

VEHICULAR LOADS

Vehicular load tables are designed in accordance with the 16th Edition of the American Association of State Highway and Transportation Officials (AASHTO) for H-10 through H-25 loads with deflection limited to the lesser of .125 inches (3.175 mm) or L/400 to a maximum simple span of 8'- 0" (2,438mm). Automobile and forklift

loads are similarly evaluated with loads calculated and distributed in accordance with the criteria shown below. If the load conditions of your application are not adequately addressed in the criteria presented, please contact Vulcraft for assistance in determining the proper grating for your application.

Vehicular Load Table Criteria	H-25 ⁵	H-20/ HL-93 ⁶	H-15	H-10 ²	Passenger Vehicles	5 Ton Forklifts ³	3 Ton Forklifts ³	1 Ton Forklifts ³
								
Truck/ Vehicle Weight (lbs)					6,322	14,400	9,800	4,200
Load Capacity (lbs)					3,578	10,000	6,000	2,000
Axle Load (lbs)	40,000	32,000	24,000	16,000				
Impact Factor	30%	30%	30%	30%	30%	30%	30%	30%
Total Load (lbs)	52,000	41,600	31,200	20,800	4,651	13,000	7,800	2,600
% of Load on Drive Axel					60%	85%	85%	85%
Wheel Load (lbs)	26,000	20,800	15,600	10,400	2,326	6,500	3,900	1,300
A-Length of distribution perpendicular to axle or parallel to main bars (in)	25	20	15	10	9	11	7	4
C-Width of distribution parallel to axle or perpendicular to main bars (in)	25	20	15	10	9	11	7	4

Notes:

- For continuous spans, use continuity factor = .80.
- This distribution results in larger grating sizes for lighter trucks on shorter spans.
- The fork lift wheel loads and load distribution patterns depicted above, generally, and only partially, represent the broad range of rubber-tired lift trucks available. For those applications falling outside of these examples, please contact Vulcraft.
- Wheeled vehicles with urethane tires should NEVER be used in conjunction with open grid bar grating.
- HS20 is the same as H20 and HS15 is the same as H15. The "S" stands for semi-trailer.
- The "HL-93" notation shown with "H-20" represents AASHTO's truck loading standard post-1993. Since, 1993, H-10, H-20, etc. have been retired in lieu of the "HL-93" loading which represents all trucks.

VEHICULAR LOADS

Note: All loads based on Smooth surface

Bearing Bar Size	S _x in ³ /ft.	I _x in ⁴ /ft.	Unit Wt. lb/ft ²	Maximum Clear Span Between Supports (in)							
				H-25	H-20 / HL-93	H-15	H-10	Auto Traffic	5-Ton Forklift	3-Ton Forklift	1-Ton Forklift
1 x ¼	0.421	0.211	9.92	15	13	11	8	13	8	7	7
1-¼ x ¼	0.658	0.411	12.06	17	15	12	10	17	10	8	10
1-½ x ¼	0.947	0.711	14.21	19	17	15	13	23	12	10	14
1-½ x ⅜	1.421	1.066	20.83	22	20	18	16	32*	15	14	20
2 x ¼	1.684	1.684	18.51	24	22	20	18	38*	17	16	23
2-½ x ¼	2.632	3.289	22.80	31	29	27	26	47*	23	22	35
3 x ¼	3.789	5.684	27.10	39	37	36	35	56*	31	31	48*
3 x ⅜	5.684	8.526	40.70	47*	47*	47*	48*	64*	43	44	55*
4 x ¼	6.737	13.474	35.69	55*	54*	55*	55*	75*	50	52	64*
4 x ⅜	10.105	20.211	53.58	62*	62*	62*	63*	85*	60*	61*	73*
5 x ⅜	15.789	39.474	66.47	77*	77*	78*	79*	107*	74*	76*	92*
6 x ⅜	22.737	68.211	79.35	92*	92*	93*	95*	128*	89*	92*	110*

* Indicates that value was controlled by L/400 ≤ 1/8" deflection limit.

Note: All loads based on Smooth surface

Bearing Bar Size	S _x in ³ /ft.	I _x in ⁴ /ft.	Unit Wt. lb/ft ²	Maximum Clear Span Between Supports (in)							
				H-25	H-20 / HL-93	H-15	H-10	Auto Traffic	5-Ton Forklift	3-Ton Forklift	1-Ton Forklift
1 x ¼	0.533	0.267	12.21	16	14	11	9	15	9	7	8
1-¼ x ¼	0.833	0.521	14.93	18	16	14	11	20	11	9	12
1-½ x ¼	1.200	0.900	17.65	21	18	16	14	27	13	12	16
1-½ x ⅜	1.800	1.350	25.98	25	23	20	19	38	17	16	23
2 x ¼	2.133	2.133	23.09	27	25	23	21	45	19	18	26
2-½ x ¼	3.333	4.167	28.53	35	33	32	30	67	27	26	40
3 x ¼	4.800	7.200	33.97	46	44	42	42	84*	36	36	57
3 x ⅜	7.200	10.800	51.01	62	60	59	60	96*	51	52	81*
4 x ¼	8.533	17.067	44.85	71	70	69	70	112*	60	61	95*
4 x ⅜	12.800	25.600	67.33	93*	93*	93*	95*	128*	87	90	108*
5 x ⅜	20.000	50.000	83.65	115*	116*	117*	118*	160*	112*	114*	135*
6 x ⅜	28.800	86.400	99.97	138*	139*	140*	142*	192*	134*	137*	163*

* Indicates that value was controlled by L/400 ≤ 1/8" deflection limit.

Note: All loads based on Smooth surface

Bearing Bar Size	S _x in ³ /ft.	I _x in ⁴ /ft.	Unit Wt. lb/ft ²	Maximum Clear Span Between Supports (in)							
				H-25	H-20 / HL-93	H-15	H-10	Auto Traffic	5-Ton Forklift	3-Ton Forklift	1-Ton Forklift
1 x ¼	0.267	0.133	6.77	14	12	10	7	10	7	6	6
1-¼ x ¼	0.417	0.260	8.13	16	13	11	9	14	9	7	8
1-½ x ¼	0.600	0.450	9.49	17	15	12	10	18	10	8	11
1-½ x ⅜	0.900	0.675	13.74	19	17	15	13	24	12	11	16
2 x ¼	1.067	1.067	12.21	20	18	16	14	28	13	12	18
2-½ x ¼	1.667	2.083	14.93	25	23	21	20	41	18	17	27
3 x ¼	2.400	3.600	17.65	30	28	27	26	50*	23	23	38
3 x ⅜	3.600	5.400	26.53	39	37	36	37	57*	32	33	50*
4 x ¼	4.267	8.533	23.09	44	42	42	43	67*	37	39	59*
4 x ⅜	6.400	12.800	34.69	55*	55*	57*	56*	76*	52	55*	67*
5 x ⅜	10.000	25.000	42.85	68*	68*	69*	70*	95*	66*	69*	84*
6 x ⅜	14.400	43.200	51.01	81*	81*	82*	84*	114*	79*	82*	101*

* Indicates that value was controlled by L/400 ≤ 1/8" deflection limit.

VEHICULAR LOADS

38HW4

Note: All loads based on Smooth surface

Bearing Bar Size	S _x in ³ /ft.	I _x in ⁴ /ft.	Unit Wt. lb/ft ²	Maximum Clear Span Between Supports (in)							
				H-25	H-20 / HL-93	H-15	H-10	Auto Traffic	5-Ton Forklift	3-Ton Forklift	1-Ton Forklift
1 x ¼	0.211	0.105	5.62	14	12	9	7	9	7	5	6
1-¼ x ¼	0.329	0.206	6.70	15	13	10	8	12	8	6	8
1-½ x ¼	0.474	0.355	7.77	16	14	11	9	16	9	8	10
1-½ x ⅜	0.711	0.533	11.17	18	16	13	12	21	11	10	14
2 x ¼	0.842	0.842	9.92	19	17	15	13	24	12	11	16
2-½ x ¼	1.316	1.645	12.06	23	20	19	17	36	16	15	24
3 x ¼	1.895	2.842	14.21	27	25	23	23	48*	20	21	34
3 x ⅜	2.842	4.263	21.37	34	33	31	32	54*	28	29	48*
4 x ¼	3.368	6.737	18.51	38	37	36	37	63*	32	34	57*
4 x ⅜	5.053	10.105	27.82	51	50	50	53	72*	45	49	65*
5 x ⅜	7.895	19.737	34.26	63*	64*	64*	67*	90*	63*	65*	81*
6 x ⅜	11.368	34.105	40.70	75*	76*	77*	80*	108*	75*	78*	97*

* Indicates that value was controlled by $L/400 \leq \frac{1}{8}$ " deflection limit.

Grating Frames

Vulcraft's structural fabrication services can be leveraged to further aid you in getting a superior solution for covering your concrete opening by also obtaining an Embed Frame with your grating. A steel embed frame can improve the quality and lifespan of your project by:

- Shielding the concrete at the opening edges from cracking and chipping,
- Providing an edge for the opening when forming the concrete pour,
- Providing uniform elevation for the opening to minimize potential for uneven surfaces,

- And providing a smooth and uniform bearing surface for the grating, allowing for easier attachment and better performance over its lifetime.

Frames are available in normal rectangular configurations only and will be supplied as a fully-assembled, four-sided unit in sizes up to those that can safely be transported via normal flatbed carriers. Sizes or configurations other than this should be discussed with Vulcraft. Embed frames can be supplied mill finished, painted, or hot-dipped galvanized. To order, please include a detail similar to the following with the Clear Opening Width and Span clearly defined as well as the desired quantities and finish.

