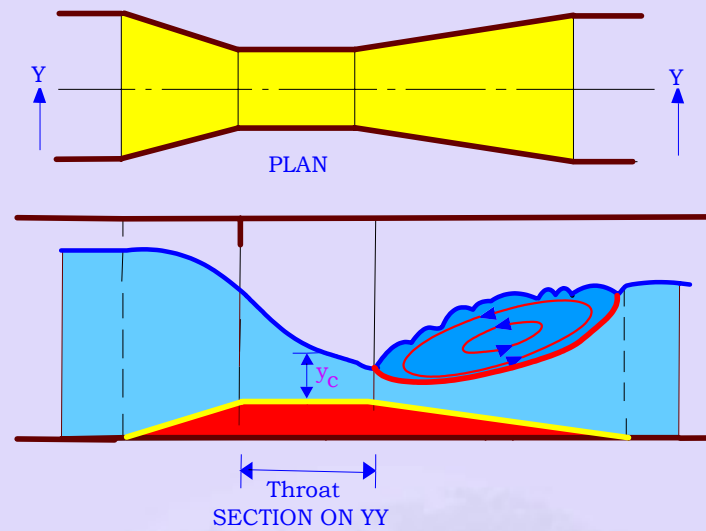


13.1 Measuring Flumes

Measuring flumes, on the contrary, introduce a width-wise contraction in the channel to achieve the same objective as weirs. Sometimes a small ramp hump on the bed may also be provided in the flume. A contracted weir of finite crest width and a measuring flume with a hump are not essentially different. These flumes are called 'Venturi Flumes', Sometimes these are referred to as Venturi Weirs too. For measurement of discharge with venturi flumes two measurements—one upstream and one at the throat (narrowest cross-section), are required, if the flow passes in a sub critical state through the flume. If the flumes are designed so as to pass the flow from sub critical to supercritical state while passing through the flume, a single measurement at the throat (which in this case becomes a critical section) is sufficient for computation of discharge. To ensure the occurrence of critical depth at the throat, the flumes are usually designed in such a way as to form a hydraulic jump on the downstream side of the structure. These flumes are called 'Standing Wave Flumes'.

It should be noted that the critical depth will not occur at a particular section of the measuring structure for all discharges. It moves upstream with increasing discharge and downstream with increasing boundary roughness for the given discharge. In order to get the critical depth at a predetermined section, several modifications of the venturi flume were incorporated. The developments of Parshall Flume and cut-throat flume (Fig 1.9 d) are the results of such studies.



STANDING WAVE FLUME

[Long throated flumes](#)

[Cut throat flumes](#)

[Parshall Flumes](#)

[H- Flumes](#)

[Throatless flumes with rounded transition](#)

