

# TREBLE R FABRICATIONS

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## CIRCULAR FLAP VALVES UPVC FRAME AND UPVC DOOR

The primary application of flap valves is for surface water drainage associated with rivers, estuaries and sea water outfalls to prevent reverse flow conditions. Flap valves can be utilised on final effluent outfalls for sewage treatment plant to prevent flood damage within the works.

The flap valves should be positioned on the outfall structure to avoid the build-up of debris around the invert area which could prevent the valve operating correctly. Sufficient 'fall away' should be provided between the invert of the flap valve and the base of the outfall structure.

Flap valve application on sea water outfalls should be given careful consideration due to turbulence of flow across the flap,

particularly when severe wave action is involved, resulting in dislocation of the flap relative to the seats. Wherever possible the flap valve should be located in a shielded position to minimise the effects of severe wave action.

In many cases the end user preference is a light duty door with a mechanical hinge to give maximum flow. The UPVC frame and UPVC door therefore satisfy this requirement giving a minimal cracking head and minimal head loss through the flap itself, during operation.



# CIRCULAR FLAP VALVES

CAT 4800-FV1

## **Circular Flap Valves**

### **UPVC Frame & UPVC Door**

#### **Operating Duty**

Application:	Prevents reverse flow
Type of Mounting:	Wall or PN16 Flanges
Type of Media:	Water and Sewage
Operating Head:	6 Metres on-seating

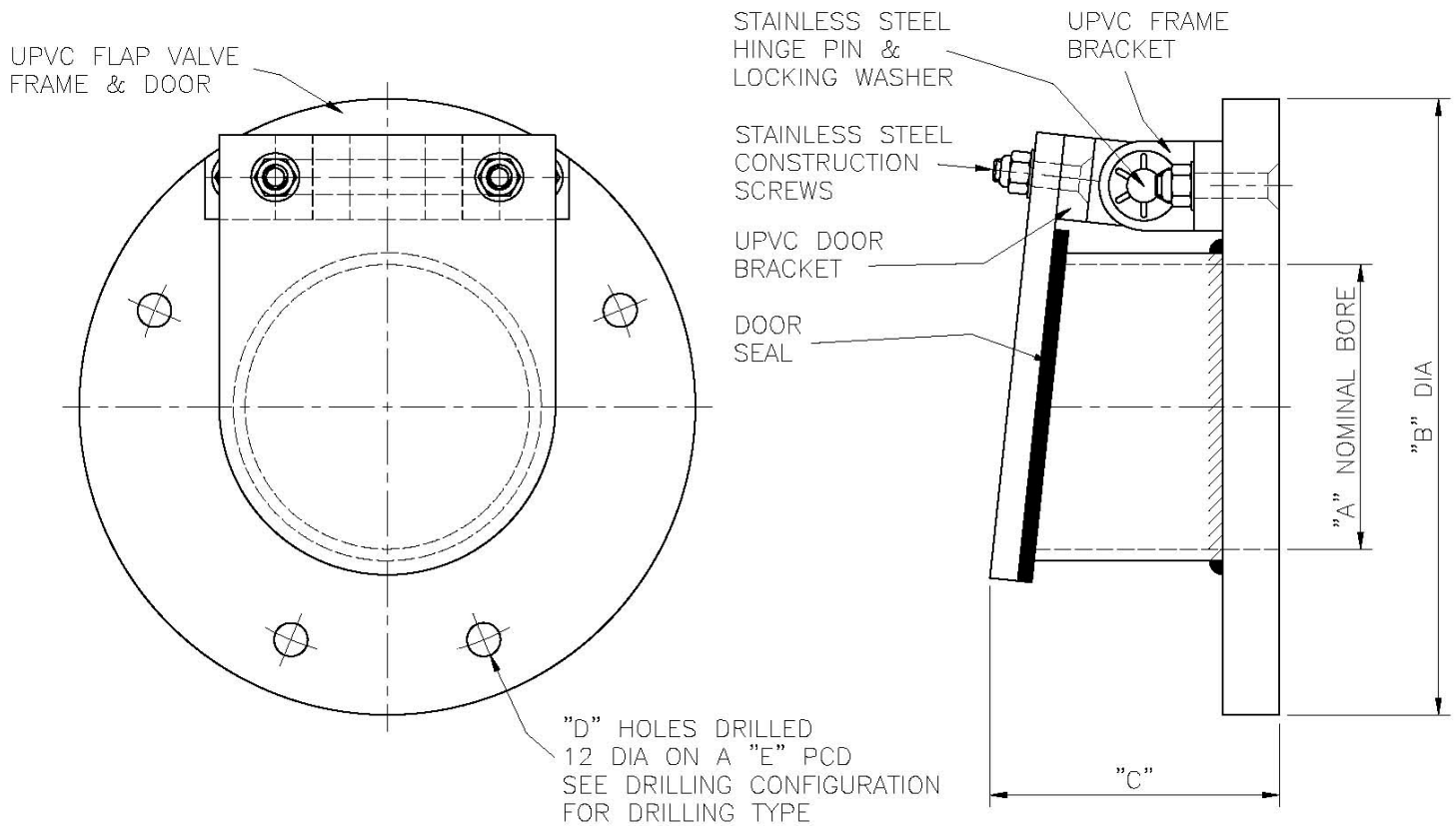
#### **Options**

Design Heads:	Higher head designs available
Size Range:	100mm to 600mm dia. Nominal bore

### **Construction Materials**

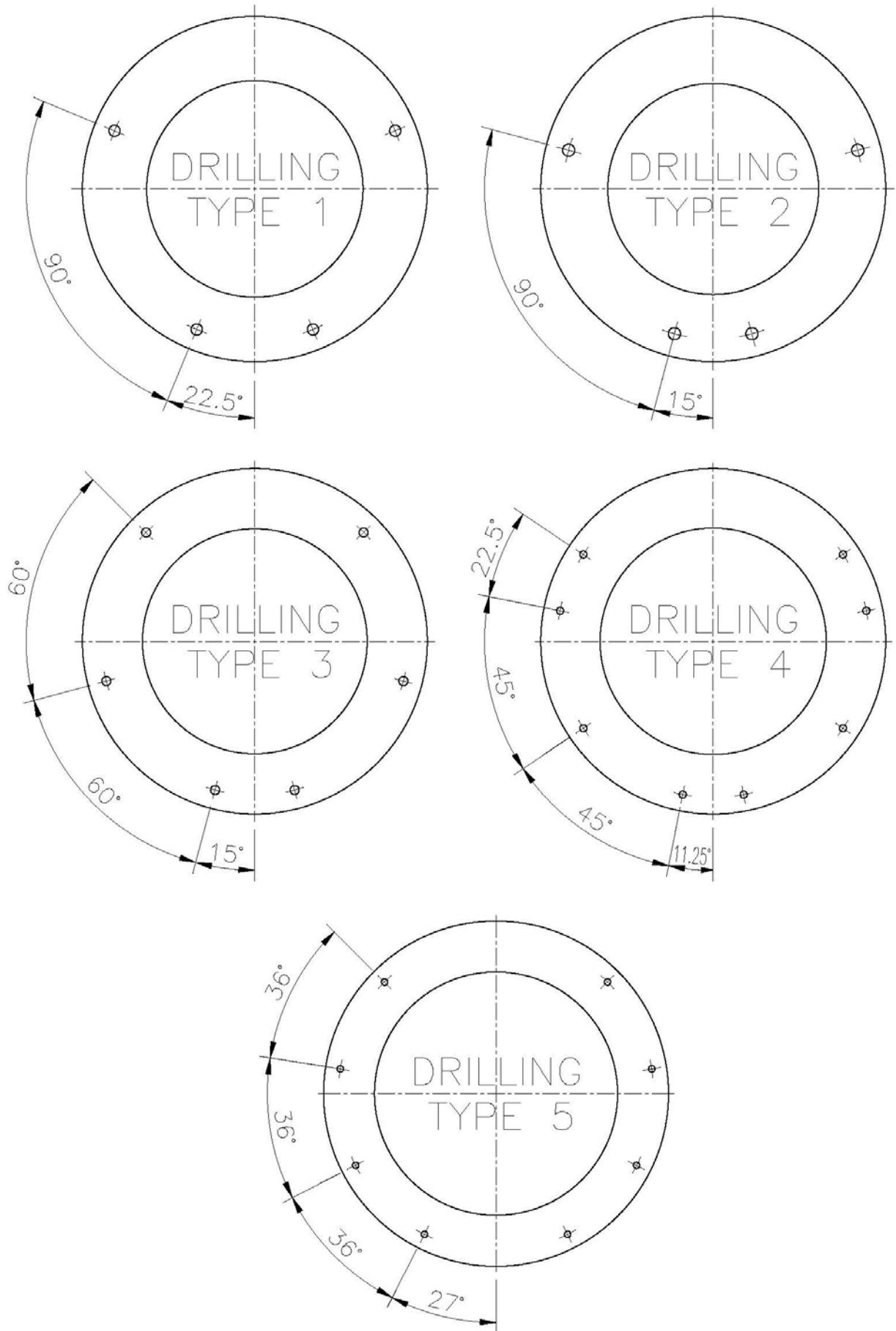
<u>ITEM</u>	<u>DESCRIPTION</u>	<u>MATERIAL</u>
1	Body	UPVC
2	Door	UPVC
3	Seal	Neoprene
4	Hinge	UPVC
5	Fasteners	Stainless Steel, BS 6105, Gr A4

# Circular Flap Valves UPVC Frame & UPVC Door



"A" BORE	"B"	"C"	"D"	"E"	DRILLING TYPE
80	200	101	4	160	1
100	220	103	4	180	1
150	285	109	4	240	1
200	340	115	4	295	2
225	368	118	4	324	1
250	405	121	6	355	3
300	460	125	6	410	3
350	520	129	8	470	4
400	580	134	8	525	4
450	640	142	8	585	5
500	715	147	8	650	5
600	840	158	8	770	5

**Circular Flap Valves**  
**UPVC Frame & UPVC Door**  
**Drilling Details**



## **LOSS OF HEAD THROUGH FLAP GATES**

Test conducted on flap gates show that the loss of head due to the flap riding on the water is very small compared with other losses in the hydraulic structure. Of course the entrance loss is usually considerably more critical than loss at the flap gate on the outlet end of conduit.

The hydraulic laboratory of the State University of Iowa conducted a series of test some years ago to determine the amount of head lost by water discharging through rectangular Flap Gates (Model 10C). The gates 16, 24 and 30 inches in diameter were supplied from commercial stock.

The following passage is excerpted from the report of Professor Floyd A. Nagler, associate professor of Mechanics and Hydraulics, who supervised the investigation.

Based on these experiments the following empirical formula was derived to express the loss in head through rectangular gates of varying sizes and with different velocities of flow.

**L** - Loss of head in feet

**V** - Velocity of flow through gate in feet per second

**D** - Diameter of outlet in feet

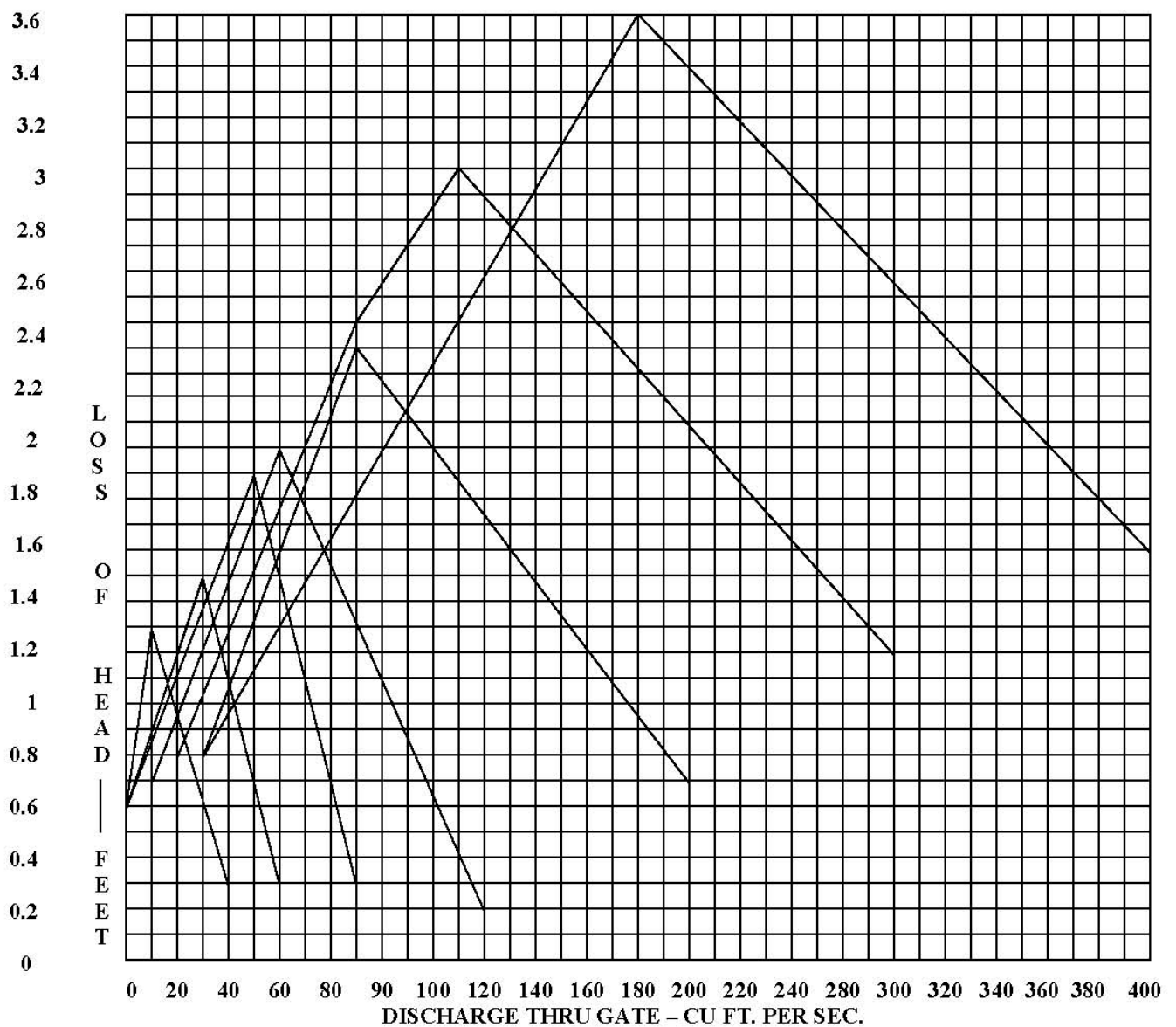
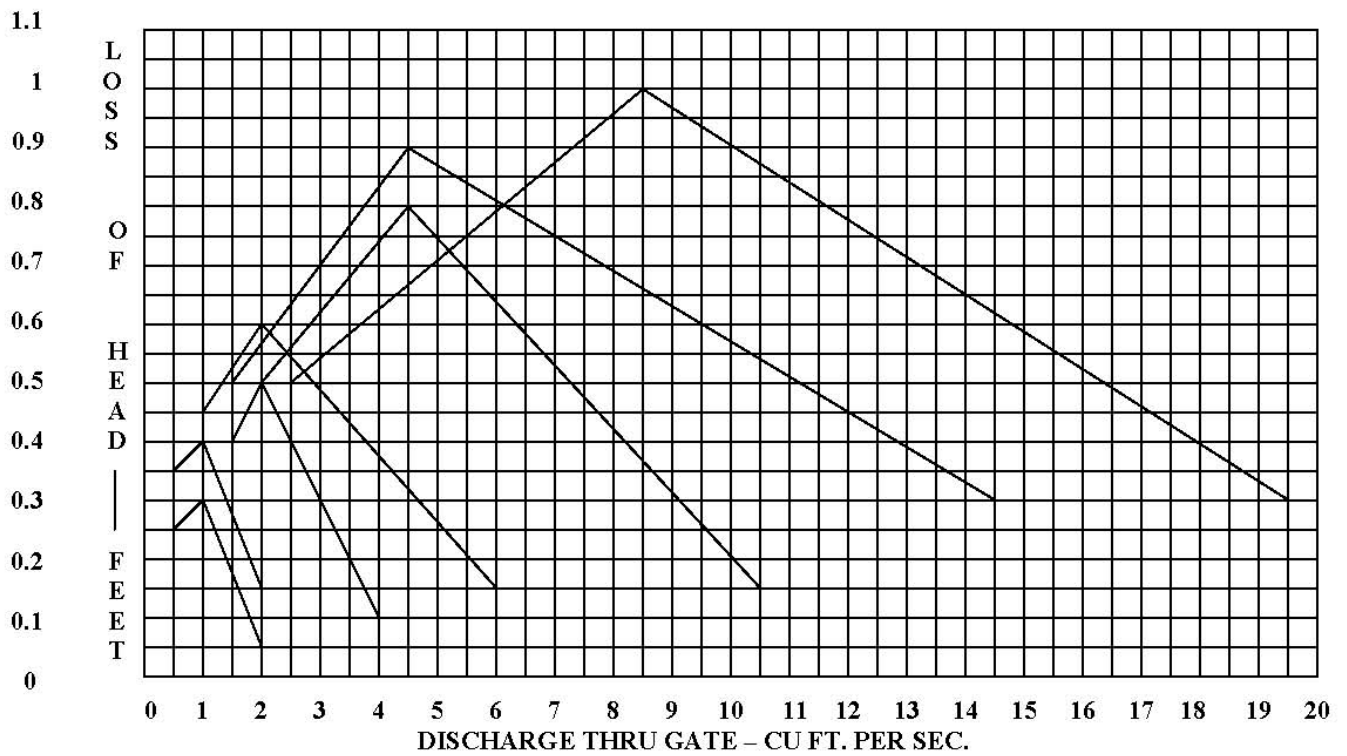
**E** - Base of natural logarithms.(2.7183)

$$L = \frac{4V^2}{G} \times E \left[ \frac{-1.15V}{\oplus D} \right]$$

It may be concluded from these experiments that the rectangular gate in its hydraulic characteristics is all that the manufacturers have claimed for it. The small loss in head obtained through these gates demonstrates that their installation has but little effect on the discharged capacity of drainage outlets.

Medium and heavy duty flap gates have heavier flaps or covers than the gate model tested. As a result, head losses through these gates may be slightly more than those indicated by the test.

# LOSS OF HEAD THROUGH FLAP GATES



**Circular Flap Valves**  
**UPVC Frame & UPVC Door**  
**Cracking Head & Head Loss Chart**

Diameter	Cracking Head (mm)	Head Loss (mm)
100	20	(83)
150	22	(86)
200	26	(89)
225	27	(90)
250	28	(90)
300	29	(93)
350	30	(94)
400	48	(112)
450	50	(114)
500	52	(116)
600	57	(124)

Head loss based on velocity = 2.045 m/s and acceleration due to gravity = 9.81 m/s<sup>2</sup>