Concrete	1.115	22
H-20 Lane	Lane	20	G14-G18	2.50	PS Tensile Stress - Concrete	1.016	20
HS-20	Truck	36	G14-G18	2.40	PS Tensile Stress - Concrete	0.724	26
HS-20 Lane	Lane	36	G14-G18	2.50	PS Tensile Stress - Concrete	1.016	36
Alternate Military Loading	Truck	24	G14-G18	2.40	PS Tensile Stress - Concrete	0.911	21
Modified AASHTO SC - Type 3	Truck	25	G14-G18	2.40	PS Tensile Stress - Concrete	0.985	24
Modified AASHTO SC - Type 3S2	Truck	36.6	G14-G18	2.40	PS Tensile Stress - Concrete	0.886	32
AASHTO - Type 3-3	Truck	40	G14-G18	2.50	PS Tensile Stress - Concrete	0.966	38

SECTION 2B - INVENTORY RATINGS - Specialized Hauling Vehicles (SHV)							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC-SHV1A	Truck	32.5	G14-G18	2.50	PS Tensile Stress - Concrete	0.719	23
SC-SHV1B	Truck	35	G14-G18	2.50	PS Tensile Stress - Concrete	0.678	23
SC-SHV2A	Truck	33	G14-G18	2.40	PS Tensile Stress - Concrete	0.719	23
SC-SHV2B	Truck	40	G14-G18	2.40	PS Tensile Stress - Concrete	0.606	24
SC-SHV3A	Truck	42.5	G14-G18	2.40	PS Tensile Stress - Concrete	0.742	31
SC-SHV3B	Truck	45	G14-G18	2.40	PS Tensile Stress - Concrete	0.702	31
SC Representative School Bus	Truck	17.525	G14-G18	2.40	PS Tensile Stress - Concrete	1.429	25
SC-SU2	Truck	20	G14-G18	2.40	PS Tensile Stress - Concrete	1.222	24
SU4	Truck	27	G14-G18	2.40	PS Tensile Stress - Concrete	0.888	23
SU5	Truck	31	G14-G18	2.40	PS Tensile Stress - Concrete	0.797	24
SU6	Truck	34.75	G14-G18	2.40	PS Tensile Stress - Concrete	0.722	25
SU7	Truck	38.75	G14-G18	2.50	PS Tensile Stress - Concrete	0.661	25

This ASR/LFR 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 (at Operating level) 1.113

SECTION 4 - REMARKS & SIGN/SEAL			
Load Rating Engineer		Quality Control Engineer	
Name: Sathvika Meenakshisundaram		Name: William Johnson	
Company/Title: HDR / Bridge Engineer		Company/Title: HDR / Bridge Engineer	
Date: 1/30/2020		Date: 2/13/2020	
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.		<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	



## ASR/LFR BRIDGE LOAD RATING SUMMARY

Version 1.0

Page 2 of 2

SECTION 1 (PAGE 2) - GENERAL BRIDGE DATA								
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SECTION 5 - OPERATING RATINGS - Design Vehicles & AASHTO Legal Trucks							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
H-20	Truck	20	G14-G18	2.40	Design Shear - Concrete	2.472	49
H-20 Lane	Lane	20	G14-G18	2.40	Design Shear - Concrete	2.091	41
HS-20	Truck	36	G14-G18	2.40	Design Shear - Concrete	1.620	58
HS-20 Lane	Lane	36	G14-G18	2.40	Design Shear - Concrete	2.091	75
Alternate Military Loading	Truck	24	G14-G18	2.40	Design Shear - Concrete	2.043	49
Modified AASHTO SC - Type 3	Truck	25	G14-G18	2.40	Design Shear - Concrete	1.930	48
Modified AASHTO SC - Type 3S2	Truck	36.6	G14-G18	2.40	Design Shear - Concrete	1.825	66
AASHTO - Type 3-3	Truck	40	G14-G18	2.40	Design Shear - Concrete	2.148	85

SECTION 6A - OPERATING RATINGS - SC Specialized Hauling Vehicles (SHV) - Legal on Non-Interstate and Permit on Interstate							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC-SHV1A	Truck	32.5	G14-G18	2.40	Design Shear - Concrete	1.404	45
SC-SHV1B	Truck	35	G14-G18	2.40	Design Shear - Concrete	1.329	46
SC-SHV2A	Truck	33	G14-G18	2.40	Design Shear - Concrete	1.428	47
SC-SHV2B	Truck	40	G14-G18	2.40	Design Shear - Concrete	1.253	50
SC-SHV3A	Truck	42.5	G14-G18	2.40	Design Shear - Concrete	1.625	69
SC-SHV3B	Truck	45	G14-G18	2.40	Design Shear - Concrete	1.543	69

SECTION 6B - OPERATING RATINGS - Two Miscellaneous SHV & AASHTO SHV - Legal on all roads							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC Representative School Bus	Truck	17.525	G14-G18	2.40	Design Shear - Concrete	3.119	54
SC-SU2	Truck	20	G14-G18	2.40	Design Shear - Concrete	2.695	53
SU4	Truck	27	G14-G18	2.40	Design Shear - Concrete	1.758	47
SU5	Truck	31	G14-G18	2.40	Design Shear - Concrete	1.600	49
SU6	Truck	34.75	G14-G18	2.40	Design Shear - Concrete	1.536	53
SU7	Truck	38.75	G14-G18	2.40	Design Shear - Concrete	1.575	61

SECTION 6C - OPERATING RATINGS - Standard Permit Vehicles & Typical Cranes							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SC - 100k	Truck	50	G14-G18	2.40	Design Shear - Concrete	1.489	74
SC - 120k	Truck	60	G14-G18	2.40	Design Shear - Concrete	1.215	72
SC - 130k	Truck	65	G14-G18	2.40	Design Shear - Concrete	1.212	78
SC Crane #544726	Truck	80	G14-G18	2.40	Design Shear - Concrete	1.100	88
SC Crane #527568	Truck	88.85	G14-G18	2.40	Design Shear - Concrete	1.121	99

SECTION 6D - OPERATING RATINGS - Emergency Vehicles (EV)							
Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
EV2	Truck	28.75	G14-G18	2.40	Design Shear - Concrete	1.912	54
EV3	Truck	43	G14-G18	2.40	Design Shear - Concrete	1.113	47

### Remarks (continued):

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.
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 sacrification. 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.