



LRFR BRIDGE LOAD RATING SUMMARY

SECTION 1 - GENERAL BRIDGE DATA					
(8) Asset ID 07937	Route Type Secondary road	(27) Year Built 1985	(90) Date of Inspection 02/2019	(411) Date Rated 7/15/2020	
(9) Bridge Location 4 MI NW OF COLUMBIA		(7) Facility Carried S-40-31		(6) Feature Intersected/Route Crossing I-26	
(49) Length 638 ft.	(11) Milepost 0.214	(2) District 1	(3) County RICHLAND	(22) Owner SCDOT	(418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) 6, 7, 7
(43, 44, 45, & 46) Bridge Description Continuous 4 Span SCS 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 6 Satisfactory	(59) Superstructure 7 Good	(60) Substructure 7 Good	(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	G10	4.0	STRENGTH-I Steel Flexure Stress	0.570
HL-93 Truck Train + Lane (90%)	Inventory	G10	4.0	STRENGTH-I Steel Flexure Stress	0.458
HL-93 Tandem + Lane	Inventory	G10	4.0	STRENGTH-I Steel Flexure Stress	0.661
HL-93 Truck + Lane	Operating	G10	4.0	STRENGTH-I Steel Flexure Stress	0.738
HL-93 Truck Train + Lane (90%)	Operating	G10	4.0	STRENGTH-I Steel Flexure Stress	0.594
HL-93 Tandem + Lane	Operating	G10	4.0	STRENGTH-I Steel Flexure Stress	0.857

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
Lane Type Loading (Neg. M only)	No	0.959

SECTION 4 - REMARKS & SIGN/SEAL		
Load Rating Engineer	Quality Control Engineer	<input checked="" type="checkbox"/> Structure is part of QA sample set. Quality Assurance Engineer
Name: Katherine Wisdom	Name: William Johnson	Name: Gerald H. Jones, P.E.
Company/Title: HDR/Bridge Engineer	Company/Title: HDR / Bridge Engineer	Company/Title: Michael Baker International/Bridge Engineer
Date: 6/24/2020	Date: 7/9/2020	Date: 7/28/2020
<p>Remarks:</p> <ol style="list-style-type: none"> As-let plans 3240.378.6 were used for the rating. Traffic data was input into BrR using Directional % = 55% and Truck % = 3%. 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.). A load of 0.016 ksf was applied to account for the weight of SIP forms and the extra concrete in bays 1-4 and 6-9. Appurtenance dead loads were distributed to the 3 adjacent girders, except for the median. The median was distributed to the 4 adjacent girders. Overhead sign dimensions not shown in plans. Dimensions based on Site Assessment dated 09/25/2019. 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. The average overhang was used since the variation in this width is not significant. Sacrificial wearing surface = 0" per LRGD section 11.2.1.1. An additional 10% of self-load was applied to all steel girders to account for splice plates and transverse intermediate stiffeners as well as welds, bolts, etc. 		

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	27600	3		828				
Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)	
Modified AASHTO SC - Type 3	Legal	25	G9	2.4	SERVICE-II Steel Flexure Stress	2.167	54	
Modified AASHTO SC - Type 3S2	Legal	36.6	G10	4.0	STRENGTH-I Steel Flexure Stress	1.651	60	
AASHTO - Type 3-3	Legal	40	G10	4.0	STRENGTH-I Steel Flexure Stress	1.578	63	
Lane Type Loading (Neg. M only)	Legal	40	G10	4.0	STRENGTH-I Steel Flexure Stress	0.959	38	
Lane Type Loading (Span > 200 ft)	Legal	40	-	-	-	-	N/A	
Modified AASHTO SC - Type 3	Permit	25	G10	4.0	STRENGTH-II Steel Flexure Stress	2.459	61	
Modified AASHTO SC - Type 3S2	Permit	36.6	G10	4.0	STRENGTH-II Steel Flexure Stress	1.627	59	
AASHTO - Type 3-3	Permit	40	G10	4.0	STRENGTH-II Steel Flexure Stress	1.554	62	
Lane Type Loading (Neg. M only)	Permit	40	G10	4.0	STRENGTH-II Steel Flexure Stress	1.188	47	
Lane Type Loading (Span > 200 ft)	Permit	40	-	-	-	-	N/A	



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Version 1.0

Page 2 of 2

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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	G9	2.4	SERVICE-II Steel Flexure Stress	1.622	52
SC-SHV1B	Legal	35	G9	2.4	SERVICE-II Steel Flexure Stress	1.517	53
SC-SHV2A	Legal	33	G9	2.4	SERVICE-II Steel Flexure Stress	1.607	53
SC-SHV2B	Legal	40	G9	2.4	SERVICE-II Steel Flexure Stress	1.343	53
SC-SHV3A	Legal	42.5	G10	4.0	STRENGTH-I Steel Flexure Stress	1.423	60
SC-SHV3B	Legal	45	G10	4.0	STRENGTH-I Steel Flexure Stress	1.345	60

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	G9	2.4	SERVICE-II Steel Flexure Stress	3.111	54
SC-SU2	Legal	20	G9	2.4	SERVICE-II Steel Flexure Stress	2.696	53
SU4	Legal	27	G9	2.4	SERVICE-II Steel Flexure Stress	1.976	53
SU5	Legal	31	G9	2.4	SERVICE-II Steel Flexure Stress	1.751	54
SU6	Legal	34.75	G9	2.4	SERVICE-II Steel Flexure Stress	1.576	54
SU7	Legal	38.75	G9	2.4	SERVICE-II Steel Flexure Stress	1.432	55

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	G9	2.4	SERVICE-II Steel Flexure Stress	1.874	53
EV3	Legal	43	G9	2.4	SERVICE-II Steel Flexure Stress	1.256	54

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	G10	4.0	STRENGTH-II Steel Flexure Stress	1.958	63
SC-SHV1B	Permit	35	G10	4.0	STRENGTH-II Steel Flexure Stress	1.820	63
SC-SHV2A	Permit	33	G10	4.0	STRENGTH-II Steel Flexure Stress	1.930	63
SC-SHV2B	Permit	40	G10	4.0	STRENGTH-II Steel Flexure Stress	1.595	63
SC-SHV3A	Permit	42.5	G10	4.0	STRENGTH-II Steel Flexure Stress	1.517	64
SC-SHV3B	Permit	45	G10	4.0	STRENGTH-II Steel Flexure Stress	1.433	64
SC Representative School Bus	Permit	17.525	G10	4.0	STRENGTH-II Steel Flexure Stress	3.266	57
SC-SU2	Permit	20	G10	4.0	STRENGTH-II Steel Flexure Stress	3.060	61
SU4	Permit	27	G10	4.0	STRENGTH-II Steel Flexure Stress	2.363	63
SU5	Permit	31	G10	4.0	STRENGTH-II Steel Flexure Stress	1.982	61
SU6	Permit	34.75	G10	4.0	STRENGTH-II Steel Flexure Stress	1.771	61
SU7	Permit	38.75	G10	4.0	STRENGTH-II Steel Flexure Stress	1.595	61
SC - 100k	Permit	50	G10	4.0	STRENGTH-II Steel Flexure Stress	1.307	65
SC - 120k	Permit	60	G10	4.0	STRENGTH-II Steel Flexure Stress	1.082	64
SC - 130k	Permit	65	G10	4.0	STRENGTH-II Steel Flexure Stress	1.010	65
SC Crane #544726	Permit	80	G10	4.0	STRENGTH-II Steel Flexure Stress	0.867	69
SC Crane #527568	Permit	88.85	G10	4.0	STRENGTH-II Steel Flexure Stress	0.789	70

Remarks:

10. Utilities on left girder Span 3 and right girder Spans 1, 3-5 were estimated to be 1" diameter std. wt. steel pipe. Utility on left girder Span 4 was estimated to be 2" diameter std. wt. steel pipe.
11. A572 flange plates 1.5" and smaller assumed to be Grade 45. A572 flange plates larger than 1.5" assumed to be Grade 42.
12. Based on the 09/25/2019 site assessment, there is no measurable deterioration to warrant a deteriorated structure model in BrR.
13. Also rated by LFR and results showed that posting is not required.