

# TREBLE R FABRICATIONS

UNIT 42 – CROSSGATE ROAD – PARK FARM INDUSTRIAL ESTATE – REDDITCH – WORCS – B987SN

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## RECTANGULAR/SQUARE FLAP VALVES

### STEEL FRAME AND STEEL 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 heavy duty door with a mechanical hinge to give maximum flow. The steel frame and steel door therefore satisfies this requirement giving a reasonable cracking head and low head loss through the flap itself, during operation. Subject to the clients needs and environmental conditions the selection of material can be mixed. The material available for this design is galvanised mild steel, painted mild steel and 304 / 316 grade stainless steel



RECTANGULAR FLAP VALVES

## **Rectangular/Square Flap Valves** **Steel Frame & Steel Door**

### **Operating Duty**

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

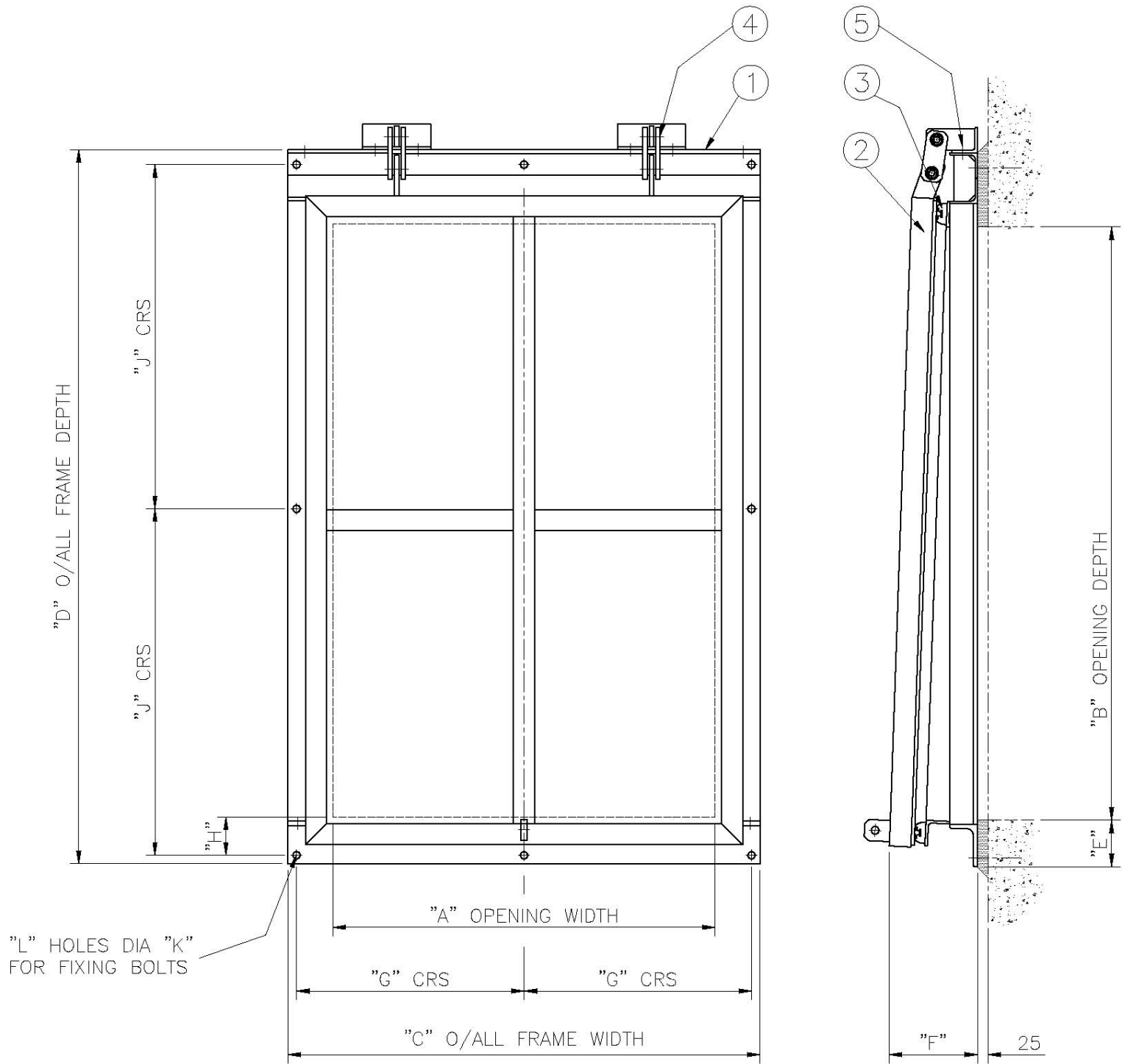
### **Options**

Design Heads:	Higher head designs available
Size Range:	Any size from 400mm to 2000mm in square or rectangular format
Extra's	Counter balanced doors

### **Construction Materials**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>MATERIAL</u>
1	Frame	Mild Steel, BS 4360 Gr 43A Stainless Steel, BS 970 Gr 304 Stainless Steel, BS 970 Gr 316
2	Door	Mild Steel, BS 4360 Gr 43A Stainless Steel, BS 970 Gr 304 Stainless Steel, BS 970 Gr 316
3	Seals	Neoprene
4	Hinge Pins	Stainless Steel, BS 970 Gr 316
5	Fasteners	Stainless Steel, BS 6105, Gr A4

# Rectangular/Square Flap Valves Steel Frame & Steel Door



**Rectangular/Square Flap Valves**  
**Steel Frame & Steel Door**

**Dimensions : See Dimensional Drawing**

<b>Range</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>
<b>A</b>	<b>Width</b>	<b>Width</b>	<b>Width</b>
<b>B</b>	<b>Depth</b>	<b>Depth</b>	<b>Depth</b>
<b>C</b>	<b>A + 212</b>	<b>A + 270</b>	<b>A + 320</b>
<b>D</b>	<b>B + 295</b>	<b>B + 352</b>	<b>B + 377</b>
<b>E</b>	<b>100</b>	<b>125</b>	<b>150</b>
<b>F</b>	<b>270</b>	<b>275</b>	<b>320</b>
<b>G/J</b>	<b>SUBJECT TO SIZE SELECTION</b>		
<b>H</b>	<b>80</b>	<b>95</b>	<b>120</b>
<b>K</b>	<b>17</b>	<b>17</b>	<b>17</b>
<b>L</b>	<b>8</b>	<b>12</b>	<b>16</b>

## 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

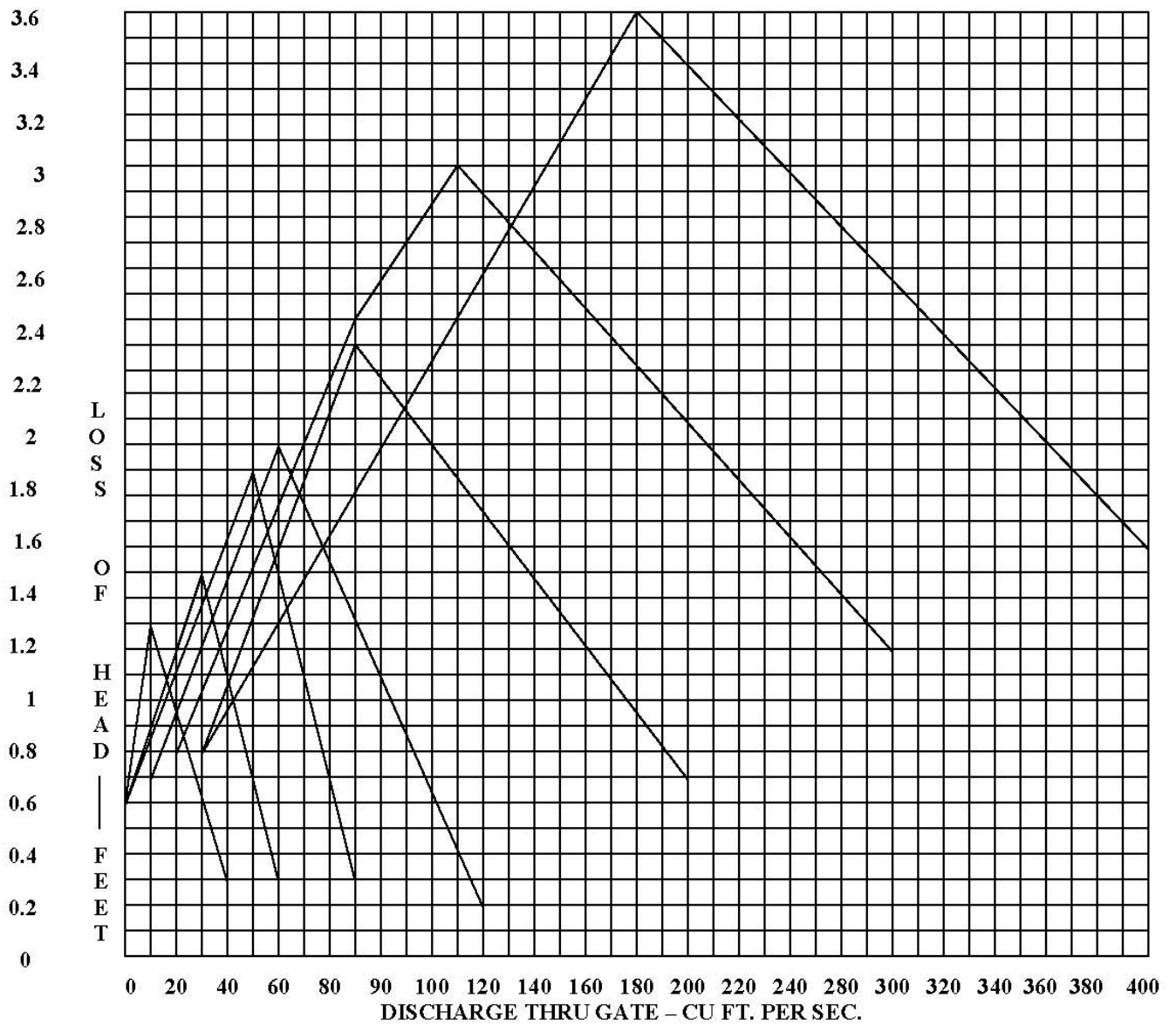
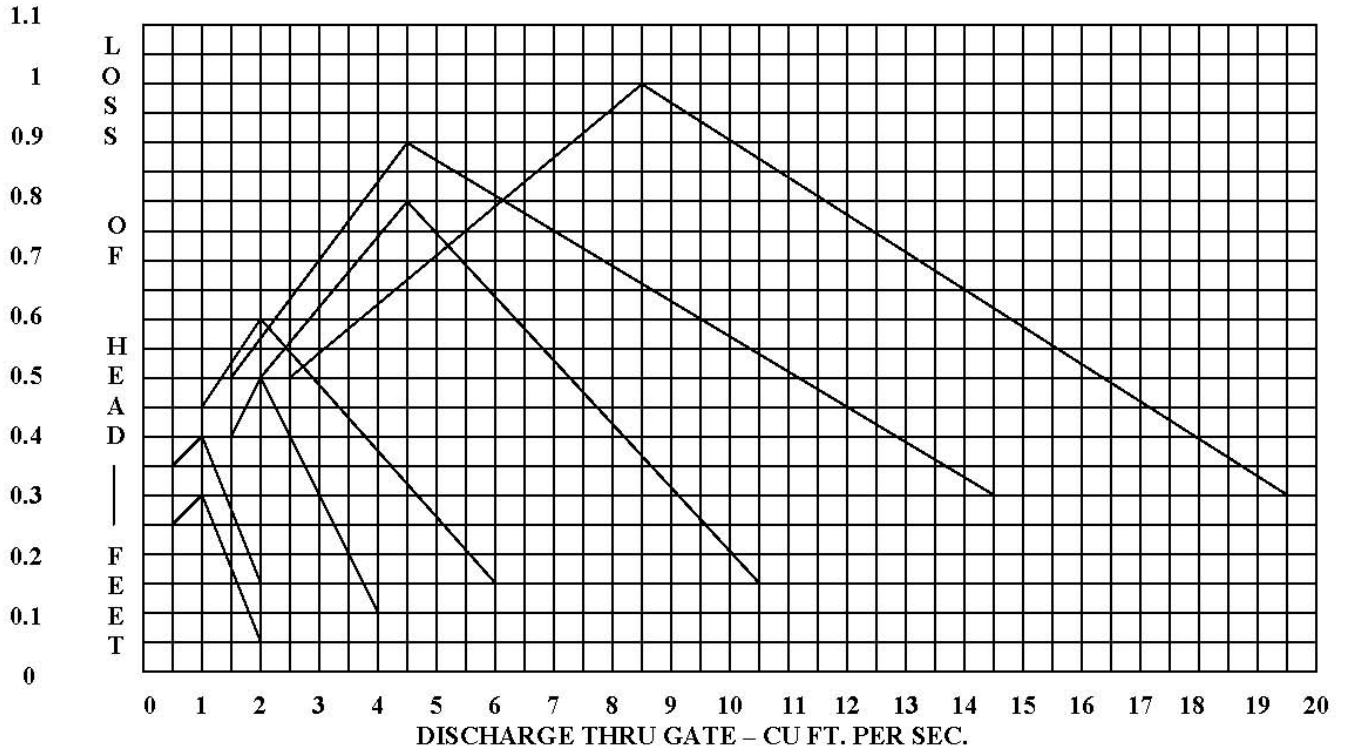
**E** - Base of natural logarithms.(2.7183)

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

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.

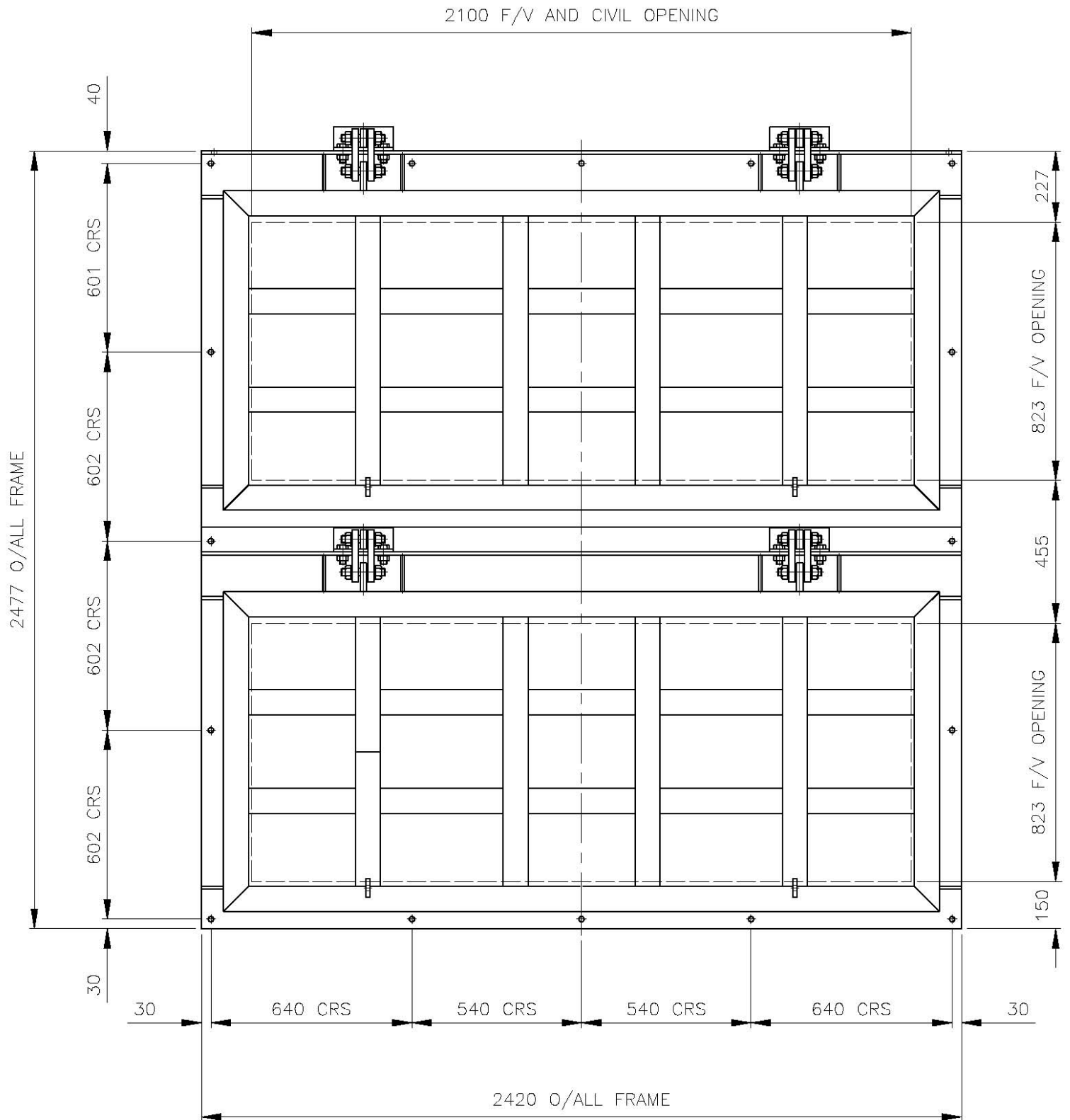
# LOSS OF HEAD THROUGH FLAP GATES



**Rectangular/Square Flap Valves**  
**Steel Frame & Steel Door**

<b>WIDTH</b>	<b>DEPTH</b>	<b>CRACKING HEAD(mm)</b>	<b>HEAD LOSS(mm)</b>
<b>500</b>	<b>500</b>	<b>31</b>	<b>95</b>
<b>600</b>	<b>600</b>	<b>56</b>	<b>103</b>
<b>700</b>	<b>700</b>	<b>64</b>	<b>110</b>
<b>800</b>	<b>800</b>	<b>69</b>	<b>113</b>
<b>900</b>	<b>900</b>	<b>73</b>	<b>115</b>
<b>1000</b>	<b>1000</b>	<b>90</b>	<b>127</b>
<b>1100</b>	<b>1100</b>	<b>93</b>	<b>130</b>
<b>1200</b>	<b>1200</b>	<b>96</b>	<b>132</b>
<b>1300</b>	<b>1300</b>	<b>98</b>	<b>134</b>
<b>1400</b>	<b>1400</b>	<b>99</b>	<b>135</b>
<b>1500</b>	<b>1500</b>	<b>101</b>	<b>136</b>
<b>1600</b>	<b>1600</b>	<b>109</b>	<b>141</b>
<b>1700</b>	<b>1700</b>	<b>119</b>	<b>148</b>
<b>1800</b>	<b>1800</b>	<b>126</b>	<b>153</b>
<b>1900</b>	<b>1900</b>	<b>133</b>	<b>158</b>
<b>2000</b>	<b>2000</b>	<b>138</b>	<b>162</b>

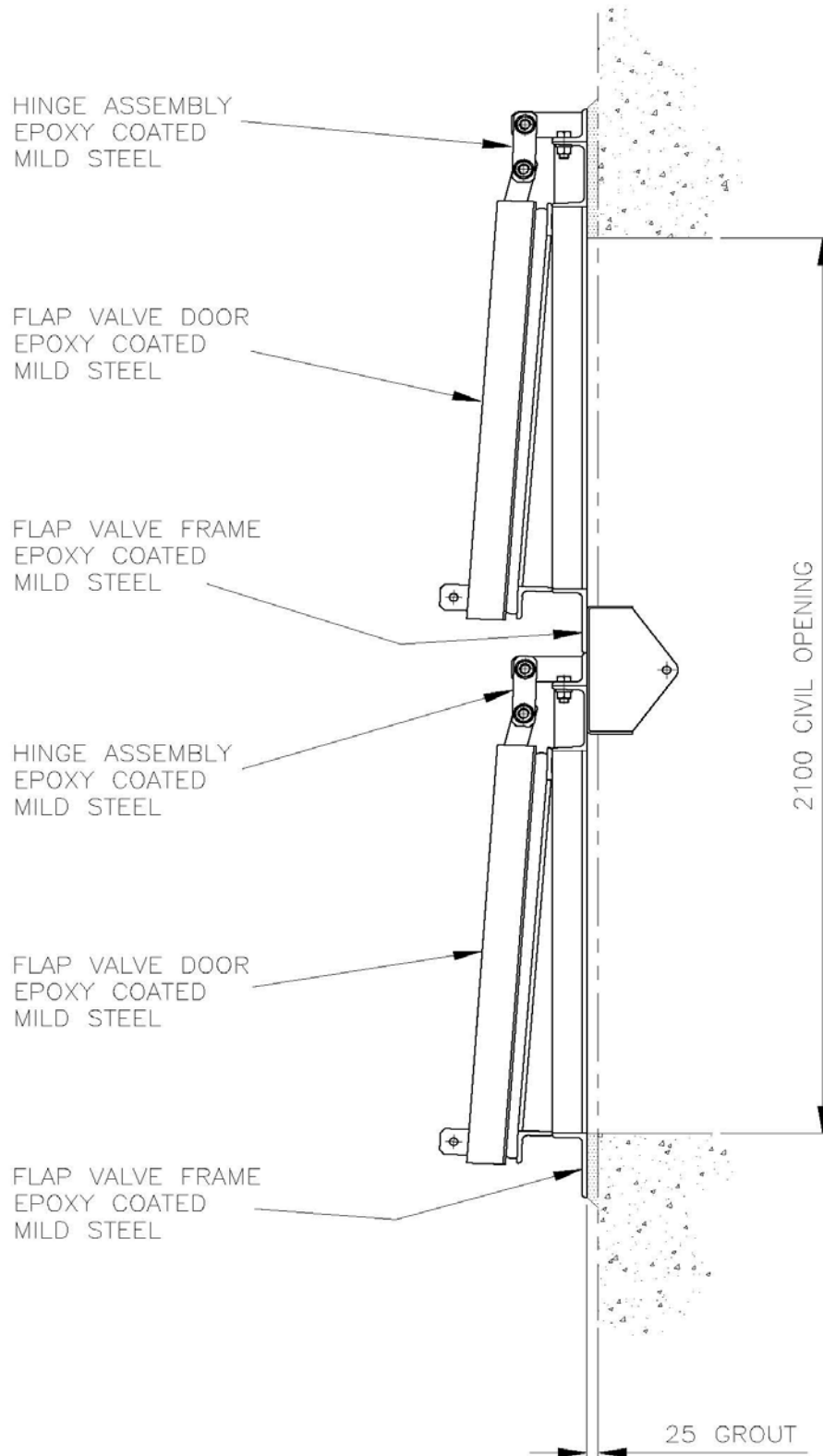
# RECTANGULAR FLAP VALVE STEEL FRAME AND STEEL DOOR



Typical Drawing only of a Rectangular  
Fabricated Flap Valve Double Door Type.  
Painted Mild Steel Frame and Door.  
Size 2100 x 2100



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