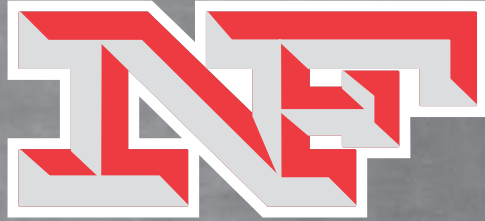




NEENAH **INF** FOUNDRY

NEENAH WI

*"Word on the street is Neenah"*



**1 MANHOLE FRAMES & COVERS**

**2 INLET FRAMES & GRATES**

**3 COMBINATION INLETS**

**4 AIRPORT CASTINGS**

**5 ROLL & GUTTER INLETS**

**6 BRIDGE SCUPPERS**

**7 DRAINAGE GRATES**

**8 DETECTABLE WARNING PLATES**

**9 TRENCH CASTINGS**

**10 VALVES & GATES**

**11 ACCESS & HATCH COVERS**

## MAIN OFFICES AND PLANTS

2121 BROOKS AVENUE, NEENAH, WI 54956

PHONE: (920) 725-7000

TOLL FREE: (800) 558-5075

FAX: (920) 729-3661

[www.neenahfoundry.com](http://www.neenahfoundry.com)

[constsales@nfco.com](mailto:constsales@nfco.com)



## REGIONAL SALES OFFICES and DISTRIBUTION CENTERS

### Phoenix AZ

Phone: (602) 225-9801  
Toll Free: (866) 765-0850  
Fax: (602) 220-0354  
[phoenix@nfco.com](mailto:phoenix@nfco.com)

### Los Angeles (South El Monte) CA

Phone: (760) 535-2267  
Toll Free: (866) 765-0850  
Fax: (760) 633-3450  
[phoenix@nfco.com](mailto:phoenix@nfco.com)

### Denver (Commerce City) CO

Phone: (303) 289-7192  
Toll Free: (800) 694-4660  
Fax: (303) 289-7193  
[denver@nfco.com](mailto:denver@nfco.com)

### Chicago (Carol Stream) IL

Phone: (630) 653-5440  
Toll Free: (800) 874-4457  
Fax: (630) 653-0170  
[carolstream@nfco.com](mailto:carolstream@nfco.com)

### Peoria IL

Phone: (815) 399-2228  
Toll Free: (800) 892-0750  
Fax: (815) 399-6765  
[rockford@nfco.com](mailto:rockford@nfco.com)

### Rockford IL

Phone: (815) 399-2228  
Toll Free: (800) 892-0750  
Fax: (815) 399-6765  
[rockford@nfco.com](mailto:rockford@nfco.com)

### Indianapolis IN

Phone: (317) 875-7245  
Toll Free: (800) 382-1359  
Fax: (317) 875-8637  
[indianapolis@nfco.com](mailto:indianapolis@nfco.com)

### Louisville (J.R. Hoe & Sons), KY

Phone: (502) 326-1347  
Toll Free: (800) 245-5521  
Fax: (502) 326-1386  
[Sales@jrhoe.com](mailto:Sales@jrhoe.com)

### Loretto MN (Ess Brothers & Sons, Inc.)

Toll Free: (800) 478-2027  
Fax: (763) 478-8868  
9350 County Rd. 19  
Loretto, MN 55357

### Minneapolis-St. Paul (Shakopee) MN

Phone: (952) 445-5335  
Toll Free: (800) 252-5801  
Fax: (952) 445-6417  
[shakopee@nfco.com](mailto:shakopee@nfco.com)

### Nashville (John Bouchard and Sons), TN

Phone: (615) 256-0112  
Toll Free: (800) 842-9156  
Fax: (615) 327-2427  
[foundry@jbouchard.com](mailto:foundry@jbouchard.com)

### St. Louis (St. Peters) MO

Phone: (636) 928-1023  
Toll Free: (800) 392-8062  
Fax: (636) 928-4727  
[stpeters@nfco.com](mailto:stpeters@nfco.com)

### Lincoln NE (Deeter Foundry)

Phone: (402) 464-7466  
Toll Free: (800) 234-7466  
Fax: (402) 464-8533  
[sales@deeter.com](mailto:sales@deeter.com)

### Albany NY

Phone: (518) 458-CAST [2278]  
Toll Free: (888) 769-2278  
Fax: (518) 458-2280  
[albany@nfco.com](mailto:albany@nfco.com)

### Cincinnati OH

Phone: (513) 621-6735  
Toll Free: (800) 423-8116  
Fax: (614) 876-0216  
[columbus@nfco.com](mailto:columbus@nfco.com)

### Cleveland OH

Phone: (614) 876-9837  
Toll Free: (800) 423-8116  
Fax: (614) 876-0216  
[columbus@nfco.com](mailto:columbus@nfco.com)

### Columbus OH

Phone: (614) 876-9837  
Toll Free: (800) 423-8116  
Fax: (614) 876-0216  
[columbus@nfco.com](mailto:columbus@nfco.com)

### Oklahoma City OK

Phone: (405) 942-8118  
Toll Free: (800) 619-6756  
Fax: (405) 942-7057  
[oklahoma@nfco.com](mailto:oklahoma@nfco.com)

### Pittsburgh (Cuddy) PA

Phone: (412) 221-1789  
Toll Free: (877) 758- 8940  
Fax: (412) 221-1863  
[pittsburgh@nfco.com](mailto:pittsburgh@nfco.com)

### Milwaukee (Waukesha) WI

Phone: (262) 544-9900  
Fax: (262) 544-9964  
[waukesha@nfco.com](mailto:waukesha@nfco.com)

*Manufacturer's Representatives are located in many principal cities throughout the U.S. Please see [www.neenahfoundry.com](http://www.neenahfoundry.com) or call for the location nearest you.*

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## GENERAL INFORMATION ABOUT CASTINGS

**GENERAL:** Castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. They shall be smooth and well cleaned by shotblasting.

**QUALITY:** Metal used in the manufacture of Neenah castings shall be ASTM-A-48, Class 35B Gray Iron or ASTM A536 Grade 80-55-06 for Ductile Iron unless otherwise specified in your order and/or acknowledged at the time of order.

**TOLERANCES:** As cast dimensions may vary one-half the maximum shrinkage possessed by the metal or +/- 1/16 inch per foot.

**BEARING SURFACES:** All circular manhole frames and covers are furnished with machined horizontal bearing surfaces unless otherwise noted within or acknowledged at the time of order. All square or rectangular units are furnished with as-cast bearing surfaces unless otherwise noted within or acknowledged at the time of order.

**UNPAINTED CASTINGS:** Castings are furnished unpainted. See page 8 for additional information on Neenah's no paint policy.

**WEIGHTS:** Weights are not shown in the catalog. Overall shape and function, rather than weight, are the major considerations to be used in evaluating castings. Focus on basic dimensions and application when creating your casting specifications and specify Neenah Catalog Number. Current weights are always available from Neenah. (see "Casting Weights" on page 6 for more information.)

**SUBMITTALS:** Manufacturer's shop drawings shall be submitted to the engineer for approval prior to manufacture or shipment of castings to job site. The engineer shall retain the right to reject castings not conforming to this specification and/or approved submittal drawings.

### GRAY IRON - Best for Construction Castings

The use of gray iron offers many advantages over other materials for construction castings.

Of all the common castable ferrous materials, gray irons exhibits the best corrosion and wear resistance as well as the desirable quality of high compressive strength. These are valuable qualities for load bearing street hardware.

#### Strength:

Gray Iron produced by Neenah Foundry is laboratory tested from specimens to verify tensile strengths. Tensile strength is determined through the use of separately cast test bar specimens. Unless otherwise indicated within or acknowledged at the time of order, 35,000 p.s.i. minimum tensile strength iron is furnished. See "Test Bars Disclaimer" on page 9 for further information.

### When to use DUCTILE IRON

Ductile Iron is an ideal material for construction castings when standard gray iron castings do not have the load bearing capabilities for a particular application.

While having the advantages of Gray Iron, Ductile Iron has greater strength characteristics than structural carbon steel without steel's inherent corrosion characteristics.

Ductile Iron is often used in areas subjected to loads greater than H20 loadings such as:

- Industrial Facilities with forklift traffic
- Container Ports
- Airports

Due to the excellent compressive strength of gray iron and the way these qualities relate to iron frames, mating ductile iron lids or grates with gray iron frames is often a cost-effective recommended approach.

There are many factors involved in choosing a grade of ductile iron. When there are unusual loading conditions or locations subjected to extreme heat or cold, please contact our Product Engineering Department for more information.

## CASTINGS FOR DIFFERENT TRAFFIC CONDITIONS

**WHEEL LOAD CAPACITY:** Visit [www.neenahfoundry.com](http://www.neenahfoundry.com) to review wheel load capacities as they relate to product selection

To assist in selecting castings which meet a general load-bearing requirement, we have classified our castings into three separate categories. These are referenced as follows:

**EXTRA HEAVY DUTY:** For airports and concentrated loads. These applications require special castings to accommodate wheel loads of 100 p.s.i. or greater. When selecting castings for heavy concentrated loads, advise loading conditions: total wheel load, tire or wheel contact area, and tire pressure. We will furnish you with information to assist you with your choice.

**HEAVY DUTY:** Castings in this category exceed proof loads of 16,000 lbs. Many of the castings in this catalog are suitable for much heavier proof loads.

**LIGHT DUTY:** These castings are recommended for sidewalks, terraces, and very light traffic. Specifiers are cautioned that it is possible for a site to be changed to a heavy duty requirement at some future date. If this happens, we strongly recommend that the installation be replaced with heavy duty castings. If in doubt, Neenah recommends specifying heavy duty castings.

### LOAD BEARING CAPABILITIES

Responsible consulting and public works engineers need to know how castings will perform in the field. For years, empirical formulas have been erroneously used to determine loading capacities. Neenah offers full scale destructive testing as an accurate method of determining true load bearing capabilities.

### FULL SCALE DESTRUCTIVE TESTING

Proof load test is the recommended method of providing load performance of casting's service. You will find this testing procedure explained in Federal Specification A-A 60005 and AASHTO-M 306-05. The essential elements of the test are:

- 1) A specified load is applied on a 9" x 9" contact area
- 2) The cover, grating or frame will be inspected for cracks or detrimental permanent deformation
- 3) Any crack or detrimental permanent deformation will cause the castings to be rejected

Most tests are performed on our 200,000 lb compression testing machine. Tests can take a casting beyond the A-A 60005 and AASHTO-M 306-05 specifications; even to destruction.

### AVAILABLE PUBLISHED SPECIFICATIONS

There are several published specifications that are available to assist designers in specifying iron castings. It is the responsibility of the designer to determine if one or all of these specifications are appropriate for a given application. These specifications are referenced as follows:

#### For Gray Iron

A-A 60005 -----	Federal Specification - Frames, covers, gratings, steps, sump and catch basins, manhole castings
ASTM-A-48 -----	Standard Specification for Gray Iron Castings
AASHTO-M 105 -----	Standard Specification for Gray Iron Castings
AASHTO-M 306-05 -----	Standard Specification for Drainage Structure Castings

#### For Ductile Iron

ASTM-A-536 -----	Standard Specification for Ductile Iron Castings
ASTM-A-897 -----	Standard Specification for Austempered Ductile Iron Castings

#### For Airport Castings

FAA AC: 150/5370-10, item D-751 -----	Manholes, Catch Basins, Inlets and Inspection Holes
FAA AC: 150/5320-6, Appendix 3 -----	Designs of Structures for Heavy Aircraft

### For Handicapped Compliance

Americans With Disabilities Act (ADA), Sections 4 Accessible Routes and Section 4.5.4 Gratings

There may be applicable requirements and specifications other than those shown above that need to be consulted before a designer specifies his requirements.

## **MODERN CASTINGS FOR TOMORROW'S WORLD**

### **BREAKTHROUGHS IN CASTING CONCEPTS**

Neenah makes continual effort to provide customers with the most modern and cost effective castings available.

### **PERFORMANCE CRITERIA**

In times past, limited knowledge of the properties of gray iron caused specifiers to rely on weight as specifying criteria when calling for gray iron castings. In reality, the material properties of gray iron allow castings to be lighter in weight and thinner in section while still meeting or exceeding performance expectations. Proof load criteria, rather than casting weights, should be used in specifying construction castings. Various published specifications are available to assist with choices. (See page 5.)

### **CASTING WEIGHTS**

The weights of Neenah Foundry castings are not shown in this catalog. Casting weights, section thicknesses and non-critical dimensions are periodically adjusted in a continued effort to bring our customers the best and most economical products available from our modern production facilities. Due to these occasional changes and adjustments, weights are not shown in this catalog in an effort to avoid confusion. Current weights are always available from Neenah.

### **Modern Platen Lids**

Neenah Engineers have known for some time that platen (plate shaped) lids are improved manhole covers which are pound per pound stronger than ribbed lids. Advantages of lighter weight, platen lids include:

- Increased load capacity
- Increased deflection resulting in increased energy absorption
- Decreased weight
- Easier to handle

### **Modern Lighter Weight Frames**

Manhole frames have an inherently strong shape. In the past, metal sections had to be thicker because foundry molding equipment was imprecise. To compensate, generous tolerances were required to ensure minimum section thickness.

Today's molding machines are capable of holding tight tolerances, allowing specifiers to reduce weights and section thicknesses. Technology now allows modern construction casting manufacturers to take advantage of the frame's inherently strong shape.

Modern frames are significantly reduced in weight and section thickness, without a reduction in relevant performance characteristics.

Lighter frames are viable because gray iron is stronger in compression than in tension. The lighter frames are still so substantial that, under load testing, gray iron covers will fail well before failure of the frame.

**FOR MORE INFORMATION, REQUEST A COPY OF OUR "MODERNIZED CASTINGS BROCHURE."**



In support of the Green Initiative, Neenah Foundry is pleased to report that our products contain a minimum of 85% recycled content in the form of a minimum of 35% consumer generated scrap metal and minimum of 50% industrial generated scrap metal.

***For more information about Neenah Foundry products and services,  
please visit our website at [www.neenahfoundry.com](http://www.neenahfoundry.com)***

## **IMPORTANT INFORMATION ON CHOOSING THE RIGHT CASTING FOR YOUR APPLICATION**

### **THESE PRODUCTS SHOULD BE SPECIFIED AND INSTALLED BY TRAINED, QUALIFIED PROFESSIONALS!**

AS PROUD AS WE ARE OF OUR PRODUCTS, WE RECOGNIZE THAT ULTIMATELY, THEIR SAFETY AND EFFECTIVENESS DEPEND UPON WHETHER A PROJECT DESIGNER HAS SELECTED THE CORRECT CASTING FOR THE JOB. WE OFFER A BROAD RANGE OF PRODUCTS FROM WHICH THAT CORRECT CASTING CAN BE CHOSEN, BUT THE PROPER SELECTION OF A NEENAH CASTING REQUIRES THE SERVICES OF A QUALIFIED PROFESSIONAL WHO KNOWS HOW AND WHERE IT WILL BE USED, AND HAS THE TRAINING AND EXPERIENCE TO TAKE INTO CONSIDERATION ALL THE CIRCUMSTANCES OF THE INTENDED APPLICATION, DETERMINE REQUIRED STRENGTH, CAPACITY, AND FUNCTION, AND ASSESS A PARTICULAR DESIGN'S SUITABILITY FOR THE SETTING IN WHICH IT WILL BE INSTALLED, INCLUDING ANY PEDESTRIAN, BICYCLE AND OTHER TRAFFIC TO WHICH IT WILL BE EXPOSED. ***THIS IS NOT A JOB FOR A NON-PROFESSIONAL.*** ALTHOUGH WE HOPE THE INFORMATION IN THIS CATALOG WILL BE INFORMATIVE TO OTHER READERS AS WELL, WE EMPHASIZE THAT IT IS WRITTEN FOR USE BY SUCH QUALIFIED PROFESSIONALS. ***NO ONE SHOULD SELECT OR SPECIFY ANY NEENAH CASTING WITHOUT FIRST OBTAINING THE ADVICE OF SUCH A PROFESSIONAL.***

### **PEDESTRIAN, BICYCLE AND HANDICAP CONSIDERATIONS**

IN ADDITION TO CONSIDERATIONS OF FUNCTION AND PERFORMANCE, PROJECT DESIGNERS AND SPECIFIERS MUST CAREFULLY CONSIDER PEDESTRIAN, BICYCLE AND HANDICAP ISSUES, INCLUDING THOSE ARISING UNDER THE AMERICANS WITH DISABILITIES ACT (THE ADA) AND RELATED REGULATIONS, WHEN SPECIFYING THE USE OF OUR CONSTRUCTION CASTINGS, TAKING INTO CONSIDERATION THE SPECIFIC CIRCUMSTANCES OF EACH PROPOSED APPLICATION. *BECAUSE WE DO NOT KNOW THOSE SPECIFIC CIRCUMSTANCES, WE CANNOT RECOMMEND THE CASTINGS TO BE USED IN THEM, THOUGH WE POINT OUT BELOW SOME GENERAL CONSIDERATIONS ON WHICH WE EXPECT A QUALIFIED PROFESSIONAL PROJECT DESIGNER WILL ADVISE.*

WHILE CASTINGS MUST ALWAYS BE SELECTED IN LIGHT OF SPECIFIC CIRCUMSTANCES AND FORESEEABLE USE, PLEASE REMEMBER THAT INSTALLATIONS DO CHANGE OVER TIME, IN CONCEPT, SCOPE OR USAGE PATTERNS. PROJECT DESIGNERS AND USERS MUST BE ALERT TO SUCH CHANGES, AND MUST RECONSIDER WHETHER THE CHOSEN CASTINGS CONTINUE TO MEET THE REQUIREMENTS OF THOSE CHANGED CIRCUMSTANCES OR WHETHER THEY SHOULD BE REPLACED WITH OTHER DESIGNS.

GRATES AND OTHER CASTINGS FOR PEDESTRIANS AND HANDICAPPED PERSONS: LAWS, REGULATIONS OR CUSTOMS MAY DICTATE THE USE OF SPECIFIC TYPES OF GRATES OR OTHER CASTINGS WHERE PEDESTRIANS AND/OR HANDICAPPED PERSONS MAY BE PRESENT. FOR INSTANCE, GRATES MAY BE REQUIRED WITH OPENINGS NO GREATER THAN 1/4" OR 1/2". PROJECT DESIGNERS MUST CAREFULLY EVALUATE THE LOCATION AND PLACEMENT OF GRATES AND OTHER CASTINGS AGAINST APPLICABLE LAWS, REGULATIONS AND OTHER SPECIFICATIONS TO ENSURE THEY ARE USING DESIGNS THAT WILL SATISFY ALL SUCH REQUIREMENTS, AND PROVIDE A PATHWAY AND ACCESSIBLE ROUTE FOR PEDESTRIANS AND HANDICAPPED PERSONS. AMONG OTHER SOURCES, PROJECT DESIGNERS MAY FIND USEFUL INFORMATION, SPECIFICATIONS AND GUIDELINES IN THE AMERICANS WITH DISABILITIES ACT.

BICYCLE SAFETY: GRATES AND OTHER CASTINGS MUST BE CHOSEN FOR SAFE USE BY BICYCLISTS. THE FOLLOWING ARE SOME IMPORTANT CONSIDERATIONS THAT WE EXPECT WILL BE CONSIDERED BY THE QUALIFIED PROFESSIONAL PROJECT DESIGNER:



1. THE STYLE OF GRATE OR OTHER CASTING SHOULD ALLOW BICYCLE TRAFFIC FROM ALL ACCESSIBLE DIRECTIONS. FOR INSTANCE, GRATES LOCATED IN OPEN AREAS, OR ADJACENT TO DRIVEWAYS, OR IN OTHER LOCATIONS WHERE THEY ARE NOT ADJACENT TO BARRIERS SUCH AS CURBS, REQUIRE SPECIAL ATTENTION IN THIS REGARD.
2. IN GENERAL, WE SUGGEST CONSIDERATION OF NEENAH'S TYPE L VANE STYLE GRATES WHERE BICYCLISTS ARE A FACTOR IN THE CHOICE OF A GRATE DESIGN, BEARING IN MIND THAT THERE IS NO SINGLE DESIGN FACTOR THAT WILL MAKE A GRATE OR OTHER CASTING APPROPRIATE IN ALL SUCH SITUATIONS.
3. IF SLOTTED GRATES OR VANE-TYPE GRATES OTHER THAN NEENAH'S TYPE L ARE CONSIDERED FOR APPLICATIONS WHERE BICYCLE TRAFFIC IS A FACTOR IN THE CHOICE OF A GRATE DESIGN, THE PROJECT DESIGNER SHOULD ENSURE THAT CASTINGS INCORPORATE SUFFICIENTLY NARROW OPENINGS, AND/OR APPROPRIATELY SPACED TRANSVERSE (CROSS) BARS, TO ENSURE THAT ANY FORESEEABLE WIDTH AND DIAMETER OF BICYCLE TIRE CANNOT SUFFICIENTLY DROP DOWN INTO OPENINGS CREATING UNSAFE CONDITIONS.
4. GUTTER SLOPES SHOULD NOT BE SUBSTANTIALLY SWALED INTO THE CURB SO AS TO CREATE A DISTURBANCE IN A ROADWAY WHICH MIGHT AFFECT THE ABILITY OF BICYCLISTS OR OTHER TRAFFIC TO TRAVERSE THEM.

## **OTHER IMPORTANT INFORMATION FOR USERS OF OUR CASTINGS**

### **FASTENING FRAMES AND COVERS TOGETHER (FASTENING DEVICES)**

THIS NEENAH FOUNDRY CATALOG CONTAINS MANY ITEMS THAT HAVE COVERS FASTENED TO FRAMES USING BOLTS OR OTHER FASTENING DEVICES. SPECIFIERS AND USERS MUST RECOGNIZE THAT BOLTS AND OTHER FASTENING DEVICES MAY HAVE A TENDENCY TO WORK LOOSE OVER A PERIOD OF TIME DUE TO TRAFFIC PATTERNS, VIBRATIONS, TEMPERATURE CYCLES, ETC. AND THAT ROUTINE INSPECTION AND MAINTENANCE SCHEDULES SHOULD BE IMPLEMENTED TO ASSURE THESE FASTENERS REMAIN TIGHT AND FUNCTIONAL. THEY MUST DETERMINE THE NECESSITY AND FREQUENCY OF THESE INSPECTION AND MAINTENANCE INTERVALS FOR EACH INSTALLATION. PROCEDURES SHOULD BE ESTABLISHED TO ASSURE THAT MAINTENANCE CREWS CHECK FASTENING DEVICES FOR PROPER FUNCTION AND TORQUE BOLTS TO YOUR ESTABLISHED REQUIREMENTS. CREWS MUST REPAIR OR REPLACE FASTENING DEVICES, STRIPPED BOLTS AND THREADS PROMPTLY. CONSIDER EACH INSTALLATION INDIVIDUALLY TO BE SURE TRAFFIC OR USAGE PATTERNS WILL ALLOW THE USE OF FASTENING DEVICES. [SEE SECTION TITLED "GASKETED FRAMES AND COVERS" BELOW.]

### **GASKETED FRAMES AND COVERS**

THE NEENAH FOUNDRY CATALOG CONTAINS MANY ITEMS THAT HAVE NEOPRENE OR EPDM GASKETS PLACED BETWEEN THE FRAME AND COVER. SPECIFIERS AND AGENCIES MUST RECOGNIZE THAT THESE GASKETS COMPRESS UNDER LOAD AND CAN RELEASE THIS COMPRESSED ENERGY IN THE FORM OF UPWARD MOTION WHEN RELEASED RAPIDLY (SUCH AS NORMAL TRAFFIC LOADING.) THIS ENERGY RELEASE MAY HAVE A TENDENCY TO DISLodge COVERS OR LOOSEN BOLTS IN BOLTED AND GASKETED UNITS. CONSIDER EACH INSTALLATION INDIVIDUALLY AND CAREFULLY TO BE SURE TRAFFIC OR USAGE PATTERNS WILL ALLOW THE USE OF GASKETS. [SEE SECTION TITLED "FASTENING FRAMES AND COVERS TOGETHER (FASTENING DEVICES) ABOVE.]

## **TEST BARS: IMPORTANT DISCLAIMER**

MOST GENERAL IRON CASTINGS SPECIFICATIONS REQUIRE PRODUCING FOUNDRIES TO MAINTAIN MINIMUM TENSILE STRENGTH PROPERTIES. THESE PROPERTIES ARE TO BE MEASURED ON TEST SPECIMENS MACHINED FROM STANDARDIZED TEST COUPONS POURED FROM THE SAME IRON, BUT SEPARATELY FROM THE CASTINGS. TEST COUPON DESIGN, DETAILS OF THE MACHINED TENSILE TEST BAR AND TEST CONDITIONS HAVE BEEN DEVELOPED SUCH AS ASTM A 48 AND AASHTO M 306-05 TO PROVIDE MEANINGFUL EVALUATIONS OF SOUND, DEFECT-FREE METAL UNDER STANDARDIZED CONDITIONS. THIS IS ONE OF THE FUNDAMENTAL PRINCIPLES UPON WHICH FOUNDRY OPERATION AND QUALITY PRACTICES ARE BASED.

SIGNIFICANTLY, THESE SPECIFICATIONS EXPLICITLY CAUTION THAT TENSILE PROPERTIES DETERMINED FROM SEPARATELY CAST COUPONS DEMONSTRATE THE POTENTIAL OF THE IRON USED TO MAKE THE CASTING. THEY ARE NOT THE ACTUAL PROPERTIES POSSIBLE, LIKELY, OR TO BE EXPECTED IN THE CASTING. THE ACTUAL PROPERTIES DEVELOPED IN THE CASTING MAY DIFFER GREATLY FROM THOSE OF SEPARATELY CAST SPECIMENS AND THEY ARE, TO THE GREATEST DEGREE, DETERMINED BY FEATURES OF CASTING DESIGN. THIS IS MOSTLY BEYOND THE CONTROL OF THE PRODUCING FOUNDRY.

FOR THOSE PRIVATE CASTING SPECIFICATIONS WHICH REQUIRE TENSILE PROPERTIES TO BE DETERMINED FROM TEST BARS MACHINED FROM CASTINGS OR FROM ATTACHED COUPONS, THE DETAILS OF COMPLIANCE WITH THESE SPECIFICATIONS AND THE COSTS THEREOF SHALL BE AS SPECIFICALLY AGREED BETWEEN THE PARTIES. ABSENT SUCH AN AGREEMENT, NEENAH FOUNDRY COMPANY DOES NOT WARRANT OR IMPLY THAT TENSILE PROPERTIES CALLED FOR IN A SEPARATE CASE SPECIMEN WILL BE ACHIEVED AT ANY LOCATION IN THE CASTINGS(S).

## **OUR CASTINGS ARE HEAVY! WORKING WITH HEAVY CASTINGS CAN CAUSE INJURY!**

CAST IRON PARTS, SUCH AS THOSE SOLD BY NEENAH FOUNDRY COMPANY, TEND TO BE HEAVY. IN AN EFFORT TO AVOID INJURY, NEENAH RECOMMENDS USERS ALWAYS USE LIFTING DEVICES WHEN HANDLING CASTINGS. PARTICULAR ATTENTION SHOULD BE PAID TO PROTECTING WORKERS' BACKS AND EXTREMITIES. IT IS THE USER'S RESPONSIBILITY TO DETERMINE WHICH LIFTING DEVICE IS SUITABLE TO EACH SITUATION.

USERS SHOULD NEVER ALLOW ANY PART OF THEIR BODIES TO ENTER THE OPENING AREA OF AN OPEN HATCH COVER UNLESS THE LID HAS BEEN SECURED IN A FASHION THAT WILL MAKE IT IMPOSSIBLE TO ACCIDENTALLY CLOSE. IT IS THE USER'S RESPONSIBILITY TO BE SURE THE CASTINGS ARE SECURE AND THE SITE IS SAFE BEFORE PROCEEDING.

## Terms and Conditions of Sale

**EXCLUSIVE TERMS:** THE TERMS AND CONDITIONS OF SALE SET FORTH HEREIN (THE "TERMS") CONSTITUTE THE COMPLETE AND EXCLUSIVE AGREEMENT BETWEEN SELLER AND BUYER PERTAINING TO THE PRODUCTS IDENTIFIED IN ANY ORDER BETWEEN SELLER AND BUYER. BUYER'S ORDER IS ACCEPTED ONLY ON THE FOLLOWING TERMS AND CONDITIONS, AND SELLER'S ACCEPTANCE OF ANY ORDER IS EXPRESSLY CONDITIONED ON BUYER'S ASSENT TO THE TERMS CONTAINED HEREIN. SELLER HEREBY OBJECTS TO ANY ADDITIONAL OR DIFFERENT TERMS CONTAINED IN ANY PURCHASE ORDER, ACKNOWLEDGEMENT, CONFIRMATION OR OTHER DOCUMENT PERTAINING TO THE SALE OF THE PRODUCTS HEREUNDER. No action by Seller shall be construed as acceptance of any additional or different terms in any purchase order, acknowledgement, confirmation or other document. Buyer shall be deemed to have accepted the Terms hereof by signing and returning a copy hereof or by other written indication of acceptance, by accepting any whole or partial shipment of goods from Seller or by making any whole or partial payment to Seller, or by any other means commonly signaling lawful agreement to be bound; provided that, the only effect thereof shall be to agree to the Terms hereof. Seller reserves the right to accept or reject all orders including but not limited to orders entered pursuant to an expired quotation.

SELLER PRESUMES THAT BUYER POSSESSES SUFFICIENT KNOWLEDGE REGARDING CONSTRUCTION CASTINGS OR BUYER HAS RETAINED PERSONNEL WITH SUFFICIENT KNOWLEDGE REGARDING CONSTRUCTION CASTINGS IN ORDER TO ORDER THE APPROPRIATE PRODUCTS TO MEET BUYER'S NEEDS AND SUBSEQUENTLY INSTALL SUCH PRODUCTS. SELLER PRESUMES THAT BUYER AND/OR BUYER'S PERSONNEL HAVE READ AND UNDERSTOOD SELLER'S APPLICABLE PRODUCT CATALOG.

**TAXES AND FEES:** Unless otherwise specified, prices do not include any manufacturer's, sales, use, excise or similar taxes, charges or duties ("taxes"), and the amount on any such taxes Seller is required to pay or collect will be invoiced to Buyer unless Buyer provides Seller with the appropriate evidence that Buyer is exempt from the payment of such taxes. Buyer shall also pay any collection fees and reasonable attorneys' fees incurred by Seller in enforcing these Terms or any order hereunder or defending against any claim for breach thereof.

**PRICES, QUOTATIONS:** All orders, whether or not submitted pursuant to a quotation, are subject to acceptance by Seller. Unless held open for a specific length of time on Seller's quotation, all prices are subject to change without notice and any unshipped balances on purchase orders will be invoiced to and paid by Buyer at prices in effect at the time of delivery. Unless otherwise specified, all quotations expire automatically 30 calendar days after the date issued, but any quotation may be amended or terminated by written notice from Seller to Buyer within that period.

**PAYMENT:** Payment terms are net cash 30 days from the date of invoice, or as specified on the Seller's current quotation. A service charge at the maximum rate allowed by law may be charged on overdue balances. If the financial condition of Buyer is or becomes unsatisfactory in the exclusive judgment of Seller, Seller may, by written notice, require full or partial cash payment in advance of performance or continuance of performance of Seller's obligations hereunder or cancel this order in whole or part. Seller may set off any amount due from Buyer, whether or not under any order pursuant to these Terms, against any amount that may become due to Buyer hereunder.

**RISK OF LOSS; SHIPMENT; TITLE:** Unless otherwise agreed to in writing, all shipments are F.O.B. Neenah Foundry Company, Neenah, Wisconsin. Risk of loss shall pass to Buyer at the moment of Seller's delivery of products to the carrier. Any delivery schedule quoted by Seller is its best estimate of lead-time as of the date of quotation and is subject to change by Seller. Delivery schedules are also contingent upon Buyer's prompt provision of all necessary, complete and correct specifications, information and data. Seller shall not be responsible for failure to meet any estimated delivery date. If Buyer requires special production service for unusual shipments, an additional charge shall be imposed, as agreed upon by the parties. Seller shall retain, and Buyer hereby grants to Seller, a security interest in any product sold by Seller hereunder until payment in full is received. Title to the products shall remain with Seller until Buyer remits the entire invoiced cash price for such products to Seller.

**INTELLECTUAL PROPERTY OWNERSHIP:** Seller shall retain all rights, title and interest in and to any and all patents, copyrights, trademarks and other intellectual property and proprietary rights and the goodwill associated thereby pertaining to the products sold per the Terms, as well as any associated developments Seller creates, realizes or reduces to practice during Seller's fulfillment of the Terms or any order hereunder. Except as otherwise particularly provided, no license, transfer or assignment of proprietary rights shall occur as a result of the Terms or any order.

**WARRANTY:** Seller warrants the products to be free from defects in materials and workmanship for a period of one year from the date of invoice. THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT. This warranty is valid only if the products have been subjected to normal use of the purpose for which the goods were designed; have not been subject to misuse, negligence or accident; and have not been modified, altered or repaired by persons other than the Seller or Seller's designees in any respect which in the judgment of Seller affects the condition or operation of the Products. Seller neither assumes nor authorizes any employee, distributor, representative, agent or other person to assume for Seller any other liability in connection with the sale or use of the products sold and there are no oral agreements or warranties collateral to or affecting these Terms or any order hereunder.

**EXCLUSIVE REMEDY:** Should Buyer wish to make a claim that any product does not conform to the foregoing warranty, Buyer must give prompt written notice to Seller. Such notice shall include a specific description of such non-conformity as well as the original job or invoice number for the affected product. Any such product or part shall be, if requested by Seller, returned freight prepaid to Seller's facility for inspection. If, upon evaluation of Buyer's claim, Seller deems the non-conformity to be in violation of the above warranty and Seller confirms that such claim was made within the warranty period, Seller will, at its option, repair or replace the non-conforming product or product part. Seller shall not be responsible for providing labor or the cost of labor for the removal of the defective part or parts and the installation of any replacement part or parts. Replacement parts shall be warranted for the balance of the original warranty.

**RETURNS:** Products may not be returned unless authorized by Seller, and the Seller reserves the right in its sole and absolute discretion to refuse to accept certain products for return, including nonstock or custom products. A return goods authorization number must accompany each return, and Buyer must abide by any requirements accompanying the Seller's transmission of such return goods authorization number. Buyer shall pay Seller a restocking charge of twenty percent (20%) the total purchase price of all goods returned. Seller may refuse to refund Buyer for products that are not returned in clean or resalable condition.

**LIMITATION OF LIABILITY:** SELLER'S LIABILITY FOR ANY CLAIMS, DAMAGES, LOSSES OR LIABILITIES ARISING OUT OF OR RELATING TO ITS PERFORMANCE OF AN ORDER MADE HEREUNDER SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCTS SOLD PER SUCH ORDER. SELLER SHALL HAVE NO LIABILITY TO BUYER OR TO BUYER'S AFFILIATES, EMPLOYEES, REPRESENTATIVES, CUSTOMERS OR AGENTS OR TO ANY THIRD PARTY FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOST PROFITS, MACHINING OR LABOR COSTS, DAMAGE TO OTHER EQUIPMENT OR LIABILITY OR INJURY TO A THIRD PARTY, ARISING FROM THE SALE, USE OR INSTALLATION OF THE PRODUCTS, FROM THE PRODUCTS BEING INCORPORATED INTO OR BECOMING A COMPONENT OF ANOTHER PRODUCT OR FROM ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON WARRANTY (EXPRESS OR IMPLIED) OR OTHERWISE BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY, REGARDLESS OF ANY ADVICE OR REPRESENTATION THAT MAY HAVE BEEN RENDERED BY SELLER REGARDING THE GOODS OR SELLER'S PERFORMANCE HEREUNDER.

**INDEMNIFICATION:** Buyer agrees to indemnify and hold Seller and its successors, assigns and customers harmless against any claim, demand, action, proceeding, liability, loss, cost or expense, including reasonable attorneys' fees, arising in connection with any claim or cause of action alleging that: Seller's incorporation or use of a specification, design, modification or drawing provided to Seller by Buyer or Buyer's use of the products in combination with other products: (a) infringes or proximately infringes a proprietary or intellectual property right of a third party; or (b) causes or proximately causes personal injury (including death) or property damage.

**FORCE MAJEURE:** Seller shall not be liable for delays or failure in performance of an order or default in delivery arising out of, or resulting from, any accident, fire, quarantine restriction, act of terrorism or suspected terrorism, breakdown, strike, sabotage, riot, insurrection, war, delay, severe weather, interruption in or failure of sources or subcontractors to supply materials and equipment, labor or transportation problems, act of God, order, contract, priority, directive, requisition or request of any governmental entity, whether or not voluntarily assumed, or other cause and condition, whether of like or different nature, that is similarly beyond Seller's control.

**CLAIMS, CANCELLATION, CHANGES, SUSPENSION:** All claims for error in weight or quantity of castings or freight damage must be made by Buyer in writing within 10 days of receipt of the product with respect to which the claim is being made. Seller reserves the right to accept or reject any such claim in whole or in part. Cancellation, modification, suspension, or delay in shipment of Buyer's order will not be accepted on terms that will not fully indemnify and reimburse Seller against loss. Such indemnity shall include recovery of all direct costs incurred, including normal indirect and overhead charges and a normal profit. No change proposed by Buyer in any terms and conditions shall be valid or binding upon Seller unless approved in writing by Seller's duly authorized personnel. Seller will not approve any change proposed by Buyer once the work is in process, and in no event may Buyer cancel, modify, suspend or delay shipment if notice of such proposed change is not received before the time work goes in process. If the work is in process, Buyer shall be charged for any castings made as well as the costs of cores, molds, or equipment discarded because of such changes. Seller may cancel any order without penalty: (a) if Buyer fails to comply with the terms or conditions of these Terms or such order; (b) if Buyer files a voluntary petition under any federal or state bankruptcy or insolvency act, an involuntary bankruptcy petition is filed against Buyer, or Buyer is declared insolvent or has a receiver or trustee appointed for it or its assets, or if Buyer makes an assignment for the benefit of creditors or commences proceedings under any state insolvency or similar law; or (c) as otherwise provided herein.

**GOVERNING LAW; VENUE; JURISDICTION:** The validity, construction and enforcement of these Terms and any order hereunder shall be governed by the internal laws of the State of Wisconsin, without regard to its conflicts of laws principles. The 1980 United Nations Convention on Contracts for the International Sale of Goods shall not apply. Buyer hereby consents to the jurisdiction and venue of the courts located in the State of Wisconsin.

**CONFIDENTIALITY:** All information furnished by Seller or any other person acting on behalf of Seller and all information learned about Seller or its operations through performance of an order or the Terms is confidential, and Buyer shall not disclose any such information to any other person, or use such information for any purpose other than performing any order or the Terms without Seller's express written consent.

**MISCELLANEOUS:** If any provision of these Terms is held to be invalid or unenforceable, the remainder of these Terms shall not be affected thereby. No waiver or modification of any of the provisions hereof shall be binding upon Seller unless in writing and signed by an authorized representative of Seller. Buyer may not assign the Terms, any order or any interest therein without the written consent of Seller. Any such actual or attempted assignment without Seller's prior written consent shall be void and shall entitle Seller to cancel any applicable order upon written notice to the Buyer.

## **NEENAH'S NO PAINT POLICY**

Painting of Neenah Castings has been discontinued for several reasons.

1) Asphaltic base paint contains volatile organic compounds or VOC's. VOC's are those air emissions coming from petroleum refineries, surface coating operations, and organic chemical manufacturing plants, to name a few. These compounds contribute to "air pollution" and are controlled under the authority of the United States Environmental Protection Agency and the Wisconsin Department of Natural Resources. In order to comply with the regulations of these agencies which limit the allowable amount of VOC's emitted per gallon of paint, Neenah Foundry construction castings will not be painted.

2) Cast iron corrosion can best be described when compared to the corrosion of steel. The physical characteristics that differ between the two include the greater concentrations of carbon and silicon in cast iron. These elements provide substantial corrosion resistance in gray iron.

Much of the carbon in gray iron occurs in the form of graphite flakes. This graphite is inert in most corrosive environments and provides a protective physical barrier against corrosion of the metal matrix. Technically speaking, it's called graphitization. However, the graphite layer can technically be worn away exposing the iron to further oxidation.

Silicon in gray iron occurs in the metal matrix. When oxidation due to moisture initially occurs, a bright orange oxide results. This loosely adhering oxide is water soluble and is easily washed or worn away. The presence of silicon in the iron eventually causes a much tighter adhering, insoluble, black oxide-iron silicate scale which inhibits further corrosion.

3) Painting of castings is cosmetic and, in fact, conceals defects which would be visible if the castings were unpainted.

4) Painted castings interferes with the significant and desirable bond between the frame and concrete.

5) The study, "A Guide To Standardized Highway Drainage Products," states that painting, welding or plugging of cast iron castings is not allowed. This study was conducted by Task Force No. 13 under the sponsorship of the Joint Committee of the American Association of State Highway and Transportation officials, the Associated General Contractors, and the American Road and Transportation Builders Association.

6) Attesting to its long life, cast iron water pipe is still in service today at Versailles, France supplying the famous fountains since its installation in 1664!

Neenah Foundry is continually upgrading its manufacturing facilities to provide the customer with a quality product. We also must protect the environment in which we live.

Neenah's *Unpainted Castings Brochure* is available on request or on our website at [www.neenahfoundry.com](http://www.neenahfoundry.com).

### **DO NOT PAINT...**

**...if environmental protection is a concern (The painting process emits VOC's into the environment.)**

**...to allow concrete to properly adhere to the castings. (Paint creates a barrier to adhesion.)**

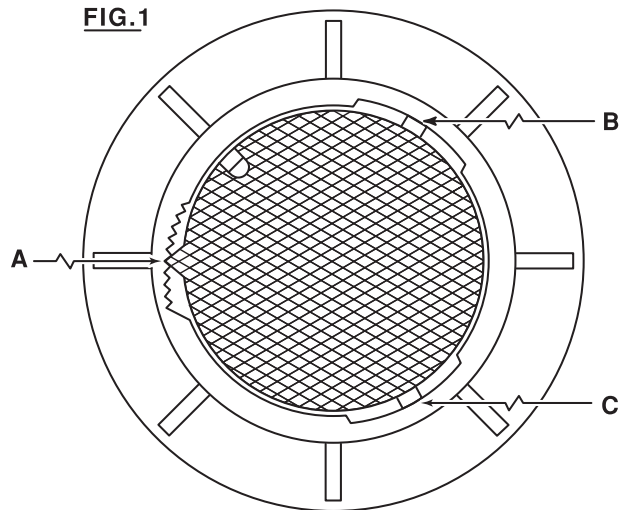
**...to visually inspect the quality of the casting. (Paint hides manufacturing defects.)**

## Non-Rocking Type Manhole Covers and Catch Basin Grates

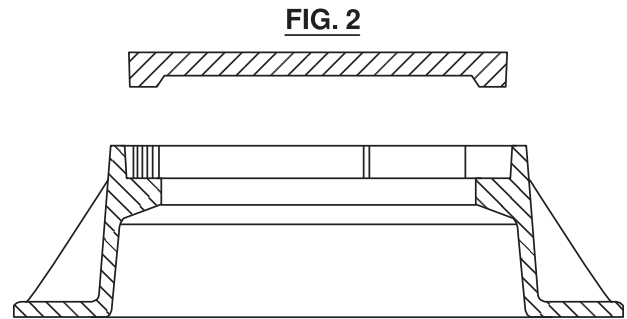
**NO NOISE  
DOES AWAY WITH LOCKS**

### Simple, Quick Adjustment

Adjustment of the Non-Rocking Cover/Grate is made by placing it in the frame and then rotating until the pointed lug on its edge engages a corresponding slot in the frame. There are multiple slots, each of which changes the diameter of the opening. Moving into place is readily accomplished by placing a hook in the pickhole and drawing the lid around until it fits snugly. When properly positioned, the Non-Rocking Cover/Grate will remain firmly seated in the frame. Removal may be accomplished with equal ease.



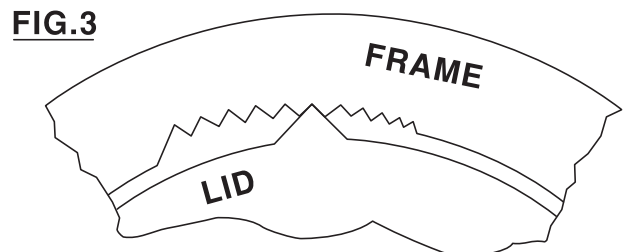
*Fig. 1 is a top plan of manhole cover showing side-bearing lugs on lid at A, B and C. Lug at A is pointed and, by rotation of the lid, may be fitted to an appropriate slot in the rack of graduated teeth of frame. Properly seated, lid cannot rock.*



*Fig 2. is a sectional view of manhole cover with lid removed.*



*Illustrating Non-Rocking feature applied to R-1689 with Type B lid.*



*Fig 3 is an enlarged view of A, showing pointed lug and graduated rack. The three bearing points, plus the tooth rack feature which receives and adjusts the pointed lug, combine to prevent movement of the lid. The lid remains properly seated in the frame.*

■ **Note:** When specifying/ordering grates, refer to "Choosing the proper inlet grate" on pages 117-118.  
 For a complete listing of FREE OPEN AREAS and WEIR PERIMETERS of all NEENAH grates, refer to pages 306-311.

## LiftMate Hinge System

Neenah Foundry has advanced municipal castings to a whole new level of function and safety. Our patent-pending LiftMate Hinge System eases operation and access while virtually eliminating many traditional hazards of working with covers for manholes, grates and trenches.

The LiftMate Hinge System provides a controlled motion pivot that helps protect workers from excess strain or off-balance maneuvering. That helps prevent on-the-job accidents as well as reduces lost-time injuries.



Illustrating R-3210-LLM

### Premium Performance

- Strong yet light platen gray iron lids provide excellent sound dampening
- Excellent strength and wear resistance - almost indestructable
- High-quality precision castings in a range of sizes

### Ball-and-Socket Hinge

- Unique design provides stability when opening or closing cover
- Handhole allows opening with a simple lever or pickaxe to significantly reduce lifting effort
- "Hold-open" safety arm prevents accidental closure
- Performance tested to more than 13,000 open-and-close cycles
- Cover easily disengages for removal or replacement
- Allows closure without having to lift full weight of cover
- Helps prevent back injuries and lost time

### Functional Flexibility

- Optional watertight application
- Security bolting options available
- Custom logo lids available
- Compatible with most internal sealing boots



### LiftMate Frame, Solid Gasketed Lid

	Clear Opening	Frame Height
R-1550-LM	21" dia.	9"
R-1642-LM	24 1/8" dia.	7"
R-1650-LM	24 1/8" dia.	4"
R-1743-LM	30" dia.	6"
R-1753-ALM	27 1/8" dia.	7"
R-1755-F2LM	25" dia.	7"

### LiftMate Inlet Frame, Grate

	Clear Opening	Frame Height
R-3210-ALM	22" x 22"	6"
R-3210-LLM	22" x 22"	6"
R-3222-1ALM	22" x 19 1/2"	7"

### LiftMate Trench Frames, Airport Grates

	Clear Opening	Frame Height
R-4994-HALM	22" trench	6"

Refer to the specific catalog pages for complete details on the above items.

Neenah Foundry is continually adding additional LiftMate offerings, please contact us for your needs.



Illustrating R-1753-ALM



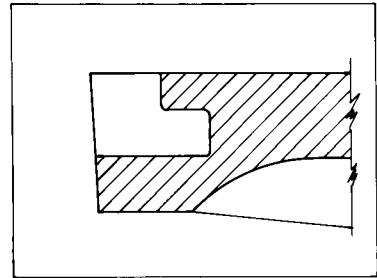
Illustrating R-1755-F2LM

## Self-Sealing Manhole Covers

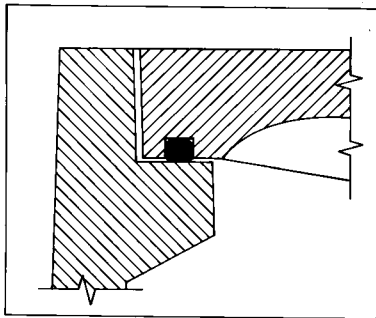
### How Self-Sealing Neenah lids prevent surface water inflow

You may be getting as much as 45 gallons of inflow per minute through some of your manhole covers. Now you can stop unwanted inflow with Neenah Self-Sealing lids.

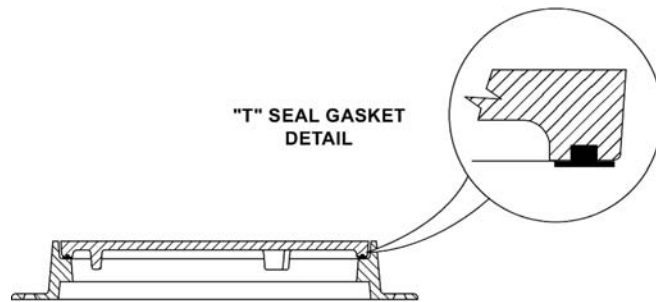
At the heart of Neenah's Self-Sealing system is a gasket which fits firmly and securely within the castings precisely machined groove. The gasket material is of special composition with good sealing qualities, abrasion resistance and low compression set.



*Neenah Self-Sealing lids include concealed pickholes which allow no water to enter. The lid can be easily removed using various common tools.*



*Self-Seal lids are shipped with gaskets pre-installed and glued firmly in place for ease of installation and extended life.*



*Most of our Self-Seal lids are furnished with our T-Seal gasket as shown above.*

### How to specify Neenah Self-Sealing Lids

Neenah Self-Sealing lids are available in most sizes to fit existing frames without digging, caulking or plugging. For new work, casting sets can be furnished with Self-Sealing lids in almost any size.

#### For New Construction

Specify: The Neenah catalog number - frame and lid with Self-Sealing application

#### For Replacement Neenah Lids Only

Specify: Self-Sealing replacement lids only per Neenah catalog number.

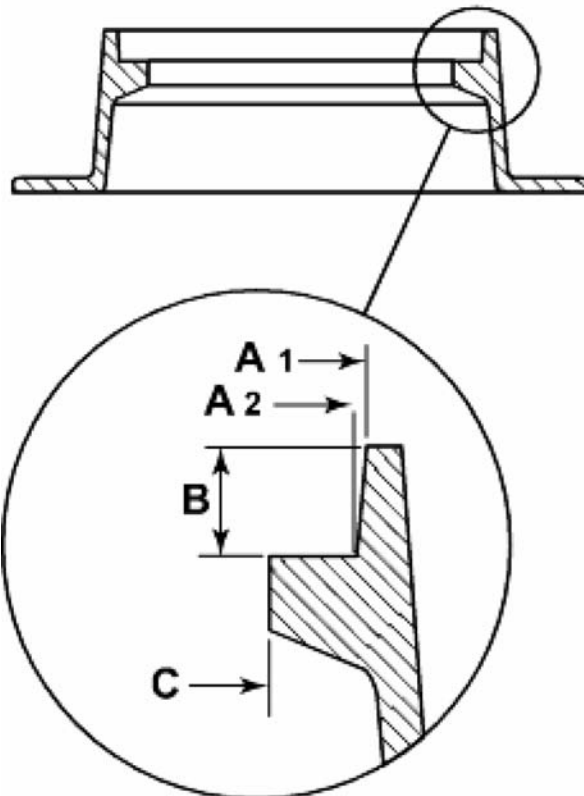
#### For lids of unknown origin:

Specify: Neenah Self-Sealing lids only to fit essential frame dimensions as follows: (see drawing at right)

**CAUTION:** Existing frames with seating surface narrower than 7/8" may require a T-seal gasket to create an effective seal.

#### IMPORTANT:

Be sure to include all dimensions as shown in sketch.

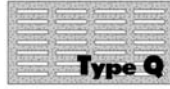


■ Note: When specifying/ordering grates, refer to “Choosing the proper inlet grate” on pages 117-118.  
 For a complete listing of FREE OPEN AREAS and WEIR PERIMETERS of all NEENAH grates, refer to pages 306-311.

## Narrow Slot Grates

Castings available with Type Q Grates

Catalog No.	Outside Dimensions	Thickness
R-1750-C1	31 7/8 dia.	1 3/8
R-1878-A1G	13 3/4 x 13 3/4	1 1/2
R-1878-A6G	25 3/4 x 25 3/4	1 1/2
R-1878-A9G	31 3/4 x 31 3/4	1 1/2
R-1881-H1	12 x 23 7/8	1 1/2
R-2569	16 x 16	1/2
R-3067	17 3/4 x 35 1/4	2
R-3540	31 3/4 x 33	3
R-3573-Q	26 1/2 x 23 13/16	2 1/2
R-3919	18 1/4 x 23 1/4	2 1/2
R-4441-1	12 x 12	1
R-4808-A	24 x 24	2
R-4859-Q	27 1/2 x 27 1/2	1
R-4990-CX	12 x 23 7/8	1 1/2
R-4990-DX	14 x 23 7/8	1 1/2
R-4990-HX	26 x 23 7/8	1 1/2
R-4996-A	8 x 29 7/8	1
R-4996-B	10 x 29 7/8	1
R-6133	25 dia.	1



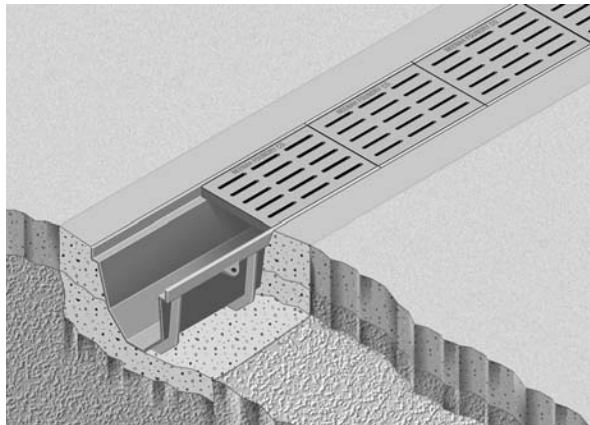
**Type Q**  
 Type Q grates have a 3/8" to 1/2" slot width



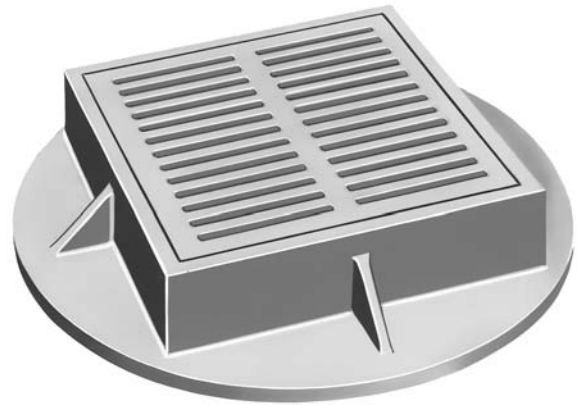
**Type P**  
 Type P grates have a 1/4" slot width

Castings available with Type P Grates

Catalog No.	Outside Dimensions	Thickness
R-3169	10 7/8 x 20	1 11/16
R-3205	17 x 22	1 3/4
R-4001-B	8 1/8 x 13 15/16	1
R-4015-A	9 x 11	1
R-4406-P	9 x 23 7/8	1 1/2
R-4430-1	11 x 23 7/8	1 1/8
R-4990-AX	8 x 23 7/8	1 1/2
R-4990-BX	10 x 23 7/8	1 1/2
R-4990-CX	12 x 23 7/8	1 1/2
R-4990-DX	14 x 23 7/8	1 1/2
R-4990-EX	17 x 23 7/8	1 1/2
R-4990-FX	20 x 23 7/8	1 1/2
R-4995-A1	11 1/2 x 23 7/8	3/4
R-4996-A1	11 1/2 x 23 7/8	1 1/2



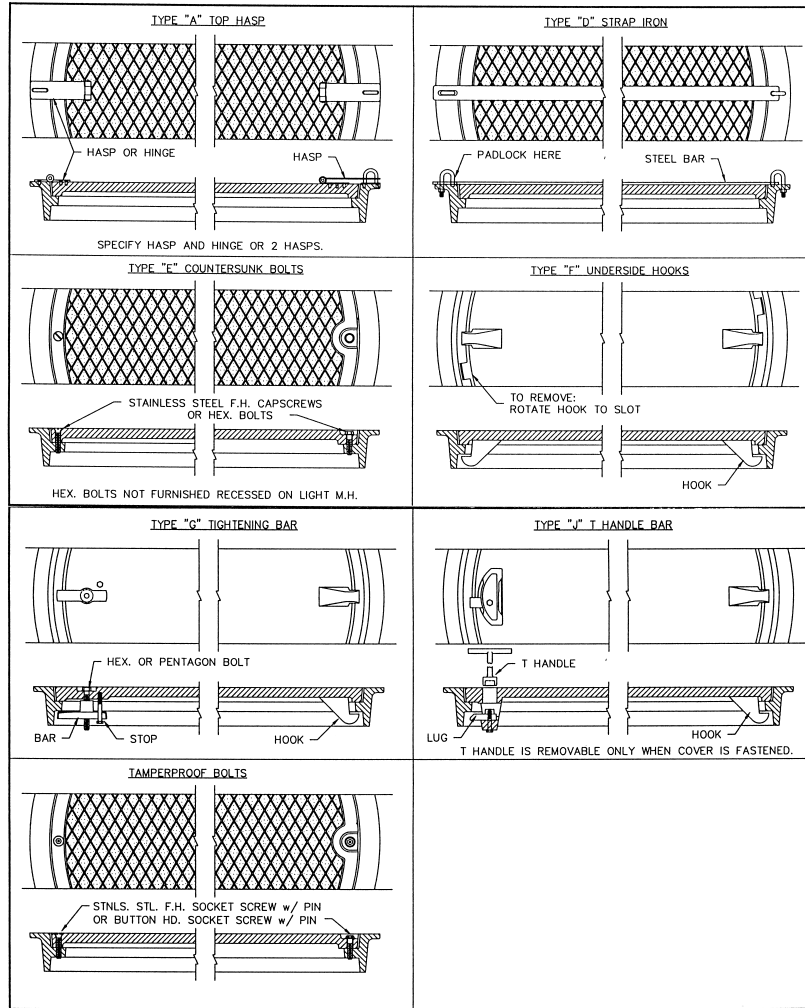
Illustrating R-4996-A trench with Type Q grate



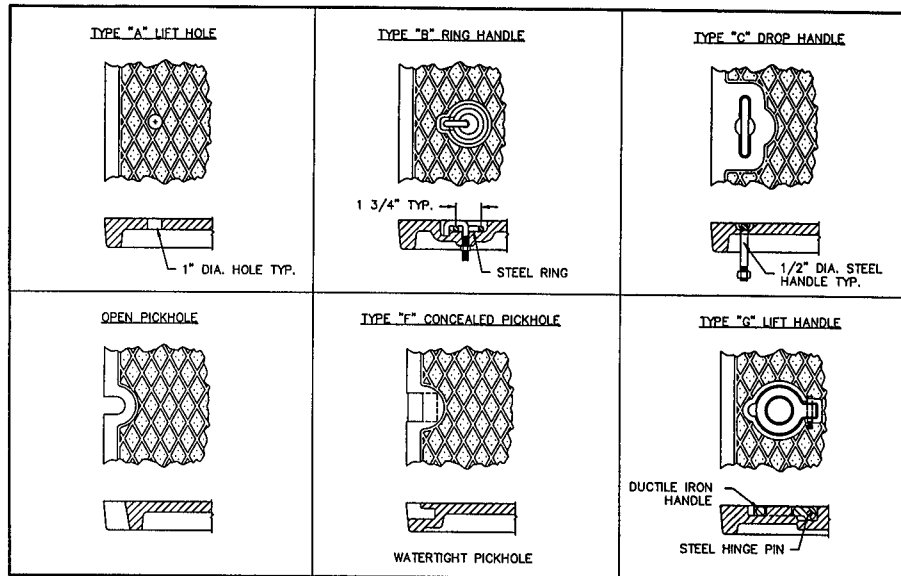
Illustrating R-2569 with Type Q grate



## Fastening Devices



## Lift Handles and Pickholes



# FREE OPEN AREAS OF NEENAH GRATES

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-1792-AG	G	0.2	2.7	R-2031	E	1.1	6.0	R-2298	F	1.2	6.7	R-2453	K	0.8	6.2
R-1792-BG	G	0.3	3.5	R-2040	D	0.9	6.0	R-2299	B	1.2	6.7	R-2461-A	A	1.1	5.8
R-1792-CG	G	0.5	4.3	R-2040	C	1.1	6.0	R-2299	F	1.2	6.7	R-2461-A	B	1.2	5.8
R-1792-DG	G	0.7	4.8	R-2040	E	1.1	6.0	R-2300	G	1.2	6.8	R-2461-A	C	1.1	5.8
R-1792-EG	G	1.0	5.8	R-2040	F	0.7	6.0	R-2300	C	1.6	6.8	R-2464	D	1.0	6.0
R-1792-FG	G	1.7	6.6	R-2050	D	0.9	6.0	R-2370	B	1.2	6.8	R-2466-A	B	1.2	5.8
R-1792-GG	G	2.0	7.4	R-2050	C	1.1	6.0	R-2370	F	1.3	6.8	R-2466-A	E	1.1	5.8
R-1792-HG	G	2.7	9.0	R-2050	E	1.1	6.0	R-2370	A	1.1	6.8	R-2467	C	1.1	5.9
R-1792-JG	G	3.7	10.5	R-2050	F	0.7	6.0	R-2370	G	1.2	6.8	R-2467	D	0.9	5.9
R-1792-KG	G	4.8	12.1	R-2060	A	1.1	6.0	R-2371	G	1.2	6.7	R-2471	D	0.9	5.9
R-1878-A1G	A or C	0.5	4.6	R-2060	B	1.2	6.0	R-2390	G	1.4	6.7	R-2471-B	D	0.9	5.9
R-1878-A2G	A or C	0.8	6.0	R-2060	C	1.1	6.0	R-2390	C	1.5	6.7	R-2474	A	1.1	5.7
R-1878-A3G	A or C	1.0	6.7	R-2060	E	1.1	6.0	R-2392	C	1.4	6.7	R-2474	G	1.2	5.7
R-1878-A4G	A or C	1.1	7.3	R-2070	D	0.9	6.0	R-2392	G	1.4	6.7	R-2475	A	1.1	5.8
R-1878-A5G	A or C	1.8	7.8	R-2070	B	1.2	6.0	R-2394	G	1.2	6.8	R-2481	A	1.1	5.7
R-1878-A6G	A or C	2.7	8.6	R-2070	E	1.1	6.0	R-2395-1	G	1.6	6.6	R-2494	G	0.8	5.1
R-1878-A7G	A or C	2.1	9.2	R-2077	B	1.2	6.0	R-2398	G	1.4	6.7	R-2496	G	0.6	4.7
R-1878-A8G	A or C	2.3	9.8	R-2077	C	1.1	6.0	R-2401	G	1.4	6.8	R-2498	G	0.4	4.1
R-1878-A9G	A or C	2.5	10.6	R-2077	D	1.0	6.0	R-2401	C	1.6	6.8	R-2498-A	G	0.4	4.1
R-1878-A10G	A or C	3.0	12.3	R-2077	E	1.1	6.0	R-2401-A	G	1.2	6.5	R-2498-B	G	0.4	4.1
R-1878-B1G	A	0.6	5.7	R-2077	F	0.6	6.0	R-2401-B	E	0.9	6.2	R-2499	G	0.2	3.1
R-1878-B2G	A	0.9	6.5	R-2080	D	1.0	5.9	R-2402	G	0.7	6.5	R-2500	H	0.9	6.2
R-1878-B3G	A	1.2	7.5	R-2080	C	1.2	5.9	R-2402	C	1.1	6.5	R-2501	A	1.1	6.8
R-1878-B4G	A	2.1	8.5	R-2090	A	1.1	5.0	R-2404	G	1.1	6.7	R-2501	C	1.2	6.8
R-1878-B5G	A	2.5	9.6	R-2090	B	1.2	5.8	R-2405	A	1.0	6.5	R-2501	F	1.4	6.8
R-1878-B6G	C	2.6	9.5	R-2090	C	1.2	5.8	R-2405	C	1.6	6.5	R-2501	G	1.1	6.8
R-1878-B7G	A	2.6	10.5	R-2090	D	1.0	5.8	R-2410	K	0.9	6.1	R-2502	C	1.2	6.0
R-1878-B8G	A	3.7	12.6	R-2090	E	1.1	5.8	R-2411-A	G	0.7	6.6	R-2502	D	0.9	6.0
R-1878-B9G	C	3.3	11.6	R-2090	G	1.0	5.8	R-2412-A	G	1.0	6.2	R-2502	E	1.5	6.0
R-1878-B10G	C	4.9	13.5	R-2100	A	1.1	5.8	R-2412-A1	E	1.0	6.3	R-2502	G	1.3	6.0
R-1878-B11G	A	5.0	14.7	R-2100	C	1.1	5.8	R-2412-A2	G	0.7	6.5	R-2504	G	1.3	6.0
R-1879-A1G	A or C	0.4	4.6	R-2100	E	1.1	5.8	R-2412-A3	C	1.1	6.3	R-2504	D	0.9	6.0
R-1879-A2G	A or C	0.8	6.0	R-2100	F	0.6	5.8	R-2412-A3	E	1.0	6.3	R-2504	C	1.2	6.0
R-1879-A3G	A or C	1.2	6.7	R-2110	A	1.1	5.8	R-2412-A4	C	1.0	6.5	R-2510	C	1.3	5.8
R-1879-A4G	A or C	1.4	7.3	R-2110	E	1.1	5.8	R-2412-A5	K	0.8	6.3	R-2510-1	G	0.4	4.1
R-1879-A5G	A or C	1.9	7.8	R-2112	A	1.1	5.8	R-2412-A6	G	1.1	6.3	R-2510-2	G	1.6	7.2
R-1879-A6G	A or C	2.0	8.6	R-2112	B	1.2	5.8	R-2414	D	1.0	6.1	R-2510-A	Beehive	1.1	5.8
R-1879-A7G	A or C	1.7	9.2	R-2112	C	1.1	5.8	R-2418	G	1.0	6.2	R-2525-A	E	0.2	3.1
R-1879-A8G	A or C	2.2	9.8	R-2112	E	1.1	5.8	R-2418-A	K	1.0	6.3	R-2525-C	G	0.4	4.1
R-1879-A9G	A or C	2.8	10.6	R-2112	F	0.6	5.8	R-2420-A	A	1.0	6.4	R-2525-D	G	0.4	4.1
R-1879-A10G	A or C	3.7	12.3	R-2112	G	0.6	5.8	R-2420-B	G	1.1	5.9	R-2525-E	E	0.6	4.7
R-1879-B1G	A	0.6	5.7	R-2120	A	1.1	5.8	R-2421-A	A	1.0	6.1	R-2525-F	G	0.8	5.4
R-1879-B2G	C	0.9	6.5	R-2120	C	1.1	5.8	R-2422-A	K	1.0	6.2	R-2525-G	G	0.8	5.1
R-1879-B3G	C	1.0	7.5	R-2120	F	0.6	5.8	R-2422-C	G	1.0	6.2	R-2533	A	1.1	5.8
R-1879-B4G	A	1.4	8.5	R-2120	G	1.1	5.8	R-2423	G	1.0	6.2	R-2533	C	1.0	5.8
R-1879-B5G	A	1.9	9.6	R-2250	G	3.0	9.9	R-2424-A	G	0.9	5.9	R-2533	B	1.2	5.8
R-1879-B6G	A	2.4	9.5	R-2251	G	2.9	9.4	R-2427	D	0.9	6.0	R-2534	C	0.9	6.0
R-1879-B7G	A	3.0	10.6	R-2255	C	1.4	8.4	R-2427-A	G	1.0	6.2	R-2535	C	1.1	5.8
R-1879-B8G	A	3.2	12.6	R-2255	G	1.9	8.4	R-2428	D	1.0	6.0	R-2535-A	C	1.1	5.8
R-1879-B9G	A	3.2	11.6	R-2270	G	1.9	8.4	R-2428	C	1.1	6.0	R-2540	D	1.1	5.9
R-1879-B10G	C	4.2	13.5	R-2275	G	1.9	8.4	R-2428	F	0.6	6.0	R-2540-A	D	1.1	5.9
				R-2290	K	1.2	7.6	R-2429	D	1.0	5.9	R-2545	K	0.4	4.7
R-2014	C	1.1	6.0	R-2290-A	K	1.2	7.6	R-2429	E	1.3	5.9	R-2546	K	0.4	3.5
R-2014	E	1.3	6.0	R-2290-B	K	1.0	7.5	R-2429	G	1.2	5.9	R-2548	V	0.8	6.7
R-2015	D	0.9	6.0	R-2293	G	1.6	7.2	R-2435	G	0.9	5.8	R-2549	D	0.9	6.0
R-2015	C	1.1	6.0	R-2296	B	1.2	6.7	R-2437	D	1.0	5.9	R-2552	K	0.8	6.2
R-2015	G	1.2	6.0	R-2296	F	1.2	6.7	R-2437	E	1.3	5.9	R-2553	G	1.1	6.3
R-2030	D	1.1	6.0	R-2297	B	1.2	6.7	R-2437-B	G	0.9	5.8	R-2554	G	1.1	6.3
R-2030	C	1.1	6.0	R-2297	F	1.2	6.7	R-2438	D	1.0	5.9	R-2555	G	1.1	6.3
R-2031	D	1.1	6.0	R-2298	B	1.2	6.7	R-2438	E	1.3	5.9	R-2556	G	1.5	6.7

• NOTE: On catalog #'s R-4990-AA thru R-4999-L9, SQ.FT. OPEN and WEIR PERIMETER are per lineal foot.  
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 \*\* roll-type or mountable curb

# FREE OPEN AREAS OF NEENAH GRATES (Continued)

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-2556	F	1.4	6.7	R-2580-A	G	1.9	8.4	R-3070	L	0.8	4.5	R-3228-J	D	2.2	6.0
R-2556-A	F	1.4	6.7	R-2580-C	G	3.0	9.9	R-3070	R	0.9	4.5	R-3228-K	C	1.9	6.0
R-2556-A	G	1.5	6.7	R-2586-A	E	0.4	3.8	R-3070	V	1.3	4.5	R-3229-A	C	1.5	8.0
R-2557	G	2.0	8.4	R-2586-B	G	0.5	4.2	R-3075	R	0.9	4.5	R-3229-A	D	1.6	8.0
R-2557-A	G	2.0	8.4	R-2586-C	E	0.6	4.7	R-3075-L	L	0.8	4.5	R-3229-A	R	1.6	8.0
R-2557-A4	G	2.0	8.4	R-2586-D	G	0.8	5.2	R-3075-V	V	1.3	4.5	R-3229-L	L	1.5	6.0
R-2558	G	2.0	8.4	R-2586-E	G	0.8	5.1	R-3076	L	1.4	7.9	R-3233	A	2.8	6.4
R-2559	F	1.4	6.7	R-2586-F	G	0.8	5.4	R-3076	V	1.5	7.9	R-3233-D	A	2.8	6.4
R-2559	G	1.4	6.7	R-2586-G	G	1.0	5.8	R-3077	L	2.8	12.9	R-3234-B1	A	1.1	5.3
R-2560-A	Beehive	0.3	3.1	R-2586-H	E	1.3	6.0	R-3077	V	3.0	12.9	R-3234-B1	R	1.4	5.3
R-2560-B	Beehive	0.2	4.1	R-2586-K	G	1.3	6.3	R-3077-L	L	1.4	7.9	R-3235	A	0.9	4.5
R-2560-C	Beehive	0.7	4.7	R-2586-M	G	1.8	7.0	R-3077-L	V	1.5	7.9	R-3235	C	0.7	4.5
R-2560-C1	Beehive	0.7	5.8	R-2586-N	G	1.7	7.9	R-3077-R	L	1.4	7.9	R-3235	L	0.8	4.5
R-2560-C2	Beehive	0.7	5.8	R-2586-O	G	1.9	8.4	R-3077-R	V	1.5	7.9	R-3235	R	0.9	4.5
R-2560-D	Beehive	1.0	5.1	R-2588-A	G	1.1	5.8	R-3078	L	1.4	5.0	R-3236	C	1.2	4.9
R-2560-D1	Beehive	1.2	5.8	R-2588-B	G	1.0	6.5	R-3078	V	1.5	5.0	R-3236-1	C	1.2	4.9
R-2560-D2	Beehive	1.2	5.8	R-2588-C	G	1.9	7.6	R-3079	L	1.4	5.5	R-3236-A	C	1.2	4.9
R-2560-D3	Beehive	1.2	5.8	R-2595-A	D	1.2	6.0	R-3079	V	1.5	5.5	R-3237	C	1.3	4.9
R-2560-D5	Beehive	1.0	5.1	R-2650	G	1.1	6.7	R-3157-1	A	1.1	5.2	R-3237-1	C	1.3	4.9
R-2560-D6	Beehive	1.0	5.1	R-2668	C	0.9	6.2	R-3157-2	L	1.6	5.2	R-3237-A	C	1.3	4.9
R-2560-D7	Beehive	1.3	5.3	R-2680	G	1.1	6.2	R-3157-A	K	2.1	6.0	R-3237-B	C	1.3	4.9
R-2560-D8	Beehive	1.3	5.3	R-2682	A	1.5	7.3	R-3157-A	L	1.2	6.0	R-3238	C	1.3	7.4
R-2560-E	Beehive	1.2	6.0	R-2750	Q	1.8	8.3	R-3157-AL	L	2.3	6.0	R-3246	C	1.6	5.8
R-2560-EA	Beehive	1.2	6.7					R-3159-A	S	1.3	4.9	R-3246	L	2.1	5.8
R-2560-EB	Beehive	1.8	6.7	R-3010	S	1.0	4.6	R-3161	S	1.3	4.7	R-3246	V	2.4	5.8
R-2560-E1	Beehive	1.4	6.7	R-3010	A	1.0	4.6	R-3165	A	1.4	4.5	R-3246-A	C	2.2	7.0
R-2560-E2	Beehive	2.0	6.7	R-3010	L	0.9	4.6	R-3165	V	1.2	4.5	R-3246-A	R	2.7	7.0
R-2560-E5	Beehive	1.2	6.7	R-3010	R	1.1	4.6	R-3169	B	0.7	3.5	R-3246-AL	L	3.1	7.0
R-2560-E6	Beehive	1.8	6.7	R-3010-L	L	0.9	4.6	R-3169	P	0.2	3.5	R-3246-AL	R	2.7	7.0
R-2560-E7	Beehive	1.2	6.7	R-3015	L	0.9	4.6	R-3169	S	0.5	3.5	R-3246-AM	R	1.9	5.8
R-2560-E8	Beehive	1.8	6.7	R-3015	R	1.1	4.6	R-3170	B	0.7	3.5	R-3246-AM	L	3.1	7.0
R-2560-E9	Beehive	1.2	6.7	R-3015	S	1.0	4.6	R-3188	C	0.5	8.6	R-3246-CC	C	1.8	5.8
R-2560-E10	Beehive	1.8	6.7	R-3015	L	0.9	4.6	R-3191	K	3.2	6.2	R-3246-CC	R	1.9	5.8
R-2560-G	Beehive	1.5	8.4	R-3015	A	1.0	4.6	R-3192	K	4.4	7.8	R-3246-CL	L	1.6	5.8
R-2561	Beehive	2.0	6.7	R-3030	A	1.0	4.6	R-3193	K	5.6	8.6	R-3246-CL	C	2.1	5.8
R-2561-A	Beehive	1.2	6.7	R-3030	R	1.1	4.6	R-3203-A	H	1.0	6.6	R-3246-E	C	1.6	5.8
R-2563	Beehive	1.2	5.8	R-3030	L	0.9	4.6	R-3203-B	H	1.0	6.6	R-3247-2D	R	3.8	8.4
R-2564	Beehive	1.0	5.8	R-3030	S	1.0	4.6	R-3203-C	H	1.0	6.6	R-3247-2L	L	4.6	8.4
R-2565-A	G	0.8	5.5	R-3031-B	S	0.8	4.8	R-3205	K	0.9	6.5	R-3247-2Q	Q	1.8	8.4
R-2565-C	G	1.2	6.0	R-3032-B	S	0.8	4.8	R-3205	P	0.3	6.5	R-3249-F	S	1.1	4.7
R-2565-E	G	1.8	7.1	R-3034-B	S	1.1	4.8	R-3210-A	A	1.5	8.0	R-3250-A	K	1.5	5.5
R-2565-F	G	1.8	7.1	R-3035-A	S	1.1	4.8	R-3210-A	C	1.5	8.0	R-3250-1	K	1.5	5.5
R-2565-G	G	1.6	7.1	R-3036-B	S	1.1	7.4	R-3210-A	R	1.6	8.0	R-3250-B	R	1.4	5.8
R-2565-H	G	1.9	7.6	R-3038-A	S	1.5	4.8	R-3210-ALM	C	1.5	8.0	R-3250-C	R	1.4	5.8
R-2565-J	G	2.4	8.5	R-3039-A	S	1.5	5.0	R-3210-L	L	1.5	8.0	R-3250-BL	L	1.0	5.8
R-2569	Q	0.6	5.3	R-3065	R	0.9	4.5	R-3210-LLM	L	1.4	8.0	R-3250-BSP	D	1.4	7.6
R-2570	G	0.8	5.4	R-3065	A	0.9	4.5	R-3210-Q	Q	0.8	8.0	R-3250-BSP	L	1.0	7.6
R-2571-A	F	0.9	5.8	R-3065	C	0.7	4.5	R-3220	C	1.5	8.0				
R-2571-B	F	1.1	5.8	R-3065-L	L	0.8	4.5	R-3220	R	1.6	8.0	R-3250-CL	L	1.0	5.8
R-2571-C	F	0.9	5.8	R-3065-V	V	1.3	4.5	R-3220-L	L	1.5	6.0	R-3250-BV	V	1.3	7.1
R-2571-D	F	0.7	6.0	R-3066	R	1.4	5.3	R-3222-C	C	1.4	5.6	R-3250-CV	V	1.3	5.8
R-2571-E	F	1.2	6.8	R-3067	C	1.6	5.8	R-3222-LA	L	1.0	5.6	R-3250-DV	V	1.3	5.8
R-2572	F	1.3	6.7	R-3067	L	2.1	5.8	R-3222-1A	L	1.0	7.6	R-3250-DVSP	V	1.3	5.8
R-2573-Series	F	1.3	6.7	R-3067	R	2.0	5.8	R-3222-1ALM	V	1.5	8.0	R-3250-EV	V	1.3	7.6
R-2573-Series	C	1.6	6.7	R-3067-C	C	2.1	8.8	R-3227	D	2.3	8.5	R-3250-EVSP	V	1.3	7.6
R-2577-Series	B	1.0	6.7	R-3067-C	L	2.1	8.8	R-3227-C	C	1.9	8.5	R-3251	C	1.0	6.3
R-2577-Series	C	1.6	6.7	R-3067-L	L	2.1	5.8	R-3227-D	R	2.3	8.5	R-3252-A	V	1.3	5.8
R-2578	C	1.0	6.0	R-3067-V	V	2.4	5.8	R-3228-BD	R	2.3	6.0	R-3260-A	A	3.2	8.0
R-2579	B	1.3	5.8	R-3067-VB	V	2.7	5.8	R-3228-G	D	2.2	6.0	R-3260-A	L	3.0	8.0
R-2580-A1	C	1.1	8.4	R-3070	A	0.9	4.5	R-3228-H	C	1.9	6.0	R-3261-A	C	1.1	5.5

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 \*\* roll-type or mountable curb

# FREE OPEN AREAS OF NEENAH GRATES (Continued)

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3266	V	1.8	7.3	R-3339	C	1.6	7.8	R-3423	B	1.6	9.9	R-3492-BG	G	2.6	9.9
R-3270	A	0.9	4.4	R-3339-1	C	1.4	7.8	R-3425-A	K	2.1	9.4	R-3492-CG	G	2.6	9.9
R-3273-A	C	1.2	4.7	R-3339-A	A or C	1.8	8.5	R-3425-A	L	2.3	9.4	R-3493-C	G	0.6	6.2
R-3273-A	S	1.0	4.7	R-3340-B	C	1.3	6.8	R-3425-B	K	2.1	9.4	R-3498-K2GS	A or C	1.5	8.6
R-3274	C	1.2	4.9	R-3340-D	C	1.2	7.5	R-3425-B	L	2.3	9.4	R-3498-P2GS	A or C	2.1	10.5
R-3274	S	1.3	4.9	R-3341	K	0.3	3.2	R-3429-A	A or C	1.0	6.0	R-3498-R2GS	A or C	3.0	12.8
R-3274-A	C	1.4	4.9	R-3342	K	0.5	4.4	R-3430	A or C	0.9	6.6	R-3498-R3GS	A	6.0	19.0
R-3274-A	S	1.3	4.9	R-3344	K	1.1	6.2	R-3433	A or C	1.5	8.0	R-3501-D2A	C**	1.0	3.4
R-3274-B	C	1.4	4.9	R-3345	K	1.1	6.8	R-3433	L	1.6	7.9	R-3501-E2	C**	1.4	4.2
R-3274-B	S	1.3	4.9	R-3346	C	1.4	8.9	R-3437	A or C	3.3	12.0	R-3501-HL	D**	3.3	5.8
R-3275	A	1.0	4.6	R-3347	K	1.3	7.4	R-3438-A	A or C	7.0	16.6	R-3501-H4	C**	2.8	6.8
R-3277-A	C	1.2	4.6	R-3347-A	K	2.3	10.4	R-3448-B	A	1.1	6.8	R-3501-L1A	C**	1.2	4.4
R-3277-A	R	1.2	4.6	R-3348	A	1.9	8.0	R-3448-C	C	0.9	6.8	R-3501-L2	V**	1.3	3.7
R-3277-A	L	0.7	4.6	R-3349-A	K	1.8	7.7	R-3448-D	S	1.2	6.8	R-3501-M	A**	2.3	5.6
R-3278-A	C	1.2	4.6	R-3350	K	2.2	9.3	R-3449	A	0.9	6.8	R-3501-N	A**	1.6	4.3
R-3278-A	R	1.2	4.6	R-3351	C	2.7	9.3	R-3451	C	1.5	7.3	R-3501-P	C**	1.5	4.3
R-3278-AL	L	0.7	4.6	R-3356-A	C	1.5	7.6	R-3451-B	C	1.7	7.8	R-3501-PR	L**	1.6	4.7
R-3278-AL	R	1.2	4.6	R-3357-A	C	2.0	8.7	R-3454	A	4.1	13.2	R-3501-R	C**	2.6	5.5
R-3280-A	C	1.8	5.5	R-3359	K	1.1	7.3	R-3454-B	D	2.5	9.9	R-3501-TB	L**	3.1	5.7
R-3280-B	C	1.2	4.5	R-3360-A	C	1.6	7.8	R-3454-BL	L	3.1	7.0	R-3501-TL	L**	1.4	4.6
R-3281-A	C	1.0	4.3	R-3360-A	D	1.7	7.8	R-3454-C	C	2.9	13.2	R-3501-TR	L**	1.4	4.6
R-3281-AL	L	0.5	4.3	R-3361	C	3.2	12.7	R-3455-A	A	2.6	9.8	R-3501-U	L**	2.4	5.0
R-3286-8V	V	0.7	4.4	R-3361	K	3.4	12.7	R-3455-C	A	2.6	10.0	R-3501-U1	L**	2.4	5.0
R-3287-5	V	3.2	11.3	R-3362	C	2.3	10.3	R-3457-C2	A	6.0	14.0	R-3502-A	A**	1.4	4.1
R-3287-10V	V	2.1	5.5	R-3362-1	C	2.3	7.0	R-3460-A	A	0.8	6.0	R-3502-B	A**	1.4	4.2
R-3287-15	V	3.2	7.5	R-3362-1	L	2.9	7.0	R-3460-A	C	1.1	6.0	R-3502-D2	C**	1.9	4.2
R-3287-SB10	S	1.5	5.5	R-3362-L	L	2.9	10.3	R-3460-D	C	0.8	6.0	R-3503-A	B**	1.3	4.1
R-3288-E2	R	2.6	7.6	R-3363-1	C	4.6	10.3	R-3460-D	A	0.8	6.0	R-3503-B	C**	2.0	4.1
R-3288-E2	V	2.8	7.6	R-3363-1	L	5.8	10.3	R-3461	C	1.5	8.0	R-3504-F	C**	2.8	5.1
R-3288-HV2	V	2.8	7.6	R-3381	A	1.0	6.8	R-3462-B	R	1.8	7.6	R-3506-A2	C**	1.4	2.9
R-3289-HV	V	1.4	5.2	R-3382	C	2.3	10.4	R-3463-B	R	3.5	12.6	R-3506-B	C**	1.2	2.9
R-3289-C	R	1.3	5.2	R-3393-A	C	2.0	8.7	R-3465	A	0.8	6.0	R-3507-C	D**	1.6	3.7
R-3290	C	1.6	5.8	R-3396	C	3.2	11.4	R-3465	C	1.1	6.0	R-3507-D	D**	1.6	3.7
R-3290	V	2.4	5.8	R-3397	A	1.1	7.2	R-3466-A	A	0.8	6.0	R-3508-A2	C**	1.7	3.8
R-3290	R	1.9	5.8	R-3401	D	1.9	7.6	R-3466-A	C	0.8	6.0	R-3508-B	C**	1.8	3.8
R-3290	L	2.1	5.8	R-3401-B	B	3.8	11.2	R-3469	A	2.7	9.2	R-3508-B1	D**	1.9	3.8
R-3290-A	C	2.6	9.9	R-3401-C	B	5.7	14.7	R-3469-E2	A	2.7	9.2	R-3508-B2	K**	1.4	7.5
R-3290-A	A	2.6	9.9	R-3402	H	0.4	4.0	R-3469-E2	C	2.3	9.2	R-3508-C	C**	1.4	3.8
R-3290-B	D	3.5	9.9	R-3402-E	A or C	2.1	8.0	R-3470	L	2.2	8.4	R-3509	K**	0.9	2.8
R-3290-C	C	3.7	11.0	R-3403	A	1.1	6.5	R-3470-2	L	4.4	12.4	R-3510	C**	2.9	4.1
R-3290-C	D	3.7	11.0	R-3403-A1	A	1.5	8.3	R-3471	C	0.6	5.8	R-3511	C**	2.0	2.9
R-3290-VB	V	2.7	5.8	R-3403-F	A	3.2	10.6	R-3472	A or C	1.3	7.3	R-3513	A**	1.4	4.7
R-3291	C	1.7	9.0	R-3404	H	1.4	7.2	R-3473	C	0.9	6.3	R-3514-F	C**	2.6	5.5
R-3292	C	1.6	5.8	R-3405	H	1.5	7.9	R-3475	A	2.7	9.8	R-3514-F2	C**	5.1	7.7
R-3295	C	2.1	5.8	R-3405-A	H	1.3	8.0	R-3475-3	A	4.1	13.7	R-3516	C**	4.0	6.2
R-3295	L	2.1	5.8	R-3405-A	L	1.5	8.0	R-3475-A	A	2.7	9.8	R-3516-1	C**	2.0	4.3
R-3295	V	2.4	5.8	R-3405-B	H	1.3	8.0	R-3475-E	A	2.4	9.8	R-3517	C**	1.8	3.7
R-3295-2	C	4.2	8.8	R-3405-B	L	1.5	8.0	R-3475-F	C	4.8	13.8	R-3525-L	L**	1.1	4.7
R-3295-2	L	4.2	8.8	R-3406	C	1.8	9.8	R-3475-G	C	7.2	17.8	R-3526-L	L**	1.9	5.7
R-3295-2	R	3.8	8.8	R-3406-A	C	1.8	9.8	R-3475-H	C	9.6	21.8	R-3527-M	V	3.4	11.3
R-3295-2	V	4.8	8.8	R-3406-2	C	3.7	15.9	R-3477-A	C	3.3	12.3	R-3527-V	V	1.7	5.6
R-3295-3	C	6.3	11.8	R-3406-A2	C	3.7	15.9	R-3480	C	3.3	12.7	R-3528-V	V	1.7	7.5
R-3295-3	L	6.3	11.8	R-3408-L	L	1.2	7.3	R-3480-A	A	1.6	8.5	R-3529-V	V	3.4	11.3
R-3295-3	R	5.7	11.8	R-3408-AL	L	2.4	9.7	R-3481	C	3.3	12.0	R-3531-A	H	6.0	13.0
R-3295-3	V	7.2	11.8	R-3408-BL	L	2.4	12.5	R-3491-AG	G	0.9	5.5	R-3531-B	H	6.0	13.0
R-3297-1	C	2.3	7.5	R-3409	C	1.5	7.6	R-3491-GG	G	1.6	7.1	R-3531-C	H	3.0	9.1
R-3297-1	L	2.4	7.5	R-3413	C	1.5	9.0	R-3491-HG	G	1.9	7.6	R-3531-D	H	3.0	9.1
R-3337-A	C	1.1	6.0	R-3415	A	4.1	13.5	R-3491-JG	G	2.4	8.5	R-3531-E	C	4.7	12.7
R-3338-F	A	1.4	6.5	R-3416	A	1.4	9.8	R-3492-1	G	1.6	7.1	R-3540	L	3.2	10.6
R-3338-G	A	2.8	9.5	R-3420	A	1.2	10.0	R-3492-A1	G	2.4	8.5	R-3540-2	L	6.4	16.3

• NOTE: On catalog #'s R-4990-AA thru R-4999-L9, SQ.FT. OPEN and WEIR PERIMETER are per lineal foot.  
 Type K indicates "Special" grate style and is not among standard types illustrated.  
 \*\* roll-type or mountable curb

# FREE OPEN AREAS OF NEENAH GRATES (Continued)

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3541	L	1.6	7.3	R-3921-B1	B	0.7	4.5	R-4015-A	P	0.1	3.6	R-4352	Beehive	1.3	5.8
R-3541-2	L	3.2	11.3	R-3921-L1	L	0.3	4.1	R-4015-A1	B	0.2	3.6	R-4353	Beehive	1.8	6.7
R-3550-2	C	5.8	15.2	R-3921-V1	V	0.5	4.1	R-4015-B	C	0.4	3.6	R-4360-A	Beehive	0.6	4.3
R-3555	B	0.5	5.3	R-3922	V	1.1	6.0	R-4015-C	B	0.3	3.6	R-4360-B	Beehive	0.8	4.7
R-3560	A or C	1.5	8.4	R-3922-A	V	0.8	5.0	R-4015-D	B	0.2	3.6	R-4360-C	Beehive	1.4	4.5
R-3561	A or C	2.3	10.4	R-3923	V	1.6	5.6	R-4015-D	P	0.1	3.6	R-4360-D	Beehive	0.7	6.3
R-3562	L	1.5	8.7	R-3924	A	2.3	8.4	R-4016-B	C	0.5	4.8	R-4370-1	C	0.1	1.7
R-3563-HB	K	1.3	7.3	R-3927	B	2.3	8.5	R-4016-H1	A	0.6	5.3	R-4370-2	G	0.2	2.5
R-3563-L	L	1.4	7.3	R-3927-A	B	2.3	8.5	R-4016-K	B or D	1.0	6.3	R-4370-3	E	0.4	3.9
R-3570	A	2.4	7.4	R-3928	B	0.5	1.9	R-4018	B	0.2	3.8	R-4370-4	G	0.6	3.9
R-3570-A	A	2.4	7.4	R-3930	B or D	0.3	3.0	R-4030-4	H	0.1	1.5	R-4370-5	G	0.8	4.7
R-3571	A	2.4	7.4	R-3935	A or C	0.6	5.3	R-4030-6	H	0.1	2.1	R-4370-6	G	0.8	5.1
R-3571-A	A	2.4	7.4	R-3935	V	1.5	5.3	R-4030-8	H	0.2	2.7	R-4370-7	G	0.8	5.2
R-3572-A	R	4.4	12.3	R-3936-A	C	1.0	6.5	R-4030-10	H	0.3	3.3	R-4370-8	E	1.0	5.5
R-3572-2D	R	3.8	12.3	R-3940	A	1.0	6.1	R-4030-12	H	0.4	3.9	R-4370-9	C	1.3	5.8
R-3572-2L	L	4.6	12.3	R-3942	V	0.8	5.1	R-4030-15	H	0.8	4.8	R-4370-10	A	1.1	5.8
R-3572-2Q	Q	1.8	12.3	R-3943	V	1.2	6.9	R-4030-18	B	1.1	5.8	R-4370-12	F	0.9	5.8
R-3573-2D	R	3.8	12.3	R-3945	L	2.4	13.0	R-4030-21	B	1.3	6.7	R-4370-13	G	1.3	5.8
R-3573-2L	L	4.6	12.3	R-3945-A	L	2.4	13.0	R-4030-24	B	2.1	7.6	R-4370-15	D	1.0	5.9
R-3573-2Q	Q	1.8	12.3	R-3945-2	L	2.4	13.0	R-4030-27	G	2.8	8.6	R-4370-17	D	1.0	6.0
R-3574-2D	R	3.8	12.3	R-3945-8	L	2.4	13.0	R-4030-30	G	3.4	9.4	R-4370-18	E	1.3	6.0
R-3574-2L	L	4.6	12.3	R-3946	L	2.9	13.5	R-4040-6	E	0.1	2.1	R-4370-21	D	0.9	6.0
R-3574-2Q	Q	1.8	12.3	R-3946-A	L	9.2	15.0	R-4040-8	E	0.2	2.7	R-4370-22	D	1.1	6.0
R-3575	B	2.6	9.5	R-3948-A	C	1.1	5.1	R-4040-10	E	0.3	3.3	R-4370-23	H	0.9	6.3
R-3576	R	2.4	9.3	R-3948-V	V	1.5	5.1	R-4040-12	E	0.5	3.9	R-4370-25	G	1.9	7.6
R-3577	D	1.8	9.2	R-3949-A	L	2.5	8.9	R-4040-15	E	0.7	4.8	R-4370-26	G	2.8	8.6
R-3578	L	2.3	10.9	R-3949-B	L	2.5	8.9	R-4040-18	E	0.9	5.8	R-4370-27A	G	2.4	9.9
R-3580	L	1.4	7.9	R-3951	L	1.6	9.0	R-4040-21	G	1.4	6.7	R-4380-AA1	E	2.8 sq. in.	1.0
R-3580-1	L	2.8	12.9	R-3952	B or D	1.1	6.3	R-4040-24	G	1.6	7.6	R-4380-A	E	3.7 sq. in.	1.1
R-3581	V	2.2	9.3	R-3954	B	1.8	8.1	R-4040-27	G	2.3	8.6	R-4380-A1	E	6.0 sq. in.	1.2
R-3588	D	1.8	7.9	R-3955	C	2.6	8.9	R-4040-30	G	2.9	9.4	R-4380-B1	E	4.8 sq. in.	1.3
R-3588-A	H	1.2	7.9	R-3956	Q	1.2	6.9	R-4215-A	Beehive	2.0	9.0	R-4380-1	E	5.4 sq. in.	1.4
R-3588-LL	L	1.6	7.9	R-3961	D	0.7	5.2	R-4215-C	Beehive	3.3	11.3	R-4380-3	E	6.0 sq. in.	1.6
R-3588-LL4	L	1.6	7.9	R-3976	B	0.2	3.3	R-4216-B	Beehive	2.2	4.1	R-4380-4	E	0.1	2.1
R-3588-LR	L	1.6	7.9	R-3977	B	0.1	2.6	R-4217	Beehive	4.9	7.1	R-4380-4A1	E	0.1	2.2
R-3588-LR4	L	1.6	7.9	R-3978	D	1.0	4.0	R-4340-A	Beehive	1.5	6.2	R-4380-4A	E	0.2	2.6
R-3589	D	1.8	7.9					R-4340-B	Beehive	1.1	6.0	R-4380-6	G	0.2	2.8
R-3589-A	H	1.2	7.9	R-4001-B	C	0.3	2.5	R-4340-C	Beehive	1.2	6.0	R-4380-7	G	0.3	3.1
R-3589-LL	L	1.5	7.9	R-4001-B	P	0.1	2.5	R-4340-F	Beehive	1.6	6.5	R-4380-8	E	0.3	3.3
R-3589-LL4	L	1.5	7.9	R-4003-A	A	0.9	6.1	R-4340-F1	Beehive	0.7	4.5	R-4380-9	E	0.4	3.7
R-3589-LR	L	1.5	7.9	R-4003-B	A	0.9	6.1	R-4340-G	Beehive	0.6	5.0	R-4380-10	E	0.5	3.9
R-3589-LR4	L	1.5	7.9	R-4003-C	A	0.9	6.1	R-4340-H	Beehive	0.5	4.5	R-4380-11	E	0.5	3.9
R-3591	A	1.5	8.0	R-4004-A	C	1.3	6.8	R-4341-A	Beehive	2.5	6.0	R-4380-12	E	0.6	4.0
R-3593	C	2.5	12.3	R-4004-B	B	1.5	7.4	R-4342	Beehive	2.0	6.0	R-4380-13	G	0.7	4.2
R-3599-A	L	0.2 per ft.	2 per ft.	R-4004-C	B	1.5	7.4	R-4343	Beehive	2.4	8.4	R-4380-13A	E	0.9	4.7
R-3599-B	L	0.2 per ft.	2 per ft.	R-4004-G1	B or D	1.9	7.3	R-4344	Beehive	0.2	2.9	R-4380-14	E	0.7	4.7
R-3801	C	34.6	42.5	R-4005-A2	B	0.4	4.3	R-4345	Beehive	2.0	8.6	R-4380-15	E	0.6	4.7
R-3805	C	11.6	21.8	R-4006	D	0.3	3.1	R-4346	Beehive	2.0	8.6	R-4380-16	E	0.8	5.0
R-3806	C	17.5	29.8	R-4007	B	0.4	4.3	R-4347	Beehive	2.0	8.6	R-4380-17	E	0.8	5.0
R-3807	D	6.0	13.4	R-4007-A6	B	0.4	4.3	R-4349-C	Beehive	2.4	6.9	R-4380-18	G	0.7	5.2
R-3808-1	C	5.2	12.3	R-4014-B1	A	2.8	9.7	R-4349-D	Beehive	5.4	10.2	R-4380-21	G	1.3	6.3
R-3808-2	C	10.3	19.9	R-4014-B1	C	1.3	9.7	R-4350-1	Beehive	0.3	2.7	R-4380-22	G	1.5	7.0
R-3900-B	L	1.9	7.7	R-4014-C1	A	2.3	8.4	R-4350-A	Beehive	0.3	3.1	R-4380-23	G	1.1	7.3
R-3900-C	L	3.8	11.8	R-4014-C2	A	2.4	8.4	R-4350-B	Beehive	0.4	3.9	R-4380-24	G	1.7	7.9
R-3900-D	L	5.7	16.0	R-4014-T	B	1.2	7.3	R-4350-C	Beehive	0.6	4.8	R-4380-25	G	2.5	8.4
R-3910-V	V	0.3	3.1	R-4014-TL	L	0.5	7.3	R-4350-D	Beehive	1.0	5.8	R-4380-26	G	2.7	8.8
R-3918	V	1.9	7.8	R-4014-T2	B	0.7	4.5	R-4350-E	Beehive	1.7	7.6	R-4385-B	E	0.1	2.1
R-3919	Q	0.9	6.9	R-4014-T2L	L	0.3	4.1	R-4351-B	Beehive	0.5	3.9	R-4385-C	E	0.3	2.7
R-3919	R	1.4	6.9	R-4014-T2V	V	0.3	4.1	R-4351-C	Beehive	1.2	5.2	R-4385-E	E	0.5	3.9
R-3920-V	V	0.9	4.2	R-4015-A	B	0.2	3.6	R-4351-D	Beehive	1.6	5.8	R-4385-F	E	0.5	4.8

• NOTE: On catalog #'s R-4990-AA thru R-4999-L9, SQ.FT. OPEN and WEIR PERIMETER are per lineal foot.  
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 \*\* roll-type or mountable curb

# FREE OPEN AREAS OF NEENAH GRATES (Continued)

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-4385-G	E	1.0	5.8	R-4585	A	1.9	9.1	R-4825-A	A	2.1	9.0	R-4977-1	B	1.5	4.0
R-4385-H	G	1.6	7.6	R-4586	A	1.5	8.6	R-4825-B	C	2.0	9.0	R-4977-2	A	2.0	5.0
R-4385-J	G	2.5	8.6	R-4600	A	0.9	6.5	R-4826	A	1.3	8.0	R-4977-2	B	2.0	5.0
R-4385-K	G	2.7	9.4	R-4603-A	A	0.8	6.7	R-4828	A	1.9	9.5	R-4977-3	A	3.7	10.0
R-4389-O	B	0.2	3.0	R-4604	C	1.3	6.7	R-4829	C	2.2	9.5	R-4977-3	B	3.7	10.0
R-4390	B	0.3	5.0	R-4604-C	A	0.7	6.7	R-4832	C	1.5	8.0	R-4977-4	A	5.3	12.0
R-4400-A	A	0.1	2.7	R-4604-D	A	1.5	6.7	R-4832-B	C	1.8	8.7	R-4977-4	B	5.3	12.0
R-4401	A	0.1	2.7	R-4608	A	0.8	6.0	R-4833	A	2.3	8.7	R-4977-5	A	8.0	15.0
R-4403	A	0.3	3.7	R-4610	A	1.0	6.4	R-4837	A	2.2	9.8	R-4977-5	B	8.0	15.0
R-4404-C	B	0.5	5.3	R-4620	A	0.8	6.0	R-4839	A	2.1	9.9				
R-4406	B	0.5	5.3	R-4630	C	0.9	6.2	R-4840	C	2.8	10.0	R-4990-AA	A	0.2 •	2.0
R-4406-C	A	0.4	5.5	R-4632	C	1.1	6.3	R-4843	A	2.6	10.0	R-4990-AX	A	0.2 •	2.0
R-4406-P	P	0.1	5.5	R-4640	A	1.3	6.4	R-4850	C	2.7	9.0		C	0.3 •	2.0
R-4406-1	A	0.5	5.3	R-4641	A	1.1	6.8	R-4852	C	2.0	9.0		P	0.1 •	2.0
R-4406-2	C	0.6	5.3	R-4641-A	A	1.2	6.8	R-4852-A	Q	1.8	9.0	R-4990-BA	A	0.3 •	2.0
R-4407-2A	B	0.6	5.6	R-4641-C	C	1.1	6.8	R-4853	A	2.5	10.5	R-4990-BX	A	0.3 •	2.0
R-4408	B	0.3	3.4	R-4641-F	A	1.8	8.5	R-4853-A	A	3.1	11.5		C	0.3 •	2.0
R-4409	A	0.4	4.6	R-4649	A	1.1	6.9	R-4853-B1	C	3.3	12.5		P	0.1 •	2.0
R-4409-A	C	0.7	5.7	R-4652	A	1.5	7.9	R-4855	A	2.0	9.3	R-4990-CA	A	0.4 •	2.0
R-4409-C	B	0.5	5.7	R-4660	C	1.1	6.0	R-4856	C	3.1	9.7	R-4990-CX	A	0.4 •	2.0
R-4409-E	A	0.5	5.7	R-4662	A	1.3	6.6	R-4857	A	3.1	12.3		C	0.4 •	2.0
R-4409-G	B	0.8	5.7	R-4670-A	A	1.1	7.0	R-4859-C	A	2.4	9.1		P	0.1 •	2.0
R-4421	C	1.0	8.3	R-4671	A	1.1	7.0	R-4859-C	C	2.3	9.1		Q	0.1 •	2.0
R-4423-A	A	1.2	9.7	R-4672	C	1.1	7.0	R-4859-Q	Q	0.9	9.1	R-4990-DA	A	0.4 •	2.0
R-4424	H	0.6	5.6	R-4689	C	1.4	7.5	R-4859-S	S	2.0	9.1		C	0.4 •	2.0
R-4430-1	P	0.2	5.8	R-4692-A	D	2.0	8.7	R-4871	B	2.7	9.2	R-4990-DX	A	0.4 •	2.0
R-4430-A	A	0.6	6.0	R-4698	A	1.7	9.0	R-4880	C	2.5	9.3		C	0.5 •	2.0
R-4430-B	C	0.7	5.9	R-4710	C	1.5	9.0	R-4880-C	C	2.2	10.0		P	0.2 •	2.0
R-4435-1	C	0.8	4.3	R-4711	C	1.1	9.5	R-4882	A	4.0	11.3		Q	0.2 •	2.0
R-4441-1	Q	0.2	4.0	R-4718	A	2.7	9.3	R-4882-A	A	2.8	11.3	R-4990-EA	A	0.5 •	2.0
R-4443	A	0.4	4.3	R-4720	C	0.9	6.7	R-4884-A	C	3.3	6.0	R-4990-EX	A	0.6 •	2.0
R-4449	A	0.8	6.0	R-4721-A	A	1.2	7.0	R-4890	C	3.4	10.8		C	0.5 •	2.0
R-4450	A	0.8	6.0	R-4725	H	1.6	7.0	R-4891	A	3.5	13.0		P	0.2 •	2.0
R-4450-A	A	0.6	6.0	R-4730	A	2.0	8.6	R-4893	C	6.0	18.0	R-4990-FA	A	0.6 •	2.0
R-4451	C	0.7	6.0	R-4731	A	2.5	9.8	R-4893-B	C	1.9	11.0	R-4990-FX	A	0.7 •	2.0
R-4454	C	0.9	6.3	R-4732	A	2.0	9.8	R-4894	C	3.3	11.5		C	0.8 •	2.0
R-4460	A	0.8	7.0	R-4735	A	1.2	7.3	R-4895-2	A	6.6	17.0		P	0.5 •	2.0
R-4462	B	0.9	7.8	R-4736	C	1.1	7.3	R-4937-A	B	0.2	2.7	R-4990-GX	A	0.8 •	2.0
R-4470	A	1.5	10.0	R-4738	A	1.1	7.3	R-4937-B	G	0.1	2.2		C	0.7 •	2.0
R-4511	A	0.5	4.7	R-4739	C	1.3	7.3	R-4937-C1	H	0.2	4.0	R-4990-HA	A	0.9 •	2.0
R-4523	A	0.9	6.3	R-4740	C	2.1	8.0	R-4937-C2	H	0.2	4.0	R-4990-HX	A	0.9 •	2.0
R-4525	A	0.8	6.3	R-4750	C	2.4	8.3	R-4937-C3	H	0.2	4.0		C	0.9 •	2.0
R-4530	A	0.8	6.1	R-4750-1	A	2.8	11.3	R-4938	A	0.8	6.9	R-4990-JX	A	1.0 •	2.0
R-4531	A	0.8	6.4	R-4751	C	1.9	7.9	R-4938-B	A	0.2	3.2		C	1.1 •	2.0
R-4540	C	1.0	6.8	R-4752	C	2.3	9.4	R-4941-A	B	0.4	4.7	R-4990-KA2	A	0.5 •	2.0
R-4541	A	1.0	7.1	R-4755-B	A	2.8	10.5	R-4941-B	B	0.4	4.7	R-4990-KX	A	1.2 •	2.0
R-4544	A	1.8	8.7	R-4755-C	C	2.9	10.5	R-4942-A	A	0.7	6.5		C	0.9 •	2.0
R-4545	A	1.8	10.4	R-4759	C	1.5	7.5	R-4943	K	0.3	5.4	R-4990-LX	A	1.2 •	2.0
R-4548	H	1.0	5.9	R-4760	C	1.7	7.3	R-4943-A	K	0.3	5.4		C	1.2 •	2.0
R-4550	H	0.8	5.0	R-4762	C	2.4	8.7	R-4943-B	K	0.3	5.4	R-4990-MX	A	1.4 •	2.0
R-4552	A	0.6	5.3	R-4765	A	1.4	7.7	R-4976-1	A	0.9	3.1		C	1.2 •	2.0
R-4557	A	0.8	5.3	R-4780	C	3.1	9.8	R-4976-1	B	0.9	3.1	R-4990-NX	A	1.4 •	2.0
R-4558	C	1.1	5.9	R-4781	C	3.0	11.7	R-4976-2	A	1.5	4.2		C	1.6 •	2.0
R-4570-1	A	0.9	6.3	R-4795	A	3.2	11.3	R-4976-2	B	1.5	4.2	R-4990-OA	A	1.3 •	2.0
R-4570-2	A	0.9	6.5	R-4798	C	2.4	9.9	R-4976-3	A	2.5	5.2	R-4990-OX	A	1.6 •	2.0
R-4573	A	1.1	7.5	R-4808-A	Q	0.8	8.0	R-4976-3	B	2.5	5.2		C	NA •	2.0
R-4575-A	A	1.7	8.5	R-4810	C	1.5	8.0	R-4976-4	A	3.7	6.3	R-4995-A1	B	0.2 •	2.0
R-4579	A	0.8	6.4	R-4820	C	1.5	8.0	R-4976-4	B	3.7	6.3		C	0.3 •	2.0
R-4583	A	0.9	6.3	R-4821-A	C	1.7	8.3	R-4976-5	B	5.2	8.1	R-4995-A2	B	0.2 •	2.0
R-4584	A	1.3	4.3	R-4825	C	1.8	9.0	R-4977-1	A	1.5	4.0				

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 \*\* roll-type or mountable curb

## FREE OPEN AREAS OF NEENAH GRATES (Continued)

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET	CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-4996-A1	Diagonal	0.3 •	2.0	R-6672-D	A or C	1.1	7.3
	Convex			R-6672-E	A or C	1.8	7.9
	C	0.3 •	2.0	R-6672-F	A or C	2.7	8.6
R-4996-A2	B	0.2 •	2.0	R-6672-F	Q	1.0	8.6
R-4996-A3	C	0.3 •	2.0	R-6672-G	A or C	2.2	9.0
R-4999 Series	Same as R-4990 Series			R-6672-H	A or C	2.1	9.2
R-4999-L3	L	0.3 •	2.0	R-6672-J	A or C	2.4	10.0
R-4999-L6	L	0.8 •	2.0	R-6672-K	A or C	2.5	10.6
R-4999-L9	L	0.9 •	2.0	R-6672-K	Q	2.1	10.6
R-5901-A	G	0.2	2.7	R-6672-M	A or C	3.0	12.3
R-5901-B	G	0.3	3.5	R-6672-Q	A or C	9.3	18.8
R-5901-C	G	0.5	4.3	R-6673-A	A	0.6	5.7
R-5901-D	G	0.7	4.8	R-6673-B	A	0.9	6.5
R-5901-E	G	1.1	5.8	R-6673-C	A	1.2	7.5
R-5901-F	G	1.6	6.6	R-6673-D	A	2.1	8.6
R-5901-G	G	2.0	7.4	R-6673-E	A	2.5	9.6
R-5901-H	G	4.2	8.9	R-6673-J	A	2.6	9.5
R-5901-J	G	3.7	10.5	R-6673-K	A	2.9	10.6
R-5901-K	G	4.8	12.1	R-6673-L	A	3.7	12.6
				R-6673-N	A	3.3	11.6
R-6110	G	0.9	5.5	R-6673-O	A	4.9	13.5
R-6111	G	1.2	6.0	R-6673-Q1	A	5.0	14.7
R-6112	G	1.3	6.0				
R-6113	G	0.9	6.3				
R-6114	G	1.8	7.0				
R-6115	G	1.6	7.1				
R-6116	G	1.9	7.6				
R-6117	G	2.4	8.5				
R-6118	G	2.6	9.9				
R-6130	G	0.8	5.4				
R-6131	G	1.0	5.6				
R-6132	G	1.3	6.3				
R-6133	G	1.3	6.5				
R-6134	G	1.5	6.9				
R-6136	G	2.5	8.3				
R-6137	G	2.7	8.8				
R-6352-A	G	0.4	3.4				
R-6352-B	G	0.8	4.2				
R-6352-D	G	0.7	4.9				
R-6352-E	G	0.8	5.5				
R-6352-G	G	1.3	6.5				
R-6400-AO	G	0.3	3.1				
R-6400-BO	G	0.8	5.0				
R-6400-CO	G	1.8	7.0				
R-6400-DO	G	1.2	7.6				
R-6450-AG	G	0.2	2.4				
R-6450-BG	G	0.2	3.1				
R-6450-CG	G	0.4	3.4				
R-6450-DG	G	0.5	4.2				
R-6450-EG	G	0.7	5.4				
R-6450-FG	G	0.1	5.6				
R-6450-GG	G	1.3	6.3				
R-6450-HG	G	1.3	6.9				
R-6450-JG	G	1.9	8.3				
R-6450-KG	G	2.7	8.8				
R-6672-1	H	0.4	3.9				
R-6672-A	A or C	0.8	4.1				
R-6672-B	A or C	0.5	4.6				
R-6672-B	Q	0.2	4.6				
R-6672-C	A or C	0.8	6.0				

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