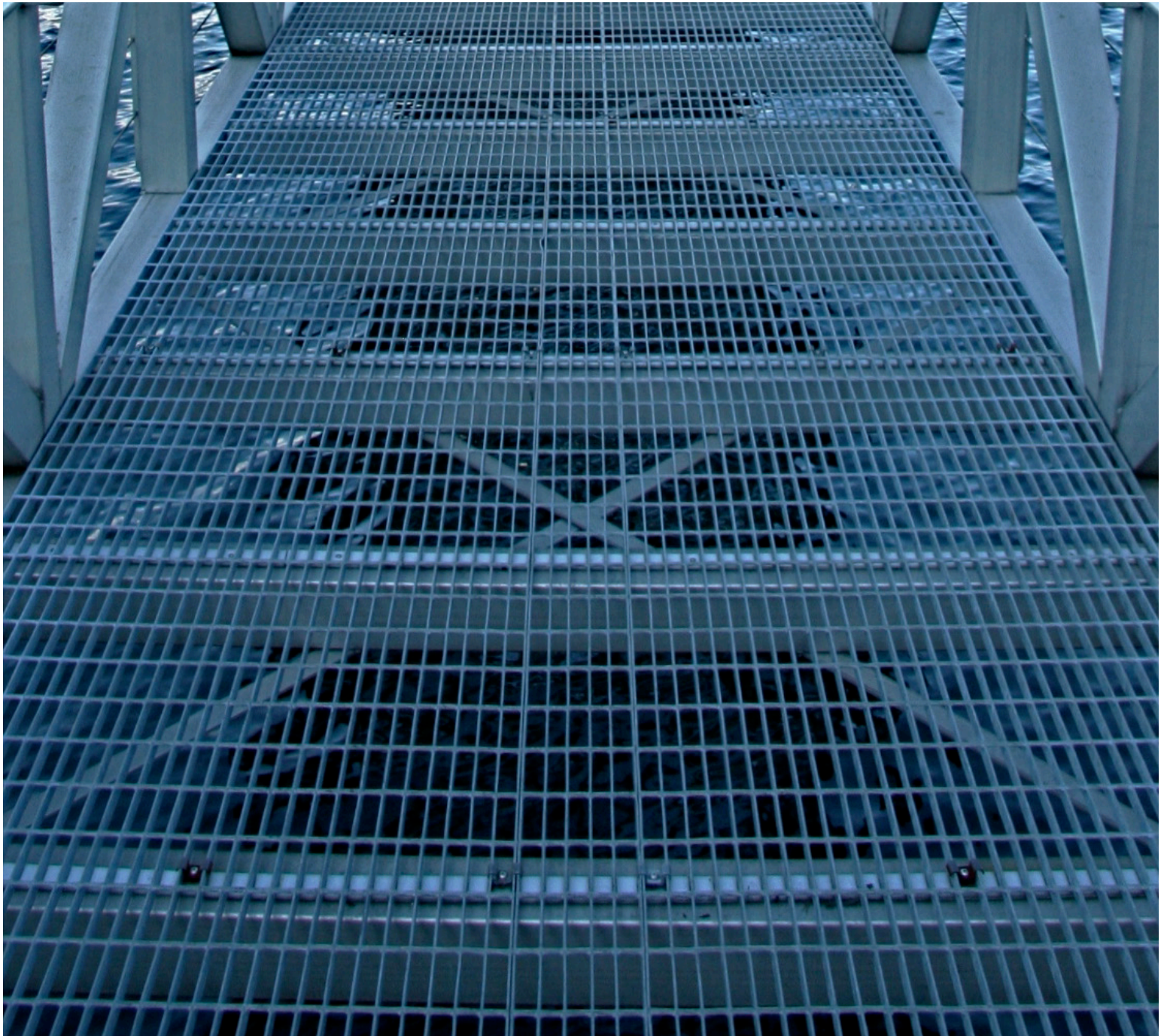


VULCRAFT®

STEEL BAR GRATING



NUCOR®
VULCRAFT CANADA

Powerful Partnerships.
Powerful Results

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INTRODUCTION

WHY GRATING?

- Easy Installation and Fabrication
- Adaptable to Complex Floor Layouts
- Allows Passage of Light and Air
- High Strength-to-Weight Ratio
- Durable and Long Lasting Surface

APPLICATIONS

- Industrial Flooring
- Walkways
- Bridge Decks
- Trenches
- Steel Mills
- Warehouses
- Chemical Plants
- Water Treatment Plants
- Power Plants
- Oil Refineries
- Agricultural Facilities

STANDARD DUTY (SD)

Standard

Standard Welded Grating is the most common type of grating used in the industrial flooring market. The open grid construction provides for maximum passage for light, air circulation and drainage.

Close Mesh

When a certain bar depth must be held but standard duty is not sufficient, Close Mesh moves the bars closer to gain more strength and stiffness. This may also be warranted if the bar gap on Standard is wider than desired.

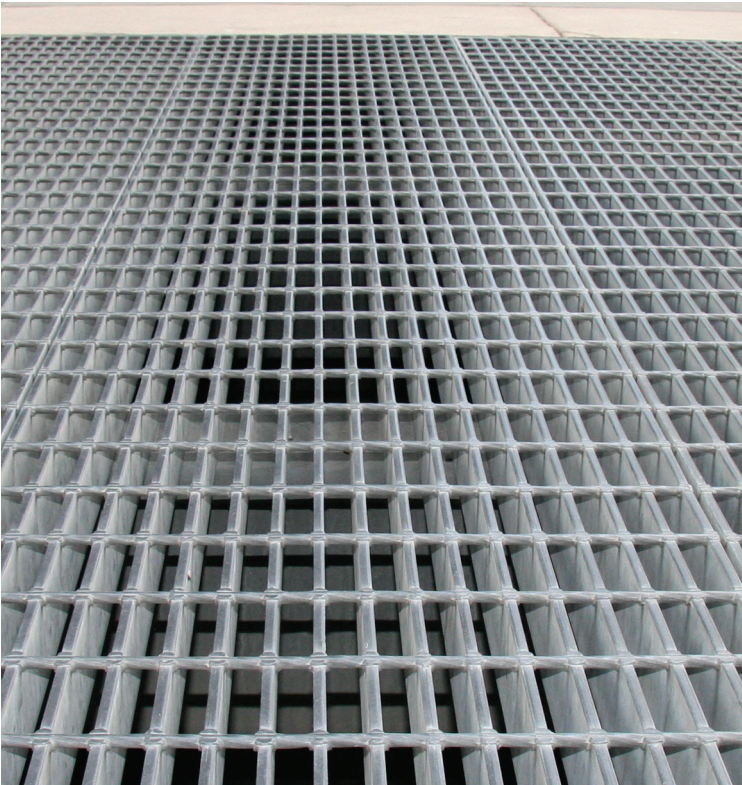
ADA-Compliant

When the Grating needs to adhere to the guidelines of the Americans-with-Disabilities Act (ADA), an even-smaller bar gap is required.



HEAVY DUTY (HD)

Heavy-Duty Welded Grating has the strength for heavy-duty load areas such as airfields, industrial plants, truck and bus terminals, parking lots and railroad yards. Common uses are flooring, driveways, subway and tunnel ventilation grilles, curb inlet grates, ramps, docks, etc.



STAIR TREADS

Welded steel stair treads are the most widely used for their strength and ease of installation and are universally used in most industrial and commercial applications. Stair Treads can be ordered with a serrated surface for additional safety.



INTRODUCTION | WHO WE ARE

Nucor offers steel products that range from bar grating to the heaviest hot rolled beam sections.

Through implementation and refinement of best practices, we continue to grow as a company. Nucor's pay-for-performance policy reflects a commitment to manufacturing the highest quality products while maintaining a safety record that is the envy of the industry.

Nucor serves the agricultural, automotive, construction, energy, furniture, machinery, metal building, railroad, recreational equipment, shipbuilding, heavy truck, and trailer industries. Which is to say, we are integral to North American industry.

Nucor and its subsidiary divisions manufacture:

- Bars (carbon and alloy steel)
- Sheets/Flatrolled
- Open Web Steel Joists
- Steel Decks
- Cold finished steel
- Metal building systems
- Steel Grating
- Wire and wire mesh
- Conduit
- Beams
- Plates
- Joist Girders
- Fabricated concrete reinforcing steel
- Steel fasteners
- Piling
- Tube



SALES CONTACTS

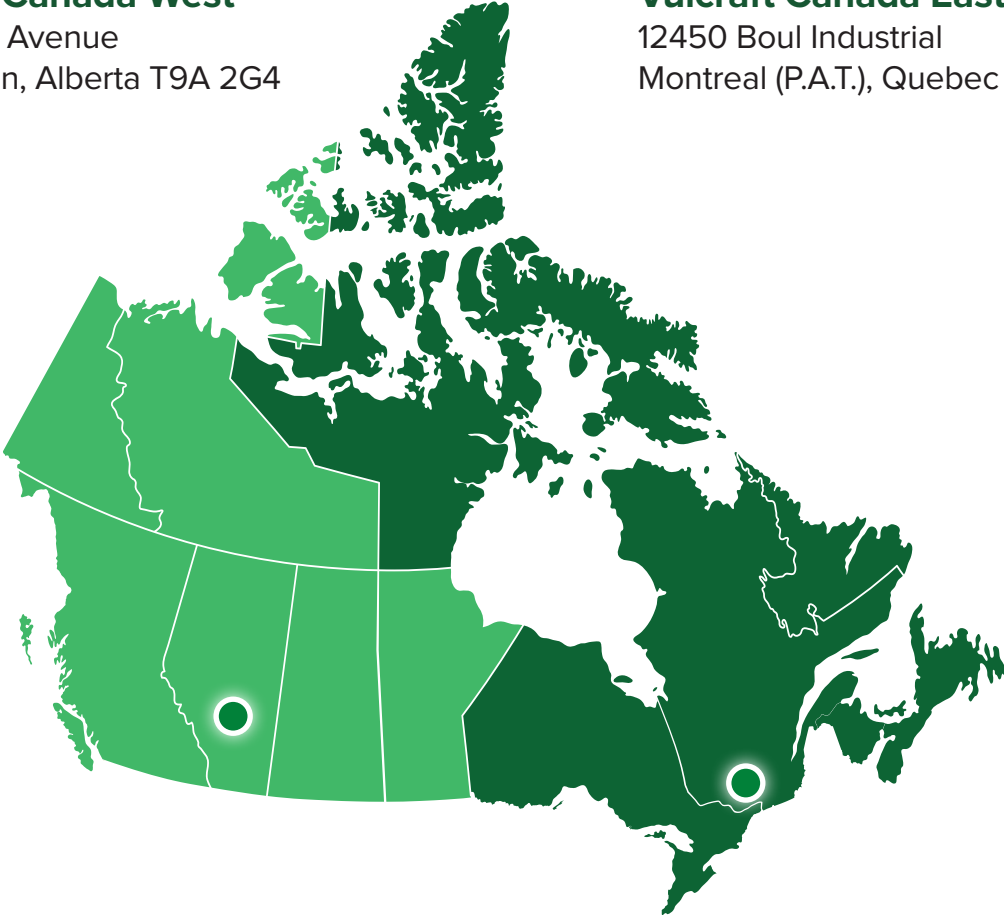
GENERAL SALES INQUIRIES:

WEST
salesvcw@vulcraft.ca

Vulcraft Canada West
4609 - 64 Avenue
Wetaskiwin, Alberta T9A 2G4

EAST
sales@vulcraft.ca

Vulcraft Canada East
12450 Boul Industrial
Montreal (P.A.T.), Quebec H1B 5M5

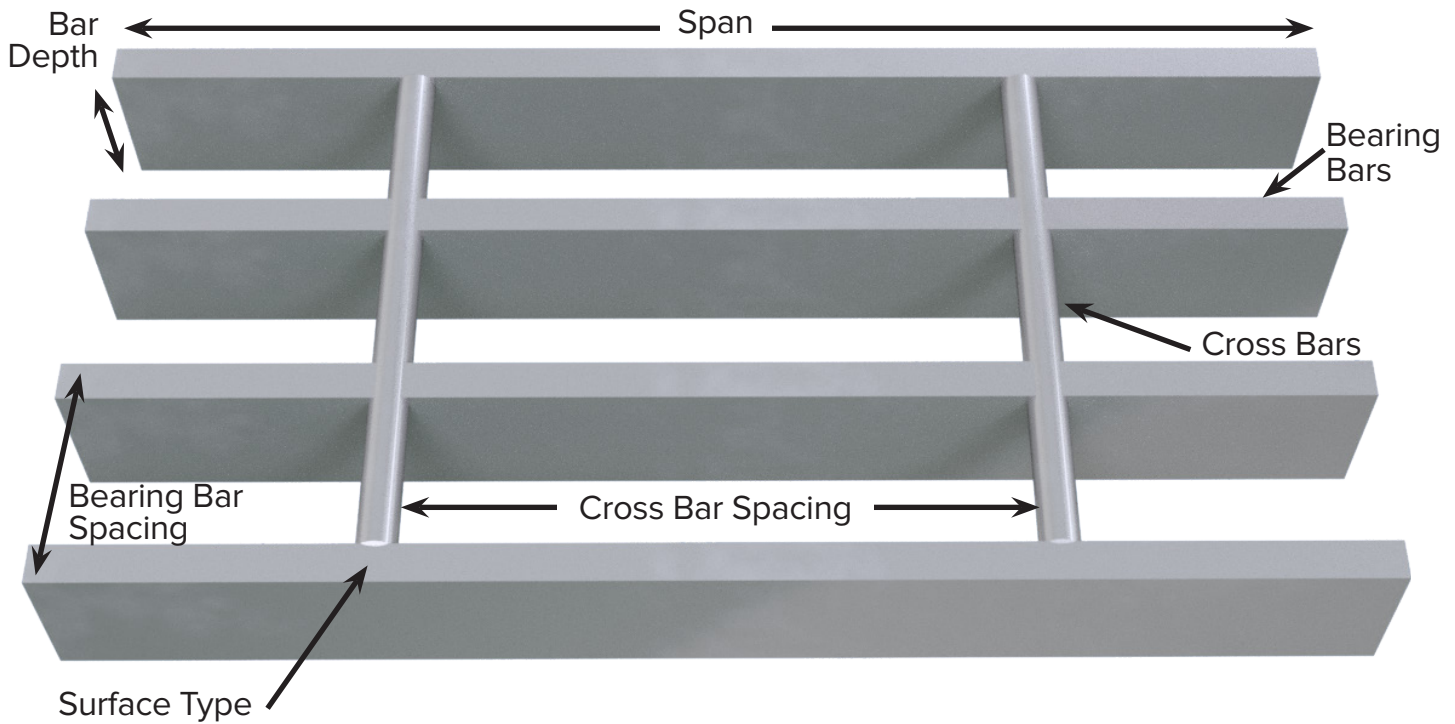


**FOR PROJECTS WITH GRATING IN PLATFORMS, WALKWAYS, STAIRS, ETC.
VISIT THE [CONTACT US PAGE AT WWW.VULCRAFT.CA](http://WWW.VULCRAFT.CA)
TO FIND YOUR LOCAL VULCRAFT SALES OFFICE.**



If you are interested in a grating type not represented in this manual, please contact a sales representative.

ENGINEERING | NOMENCLATURE



- Bearing Bars** load carrying, span of grating
- Cross Bars** connecting bars, runs along width of grating
- Finish** coating applied-painted black, galvanized
- Serrated** notching process for non-slip surface
- Widths** overall dimension measured perpendicular to bearing bars
- Span** distance running along direction of bearing bars
- Banding** bar of the same size as bearing bar used to close open ends
- Kick Plate** flat bar welded to outer edge with projection above grating

Bar Spacing —
of 1/16" from center to center of vertical bearing bars

Cross Bar —
Spacing in inches of the cross bars

Surface —
SMO = Smooth
SER = Serrated

19W4 1 1/4 x 3/16 SER BLK

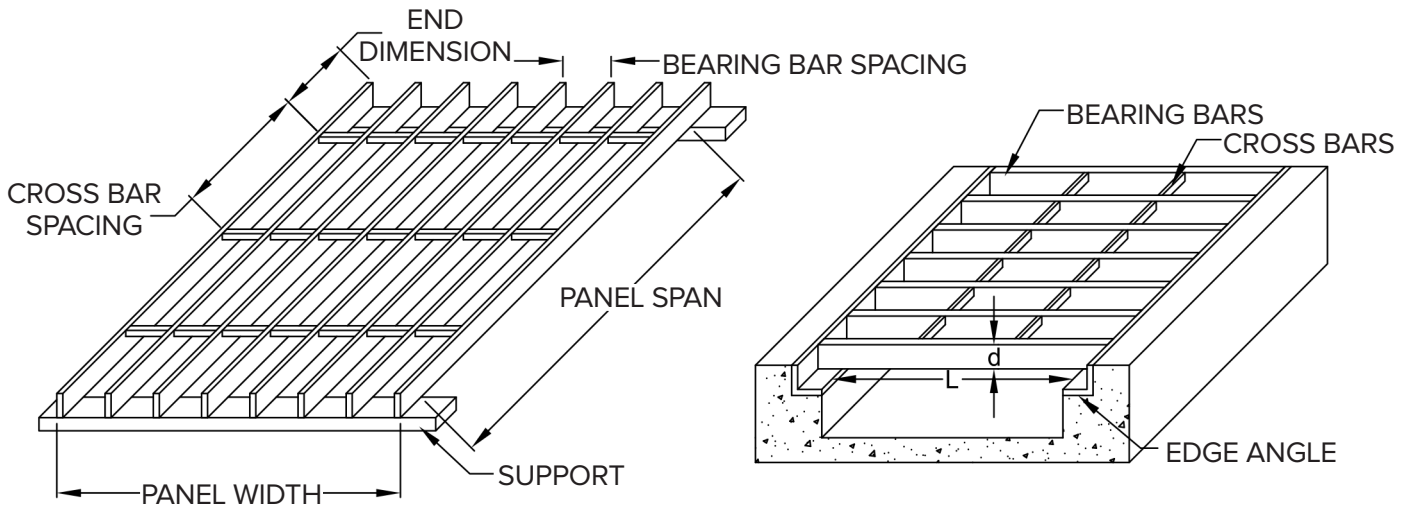
Construction Type —
W = Welded

Bar Size —
Size of bearing bars

Finish —
UNP = Unpainted
GAL = Galvanized
BLK = Black Paint

LOAD-CARRYING CAPABILITY SPAN

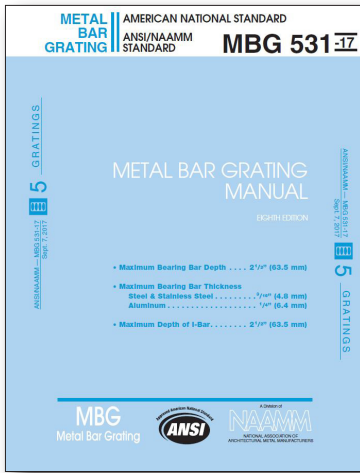
Usually this space has structural supports to carry the load. The distance between supports is called the span. Bearing bars run in the direction of the span. Deflection is generally limited to 6mm (1/4") only in order to limit an uncomfortable movement of the traffic surface.



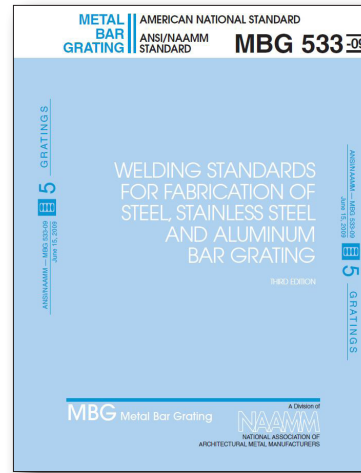
ENGINEERING | CONTROLLING STANDARDS

For additional specifications, tolerances, engineering and welding data please refer to National Associations of Architectural Metal Manufacturer's (NAAMM) Guides.

See the NAAMM guides for additional information such as Standard Specifications and Code of Standard Practice.



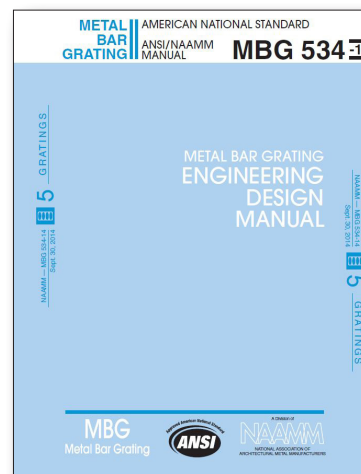
ANSI/NAAMM MBG 531-17
Metal Bar Grating Manual, 8th Ed



ANSI/NAAMM MBG 533-09
Welding Standards for Fabrication of Steel, Stainless Steel and Aluminum Bar Grating, 3rd Ed



ANSI/NAAMM MBG 532-19
Heavy Duty Metal Bar Grating Manual, 6th Ed



NAAMM MBG 534-14
Metal Bar Grating Engineering Design Manual

NOT JUST GRATING FABRICATION

Your partner for structural steel as well as grating detailing and fabrication. Vulcraft Grating has the capability and capacity to handle even the toughest structural steel detailing and fabrication projects.

Contact us today with how we can assist you in meeting your customer's needs.



ENGINEERING

Standard

- Description of Grating (see pp. 6)
- Drawing Showing:
 - area to be covered, with cutouts
 - span with direction of bearing
 - method of support
 - all critical dimensions
- Type of Anchorage
- Finish

Stair Treads

- Description of Grating (see pp. 6)
- Type of Nosing
- Dimensions (length and width of tread)
- Number of Treads
- Finish

Heavy Duty

- Description of Grating (see pp. 6)
- Drawing Showing:
 - area to be covered, with cutouts
 - span with direction of bearing
 - method of support
 - all critical dimensions
- Type of Anchorage
- Finish

Grating Specification/Detailing Checklist

Grating Description

- Grating Type (30W102, 24W102, etc.)
- Bar Size
- Finish
- Smooth/Serrated
- Banding/Kick Plate/Hand Rails

Stair Tread Description

- Grating Type (30W102, 24W102, etc.)
- Bar Size
- Finish
- Smooth/Serrated
- Nosing Type

Attachment

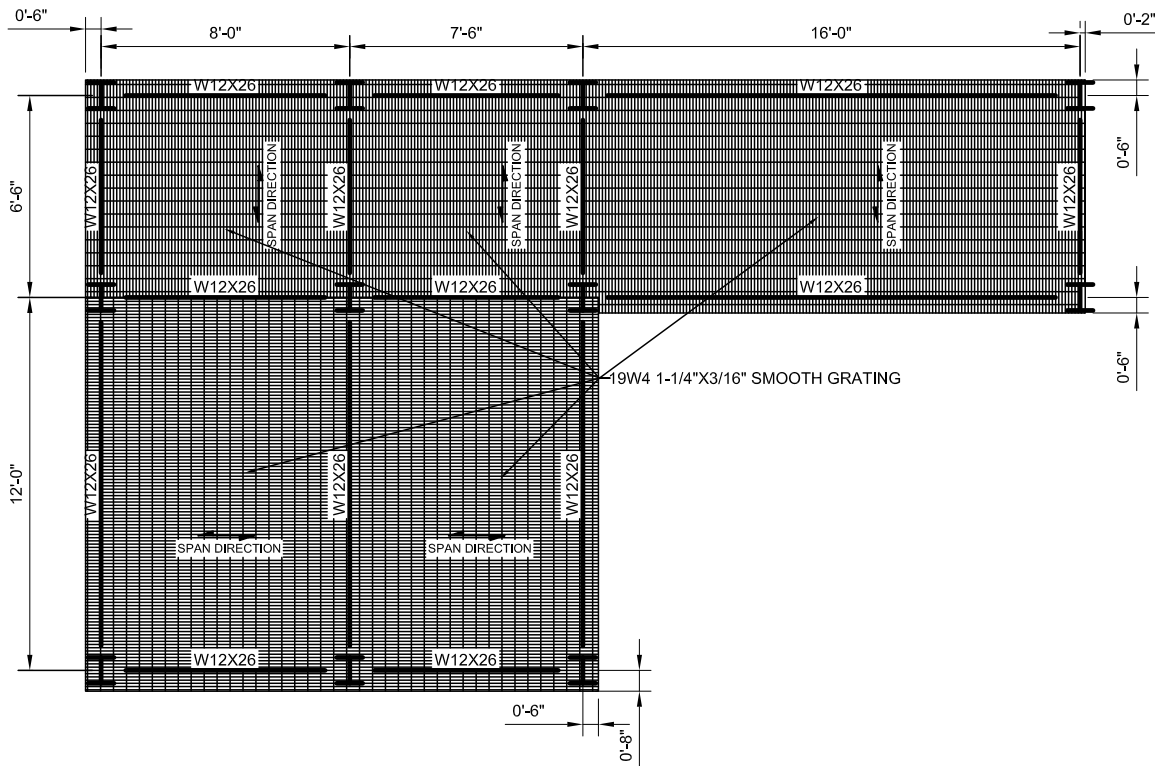
- Clips
- Welds
- Lugs

Layout

- Area to be Covered (See Drawing Example)
- Edge Conditions
- Cutouts
- Span
- Supports



DRAWING AND GENERAL NOTES EXAMPLE



General Notes Examples

The following are examples of suggested notes that should be included on drawings where Grating products are being specified:

Grating

Unless otherwise noted on the drawings, interior grating use 19W4 1 1/4" x 3/16" smooth, painted black. Exterior grating use 19W4 1 1/2" x 3/16" serrated, galvanized. Attachment is clip type or indicate that grating to be welded to supports.

Treads

Unless otherwise noted on the drawings, treads are to be the same grating type as walkway grating, stair treads are to have checkered plate nosing.

Edge Sections:

Edge conditions sections are a very important part of proper grating detailing and fabrication. Items to be shown in section drawings should be:

- Grating edge dimension in relation to grid line or support
- Kick Plates
- Hand Rail Conditions

Sections should also be shown for any cutouts that need to be created in the grating panels.

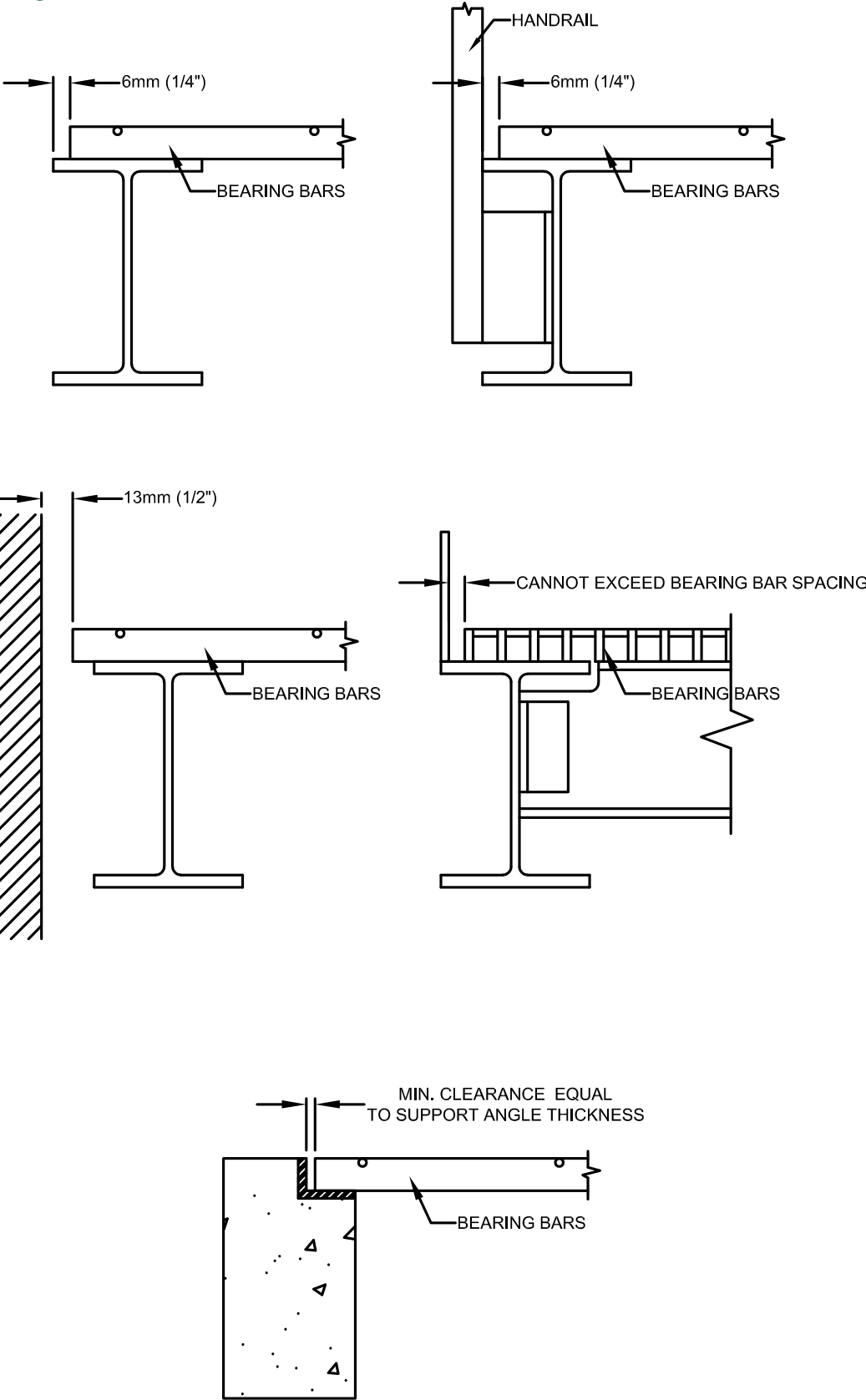
Sections can be shown as independent sections specific to grating or as a part of the typical construction section drawings, as long as the grating requirements are clearly shown.

The following pages show examples of some typical grating sections.

These sections can be downloaded from our website www.vulcraft.ca/products/grating.

ENGINEERING | HOW TO SPECIFY

Example Grating Edge Sections:



Guidance for Grating Plan View:

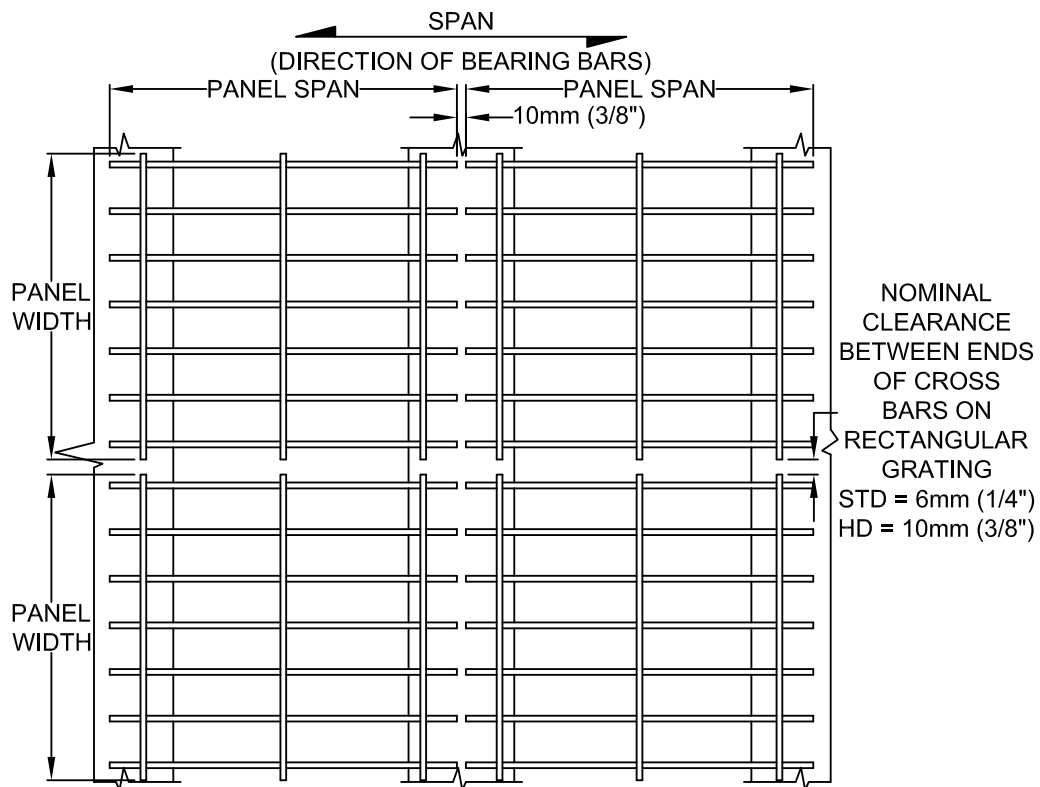


Figure 1

Guidance for Specifying Cutouts:

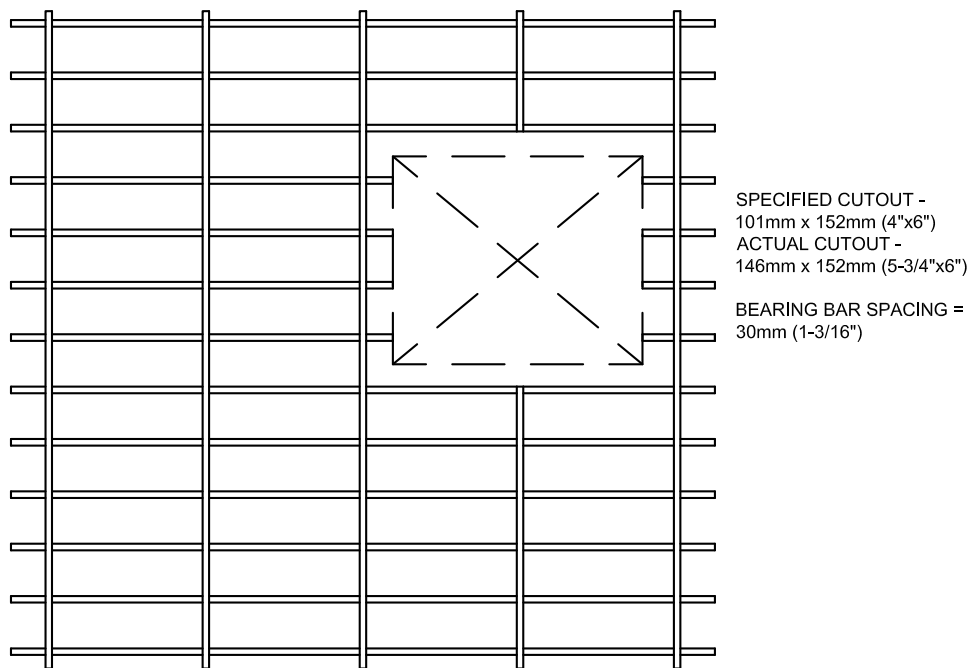


Figure 2

ENGINEERING | SAFE INSTALLATION

- Grating panels must be installed with cross bars on top side.
- It is NOT recommended to notch bearing bars at supports to maintain proper elevation. If notching is required for installation, manufacturer should be consulted.
- Metal should always be used for grating supports.
- A minimum of 1" (25mm) support bearing shall be provided for steel grating having bearing bar depths up to 2 1/4" (57mm) and 2" support bearing for bar depths of 2 1/2" (64mm) and greater.
- Clearances shown in Figure 1 (pg 13) are recommended, but may vary in accordance with dimensional tolerances.
- Standard and Heavy duty grating should be designed to have structural support under each bearing bar at cutouts.
- As shown in Figure 2 (pg 13), all rectangular cutouts are made to the next bearing bar beyond the penetration with a clearance not to exceed bearing bar spacing.
- Cutouts for circular obstructions are recommended to be at least 51mm (2") larger in diameter than the obstruction. It is further recommended that cutouts for all piping 102mm (4") or less be made in the field.



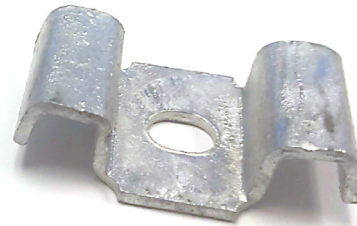
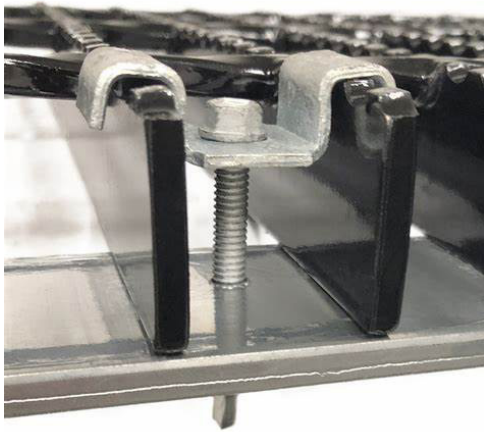
ANCHORAGE TYPES

CLIP (SD)

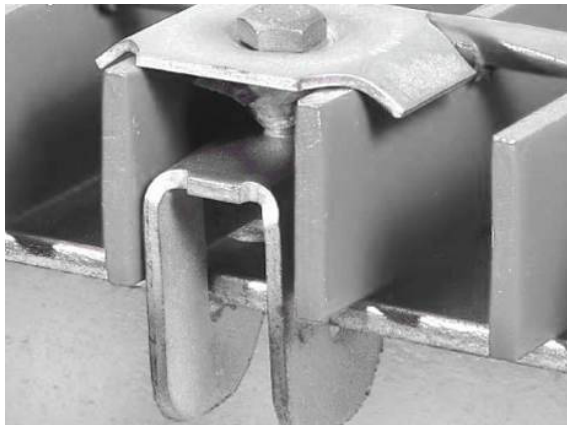
The clip bridges two bearing bars and is attached with 6mm (1/4") self-tapping bolt, 6mm (1/4") self threader, 6mm (1/4") weld stud or 6mm (1/4") bolt and nut when hole is drilled through supporting flange. Fasteners should be specified separate from clips. (Bolts not included)



F-10 CLIPS

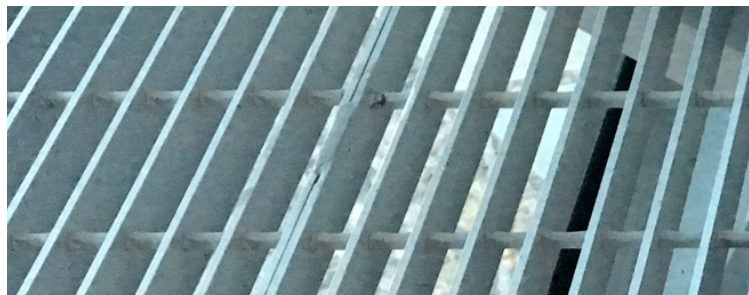


G CLIPS



FIELD WELDED

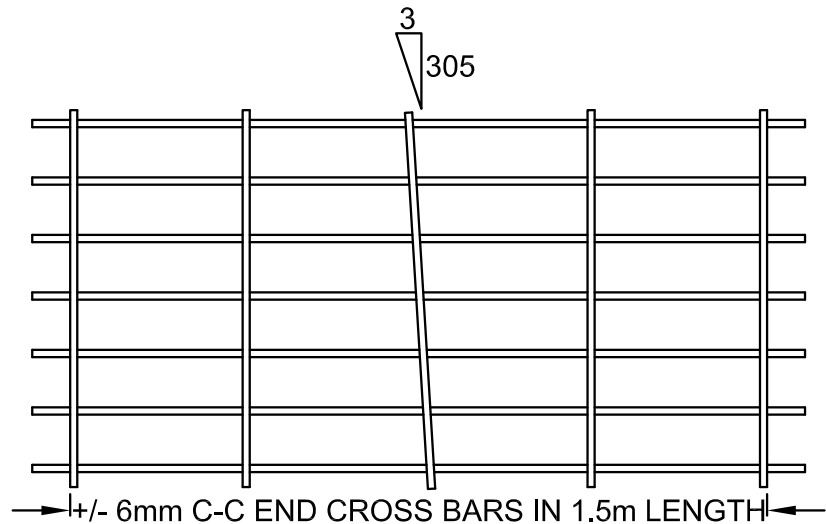
Recommended for all permanently installed grating panels. Welds should be 5mm (3/16") fillet welds, 19mm (3/4") long located approximately 152mm (6") from each side of panel (4 locations) and one weld in middle of panel at each intermediate support.



BEARING BAR AND CROSS ROD TOLERANCES

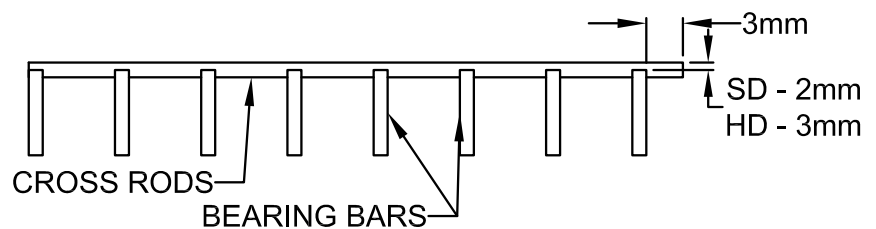
Cross Rod Spacing and Alignment

Cross rods should not vary more than a slope of 3mm (1/8") to 305mm (12") in either direction from perpendicular alignment with bearing bars. The tolerance of the cross bar spacing for 1.5m (5') in length is +/- 6mm (1/4")



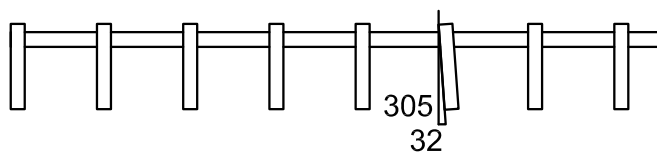
Cross Rod Position

The top the cross rod should not projected more than 2mm (1/16") above the top of the bearing bars for standard grating (3mm (1/8") for heavy-duty) and should not extend more than 3mm (1/8") from side of bearing bars.



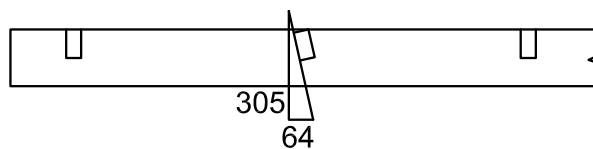
Bearing Bar Lean

Bearing bar lean must not exceed a slope of 32mm (1-1/4") to 305 (12).



Cross Bar Lean

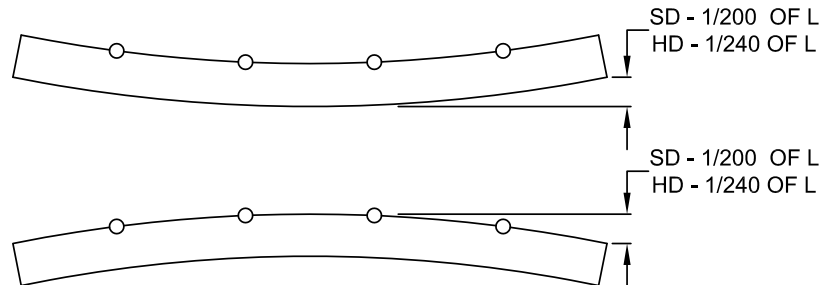
Cross bar lean must not exceed a slope of 64mm (2-1/2") to 305 (12).



PANEL TOLERANCES

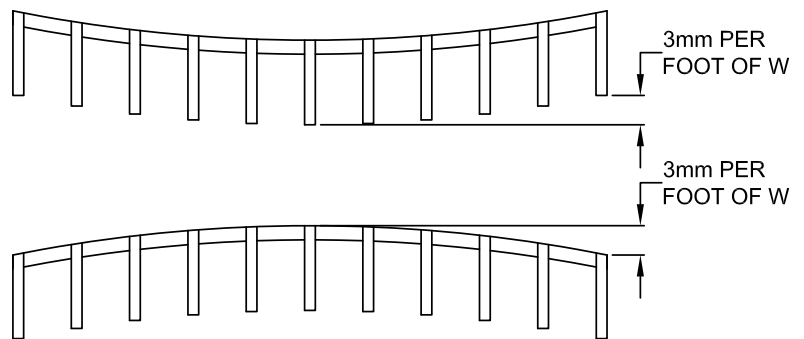
Longitudinal Bow

Longitudinal bow should be less than 1/200 of the length for the standard grating (1/240 for heavy duty).



Traverse Bow

Before banding, the traverse bow should be less than 3mm (1/8") per foot or width.

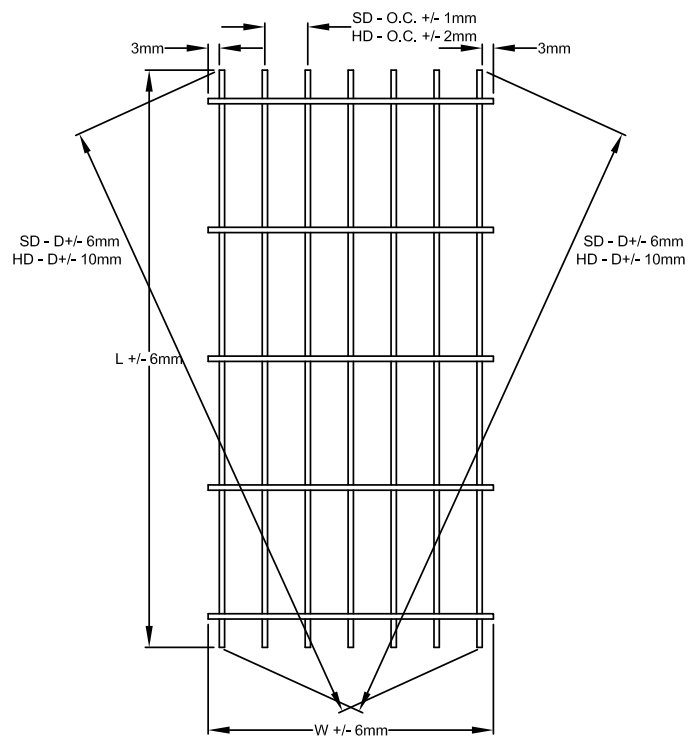


Overall Dimension and Squareness

D = Overall diagonal dimension

W = Width of panel including cross rod extensions outside of bearing bars

L = Length of bearing bars

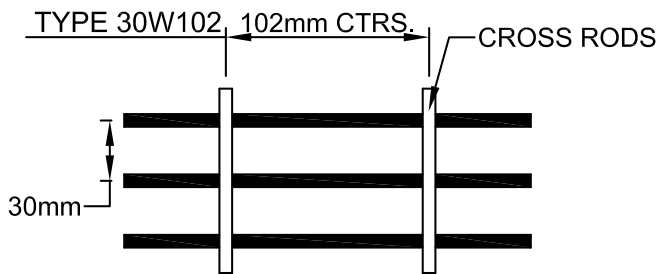


SWEEP 1/200 OF SPAN

LOAD TABLES | STANDARD, METRIC

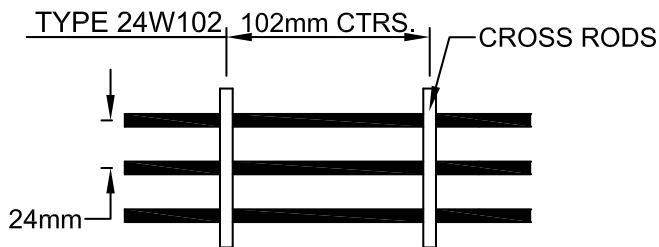
OVERVIEW

Standard



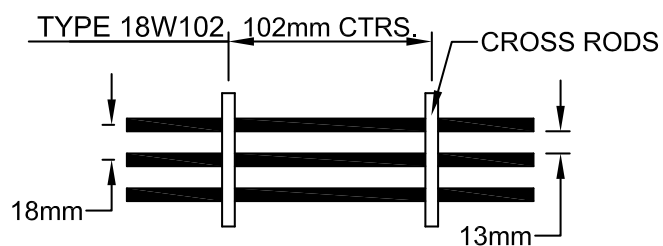
Standard Welded Grating is the most common type of grating used in the industrial flooring market. The open grid construction provides for maximum passage for light, air circulation and drainage.

Close-Mesh (Special Order)



When a certain bar depth must be held but standard duty is not sufficient, Close Mesh moves the bars closer to gain more strength and stiffness. This may also be warranted if the bar gap on Standard Duty is wider than desired.

ADA-Compliant (Special Order)



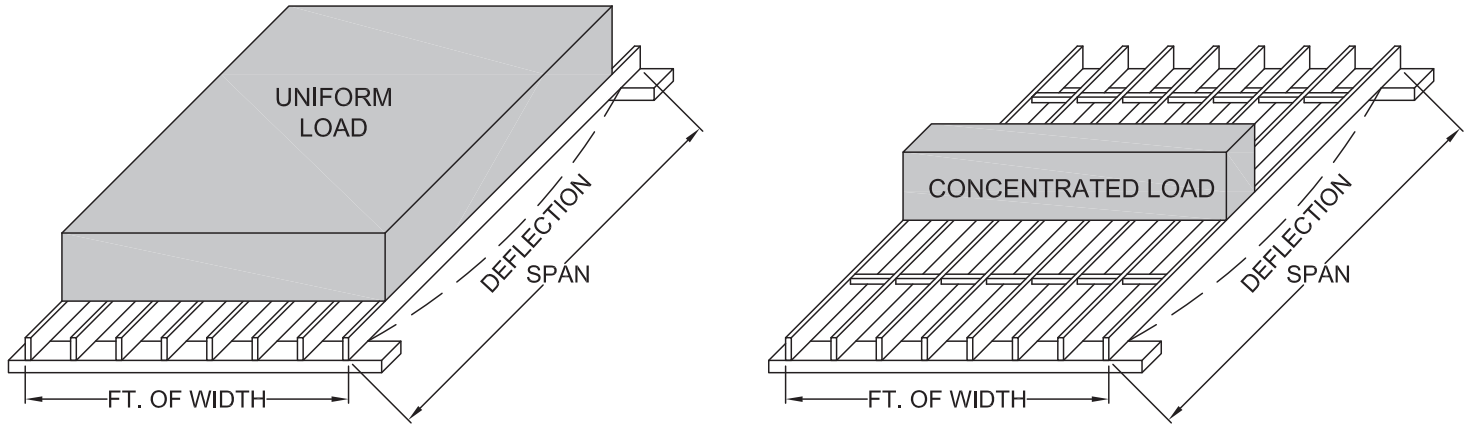
When the Grating needs to adhere to the guidelines of the Americans-with-Disabilities Act (ADA), an even-smaller bar gap is required. The ADA requires no more than a 13mm opening as part of Chapter 3, Section 302.3 of the ADA Guide published by the United States Access Board.

Panel widths shown are out-to-out of bearing bars

| Bars | ADA-COMPLIANT 18 SPACE (18mm ctrs) | | CLOSE MESH 24 SPACE (24mm ctrs) | | STANDARD 30 SPACE (30mm ctrs) | |
|------|--|--------|---------------------------------------|--------|-------------------------------------|--------|
| | 3.2 mm | 4.8 mm | 3.2 mm | 4.8 mm | 3.2 mm | 4.8 mm |
| | 2 | 21 | 22 | 27 | 29 | 33 |
| 3 | 38 | 40 | 51 | 52 | 64 | 65 |
| 4 | 56 | 57 | 75 | 76 | 94 | 95 |
| 5 | 73 | 75 | 98 | 100 | 124 | 125 |
| 6 | 90 | 92 | 122 | 124 | 154 | 156 |
| 7 | 108 | 110 | 146 | 148 | 184 | 186 |
| 8 | 125 | 127 | 170 | 171 | 214 | 216 |
| 9 | 143 | 144 | 194 | 195 | 244 | 246 |
| 10 | 160 | 162 | 217 | 219 | 275 | 276 |
| 11 | 178 | 179 | 241 | 243 | 305 | 306 |
| 12 | 195 | 197 | 265 | 267 | 335 | 337 |
| 13 | 213 | 214 | 289 | 291 | 365 | 367 |
| 14 | 230 | 232 | 313 | 314 | 395 | 397 |
| 15 | 248 | 249 | 337 | 338 | 425 | 427 |
| 16 | 265 | 267 | 360 | 362 | 456 | 457 |
| 17 | 283 | 284 | 384 | 386 | 486 | 487 |
| 18 | 300 | 302 | 408 | 410 | 516 | 518 |
| 19 | 318 | 319 | 432 | 433 | 546 | 548 |
| 20 | 335 | 337 | 456 | 457 | 576 | 578 |
| 21 | 352 | 354 | 479 | 481 | 606 | 608 |
| 22 | 370 | 371 | 503 | 505 | 637 | 638 |
| 23 | 387 | 389 | 527 | 529 | 667 | 668 |
| 24 | 405 | 406 | 551 | 552 | 697 | 699 |
| 25 | 422 | 424 | 575 | 576 | 727 | 729 |
| 26 | 440 | 441 | 598 | 600 | 757 | 759 |
| 27 | 457 | 459 | 622 | 624 | 787 | 789 |
| 28 | 475 | 476 | 646 | 648 | 818 | 819 |
| 29 | 492 | 494 | 670 | 672 | 848 | 849 |
| 30 | 510 | 511 | 694 | 695 | 878 | 879 |
| 31 | 527 | 529 | 718 | 719 | 908 | 910 |
| 32 | 545 | 546 | 741 | 743 | | |
| 33 | 562 | 564 | 765 | 767 | | |
| 34 | 579 | 581 | 789 | 791 | | |
| 35 | 597 | 598 | 813 | 814 | | |
| 36 | 614 | 616 | 837 | 838 | | |
| 37 | | | 860 | 862 | | |
| 38 | | | 884 | 886 | | |
| 39 | | | 908 | 910 | | |

All metric dimensions are based on a "soft" conversion.

DESIGN CRITERIA



| | Uniform Load | Concentrated Load |
|--------------------------|----------------------------|----------------------------|
| Determine M: | $M = \frac{FS}{12}$ | $M = \frac{FS}{12}$ |
| Determine U or C: | $U = \frac{8M}{L^2}$ | $C = \frac{4M}{L}$ |
| Check D*: | $D = \frac{5UL^3}{384 EI}$ | $D = \frac{C^*L^3}{48 EI}$ |

*Deflection should be limited to 7mm under .45kN uniform load to afford pedestrian comfort.

- U = Uniform Load - kPa
- C = Concentrated Load - kN/m of grating width
- S = Section Modulus - mm³/m of grating width
- I = Moment of Inertia - mm⁴/m of grating width
- L = Simple Clear Span - m
- D = Deflection - mm
- E = Modulus of Elasticity - kPa
- F = Allowable Bending Stress - kPa
- M = Bending Moment - kN-m



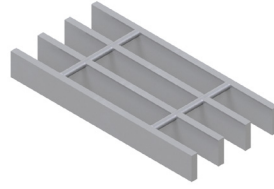
Vulcraft Online Bar Grating Design Tools

If you are uncertain about which type of grating to use, try our on-line calculator. Enter your project specs and our calculator will recommend the appropriate grating. This powerful on-line tool allows you to compare alternatives so you can optimize weight, cost, or both. It saves you valuable time by eliminating manual calculations and the risk of errors. Visit www.vulcraft.com/DesignTools/BarGratingDesignAid

LOAD TABLES | STANDARD, METRIC

LOAD TABLES - SD

Grating Type: **30W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Smooth**



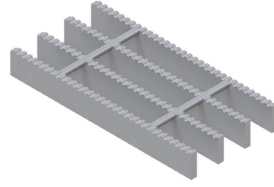
U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|------|------|------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|-----------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | |
| 25 x 3 | 25.0 | 1,312.00 | U | 30.6 | 19.6 | 13.6 | 10.0 | 7.7 | 6.0 | | | | | | | | | 11,470 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | | | | | | | | | | 145.66E+3 |
| | | | C | 9.3 | 7.5 | 6.2 | 5.3 | 4.7 | 4.2 | | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | | | | | | | | | | |
| 25 x 5 | 35.9 | 1,452.00 | U | 45.9 | 29.4 | 20.4 | 15.0 | 11.5 | 9.1 | 7.4 | | | | | | | | 17,200 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | | | | | | | | | 218.49E+3 |
| | | | C | 14.0 | 11.2 | 9.3 | 8.0 | 7.0 | 6.2 | 5.6 | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | | | | | | | | | |
| 32 x 3 | 30.5 | 1,552.00 | U | 48.0 | 30.7 | 21.3 | 15.7 | 12.0 | 9.5 | 7.7 | 6.3 | | | | | | | 17,980 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.0 | 7.7 | 9.4 | 11.4 | | | | | | | | 285.84E+3 |
| | | | C | 14.6 | 11.7 | 9.8 | 8.4 | 7.3 | 6.5 | 5.9 | 5.3 | | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.6 | 9.1 | | | | | | | | |
| 32 x 5 | 44.1 | 1,718.00 | U | 72.0 | 46.1 | 32.0 | 23.5 | 18.0 | 14.2 | 11.5 | 9.5 | 8.0 | | | | | | 26,970 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.0 | 7.7 | 9.4 | 11.4 | 13.6 | | | | | | | 428.77E+3 |
| | | | C | 21.9 | 17.6 | 14.6 | 12.5 | 11.0 | 9.8 | 8.8 | 8.0 | 7.3 | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.6 | 9.1 | 10.9 | | | | | | | |
| 38 x 3 | 39.0 | 1,778.00 | U | 68.9 | 44.1 | 30.6 | 22.5 | 17.2 | 13.6 | 11.0 | 9.1 | 7.7 | | | | | | 25,810 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | | | | | | | 491.61E+3 |
| | | | C | 21.0 | 16.8 | 14.0 | 12.0 | 10.5 | 9.3 | 8.4 | 7.6 | 7.0 | | | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | | | | | | | |
| 38 x 5 | 52.1 | 1,967.00 | U | 103.3 | 66.1 | 45.9 | 33.7 | 25.8 | 20.4 | 16.5 | 13.7 | 11.5 | 9.8 | | | | | 38,710 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | | | | | | 737.42E+3 |
| | | | C | 31.5 | 25.2 | 21.0 | 18.0 | 15.8 | 14.0 | 12.6 | 11.5 | 10.5 | 9.7 | | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | | | | | | |
| 45 x 5 | 60.3 | 2,210.00 | U | 140.9 | 90.2 | 62.7 | 46.0 | 35.2 | 27.9 | 22.6 | 18.6 | 15.7 | 13.4 | 11.5 | 10.0 | | | 52,810 | |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.2 | 15.2 | | | | 1.17E+6 |
| | | | C | 43.0 | 34.4 | 28.7 | 24.6 | 21.5 | 19.1 | 17.2 | 15.6 | 14.3 | 13.2 | 12.3 | 11.5 | | | | |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.6 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.1 | | | | |
| 51 x 5 | 68.4 | 2,441.00 | U | 183.6 | 117.6 | 81.6 | 60.0 | 45.9 | 36.3 | 29.4 | 24.3 | 20.4 | 17.4 | 15.0 | 13.1 | 11.5 | | 68,820 | |
| | | | D _u | 0.9 | 1.5 | 2.1 | 2.9 | 3.8 | 4.8 | 5.9 | 7.2 | 8.5 | 10.0 | 11.6 | 13.3 | 15.1 | | | 1.75E+6 |
| | | | C | 56.0 | 44.8 | 37.3 | 32.0 | 28.0 | 24.9 | 22.4 | 20.4 | 18.7 | 17.2 | 16.0 | 14.9 | 14.0 | | | |
| | | | D _c | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | | |
| 64 x 5 | 84.7 | 2,886.00 | U | 286.9 | 183.7 | 127.6 | 93.7 | 71.8 | 56.7 | 45.9 | 38.0 | 31.9 | 27.2 | 23.4 | 20.4 | 18.0 | | 107,530 | |
| | | | D _u | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | | 3.41E+6 |
| | | | C | 87.5 | 70.0 | 58.4 | 50.0 | 43.8 | 38.9 | 35.0 | 31.8 | 29.2 | 26.9 | 25.0 | 23.3 | 21.9 | | | |
| | | | D _c | 0.6 | 0.9 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.4 | 6.4 | 7.4 | 8.5 | 9.7 | | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - SD

Grating Type: **30W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|------|------|------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|-----------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³ /m) | I _x (mm ⁴ /m) | |
| 25 x 3 | 25.0 | 1,055.00 | U | 17.1 | 11.0 | 7.6 | | | | | | | | | | | | 6,420 | |
| | | | D _u | 2.5 | 4.0 | 5.7 | | | | | | | | | | | | | 60.97E+3 |
| | | | C | 5.2 | 4.2 | 3.5 | | | | | | | | | | | | | |
| | | | D _c | 2.0 | 3.2 | 4.6 | | | | | | | | | | | | | |
| 25 x 5 | 35.9 | 1,168.00 | U | 25.7 | 16.4 | 11.4 | 8.4 | 6.4 | | | | | | | | | | 9,630 | |
| | | | D _u | 2.5 | 4.0 | 5.7 | 7.7 | 10.1 | | | | | | | | | | | 91.45E+3 |
| | | | C | 7.8 | 6.3 | 5.2 | 4.5 | 3.9 | | | | | | | | | | | |
| | | | D _c | 2.0 | 3.2 | 4.6 | 6.2 | 8.1 | | | | | | | | | | | |
| 32 x 3 | 30.5 | 1,312.00 | U | 30.6 | 19.6 | 13.6 | 10.0 | 7.7 | 6.0 | | | | | | | | | 11,470 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | | | | | | | | | | 145.66E+3 |
| | | | C | 9.3 | 7.5 | 6.2 | 5.3 | 4.7 | 4.2 | | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | | | | | | | | | | |
| 32 x 5 | 44.1 | 1,452.00 | U | 45.9 | 29.4 | 20.4 | 15.0 | 11.5 | 9.1 | 7.4 | | | | | | | | 17,200 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | | | | | | | | | 218.49E+3 |
| | | | C | 14.0 | 11.2 | 9.3 | 8.0 | 7.0 | 6.2 | 5.6 | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | | | | | | | | | |
| 38 x 3 | 35.9 | 1,549.00 | U | 47.7 | 30.5 | 21.2 | 15.6 | 11.9 | 9.4 | 7.6 | 6.3 | | | | | | | 17,870 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.5 | | | | | | | | 283.16E+3 |
| | | | C | 14.5 | 11.6 | 9.7 | 8.3 | 7.3 | 6.5 | 5.8 | 5.3 | | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.9 | 6.1 | 7.6 | 9.2 | | | | | | | | |
| 38 x 5 | 52.1 | 1,714.00 | U | 71.5 | 45.8 | 31.8 | 23.4 | 17.9 | 14.1 | 11.4 | 9.5 | 8.0 | | | | | | 26,800 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.5 | 13.6 | | | | | | | 424.73E+3 |
| | | | C | 21.8 | 17.4 | 14.5 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 | 7.3 | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.9 | 6.1 | 7.6 | 9.2 | 10.9 | | | | | | | |
| 45 x 5 | 60.3 | 1,967.00 | U | 103.3 | 66.1 | 45.9 | 33.7 | 25.8 | 20.4 | 16.5 | 13.7 | 11.5 | 9.8 | | | | | 38,710 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | | | | | | 737.42E+3 |
| | | | C | 31.5 | 25.2 | 21.0 | 18.0 | 15.8 | 14.0 | 12.6 | 11.5 | 10.5 | 9.7 | | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | | | | | | |
| 51 x 5 | 68.4 | 2,207.00 | U | 140.3 | 89.8 | 62.4 | 45.8 | 35.1 | 27.7 | 22.5 | 18.6 | 15.6 | 13.3 | 11.5 | 10.0 | | | 52,570 | |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.3 | 15.2 | | | | 1.17E+6 |
| | | | C | 42.8 | 34.2 | 28.5 | 24.5 | 21.4 | 19.0 | 17.1 | 15.6 | 14.3 | 13.2 | 12.2 | 11.4 | | | | |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.7 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.2 | | | | |
| 64 x 5 | 84.7 | 2,665.00 | U | 232.0 | 148.5 | 103.2 | 75.8 | 58.0 | 45.9 | 37.1 | 30.7 | 25.8 | 22.0 | 19.0 | 16.5 | 14.5 | | 86,940 | |
| | | | D _u | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.5 | | | 2.48E+6 |
| | | | C | 70.8 | 56.6 | 47.2 | 40.4 | 35.4 | 31.5 | 28.3 | 25.7 | 23.6 | 21.8 | 20.2 | 18.9 | 17.7 | | | |
| | | | D _c | 0.7 | 1.1 | 1.5 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.1 | 7.1 | 8.2 | 9.5 | 10.8 | | | |

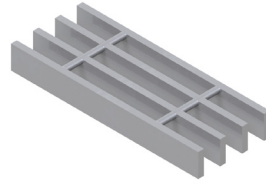
LOAD TABLES - SD METRIC

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES | STANDARD, METRIC

LOAD TABLES - CLOSE-MESH

Grating Type: **24W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Smooth**



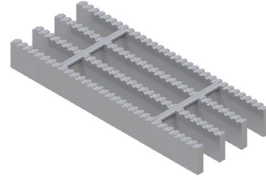
U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|-------|------|------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|-----------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³ /m) | I _x (mm ⁴ /m) | |
| 25 x 3 | 30.1 | 1,387.00 | U | 38.3 | 24.5 | 17.0 | 12.5 | 9.6 | 7.6 | 6.1 | | | | | | | | 14,340 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | | | | | | | | | 182.08E+3 |
| | | | C | 11.7 | 9.3 | 7.8 | 6.7 | 5.8 | 5.2 | 4.7 | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | | | | | | | | | |
| 25 x 5 | 43.5 | 1,535.00 | U | 57.4 | 36.7 | 25.5 | 18.7 | 14.4 | 11.3 | 9.2 | 7.6 | | | | | | | 21,510 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | 14.3 | | | | | | | | 273.12E+3 |
| | | | C | 17.5 | 14.0 | 11.7 | 10.0 | 8.8 | 7.8 | 7.0 | 6.4 | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.4 | | | | | | | | |
| 32 x 3 | 36.9 | 1,641.00 | U | 60.0 | 38.4 | 26.7 | 19.6 | 15.0 | 11.9 | 9.6 | 7.9 | | | | | | | 22,470 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.0 | 7.7 | 9.4 | 11.4 | 11.4 | | | | | | | 357.31E+3 |
| | | | C | 18.3 | 14.6 | 12.2 | 10.5 | 9.1 | 8.1 | 7.3 | 6.7 | | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.6 | 9.1 | 9.1 | | | | | | | |
| 32 x 5 | 53.7 | 1,817.00 | U | 89.9 | 57.6 | 40.0 | 29.4 | 22.5 | 17.8 | 14.4 | 11.9 | 10.0 | | | | | | 33,710 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.0 | 7.7 | 9.4 | 11.4 | 13.6 | | | | | | | 535.96E+3 |
| | | | C | 27.4 | 21.9 | 18.3 | 15.7 | 13.7 | 12.2 | 11.0 | 10.0 | 9.1 | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.6 | 9.1 | 10.9 | | | | | | | |
| 38 x 3 | 46.7 | 1,880.00 | U | 86.1 | 55.1 | 38.3 | 28.1 | 21.5 | 17.0 | 13.8 | 11.4 | 9.6 | 8.2 | | | | | 32,260 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | | | | | | 614.52E+3 |
| | | | C | 26.3 | 21.0 | 17.5 | 15.0 | 13.1 | 11.7 | 10.5 | 9.6 | 8.8 | 8.1 | | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | | | | | | |
| 38 x 5 | 63.6 | 2,080.00 | U | 129.1 | 82.7 | 57.4 | 42.2 | 32.3 | 25.5 | 20.7 | 17.1 | 14.4 | 12.2 | 10.5 | | | | 48,390 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | 15.5 | | | | | 921.77E+3 |
| | | | C | 39.4 | 31.5 | 26.3 | 22.5 | 19.7 | 17.5 | 15.8 | 14.3 | 13.1 | 12.1 | 11.3 | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | 12.4 | | | | | |
| 45 x 5 | 73.8 | 2,337.00 | U | 176.1 | 112.8 | 78.3 | 57.5 | 44.1 | 34.8 | 28.2 | 23.3 | 19.6 | 16.7 | 14.4 | 12.5 | 11.0 | | 66,010 | |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.2 | 15.2 | 17.3 | | | 1.47E+6 |
| | | | C | 53.7 | 43.0 | 35.8 | 30.7 | 26.9 | 23.9 | 21.5 | 19.5 | 17.9 | 16.5 | 15.4 | 14.3 | 13.4 | | | |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.6 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.1 | 13.8 | | | |
| 51 x 5 | 83.7 | 2,581.00 | U | 229.5 | 146.9 | 102.1 | 75.0 | 57.4 | 45.4 | 36.8 | 30.4 | 25.5 | 21.8 | 18.8 | 16.3 | 14.4 | | 86,020 | |
| | | | D _u | 0.9 | 1.5 | 2.1 | 2.9 | 3.8 | 4.8 | 5.9 | 7.2 | 8.5 | 10.0 | 11.6 | 13.3 | 15.1 | | | 2.18E+6 |
| | | | C | 70.0 | 56.0 | 46.7 | 40.0 | 35.0 | 31.1 | 28.0 | 25.5 | 23.3 | 21.6 | 20.0 | 18.7 | 17.5 | | | |
| | | | D _c | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | | |
| 64 x 5 | 103.8 | 3,052.00 | U | 358.6 | 229.6 | 159.5 | 117.2 | 89.7 | 70.9 | 57.4 | 47.5 | 39.9 | 34.0 | 29.3 | 25.5 | 22.5 | | 134,410 | |
| | | | D _u | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | | 4.27E+6 |
| | | | C | 109.4 | 87.5 | 72.9 | 62.5 | 54.7 | 48.6 | 43.8 | 39.8 | 36.5 | 33.7 | 31.3 | 29.2 | 27.4 | | | |
| | | | D _c | 0.6 | 0.9 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.4 | 6.4 | 7.4 | 8.5 | 9.7 | | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - CLOSE-MESH

Grating Type: **24W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|------|------|------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|-----------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | |
| 25 x 3 | 30.1 | 1,116.00 | U | 21.4 | 13.7 | 9.5 | 7.0 | 5.4 | | | | | | | | | | 8,020 | |
| | | | D _u | 2.5 | 4.0 | 5.7 | 7.7 | 10.1 | | | | | | | | | | | 76.21E+3 |
| | | | C | 6.5 | 5.2 | 4.4 | 3.7 | 3.3 | | | | | | | | | | | |
| | | | D _c | 2.0 | 3.2 | 4.6 | 6.2 | 8.1 | | | | | | | | | | | |
| 25 x 5 | 43.5 | 1,235.00 | U | 32.1 | 20.6 | 14.3 | 10.5 | 8.0 | 6.3 | | | | | | | | | 12,030 | |
| | | | D _u | 2.5 | 4.0 | 5.7 | 7.7 | 10.1 | 12.8 | | | | | | | | | | 114.32E+3 |
| | | | C | 9.8 | 7.8 | 6.5 | 5.6 | 4.9 | 4.4 | | | | | | | | | | |
| | | | D _c | 2.0 | 3.2 | 4.6 | 6.2 | 8.1 | 10.2 | | | | | | | | | | |
| 32 x 3 | 36.9 | 1,387.00 | U | 38.3 | 24.5 | 17.0 | 12.5 | 9.6 | 7.6 | 6.1 | | | | | | | | 14,340 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | | | | | | | | | 182.08E+3 |
| | | | C | 11.7 | 9.3 | 7.8 | 6.7 | 5.8 | 5.2 | 4.7 | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | | | | | | | | | |
| 32 x 5 | 53.7 | 1,535.00 | U | 57.4 | 36.7 | 25.5 | 18.7 | 14.4 | 11.3 | 9.2 | 7.6 | | | | | | | 21,510 | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | 14.3 | | | | | | | | 273.12E+3 |
| | | | C | 17.5 | 14.0 | 11.7 | 10.0 | 8.8 | 7.8 | 7.0 | 6.4 | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.4 | | | | | | | | |
| 38 x 3 | 43.5 | 1,638.00 | U | 59.6 | 38.1 | 26.5 | 19.5 | 14.9 | 11.8 | 9.5 | 7.9 | | | | | | | 22,330 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.5 | | | | | | | | 353.95E+3 |
| | | | C | 18.2 | 14.5 | 12.1 | 10.4 | 9.1 | 8.1 | 7.3 | 6.6 | | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.9 | 6.1 | 7.6 | 9.2 | | | | | | | | |
| 38 x 5 | 63.6 | 1,812.00 | U | 89.4 | 57.2 | 39.7 | 29.2 | 22.4 | 17.7 | 14.3 | 11.8 | 9.9 | | | | | | 33,500 | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.5 | 13.6 | | | | | | | 530.92E+3 |
| | | | C | 27.3 | 21.8 | 18.2 | 15.6 | 13.6 | 12.1 | 10.9 | 9.9 | 9.1 | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.9 | 6.1 | 7.6 | 9.2 | 10.9 | | | | | | | |
| 45 x 5 | 73.8 | 2,080.00 | U | 129.1 | 82.7 | 57.4 | 42.2 | 32.3 | 25.5 | 20.7 | 17.1 | 14.4 | 12.2 | 10.5 | | | | 48,390 | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | 15.5 | | | | | 921.77E+3 |
| | | | C | 39.4 | 31.5 | 26.3 | 22.5 | 19.7 | 17.5 | 15.8 | 14.3 | 13.1 | 12.1 | 11.3 | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | 12.4 | | | | | |
| 51 x 5 | 83.7 | 2,333.00 | U | 175.3 | 112.2 | 78.0 | 57.3 | 43.9 | 34.7 | 28.1 | 23.2 | 19.5 | 16.6 | 14.3 | 12.5 | 11.0 | | 65,710 | |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.3 | 15.2 | 17.3 | | | 1.46E+6 |
| | | | C | 53.5 | 42.8 | 35.7 | 30.6 | 26.7 | 23.8 | 21.4 | 19.5 | 17.8 | 16.5 | 15.3 | 14.3 | 13.4 | | | |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.7 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.2 | 13.8 | | | |
| 64 x 5 | 103.8 | 2,818.00 | U | 290.0 | 185.6 | 128.9 | 94.7 | 72.5 | 57.3 | 46.4 | 38.4 | 32.2 | 27.5 | 23.7 | 20.6 | 18.2 | | 108,680 | |
| | | | D _u | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.5 | | | 3.10E+6 |
| | | | C | 88.4 | 70.8 | 59.0 | 50.6 | 44.2 | 39.3 | 35.4 | 32.2 | 29.5 | 27.2 | 25.3 | 23.6 | 22.1 | | | |
| | | | D _c | 0.7 | 1.1 | 1.5 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.1 | 7.1 | 8.2 | 9.5 | 10.8 | | | |

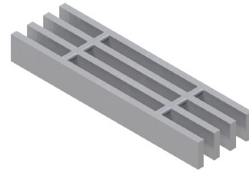
Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - SD METRIC

LOAD TABLES | STANDARD, METRIC

LOAD TABLES - ADA

Grating Type: **18W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Smooth**



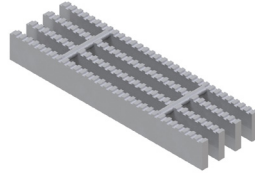
U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|-------|-------|-------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m |
| 25 x 5 | 59.8 | 1,673.00 | U | 81.0 | 51.9 | 36.0 | 26.5 | 20.3 | 16.0 | 13.0 | 10.7 | | | | | | | 30,360 |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | 14.3 | | | | | | | |
| | | | C | 24.7 | 19.8 | 16.5 | 14.1 | 12.4 | 11.0 | 9.9 | 9.0 | | | | | | | 385.58E+3 |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.4 | | | | | | | |
| 32 x 5 | 74.0 | 1,980.00 | U | 127.0 | 81.3 | 56.5 | 41.5 | 31.8 | 25.1 | 20.3 | 16.8 | 14.1 | 12.0 | | | | | 47,590 |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.0 | 7.7 | 9.4 | 11.4 | 13.6 | 16.0 | | | | | |
| | | | C | 38.7 | 31.0 | 25.8 | 22.1 | 19.4 | 17.2 | 15.5 | 14.1 | 12.9 | 11.9 | | | | | 756.65E+3 |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.6 | 9.1 | 10.9 | 12.8 | | | | | |
| 38 x 5 | 88.0 | 2,268.00 | U | 182.3 | 116.7 | 81.0 | 59.6 | 45.6 | 36.0 | 29.2 | 24.1 | 20.3 | 17.3 | 14.9 | 13.0 | | | 68,310 |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | 15.5 | 17.7 | | | |
| | | | C | 55.6 | 44.5 | 37.1 | 31.8 | 27.8 | 24.7 | 22.2 | 20.2 | 18.5 | 17.1 | 15.9 | 14.8 | | | 1.30E+6 |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | 12.4 | 14.2 | | | |
| 45 x 5 | 102.3 | 2,548.00 | U | 248.7 | 159.2 | 110.6 | 81.2 | 62.2 | 49.2 | 39.8 | 32.9 | 27.7 | 23.6 | 20.3 | 17.7 | 15.6 | | 93,190 |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.2 | 15.2 | 17.3 | | |
| | | | C | 75.8 | 60.7 | 50.6 | 43.3 | 37.9 | 33.7 | 30.3 | 27.6 | 25.3 | 23.3 | 21.7 | 20.2 | 19.0 | | 2.07E+6 |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.6 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.1 | 13.8 | | |
| 51 x 5 | 116.3 | 2,814.00 | U | 324.0 | 207.4 | 144.1 | 105.9 | 81.1 | 64.1 | 51.9 | 42.9 | 36.0 | 30.7 | 26.5 | 23.1 | 20.3 | | 121,440 |
| | | | D _u | 0.9 | 1.5 | 2.1 | 2.9 | 3.8 | 4.8 | 5.9 | 7.2 | 8.5 | 10.0 | 11.6 | 13.3 | 15.1 | | |
| | | | C | 98.8 | 79.1 | 65.9 | 56.5 | 49.4 | 43.9 | 39.5 | 36.0 | 33.0 | 30.4 | 28.3 | 26.4 | 24.7 | | 3.08E+6 |
| | | | D _c | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | |
| 64 x 5 | 144.5 | 3,326.00 | U | 506.3 | 324.1 | 225.1 | 165.4 | 126.7 | 100.1 | 81.1 | 67.0 | 56.3 | 48.0 | 41.4 | 36.0 | 31.7 | | 189,750 |
| | | | D _u | 0.8 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.8 | 8.0 | 9.3 | 10.6 | 12.1 | | |
| | | | C | 154.4 | 123.6 | 103.0 | 88.3 | 77.2 | 68.7 | 61.8 | 56.2 | 51.5 | 47.5 | 44.1 | 41.2 | 38.6 | | 6.02E+6 |
| | | | D _c | 0.6 | 0.9 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.4 | 6.4 | 7.4 | 8.5 | 9.7 | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - ADA

Grating Type: **18W102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 124.11 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | Section Properties | | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|-------|-------|-------|-------|------|------|------|------|------|------|------|--------------------|-------------------------------------|-------------------------------------|-----------|---------|
| | | | | 610 | 762 | 915 | 1067 | 1220 | 1372 | 1524 | 1677 | 1829 | 1982 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | | |
| 25 x 5 | 59.8 | 1,346.00 | U | 45.3 | 29.0 | 20.2 | 14.8 | 11.3 | 9.0 | | | | | | | | | 16,990 | | |
| | | | D _u | 2.5 | 4.0 | 5.7 | 7.7 | 10.1 | 12.8 | | | | | | | | | | 161.39E+3 | |
| | | | C | 13.8 | 11.1 | 9.2 | 7.9 | 6.9 | 6.1 | | | | | | | | | | | |
| | | | D _c | 2.0 | 3.2 | 4.6 | 6.2 | 8.1 | 10.2 | | | | | | | | | | | |
| 32 x 5 | 74.0 | 1,673.00 | U | 81.0 | 51.9 | 36.0 | 26.5 | 20.3 | 16.0 | 13.0 | 10.7 | | | | | | | 30,360 | | |
| | | | D _u | 1.9 | 3.0 | 4.3 | 5.8 | 7.6 | 9.6 | 11.8 | 14.3 | | | | | | | | 385.58E+3 | |
| | | | C | 24.7 | 19.8 | 16.5 | 14.1 | 12.4 | 11.0 | 9.9 | 9.0 | | | | | | | | | |
| | | | D _c | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.4 | | | | | | | | | |
| 38 x 5 | 88.0 | 1,976.00 | U | 126.2 | 80.8 | 56.1 | 41.2 | 31.6 | 24.9 | 20.2 | 16.7 | 14.0 | 12.0 | | | | | 47,290 | | |
| | | | D _u | 1.5 | 2.4 | 3.4 | 4.6 | 6.1 | 7.7 | 9.5 | 11.5 | 13.6 | 16.0 | | | | | | 749.53E+3 | |
| | | | C | 38.5 | 30.8 | 25.7 | 22.0 | 19.2 | 17.1 | 15.4 | 14.0 | 12.8 | 11.8 | | | | | | | |
| | | | D _c | 1.2 | 1.9 | 2.7 | 3.7 | 4.9 | 6.1 | 7.6 | 9.2 | 10.9 | 12.8 | | | | | | | |
| 45 x 5 | 102.3 | 2,268.00 | U | 182.3 | 116.7 | 81.0 | 59.6 | 45.6 | 36.0 | 29.2 | 24.1 | 20.3 | 17.3 | 14.9 | 13.0 | | | 68,310 | | |
| | | | D _u | 1.3 | 2.0 | 2.8 | 3.9 | 5.0 | 6.4 | 7.9 | 9.5 | 11.4 | 13.3 | 15.5 | 17.7 | | | | 1.30E+6 | |
| | | | C | 55.6 | 44.5 | 37.1 | 31.8 | 27.8 | 24.7 | 22.2 | 20.2 | 18.5 | 17.1 | 15.9 | 14.8 | | | | | |
| | | | D _c | 1.0 | 1.6 | 2.3 | 3.1 | 4.0 | 5.1 | 6.3 | 7.6 | 9.1 | 10.7 | 12.4 | 14.2 | | | | | |
| 51 x 5 | 116.3 | 2,543.00 | U | 247.5 | 158.5 | 110.1 | 80.9 | 61.9 | 48.9 | 39.6 | 32.8 | 27.5 | 23.5 | 20.2 | 17.6 | 15.5 | | | 92,770 | |
| | | | D _u | 1.1 | 1.7 | 2.4 | 3.3 | 4.3 | 5.5 | 6.8 | 8.2 | 9.7 | 11.4 | 13.3 | 15.2 | 17.3 | | | | 2.06E+6 |
| | | | C | 75.5 | 60.4 | 50.3 | 43.2 | 37.8 | 33.6 | 30.2 | 27.5 | 25.2 | 23.2 | 21.6 | 20.1 | 18.9 | | | | |
| | | | D _c | 0.9 | 1.4 | 1.9 | 2.7 | 3.5 | 4.4 | 5.4 | 6.5 | 7.8 | 9.1 | 10.6 | 12.2 | 13.8 | | | | |
| 64 x 5 | 144.5 | 3,072.00 | U | 409.4 | 262.1 | 182.0 | 133.8 | 102.4 | 80.9 | 65.6 | 54.2 | 45.5 | 38.8 | 33.5 | 29.1 | 25.6 | | | 153,430 | |
| | | | D _u | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.5 | | | | 4.38E+6 |
| | | | C | 124.9 | 99.9 | 83.3 | 71.4 | 62.5 | 55.5 | 50.0 | 45.4 | 41.6 | 38.4 | 35.7 | 33.3 | 31.2 | | | | |
| | | | D _c | 0.7 | 1.1 | 1.5 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.1 | 7.1 | 8.2 | 9.5 | 10.8 | | | | |

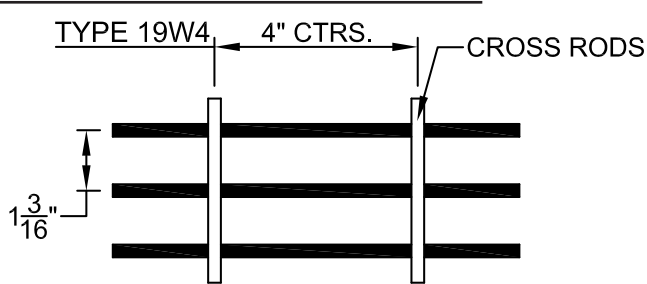
Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - SD METRIC

LOAD TABLES | STANDARD, IMPERIAL

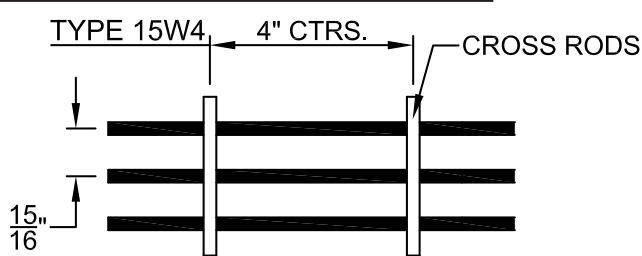
OVERVIEW

Standard



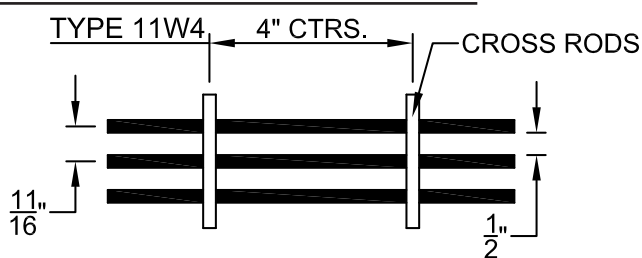
Standard Welded Grating is the most common type of grating used in the industrial flooring market. The open grid construction provides for maximum passage for light, air circulation and drainage.

Close-Mesh (Special Order)



When a certain bar depth must be held but standard duty is not sufficient, Close Mesh moves the bars closer to gain more strength and stiffness. This may also be warranted if the bar gap on Standard Duty is wider than desired.

ADA-Compliant (Special Order)



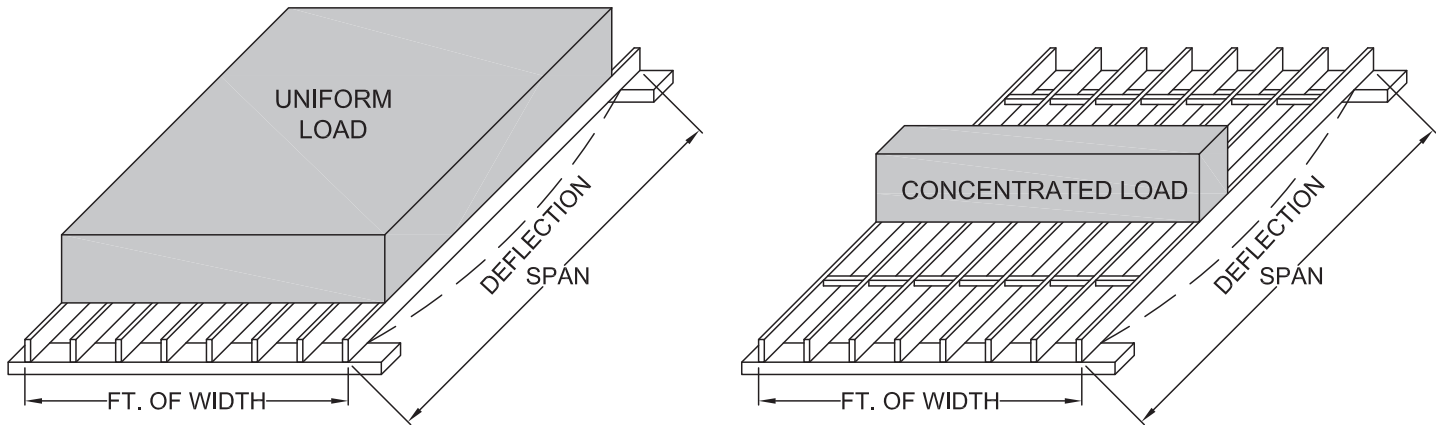
When the Grating needs to adhere to the guidelines of the Americans-with-Disabilities Act (ADA), an even-smaller bar gap is required. The ADA requires no more than a 1/2" opening as part of Chapter 3, Section 302.3 of the ADA Guide published by the United States Access Board.

Panel widths shown are out-to-out of bearing bars

| Bars | ADA-COMPLIANT 11 SPACE (11/16" ctrs) | | CLOSE MESH 15 SPACE (15/16" ctrs) | | STANDARD 19 SPACE (1 3/16" ctrs) | |
|------|--|----------|---|----------|--|----------|
| | 1/8" | 3/16" | 1/8" | 3/16" | 1/8" | 3/16" |
| 2 | 13/16 | 7/8 | 1 1/16 | 1 1/8 | 1 5/16 | 1 3/8 |
| 3 | 1 1/2 | 1 9/16 | 2 | 2 1/16 | 2 1/2 | 2 9/16 |
| 4 | 2 3/16 | 2 1/4 | 2 15/16 | 3 | 3 11/16 | 3 3/4 |
| 5 | 2 7/8 | 2 15/16 | 3 7/8 | 3 15/16 | 4 7/8 | 4 15/16 |
| 6 | 3 9/16 | 3 5/8 | 4 13/16 | 4 7/8 | 6 1/16 | 6 1/8 |
| 7 | 4 1/4 | 4 5/16 | 5 3/4 | 5 13/16 | 7 1/4 | 7 5/16 |
| 8 | 4 15/16 | 5 | 6 11/16 | 6 3/4 | 8 7/16 | 8 1/2 |
| 9 | 5 5/8 | 5 11/16 | 7 5/8 | 7 11/16 | 9 5/8 | 9 11/16 |
| 10 | 6 5/16 | 6 3/8 | 8 9/16 | 8 5/8 | 10 13/16 | 10 7/8 |
| 11 | 7 | 7 1/16 | 9 1/2 | 9 9/16 | 12 | 12 1/16 |
| 12 | 7 11/16 | 7 3/4 | 10 7/16 | 10 1/2 | 13 3/16 | 13 1/4 |
| 13 | 8 3/8 | 8 7/16 | 11 3/8 | 11 7/16 | 14 3/8 | 14 7/16 |
| 14 | 9 1/16 | 9 1/8 | 12 5/16 | 12 3/8 | 15 9/16 | 15 5/8 |
| 15 | 9 3/4 | 9 13/16 | 13 1/4 | 13 5/16 | 16 3/4 | 16 13/16 |
| 16 | 10 7/16 | 10 1/2 | 14 3/16 | 14 1/4 | 17 15/16 | 18 |
| 17 | 11 1/8 | 11 3/16 | 15 1/8 | 15 3/16 | 19 1/8 | 19 3/16 |
| 18 | 11 13/16 | 11 7/8 | 16 1/16 | 16 1/8 | 20 5/16 | 20 3/8 |
| 19 | 12 1/2 | 12 9/16 | 17 | 17 1/16 | 21 1/2 | 21 9/16 |
| 20 | 13 3/16 | 13 1/4 | 17 15/16 | 18 | 22 11/16 | 22 3/4 |
| 21 | 13 7/8 | 13 15/16 | 18 7/8 | 18 15/16 | 23 7/8 | 23 15/16 |
| 22 | 14 9/16 | 14 5/8 | 19 13/16 | 19 7/8 | 25 1/16 | 25 1/8 |
| 23 | 15 1/4 | 15 5/16 | 20 3/4 | 20 13/16 | 26 1/4 | 26 5/16 |
| 24 | 15 15/16 | 16 | 21 11/16 | 21 3/4 | 27 7/16 | 27 1/2 |
| 25 | 16 5/8 | 16 11/16 | 22 5/8 | 22 11/16 | 28 5/8 | 28 11/16 |
| 26 | 17 5/16 | 17 3/8 | 23 9/16 | 23 5/8 | 29 13/16 | 29 7/8 |
| 27 | 18 | 18 1/16 | 24 1/2 | 24 9/16 | 31 | 31 1/16 |
| 28 | 18 11/16 | 18 3/4 | 25 7/16 | 25 1/2 | 32 3/16 | 32 1/4 |
| 29 | 19 3/8 | 19 7/16 | 26 3/8 | 26 7/16 | 33 3/8 | 33 7/16 |
| 30 | 20 1/16 | 20 1/8 | 27 5/16 | 27 3/8 | 34 9/16 | 34 5/8 |
| 31 | 20 3/4 | 20 13/16 | 28 1/4 | 28 5/16 | 35 3/4 | 35 13/16 |
| 32 | 21 7/16 | 21 1/2 | 29 3/16 | 29 1/4 | | |
| 33 | 22 1/8 | 22 3/16 | 30 1/8 | 30 3/16 | | |
| 34 | 22 13/16 | 22 7/8 | 31 1/16 | 31 1/8 | | |
| 35 | 23 1/2 | 23 9/16 | 32 | 32 1/16 | | |
| 36 | 24 3/16 | 24 1/4 | 32 15/16 | 33 | | |
| 37 | | | 33 7/8 | 33 15/16 | | |
| 38 | | | 34 13/16 | 34 7/8 | | |
| 39 | | | 35 3/4 | 35 13/16 | | |

DESIGN CRITERIA

The following tables of safe loads have been calculated using these design parameters:



| | Uniform Load | Concentrated Load |
|--------------------------|---|--------------------------------------|
| Determine M: | $M = \frac{FS}{12}$ | $M = \frac{FS}{12}$ |
| Determine U or C: | $U = \frac{8M}{L^2}$ | $C = \frac{4M}{L}$ |
| Check D*: | $D = \frac{5UL(L \times 12)^3}{384 EI}$ | $D = \frac{C(L \times 12)^3}{48 EI}$ |

*Deflection should be limited to ¼" under 100lb/ft² uniform load to afford pedestrian comfort.

- U = Uniform Load - lbs/ft²
- C = Concentrated Load - lbs/ft of grating width
- S = Section Modulus - in³/ft of grating width
- I = Moment of Inertia - in⁴/ft of grating width
- L = Simple Clear Span - feet
- D = Deflection - inches
- E = Modulus of Elasticity
- F = Allowable Bending Stress
- M = Bending Moment



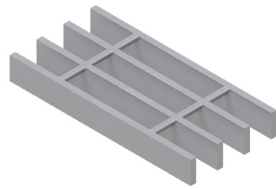
Vulcraft Online Bar Grating Design Tools

If you are uncertain about which type of grating to use, try our on-line calculator. Enter your project specs and our calculator will recommend the appropriate grating. This powerful on-line tool allows you to compare alternatives so you can optimize weight, cost, or both. It saves you valuable time by eliminating manual calculations and the risk of errors. Visit www.vulcraft.com/DesignTools/BarGratingDesignAid

LOAD TABLES | STANDARD, IMPERIAL

LOAD TABLES - SD

Grating Type: **19W4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Smooth**



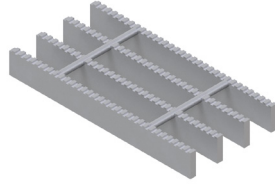
U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|-------|--|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft | I _x (in ⁴)/ft | | |
| 1" x 1/8" | 5.14 | 51 | U | 632 | 404 | 281 | 206 | 158 | 125 | | | | | | | 0.211 | | | | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | | | | | | | 0.105 | | | | |
| | | | C | 632 | 505 | 421 | 361 | 316 | 281 | | | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | | | | | | | | | | | |
| 1" x 3/16" | 7.33 | 57 | U | 947 | 606 | 421 | 309 | 237 | 187 | 152 | | | | | | | 0.316 | | | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | 0.158 | | | |
| | | | C | 947 | 758 | 632 | 541 | 474 | 421 | 379 | | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | | | | |
| 1 1/4" x 1/8" | 6.23 | 61 | U | 987 | 632 | 439 | 322 | 247 | 195 | 158 | 130 | | | | | 0.329 | | | | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | | | | | 0.206 | | | | |
| | | | C | 987 | 789 | 658 | 564 | 493 | 439 | 395 | 359 | | | | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | | | | | | | | | |
| 1 1/4" x 3/16" | 8.98 | 67 | U | 1,480 | 947 | 658 | 483 | 370 | 292 | 237 | 196 | 164 | | | | | 0.493 | | | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | | | | | 0.308 | | | |
| | | | C | 1,480 | 1,184 | 987 | 846 | 740 | 658 | 592 | 538 | 493 | | | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | | | | | | | | |
| 1 1/2" x 1/8" | 7.33 | 70 | U | 1,421 | 909 | 632 | 464 | 355 | 281 | 227 | 188 | 158 | | | | | 0.474 | | | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | | | | | 0.355 | | |
| | | | C | 1,421 | 1,137 | 947 | 812 | 711 | 632 | 568 | 517 | 474 | | | | | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | | | | | | | |
| 1 1/2" x 3/16" | 10.63 | 77 | U | 2,132 | 1,364 | 947 | 696 | 533 | 421 | 341 | 282 | 237 | 202 | | | | | 0.711 | | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.59 | | | | | 0.533 | |
| | | | C | 2,132 | 1,705 | 1,421 | 1,218 | 1,066 | 947 | 853 | 775 | 711 | 656 | | | | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | | | | | | | |
| 1 3/4" x 3/16" | 12.27 | 87 | U | 2,901 | 1,857 | 1,289 | 947 | 725 | 573 | 464 | 384 | 322 | 275 | 237 | 206 | | | 0.967 | | |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | | | 0.846 | | |
| | | | C | 2,901 | 2,321 | 1,934 | 1,658 | 1,451 | 1,289 | 1,161 | 1,055 | 967 | 893 | 829 | 774 | | | | | |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | | | | | |
| 2" x 3/16" | 13.92 | 96 | U | 3,789 | 2,425 | 1,684 | 1,237 | 947 | 749 | 606 | 501 | 421 | 359 | 309 | 269 | 237 | | | 1.263 | |
| | | | D _u | 0.04 | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.34 | 0.39 | 0.46 | 0.52 | 0.60 | | | 1.263 | |
| | | | C | 3,789 | 3,032 | 2,526 | 2,165 | 1,895 | 1,684 | 1,516 | 1,378 | 1,263 | 1,166 | 1,083 | 1,011 | 947 | | | | |
| | | | D _c | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | | | | |
| 2 1/2" x 3/16" | 17.21 | 113 | U | 5,921 | 3,789 | 2,632 | 1,933 | 1,480 | 1,170 | 947 | 783 | 658 | 561 | 483 | 421 | 370 | | | 1.974 | |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | | | 2.467 | |
| | | | C | 5,921 | 4,737 | 3,947 | 3,383 | 2,961 | 2,632 | 2,368 | 2,153 | 1,974 | 1,822 | 1,692 | 1,579 | 1,480 | | | | |
| | | | D _c | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.34 | 0.38 | | | | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - SD

Grating Type: **19W4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft | I _x (in ⁴)/ft |
| 1" x 1/8" | 5.14 | 42 | U | 355 | 227 | 158 | 116 | | | | | | | | | | | 0.118 |
| | | | D _u | 0.10 | 0.16 | 0.22 | 0.30 | | | | | | | | | | | 0.044 |
| | | | C | 355 | 284 | 237 | 203 | | | | | | | | | | | |
| | | | D _c | 0.08 | 0.12 | 0.18 | 0.24 | | | | | | | | | | | |
| 1" x 3/16" | 7.33 | 46 | U | 533 | 341 | 237 | 174 | 133 | | | | | | | | | | 0.178 |
| | | | D _u | 0.10 | 0.16 | 0.22 | 0.30 | 0.40 | | | | | | | | | | 0.067 |
| | | | C | 533 | 426 | 355 | 305 | 266 | | | | | | | | | | |
| | | | D _c | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | | | | | | | | | | |
| 1 1/4" x 1/8" | 6.23 | 51 | U | 632 | 404 | 281 | 206 | 158 | 125 | | | | | | | | | 0.211 |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | | | | | | | | | 0.105 |
| | | | C | 632 | 505 | 421 | 361 | 316 | 281 | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.36 | | | | | | | | |
| 1 1/4" x 3/16" | 8.98 | 57 | U | 947 | 606 | 421 | 309 | 237 | 187 | 152 | | | | | | | | 0.316 |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | | 0.158 |
| | | | C | 947 | 758 | 632 | 541 | 474 | 421 | 379 | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.43 | | | | | | | |
| 1 1/2" x 1/8" | 7.33 | 61 | U | 987 | 632 | 439 | 322 | 247 | 195 | 158 | 130 | | | | | | | 0.329 |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | | | | | | | 0.206 |
| | | | C | 987 | 789 | 658 | 564 | 493 | 439 | 395 | 359 | | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.42 | | | | | | |
| 1 1/2" x 3/16" | 10.63 | 67 | U | 1,480 | 947 | 658 | 483 | 370 | 292 | 237 | 196 | 164 | | | | | | 0.493 |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | | | | | | 0.308 |
| | | | C | 1,480 | 1,184 | 987 | 846 | 740 | 658 | 592 | 538 | 493 | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.50 | | | | | |
| 1 3/4" x 3/16" | 12.27 | 77 | U | 2,132 | 1,364 | 947 | 696 | 533 | 421 | 341 | 282 | 237 | 202 | | | | | 0.711 |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | | | | | 0.533 |
| | | | C | 2,132 | 1,705 | 1,421 | 1,218 | 1,066 | 947 | 853 | 775 | 711 | 656 | | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.48 | | | | |
| 2" x 3/16" | 13.92 | 87 | U | 2,901 | 1,857 | 1,289 | 947 | 725 | 573 | 464 | 384 | 322 | 275 | 237 | 206 | | | 0.967 |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | | | 0.846 |
| | | | C | 2,901 | 2,321 | 1,934 | 1,658 | 1,451 | 1,289 | 1,161 | 1,055 | 967 | 893 | 829 | 774 | | | |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | | |
| 2 1/2" x 3/16" | 17.21 | 105 | U | 4,796 | 3,069 | 2,132 | 1,566 | 1,199 | 947 | 767 | 634 | 533 | 454 | 392 | 341 | 300 | | 1.599 |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | | 1.799 |
| | | | C | 4,796 | 3,837 | 3,197 | 2,741 | 2,398 | 2,132 | 1,918 | 1,744 | 1,599 | 1,476 | 1,370 | 1,279 | 1,199 | | |
| | | | D _c | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.13 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.37 | 0.42 | | |

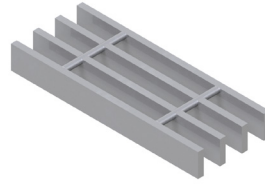
LOAD TABLES - SD IMPERIAL

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES | STANDARD, IMPERIAL

LOAD TABLES - CLOSE-MESH

Grating Type: **15W4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Smooth**



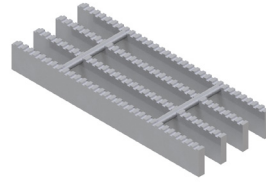
U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|-------|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft | I _x (in ⁴)/ft | |
| 1" x 1/8" | 6.27 | 55 | U | 800 | 512 | 356 | 261 | 200 | 158 | 128 | | | | | | | | 0.267 | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | | | 0.133 |
| | | | C | 800 | 640 | 533 | 457 | 400 | 356 | 320 | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | | | |
| 1" x 3/16" | 9.03 | 60 | U | 1,200 | 768 | 533 | 392 | 300 | 237 | 192 | | | | | | | | 0.400 | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | | | 0.200 |
| | | | C | 1,200 | 960 | 800 | 686 | 600 | 533 | 480 | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | | | |
| 1 1/4" x 1/8" | 7.65 | 65 | U | 1,250 | 800 | 556 | 408 | 313 | 247 | 200 | 165 | | | | | | | 0.417 | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.45 | | | | | | | 0.260 |
| | | | C | 1,250 | 1,000 | 833 | 714 | 625 | 556 | 500 | 455 | | | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.36 | | | | | | | |
| 1 1/4" x 3/16" | 11.10 | 71 | U | 1,875 | 1,200 | 833 | 612 | 469 | 370 | 300 | 248 | 208 | | | | | | 0.625 | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | 0.54 | | | | | | 0.391 |
| | | | C | 1,875 | 1,500 | 1,250 | 1,071 | 938 | 833 | 750 | 682 | 625 | | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.43 | | | | | | |
| 1 1/2" x 1/8" | 9.03 | 74 | U | 1,800 | 1,152 | 800 | 588 | 450 | 356 | 288 | 238 | 200 | 170 | | | | | 0.600 | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.52 | | | | | 0.450 |
| | | | C | 1,800 | 1,440 | 1,200 | 1,029 | 900 | 800 | 720 | 655 | 600 | 554 | | | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.42 | | | | | |
| 1 1/2" x 3/16" | 13.18 | 82 | U | 2,700 | 1,728 | 1,200 | 882 | 675 | 533 | 432 | 357 | 300 | 256 | 220 | | | | 0.900 | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.61 | 0.61 | | | | 0.675 |
| | | | C | 2,700 | 2,160 | 1,800 | 1,543 | 1,350 | 1,200 | 1,080 | 982 | 900 | 831 | 771 | | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.49 | 0.49 | | | | |
| 1 3/4" x 3/16" | 15.25 | 92 | U | 3,675 | 2,352 | 1,633 | 1,200 | 919 | 726 | 588 | 486 | 408 | 348 | 300 | 261 | 230 | | 1.225 | |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | 0.68 | 0.68 | | 1.072 |
| | | | C | 3,675 | 2,940 | 2,450 | 2,100 | 1,838 | 1,633 | 1,470 | 1,336 | 1,225 | 1,131 | 1,050 | 980 | 919 | | | |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | 0.54 | | |
| 2" x 3/16" | 17.32 | 102 | U | 4,800 | 3,072 | 2,133 | 1,567 | 1,200 | 948 | 768 | 635 | 533 | 454 | 392 | 341 | 300 | | 1.600 | |
| | | | D _u | 0.04 | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.34 | 0.39 | 0.46 | 0.52 | 0.60 | 0.60 | | 1.600 |
| | | | C | 4,800 | 3,840 | 3,200 | 2,743 | 2,400 | 2,133 | 1,920 | 1,745 | 1,600 | 1,477 | 1,371 | 1,280 | 1,200 | | | |
| | | | D _c | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | 0.48 | | |
| 2 1/2" x 3/16" | 21.46 | 120 | U | 7,500 | 4,800 | 3,333 | 2,449 | 1,875 | 1,481 | 1,200 | 992 | 833 | 710 | 612 | 533 | 469 | | 2.500 | |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | 0.48 | | 3.125 |
| | | | C | 7,500 | 6,000 | 5,000 | 4,286 | 3,750 | 3,333 | 3,000 | 2,727 | 2,500 | 2,308 | 2,143 | 2,000 | 1,875 | | | |
| | | | D _c | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.34 | 0.38 | 0.38 | | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - CLOSE-MESH

Grating Type: **15W4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft |
| 1" x 1/8" | 6.27 | 44 | U | 450 | 288 | 200 | 147 | 113 | | | | | | | | | 0.150 |
| | | | D _u | 0.10 | 0.16 | 0.22 | 0.30 | 0.40 | | | | | | | | | 0.056 |
| | | | C | 450 | 360 | 300 | 257 | 225 | | | | | | | | | |
| | | | D _c | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | | | | | | | | | |
| 1" x 3/16" | 9.03 | 49 | U | 675 | 432 | 300 | 220 | 169 | 133 | | | | | | | | 0.225 |
| | | | D _u | 0.10 | 0.16 | 0.22 | 0.30 | 0.40 | 0.50 | | | | | | | | 0.084 |
| | | | C | 675 | 540 | 450 | 386 | 338 | 300 | | | | | | | | |
| | | | D _c | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | 0.40 | | | | | | | | |
| 1 1/4" x 1/8" | 7.65 | 55 | U | 800 | 512 | 356 | 261 | 200 | 158 | 128 | | | | | | | 0.267 |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | 0.133 |
| | | | C | 800 | 640 | 533 | 457 | 400 | 356 | 320 | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | |
| 1 1/4" x 3/16" | 11.10 | 60 | U | 1,200 | 768 | 533 | 392 | 300 | 237 | 192 | | | | | | | 0.400 |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | 0.200 |
| | | | C | 1,200 | 960 | 800 | 686 | 600 | 533 | 480 | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | |
| 1 1/2" x 1/8" | 9.03 | 65 | U | 1,250 | 800 | 556 | 408 | 313 | 247 | 200 | 165 | | | | | | 0.417 |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | | | | | | 0.260 |
| | | | C | 1,250 | 1,000 | 833 | 714 | 625 | 556 | 500 | 455 | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | | | | | | |
| 1 1/2" x 3/16" | 13.18 | 71 | U | 1,875 | 1,200 | 833 | 612 | 469 | 370 | 300 | 248 | 208 | | | | | 0.625 |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | | | | | 0.391 |
| | | | C | 1,875 | 1,500 | 1,250 | 1,071 | 938 | 833 | 750 | 682 | 625 | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | | | | | |
| 1 3/4" x 3/16" | 15.25 | 82 | U | 2,700 | 1,728 | 1,200 | 882 | 675 | 533 | 432 | 357 | 300 | 256 | 220 | | | 0.900 |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.61 | | | 0.675 |
| | | | C | 2,700 | 2,160 | 1,800 | 1,543 | 1,350 | 1,200 | 1,080 | 982 | 900 | 831 | 771 | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.49 | | | |
| 2" x 3/16" | 17.32 | 92 | U | 3,675 | 2,352 | 1,633 | 1,200 | 919 | 726 | 588 | 486 | 408 | 348 | 300 | 261 | 230 | 1.225 |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | 0.68 | 1.072 |
| | | | C | 3,675 | 2,940 | 2,450 | 2,100 | 1,838 | 1,633 | 1,470 | 1,336 | 1,225 | 1,131 | 1,050 | 980 | 919 | |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | |
| 2 1/2" x 3/16" | 21.46 | 111 | U | 6,075 | 3,888 | 2,700 | 1,984 | 1,519 | 1,200 | 972 | 803 | 675 | 575 | 496 | 432 | 380 | 2.025 |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | 2.278 |
| | | | C | 6,075 | 4,860 | 4,050 | 3,471 | 3,038 | 2,700 | 2,430 | 2,209 | 2,025 | 1,869 | 1,736 | 1,620 | 1,519 | |
| | | | D _c | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.13 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.37 | 0.42 | |

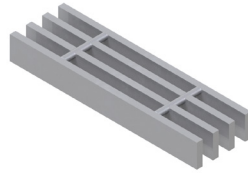
Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - SD IMPERIAL

LOAD TABLES | STANDARD, IMPERIAL

LOAD TABLES - ADA

Grating Type: 11W4
 Design Code: NAAMM MBG 534
 Material: ASTM A1011CS Type B
 Surface: Smooth



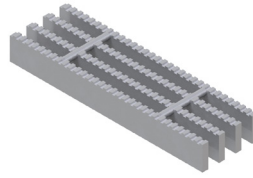
U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|-------|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft | I _x (in ⁴)/ft | |
| 1" x 1/8" | 8.25 | 59 | U | 1,091 | 698 | 485 | 356 | 273 | 215 | 175 | | | | | | | | 0.364 | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | | | | | | | | | 0.182 |
| | | | C | 1,091 | 873 | 727 | 623 | 545 | 485 | 436 | | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | | | | | | | | | |
| 1 1/4" x 3/16" | 14.82 | 77 | U | 2,557 | 1,636 | 1,136 | 835 | 639 | 505 | 409 | 338 | 284 | 242 | | | | | 0.852 | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | 0.63 | | | | | | |
| | | | C | 2,557 | 2,045 | 1,705 | 1,461 | 1,278 | 1,136 | 1,023 | 930 | 852 | 787 | | | | | | 0.533 |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.50 | | | | | | |
| 1 1/2" x 3/16" | 17.64 | 89 | U | 3,682 | 2,356 | 1,636 | 1,202 | 920 | 727 | 589 | 487 | 409 | 349 | 301 | 262 | | | 1.227 | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.61 | 0.70 | | | | |
| | | | C | 3,682 | 2,945 | 2,455 | 2,104 | 1,841 | 1,636 | 1,473 | 1,339 | 1,227 | 1,133 | 1,052 | 982 | | | | 0.920 |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.49 | 0.56 | | | | |
| 1 3/4" x 3/16" | 20.45 | 99 | U | 5,011 | 3,207 | 2,227 | 1,636 | 1,253 | 990 | 802 | 663 | 557 | 474 | 409 | 356 | 313 | | 1.670 | |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | 0.68 | | | |
| | | | C | 5,011 | 4,009 | 3,341 | 2,864 | 2,506 | 2,227 | 2,005 | 1,822 | 1,670 | 1,542 | 1,432 | 1,336 | 1,253 | | | 1.462 |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | | | |
| 2" x 3/16" | 23.27 | 110 | U | 6,545 | 4,189 | 2,909 | 2,137 | 1,636 | 1,293 | 1,047 | 866 | 727 | 620 | 534 | 465 | 409 | | 2.182 | |
| | | | D _u | 0.04 | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.34 | 0.39 | 0.46 | 0.52 | 0.60 | | | |
| | | | C | 6,545 | 5,236 | 4,364 | 3,740 | 3,273 | 2,909 | 2,618 | 2,380 | 2,182 | 2,014 | 1,870 | 1,745 | 1,636 | | | 2.182 |
| | | | D _c | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | | | |
| 2 1/2" x 3/16" | 28.90 | 130 | U | 10,227 | 6,545 | 4,545 | 3,340 | 2,557 | 2,020 | 1,636 | 1,352 | 1,136 | 968 | 835 | 727 | 639 | | 3.409 | |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | | | |
| | | | C | 10,227 | 8,182 | 6,818 | 5,844 | 5,114 | 4,545 | 4,091 | 3,719 | 3,409 | 3,147 | 2,922 | 2,727 | 2,557 | | | 4.261 |
| | | | D _c | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.34 | 0.38 | | | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - ADA

Grating Type: **11W4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A1011CS Type B**
 Surface: **Serrated**



U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 18 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|-------|
| | | | | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³)/ft | I _x (in ⁴)/ft | |
| 1" x 1/8" | 8.25 | 48 | U | 614 | 393 | 273 | 200 | 153 | | | | | | | | | | 0.205 | |
| | | | D _u | 0.10 | 0.16 | 0.22 | 0.30 | 0.40 | | | | | | | | | | | 0.077 |
| | | | C | 614 | 491 | 409 | 351 | 307 | | | | | | | | | | | |
| | | | D _c | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | | | | | | | | | | | |
| 1 1/4" x 3/16" | 14.82 | 65 | U | 1,636 | 1,047 | 727 | 534 | 409 | 323 | 262 | 216 | | | | | | | 0.545 | |
| | | | D _u | 0.07 | 0.12 | 0.17 | 0.23 | 0.30 | 0.38 | 0.47 | 0.56 | | | | | | | | 0.273 |
| | | | C | 1,636 | 1,309 | 1,091 | 935 | 818 | 727 | 655 | 595 | | | | | | | | |
| | | | D _c | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | | | | | | | | |
| 1 1/2" x 3/16" | 17.64 | 77 | U | 2,557 | 1,636 | 1,136 | 835 | 639 | 505 | 409 | 338 | 284 | 242 | | | | | 0.852 | |
| | | | D _u | 0.06 | 0.09 | 0.13 | 0.18 | 0.24 | 0.30 | 0.37 | 0.45 | 0.54 | 0.63 | | | | | | 0.533 |
| | | | C | 2,557 | 2,045 | 1,705 | 1,461 | 1,278 | 1,136 | 1,023 | 930 | 852 | 787 | | | | | | |
| | | | D _c | 0.05 | 0.07 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.50 | | | | | | |
| 1 3/4" x 3/16" | 20.45 | 89 | U | 3,682 | 2,356 | 1,636 | 1,202 | 920 | 727 | 589 | 487 | 409 | 349 | 301 | 262 | | | 1.227 | |
| | | | D _u | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 | 0.25 | 0.31 | 0.38 | 0.45 | 0.52 | 0.61 | 0.70 | | | | 0.920 |
| | | | C | 3,682 | 2,945 | 2,455 | 2,104 | 1,841 | 1,636 | 1,473 | 1,339 | 1,227 | 1,133 | 1,052 | 982 | | | | |
| | | | D _c | 0.04 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 0.42 | 0.49 | 0.56 | | | | |
| 2" x 3/16" | 23.27 | 99 | U | 5,011 | 3,207 | 2,227 | 1,636 | 1,253 | 990 | 802 | 663 | 557 | 474 | 409 | 356 | 313 | | 1.670 | |
| | | | D _u | 0.04 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.32 | 0.38 | 0.45 | 0.52 | 0.60 | 0.68 | | | 1.462 |
| | | | C | 5,011 | 4,009 | 3,341 | 2,864 | 2,506 | 2,227 | 2,005 | 1,822 | 1,670 | 1,542 | 1,432 | 1,336 | 1,253 | | | |
| | | | D _c | 0.03 | 0.05 | 0.08 | 0.10 | 0.14 | 0.17 | 0.21 | 0.26 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | | | |
| 2 1/2" x 3/16" | 28.90 | 120 | U | 8,284 | 5,302 | 3,682 | 2,705 | 2,071 | 1,636 | 1,325 | 1,095 | 920 | 784 | 676 | 589 | 518 | | 2.761 | |
| | | | D _u | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | | | 3.107 |
| | | | C | 8,284 | 6,627 | 5,523 | 4,734 | 4,142 | 3,682 | 3,314 | 3,012 | 2,761 | 2,549 | 2,367 | 2,209 | 2,071 | | | |
| | | | D _c | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.13 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.37 | 0.42 | | | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES | HEAVY DUTY, METRIC

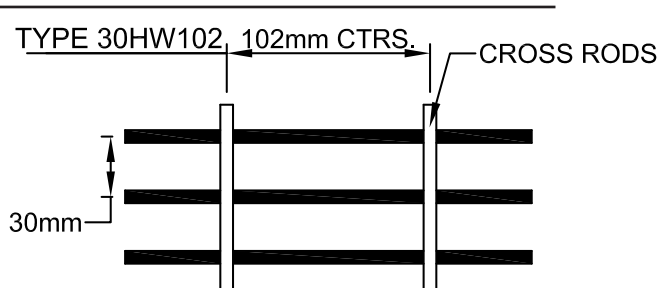
OVERVIEW

Heavy-Duty Welded Grating has the strength for heavy-duty load areas such as airfields, industrial plants, truck and bus terminals, parking lots and railroad yards. Common uses are flooring, driveways, subway and tunnel ventilation grilles, curb inlet grates, ramps, docks, etc.

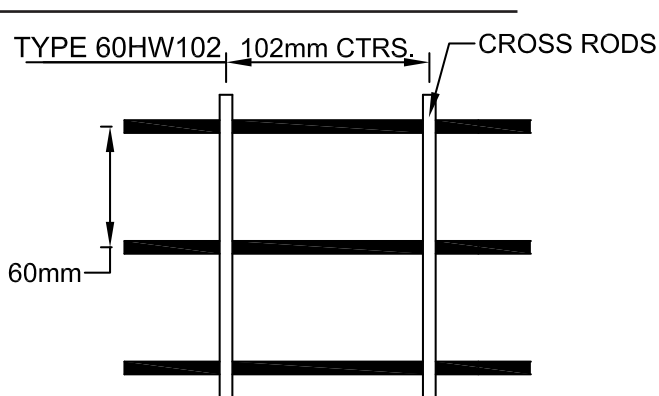
It is a sturdy grating to carry loads and maintain the same level over many years of use. Whenever rolling wheel loads are to be used over the grating, we recommend that the grating be load banded to add lateral strength. Serrations are available on bars up to 10mm thick to provide additional traction for rolling loads.

Standard heavy-duty bar grating is resistance-welded for durability, strength and safety using an automated electric/hydraulic welding process. High temperatures, combined with high pressure fuse the bearing bars and cross bars together to form a permanent joint.

Heavy-Duty



Wide Mesh



Panel widths shown are out-to-out of bearing bars

| Bars | HEAVY DUTY 30 SPACE (30mm ctrs) | | WIDE MESH 60 SPACE (60mm ctrs) | |
|------|---------------------------------------|-------|--------------------------------------|-------|
| | 6 mm | 10 mm | 6 mm | 10 mm |
| 2 | 37 | 40 | 67 | 70 |
| 3 | 67 | 70 | 127 | 130 |
| 4 | 97 | 100 | 187 | 191 |
| 5 | 127 | 130 | 248 | 251 |
| 6 | 157 | 160 | 308 | 311 |
| 7 | 187 | 191 | 368 | 371 |
| 8 | 217 | 221 | 429 | 432 |
| 9 | 248 | 251 | 489 | 492 |
| 10 | 278 | 281 | 549 | 552 |
| 11 | 308 | 311 | 610 | 613 |
| 12 | 338 | 341 | 670 | |
| 13 | 368 | 371 | 730 | |
| 14 | 398 | 402 | 791 | |
| 15 | 429 | 432 | 851 | |
| 16 | 459 | 462 | 911 | |
| 17 | 489 | 492 | | |
| 18 | 519 | 522 | | |
| 19 | 549 | 552 | | |
| 20 | 579 | 583 | | |
| 21 | 610 | 613 | | |
| 22 | 640 | | | |
| 23 | 670 | | | |
| 24 | 700 | | | |
| 25 | 730 | | | |
| 26 | 760 | | | |
| 27 | 791 | | | |
| 28 | 821 | | | |
| 29 | 851 | | | |
| 30 | 881 | | | |
| 31 | 911 | | | |

All metric dimensions are based on a "soft" conversion.

DESIGN CRITERIA

The load and deflection tables on the following pages have been prepared to provide the designer with a convenient reference for the load carrying capabilities of typical heavy duty grating.

Static Loads

Uniform loads and concentrated loads per foot of grating width are given on 152.4mm increments for spans from 300mm to 2,438mm. The values in these load tables are based on allowable stresses for static loads.

| | |
|---|--|
| Determine M: | $M = \frac{FS}{12}$ |
| Substituting for M, solve for L: | (i) $a > L$ (ii) $a > L$ $M = \frac{PL^2}{8ab}$ $M = \frac{P(.25L - .125a)}{b}$ |
| Check D*: | $D = \frac{P_1[(2L^3) - (a^2L) + (a^3/4)]}{96EI}$ |

*Deflection should be limited to 1/400 span.

M = Bending Moment

S = Section Modulus - mm³/m of grating width

I = Moment of Inertia - mm³/m of grating width

E = Modulus of Elasticity

F = Allowable Bending Stress

L = Simple Clear Span - mm

D = Deflection - mm

a = Partial Load Contact Parallel to Span - mm

s = Center-to-Center Spacing Between Bars - mm

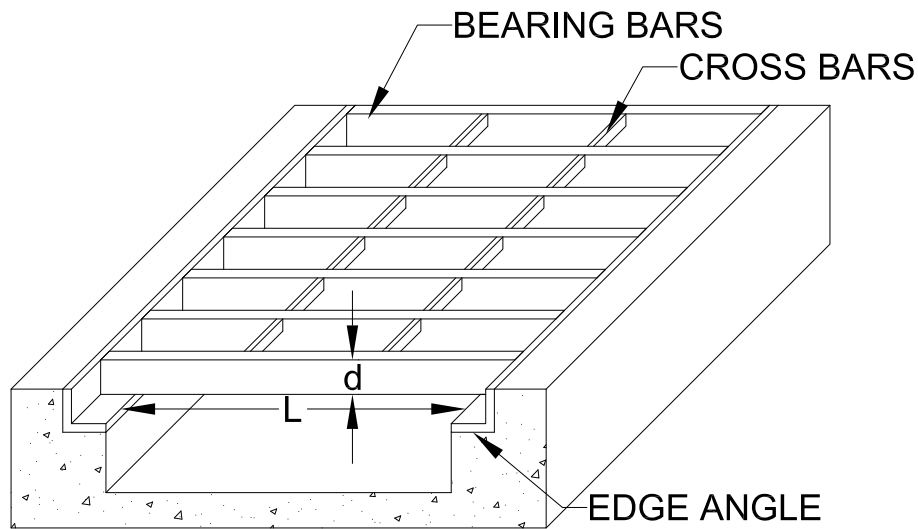
b = Partial Load Contact Dimension at 90° to span - mm

b = a + (2s)

P = Total Wheel of Partial Load Including Impact - kN.

P₁ = P per bearing bar

P₁ = P x (s/b)











LOAD TABLES | HEAVY DUTY, METRIC

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 (kN) | | | | | 28 | 64 | 44 | 19 |
| Load Capacity (kN) | | | | | 16 | 44 | 27 | 9 |
| Axle Load (kN) | 178 | 142 | 107 | 71 | | | | |
| Impact Factor | 30% | 30% | 30% | 30% | 30% | 30% | 30% | 30% |
| Total Load (kN) | 231 | 185 | 139 | 93 | 21 | 58 | 35 | 12 |
| % of Load on Drive Axel | | | | | 60% | 85% | 85% | 85% |
| Wheel Load (kN) | 116 | 93 | 69 | 46 | 10 | 29 | 17 | 6 |
| A-Length of distribution perpendicular to axle or parallel to main bars (mm) | 635 | 508 | 381 | 254 | 229 | 279 | 178 | 102 |
| C-Width of distribution parallel to axle or perpendicular to main bars (mm) | 635 | 508 | 381 | 254 | 229 | 279 | 178 | 102 |

Notes:

1. For continuous spans, use continuity factor = .80.
2. This distribution results in larger grating sizes for lighter trucks on shorter spans.
3. 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.
4. Wheeled vehicles with urethane tires should NEVER be used in conjunction with open grid bar grating.
5. HS20 is the same as H20 and HS15 is the same as H15. The "S" stands for semi-trailer.
6. 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

30HW102

| Bearing Bar Size | S _x mm ³ /m | I _x mm ⁴ /m | Unit Wt. kPa | Maximum Clear Span Between Supports (mm) | | | | | | | |
|------------------|--------------------------------------|--------------------------------------|-----------------|--|--------------|--------|--------|--------------|----------------|----------------|----------------|
| | | | | H-25 | H-20 / HL-93 | H-15 | H-10 | Auto Traffic | 5-Ton Forklift | 3-Ton Forklift | 1-Ton Forklift |
| 25 x 6 | 22,940 | 291.33E+3 | 47.87 | 393 | 331 | 270 | 212 | 324 | 210 | 165 | 183 |
| 32 x 6 | 35,960 | 571.69E+3 | 58.59 | 435 | 374 | 314 | 259 | 442 | 250 | 208 | 258 |
| 38 x 6 | 51,610 | 983.22E+3 | 69.14 | 486 | 426 | 369 | 318 | 586 | 299 | 261 | 349 |
| 38 x 10 | 76,610 | 1.46E+6 | 100.76 | 571 | 513 | 458 | 413 | 822 | 378 | 347 | 498 |
| 51 x 6 | 91,760 | 2.33E+6 | 90.41 | 618 | 561 | 508 | 466 | 954 | 422 | 395 | 580 |
| 64 x 6 | 143,370 | 4.55E+6 | 111.68 | 786 | 733 | 686 | 657 | 1,326* | 581 | 567 | 878 |
| 76 x 6 | 206,450 | 7.87E+6 | 132.95 | 993 | 944 | 905 | 890 | 1,589* | 776 | 777 | 1,242 |
| 76 x 10 | 306,450 | 11.68E+6 | 197.65 | 1,330 | 1,289 | 1,262 | 1,271 | 1,818* | 1,094 | 1,121 | 1,557* |
| 102 x 6 | 367,020 | 18.64E+6 | 175.48 | 1,518 | 1,480 | 1,460 | 1,483 | 2,116* | 1,270 | 1,312 | 1,812* |
| 102 x 10 | 544,800 | 27.68E+6 | 260.79 | 1,752* | 1,752* | 1,762* | 1,793* | 2,421* | 1,689* | 1,730* | 2,075* |

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

Note: All loads based on Smooth surface

60HW102

| Bearing Bar Size | S _x mm ³ /m | I _x mm ⁴ /m | Unit Wt. kPa | Maximum Clear Span Between Supports (mm) | | | | | | | |
|------------------|--------------------------------------|--------------------------------------|-----------------|--|--------------|-------|-------|--------------|----------------|----------------|----------------|
| | | | | H-25 | H-20 / HL-93 | H-15 | H-10 | Auto Traffic | 5-Ton Forklift | 3-Ton Forklift | 1-Ton Forklift |
| 25 x 6 | 11,470 | 145.66E+3 | 26.61 | 358 | 296 | 236 | 177 | 241 | 181 | 137 | 142 |
| 32 x 6 | 17,980 | 285.84E+3 | 31.96 | 381 | 320 | 261 | 206 | 312 | 205 | 164 | 193 |
| 38 x 6 | 25,810 | 491.61E+3 | 37.24 | 409 | 349 | 292 | 241 | 399 | 233 | 197 | 255 |
| 38 x 10 | 38,310 | 729.74E+3 | 53.41 | 455 | 397 | 343 | 297 | 542 | 280 | 250 | 357 |
| 51 x 6 | 45,880 | 1.17E+6 | 47.87 | 481 | 424 | 371 | 329 | 621 | 306 | 280 | 414 |
| 64 x 6 | 71,680 | 2.28E+6 | 58.51 | 572 | 519 | 472 | 442 | 906 | 400 | 388 | 618 |
| 76 x 6 | 103,230 | 3.93E+6 | 69.14 | 684 | 635 | 596 | 581 | 1,255 | 514 | 520 | 868 |
| 76 x 10 | 153,230 | 5.84E+6 | 102.94 | 868 | 826 | 799 | 808 | 1,538* | 701 | 735 | 1,276 |
| 102 x 6 | 183,510 | 9.32E+6 | 90.41 | 970 | 932 | 912 | 935 | 1,790* | 805 | 855 | 1,503 |
| 102 x 10 | 272,400 | 13.84E+6 | 134.51 | 1,296 | 1,271 | 1,272 | 1,338 | 2,048* | 1,138 | 1,238 | 1,829* |

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



LOAD TABLES | HEAVY DUTY, METRIC

VEHICULAR LOADS

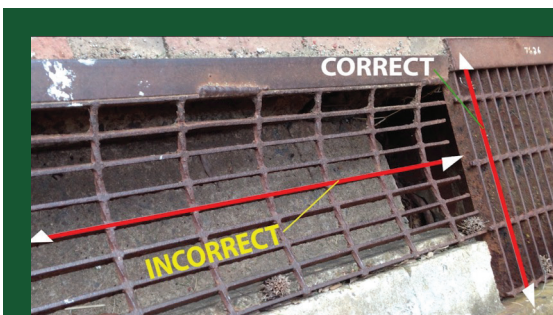
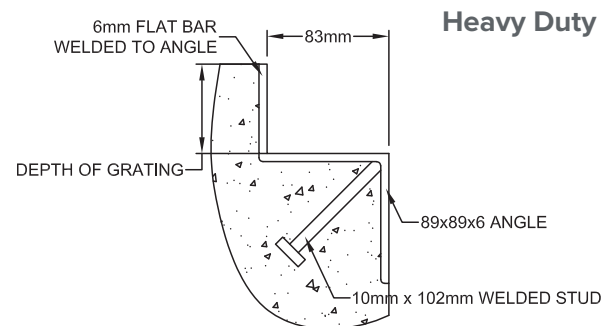
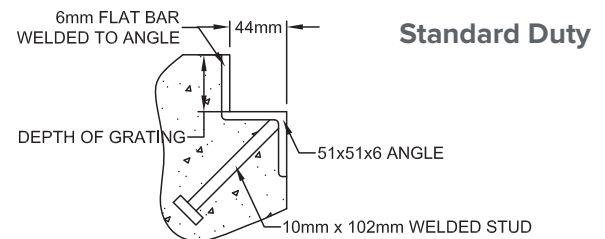
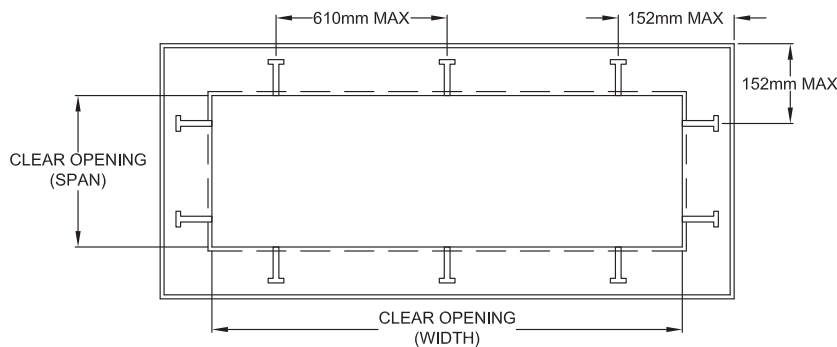
Grating Frames

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.



Cross Bars are not load bearing

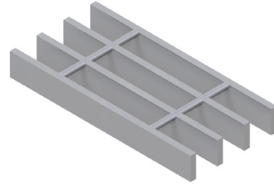
The bearing bars are the bars that carry the load and the cross bars hold the bearing bars in place creating the shape of the panel. In order to function properly, make sure that both ends of each bearing bar is supported by the load bearing structure and avoid the situation depicted in the picture to the left.



LOAD TABLES | HEAVY DUTY, METRIC

LOAD TABLES - HD

Grating Type: 30HW102
Design Code: NAAMM MBG 534
Material: ASTM A36M
Surface: Smooth



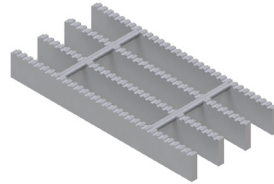
U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 137.9 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | | | Section Properties | | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|---------|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|-------------------------------------|-------------------------------------|---------|-----------|
| | | | | 305 | 457 | 610 | 762 | 915 | 1067 | 1219 | 1372 | 1524 | 1677 | 1829 | 1981 | 2134 | 2286 | 2438 | S _x (mm ³ /m) | I _x (mm ⁴ /m) | | |
| 25 x 6 | 46.7 | 1,560.00 | U | 272.0 | 121.0 | 68.1 | 43.6 | 30.3 | 22.2 | 17.0 | 13.4 | 10.9 | 9.0 | | | | | | | | 22,940 | |
| | | | D _u | 0.5 | 1.2 | 2.1 | 3.3 | 4.7 | 6.4 | 8.4 | 10.6 | 13.1 | 15.9 | | | | | | | | | 291.33E+3 |
| | | | C | 41.5 | 27.7 | 20.7 | 16.6 | 13.8 | 11.9 | 10.4 | 9.2 | 8.3 | 7.5 | | | | | | | | | |
| | | | D _c | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | | | | | | | | | |
| 32 x 6 | 57.6 | 1,846.00 | U | 426.4 | 189.6 | 106.7 | 68.3 | 47.4 | 34.8 | 26.7 | 21.1 | 17.1 | 14.1 | 11.9 | 10.1 | | | | | | 35,960 | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.1 | 6.7 | 8.5 | 10.5 | 12.7 | 15.1 | 17.7 | | | | | | | 571.69E+3 |
| | | | C | 65.0 | 43.4 | 32.5 | 26.0 | 21.7 | 18.6 | 16.3 | 14.5 | 13.0 | 11.8 | 10.8 | 10.0 | | | | | | | |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | 12.1 | 14.2 | | | | | | | |
| 38 x 6 | 68.4 | 2,114.00 | U | 612.1 | 272.2 | 153.1 | 98.0 | 68.1 | 50.0 | 38.3 | 30.3 | 24.5 | 20.3 | 17.0 | 14.5 | 12.5 | | | | | 51,610 | |
| | | | D _u | 0.4 | 0.8 | 1.4 | 2.2 | 3.2 | 4.3 | 5.6 | 7.1 | 8.8 | 10.6 | 12.6 | 14.8 | 17.2 | | | | | | 983.22E+3 |
| | | | C | 93.3 | 62.2 | 46.7 | 37.4 | 31.1 | 26.7 | 23.3 | 20.8 | 18.7 | 17.0 | 15.6 | 14.4 | 13.3 | | | | | | |
| | | | D _c | 0.3 | 0.6 | 1.1 | 1.8 | 2.5 | 3.4 | 4.5 | 5.7 | 7.0 | 8.5 | 10.1 | 11.8 | 13.7 | | | | | | |
| 38 x 10 | 101.1 | 2,334.00 | U | 908.6 | 404.0 | 227.3 | 145.5 | 101.0 | 74.2 | 56.8 | 44.9 | 36.4 | 30.1 | 25.3 | 21.5 | 18.6 | 16.2 | 14.2 | | | 76,610 | |
| | | | D _u | 0.4 | 0.8 | 1.4 | 2.2 | 3.2 | 4.3 | 5.6 | 7.1 | 8.8 | 10.6 | 12.6 | 14.8 | 17.2 | 19.7 | 22.4 | | | | 1.46E+6 |
| | | | C | 138.6 | 92.4 | 69.3 | 55.4 | 46.2 | 39.6 | 34.7 | 30.8 | 27.7 | 25.2 | 23.1 | 21.3 | 19.8 | 18.5 | 17.3 | | | | |
| | | | D _c | 0.3 | 0.6 | 1.1 | 1.8 | 2.5 | 3.4 | 4.5 | 5.7 | 7.0 | 8.5 | 10.1 | 11.8 | 13.7 | 15.8 | 17.9 | | | | |
| 51 x 6 | 90.1 | 2,623.00 | U | 1,088.2 | 483.8 | 272.2 | 174.2 | 121.0 | 88.9 | 68.1 | 53.8 | 43.6 | 36.0 | 30.3 | 25.8 | 22.2 | 19.4 | 17.0 | | | 91,760 | |
| | | | D _u | 0.3 | 0.6 | 1.1 | 1.6 | 2.4 | 3.2 | 4.2 | 5.3 | 6.6 | 7.9 | 9.5 | 11.1 | 12.9 | 14.8 | 16.8 | | | | 2.33E+6 |
| | | | C | 165.9 | 110.7 | 83.0 | 66.4 | 55.3 | 47.4 | 41.5 | 36.9 | 33.2 | 30.2 | 27.7 | 25.5 | 23.7 | 22.1 | 20.8 | | | | |
| | | | D _c | 0.2 | 0.5 | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.4 | | | | |
| 64 x 6 | 111.8 | 3,101.00 | U | 1,700.2 | 756.0 | 425.3 | 272.3 | 189.1 | 138.9 | 106.4 | 84.0 | 68.1 | 56.3 | 47.3 | 40.3 | 34.7 | 30.3 | 26.6 | | | 143,370 | |
| | | | D _u | 0.2 | 0.5 | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.4 | | | | 4.55E+6 |
| | | | C | 259.3 | 172.9 | 129.7 | 103.8 | 86.5 | 74.1 | 64.9 | 57.6 | 51.9 | 47.2 | 43.2 | 39.9 | 37.1 | 34.6 | 32.4 | | | | |
| | | | D _c | 0.2 | 0.4 | 0.7 | 1.1 | 1.5 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.1 | 7.1 | 8.2 | 9.5 | 10.8 | | | | |
| 76 x 6 | 133.5 | 3,556.00 | U | 2,448.3 | 1,088.6 | 612.5 | 392.0 | 272.3 | 200.1 | 153.2 | 121.0 | 98.0 | 81.0 | 68.1 | 58.0 | 50.0 | 43.6 | 38.3 | | | 206,450 | |
| | | | D _u | 0.2 | 0.4 | 0.7 | 1.1 | 1.6 | 2.1 | 2.8 | 3.5 | 4.4 | 5.3 | 6.3 | 7.4 | 8.6 | 9.9 | 11.2 | | | | 7.87E+6 |
| | | | C | 373.4 | 249.0 | 186.7 | 149.4 | 124.5 | 106.7 | 93.4 | 83.0 | 74.7 | 67.9 | 62.3 | 57.5 | 53.4 | 49.8 | 46.7 | | | | |
| | | | D _c | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | |
| 76 x 10 | 199.7 | 3,925.00 | U | 3,634.3 | 1,615.9 | 909.2 | 581.9 | 404.2 | 297.0 | 227.4 | 179.7 | 145.5 | 120.3 | 101.1 | 86.1 | 74.3 | 64.7 | 56.9 | | | 306,450 | |
| | | | D _u | 0.2 | 0.4 | 0.7 | 1.1 | 1.6 | 2.1 | 2.8 | 3.5 | 4.4 | 5.3 | 6.3 | 7.4 | 8.6 | 9.9 | 11.2 | | | | 11.68E+6 |
| | | | C | 554.2 | 369.6 | 277.2 | 221.8 | 184.8 | 158.4 | 138.6 | 123.2 | 110.9 | 100.8 | 92.4 | 85.3 | 79.2 | 73.9 | 69.3 | | | | |
| | | | D _c | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | |
| 89 x 6 | 155.2 | 3,991.00 | U | 3,332.5 | 1,481.7 | 833.7 | 533.6 | 370.6 | 272.3 | 208.5 | 164.7 | 133.4 | 110.3 | 92.7 | 79.0 | 68.1 | 59.3 | 52.2 | | | 281,000 | |
| | | | D _u | 0.2 | 0.3 | 0.6 | 0.9 | 1.4 | 1.8 | 2.4 | 3.0 | 3.8 | 4.5 | 5.4 | 6.3 | 7.4 | 8.4 | 9.6 | | | | 12.49E+6 |
| | | | C | 508.2 | 338.9 | 254.2 | 203.4 | 169.5 | 145.3 | 127.1 | 113.0 | 101.7 | 92.4 | 84.7 | 78.2 | 72.6 | 67.8 | 63.6 | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.1 | 1.5 | 1.9 | 2.4 | 3.0 | 3.6 | 4.3 | 5.1 | 5.9 | 6.8 | 7.7 | | | | |
| 89 x 10 | 231.9 | 4,406.00 | U | 4,946.6 | 2,199.5 | 1,237.5 | 792.1 | 550.1 | 404.2 | 309.5 | 244.5 | 198.1 | 163.7 | 137.6 | 117.2 | 101.1 | 88.0 | 77.4 | | | 417,110 | |
| | | | D _u | 0.2 | 0.3 | 0.6 | 0.9 | 1.4 | 1.8 | 2.4 | 3.0 | 3.8 | 4.5 | 5.4 | 6.3 | 7.4 | 8.4 | 9.6 | | | | 18.54E+6 |
| | | | C | 754.4 | 503.0 | 377.3 | 301.9 | 251.6 | 215.6 | 188.7 | 167.7 | 151.0 | 137.2 | 125.8 | 116.1 | 107.8 | 100.6 | 94.4 | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.1 | 1.5 | 1.9 | 2.4 | 3.0 | 3.6 | 4.3 | 5.1 | 5.9 | 6.8 | 7.7 | | | | |
| 102 x 6 | 176.9 | 4,412.00 | U | 4,352.6 | 1,935.3 | 1,088.9 | 697.0 | 484.0 | 355.6 | 272.3 | 215.2 | 174.3 | 144.0 | 121.0 | 103.1 | 88.9 | 77.5 | 68.1 | | | 367,020 | |
| | | | D _u | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.7 | 3.3 | 4.0 | 4.7 | 5.6 | 6.4 | 7.4 | 8.4 | | | | 18.64E+6 |
| | | | C | 663.8 | 442.6 | 332.0 | 265.6 | 221.4 | 189.7 | 166.0 | 147.6 | 132.8 | 120.8 | 110.7 | 102.2 | 94.9 | 88.6 | 83.0 | | | | |
| | | | D _c | 0.1 | 0.2 | 0.4 | 0.7 | 0.9 | 1.3 | 1.7 | 2.1 | 2.6 | 3.2 | 3.8 | 4.4 | 5.1 | 5.9 | 6.7 | | | | |
| 102 x 10 | 264.1 | 4,870.00 | U | 6,460.9 | 2,872.8 | 1,616.3 | 1,034.6 | 718.5 | 527.9 | 404.2 | 319.4 | 258.7 | 213.8 | 179.7 | 153.1 | 132.0 | 115.0 | 101.1 | | | 544,800 | |
| | | | D _u | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.7 | 3.3 | 4.0 | 4.7 | 5.6 | 6.4 | 7.4 | 8.4 | | | | 27.68E+6 |
| | | | C | 985.3 | 657.0 | 492.8 | 394.3 | 328.6 | 281.6 | 246.4 | 219.1 | 197.2 | 179.2 | 164.3 | 151.7 | 140.8 | 131.4 | 123.3 | | | | |
| | | | D _c | 0.1 | 0.2 | 0.4 | 0.7 | 0.9 | 1.3 | 1.7 | 2.1 | 2.6 | 3.2 | 3.8 | 4.4 | 5.1 | 5.9 | 6.7 | | | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD

Grating Type: **30HW102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36M**
 Surface: **Serrated**



U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 137.9 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | | | | | Section Properties | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------------|-------------------------------------|-----------|-----------|--|
| | | | | 305 | 457 | 610 | 762 | 915 | 1067 | 1219 | 1372 | 1524 | 1677 | 1829 | 1981 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | | | |
| 25 x 6 | 46.7 | 1,255.00 | U | 152.2 | 67.7 | 38.1 | 24.4 | 16.9 | 12.4 | 9.5 | 7.5 | | | | | | | | | | | 12,840 | |
| | | | D _u | 0.7 | 1.6 | 2.8 | 4.4 | 6.3 | 8.6 | 11.2 | 14.2 | | | | | | | | | | | | |
| | | | C | 23.2 | 15.5 | 11.6 | 9.3 | 7.7 | 6.6 | 5.8 | 5.2 | | | | | | | | | | | | |
| | | | D _c | 0.6 | 1.3 | 2.2 | 3.5 | 5.1 | 6.9 | 9.0 | 11.4 | | | | | | | | | | | 121.94E+3 | |
| 32 x 6 | 57.6 | 1,560.00 | U | 272.0 | 121.0 | 68.1 | 43.6 | 30.3 | 22.2 | 17.0 | 13.4 | 10.9 | 9.0 | | | | | | | 22,940 | | | |
| | | | D _u | 0.5 | 1.2 | 2.1 | 3.3 | 4.7 | 6.4 | 8.4 | 10.6 | 13.1 | 15.9 | | | | | | | | | | |
| | | | C | 41.5 | 27.7 | 20.7 | 16.6 | 13.8 | 11.9 | 10.4 | 9.2 | 8.3 | 7.5 | | | | | | | | | | |
| | | | D _c | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | | | | | | | 291.33E+3 | | | |
| 38 x 6 | 68.4 | 1,842.00 | U | 423.7 | 188.4 | 106.0 | 67.8 | 47.1 | 34.6 | 26.5 | 20.9 | 17.0 | 14.0 | 11.8 | 10.0 | | | | | 35,730 | | | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | 15.2 | 17.8 | | | | | | | | |
| | | | C | 64.6 | 43.1 | 32.3 | 25.9 | 21.5 | 18.5 | 16.2 | 14.4 | 12.9 | 11.8 | 10.8 | 9.9 | | | | | | | | |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | 12.1 | 14.2 | | | | | 566.31E+3 | | | |
| 38 x 10 | 101.1 | 2,033.00 | U | 629.0 | 279.7 | 157.3 | 100.7 | 69.9 | 51.4 | 39.3 | 31.1 | 25.2 | 20.8 | 17.5 | 14.9 | 12.9 | | | | | 53,040 | | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | 15.2 | 17.8 | 20.6 | | | | | | | |
| | | | C | 95.9 | 64.0 | 48.0 | 38.4 | 32.0 | 27.4 | 24.0 | 21.3 | 19.2 | 17.4 | 16.0 | 14.8 | 13.7 | | | | | | | |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | 12.1 | 14.2 | 16.5 | | | | | 840.62E+3 | | |
| 51 x 6 | 90.1 | 2,371.00 | U | 831.2 | 369.6 | 207.9 | 133.1 | 92.4 | 67.9 | 52.0 | 41.1 | 33.3 | 27.5 | 23.1 | 19.7 | 17.0 | 14.8 | 13.0 | | | 70,090 | | |
| | | | D _u | 0.3 | 0.7 | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.5 | 9.1 | 10.8 | 12.7 | 14.7 | 16.9 | 19.2 | | | | | |
| | | | C | 126.8 | 84.5 | 63.4 | 50.7 | 42.3 | 36.2 | 31.7 | 28.2 | 25.4 | 23.1 | 21.1 | 19.5 | 18.1 | 16.9 | 15.9 | | | | | |
| | | | D _c | 0.2 | 0.5 | 1.0 | 1.5 | 2.2 | 2.9 | 3.8 | 4.9 | 6.0 | 7.3 | 8.7 | 10.2 | 11.8 | 13.5 | 15.4 | | | 1.56E+6 | | |
| 64 x 6 | 111.8 | 2,864.00 | U | 1,374.8 | 611.3 | 343.9 | 220.1 | 152.9 | 112.3 | 86.0 | 68.0 | 55.0 | 45.5 | 38.2 | 32.6 | 28.1 | 24.5 | 21.5 | | | 115,930 | | |
| | | | D _u | 0.2 | 0.5 | 0.9 | 1.5 | 2.1 | 2.9 | 3.7 | 4.7 | 5.8 | 7.1 | 8.4 | 9.9 | 11.5 | 13.1 | 15.0 | | | | | |
| | | | C | 209.7 | 139.8 | 104.9 | 83.9 | 69.9 | 59.9 | 52.4 | 46.6 | 42.0 | 38.1 | 35.0 | 32.3 | 30.0 | 28.0 | 26.2 | | | | | |
| | | | D _c | 0.2 | 0.4 | 0.7 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.7 | 7.9 | 9.2 | 10.5 | 12.0 | | | 3.31E+6 | | |
| 76 x 6 | 133.5 | 3,329.00 | U | 2,054.3 | 913.4 | 513.9 | 329.0 | 228.5 | 167.9 | 128.5 | 101.6 | 82.3 | 68.0 | 57.1 | 48.7 | 42.0 | 36.6 | 32.2 | | | 173,230 | | |
| | | | D _u | 0.2 | 0.4 | 0.8 | 1.2 | 1.7 | 2.3 | 3.1 | 3.9 | 4.8 | 5.8 | 6.9 | 8.1 | 9.4 | 10.8 | 12.2 | | | | | |
| | | | C | 313.3 | 208.9 | 156.7 | 125.4 | 104.5 | 89.6 | 78.4 | 69.7 | 62.7 | 57.0 | 52.2 | 48.2 | 44.8 | 41.8 | 39.2 | | | | | |
| | | | D _c | 0.2 | 0.3 | 0.6 | 1.0 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.5 | 6.5 | 7.5 | 8.6 | 9.8 | | | 6.05E+6 | | |
| 76 x 10 | 199.7 | 3,675.00 | U | 3,049.4 | 1,355.9 | 762.9 | 488.3 | 339.1 | 249.2 | 190.8 | 150.7 | 122.1 | 100.9 | 84.8 | 72.3 | 62.3 | 54.3 | 47.7 | | | 257,140 | | |
| | | | D _u | 0.2 | 0.4 | 0.8 | 1.2 | 1.7 | 2.3 | 3.1 | 3.9 | 4.8 | 5.8 | 6.9 | 8.1 | 9.4 | 10.8 | 12.2 | | | | | |
| | | | C | 465.0 | 310.1 | 232.6 | 186.1 | 155.1 | 132.9 | 116.3 | 103.4 | 93.1 | 84.6 | 77.5 | 71.6 | 66.5 | 62.0 | 58.2 | | | | | |
| | | | D _c | 0.2 | 0.3 | 0.6 | 1.0 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.5 | 6.5 | 7.5 | 8.6 | 9.8 | | | 8.97E+6 | | |
| 89 x 6 | 155.2 | 3,774.00 | U | 2,869.9 | 1,276.1 | 718.0 | 459.5 | 319.2 | 234.5 | 179.5 | 141.9 | 114.9 | 95.0 | 79.8 | 68.0 | 58.6 | 51.1 | 44.9 | | | 242,000 | | |
| | | | D _u | 0.2 | 0.4 | 0.6 | 1.0 | 1.5 | 2.0 | 2.6 | 3.3 | 4.0 | 4.9 | 5.8 | 6.8 | 7.9 | 9.1 | 10.3 | | | | | |
| | | | C | 437.7 | 291.8 | 218.9 | 175.1 | 146.0 | 125.1 | 109.5 | 97.3 | 87.6 | 79.6 | 73.0 | 67.4 | 62.6 | 58.4 | 54.8 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.6 | 3.2 | 3.9 | 4.7 | 5.5 | 6.3 | 7.3 | 8.3 | | | 9.98E+6 | | |
| 89 x 10 | 231.9 | 4,166.00 | U | 4,260.0 | 1,894.2 | 1,065.7 | 682.1 | 473.8 | 348.1 | 266.5 | 210.6 | 170.6 | 141.0 | 118.5 | 100.9 | 87.0 | 75.8 | 66.7 | | | 359,220 | | |
| | | | D _u | 0.2 | 0.4 | 0.6 | 1.0 | 1.5 | 2.0 | 2.6 | 3.3 | 4.0 | 4.9 | 5.8 | 6.8 | 7.9 | 9.1 | 10.3 | | | | | |
| | | | C | 649.7 | 433.2 | 324.9 | 260.0 | 216.6 | 185.7 | 162.5 | 144.4 | 130.0 | 118.2 | 108.3 | 100.0 | 92.9 | 86.7 | 81.3 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.6 | 3.2 | 3.9 | 4.7 | 5.5 | 6.3 | 7.3 | 8.3 | | | 14.82E+6 | | |
| 102 x 6 | 176.9 | 4,202.00 | U | 3,821.5 | 1,699.2 | 956.0 | 611.9 | 425.0 | 312.3 | 239.1 | 188.9 | 153.0 | 126.5 | 106.3 | 90.6 | 78.1 | 68.0 | 59.8 | | | 322,240 | | |
| | | | D _u | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | | |
| | | | C | 582.8 | 388.6 | 291.5 | 233.2 | 194.3 | 166.6 | 145.8 | 129.6 | 116.6 | 106.0 | 97.2 | 89.7 | 83.3 | 77.7 | 72.9 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.4 | 0.7 | 1.0 | 1.4 | 1.8 | 2.3 | 2.8 | 3.4 | 4.0 | 4.7 | 5.5 | 6.3 | 7.2 | | | 15.34E+6 | | |
| 102 x 10 | 264.1 | 4,638.00 | U | 5,672.6 | 2,522.2 | 1,419.1 | 908.3 | 630.8 | 463.5 | 354.9 | 280.4 | 227.1 | 187.7 | 157.7 | 134.4 | 115.9 | 101.0 | 88.8 | | | 478,330 | | |
| | | | D _u | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | | |
| | | | C | 865.1 | 576.8 | 432.7 | 346.2 | 288.5 | 247.3 | 216.4 | 192.3 | 173.1 | 157.4 | 144.3 | 133.2 | 123.7 | 115.4 | 108.2 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.4 | 0.7 | 1.0 | 1.4 | 1.8 | 2.3 | 2.8 | 3.4 | 4.0 | 4.7 | 5.5 | 6.3 | 7.2 | | | 22.77E+6 | | |

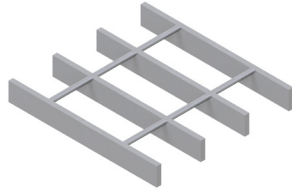
Spans and loads in red indicate a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD METRIC

LOAD TABLES | HEAVY DUTY, METRIC

LOAD TABLES - WIDE MESH

Grating Type: **60HW102**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36M**
 Surface: **Smooth**



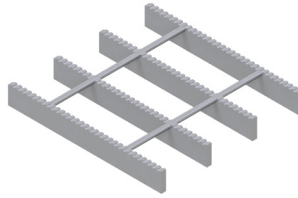
U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 137.9 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | | | | Section Properties | | | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|---------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|-------------------------------------|-------------------------------------|-----------|----------|-----------|
| | | | | 305 | 457 | 610 | 762 | 915 | 1067 | 1219 | 1372 | 1524 | 1677 | 1829 | 1981 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | | | |
| 25 x 6 | 26.2 | 1,312.00 | U | 136.0 | 60.5 | 34.0 | 21.8 | 15.1 | 11.1 | 8.5 | 6.7 | | | | | | | | | | | 11,470 | 145.66E+3 |
| | | | D _u | 0.5 | 1.2 | 2.1 | 3.3 | 4.7 | 6.4 | 8.4 | 10.6 | | | | | | | | | | | | |
| | | | C | 20.7 | 13.8 | 10.4 | 8.3 | 6.9 | 5.9 | 5.2 | 4.6 | | | | | | | | | | | | |
| | | | D _c | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | | | | | | | | | | | | |
| 32 x 6 | 31.7 | 1,552.00 | U | 213.2 | 94.8 | 53.3 | 34.1 | 23.7 | 17.4 | 13.3 | 10.5 | 8.5 | 7.1 | | | | | | | 17,980 | 285.84E+3 | | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.1 | 6.7 | 8.5 | 10.5 | 12.7 | | | | | | | | | | |
| | | | C | 32.5 | 21.7 | 16.3 | 13.0 | 10.8 | 9.3 | 8.1 | 7.2 | 6.5 | 5.9 | | | | | | | | | | |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | | | | | | | | | | |
| 38 x 6 | 37.0 | 1,778.00 | U | 306.0 | 136.1 | 76.6 | 49.0 | 34.0 | 25.0 | 19.1 | 15.1 | 12.3 | 10.1 | 8.5 | | | | | 25,810 | 491.61E+3 | | | |
| | | | D _u | 0.4 | 0.8 | 1.4 | 2.2 | 3.2 | 4.3 | 5.6 | 7.1 | 8.8 | 10.6 | 12.6 | | | | | | | | | |
| | | | C | 46.7 | 31.1 | 23.3 | 18.7 | 15.6 | 13.3 | 11.7 | 10.4 | 9.3 | 8.5 | 7.8 | | | | | | | | | |
| | | | D _c | 0.3 | 0.6 | 1.1 | 1.8 | 2.5 | 3.4 | 4.5 | 5.7 | 7.0 | 8.5 | 10.1 | | | | | | | | | |
| 38 x 10 | 52.8 | 1,962.00 | U | 454.3 | 202.0 | 113.6 | 72.7 | 50.5 | 37.1 | 28.4 | 22.5 | 18.2 | 15.0 | 12.6 | 10.8 | | | | | 38,310 | 729.74E+3 | | |
| | | | D _u | 0.4 | 0.8 | 1.4 | 2.2 | 3.2 | 4.3 | 5.6 | 7.1 | 8.8 | 10.6 | 12.6 | 14.8 | | | | | | | | |
| | | | C | 69.3 | 46.2 | 34.7 | 27.7 | 23.1 | 19.8 | 17.3 | 15.4 | 13.9 | 12.6 | 11.6 | 10.7 | | | | | | | | |
| | | | D _c | 0.3 | 0.6 | 1.1 | 1.8 | 2.5 | 3.4 | 4.5 | 5.7 | 7.0 | 8.5 | 10.1 | 11.8 | | | | | | | | |
| 51 x 6 | 47.9 | 2,206.00 | U | 544.1 | 241.9 | 136.1 | 87.1 | 60.5 | 44.5 | 34.0 | 26.9 | 21.8 | 18.0 | 15.1 | 12.9 | 11.1 | 9.7 | | | 45,880 | 1.17E+6 | | |
| | | | D _u | 0.3 | 0.6 | 1.1 | 1.6 | 2.4 | 3.2 | 4.2 | 5.3 | 6.6 | 7.9 | 9.5 | 11.1 | 12.9 | 14.8 | | | | | | |
| | | | C | 83.0 | 55.3 | 41.5 | 33.2 | 27.7 | 23.7 | 20.8 | 18.4 | 16.6 | 15.1 | 13.8 | 12.8 | 11.9 | 11.1 | | | | | | |
| | | | D _c | 0.2 | 0.5 | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | | | | | | |
| 64 x 6 | 58.7 | 2,608.00 | U | 850.1 | 378.0 | 212.7 | 136.1 | 94.5 | 69.5 | 53.2 | 42.0 | 34.0 | 28.1 | 23.6 | 20.1 | 17.4 | 15.1 | 13.3 | | | 71,680 | 2.28E+6 | |
| | | | D _u | 0.2 | 0.5 | 0.8 | 1.3 | 1.9 | 2.6 | 3.4 | 4.3 | 5.3 | 6.4 | 7.6 | 8.9 | 10.3 | 11.8 | 13.4 | | | | | |
| | | | C | 129.6 | 86.4 | 64.8 | 51.9 | 43.2 | 37.1 | 32.4 | 28.8 | 25.9 | 23.6 | 21.6 | 20.0 | 18.5 | 17.3 | 16.2 | | | | | |
| | | | D _c | 0.2 | 0.4 | 0.7 | 1.1 | 1.5 | 2.1 | 2.7 | 3.4 | 4.2 | 5.1 | 6.1 | 7.1 | 8.2 | 9.5 | 10.8 | | | | | |
| 76 x 6 | 69.6 | 2,990.00 | U | 1,224.2 | 544.3 | 306.2 | 196.0 | 136.1 | 100.0 | 76.6 | 60.5 | 49.0 | 40.5 | 34.0 | 29.0 | 25.0 | 21.8 | 19.2 | | | 103,230 | 3.93E+6 | |
| | | | D _u | 0.2 | 0.4 | 0.7 | 1.1 | 1.6 | 2.1 | 2.8 | 3.5 | 4.4 | 5.3 | 6.3 | 7.4 | 8.6 | 9.9 | 11.2 | | | | | |
| | | | C | 186.7 | 124.5 | 93.4 | 74.7 | 62.3 | 53.4 | 46.7 | 41.5 | 37.4 | 34.0 | 31.1 | 28.7 | 26.7 | 24.9 | 23.4 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | | |
| 76 x 10 | 103.1 | 3,300.00 | U | 1,817.1 | 808.0 | 454.6 | 291.0 | 202.1 | 148.5 | 113.7 | 89.8 | 72.8 | 60.1 | 50.5 | 43.1 | 37.1 | 32.3 | 28.4 | | | 153,230 | 5.84E+6 | |
| | | | D _u | 0.2 | 0.4 | 0.7 | 1.1 | 1.6 | 2.1 | 2.8 | 3.5 | 4.4 | 5.3 | 6.3 | 7.4 | 8.6 | 9.9 | 11.2 | | | | | |
| | | | C | 277.1 | 184.8 | 138.6 | 110.9 | 92.4 | 79.2 | 69.3 | 61.6 | 55.5 | 50.4 | 46.2 | 42.7 | 39.6 | 37.0 | 34.7 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | | | | | |
| 89 x 6 | 80.4 | 3,356.00 | U | 1,666.2 | 740.9 | 416.8 | 266.8 | 185.3 | 136.1 | 104.2 | 82.4 | 66.7 | 55.1 | 46.3 | 39.5 | 34.0 | 29.7 | 26.1 | | | 140,500 | 6.25E+6 | |
| | | | D _u | 0.2 | 0.3 | 0.6 | 0.9 | 1.4 | 1.8 | 2.4 | 3.0 | 3.8 | 4.5 | 5.4 | 6.3 | 7.4 | 8.4 | 9.6 | | | | | |
| | | | C | 254.1 | 169.4 | 127.1 | 101.7 | 84.7 | 72.6 | 63.6 | 56.5 | 50.8 | 46.2 | 42.4 | 39.1 | 36.3 | 33.9 | 31.8 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.1 | 1.5 | 1.9 | 2.4 | 3.0 | 3.6 | 4.3 | 5.1 | 5.9 | 6.8 | 7.7 | | | | | |
| 89 x 10 | 119.2 | 3,705.00 | U | 2,473.3 | 1,099.7 | 618.7 | 396.0 | 275.1 | 202.1 | 154.7 | 122.3 | 99.0 | 81.9 | 68.8 | 58.6 | 50.5 | 44.0 | 38.7 | | | 208,560 | 9.27E+6 | |
| | | | D _u | 0.2 | 0.3 | 0.6 | 0.9 | 1.4 | 1.8 | 2.4 | 3.0 | 3.8 | 4.5 | 5.4 | 6.3 | 7.4 | 8.4 | 9.6 | | | | | |
| | | | C | 377.2 | 251.5 | 188.7 | 150.9 | 125.8 | 107.8 | 94.3 | 83.9 | 75.5 | 68.6 | 62.9 | 58.1 | 53.9 | 50.3 | 47.2 | | | | | |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.1 | 1.5 | 1.9 | 2.4 | 3.0 | 3.6 | 4.3 | 5.1 | 5.9 | 6.8 | 7.7 | | | | | |
| 102 x 6 | 91.3 | 3,710.00 | U | 2,176.3 | 967.7 | 544.4 | 348.5 | 242.0 | 177.8 | 136.2 | 107.6 | 87.1 | 72.0 | 60.5 | 51.6 | 44.5 | 38.7 | 34.1 | | | 183,510 | 9.32E+6 | |
| | | | D _u | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.7 | 3.3 | 4.0 | 4.7 | 5.6 | 6.4 | 7.4 | 8.4 | | | | | |
| | | | C | 331.9 | 221.3 | 166.0 | 132.8 | 110.7 | 94.9 | 83.0 | 73.8 | 66.4 | 60.4 | 55.3 | 51.1 | 47.4 | 44.3 | 41.5 | | | | | |
| | | | D _c | 0.1 | 0.2 | 0.4 | 0.7 | 0.9 | 1.3 | 1.7 | 2.1 | 2.6 | 3.2 | 3.8 | 4.4 | 5.1 | 5.9 | 6.7 | | | | | |
| 102 x 10 | 135.3 | 4,095.00 | U | 3,230.5 | 1,436.4 | 808.1 | 517.3 | 359.3 | 264.0 | 202.1 | 159.7 | 129.4 | 106.9 | 89.8 | 76.5 | 66.0 | 57.5 | 50.6 | | | 272,400 | 13.84E+6 | |
| | | | D _u | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.7 | 3.3 | 4.0 | 4.7 | 5.6 | 6.4 | 7.4 | 8.4 | | | | | |
| | | | C | 492.6 | 328.5 | 246.4 | 197.1 | 164.3 | 140.8 | 123.2 | 109.5 | 98.6 | 89.6 | 82.2 | 75.8 | 70.4 | 65.7 | 61.6 | | | | | |
| | | | D _c | 0.1 | 0.2 | 0.4 | 0.7 | 0.9 | 1.3 | 1.7 | 2.1 | 2.6 | 3.2 | 3.8 | 4.4 | 5.1 | 5.9 | 6.7 | | | | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - WIDE MESH

Grating Type: 60HW102
Design Code: NAAMM MBG 534
Material: ASTM A36M
Surface: Serrated



U = Safe Uniform Load (kPa)
 D_u = Deflection Due to Safe Uniform Load (mm)
 C = Safe Concentrated Load (kN/meter of grating width)
 D_c = Deflection Due to Safe Concentrated Load (mm)
 Allowable Extreme Fiber Stress = 137.9 MPa

| Bearing Bar Size (mm) | Approx. Weight (kg/m ²) | Ped. Span (mm) | Load / Deflection | SPAN (mm) | | | | | | | | | | | | | | | | Section Properties | | |
|-----------------------|-------------------------------------|----------------|-------------------|-----------|---------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|-------------------------------------|-------------------------------------|---------|-----------|
| | | | | 305 | 457 | 610 | 762 | 915 | 1067 | 1219 | 1372 | 1524 | 1677 | 1829 | 1981 | 2134 | 2286 | 2438 | S _x (mm ³)/m | I _x (mm ⁴)/m | | |
| 25 x 6 | 26.2 | 1,055.00 | U | 76.1 | 33.8 | 19.0 | 12.2 | 8.5 | 6.2 | | | | | | | | | | | | 6,420 | |
| | | | D _u | 0.7 | 1.6 | 2.8 | 4.4 | 6.3 | 8.6 | | | | | | | | | | | | | |
| | | | C | 11.6 | 7.7 | 5.8 | 4.6 | 3.9 | 3.3 | | | | | | | | | | | | | 60.97E+3 |
| | | | D _c | 0.6 | 1.3 | 2.2 | 3.5 | 5.1 | 6.9 | | | | | | | | | | | | | |
| 32 x 6 | 31.7 | 1,312.00 | U | 136.0 | 60.5 | 34.0 | 21.8 | 15.1 | 11.1 | 8.5 | 6.7 | | | | | | | | | | 11,470 | |
| | | | D _u | 0.5 | 1.2 | 2.1 | 3.3 | 4.7 | 6.4 | 8.4 | 10.6 | | | | | | | | | | | |
| | | | C | 20.7 | 13.8 | 10.4 | 8.3 | 6.9 | 5.9 | 5.2 | 4.6 | | | | | | | | | | | 145.66E+3 |
| | | | D _c | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | | | | | | | | | | | |
| 38 x 6 | 37.0 | 1,549.00 | U | 211.9 | 94.2 | 53.0 | 33.9 | 23.6 | 17.3 | 13.3 | 10.5 | 8.5 | 7.0 | | | | | | | | 17,870 | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | 15.2 | | | | | | | | |
| | | | C | 32.3 | 21.5 | 16.2 | 12.9 | 10.8 | 9.2 | 8.1 | 7.2 | 6.5 | 5.9 | 5.2 | | | | | | | | 283.16E+3 |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | 12.1 | | | | | | | | |
| 38 x 10 | 52.8 | 1,710.00 | U | 314.5 | 139.8 | 78.7 | 50.4 | 35.0 | 25.7 | 19.7 | 15.5 | 12.6 | 10.4 | 8.7 | | | | | | | 26,520 | |
| | | | D _u | 0.4 | 0.9 | 1.7 | 2.6 | 3.8 | 5.2 | 6.7 | 8.5 | 10.5 | 12.7 | 15.2 | 18.0 | | | | | | | |
| | | | C | 48.0 | 32.0 | 24.0 | 19.2 | 16.0 | 13.7 | 12.0 | 10.7 | 9.6 | 8.7 | 8.0 | 7.3 | | | | | | | 420.31E+3 |
| | | | D _c | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.4 | 6.8 | 8.4 | 10.2 | 12.1 | 14.9 | | | | | | | |
| 51 x 6 | 47.9 | 1,994.00 | U | 415.6 | 184.8 | 104.0 | 66.6 | 46.2 | 34.0 | 26.0 | 20.5 | 16.6 | 13.8 | 11.6 | 9.8 | 8.5 | | | | | 35,050 | |
| | | | D _u | 0.3 | 0.7 | 1.2 | 1.9 | 2.7 | 3.7 | 4.8 | 6.1 | 7.5 | 9.1 | 10.8 | 12.7 | 14.7 | 17.8 | | | | | |
| | | | C | 63.4 | 42.3 | 31.7 | 25.4 | 21.1 | 18.1 | 15.9 | 14.1 | 12.7 | 11.5 | 10.6 | 9.8 | 9.1 | 8.4 | | | | | 778.03E+3 |
| | | | D _c | 0.2 | 0.5 | 1.0 | 1.5 | 2.2 | 2.9 | 3.8 | 4.9 | 6.0 | 7.3 | 8.7 | 10.2 | 11.8 | 13.8 | | | | | |
| 64 x 6 | 58.7 | 2,408.00 | U | 687.4 | 305.6 | 172.0 | 110.1 | 76.4 | 56.2 | 43.0 | 34.0 | 27.5 | 22.7 | 19.1 | 16.3 | 14.0 | 12.2 | 10.8 | | | 57,960 | |
| | | | D _u | 0.2 | 0.5 | 0.9 | 1.5 | 2.1 | 2.9 | 3.7 | 4.7 | 5.8 | 7.1 | 8.4 | 9.9 | 11.5 | 13.1 | 15.0 | 17.0 | | | |
| | | | C | 104.8 | 69.9 | 52.4 | 41.9 | 35.0 | 30.0 | 26.2 | 23.3 | 21.0 | 19.1 | 17.5 | 16.1 | 15.0 | 14.0 | 13.1 | 12.1 | | | 1.65E+6 |
| | | | D _c | 0.2 | 0.4 | 0.7 | 1.2 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.7 | 7.9 | 9.2 | 10.5 | 12.0 | 13.8 | | | |
| 76 x 6 | 69.6 | 2,800.00 | U | 1,027.2 | 456.7 | 257.0 | 164.5 | 114.2 | 83.9 | 64.3 | 50.8 | 41.1 | 34.0 | 28.6 | 24.3 | 21.0 | 18.3 | 16.1 | | | 86,610 | |
| | | | D _u | 0.2 | 0.4 | 0.8 | 1.2 | 1.7 | 2.3 | 3.1 | 3.9 | 4.8 | 5.8 | 6.9 | 8.1 | 9.4 | 10.8 | 12.2 | 13.8 | | | |
| | | | C | 156.6 | 104.5 | 78.3 | 62.7 | 52.2 | 44.8 | 39.2 | 34.8 | 31.3 | 28.5 | 26.1 | 24.1 | 22.4 | 20.9 | 19.6 | 18.4 | | | 3.02E+6 |
| | | | D _c | 0.2 | 0.3 | 0.6 | 1.0 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.5 | 6.5 | 7.5 | 8.6 | 9.8 | 11.1 | | | |
| 76 x 10 | 103.1 | 3,090.00 | U | 1,524.7 | 677.9 | 381.4 | 244.1 | 169.6 | 124.6 | 95.4 | 75.4 | 61.1 | 50.5 | 42.4 | 36.1 | 31.2 | 27.1 | 23.9 | | | 128,570 | |
| | | | D _u | 0.2 | 0.4 | 0.8 | 1.2 | 1.7 | 2.3 | 3.1 | 3.9 | 4.8 | 5.8 | 6.9 | 8.1 | 9.4 | 10.8 | 12.2 | 13.8 | | | |
| | | | C | 232.5 | 155.0 | 116.3 | 93.0 | 77.5 | 66.5 | 58.2 | 51.7 | 46.5 | 42.3 | 38.8 | 35.8 | 33.2 | 31.0 | 29.1 | 27.4 | | | 4.49E+6 |
| | | | D _c | 0.2 | 0.3 | 0.6 | 1.0 | 1.4 | 1.9 | 2.4 | 3.1 | 3.8 | 4.6 | 5.5 | 6.5 | 7.5 | 8.6 | 9.8 | 11.1 | | | |
| 89 x 6 | 80.4 | 3,173.00 | U | 1,435.0 | 638.0 | 359.0 | 229.8 | 159.6 | 117.2 | 89.8 | 70.9 | 57.5 | 47.5 | 39.9 | 34.0 | 29.3 | 25.5 | 22.5 | | | 121,000 | |
| | | | D _u | 0.2 | 0.4 | 0.6 | 1.0 | 1.5 | 2.0 | 2.6 | 3.3 | 4.0 | 4.9 | 5.8 | 6.8 | 7.9 | 9.1 | 10.3 | 11.7 | | | |
| | | | C | 218.8 | 145.9 | 109.5 | 87.6 | 73.0 | 62.6 | 54.7 | 48.7 | 43.8 | 39.8 | 36.5 | 33.7 | 31.3 | 29.2 | 27.4 | 25.8 | | | 4.99E+6 |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.6 | 3.2 | 3.9 | 4.7 | 5.5 | 6.3 | 7.3 | 8.3 | 9.4 | | | |
| 89 x 10 | 119.2 | 3,503.00 | U | 2,130.0 | 947.1 | 532.9 | 341.1 | 236.9 | 174.0 | 133.3 | 105.3 | 85.3 | 70.5 | 59.2 | 50.5 | 43.5 | 37.9 | 33.3 | | | 179,610 | |
| | | | D _u | 0.2 | 0.4 | 0.6 | 1.0 | 1.5 | 2.0 | 2.6 | 3.3 | 4.0 | 4.9 | 5.8 | 6.8 | 7.9 | 9.1 | 10.3 | 11.7 | | | |
| | | | C | 324.8 | 216.6 | 162.5 | 130.0 | 108.3 | 92.9 | 81.2 | 72.2 | 65.0 | 59.1 | 54.2 | 50.0 | 46.4 | 43.3 | 40.6 | 38.3 | | | 7.41E+6 |
| | | | D _c | 0.1 | 0.3 | 0.5 | 0.8 | 1.2 | 1.6 | 2.1 | 2.6 | 3.2 | 3.9 | 4.7 | 5.5 | 6.3 | 7.3 | 8.3 | 9.4 | | | |
| 102 x 6 | 91.3 | 3,533.00 | U | 1,910.8 | 849.6 | 478.0 | 306.0 | 212.5 | 156.1 | 119.5 | 94.5 | 76.5 | 63.2 | 53.1 | 45.3 | 39.0 | 34.0 | 29.9 | | | 161,120 | |
| | | | D _u | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | 10.1 | | | |
| | | | C | 291.4 | 194.3 | 145.7 | 116.6 | 97.2 | 83.3 | 72.9 | 64.8 | 58.3 | 53.0 | 48.6 | 44.9 | 41.7 | 38.9 | 36.5 | 34.2 | | | 7.67E+6 |
| | | | D _c | 0.1 | 0.3 | 0.4 | 0.7 | 1.0 | 1.4 | 1.8 | 2.3 | 2.8 | 3.4 | 4.0 | 4.7 | 5.5 | 6.3 | 7.2 | 8.1 | | | |
| 102 x 10 | 135.3 | 3,900.00 | U | 2,836.3 | 1,261.1 | 709.5 | 454.2 | 315.4 | 231.8 | 177.4 | 140.2 | 113.6 | 93.9 | 78.9 | 67.2 | 57.9 | 50.5 | 44.4 | | | 239,160 | |
| | | | D _u | 0.1 | 0.3 | 0.6 | 0.9 | 1.3 | 1.7 | 2.2 | 2.8 | 3.5 | 4.2 | 5.0 | 5.9 | 6.9 | 7.9 | 9.0 | 10.1 | | | |
| | | | C | 432.5 | 288.4 | 216.3 | 173.1 | 144.2 | 123.6 | 108.2 | 96.2 | 86.6 | 78.7 | 72.1 | 66.6 | 61.8 | 57.7 | 54.1 | 50.8 | | | 11.38E+6 |
| | | | D _c | 0.1 | 0.3 | 0.4 | 0.7 | 1.0 | 1.4 | 1.8 | 2.3 | 2.8 | 3.4 | 4.0 | 4.7 | 5.5 | 6.3 | 7.2 | 8.1 | | | |

Spans and loads in red exceed a deflection of 6mm for uniform loads of 5kPa. Experience has shown that 6mm deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD METRIC

LOAD TABLES | HEAVY DUTY, IMPERIAL

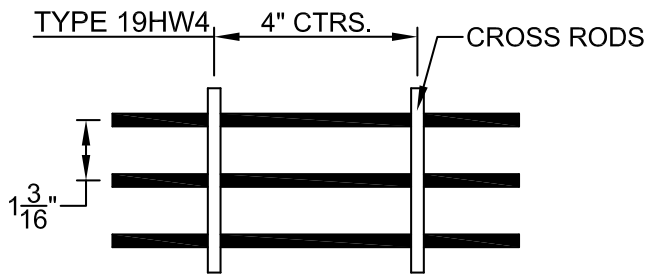
OVERVIEW

Heavy-Duty Welded Grating has the strength for heavy-duty load areas such as airfields, industrial plants, truck and bus terminals, parking lots and railroad yards. Common uses are flooring, driveways, subway and tunnel ventilation grilles, curb inlet grates, ramps, docks, etc.

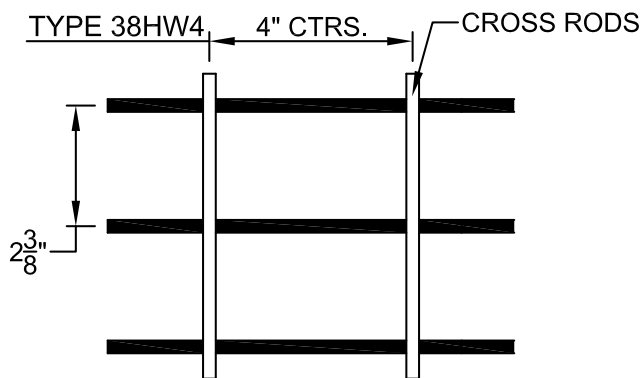
It is a sturdy grating to carry loads and maintain the same level over many years of use. Whenever rolling wheel loads are to be used over the grating, we recommend that the grating be load banded to add lateral strength. Serrations are available on bars up to $\frac{3}{8}$ " thick to provide additional traction for rolling loads.

Standard heavy-duty bar grating is resistance-welded for durability, strength and safety using an automated electric/hydraulic welding process. High temperatures, combined with high pressure fuse the bearing bars and cross bars together to form a permanent joint.

Heavy-Duty



Wide Mesh



Panel widths shown are out-to-out of bearing bars

| Bars | HEAVY DUTY 19 SPACE ($1\frac{3}{16}$ " ctrs) | | WIDE MESH 38 SPACE ($2\frac{3}{8}$ " ctrs) | |
|------|---|----------|---|--------|
| | 1/4" | 3/8" | 1/4" | 3/8" |
| 2 | 1 7/16 | 1 9/16 | 2 5/8 | 2 3/4 |
| 3 | 2 5/8 | 2 3/4 | 5 | 5 1/8 |
| 4 | 3 13/16 | 3 15/16 | 7 3/8 | 7 1/2 |
| 5 | 5 | 5 1/8 | 9 3/4 | 9 7/8 |
| 6 | 6 3/16 | 6 5/16 | 12 1/8 | 12 1/4 |
| 7 | 7 3/8 | 7 1/2 | 14 1/2 | 14 5/8 |
| 8 | 8 9/16 | 8 11/16 | 16 7/8 | 17 |
| 9 | 9 3/4 | 9 7/8 | 19 1/4 | 19 3/8 |
| 10 | 10 15/16 | 11 1/16 | 21 5/8 | 21 3/4 |
| 11 | 12 1/8 | 12 1/4 | 24 | 24 1/8 |
| 12 | 13 5/16 | 13 7/16 | 26 3/8 | |
| 13 | 14 1/2 | 14 5/8 | 28 3/4 | |
| 14 | 15 11/16 | 15 13/16 | 31 1/8 | |
| 15 | 16 7/8 | 17 | 33 1/2 | |
| 16 | 18 1/16 | 18 3/16 | 35 7/8 | |
| 17 | 19 1/4 | 19 3/8 | | |
| 18 | 20 7/16 | 20 9/16 | | |
| 19 | 21 5/8 | 21 3/4 | | |
| 20 | 22 13/16 | 22 15/16 | | |
| 21 | 24 | 24 1/8 | | |
| 22 | 25 3/16 | | | |
| 23 | 26 3/8 | | | |
| 24 | 27 9/16 | | | |
| 25 | 28 3/4 | | | |
| 26 | 29 15/16 | | | |
| 27 | 31 1/8 | | | |
| 28 | 32 5/16 | | | |
| 29 | 33 1/2 | | | |
| 30 | 34 11/16 | | | |
| 31 | 35 7/8 | | | |

DESIGN CRITERIA

The load and deflection tables on the following pages have been prepared to provide the designer with a convenient reference for the load carrying capabilities of typical heavy duty grating.

Static Loads

Uniform loads and concentrated loads per foot of

grating width are given on six inch increments for simple spans ranging from one foot to eight feet. Metric tables provide loads per meter of grating width in 152.4 millimeters increments for spans from 304.8 millimeters to 2438.4 millimeters. The values in these load tables are based on allowable stresses for static loads.

| | |
|---|--|
| Determine M: | $M = \frac{FS}{12}$ |
| Substituting for M, solve for L: | (i) $a > L$ (ii) $a > L$ $M = \frac{PL^2}{8ab}$ $M = \frac{P(.25L - .125a)}{b}$ |
| Check D*: | $D = \frac{P_1[(2L^3) - (a^2L) + (a^3/4)]}{96EI}$ |

*Deflection should be limited to 1/400 span.

M = Bending Moment

S = Section Modulus - in³/ft of grating width

I = Moment of Inertia - in⁴/ft of grating width

E = Modulus of Elasticity

F = Allowable Bending Stress

L = Simple Clear Span - inches

D = Deflection - inches

a = Partial Load Contact Parallel to Span - inches

s = Center-to-Center Spacing Between Bars - inches

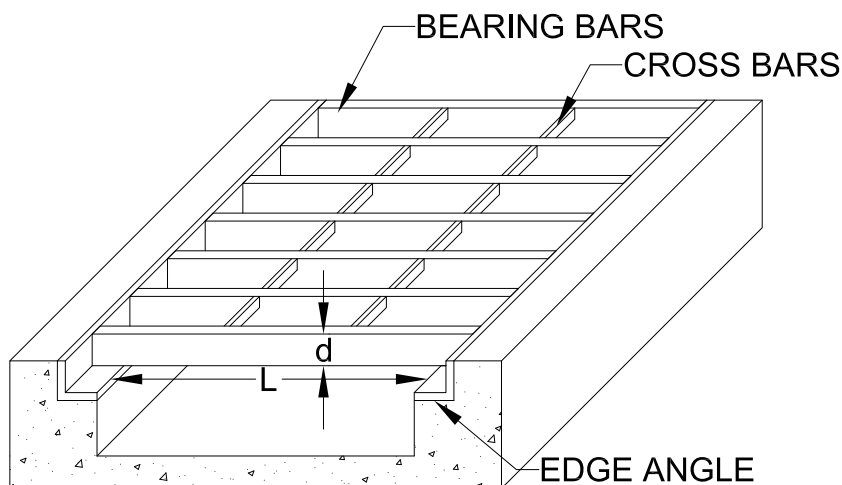
b = Partial Load Contact Dimension at 90° to span - inches

b = a + (2s)

P = Total Wheel of Partial Load Including Impact - lbs.

P₁ = P per bearing bar

P₁ = P x (s/b)











LOAD TABLES | HEAVY DUTY, IMPERIAL

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:

1. For continuous spans, use continuity factor = .80.
2. This distribution results in larger grating sizes for lighter trucks on shorter spans.
3. 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.
4. Wheeled vehicles with urethane tires should NEVER be used in conjunction with open grid bar grating.
5. HS20 is the same as H20 and HS15 is the same as H15. The "S" stands for semi-trailer.
6. 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

19HW4

| 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* |

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

Note: All loads based on Smooth surface

38HW4

| 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* |

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



LOAD TABLES | HEAVY DUTY, IMPERIAL

VEHICULAR LOADS

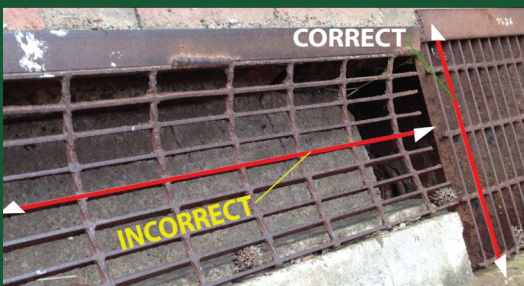
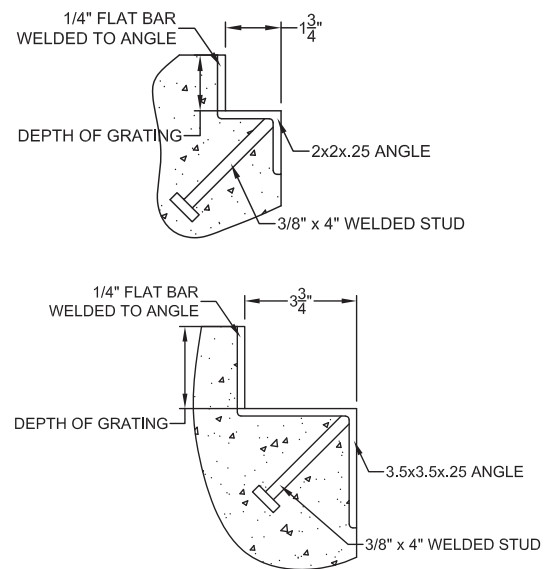
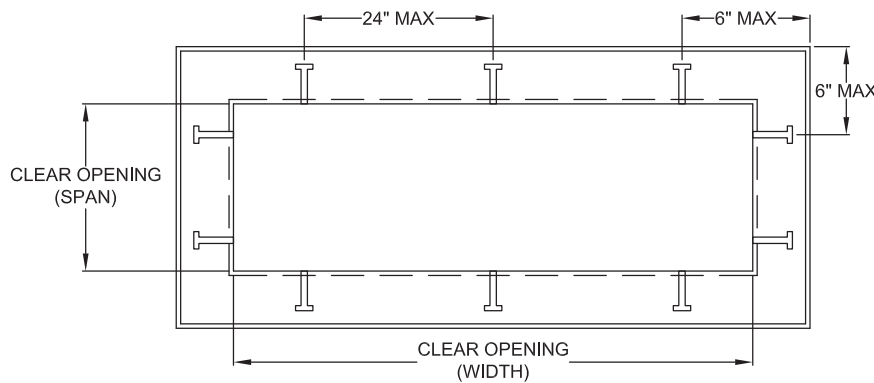
Grating Frames

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.

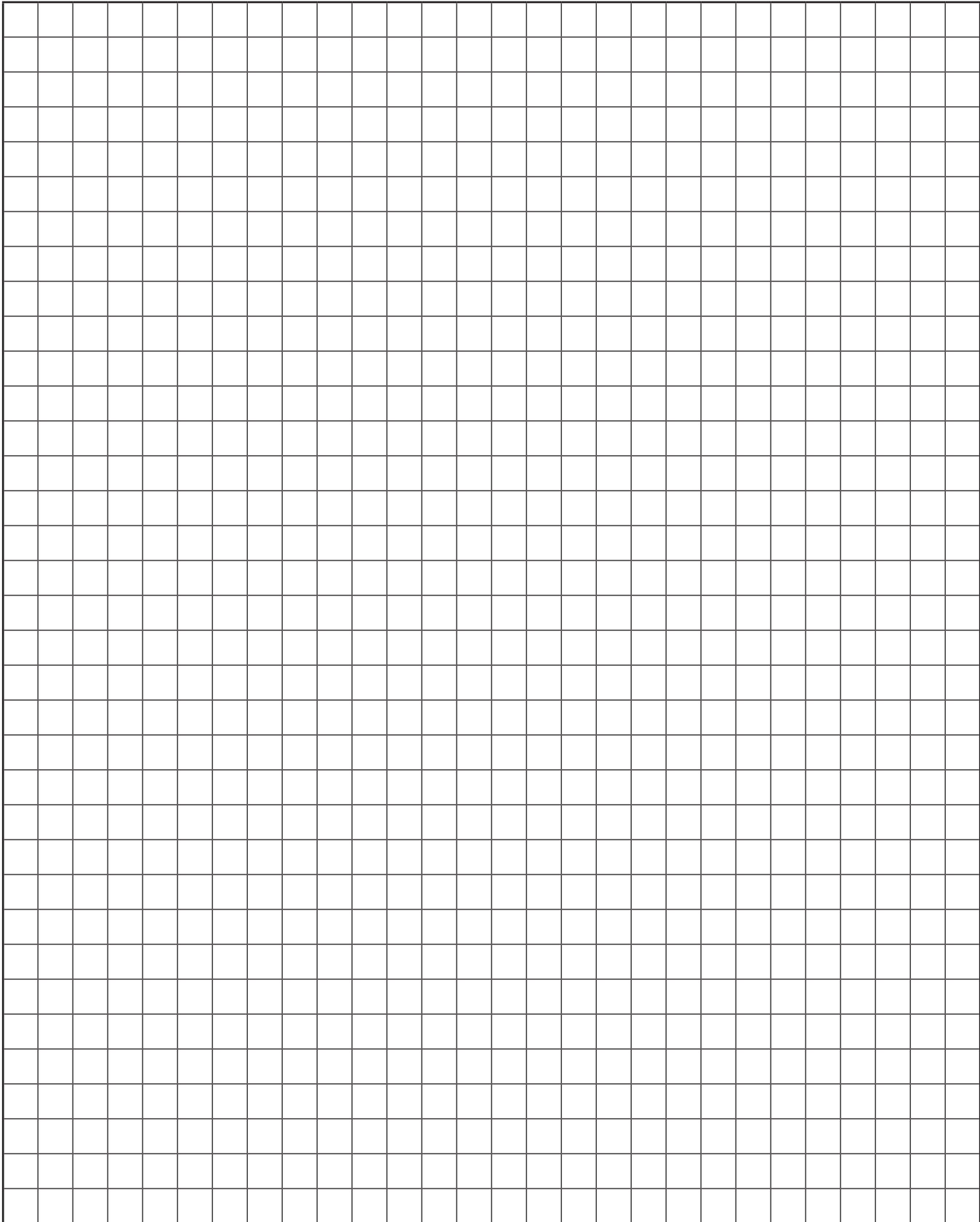
Frames are available in normal rectangular configurations only and will be supplied as a fully-assembled, four-sided unit in sizes up to those that can safely be transported via normal flatbed carriers. Sizes or configurations other than this should be discussed with Vulcraft. Embed frames can be supplied 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.



Cross Bars are not load bearing

The bearing bars are the bars that carry the load and the cross bars hold the bearing bars in place creating the shape of the panel. In order to function properly, make sure that both ends of each bearing bar is supported by the load bearing structure and avoid the situation depicted in the picture to the left.

NOTES

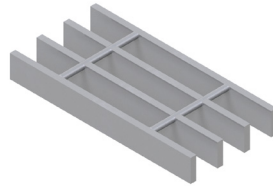


LOAD TABLES - HD IMPERIAL

LOAD TABLES | HEAVY DUTY, IMPERIAL

LOAD TABLES - HD

Grating Type: **19HW4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36**
 Surface: **Smooth**



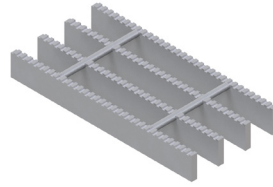
U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 20 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | | | | | Section Properties | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------------------|--------------------------------------|--------|
| | | | | 1' - 0" | 1' - 6" | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³ /ft) | I _x (in ⁴ /ft) | |
| | | | | | | | | | | | | | | | | | | | | | |
| 1" x 1/4" | 9.53 | 61 | U | 5,614 | 2,495 | 1,404 | 898 | 624 | 458 | 351 | 277 | 225 | 186 | | | | | | | 0.421 | |
| | | | D _u | 0.02 | 0.05 | 0.08 | 0.13 | 0.19 | 0.25 | 0.33 | 0.42 | 0.52 | 0.63 | | | | | | | 0.211 | |
| | | | C | 2,807 | 1,871 | 1,404 | 1,123 | 936 | 802 | 702 | 624 | 561 | 510 | | | | | | | | |
| | | | D _c | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | | | | | | | | |
| 1 1/4" x 1/4" | 11.72 | 72 | U | 8,772 | 3,899 | 2,193 | 1,404 | 975 | 716 | 548 | 433 | 351 | 290 | 244 | | | | | | | 0.658 |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | 0.60 | | | | | | | 0.411 |
| | | | C | 4,386 | 2,924 | 2,193 | 1,754 | 1,462 | 1,253 | 1,096 | 975 | 877 | 797 | 731 | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | 0.48 | | | | | | | |
| 1 1/2" x 1/4" | 13.92 | 83 | U | 12,632 | 5,614 | 3,158 | 2,021 | 1,404 | 1,031 | 789 | 624 | 505 | 418 | 351 | 299 | 258 | | | | 0.947 | |
| | | | D _u | 0.01 | 0.03 | 0.06 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.42 | 0.50 | 0.58 | 0.68 | 0.68 | 0.71 | 0.711 | | |
| | | | C | 6,316 | 4,211 | 3,158 | 2,526 | 2,105 | 1,805 | 1,579 | 1,404 | 1,263 | 1,148 | 1,053 | 972 | 902 | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.07 | 0.10 | 0.14 | 0.18 | 0.22 | 0.28 | 0.33 | 0.40 | 0.47 | 0.54 | | | | | |
| 1 1/2" x 3/8" | 20.78 | 92 | U | 18,947 | 8,421 | 4,737 | 3,032 | 2,105 | 1,547 | 1,184 | 936 | 758 | 626 | 526 | 448 | 387 | 337 | 296 | | | 1.421 |
| | | | D _u | 0.01 | 0.03 | 0.06 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.42 | 0.50 | 0.58 | 0.68 | 0.78 | 0.88 | | | 1.066 |
| | | | C | 9,474 | 6,316 | 4,737 | 3,789 | 3,158 | 2,707 | 2,368 | 2,105 | 1,895 | 1,722 | 1,579 | 1,457 | 1,353 | 1,263 | 1,184 | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.07 | 0.10 | 0.14 | 0.18 | 0.22 | 0.28 | 0.33 | 0.40 | 0.47 | 0.54 | 0.62 | 0.71 | 0.71 | | |
| 2" x 1/4" | 18.31 | 103 | U | 22,456 | 9,981 | 5,614 | 3,593 | 2,495 | 1,833 | 1,404 | 1,109 | 898 | 742 | 624 | 532 | 458 | 399 | 351 | | | 1.684 |
| | | | D _u | 0.01 | 0.02 | 0.04 | 0.06 | 0.09 | 0.13 | 0.17 | 0.21 | 0.26 | 0.31 | 0.37 | 0.44 | 0.51 | 0.58 | 0.66 | | | 1.684 |
| | | | C | 11,228 | 7,485 | 5,614 | 4,491 | 3,743 | 3,208 | 2,807 | 2,495 | 2,246 | 2,041 | 1,871 | 1,727 | 1,604 | 1,497 | 1,404 | | | |
| | | | D _c | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.26 | 0.31 | 0.37 | 0.44 | 0.51 | 0.58 | 0.66 | | |
| 2 1/2" x 1/4" | 22.70 | 122 | U | 35,088 | 15,595 | 8,772 | 5,614 | 3,899 | 2,864 | 2,193 | 1,733 | 1,404 | 1,160 | 975 | 830 | 716 | 624 | 548 | | | 2.632 |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | | | 3.289 |
| | | | C | 17,544 | 11,696 | 8,772 | 7,018 | 5,848 | 5,013 | 4,386 | 3,899 | 3,509 | 3,190 | 2,924 | 2,699 | 2,506 | 2,339 | 2,193 | | | |
| | | | D _c | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.13 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.37 | 0.42 | | | |
| 3" x 1/4" | 27.10 | 140 | U | 50,526 | 22,456 | 12,632 | 8,084 | 5,614 | 4,125 | 3,158 | 2,495 | 2,021 | 1,670 | 1,404 | 1,196 | 1,031 | 898 | 789 | | | 3.789 |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.34 | 0.39 | 0.44 | | | 5.684 |
| | | | C | 25,263 | 16,842 | 12,632 | 10,105 | 8,421 | 7,218 | 6,316 | 5,614 | 5,053 | 4,593 | 4,211 | 3,887 | 3,609 | 3,368 | 3,158 | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | |
| 3" x 3/8" | 40.99 | 154 | U | 75,789 | 33,684 | 18,947 | 12,126 | 8,421 | 6,187 | 4,737 | 3,743 | 3,032 | 2,505 | 2,105 | 1,794 | 1,547 | 1,347 | 1,184 | | | 5.684 |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.34 | 0.39 | 0.44 | | | 8.526 |
| | | | C | 37,895 | 25,263 | 18,947 | 15,158 | 12,632 | 10,827 | 9,474 | 8,421 | 7,579 | 6,890 | 6,316 | 5,830 | 5,414 | 5,053 | 4,737 | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | |
| 3 1/2" x 1/4" | 31.49 | 157 | U | 68,772 | 30,565 | 17,193 | 11,004 | 7,641 | 5,614 | 4,298 | 3,396 | 2,751 | 2,273 | 1,910 | 1,628 | 1,404 | 1,223 | 1,075 | | | 5.158 |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.33 | 0.38 | | | 9.026 |
| | | | C | 34,386 | 22,924 | 17,193 | 13,754 | 11,462 | 9,825 | 8,596 | 7,641 | 6,877 | 6,252 | 5,731 | 5,290 | 4,912 | 4,585 | 4,298 | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.30 | | | |
| 3 1/2" x 3/8" | 47.57 | 173 | U | 103,158 | 45,848 | 25,789 | 16,505 | 11,462 | 8,421 | 6,447 | 5,094 | 4,126 | 3,410 | 2,865 | 2,442 | 2,105 | 1,834 | 1,612 | | | 7.737 |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.33 | 0.38 | | | 13.539 |
| | | | C | 51,579 | 34,386 | 25,789 | 20,632 | 17,193 | 14,737 | 12,895 | 11,462 | 10,316 | 9,378 | 8,596 | 7,935 | 7,368 | 6,877 | 6,447 | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.30 | | | |
| 4" x 1/4" | 35.88 | 173 | U | 89,825 | 39,922 | 22,456 | 14,372 | 9,981 | 7,333 | 5,614 | 4,436 | 3,593 | 2,969 | 2,495 | 2,126 | 1,833 | 1,597 | 1,404 | | | 6.737 |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.33 | | | 13.474 |
| | | | C | 44,912 | 29,942 | 22,456 | 17,965 | 14,971 | 12,832 | 11,228 | 9,981 | 8,982 | 8,166 | 7,485 | 6,910 | 6,416 | 5,988 | 5,614 | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.13 | 0.15 | 0.17 | 0.20 | 0.23 | 0.26 | | | |
| 4" x 3/8" | 54.16 | 192 | U | 134,737 | 59,883 | 33,684 | 21,558 | 14,971 | 10,999 | 8,421 | 6,654 | 5,389 | 4,454 | 3,743 | 3,189 | 2,750 | 2,395 | 2,105 | | | 10.105 |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.33 | | | 20.211 |
| | | | C | 67,368 | 44,912 | 33,684 | 26,947 | 22,456 | 19,248 | 16,842 | 14,971 | 13,474 | 12,249 | 11,228 | 10,364 | 9,624 | 8,982 | 8,421 | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.13 | 0.15 | 0.17 | 0.20 | 0.23 | 0.26 | | | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD

Grating Type: **19HW4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36**
 Surface: **Serrated**



U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 20 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------------------|--------------------------------------|-------|--------|--|
| | | | | 1' - 0" | 1' - 6" | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³ /ft) | I _x (in ⁴ /ft) | | | |
| | | | | 1" x 1/4" | 9.53 | 49 | U | 3,158 | 1,404 | 789 | 505 | 351 | 258 | 197 | 156 | | | | | | | | |
| D _u | 0.03 | 0.06 | 0.11 | | | | 0.17 | 0.25 | 0.34 | 0.44 | 0.56 | | | | | | | | | | | 0.089 | |
| C | 1,579 | 1,053 | 789 | | | | 632 | 526 | 451 | 395 | 351 | | | | | | | | | | | | |
| D _c | 0.02 | 0.05 | 0.09 | | | | 0.14 | 0.20 | 0.27 | 0.35 | 0.45 | | | | | | | | | | | | |
| 1 1/4" x 1/4" | 11.72 | 61 | U | 5,614 | 2,495 | 1,404 | 898 | 624 | 458 | 351 | 277 | 225 | 186 | | | | | | | | 0.421 | | |
| | | | D _u | 0.02 | 0.05 | 0.08 | 0.13 | 0.19 | 0.25 | 0.33 | 0.42 | 0.52 | 0.63 | | | | | | | | | 0.211 | |
| | | | C | 2,807 | 1,871 | 1,404 | 1,123 | 936 | 802 | 702 | 624 | 561 | 510 | | | | | | | | | | |
| | | | D _c | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | | | | | | | | | | |
| 1 1/2" x 1/4" | 13.92 | 72 | U | 8,772 | 3,899 | 2,193 | 1,404 | 975 | 716 | 548 | 433 | 351 | 290 | 244 | | | | | | | 0.658 | | |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | 0.60 | | | | | | | | 0.411 | |
| | | | C | 4,386 | 2,924 | 2,193 | 1,754 | 1,462 | 1,253 | 1,096 | 975 | 877 | 797 | 731 | | | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | 0.48 | | | | | | | | | |
| 1 1/2" x 3/8" | 20.78 | 80 | U | 13,158 | 5,848 | 3,289 | 2,105 | 1,462 | 1,074 | 822 | 650 | 526 | 435 | 365 | 311 | 269 | | | | | 0.987 | | |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | 0.60 | 0.70 | 0.81 | | | | | | 0.617 | |
| | | | C | 6,579 | 4,386 | 3,289 | 2,632 | 2,193 | 1,880 | 1,645 | 1,462 | 1,316 | 1,196 | 1,096 | 1,012 | 940 | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | 0.48 | 0.56 | 0.65 | | | | | | | |
| 2" x 1/4" | 18.31 | 93 | U | 17,193 | 7,641 | 4,298 | 2,751 | 1,910 | 1,404 | 1,075 | 849 | 688 | 568 | 478 | 407 | 351 | 306 | 269 | | | 1.289 | | |
| | | | D _u | 0.01 | 0.03 | 0.05 | 0.07 | 0.11 | 0.14 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.50 | 0.58 | 0.67 | 0.76 | | | | 1.128 | |
| | | | C | 8,596 | 5,731 | 4,298 | 3,439 | 2,865 | 2,456 | 2,149 | 1,910 | 1,719 | 1,563 | 1,433 | 1,323 | 1,228 | 1,146 | 1,075 | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.34 | 0.40 | 0.46 | 0.53 | 0.61 | | | | | |
| 2 1/2" x 1/4" | 22.70 | 113 | U | 28,421 | 12,632 | 7,105 | 4,547 | 3,158 | 2,320 | 1,776 | 1,404 | 1,137 | 940 | 789 | 673 | 580 | 505 | 444 | | | 2.132 | | |
| | | | D _u | 0.01 | 0.02 | 0.04 | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.33 | 0.39 | 0.45 | 0.52 | 0.59 | | | | 2.398 | |
| | | | C | 14,211 | 9,474 | 7,105 | 5,684 | 4,737 | 4,060 | 3,553 | 3,158 | 2,842 | 2,584 | 2,368 | 2,186 | 2,030 | 1,895 | 1,776 | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.31 | 0.36 | 0.41 | 0.47 | | | | | |
| 3" x 1/4" | 27.10 | 131 | U | 42,456 | 18,869 | 10,614 | 6,793 | 4,717 | 3,466 | 2,654 | 2,097 | 1,698 | 1,404 | 1,179 | 1,005 | 866 | 755 | 663 | | | 3.184 | | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | | | | 4.378 | |
| | | | C | 21,228 | 14,152 | 10,614 | 8,491 | 7,076 | 6,065 | 5,307 | 4,717 | 4,246 | 3,860 | 3,538 | 3,266 | 3,033 | 2,830 | 2,654 | | | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.34 | 0.39 | | | | | |
| 3" x 3/8" | 40.99 | 145 | U | 63,684 | 28,304 | 15,921 | 10,189 | 7,076 | 5,199 | 3,980 | 3,145 | 2,547 | 2,105 | 1,769 | 1,507 | 1,300 | 1,132 | 995 | | | 4.776 | | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | | | | 6.567 | |
| | | | C | 31,842 | 21,228 | 15,921 | 12,737 | 10,614 | 9,098 | 7,961 | 7,076 | 6,368 | 5,789 | 5,307 | 4,899 | 4,549 | 4,246 | 3,980 | | | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.34 | 0.39 | | | | | |
| 3 1/2" x 1/4" | 31.49 | 148 | U | 59,298 | 26,355 | 14,825 | 9,488 | 6,589 | 4,841 | 3,706 | 2,928 | 2,372 | 1,960 | 1,647 | 1,404 | 1,210 | 1,054 | 927 | | | 4.447 | | |
| | | | D _u | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.41 | | | | 7.227 | |
| | | | C | 29,649 | 19,766 | 14,825 | 11,860 | 9,883 | 8,471 | 7,412 | 6,589 | 5,930 | 5,391 | 4,942 | 4,561 | 4,236 | 3,953 | 3,706 | | | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.33 | | | | | |
| 3 1/2" x 3/8" | 47.57 | 164 | U | 88,947 | 39,532 | 22,237 | 14,232 | 9,883 | 7,261 | 5,559 | 4,392 | 3,558 | 2,940 | 2,471 | 2,105 | 1,815 | 1,581 | 1,390 | | | 6.671 | | |
| | | | D _u | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.41 | | | | 10.840 | |
| | | | C | 44,474 | 29,649 | 22,237 | 17,789 | 14,825 | 12,707 | 11,118 | 9,883 | 8,895 | 8,086 | 7,412 | 6,842 | 6,353 | 5,930 | 5,559 | | | | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.33 | | | | | |
| 4" x 1/4" | 35.88 | 165 | U | 78,947 | 35,088 | 19,737 | 12,632 | 8,772 | 6,445 | 4,934 | 3,899 | 3,158 | 2,610 | 2,193 | 1,869 | 1,611 | 1,404 | 1,234 | | | 5.921 | | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | | 11.102 | |
| | | | C | 39,474 | 26,316 | 19,737 | 15,789 | 13,158 | 11,278 | 9,868 | 8,772 | 7,895 | 7,177 | 6,579 | 6,073 | 5,639 | 5,263 | 4,934 | | | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.28 | | | | | |
| 4" x 3/8" | 54.16 | 183 | U | 118,421 | 52,632 | 29,605 | 18,947 | 13,158 | 9,667 | 7,401 | 5,848 | 4,737 | 3,915 | 3,289 | 2,803 | 2,417 | 2,105 | 1,850 | | | 8.882 | | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | | 16.653 | |
| | | | C | 59,211 | 39,474 | 29,605 | 23,684 | 19,737 | 16,917 | 14,803 | 13,158 | 11,842 | 10,766 | 9,868 | 9,109 | 8,459 | 7,895 | 7,401 | | | | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.28 | | | | | |

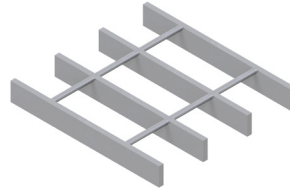
Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD IMPERIAL

LOAD TABLES | HEAVY DUTY, IMPERIAL

LOAD TABLES - WIDE MESH

Grating Type: **38HW4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36**
 Surface: **Smooth**



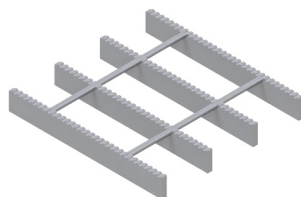
U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 20 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft - in) | | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|---------|--------------------------------------|--------------------------------------|
| | | | | 1' - 0" | 1' - 6" | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³ /ft) | I _x (in ⁴ /ft) |
| 1" x 1/4" | 5.55 | 51 | U | 2,807 | 1,248 | 702 | 449 | 312 | 229 | 175 | 139 | | | | | | | | 0.211 | |
| | | | D _u | 0.02 | 0.05 | 0.08 | 0.13 | 0.19 | 0.25 | 0.33 | 0.42 | | | | | | | | | |
| | | | C | 1,404 | 936 | 702 | 561 | 468 | 401 | 351 | 312 | | | | | | | | | |
| | | | D _c | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | | | | | | | | | 0.105 |
| 1 1/4" x 1/4" | 6.68 | 61 | U | 4,386 | 1,949 | 1,096 | 702 | 487 | 358 | 274 | 217 | 175 | 145 | | | | | | 0.329 | |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | | | | | | | |
| | | | C | 2,193 | 1,462 | 1,096 | 877 | 731 | 627 | 548 | 487 | 439 | 399 | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | | | | | | | 0.206 |
| 1 1/2" x 1/4" | 7.82 | 70 | U | 6,316 | 2,807 | 1,579 | 1,011 | 702 | 516 | 395 | 312 | 253 | 209 | 175 | | | | | 0.474 | |
| | | | D _u | 0.01 | 0.03 | 0.06 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.42 | 0.50 | | | | | | |
| | | | C | 3,158 | 2,105 | 1,579 | 1,263 | 1,053 | 902 | 789 | 702 | 632 | 574 | 526 | | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.07 | 0.10 | 0.14 | 0.18 | 0.22 | 0.28 | 0.33 | 0.40 | | | | | | 0.355 |
| 1 1/2" x 3/8" | 11.22 | 77 | U | 9,474 | 4,211 | 2,368 | 1,516 | 1,053 | 773 | 592 | 468 | 379 | 313 | 263 | 224 | | | | 0.711 | |
| | | | D _u | 0.01 | 0.03 | 0.06 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.42 | 0.50 | 0.58 | | | | | |
| | | | C | 4,737 | 3,158 | 2,368 | 1,895 | 1,579 | 1,353 | 1,184 | 1,053 | 947 | 861 | 789 | 729 | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.07 | 0.10 | 0.14 | 0.18 | 0.22 | 0.28 | 0.33 | 0.40 | 0.47 | | | | | 0.533 |
| 2" x 1/4" | 10.08 | 87 | U | 11,228 | 4,990 | 2,807 | 1,796 | 1,248 | 917 | 702 | 554 | 449 | 371 | 312 | 266 | 229 | 200 | | 0.842 | |
| | | | D _u | 0.01 | 0.02 | 0.04 | 0.06 | 0.09 | 0.13 | 0.17 | 0.21 | 0.26 | 0.31 | 0.37 | 0.44 | 0.51 | 0.58 | | | |
| | | | C | 5,614 | 3,743 | 2,807 | 2,246 | 1,871 | 1,604 | 1,404 | 1,248 | 1,123 | 1,021 | 936 | 864 | 802 | 749 | | | |
| | | | D _c | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.47 | | 0.842 |
| 2 1/2" x 1/4" | 12.35 | 102 | U | 17,544 | 7,797 | 4,386 | 2,807 | 1,949 | 1,432 | 1,096 | 866 | 702 | 580 | 487 | 415 | 358 | 312 | 274 | 1.316 | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | | |
| | | | C | 8,772 | 5,848 | 4,386 | 3,509 | 2,924 | 2,506 | 2,193 | 1,949 | 1,754 | 1,595 | 1,462 | 1,350 | 1,253 | 1,170 | 1,096 | | |
| | | | D _c | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.13 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.37 | 0.42 | | 1.645 |
| 3" x 1/4" | 14.62 | 117 | U | 25,263 | 11,228 | 6,316 | 4,042 | 2,807 | 2,062 | 1,579 | 1,248 | 1,011 | 835 | 702 | 598 | 516 | 449 | 395 | 1.895 | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.34 | 0.39 | 0.44 | | |
| | | | C | 12,632 | 8,421 | 6,316 | 5,053 | 4,211 | 3,609 | 3,158 | 2,807 | 2,526 | 2,297 | 2,105 | 1,943 | 1,805 | 1,684 | 1,579 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | 2.842 |
| 3" x 3/8" | 21.86 | 130 | U | 37,895 | 16,842 | 9,474 | 6,063 | 4,211 | 3,093 | 2,368 | 1,871 | 1,516 | 1,253 | 1,053 | 897 | 773 | 674 | 592 | 2.842 | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.11 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.34 | 0.39 | 0.44 | | |
| | | | C | 18,947 | 12,632 | 9,474 | 7,579 | 6,316 | 5,414 | 4,737 | 4,211 | 3,789 | 3,445 | 3,158 | 2,915 | 2,707 | 2,526 | 2,368 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | 4.263 |
| 3 1/2" x 1/4" | 16.88 | 132 | U | 34,386 | 15,283 | 8,596 | 5,502 | 3,821 | 2,807 | 2,149 | 1,698 | 1,375 | 1,137 | 955 | 814 | 702 | 611 | 537 | 2.579 | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.33 | 0.38 | | |
| | | | C | 17,193 | 11,462 | 8,596 | 6,877 | 5,731 | 4,912 | 4,298 | 3,821 | 3,439 | 3,126 | 2,865 | 2,645 | 2,456 | 2,292 | 2,149 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.30 | | 4.513 |
| 3 1/2" x 3/8" | 25.26 | 146 | U | 51,579 | 22,924 | 12,895 | 8,253 | 5,731 | 4,211 | 3,224 | 2,547 | 2,063 | 1,705 | 1,433 | 1,221 | 1,053 | 917 | 806 | 3.868 | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.25 | 0.29 | 0.33 | 0.38 | | |
| | | | C | 25,789 | 17,193 | 12,895 | 10,316 | 8,596 | 7,368 | 6,447 | 5,731 | 5,158 | 4,689 | 4,298 | 3,968 | 3,684 | 3,439 | 3,224 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.30 | | 6.770 |
| 4" x 1/4" | 19.15 | 146 | U | 44,912 | 19,961 | 11,228 | 7,186 | 4,990 | 3,666 | 2,807 | 2,218 | 1,796 | 1,485 | 1,248 | 1,063 | 917 | 798 | 702 | 3.368 | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.33 | | |
| | | | C | 22,456 | 14,971 | 11,228 | 8,982 | 7,485 | 6,416 | 5,614 | 4,990 | 4,491 | 4,083 | 3,743 | 3,455 | 3,208 | 2,994 | 2,807 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.13 | 0.15 | 0.17 | 0.20 | 0.23 | 0.26 | | 6.737 |
| 4" x 3/8" | 28.66 | 161 | U | 67,368 | 29,942 | 16,842 | 10,779 | 7,485 | 5,499 | 4,211 | 3,327 | 2,695 | 2,227 | 1,871 | 1,595 | 1,375 | 1,198 | 1,053 | 5.053 | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.33 | | |
| | | | C | 33,684 | 22,456 | 16,842 | 13,474 | 11,228 | 9,624 | 8,421 | 7,485 | 6,737 | 6,124 | 5,614 | 5,182 | 4,812 | 4,491 | 4,211 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.13 | 0.15 | 0.17 | 0.20 | 0.23 | 0.26 | | 10.105 |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - WIDE MESH

Grating Type: **38HW4**
 Design Code: **NAAMM MBG 534**
 Material: **ASTM A36**
 Surface: **Serrated**



U = Safe Uniform Load (lbs/ft²)
 D_u = Deflection Due to Safe Uniform Load (in)
 C = Safe Concentrated Load (lbs/ft of grating width)
 D_c = Deflection Due to Safe Concentrated Load (in)
 Allowable Extreme Fiber Stress = 20 ksi

| Bearing Bar Size (inches) | Approx. Weight (lbs/ft ²) | Ped. Span (inches) | Load / Deflection | Span (ft -in) | | | | | | | | | | | | | | Section Properties | | | |
|---------------------------|---------------------------------------|--------------------|-------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------|--------------------------------------|--------------------------------------|-------|
| | | | | 1' - 0" | 1' - 6" | 2' - 0" | 2' - 6" | 3' - 0" | 3' - 6" | 4' - 0" | 4' - 6" | 5' - 0" | 5' - 6" | 6' - 0" | 6' - 6" | 7' - 0" | 7' - 6" | 8' - 0" | S _x (in ³ /ft) | I _x (in ⁴ /ft) | |
| 1" x 1/4" | 5.55 | 42 | U | 1,579 | 702 | 395 | 253 | 175 | 129 | | | | | | | | | | | 0.118 | |
| | | | D _u | 0.03 | 0.06 | 0.11 | 0.17 | 0.25 | 0.34 | | | | | | | | | | | | |
| | | | C | 789 | 526 | 395 | 316 | 263 | 226 | | | | | | | | | | | | |
| | | | D _c | 0.02 | 0.05 | 0.09 | 0.14 | 0.20 | 0.27 | | | | | | | | | | | | 0.044 |
| 1 1/4" x 1/4" | 6.68 | 51 | U | 2,807 | 1,248 | 702 | 449 | 312 | 229 | 175 | 139 | | | | | | | 0.211 | | | |
| | | | D _u | 0.02 | 0.05 | 0.08 | 0.13 | 0.19 | 0.25 | 0.33 | 0.42 | | | | | | | | | | |
| | | | C | 1,404 | 936 | 702 | 561 | 468 | 401 | 351 | 312 | | | | | | | | | | |
| | | | D _c | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | | | | | | | | 0.105 | | |
| 1 1/2" x 1/4" | 7.82 | 61 | U | 4,386 | 1,949 | 1,096 | 702 | 487 | 358 | 274 | 217 | 175 | 145 | | | | | 0.329 | | | |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | | | | | | | | |
| | | | C | 2,193 | 1,462 | 1,096 | 877 | 731 | 627 | 548 | 487 | 439 | 399 | | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | | | | | | 0.206 | | |
| 1 1/2" x 3/8" | 11.22 | 67 | U | 6,579 | 2,924 | 1,645 | 1,053 | 731 | 537 | 411 | 325 | 263 | 217 | 183 | | | | | 0.493 | | |
| | | | D _u | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.34 | 0.41 | 0.50 | 0.60 | | | | | | | |
| | | | C | 3,289 | 2,193 | 1,645 | 1,316 | 1,096 | 940 | 822 | 731 | 658 | 598 | 548 | | | | | | | |
| | | | D _c | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.16 | 0.21 | 0.27 | 0.33 | 0.40 | 0.48 | | | | | | 0.308 | |
| 2" x 1/4" | 10.08 | 78 | U | 8,596 | 3,821 | 2,149 | 1,375 | 955 | 702 | 537 | 425 | 344 | 284 | 239 | 203 | | | | 0.645 | | |
| | | | D _u | 0.01 | 0.03 | 0.05 | 0.07 | 0.11 | 0.14 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.50 | | | | | | |
| | | | C | 4,298 | 2,865 | 2,149 | 1,719 | 1,433 | 1,228 | 1,075 | 955 | 860 | 781 | 716 | 661 | | | | | | |
| | | | D _c | 0.01 | 0.02 | 0.04 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.34 | 0.40 | | | | | 0.564 | |
| 2 1/2" x 1/4" | 12.35 | 95 | U | 14,211 | 6,316 | 3,553 | 2,274 | 1,579 | 1,160 | 888 | 702 | 568 | 470 | 395 | 336 | 290 | 253 | 222 | 1.066 | | |
| | | | D _u | 0.01 | 0.02 | 0.04 | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.33 | 0.39 | 0.45 | 0.52 | 0.59 | | | |
| | | | C | 7,105 | 4,737 | 3,553 | 2,842 | 2,368 | 2,030 | 1,776 | 1,579 | 1,421 | 1,292 | 1,184 | 1,093 | 1,015 | 947 | 888 | | | |
| | | | D _c | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.31 | 0.36 | 0.41 | 0.47 | | 1.199 | |
| 3" x 1/4" | 14.62 | 110 | U | 21,228 | 9,435 | 5,307 | 3,396 | 2,359 | 1,733 | 1,327 | 1,048 | 849 | 702 | 590 | 502 | 433 | 377 | 332 | 1.592 | | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | | | |
| | | | C | 10,614 | 7,076 | 5,307 | 4,246 | 3,538 | 3,033 | 2,654 | 2,359 | 2,123 | 1,930 | 1,769 | 1,633 | 1,516 | 1,415 | 1,327 | 888 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.34 | 0.39 | | 2.189 | |
| 3" x 3/8" | 21.86 | 122 | U | 31,842 | 14,152 | 7,961 | 5,095 | 3,538 | 2,599 | 1,990 | 1,572 | 1,274 | 1,053 | 885 | 754 | 650 | 566 | 498 | 2.388 | | |
| | | | D _u | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | | | |
| | | | C | 15,921 | 10,614 | 7,961 | 6,368 | 5,307 | 4,549 | 3,980 | 3,538 | 3,184 | 2,895 | 2,654 | 2,449 | 2,274 | 2,123 | 1,990 | 888 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.34 | 0.39 | | 3.284 | |
| 3 1/2" x 1/4" | 16.88 | 125 | U | 29,649 | 13,177 | 7,412 | 4,744 | 3,294 | 2,420 | 1,853 | 1,464 | 1,186 | 980 | 824 | 702 | 605 | 527 | 463 | 2.224 | | |
| | | | D _u | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.41 | | | |
| | | | C | 14,825 | 9,883 | 7,412 | 5,930 | 4,942 | 4,236 | 3,706 | 3,294 | 2,965 | 2,695 | 2,471 | 2,281 | 2,118 | 1,977 | 1,853 | 888 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.33 | | 3.613 | |
| 3 1/2" x 3/8" | 25.26 | 138 | U | 44,474 | 19,766 | 11,118 | 7,116 | 4,942 | 3,631 | 2,780 | 2,196 | 1,779 | 1,470 | 1,235 | 1,053 | 908 | 791 | 695 | 3.336 | | |
| | | | D _u | 0.01 | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.41 | | | |
| | | | C | 22,237 | 14,825 | 11,118 | 8,895 | 7,412 | 6,353 | 5,559 | 4,942 | 4,447 | 4,043 | 3,706 | 3,421 | 3,177 | 2,965 | 2,780 | 888 | | |
| | | | D _c | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.33 | | 5.420 | |
| 4" x 1/4" | 19.15 | 139 | U | 39,474 | 17,544 | 9,868 | 6,316 | 4,386 | 3,222 | 2,467 | 1,949 | 1,579 | 1,305 | 1,096 | 934 | 806 | 702 | 617 | 2.961 | | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | |
| | | | C | 19,737 | 13,158 | 9,868 | 7,895 | 6,579 | 5,639 | 4,934 | 4,386 | 3,947 | 3,589 | 3,289 | 3,036 | 2,820 | 2,632 | 2,467 | 888 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.28 | | 5.551 | |
| 4" x 3/8" | 28.66 | 154 | U | 59,211 | 26,316 | 14,803 | 9,474 | 6,579 | 4,834 | 3,701 | 2,924 | 2,368 | 1,957 | 1,645 | 1,401 | 1,208 | 1,053 | 925 | 4.441 | | |
| | | | D _u | 0.01 | 0.01 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | | | |
| | | | C | 29,605 | 19,737 | 14,803 | 11,842 | 9,868 | 8,459 | 7,401 | 6,579 | 5,921 | 5,383 | 4,934 | 4,555 | 4,229 | 3,947 | 3,701 | 888 | | |
| | | | D _c | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.28 | | 8.326 | |

Spans and loads in red exceed a deflection of 1/4" for uniform loads of 100 lbs./sq. ft. Experience has shown that 1/4" deflection is the maximum deflection to give pedestrian comfort, but can be exceeded for other types of loads at the discretion of the specifying professional.

LOAD TABLES - HD IMPERIAL

LOAD TABLES | STAIR TREADS

Welded steel stair treads are the most widely used for their strength and ease of installation and are universally used in most industrial and commercial applications. Both can be ordered with a serrated surface for additional safety.

Rectangular bar stair treads provide a high strength and stiffness-to-weight ratio and are available with a serrated surface when additional safety is required.

All stair treads are custom fabricated to meet the size, width and length specifications of a particular job. In addition, end plates can be custom fabricated to meet special bolt hole size or location requirements.

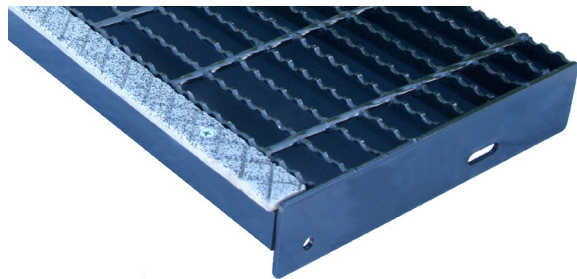
Steel nosings are available to add strength at the point of greatest impact and provide a definitive visible edge for extra safety. Choose our checkered plate nosing for normal use.



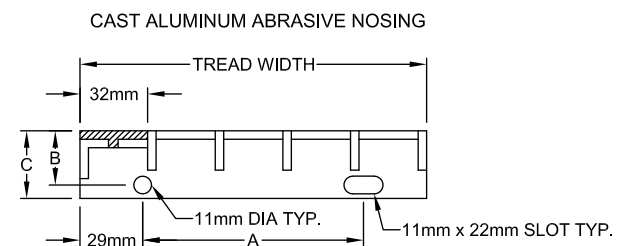
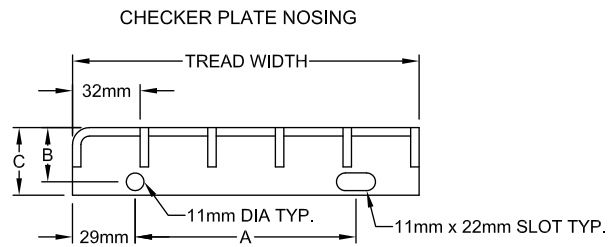
Stair Tread Types



Checker Plate Nosing (CP)



Cast Aluminum Abrasive Nosing (CAAN)



| End Plate Dimensions | | |
|----------------------|---------------|---------------|
| Grating Depth | "B" Dimension | "C" Dimension |
| up to 32m | 44mm | 64mm |
| 38mm | 57mm | 76mm |

See Tread Width and Bolt Hole Spacing for "A" Dimension

| End Plate Dimensions | | |
|----------------------|---------------|---------------|
| Grating Depth | "B" Dimension | "C" Dimension |
| up to 1-1/4" | 1-3/4" | 2-1/2" |
| 1-1/2" | 2-1/4" | 3" |

See Tread Width and Bolt Hole Spacing for "A" Dimension

Tread Width and Bolt Hole Spacing

30W102

| No. of Bearing Bars and Nosing | Bearing Bar | **Bolt Hole Spacing "A" |
|--------------------------------|-------------|-------------------------|
| | 5mm | |
| Tread Width | | |
| 5 | 157mm | 64mm |
| 6 | 187mm | 115mm |
| 7 | 217mm | 115mm |
| 8 | 248mm | 178mm |
| 9 | 278mm | 178mm |
| 10 | 308mm | 178mm |

**See Drawing Above

Tread Width and Bolt Hole Spacing

19W4

| No. of Bearing Bars and Nosing | Bearing Bar | **Bolt Hole Spacing "A" |
|--------------------------------|-------------|-------------------------|
| | 3/16" | |
| Tread Width | | |
| 5 | 6-3/16" | 2-1/2" |
| 6 | 7-3/8" | 4-1/2" |
| 7 | 8-9/16" | 4-1/2" |
| 8 | 9-3/4" | 7" |
| 9 | 10-15/16" | 7" |
| 10 | 12-1/8" | 7" |

**See Drawing Above

Maximum Tread Length (mm)

| Bar Size (mm) | Smooth | Serrated |
|---------------|--------|----------|
| | 30W102 | 30W102 |
| 25 x 5 | 1041 | 863 |
| 32 x 5 | 1422 | 1270 |
| 38 x 5 | 1676 | 1600 |

Data Created Based on NAAMM 531-17:

- 1.32kN point load at center, loading only first five bars, up to 1.7m.
- 1.32kN point loads at third-points, loading only first five bars, when > 1.7m.
- L/240 deflection limit on both.

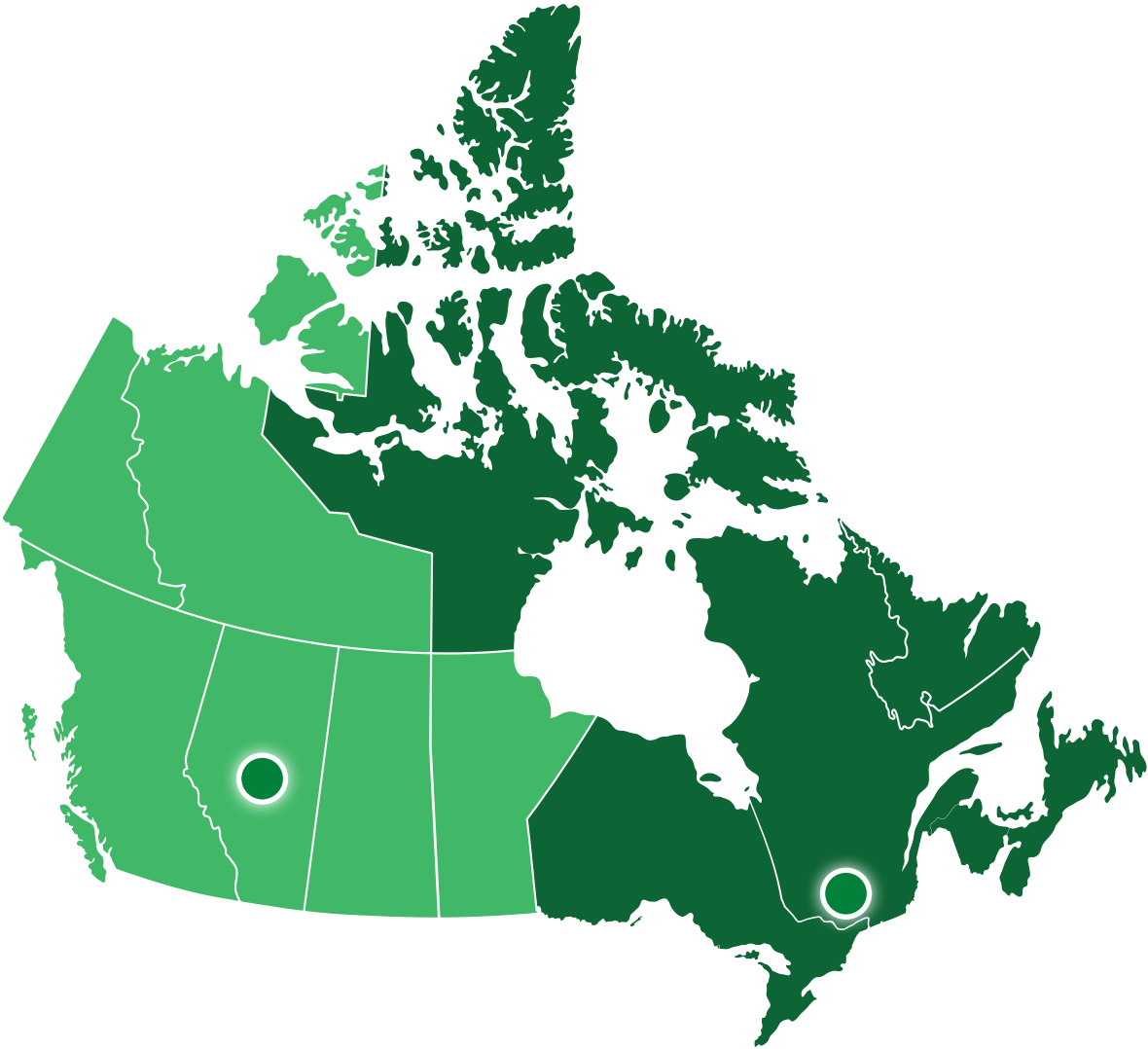
Maximum Tread Length (in)

| Bar Size (in) | Smooth | Serrated |
|---------------|--------|----------|
| | 19W4 | 19W4 |
| 1 x 3/16 | 41 | 34 |
| 1/4 x 3/16 | 56 | 50 |
| 1/2 x 3/16 | 66 | 63 |

Data Created Based on NAAMM 531-17:

- 300-lb point load at center, loading only first five bars, up to 5'-6".
- 300-lb point loads at third-points, loading only first five bars, when > 5'-6".
- L/240 deflection limit on both.

Nucor Grating Plant Locations



WEST

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