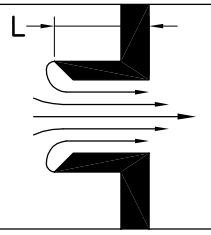
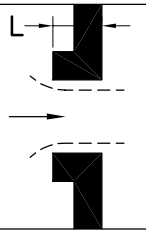
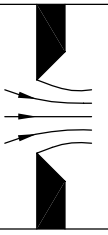
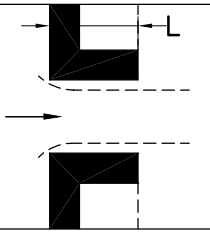
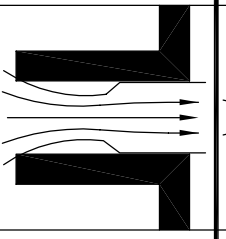
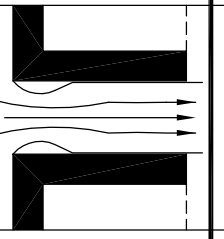
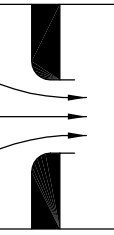
Metropolitan Water Reclamation District of Greater Chicago
Orifice Discharge Coefficients

For use in designing stormwater detention outflow control devices.

(For further information, request MWRD publication entitled *Recommendations for Design of Outflow Control Devices of Stormwater Detention Facilities, April 1978)*

Nominal Coefficients for Orifices (C)*						
	1		2		3	4	5
	Projecting Edge Sharp (Borda)	Re–Entrant Tube	Sharp Edge	Square Edge Thin Wall/Plate	Re–Entrant Tube	Short Tube Thick Wall/Plate	Rounded
							
C Coefficient	0.52		0.61		0.73	0.82	0.98
L Length	=1/2d to 1d		<2d		2 to 3d	2 to 3d	

* For use in orifice formula, $Q=CA\sqrt{2gh}$

where Q is discharge rate, $ft^3/sec.$

C is orifice discharge coefficient

A is orifice area, ft^2

g is acceleration due to gravity, 32.2 ft/sec^2

h is head (vertical distance, in feet) from water surface to center of orifice if outlet is unsubmerged; differential head if outlet is submerged.

Note: Short restrictor pipes installed in larger diameter pipes must be minimum 2 feet in length, grouted/cemented (non-shrink) in place over their entire length. Steel orifice plates must be securely installed (e.g. minimum (4) tack welded bolt heads or nuts embedded bolts or rods).