

2 CARN GWILYM GOCH
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GABION RETAINING WALL

STRUCTUAL CALCULATIONS

PROJECT NO. 1809-5

APRIL 2023

**STEVENSON CALAM
ASSOCIATES**

Consulting Engineers

Ref

Calculation

Comments

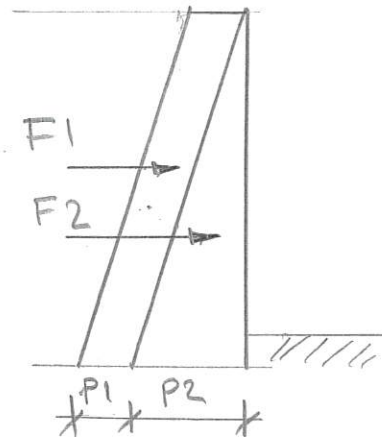
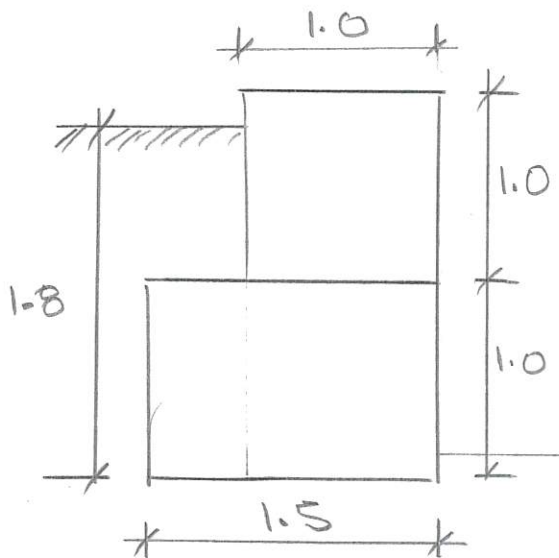
1.0

PROPOSALS.

These calculations consider the stability of a 1.8m high retaining wall constructed using stone filled Gabion Baskets.

2.0

LAYOUT



3.0

LOADINGS

Assume soil with a density of 18 kN/m^2

$$K_a = \frac{1 - \sin \theta}{1 + \sin \theta} = 0.33.$$

surcharge for domestic traffic loading = 5.0 kN/m^2

Ref Calculation

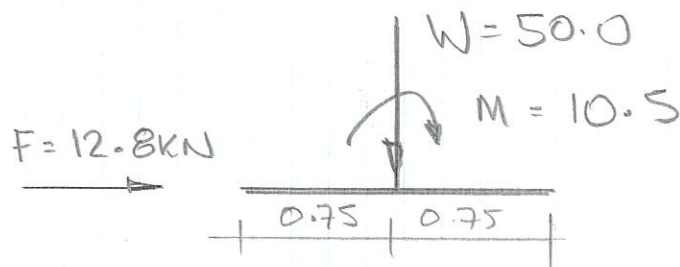
$$\begin{aligned}
 P1 &= 0.33 \times 5.0 &= 1.7 \\
 P2 &= 0.33 \times 18 \times 1.8 &= 10.7 \\
 \Sigma P &= 12.4 \text{ kN/m}^2
 \end{aligned}$$

$$\begin{aligned}
 F1 &= 1.7 \times 1.8 &= 3.1 \\
 F2 &= 10.7 \times 1.8 / 2 &= 9.7 \\
 \Sigma F &= 12.8 \text{ kN}
 \end{aligned}$$

$$\begin{aligned}
 M1 &= 3.1 \times 1.8 / 2 &= 2.8 \\
 M2 &= 12.8 \times 1.8 / 3 &= 7.7 \\
 \Sigma M &= 10.5 \text{ kNm}
 \end{aligned}$$

4.0 GABION BASKETS

sw baskets filled with stone
 $= 20.0 (1.0 \times 1.0 + 1.0 \times 1.5) = 50 \text{ kN}$



$$e = \frac{M}{W} = \frac{10.5}{50.0} = 0.21$$

1809-5

03

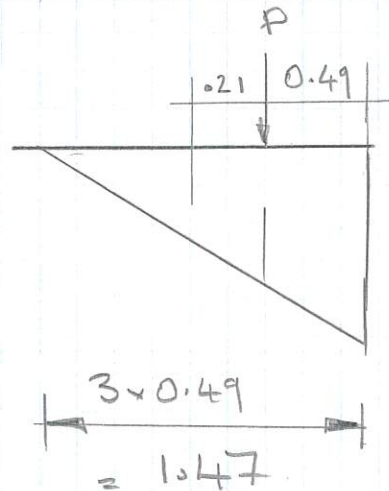
APRIL 23

GS

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Ref

Calculation



P_{max} (MAX PRESSURE ON
STONE STRATA)

$$P_{max} = \frac{50 \times 2}{1.47} = 68 \text{ kN/m}^2 - \text{OK}$$

$$\text{Max horizontal load} = 12.8 \text{ kN}$$

Assuming coefficient of friction = 0.40

Factor of Safety against sliding

$$= \frac{0.4 \times 50}{12.8} = 1.6 - \text{OK}$$