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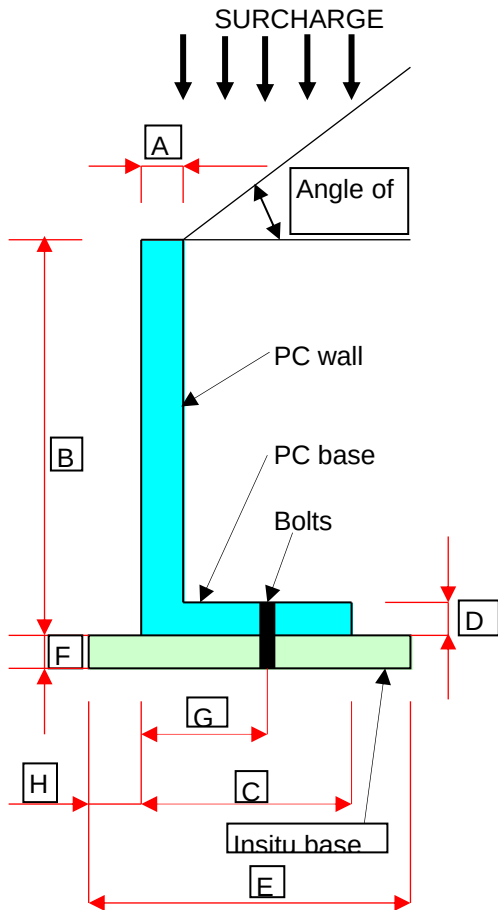
Design of **Rocwall** precast concrete wall

Client: Jones Brothers(Henllan)

File Ref: KQ/03/21/135

Job Title: Meadow Road, Neath - 3.4m High Rocwall Panel

Date: 27/01/2022



INPUT

INPUT	Overall length of wall	1.2 m
INPUT	Angle of slope of excavation	60 Degrees
INPUT	Angle of slope	0 Degrees
INPUT	Surcharge	10 kN/m ²
INPUT	Allowable GBP	150 kN/m ²
INPUT A	Thickness of PC wall	0.225 m
INPUT B	Height of PC wall	3.400 m
INPUT C	Width of PC base	0.650 m
INPUT D	Thickness of PC base	0.300 m
INPUT E	Width of insitu base	2.850 m
INPUT F	Thickness of insitu base	0.300 m
INPUT G	Bolt distance	0.500 m
INPUT H	Wall distance	0.400 m
INPUT	Number of Selfix bolts	3 number
INPUT	Number of Fosroc bolts	0 number

SUMMARY

FOS O/T =	5.7 (MIN=1.6)
FOS SLIDING=	2.3 (MIN=1.6)
GBP =	71 kN/m ²
Bolt factor =	1.1 (MAX=1.4)

APPROXIMATE QUANTITIES

Number of PC units =	1 Number
Weight of each PC wall =	21.42 kN
Volume of insitu concrete =	1.026 m ³
Volume of fill =	14.5 m ³
Number of bolts =	2

PC RETAINING WALL TYPE A

PARAMETERS

Existing ground condition	GRANULAR
Thickness of PC wall	0.225 m
Height of PC wall	3.4 m
Width of PC base	0.65 m
Thickness of PC base	0.3 m
Width of insitu base	2.85 m
Thickness of insitu base	0.3 m
Angle of slope	0 degrees
Surcharge	10 kN/m ²
Bolt distance	0.5 m
Wall distance	0.4 m

WALL

SIN A	0.57357644
(SIN^2)A	0.32898993
SIN 2A	0.93969262
TAN B	0
ALPHA	0.57357644
K	0.271

Earth pressures on insitu base

Maximum pressure =	18.0 kN/m ²
Horizontal force =	33.4 kN
Overturning moment on insitu base =	41.2 kNm

Surcharge pressures on insitu base

Maximum pressure =	2.7 kN/m ²
Horizontal force =	10.0 kN
Overturning moment on insitu base =	18.5 kNm

Total loads on insitu base

Total horizontal force on insitu base =	43.4 kN
Total moment on insitu base =	59.7 kNm

	weight(kN)	lever arm(m)	MR(kNm)
PC wall	16.740	0.513	8.6
PC base	4.680	0.725	3.4
Surcharge over PC base	4.250	0.838	3.6
Fill over PC base	23.715	0.838	19.9
Insitu base	20.520	1.425	29.2
Surcharge over insitu base	18.000	2.150	38.7
Fill over insitu base	110.160	2.150	236.8
TOTAL	198.065 kN		340 kNm

Eccentricity of vertical loads =	-0.293 m
shift of eccentricity due to overturning =	0.302 m
Total eccentricity =	0.009 m
Resistance against sliding =	99.0 kN
Factor of safety against overturning =	5.70
e/d =	0.00
Factor of safety against sliding =	2.28
Maximum applied Ground Bearing Pressure =	71 kN/m²

PC RETAINING WALL TYPE A

HOLDING DOWN BOLTS

Allowable bolt tension =	SELFIX BOLTS	26.6 kN
Allowable bolt shear =	SELFIX BOLTS	29.4 kN
	weight(kN) lever arm(m)	MR(kNm)
PC wall	16.7 0.113	1.9
PC base	4.7 0.325	1.5
Surcharge over PC base	4.3 0.438	1.9
Fill over PC base	23.7 0.438	10.4
	TOTAL	49 kN
	TOTAL	16 kNm

Earth pressures on PC wall

Maximum pressure =	17 kN/m ²
Horizontal force =	28.2 kN
Overturning moment =	32 kNm

Surcharge pressures on PC wall

Maximum pressure =	2.7 kN/m ²
Horizontal force =	9.2 kN
Overturning moment =	15.7 kNm

Total loads on PC wall

Total horizontal load on PC wall =	37.4 kN
Total overturning moment on PC wall =	48 kNm
Number of HD bolts	3.0 number
Tension per HD bolt =	25.6 kN
Shear per HD bolt =	3.1 kN
Bolt factor for HD bolts (MUST BE EQUAL OR LESS THAN 1.4) =	1.1
Number of PC units =	1
volume of insitu concrete	1.0

TAN A	0	
TAN B	1.73205081	
1-tanA/tanB	1	
a+ftanA	3.7	
a	3.700	
b	0.000 check	0.000
c	4.361 check	4.361
d	3.700 check	3.700
e	2.136 check	2.136
f	2.225	

o/a area	16.1364252
less	-3.9519626

0

-0.1275

-0.6675

net volume	12.0569626
total volume=	14.4683551
number of bolts=	3