Project:	24-451
Type of Calculation:	Radial & Planar Confined Aquifer Dewatering Flow Rate Estimates
Prepared by:	MAW
Checked by:	DW
Date:	13/01/2025

Calculation Details			
Ground level (mAOD)	0.0	0.0	0.0
Length of Excavation (m)	10.5	10.5	10.5
Width of Excavation (m)	10.5	10.5	10.5
Initial Groundwater Level (mAOD)	-0.7	-0.7	-0.7
Target Groundwater Level (mAOD)	-4.8	-4.8	-4.8
Drawdown (m)	4.10	4.10	4.10
Strata being Dewatered	**Alluvium Sand & Gravel**		
Permeability Range of Dewatered Strata (m/s)	7.38E-04	5.33E-03	6.80E-03
Top of Aquifer (mAOD)	-2.3	-2.3	-2.3
Base of Aquifer (mAOD)	-4.8	-4.8	-4.8
Thickness of Aquifer (m)	2.50	2.50	2.50

Partial penetration factors used in analyses	
Dewatering Well Penetration into Aquifer (P) (m)	2.80
P/H	0.68
P/D	1.12
Lamda	0.01
B	0.99

Planar Flow to the Excavation from Both Sides			
H (m)	4.10	4.10	4.10
hw	0	0	0
(H-hw)	4.10	4.10	4.10
Distance of Influence (Lo by Sichardt Formula)	194.92	523.82	591.67
Total Estimated Dewatering Flow Rate (l/s)	0.81	2.19	2.47
Total Estimated Dewatering Flow Rate (m3/day)	70	189	214
Radial Flow to The Excavation from Both Ends			
Radius of Equivalent Well re (m)	5.25	5.25	5.25
Distance of Influence (Ro by Sichardt Formula)	339.39	903.23	1019.53
Total Estimated Dewatering Flow Rate (l/s)	11.31	66.16	82.47
Total Estimated Dewatering Flow Rate (m3/day)	977	5716	7125

Estimated Required Dewatering Flow Rates			
Total Estimated Dewatering Flow Rate (l/s)	**12.1**	**68.4**	**84.9**
Total Estimated Dewatering Flow Rate (m3/day)	**1047.7**	**5905.6**	**7339.0**

NOTES ON CALCULATIONS:

Calculations are undertaken in accordance with CIRIA C750 Groundwater control: design and practice, second edition (2016).

Radial Confined calculations undertaken as per :

Radius of Equivalent Well (CIRIA C750 Equation 6.6)

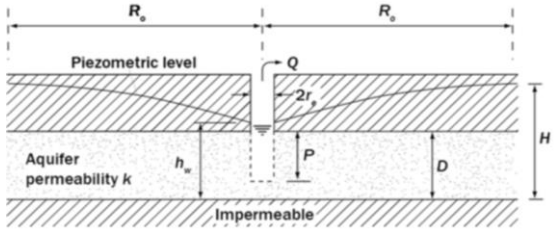
$$r_e = (a + b)/\pi$$

Confined conditions: $Q = \frac{2\pi kD(H - h_w)}{\ln[R_o/r_e]}$

Partial Penetration Factor (CIRIA C750 6.7 and 6.10)

$$Q_{pp} = BQ_{fp}$$

Radial flow: $R_o = C(H - h_w)\sqrt{(k)}$



Extracted from CIRIA C750 (Figure 6.8 A)