



# FLOOR DRAINS TECHNICAL DATA

## HOW TO SELECT A FLOOR DRAIN

Floor drains are primarily used for inside locations where the flow rate into the drain can be anticipated and for outside areas where rainfall intensity dictates sizing. Drains should be selected with sufficient top size and grate free area to pass the anticipated flow. Grate free area is defined as "the total area of the drainage openings in the grate." The drain outlet should be sized large enough so that it will safely pass the maximum flow through the grate, without creating water buildup.

**Sizing and Location**—For most indoor locations, the grate free area should be 1 1/2 times the transverse area of the connecting pipe. The number and location of drains are based on the configuration of the floor plan, type of operation and location of equipment. Location and number of floor drains required can be determined only after careful review of the plans and anticipated building use.

Floor drains or area drains, when used to drain exterior areas, should have an open area equal to twice the transverse area of the connecting pipe (Table 1.) See roof drain section for rainfall and sizing data (Pg. 1-03).

Recommended Grate Free Areas for Various Outlet Pipe Sizes			
Nominal Pipe Size, IN	Transverse Area of Pipe, SQ IN	Minimum Flow Requirements (Interior Areas) SQ IN	Maximum Flow Requirements (Exterior Areas) SQ IN
1 1/2	2.04	3.06	4.08
2	3.14	4.71	6.28
3	7.06	10.59	14.12
4	12.60	18.90	25.20
5	19.60	29.40	39.20
6	28.30	42.45	56.60
8	50.25	75.38	100.50

Table 1

## SELECTING THE DRAIN

After the top size is determined based on anticipated flow into the drain, the following points should be considered when making the final selection of the floor drain.

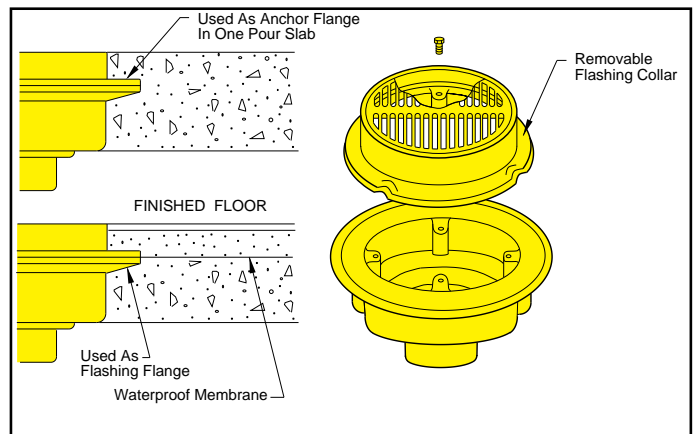
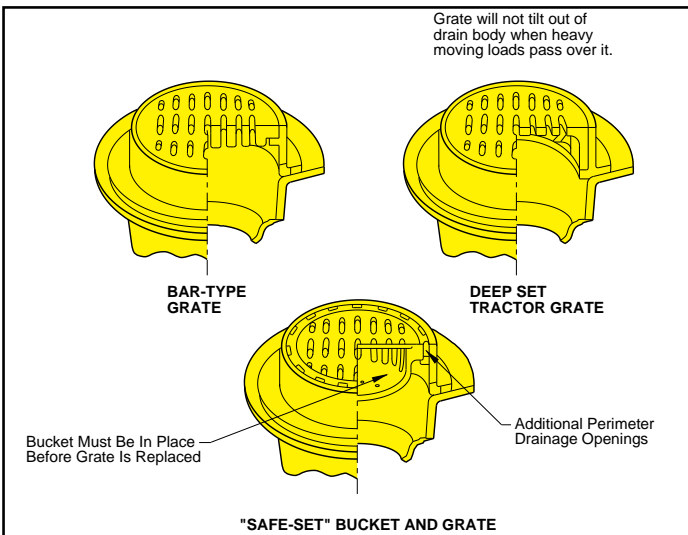
**Selection of Top (Based on Anticipated Traffic)**—Establish the maximum anticipated traffic (loading) which will pass over the grate and select the grate type which will support that load. Each drain shown in this section has a description listing the type of load it will take. The categories listed are for various drains in respect to grate loading. The load classifications are in accordance with the American National Standards ASME A112.21.1M. ASME Ratings are as follows:

- **Light Duty**—All grates having safe live load under 2,000 lbs. (900 KG)
- **Medium Duty**—All grates having safe live load between 2,000 lbs. (900 KG) and 4,999 lbs. (2250 KG)
- **Heavy Duty**—All grates having safe live load between 5,000 lbs. (2250 KG) and 7,499 lbs. (3375 KG)
- **Extra Heavy Duty**—All grates having safe live load between 7,500 lbs. (3375 KG) and 10,000 lbs. (4500 KG)

The above categories are given as a guide only. Conditions of use, load concentrations, installations, etc., can affect results and service. For unusual applications, consult the factory.

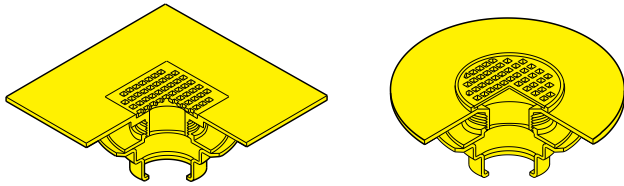
After the weight loading capacity is established, a suitable drain can be selected.

Illustrated below are various types of grate designs which will be mentioned throughout the catalog.



Most floor drain bodies are available with a flange for either anchoring the drain in the floor slab or for use as a flashing flange in upper floors and waterproofed areas. Many Smith drains are regularly furnished with a flanged body and a combination "top flashing collar" which can be used to clamp the waterproof membrane.

**PREFIX DX-WIDE FLANGE BODY DRAINS**



The Prefix DX designates a wide flange that can be furnished on certain Smith floor drains. This flange receives the membranes and coatings of a waterproof floor covering system. These coverings are thin coatings which are installed in a series of trowel coats. The covering forms its own membrane, flashing and durable traffic surface. The wide flange is regularly furnished 4" wide. The usual covering is approximately 3/16" thick and may be applied over many subsurfaces such as concrete, gypsum or wood decks. This type of covering is particularly adaptable to flat roofs which are used for recreational purposes, balconies, area ways, plazas, sun decks, floors and corridors.

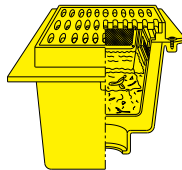
When a DX flange is required on drains other than those shown in this section, the prefix DX must be used with the figure number. The flange will be 4" wide (minimum) with a 3/16" lip regularly furnished. If the waterproof deck covering is greater or less than 3/16", the lip dimension must be specified or the drain has to be set at the proper elevation by the plumbing contractor to compensate for these differences. Roughing dimensions of the body must be adjusted accordingly. Drain body should be set low enough to permit "dimpling" of the area surrounding the drain.

**BUCKET VARIATIONS**

Some job applications require drains with buckets to intercept and collect debris such as solid objects and leaves so the waste system is protected. Smith engineers have designed various types of buckets for different applications to accomplish this purpose. **NOTE:** Where a bucket is not available, a dome bottom strainer or flat bottom strainer may be used to protect the waste system.

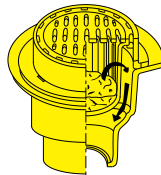
**SOLID SUSPENDED BUCKET WITH PORTED OPENINGS**

This bucket is ideal for drains which are located in areas where a large amount of debris is anticipated. It is particularly useful in areas such as vegetable storerooms where vegetables are pre-cleaned and a considerable amount of leaves and stalks are washed into the drain. The solid bottom of this bucket retains this type of solid matter while the overflow is discharged through the screens in the top of the bucket.



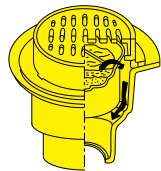
**DEEP SUSPENDED SLOTTED BUCKET**

Used where large leafy objects such as peelings, leaves and paper are to be intercepted. When wetted down, these types of solids will compact at the bottom of the bucket. Slots run completely up the sides of the bucket to offer complete drainage even when the bottom section is filled with debris.



**SOLID FREE STANDING BUCKET**

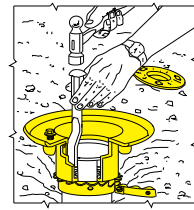
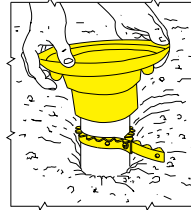
Used where heavy materials such as sand, stones and chips are to be intercepted and separated from the drainage water. When sand laden drainage water enters the bucket, the sand falls to the bottom and the clear water flows over the top of the bucket into the waste line.



**DRAIN GASKET INSTALLATION DATA**



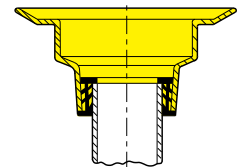
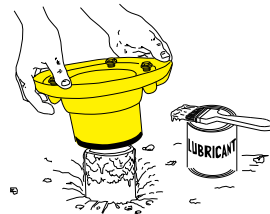
Jay R. Smith Speedi-Seal (Fig. 9502) and Speedi-Set (L) gaskets are available for use with cast iron, plastic, steel or glass pipe. Installation of your floor drains using Speedi-Seal or Speedi-Set can represent a significant reduction in time and labor costs over conventional caulk or NO-HUB installations.



**SPEEDI-SEAL GASKET WITH FIG. 9239 CAULK SUPPORT STRAP**

The caulk support strap eliminates the need to search for supports for the drain during the caulking operation and the need to purchase expensive riser clamps. Its unique design allows it to be used on 2, 3 or 4" service weight or extra heavy pipe. The installer secures the strap in place, lubricates the plain end of the spigot, then rests the inside caulk outlet drain on the caulk support strap. The strap supports the drain body weight and the force created by the caulking operation without slipping. The inside surface of the Speedi-Seal gasket is then lubricated, pressed in place down over the pipe and lightly tapped until flush with the top of the pipe. Installation is fast and simple and the caulk support strap may be left in place or reused.

**SPEEDI-SET OUTLET TYPE L**



Speedi-Set drains are available with most bottom outlet models by specifying (L) and piping material used. Service weight (SW) is regularly furnished or specify extra heavy (LXH). The Speedi-Set joint consists of a NO-HUB outlet body and a factory inserted extra heavy or service weight Speedi-Set neoprene gasket. The installer simply lubricates the plain end of the spigot and the inside of the gasket, then presses the drain body down over the pipe until contact is made with the internal stop of the gasket. The installation eliminates the need for hot lead, caulking irons, NO-HUB clamps, etc.

**APPLICATION CHART FOR SPEEDI-SEAL AND SPEEDI-SET GASKETS**

JAY R. SMITH FIG. NO.	NOM. PIPE SIZE & DESC.	PIPE OD TOLERANCE RANGE				GASKET-PIPE COMPATIBILITY							
		INCHES		MILLIMETERS		CAST IRON PIPE		ABS	PVC THIN WALL	STEEL	COPPER DWV	GLASS	
		FROM MIN	TO MAX	FROM MIN	TO MAX	XH	SW						NO-HUB
SPEEDI-SEAL	9502SW02	2.125	2.390	54.0	60.7		X				X	X	X
	9502SW03	3.125	3.390	79.4	86.1		X	X			X	X	X
	9502SW04	4.124	4.390	104.8	111.5		X	X		X		X	X
	9502SW05	5.210	5.390	132.3	136.9		X	X					
	9502SW06	6.210	6.390	157.7	162.3		X	X					
	9502XH02	2.290	2.470	58.2	62.7	X		X	X	X			X
	9502XH03	3.410	3.590	86.6	91.2	X			X	X	X		X
	9502XH04	4.410	4.590	112.0	116.6	X			X	X	X		X
	9502XH05	5.410	5.590	137.4	142.0	X							
	9502XH06	6.410	6.590	162.8	167.4	X							
SPEEDI-SET	9502SP06	6.550	6.70	166.4	170.2				X	X	X		X
	9503L02	2.125	2.390	54.0	60.7		X				X		X
	9503L03	3.125	3.390	79.4	86.1		X	X		X			X
	9503L04	4.125	4.390	104.8	111.5		X	X					
	9503LXH02	2.290	2.470	58.2	62.7	X		X	X	X	X		X
	9503LXH03	3.410	3.590	86.6	91.2	X		X	X	X	X		X
	9503LXH04	4.410	4.59	112.0	116.0	X		X	X	X	X		X

SW = SERVICE WEIGHT      LH = SPEEDI-SET EXTRA HEAVY      XH = EXTRA HEAVY  
L = SPEEDI-SET SERVICE WEIGHT      LXH = SPEEDI-SET EXTRA HEAVY      SP = STEEL PIPE

**OPTIONAL VARIATIONS**

Variations to meet particular job requirements are available. The illustrations shown below are some of the more common variations.

**Suffix -B**  
Sediment Bucket

**Suffix -H**  
Hinged Grate  
Allows quick access to the line and assures replacement of grate.

**Suffix -S**  
Square Top

**Suffix -D**  
Dome Grate

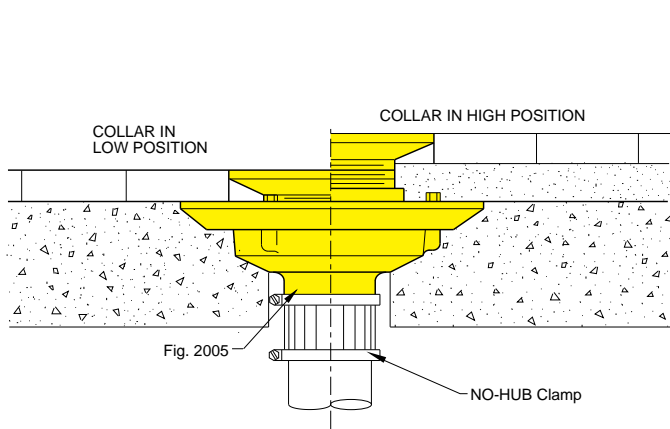
**Suffix -P**  
Trap Primer Connection  
-P050 (1/2") Regularly Furnished, -P075 (3/4") available on request.

**Suffix -U**  
Vandal Proof Screws  
**REGULARLY FURNISHED:**  
Flat Head Socket Machine Screw.



# INSTALLATION AND SPECIAL APPLICATION

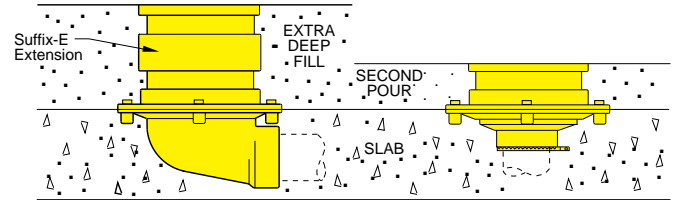
**Adjustable Top**—The Smith 2005/2010 Series of floor drains are available with over 100 different strainer heads. Strainer heads have a 3 3/4 - 12 threaded shank which threads into flashing collar. This type of drain is particularly adaptable to two-pour construction, such as toilet rooms, shower rooms, locker rooms and other light duty finished areas. Strainer head is easily adjusted when tile floor is being set.



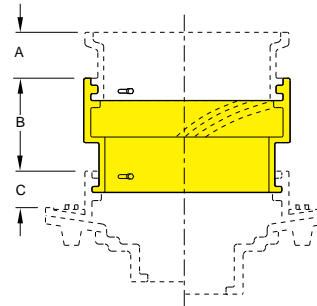
Reversible flashing collar in low position permits adjustment of the strainer to as low as 3/4" (measured from top of body pan to finished floor). This low position is particularly adaptable for installations where ceramic tile is applied directly to the slab. With collar in high position, sufficient adjustment is available for all normal two-pour installations. Usually the normal sand and cement fill and ceramic tile measures approximately 1 1/2". For unusually deep floor fills or unique construction, additional height can be obtained by using a Suffix -X Extension Adaptor.

**NOTE:** See below for Suffix -X Extension Adaptor.

**Adjustable Top and Extension**—Smith has available adjustable drains in the 8 1/2" and the 12" top sizes. Both sizes are available with light duty, medium duty, or heavy duty tops. See Table 2 below for variations



Adjustable drains are particularly useful in areas where the finished floor elevation may vary or is not immediately determined. Additional adjustable extension sleeve is available for extra deep roughing conditions (Specify Suffix -E).



**2300 SERIES SUFFIX -E ADJUSTABLE EXTENSIONS**  
Table 2 lists the min.-max. adjustment and drains for which this extension is available.

TYPE TOP	SIZE TOP	FIG. NO.	A		B		C
			MIN	MAX	MIN	MAX	
"SAFE-SET"	8 1/2 DIA	2350 2355	1 1/4	2 3/4	3 5/8	5 1/4	2
	12 DIA	2360 2365	1 3/4	3	2 3/4	4 3/4	2 1/2
MEDIUM DUTY	8 1/2 DIA	2310 2315	1 1/4	2 3/4	3 5/8	5 1/4	2
	8 1/2 DIA	2320 2325	1 1/4	2 3/4	3 5/8	5 1/4	2
HEAVY DUTY	12 DIA	2330 2335	1 3/4	3	2 3/4	4 3/4	2 1/2
	12 DIA	2340 2345	1 3/4	3	2 3/4	4 3/4	2 1/4

Table 2