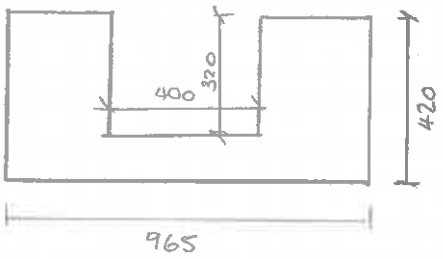
The Coal Authority 200 Lichfield Lane, Mansfield NG18 4RG	Project Name: JUNKIES ADIT		Project Ref: ENV OPS STS MUM (DECC)
	Design Element: CHANNEL FLOW CALC		Page: of:
	Calc. by: PJS Date: 19/08/15	Chk'd by: Date:	App'd by: Date:

USING BS ISO 1438:2008

DIAGRAM SCALE 1:20



MEASURED WATER DEPTH 130 - 140mm ABOVE BASE OF NOTCH

$b = 400$ $P = 100$
$B = 965$ $h = 135$

$\frac{b}{B} = \frac{400}{965} = 0.415$ ✓

$\frac{h}{P} = \frac{135}{100} = 1.35$ ✓

using $Q = C_d \frac{2}{3} b_e \sqrt{2g}\, h_e^{3/2}$

C_b ⇒ figure 4 (BS ISO 1438:2008) ⇒ $a = 0.591$; $a' = 0.0064$

$C_d = 0.591 + 0.0064 \times \frac{h}{P}$ ⇒ $C_d = 0.6$ ✓

take k_h as 0.001m ; $k_b = 2.77$

$b_e = b + k_b$ ⇒ $0.4 + 0.003 = 0.403m$

$h_e = h + k_h$ ⇒ $0.135 + 0.001 = 0.136m$

⇒ $Q = 0.6 \times \frac{2}{3} \times 0.403 \times \sqrt{2 \times 9.81} \times 0.136^{3/2}$

$= 0.036 m^3/s$ or 36 l/s

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Project Name: JUNKIE ADIT			Project Ref: ENVOPS STS MMM (NCC)
Design Element: WEIR PLATE MAX CAPACITY			Page: of:
Calc. by: PJS	Date: 19/08/15	Chk'd by:	Date: App'd by: Date:

Assume $h = 310mm$

$b = 400$ $P = 100$ $\frac{b}{B} = 0.415$; $\frac{h}{P} = 3.1$

$B = 965$ $h = 310$

using $Q = Cd \frac{2}{3} be \sqrt{2g}\, he^{3/2}$

$C_d \Rightarrow a = 0.591$ $a = 0.0064$

$Cd = 0.591 + 0.0064 \times 3.1 = 0.61$

take k_h as $0.001m$; $k_b = 2.77mm$

$be = 0.4 + 0.003 = 0.403m$

$he = 0.31 + 0001 = 0.311m$

$Q = 0.6 \times \frac{2}{3} \times 0.403 \times \sqrt{2 \times 9.81} \times 0.311^{3/2}$

$Q = 0.124 m^3/s$ or $124 L/s$

∴ DESIGN NEW WEIR PLATE TO INCREASE CAPACITY TO CIRCA 200L/s

The Coal Authority
200 Lichfield Lane, Mansfield
NG18 4RG

Project Name: Junkies Adit			Project Ref:
Design Element: Channel flow Calc			Page: of:
Calc. by: PJS	Date: 11/9/15	Chk'd by: Date:	App'd by: Date:

Junkies

$$Q = C_d \tfrac{2}{3} \sqrt{2g}\, b_e h_e^{3/2}$$

$b = 400$ $B = 965$ $\frac{b}{B} = 0.415$

$P = 100$ $h = 150$ $\frac{h}{P} = \frac{150}{100} = 1.5$

$C_d \Rightarrow$ Figure 4 (BS ISO 1438: 2008)

$\Rightarrow a = 0.591$ $a' = 0.0064$

$C_d = 0.591 + 0.0064 \times 1.5 \Rightarrow C_d = 0.6$

take k_h as 0.001m $\therefore k_b = 2.77$

$b_e = b + k_b = 0.4 + 0.003 = 0.403m$

$h_e = h + k_h = 0.15 + 0.001 = 0.151m$

$0.6 \times \frac{2}{3} \sqrt{2 \times 981} \times 0.403 \times 0.151^{3/2} = 0.042 m/s$

or 42 l/s

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Project Name: Junkies Addt		Project Ref:
Design Element: CHANNEL FLOW CALC		Page: of:
Calc. by: PJS Date: 26/11/15	Chk'd by: Date:	App'd by: Date:

flow depth measured at 156mm

$$Q = C_d \frac{2}{3}\sqrt{2g}\, b_e h_e^{3/2}$$

$b = 400$ $B = 965$ $\frac{D}{B} = 0.415$ $P = 100$ $h = 156$ $\frac{h}{P} = \frac{156}{100} = 1.56$

$C_d \Rightarrow$ figure 4 (BS ISO 1438:2008)

$\Rightarrow a = 0.591$ $a' = 0.0004$

$C_d = 0.591 + 0.0004 \times 1.5 \Rightarrow C_d = 0.6$

take K_h as 0.001m ; $K_b = 2.77$

$b_e = b + K_b = 0.4 + 0.003 = 0.403$m

$h_e = h + K_h = 0.156 + 0.001 = 0.157$m

$0.6 \times \frac{2}{3}\sqrt{2 \times 9.81} \times 0.403 \times 0.156^{3/2} = 0.06399$

$= 66$ l/s