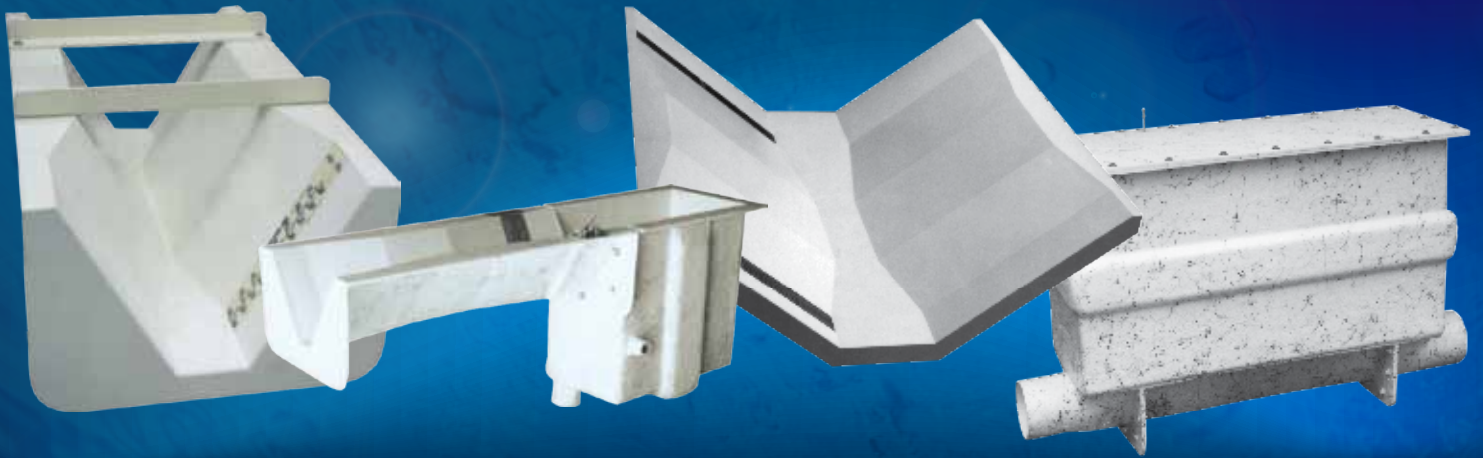




# TRAPEZOIDAL FLUMES

FIBERGLASS REINFORCED POLYESTER FOR CORROSION RESISTANCE



## BEST LOW FLOW CAPABILITY, EASY TO INSTALL & ECONOMICAL

Sized to measure a wide range of flows, yet still accurate at even very low levels. Design self-cleans silt, solids and debris. Can be installed in sewage systems, manholes and piping.

- Maintenance Free
- Dimensionally Stable
- Easily Installed
- Lightweight
- Accurate
- Economical



Plasti-Fab is recognized throughout North American and abroad as an experienced innovator and problem solver in open channel flow measurement and flow control products. Our team assists project engineers, contractors, municipalities, and the industry to complete projects on time and on budget. Contact our experienced team with any questions.

# MEASURING SMALL FLOWS IS NO PROBLEM WITH PLASTI-FAB® FRP WIDE-CAPACITY TRAPEZOIDAL FLUMES.

Even when flows reach their lowest levels, Plasti-Fab's trapezoidal flumes are on the job with answers. Designed for accuracy, shallow installation, clear trash passage and minimal backwater, our family of 60° V, 45° WSC and 45°SRCRC flumes cover a wide range of flow capacities, from 1 to 22,440 gpm.

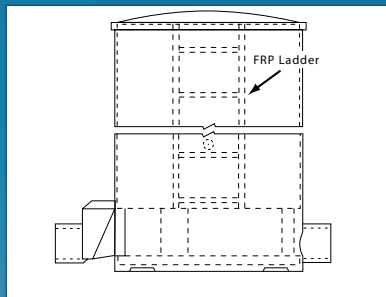
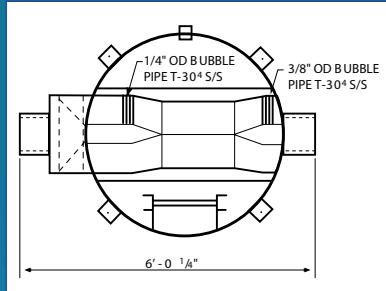
Rugged Fiberglass Reinforced Polyester (FRP) construction resists corrosion from virtually any chemicals found in stormwater or wastewater. Plus our economical 60° V flumes can retrofit into 48" manholes and easily install in channels and piping systems.

## PROVED & IMPROVED

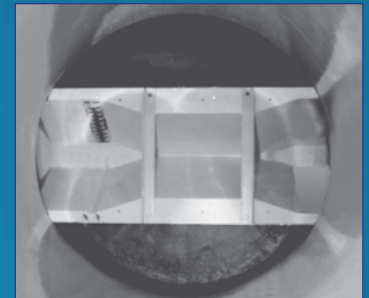
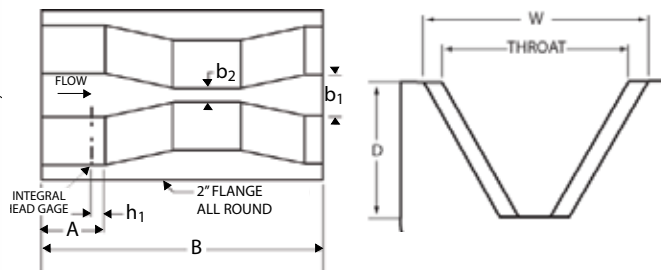
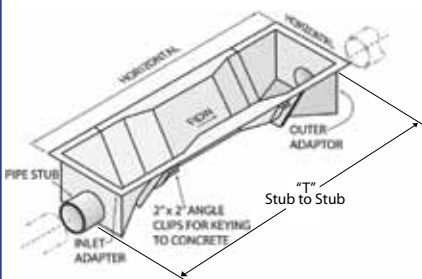
Originally developed for irrigation, trapezoidal flumes have proved their effectiveness during years of use by the Soil Conservation Service and the Department of Agriculture—both to monitor flows in furrows and in sloping-sided irrigation ditches. Today their inherent advantages are making trapezoidal flumes increasingly popular for industrial and municipal applications, particularly where low-flow measurements are required.

Because trapezoidal flumes have a V-shaped throat that bottoms at the same elevation as the channel invert, they are able to produce readings at very low flow levels without the numerous drawbacks of traditional V-notch or rectangular weirs.

Trapezoidal Flumes are available in Plasti-Fab Packaged Metering Manholes. Contact your Plasti-Fab representative today for details on the many combinations available.



Large 60°V Trapezoidal Flume with flanged end connection and adjustable ultrasonic mounting bracket

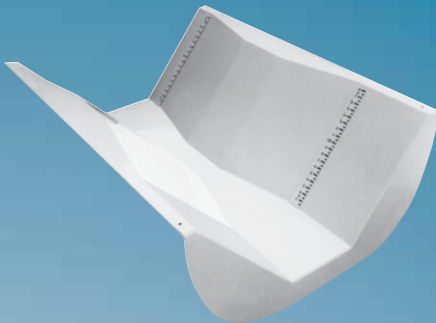


## COMMON SIZES OF PLASTI-FAB TRAPEZOIDAL FLUMES

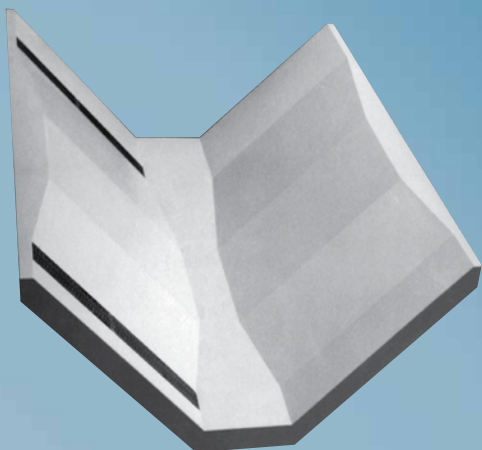
Description	Flow Range GPM	b <sub>1</sub>	b <sub>2</sub>	B	W	D	h <sub>1</sub>	T
Sm 60°V	1 - 30	2"	0	1'- 8 <sup>3</sup> / <sub>32</sub> "	6 <sup>3</sup> / <sub>4</sub> "	4"	1"	3'- 8 <sup>3</sup> / <sub>32</sub> "
Lg 60°V	1 - 115	2"	0	2'- 6 <sup>7</sup> / <sub>8</sub> "	10"	6 <sup>3</sup> / <sub>4</sub> "	1 <sup>1</sup> / <sub>2</sub> "	4'- 6 <sup>7</sup> / <sub>8</sub> "
XL 60°V	1 - 600	4 <sup>1</sup> / <sub>2</sub> "	0	3'- 5 <sup>7</sup> / <sub>8</sub> "	1'- 6 <sup>3</sup> / <sub>8</sub> "	12"	1 <sup>1</sup> / <sub>2</sub> "	6'- 5 <sup>7</sup> / <sub>8</sub> "
3 ft 60°V	2 - 6300	1' - 0"	0	9' - 9"	4'- 10 <sup>3</sup> / <sub>4</sub> "	3' - 0"	1' - 0"	15' - 1"
2" - 45° WSC	13 - 980	4 <sup>7</sup> / <sub>8</sub> "	2"	3'- 0 <sup>1</sup> / <sub>4</sub> "	2'- 2 <sup>1</sup> / <sub>16</sub> "	10 <sup>19</sup> / <sub>32</sub> "	1 <sup>1</sup> / <sub>2</sub> "	-
12" - 45°SRCRC	55 - 2730	1' - 0"	4 <sup>13</sup> / <sub>16</sub> "	5'- 7 <sup>1</sup> / <sub>8</sub> "	3' - 8"	1' - 4"	1 <sup>3</sup> / <sub>4</sub> "	-
18" - 45°TRAP	120-14,400	1' - 6"	6"	8' - 0"	7' - 8"	3' - 0"	9"	-
2 ft USDA	305 - 21,990	2' - 0"	1' - 0"	10' - 6"	9' - 6"	3' - 0"	6"	-

# PLASTI-FAB BUILDS FLUMES WITH ALL THE RIGHT ANSWERS.

- Rugged, long-lasting, corrosion-resistant FRP.
- Little or no transition required. The trapezoid's natural shape mimics both earthen and concrete-lined ditches.
- Angled walls cut upstream head and let trash pass through easily.
- Eliminate silt build-up get accurate low-flow readings. Level front-to-back floor sheds silt and assures readings as small as 1 gpm.
- Trapezoidal flumes are compatible with most popular instrumentation packages.
- Broad acceptance for both stormwater and wastewater compliance monitoring.
- Adaptable to a variety of in-line applications. Plasti-Fab can provide end flanges to fit U-shaped or rectangular channels, adapters for pipe connections, or flanges for bolting to manholes or vault walls. Also available in Packaged Metering Manholes.
- New, bigger V sizes accommodate flow ranges up to 6,200 gpm.



12" 45° WSC Trapezoidal Flume

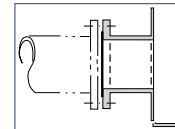


2 foot—USDA Trapezoidal  
Flume for flows up to 50 CFS



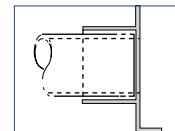
Lg 60° Trapezoidal Flume with  
Access Box & Cover

## A VARIETY OF CONNECTIONS TO MEET YOUR NEED.



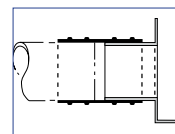
### Neoprene Boots

Boot with stainless steel bands slips over pipe stub, and is sized to match O.D. of connecting pipe.



### Caulking Collars

Collars made 1" to 2" larger than pipe O.D. to allow for some adjustment in leveling flume.



### Bolted Flange

PVC, FRP or Van Stone flanges are available— plus other connections to meet your specific requirement.

## TRAPEZOIDAL FLUMES WON'T TRAP SILT, SOLIDS OR DEBRIS.

1. This flume produces more head under 10 gpm than any other type of flume. The greater upstream water depth helps to keep solids moving rather than settling.
2. The flat floor and wall design help to transition solids through the throat.
3. The walls gradually converge in at the throat and flow reaches critical velocity as it passes through the throat. This helps propel solids through the flume.
4. During low or no flow periods, heavy solids may temporarily settle in front of the throat. Typically, when flow resumes, water quickly builds up depth and pressure to clear the blockage.

## INSTALLATION

Trapezoidal flumes should be installed level in both directions, and should be designed to operate in a free flow condition.

If the flume is installed in an earth ditch, the flume bottom would always be placed higher than the ditch bottom. If the flume is installed in a concrete ditch with very little slope that could cause submergence, then the flume should also be raised slightly above the bottom.

In general, the 60° V-Trapezoidal flumes operate best when they are installed 1/2" to 1" above the outlet pipe or channel. The larger Trapezoidal flumes may be set up 1" or more above the outlet pipe or channel. Raising the flume helps the flow to exit more efficiently and can prevent submergence. On the inlet end, raising the flume helps to pool and condition the flow before it reaches the measurement point. Flow entering the flume should be approximately one-half of critical velocity. This generally means an entrance slope of 1% or less. A smooth transition entering the flume is recommended to produce laminar flow and help reduce turbulence. Adapters are available to create this transition from a pipe.

There are three basic criteria for any open-channel primary device (such as a flume) to function properly.

1. Every flume requires a low velocity, non-turbulent flow entering the flume. Commonly, high velocities will show up in the form of turbulence and surface ripples or waves. This commonly causes false low readings.
2. The proper type and size of flume must be selected according to the flow range and installation conditions. This flume must be installed level in both directions and must maintain dimensional integrity.
3. The downstream conditions must be adequate and capable of taking the water away from the flume so there is no backwater submergence caused in the flume.

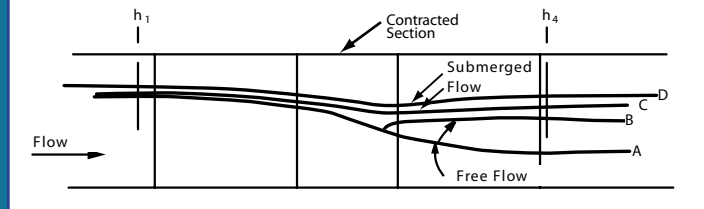
If these three conditions are met, the flume can operate in an accuracy range of  $\pm 2 - 5\%$ . We are aware that there are laboratory studies showing that flume accuracies can be achieved at 1 - 2% error and likewise meters that can achieve a 1 - 2% error. However, with human errors and other factors, we

believe a realistic margin of error for many field installations can be expected to be in the range of  $\pm 5\%$ .

All things considered, we believe that of all the forms of flow measurement, including Mag meters, sonic closed pipe meters, etc., the open channel flume is the most reliable and accurate. You can see the flow stream, and evaluate the conditions to know if it is working correctly. The gauge gives an easy, quick check on the flow meter for head comparison. Solids don't affect the reading, and you don't have to send the flume to the factory for the "mysterious" calibration.

## ACCURATE OPERATION

### FLOW PROFILES



All Plasti-Fab trapezoidal flumes are supplied with an inlet head gage at the  $h_1$  location. The 45° and larger flumes also have a second measurement point,  $h_4$ , near the flume outlet which can be used to measure submerged flow. However, Trapezoidal Flume installations should be designed for free flow whenever possible. They will produce accurate free flow measurement at up to 80% submergence. The flow diagram shows typical profiles for free and submerged flow.

When operating in a free flow condition, water passes through the throat at critical velocity as illustrated by profiles A and B.

The initial energy is often reduced by downstream back pressure to produce a tail water curl, B. This can extend back into the throat without affecting the flume's accuracy as long as the 80%  $h_4/h_1$  relation is not exceeded. When flow becomes submerged, profiles C and D, velocity in the throat begins to decrease appreciably and the head at  $h_1$  increases. Above 80% submergence, it may be possible to determine flow by measuring head at both  $h_1$  and  $h_4$  and referring to the appropriate submerged flow chart.

### EQUIVALENTS

1 cu.ft.	= 7.48 gals
1 mgd	= 694.4 gpm
1 mgd	= 1.55 cfs
1 cfs	= 449 gpm
1 cfs	= 0.646 mgd

## A WORLD OF SOLUTIONS IN WASTEWATER CONTROL

Plasti-Fab is the recognized leader in corrosion resistant equipment for water and wastewater treatment and control, specializing in Reinforced Copolymer (FRP) equipment for industry and infrastructure. Our equipment is resisting corrosion in abusive environments all around the world. Contact one of our technical experts today to discuss how your specific requirements will be met with Plasti-Fab quality products and custom services.

- FLOW MEASUREMENT FLUMES
- WEATHERPROOF SHELTERS
- WASTEWATER TREATMENT PRODUCTS
- PACKAGED METERING MANHOLES
- ROTATING SCUM SKIMMERS
- TITSEAL GATES/FLAP VALVES
- STOPLOGS AND GATES
- GAGES



**PLASTI-FAB Inc.**

PO Box 100  
Tualatin, Oregon 97062-0100

phone: 503-692-5460

fax: 503-692-1145

[www.plasti-fab.com](http://www.plasti-fab.com)