



Environmental Engineering
Quarryfields, Ruthin
Denbighshire LL15 2UG
(01824 709102)
(01824 709105)
Email: enquiries@rpcltd.co.uk

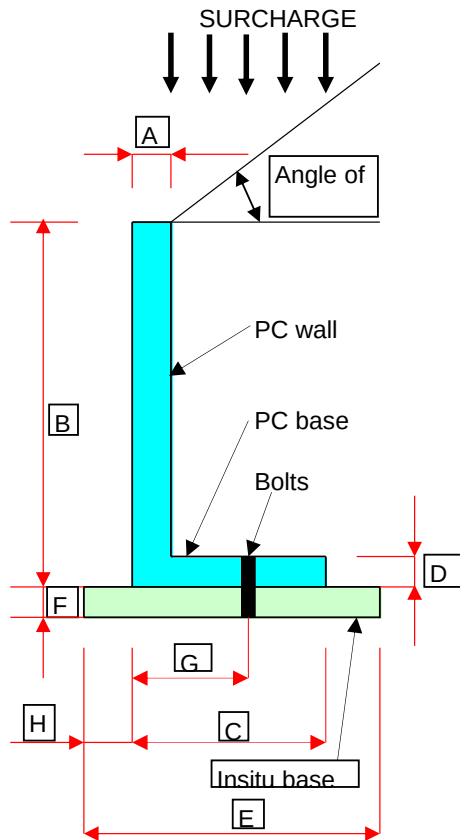
Design of **Rocwall** precast concrete wall

Client: Jones Brothers(Henllan)

File Ref: KQ/03/21/135

Job Title: Meadow Road, Neath - 3.0m 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	3.000 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	2.300 m
INPUT F	Thickness of insitu base	0.300 m
INPUT G	Bolt distance	0.550 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 =	4.6 (MIN=1.6)
FOS SLIDING=	2.0 (MIN=1.6)
GBP =	67 kN/m ²
Bolt factor =	0.6 (MAX=1.4)

APPROXIMATE QUANTITIES

Number of PC units =	1 Number
Weight of each PC wall =	19.26 kN
Volume of insitu concrete =	0.828 m ³
Volume of fill =	10.3 m ³
Number of bolts =	2

PARAMETERS

Existing ground condition	GRANULAR
Thickness of PC wall	0.225 m
Height of PC wall	3 m
Width of PC base	0.65 m
Thickness of PC base	0.3 m
Width of insitu base	2.3 m
Thickness of insitu base	0.3 m
Angle of slope	0 degrees
Surcharge	10 kN/m ²
Bolt distance	0.55 m
Wall distance	0.4 m

WALL

SIN A	0.5735764
(SIN ²)A	0.3289899
SIN 2A	0.9396926
TAN B	0
ALPHA	0.5735764
K	0.271

Earth pressures on insitu base

Maximum pressure =	16.1 kN/m ²
Horizontal force =	26.6 kN
Overturning moment on insitu base =	29.2 kNm

Surcharge pressures on insitu base

Maximum pressure =	2.7 kN/m ²
Horizontal force =	8.9 kN
Overturning moment on insitu base =	14.8 kNm

Total loads on insitu base

Total horizontal force on insitu base =	35.5 kN
Total moment on insitu base =	44.0 kNm

	weight(kN)	lever arm(m)	MR(kNm)
PC wall	14.580	0.513	7.5
PC base	4.680	0.725	3.4
Surcharge over PC base	4.250	0.838	3.6
Fill over PC base	20.655	0.838	17.3
Insitu base	16.560	1.150	19.0
Surcharge over insitu base	12.500	1.875	23.4
Fill over insitu base	67.500	1.875	126.6
TOTAL	140.725 kN		TOTAL 201 kNm

Eccentricity of vertical loads =	-0.277 m
shift of eccentricity due to overturning =	0.312 m
Total eccentricity =	0.036 m
Resistance against sliding =	70.4 kN
Factor of safety against overturning =	4.57
e/d =	0.02
Factor of safety against sliding =	1.98
Maximum applied Ground Bearing Pressure =	67 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	14.6	0.113	1.6
PC base	4.7	0.325	1.5
Surcharge over PC base	4.3	0.438	1.9
Fill over PC base	20.7	0.438	9.0
	TOTAL	44 kN	TOTAL 14 kNm
Earth pressures on PC wall			
Maximum pressure =			15 kN/m ²
Horizontal force =			22.0 kN
Overturning moment =			22 kNm
Surcharge pressures on PC wall			
Maximum pressure =			2.7 kN/m ²
Horizontal force =			8.1 kN
Overturning moment =			12.2 kNm
Total loads on PC wall			
Total horizontal load on PC wall =			30.1 kN
Total overturning moment on PC wall =			34 kNm
Number of HD bolts			3.0 number
Tension per HD bolt =			14.6 kN
Shear per HD bolt =			1.4 kN
Bolt factor for HD bolts (MUST BE EQUAL OR LESS THAN 1.4) =			0.6
Number of PC units =			1
volume of insitu concrete			0.8
TAN A	0		
TAN B	1.73205081		
1-tanA/tanB	1		
a+ftanA	3.3		
a	3.300		
b	0.000	check	0.000
c	3.580	check	3.580
d	3.300	check	3.300
e	1.905	check	1.905
f	1.675		
o/a area	11.8148444		
less	-3.1436722		
	0		
	-0.1275		
	-0.5025		
net volume	8.54367222		
total volume=	10.2524067		
number of bolts=	3		