

Proposed Gabion Retaining Wall at: 25, Heol Corn Ddu, Beacon Heights Merthyr Tydfil	Apr-21
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Ref	Calculations	Output
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	Weight of Soil =	16 Kg/m ³	
	Weight of Stone Fill =	19 Kg/m ³	
	Weight of Concrete =		
	Height of Retaining Wall =	2.00 m	
	Horizontal Thrust Pa =	gh	
	Pa =	8.67 Kn/lin m	
	Rankines Coefficient (Ka) =	$\frac{1 - \sin \theta}{1 + \sin \theta}$	
	Where $\theta =$	35 °	Tan35° = 0.70
	K _A =	0.271	
	Active Pressure P _A =	0.50 K _A gh ²	
	At Section 1-1 P _A =	2.17 Kn/m ²	
	At Section 2-2 P _A =	10.30 Kn/m ²	
	Basket Density (80% of full) =	15.20 Kn/m ²	Ø
	<u>Overturning Moment at Section 1-1</u>		
	=	2.17 x 0.333	
	=	0.72 Knm	0.72 Knm

Balancing Moments about pivot 'A'

<u>Stone</u>	1.000	x	1.00	x	15.20	=	Kn	x	0.500	=	Knm
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Therefore

Factor of Safety (Overturning) = **10.52** **Satisfactory**

Overturning Moment at Section 2-2

$$\begin{aligned} &= 10.30 \times 0.667 \\ &= 6.87 \text{ Knm} \end{aligned}$$

6.87 Knm

Balancing Moments about pivot 'A'

$$\begin{array}{l} \text{Stone} \\ 2.000 \times 1.00 \times 15.20 = 30.40 \times 1.000 = 30.400 \end{array} \quad \begin{array}{l} \text{Kn} \\ \text{Knm} \end{array}$$

Therefore

Factor of Safety (Overturning) =

4.43

Satisfactory

Check Sliding

$$\begin{aligned} R_s &= W \times 2/3 \tan \theta \\ &= \underline{14.19} \text{ Kn} \end{aligned}$$

Factor of Safety against Sliding =

7.09

Satisfactory

Ground Bearing Pressure

Assumed GBP taken as **150 Kn/m²**

$$P = \frac{R}{b} \pm \frac{M}{z}$$

Where:

$$b = 1.00 \text{ m}$$

$$d = 2.00 \text{ m}$$

and

$$z = d^2 / 6 = 0.667 \text{ m}^2$$

$$\begin{aligned} P_{max} &= 30.40 + 10.30 \\ &= \underline{40.70} \text{ Kn/m}^2 \end{aligned}$$

$$\begin{aligned} P_{min} &= 30.40 - 10.30 \\ &= \underline{20.10} \text{ Kn/m}^2 \end{aligned}$$

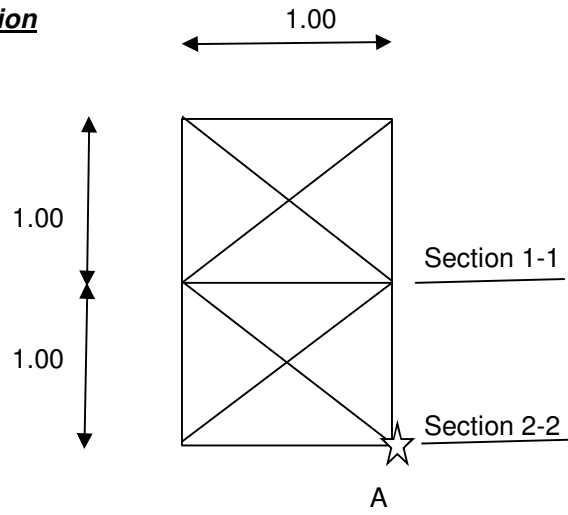
Factor of Safety = **3.69**

Satisfactory

Summary

The 'Gabion' baskets are to be positioned in brick bond ie no straight vertical joints.
If, during construction any soft spots are evident, these should be removed and filled
suitable hardcore compacted in 150mm thick layers.
Baskets to be hand-filled with clean stone.

Gabion Wall Section



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