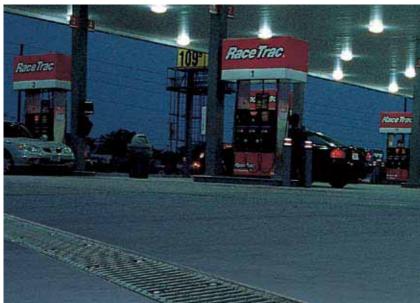
# **Technical Handbook and Product Catalog**



# **FlowDrain Section**

High capacity trench drainage

ACO Drain offer a comprehensice 116 page catalog covering everything you need to know about about trench drainage and the products and services available.

To ease electronic transmission of data the catalog has been divided into sections - for a hard copy or other sections call (800) 543-4764 or (888) 490-9552 or go to www.acousa.com.

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- 8 Product selection
- 10 Trench drain hydraulics
- 16 Loadings
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- 24 End user requirements

#### **Standard Products**

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- 54 Accessories

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#### **Problem Solving Products**

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This PDF relates to this section only

# ΑΟΟ

# **Typical applications**

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

# FG100 FG200

FlowDrain provides an ideal solution to long runs in concrete slabs.

The fiberglass channel body with steel frame provides a quick and simple way to create a smooth, corrosion resistant trench drain.

A choice of grates in different materials and slot configurations can be secured to the metal frame.

FlowDrain is available in 3.75" (FG100) and 8" (FG200) internal widths.







AA

NE44

# **FlowDrain**

High capacity trench drainage

MA

# **FlowDrain Features**



**Black coated steel frame** provides grate support and protects the channel edge from damage. Available for FG100 & FG200.

**Bolted grates -** FG200 grates are lockable with two  $1/2 - 13 \times 11/2$ " bolts fixing directly into the steel frame at 18" (457mm) intervals.

Wide choice of grates in various materials and styles (including ADA compliant) for applications up to Load Class E.

**Sloped (1.0%) channel units** - neutral channel units, end caps and a choice of catch basins provide a complete trench drain system. This equates to <sup>1</sup>/8" fall per linear foot.

Fiberglass - a lightweight material that is made from polyester resin binder reinforced by glass matting and fibers. See page 22 for material properties.

**FG200 8" internal width** - modular nine foot (2.75meters) and three foot (0.915meters) channels. 'V' shaped bottom improves flow hydraulics.

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**Interconnecting end profiles** allow easy and effective joining of channels. Sealant can be used to create a sealed joint.



**FG100 3.75" internal width** - modular three meter (9'-10") and one meter (39.37") channels. 'V' shaped bottom improves flow hydraulics.

www.acousa.com

# **ACO DRAIN**

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



**Direction arrows** on the sides of the channel indicate flow direction and ensure channels are installed correctly.

**Galvanized or stainless steel frame** provides grate support and protects the channel edge from damage. Available for FG100 & FG200.

**QuickLok** - FG100 available with patented, boltless locking system provides quick fitting and removal of grates. Helps to reduce installation/maintenance time and costs.

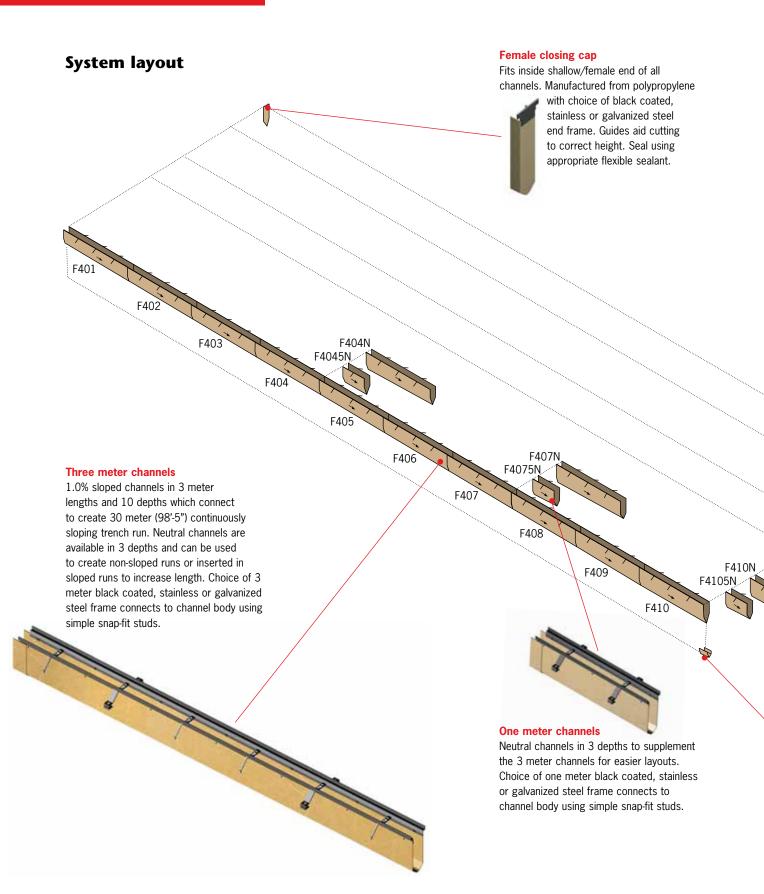
**Nelson studs** attached to the frame act as concrete anchors to secure channels into concrete surround.



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

**Bracing blocks** are supplied to brace the deeper channels during the concrete pour, details are given on each channel.

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# ACO DRAIN



#### Male closing/outlet cap

Fits outside deep/male end of all channels. 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. Optional bell end connection to fit 4" or 6" Schedule 40 pipes.

Note: Can be used as an inlet cap if female socket is cut from channel.

For depth 401-404 channels ACO recommends removal of unused sections of the bell end to ensure adequate pavement material coverage.

# Grates

A wide selection of QuickLok grates available for use with FG100. See pages 36-39 for details.

#### 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 69 for details.

# F660 F900

# Vertical outlet adapter



4" or 6" Schedule 40 vertical outlet adapter manufactured from brown polypropylene. Can be secured to underside of channel using appropriate

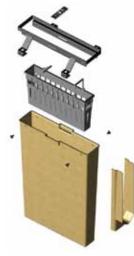
F880

flexible sealant to provide vertical bell end for easy attachment to 4" or 6" Schedule 40 pipe. Can be used anywhere along channel.

#### F900 in-line catch basin

In-line catch basin with choice of black coated, stainless or galvanized steel frame, grate and plastic trash bucket. F900 catch basin is fitted with removable QuickLok bar to secure grate.

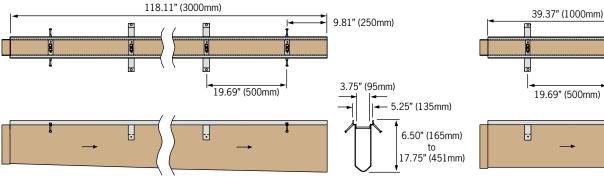
Accessories include 4", 6" and 8" pipe adapters and channel collar. See page 69 for details.



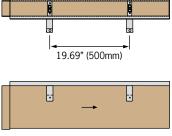
# FlowDrain - FG100

**Three meter channel** 

**One meter channel** 

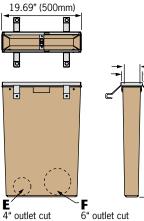


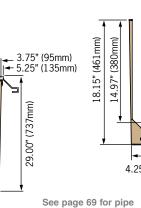
F900 channel collar



P

In-line catch basin





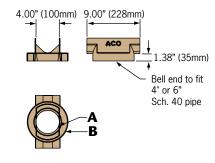
outlet adapters

16.09" (409mm) 4.25" (108mm) 3.39" (86mm)

17.75" (451mm)

2.85" (72mm)

**Vertical outlet adapter** 



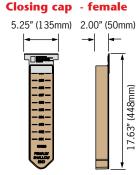
at deepest invert at deepest invert

#### **Outlet flow rates**

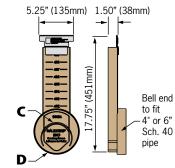
Outlet	Product	Outlet Size (Sch 40)	Invert Depth	GPM	CFS
A	F401 channel	4" round	7.50	147	0.32
A	F410 channel	4" round	17.63	228	0.50
В	F401 channel	6" round	7.50	244	0.56
В	F410 channel	6" round	17.63	374	0.86
C	F402 channel	4" round	8.63	138	0.32
C	F410 channel	4" round	17.63	213	0.49
D	F404 channel	6" round	10.88	257	0.59
D	F410 channel	6" round	17.63	346	0.80
E	F900*	4" round	28.88	282	0.63
F	F900*	6" round	28.88	623	1.39

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

\* F900 flow rates without trash bucket - using trash bucket reduces flow.



Closing/outlet cap - male

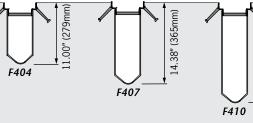


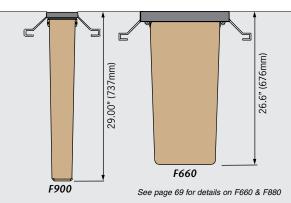


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Ground line





# **FG100 Parts list**

Description	Part		Inver	t Depth				Weight		
	No	inc	inches mm			inches			nm	lbs
		Female	Male	Female	Male	Female	Male	Female	Male	
F401 Sloped channel - 118" (3m)	93190	6.38	7.50	162	191	6.50	7.63	165	194	11.0
F402 Sloped channel - 118" (3m)	93209	7.50	8.63	191	219	7.63	8.75	194	222	12.9
F403 Sloped channel - 118" (3m)	93217	8.63	9.75	219	248	8.75	9.88	222	251	14.8
F404 Sloped channel - 118" (3m)	93225	9.75	10.88	248	276	9.88	11.00	251	279	16.7
F404N Neutral channel - 118" (3m)	93233	10.88	10.88	276	276	11.00	11.00	279	279	18.6
F4045N Neutral channel - 39.37" (1m)	93241	10.88	10.88	276	276	11.00	11.00	279	279	6.7
F405 Sloped channel - 118" (3m)	93250	10.88	12.00	276	305	11.00	12.13	279	308	20.5
F406 Sloped channel - 118" (3m)	93268	12.00	13.13	305	333	12.13	13.25	308	337	22.4
F407 Sloped channel - 118" (3m)	93276	13.13	14.25	333	362	13.25	14.38	337	365	24.3
F407N Neutral channel - 118" (3m)	93284	14.25	14.25	362	362	14.38	14.38	365	365	26.2
F4075N Neutral channel - 39.37" (1m)	93292	14.25	14.25	362	362	14.38	14.38	365	365	9.4
F408 Sloped channel - 118" (3m)	93301	14.25	15.38	362	391	14.38	15.50	365	394	28.1
F409 Sloped channel - 118" (3m)	93313	15.38	16.50	391	419	15.50	16.63	394	442	30.0
F410 Sloped channel - 118" (3m)	93325	16.50	17.63	419	448	16.63	17.75	442	451	31.9
F410N Neutral channel - 118" (3m)	93337	17.63	17.63	448	448	17.75	17.75	451	451	33.8
F4105N Neutral channel - 39.37" (1m)	93349	17.63	17.63	448	448	17.75	17.75	451	451	12.1
Channel Frames										
Black coated steel frame - 118" (3m)	98567	-	-	-	-	2.56	2.56	65	65	31.0
Black coated steel frame - 39.37" (1m)	95228	-	-	-	-	2.56	2.56	65	65	11.0
Galvanized steel frame - 118" (3m)	98572	-	-	-	-	2.56	2.56	65	65	31.0
Galvanized steel frame - 39.37" (1m)	95232	-	-	-	-	2.56	2.56	65	65	11.0
Stainless steel frame - 118" (3m)*	98581	-	-	-	-	2.56	2.56	65	65	31.0
Stainless steel frame - 39.37" (1m)*	95243	-	-	-	-	2.56	2.56	65	65	11.0
In-line Catch Basins - For information on F660	0 and F880 ca	atch basins s	ee page	69						
F900 In-line catch basin - 19.69" (0.5m)	98407	28.88	28.88	734	734	29.00	29.00	737	737	16.0
F900 Black coated steel catch basin frame	98397	-	-	-	-	2.56	2.56	65	65	5.0
F900 Galvanized steel catch basin frame	98406	-	-	-	-	2.56	2.56	65	65	5.0
F900 Stainless steel catch basin frame*	98403	-	-	-	-	2.56	2.56	65	65	5.0
F900 Channel/Catch basin collar	98163	-	-	-	-	18.15	18.15	461	461	0.7
Series 900 Plastic trash bucket	01498	-	-	-	-	9.33	9.33	237	237	1.1
Accessories										
Closing cap (F) with black end frame	98593	-	-	-	-	17.63	17.63	448	448	0.6
Closing cap (F) with galv steel end frame	98597	-	-	-	-	17.63	17.63	448	448	0.6
Closing cap (F) with stainless end frame*	98605	-	-	-	-	17.63	17.63	448	448	0.6
Closing/outlet cap (M) with black end frame	98604	-	-	-	-	17.75	17.75	451	451	0.8
Closing/outlet cap (M) with galv steel end frame	98603	-	-	-	-	17.75	17.75	451	451	0.8
Closing/outlet cap (M) with stainless end frame		-	-	-	-	17.75	17.75	451	451	0.8
Vertical outlet adapter - 4" or 6" outlet	98195	-	-	-	-	-	-	-	-	0.7
QuickLok/PowerLok grate removal tool	01318				-				_	0.3

#### Notes:

1. Invert and overall depths are for the channel/catch basin body & frame assembled

2. Channel weights are for fiberglass body only

3. For maximum hydraulic efficiency remove trash bucket from catch basin

4. Closing caps can be cut down to suit all channels

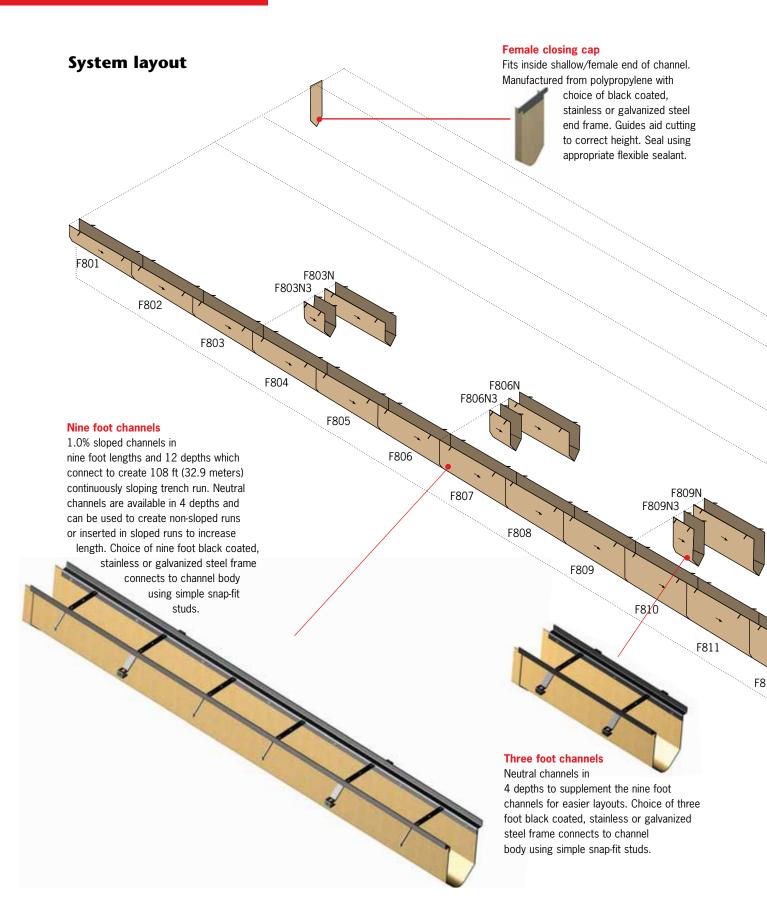
5. Add 2" to length of each channel for female joining flange (only applicable at shallowest end of trench run)

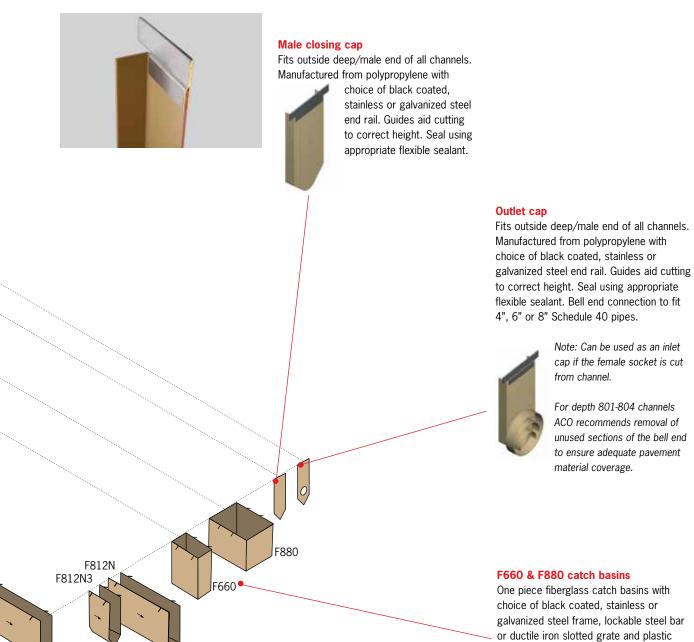
6. Frames supplied with plastic snap-fit studs for connecting to fiberglass body

7. (F) = female

8. (M) = male

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





#### Vertical outlet adapter

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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.

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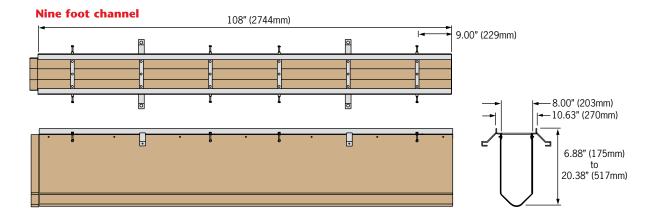
trash bucket.

Accessories include 4", 6" and 8" Schedule 40 pipe adapters and channel collars to

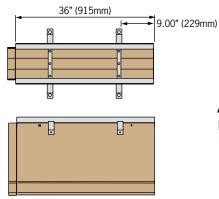
connect channel to catch basin.

See page 69 for details.

# FlowDrain - FG200

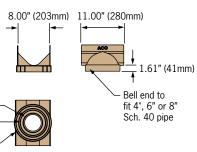


Three foot channel

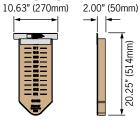


Vertical outlet adapter

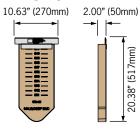
B



**Closing cap (Female)** 



#### Closing cap (Male)

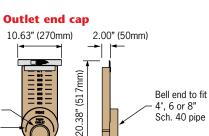


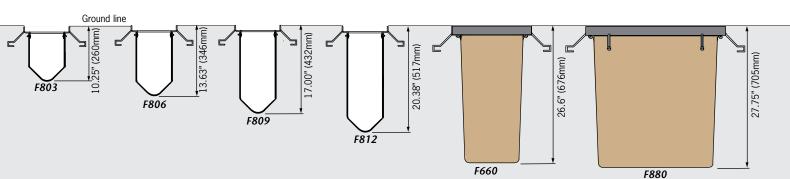
### **Outlet flow rates**

66

Outlet	Product	Outlet Size (Sch 40)	Invert Depth	GPM	CFS
Α	F801 channel	4" round	7.88	154	0.34
Α	F812 channel	4" round	20.25	246	0.54
В	F801 channel	6" round	7.88	346	0.77
В	F812 channel	6" round	20.25	553	1.23
С	F801 channel	8" round	7.88	616	1.37
С	F812 channel	8" round	20.25	982	2.18
D	F802 channel	4" round	9.00	145	0.33
D	F812 channel	4" round	20.25	233	0.54
E	F803 channel	6" round	10.13	330	0.76
E	F812 channel	6" round	20.25	510	1.17
F	F805 channel	8" round	12.38	635	1.46
F	F812 channel	8" round	20.25	880	2.03

 $\ensuremath{\textbf{Note:}}$  These are the pipe flow rates at the specified outlet,  $\ensuremath{\textbf{NOT}}$  channel flow rates.





D

Ε

F

## **FG200** Parts list

Description	Part		Inver	t Depth			Weight			
	No	inc	inches mm		inches		mm		lbs	
		Female	Male	Female	Male	Female	Male	Female	Male	
F801 Sloped channel - 108" (2.75m)	99006	6.75	7.88	172	200	6.88	8.00	175	203	11.0
F802 Sloped channel - 108" (2.75m)	99013	7.88	9.00	200	229	8.00	9.13	203	232	12.0
F803 Sloped channel - 108" (2.75m)	99021	9.00	10.13	229	257	9.13	10.25	232	260	13.0
F803N Neutral channel - 108" (2.75m)	99048	10.13	10.13	257	257	10.25	10.25	260	260	15.5
F803N3 Neutral channel - 36" (0.915m)	99034	10.13	10.13	257	257	10.25	10.25	260	260	5.2
F804 Sloped channel - 108" (2.75m)	99055	10.13	11.25	257	286	10.25	11.38	260	289	14.1
F805 Sloped channel - 108" (2.75m)	99062	11.25	12.38	286	314	11.38	12.50	289	317	15.2
F806 Sloped channel - 108" (2.75m)	99071	12.38	13.50	314	343	12.50	13.63	317	346	16.3
F806N Neutral channel - 108" (2.75m)	99095	13.50	13.50	343	343	13.63	13.63	346	346	16.3
F806N3 Neutral channel - 36" (0.915m)	99084	13.50	13.50	343	343	13.63	13.63	346	346	5.5
F807 Sloped channel - 108" (2.75m)	99109	13.50	14.63	343	371	13.63	14.75	346	374	17.4
F808 Sloped channel - 108" (2.75m)	99116	14.63	15.75	371	400	14.75	15.88	374	403	18.5
F809 Sloped channel - 108" (2.75m)	99123	15.75	16.87	400	429	15.88	17.00	403	432	19.6
F809N Neutral channel - 108" (2.75m)	99145	16.87	16.87	429	429	17.00	17.00	432	432	19.6
F809N3 Neutral channel - 36" (0.915m)	99132	16.87	16.87	429	429	17.00	17.00	432	432	6.5
F810 Sloped channel - 108" (2.75m)	99156	16.87	18.00	429	457	17.00	18.13	432	460	20.7
F811 Sloped channel - 108" (2.75m)	99162	18.00	19.13	457	486	18.13	19.25	460	489	21.8
F812 Sloped channel - 108" (2.75m)	99175	19.13	20.25	486	514	19.25	20.38	489	517	23.0
F812N Neutral channel - 108" (2.75m)	99192	20.25	20.25	514	514	20.38	20.38	517	517	23.0
F812N3 Neutral channel - 36" (0.915m)	99186	20.25	20.25	514	514	20.38	20.38	517	517	7.7
Channel Frames										
Black coated steel frame - 108" (2.75m)	97066	-	-	-	-	2.69	2.69	68	68	57.9
Black coated steel frame - 36" (0.915m)	98524	-	-	-	-	2.69	2.69	68	68	19.3
Galvanized steel frame - 108" (2.75m)	97079	-	-	-	-	2.69	2.69	68	68	57.9
Galvanized steel frame - 36" (0.915m)	98538	-	-	-	-	2.69	2.69	68	68	19.3
Stainless steel frame - 108" (2.75m)*	97087	-	-	-	-	2.69	2.69	68	68	57.9
Stainless steel frame - 36" (0.915m)*	98545	-	-	-	-	2.69	2.69	68	68	19.3
In-line Catch Basins - For information on F660	and F880 ca	atch basins s	ee page	69						
Accessories										
Oleging and (D) with black and frages	00205					20.25	20.25	E1 4	E 1 4	1.1
Closing cap (F) with black end frame	98365	-	-	-	-	20.25	20.25	514	514	1.1
Closing cap (F) with galv steel end frame	98386	-	-	-	-	20.25	20.25	514	514	1.1
Closing cap (F) with stainless end frame*	98375	-	-	-	-	20.25	20.25	514	514	1.1
Closing cap (M) with black end frame	98363	-	-	-	-	20.38	20.38 20.38	517	517	1.3
Closing cap (M) with galv steel end frame	98382	-	-	-	-	20.38		517	517	1.3
Closing cap (M) with stainless end frame*	98372	-	-	-	-	20.38	20.38	517	517	1.3
Outlet cap (M) with black end frame	98361	-	-	-	-	20.38	20.38	517	517	1.8
Outlet cap (M) with galv steel end frame	98381	-	-	-	-	20.38	20.38	517	517	1.8
Outlet cap (M) with stainless end frame*	98373	-	-	-	-	20.38	20.38	517	517	1.8
Vertical outlet adapter - 4", 6" or 8" outlet	98103	-	-	-	-	-	-	-	-	1.6

Notes:

1. Invert and overall depths are for the channel body & frame assembled

2. Channel weights are for fiberglass body only

3. Closing/Outlet 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

6. See page 68 for grate details

7. (F) = female

8. (M) = male

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

# **FG200 Grates**

a	BAR STEEL	DIN 19580	i C	<b>Commercial vehicle</b>				
		Description	Part No.	Length ins <i>(meters</i> )	Weight Ibs	Slot size (ins)	Intake area inches <sup>2</sup>	Locking Type
		Galvanized steel Stainless steel*	93899 93891	36" (0.9m) 36" (0.9m)	28.6 28.6	3.6 x 1.0 3.6 x 1.0	264.0 264.0	Bolted <sup>1</sup> Bolted <sup>2</sup>
54					* Grade 304	stainless steel		

<b>B</b>	ADA IRON	DIN 19580	Class E	- 135,000lbs	s - 2,32	Bpsi	Medium in	dustrial
		Description	Part No.	Length ins <i>(meters)</i>	Weight Ibs	Slot size (ins)	Intake area inches <sup>2</sup>	Locking Type
		Ductile iron*	93893	18" (0.45m)	28.2	0.25 x 1.75	35.0	Bolted <sup>3</sup>
<b>E</b>	47 <sup>1</sup>				* Ductile iror	to ASTM A 536	5-84 - grade 65-45-	12

A	SLOTTED IRON	DIN 19580	Class E	- 135,000lb	s - 2,32	3psi 🛛	<b>Medium industrial</b>		
		Description	Part No.	Length ins <i>(meters</i> )	Weight Ibs	Slot size (ins)	Intake area inches <sup>2</sup>	Locking Type	
		Ductile iron*	93896	18" (0.45m)	25.2	7.87 x 0.61	58.7	Bolted <sup>3</sup>	
					* Ductile iror	n to ASTM A 53	6-84 - grade 65-45-	12	

#### Notes:

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1. Supplied with four galvanized steel socket head bolts  $(1/2 - 13 \times 11/2")$  - replacement part 93895 2. Supplied with four stainless steel socket head bolts  $(1/2 - 13 \times 11/2")$  - replacement part 93897 3. Supplied with two stainless steel hex head bolts  $(1/2 - 13 \times 11/2")$  - replacement part 93892

## Outlet flow rates for catch basins - see opposite page

Outlet	Product	Outlet Size (Sch 40)	Invert Depth	GPM	CFS
97425	F660	4" round	26.5 max	269	0.60
97425	F880	4" round	27.5 max	275	0.61
97438	F660	6" round	26.5 max	594	1.32
97438	F880	6" round	27.5 max	606	1.35
97444	F660	8" round	26.5 max	1032	2.30
97444	F880	8" round	27.5 max	1055	2.35

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

\* Flow rates without trash bucket - using trash bucket reduces flow.

# **FG200 Catch Basins**

Fiberglass catch basins parts list

Fiberglass catch basins are available with a	F
variety of frames and grates.	F

Channel collars are available to connect all depths of either FG100 or FG200 on any side of the catch basin.

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

To attach collars or pipe adapters, first cut hole to required size then secure part to the outer wall of the catch basin using appropriate sealant.



Description	Part	Overal	Overall Depth		
	No	inches	mm	lbs	
F660 Catch basin - 24" x 12"	98069	26.6	676	22.0	
F660 Black coated steel frame	97995	3.13	79	13.8	
F660 Galvanized steel frame	98008	3.13	79	14.4	
F660 Stainless steel frame*	98013	3.13	79	14.4	
F660 Plastic trash bucket	98067	5.75	146	5.0	
F880 Catch basin - 24" x 24"	98075	27.7	703	22.0	
F880 Black coated steel frame	98021	3.13	79	23.2	
F880 Galvanized steel frame	98034	3.13	79	24.2	
F880 Stainless steel frame*	98048	3.13	79	24.2	
F880 Plastic trash bucket	98059	6.75	172	8.4	
Accessories					
4" Pipe plain end adapter	97425	6.53	167	0.4	
6" Pipe plain end adapter	97438	8.66	220	0.6	
8" Pipe plain end adapter	97444	10.66	270	0.9	
FG100 Channel/catch basin collar	98167	16.40	416	1.0	
FG200 Channel/catch basin collar	98171	19.74	501	1.1	
Grates					
F660 Class C galv. steel bar grate	97443	-	-	35.2	
F660 Class C stainless bar grate*	97442	-	-	35.2	
F660 Class E ductile iron grate	97449	-	-	75.0	
F880 Class C galv. steel bar grate	97452	-	-	63.8	
F880 Class C stainless bar grate*	97455	-	-	63.8	
F880 Class E ductile iron grate	97453	-	-	206.0	
Notes:					

Notes:

1. Invert and overall depths are for the channel body & frame assembled

2. If foul air trap required, please contact ACO

\* Grade 304 stainless steel

**F880** 

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

**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 two sizes.

**Channel collar** - adapter to enable smooth transition of any depth FG100 or 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; can be used with F900 (See pages 60-63).

