ej

135 Years
Since 1883

Airport and Port Infrastructure Access Solutions

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Airport and Port Authority Access Solutions

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1845 Series
Up to 42 1/4" of clear opening (page 16)

6900 Linear Trench Drainage Series
Our most popular heavy duty trench series (page 29)

Airport and Port Construction Castings and Innovative Access Solutions

EJ products are used on airport projects around the world, providing reliable drainage and access solutions.

EJ offers a wide variety of infrastructure components for airport and water port projects - for either landside or airside/waterside applications - as solutions for both new construction, or maintenance/repair.

The many styles of construction castings are specifically designed for airports and other environments that undergo excessive load conditions. Application-engineered access hatch assemblies include round or square manhole/handhole frames and covers. Stormwater management solutions include catch basins or drainage inlets. Linear trench assemblies with drainage grates are designed for stormwater and/or glycol/de-icing capture — and solid cover versions have many uses, including shorepower vaults at ship berths. Airport extra heavy duty mooring eyes are an effective means of aircraft tie-down.

Cast components for airside/waterside are offered with high load ratings to meet your requirements. All extra heavy duty construction castings are manufactured with gray iron conforming to ASTM A48 Class 35B; or ductile iron conforming to ASTM A536. Many of our airport castings can be made-to-order with custom logos and messaging, in most languages, to meet your project specifications.

Other landside applications may only require load ratings intended for vehicle or pedestrian traffic. Innovative solutions include access hatches fabricated from aluminum or steel, with optional safety grates for OSHA fall-through protection. A continuously expanding product line now includes covers made of composite (for certain electrified environments, etc.). In total, EJ has you covered with offerings in a wider array of materials to satisfy the most diverse project requirements.

Loading Requirements

All of our products are designed to meet or exceed the specified loading requirements. They conform to AASHTO and ASTM standards. These standards specify product groups and minimum load classifications dependent on the place of installation. Additionally many casting are also certified by a third party to meet EN124 requirements.

Proof Load Testing – Airport Castings

All airport construction castings must pass a rigorous proof load test conducted in accordance with AASHTO M306 guidelines, with the proof load amount revised to 200,000 pounds to account for high loading environments. The proof load testing procedure calls for the load to be concentrated on a 9" x 9" contact area in the center of the cover or grate and hold 200,000 pounds for one minute. Following the test the casting is carefully inspected. Cracks or permanent deformation are cause for rejection. Frequently, EJ castings are tested far beyond the specified proof load, often to destruction. EJ castings that are rated for airport service are designed to meet or exceed the loading requirements listed in Federal Aviation Administration (FAA) advisory circulars AC 150/5320-6D Appendix 3 and AC 150/5370-10A, Item D-751.

Material Selection

Depending on the model, our construction castings can be manufactured using either gray iron or ductile iron. Gray iron has an unequaled record of success as a material for construction castings. Gray iron is highly resistant to corrosion and maintains compressive strength, abrasion resistance, vibration absorption and low-notch sensitivity. Additionally, gray iron has a long service life and is very cost effective. Ductile iron combines the advantages of gray iron with greater strength, toughness, higher impact resistance and increased durability without additional weight. Because it has the ability to withstand greater loads without failure, it is often specified for extra-heavy load applications.

Load Ratings and Descriptions

Rating	Acceptable Load Weight (lbs)	Description
Airport Extra Heavy Duty	Max. 200,000	Casting has been proof load tested to a minimum 200,000 lbs. This includes an additional safety factor over FAA design loading.
Extra Heavy Duty	Max. 100,000	Casting has been proof load tested to 100,000 - 200,000 lbs. This meets the design loading associated with the FAA wheel loading.
Heavy Duty	Max. 40,000	Casting must meet the requirements of AASHTO M306 to be classified as heavy duty. AASHTO M306 requires that castings bear a minimum of 40,000 lbs on a 9" x 9" area.

We Are EJ

EJ is the leader in the design, manufacture and distribution of access solutions for water, sewer, drainage, telecommunications and utility networks worldwide.

EJ offers the broadest range of high-quality infrastructure access solutions. Our distribution coverage continues to expand into new markets. As an entrepreneurial family-owned company, we have a long, successful heritage of meeting change with innovation.

Since our founding in 1883, we have grown by providing access solutions to meet the demands of the world's growing infrastructure. Fueled by innovation, our design, manufacturing, and distribution processes continue to evolve—creating solutions that provide an unparalleled customer experience.

EJ is a family-owned company that has a long history of fostering strong customer relationships. These relationships are supported with personal contact from company representatives, a complete offering of product literature, a comprehensive web site (ejco.com), trade show exhibits, as well as seminars and training opportunities. All these services help to provide customers with the product information required for successful projects.

Wherever you are, EJ provides access solutions that adhere to the local specifications in a timely and competitive manner. We also work with our customers to produce access solutions to meet their specialized requirements. Our sales staff around the world understand the unique needs of your market.

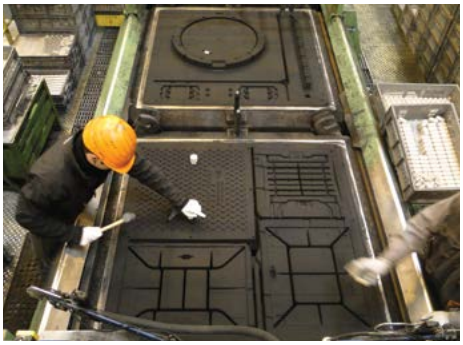
Our people: our core strength. While working together, employees use their expertise, knowledge, and ability to achieve positive results. Core values at EJ include safety and security, honesty and integrity, environmental responsibility, respect for others, quality and excellence, and social responsibility. These core values are imbedded into our culture and are practiced daily throughout the organization.

Our state-of-the-art manufacturing plants employ world class machinery, systems, and processes to produce specified products efficiently and on time.

Wherever you are, whatever your specific requirement might be, EJ has the best access solutions for your infrastructure project.

Product Range

EJ offers a comprehensive portfolio of products and services, including municipal and construction castings, fabricated products, water distribution solutions, and other infrastructure access solutions.



Quality Manufacturing

Integrating technology, lean processes and over a century of experience in crafting metal castings and fabrications, keeps our facilities performing at peak efficiencies.

Distribution Network

Access solution products, including municipal and construction castings, are available worldwide at our internal stocking locations and from our extensive network of distribution partners.

A Legacy is Cast

The EJ legacy dates back to 1883 when William E. Malpass and his father-in-law Richard W. Round established a foundry on the shores of Lake Charlevoix, in the town of East Jordan, Michigan, USA. This foundry was called Round and Malpass Foundry and originally produced cast parts for the lumber industry, machinery, ships, agricultural equipment, and railroads. In 1886, William's brother, James, joined the business and the company was renamed East Jordan Iron Works.

In the 1920s, when the lumbering era came to a close, the company welcomed the second generation to the business and expanded into new markets allowing continued success in changing times. Production shifted to street castings, water works valves, fire hydrants, and various industrial castings.

William E. Malpass (standing back right) with employees during the 1920s.

Through World War II, the foundry produced castings for the war effort. In the 1950s, semi-automation was introduced into the foundry.

During the 1960s, the third generation automated the foundry with the addition of a high-pressure molding line. By integrating automatic sand processing and mechanized casting handling systems, the company was operating the largest automated molding line in the United States and maximized production capabilities.

Since the late 1980s, the business has been led by the fourth generation descendants of the Malpass family. They have transformed the Midwest business into an international leader of providing access solutions to infrastructure systems.

Beginning in the 1990s, acquisitions throughout the United States allowed the company to expand product lines, sales offices, distribution capabilities, and customer services across North America. In 2001, a new foundry was built in Oklahoma providing additional capacity to service growing markets in the United States, as well as Central and South America. The fifth generation of the Malpass family began joining the company in the late 1990s, continuing the strong family commitment to the company's success.

In the early 2000s, East Jordan Iron Works began turning its attention to expansion in other parts of the world, with the acquisition of Cavanagh Foundry in Ireland (2000), Norinco in France (2004), McCoy Construction Castings in Canada (2006), and HaveStock in Australia (2010).

In 2012, East Jordan Iron Works and its affiliated companies began doing business using the same name and brand, EJ. One global name and brand, supported by a single mission, vision, and set of values has unified the company. This action leverages all company resources to improve internal operations, as well as provide superior product offerings and services to its valued customers.

Increasing its global footprint, EJ continues to grow through acquisition and reinvestment with the addition of Bernard Cassart & Cie in Belgium (2012), Syracuse Castings Sales Corporation and Syracuse Castings West Corporation in the USA (2012), Etheridge Foundry & Machine Company in the USA (2012), E.A. Quirin Machine in the USA (2013), GMI Composites in the USA (2014), the municipal casting distribution of Mueller Canada Ltd., in Canada (2014), GAV GmbH in Germany (2015), Peter Savage Ltd. and Integrated Ducting Systems in the United Kingdom (2015), Schacht und Bautechnik Vertriebs GmbH (SBV) in Austria (2016), as well as the expansion of composite manufacturing in Birr, Ireland in (2018), the construction of a state-of-the-art manufacturing facility in Northern Michigan, USA (2018) and the construction of a new fabrication facility in New York, USA (2019).

East Jordan Foundry, October 2018.

Today, the company provides a full line of access solutions for the infrastructure systems of municipalities, utility companies, airport and port authorities, and private companies. Products include manhole covers and frames, catch basin and curb inlet grates and frames, trench grates, and tree grates. In addition to traditional materials of gray or ductile cast iron, a continuously expanding array of innovative solutions are offered in composites, fabricated steel, and fabricated aluminum. EJ also provides products for water supply systems including fire hydrants and valves, valve and service boxes, and various other water supply products. EJ supplies products to infrastructure projects in 6 of the 7 continents.

EJ continues to be 100% owned by descendants of William E. Malpass, and members of the family continue to be active in managing the business. The fourth and fifth generation remain dedicated to maintaining the company's long-established culture and values, setting strategies and priorities. This has allowed EJ to remain one of the most stable, progressive, and well-tooled manufacturing companies in the world. The corporate headquarters continues to remain in East Jordan, Michigan, USA.

Product Lines

Street Castings
- Manhole Frames and Covers
- Curb Inlets and Frames
- Utility Castings
- Airport and Port Authority Castings
- Tree Grates
- Trench Grates
- Drainage Grates
- DURALAST® Detectable Warning Plates

Fabricated Products
- Grating
- Riser Rings
- INFRA-RISER® Adjustment Risers
- Aluminum Access Hatches
- Custom Fabrications

Water Products
- WaterMaster® Fire Hydrants
- FlowMaster® RW Gate Valves
- Valve Boxes
- Meter Boxes

Innovative Access Solutions
- Captive Hinge Grates/Covers
- ERGO® and ERGO® XL Access Assemblies
- Ductile Hinged Hatch Access Assemblies
- 5624 Heavy Duty Hinged Grates
- SELFLEVEL® Access Assemblies
- REVOLUTION® Access Assemblies
- ERMATIC® Modular Covers
- MULTILEAF™ Hinged Covers
- CAMPRESSION® Access Assemblies
- Composite Access Solutions

Innovative Features
- LOCKEO® Security Feature
- Mechanical Strut Lift Assist
- Cam Lock
- EON LOCK® Bolting
- EPIC® Pick Bar
- MPIC® Multi-tool Pick Bar







Capabilities

Service
- Employees with localized knowledge throughout the world
- On-site assistance
- Seminars and technical presentations
- Communicate new product innovations
- Assistance with specification process

Innovative Use of Technology
- Electronic invoicing and EDI transactions
- ejco.com—comprehensive product database with advanced search and browsing capabilities
- Electronic certification of materials provided upon request
- CAD and PDF drawings available electronically

Quality Manufacturing
- Product research and development
- Commitment to reinvestment
- North America ISO 9001 certified facilities
- Europe ISO 9001, ISO 14001, OHSAS 18001 certified facilities
- Australia ISO 9001 certified facilities

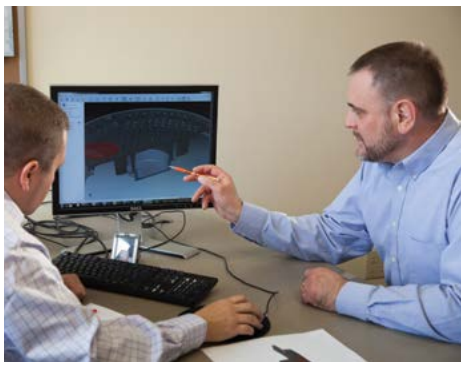
Foundry Facilities
- East Jordan, Michigan
- Ardmore, Oklahoma
- Picardie/St. Crepin, France

Fabrication Facilities
- Birr, Ireland
- Youngstown, Ohio
- Cicero, New York
- Tooele, Utah
- Ardennes/Bogny sur Meuse, France
- Geebung/Queensland, Australia
- Boppard, Germany

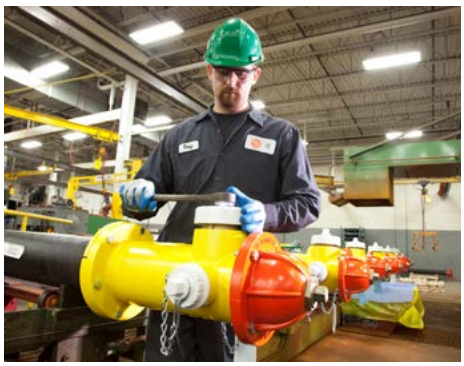
Water Products Manufacturing
- East Jordan, Michigan

Distribution
- Delivering products quickly and smoothly worldwide
- Stocking branch locations throughout U.S., Canada, Europe, and Australia
- Distribution centers located in Michigan, Oklahoma, Ireland, United Kingdom, France, Germany, and Australia

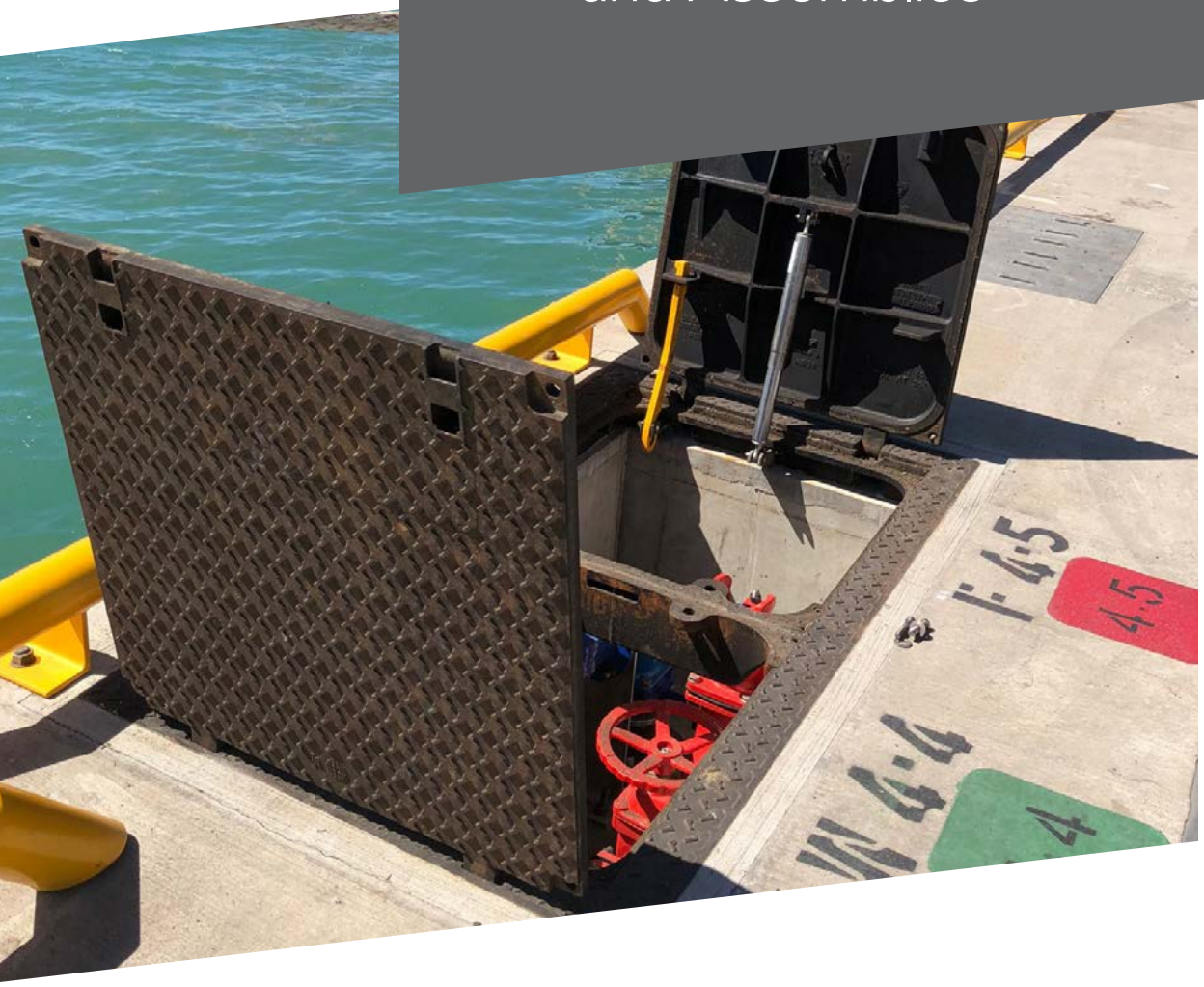









Manhole Frames, Covers and Assemblies



ERGO® XL ACCESS ASSEMBLY

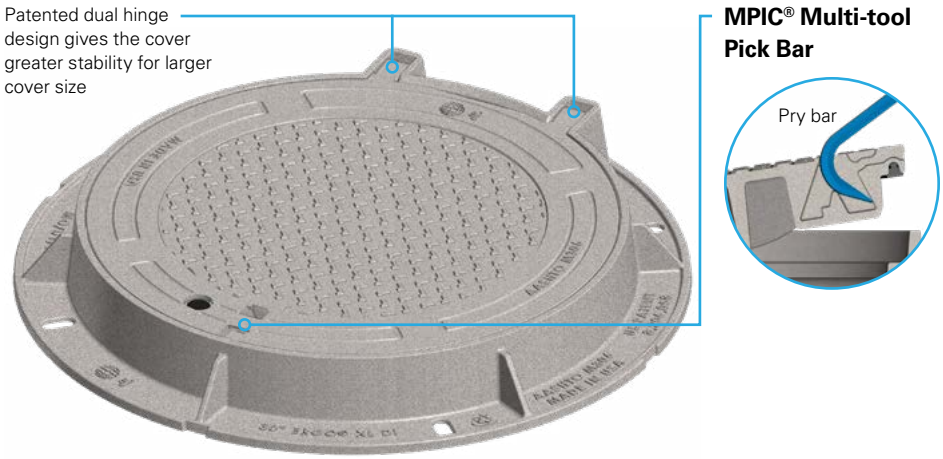
The ERGO XL Access Assembly offers an advanced level of functionality and safety for 28" clear openings and above.

This product is easy to lift open, reduces excess strain, and promotes safe working conditions. To address ease of use, choose an optional stainless steel mechanical strut that reduces the lifting force to raise the cover to less than 35 lb.

Standard Features
- Heavy duty
- Gasketed
- Patented hinge assembly
- Opens to 120°
- Safety catch and removal at 90°
- Hinge design allows for flood pressure relief — lid remains attached
- Ductile iron cover
- MPIC® multi-tool pick bar

Options
- Airport extra heavy duty
- Special lettered covers
- Custom logo covers
- Environmental messaging
- Grates available
- Cam lock security
- EON LOCK® bolting
- Watertight (Level 1)*
- Lift assist
- Multiple frame openings and heights available (see table)

ERGO XL adds convenience to 30" and 36" access assemblies.



ERGO XL Access Assembly Sizes

Clear Opening	Frame Height	Series No.
30	4 1/2	ERGO30*
30	5 1/2	ERGO30*
36	6	ERGO36

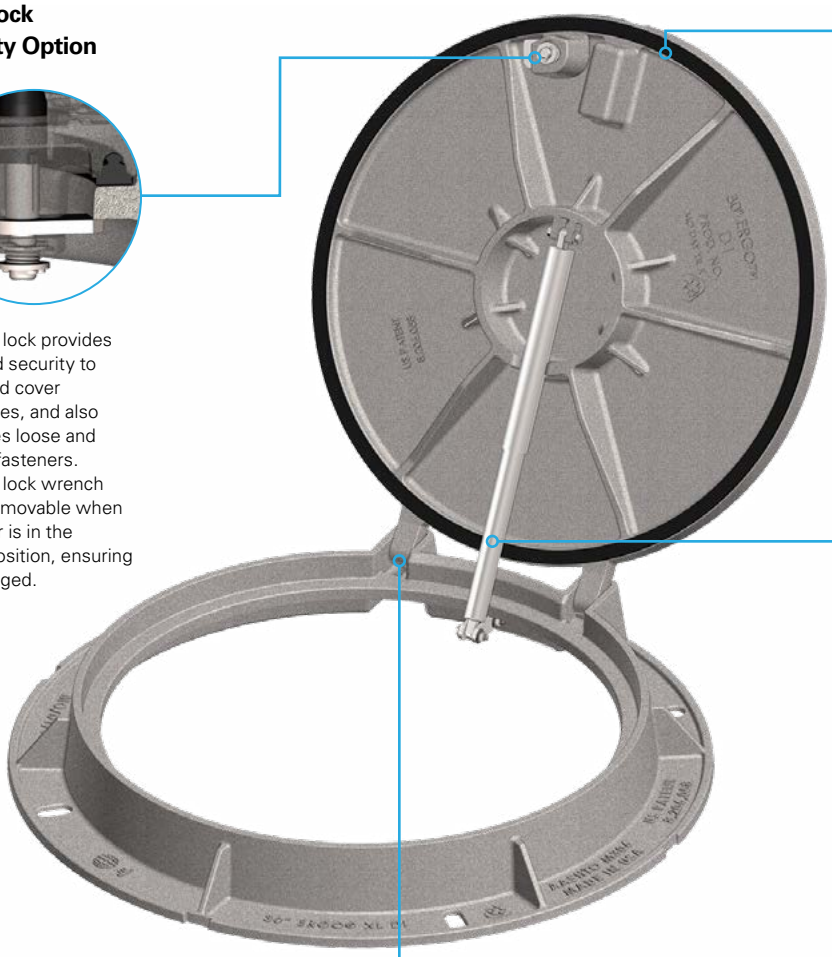
Note: All dimensions are in inches.
*Airport extra heavy duty rated

Important Safety Information
Complete removal of the cover is recommended when entering the access point.

*Bolted cover, no cam lock, beaded gasket, and non-draining hinge pocket frame assembly required.

Cam Lock Security Option

The cam lock provides improved security to frame and cover assemblies, and also eliminates loose and missing fasteners. The cam lock wrench is only removable when the cover is in the locked position, ensuring it is engaged.



T-Gasket

The thick and durable gasket cushions traffic shock and resists infiltration.

Lift Assist

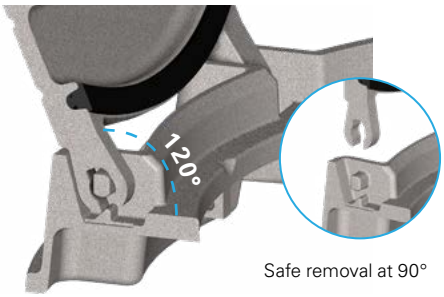
Optional lift assist is a corrosion-resistant stainless steel mechanical spring strut that reduces the lifting force of the cover to less than 35 lb. It is available only on the ERGO® XL.

Mechanical Strut Lift Assist

The rugged design is clean and maintenance free. The strut takes up less space in the clear opening than a traditional spring assist. It is fully self-contained, protecting coils from exposure to the elements.

Made without internal gases or seals, the struts have an effective operating temperature range of -30° F to 400° F. The durability has been tested at over 150,000 cycles.

Opening Range and Safe Cover Removal



Safe removal at 90°

Our patented dual hinge design allows the cover to open up to 120°, where it rests in a safe and secure position. From the 90° position, the cover can be safely removed.

U.S. Patent 8,206,058

Visit our YouTube Channel for videos on this and other products at www.youtube.com/AccessInfrastructure

1207 FRAME, COVER, AND GRATE

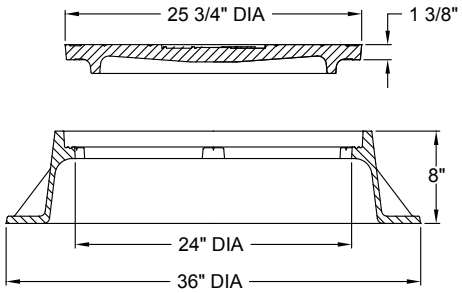
Airport extra heavy duty
Special proof load to 245,000 lbs

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Vented
Closed pickholes
Thread lift holes

Grates
Ductile iron
Extra heavy duty
1203M1—202 sq. in. open area

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts



1207 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	3771Z
4	Bottom Flange	1203Z1
6	Bottom Flange	1405Z
8	Bottom Flange	1203Z3
10	Bottom Flange	1204Z

Note: All dimensions are in inches
*Flange dimensions vary per series

1230 FRAME, COVER, AND GRATE

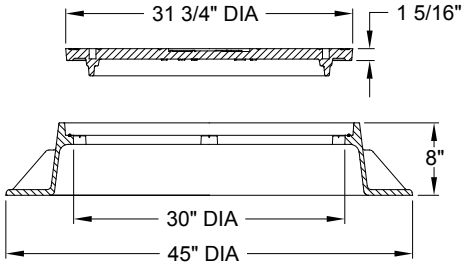
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering
Grounding strap locations

Covers
Ductile iron
Solid
Vented
Closed pickholes
Threaded lift holes

Grates
Ductile Iron
Airport extra heavy duty
V3600-4—350 sq. in. open area

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts



1230 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	V1600-4
4	Bottom Flange	1230Z
5 5/8	Bottom Flange	1820Z
6 1/2	Bottom Flange	1232Z
7 frame with square base flange	Bottom Flange	8027Z
7 1/2	Bottom Flange	1370Z
8	Bottom Flange	1234Z1
10	Bottom Flange	1825Z

Note: All dimensions are in inches
*Flange dimensions vary per series

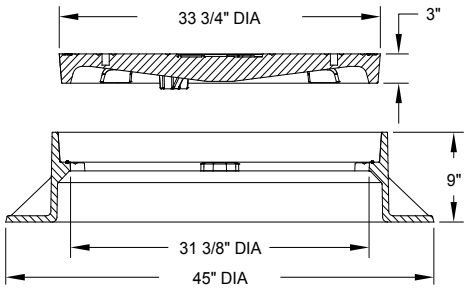
1240 FRAME AND COVER

Airport extra heavy duty
Special proof load to 245,000 lbs

Options
Gaskets
Custom badging/lettering
Ground strap locations

Covers
Ductile iron
Solid
Vented
Closed pickholes
Threaded lift holes

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts



1240 Frame Options (All gray iron)

Frame Height	Frame Style	Series
9	Bottom Flange	1240ZPT

Note: all dimensions are in inches

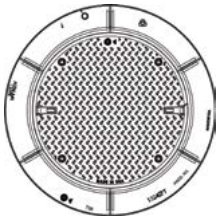
1324 FRAME, COVER, AND GRATE

Airport extra heavy duty
Watertight L1

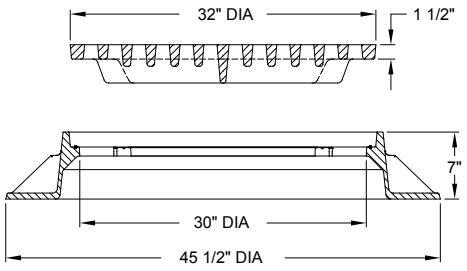
Covers
Ductile iron
Solid
Vented
Extra heavy duty also available
EPIC® pick bars
Gaskets
Custom badging/lettering

Grates
Ductile iron
1324M—270 sq. in. open area

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts



1324 solid cover assembly



1324 frame and grate assembly

1324 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	V1480Z
4 1/2	Bottom Flange	V1420
4 1/2	Top Flange	V1816
5 1/2	Bottom Flange	1496Z
6 1/2	Bottom Flange	1320Z, 1322Z
6 1/2 frame with square base flange	Bottom Flange	1323Z
7	Bottom Flange	1324Z
8 1/2	Bottom Flange	V1419

*Flange dimensions vary per series

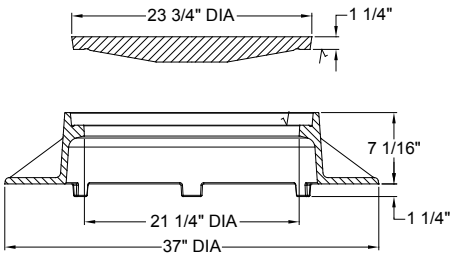
1770 FRAME AND COVER

Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Closed pickholes

Lock Types
Crack drill hex bolts
Crack drill tamper proof bolts
Crack drill pent head bolts



1770 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
2 1/2	Bottom Flange	V1136
4	Bottom Flange	1244Z
4	Reversible Flange	1244Z1
4	Top Flange	2855Z
6	Bottom Flange	1246Z1, 1337Z, 1338Z
7 1/16	Bottom Flange	1771Z2
8	Bottom Flange	1248Z1

Note: All dimensions are in inches
*Flange dimensions vary per series

1810 FRAME, COVER, AND GRATE

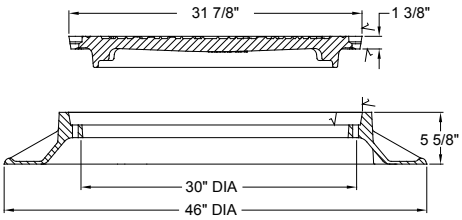
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Pick bars
Open pickholes

Grates
Ductile Iron
V3600-4—350 sq. in. open area

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts
Stabilocs



1810 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	V1600-4
4	Bottom Flange	1230Z
5 5/8	Bottom Flange	1820Z
6 1/2	Bottom Flange	1232Z
7 with square base flange	Bottom Flange	8027Z
7 1/2	Bottom Flange	1370Z
8	Bottom Flange	1234Z1
10	Bottom Flange	1825Z

Note: All dimensions are in inches
*Flange dimensions vary per series

1833 FRAME, COVER AND GRATE

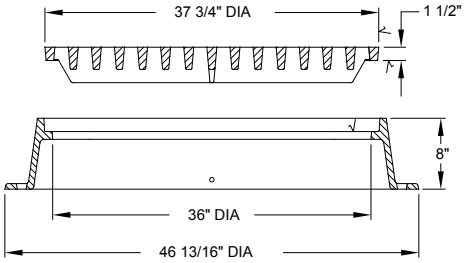
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering
Customizable brass tags
Grounding strap locations

Covers
Ductile iron
Solid
Closed pickholes
Threaded lifting hole

Grates
Ductile Iron
Airport extra heavy duty 2812M /1580M—458 sq. in of open area
Extra heavy duty 2812M2 ADA style—304 sq. in. of open area

Lock Types
Hex bolts
Tamper proof bolts
Pent head bolts



1833 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Bottom Flange	1833Z4
4 1/2	Top Flange	2812Z
5 with square base flange	Bottom Flange	1833Z3
6	Bottom Flange	2287Z
8	Bottom Flange	1833Z2
8 with square base flange	Bottom Flange	1833Z1
10	Bottom Flange	2381Z

Note: All dimensions are in inches
*Flange dimensions vary per series

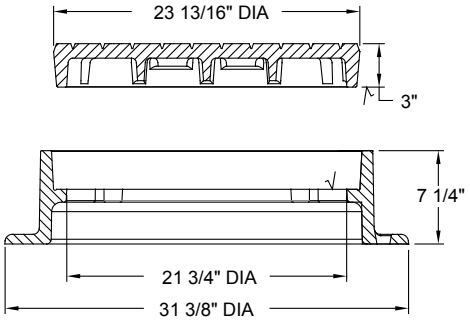
1835 FRAME AND COVER

Airport extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Vented
Lift holes
Closed pickholes

Lock Types
Crack drill hex bolts
Crack drill pent head bolts



1835 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Bottom Flange	1834Z
7 1/16	Bottom Flange	1835Z
7 1/4	Bottom Flange	1840Z

Note: All dimensions are in inches
*Flange dimensions vary per series

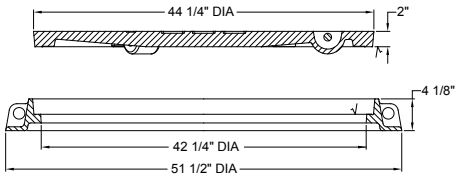
1845 FRAME AND COVER

Airport extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Pick bars
Inner/outer cover—accepts 1810 inner cover

Lock Types
Crack drill hex bolts
Crack drill pent head bolts
Crack drill tamper proof



1845 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Top Flange	1843Z2
4 1/8	Bottom Flange	1845Z
8 1/2	Bottom Flange	1845Z2

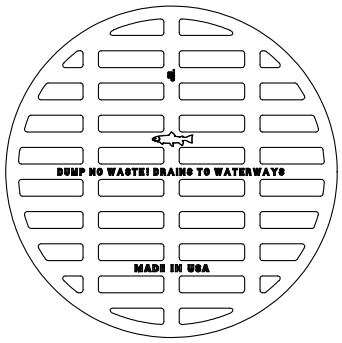
Note: All dimensions are in inches
*Flange dimensions vary per series

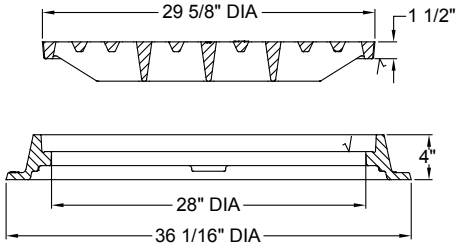
1892 FRAME AND GRATE

Airport extra heavy duty

Grates
Ductile Iron
253 sq. in. of open area

Lock Types
Crack drill hex bolts
Crack drill pent head bolts





1892 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Bottom Flange	1892Z
7 1/4	Bottom Flange	1470Z

Note: All dimensions are in inches
*Flange dimensions vary per series

1895 FRAME, COVER, AND GRATE

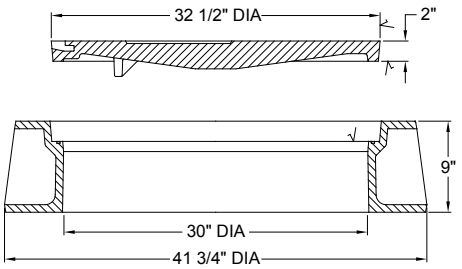
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Vented
Closed pickholes
EPIC® pick bars

Grates
Ductile Iron
378 sq. in. of open area—1895M

Lock Types
Hex bolts
Pent head bolts

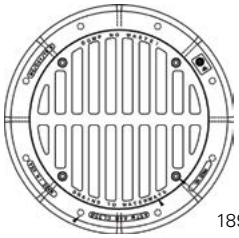


1895 frame and cover assembly

1895 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
9	Bottom Flange	1895Z

Note: All dimensions are in inches
*Flange dimensions vary per series



1895 frame and grate assembly

1900 FRAME, COVER, AND GRATE

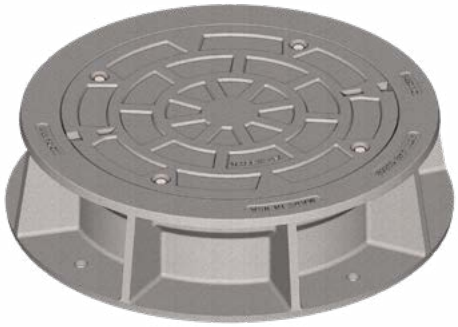
Airport extra heavy duty

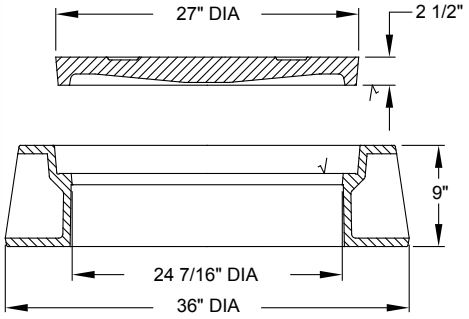
Options
Gaskets
Custom badging/lettering
Glycol collection pan

Covers
Ductile iron
Solid
Vented
Closed pickholes
EPIC® pick bars

Grates
Ductile Iron
378 sq. in. of open area—2870

Lock Types
Hex bolts
Pent head bolts



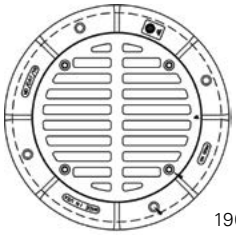


1900 frame and cover assembly

1900 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
9	Bottom Flange	1900Z

Note: All dimensions are in inches
*Flange dimensions vary per series



1900 frame and grate assembly

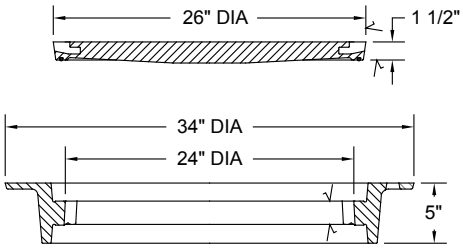
1905 FRAME AND COVER

Airport extra heavy duty

Options
Gaskets
Custom badging/lettering
Pick options available

Covers
Ductile iron
Solid
Closed pickholes

Lock Types
Hex bolts
Pent head bolts



1905 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Cast in Slab Type Frame	1080Z
4	Top Flange	2800Z, 2800Z1
4	Bottom Flange	1046Z
5	Reversible	2450Z
6	Bottom Flange	V1380-1, V1424-2
7	Bottom Flange	1040Z, 1045Z, 1045Z1, 1045Z2, 1045Z3
7 1/2	Bottom Flange	2027Z1
8	Bottom Flange	1047Z
9	Bottom Flange	1048Z
10	Bottom Flange	1049Z

Note: All dimensions are in inches
*Flange dimensions vary per series

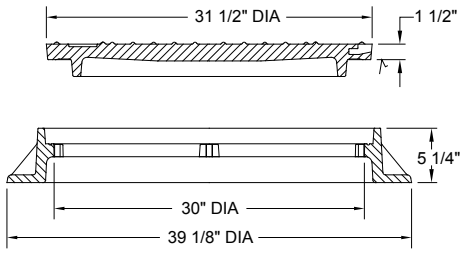
2230 FRAME AND COVER

Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Closed pickholes

Lock Types
Hex bolts
Pent head bolts



2230 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	2230Z1
5 1/4	Bottom Flange	2230Z, 2295Z
6	Bottom Flange	2232Z

Note: All dimensions are in inches
*Flange dimensions vary per series

2812 FRAME, COVER, AND GRATE

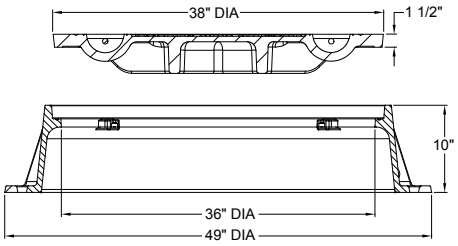
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid
Pick bars
Drop handles

Grates
Ductile Iron
Airport extra heavy duty
2812M/1580M—458 sq. in. open area
Extra heavy duty ADA style 2812M2—304 sq. in. open area

Lock Types
Hex bolts
Pent head bolts
Tamper proof bolts

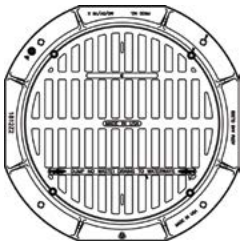


2812 frame and cover assembly

2812 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4 1/2	Top Flange	2812Z
6	Bottom Flange	2380Z
7	Bottom Flange	1812Z3
10	Bottom Flange	1812Z2, 2381Z

Note: All dimensions are in inches
*Flange dimensions vary per series



2812 frame and grate assembly

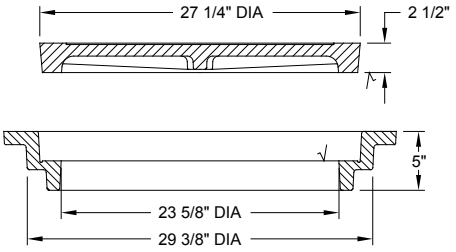
2870 FRAME, COVER, AND GRATE

Airport extra heavy duty

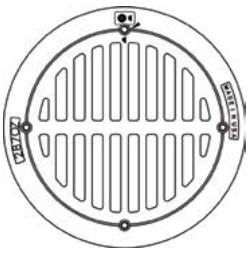
Covers
Ductile iron
Solid
Drop handles
Custom badging/lettering

Grates
Ductile Iron
236 sq. in. of open area

Lock Types
Hex bolts
Pent head bolts
Tamper proof bolts
Cross strap



2870 frame and cover assembly



2870 frame and grate assembly

2870 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
5	Top Flange	2870Z

Note: All dimensions are in inches
*Flange dimensions vary per series

2880 FRAME, COVER, AND GRATE

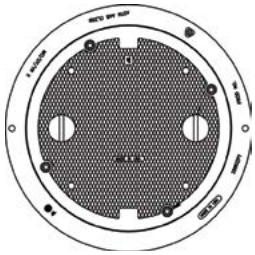
Airport extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Drop handles

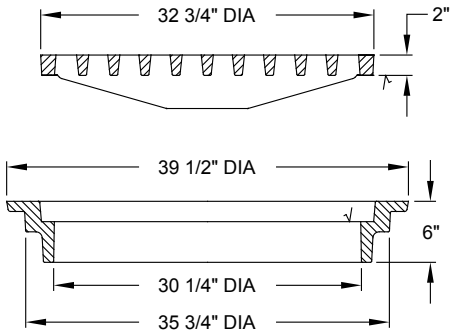
Grates
Ductile iron
378 sq. in. of open area

Lock Types
Hex bolts
Pent head bolts



2880 frame and cover assembly

2880 frame and grate assembly



2880 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
5	Top Flange	2880Z

Note: All dimensions are in inches

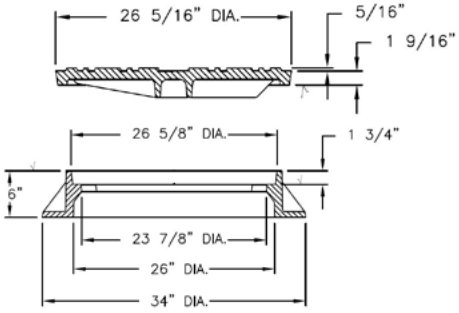
3767 FRAME AND COVER

Extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Vented
Lift holes

Lock Type
Allen head bolts



3767 Frame Options (All gray iron)

Frame Height	Frame Style	Series
6	Bottom Flange	3767Z

Note: All dimensions are in inches

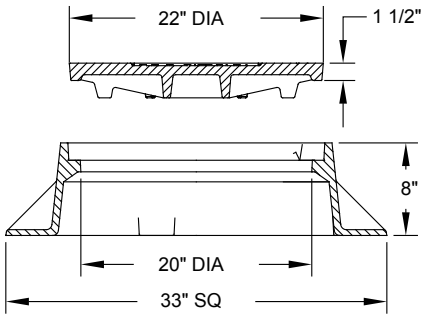
8055 FRAME AND 1130 COVER

Airport extra heavy duty

Options
Custom badging/lettering
Gaskets

Covers
Ductile iron
Solid
Vented
Lift hole
Closed pickhole

Lock Types
Hex bolts
Pent head bolts



8055 Frame Options (All gray iron)

Frame Height	Frame Style*	Series
4	Reversible	1135Z, 1490Z2
4	Top Flange	2935Z
4	Bottom Flange	1130Z, 1490Z
8	Bottom transitional frame with square base flange	8055Z
8	Bottom Flange	1125Z

Note: All dimensions are in inches
*Flange dimensions vary per series

V6667 JUNCTION BOX FRAME WITH DOUBLE COVERS, GRATES

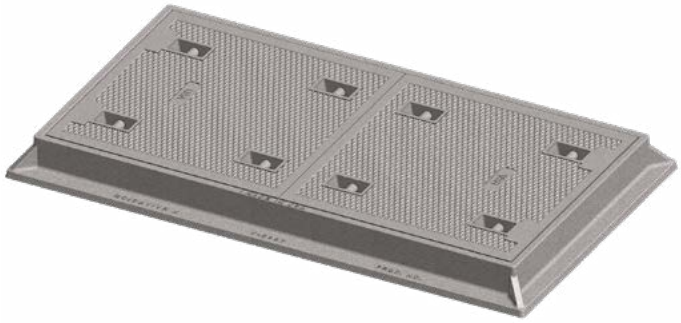
Extra heavy duty

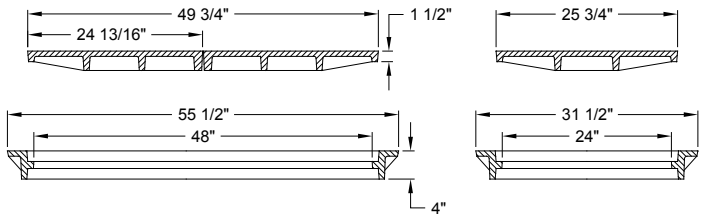
Options
Custom badging/lettering

Covers
Ductile iron
Solid
Pick bar

Grates
Ductile iron
V5667 (see pg. 37)

Lock Types
Crack drill hex bolts
Crack drill pent head bolting





V6667 Frame Options (All gray iron)

Frame Height	Frame Style	Series
4	Reversible	V6667

Note: All dimensions are in inches

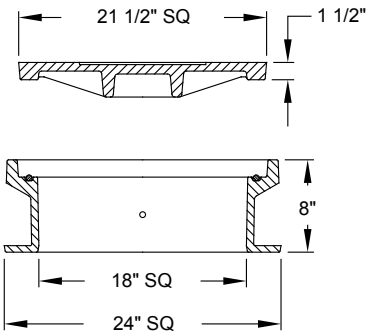
8080 JUNCTION BOX FRAME AND COVER

Airport extra heavy duty

Options
Custom badging/lettering
Gaskets
Location for grounding strap

Covers
Ductile iron
Solid
Pick bar

Lock Types
Hex bolts
Pent head bolts



8080 Frame Options (All gray iron)

Frame Height	Frame Style	Series
8	Bottom Flange	8080Z

Note: All dimensions are in inches

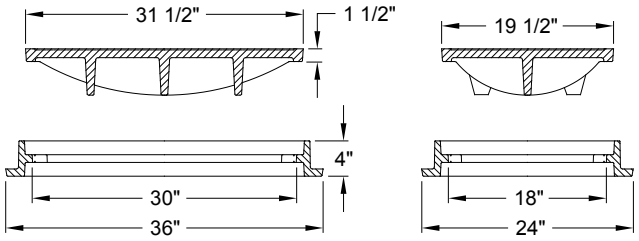
8083 JUNCTION BOX FRAME AND COVER

Airport extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Drop handles

Lock Types
Hex bolts
Pent head bolts



8083 Frame Options (All gray iron)

Frame Height	Frame Style	Series
8	Reversible	8083Z

Note: All dimensions are in inches

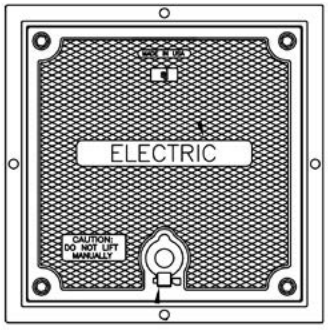
8085 JUNCTION BOX FRAME AND COVER

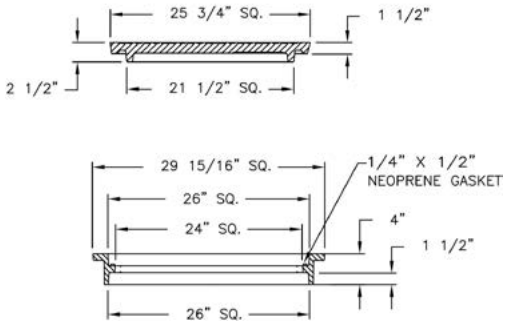
Airport extra heavy duty

Options
Gaskets
Custom badging/lettering

Covers
Ductile iron
Solid

Lock Types
Hex bolts
Pent head bolts





8085 Frame Options (All gray iron)

Frame Height	Frame Style	Series
4	Top Flange	8085
4	Reversible	8308

Note: All dimensions are in inches

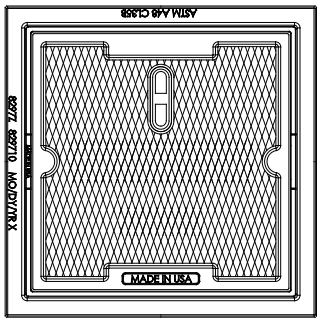
8297 JUNCTION BOX FRAME AND COVER

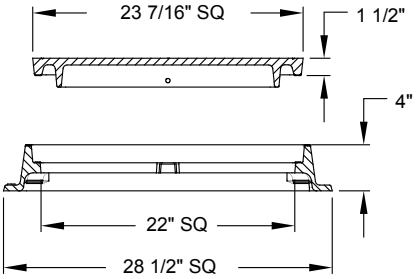
Extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Pick bar
Location for grounding strap

Lock Types
Hex bolts
Pent head bolts





8297 Frame Options (All gray iron)

Frame Height	Frame Style	Series
4	Bottom Flange	8297Z

Note: All dimensions are in inches

DUCTILE IRON HINGED HATCH ACCESS ASSEMBLY

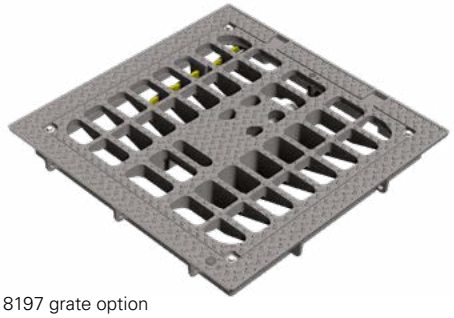
Ductile iron access hatches have been designed for improved ergonomics, and are available in heavy duty and airport extra heavy duty applications.

On a cover that can weigh as much as 550 lb, the lifting force required to open the cover is less than 35 lb due to the uniquely designed mechanical strut.

The self-engaging safety bar provides added protection while the underground infrastructure is accessed, and safety grates can be specified for added fall through protection.

Features
- Ductile iron frame and cover
- Cover opens to 105°, safety catch and removal at 90°
- Self-engaging safety bar
- EON LOCK® bolting
- MPIC® multi-tool pick bar
- Bolting

Options
- Mechanical lift assist (standard feature for airport rated models)
- Top and bottom flange designs
- Safety grate
- INFRA-RISER® adjustment riser
- Forming skirt



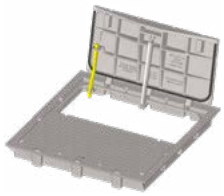
8197 grate option
36" x 36"

Wide Availability of Sizes

Shown below are just a sample of the various cover openings and sizes. See the table below for the full range of available clear opening sizes and load ratings.

8192 hinged hatch
24" x 36"

8198 hinged hatch with dual lift assist
48" x 48"



8218 double assembly
48" x 48"

8196 double assembly
30" x 62"

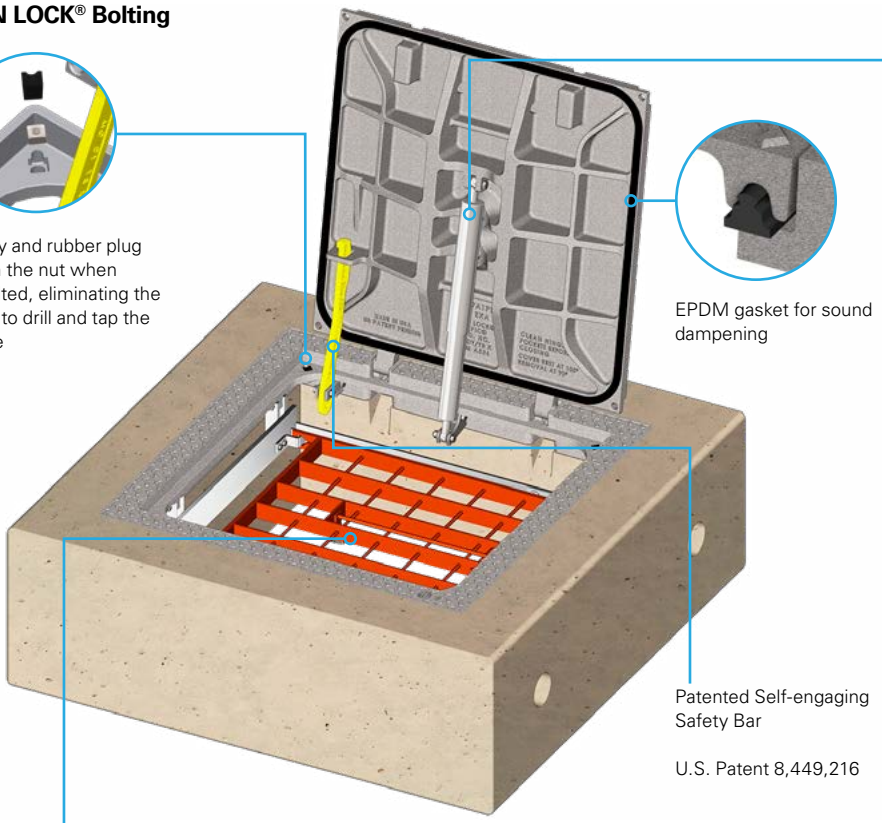
Ductile Hinged Hatch Clear Opening Options

Clear Opening Size	Airport Extra Heavy Duty Series No.	Heavy Duty Series No.
24 x 24	8195	8215
24 x 36	8192	8212
30 x 30	8196	8216
30 x 62	8196—Double	8216—Double
36 x 36	8197	8217
36 x 74	8197—Double	8217—Double
48 x 48	8198	8218
48 x 48	—	8218—Double
48 x 96	8198—Double	8218—Double

Note: All dimensions are in inches.

EON LOCK® Bolting

Cavity and rubber plug retain the nut when unbolted, eliminating the need to drill and tap the frame



EPDM gasket for sound dampening

Patented Self-engaging Safety Bar

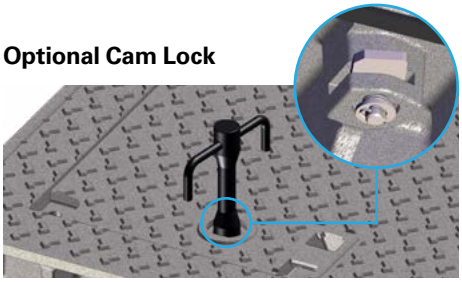
U.S. Patent 8,449,216

Lift Assist

Lift Assist is a corrosion-resistant stainless steel mechanical spring strut. The rugged design is clean and maintenance free. The strut takes up less space in the clear opening than a traditional spring assist. It is fully self-contained, protecting coils from exposure to the elements.

Made without internal gases or seals, the struts have an effective operating temperature range of -30° F to 400° F. The durability has been tested at over 150,000 cycles.

Optional Cam Lock



Security cam lock and wrench shown. Wrench is only removable when cover is in the locked position.

Optional Safety Grate

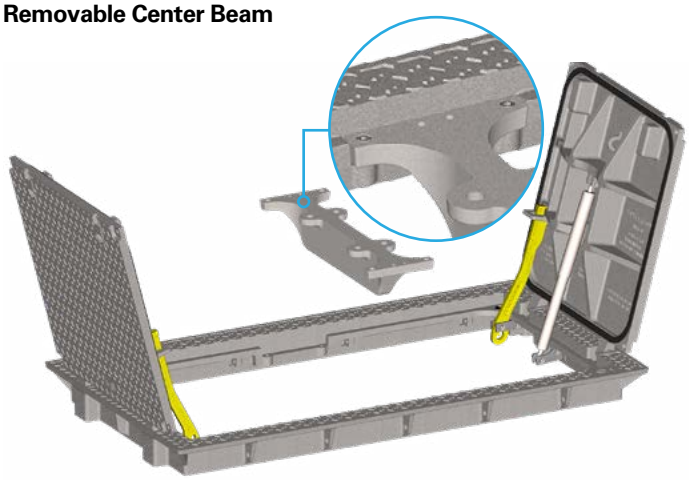
Provides additional safety features

- Doors cannot be closed unless the fall through protection has been put back in place (protecting the next operator).
- Visual inspections and limited maintenance can be done while safety grate is left in place.
- Orange safety grates create a visual barrier around the pit; promotes an awareness of the hazard.
- Grate can be locked independently of the hatch, adding another level of security when needed.

Optional Forming Skirt

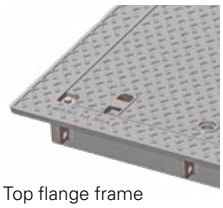
Available forming skirt simplifies precasting the hatch in concrete—no need for added forming to protect the inner hatch. The leave-in-place aluminum skirt can be made to fit any concrete slab thickness. (Image showing hatch upside down with forming skirt.)

Removable Center Beam

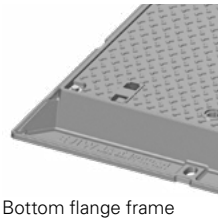


Removable center beam provides a much greater clear opening access on several double hatch models. Removal/replacement is simple with 4 bolts securing the beam to the frame.

Frame Options



Top flange frame



Bottom flange frame

Visit our YouTube Channel for videos on this and other products at www.youtube.com/AccessInfrastructure

Trench and Drainage Grates

HINGED TRENCH ASSEMBLY

The hinged trench assembly simplifies access for supply lines and collection systems. Available with hinged covers or grates, the system can be configured to any length of trench needed.

Optional mechanical strut improves ergonomics by reducing lifting force to 35 lb or less for the entire range of motion—available for both cover and grate versions.

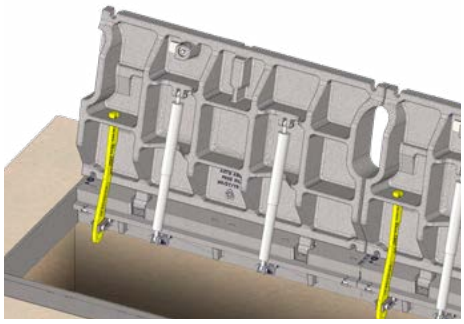
The covers offer optional cable cut outs for electrical, telecommunications, and other supply lines to be temporarily exposed for use while the covers remain in the closed position.

Features

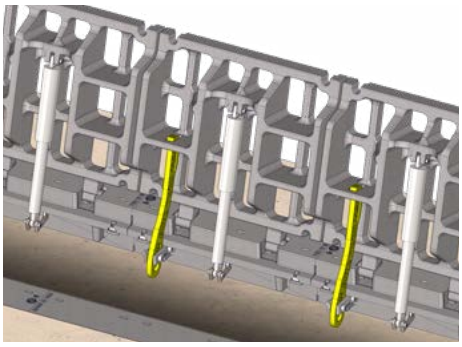
· Airport extra heavy duty
· Top flange design
· Rail vent slots
· Self-engaging safety bar
· Rebar holes in gussets
· Bolt holes for connecting rails together

Self-engaging safety bar with optional mechanical lift assist make the hinged trench covers and grates safe and easy to use.

Covers

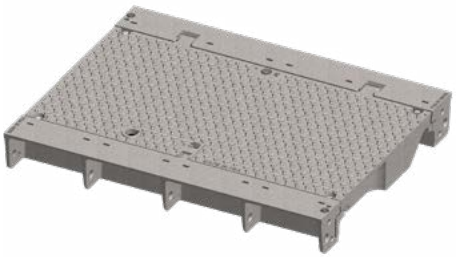


Grate



Hinged Trench Available Options

Options	Grate	Cover
Bolting	Yes	Yes
Cam Lock	—	Yes
Cable Cut Outs	—	Yes
Lift Assist	Yes	Yes
MPIC® Pick Bar	—	Yes



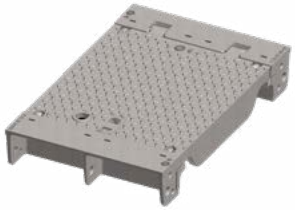
48" long solid cover

24" long grate

Hinged Trench Sizes

Type	Trench Width	Length	Series Number
Grate	18	24	6906
Cover	24	24, 36, 48	6808
Grate	24	24	6908
Cover	36	24, 36, 48	6811

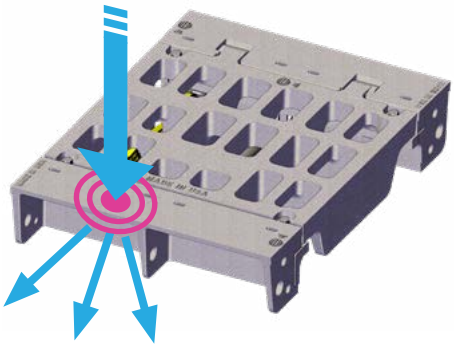
Note: All dimensions are in inches.



24" long solid cover

37 3/8" wide steel end plate

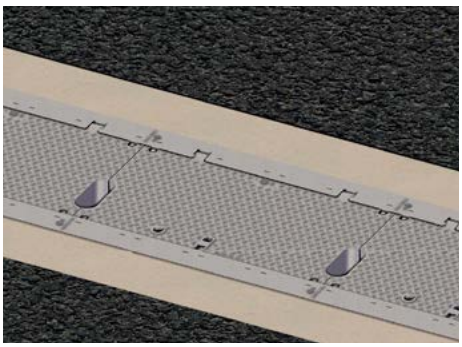
Top Flange Design



The top flange design with a wide flange, fully supported with concrete underneath, distributes heavy loads over a larger area which reduces cracking and spalling of the surrounding concrete.

Venting slots in the frame rail allow for air to escape during the pouring process, fully filling the voids with concrete for support and weight disbursement.

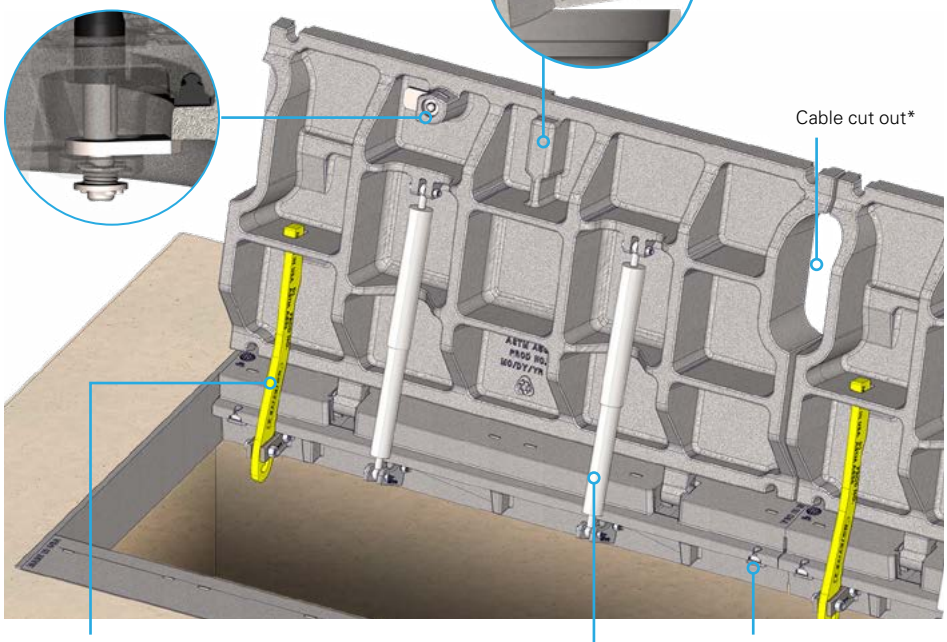
Cable Cut Outs*



Optional cable cut outs for covers allow for temporary access to supply lines while keeping the covers closed.

*Not available for grates

Cam Lock Security Option*



MPIC® Multi-tool Pick Bar*

Safety Bar

Patented Self-engaging Safety Bar keeps the trench open and protects from unintended closure

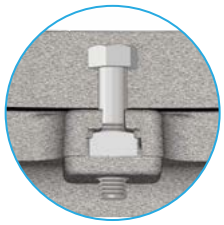
Lift Assist Option

Lift Assist is a corrosion-resistant stainless steel mechanical spring strut. The rugged design is clean and maintenance free. The strut takes up less space in the clear opening than a traditional spring assist. It is fully self-contained, protecting coils from exposure to the elements.

Made without internal gases or seals, the struts have an effective operating temperature range of -30° F to 400° F. The durability has been tested at over 150,000 cycles.

EON LOCK® Bolting

Compatible with standard hex bolts or special security designs, the EON LOCK design retains the nut when the cover is unbolted and allows the nut to be removed in the future should it need to be replaced.



Designed to work with EPS/styrofoam, the concrete trench forming system improves the speed of installation versus traditional installation. Using concrete, no liners are needed— eliminating combustible material in applications where fire suppression measures are needed.

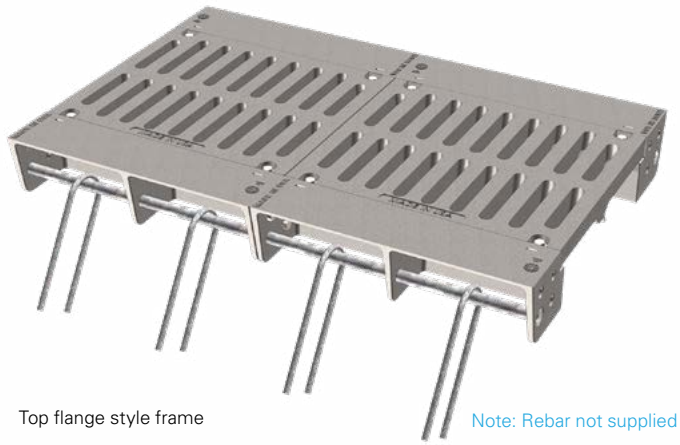
6900 LINEAR TRENCH DRAINAGE SERIES

Airport extra heavy duty
Holes in rail for rebar
Also available in standard heavy duty
Solid covers available

Options
End cap for 10", 24", 36" wide trench
45 degree turns—18", 48" wide trenches
90 degree turns—18", 24" wide trenches
90 degree tee—18", 24" wide trenches
90 degree cross intersection—18", 24" wide trenches

Grates
Ductile or gray iron

Lock Types
Hex bolts
Pent head bolts



Top flange style frame

Note: Rebar not supplied

Angle style frame

Note: Rebar (not supplied) to be installed in all trench frames per engineer or designer's direction

6900 Top Flange Trench Frame and Grate Series

Series Number	Grate Width	Seat Depth	Trench Width	Open Area Sq. In/Ft
6901	8	2	6	29
6902*	10	2	8	33
6903	12	2	10	40
6904*	14	2	12	49
6905	17	2	15	66
6906*	20	2	18	90
6907	23	2	21	92
6908*	26	2	24	102
6909	32	2	30	254
6909M2	29	2	27	113
6910	34	2	32	138
6912	51	2	48	248

Note: All dimensions are in inches.
*Solid covers available

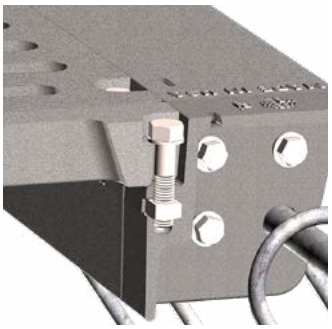
6900 Top Flange Trench Frame Options

Frame Length	Frame Style	Material	Series
24	Top Flange (6-11/16 wide)	Gray iron	6900Z4
24	Top Flange (5 wide)	Gray iron	6900Z5
24	Angle Style	Gray or ductile iron	6900Z1
48	Angle Style	Gray or ductile iron	6900Z2

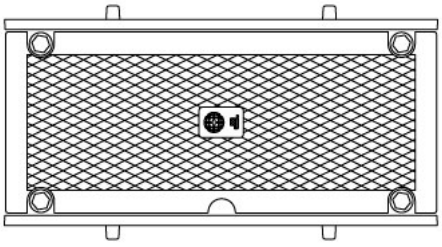
Note: All dimensions are in inches.

Trench frame and grate with EON LOCK® security feature

EON LOCK® square nut out horizontally

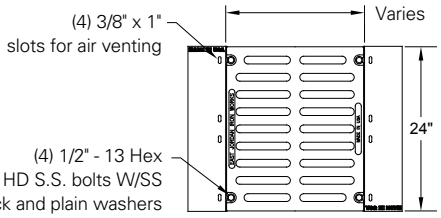


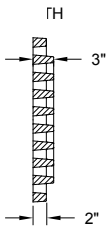
EON LOCK® square nut in horizontally

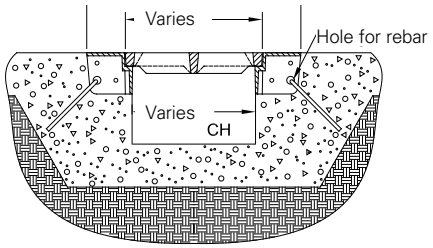


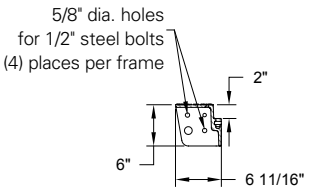
00690222B01 Cover

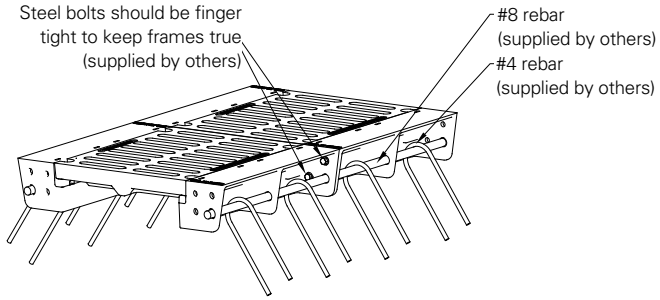
6900 LINEAR TRENCH DRAINAGE SERIES (CONTINUED)

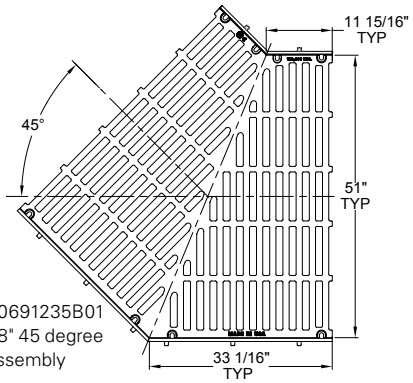




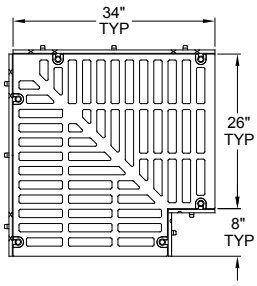




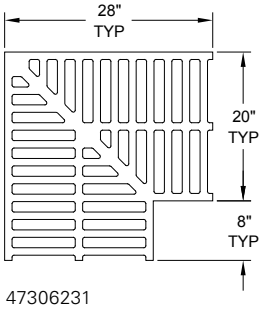




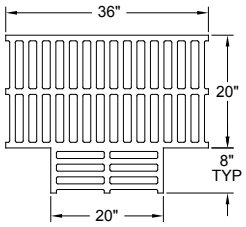
00691235B01
48" 45 degree
assembly



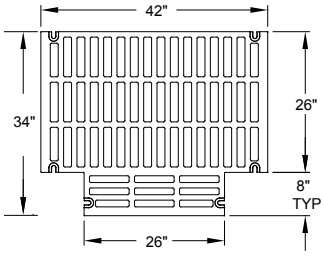
47308202
90 degree turn bolted assembly



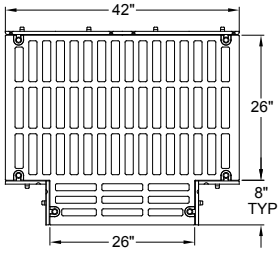
47306231
20" 90 degree turn assembly



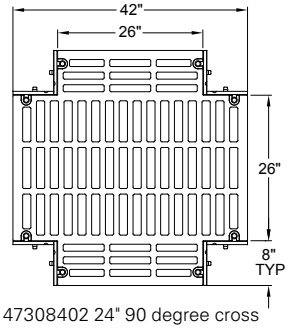
47306331
20" 90 degree tee trench grate



47308332
26" 90 degree tee intersection trench
grate



47308302
24" 90 degree tee assembly



47308402 24" 90 degree cross
bolted assembly

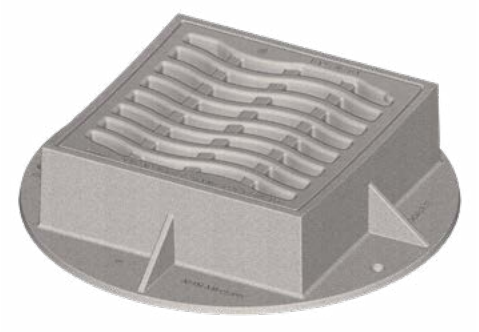
For more information
about linear trench and
other airport products,
please scan this QR code.

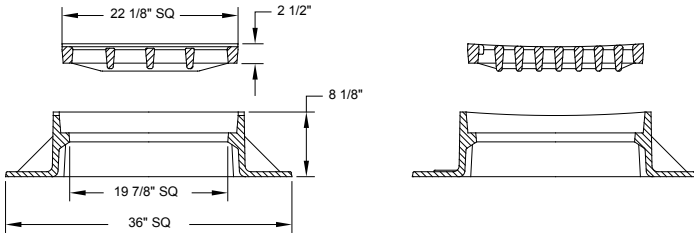
5105 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
Sinusoidal style—652 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolting
Crack drill pent head bolting





5105 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Bottom Flange	5100Z1
8	Bottom Flange	5100Z

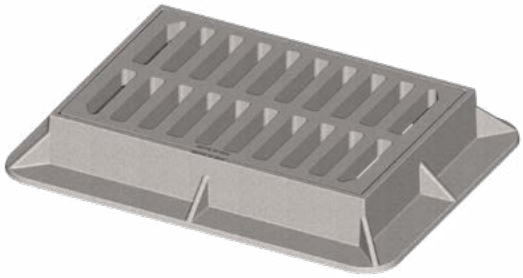
Note: All dimensions are in inches.

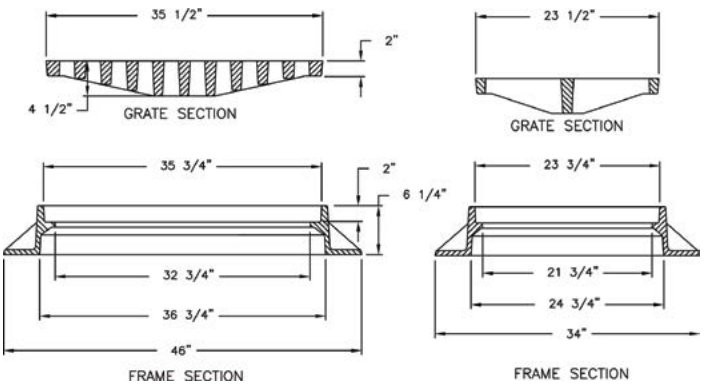
5430 FRAME AND GRATE

Extra heavy duty

Grates
Gray iron
355 sq. in. open area
Dump No Waste messaging

Lock Types
Crack drill hex bolting
Crack drill pent head bolting





5430 Frame Options (All gray iron)

Frame Length	Frame Style	Series
6 1/4	Bottom Flange	5430Z

Note: All dimensions are in inches.

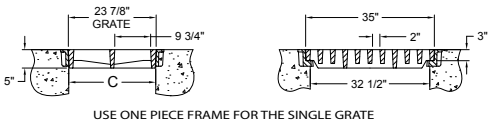
5436 TRENCH GRATE, FRAME, AND COVER SERIES

Airport extra heavy duty
Solid covers available
Monolithic frame available for single and double assemblies for ease of assembly

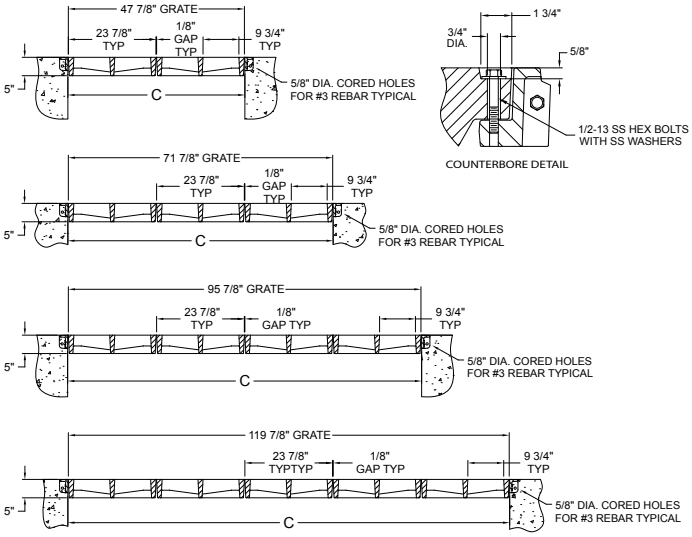
Covers
Ductile iron
Available for 1, 2, 3 and 4 grate
Custom badging/lettering

Grates
Ductile iron
385 sq. in. of open area per grate

Lock Types
Hex bolts
Pent head bolting



USE ONE PIECE FRAME FOR THE SINGLE GRATE



Caution: Do not disassemble bolted grates before setting sections in concrete

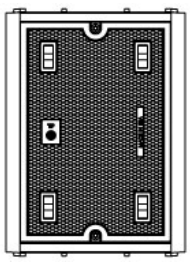
5436 Frame Options (All ductile iron)

Frame Style	Series
Top Flange—One Piece	5436Z5 single grate or cover
Top Flange—Two Piece	5436Z6 double grate or cover
Top Flange—Modular/ Expandable	5436Z1—Load bearing support side frame (with 1 1/2" thick support area)
Top Flange—Modular/ Expandable	5436Z2—End side frame

Note: All dimensions are in inches.

5436 Standard Drainage Inlet, Frame and Grate Assembly Series

Series Number	Grates	Grate Width	Seat Depth	Trench Clear Opening Width	Trench Opening Length	Open Area Sq. In
00543633B03	1 Grate*	23 7/8	3	23 3/4	32	385
00543632B03	2 Grate, 1 piece frame*	48 1/8	3	47 7/8	32 1/2	769
00543606	3 Grate*	72 1/8	3	71 7/8	32 1/2	1155
00543608	4 Grate*	96 1/4	3	95 7/8	32 1/2	1538
00543734B01	5 Grate	120 1/8	3	119 7/8	38 7/8**	1930


00543601 Cover

Note: All dimensions are in inches.
*Solid covers available
**Larger opening length than the rest of the series

5440 FRAME AND GRATES

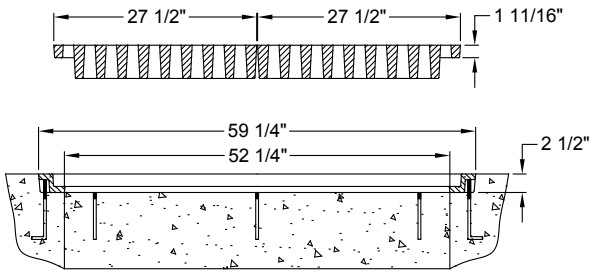
Airport extra heavy duty

Options
Anchor bolts on frame

Grates
Ductile iron
590 sq. in. of open area per assembly

Frame
Gray iron
Top flange

Lock Types
Hex bolts
Pent head bolting

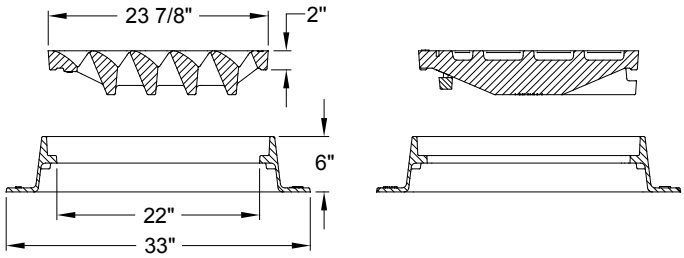


5520 FRAME AND GRATE

Airport extra heavy duty

Options
Dump No Waste messaging

Lock Types
Hex bolts
Pent head bolting
Cam lock—5520M8 only



5520 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Bottom Flange	5525Z
6	Reversible	5370Z
6	Bottom Flange	5546Z
8	Bottom Flange	5521Z

Note: All dimensions are in inches.

5520 Grate Options

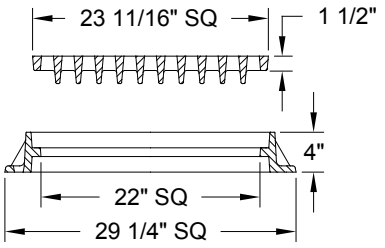
Grate Style	Grate Material	Open Area	Series
Flat bar	Ductile iron	217 sq. in.	5520M5
Vane	Gray iron	300 sq. in.	5520M8

V5622 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
266 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



5622 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	V5622
5	Bottom Flange	V5622-1
6	Bottom Flange	V5250Z
8	Bottom Flange	5235Z

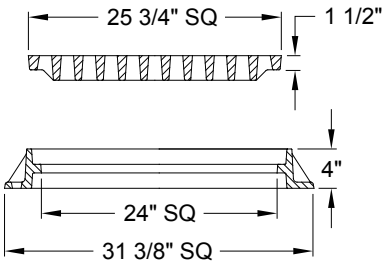
Note: All dimensions are in inches.

V5624 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
295 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



5624 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	V5624

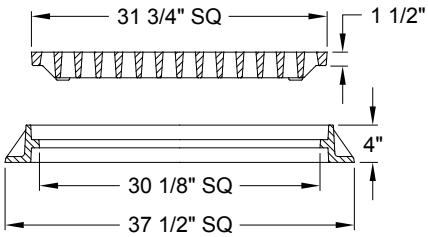
Note: All dimensions are in inches.

V5630 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
474 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



5630 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	V5630

Note: All dimensions are in inches.

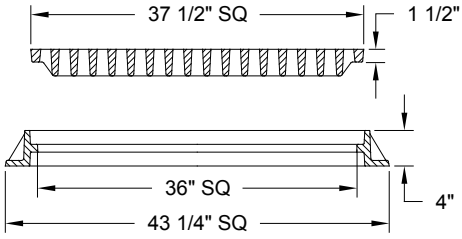
V5636 FRAME AND GRATE

Extra heavy duty

Options
Anchor bolts in frame

Grates
Ductile iron
651 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



5636 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	V5636

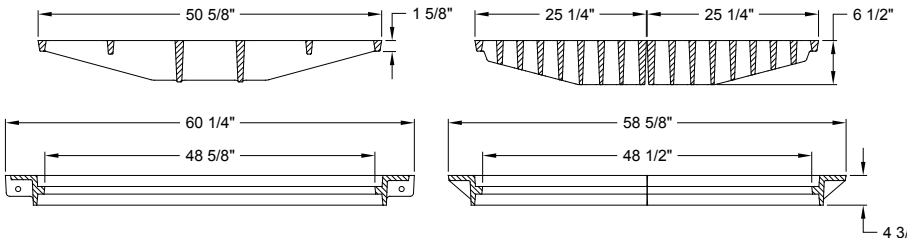
Note: All dimensions are in inches.

V5648 FRAME AND GRATE

Airport extra heavy duty

Grates
Ductile iron
1374 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



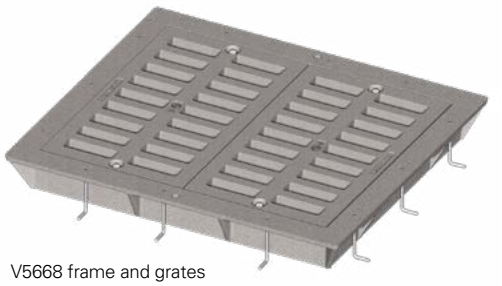
5648 Frame Options (All ductile iron)

Frame Length	Frame Style	Series
4 3/8	Reversible 2 piece frame	V5648

Note: All dimensions are in inches.

5436 double frame and grate trench assembly

V5667, V5668, V5669, AND V5670 FRAME, GRATE, AND COVER

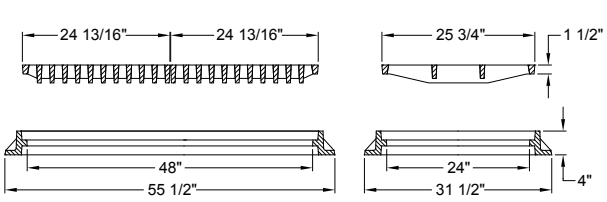


V5668 frame and grates

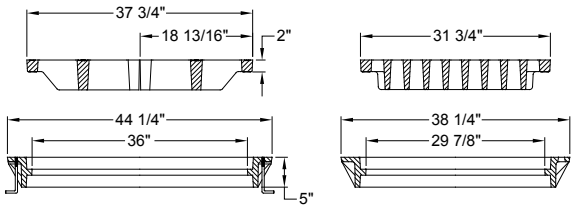
V5667, V5668, V5669, and V5670 Frame, Grate and Cover Series

Series	Clear Opening	Features	Grate	Frame	Lock Type	Other
V5667	24 x 48	Extra heavy duty	Ductile iron 598 sq. in. of open area per assembly	Ductile iron V6667 shown in junction box section (see pg. 22)	Gray iron **Reversible** 4" Frame—V5667	Crack drill hex bolts Crack drill pent head bolting
V5668	30 x 36	Airport extra heavy duty	Ductile iron 472 sq. in. of open area per assembly	Gray iron **Reversible** 5" frame—V5668	Hex bolting Pent head bolting	Anchor bolts in frame*
V5669	30 x 48	Extra heavy duty	Ductile iron 724 sq. in. of open area per assembly	Gray iron **Reversible** 4" frame—V5669	Crack drill hex bolting Crack drill pent head bolting	
V5670	36 x 48	Extra heavy duty	Ductile iron 708 sq. in. of open area per assembly	Gray iron **Reversible** 4" frame—V5670	Crack drill hex bolting Crack drill pent head bolting	

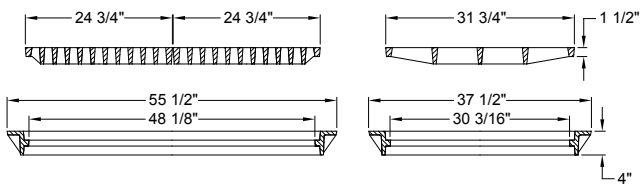
* (12) 3/8-16NC anchor bolts supplied by EJ and added by the customer



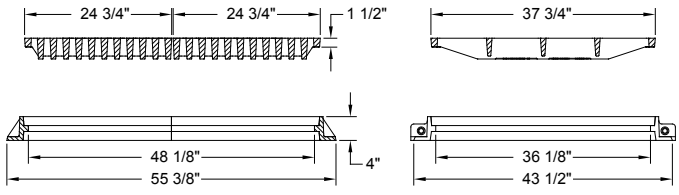
V5667



V5668



V5669



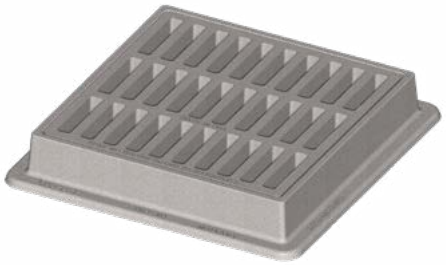
V5670

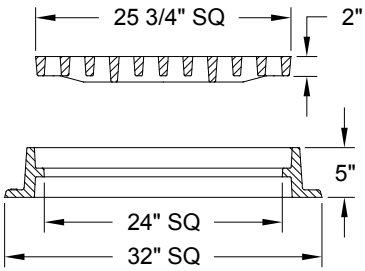
V5726 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
321 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting





5726 Frame Options (All gray iron)

Frame Length	Frame Style	Series
2 3/4	Angle Style	V5726-1
5	Bottom Flange	V5626-1
6	Reversible	V5626-2

Note: All dimensions are in inches.

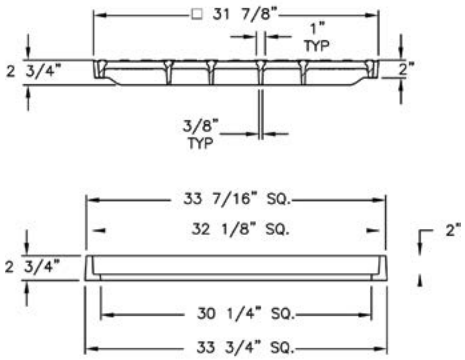
V5732 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
478 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting

Frame
Gray Iron

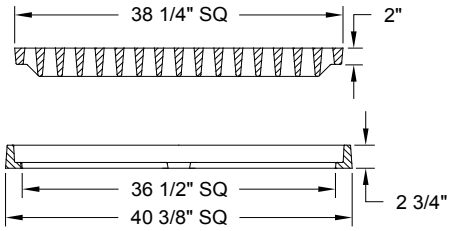


V5736 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
652 sq. in. of open area
Dump No Waste messaging

Lock Types
Crack drill hex bolts
Crack drill pent head bolting



5736 Frame Options (Gray or Ductile Iron)

Frame Length	Frame Style	Series
2 3/4	Angle Style	V5736

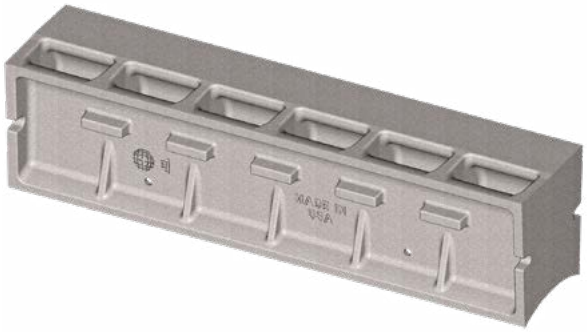
Note: All dimensions are in inches.

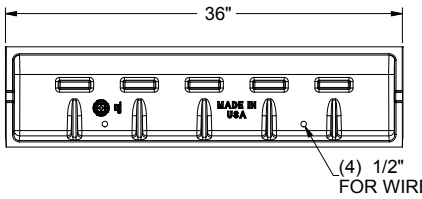
5436 frame and grate assembly

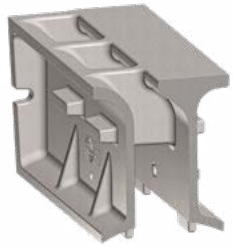
5436 frame and grate assembly

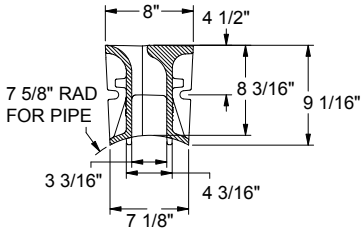
6979 LINEAR SLOTTED DRAIN VANE GRATE

Vane style grate
9" tall
Fits into slot cut into pipe
Allows for capture of surface water between catch basins



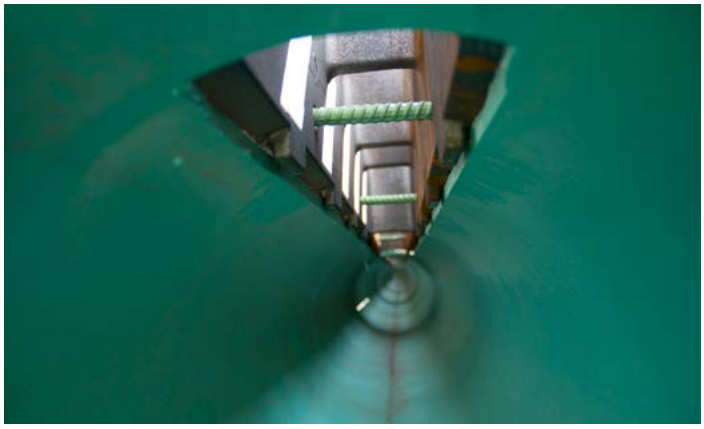






Cross section view

Linear slotted drain vane grate during installation



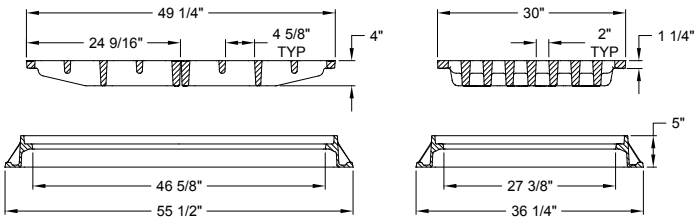
View inside PVC pipe

7585 FRAME AND GRATE

Airport extra heavy duty
Special proof load to 245,000 lbs

Grates
Ductile iron
560sq. in. of open area per assembly
Dump No Waste messaging

Lock Types
Hex bolts
Pent head bolts



7585 Frame Options (All gray iron)

Frame Length	Frame Style	Series
5	Bottom Flange	7585Z1

Note: All dimensions are in inches.

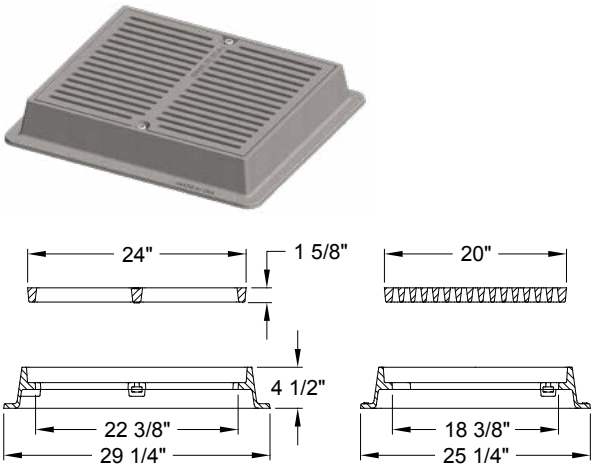
7750 FRAME, GRATE AND COVER

Extra heavy duty

Options
Dump No Waste Messaging

Column
Solid cover
00775000

Lock Types
Allen head bolts



7750 Grate Options

Grate Style	Grate Material	Open Area	Series
Herringbone	Ductile iron	185 sq. in.	7750M1
Vane	Ductile iron	216 sq. in.	7750M2

7750 Frame Options (All gray iron)

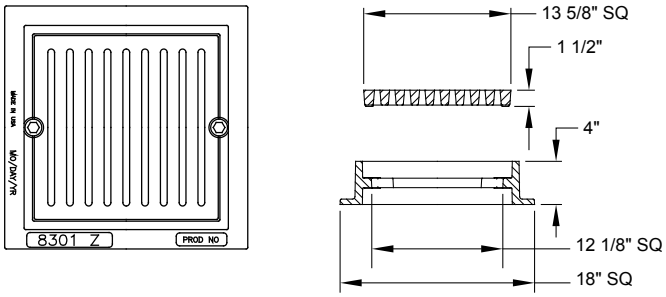
Frame Length	Frame Style	Series
4 1/2	Reversible	7750Z

Note: All dimensions are in inches.

8301 FRAME AND GRATE

Extra heavy duty

Lock Types
Crack drill hex bolts
Crack drill pent head bolts



8301 Grate Options (All ductile iron)

Open Area	Grate Style	Series
50 sq. in.	ADA	8201M

8301 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	8301Z

Note: All dimensions are in inches.

EXPANDED POLYSTYRENE (EPS) TRENCH FORMING INSTALLATION GUIDELINES

The alternate EPS trench forming system can be installed much faster and less expensively than traditional forming procedures. Meant to work with the 6800, 6808 and 6900 series bolted top flange trench frames, it is installed at the end of a project instead of the beginning, ensuring that the trench drain will be lower than the surrounding area.

To use this system, determine the length of individual runs. Note that the most cost effective trenches come in 8' increments, but others are available. Also determine the starting depth and ending depth of each run, if incorporating in a slope. Note that a neutral slope (start depth equals ending depth) can also drain water effectively and is the most cost effective option. Select a trench cross sectional profile- note that the classic trapezoidal look can be designed to accept a flat blade shovel on the bottom of trench for ease of cleaning and routine maintenance.

Step 1

Step 1, stacked assemblies.

Step 2

Basic items needed for installation:

1. 2" x 4" boards – 8' long. These are used to fasten the forms to the trench assemblies. Use one for trenches under 15" wide. Use two for trenches over 15" wide.
2. 4" x 4" boards– Length depends on how wide of a trench is selected. These are used to hang the trench assemblies in the open area. Two are needed per 8' long assembly.
3. 12" long J Hooks – four needed per 8' long assembly. You can also bend long 1/2" bolts so the head of the bolt can be hooked under a bar of the trench grate assembly.
4. 10" to 12" long wood screws – eight needed per 8' long assembly. These are used to connect the forms to the trench drain assemblies.
5. Various shims of thicknesses ranging from 1/16" – 1".
6. Rebar – per the plans or engineer's specification.
7. 1/2" bolts (2 3/4" long), nuts, and washers to bolt assemblies together. Two needed per foot of trench.

Step 1. The trench assemblies can be fabricated off site to minimize impact on construction area. Prepare trench frame and grate assemblies by laying them out in manageable sections that can be safely lifted with equipment. Each frame and grate section should be bolted end to end with four 1/2" bolts. To expedite assembly these can be then stacked once assembled. The top flange trench assemblies shall be assembled in the length of the forms.

Step 2. Select the correct foam sections based on the layout profile and remove forms from their shipping shell. Turn foam sections upside down and apply two coats of the supplied form release. Apply the form release by brush or roller in accordance with product instructions. Let forms cure for 24 hours between coats.

EXPANDED POLYSTYRENE (EPS) TRENCH FORMING INSTALLATION GUIDELINES (CONTINUED)

Step 2. (continued) Also note that alternatively the second coat of form release can be applied immediately before the trench assemblies are installed prior to pouring concrete. The forms need to remain dry as moisture activates the form release agent.

Step 3. Once the form release has cured prepare foam sections for attachment to the trench assemblies. Plastic sheets will help prevent the mold release from transferring to the floor when the foam core invert section is turned over. Insert 2" x 4" in channels cut in foam core. You can now set the trench frame section on the invert channel section and secure them together with the ten 12" deck screws. Typically, two to four in each grate section is sufficient. (Note: If using a parabolic or rounded bottom profile, save the protective shipping pieces so they can be re-used to provide a flat bottom to attach trench assemblies). Several sections can be prepared for trench installation.

Step 4. The area where the trench is to be installed shall have an open area in the concrete that is at least 2' wider than the clear opening of the trench drain assembly. Rebar cages can be assembled and installed into the trench opening. Transport the trench drain assemblies to the job location. Attach 4" x 4" to the top of each trench drain assembly near the ends of each trench drain and form assembly. Use the J Hooks and drill holes through the 4" x 4" boards, hooking the J- hooks under a bar on the trench drain assembly. Using washers and nuts, secure the 4" x 4" tightly to the trench drain assembly.

Step 5. Transport the trench drain assemblies to the job location. Attach 4" x 4" to the top of each trench drain assembly near the ends of each trench drain and form assembly. Use the J Hooks and drill holes through the 4" x 4" boards, hooking the J- hooks under a bar on the trench drain assembly. Using washers and nuts, secure the 4" x 4" tightly to the trench drain assembly.

Step 6. Set the trench drain and form sections into trench in the order shown on the layout detail sheet. Set the correct height of each section by using shims placed under the 4" x 4" boards on the adjacent concrete. Typically, the trench assembly is placed 1/8" to 1/4" below the adjacent concrete. After the height is set on an assembly, install the next assembly and bolt the flanges of each assembly together. Holes are provided in cast iron frame sections if continuous rebar is required. Install it at some point during this assembly to tie into the pretied rebar cage.

Note: DO NOT cover vent holes in frame, these allow trapped air to escape and ensure complete embedment of the frame section. Attach the trench end section if using. If using a hinged trench product, take care to cover the hinge pockets so that excess concrete does not foul the hinge pocket area.

Step 3

Step 4

Step 6

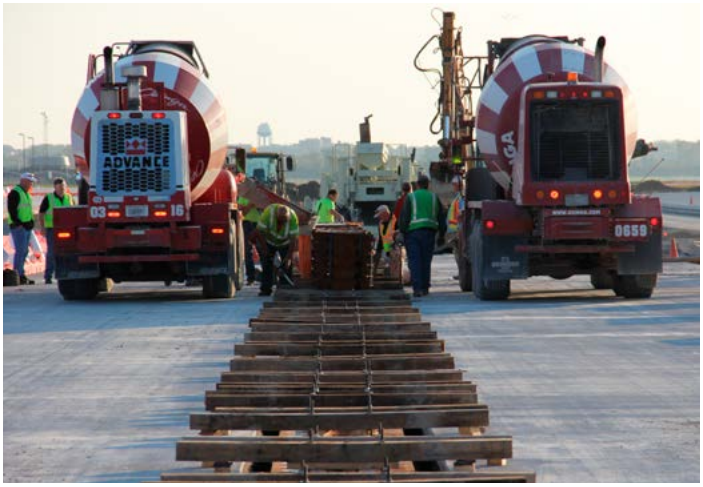
EXPANDED POLYSTYRENE (EPS) TRENCH FORMING INSTALLATION GUIDELINES (CONTINUED)

Step 7. Pour concrete equally from both sides of the trench. Fill the trench until the trench is about 3/4 full (concrete just touching the bottom of the trench frame). Be sure to properly use vibratory equipment during the concrete pouring process. When the concrete is just touching the bottom of the trench frame, place weights on top of the trench assemblies. These will ensure that the assemblies do not float while the trench is filled to the top. Come back and fill the trench to the surface and use vibratory equipment to ensure that concrete comes through the vent holes. Continue to check the height of the trench assemblies to ensure that it is still correct. Additional weight may be needed to maintain proper elevation in trench. The foam sections will float when vibratory equipment is used to consolidate the concrete when placement is occurring.

Step 8. Finish concrete as required by project details/plans. Allow concrete to hard cure set (green cure). You can now start to remove surface timber and counterweight materials. The trench can be left with the forming materials in place until several sections are ready for removal. It is recommended that the forms remain installed for at least 48 hours before removal.

Step 9. To remove forming materials, unbolt grate sections and remove them (hinged grates have a self engaging safety arm). Remove center wedge section, then collapse side wall sections. Foam sections are NOT re-usable. Remove 2" x 4" boards from center core sections and dispose of foam in accordance with local laws/ordinances. Sweep up and dispose of any debris that may be reamaining in the trench. If additional hardware (lift assist struts) is required, they can be installed in designated sections using provided hardware. To lower the grate, lift the "Yellow" safety arm until the arm "disengages". Lower the grate down until it sits flush in the frame. Do NOT allow the grate to slam shut. Resecure the grates using previously removed hardware.

For more information, please call 800 626 4653.



Step 7

Step 8, 9

Step 8, 9

TOP FLANGE TRADITIONAL TRENCH GRATE INSTALLATION GUIDELINES

These instructions are meant to be a guide and do not encompass all situations. The contractor or owner has the discretion to modify as they see fit to meet special conditions if they exist. Local civil engineering codes should be followed to ensure long term installation success.

Step 1. Establish overall grade of trench installation and pour base slab of trench. The width and thickness of this base slab will vary depending on site conditions and expected loading. A typical trench base slab is between 10" and 16" thick, and the width of the trench plus the width of the side walls. An example is if an 18" wide trench is being installed with 12" wide side walls the base slab will be 42". Typically #4 rebar is added to the base slab and the rebar is extended above the top of the slab to allow for the side wall rebar to tie into it. The base slab is sloped to allow for collected drainage water to flow to the collection point. The exact slope and depth of the trench is determined by site conditions and by the specifying engineer. Often the base slab is poured monolithically without expansion joints. If expansion joints are desired they can be added as determined by local conditions.

Step 2. Following an appropriate curing time, the side walls of the trench are constructed. An inside form is created that is strong enough for the trench grating assemblies to sit on top of the form. Typically 3/4" plywood or similar is used. The trench product is designed to rest on the form. It should rest on the underside of the grate and be pushed against the vertical inside wall of the trench rail. The grade of the finished product can be established by measuring the thickness of grate where the form rests and subtracting that number from where the final grade shall be. One method that can be used to construct the forms is to build the trench run, then establish the final grade on the outside of the form with various markings. Next, make markings below the grade markings that account for the thickness of the grate. Then, make a chalk line along the outside of the form. Finally, take a circular saw and cut along the chalk line, which should put the form at the proper height.

Step 3. Place the trench product on top of the forms. The trench product must be placed on the form as a complete assembly in order to ensure that the bolting features line up. Trench assemblies shall be placed next to one another and bolted together. They shall be bolted snuggly. EJ recommends using a minimum of 2 bolts be used at each joint, but the contractor can use what locations are convenient.

Step 4. Install rebar in the vertical sidewall of the trench. Typically a #8 rebar is installed in the one main gusset hole in the underside of the trench frame. Typically #4 to #8 rebar is used to connect to the rebar that is sticking out from the base slab and it is looped appropriately inside where the trench side wall will be. Typical spacing of the #4 rebar is a loop every 12".

Step 1

Step 2, Step 3

Step 4

TOP FLANGE TRADITIONAL TRENCH GRATE INSTALLATION GUIDELINES (CONTINUED)

Step 5. Construct either an expansion joint or a cold joint. Typically, rebar is stopped on either side of an expansion joint, although having rebar run through an expansion joint is done as well. Often longer bolts are used to bolt the adjacent top flange frames to one another through the expansion joint. Expansion joints can be evenly spaced on a trench run. Cold joints can also be constructed where a pour is halted. Often, one would want to run dowels into the area being poured and extending out past the cold joint so that the next pour can be dowelled into the original pour.

Step 5

Step 6. Place the outer forms around the trench to form the outer side wall. If desired, dowels can be placed into the side wall of the trench so that when the final slab is poured the trench will be incorporated into the surface slab. It is recommended that the concrete be evenly distributed on either side of the trench at the same time so the weight on forms is evenly distributed. Hand finishing of the top edge of the trench is recommended as well. When pouring the trench, the side walls shall be vibrated properly and concrete shall be witnessed coming out of the vent holes. This ensures that the concrete is fully underneath the trench frame.

Step 6

Note A: If using a hinged product, take care to cover the hinge pockets so that excess concrete does not foul with hinges after installation.

Note B: For aesthetic reasons, plastic sheeting may be placed over the trench product and taped to the top of the product. This will prevent concrete from inadvertently being poured into the trench and will help keep the product clean. There are a number of air vent holes on the top of the frame that will need to be exposed by making small cuts in the plastic sheet over the vent holes.

Note A

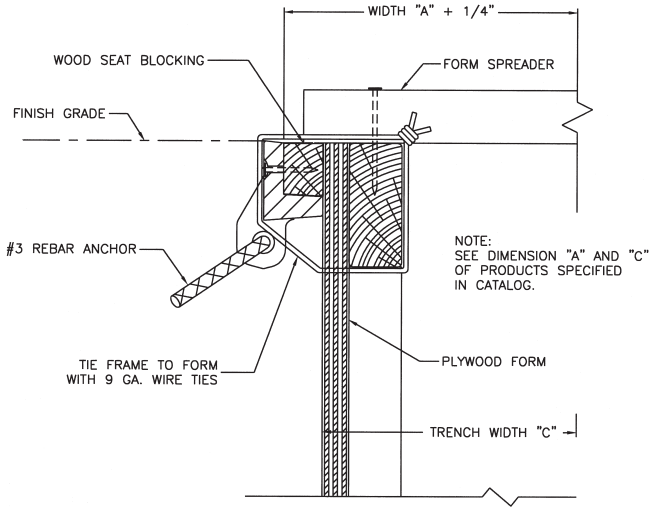
Step 7. After an appropriate curing time, the forms can be stripped and the plastic sheeting removed. Remove the grates and the inner forms. Clean the inside of the trench of any debris. Place the grates back in their original location and bolt them down appropriately. Clean the top of the grating and the trench.

Step 7

ANGLE TRENCH GRATE INSTALLATION GUIDELINES

Standard Trench Grate Installation

Step 1. Pour and finish trench bottom concrete to proper depth and slope and allow curing time. After the bottom has cured, begin erecting the trench form. For properly fitted grates, the form must be plumb, level, and straight. The width of the trench (clear opening) must correspond to the outside edge of the form. This width corresponds to dimension "C" in the catalog. The height of the form will determine the finished grade elevation of the installed grates.



Step 2. Extend the spreader beyond the edge of the form to provide a stop for the wood seat blocking. The wood seat blocking is nailed to the form and the cast iron frame is nailed to the wood seat blocking using the bolts in the face of the frame.

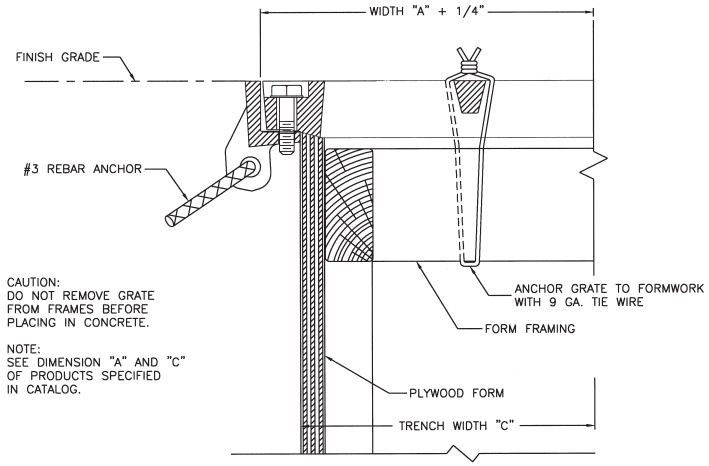
Step 3. The cast iron frame and wood seat blocking are then secured with 9 gauge tie wire. The frames should be butted together to leave as little gap as possible.

Step 4. Place at least eight inches of bent #3 rebar through the anchor lug holes to provide anchorage to the concrete. The frames should be spaced according to the catalog dimension "A" plus 1/4 inch. Trench side frames are not designed to be bolted to each other.

Step 5. The concrete for the trench side walls may then be poured. Once the concrete has cured, complete installation by stripping all forming material and tie wires.

Bolted Trench Grate Installation

Step 1. The bolted grates are shipped assembled to the frame. These units should not be disassembled during installation. Pour and finish trench bottom concrete to proper depth and slope and allow curing time.



Step 2. After the bottom has cured begin erecting the trench form. For properly fitted grates, the form must be plumb, level, and straight. The width of the trench (clear opening) must correspond to the outside edge of the form. This width corresponds to dimension "C" in the catalog . The height of the form will determine the finished grade elevation of the installed grates.

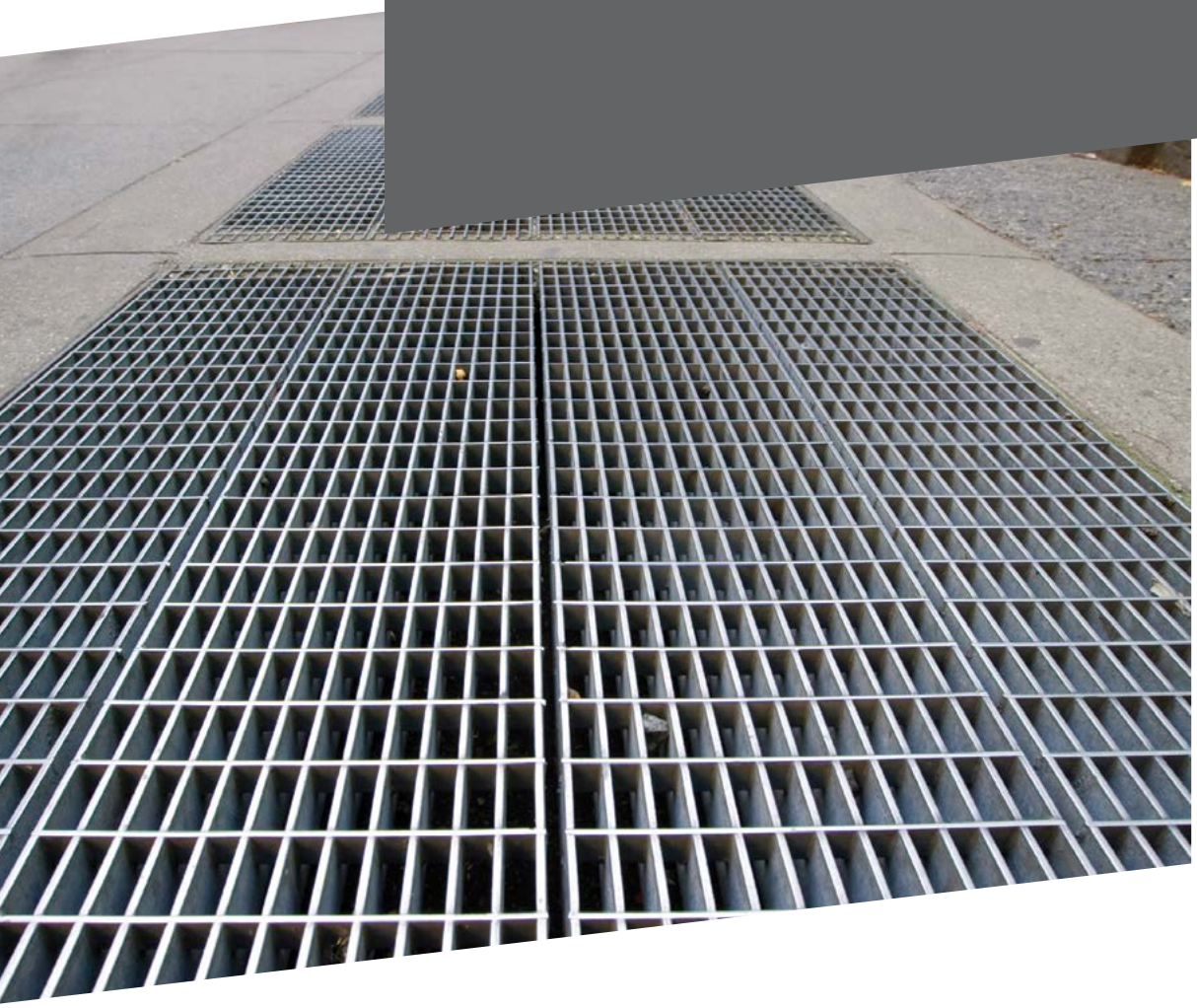
Step 3. The frame and grate units should be butted together to leave as little gap as possible. Bolted trench grate assemblies may change during shipping and handling. Make sure the side frames are spaced according to dimension "A" plus 1/4" as illustrated.

Step 4. The frame and grate units are then secured with 9 gauge wire tied to the forming brace.

Step 5. Place at least eight inches of bent #3 rebar through the anchor lug holes to provide anchorage to the concrete.

Step 6. The concrete for the trench side walls may then be poured. Once the concrete has cured, complete installation by stripping all forming material and tie wires.

Custom Fabricated Drainage



CUSTOM FABRICATED DRAINAGE

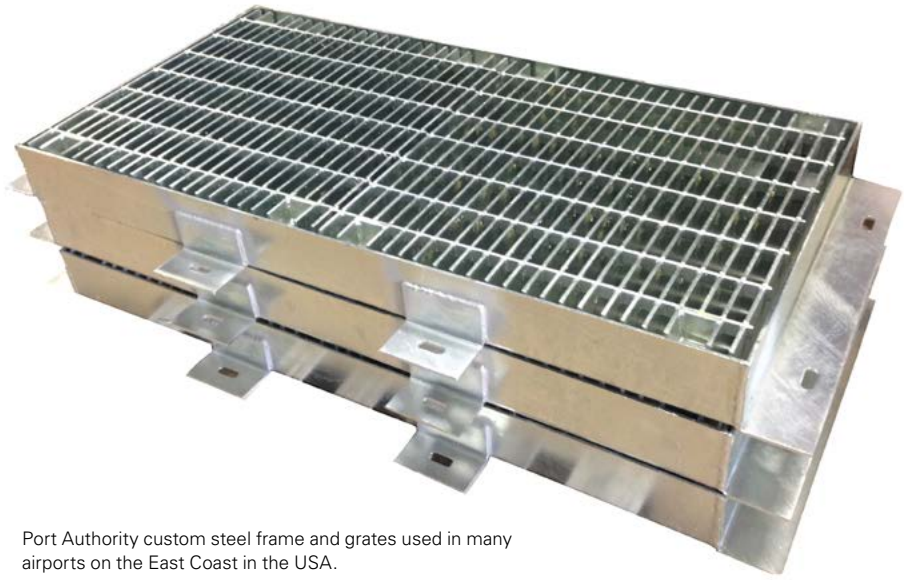
EJ offers a variety of custom fabricated solutions designed for airports and other enivironments that undergo excessive load conditions. Our fabricated steel drainage grating conforms to design load guidelines and are used on projects across the USA and around the world.

Customers often turn to EJ for products that help existing infrastructure problems because many products are not designed to withstand the expected load condition. The design teams at EJ frequently design replacement grating solutions for retrofit applications engineered to meet the airport requirements.

Contact our expert design team the next time you need a custom solution for your project.

Products
- Galvanized steel frame and grate sets
- Steel reticuline steel frame and grate catch basins
- Taxiway drainage grates
- Other custom fabricated solutions to satisfy your specific application

Airport steel galvanized pipe grates for taxiway drainage.



Port Authority custom steel frame and grates used in many airports on the East Coast in the USA.

Galvanized steel single frame and grate for airports.

Cleanout and Monument Boxes

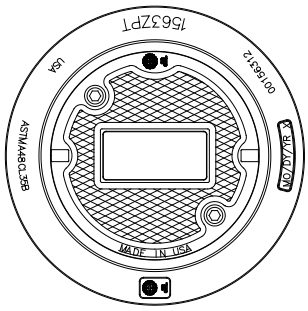
1563 CLEANOUT/MONUMENT BOX FRAME AND COVER

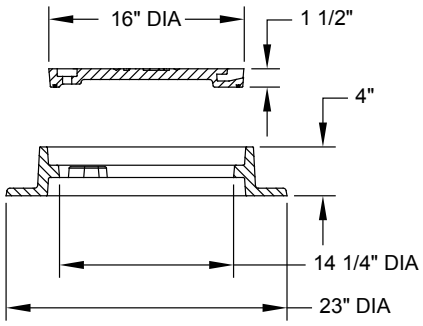
Extra heavy duty

Options
Gasketed
Custom badging/lettering

Covers
Gray iron
Solid
Closed pickholes

Lock Types
Hex bolts
Pent head bolts





1563 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	1563Z

Note: All dimensions are in inches.

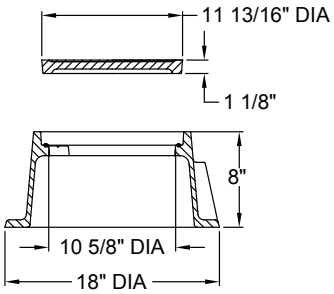
1564 CLEANOUT/MONUMENT BOX FRAME AND COVER

Extra heavy duty

Options
Gasketed
Custom badging/lettering

Covers
Gray iron
Solid
Closed pickholes

Lock Types
Cam locking
Hex bolts
Pent head bolts



1564 Frame Options (All gray iron)

Frame Length	Frame Style	Series
8	Bottom Flange	1564Z

Note: All dimensions are in inches.

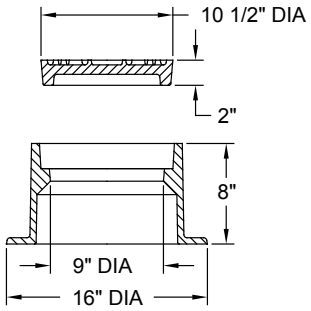
1565 CLEANOUT/MONUMENT BOX FRAME AND COVER

Extra heavy duty

Options
Gasketed
Custom badging/lettering

Covers
Gray iron
Solid
Closed pickholes

Lock Types
Crack drill hex bolts
Crack drill pent head bolts



1565 Frame Options (All gray iron)

Frame Length	Frame Style	Series
8	Bottom Flange	1564Z

Note: All dimensions are in inches.

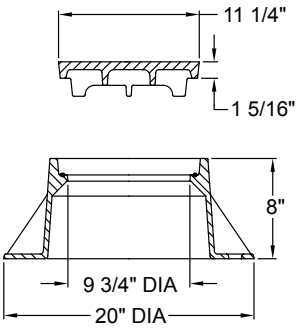
1578 CLEANOUT/MONUMENT BOX FRAME AND COVER

Airport extra heavy duty

Options
Gasketed
Custom badging/lettering

Covers
Ductile iron
Solid
Closed pickholes

Lock Types
Hex bolts
Pent head bolts



1578 Frame Options (All gray iron)

Frame Length	Frame Style	Series
8	Bottom Flange	1578Z

Note: All dimensions are in inches.

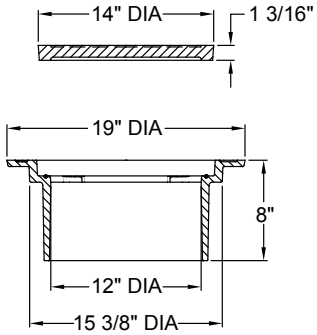
1716 CLEANOUT/MONUMENT BOX FRAME AND COVER

Airport extra heavy duty

Options
Gasketed
Custom badging/lettering
Anchor studs on 3" frame

Covers
Ductile iron
Solid
Closed pickholes

Lock Types
Hex bolts
Pent head bolts



1716 Frame Options (All gray iron)

Frame Length	Frame Style	Series
3	Top Flange	1716Z
8	Top Flange	1716Z1

Note: All dimensions are in inches.

2965 CLEANOUT/MONUMENT BOX FRAME, COVER AND GRATE

Airport extra heavy duty

Options
Custom badging/lettering

Covers
Ductile iron
Solid
Extra deep 3" skirt on underside of cover
Open pickholes

Lock Types
Crack drill hex bolts
Crack drill pent head bolts

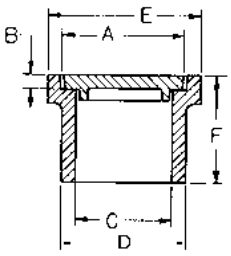
Grate
Ductile iron
2695M—17 sq. in. of open area

Illustrating bottom flange.

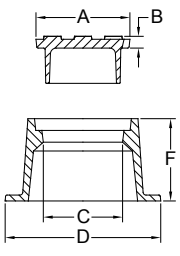
2965 Frame Options (All gray iron)

Frame Length	Frame Style	Series
7	Bottom Flange	1570Z
10	Bottom Flange	2966Z
10	Top Flange	2965Z

Note: All dimensions are in inches.



Illustrating top flange



Illustrating bottom flange

2960 - 2980 Monument Boxes

Series	Cover Diameter A	Cover Thickness B	Clear Opening C	Dimension D	Top Flange E	Frame Height F
2960†	6.5	1 1/2	5	5 3/4	7 5/8	6 1/4
2965*	8	1	6 1/2	8	9 3/4	10
2966*	8	1	6 1/2	11 1/2	9 3/4	10
2967†	8	1	6 1/2	7 13/16	9 3/4	10
2970†	8 1/4	3/4	7	7 3/4	9 1/2	6 1/4
2975†	9 5/8	3/4	8 1/4	9	10 3/4	7 1/2
2980†	11 3/8	5/8	10	–	13	7 1/2

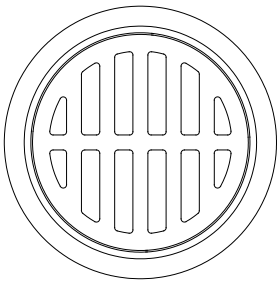
Note: All dimensions are in inches. *Airport extra heavy duty rated. †Heavy duty rated.

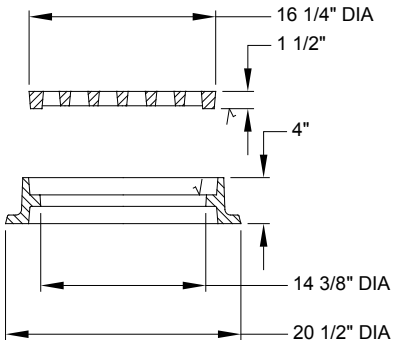
V3610-4 FRAME AND GRATE

Extra heavy duty

Grates
Ductile iron
73 sq. in. of open area—V3610-3

Lock Types
Crack drill hex bolts
Crack drill pent head bolts





V3610-4 Frame Options (All gray iron)

Frame Length	Frame Style	Series
4	Reversible	V1610-3

Note: All dimensions are in inches.

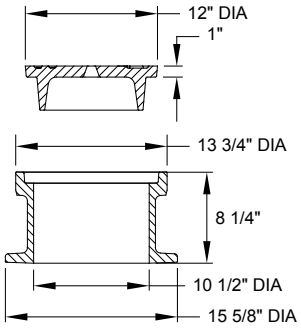
3697 CLEANOUT/MONUMENT BOX FRAME AND COVER

Airport extra heavy duty

Other
Custom badging/lettering

Cover
Ductile iron
Vented
Lift hole

Lock Types
Crack drill hex bolts
Crack drill pent head bolts



3697 Frame Options (All gray iron)

Frame Length	Frame Style	Series
8 1/4	Bottom Flange	3697Z

Note: All dimensions are in inches.

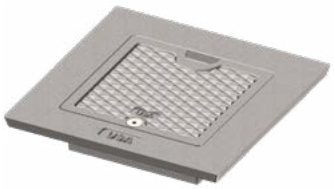
8350 MONUMENT BOX FRAME AND COVER

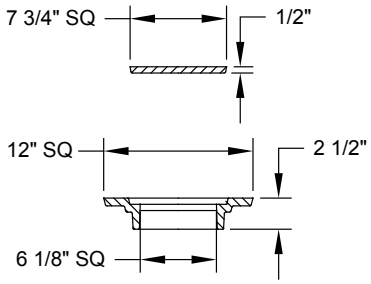
Airport extra heavy duty

Options
Custom badging/lettering

Cover
Gray iron
Solid
Open pickhole

Lock Types
Counter sunk screw





8350 Frame Options (All gray iron)

Frame Length	Frame Style	Series
2 1/2	Top Flange	8380Z

Note: All dimensions are in inches.

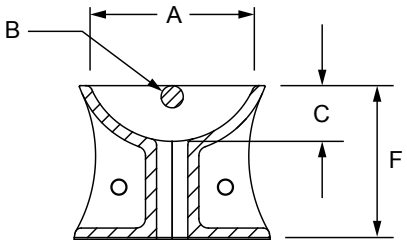
AIRPORT MOORING EYES

Airport extra heavy duty
Ductile iron

5993 Series

5996 Series

5999 Series



Airport Mooring Eyes

Catalog Number	Width A	Dia. B	Depth C	Height D	Pull Out Force*
00599300	6 1/2	7/8	2 3/16	3 1/2	20,000 lbs
00599600	6 1/2	7/8	2 3/16	6	20,000 lbs
00599900	16	2 3/8	8	9	20,000 lbs

Note: All dimensions are in inches

*Pull out force of mooring eyes is dependent on proper anchoring in the field. These products are suitable for environments requiring much greater pull out force, if properly anchored.

Additional Solutions and Information

ERMATIC® MODULAR COVERS

The ERMATIC® system is a comprehensive and highly engineered range of access covers for a wide variety of underground services. This modular system can be customized to fit any underground vault dimension or cover configuration. The ERMATIC range leverages the global engineering and design experience within EJ, to enhance ergonomic design and security.

Features/Options
- Pedestrian to airport rated (or EN124 Standards—B125, C250, D400, E600, F900)
- Standard sizes between 2' x 2' to 10' x 17'
- Custom sizes available
- Water resistant
- Security locking
- Available with hinged and assisted opening (gas or spring loaded struts)
- Ergonomic key for opening
- Available with safety grates and/or safety railings
- Cover options: solid cover with 4L slip resistant tread, recessed for concrete infill or brick pavers, or cover with removable inner hatch/cover
- Available with PREMARK® anti-skid coating

Project Applications
- Sewerage: inspection pits for sludge chambers, access shafts for large plants, etc.
- Telecommunications: cable jointing chambers, etc.
- Utility: lighting, signals, transformer pits, cable joint boxes, etc.

Project Types
- Airports and ports
- Railways
- Tunnels
- Power stations
- Water treatment and purification plants
- Manufacturing plants
- Exhibition and convention centers, leisure parks, stadiums, etc.

The ERMATIC range of modular covers are produced in France.

Modular Construction—The use of modular elements gives a vast range of sizes. Frame elements (side frames and end plates) are assembled using bolts and aluminium joints to provide linear openings for even the longest ducts. Above clear opening spans of 47 1/4" (1200 mm), ERMATIC units use removable beams supported in boxes which are fixed to the frames. This allows the construction of units to suit the largest openings.

1/2/3 covers and frames

Cover with removable beams

Maximizes Surface Area for Unobstructed Use

ERMATIC products assure protection against damage, debris or aggressive chemicals, and allow designers to conceal underground services, maximizing productive use of the unobstructed surface area.

ALUMINUM ACCESS HATCHES

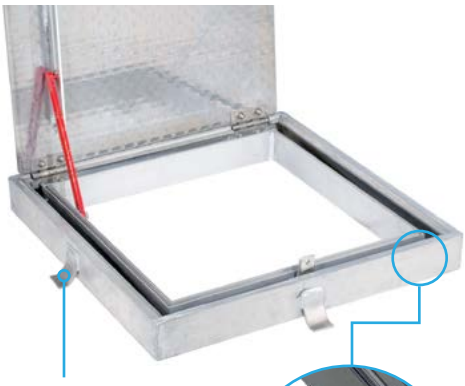
Aluminum access hatches by EJ are designed to withstand heavy use. They are available for pedestrian (non-traffic) or unintended vehicular traffic (AASHTO H20 rated) situations.

This product features heavy duty lift handles, stainless steel hinges with a 3/8" diameter stainless steel hinge pin, and 1/4" aluminum diamond plate covers. Hatches are available in a wide variety of standard and custom sizes to fit your application needs.

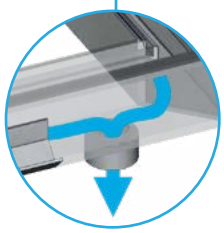
Design Features
- Easy installation: in many cases, all that is needed is the removal of the existing cover and hinges. The new hatch is then lagged to the top of the existing structure.
- All stainless steel hardware
- Stainless steel lift-spring for ease of opening cover
- Exposed padlock clip: other locking devices are available upon request.

Design Benefits
- Visual inspection: limited maintenance can be performed with safety grates in place.
- Visible hazard barrier: safety orange epoxy coating is highly visible for hazard areas.
- Corrosion resistant

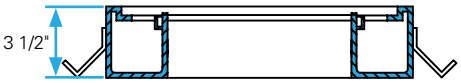
Channel Frame



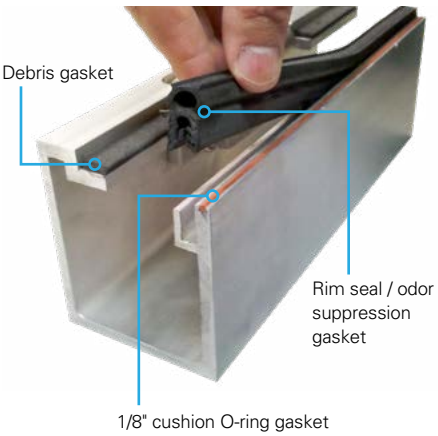
Welded anchor flanges secure the frame when cast in concrete



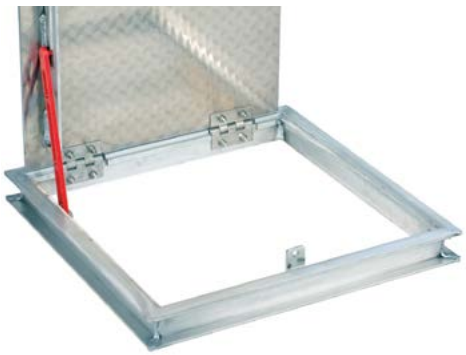
The channel design with integrated drain coupler helps divert water away from the hatch structure. (Drainage piping provided by others not shown)



Optional Gaskets

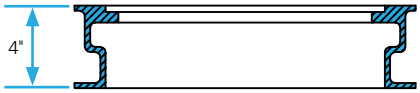


Angle Frame



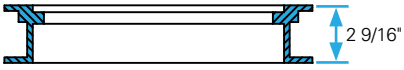
Showing non-traffic, pedestrian application angle frame

For Unintended Vehicular Traffic Applications*
With added strength, this frame is used for unintended vehicular traffic applications.



*Frame alone doesn't assure unintended vehicular traffic rating. Consult with your EJ sales representative for correct products to meet the needs of unintended vehicular traffic rated applications.

For Non-traffic, Pedestrian Applications
Engineered to maximize efficiency, our lean design is built for pedestrian rated applications.



Load Rating

Non-traffic, Pedestrian Rated
Light weight and durable—safe for pedestrians at 300 lb per sq ft live load.

Unintended Vehicular Traffic Rated
Engineered with more robust fabrication—meets the needs of AASHTO H20 rating.

Cover Treatment

Standard non-treated aluminum plate

Sure grip treatment option

Engraving

Add unique identifiers or artwork to your covers (shown with sure grip treatment).

Hinges

Robust, heavy duty grade 316 stainless steel hinge hardware with 3/8" diameter pins provide long, dependable life.

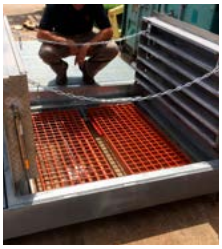
Lift Handle

Lift handle gives a secure grip for opening and closing the cover. Recessed pocket allows handle to fall to a flush resting position when cover is closed.

Self-engaging Safety Bar

Highly visible and strong stainless steel safety bar automatically engages when the cover fully opens—keeping the cover from accidentally closing.

Safety Chain



Safety chain option

SAFE HATCH® Safety Access System

Available SAFE HATCH safety access system for through protection and added security

Lift Assist

Pneumatic lift assist to easily open steel and aluminum access hatches.

Recessed Padlock Clip

Conceals the lock under a protective cover, resting flush with the cover when closed.†

Exposed Padlock Clip

Available where flush cover profile is not required.†

Slam Lock

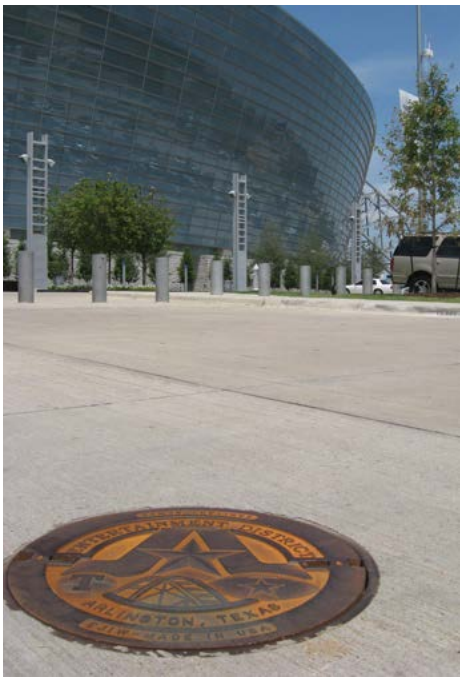
The weight of the cover causes the latch to automatically lock when the cover is closed. (Showing under side of slam lock.)

Turning the key to the unlock position and lifting on the handle opens the hatch.

Nut rail option

Integrate mounting points for spring nut and bolt systems, conduit clamps, and other hardware.

MANHOLE FRAMES AND COVERS



EJ produces street castings to meet ASTM and AASHTO criteria. In addition, our castings meet federal and state DOT specifications, and that of individual customers. Non-traffic, light, medium, heavy, extra heavy-duty, and extra heavy-duty airport are the load designations assigned, which indicate where (on which application) a product should be used.

As a result of continued research and development—the product line is increasingly expanding—and has become more complex and diverse than ever. New features such as ergonomic lift-assist devices; new configurations that are more modular and scalable; new advanced security attributes help prevent theft or mitigate explosions; and applied technology provides capabilities like remote sensing with wireless telemetry.

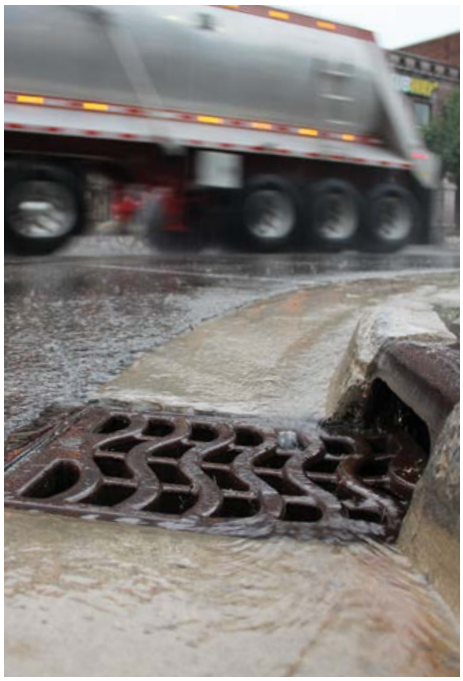
UTILITY AND TELECOMM CASTINGS

EJ offers a comprehensive line of high quality utility construction casting solutions for specialized applications such as telecommunication, electric, gas, traffic signals, and street lighting.

Utilities are the lifeblood of any facility, and uninterrupted service is crucial. Our product designs offer superior access and unparalleled security for critical infrastructure—available in a variety of sizes, shapes, materials, and load ratings to fit the needs of any project.

EJ is the world leader in telecommunication and utility solutions, offering features and attributes to meet your unique requirements:
Ergonomic and safety
Vented covers
Composite materials
Wireless monitoring
Specialty and custom
Explosion mitigation

DRAINAGE CASTINGS



Drainage castings or grates are designed to accept water and can be round, square, or rectangular. They are typically sold with a frame, curb inlet frame, monument box, or bridge drain. Some markets call these slotted covers.

Specifying the appropriate drainage solution is an important part of a storm water management plan. EJ offers a wide array of products designed for storm water drainage including ditch grates, pipe grates, curb and gutter inlets, and catch basins. Drainage castings are available as an assembly or set. EJ also offers bridge drains, scuppers, and ADA grates.

Optional "Dump No Waste! Drains To Waterways" and other permanent cast-in lettering is an effective, low cost, and long-term means to support local environmental initiatives.

TRENCH GRATES

From pedestrian areas to airport loading ramps, EJ has the trench drainage solution to fit your application. With a grate that is designed to be supported on two sides, it is expandable and available in numerous widths.

Grating options include parallel grates, perpendicular cross-street drainage, and ADA styles - available in 24" lengths, and widths from 8" to 51". Frames available in standard 24", 36", and 48" lengths.

Standard heavy duty grates and covers are suitable for general traffic service and AASHTO H-20 loading conditions. Our ADA style trench grating and solid trench covers are available for either general traffic loading or non-traffic applications. Extra heavy duty (EXA) airport trench grating is made with ductile iron and is proof load tested to 200,000 pounds.

For that artistic touch, EJ offers designer trench grates that can be stand alone architectural enhancements, or can accompany matching tree grate designs.

ADJUSTMENT RISERS

Maintain the integrity of your infrastructure by reducing traffic vibration damage. Adjust any manhole or catch basin to grade on your resurfacing projects, new installations, or rehabilitation work with INFRA-RISER® rubber composite adjustment risers.

Below ground, the rubber composite adjustment riser reduces traffic vibration damage—prolonging the life of manhole structures and surrounding pavement:

- Protects against load concentration stress
- Dramatically reduces water infiltration
- Perfect grade adjustment in moments with uniform precision
- Will not break, split, rot, crack, or chip
- Made of 92% recycled raw materials
- Round, square, and rectangular designs; flat and tapered risers, select bolt hole patterns
- Custom sizes available

INFRA-RISER adjustment riser is a simple, economic, efficient, and long-lasting solution. It dissipates the energy transferred between the casting and the manhole structure.

RISER RINGS

Riser rings are an adjustable solution to bring a manhole or catch basin to grade on your resurfacing projects. They are used in conjunction with a frame to increase its overall height. A typical application would be during pavement overlays.

Avoid unnecessary project costs by eliminating extra labor, equipment and materials. There are reduced traffic disruptions—when the street is paved the job is done and the manhole cover is finished to grade.

- Solid or adjustable styles
- Steel and cast iron risers available to fit all your grade adjustments
- Load tested to ensure dependable strength and long lasting durability
- Large inventory ready for delivery nationwide
- Made to order sizes for custom application
- Sloped risers available
- DOT approved in many states

FIRE HYDRANTS

WaterMaster® Fire Hydrants have set the standard for reliability and ease of maintenance. With 2 and 3-nozzle hydrant designs, along with multiple shoe connection options, WaterMaster hydrants offer the right options to meet your standard specifications. All hydrants are compliant with the Reduction of Lead in Drinking Water Act 2011. Computer aided design and analysis, along with ductile iron construction, ensures superior performance. All cast components are made and assembled in the USA.

Each hydrant is pressure tested to twice the rated working pressure. WaterMaster 5CD250 and 5BR250 fire hydrants meet or exceed the requirements of ANSI/AWWA C502 Standard for Dry-Barrel Fire Hydrants, Underwriters Laboratories Standard UL246, and Factory Mutual 1510.

Options include individual hydrants being assembled to your (municipal) specification. Additionally, EJ offers hydrant accessories, including the snow barrel for BR models to keep hydrants accessible for areas with high snowfall, and Storz nozzle connections for quick pumper nozzle attachment.

GATE VALVES

FlowMaster® Resilient Wedge Gate Valves are designed to control the flow of water in fire hydrant applications—but can also be utilized for other water distribution or sewer system applications. All valves are compliant with the Reduction of Lead in Drinking Water Act 2011.

The valves incorporate quality parts and a simple design. All-ductile iron construction delivers superior strength, impact resistance and reduced weight ensuring long service life. All valve parts are manufactured and assembled in the USA.

Available in 2" through 24" sizes, with multiple end connections, and bevel or spur gear operators for 20" and 24" valves. The valves are available as either an assembly or set.

FlowMaster valves meet or exceed the performance requirements of AWWA C515 and Underwriters Laboratories Standards UL262. The valve body and other ductile iron components are manufactured from material conforming to ASTM A536. The wedge is fully rubber encapsulated to meet ASTM D429 requirements.

VALVE BOXES

Valve boxes are used to access an underground valve and can be adjustable using multiple pieces with either a screw type or slip type arrangement.

- Valve boxes are available to accommodate
- 4" through 20" valves.
- Natural gray iron or water-based asphaltic coating
- Covers with special lettering and custom logos
- Locking lids
- Valve box risers—raise valve box lid to adapt to a new grade
- Made in the USA

The slip type has interchangeable pieces that allow for overall height adjustment with parts sliding past each other, while the screw type has interchangeable pieces that allow for overall height adjustment with parts threaded into each other. Valve boxes are available as either an assembly or set.

METER BOXES

The meter box product is specifically intended to cover a water meter. It is typically large enough to allow for inspection and limited access, and is often intended for non-traffic situations.

EJ offers an assortment of meter boxes, covers, and rings to fit your application. Our broad meter box product offering includes customized logo covers to help promote your identity, special lettered covers that clearly identify the access point, and touch read covers.

- Oval meter boxes
- Round meter boxes
- Rectangular meter boxes
- Meter pits
- Meter lids
- Meter box cover accessories including security locking

Meter boxes are available as either an assembly or set.

TREE GRATES

Style your surroundings with timeless and appealing streetscape products manufactured by EJ. Tree grates are durable, functional, and architecturally appealing, and promote healthy tree growth. Designed for pedestrian traffic; our full line of tree grates provide natural drainage and enhance any urban, campus, or park setting.

The slotted design allows for efficient watering and is ADA compliant for pedestrian safety. The narrow slot of an ADA grate also prohibits litter from collecting in the tree well and minimizes the growth of weeds.

Optional expandable tree openings consist of removable center rings, which are a convenient way to adjust diameter of the grate opening as the tree trunk grows in width. Other options include security bolting features, and light port options.

Cast iron grating is strong and stands up to harsh environmental conditions. As an added value, the tree grates can carry community logos and mottos and are made in the USA.

DETECTABLE WARNING PLATES

DURALAST® Detectable Warning Plates help warn visually impaired pedestrians of the approaching street. Engineered to outlast the sidewalk, this cast iron plate is a long-lasting streetscape product that can withstand rigorous urban conditions, such as snow plows, street cleaning machines, and vehicular traffic.

Lower your maintenance and product life cycle costs by using DURALAST detectable warnings—your ADA compliant and environmentally friendly solution.

- Long-wearing cast iron (over 500 times more wear resistant than composites*)
- Withstands vehicular and snow plow traffic
- Corrosion resistant
- Permanently embedded into concrete
- Comply with the latest ADA guidelines regarding pedestrian and vehicular traffic

*An independent third party laboratory test was conducted to determine the wear index values of DURALAST® Detectable Warning Plates versus a competing composite surface. Test results indicate that DURALAST plates are over 500 times more wear resistant than composites.

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