



LRFR BRIDGE LOAD RATING SUMMARY

SECTION 1 - GENERAL BRIDGE DATA					
(8) Asset ID 04366	Route Type Interstate	(27) Year Built 1964	(90) Date of Inspection 12/2/2019	(411) Date Rated 2/14/2020	
(9) Bridge Location 5MI NW OF COLA		(7) Facility Carried I-20	(6) Feature Intersected/Route Crossing RR CN&L		
(49) Length 176 ft.	(11) Milepost 63.010	(2) District 1	(3) County LEXINGTON	(22) Owner SCDOT	(418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) 7, 7, 7
(43, 44, 45, & 46) Bridge Description Simple 3 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, 2018
(58) Deck 7 Good	(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	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.019
HL-93 Truck Train + Lane (90%)	Inventory	-	-	-	-
HL-93 Tandem + Lane	Inventory	G2-G6	1.5	SERVICE-III PS Tensile Stress	1.117
HL-93 Truck + Lane	Operating	G2-G6	1.5	STRENGTH-I Concrete Flexure	1.571
HL-93 Truck Train + Lane (90%)	Operating	-	-	-	-
HL-93 Tandem + Lane	Operating	G2-G6	1.5	STRENGTH-I Concrete Flexure	1.718

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	0.779

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: Sathwika M	Name: William Johnson	Name:
Company/Title: HDR Inc. / Bridge Engineer	Company/Title: HDR Inc. / Bridge Engineer	Company/Title:
Date: 12/23/2019	Date: 2/12/2020	Date:
Remarks: 1. As-built plans 32.467 for the original structure and As-Let plans 32.806 for the widening were used for the rating. 2. Traffic data was input into BrR using Directional % = 55% and Truck % = 12% 3. Condition factor of 1.00 was used based on the Inspection Report. 4. Spans 1 through 3 are all 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 three spans. 5. Utility was estimated to be 3" diameter std. wt. steel pipe. A weight of 0.008 klf was assumed for the gvanized metal pipe. Utility load was distributed to the three adjacent girders. 6. The post and rail traffic barriers on the original structure were retrofitted to a modified barrier at the outside shoulders. The barriers utilized 0.115 kcf lightweight concrete which was used to calculate the weight of the barrier section. 7. 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.		 2/14/2020

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	83700	12	10044				
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-G6	1.5	SERVICE-III PS Tensile Stress	1.354	33
Modified AASHTO SC - Type 3S2	Legal	36.6	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.347	49
AASHTO - Type 3-3	Legal	40	G2-G6	1.5	SERVICE-III PS Tensile Stress	1.510	60
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-G6	1.5	STRENGTH-II Concrete Flexure	2.602	65
Modified AASHTO SC - Type 3S2	Permit	36.6	G2-G6	1.4	STRENGTH-II Concrete Flexure	2.504	91
AASHTO - Type 3-3	Permit	40	G2-G6	1.5	STRENGTH-II Concrete Flexure	2.799	111
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 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-G6	1.5	SERVICE-III PS Tensile Stress	0.964	31
SC-SHV1B	Legal	35	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.914	31
SC-SHV2A	Legal	33	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.971	32
SC-SHV2B	Legal	40	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.833	33
SC-SHV3A	Legal	42.5	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.129	47
SC-SHV3B	Legal	45	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.069	48

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-G6	1.4	SERVICE-III PS Tensile Stress	1.985	34
SC-SU2	Legal	20	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.685	33
SU4	Legal	27	G2-G6	1.5	SERVICE-III PS Tensile Stress	1.205	32
SU5	Legal	31	G2-G6	1.4	SERVICE-III PS Tensile Stress	1.102	34
SU6	Legal	34.75	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.992	34
SU7	Legal	38.75	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.915	35

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-G6	1.4	SERVICE-III PS Tensile Stress	1.170	33
EV3	Legal	43	G2-G6	1.5	SERVICE-III PS Tensile Stress	0.779	33

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-G6	1.5	STRENGTH-II Concrete Flexure	1.925	62
SC-SHV1B	Permit	35	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.825	63
SC-SHV2A	Permit	33	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.938	63
SC-SHV2B	Permit	40	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.663	66
SC-SHV3A	Permit	42.5	G2-G6	1.4	STRENGTH-II Concrete Flexure	2.178	92
SC-SHV3B	Permit	45	G2-G6	1.4	STRENGTH-II Concrete Flexure	2.062	92
SC Representative School Bus	Permit	17.525	G2-G6	1.4	STRENGTH-II Concrete Flexure	3.690	64
SC-SU2	Permit	20	G2-G6	1.4	STRENGTH-II Concrete Flexure	3.248	64
SU4	Permit	27	G2-G6	1.5	STRENGTH-II Concrete Flexure	2.406	64
SU5	Permit	31	G2-G6	1.4	STRENGTH-II Concrete Flexure	2.125	65
SU6	Permit	34.75	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.907	66
SU7	Permit	38.75	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.758	68
SC - 100k	Permit	50	G2-G6	1.4	STRENGTH-II Concrete Flexure	2.019	100
SC - 120k	Permit	60	G2-G6	1.4	STRENGTH-II Concrete Flexure	1.674	100
SC - 130k	Permit	65	G2-G6	1.4	STRENGTH-II Concrete Flexure	1.627	105
SC Crane #544726	Permit	80	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.470	117
SC Crane #527568	Permit	88.85	G2-G6	1.5	STRENGTH-II Concrete Flexure	1.347	119

Remarks (continued):

- The original bridge deck was 6.5" with a 3" concrete overlay after 0.25" deck sacrification. The typical widening bridge deck thickness is 7.5". A deck thickness of 7.5" is used in BrR superstructure definition. Extra thickness of 1.75" for the original bridge section was distributed equally to the original girders and applied as a non-composite member load.
- Based on the Dec 2, 2019 Inspection Report, there is no measurable deterioration to warrant a Deteriorated Structure model in BrR.
- Based on the Aug 27, 2019 site assessment, there is no measurable deterioration to warrant a Deteriorated Structure model in BrR.
- Sacrificial wearing surface = 0" per LRGD section 10.2
- Also rated by LFR and results show that posting is not required.
- The span length varied between the original girders and the girders on the widening by 2". The longer span length was conservatively used in model and the beam projection was adjusted to total the original out-to-out beam length.
- A 0.75" haunch depth was assumed at midspan at the girders in the widening and 0" haunch depth was assumed for the original girders.
- Controlling member G2-G6 also includes G11-G15.