

NEENAH FOUNDRY CO.

STORMWATER SOLUTIONS

MADE IN USA

NEENAH **NF**  
FOUNDRY  
AMERICA IS BUILT ON NEENAH



At Neenah Foundry, Stormwater management is the lifeblood of our company. Since Neenah Foundry opened in 1872, we've learned a lot about what it takes to create products that stand the test of time. The only thing more durable than our cast iron is our determination to produce high quality products worthy of the cities they serve.

The Stormwater products we provide range from catch basin grates, trench drains, downspouts and flap gates as well as our newest product HydroVent.

Combining an extensive distribution network, nationwide sales force and unparalleled engineering support, Neenah Foundry is uniquely positioned to meet your every need. Our well balanced line of Stormwater products aren't just made in America-they make America.

Because America is Built on Neenah.



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## Product Overview

### GENERAL

Neenah Foundry stormwater material made in the USA in cast iron.

### MATERIAL

Grey iron castings conform to A.S.T.M. A-48, Class 35B or better.

### FINISH

All castings are manufactured true to pattern, and component parts fit together seamlessly. They are all high quality, free from blowholes, porosity, hard spots, shrinkage distortion or other defects. They can be cleaned by blasting.

### PAINT

Neenah Foundry castings are furnished standard without paint or primer.

### SUBMITTALS

Manufacturers shop drawings are submitted to the architect/engineer for approval prior to manufacturing. The architect/engineer can reject castings that don't conform to their specifications and/or approved submittal drawings.





# HYDROVENT™

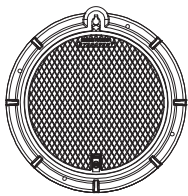
## PRODUCT DESCRIPTION

Neenah Foundry's HydroVent™ manhole cover is designed using LiftMate™ ball and socket hinge system technology coupled with a heavy duty latching mechanism. The HydroVent™ manhole cover is designed to provide surge relief at the location of the installation during events when the sewer system becomes surcharged.

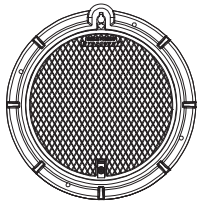
### Design features include:

- Gray iron construction – Fatigue resistant durability plus noise suppression
- Heavy duty latching mechanism automatically engages when lid is closed
- Hinge and latch design allows pressure relief while preventing lid blow off
- Superior gasket design and material resists water inflow
- Solid flange improves resistance to inflow
- Automatic “hold open” arm helps prevent accidental closure
- “Made-in-USA” ensures acceptability with federally funded projects
- No dead lifting required to close cover
- Ball and socket hinge provides full support when opening and closing
- Hinge easily disengages for complete lid removal, no tools required
- Traffic rated, exceeds 40,000 pound proof loading requirements of AASHTO-M-306-07

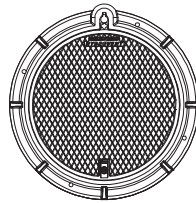
Additional questions regarding Neenah Foundry HydroVent™ manhole cover should be directed to our Product Engineering Department (920) 725-7000.



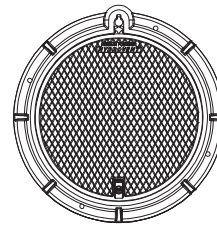
R-1550-HV 21"



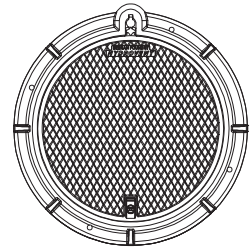
R-1642-HV 24"



R-1650-HV 24"



R-1743-HV 30"



R-1739-HV 36"

HydroVent™ System		
MODEL	CLEAR OPENING (Diameter)	FRAME HEIGHT
R-1550-HV	21"	9"
R-1642-HV	24- <sup>1</sup> / <sub>8</sub> "	7"
R-1650-HV	24- <sup>1</sup> / <sub>8</sub> "	4"
R-1743-HV	30"	6"
R-1739-HV	36"	6"

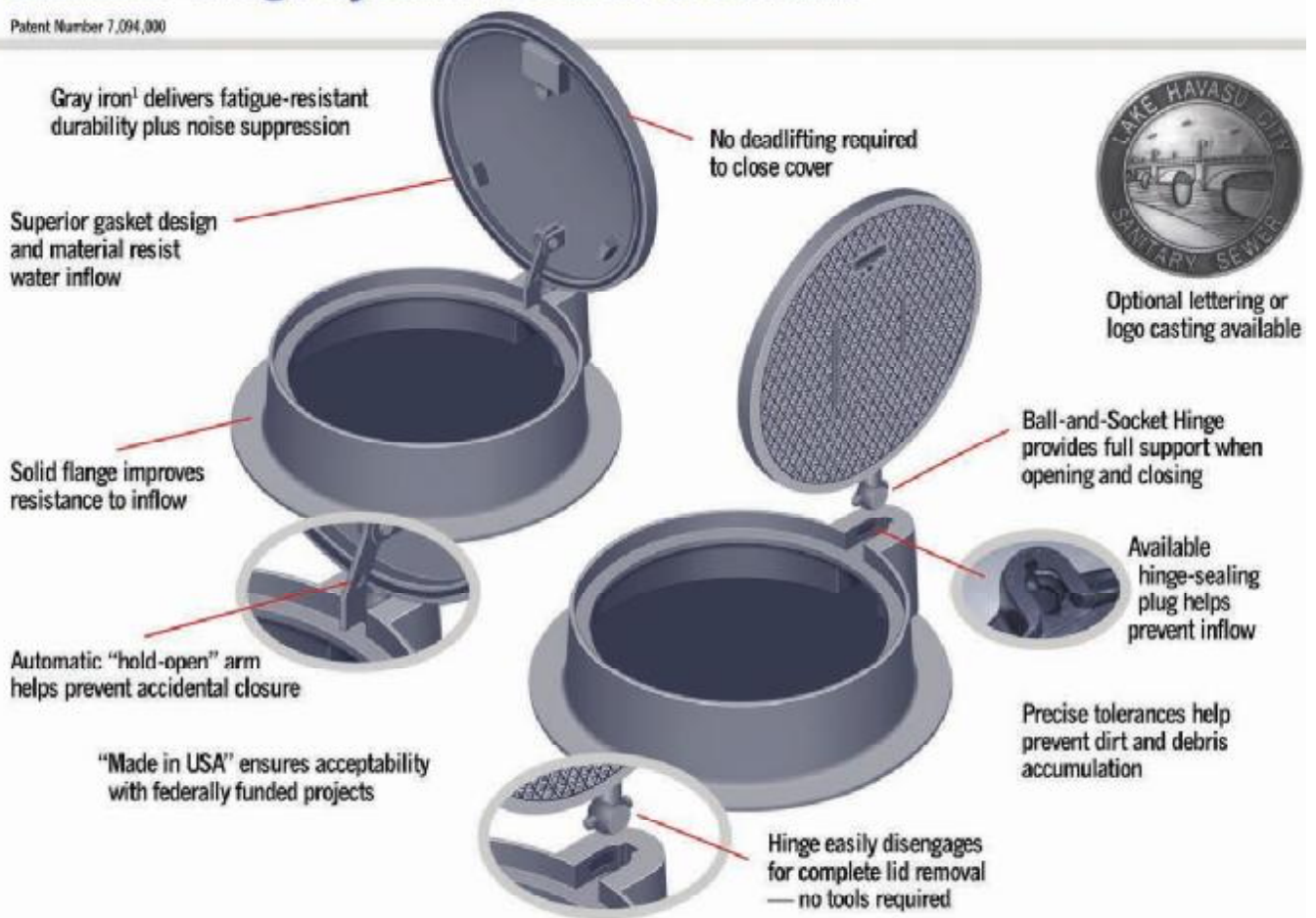


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# LiftMate™ Hinge System Features & Benefits

Patent Number 7,094,000



## Premium, Made in USA Quality and Performance

Strong, yet light, platen gray iron<sup>1</sup> lids exceed AASHTO's M306-07, 40,000# proof load

Superior traffic sound mitigating properties

Excellent strength and wear resistance — almost indestructible<sup>2</sup>

Standard neoprene self-sealing T-gasket

Compatible with most internal chimney seals

High-quality precision castings in a full range of sizes

True custom lettering or logo lids available

## Ergonomic Ball-and-Socket Hinge

Handhole allows opening with a lever or pickaxe to significantly reduce lifting effort

Unique design increases stability when opening or closing cover

“Hold-open” arm automatically locks to help prevent accidental closure

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, physical strain and lost time

<sup>1</sup>Conforms to ASTM A48 Class 35B

<sup>2</sup>Meets or exceeds 40,000-pound proof loading requirements of AASHTO-M-306-07

Patent Number 7,094,000

## MATERIAL

The proven strength, economics and sound-dampening properties of gray iron

## OPERATION

One-man-operable lids are easier to open and close — no deadlifting full lid weight

## SAFETY

Gravity-driven mechanism automatically locks when opened, easily unlocks when closing

## WATER RESISTANCE

Superior T-seal gasket is standard

## Grates and Trench Covers

The benefits of the LiftMate™ Hinge System are available with the proven strength and performance of Neenah Foundry grates and trench covers. Grates meet or exceed all applicable strength and traffic loading requirements. Hydraulic performance information is available on request.



LiftMate™ Hinge System grates and trench covers, cast from high-strength gray iron or Ductile Iron as appropriate, offer exceptional durability and hydraulic performance.



## Available Security Options

In addition to high-strength camlock mechanisms, Neenah offers a wide range of bolt options. For further information, visit [www.nfco.com/literature/brochures/bolting.html](http://www.nfco.com/literature/brochures/bolting.html)



Countersunk bolts for security furnished standard



Optional camlock mechanism for added security

## LiftMate™ Hinge System

LiftMate™ Frame, Solid Gasketed Lid		
Model	Clear Opening (Diameter)	Frame Height
R-1550-LM	21"	9"
R-1642-LM	24-1/4"	7"
R-1650-LM	24-1/4"	4"
R-1743-LM	30"	6"
R-1753-ALM	27-1/2"	7"
R-1755-F2LM	25"	7"

## Also Available:

### LiftMate™ Trench Frames and Grates Rated for Airport & Container Port Use

Manufactured using high-strength Ductile Iron to meet or exceed airport and container port guidelines<sup>3</sup>. Hydraulic performance information is available on request. For complete listings of systems rated for these applications, refer to the Neenah Foundry Airport and Port-Type Castings catalog.

Model	Clear Opening (Trench)	Frame Height
R-4994-HALM	24"	6"

LiftMate™ Inlet Frame, Grate				
Model	Clear Opening	Frame Height	Free Open Area (sq ft)	Weir Perimeter (lineal ft)
R-3210-ALM	22' x 22'	6"	1.5	8.0
R-3210-LLM	22' x 22'	6"	1.4	8.0
R-3222-1ALM	22' x 19-1/2'	7"	1.5	8.0

Contact your Neenah Representative for complete details. Neenah Foundry can also custom make sizes according to your specifications.

<sup>3</sup>Capable of withstanding minimum 100,000-pound loads and other criteria as specified in applicable FAA Advisory Circulars.

### SURGE RELIEF

Hinge allows pressure relief but prevents lid blow-off

### TRAFFIC RATED

Exceeds 40,000-pound proof loading requirements of AASHTO-M-306-07

### WORKER PROTECTION

Reduces operators' risk of excess physical strain and off-balance maneuvering

### SECURITY

Available bolt and camlock options effectively resist unauthorized access





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R-4990 COLLECTION

R-4990 HEAVY DUTY TRENCH

CATALOG NO.	A	B	C	TYPE A	TYPE C	TYPE D	TYPE K RIVERWALK	TYPE K TIDAL WAVE	TYPE P	TYPE Q
R-4990-AX	8	1 1/2	6	X	X	X			X	
R-4990-BX	10	1 1/2	8	X	X	X			X	
R-4990-CX	12	1 1/2	10	X	X	X		X	X	X
R-4990-DX	14	1 1/2	12	X	X	X			X	X
R-4990-EX	17	1 1/2	15	X	X	X			X	
R-4990-FX	20	1 1/2	18	X	X	X	X		X	
R-4990-GX	23	1 1/2	21	X	X	X				X
R-4990-HX	26	1 1/2	24	X	X	X				
R-4990-IX	30	2	27	X	X	X				
R-4990-KX	33	2	30	X	X	X				
R-4990-LX	36	2	33	X	X	X				
R-4990-MX	39	2	36	X	X	X				
R-4990-NX	45	2	42	X	X	X			X	X
R-4990-OX	51	2	48	X		X				



**TYPE A**  
GRATE OPENINGS



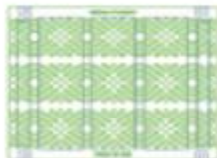
**TYPE C**  
GRATE OPENINGS



**TYPE P**  
GRATE OPENINGS



**TYPE Q**  
GRATE OPENINGS



**TYPE K GRATE  
RIVERWALK**  
GRATE OPENINGS

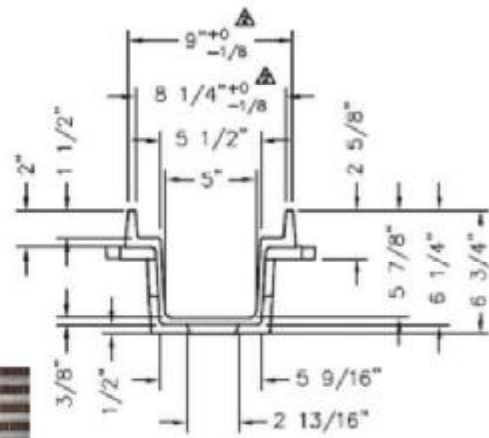
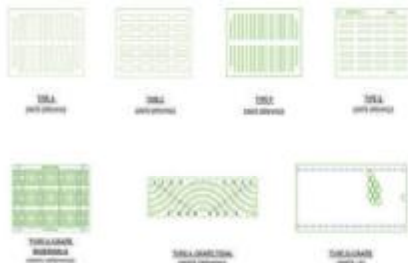


**TYPE K GRATE TIDAL**  
GRATE OPENINGS



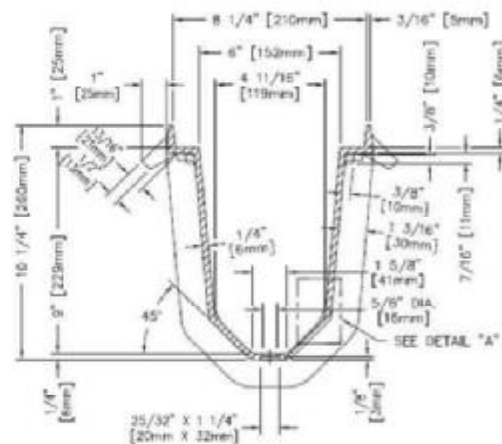
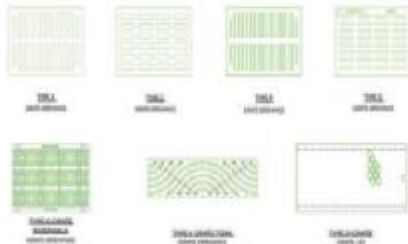
**TYPE D GRATE**  
GRATE LID





**R-4996 TYPE M TRENCH FRAME**

CATALOG NO.	COVER DIMENSIONS		FRAME DIMENSIONS		FRAME LENGTH	OUTLET LOCATION/SIZE			AVAILABLE GRATES/COVER			
	A	B	C	D		END	BOTTOM	SIDE	TYPE A	TYPE C	TYPE D	TYPE K
R-4996-A8	8	1 1/2	5 1/2	4 3/4	24	4	4, 6	4	X	X	X	
R-4996-A12	12	1 1/2	10	6	24	4, 6	4, 6, 8	4, 6	X	X	X	X



**R-4996 SELF-FORMING TRENCH PAN**

CATALOG NO.	COVER DIMENSIONS		FRAME DIMENSIONS		FRAME LENGTH	OUTLET LOCATION/SIZE			AVAILABLE GRATES/COVER
	A	B	C	D		END	BOTTOM	SIDE	
R-4996-A	8	1	6	9	30	4	4	4, 6	Q**
R-4996-B	10	1	8	10 1/2	30	4, 6	4, 6	4, 6, 8	P, Q**
R-4996-C	12	1 1/2	10	10	36	4, 6, 8	4, 6, 8	4, 6, 8	A, C, D, L, P, Q
R-4996-CA*	12	1 1/2	10	10	36	4, 6, 8	4, 6, 8	4, 6, 8	A



## R-4999 L SERIES BOLTED

CATALOG NO.	A	B	C
R-4999-L2***	12	1/1/02	10
R-4999-L3*	14	1/1/02	12
R-4999-L6**	23 7/8	2	21 7/8
R-4999-L7*	26 5/8	2	24 5/8
R-4999-L9***	29 3/4	2 1/02	26 3/4

- \* Furnished in 24" sections  
 \*\* Furnished in 12" or 24" sections  
 \*\*\* Furnished in 18" or 36" sections

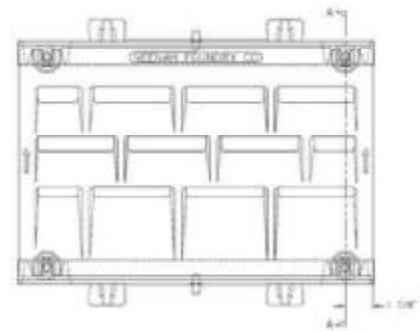


## R-3599 A & B SLOTTED VANE DRAIN

CATALOG NO.	GRATE TYPE	SQUARE FEET OPEN	WEIR PERIMETER LINEAL FEET	TYPE
R-3599-A	L	0.2 per ft.	2 per ft.	Heavy Duty
R-3599-B	L	0.2 per ft.	2 per ft.	Extra Heavy Duty



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Combination of Slotted Vane Drain  
& vane grate curb inlet.





## TYPE "L" VANE STYLE GRATES

### CAPACITY

An important function of an inlet grate is capacity – the ability to intercept the stormwater from the gutter. Hydraulic tests prove the Type "L" Vane Style Grates will accept more water than any of the conventional grate styles under virtually all flow conditions. Even with extremely high volume and velocity conditions in the gutter, there will be very little if any water that the grate will not capture, providing the water passes over it. The efficiency of these grates can be as much as 20% greater than conventional designs. For this reason, an ever increasing number of states, counties and municipalities have adopted the Type "L" Vane Style Grate as a standard.

### GRATE PLACEMENT

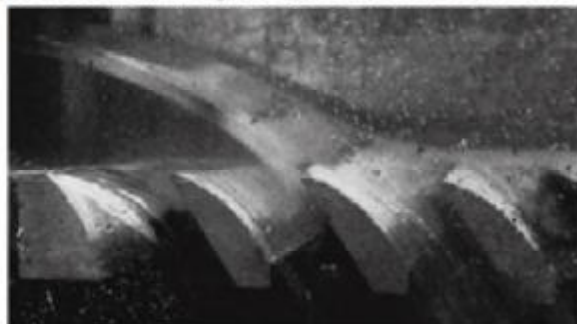
Type "L" Vane Style Grates are being used in grate replacement programs in many cities throughout the country, not only because of their stormwater capacity features, but also because they are more likely to be safe for bicycles than many other styles of grates. A replacement high capacity Type "L" grate can be dimensioned to fit most catch basin inlets. Our Product Engineering and Sales Departments are available to assist you in developing your grate replacement program.

### BICYCLE GRATES

Please read in its entirety "Pedestrian, Bicycle and Handicap Considerations" on page 7, in which we suggest consideration of Type "L" vane style grates where bicycles are a factor in the choice of a casting.

### DEBRIS

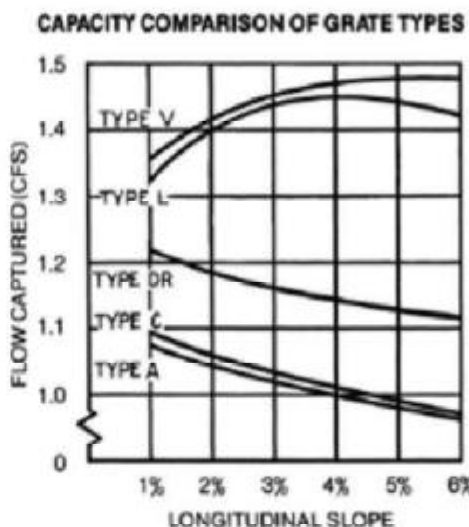
A properly functioning inlet grate such as the Type "L" Vane Style Grate must screen out the larger harmful debris and prevent it from entering and clogging the sewer pipe. Small debris, which can be easily handled by the underground portions of the storm sewer, are allowed to pass through the grate openings to prevent blockage on the surface of the grate.



Cross section of Vane Style Grate in testing flume showing hydraulic performance at 2 cfs.



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The above chart shows flume test results using 17" x 20" full size grates in the types detailed top right. A constant transverse or gutter slope of 6% was used to contain more water over the grate. The gutter flow in the channel was set at 2 cfs. Note the improved performance of the Type "L" and "V" Vane Grates.

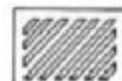
### GRATE TYPES



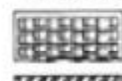
TYPE A



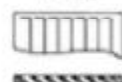
TYPE C



TYPE DR-OL



TYPE L



TYPE V

**Over the years, the industry has seen premature failure of bolted trench because of poor trench maintenance**



**A blind hole will fill with debris and prevent the bolt from turning completely and properly holding the grate to the frame. A worker determined to properly fasten the grate can shear the bolt. Tightening a bolt against debris creates tensile stresses against the bond between the frame and the concrete supporting it**



**Neenah Foundry has developed a solution to solve bolt hole debris problems by eliminating all the maintenance issues altogether.....**



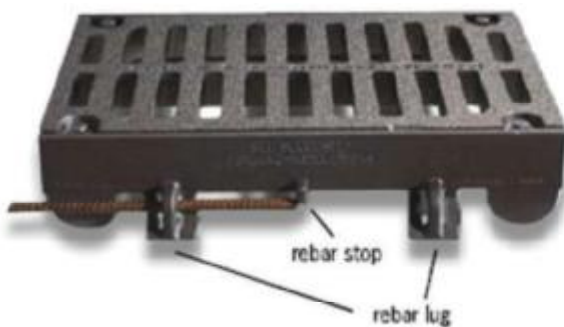
# INTRODUCING THE DEBRIS CHUTE FOR BOLTED TRENCH



## GENERAL

Neenah's debris chutes allow material that falls into the bolt hole of the frame to harmlessly pass through into the trench below.

## Innovation



## And Improvement



The rebar stop prevents a common error for those who do not follow Neenah's recommended forming instructions.

Easily anchored frame. The rebar lug on Neenah's patented frame is sized for a number 4 rebar. If the rebar is bent 90 degrees or less, it will automatically be positioned at the proper angle to the frame for anchoring in concrete.



## WE MAKE GATES, VALVES AND SOLID PARTNERSHIPS

At Neenah Foundry, we offer a wide array of hardworking products including gates, valves and traps. When it comes to controlling water volume and pressure, we make sure you have all the equipment you need. For over 140 years, we've been helping customers select the right products for their project, and if you call us today, we'll do the same for you.

Let's go to work. Visit [neenahfoundry.com](http://neenahfoundry.com)  
or call 800-558-5075.

**NEENAH** **IF**  
FOUNDRY  
IRONCLAD PARTNERSHIPS





## Gates



### R-5050 SERIES AUTOMATIC FLAP GATES

Automatic flap gates are used in drainage areas to prevent back flow, such as storm and sanitary sewer systems.



### R-5005 SERIES SHEAR GATES

Shear gates are used as control applications where positive flow regulation is required.

## Valves



### R-5000 TO R-5002 SERIES PRESSURE RELIEF VALVES

Outside water pressure forces the valve to open.



### R-5004 SERIES FLANGED FLAP VALVE

The flap valve can be opened to flush the area of water where water accumulates.



**NEENAH**  
FOUNDRY **INF**

## DOWNSPOUT PROTECTION BY NEENAH FOUNDRY

**PROTECT** your rain water leader  
**CONNECT** your rain water leader sub-drain system  
**WIDE** selection to meet your needs  
**ALL** units available with cleanouts

**ENVIRONMENT** No paint/oil bake/eco bake. Neenah products are 100% environmentally friendly

**COATINGS** Custom coatings available upon request. Powder coat, porcelain enamel, galvanized, etc.

**ACCESSORIES** Extensions and adaptors for custom applications.

FOR MORE INFORMATION VISIT [WWW.NFCO.COM](http://WWW.NFCO.COM)



## DOWNSPOUT PROTECTION BY

# NEENAH FOUNDRY

Neenah's cast iron downspouts are the best in the industry. Cast in a wide variety of compatible sizes, they're built to connect and protect your Rain Water Leader. They're also 100 percent eco-friendly thanks to our custom eco-baking process. With extensions and adaptors for custom applications plus special coatings available on request, the Neenah downspout gives quality a new name.

FOR MORE INFORMATION VISIT  
[WWW.NFCO.COM](http://WWW.NFCO.COM)



**MADE IN**  
  
**THE USA**

### CURRENT STOCK PARTS LIST

#### DOWNSPOUT SHOES

CATALOG NUMBER	INSIDE TOP BELL	OUTSIDE SPIGOT	LENGTH	CLEANOUT	SHAPE
R-4929-A2C	3x4	4-7/8 dia	40	X	Angular
R-4929-A11C	3x4	6-1/4 dia	32	X	Angular
R-4929-A12C	3x4	6-1/4 dia	42	X	Angular
R-4929-A5C	4x5	4-7/8 dia	40	X	Angular
R-4929-A15C	4x5	6-1/4 dia	42	X	Angular
R-4929-A3	4x5	4-7/8 dia	14-1/2		Angular
R-4929-A6C	4x6	4-7/8 dia	30	X	Angular
R-4929-A8C	4x6	4-7/8 dia	40	X	Angular
R-4929-A18C	4x6	6-1/4 dia	42	X	Angular
R-4929-A10C	5x7	4-7/8 dia	40	X	Angular
R-4929-A20C	5x7	6-1/4 dia	42	X	Angular
R-4929-A22C	6x6	4-7/8 dia	40	X	Angular
R-4929-A21	6 1/2x9	7x9	36		Angular
R-4929-O2C	3x4	4-7/8 dia	30	X	Offset
R-4929-O4C	3x4	4-7/8 dia	40	X	Offset
R-4929-O1C	3x4	4-7/8 dia	20-1/2	X	Offset
R-4929-O19C	4x4	4-7/8 dia	40	X	Offset
R-4926-G1	4-3/8 dia	4-7/8 dia	30		Offset
R-4926-G1C	4-3/8 dia	4-7/8 dia	30	X	Offset
R-4929-O5C	4x5	4-7/8 dia	28	X	Offset
R-4929-O8C	4x5	4-7/8 dia	40	X	Offset
R-4929-O10	4x6	4-7/8 dia	39-3/4		Offset
R-4929-O11C	4x6	4-7/8 dia	40	X	Offset
R-4929-O18C	5x5	4-7/8 dia	40	X	Offset
R-4929-O12	5x6	6-5/8 dia	39-1/4		Offset
R-4929-O14C	5x7	4-7/8 dia	40	X	Offset
R-4926-O	6 dia	4-7/8 dia	40		Offset
R-4929-O17C	6x6	4-7/8 dia	40	X	Offset
R-4929-O	6x6	7-1/2 dia	30		Offset
R-4929-O15	6-5/8x8-1/4	8-5/8 dia	28		Offset
R-4926-A	4-7/8 dia	4-1/2 dia	39		Straight
R-4926-B	4-7/8 dia	4-1/2 dia	51		Straight
R-4926-C	4-7/8 dia	4-1/2 dia	63		Straight
R-4929-S9	6x6	5-7/8 dia	18		Straight

#### EXTENSIONS

CATALOG NUMBER	INSIDE TOP BELL	OUTSIDE SPIGOT	LENGTH
4929-3443	3x4	4x5	30
4929-4443	4x4	5x5	30
4929-4543	4x5	4x5	30
4929-4643	4x6	4x5	30
4929-5743	5x7	4x5	30
4929-3446	3x4	4x5	40
4929-4546	4x5	4x5	40
4929-4646	4x6	4x5	40
4929-5746	5x7	4x5	40

#### ADAPTORS

CATALOG NUMBER	INSIDE TOP BELL	OUTSIDE SPIGOT	LENGTH	CLEANOUT	SHAPE
R-4927-A	3x4	4-5/8 dia	11-1/2		Straight
R-4927-A1	2x3	3-7/8 dia	11-1/2		Straight
R-4927-BC	3x4-3/4	4-7/8 dia	13-3/4	X	Straight
R-4927-C	4x4	4-7/8 dia	13-1/2		Straight
R-4927-D	4-3/8x5-3/8	4-7/8 dia	14-1/2		Straight
R-4927-F	4x5	5-7/8 dia	14-3/8		Straight
R-4927-G	5x7	7-5/8 dia	14-3/8		Straight

**NEENAH FOUNDRY COMPANY**  
PO Box 729, Neenah, Wisconsin 54957-0729

800-558-5075 | [www.nfco.com](http://www.nfco.com)  
920-725-7000 | Fax: 920-729-3661



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 a minimum of 50% industrial-generated scrap metal.

Stormwater Solutions



## GREEN INFRASTRUCTURE & NEENAH FOUNDRY'S ROLE

Neenah Foundry has a comprehensive line of products designed to effectively capture and convey stormwater to and from your bioswale or rain garden.

**WHEN IT RAINS, IT DRAINS**

### Capturing Stormwater

- R-3170 Curb Box**
- 20-1/2" Wide
  - 4" to 10" in Height



### Conveying Stormwater

- R-4990 Heavy Duty Trench**
- Type P Grate Openings



### Capturing Stormwater

- Combination Inlet Frame, Grate, Curb Box with Rear Outlet**
- R-3165
  - Available with 8", 10" or 12" rear outlet
  - Available with type A or V grate
  - Curb Plate available



### Conveying Stormwater

- R-4990 Heavy Duty Trench**
- Type P Grate Openings



### Capturing Stormwater

- Curb Plates**
- R-3288-E2 (72")
  - R-3289-C (42")



### Conveying Stormwater

- R-4990 Heavy Duty Trench with Riverwalk or Wave Grate**





## **CALCULATORS AND TOOLS TO HELP GET THE JOB DONE.**

For over a century Neenah Foundry has hung our hard hats on engineering quality iron castings for the municipal sector. To help your vision become a reality we've added an entire suite of online services, including tools and calculators for engineers and more. These tools are available at [nfc.com](http://nfc.com).

### **Curb Opening Hydraulics Calculator**

The curb opening calculation is a program that will calculate the capacity of a curb opening on grade conditions, and will determine the length to capture a percentage of flow.

### **Manning Equation Calculator**

The Modified Manning Equation is used to calculate flow velocities and volume (in cubic feet per second or cfs). This information is vitally important when selecting a grate type and size for a given project.

### **Weir & Orifice Calculator**

The Weir and Orifice Calculator is used to determine the inlet capacity in sag (ponding) conditions by use of the Weir and Orifice equations. Knowing this information will allow you to select the proper grate type and size for your specific job or project.

### **R-4999 VANE TRENCH GRATE HYDRAULICS**

The Type L vane shaped grates have the ability to remove significant amounts of sheet flow from streets, parking lots and industrial lots. Neenah Foundry's detailed graphs allow you to determine just how much stormwater will be captured.

### **NEENAH GRATE INFORMATION**

A detailed table listing the various Neenah Foundry grates which are available. In addition to the free opening areas which are necessary to determine the discharge, the tables also show the grate type or style which are shown for easy identification.

### **INLET SPACING**

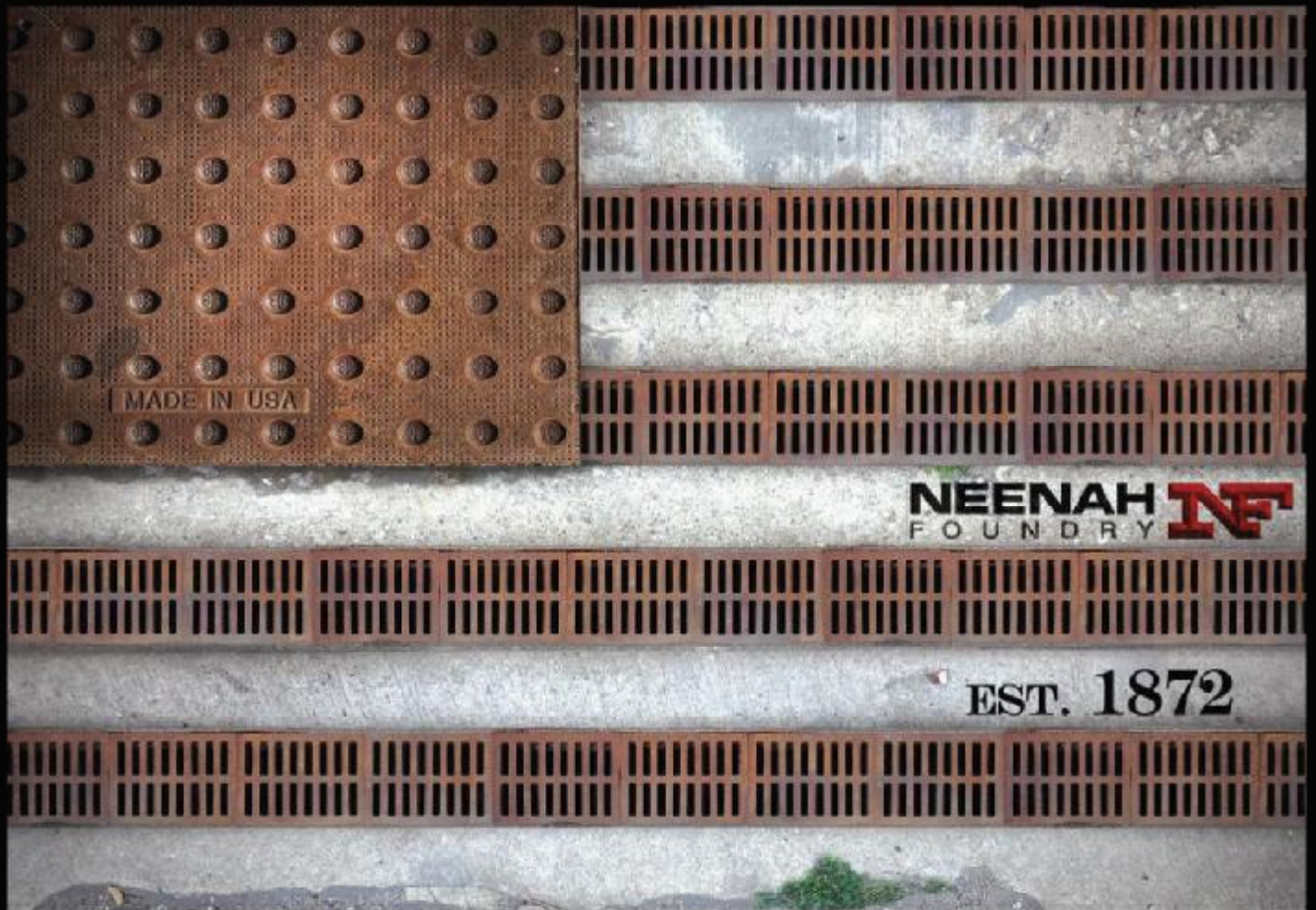
Neenah Foundry has provided a detailed example explaining the methods for determining inlet spacing. These step by step examples aid in a properly designed stormwater conveyance system.

### **DETECTABLE WARNING PLATE - RADIUS CALCULATOR**

Regulatory-compliant cast iron Detectable Warning Plates from Neenah Foundry offer appealing aesthetics, exceptional longevity and freedom from maintenance. By using Neenah's Detectable Warning Plates, specifiers can be confident that the critical warning message will be delivered for the lifetime of the installation. Neenah Foundry's Radius Calculator will help you determine the type and quantity of radius plates needed to complete your job.







### BUY AMERICAN

The American Recovery and Reinvestment Act (ARRA) of 2009 was enacted to stimulate the economy by incentivizing the use of American-made products. By choosing Neenah cast iron products, not only are you getting the quality and durability you need while supporting American jobs, you could also qualify for federal funding on your project.



### GO GREEN

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 a minimum of 50% industrial-generated scrap metal.

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FOUNDRY

These products are to be specified and used under the guidance of qualified design professionals.