INSTALLATION

The conditions required for the successful use of Parshall flumes can be divided into three areas of concern:

- *Upstream conditions* should promote laminar flow conditions at the inlet of the flume. Channel turns, tees, elevation drops or other obstructions should be avoided. Upstream channel slope should not allow excessive velocity at the flume. Provide a slope of almost flat, to 3% maximum, for very small flumes, and 2% maximum for larger flumes. A 1:4 sloping ramp upstream should be provided for flumes installed above channel floor.
- *The crest of the flume* (the floor of the converging section where depth measurements are made) must be level both longitudinally & transversely.
- *The downstream channel* should not permit submerged flow conditions to occur. A large fall immediately downstream of the metering station can eliminate the possibility of submerged flow conditions. Long, narrow, flat or undersized channels can result in a backwater effect at the flume and should be avoided.

Sizing of flumes is be based on anticipated normal and maximum flows. In general, the smallest flume of adequate capacity is selected. Flumes are restrictions in the channel and consideration should be given to the effect of the resulting backwater on upstream drains and channel walls or banks.

Observe elevations during design & installation such that modular flow, also known as "Free Flow" conditions are always present. Submerged flow conditions are usually avoided to allow use of the standard discharge tables and depth measurments at H_a only.

Submerged Flow

Submerged flow conditions occur when the resistance to flow in the downstream channel becomes sufficient to reduce the velocity, increase the flow depth, and cause a backwater effect at the Parshall flume. The standard flow tables must be corrected when the Submergence Ratio, H_b/H_a, expressed as a per cent, exceeds the following values:

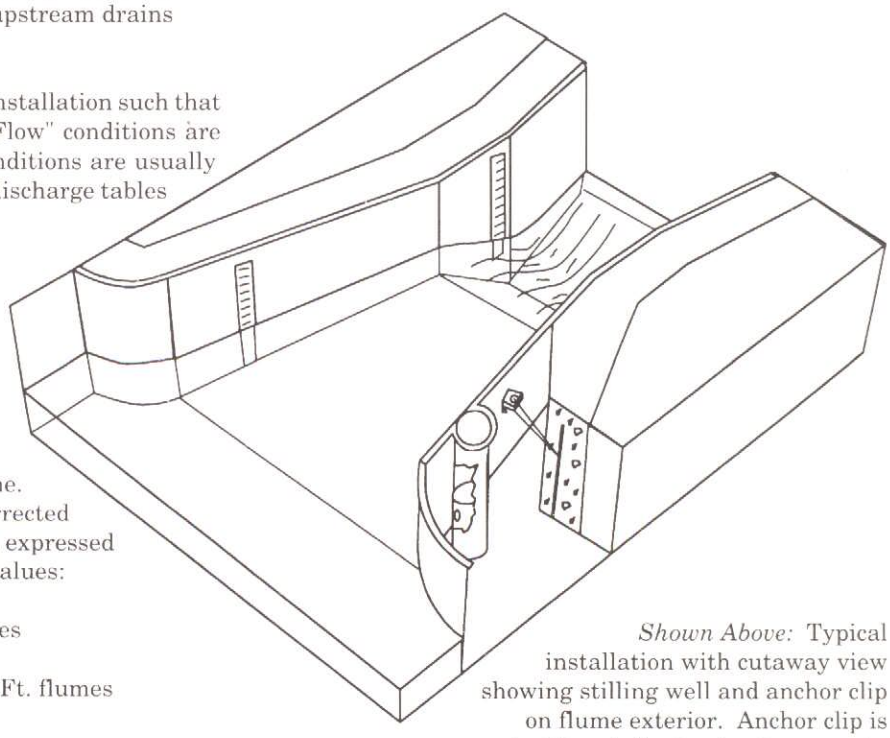
50% for 1", 2" & 3" flumes
60% for 6" & 9" flumes
70% for 1 Ft. through 8 Ft. flumes

Montana Flume Installation

When a Parshall flume is installed with a large fall downstream, which assures that submerged flow conditions will not occur, there is no need to construct the portion downstream of the throat. The truncated Parshall flume (without diverging section) has the same modular characteristics as the standard flume. The truncated flume is sometimes referred to as the "Montana Flume".

Parshall Flume Capacities

Throat Width	H_a Depth	Flow Rate		
Inches	Inches	GPM	MGD	Sec-Ft
1	10	114.3	.1646	.2547
2	10	228.7	.3293	.5095
3	18	834.6	1.201	1.859
6	18	1,754	2.526	3.909
9	24	3,978	5.729	8.865
12	30	7,241	10.42	16.13
18	30	11,021	15.87	24.56
24	30	14,953	21.38	33.10
36	30	22,618	32.56	50.40
48	30	30,482	43.89	67.92
60	30	38,425	55.33	85.62
72	30	46,431	66.86	103.5
84	30	54,484	78.46	121.4
96	30	62,607	90.15	139.5
120	36	102,506	147.6	228.4
144	54	232,805	335.2	518.7



Shown Above: Typical installation with cutaway view showing stilling well and anchor clip on flume exterior. Anchor clip is wired to reinforcing bar in concrete. Cutaway stilling well shows connecting port and water level.

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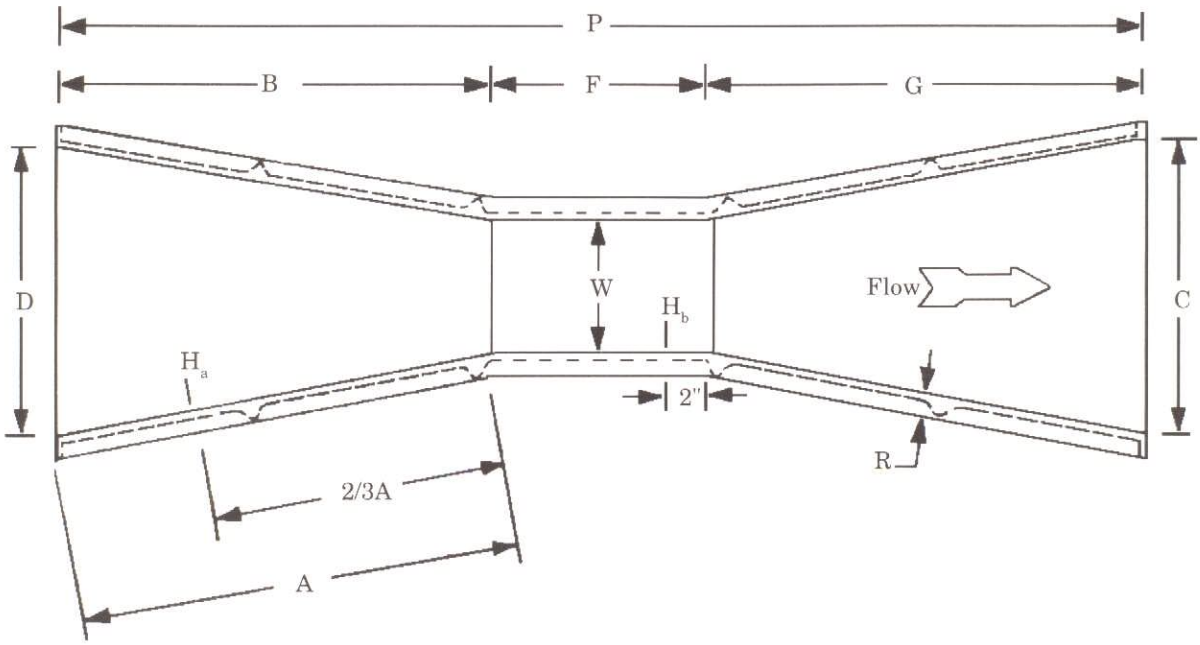
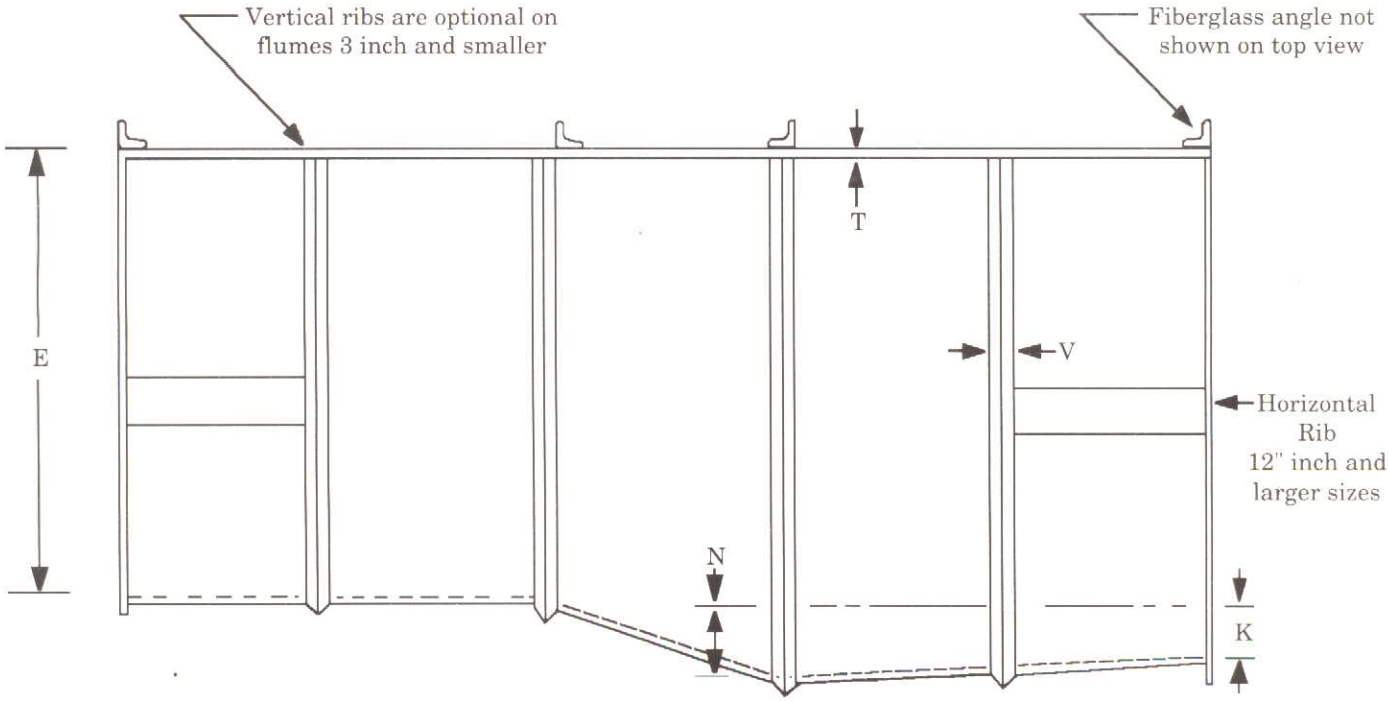
Free Flow Parshall Flume Dimensions





W	A	2/3-A	B	C	D	E	F	G	K	N	P	T	R	V
1	14-9/32	9-17/32	14	3-21/32	6-19/32	12	3	8	3/4	1-1/8	25	1/4	1-1/2	-
2	16-5/16	10-7/8	16	5-5/16	8-13/32	12	4-1/2	10	7/8	1-11/16	30-1/2	1/4	1-1/2	-
3	18-3/8	12-1/4	18	7	10-3/16	24	6	12	1	2-1/4	36	1/4	1-3/4	2
6	24-7/16	16-5/16	24	15-1/2	15-5/8	24	12	24	3	4-1/2	60	1/4	1-3/4	2-1/2
9	34-5/8	23-1/8	34	15	22-5/8	30	12	18	3	4-1/2	64	1/4	2-1/2	3
12	54	36	52-7/8	24	33-1/4	36	24	36	3	9	112-7/8	3/8	2-1/2	3
18	57	38	55-7/8	30	40-3/8	36	24	36	3	9	115-7/8	3/8	2-1/2	3
24	60	40	58-7/8	36	47-1/2	36	24	36	3	9	118-7/8	3/8	2-1/2	3
36	66	44	64-3/4	48	61-7/8	36	24	36	3	9	124-3/4	3/8	2-1/2	3
48	72	48	70-5/8	60	76-1/4	36	24	36	3	9	130-5/8	3/8	2-1/2	3
60	78	52	76-1/2	72	90-5/8	36	24	36	3	9	136-1/2	3/8	2-1/2	3
72	84	56	82-3/8	84	105	36	24	36	3	9	142-3/8	3/8	2-1/2	3

Dimensions in Inches