ACO DRAIN

Commercial trench drainage
Technical handbook & product catalog
The ACO Group

Founded in 1946, the ACO Group manufactures products for the building and construction industry. Today, ACO employs over 4,000 people worldwide and has sales and manufacturing operations in more than 40 countries.

ACO is the pioneer and world leader of modular trench drain systems. ACO drainage systems are used in a variety of applications from domestic environments to airports. ACO products have been used at many prestigious locations, including Olympic stadiums, since 1972.

ACO USA

ACO USA was founded in 1978 and is America’s foremost manufacturer of trench drainage products.

As market leader, ACO USA is constantly innovating to bring new products to the market.

ACO has a fully established R&D department responsible for continuous development, quality and testing to ensure ACO products continue to lead the market.

Trench drain pioneers

ACO Drain is the market leading modular trench drain system and is manufactured at the company’s modern manufacturing facilities in Arizona and Ohio.

ACO Drain offers the most comprehensive range of trench drain solutions for every application. ACO Drain products are offered in a variety of widths, depths, and load ratings, with grates to suit. In conjunction with a comprehensive, quality product range, ACO supports its business with extensive stocking distributors, technical sales support and world class customer service.

ACO. The future of drainage.

System chain

ACO is a global leader in surface water drainage. ACO manufactures products to collect, clean, hold and release water. This addresses all phases of the water cycle and supports Sustainable Drainage (SD, SUDS, WSUDS), Low Impact Development (LID) and LEED principles.

Service chain

To support this extensive product range, ACO provides full support from design conception to product after care.

Train
ACO believes in the benefits of education and is heavily involved in product training and continuing education.

Design
A complementary design service is offered by qualified in-house engineers to help customers ensure the right product, layout and installation details.

Support
Technical Sales support provide complimentary on-site training, assistance and advice during installation to ensure best possible results.

Care
Our customer service goes beyond getting the order. It starts with early design concepts and continues through the service life of the product.

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Introduction - selecting the right product

When selecting trench drains the following two main factors should be considered to ensure a long service life.

1. **Application**
   - Installed location factors - loading, site & user requirements

2. **Hydraulics**
   - Amount of liquid to collect and drain

Summarized information is provided on pages 8 - 9 with additional supporting information provided on pages 124 - 149.
A trench drain is a continuous line of drainage that removes liquid from impermeable/semi-permeable surfaces. It has a continuous inlet along the entire length ensuring maximum liquid capture. Trench drains allow simple one-way grading of surfaces to be drained.

**What are trench drains?**

- **Narrow grates**
  - Typically narrow grates are significantly cheaper, particularly in high load class applications.

- **Grading**
  - Simple one-way slopes; easy and quick to construct.

- **Hydraulics**
  - Narrow systems with built-in slopes create increased velocity and system efficiency, often results in lower materials costs.

- **Product costs**
  - Initial costs may seem high, but can be offset by lower pipe and installation costs.

- **Maintenance**
  - Easy access to system, increased flow velocity = less sediment build-up and maintenance.

**Modular**
Factory produced units offer consistent quality and can be created with advanced shape profiles and built-in slope, providing additional benefits and savings.

**Safety**
- Superior liquid capture minimizes slip hazards to pedestrians and vehicles (reduce risk of litigation).

**Pavement longevity**
- Reduced standing water extends service life (especially in freeze-thaw environments) and pavement aesthetics.

**Environmental/Health**
- Standing water attracts insects and bacteria.
- Collection of rainwater for reuse (LEED).
- Collection of liquids for treatment (EPA).

**Pipe savings**
- Minimal underground pipe, related excavation and site work required.

**Cast-in-place**
- Boxed-in trench created on site during concrete pour. Offers many of the benefits and savings of modular trench drains with the following exceptions:
  - **Deterioration**
    - Concrete surface deteriorates, especially in freeze-thaw environments, resulting in lower performing hydraulics and hard to clean surfaces.
  - **Wider grates**
    - Typically wider grates are significantly more expensive, particularly in higher load class applications.

- **Site work**
  - Excavation, formwork construction, creation of slope and U or V profile can be costly and time consuming. Tees/corners are difficult and time consuming to create.

- **Quality**
  - Can vary greatly and be inconsistent depending upon the contractor. Difficult to achieve level grate and frame with good concrete support resulting in the common cause of many future problems.

**Alternatives to a trench drain**

- **Low cost**
  - Relatively quick to create and no product costs.

- **Inconvenience**
  - Cannot be walked on even in low rainfall.

- **Performance**
  - Shallow, inconsistent/irregular surface and lack of slope results in reduced hydraulics.

- **Product costs**
  - Initial costs may be less, usually offset by higher pipe and installation costs.

- **Pipe cost**
  - Extensive underground pipework; related excavation and site work required.

- **Pavement longevity**
  - Ponding and undulating surface often deteriorates and results in shorter service life (especially in freeze-thaw environments).

- **Maintenance**
  - Pipes are easily blocked by build-up of debris and require frequent maintenance.

- **Risk litigation from damage to property or injury to persons.**

- **Increased maintenance and reduced service life of paved areas.**

- **Potential property damage due to water ingress.**

**B - Open swale**
- Formed ditch in pavement often leading to a catch basin.

**C - Catch basin**
- Series of catch basins located at strategic places in the pavement. Precise and exact grading is needed to drain effectively.
1 Application
- Installed location factors; loading, site and user requirements

2 Hydraulics
- Amount of liquid to collect and drain

Summarized information is provided on these pages - additional supporting information is provided on pages 134-149.

When selecting trench drains, the following factors should be considered to ensure a long service life.

1a) Loading

Loading refers to any kind of traffic or load being applied to the trench and grate. There are several US Load Standards relating to larger catch basin grates. ACO uses the EN 1433 standard which is specifically written for trench drains of different widths.

Loading is categorized into several load classes (light, medium and heavy). Choosing the correct solution is determined by:

- Type of traffic - Pedestrians, cars, trucks, forklift, aircraft, etc.
- Wheel loads - Include vehicle, weight of load being carried and type of tire (solid or pneumatic).
- Unusual traffic - E.g. dumpsters/snow plows being dragged across trench etc.
- Frequency - Occasional versus frequent use may also affect product choice.

1b) Site requirements

Specifics of the installed environment may drive, or limit, the choice of trench drain and grate.

- Installation restrictions such as limited down times may require trench drains that are quick to install.
- Limited construction depth may demand a shallow trench drain system.
- Chemicals, or other corrosive elements may influence channel and grate material choices. See page 139.
- Non-metallic trench drains may be required for factors other than chemical resistance - non-magnetic explosive environments (sparking) may be required in certain industrial applications.

1c) User requirements

User requirements typically affect the grate, as that is the exposed part once trench drain is installed.

- Aesthetics - Intake shape (slots, holes or other shapes) and material (iron, stainless, plastic) can be chosen to complement surrounding landscape.
- Legal requirements typically relate to ADA compliance, heel safety and bicycle safe needs.
- Safety requirements typically refer to grate lockings and special surfaces (slip resistance). ACO recommends all grates are locked in place (especially in high load areas). Some applications may require multiple lock per grate or security lockings. On occasion, monolithic trench drains may be required for maximum grate security - See ACO Infrastructure product line.

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# Selection Criteria

## 1a) Loading notes

The amount of loading (weight) pounds per square inch, a trench drain needs to withstand. All ACO products are independently certified to EN 1433, and relevant US load standards - full details and a comparison to common US load standards are provided on page 129-133.

### Required load rating

**EN 1433** suggests monolithic systems for Load Class D due to dynamic loading of fast moving vehicles. See ACO Infrastructure HighwaysDrain for product solutions.

**HS100** is rated up to Load Class E even if grates of higher load class are used (HS100K & HS200K up to Load Class E (depending on rating of grate chosen) HS300K & HS400K up to Load Class F (Depending upon rating of grate chosen)).

**KlassikDrain** is recommended to a maximum of Load Class C even if grates of higher load class are used.

### Loading notes

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**

## 1b) Site requirements notes

Project environment may drive, or limit, the choice of trench drain and grate material. For chemical and application requirements not met by standard products, ACO’s Aquaduct line offers a range of different fiberglass resins and can be customized to suit. Stainless steel channels are also available. Contact (800) 543-764 or info@acousa.com for details.

### Channel material

- Polymer concrete
- Galvanized or stainless steel
- Stainless steel/Non-metallic

### Edge rail

- Galvanized or stainless steel
- Ductile iron
- Stainless steel
- Non-metallic

### Grates

- C & E grate only
- C & E grate only
- C & E grate only
- C & E grate only

### Site requirements

**HS100**

- C & E grate only
- C & E grate only
- C & E grate only
- C & E grate only

**HS20**

- C, E & F grate only
- C, E & F grate only
- C, E & F grate only
- C, E & F grate only

**HS25**

- C, E & F grate only
- C, E & F grate only
- C, E & F grate only
- C, E & F grate only

## 1c) User requirements

Typically project led criteria based on design preference or legislation compliance.

### Lockings

- QuickLok™
- DrainLok™
- DrainLok™
- DrainLok™
- DrainLok™
- NA
- NA
- PowerLok™
- PowerLok™
- PowerLok™
- PowerLok™
- Various

### Aesthetic options

- Aesthetic grate
- Non-Aesthetic grate
- Anti-Slip grate

### Safety

- ADA compliant
- Heel resistant
- Bicycle Safe
- Aesthetic
- Antislip'

### HYDRAULICS

**Channel width**

- 4” 100mm
- 8” 200mm
- 12” 300mm
- 2” 50mm
- 4” 100mm
- 8” 200mm
- 12” 300mm
- 4” 100mm
- 8” 200mm
- 12” 300mm

## Selection Criteria

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- Polymer concrete
- Galvanized or stainless steel
- Stainless steel/Non-metallic

### Edge rail

- Galvanized or stainless steel
- Ductile iron
- Stainless steel
- Non-metallic

### Grates

- C & E grate only
- C & E grate only
- C & E grate only
- C & E grate only

### Site requirements

**HS100**

- C & E grate only
- C & E grate only
- C & E grate only
- C & E grate only

**HS20**

- C, E & F grate only
- C, E & F grate only
- C, E & F grate only
- C, E & F grate only

**HS25**

- C, E & F grate only
- C, E & F grate only
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## 1c) User requirements

Typically project led criteria based on design preference or legislation compliance.

### Lockings

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- NA
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### Aesthetic options

- Aesthetic grate
- Non-Aesthetic grate
- Anti-Slip grate

### Safety

- ADA compliant
- Heel resistant
- Bicycle Safe
- Aesthetic
- Antislip’

### HYDRAULICS

**Channel width**

- 4” 100mm
- 8” 200mm
- 12” 300mm
- 2” 50mm
- 4” 100mm
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ACO Drain consists of a wide selection of products to meet most project loading, design, hydraulic and budget requirements.

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KlassikDrain features

**Wide choice of grates** - In various materials and styles (including ADA compliant) for applications from Load Class A to Load Class E. See next page for more details.

**Steel edge rail** - Provides additional strength and protects channel body from damage. Stainless steel edge rail also available.

**Interconnecting end profiles** - Allow easy and effective joining of channels. Appropriate sealant can be used to create a sealed joint.

**Knock-outs** - Included on all channel units to allow vertical evacuation of the system along the run. See product pages for sizes for each system.

**System numbering** - Each end of the channel indicates the number of the channel that will connect to it.

**QuickLok™ & DrainLok™** - Patented, boltless locking systems provide quick fitting and removal of grates. Helps reduce installation/maintenance time and cost.

**Anti-shunt lugs** - Protrusions in grate fit into recesses on the edge rail to prevent longitudinal movement.

**Channel identification** - Channels feature numbering on sidewalls and base of channel (to allow easy identification after concrete encasement).

**Direction arrows** - Cast on side of channel indicate flow direction and ensure channels are installed correctly.

**Sloped (0.5%) channel units** - Meter long units provide 131’-3” continuous slope - equates to 1/17” fall per linear foot. Constant depth units can be used to extend run lengths.

**Profiled side walls** - Strengthening pillars and frost keys provide channel body strength and mechanical keying to surrounding concrete.

**Shipping gipple/groove** - Side interlocking feature ensures safer stacking of channels on pallets for shipping and minimizes breakage.

**Polymer concrete** - A durable, yet lightweight material made from polyester a resin binder reinforced by mineral aggregates and fillers. It provides up to four times the compressive strength of cement concrete. See page 136 for material properties.

**MiniKlassik K50** - A 2” internal width, constant depth system for high profile, aesthetic applications where a barrier is required to separate wet and dry areas. See page 54.

**Brickslot 100 & 200** - A discreet drainage solution for use with brick or stone pavers. Available as standard, Heel Resistant and Twistslot versions. See page 58.

**Polymer concrete** - A durable, yet lightweight material made from polyester a resin binder reinforced by mineral aggregates and fillers. It provides up to four times the compressive strength of cement concrete. See page 136 for material properties.
Grate selection

A drainage grate’s primary function is to let surface water enter the drainage system and allow efficient removal of excess water. These grates have to remove the quantity of water specified and be strong enough to withstand traffic without collapsing.

Design criteria for grate

- Water intake capacity
- Loading
- Material - durability & aesthetics
- Slot style
- Legal requirements
  - ADA compliance
  - Slip resistance
  - Heel and bicycle safety
- Locking

In recent years, the visual importance of these drainage systems has become more prominent.

As the global leader, ACO has introduced many different sized patterns and materials, including discreet drainage concepts such as Brickslot.

The newest innovation is Freestyle - An easy and cost effective way to design your own iron grate.

ACO now offers a surface and grate Visualizer, an online tool that offers designers the chance to visualize each ACO Drain grate in a number of different pavements.

Choosing grates for trench drainage

Contrast - grates contrast to surrounding surface

Aesthetics - grates are a design element in surrounding surface

Design point - grates are an integral part of surface design

Discreet - water intake is ‘invisible’ at first glance

Function - efficient water flow into system

Standard grates

ACO Drain provides a wide selection of standard grates for all sizes and types of channels. These offer the most economic option and encompass popular styles and materials. Details can be found on:

- Page 30 - K100 grates
- Page 42 - K200 grates
- Page 52 - K300 grates
- Page 57 - K50 grates
- Page 74 - S100K grates
- Page 84 - S200K grates
- Page 94 - S300K grates
- Page 122 - FG200 grates

Freestyle grates

ACO offers a semi-custom option with the opportunity to design the top surface look of an iron grate to complement your project design. See page 20 for full details.

Exotic grate solutions

On rare occasions the grate design and/or material becomes a focal point. For these projects ACO can fully customize materials and/or finishes of grates to suit client requirements.
Freestyle grates

Architectural features such as entrances, promenades, courtyards and landscaped areas, whether public or private, can all have their appearance significantly enhanced through the creative use of ACO Freestyle grates.

Flexible production tools with ACO’s own foundries make it possible to create unique grate designs for projects with a custom surface design on a standard KlassikDrain DrainLok™ grate.

The two-part tool consists of a standard lower part to provide the structural support of the grate and a customizable top part where the designer’s unique designs can be created.

A minimum order of 400 grates is required for this option.

Grate design

Features
- Load Class D to EN 1433
- ACO Freestyle grates are available for 4”, 8” and 12” KlassikDrain systems
- Manufactured from ductile iron
- ACO DrainLok™ locking system

Examples
K100/KS100 - 4" wide general purpose system

K100 is a 4" wide general purpose system with galvanized steel edge rail and the widest choice of grates in different materials and slot styles up to Load Class E (60 ton) featuring either patented DrainLok™ or QuickLok™ boltless locking systems.

KS100 is the same system, but the edge rail is grade 304 stainless steel. KS100 should be used where increased aesthetics are required or where increased corrosion resistance is required.

Typical applications
- Parking lots & garages
- Shopping malls
- Pedestrian areas
- Light industrial areas
- Commercial areas
- Internal applications

Key Dimensions

<table>
<thead>
<tr>
<th>Product</th>
<th>Minimum Width</th>
<th>Maximum Width</th>
<th>Minimum Height</th>
<th>Maximum Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>K100</td>
<td>4&quot;</td>
<td>12&quot;</td>
<td>5&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>KS100</td>
<td>4&quot;</td>
<td>13&quot;</td>
<td>5&quot;</td>
<td>13&quot;</td>
</tr>
</tbody>
</table>

Product can be used towards LEED & EPA requirements

Resistant to many everyday chemicals. Check page 139

Multiple grate options to meet legal requirements

Multiple grate options to meet design requirements

General everyday hydraulic capacity

Constant depth and/or sloped depth channels

Selection criteria

Light to industrial duty loads

Product can be used towards LEED & EPA requirements

Resistant to many everyday chemicals. Check page 139

Multiple grate options to meet legal requirements

Multiple grate options to meet design requirements

General everyday hydraulic capacity

Constant depth and/or sloped depth channels

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ACO DRAIN

System layout

Removable grates

Channels

6" inlet/outlet endcaps

4" pipe (by others) for bottom knockout

6" oval/tower round adapter for bottom knockout

Universal closing 4" outlet end-cap

Installation device

Catch basins

Type 900

Series 600

KlassikDrain K100/ KS100

Closing/4 in. inlet/outlet cap

Fits all channels and manufactured from gray ABS to complement edge rail. Guides aid cutting to correct height. Wings clip cap onto end of channel. 4" bell end connection to Schedule 40 pipe. Seal using PVC-ABS cement.

Note: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

Installation device

Fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

Type 901 In-line catch basin

Two part inline catch basin with 4", 6" and 8" drill-outs for pipe connection. Supplied with plastic trash bucket. Options include an in-line or side foul air trap. Available with either galvanized or stainless steel edge rail.

Any channel can be connected into the catch basin by removing the end wall to the correct height with a box cutter. Cut-out guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. One blanking end plate supplied with inline catch basin.

Series 600 catch basin

Two part catch basin; bases have 4", 6" and 8" drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene risers/bases. Available with either galvanized or stainless steel edge rail.

Any channel can be connected to catch basin by removing end/side wall to correct height. Drill-outs guide connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends.

6 in. Sch. 40 inlet/outlet caps

6" Schedule 40 plain end polypropylene pipe; oval to round adapter cast into polymer concrete end cap and available in two heights. Solvent weld to coupler.

Note: These end caps cannot be cut to height, and fit only at positions shown in layout diagram.

Meter channels - sloping & constant depth

0.5% sloped channels in meter lengths and 40 depths which connect to create 40 meter (131’-2”) continuously sloping run. Available with either galvanized or stainless steel edge rail.

Constant depth channels available in 5 depths. Can be used to create non-sloped runs, or inserted in sloped runs to increase length.

Bottom knockouts on all constant depths and 5, 10, 15, 20, 25, 30, 35, 40 channels.

Half meter channels

Constant depth channels in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels. Available with either galvanized or stainless steel edge rail.

Any channel can be connected to catch basin by removing end/side wall to correct height. Drill-outs guide connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends.

Note: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.
Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>K1-901G/S</th>
<th>K1-621G/S</th>
<th>K1-631G/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet Size (Sch 40)</td>
<td>Invert (in.)</td>
<td>GPM</td>
<td>CFS</td>
</tr>
<tr>
<td>A</td>
<td>K1-00 - 4&quot; round</td>
<td>3.94&quot;</td>
<td>74</td>
</tr>
<tr>
<td>B</td>
<td>K1-00 - 6&quot; oval</td>
<td>3.94&quot;</td>
<td>177</td>
</tr>
<tr>
<td>C</td>
<td>K1-40 - 4&quot; round</td>
<td>8.86&quot;</td>
<td>134</td>
</tr>
<tr>
<td>D</td>
<td>K1-40 - 6&quot; oval</td>
<td>8.86&quot;</td>
<td>239</td>
</tr>
<tr>
<td>E</td>
<td>K1-40 - 4&quot; round</td>
<td>11.81&quot;</td>
<td>171</td>
</tr>
<tr>
<td>F</td>
<td>K1-60 - 6&quot; oval</td>
<td>11.81&quot;</td>
<td>227</td>
</tr>
<tr>
<td>G</td>
<td>K1-60 - 4&quot; round</td>
<td>19.92&quot;</td>
<td>233</td>
</tr>
<tr>
<td>H</td>
<td>K1-60 - 6&quot; oval</td>
<td>19.92&quot;</td>
<td>278</td>
</tr>
<tr>
<td>I</td>
<td>K1-80 - 6&quot; oval</td>
<td>19.92&quot;</td>
<td>322</td>
</tr>
<tr>
<td>J</td>
<td>K1-80 - 4&quot; round</td>
<td>19.92&quot;</td>
<td>233</td>
</tr>
<tr>
<td>K</td>
<td>K1-80 - 6&quot; oval</td>
<td>19.92&quot;</td>
<td>322</td>
</tr>
<tr>
<td>L</td>
<td>K1-100 - 6&quot; oval</td>
<td>19.92&quot;</td>
<td>322</td>
</tr>
<tr>
<td>M</td>
<td>K1-100 - 4&quot; round</td>
<td>19.92&quot;</td>
<td>233</td>
</tr>
<tr>
<td>N</td>
<td>K1-100 - 6&quot; oval</td>
<td>19.92&quot;</td>
<td>322</td>
</tr>
<tr>
<td>O</td>
<td>K1-100 - 4&quot; round</td>
<td>19.92&quot;</td>
<td>233</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates. Catch basin flow rates without trash bucket - using trash bucket reduces flow.
ACO DRAIN

Polymer concrete catch basins

Polymer concrete catch basins are used either as standalone area drains or most commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to the pipe system for maintenance.

The Type 901 provides an in-line catch basin (same width and visually indistinguishable from the trench run) and the Series 600 is 12" wide and provides a greater hydraulic output.

K1-Type 910 4 in. wide in-line catch basin

Part No. | K100 | K1000 | Vol Wgt | Cal Ibns
--- | --- | --- | --- | ---
K1-012 | 4.0 | 350 | 74030 | 74033
K1-000 | 3.0 | 200 | 74010 | 74013
K1-010 Constant depth channel - 39.37" (1m) | 4.0 | 350 | 74030 | 74033
K1-009 | 2.0 | 100 | 74001 | 74004
K1-013 | 2.0 | 100 | 74011 | 74014
K1-020 Constant depth channel - 39.37" (1m) | 3.0 | 200 | 74045 | 74048
K1-008 | 1.0 | 50 | 74007 | 74010

Notes:
1. K100 has a galvanized steel edge rail for general use. K1000 has a galvanized 304 stainless steel edge rail for use where increased aesthetics or corrosion resistance is required.
2. KlassikDrain is sold as channel only. Choose appropriate grate from pages 30-33.
3. Preferred. 4" dia. 4" outlet size and 6" outlet size on underground channels (8, 10, 15, 20, 20, 020, 023. 30, 030, 035, 40, 040, 043, 046). 5. Closing/locking bar can be cut down to suit all channels.
5. Drain strainer details for 4" dia. outlet on page 103.

Series 600 grates - choice of grates to match/complement channel with DrainLok™ or QuickLok™ buttressing locking. See page 52-53.

Type 900 grates - choice of grates to match channel grates with DrainLok™ or QuickLok™ buttressing locking. See page 30-33. QuickLok™ grates require a removable QuickLok™ locking bar for safe access to trash bucket and pipework.

Top section - polymer concrete with integrally cast in molded stainless steel frame. Galvanised connection of male channel ends at A, B, C and D, 30 and 40 degrees. Other channels can be connected by removing union required height. Buckling and rail supplied with K1-901. See page 159.

Trash bucket - plastic trash bucket designed to collect debris washed from trench run. Supported in catch basin top to avoid creation of a vacuum and reduction in outflow. K1-631 uses deeper bucket with riser.

Riser - a plastic riser, supplied with K1-631, designed to provide additional catch basin hydraulic and output. Galvanised enabling cutting to suit 5" dia. outlet - max size" 2" and maximum 12" height. Additional units can be used (a minimum of 2 is recommended to ensure square is maintained for structural stability). Contact ACO for nonpolyethylene riser.

Base - polyethylene bases with wide range of Schedule 40, 4", 6" and 8" outlets for easy pipe connection. Cut outs on end and side allow connection of ACO foul air trap. Contact ACO for nonpolyethylene bases.

K1-631 catch basin - 19.69" (0.5m)

K1-040 Constant depth channel - 19.69" (0.5m) 
K1-049 | 2.0 | 100 | 74047 | 74048
K1-046 | 2.0 | 100 | 74040 | 74041
Part No. | K100 | K1000 | Volume | Weight
--- | --- | --- | --- | ---
K1-901 | 3.5 | 74050 | 74055 | 74061 | 74066
K1-931 catch basin - 19.69" (0.5m)

Series 600 optional riser

K999 | 3.0 | 200 | 74012 | 74015
Foil air trap - fits both 900 and 600 basins

ACO Drain K100 / K1000 Parts table

Part No | K100 | K1000 | Invert Depth | Overall Depth | Vol Wgt | Cal Ibns
--- | --- | --- | --- | --- | --- | ---
K1-000 Constant depth channel - 39.37" (1m) | 4.0 | 350 | 74044 | 74047 | 74041 | 74044
K1-001 | 3.0 | 200 | 74011 | 74016 | 74010 | 74013
K1-255 | 2.0 | 100 | 74007 | 74010 | 74004 | 74008
K1-230 | 1.0 | 50 | 74007 | 74010 | 74004 | 74008

Notes:
1. K100 has a galvanized steel edge rail for general use. K1000 has a galvanized 304 stainless steel edge rail for use where increased aesthetics or corrosion resistance is required.
2. KlassikDrain is sold as channel only. Choose appropriate grate from pages 30-33.
3. Preferred. 4" dia. 4" outlet size and 6" outlet size on underground channels (8, 10, 15, 20, 20, 020, 023. 30, 030, 035, 40, 040, 043, 046). 5. Closing/locking bar can be cut down to suit all channels.
5. Drain strainer details for 4" dia. outlet on page 103.
### Available K100/KS100 DrainLok™ grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load Class A - 3,500lbs - EN 1433</strong> 70psi Pedestrian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforated steel</td>
<td>Type 410D - galvanized</td>
<td>12666</td>
<td>39.37 (1.0m)</td>
<td>0.25 dia.</td>
<td>28.3</td>
</tr>
<tr>
<td></td>
<td>Type 411D - stainless*</td>
<td>12669</td>
<td>19.69 (0.5m)</td>
<td>14.1</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Type 412D - galvanized</td>
<td>12667</td>
<td>39.37 (1.0m)</td>
<td>0.38 x 1.46 avg</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td>Type 415D - stainless*</td>
<td>12664</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Slotted steel</td>
<td>Type 420D - galvanized</td>
<td>12610</td>
<td>39.37 (1.0m)</td>
<td>0.38 x 1.46 avg</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td>Type 421D - stainless*</td>
<td>12641</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Longitudinal plastic</td>
<td>Type 444D - black</td>
<td>99975</td>
<td>1.76 x 0.34</td>
<td>27.4</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Type 445D - gray</td>
<td>99976</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Type 496D - tan</td>
<td>99977</td>
<td>Polypropylene **</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Load Class B - 28,000lbs - EN 1433</strong> 581psi Light duty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longitudinal stainless steel</td>
<td>Type 447D - stainless</td>
<td>142215</td>
<td>39.37 (1.0m)</td>
<td>1.61 x 0.24</td>
<td>93.7</td>
</tr>
<tr>
<td></td>
<td>Type 448D - stainless</td>
<td>142216</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>4.0</td>
</tr>
<tr>
<td>Longitudinal galvanized steel</td>
<td>Type 432D - galvanized</td>
<td>132555</td>
<td>39.37 (1.0m)</td>
<td>1.15 x 0.3</td>
<td>66.0</td>
</tr>
<tr>
<td></td>
<td>Type 433D - galvanized</td>
<td>132550</td>
<td>19.69 (0.5m)</td>
<td>33.0</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Load Class C - 56,000lbs - EN 1433</strong> 1,162psi Commercial vehicle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slotted plastic</td>
<td>Type 450D - black**</td>
<td>132720</td>
<td>Polypropylene **</td>
<td>Monogram texture (black only)</td>
<td>3.9 x 1.69 avg</td>
</tr>
<tr>
<td></td>
<td>Type 47D - gray</td>
<td>132266</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>4.0</td>
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<tr>
<td></td>
<td>Type 48D - tan</td>
<td>132712</td>
<td>Polypropylene **</td>
<td>Monogram texture (black only)</td>
<td>3.9 x 1.69 avg</td>
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<tr>
<td>Slotted steel</td>
<td>Type 450D - galvanized</td>
<td>12614</td>
<td>39.37 (1.0m)</td>
<td>0.38 x 1.46 avg</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td>Type 452D - galvanized</td>
<td>12615</td>
<td>19.69 (0.5m)</td>
<td>17.6</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Type 455D - stainless*</td>
<td>12664</td>
<td>39.37 (1.0m)</td>
<td>0.38 x 1.46 avg</td>
<td>25.2</td>
</tr>
<tr>
<td>Key</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locking mechanism</td>
<td>1</td>
<td>Compliant with Americans with Disabilities Act of 1990 Section 4.5.4 (Page 140)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write safe equal or less than 0.25&quot; 6.5mm (Page 140)</td>
<td>2</td>
<td>Bicycle Safe compliant to Australian Standard AS 1996 - 2006 (Page 140)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KlassikDrain K100/ KS100</td>
<td>3</td>
<td>ASME A112.6.3 - 2001. Heel resistant less than 0.33&quot; (8mm) (Page 140)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DrainLok™ - boltless &amp; bareless locking system</td>
<td>1</td>
<td>ANSI A112.6.3 - 2001. Heel resistant less than 0.33&quot; (8mm) (Page 140)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position grate onto channel and align anti-shunt detail with recess in rail.</td>
<td>2</td>
<td>KlassikDrain K100/ KS100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push-down or stand on grate until it clicks into position.</td>
<td>3</td>
<td>Ductile iron to ASTM A 536-64 - minimum grade 6445.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For QuickLok™ grates see next page

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## Available K100/KS100 QuickLok™ grates

**C** Load Class C - 56,000lbs - EN 1433  1,162psi  Commercial vehicle

### Deco iron

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 481Q - iron</td>
<td>97120</td>
<td>19.69” (0.5m)</td>
<td>0.44 x 0.6 avg</td>
<td>19.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

### Mosaic iron

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 479Q - iron</td>
<td>97116</td>
<td>19.69” (0.5m)</td>
<td>0.43 avg</td>
<td>13.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

### Slotted iron

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 461Q - iron</td>
<td>96752</td>
<td>19.69” (0.5m)</td>
<td>0.40 x 3.93</td>
<td>34.1</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

### Slotted steel

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 435Q - galvanized</td>
<td>31590</td>
<td>39.37” (1.0m)</td>
<td>0.38 x 1.46 avg</td>
<td>26.2</td>
<td>13.7</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

### Longitudinal iron

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 478Q - iron</td>
<td>03314</td>
<td>19.69” (0.5m)</td>
<td>1.77 x 0.27</td>
<td>22.5</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

### QuickLok™ - boltless locking system

1. **Fit locking bar**
   - Locate locking bar in channel wall recesses by rotating clockwise.
   - Use hammer to tap bar into place, so that serrated ends grip in recess.

2. **Fit grate**
   - To install grate, align QuickLok™ stud directly over locking bar.
   - Push down or stand on grate until it clicks into position.

3. **Grate removal**
   - To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.
   - To remove bar, insert screwdriver into hole at end of bar and lever back serrated end, rotate bar free.

**Key**
- Locking mechanism
- Heel resistant equal or less than 0.25” (6.5mm)
- Compliant with Americans with Disabilities Act of 1990 Section 4.5.4
- ASME A112.6.3 - 2001: Heel resistant less than 0.33” (8.5mm)
- Bicycle Safe compliant to Australian Standard AS 3996
- For DrainLok™ grates see previous pages

## KlassikDrain K100/KS100

**C** Load Class C - 56,000lbs - EN 1433  1,162psi  Commercial vehicle

### Steel Brickslot 100

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 441 - galvanized</td>
<td>138040</td>
<td>39.37” (1.0m)</td>
<td>0.38 x 1.46</td>
<td>18.6</td>
<td>9.0</td>
</tr>
</tbody>
</table>

* Grade 304 stainless steel. See page 58 for full details/access units.

### Steel Heel Resistant Brickslot 100

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 470 - galvanized</td>
<td>138050</td>
<td>39.37” (1.0m)</td>
<td>0.38 x 1.46</td>
<td>24.8</td>
<td>9.2</td>
</tr>
</tbody>
</table>

* Grade 304 stainless steel. See page 58 for full details/access units.

For DrainLok™ grates see previous pages
K200/KS200 - 8" wide general purpose system

K200 is an 8" wide system with galvanized steel edge rail and wide choice of grates in different materials and slot styles up to Load Class E (60 ton) featuring either patented DrainLok™ or QuickLok™ boltless locking systems.

KS200 is the same system, but the edge rail is grade 304 stainless steel. KS200 should be used where increased aesthetics are required, or where increased corrosion resistance is required.

Typical applications:
- Parking lots & garages
- Shopping malls
- Pedestrian areas
- Light industrial areas
- Commercial areas
- Internal applications

Selection criteria:
- Light to industrial duty loads
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Increased hydraulic capacity
- Resistant to many everyday chemicals. Check page 239
- Product can be used towards LEED & EPA requirements
- Constant depth and/or sloped depth channels

www.ACODrain.us
System layout

Removable grates

Channels

Sloping channels

Constant depth channels

Half meter channels

Accessories

4” or 6” pipe (by others) for bottom knockout

Universal closing 4”/6” outlet endcap

Installation device

Cut-outs guide connection to channels 00, 010, 020, 030 and 040.

Any cut-outs to receive male channel ends.

Blanking kit end rail available to stop concrete ingress during final pour.

Installation device fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is "lost" within concrete haunch.

Type 902 In-line catch basin

Two part in-line catch basin with 4”, 6” and 8” drill-outs for pipe connection. Supplied with plastic trash bucket. Options include an in-line or side foul air trap. Available with either galvanized or stainless steel edge rail.

Any channel can be connected into the catch basin by removing the end wall to the correct height with a box cutter. Cut-out guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends.

Series 600 catch basin

Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. Blanking kit end rail available to stop concrete ingress during final pour.

Closing/4 in. or 6 in. outlet cap

Fits all channels and manufactured from gray polypropylene to complement edge rail. Guides aid cutting to correct height. Wings clip cap onto end of channel. 4” and 6” bell end provides connection to Schedule 40 pipe. Seal using appropriate flexible sealant.

Note: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

Meter channels - sloping & constant depth

0.5% sloped channels in meter lengths and 40 depths which connect to create 40 meter (131’-2”) continuously sloping run. Available with either galvanized or stainless steel edge rail.

Constant depth channels are available in 5 depths. Can be used to create non-sloped runs, or inserted in sloped runs to increase length.

Bottom knockouts on all constant depths and 5, 10, 15, 20, 25, 30, 35, 40 channels.

Half meter channels

Constant depth channels in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels. Available with either galvanized or stainless steel edge rail.

Series 600

Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. Blanking kit end rail available to stop concrete ingress during final pour.

Type 902

In-line catch basin

Two part in-line catch basin with 4”, 6” and 8” drill-outs for pipe connection. Supplied with plastic trash bucket. Options include an in-line or side foul air trap. Available with either galvanized or stainless steel edge rail.

Any channel can be connected into the catch basin by removing the end wall to the correct height with a box cutter. Cut-out guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends.

Installation device fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is "lost" within concrete haunch.

Cut-outs guide connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends.
Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>K00 - 4&quot; round</td>
<td>7.87&quot;</td>
<td>9.84&quot;</td>
<td>7.87&quot;</td>
<td>9.84&quot;</td>
</tr>
<tr>
<td>K40 - 4&quot; round</td>
<td>216 GPM</td>
<td>202 GPM</td>
<td>153 GPM</td>
<td>320 GPM</td>
</tr>
<tr>
<td>K00 - 6&quot; round</td>
<td>8.75&quot;</td>
<td>11.81&quot;</td>
<td>7.87&quot;</td>
<td>11.81&quot;</td>
</tr>
<tr>
<td>K40 - 6&quot; round</td>
<td>282 GPM</td>
<td>343 GPM</td>
<td>216 GPM</td>
<td>320 GPM</td>
</tr>
<tr>
<td>K10 - 6&quot; round</td>
<td>9.84&quot;</td>
<td>13.86&quot;</td>
<td>9.84&quot;</td>
<td>13.86&quot;</td>
</tr>
<tr>
<td>K40 - 6&quot; round</td>
<td>320 GPM</td>
<td>377 GPM</td>
<td>320 GPM</td>
<td>377 GPM</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates. Catch basin flow rates without trash bucket - using trash bucket reduces flow.
Polymer concrete catch basins

Polymer concrete catch basins are used either as stand-alone area drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to pipe system for maintenance.

Type 900 provides an inline catch basin (same width and visually indistinguishable from the trench run and the Series 600 is 12" wide and provides greater a hydraulic output.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>K200</th>
<th>K200C</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Vol</th>
<th>Gal</th>
<th>Wgt</th>
<th>Lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2-00 39.37&quot; (1 m)</td>
<td>75041 75441</td>
<td>7.87</td>
<td>7.87</td>
<td>200</td>
<td>200</td>
<td>8.66</td>
<td>8.66</td>
<td>225</td>
</tr>
<tr>
<td>K2-01 39.37&quot; (1 m)</td>
<td>75042 75442</td>
<td>8.07</td>
<td>8.07</td>
<td>205</td>
<td>205</td>
<td>8.66</td>
<td>8.66</td>
<td>230</td>
</tr>
<tr>
<td>K2-02 39.37&quot; (1 m)</td>
<td>75043 75443</td>
<td>8.17</td>
<td>8.17</td>
<td>210</td>
<td>210</td>
<td>9.25</td>
<td>9.25</td>
<td>235</td>
</tr>
<tr>
<td>K2-03 39.37&quot; (1 m)</td>
<td>75044 75444</td>
<td>8.46</td>
<td>8.46</td>
<td>220</td>
<td>220</td>
<td>9.45</td>
<td>9.45</td>
<td>240</td>
</tr>
<tr>
<td>K2-04 39.37&quot; (1 m)</td>
<td>75045 75445</td>
<td>8.66</td>
<td>8.66</td>
<td>220</td>
<td>225</td>
<td>9.65</td>
<td>9.65</td>
<td>245</td>
</tr>
<tr>
<td>K2-05 39.37&quot; (1 m)</td>
<td>75046 75446</td>
<td>8.86</td>
<td>8.86</td>
<td>225</td>
<td>230</td>
<td>9.84</td>
<td>9.84</td>
<td>250</td>
</tr>
<tr>
<td>K2-06 39.37&quot; (1 m)</td>
<td>75047 75447</td>
<td>9.06</td>
<td>9.25</td>
<td>230</td>
<td>235</td>
<td>10.04</td>
<td>10.24</td>
<td>255</td>
</tr>
<tr>
<td>K2-07 39.37&quot; (1 m)</td>
<td>75048 75448</td>
<td>9.25</td>
<td>9.45</td>
<td>235</td>
<td>240</td>
<td>10.24</td>
<td>10.43</td>
<td>260</td>
</tr>
<tr>
<td>K2-08 39.37&quot; (1 m)</td>
<td>75049 75449</td>
<td>9.45</td>
<td>9.65</td>
<td>240</td>
<td>245</td>
<td>10.43</td>
<td>10.63</td>
<td>265</td>
</tr>
</tbody>
</table>

Grate removal tool

ACO DRAIN

Type 900 provides an inline catch basin (same width and visually indistinguishable from the trench run and the Series 600 is 12" wide and provides greater a hydraulic output.

Polymer concrete catch basins

Polymer concrete catch basins are used either as stand-alone area drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to pipe system for maintenance.

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Type 900 provides an inline catch basin (same width and visually indistinguishable from the trench run and the Series 600 is 12" wide and provides greater a hydraulic output. From page 42-43, Quickick™ locking bar.

Quickick™ locking bar

Series 600 grates - choice of grate to match channel/grates with Dri-Ack™ or Quickick™ boltless locking. See page 52-53.

Type 900 grates - choice of grate to match channel grates with Dri-Ack™ or Quickick™ boltless locking. See page 42-43, Quickick™ locking bar for easy access to trash bucket and pipework.

Top section - polymer concrete with integrally cast in galvanized or stainless steel frame. Gaskets aid connection of male channel ends at 45°, 30° and 45°. Other channels can be connected by removing wall to required height. Blank end cap supplied with K200, and blanking kit available for Series 600. See page 159.

Trash bucket - plastic trash bucket designed to collect debris washed from trench run. Supported in catch basin top to avoid creation of a vacuum and reduction in soilflow. K2-631 uses deeper bucket with riser.

Riser - a plastic riser, supplied with K2-63, designed to provide additional catch basin depth and hydraulic output. Gaskets enable cutting to size at 2" (50 mm) intervals - maximum 2" and maximum 12" height. Additional sets can be used (a maximum of 2 is recommended to ensure seals are maintained. See page 88 for structural stability). Contact ACO for non-polyethylene risers.

Base - polyethylene base with wide range of Schedule 40, 40°, 6° and 8° cuts-outs for easy pipe connection. Cut-outs on end and side allow connection of ACO kast air trap. Contact ACO for non-polyethylene bases.
ACO DRAIN

Available K200/KS200 DrainLok™ grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (avg)</th>
<th>Intake Area (sq. in.)</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitudinal stainless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 647D - stainless</td>
<td>138080</td>
<td>39.37 (1.0m)</td>
<td>21.0</td>
<td>10.5</td>
<td>22.6</td>
</tr>
<tr>
<td>Type 648D - stainless</td>
<td>138081</td>
<td>19.69 (0.5m)</td>
<td>22.3</td>
<td>10.5</td>
<td>16.1</td>
</tr>
<tr>
<td>Type 655D - stainless</td>
<td>138082</td>
<td>39.37 (1.0m)</td>
<td>21.0</td>
<td>10.5</td>
<td>22.6</td>
</tr>
<tr>
<td>Type 666D - stainless</td>
<td>138083</td>
<td>19.69 (0.5m)</td>
<td>22.3</td>
<td>10.5</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Slotted iron

| Type 660D - iron       | 138075   | 39.4 x 0.47     |                 |                       | 19.69  |
|                        | 138076   | 16.1 x 0.3    |                 |                       | 19.69  |

Wave iron

| Type 680D - iron       | 138077   | 39.4 x 0.3     |                 |                       | 19.69  |

DrainLok™ - boltless & barless locking system

Fit locking bar
- Locate locking bar in recess, rotate and use hammer to tap securely in place. Serrated ends grip in recess.

Fit grate
- To install grate, align QuickLok™ stud directly over locking bar.

Grate removal
- To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.

KlassikDrain K200/ KS200

Available K200/KS200 QuickLok™ grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (avg)</th>
<th>Intake Area (sq. in.)</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesh steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 6605 - galvanized</td>
<td>138057</td>
<td>39.37 (1.0m)</td>
<td>21.0</td>
<td>10.5</td>
<td>22.6</td>
</tr>
<tr>
<td>Type 6605 - stainless</td>
<td>138058</td>
<td>19.69 (0.5m)</td>
<td>22.3</td>
<td>10.5</td>
<td>16.1</td>
</tr>
<tr>
<td>Type 6606 - stainless</td>
<td>138059</td>
<td>39.37 (1.0m)</td>
<td>21.0</td>
<td>10.5</td>
<td>22.6</td>
</tr>
<tr>
<td>Type 6606 - stainless</td>
<td>138060</td>
<td>19.69 (0.5m)</td>
<td>22.3</td>
<td>10.5</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Mosaic iron

| Type 679Q - iron       | 138061   | 39.37 (1.0m)    | 21.0            | 10.5                  | 22.6   |
|                        | 138062   | 19.69 (0.5m)    | 22.3            | 10.5                  | 16.1   |

QuickLok™ - boltless locking system

Fit locking bar
- Locate locking bar in recess, rotate and use hammer to tap securely in place. Serrated ends grip in recess.

Fit grate
- To install grate, align QuickLok™ stud directly over locking bar.

Grate removal
- To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.

Steel Brickslot 200

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (avg)</th>
<th>Intake Area (sq. in.)</th>
<th>Wgt lbs</th>
</tr>
</thead>
</table>
| Steel Resist Ductile iron
- Type 670 - galvanized | 138070   | 39.37 (1.0m)    | 21.0            | 10.5                  | 22.6   |
| Steel Resist Ductile iron
- Type 673 - stainless  | 138073   | 19.69 (0.5m)    | 22.3            | 10.5                  | 16.1   |

Steel Resist Ductile iron
- Type 674 - stainless  | 138074   | 39.37 (1.0m)    | 21.0            | 10.5                  | 22.6   |
| Steel Resist Ductile iron
- Type 674 - stainless  | 138075   | 19.69 (0.5m)    | 22.3            | 10.5                  | 16.1   |

Steel Resist Ductile iron
- Type 675 - stainless  | 138076   | 39.37 (1.0m)    | 21.0            | 10.5                  | 22.6   |
| Steel Resist Ductile iron
- Type 675 - stainless  | 138077   | 19.69 (0.5m)    | 22.3            | 10.5                  | 16.1   |

Steel Resist Ductile iron
- Type 676 - stainless  | 138078   | 39.37 (1.0m)    | 21.0            | 10.5                  | 22.6   |
| Steel Resist Ductile iron
- Type 676 - stainless  | 138079   | 19.69 (0.5m)    | 22.3            | 10.5                  | 16.1   |
KlassikDrain K300/KS300

K300 is a 12” wide system with galvanized steel edge rail and wide choice of grates in different materials and slot styles up to Load Class E (60 ton) featuring either patented DrainLock™ or QuickLock™ boltless locking systems.

KS300 is the same system, but the edge rail is grade 304 stainless steel. KS300 should be used where increased aesthetics are required, or where increased corrosion resistance is required.

Maximum hydraulic capacity

Typical applications
- Parking lots & garages
- Shopping malls
- Pedestrian areas
- Light industrial areas
- Commercial areas
- Internal applications

Selection criteria
- Light to industrial duty loads
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Constant depth and/or sloped depth channels
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139

K300/KS300 - 12” wide general purpose system

www.ACODrain.us
The document contains information about ACO DRAIN systems, including:

- **Channels**
  - Removable grates
  - Catch basin
  - Removable grates
  - Accessories
    - 6” or 8” pipe (by others) for bottom knockout
    - Universal closing 6"/8"/10" outlet endcap
  - Installation device
    - Fits molded recesses on body of channel. Provides height and joint alignment—a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is 'lost' within concrete haunch.

- **System layout**

- **Removable grates**

- **Channels**
  - Catch basin
  - Removable grates

- **Shallow channels**

- **Constant depth channels**

- **Half meter channels**

- **Accessories**
  - 6” or 8” pipe (by others) for bottom knockout
  - Universal closing 6”/8”/10” outlet endcap
  - Installation device
    - Fits molded recesses on body of channel. Provides height and joint alignment—a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

- **Catch basins**
  - Type 900

- **Closing/6 in., 8 in., or 10 in. outlet cap**
  - Fits all channels are manufactured from gray polypropylene to complement edge rail. Guides aid cutting to correct height. Wings slip cap onto end of channel. 6”, 8” and 10” bell end provides connection to Schedule 40 pipe. Seal using appropriate flexible sealant.

- **Note**: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

- **Type 903/904 In-line catch basins**
  - Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

- **Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030, and 040. All cut-outs to receive male channel ends. Blanking end rail supplied to stop concrete ingress during final pour.

- **Installation device**
  - Fits molded recesses on body of channel. Provides height and joint alignment—a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

- **Type 903/904 In-line catch basins**
  - Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

- **Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030, and 040. All cut-outs to receive male channel ends. Blanking end rail supplied to stop concrete ingress during final pour.

- **Half meter channels**
  - Constant depth channels in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels. Available with either galvanized or stainless steel edge rail.

- **CE approved**

- **KlassikDrain K300/ K500**

- **ACO DRAIN**

- **Accessories**
  - 6” or 8” pipe (by others) for bottom knockout
  - Universal closing 6”/8”/10” outlet endcap
  - Installation device
    - Fits molded recesses on body of channel. Provides height and joint alignment—a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

- **Type 903/904 In-line catch basins**
  - Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

- **Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030, and 040. All cut-outs to receive male channel ends. Blanking end rail supplied to stop concrete ingress during final pour.

- **Installation device**
  - Fits molded recesses on body of channel. Provides height and joint alignment—a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

- **Type 903/904 In-line catch basins**
  - Two part catch basin; bases have 4”, 6” and 8” drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases. Available with either galvanized or stainless steel edge rail.

- **Any channel can be connected to catch basin by removing end/side wall to correct height. Cut-outs guide connection to channels 00, 010, 020, 030, and 040. All cut-outs to receive male channel ends. Blanking end rail supplied to stop concrete ingress during final pour.**
**Catch basins**

**Outlet flow rates**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>K00 - 6&quot; round</td>
<td>11.81&quot;</td>
<td>421</td>
<td>0.94</td>
</tr>
<tr>
<td>A</td>
<td>K40 - 6&quot; round</td>
<td>19.69&quot;</td>
<td>748</td>
<td>1.67</td>
</tr>
<tr>
<td>B</td>
<td>K00 - 8&quot; round</td>
<td>11.81&quot;</td>
<td>966</td>
<td>2.15</td>
</tr>
<tr>
<td>B</td>
<td>K40 - 8&quot; round</td>
<td>19.69&quot;</td>
<td>1304</td>
<td>2.91</td>
</tr>
<tr>
<td>C</td>
<td>K00 - 6&quot; round</td>
<td>19.69&quot;</td>
<td>500</td>
<td>1.11</td>
</tr>
<tr>
<td>D</td>
<td>K10 - 8&quot; round</td>
<td>13.78&quot;</td>
<td>681</td>
<td>1.52</td>
</tr>
<tr>
<td>D</td>
<td>K40 - 8&quot; round</td>
<td>19.69&quot;</td>
<td>863</td>
<td>1.92</td>
</tr>
<tr>
<td>E</td>
<td>K20 - 10&quot; round</td>
<td>15.75&quot;</td>
<td>1116</td>
<td>2.49</td>
</tr>
<tr>
<td>E</td>
<td>K40 - 10&quot; round</td>
<td>19.69&quot;</td>
<td>1304</td>
<td>2.91</td>
</tr>
</tbody>
</table>

**Outlet flow rates with trash bucket**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>K00 - 6&quot; round</td>
<td>11.81&quot;</td>
<td>421</td>
<td>0.94</td>
</tr>
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<td>748</td>
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<td>966</td>
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</tr>
<tr>
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</tr>
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<td>19.69&quot;</td>
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<td>13.78&quot;</td>
<td>681</td>
<td>1.52</td>
</tr>
<tr>
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<td>19.69&quot;</td>
<td>863</td>
<td>1.92</td>
</tr>
<tr>
<td>E</td>
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<td>15.75&quot;</td>
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<td>2.49</td>
</tr>
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<td>E</td>
<td>K40 - 10&quot; round</td>
<td>19.69&quot;</td>
<td>1304</td>
<td>2.91</td>
</tr>
</tbody>
</table>

**Note:** These are pipe flow rates at specified outlet, **NOT** channel flow rates. Catch basin flow rates without trash bucket - using trash bucket reduces flow.

**Installation device**

- **Bell end to fit 4", 6", or 8" Sch. 40 pipes**
- **1.25" (32mm)**
- **0.20" (5mm)**
- **22.17" (563mm)**

**Closing/G 6 in., 8 in. or 10 in. outlet cap**

- **0.20" (5mm)**
- **1.25" (32mm)**
- **1.89" (48mm)**
- **2.69" (68.2mm)**

**KlassikDrain K300/ K5300**

- **K3-903G/S In-line catch basin**
- **K3-904G/S In-line catch basin**

**Outlet flow rates for KlassikDrain K300/ K5300**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4&quot; round</td>
<td>28.22&quot;</td>
<td>279</td>
<td>0.64</td>
</tr>
<tr>
<td>B</td>
<td>4&quot; round</td>
<td>31.93&quot;</td>
<td>319</td>
<td>0.75</td>
</tr>
<tr>
<td>C</td>
<td>6&quot; round</td>
<td>25.89&quot;</td>
<td>280</td>
<td>0.62</td>
</tr>
<tr>
<td>D</td>
<td>6&quot; round</td>
<td>30.37&quot;</td>
<td>363</td>
<td>0.75</td>
</tr>
<tr>
<td>E</td>
<td>4&quot; round</td>
<td>24.89&quot;</td>
<td>281</td>
<td>0.63</td>
</tr>
<tr>
<td>F</td>
<td>4&quot; round</td>
<td>28.37&quot;</td>
<td>312</td>
<td>0.70</td>
</tr>
<tr>
<td>G</td>
<td>4&quot; round</td>
<td>29.80&quot;</td>
<td>337</td>
<td>0.77</td>
</tr>
<tr>
<td>H</td>
<td>4&quot; round</td>
<td>36.29&quot;</td>
<td>394</td>
<td>0.86</td>
</tr>
<tr>
<td>I</td>
<td>6&quot; round</td>
<td>31.79&quot;</td>
<td>319</td>
<td>0.75</td>
</tr>
<tr>
<td>J</td>
<td>6&quot; round</td>
<td>35.29&quot;</td>
<td>370</td>
<td>0.83</td>
</tr>
<tr>
<td>K</td>
<td>4&quot; round</td>
<td>28.37&quot;</td>
<td>312</td>
<td>0.70</td>
</tr>
<tr>
<td>L</td>
<td>6&quot; round</td>
<td>35.29&quot;</td>
<td>370</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Outlet flow rates for KlassikDrain K300/ K5300 with trash bucket**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4&quot; round</td>
<td>28.22&quot;</td>
<td>279</td>
<td>0.64</td>
</tr>
<tr>
<td>B</td>
<td>4&quot; round</td>
<td>31.93&quot;</td>
<td>319</td>
<td>0.75</td>
</tr>
<tr>
<td>C</td>
<td>6&quot; round</td>
<td>25.89&quot;</td>
<td>280</td>
<td>0.62</td>
</tr>
<tr>
<td>D</td>
<td>6&quot; round</td>
<td>30.37&quot;</td>
<td>363</td>
<td>0.75</td>
</tr>
<tr>
<td>E</td>
<td>4&quot; round</td>
<td>24.89&quot;</td>
<td>281</td>
<td>0.63</td>
</tr>
<tr>
<td>F</td>
<td>4&quot; round</td>
<td>28.37&quot;</td>
<td>312</td>
<td>0.70</td>
</tr>
<tr>
<td>G</td>
<td>4&quot; round</td>
<td>29.80&quot;</td>
<td>337</td>
<td>0.77</td>
</tr>
<tr>
<td>H</td>
<td>4&quot; round</td>
<td>36.29&quot;</td>
<td>394</td>
<td>0.86</td>
</tr>
<tr>
<td>I</td>
<td>6&quot; round</td>
<td>31.79&quot;</td>
<td>319</td>
<td>0.75</td>
</tr>
<tr>
<td>J</td>
<td>6&quot; round</td>
<td>35.29&quot;</td>
<td>370</td>
<td>0.83</td>
</tr>
<tr>
<td>K</td>
<td>4&quot; round</td>
<td>28.37&quot;</td>
<td>312</td>
<td>0.70</td>
</tr>
<tr>
<td>L</td>
<td>6&quot; round</td>
<td>35.29&quot;</td>
<td>370</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Outlet flow rates for KlassikDrain K300/ K5300 with half meter channels**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6&quot; round</td>
<td>22.67&quot;</td>
<td>576</td>
<td>1.35</td>
</tr>
<tr>
<td>B</td>
<td>8&quot; round</td>
<td>19.69&quot;</td>
<td>500</td>
<td>1.11</td>
</tr>
<tr>
<td>C</td>
<td>8&quot; round</td>
<td>22.67&quot;</td>
<td>714</td>
<td>1.68</td>
</tr>
<tr>
<td>D</td>
<td>10&quot; round</td>
<td>19.69&quot;</td>
<td>863</td>
<td>1.92</td>
</tr>
<tr>
<td>E</td>
<td>10&quot; round</td>
<td>22.67&quot;</td>
<td>1116</td>
<td>2.49</td>
</tr>
</tbody>
</table>

**Outlet flow rates for KlassikDrain K300/ K5300 with meter channels**

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet Size</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6&quot; round</td>
<td>22.67&quot;</td>
<td>576</td>
<td>1.35</td>
</tr>
<tr>
<td>B</td>
<td>8&quot; round</td>
<td>19.69&quot;</td>
<td>500</td>
<td>1.11</td>
</tr>
<tr>
<td>C</td>
<td>8&quot; round</td>
<td>22.67&quot;</td>
<td>714</td>
<td>1.68</td>
</tr>
<tr>
<td>D</td>
<td>10&quot; round</td>
<td>19.69&quot;</td>
<td>863</td>
<td>1.92</td>
</tr>
<tr>
<td>E</td>
<td>10&quot; round</td>
<td>22.67&quot;</td>
<td>1116</td>
<td>2.49</td>
</tr>
</tbody>
</table>

**Note:** These are pipe flow rates at specified outlet, **NOT** channel flow rates. Catch basin flow rates without trash bucket - using trash bucket reduces flow.
## Polymer concrete catch basins

Polymer concrete catch basins are used either as stand-alone area drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to the pipe system for maintenance.

### In-line Type 903 and 904 catch basins

Type 903 and 904 catch basins are suitable for use in trench runs. They are used to provide a high hydraulic output, allowing for easy access to the pipe system for maintenance.

### Polydrain parts table

<table>
<thead>
<tr>
<th>Part No</th>
<th>Polydrain Part Description</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>94615</td>
<td>KlassikDrain K300/100</td>
<td>49.56</td>
<td>49.5</td>
</tr>
<tr>
<td>94614</td>
<td>KlassikDrain K300/220</td>
<td>57.66</td>
<td>57.6</td>
</tr>
<tr>
<td>94613</td>
<td>KlassikDrain K300/300</td>
<td>70.68</td>
<td>70.7</td>
</tr>
</tbody>
</table>

### Charges

Grates - choice of grates to match complement channel with QuickLok™ or QuickLok™ bolted locking. See page 52–53. QuickLok™ grates require a removable QuickLok™ locking bar for easy access to trash basket and pipework.

**Top section** - polymer concrete with integrally cast galvanized or stainless steel frame. Gaskets aid connection of male channel ends at least 1.5m apart. Other channels can be connected by removing wall to required height. Blanking end supplied. See page 75.

**Trash basket** - plastic trash basket designed to collect debris washed from trench run. Supported in catch basin top to avoid creation of a vacuum and reduction in outflow. K304 uses deeper trash basket with rivet. Riser - a plastic riser, supplied with K304, designed to provide additional catch basin depth and hydraulic output. Gaskets enable cutting to size at 250mm intervals - minimum 250mm and maximum 12m height. Additional units can be used (a maximum of 2 is recommended to ensure stability). Contact ACO for non-polyethylene riser.

**Base** - polyethylene basins with wide range of Schedule 40/40 6" and 8" cut-outs for easy pipe connection. Cut-outs on end and side allow easy connection to ACO Industries. Contact ACO for non-polyethylene bases.

---

### Notes

1. K300 has a galvanized steel edge rail for general use. K300 has a grade 304 stainless steel edge rail for use where increased aesthetics or corrosion resistance is required.
2. KlassikDrain is sold as channel only. Choose appropriate grate from pages 52–53.
3. Perform 6" & 8" dia. drillouts cast on underside of certain channels (K0, 5, 10, 100, 13, 135, 15, 20, 200, 25, 30, 300, 33, 35, 30, 40, 400, 40).
4. Closing/offset cap can be used to suit all channels.
5. Catch basin details on page 51.

---

### KlassikDrain K300/300 Parts table

<table>
<thead>
<tr>
<th>Part No</th>
<th>KlassikDrain Part Description</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>94616</td>
<td>KlassikDrain K300/300</td>
<td>57.66</td>
<td>57.6</td>
</tr>
<tr>
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<td>KlassikDrain K300/300</td>
<td>70.68</td>
<td>70.7</td>
</tr>
</tbody>
</table>

---

### Grate selection

Grates are available for a variety of applications, including in-line and underground use. For more information on grate selection, see pages 52-53.

---

### QuickLok™ locking bar

QuickLok™ locking bars provide easy access to trash baskets and pipework. See page 52–53 for more information.

---

### Parts table - KlassikDrain K300/300

<table>
<thead>
<tr>
<th>Part No</th>
<th>KlassikDrain Part Description</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>94614</td>
<td>KlassikDrain K300/100</td>
<td>49.56</td>
<td>49.5</td>
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<tr>
<td>94613</td>
<td>KlassikDrain K300/220</td>
<td>57.66</td>
<td>57.6</td>
</tr>
<tr>
<td>94612</td>
<td>KlassikDrain K300/300</td>
<td>70.68</td>
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</tr>
</tbody>
</table>

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### KlassikDrain K300/300 Parts table

<table>
<thead>
<tr>
<th>Part No</th>
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</tr>
</thead>
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<td>57.6</td>
</tr>
<tr>
<td>94617</td>
<td>KlassikDrain K300/300</td>
<td>70.68</td>
<td>70.7</td>
</tr>
</tbody>
</table>

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### QuickLok™ locking bar

QuickLok™ locking bars provide easy access to trash baskets and pipework. See page 52–53 for more information.

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### Parts table - KlassikDrain K300/300

<table>
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<tr>
<th>Part No</th>
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<th>Weight</th>
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<tbody>
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<td>49.5</td>
</tr>
<tr>
<td>94613</td>
<td>KlassikDrain K300/220</td>
<td>57.66</td>
<td>57.6</td>
</tr>
<tr>
<td>94612</td>
<td>KlassikDrain K300/300</td>
<td>70.68</td>
<td>70.7</td>
</tr>
</tbody>
</table>

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### KlassikDrain K300/300 Parts table

<table>
<thead>
<tr>
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<th>KlassikDrain Part Description</th>
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<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
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<td>KlassikDrain K300/300</td>
<td>57.66</td>
<td>57.6</td>
</tr>
<tr>
<td>94617</td>
<td>KlassikDrain K300/300</td>
<td>70.68</td>
<td>70.7</td>
</tr>
</tbody>
</table>
**Available K300/KS300 DrainLok™ grates**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (sq. in.)</th>
<th>Intake area</th>
<th>Wgt (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Longitudinal stainless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 847D - stainless</td>
<td>142223</td>
<td>39.37” (1.0m)</td>
<td>0.81 x 0.29</td>
<td>263.2 131.6 28.6 14.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td>Type 848D - stainless</td>
<td>142224</td>
<td>19.69” (0.5m)</td>
<td>0.81 x 0.29</td>
<td>64.8 31.9 15.0 7.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>B</strong> Perforated steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 811D - galvanized</td>
<td>138090</td>
<td>39.37” (1.0m)</td>
<td>0.25 dia.</td>
<td>64.8 31.9 15.0 7.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td>Type 813D - galvanized</td>
<td>138091</td>
<td>19.69” (0.5m)</td>
<td>0.25 dia.</td>
<td>64.8 31.9 15.0 7.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>C</strong> Mesh steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 890D - galvanized</td>
<td>138189</td>
<td>19.69” (0.5m)</td>
<td>0.63 x 0.87</td>
<td>163.7 29.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td>Type 830D - stainless*</td>
<td>13849</td>
<td>19.69” (0.5m)</td>
<td>0.63 x 0.87</td>
<td>163.7 29.5</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>D</strong> Longitudinal iron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 876D - iron</td>
<td>99588</td>
<td>19.69” (0.5m)</td>
<td>1.97 x 0.24</td>
<td>64.3 35.0</td>
<td>DL ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>E</strong> Wave iron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 887D - iron</td>
<td>99581</td>
<td>19.69” (0.5m)</td>
<td>0.27 x 0.9</td>
<td>88.5 48.0</td>
<td>DL ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

**DrainLok™ - boltless & barless locking system**

1. Position grate onto channel, align anti-shunt detail with recess in rail.
2. Push down or slide on grate until it clicks into position.
3. To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.

**QuickLok™ - boltless locking system**

1. Locate locking bar in recesses, rotate and use hammer to tap securely into place. Serrated ends grip in recess.
2. 622 channels use plastic safety clip to hold in place.
3. To install grate, align QuickLok™ stud directly over locking bar.
4. Push down or slide on grate until it clicks into position.
5. To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.
6. To remove bar, insert screwdriver into hole at end of bar and lever back serrated end; rotate bar free.

Key

- Locking mechanism
- Heel safe equal or less than 0.25” (6.5mm)
- Compliant with Americans with Disabilities Act of 1990 Section 4.3.4
- Bicycle Safe compliant to Australian Standard AS 3996 - 2006
- Anti-skid: RMI over 24
- Heel resistant: less than 0.31” (8mm)
- ASME A12.6.3 - 2001
- Standard AS 3996 - 2006

**Available K300/KS300 QuickLok™ grates**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (sq. in.)</th>
<th>Intake area</th>
<th>Wgt (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C</strong> Decorative iron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 801Q - iron</td>
<td>93950</td>
<td>19.69” (0.5m)</td>
<td>0.29 x 0.43</td>
<td>54.6 47.0</td>
<td>QL ✓ ✓ ✓</td>
</tr>
<tr>
<td>Type 848Q - stainless*</td>
<td>142224</td>
<td>19.69” (0.5m)</td>
<td>0.29 x 0.43</td>
<td>54.6 47.0</td>
<td>QL ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>E</strong> Industrial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 878Q - iron</td>
<td>93952</td>
<td>19.69” (0.5m)</td>
<td>0.30 x 0.98</td>
<td>47.3 47.0</td>
<td>QL ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

**KlassikDrain K300/KS300**

- Load Class C - 56,000lbs - EN 1433 967psi
- Decorative iron
- Type 881Q - iron
- Type 848Q - stainless
- Load Class E - 135,000lbs - EN 1433 2,321psi
- Slotted iron
- Type 861Q - iron

**QuickLok™ - boltless locking system**

1. Locate locking bar in recesses, rotate and use hammer to tap securely into place. Serrated ends grip in recess.
2. 622 channels use plastic safety clip to hold in place.
3. To install grate, align QuickLok™ stud directly over locking bar.
4. Push down or slide on grate until it clicks into position.
5. To remove first grate, insert grate removal tool into slots at end of grate, pull up sharply. Remaining grates can be removed by hand.
6. To remove bar, insert screwdriver into hole at end of bar and lever back serrated end; rotate bar free.

Key

- Locking mechanism
- Heel safe equal or less than 0.25” (6.5mm)
- Compliant with Americans with Disabilities Act of 1990 Section 4.3.4
- Bicycle Safe compliant to Australian Standard AS 3996 - 2006
- Anti-skid: RMI over 24
- Heel resistant: less than 0.31” (8mm)
- ASME A12.6.3 - 2001
- Standard AS 3996 - 2006

**KlassikDrain K300/KS300**

- Load Class C - 56,000lbs - EN 1433 967psi
- Decorative iron
- Type 881Q - iron
- Type 848Q - stainless
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- Slotted iron
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- Heel resistant: less than 0.31” (8mm)
- ASME A12.6.3 - 2001
- Standard AS 3996 - 2006
MiniKlassik K50/KS50 - 2” wide general purpose system

K50 is a 2” internal width system with galvanized steel edge rail for high profile, aesthetic applications where a barrier is required to separate wet and dry areas.

K50 is the same system, but the edge rail is grade 304 stainless steel. K50 should be used where increased aesthetics are required, or where increased corrosion resistance is required.

EN 1433 does not cover grates for 2” (50 mm) internal width trench drains, but grates have been load tested in accordance with EN 1433 guidelines. Grates feature patented DrainLok™ boltless locking systems. Loading is determined by grate up to Load Class C (25 ton).

Typical applications
- Aesthetic areas
- Pedestrian plazas
- Sidewalks
- Paved areas

Selection criteria
- Light to medium duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Limited hydraulic capacity
- Constant depth channels

Key Dimensions
- Constant depth

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ACO DRAIN

MiniKlassik features

- 2 in. internal width trench system - Meter (39.37”) channels. ‘U’ shaped bottom improves flow hydraulics.
- Interconnecting end profiles - Allow easy and effective joining of channels. Appropriate sealant can be used to create sealed joint.
- Anti-shunt lugs - recesses in grate fit around lugs on the edge rail to prevent longitudinal movement.
- 1.5 in. Sch. 40 drill-out - Allows vertical evacuation at male end of channel at any point along the run.
- DrainLok™ - Patented, boltless locking system provides quick fitting and removal of grates. Helps reduce installation/maintenance time and cost.
- Choice of grates - Various materials and styles (including ADA compliant) for applications from Load Class A to Load Class C.
- Integrally cast-in galvanized steel edge rail - Provides additional strength and protects the channel edge from damage. (Stainless steel edge rail also available).

ACO DRAIN

MiniKlassik Parts table

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant depth channel - 39.37” (1m)</td>
<td>04071 06750</td>
<td>2.90 74</td>
<td>3.50 89</td>
<td>0.64 18.0</td>
<td></td>
</tr>
<tr>
<td>Steel closing cap</td>
<td>95395 95403</td>
<td>-</td>
<td>-</td>
<td>3.50 89</td>
<td>- 0.3</td>
</tr>
</tbody>
</table>

Notes:
1. Preformed 1.5” dia. drill-out outlet on underside of channel provides a flow rate of 12.7GPM - 0.03CFS.
2. MiniKlassik does not fit with any ACO catch basin - discharge through vertical outlet only or contact ACO for additional advice.

Available K50/KS50 DrainLok™ grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Load Class A - 3,500lbs - EN 1433 70psi Pedestrian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforated steel</td>
<td>Type 210D - galvanized</td>
<td>138100</td>
<td>0.23 dia.</td>
<td>4.0</td>
<td>23.8</td>
</tr>
<tr>
<td></td>
<td>Type 210D - stainless</td>
<td>138101</td>
<td>0.23 dia.</td>
<td>4.0</td>
<td>23.8</td>
</tr>
<tr>
<td>Slotted steel</td>
<td>Type 220D - galvanized</td>
<td>138102</td>
<td>0.38 x 1.35</td>
<td>18.7</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>Type 220D - stainless</td>
<td>138103</td>
<td>0.38 x 1.35</td>
<td>18.7</td>
<td>24.4</td>
</tr>
<tr>
<td>Mosaic plastic</td>
<td>Type 200D - black</td>
<td>138104</td>
<td>0.3 x 1.2 aug</td>
<td>11.6</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Type 200D - gray</td>
<td>138105</td>
<td>0.3 x 1.2 aug</td>
<td>11.6</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Type 200D - tan</td>
<td>138106</td>
<td>0.3 x 1.2 aug</td>
<td>11.6</td>
<td>NA</td>
</tr>
<tr>
<td><strong>B</strong> Load Class B - 28,000lbs - EN 1433 581psi Light duty</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Longitudinal steel</td>
<td>Type 2470 - stainless</td>
<td>142436</td>
<td>1.46 x 0.24</td>
<td>14.9</td>
<td>31.6</td>
</tr>
<tr>
<td></td>
<td>Grade 304 stainless steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C</strong> Load Class C - 56,000lbs - EN 1433 1,162psi Commercial vehicle</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Longitudinal iron</td>
<td>Type 276D - iron</td>
<td>138107</td>
<td>1.5 x 0.29</td>
<td>17.4</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Key: Locking mechanism
- Heel safe equal or less than 0.25” (6.5 mm) (Page 140)
- Bicycle Safe compliant to Australian Standard AS 3996 - 2009 (Page 140)
- Anti-slip grates - BPN over 24 (Page 140)
- Heel resistant less than 0.31” (8 mm) (Page 140)
- Compliant with Americans with Disabilities Act of 1990 Section 4.5.4 (Page 140)
- ASME A112.6.3 - 2001: Heel resistant less than 0.31” (8 mm) (Page 140)

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Brickslot is a discreet drainage solution for use with 3 1/8" or less brick or stone pavers. The slot(s) blend in with the paving joints giving an aesthetic solution.

Brickslot 100 offers a single, offset slot, or a twin Heel Resistant slot option. Brickslot 200 offers increased capacity via a double spaced 'Twinslot', or a central twin Heel Resistant slot.

Stainless steel Brickslot is the same system, but is manufactured entirely in grade 304 stainless steel. Stainless steel Brickslot should be used where increased aesthetics are desired, or where increased corrosion resistance is required.

Typical applications
- Aesthetic areas
- Pedestrian plazas
- Sidewalks
- Paved areas

Selection criteria
- Light to medium duty loads
- Multiple grate options to meet legal requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet design requirements
- General everyday or increased hydraulic capacity
- Constant depth and/or sloped depth channels
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139

Brickslot 100/200 - Discreet 4" & 8" slot drainage

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### ACO DRAIN

#### Brickslot 100 features

- **1/4 in. (12mm) slot** - Easy to clean smooth water flow into channel (shown).
- **1 1/2 in. (19mm) flared slot opening to 2" (50mm) slot allows continuous water flow into channel** (shown).
- **Offset, heel resistant double 1 1/2 in. (19mm) flared slot opening to 2" (50mm) slot for increased drainage capacity not shown**.

**End caps and accessories** - Available from the K100 range. See page 28 for details.

#### Brickslot 200 features

- **Two 6 in. parallel 1/4 in. (12mm) slots** - Easy to clean smooth water flow into channel (shown).
- **Central, heel resistant double 1 1/2 in. (19mm) flared slot opening to 2" (50mm) slot for increased drainage capacity not shown**.

**End caps and accessories** - Available from the K200 range. See page 40 for details.

### Brickslot Parts table

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Overall Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twinslot 200</td>
<td>138041</td>
<td>4.06</td>
<td>103</td>
</tr>
<tr>
<td>T100</td>
<td>138042</td>
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<tr>
<td>T100</td>
<td>138082</td>
<td>4.06</td>
<td>103</td>
</tr>
</tbody>
</table>

**Notes:**

1. For K100 channels and K1-900 catch basin information see page 28. For K200 channels and K2-900 catch basin information see page 40.
2. Brickslot can also be used with SlabDrain HK channels - see page 102.
3. Access units can be used on channels or catch basins - for details please refer to separate Spec Info sheets.
4. Only access cover can be removed once Brickslot has been installed.
5. For custom slot widths/heights, contact Aquaduct at (800) 543-4764.

### Bricksol 100

![Brick pavers - Fit directly against slot. For light duty pedestrian applications, pavers can be set on sand for heavy duty projects, pavers should be set on concrete. Maximum paver depth (allowing for 1/8" (3mm) bedding material): 3/4" (85mm).](image)

### Heel Resistant Bricksol 100

- **Heel Resistant Brickslot 100** - fits directly into K100 channel grate recess. Half meter sections are available. Half meter access units provide access to channel or catch basin for maintenance. See page 28 for details.

### Heel Resistant Bricksol 200

- **Heel Resistant Brickslot 200** - fits directly into K200 channel recess. Half meter sections are available. Half meter access units provide access to channel or catch basin for maintenance. See page 40 for details.

### Twinslot 200

![Brick pavers - Fit directly against slot. For light duty pedestrian applications, pavers can be set on sand for heavy duty projects, pavers should be set on concrete. Maximum paver depth (allowing for 1/8" (3mm) bedding material): 3/4" (85mm).](image)

### Heel Resistant Twinslot 200

- **Twinslot 200** - fits directly into K200 channel recess. Half meter sections are available. Half meter access units provide access to channel or catch basin for maintenance. See page 40 for details.

### Heel Resistant Twinslot 200

![Brick pavers - Fit directly against slot. For light duty pedestrian applications, pavers can be set on sand for heavy duty projects, pavers should be set on concrete. Maximum paver depth (allowing for 1/8" (3mm) bedding material): 3/4" (85mm).](image)
PowerDrain
Heavy duty trench drain

$100K ....................66
$200K ....................76
$300K ....................86
**PowerDrain features**

**Ductile iron edge rail** - Integrally cast-in rail provides maximum strength and protection for channel body. Shock absorbing widgets, with M10 stainless steel threads, fitted in rail to assist grate fit and aid hanging installation.

**Interconnecting end profiles** - Allow easy and effective joining of channels. Appropriate sealant can be used to create sealed joint.

**Polymer concrete** - Durable, yet lightweight material made from polyester resin binder reinforced by mineral aggregates and fillers. Provides up to four times the compressive strength of cement concrete. See page 136 for material properties.

**Channel identification** - Channels feature numbering on sidewalls. Numbering in base of channel allows easy identification after concrete encasement.

**System numbering** - Each end of channel indicates number of appropriate sloped channel that connects to it.

**PowerLok™** - A patented, boltless locking system that provides quick fitting and removal of grates. Helps reduce installation/maintenance time and cost.

**Knock-outs** - Included on all channel units to allow vertical evacuation of the system along the run. See product pages for sizes for each system.

**Concrete anchor boss** - A drill-through hole in the ductile iron rail enables a concrete anchor (4 per meter) to be attached for extra embedment into concrete haunch.

**Anti-shunt lugs** - Recesses in grate fit around lugs on edge rail to prevent longitudinal movement.

**Sloped (0.5%) channel units** - Meter long units provide 131’-3” continuous slope - equates to 1/17” fall per linear foot. Constant depth units can be used to extend run lengths.

**Shipping gripple/groove** - Side interlocking feature ensures safer stacking of channels on pallets for shipping to minimize breakage.

**Profiled side walls** - Strengthening pillars and frost keys provide channel body strength and mechanical keying to surrounding concrete.

**4-Bolt slotted grate** - 4-bolt grate option is available on all widths to provide maximum security and stability for super heavy duty applications.

**Direction arrows** - Cast on side of channel indicate flow direction and ensure channels are installed correctly.

**Ductile iron grates** - Heavy duty ductile iron grates in choice of ADA compliant (Load Class E*) or slotted (Load Class F, "$100K ADA grates rated to Load Class F").

**Profiled side walls** - Strengthening pillars and frost keys provide channel body strength and mechanical keying to surrounding concrete.
S100K is a 4" wide system with choice of Class F (90 ton) slotted or ADA compliant ductile iron grates featuring PowerLok™ patented boltless locking system. A 4-bolt slotted grate is also available.

S100K - 4" wide heavy duty system

Key Dimensions

Typical applications
- Airports
- Highways
- Heavy duty industrial areas
- Gas stations
- Docks & ports
- Military bases
- Truck stops

Selection criteria
- Light to heavy industrial duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 239
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- General everyday hydraulic capacity
- Constant depth and/or sloped depth channels

PowerDrain S100K

Typical applications
- Airports
- Highways
- Heavy duty industrial areas
- Gas stations
- Docks & ports
- Military bases
- Truck stops

Selection criteria
- Light to heavy industrial duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 239
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- General everyday hydraulic capacity
- Constant depth and/or sloped depth channels
**ACO DRAIN**

**System layout**

- **Channels**
  - Sloping channels
  - Constant depth channels
  - Half meter channels

- **Accessories**
  - 6" inlet/outlet endcaps
  - 4" pipe (by others) for bottom knockout
  - 6" oval-to-round adapter for bottom knockout
  - Universal closing 4" outlet endcap

- **Installation device**
  - Fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour.
  - Not reusable; it is ‘lost’ within concrete haunch.

- **Catch basins**
  - Type 900
  - Series 600

- **PowerDrain - S100K**

  **Meter channels - sloping & constant depth**
  - 0.5% sloped channels with ductile iron edge rail, in meter lengths and 40 depths to create a 40 meter (131'-2") continuously sloping run.
  - Bottom knockouts on all constant depths and 5, 10, 15, 20, 25, 30, 35, 40 channels.

  **Half meter channels**
  - Constant depth channels with ductile iron edge rail, in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels.

- **6" Sch 40 inlet/outlet caps**
  - Fits all channels, manufactured from black ABS to complement edge rail. Guides aid cutting to correct height. Wings clip cap onto end of channel. 4" bell end connection to Schedule 40 pipe. Seal using PVC-ABS cement.
  - Note: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

- **Type 901D In-line catch basin**
  - Two part inline catch basin with 4", 6" and 8" drill-outs for pipe connection. Supplied with ductile iron edge rail and plastic trash bucket. Options include an inline or side foul air trap.
  - Any channel can be connected into the catch basin by removing the end wall to the correct height with a box cutter. Cutout guides provided for connection to channels 00, 010, 020, 030 and 040. All cutouts to receive male channel ends. One blanking end plate supplied with in-line catch basin.

- **Series 600D catch basin**
  - Two part inline catch basin; bases have 4", 6" and 8" drill-outs for pipe connections. Supplied with ductile iron edge rail and plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases.
  - Any channel can be connected to catch basin by removing end/side wall to correct height. Drillouts guide connection to channels 00, 010, 020, 030 and 040. All cutouts to receive male channel ends.
PowerDrain S100K

Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>Outlet (Sch 40)</th>
<th>Invert in.</th>
<th>GPM</th>
<th>CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SK1-100 - 4” round</td>
<td>3.94”</td>
<td>108</td>
<td>0.24</td>
</tr>
<tr>
<td>B</td>
<td>SK1-40 - 4” round</td>
<td>3.94”</td>
<td>107</td>
<td>0.23</td>
</tr>
<tr>
<td>C</td>
<td>SK1-60 - 4” oval</td>
<td>3.94”</td>
<td>107</td>
<td>0.23</td>
</tr>
<tr>
<td>D</td>
<td>SK1-80 - 6” oval</td>
<td>3.94”</td>
<td>107</td>
<td>0.23</td>
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<tr>
<td>E</td>
<td>SK1-20 - 4” round</td>
<td>3.94”</td>
<td>106</td>
<td>0.22</td>
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<tr>
<td>F</td>
<td>SK1-40 - 6” oval</td>
<td>3.94”</td>
<td>106</td>
<td>0.22</td>
</tr>
<tr>
<td>G</td>
<td>SK1-60 - 6” oval</td>
<td>3.94”</td>
<td>106</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates.
Catch basin flow rates without trash bucket - using trash bucket reduces flow.

Outlet sizes

- 6 in. Sch. 40 inlet/outlet caps
- 5.5” (140mm)
- 1.25” (32mm)
- 1.33” (34mm)
- 1.61” (41mm)
- 1.85” (47mm)

Closing/4 in. inlet/outlet cap
- 5” (125mm)
- 1.13” (29mm)
- 1.25” (32mm)
- 2.28” (58mm)

Installation device
- Bell end to fit 4” Sch. 40 pipe
- 5.5” (140mm)
- 1.33” (34mm)

SK1-901D in-line catch basin
- 19.69” (500mm)
- 10.06” (255mm)
- 22.67” (576mm)
- 5.98” (152mm)

SK1-621D catch basin
- 22.67” (576mm)
- 5.98” (152mm)
- 19.69” (500mm)

SK1-631D catch basin
- 21.02” (534mm)
- 5.98” (152mm)
- 19.69” (500mm)

PowerDrain S100K

Outlet sizes

- 6 in. Sch. 40 inlet/outlet caps
- 5.5” (140mm)
- 1.25” (32mm)
- 1.33” (34mm)
- 1.61” (41mm)
- 1.85” (47mm)

Closing/4 in. inlet/outlet cap
- 5” (125mm)
- 1.13” (29mm)
- 1.25” (32mm)
- 2.28” (58mm)

Installation device
- Bell end to fit 4” Sch. 40 pipe
- 5.5” (140mm)
- 1.33” (34mm)

SK1-901D in-line catch basin
- 19.69” (500mm)
- 10.06” (255mm)
- 22.67” (576mm)
- 5.98” (152mm)
ACO DRAIN

**S100K Parts table**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Vol Gall</th>
<th>Wt lbs</th>
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</thead>
<tbody>
<tr>
<td>67041</td>
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<td>67003</td>
<td>4.33</td>
<td>4.53</td>
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<td>5.91</td>
<td>6.10</td>
<td>150</td>
<td>155</td>
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</tbody>
</table>

**Notes:**
1. PowerDrain is sold as channel only. Choose appropriate grate from page 74.
2. Preformed 4" dia. or 6" oval duct-outs cast on underside of certain channels 00, 5, 10, 010, 0103, 15, 30, 020, 25, 30, 030, 035, 40, 040, 043.
3. Grate outlet/cap can be cut down to fit all channels.
4. Channel length details on page 73.
5. Debris strainer details for 4" dia. outlet on page 103.

---

**PowerDrain S100K**

Polymer concrete catch basins are used either as stand alone area drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to pipe system for maintenance.

Type 901D provides an inline catch basin (frame width and usually indistinguishable from trench run and the Series 6000 is 12" wide and provides greater hydraulic output.

**Polymer concrete catch basins**

**Series 600 grates** - choice of Class F slotted or Class E longitudinal ADA compliant ductile iron grates with PowerLok™ boltless locking or Class F slotted ductile iron 400 grits. See page 94.

**Type 900 grates** - choice of Class F slotted or ADA compliant ductile iron grates with PowerLok™ boltless locking or slotted ductile iron 400 grits. See page 74.

**Top section** - polymer concrete with integrally cast ductile iron frame. Guides all connection of male channel ends at 10, 20, 30 and 40 depths. Other channels can be connected by removing wall to required height. Enabling drain tail supplied with SK1-631D. See page 155.

**Trash bucket** - plastic trash bucket designed to collect debris washed from trench run. Supplied in catch basin top to avoid creation of a vacuum and retraction in soil for 4" channel. SK1-631D uses deeper bucket with riser.

**Riser** - a plastic riser, supplied with SK1-631D, designed to provide additional catch basin depth and hydraulic output. Guides stone cutting to size in 2" (50mm) intervals (minimum 2" and maximum 12" height). Additional units can be used to ensure maximum is of 2" recommended to ensure stable access is maintained and for structural stability. Contact ACO for non-polyethylene riser.

**Base** - polyethylene bases with wide range of Schedule 40, 6" dia. outlet for easy pipe connection. Outlets on end and side alike connection of ACO foul air trap. Contact ACO for non-polyethylene bases.
ACO DRAIN

Available S100K grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (m)</th>
<th>Slot Size</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
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<tbody>
<tr>
<td>Longitudinal iron</td>
<td>96096</td>
<td>1.36 x 0.45</td>
<td>25.2</td>
<td>13.6 PL ✔ ✔</td>
<td>28.1</td>
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<tr>
<td>Iron</td>
<td>Ductile iron to ASTM A 536-84 - minimum grade 65-45-12</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slotted iron</td>
<td>96082</td>
<td>0.43 x 1.98 avg.</td>
<td>25.7</td>
<td>12.3 PL ✔ ✔</td>
<td>35.6</td>
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<tr>
<td>Iron</td>
<td>Ductile iron to ASTM A 536-84 - minimum grade 65-45-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-bolt iron</td>
<td>99590</td>
<td>0.71 x 1.81 avg.</td>
<td>36.0</td>
<td>10.8 Bolt ✔ ✔</td>
<td>35.6</td>
</tr>
</tbody>
</table>

Choosing S100K grates

There are three available grate styles to fit the S100K heavy duty channel body.

The conventional slotted grate, with PowerLok™, gives an excellent all-around heavy duty solution with the ease of the PowerLok™ locking/unlocking mechanism. Ideal for use where regular removal of the grate for maintenance is required.

The ADA compliant, longitudinal slotted grate, with PowerLok™, gives the ideal solution to a heavy duty location where some pedestrian access may be required.

Although easy locking and grate removal is important for maintenance, some specific applications require a 4-bolt solution. The four threaded stainless steel inserts in the S100K channel body allow a 4-bolt grate to be bolted into the channel for ultimate stiffness and security. Tamper resistant bolts can also be used.

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**S200K** - 8” wide heavy duty system

S200K is an 8” wide system with choice of Class F (90 ton) slotted or Class E (60 ton) ADA compliant ductile iron grates featuring the PowerLoc™ patented boltless locking system. A 4-bolt slotted grate is also available.

**PowerDrain S200K**

### Key Dimensions

8" to 16"

131’ continuous slope

### Typical applications

- Airports
- Highways
- Heavy duty industrial areas
- Gas stations
- Docks & ports
- Military bases
- Truck stops

### Selection criteria

- Light to heavy industrial duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Increased hydraulic capacity
- Constant depth and/or sloped depth channels
### System layout

**Removable grates**

**Channels**

**Slipping channels**

**Constant depth channels**

**Half meter channels**

**Accessories**

- 4" or 6" pipe (by others) for bottom knockout

**Universal closing 4" or 6" outlet endcap**

**Installation device**

**Catch basins**

- Type 900
- Series 600

---

**PowerDrain - S200K**

**Meter channels - sloping & constant depth**

0.5% sloped channels with ductile iron edge rail, in meter lengths and 40 depths which connect to create 40 meter (131’-2”) continuously sloping run.

Constant depth channels are available in 5 depths. Can be used to create non-sloped runs, or inserted in sloped runs to increase length.

Bottom knockouts on all constant depths and 5, 10, 15, 20, 25, 30, 35, 40 channels.

---

**Half meter channels**

Constant depth channels with ductile iron edge rail, in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels.

---

**Closing/4 in. or 6 in. outlet cap**

Fits all channels and manufactured from black polypropylene to complement edge rail. Guides aid cutting to correct height. Wings clip cap onto end of channel. 4" and 6" bell end provides connection to Schedule 40 pipe. Seal using appropriate flexible sealant.

**Note:** For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

---

**Installation device**

Fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is ‘lost’ within concrete haunch.

---

**Type 902D in-line catch basin**

Two part in-line catch basin with ductile iron edge rail; bases have 4", 6" and 8" drillouts for pipe connections. Supplied with plastic trash bucket.

Any channel can be connected to catch basin by removing the end wall to the correct height with a box cutter. Cut-out guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. One blanking end plate supplied with inline catch basin.

---

**Series 600D catch basin**

A two part in-line catch basin with ductile iron edge rail; bases have 4", 6" and 8" drillouts for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases.

Any channel can be connected to catch basin by removing the end/side wall to the correct height. Drillout guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. Two blanking end plates supplied with inline catch basin.
Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>Size (Sch 40)</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SK2-00 - 4&quot;</td>
<td>7.87&quot;</td>
<td>153</td>
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<td></td>
<td>SK2-40 - 4&quot;</td>
<td>15.75&quot;</td>
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<thead>
<tr>
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<th>SK2-631D</th>
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<tr>
<td>Outlet flow rates</td>
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<tr>
<td></td>
<td>a 4&quot; round</td>
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<td></td>
<td>b 4&quot; round</td>
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<td>c 4&quot; round</td>
<td>23.76&quot;</td>
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<td>e 4&quot; round</td>
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<td>658</td>
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</tbody>
</table>

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### ACO DRAIN

#### S200K Parts table

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Overall Depth</th>
<th>Vol Gal</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2K-00 Constant depth channel - 39.37&quot; (1m)</td>
<td>14.76</td>
<td>9.25</td>
<td>11.54</td>
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<tr>
<td>SK-1 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-4 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-5 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-9 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-10 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-34 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-36 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-44 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-46 Slotted channel - 39.37&quot; (1m)</td>
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<td>SK-48 Slotted channel - 39.37&quot; (1m)</td>
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</tbody>
</table>

#### ACO Drain Universal end cap

- **1. PowerDrain is sold as channel only. Choose appropriate grate from page 84.**
- **2. Prefabricated 4" & 6" dia. knockouts can be used on underside of certain channels (10, 5, 10, 010, 013, 15, 20, 020, 025, 30, 300, 35, 40, 040, 045).**
- **3. Closing/outlet cap can be cut down to suit all channels.**
- **4. Catch basin details on page 83.**
- **5. Drainer standards details for 4" dia. outlet on page 103.**

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### PowerDrain S200K

Polymer concrete catch basins are used either as stand alone areas drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to pipe system for maintenance.

**Type 902D provides an inline catch basin (same width and visually indistinguishable from trench run) and the Series 600 is 12" wide and provides greater hydraulic output.**

**Series 600 gratings – choice of Class F bolted or Class E longitudinal ADA compliant ductile iron gratings with PowerLock™ boltless locking or Class F slotted ductile iron-Knob grat. See page 94.**

**Type 900 gratings – choice of Class F bolted or Class E longitudinal ADA compliant ductile iron gratings supplied with PowerLock™ boltless locking or Class F slotted ductile iron-Knob grat. See page 84.**

#### Top section - polymer concrete with integrally cast ductile iron frame for grate. Guides aid connection of male channel ends at A10.20.30 and 40 depths. Other channels can be connected by removing wash to required height. The back end wall is supplied with SK2-902D and kit available for Series 600. See page 195.

#### Trash bucket – plastic trash bucket designed to collect debris washed from trench run. Supported in catch basin top to avoid creation of a vortex and flow reduction. SK-6310 uses deep bucket with rear.

#### Riser - a plastic riser, supplied with SK2-6310, designed to provide additional catch basin depth and hydraulic output. Guides enable cutting to size at 2° (~90mm) intervals - minimum 2" and maximum 12" height. Additional units can be used (a maximum of 2 is recommended to ensure snake access is maintained and for structural stability). Contact ACO for non-polyethylene riser.

#### Base - polyethylene bases with wide range of Schedule 40, 4" and 6" couplings for easy pipe connection. Couplings on end and side allow access to ACO foul air trap. Contact ACO for non-polyethylene bases.

#### PowerDrain 8 in. wide in-line catch basin

**Polymer concrete catch basins**

**Series 600 gratings – choice of Class F bolted or Class E longitudinal ADA compliant ductile iron gratings with PowerLock™ boltless locking or Class F slotted ductile iron-Knob grat. See page 94.**

**Type 900 gratings – choice of Class F bolted or Class E longitudinal ADA compliant ductile iron gratings supplied with PowerLock™ boltless locking or Class F slotted ductile iron-Knob grat. See page 84.**

#### Schedule 40, 4" and 6" x 4" square and 6" round couplings for easy pipe connection. Couplings on end and side allow access to ACO foul air trap. Contact ACO for non-polyethylene bases.

#### Parts table - S200K Catch basins

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK2-902D inline catch basin - 19.69&quot; (0.5m)</td>
<td>68053</td>
<td>18.1</td>
</tr>
<tr>
<td>SK2-6310 catch basin - 19.69&quot; (0.5m)</td>
<td>68055</td>
<td>30.4</td>
</tr>
<tr>
<td>SK2-6310 catch basin - 19.69&quot; (0.5m)</td>
<td>68056</td>
<td>40.2</td>
</tr>
<tr>
<td>Foul air trap - fits both Type 902D &amp; 600 basins</td>
<td>99992</td>
<td>3.9</td>
</tr>
</tbody>
</table>

* Volume is to grate seat and without trash bucket.
Available S200K grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt (lbs)</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Class E - 135,000lbs - EN1433</td>
<td>72263</td>
<td>19.69 (0.5m)</td>
<td>1.34 x 0.43</td>
<td>52.4</td>
<td>26.4</td>
<td>PL</td>
</tr>
<tr>
<td>Load Class F - 200,000lbs - EN1433</td>
<td>02449</td>
<td>19.69 (0.5m)</td>
<td>0.71 x 3.62 avg.</td>
<td>70.1</td>
<td>30.8</td>
<td>PL</td>
</tr>
<tr>
<td>Load Class F - 200,000lbs - EN1433</td>
<td>99591</td>
<td>19.69 (0.5m)</td>
<td>0.71 x 3.62 avg.</td>
<td>71.3</td>
<td>26.4</td>
<td>Bolt</td>
</tr>
</tbody>
</table>

Key:
- PL: PowerLok™
- Bolt: 4-bolt solution
- Supplied with bolts.

PowerLok™ - safety clip
For areas of extra security or safety concern, an optional safety clip is available that provides a visual alert if the PowerLok™ device is left open. The clip push fits next to the PowerLok™ device and sits level with the grate when the grate is locked. The clip cannot be fitted if the PowerLok™ is open. If all grates are engaged, a run of red dots is visible.

Choosing S200K grates
There are three available grate styles to fit the S200K heavy duty channel body.

The conventional slotted grate, with PowerLok™, gives an excellent all-around heavy duty solution with the ease of the PowerLok™ locking/unlocking mechanism. Ideal for use where regular removal of the grate for maintenance is required.

The ADA compliant, longitudinal slotted grate, with PowerLok™, gives the ideal solution to a heavy duty location where some pedestrian access may be required.

Although easy locking and grate removal is important for maintenance, some specific applications require a 4-bolt solution. The four threaded stainless steel inserts in the S200K channel body allow a 4-bolt grate to be bolted into the channel for ultimate stiffness and security. Tamper resistant bolts can also be used.

Grate accessories
<table>
<thead>
<tr>
<th>Part No.</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>10443</td>
<td>0.1</td>
</tr>
<tr>
<td>95526</td>
<td>0.1</td>
</tr>
<tr>
<td>138127</td>
<td>0.1</td>
</tr>
<tr>
<td>138128</td>
<td>0.1</td>
</tr>
</tbody>
</table>

* Supplied with bolts.
S300K - 12” wide heavy duty system

S300K is a 12” wide system with choice of Class F (90 ton) slotted or Class E (60 ton) ADA compliant ductile iron grates featuring the patented PowerLok™ boltless locking system. A 4-bolt slotted grate is also available.

Typical applications
- Airports
- Highways
- Heavy duty industrial areas
- Gas stations
- Docks & ports
- Military bases
- Truck stops

Selection criteria
- Light to heavy industrial duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Increased hydraulic capacity
- Constant depth and/or sloped depth channels

Key Dimensions

131' continuous slope

4” to 12”

12” to 20”

12” to 21”
ACO DRAIN
System layout

Meter channels - sloping & constant depth
0.5% sloped channels with ductile iron edge rail; in meter lengths and 40 depths which connect to create 40 meter (131') continuously sloping run.

Constant depth channels are available in 5 depths. Can be used to create non-sloped runs, or inserted in sloped runs to increase length.

Bottom knockouts on all constant depths and 5, 10, 15, 20, 25, 30, 35, 40 channels.

Half meter channels
Constant depth channels with ductile iron edge rail; in 4 depths supplement meter channels. Side knockout and profiling enable side junction to be created. Bottom knockouts on all half meter channels.

Closing/6 in., 8 in. or 10 in. outlet cap
Fits all channels and manufactured from black polypropylene to complement edge rail. Guides aid cutting to correct height. Wings clip cap onto end of channel. 6", 8" and 10" bell end provides connection to Schedule 40 pipe. Seal using appropriate flexible sealant.

Note: For depth 1-10 channels, ACO recommends removal of unused sections of bell end to ensure adequate pavement material coverage.

Installation device
Fits molded recesses on body of channel. Provides height and joint alignment - a sliding clamp locks the two channels together. Bolt to rebar on either side of channel to hold channels in place during concrete pour. Not reusable; it is 'lost' within concrete haunch.

Type 903D/904D In-line catch basins
A two part in-line catch basin with ductile iron edge rail; bases have 4", 6" and 8" drill-outs for pipe connections. Supplied with plastic trash bucket. Optional riser available for increased depth. Contact ACO for non-polyethylene riser/bases.

Any channel can be connected to catch basin by removing the end/side wall to the correct height. Drill out guides provided for connection to channels 00, 010, 020, 030 and 040. All cut-outs to receive male channel ends. Blanking end rail supplied to stop concrete ingress during final pour.
PowerDrain S300K

SK3-903D In-line catch basin

- Closing/6 in., 8 in. or 10 in. outlet cap
- Bell end to fit 6", 8" or 10" Sch. 40 pipes
- Installation device
- Invert: 11.81", 19.69" (300mm, 500mm)
- Half meter channels
  - 14.76" (375mm)
  - 16.73" (425mm)
  - 18.70" (475mm)
  - 20.67" (525mm
- Half meter channels
  - 19.69" (500mm)
- Meter channels
  - 13.80" (350mm)
  - 18.70" (475mm)
  - 20.67" (525mm)
- 14.25" (360mm)

Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>Size (Sch 40)</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SK3-00 - 6&quot; round</td>
<td>11.81&quot;</td>
<td>421</td>
<td>0.94</td>
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<tr>
<td>B</td>
<td>SK3-10 - 8&quot; round</td>
<td>13.78&quot;</td>
<td>631</td>
<td>1.44</td>
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<tr>
<td>C</td>
<td>SK3-20 - 10&quot; round</td>
<td>15.76&quot;</td>
<td>1116</td>
<td>2.56</td>
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</table>

Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>Size (Sch 40)</th>
<th>Invert</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SK3-903D</td>
<td>19.69&quot;</td>
<td>1304</td>
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<td>B</td>
<td>SK3-904D</td>
<td>19.69&quot;</td>
<td>1237</td>
<td>2.76</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates. Capture basin flow rates without trash bucket - using trash bucket reduces flow.
## ACO DRAIN

### S300K Parts table

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Vol</th>
<th>Wgt</th>
</tr>
</thead>
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</table>

### Polymer concrete catch basins

Polymer concrete catch basins are used either as stand alone area drains or more commonly as the outlet to a trench run. They provide the highest hydraulic output and allow easy access to the pipe system for maintenance.

Type 903D and 904D are same width and visually indistinguishable from trench run.

**Type 900 grates - choice of Class F slotted or Class E longitudinal ADA compliant ductile iron grates with PowerDrain™ bottle locking or Class F slotted ductile iron 48g unit. See page 94.**

**Top section - polymer concrete with integrally cast ductile iron frame for grate. End guides aid connection of male channel ends at #10, 20, 30 and 40 depths. Other channels can be connected by removing weld to correct height. Beasting and rail supplied. See page 155.**

**Trash bucket - plastic trash bucket designed to collect debris washed from trench run. Supported in catch basin top to avoid creation of a vacuum and reduction in outlet. Use deeper bucket with riser.**

**Riser - a plastic riser, supplied with SK3(904D), designed to provide additional catch basin depth and hydraulic output. Guides easily cut to size at 2”(50mm) intervals - minimum 2” and maximum 12” height. Additional units can be used (a maximum of 2 is recommended to ensure snake access is maintained and for structural stability). Contact ACO for non-polyethylene risers.**

**Base - polyethylene bases with wide range of Schedule 40, 4” and 6” joints and 1/2” to 6” outlets for easy pipe connection. Outlets on end and side allow insertion of ACC foil air trap. Contact ACO for non-polyethylene bases.**

### Parts table - S300K Catch basins

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>69053</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69054</td>
<td></td>
<td></td>
</tr>
<tr>
<td>99902</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90854</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Volume is up to grate seat and without trash bucket.**

---

1. PowerDrain is sold as channel only. Choose appropriate grate from page 94.
2. Preferred 6” & 8” dia knockouts cast on underside of certain channel (92, 5, 10, 010, 030, 15, 20, 020, 030, 25, 30, 030, 35, 40, 040, 043).
3. Casing/outlet cap can be cut down to suit all channels.
4. Catch basin details on page 93.
ACO DRAIN

Available S300K grates

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length inches (m)</th>
<th>Slot Size inches</th>
<th>Intake area sq. in.</th>
<th>Wgt lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Class E - 135,000lbs - EN1433</td>
<td>2,321psi</td>
<td>96833</td>
<td>19.69&quot; (0.5m)</td>
<td>0.76 x 0.31</td>
<td>63.2</td>
</tr>
</tbody>
</table>

Longitudinal iron

Ductile iron to ASTM A 536-84 - minimum grade 65-45-12

Load Class F - 200,000lbs - EN1433 | 3,481psi | 02445 | 19.69" (0.5m) | 0.71 x 3.61 avg. | 122.6 | 50.0 | PL | 31.5 |

Slotted iron

Ductile iron to ASTM A 536-84 - minimum grade 65-45-12

This grate complies with WFH 621E 200,000lb proof load test.

*Supplied with bolts.

4-bolt iron

Ductile iron to ASTM A 536-84 - minimum grade 65-45-12

This grate complies with WFH 621E 200,000lb proof load test.

Choosing S300K grates

There are three available grate styles to fit the S300K heavy duty channel body.

The conventional slotted grate, with PowerLok™, gives an excellent all-around heavy duty solution with the ease of the PowerLok™ locking/unlocking mechanism. Ideal for use where regular removal of the grate for maintenance is required.

The ADA compliant, longitudinal slotted grate, with PowerLok™, gives the ideal solution to a heavy duty location where some pedestrian access may be required.

Although easy locking and grate removal is important for maintenance, some specific applications require a 4-bolt solution. The four threaded stainless steel inserts in the S300K channel body allow a 4-bolt grate to be bolted into the channel for ultimate stiffness and security. Tamper resistant bolts can also be used.

4-Bolt grates

PowerLok™ - boltless locking system

For areas of extra security or safety concern, an optional safety clip is available that provides a visual alert if the PowerLok™ devices are left open. The clip push fits next to the PowerLok™ device and sits level with the grate when the grate is locked. The clip cannot be fitted if the PowerLok™ is open. If all grates are engaged, a run of red dots is visible.

PowerLok™ - safety clip

This grate complies with RR-F-621E '200,000lb proof load' test.

Grate accessories

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10443</td>
<td>0.1</td>
</tr>
<tr>
<td>95526</td>
<td>0.1</td>
</tr>
<tr>
<td>138127</td>
<td>0.1</td>
</tr>
</tbody>
</table>

For areas of extra security or safety concern, an optional safety clip is available that provides a visual alert if the PowerLok™ devices are left open. The clip push fits next to the PowerLok™ device and sits level with the grate when the grate is locked. The clip cannot be fitted if the PowerLok™ is open. If all grates are engaged, a run of red dots is visible.

Grate accessories

* Supplied with bolts.
Slab Solutions
Trench drains for concrete slabs

Slab Drain ............... 100
Membrane Drain ......... 106
Flow Drain .............. 112
Slab Solutions features

**Ductile iron grates** - Heavy duty ductile iron grates in choice of Load Class F slotted or longitudinal ADA compliant H100SK & H300SK ADA grates are rated to Load Class E. A 4-bolt slotted grate is also available.

**Bolted grates** - FG200 grates are lockable with ten 1/2" - 13 x 1 1/2" bolts fixing directly into steel frame at 18" (457mm) intervals.

**Fiberglass** - A lightweight material that is made from polyester resin binder reinforced by glass matting and fibers.

**Choice of steel frame** - Provides grate support and protects channel edge from damage. Available in black coated, galvanized and stainless steel.

**Anti-shunt lugs** - Recesses in grate fit around lugs on the edge rail to prevent longitudinal movement.

**Interconnecting end profiles** - Allow easy and effective joining of channels.

**SF Sealant Groove** - A groove is cast into the ends of every channel. The combined groove this creates allows for a bead of appropriate flexible sealant to be inserted at joints.

**Bottom drill-outs** - Included on all constant depth channels to allow vertical evacuation of the system at any point in the run. Drill-outs sized for:
- 4" pipes - H100/H200/H300K, H200SK
- 4" & 6" pipes - H200K/H300SK, 6" & 8" pipes - H300K/H300SK

**Cross Sidewalk Drain** - Allows water from a down spout to drain safely, through the Slab Drain, across the sidewalk to the curb.

**QuickLok™ & DrainLok™ on H100K/H200K/H300K** - Patented, boltless locking systems provide quick fitting and removal of grates. Helps reduce installation/maintenance time and cost. H100 will accept QuickLok™ grates only.

**H300SK/H200SK/H300K Integrally cast-in galvanized steel edge rail** - Provides additional strength and protects channel body from damage. (Stainless steel edge rail also available).

**H100K/H200K/H300K Integrally cast-in ductile iron edge rail** - Provides maximum strength and protection for channel body.

**H100K/H200K/H300K Integrally cast-in galvanized steel edge rail** - Provides maximum strength and protection for channel body.

**Choice of grates** - In various materials, styles and slot configurations including ADA compliant.

**H100 - From Load Class A to Load Class C (25 tons).**

**H100K/H200K/H300K - From Load Class A to Load Class E (60 tons).**

**H300K** - 12" internal width

**H200K** - 8" internal width

**H100K** - 4" internal width

**H100** - 4" internal width

**Fiberglass** - A lightweight material that is made from polyester resin binder reinforced by glass matting and fibers.

**Choice of steel frame** - Provides grate support and protects channel edge from damage. Available in black coated, galvanized and stainless steel.

**Anti-shunt lugs** - Recesses in grate fit around lugs on the edge rail to prevent longitudinal movement.

**Interconnecting end profiles** - Allow easy and effective joining of channels.

**SF Sealant Groove** - A groove is cast into the ends of every channel. The combined groove this creates allows for a bead of appropriate flexible sealant to be inserted at joints.

**Bottom drill-outs** - Included on all constant depth channels to allow vertical evacuation of the system at any point in the run. Drill-outs sized for:
- 4" pipes - H100/H100K/H100SK, H200K/H300SK
- 4" & 6" pipes - H200K/H300SK, 6" & 8" pipes - H300K/H300SK

**MembraneDrain** - For use in a suspended slab where liquid penetrating through the pavement is collected on a membrane and directed into the trench drain.

**Wide choice of grates** - In various materials, styles and slot configurations including ADA compliant.

**H100 - From Load Class A to Load Class C (25 tons).**

**H100K/H200K/H300K - From Load Class A to Load Class E (60 tons).**

**H300K** - 12" internal width

**H200K** - 8" internal width

**H100K** - 4" internal width

**H100** - 4" internal width

**H300SK** - 12" internal width

**H200SK** - 8" internal width

**H100SK** - 4" internal width

**H300K** - 12" internal width

**H200K** - 8" internal width

**H100K** - 4" internal width

**H100** - 4" internal width

**H300SK** - 12" internal width

**H200SK** - 8" internal width

**H100SK** - 4" internal width

**H300K** - 12" internal width

**H200K** - 8" internal width

**H100K** - 4" internal width

**H100** - 4" internal width
On occasion, installation constraints are of greater concern than hydraulics. The most common constraint is lack of depth. To offer solutions where shallow trench drains are required, SlabDrain is available in 3 edge versions and 3 widths - all constant depth.

Loading varies for each system, depending upon edge rail and grate, up to heavy duty Class F (90 tons) EN 1433. All grates are secured to the channel body by either QuickLok™ or PowerLok™.

Polymer concrete edge rail on H100-8/H100-10 can be used to provide a non-metallic drainage option.

Typical applications
- Restricted depth applications
- Parking decks
- Elevated slabs
- Retro-fit
- Threshold applications

Selection criteria
- Light to heavy industrial duty loads - dependent on type
- Product can be used towards LEED & CIP requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Limited hydraulic capacity
- Constant depth channels

www.ACODrain.us
ACO DRAIN

System layout

Removable grates

Constant depth channels

Closing cap

Bottom knockout

H100K-8 - 4”
H200K-13 - 4” & 6”
H300K-13 - 6” & 8”

Notes:
1. H100KS-8 has Grade 304 stainless steel rails and closing cap.
2. See pages 30-33 for details on grates - for optimum flow use DrainLok™ grates.

H100K-8/H100KS-8 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>H100K-8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>H100KS-8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Invert Depth</td>
<td>inches</td>
<td>mm</td>
<td>Overall Depth</td>
<td>inches</td>
</tr>
<tr>
<td>Constant depth channel - 39.37” (1m)</td>
<td>95365</td>
<td>95373</td>
<td>2.56</td>
<td>65</td>
</tr>
<tr>
<td>Steel closing cap</td>
<td>98462</td>
<td>98471</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Debris strainer for 4” bottom KO</td>
<td>93488</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>QuickLok™ locking bar</td>
<td>02899</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Grate removal tool</td>
<td>01318</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
1. H200KS-13 has Grade 304 stainless steel rails and closing cap.
2. See pages 42-43 for details on grates - for optimum flow use DrainLok™ grates.

H200K-13/H200KS-13 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>H200K-13</td>
<td>H200KS-13</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Invert Depth</td>
<td>inches</td>
<td>mm</td>
<td>Overall Depth</td>
<td>inches</td>
</tr>
<tr>
<td>Constant depth channel - 39.37” (1m)</td>
<td>93454</td>
<td>93455</td>
<td>3.94</td>
<td>100</td>
</tr>
<tr>
<td>Steel closing cap</td>
<td>93458</td>
<td>93459</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Debris strainer for 4” bottom KO</td>
<td>93488</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>QuickLok™ locking bar</td>
<td>10457</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Grate removal tool</td>
<td>01318</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
1. H300KS-13 has Grade 304 stainless steel rails and closing cap.
2. See pages 52-53 for details on grates - for optimum flow use DrainLok™ grates.

H300K-13/H300KS-13 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>H300K-13</td>
<td>H300KS-13</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Invert Depth</td>
<td>inches</td>
<td>mm</td>
<td>Overall Depth</td>
<td>inches</td>
</tr>
<tr>
<td>Constant depth channel - 39.37” (1m)</td>
<td>93464</td>
<td>93465</td>
<td>3.94</td>
<td>100</td>
</tr>
<tr>
<td>Steel closing cap</td>
<td>93468</td>
<td>93469</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>QuickLok™ locking bar</td>
<td>10458</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Grate removal tool</td>
<td>01318</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
1. H300KS-13 has Grade 304 stainless steel rails and closing cap.
2. See pages 52-53 for details on grates - for optimum flow use DrainLok™ grates.
ACO DRAIN

System layout

Removable grates

Constant depth channels:

Closing cap

Bottom knockout - H100SK-10 - 4" & H100SK-13 - 6" & 8"

SlabDrain - H100SK/H200SK/H300SK

Outlet flow rates

<table>
<thead>
<tr>
<th>Outlet Product</th>
<th>Size (Inch I.D.)</th>
<th>Invert (In.)</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Bottom outlet-1000</td>
<td>4&quot; knockout</td>
<td>4.00</td>
<td>138</td>
</tr>
<tr>
<td>B</td>
<td>Bottom outlet-1000</td>
<td>6&quot; knockout</td>
<td>4.00</td>
<td>243</td>
</tr>
<tr>
<td>C</td>
<td>Bottom outlet-1000</td>
<td>8&quot; knockout</td>
<td>4.00</td>
<td>348</td>
</tr>
</tbody>
</table>

Notes:

1. See page 74 for details on grates.
2. Debris strainer details for 4" dia. outlet on page 103.

H100SK-10 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume Gallons</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>93412</td>
<td>2.56</td>
<td>65</td>
<td>3.35</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.2</td>
</tr>
</tbody>
</table>

Notes:

1. See page 94 for details on grates.

H200SK-13 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume Gallons</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>63456</td>
<td>3.94</td>
<td>100</td>
<td>5.12</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66.4</td>
</tr>
</tbody>
</table>

Notes:

1. See page 84 for details on grates.
2. Debris strainer details for 4" dia. outlet on page 103.

H300SK-13 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume Gallons</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>63456</td>
<td>3.94</td>
<td>100</td>
<td>5.12</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66.4</td>
</tr>
</tbody>
</table>

Notes:

1. See page 94 for details on grates.
ACO DRAIN

System layout

Renewable grates

Constant depth channels

Closing cap

Bottom knockout: H100-8/H100-10 - 4"

H100-8/10 channel

39.37" (1 meter)

6.12" (155mm)

6.10" (155mm)

Closing cap

3.15" (80mm), or 3.97" (100mm)

3.94" (100mm)

3.15" (80mm), or 3.97" (100mm)

Building

Cross Sidewalk Drain (CSD)

CSD is a cross sidewalk drainage system which has a polymer concrete curb unit, that is cast into the curb line, to allow water from the H100K-8 or H100KS-8 SlabDrain to discharge into the road. A down spout inlet, also manufactured from polymer concrete, allows rainwater down spouts to drain into the channel.

H100-8 & H100-10 Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>00985</td>
<td>2.56</td>
<td>65</td>
<td>3.15</td>
<td>80</td>
</tr>
<tr>
<td>00549</td>
<td>3.35</td>
<td>85</td>
<td>3.95</td>
<td>100</td>
</tr>
</tbody>
</table>

H100-8 polymer concrete closing cap

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>05935</td>
<td>-</td>
<td>-</td>
<td>3.15</td>
<td>80</td>
</tr>
<tr>
<td>05939</td>
<td>-</td>
<td>-</td>
<td>3.95</td>
<td>100</td>
</tr>
</tbody>
</table>

Grate removal tool

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>01318</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Notes:
1. See page 32 for details on suitable QuickLok™ grates, max. load Class C (56,000lb - 280psi).
2. Use grate removal tool to remove grates (Part #01318).
3. Debris strainer details for 4" dia. outlet on page 103.

Outlet flow rates

<table>
<thead>
<tr>
<th>Outlet Product</th>
<th>Size (Sch 40)</th>
<th>Invert In.</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Bottom outlet</td>
<td>4&quot; round</td>
<td>2.56</td>
<td>0.15</td>
</tr>
<tr>
<td>A</td>
<td>Bottom outlet</td>
<td>4&quot; round</td>
<td>3.95</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates.

CSD Parts list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>96924</td>
<td>3.5</td>
<td>93</td>
<td>7.87</td>
</tr>
<tr>
<td>96932</td>
<td>3.2</td>
<td>82</td>
<td>3.95</td>
</tr>
</tbody>
</table>

Notes:
1. For use with H100K8 or H100KS8 channels only - see page 102-103 for details.

Outlet flow rates

<table>
<thead>
<tr>
<th>Outlet Product</th>
<th>Size (Sch 40)</th>
<th>Invert In.</th>
<th>GPM</th>
<th>CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Bottom outlet</td>
<td>4&quot; round</td>
<td>2.56</td>
<td>0.15</td>
</tr>
<tr>
<td>A</td>
<td>Bottom outlet</td>
<td>4&quot; round</td>
<td>3.95</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates.
MembraneDrain - External elevated slab drain

Specifically for use in suspended slab where any liquid permeating through the pavement is collected and directed into the trench drain.

Loading is determined by grate, up to Load Class C (25 ton).

For membrane applications above a habitable area, ACO Building Drainage offers ProfiLine and other suitable products manufactured from stainless steel that are installed entirely above the membrane.

Typical applications:
- Rail stations
- Parking garages
- Office buildings
- Airports
- Roof top gardens

Selection criteria:
- Light to medium duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Limited hydraulic capacity
- Constant depth channels

MembraneDrain
Key dimensions

Constant depth

Limited hydraulic capacity

Product can be used towards LEED & EPA requirements

Resistant to many everyday chemicals. Check page 139

Multiple grate options to meet legal requirements

Multiple grate options to meet design requirements

Light to medium duty loads
ACO DRAIN

MembraneDrain features

Clamping device - An inverted ‘U’ shaped locking bar is fitted to the H100-8/H100-10 channel. The locking bar is fitted to the MembraneDrain subframe. Two bolts allow connection between the two bars and hold the membrane tight.

Membrane - Is clamped between channel and subframe. Maximum membrane of 1/2" (12.7mm) can be accommodated - ensure weep holes are not blocked if using a thick or hot-mopped membrane. Liquids seep through the pavement, collect on the membrane (not supplied by ACO) and drain into channel.

Grates - Sit directly into the MembraneDrain subframe and lock into position with DrainLok™ or QuickLok™.

Weep holes - Along each side allow liquids collecting on the membrane to run into the channel. Each weep hole opening is 1.18" (30mm) x 0.15" (4mm).

Membrane end cap - Cut down and use top part of K100 closing cap to close end of subframe (Part #96822). See page 28 for details.

End caps and accessories - Are available from the H100-8/H100-10 range. See page 106 for details.

MembraneDrain Parts list

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MembraneDrain subframe - 19.69&quot; (0.5m)</td>
<td>96903</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MembraneDrain clamping device</td>
<td>96905</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Notes:
1. For H100-8/H100-10 channel information see page 106.

Membrane collects liquids that seep through surface materials.
FlowDrain FG200 - 8" wide fiberglass system

**Selection criteria**

- Light to heavy industrial duty loads
- Product can be used towards LEED & EPA requirements
- Resistant to many everyday chemicals. Check page 139
- Multiple grate options to meet legal requirements
- Multiple grate options to meet design requirements
- Increased hydraulic capacity
- Constant depth and/or sloped depth channels

**Typical applications**

- Parking lots & garages
- Airports
- Gas stations
- Industrial areas
- Commercial areas
- Internal applications

FG200 is an 8" wide fiberglass system with choice of steel slotted Class C (25 ton) or ductile iron Class E (60 ton) grates. Grates are bolted into the steel frame with 2 bolts per 18" section.
**FlowDrain features**

- **Bolted grates** - FG200 grates are lockable with two 1/2" - 13 x 1/2" bolts fixing directly into steel frame at 18" (457mm) intervals.

- **Choice of grates** - In various materials and styles (including ADA compliant) for applications up to Load Class E.

- **Interconnecting end profiles** - Allow easy and effective joining of channels. Sealant can be used to create sealed joints.

- **Bracing blocks** - Supplied to brace deeper channels during concrete pour. Details on how to position are shown on a sticker on each channel.

- **Nelson studs** - Attached to frame, act as concrete anchors to secure channels into concrete surround.

- **Choice of steel frame** - Provides grate support and protects channel edge from damage. Available in black coated, galvanized and stainless steel.

- **Snap-fit studs** - Hold channel body securely to frame and allows quick assembly on-site. Supplied with frame.

- **Installation brackets** - Provide simple and easy installation using No. 4 or 5 rebar.

- **Direction arrows** - Sticker on side of channel indicates flow direction and ensures channels are installed correctly.

- **Sloped (1.0%) channel units** - 9' (2.75 meter) long units provide 108' (32.9 meter) continuous slope. Equates to 1/8" fall per linear foot. Four constant depth channels extend run lengths. Four 3' (0.915 meter) units and accessories also available.

- **Fiberglass** - A lightweight material that is made from polyester resin binder reinforced by glass matting and fibers. See page 136 for material properties.
ACO DRAIN

System layout

Channels
- Removable grates
- Constant depth channels
- 3 ft channels

Accessories
- Closing end caps
- Female/male
- Outlet end caps
- 4", 6", 8"
- Bottom outlet adapter
- 4", 6", 8"

Catch basins
- F660
- F880

9 ft channels
1.0% sloped channels in 9' lengths and 12 depths which connect to create 108' (33.9 meters) continuously sloping trench run. Constant depth channels are available in 4 depths and can be used to create non-sloped runs or inserted in sloped runs to increase length. Choice of 9' black coated, stainless or galvanized steel frame connects to channel body using simple snap-fit studs.

3 ft channels
Constant depth channels in 4 depths to supplement the 9' channels for easier layouts. Choice of 3' black coated, stainless or galvanized steel frame connects to channel body using simple snap-fit studs.

Outlet cap
Fits outside deep/male end of all channels. Manufactured from polypropylene with choice of black coated, stainless or galvanized steel end rail. Guides aid cutting to correct height. Seal using appropriate flexible sealant.

Female closing cap
Fits inside shallow/female end of channel. Manufactured from polypropylene with choice of black coated, stainless or galvanized steel end frame. Guides aid cutting to correct height. Seal using appropriate flexible sealant.

Vertical outlet adapter
4", 6" or 8" Schedule 40 vertical outlet adapter manufactured from polypropylene. Can be secured to underside of channel using appropriate flexible sealant to provide vertical bell end for easy attachment to 4", 6" or 8" Schedule 40 pipe. Can be used anywhere along channel.

Outlet end caps
4", 6", 8" Schedule 40 vertical outlet adapter manufactured from polypropylene. Can be secured to underside of channel using appropriate flexible sealant to provide vertical bell end for easy attachment to 4", 6" or 8" Schedule 40 pipe. Can be used anywhere along channel.

Note: For depth 801-804 channels ACO recommends removal of unused sections of the bell end to ensure adequate pavement material coverage.

F660 & F880 catch basins
One piece fiberglass catch basins with choice of black coated, stainless or galvanized steel frame, lockable steel bar or ductile iron slotted grate and plastic trash bucket.

Accessories include 4", 6" and 8" Schedule 40 pipe adapters and channel collars to connect channel to catch basin.

See page 121 for details.
## Outlet flow rates

<table>
<thead>
<tr>
<th>Channels</th>
<th>F660</th>
<th>F880</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet</td>
<td>Size</td>
<td>Invert</td>
</tr>
<tr>
<td>A</td>
<td>4” round</td>
<td>7.88”</td>
</tr>
<tr>
<td>A</td>
<td>4” round</td>
<td>20.25”</td>
</tr>
<tr>
<td>B</td>
<td>6” round</td>
<td>10.63”</td>
</tr>
<tr>
<td>C</td>
<td>8” round</td>
<td>9.00”</td>
</tr>
<tr>
<td>D</td>
<td>4” round</td>
<td>9.00”</td>
</tr>
<tr>
<td>E</td>
<td>6” round</td>
<td>10.63”</td>
</tr>
<tr>
<td>F</td>
<td>8” round</td>
<td>12.38”</td>
</tr>
</tbody>
</table>

Note: These are pipe flow rates at specified outlet, NOT channel flow rates. Catch Basin flow rates without trash bucket - using trash bucket reduces flow.

## Catch basins

<table>
<thead>
<tr>
<th>F660</th>
<th>F880</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet</td>
<td>Size</td>
</tr>
<tr>
<td>G</td>
<td>4” round</td>
</tr>
<tr>
<td>H</td>
<td>6” round</td>
</tr>
<tr>
<td>I</td>
<td>8” round</td>
</tr>
</tbody>
</table>

Pipe adapter

- 4” pipe adapter
- 6” pipe adapter
- 8” pipe adapter

Channel collar

- 4” Sch 40
- 6” Sch 40
- 8” Sch 40
Fiberglass catch basins

Fiberglass catch basins are available with a variety of frames and grates. Channel collars are available to connect all depths of channel on any side of the catch basin.

Pipe adapters are available to allow inlet/outlet pipe connections at any position on the catch basin.

Grates - a choice of galvanized or stainless steel for or slotted ductile iron grates, locked in place with 2 bolts. See page 123.

Trash bucket - plastic trash bucket designed to collect debris that has collected in the trench and washed into the catch basin.

Frame - coated black, galvanized or stainless steel frame attached to catch basin body with snap-fit studs.

Catch basin body - fiberglass body in choice of 4 sizes.

Channel collar - adapter to enable smooth transition of any depth FG200 channel on any side. Can be cut to correct height.

Pipe adapter - plain end adapter to allow inlet or outlet pipes to be easily attached to the outer wall of catch basin at any position. Available for 4", 6" and 8" Schedule 40 pipes.

### FG200 Parts Table

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Vol</th>
<th>Wgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG200</td>
<td>1.1</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Invert depths are for the channel body & frame assembled.
2. Channel weights are for fiberglass body only.
3. Closing/Ouflow caps can be cut down to suit all channels.
4. Add 2" to length of each channel for female joining flange (only applicable at shallowest end of trench run).
5. Frames supplied with plastic snap-fit studs for connecting to fiberglass body.

* Grade 304 stainless steel frames, ACO recommends the use of non-galvanized grates with stainless steel frames to avoid galvanic corrosion.

---

**FlowDrain - FG200**

Fiberglass catch basins

Fiberglass catch basins are available with a variety of frames and grates. Channel collars are available to connect all depths of channel on any side of the catch basin.

Pipe adapters are available to allow inlet/outlet pipe connections at any position on the catch basin.

### FG60 Catch basin

**Grates** - a choice of galvanized or stainless steel for or slotted ductile iron grates, locked in place with 2 bolts. See page 123.

**Trash bucket** - plastic trash bucket designed to collect debris that has collected in the trench and washed into the catch basin.

**Frame** - coated black, galvanized or stainless steel frame attached to catch basin body with snap-fit studs.

**Catch basin body** - fiberglass body in choice of 4 sizes.

**Channel collar** - adapter to enable smooth transition of any depth FG200 channel on any side. Can be cut to correct height.

**Pipe adapter** - plain end adapter to allow inlet or outlet pipes to be easily attached to the outer wall of catch basin at any position. Available for 4", 6" and 8" Schedule 40 pipes.

---

**Parts table - FG200 Catch basins**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Volume Gallons</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG60 catch basin</td>
<td>24&quot; x 12&quot;</td>
<td>20.0</td>
</tr>
<tr>
<td>FG60 black coated steel frame</td>
<td>97995</td>
<td>12.8</td>
</tr>
<tr>
<td>FG60 galvanized steel frame</td>
<td>98028</td>
<td>14.4</td>
</tr>
<tr>
<td>FG60 stainless steel frame*</td>
<td>98013</td>
<td>14.4</td>
</tr>
<tr>
<td>FG60 plastic trash bucket</td>
<td>98067</td>
<td>5.0</td>
</tr>
<tr>
<td>F880 catch basin - 24&quot; x 24&quot;</td>
<td>98079</td>
<td>55.0</td>
</tr>
<tr>
<td>F880 black coated steel frame</td>
<td>98021</td>
<td>23.2</td>
</tr>
<tr>
<td>F880 galvanized steel frame</td>
<td>98034</td>
<td>24.2</td>
</tr>
<tr>
<td>F880 stainless steel frame*</td>
<td>98048</td>
<td>24.2</td>
</tr>
<tr>
<td>F880 plastic trash bucket</td>
<td>98059</td>
<td>8.4</td>
</tr>
<tr>
<td>F800 channel/catch basin adapter</td>
<td>98171</td>
<td>1.1</td>
</tr>
<tr>
<td>4&quot; pipe plain end adapter</td>
<td>97425</td>
<td>0.4</td>
</tr>
<tr>
<td>6&quot; pipe plain end adapter</td>
<td>97438</td>
<td>0.6</td>
</tr>
<tr>
<td>8&quot; pipe plain end adapter</td>
<td>97444</td>
<td>0.9</td>
</tr>
</tbody>
</table>

* Grade 304 stainless steel frames. ACO recommends the use of non-galvanized grates with stainless steel frames to avoid galvanic corrosion.

---

**FG200 Parts table**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Invert Depth</th>
<th>Overall Depth</th>
<th>Vol</th>
<th>Wgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG200</td>
<td>1.1</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Invert depths are for the channel body & frame assembled.
2. Channel weights are for fiberglass body only.
3. Closing/Ouflow caps can be cut down to suit all channels.
4. Add 2" to length of each channel for female joining flange (only applicable at shallowest end of trench run).
5. Frames supplied with plastic snap-fit studs for connecting to fiberglass body.

* Grade 304 stainless steel frames, ACO recommends the use of non-galvanized grates with stainless steel frames to avoid galvanic corrosion.
**Available FG200 grates**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bar steel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galvanized</td>
<td>93899</td>
<td>36 (9.0m)</td>
<td>1.0 x 3.6</td>
<td>264.0</td>
<td>28.6</td>
<td>Bolt × × ×</td>
</tr>
<tr>
<td>Stainless*</td>
<td>93891</td>
<td>36 (9.0m)</td>
<td>1.0 x 3.6</td>
<td>264.0</td>
<td>28.6</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12.

This grate complies with RR-F-621E '200,000lb proof load' test.

---

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slotted iron</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>93896</td>
<td>18 (0.45m)</td>
<td>0.61 x 7.87</td>
<td>58.7</td>
<td>25.2</td>
<td>Bolt × × ×</td>
</tr>
<tr>
<td>Stainless*</td>
<td>93892</td>
<td>18 (0.45m)</td>
<td>0.61 x 7.87</td>
<td>58.7</td>
<td>25.2</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12.

This grate complies with RR-F-621E '200,000lb proof load' test.

---

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Longitudinal iron</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>93893</td>
<td>18 (0.45m)</td>
<td>1.75 x 0.25</td>
<td>35.0</td>
<td>28.2</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12.

This grate complies with RR-F-621E '200,000lb proof load' test.

**Notes:**
1. Supplied with 4 galvanized steel socket head bolts (½" - 13 x 1½") - replacement part 93895.
2. Supplied with 4 stainless steel socket head bolts (½" - 13 x 1½") - replacement part 93897.
3. Supplied with 2 stainless steel hex head bolts (½" - 13 x 1½") - replacement part 93892.

**Key:**
- Locking mechanism
- Heel safe equal or less than 0.25" (6.5mm)
- 200,000lb proof load compliant
- Compliant with Americans with Disabilities Act of 1990 Section 4.5.4
- Compliant with AS 3996 - 2006
- Ductile iron to ASTM A 536-84 - minimum grade 64-45-12
- Stainless* - Grade 304 stainless steel.

**Bolted grates**

Bolted FG200 grates offer mechanical, secure fixing of grates into the channel frame. Two bolts per 18" grate section lock into cross bars in the steel frame. Care must be taken to ensure that all bolts are secure and are not overtightened which can damage the frame.

1. Position grate onto channel, align holes in grate with matching holes in frame cross-bar.
2. Using wrench or socket set to tighten. If using a torque wrench do not set to more than 15 ft. lbs.
3. To remove grates use wrench or socket set. Carefully store bolts for refitting of grates.

---

**Available F660 grates**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bar steel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galvanized</td>
<td>97443</td>
<td>24 (0.6m)</td>
<td>1.0 x 3.3</td>
<td>267.0</td>
<td>35.2</td>
<td>Bolt × × ×</td>
</tr>
<tr>
<td>Stainless*</td>
<td>97444</td>
<td>24 (0.6m)</td>
<td>1.0 x 3.3</td>
<td>267.0</td>
<td>35.2</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

* Grade 304 stainless steel.

---

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slotted iron</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>97449</td>
<td>24 (0.6m)</td>
<td>1.2 x 6.1 avg</td>
<td>130.0</td>
<td>75.0</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

---

**Available F880 grates**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bar steel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galvanized</td>
<td>97452</td>
<td>24 (0.6m)</td>
<td>1.0 x 3.3</td>
<td>456.0</td>
<td>63.8</td>
<td>Bolt × × ×</td>
</tr>
<tr>
<td>Stainless*</td>
<td>97455</td>
<td>24 (0.6m)</td>
<td>1.0 x 3.3</td>
<td>456.0</td>
<td>63.8</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

* Grade 304 stainless steel.

---

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Length (inches)</th>
<th>Slot Size (inches)</th>
<th>Intake area (sq. in.)</th>
<th>Wgt lbs</th>
<th>Proof Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slotted iron</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>97453</td>
<td>24 (0.6m)</td>
<td>1.2 x 5.5</td>
<td>226.0</td>
<td>206.0</td>
<td>Bolt × × ×</td>
</tr>
</tbody>
</table>

Ductile iron to ASTM A 536-84 - minimum grade 64-45-12

---

**Notes:**
1. Supplied with 2 galvanized steel socket head bolts (½" - 13 x 1½") - replacement part 93895.
2. Supplied with 2 stainless steel socket head bolts (½" - 13 x 1½") - replacement part 93897.
3. Supplied with 2 stainless steel hex head bolts (½" - 13 x 1½") - replacement part 93892.
ACO has an established Technical Services Department with engineers and support staff offering many years experience advising on surface water management.

These free services are offered with no obligation and are supported with extensive, high quality information, literature and project specific technical documentation.

Technical support falls into four areas:

1. **Application** .......................................................... 126
   - Installed location factors - loading, site & user requirements

2. **Hydraulics** ............................................................. 142
   - Amount of liquid to collect and drain

3. **Trench layout** ....................................................... 148
   - Where to position trench drain & outlets

4. **Installation support** ............................................. 150
   - Correct installation for long service life
Trench drains are designed to collect and remove surface water. Failure is usually due to application issues. If the product ‘physically’ fails, replacement is essential. The priority is to address where and how the product will be used to ensure long service life.

1a) Loading

Loads influence pavement design and as the trench system is an integral part of the pavement, the correct installation detail is critical to product longevity. A summary and comparison of commonly referenced Load Standards is provided on pages 128-129.

1b) Site requirements

There are a variety of materials used in trench drain systems. A summary of each is provided on pages 136-137.

Each material behaves differently in various environments and situations. ACO can provide advice on chemical and corrosion resistance for most common trench drain materials.

1c) User requirements

ACO provides specific product documentation indicating the standards each complies with.

ACO offers several project specific hydraulic support services to accurately determine the most hydraulically efficient and cost effective trench drain size and layout.

Trench hydraulics - Hydro

SERVICE E - ACO can supply:
- Hydraulic liquid profiles for individual trench runs
- Liquid depth profiles at design conditions

Trench hydraulics - Ponding

SERVICE F - ACO can supply:
- Map of temporary ponding
- Approximate duration of any temporary ponding

Grate hydraulics - GIC

SERVICE G - ACO can supply:
- Grate performance dependent on location with crossfalls

Hydraulics covers trench drain functionality and failure isn’t always apparent. Use of an undersized or oversized trench drain can have major cost and liability consequences, particularly in applications where flood damage to property or personal risk are of concern.

ACO can supply:
- Industry standards/requirements and 3rd party test data, where relevant

Supporting documentation

SERVICE D - ACO can supply:
- Industry standards/requirements and 3rd party test data, where relevant

Installation details

SERVICE A - ACO can supply:
- Advice on application load class
- Load test certificates
- Installation section details

Material data

SERVICE B/C - ACO can supply:
- Material coupons (samples) for on site testing
- Material test reports

Grate hydraulics - GIC

SERVICE G - ACO can supply:
- Grate performance dependent on location with crossfalls

Trench layout documents

SERVICE H - ACO can supply:
- Plan layouts of trench runs (CAD)
- Section layouts of trench runs showing modular sequence of channel units
- Bill of Materials (BOM) - fully itemizing parts and pieces

Trench layout

Modular trench runs can be complex and ensuring the correct materials can be time consuming, particularly where multiple trench runs are involved. In addition, once materials arrive on site, determining what pieces go where can be a challenge. ACO offers several services to ensure this part of the process runs as smoothly and efficiently as possible.

Installation support

Even the right product can fail if incorrectly installed. Therefore, to ensure your trench drain investment performs as expected, getting the installation right is important. ACO has an in house team of engineers qualified to offer advice on most installation issues, such as size of concrete surround, haunch details, installation method options, etc.

4 Installation support

SERVICE H - ACO can supply:
- Installation section details by product type, pavement type and loading type
- Consultation on specific installation concerns

Even the right product can fail if incorrectly installed. Therefore, to ensure your trench drain investment performs as expected, getting the installation right is important. ACO has an in house team of engineers qualified to offer advice on most installation issues, such as size of concrete surround, haunch details, installation method options, etc.
Current US load standards

A number of US standards make reference to grate loading. There is no current standard that specifically deals with trench drains of different widths.

Where possible, to enable comparison between the loading specified within each standard, equivalent stresses (psi) are calculated from the specified test load and test block size of each standard.

To assist with applying these standards to ACO products, a guide is provided below equating stresses (psi) to the Load Class A - F categories from EN 1433: 2002 Drainage channels for vehicular and pedestrian areas. It is also broken down by internal channel widths.

Load class certification for each product is available upon request.

Common standards in North America:

ASME: A112.3.6 - 2001

Plumbing standard relating to internal floor drains.

Light Duty (Live Load < 2,000lb)

Medium Duty (2,000lb < Live Load < 4,999lb)

Heavy Duty (5,000lb < Live Load < 7,499lb)

Extra Heavy Duty (7,500lb < Live Load < 10,000lb)

Special Duty (Live Load > 10,000lb)

AASHTO Standard Specification for Highway Bridges

Standard relating to design for bridges. Loadings are dealt with by wheel ‘footprints’ and axle ratings. No specification is given for measurement of the performance of trench drains.

General specifications relate to vehicle loading up to HS20/HS25. Maximum truck weight 90,000lbs - 3 axles.

HS20 Load - minimum 494 psi

HS25 Load - minimum 617 psi

200,000 lb Load - minimum 2,469 psi

AASHTO: MH306 - 10 Drainage Structure Castings

Standard relating to castings in roadways

See HS20 / HS25

* Although the chart indicates that the minimum psi for HS20 falls into the top of Load Class B range, ACO strongly recommends using Load Class C or higher due to the volume and dynamic nature (speed, turning & braking) of traffic in typical HS20 applications.

Load standard comparison chart

Pounds per square inch (PSI) comparison of load testing

4 in. - 8 in. internal width channels

<table>
<thead>
<tr>
<th>PSI</th>
<th>500</th>
<th>1,000</th>
<th>1,500</th>
<th>2,000</th>
<th>2,500</th>
<th>3,000</th>
<th>3,500</th>
<th>4,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>up to 70 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>up to 540 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class C</td>
<td>up to 1,160 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class D</td>
<td>up to 1,856 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class E</td>
<td>up to 2,785 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class F</td>
<td>up to 4,177 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AASHTO: MH306 - 10 Drainage Structure Castings

See HS20 / HS25

* Although the chart indicates that the minimum psi for HS20 falls into the top of Load Class B range, ACO strongly recommends using Load Class C or higher due to the volume and dynamic nature (speed, turning & braking) of traffic in typical HS20 applications.
1. Application - Loading

**Load Class A** - 3,372 lbs - 15kN (44-70 psi)
Residential and light pedestrian traffic

**Load Class B** - 28,100 lbs - 125kN (369-580 psi)
Sidewalks and small private parking lots

**Load Class C** - 56,200 lbs - 250kN (739-1,160 psi)
Parking lots and general commercial areas

**Load Class D** - 89,920 lbs - 400kN (1,182-1,856 psi)
 Trafficked sections of roads and highways

**Load Class E** - 134,800 lbs - 600kN (1,773-2,785 psi)
Aircraft hangars, industrial areas, gas stations and light commercial forklifts

**Load Class F** - 202,320 lbs - 900kN (2,659-4,177 psi)
Aircraft runways, military establishments, docks, heavy industrial, heavy fork trucks and very heavy wheel loads
Load testing

EN 1433

The only standard written specifically for trench drains, and internationally recognized, is EN 1433: 2002 Drainage channels for vehicular and pedestrian areas.

EN 1433 accounts for different widths of grates. For trench drains less than 200mm wide, test block for load testing is 10" long by 3" wide. For trench drains 200mm to 300mm wide, test block is 10" long by 6" wide; for trench drains over 300mm, the test block is 10" diameter. This ensures that the full force of the test load is directed onto the grate.

EN 1433 also prescribes testing methods for system testing (the complete trench drain and grate). It accounts for both proof loading and catastrophic failure.

EN 1433 also outlines system testing for monolithic trench drains (grate and body manufactured as a single unit). See ACO Infrastructure for monolithic trench drains.

EN 1433 load test - with width specific test block

Diagrams show test load applied to typical grates through an EN 1433 prescribed width specific test block. Test blocks are sized to ensure the entire test load is applied to grate NOT grate supports - this ensures relevant results for all trench drain widths.

Grate for 4 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

Grate for 8 in. - 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

Grate for over 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

ASME: A112.6.3 load test - 3.5 in. dia. test block

This load standard is designed for small internal floor drains and prescribes a smaller (3.5" dia.) test block therefore exerting entire test load into the grate, providing relevant results for all trench drain widths.

Grate for 4 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

Grate for 8 in. - 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

Grate for over 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.

AASHTO load test - 9 in. x 9 in. test block

Diagrams show test load applied to grates through a 9" x 9" (225 x 225mm) test block. At 4" and 8" widths, grate is NOT tested - the load is taken by supports rather than grate - results from these tests are questionable. Only at 12" and wider is grate being tested and relevant results will be provided.

Grate for 4 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is NOT being applied to grate giving an unreliable result.

Grate for 8 in. - 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is NOT being applied to grate giving an unreliable result.

Grate for over 12 in. internal width trench drain

Diagram shows test block positioned centrally on grate - full test load is being applied to grate giving a meaningful result.
1. APPLICATION - LOADING

Factors affecting loading

Contact area
Contact area between load and trench drain grate affects pressure (psl) exerted by load. Typically relates to tire type, but can include anything that may rest permanently or periodically on trench drain.

Wheel loads
Combined with contact area to calculate loading:
- Weight of vehicle/cart and its typical load, eg. fork lift & weight of typical loaded pallet
- Number of wheels and axles that load is distributed over, affects individual wheel load
- Unusual traffic, eg. dollys/dumpsters going over trench

Load frequency
It is also important to consider how often load is applied. Frequent or continuous loads will require heavier duty trench drain and/or larger concrete encasement detail than occasional loads of same weight.

Dynamic vs static loads

Static loads are a load/weight applied vertically onto the trench - no other movement. Not typically found in real-life scenarios, but are used for load testing a grate or trench drain. They provide an objective measuring scale to rate loadings of grate/trench drain.

Dynamic load
Dynamic/moving loads - forces rise rapidly as traffic speed increases. Factors that intensify dynamic loading include:
- Vehicles traveling across or along trench
- Traffic braking, accelerating or turning on trench
- Speed of traffic
- Trench located at top or bottom of a ramp

Dynamic vs static loads: To advise on dynamic loads, the following information is required:
- Type of traffic
- Location of trench - bottom of ramp, alongside building, etc.
- Wheel type, if appropriate
- Vehicle/cart weight and weight of typical load
- Typical vehicle speed
- Traffic flow pattern - along or across trench? Turning or braking on trench?
- Unusual traffic - snow plows, dumpsters, etc.

Concrete surround
Loading will also impact the size of concrete encasement required. It is recommended that the cement concrete encasement be durable and conform to minimum strength requirements shown in ACO’s recommended installation detail.

To select correct section detail, the following information is required:
- Load class
- Product type & width (eg. KlassikDrain K200)
- Pavement finish

ACO POLYMER PRODUCTS, INC.
Casa Grande, AZ 85122
Fax: 520-421-9899
Tel: 520-421-9988

K100 - KLASSIKDRAIN - LOAD CLASS: B
INSTALLATION DRAWING - ACO DRAIN

To assist product selection, ACO independently tests each channel and grate to an internationally recognized load standard - EN 1433. Results are categorized into 6 classes from light duty - ‘A' to heavy duty - 'F'.

To advise on most appropriate Load Class, the following information is required:
- Type of traffic
- Location of trench - bottom of ramp, alongside building, etc.
- Wheel type, if appropriate
- Vehicle/cart weight and weight of typical load
- Typical vehicle speed
- Traffic flow pattern - along or across trench? Turning or braking on trench?
- Unusual traffic - snow plows, dumpsters, etc.

Concrete surround
Loading will also impact the size of concrete encasement required. It is recommended that the cement concrete encasement be durable and conform to minimum strength requirements shown in ACO’s recommended installation detail.

Poor site conditions and low load bearing pavements will require an increase in these dimensions to meet both vertical and lateral loads.

Some applications will also require concrete reinforcement.

To select correct section detail, the following information is required:
- Load class
- Product type & width (eg. KlassikDrain K200)
- Pavement finish
1.6 Application - Site requirements

Trench materials

Polymer concrete

Polymer concrete is a composite material produced by mixing mineral aggregates with a resin binding agent. The finished material has excellent mechanical and thermal properties and offers good corrosion resistance to many chemicals. A maximum working temperature of 180°F (82°C) is recommended.

Due to their structural rigidity, polymer concrete trench drains can be used in a variety of pavement types such as concrete, asphalt and brick pavers.

Fiberglass

Fiberglass uses similar resin binding agents to those used for polymer concrete, but glass microfibres are used instead of mineral aggregates to provide a robust flexible material.

Fiberglass trench drains are designed to be fully enclosed in concrete.

Cement concrete

Cement concrete is Portland cement mixed with mineral aggregates. Generally used for large cast-in-place slab applications, where mass is required for structural rigidity.

Expanded polystyrene foams have disposal concerns, and are often released using gasolene. Local EPA regulations should be complied with.

Plastics

The most common plastic used in a trench drain is polyethylene - usually HDPE (High density PE) or MDPE (Medium density PE). Both HDPE & MDPE are readily available, economical materials that are easy to mold.

Plastic trench drains are designed to be fully enclosed in concrete, however, HDPE/ MDPE have thermal properties that require the addition of concrete keys to securely anchor the product within the concrete slab. Without adequate concrete keying features the trench may lose bond (pull away) from the concrete encasement and buckle, ultimately leading to product failure. This is of particular concern in applications where short term wide temperature ranges are expected, and/or long trench runs are involved.

Metals

Trench drains can also be fabricated from mild or stainless steel. ACO recommends stainless steel trench drains for hygienic applications. See ACO Building Drainage products for details.

A material comparison chart is provided opposite and chemical resistance chart on page 139.

Grate materials

Grates are manufactured from a variety of materials. The most common are ductile iron, mild steel, stainless steel and plastic.

Grates need higher bending strength properties than the trench body to withstand flexural loads. Unlike the trench drain body, grates can be removed and replaced after installation.

In commercial applications, all grates should be locked in place to ensure user safety and channel longevity.

Edge protection

The exposed edge of the trench helps pavement to maintain a visual straight line and helps hold the grate in position. The exposed edge is subjected to the same loads as the grate. In addition to effect of traffic and climate, the edge is exposed to impact from items being dropped or pulled across (e.g. snow plows). Once the edge fails, the grate will move and cause catastrophic failure.

Metal edges are most commonly used as a wearing rail to withstand rigorous and repetitive traffic. Edge protection rails should be integrally cast or mechanically connected to the trench body. Edge rails that sit on existing standard edges are often brittle and susceptible to failure.

Edge rails also provide some protection during installation. Appropriate edge protection is particularly important in asphalt situations where rolling machines can damage exposed edges, leading to premature trench drain failure.

Polymer concrete is a good material for non-metallic requirements. It offers excellent installation properties - electrical resistivity rating of 1.1x10¹⁰ ohm/ft²/s.

H100 is a 100% polymer concrete channel that can be used with non-metallic grates (Types 4940/4950 - See ACO Sport range to provide a 100% nonmetallic trench drain system).

Call ACO’s Technical Services Department for additional suggestions if this is not a suitable solution.

Polymer - Fiberglass

<table>
<thead>
<tr>
<th>Polyethylene</th>
<th>Fiberglass</th>
<th>Polyurethane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>180°F/82°C</td>
<td>137°F/58°C</td>
</tr>
<tr>
<td>Flexural</td>
<td>4,000psi</td>
<td>8,450psi</td>
</tr>
<tr>
<td>Compressive</td>
<td>9,943psi</td>
<td>14,000psi</td>
</tr>
<tr>
<td>Modulus</td>
<td>419 psi</td>
<td>2,000 psi</td>
</tr>
</tbody>
</table>
Sustainable drainage

In an environmentally perfect world permeable landscapes would be everywhere, allowing nature to work as intended. However, in reality, this is not possible and hard landscapes are common.

Sustainable drainage is the collection of rainwater, its treatment and, ultimately, its reuse.

The process involves collecting water runoff (that may or may not contain pollutants) and allowing it to be dealt with. Trench drains are ideal as they provide maximum minimal impact to the environment.

Surface drainage can be used to assist the ‘collect’ part of this process. Trench drains are used as they provide maximum collection and can form a barrier to prevent runoff flowing onto sensitive areas or soft landscaping. This is particularly important if the toxic risk of pollutants is high, such as highway and gas station applications.

LEED

Leadership in Energy and Environmental Design provides a green building rating system. Principles have been applied to commercial and institutional projects, schools, multifamily residential buildings, manufacturing plants, laboratories and other building types.

Areas where the use of trench drainage may assist in assignment of credits include:

- **SUSTAINABLE SITES**
  - Protect or Restore Habitat
  - Rainwater Management

The primary method to control stormwater discharges is the use of Best Management Practices (BMPs). In addition, most stormwater discharges are considered point sources and require coverage under an NPDES permit.

WATER EFFICIENCY

- **Water Use Reduction**
  - Reclaimed water/Alternative water source - use of trench drains to capture rainwater for future irrigation/toilet flushing use to achieve increased water use reduction.

MATERIALS & RESOURCES

- **Construction & Demolition Waste Management**
  - To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

Compared to catch basins, trench drains require minimal excavation; reducing site waste/debris.

Go to [www.usgbc.org](http://www.usgbc.org) for full details.

Chemical resistance

ACO Drain channel bodies are highly resistant to chemical attack and, with the appropriate grate, can be used in most environments where everyday acids and dilute alkalies are encountered.

Important considerations for chemical environments

When reviewing potential applications of trench drains in chemical environments, the following issues should be considered:

1. Type(s) & mixture of chemicals.
2. Concentration percentages.
3. Contact time with trench system.
4. Temperature of chemicals flowing into the trench drain. 180°F (82°C) max.
5. Flooding system employed to clear chemicals from the system.
6. Cleaning agents should be checked for compatibility with trench materials.
7. ACO test coupons can be used for final determination of chemical resistance.
8. Grate, locking mechanism, edge seal, outlet and trash bucket materials should be checked for chemical resistance.
9. Check sealant for compatibility, if applicable.

Hydrocarbons

Stormwater runoff frequently carries the risk of containing hydrocarbons. Trench drains in high risk areas; i.e. gas stations and airports almost always drain into oil-water separators. Refer to ACO Environment for details.

ACO now offers solutions for hydrocarbons to be removed at the outlet - these solutions are ideal for applications where the risk is lower, and/or where space does not allow for the use of an independent oil-water separator. Call ACO for details.

**Chemical resistance chart**

<table>
<thead>
<tr>
<th>Chemical Medium</th>
<th>Max. conc.</th>
<th>Short time exposure 72 hours</th>
<th>Long time exposure 42 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>10%</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Methyl Alcohol</td>
<td>10%</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Hexane</td>
<td>10%</td>
<td>✗</td>
<td>✗</td>
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<tr>
<td>Methanol</td>
<td>10%</td>
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<td>✗</td>
</tr>
<tr>
<td>Toluene</td>
<td>10%</td>
<td>✗</td>
<td>✗</td>
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<tr>
<td>Chlorinated Acetone</td>
<td>25%</td>
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<td>✗</td>
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<tr>
<td>Acetaldehyde</td>
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<tr>
<td>Benzoic Acid</td>
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</tr>
<tr>
<td>Ethanol</td>
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<tr>
<td>Glycol</td>
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<tr>
<td>Carbolic Acid</td>
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<tr>
<td>Carbon Tetrachloride</td>
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<tr>
<td>Benzene</td>
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<tr>
<td>Chlorine</td>
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<td>Hydrobromic Acid</td>
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<td>Hydrogen Peroxide</td>
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<tr>
<td>Iodine</td>
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<td>Malonic Acid</td>
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<td>Methanol</td>
<td>100%</td>
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<tr>
<td>Methyl Ethyl Ketone</td>
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<tr>
<td>Nitric Acid</td>
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<td>Phenol</td>
<td>100%</td>
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<tr>
<td>Toluene</td>
<td>100%</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Urea</td>
<td>100%</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Xylene</td>
<td>100%</td>
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ACO DRAIN

www.ACODrain.us

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1. Legislative compliance

Trench drains are commonly used in public areas where accessibility is a concern and ADA legislation must be met. A number of grates are available that provide ADA compliance without compromising aesthetics or performance.

ADA REQUIREMENTS are set out in The Americans with Disabilities Act of 1990; Section 4.5.4.

Where grates are used within walking surfaces, the open slots should be no greater than 0.05 inches (1.27mm) wide in one direction. Where the length of the slot is greater than 0.05 inches, the opening should run perpendicular to the main direction of traffic.

The diagram shows the slots perpendicular to the flow of traffic; this helps prevent wheelchair wheels and walking aids becoming trapped or slipping on the grate surface.

2. User safety

ACO has categorized grate safety into 3 main types:
- Heel resistant - complies with ASME: A112.6.3
- Heel safe - Narrow slots for stiletto heel safety
- Bicycle safe - compliant with AS 3996

ACO has tested grate patterns using the widely accepted pendulum test.

PENDULUM TEST - A pendulum is swung over a wet and measured surface to find slip resistant properties. Test results are given in an 8PM value as the surrounding pavement finish. Pavement slope, presence of surface contaminants, etc. can also negatively affect slip and skid resistance.

ACO recommends selecting a grate with the similar 8PM values as the surrounding pavement finish. Pavement slope, presence of surface contaminants, etc. can also negatively affect slip and skid resistance.

3. Grate security

ACO recommends that grates be secured to prevent movement by traffic which can cause damage to the trench and/or grate.

BOLTLESS LOCKING - mechanisms that hold grates captive without use of bolts. They are quick to install and remove, making installation and maintenance easier.

OTHER LOCKINGS - on rare occasions, something other than standard lockings are required, such as tamper resistant bolts. Contact ACO for more information.

4. Aesthetics

The top of the trench, usually the grate, is the most visible part of the trench drain and aesthetically the most important.

Grates can be selected to blend into the pavement, or used as a feature or border.

5. Slip resistance

Slip resistance is critical for user safety. Ideally the slip resistance of the grate should be similar to the surrounding pavement to avoid both slip and/or trip hazards.

ACO has categorized grate safety into 3 main types:
- Heel resistant - complies with ASME: A112.6.3
- Heel safe - Narrow slots for stiletto heel safety
- Bicycle safe - compliant with AS 3996

PENDULUM TEST - A pendulum is swung over a wet and measured surface to find slip resistant properties. Test results are given in an 8PM value as the surrounding pavement finish. Pavement slope, presence of surface contaminants, etc. can also negatively affect slip and skid resistance.

ACO recommends selecting a grate with the similar 8PM values as the surrounding pavement finish. Pavement slope, presence of surface contaminants, etc. can also negatively affect slip and skid resistance.

Other tests exist, such as the Variableangle ramp test and horizontal pull test and can be carried out as necessary if required for specific projects.

For applications where high stiletto heels are commonplace, ACO recommends grates with openings of 0.05" (1.27mm) or less to prevent heels from becoming trapped, causing injury or falls.

HEEL RESISTANT - ASME: A112.6.3 : Section 7.12 Heel Resistant Strainers & Grates
- A grate designed to resist entry of heeled shoes, in which the maximum grate hole size in least dimension shall be 0.31" (8mm).

HEEL SAFE
- For applications where high stiletto heels are commonplace, ACO recommends grates with openings of 0.05" (1.27mm) or less to prevent heels from becoming trapped, causing injury or falls.

HEEL RESISTANT - ASME: A112.6.3
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BICYCLE SAFE - AS 3996 - 2006 Clause 3.3.6
- No US Standard exists detailing slot sizes to avoid bicycle tires from becoming trapped. ACO rates grates based on Australian Standard AS 3996 - 2006 Clause 3.3.6 which specifies maximum slot length dependent on slot width for grates that are deemed Bicycle Tire Penetration Resistant.

OTHER LOCKINGS - on rare occasions, something other than standard lockings are required, such as tamper resistant bolts. Contact ACO for more information.

To help determine the right aesthetics for a project, ACO offers an online grate Visualizer that allows pavement and grate choice combinations to be viewed.
2. Hydraulics

Catchment hydraulics - calculating run-off

To calculate correct size of trench drain, catchment run-off must be calculated.

- Catchment area = pavement length x width (ft)
- Rainfall intensity in inches per hour

Once catchment runoff is calculated, other inflows, e.g. down spouts, can be added. Other factors that affect trench drain hydraulics:

- Ground fall percentage
- Pavement material - some materials absorb liquids, e.g. brick pavers
- Position and size of outlet pipe
- Surface roughness of trench material. Manning’s coefficient of roughness figures. See page 157
- Angle of approach to trench - this can affect grate hydraulics (steep slopes may cause bypass)

Non-uniform flow (Spatially Varied Flow)

Non-uniform flow accounts for liquid being carried in a trench plus the constant addition of liquid collected through the grates along the trench run - lateral intake. Run lengths, therefore, also influence a trench drain’s capacity.

A characteristic of nonuniform flow is liquid velocity and height change at successive cross sections along the trench.

To correctly model this situation, differential calculus is required, usually computer modeling is needed.

Hydro software - modeling trench hydraulics

To generate results from the Hydro program, the following information is required:

- Length of trench run (feet or meters)
- Length and width of catchment area (feet or meters). See page 142.
- Surrounding pavement/surface type, e.g., concrete, asphalt, etc.
- Rainfall intensity (in/hr or mm/hr)
- Ground fall along trench (%)
- Perpendicular approach slopes to trench (%)
- Preferred position of outlets along trench and any outlet size restrictions
- Any slab depth restrictions

Results are provided either electronically and/or in printout format, in metric or imperial units.

Electronic request form can be found at www.ACODrain.us.

Hydro printout shows:

1. Position and size of minimum freeboard (gap between underside of grate and top of liquid in trench)
2. Hydraulic profile of liquid
3. Flow velocity and flow rate at all points along the trench
4. Maximum discharge capacity of trench run (gpm), e.g., 27.3 (3% from example below)
5. Hydraulic utilization of trench (%) is given. If over 100%, flooding occurs. (12.7%) from example below)
Effect of slope on trench hydraulic performance

Slope increases the hydraulic performance of the trench system because flow velocity is increased. The drawings below highlight the water profile in the trench - all parameters are the same on both examples except lower image has a 1% slope added.

This increase in capacity may result in larger areas being drained, outlets spaced further apart, or a narrower or shallower trench system being specified which will result in product and/or installation savings.

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Position of outlet

A trench drain is ultimately connected to an underground pipe system. Outlet position can dramatically affect size and length of trench drain required.

End outlet - Water builds up along trench and may flood before reaching outlet. A larger/more costly trench drain and/or more outlets may be required.

Central outlet - If zero ground slope, run lengths to outlet are shorter and less likely to exceed capacity and flood. Allows smaller, more economic trench drain and/or fewer outlets with associated pipework.

Double end outlet - Where zero ground slope, allows run lengths to outlet to be shorter and less likely to exceed capacity and flood. Allows smaller, more economic trench drain but more outlets and associated pipework.

Size and type of outlet

In modeling hydraulic performance of trench drains, the assumption is that the outlet is not a restricting factor. Designers should ensure outlet, and subsequent pipe infrastructure, is not under sized and restricts outflow of the trench drain.

In-line catch basin - same width as trench, but deeper. Offers superior outlet capacity as larger pipes can be connected and increased depth gives significant head of water pressure.

Catch basin - larger basin wider and deeper than trench. Offers best outlet capacity as larger pipes can be used and increased depth gives significant head of water pressure.

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2. Hydraulics

Grate hydraulics

Usually the trench drain reaches hydraulic capacity before the grate. However, where there are concentrated flows running down steep slopes, the grate may not be capable of capturing all flow - even if the underlying trench is correctly sized.

Properly located trench runs put grates in the direct path of surface water runoff, exposing them to the following conditions:

- Flow rate of liquid from catchment area or point source(s). See page 142.
- Velocity and approach head (depth) of liquid determined by catchment roughness and slope.

A grate has a finite capacity to capture flow (surface water run-off) originating from catchment area - bypass occurs when the grate’s hydraulic capacity is exceeded.

A grate’s hydraulic performance is influenced by:

1. Grate characteristics
   - Intake area
   - Width of grate
   - Design features e.g. direction of bars/ slots, slip resistant features

2. Catchment characteristics
   - Approach catchment slope (determines water velocity)
   - Catchment roughness (determines flow direction, water velocity and head)
   - One direction (barrier drain) or two or more directions (sag/valley drain)
   - Type of liquid
   - Debris

Designers should be aware of the trade-off between small inlets for heel safety and large inlets for optimum grate hydraulics.

1.1 Grate Capture

All liquid flowing through grate openings.

Less than 100% Capture
Not all liquid flows through grate openings - bypass occurs.
Reasons:
- Not enough grate open area.
- Too much load.
- Too much slope perpendicular to grate.

The science of grate hydraulics is difficult to model in fluid mechanics. A grate’s hydraulic performance can be greatly influenced by subtle changes to grate, and/or catchment characteristics described left.

When liquid moves over a grate, either/or a combination of two scenarios can occur:
- Weir scenario: relevant where water depths are minimal and approach with speed.
- Drowned orifice: relevant where there is an accumulation of water above grate.

Drains positioned in sag/valley locations give rise to higher flow rates due to pressure of substantial static head (liquid depth) being pushed through grate openings.

Longitudinal opening grate at capacity
When comparing grates of equal intake area and width, longitudinal opening grates offer maximum potential for flow evacuation leading to high water intake. For example:

- 4 bars to interrupt and slow down flow before weir is produced.
- Slots 1, 2, 3 are treated as drowned orifices.
- Slot 4 acts as a weir.

Transverse opening grate at capacity
When comparing grates of equal intake area and width, transverse grates offer moderate water intake. Bars bridge across both sides of trench giving little flow interruption, but some drowned orifice effect.

Slot opening grate at capacity
There is very little flow interruption before the weir is produced leading to low water intake. The minimal depth above the slot will have negligible drowned orifice effect.

Grate intake experiments

Due to the complex nature of fluids in relation to grate intake hydraulics, testing is the only way to accurately predict how a grate will intercept surface water run-off.

ACO has conducted leading universities for the purpose of research and testing, in the area of grate hydraulics. Three studies carried out in 2016, 2004 and 1998 show capture rates for a number of ACO grates recorded at various water flows discharging down a ramp at a set of longitudinal angles, and cross falls.

Based on project specific requirements, results from these empirical tests allow ACO to accurately recommend a grate for designers with specific catchment hydraulics.

To generate results from the GIC program the following information is required:

- Length of trench run (feet or meters)
- Length and width of catchment area (feet or meters). See page 142.
- Position of trench in catchment area
- Surrounding pavement/surface type, e.g., concrete, asphalt, etc.
- Rainfall intensity (in/hr or mm/hr)
- Preferred grate type
- Perpendicular approach slopes to trench (%)
- Additional notes relating to grate performance

Results are provided either electronically and/or in printout format.

GIC printout shows:

1. Capture geometry and hydraulics
2. Total intake area per foot of trench run
3. Recommended grate information
4. Hydraulic utilization of grate (100% means all grate intake capacity is used)
5. Additional notes relating to grate performance
3. Trench layout

Run layout service and part scheduling

ACO Scheduler
ACO has written a proprietary software program, Scheduler, that shows trench drain runs in profile and plan views. The program automatically prints out each run showing positions of accessories, outlets, junctions, etc. It automatically calculates a Bill of Materials for each run and totals multiple runs to ensure the correct amount of parts and pieces are ordered. Scheduler printouts are particularly useful for installers.

Scheduler printouts provide:
1. Profile and plan view of each trench run
2. Trench run direction change - e.g., 90° corner or junction
3. Positions and type of outlets
4. Detailed Bill of Materials to ensure all parts are correctly ordered

Results provided are:
- Sectioned profile of trench runs
- Plan view of trench runs
- Parts schedule fully itemizing parts and pieces

CAD design services
For more complex projects ACO can provide a custom trench drain layout using Auto-CAD to illustrate required positions and layouts of trench runs.

In order to produce a plan layout, the following information is required:
- Plan of site showing elevations
- Existence of any depth restrictions
- Position and type of any plumbing fixtures/outlets
- Position of any permanent structures
- Liquid flow pattern and type of traffic (including traffic flow)

Results provided are:
- Plan layouts (CAD) showing the trench drain runs positions relative to site structures

CAD printout provides:
1. Plan view of trench run layout with inverts
2. Liquid flow directions
3. Position and type of outlet
4. Trench and grate type
Installation guidelines

ACO has a qualified site support technician available for installation training and assistance.

A fabrication service can assist with creating difficult corners, tees, shortened channels, etc. to make installation quicker and easier.

A Site Installation Guide is available, in addition to installation section drawings.

1 Installation .......................................................... 152
   - Overview of key steps required

2 Site work ............................................................ 154
   - Specific areas to consider

3 Layout options ................................................... 155
   - Connection options for complex layouts

4 Installation sections ............................................. 156
   - Overview of different pavements and loadings
### Installation

**Channel units** are installed in a continuous trench, and are encased with concrete.

Full installation instructions are available in the Site Installation Manual. Contact ACO or visit [www.ACODrain.us](http://www.ACODrain.us) or view ACO Installation videos on [www.youtube.com/user/acoamerica](http://www.youtube.com/user/acoamerica)

### 1. Excavation

Excavate trench to accommodate trench drain system. Excavation should be around center line of trench.

1. Excavation
2. Outlet installation
3. Trench drain installation
4. Channel bracing
5. Concrete pour
6. Pavement finishing
7. Completing installation
8. Maintenance

**Excavation**

- **Channel/catch basin width and depth dimensions.**
- Concrete surround dimensions - 4” - 12”.
- Specific loading and ground conditions will increase the excavation size.
- For sloped systems, excavate base to roughly follow fall of trench drain run.

**Outlet installation**

- Accommodate each of the following:
  - Excavation must be sufficient enough to accommodate trench drain system. Excavation should be around center line of trench.
  - Trench drain must be supported at correct height and held securely in place to avoid movement during concrete pour. There are a number of options available:
    - **Patty supports**
    - Care should be taken that concrete is not trapped in joint between channels.

**Concrete pour**

Concrete should have compressive strength of minimum 4,000 psi.

**Pavement finishing**

Top of adjacent pavement must be above grate level by approximately 1/8” (3mm).

**Completing installation**

- Re-install grates and locking devices
- Repair damaged surfaces where necessary with an appropriate ACO repair kit. See page 154.
- Renew joint seals as required
- Re-install trash bucket
- Re-install grates, ensuring they are locked back in place

### Maintenance guidelines:

1. Remove grates
2. Remove debris from channel
3. Flush channels with water or high pressure washer (do not use boiling water or aggressive cleaning agents)
4. Repair damaged surfaces where necessary
5. Renew joint seals as required
6. Empty trash buckets and clean out pipe connections
7. Re-install trash bucket
8. Re-install grates, ensuring they are locked back in place

**Maintenance**

Regular inspections of the trench drain are recommended. Frequency will depend on local conditions and environment, but should be done at least annually.

**Inspections should cover:**

- Grates and locking devices
- Catch basins and trash buckets
- Concrete surround and adjacent paving

All items should be inspected for damage, blockage or movement. Compare with site drawings if necessary.
Catch basins

The catch basin is typically the low point and has female connections at each side for easy connection to male (deeper) channel end.

Blanking end plates

For 100mm in-line basins a blanking end plate is supplied to prevent concrete ingress during concrete pour. It also provides an aesthetic end finish.

Blanking end plates

For 200 and 300mm catch basins, a kit is available to close one end and fill gaps between channel and catch basin.

Connection options

Male-female connection

Interconnecting end details allow easy and effective joining of channels. It also helps with height and sideways alignment between channels. An SF groove provides positive placement for appropriate sealant.

Female-female connection

Creation of a direction change and high point, requires an outlet at start and end of run. To create, remove female end details and butt channels together, hold in place with ACO Bond.

Male-male connection

Creation of a low point, usually with bottom outlet where a catch basin is not required. To create, butt male ends together and fill gaps with ACO Bond.

Site work

ACO provides separate installation details for each product with comprehensive on-site advice, when appropriate.

Ground conditions

Specific ground conditions or contaminated ground may call for a deeper/wider concrete surround or larger haunch than minimum recommendations.

If in doubt, seek engineering advice.

Thermal movement

Longitudinal expansion joints, which for some slabs may be dowelled horizontally and de-bonded, will isolate the trench and concrete haunch from thermal movement of large concrete slabs.

Transverse joints in the concrete slab should be positioned to coincide with channel-to-channel joints. Alternatively the channel may be cut to align with the slab joint and resealed with a suitable flexible sealant.

Engineering advice should be sought for specifying expansion joints.

Temporary installation

During site work, and after trench run is laid, the trench top can be vulnerable to damage. Site traffic should be routed away from the trench. If temporary crossings are required, a base course of minimum width 3 feet should be installed either side of the trench for protection. Loose boards or plates are inadequate.

Joint sealing

All channel-to-channel and channel-to-fitting joints should be sealed with appropriate sealant.

ACO channels are supplied with an ‘SF Sealant Groove’ as standard. This provides a groove that can be filled with an appropriate flexible sealant to create a watertight joint. This is particularly important with elevated slabs and where liquids may contain chemicals or oils.

Sealant should be resistant to the same chemicals as the trench material and be flexible to allow for any slab movement from temperature changes. Surfaces should be correctly prepared prior to applying sealant to ensure good adhesion.

Contact ACO Technical Department, or go to www.ACODrain.us for Technical Bulletin.

Site work accessories

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Weight lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal and patch materials</td>
<td></td>
</tr>
<tr>
<td>ACO Seal flexible joint sealant - 10oz</td>
<td>91120</td>
</tr>
<tr>
<td>ACO Bond - polymer concrete repair kit - 1 gallon</td>
<td>06919</td>
</tr>
<tr>
<td>ACO Bond - polymer concrete repair kit - 5 gallons</td>
<td>06916</td>
</tr>
<tr>
<td>ACO Fiberglass repair kit - 1 gallon</td>
<td>08203</td>
</tr>
</tbody>
</table>
4. Installation support

Installation sections

An installed ACO Drain System should incorporate the following:

- Correct grate type
- Correct channel type and size
- Minimum grade 4,000 psi compressive strength cement concrete surround

It is recommended that the cement concrete surround be durable and conform to minimum strength requirements, as shown in the illustrations. Poor site conditions and low load bearing pavements will require an increase in these dimensions to meet both vertical and lateral loads.

These illustrations are a guide for average ground conditions only. Electronic installation drawings are available at www.ACODrain.us.

It is the customer’s responsibility to ensure that encasement size and detail is suitable for the specific application.

These illustrations are typical only.

If in doubt, seek engineering advice.

4 in. (100mm) Channels
ASPHALT - EN 1433 Class C

4 in. (100mm) Channels
CONCRETE - EN 1433 Class E/F

8 in. (200mm) Channels
BLOCK PAVERS - EN 1433 Class B

8 in. (200mm) Channels
ASPHALT - EN 1433 Class C

8 in. (200mm) Channels
CONCRETE - EN 1433 Class E/F

Note:
1. Grate should be 1/8" (3mm) below pavement surface.
2. Care should be taken with asphalt rolling machines to avoid damage to channel edge and/or grate.

Note:
1. Grate should be 1/8" (3mm) below pavement surface.
2. Installation brackets on FG200 require a minimum 10" (250mm) surround.
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4. Installation support

**Installation sections**

<table>
<thead>
<tr>
<th>12 in. (300mm) Channels</th>
<th>12 in. (300mm) Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BLOCK PAVERS - EN 1433 Class B</strong></td>
<td><strong>ASPHALT - EN 1433 Class C</strong></td>
</tr>
</tbody>
</table>

**Note:**
1. Grate should be 1/8" (3mm) below pavement surface.

<table>
<thead>
<tr>
<th>12 in. (300mm) Channels</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE - EN 1433 Class E</strong></td>
<td><strong>CONCRETE - EN 1433 Class F</strong></td>
</tr>
</tbody>
</table>

**Note:**
1. Grate should be 1/8" (3mm) below pavement surface.

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**Glossary**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway &amp; Transportation Officials.</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disability Act. See page 140.</td>
</tr>
<tr>
<td>Anti-shunt lugs</td>
<td>Interlocking details on grate and edge rail prevent longitudinal movement - see Product pages.</td>
</tr>
<tr>
<td>Anti-slip grates</td>
<td>Slip resistance of grates has been tested using ASTM E303. See page 141.</td>
</tr>
<tr>
<td>AS 3996-Australian Accessories &amp; Grates</td>
<td>Standard detailing Bicycle Safe grate specifications. See page 140.</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers.</td>
</tr>
<tr>
<td>Ball end</td>
<td>Flared end of pipe to accept a certain pipe size inside - similar to coupler.</td>
</tr>
<tr>
<td>Bicycle safe</td>
<td>Grate with slots that reduce ‘trembling’ of tires. See page 140.</td>
</tr>
<tr>
<td>Bolt size</td>
<td>Diameter - pitch per inch from seat of head to base.</td>
</tr>
<tr>
<td>Catchment area</td>
<td>Paved area that will collect liquids. See page 142.</td>
</tr>
<tr>
<td>CaIn-place</td>
<td>Grate cast in place while concrete is still wet, provides a smooth finish.</td>
</tr>
<tr>
<td>Catch basin</td>
<td>Large basin to collect liquid into underground pipe work.</td>
</tr>
<tr>
<td>Channel</td>
<td>Individual modular unit.</td>
</tr>
<tr>
<td>Chemical resistance</td>
<td>Ability to withstand specified chemicals.</td>
</tr>
<tr>
<td>Corrosion resistance</td>
<td>Ability to withstand weathering.</td>
</tr>
<tr>
<td>Cut-outs</td>
<td>Shaped plastic inserts cast in ends of polymer concrete catch basins to enable easy removal of material for channel connection.</td>
</tr>
<tr>
<td>DrainLok™</td>
<td>ACO’s patented boltless locking system for $\text{RivAfree}$ and $\text{SlaBfree}$ series. See page 15 &amp; 98.</td>
</tr>
<tr>
<td>Drill-outs</td>
<td>Shaped recesses cast in polymer concrete and enable easy removal of material for pipe/channel connection.</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>Pig iron with magnesia added to provide added durability and strength. Often referred to as spinodal graphite (SG) iron.</td>
</tr>
<tr>
<td>Edge protection</td>
<td>Metal edge rail to prevent impact or general damage to trench body - see page 136.</td>
</tr>
<tr>
<td>Foul air trap</td>
<td>Shaped pipe section to prevent odors traveling up from underground waste water system.</td>
</tr>
<tr>
<td>Free area</td>
<td>Area for water flow. Determined by clear opening width and invert depth. See page 9.</td>
</tr>
<tr>
<td>Freestyle</td>
<td>New semi-custom grates. See page 20.</td>
</tr>
<tr>
<td>FRP</td>
<td>Fiber reinforced plastic.</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>Black steel with protective galvanised coating.</td>
</tr>
<tr>
<td>GIC</td>
<td>ACO’s proprietary software program to calculate grate intake hydraulics. See page 147.</td>
</tr>
<tr>
<td>GPM</td>
<td>Gallons per minute - measure of flow.</td>
</tr>
<tr>
<td>Grades</td>
<td>Angle of pavement slope. See page 142.</td>
</tr>
<tr>
<td>Gray iron</td>
<td>Pig iron melted in a furnace and poured into molds.</td>
</tr>
<tr>
<td>Grate</td>
<td>Performance of liquid entering grate openings. See page 146.</td>
</tr>
<tr>
<td>Grate openings</td>
<td>Percentage of slope along length of trench. See page 142.</td>
</tr>
<tr>
<td>Ground slope</td>
<td>Percent of slope above base of channel. See page 9.</td>
</tr>
<tr>
<td>Heel resistant</td>
<td>ASME standard testing maximum grate slot size of 0.31&quot; (8mm), deemed safe for heeled shoes. See page 140.</td>
</tr>
<tr>
<td>Heel safety</td>
<td>ACO stipulated criteria of maximum grate slot size of 0.25&quot; (6.5mm), deemed safe for stillets shoes. See page 140.</td>
</tr>
<tr>
<td>Hydro</td>
<td>ACO’s proprietary software program to accurately calculate trench hydraulics. See page 142.</td>
</tr>
<tr>
<td>Hydrological cycle</td>
<td>Cycle of water from oceans to rainfall, back to the ocean.</td>
</tr>
<tr>
<td>In-line catch basin</td>
<td>Similar width basin connected to trench which acts as exit point to underground pipe work.</td>
</tr>
<tr>
<td>Invert depth</td>
<td>Depth from top of grate to base of channel. See page 9.</td>
</tr>
<tr>
<td>kiN</td>
<td>Kilometres - measurement of force, 1kN = 1,000N.</td>
</tr>
<tr>
<td>kN/m²</td>
<td>Kilonewton per square metre.</td>
</tr>
<tr>
<td>Lateral intake</td>
<td>Liquid entering the trench from surrounding paved area.</td>
</tr>
<tr>
<td>Male</td>
<td>Has protruding details to interconnect with a female piece to enable a good fit.</td>
</tr>
<tr>
<td>Manning’s equation</td>
<td>Standard uniform flow equation for calculating flow in pipes or culverts. Does not allow for lateral intake of liquids. Manning’s roughness coefficient - measure of roughness of a material’s surface. See page 137.</td>
</tr>
<tr>
<td>Manning’s coefficient</td>
<td>Measure of roughness of a material’s surface. See page 137.</td>
</tr>
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<td>Manning’s equation</td>
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Surface drainage and building accessories for track & field.

ACO Infrastructure
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Aqueduct
Custom design and manufacture of fiberglass trench drain systems.

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