

# SHV LOAD RATINGS FOR H-STANDARD BRIDGES

January, 2016

## Introduction

A load rating states the load in tons which a vehicle can impose on a bridge. Changes in guidelines, standards, and customary uses of bridges require analyses of bridges to be updated and reevaluated.

In this report, ten H-standards are rated for SHV's (SU7, SU6, SU5, and SU4) utilizing Load Factor methodology. The ratings are reported in tons. For easier reference, the HS20 inventory and operating ratings for these standards are also included. The HS20 ratings were first published in the research report of HR-239 Phase IV (Oct, 2008). The rated H-standards include: **H24-87, H30-87, H24s-87, H30S-87, H24SI-05, H30SI-05, H24-06, H30-06, H40-06, H44-07.**

The ratings apply only to those bridges which:

- 1) Are built according to the applicable bridge standard plans,
- 2) Have no structural deterioration or damage, and
- 3) Have no added wearing surface in excess of one-half inch integral wearing surface

Load Ratings listed in this report are in compliance with the 1994 AASHTO Manual for Condition Evaluation of Bridges, second edition, including interim revision through 2000.

The proper use and application of these bridge ratings requires due consideration and evaluation by a qualified engineer of all relevant factors affecting these ratings. Anyone using any part of the bridge ratings assumes sole responsibility for their proper application.

## References

1. Manual for Condition Evaluation of Bridges, 2<sup>nd</sup> edition, including revisions from Interim Specification for Bridge 1995, 1996, 1998, and 2000, prepared by Highway Subcommittee on Bridge and Structures publ. American Association of State Highway and Transportation Officials, Washington, D.C., 1994.
2. Standard Specifications For Highway Bridges, 17<sup>th</sup> edition, as amended by Interim Specifications, prepared by Highway Subcommittee on Bridge and Structures publ. American Association of State Highway and Transportation Officials, Washington, D.C., 2000.

Summary of Iowa DOT standard PPCB Bridges Load Ratings for SHVs 2016

H24-87

H30-87

H24s-87

H30S-87

H24SI-05

H30SI-05

H24-06

H30-06

H40-06

H44-07

**H24-87 Beam Bridge Standards Issued 1987**

2'-8" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
126'-4	A46	HS 23.0	HS 44.0	75.82	72.96	71.99	67.83
138'-10	A42	HS 22.4	HS 40.6	69.63	66.61	65.56	61.33
151'-4	A46	HS 21.4	HS 44.0	75.82	72.96	71.99	67.83
163'-10	B50	HS 23.4	HS 42.6	73.70	71.24	70.42	66.74
176'-4	B55R	HS 22.6	HS 43.4	75.33	73.07	72.34	68.88
188'-10	B59R	HS 22.0	HS 45.6	79.37	77.21	76.53	73.16
201'-4	C63	HS 22.6	HS 46.0	80.26	78.26	77.64	74.47
213'-10	C67R	HS 23.0	HS 46.2	80.77	78.93	78.36	75.38
226'-4	C71R	HS 20.6	HS 48.6	85.12	83.32	82.77	79.83
243'-0	C80R	HS 20.6	HS 50.6	88.89	87.25	86.77	84.03

2'-5" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
126'-4	A46	HS 23.2	HS 44.4	76.51	73.63	72.65	68.45
138'-10	A42	HS 22.8	HS 40.8	69.97	66.94	65.88	61.64
151'-4	A46	HS 21.8	HS 44.4	76.51	73.63	72.65	68.45
163'-10	B50	HS 23.8	HS 42.8	74.05	71.57	70.75	67.05
176'-4	B55R	HS 23.0	HS 43.6	75.68	73.41	72.68	69.20
188'-10	B59R	HS 22.4	HS 46.0	80.07	77.89	77.20	73.80
201'-4	C63	HS 23.0	HS 46.4	80.96	78.95	78.32	75.12
213'-10	C67R	HS 23.6	HS 46.8	81.82	79.95	79.38	76.36
226'-4	C71R	HS 21.2	HS 49.0	85.82	84.00	83.45	80.48
243'-0	C80R	HS 21.2	HS 51.2	89.95	88.29	87.79	85.02

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 24 feet.

### H30-87 Beam Bridge Standards Issued 1987

#### 2'-8" High Barrier Rail

Bridge Length	Control Beam	Inventory		Operating		SHV Ratings (Tons)			
		HS	23.4	HS	45.4	SU7	SU6	SU5	SU4
126'-4	A46	HS	23.4	HS	45.4	78.24	75.28	74.28	69.99
138'-10	A42	HS	22.8	HS	41.0	70.31	67.27	66.21	61.94
151'-4	A46	HS	21.8	HS	45.4	78.24	75.28	74.28	69.99
163'-10	B50	HS	23.8	HS	43.0	74.39	71.91	71.08	67.37
176'-4	B55R	HS	23.2	HS	50.6	87.83	85.20	84.34	80.31
188'-10	B59R	HS	22.6	HS	52.2	90.86	88.39	87.61	83.75
201'-4	C63	HS	23.2	HS	48.0	83.75	81.67	81.02	77.71
213'-10	C67R	HS	23.6	HS	54.4	95.11	92.93	92.27	88.76
226'-4	C71R	HS	21.2	HS	53.8	94.23	92.23	91.63	88.37
243'-0	C80R	HS	21.2	HS	58.6	102.95	101.05	100.48	97.31

#### 2'-5" High Open Rail

Bridge Length	Control Beam	Inventory		Operating		SHV Ratings (Tons)			
		HS	23.6	HS	45.6	SU7	SU6	SU5	SU4
126'-4	A46	HS	23.6	HS	45.6	78.58	75.62	74.61	70.30
138'-10	A42	HS	23.2	HS	41.2	70.65	67.59	66.53	62.24
151'-4	A46	HS	22.2	HS	45.6	78.58	75.62	74.61	70.30
163'-10	B50	HS	24.2	HS	43.2	74.74	72.24	71.41	67.68
176'-4	B55R	HS	23.4	HS	50.8	88.18	85.53	84.68	80.63
188'-10	B59R	HS	22.8	HS	52.4	91.21	88.73	87.94	84.07
201'-4	C63	HS	23.6	HS	48.4	84.45	82.35	81.69	78.36
213'-10	C67R	HS	24.0	HS	54.6	95.46	93.28	92.60	89.08
226'-4	C71R	HS	21.6	HS	54.2	94.93	92.92	92.31	89.02
243'-0	C80R	HS	21.6	HS	59.0	103.65	101.74	101.17	97.98

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 30 feet.

**H24S-87 Beam Bridge Standards Issued 1987**

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2'-8" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
30'-0	A30	HS 26.6	HS 44.4	72.41	67.77	66.24	61.79
42'-6	A42	HS 24.4	HS 40.6	69.63	66.61	65.56	61.33
55'-0	LXA55	HS 21.6	HS 46.0	79.85	77.45	76.68	73.01
67'-6	LXB67	HS 22.2	HS 49.0	85.67	83.71	83.11	79.95
80'-0	LXC80	HS 20.8	HS 50.8	89.24	87.60	87.11	84.36

2'-5" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
30'-0	A30	HS 26.8	HS 44.6	72.73	68.07	66.54	62.07
42'-6	A42	HS 24.4	HS 40.8	69.97	66.94	65.88	61.64
55'-0	LXA55	HS 21.8	HS 46.4	80.54	78.13	77.34	73.64
67'-6	LXB67	HS 22.4	HS 49.4	86.37	84.39	83.78	80.60
80'-0	LXC80	HS 21.2	HS 51.2	89.95	88.29	87.79	85.02

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 24 feet.

**H30S-87 Beam Bridge Standards Issued 1987**

2'-8" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
30'-0	A30	HS 26.8	HS 44.8	73.06	68.38	66.83	62.35
42'-6	A42	HS 24.6	HS 41.0	70.31	67.27	66.21	61.94
55'-0	LXA55	HS 21.8	HS 46.6	80.89	78.46	77.68	73.96
67'-6	LXB67	HS 22.6	HS 49.6	86.72	84.73	84.12	80.93
80'-0	LXC80	HS 21.4	HS 51.4	90.30	88.63	88.14	85.36

2'-5" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
30'-0	A30	HS 26.8	HS 44.8	73.06	68.38	66.83	62.35
42'-6	A42	HS 24.6	HS 41.2	70.65	67.59	66.53	62.24
55'-0	LXA55	HS 22.2	HS 46.8	81.23	78.80	78.01	74.28
67'-6	LXB67	HS 22.8	HS 49.8	87.07	85.08	84.46	81.25
80'-0	LXC80	HS 21.6	HS 51.8	91.00	89.32	88.82	86.02

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 30 feet.

**H24SI-05 Beam Bridge Standards Issued 2005**

2'-10" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
46'-8	LXA46	HS 25.2	HS 43.6	75.13	72.30	71.34	67.22
55'-0	LXA55	HS 23.2	HS 45.6	79.15	76.78	76.01	72.38
67'-6	LXB67	HS 24.0	HS 48.6	84.97	83.03	82.43	79.29
80'-0	LXC80	HS 22.8	HS 50.2	88.19	86.56	86.08	83.36
90'-0	LXD90	HS 23.4	HS 46.6	82.10	80.78	80.41	78.17
100'-0	LXD100	HS 23.4	HS 52.6	92.88	91.57	91.20	88.93
110'-0	LXD110	HS 22.4	HS 58.2	102.95	101.65	101.29	99.02

2'-5" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
46'-8	LXA46	HS 25.6	HS 44.4	76.51	73.63	72.65	68.45
55'-0	LXA55	HS 23.8	HS 46.4	80.54	78.13	77.34	73.64
67'-6	LXB67	HS 24.6	HS 49.4	86.37	84.39	83.78	80.60
80'-0	LXC80	HS 23.6	HS 51.2	89.95	88.29	87.79	85.02
90'-0	LXD90	HS 24.4	HS 47.8	84.21	82.86	82.48	80.18
100'-0	LXD100	HS 24.4	HS 53.8	94.99	93.65	93.28	90.96
110'-0	LXD110	HS 23.6	HS 59.4	105.07	103.75	103.38	101.06

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 24 feet.

**H30SI-05 Beam Bridge Standards Issued 2005**

2'-10" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
46'-8	LXA46	HS 25.6	HS 44.2	76.17	73.29	72.32	68.14
55'-0	LXA55	HS 23.6	HS 46.2	80.19	77.79	77.01	73.33
67'-6	LXB67	HS 24.6	HS 49.2	86.02	84.05	83.45	80.27
80'-0	LXC80	HS 23.4	HS 51.0	89.60	87.94	87.45	84.69
90'-0	LXD90	HS 24.2	HS 47.4	83.51	82.17	81.79	79.51
100'-0	LXD100	HS 24.2	HS 53.6	94.64	93.31	92.93	90.62
110'-0	LXD110	HS 23.2	HS 59.2	104.72	103.40	103.03	100.72

2'-5" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
46'-8	LXA46	HS 26.0	HS 44.6	76.86	73.96	72.97	68.76
55'-0	LXA55	HS 24.2	HS 46.8	81.23	78.80	78.01	74.28
67'-6	LXB67	HS 25.2	HS 49.8	87.07	85.08	84.46	81.25
80'-0	LXC80	HS 24.2	HS 51.8	91.00	89.32	88.82	86.02
90'-0	LXD90	HS 25.0	HS 48.4	85.27	83.90	83.51	81.19
100'-0	LXD100	HS 25.0	HS 54.6	96.41	95.05	94.66	92.31
110'-0	LXD110	HS 24.2	HS 60.2	106.49	105.15	104.77	102.42

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 30 feet.



**H24-06 Beam Bridge Standards Issued 2006**

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2'-10" High Open Rail

Bridge Length	Control Beam	Inventory		Operating		SHV Ratings (Tons)			
		HS		HS		SU7	SU6	SU5	SU4
138'-10	A42	HS	20.4	HS	33.8	57.96	55.45	54.58	51.06
151'-4	A46	HS	20.8	HS	36.2	62.38	60.03	59.23	55.81
163'-10	B50	HS	25.4	HS	42.6	73.70	71.24	70.42	66.74
176'-4	B55	HS	24.6	HS	43.0	74.64	72.40	71.68	68.25
188'-10	B59	HS	23.0	HS	46.0	80.07	77.89	77.20	73.80
201'-4	C63	HS	26.8	HS	51.2	89.33	87.11	86.42	82.89
213'-10	C67	HS	25.6	HS	53.0	92.66	90.54	89.89	86.47
226'-4	C71	HS	24.2	HS	53.4	93.53	91.55	90.95	87.71
243'-0	C80	HS	24.2	HS	55.4	97.33	95.53	95.00	92.00

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 24 feet.

**H30-06 Beam Bridge Standards Issued 2006**

2'-10" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 21.2	HS 35.4	60.71	58.08	57.16	53.48
151'-4	A46	HS 22.2	HS 37.8	65.14	62.68	61.85	58.28
163'-10	B50	HS 26.6	HS 44.4	76.82	74.25	73.40	69.56
176'-4	B55	HS 26.0	HS 44.8	77.76	75.43	74.68	71.11
188'-10	B59	HS 24.4	HS 47.8	83.20	80.94	80.22	76.69
201'-4	C63	HS 28.2	HS 53.4	93.17	90.86	90.13	86.45
213'-10	C67	HS 27.0	HS 55.2	96.51	94.30	93.62	90.06
226'-4	C71	HS 25.6	HS 55.8	97.73	95.66	95.03	91.65
243'-0	C80	HS 25.6	HS 57.6	101.19	99.32	98.77	95.65

2'-8" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 21.4	HS 35.6	61.05	58.41	57.49	53.78
151'-4	A46	HS 22.6	HS 38.0	65.48	63.01	62.17	58.58
163'-10	B50	HS 26.8	HS 44.8	77.51	74.92	74.06	70.19
176'-4	B55	HS 26.4	HS 45.2	78.46	76.11	75.34	71.74
188'-10	B59	HS 24.8	HS 48.4	84.25	81.96	81.23	77.65
201'-4	C63	HS 28.6	HS 53.8	93.87	91.54	90.81	87.10
213'-10	C67	HS 27.6	HS 55.8	97.56	95.33	94.64	91.04
226'-4	C71	HS 26.2	HS 56.2	98.43	96.35	95.72	92.31
243'-0	C80	HS 26.2	HS 58.2	102.24	100.36	99.80	96.65

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 30 feet.

**H40-06 Beam Bridge Standards Issued 2006**

2'-10" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 19.2	HS 32.0	54.88	52.50	51.67	48.34
151'-4	A46	HS 19.4	HS 34.2	58.94	56.71	55.96	52.73
163'-10	B50	HS 24.0	HS 40.2	69.55	67.23	66.45	62.98
176'-4	B55	HS 22.8	HS 40.6	70.47	68.36	67.67	64.44
188'-10	B59	HS 21.4	HS 43.4	75.54	73.49	72.84	69.63
201'-4	C63	HS 25.0	HS 48.4	84.45	82.35	81.69	78.36
213'-10	C67	HS 23.8	HS 50.2	87.77	85.76	85.14	81.91
226'-4	C71	HS 22.4	HS 50.6	88.63	86.75	86.18	83.11
243'-0	C80	HS 22.4	HS 52.4	92.05	90.35	89.85	87.02

2'-8" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 19.4	HS 32.2	55.22	52.83	52.00	48.64
151'-4	A46	HS 19.6	HS 34.3	59.11	56.88	56.12	52.88
163'-10	B50	HS 24.2	HS 40.4	69.90	67.56	66.79	63.29
176'-4	B55	HS 23.2	HS 41.0	71.17	69.03	68.34	65.07
188'-10	B59	HS 21.8	HS 43.8	76.24	74.17	73.51	70.27
201'-4	C63	HS 25.2	HS 48.8	85.14	83.03	82.37	79.01
213'-10	C67	HS 24.2	HS 50.6	88.47	86.44	85.82	82.56
226'-4	C71	HS 22.8	HS 51.0	89.33	87.43	86.86	83.77
243'-0	C80	HS 22.8	HS 53.0	93.11	91.39	90.88	88.01

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 40 feet.

**H44-07 Beam Bridge Standards Issued 2007**

2'-10" High Barrier Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 21.2	HS 35.4	60.71	58.08	57.16	53.48
151'-4	A46	HS 22.2	HS 37.6	64.79	62.35	61.52	57.97
163'-10	B50	HS 26.6	HS 44.2	76.47	73.91	73.07	69.25
176'-4	B55	HS 26.0	HS 44.8	77.76	75.43	74.68	71.11
188'-10	B59	HS 24.6	HS 48.0	83.55	81.28	80.56	77.01
201'-4	C63	HS 28.4	HS 53.4	93.17	90.86	90.13	86.45
213'-10	C67	HS 27.4	HS 55.2	96.51	94.30	93.62	90.06
226'-4	C71	HS 25.8	HS 55.8	97.73	95.66	95.03	91.65
243'-0	C80	HS 25.8	HS 57.8	101.54	99.67	99.11	95.98

2'-8" High Open Rail

Bridge Length	Control Beam	Inventory	Operating	SHV Ratings (Tons)			
				SU7	SU6	SU5	SU4
138'-10	A42	HS 21.2	HS 35.6	61.05	58.41	57.49	53.78
151'-4	A46	HS 22.6	HS 38.0	65.48	63.01	62.17	58.58
163'-10	B50	HS 26.6	HS 44.4	76.82	74.25	73.40	69.56
176'-4	B55	HS 26.4	HS 45.2	78.46	76.11	75.34	71.74
188'-10	B59	HS 25.0	HS 48.2	83.90	81.62	80.89	77.33
201'-4	C63	HS 28.6	HS 53.6	93.52	91.20	90.47	86.78
213'-10	C67	HS 27.6	HS 55.6	97.21	94.98	94.30	90.72
226'-4	C71	HS 26.2	HS 56.2	98.43	96.35	95.72	92.31
243'-0	C80	HS 26.2	HS 58.2	102.24	100.36	99.80	96.65

- Note:
1. Ratings were calculated using 1/2" integral wearing surface deducted from the slab as shown on the standard plans.
  2. Nominal roadway width is 44 feet.