

BRICK MASONRY RETAINING WALL DESIGN

1) 215 ~220 MM THICK BRICK WALL DESIGN

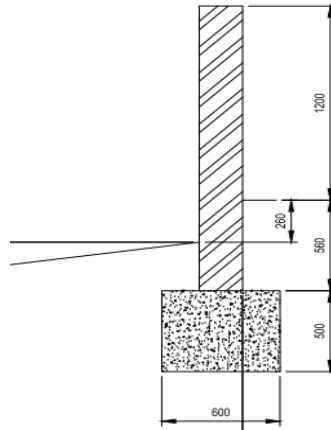
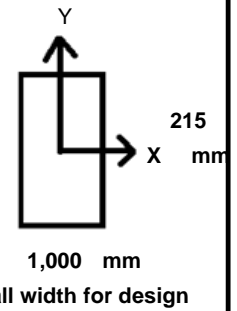
Oak

GENERAL DATA

Density of Brick (kN/Cum):	18.0	
Bending Stress (Mpa) :	0.3	BS5628
Mortor	1:1:6	
Surcharge Load (kN/Sqm)	2.0	
Density of Soil (kN/Cum):	16.0	
Angle of Repose (30°) , K :	0.33	(Assumed)
Density of Concrete (kN/Cum):	24.0	

WALL DATA

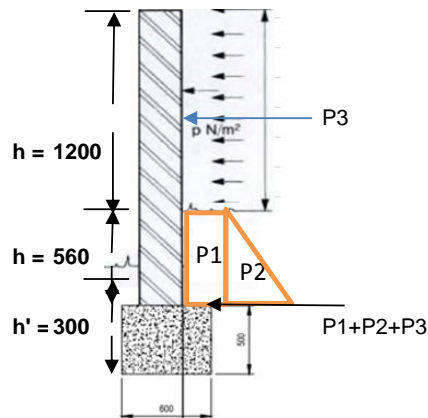
Depth 'h' [mm] =	215
Width 'b' [mm] =	1000
Total 'I' [mm] =	2400
Ixx [cm4] =	82819.79
Zxx [cm3] =	7704.17
Wall Height [mm] =	1760
Self weight, [kN/m], W :	6.81



TYPICAL RETAINING WALL SECTION

WIND LOAD ON WALL

The wall height above ground level is less than 3 m, thus use minimum wind pressure 1 kN/Sqm, considering ground roughness category -3 & wind speed (38m/sec)



LOADING DIAGRAM

$P1 = K \times p \times h = 0.37 \text{ kN/m}$	Reaction on support, $P = 2.398 \text{ kN (P1+P2+P3)}$
$P2 = K \times d \times h \times h / 2 = 0.83 \text{ kN/m}$	Bending Moment wall Bottom, $M = 1.538 \text{ kN/m}$
$P3 = 1.0 \times h = 1.20 \text{ kN/m}$	

Check stresses at wall bottom : $W / A \pm M / Z_{xx}$

$$\begin{aligned}
 &= 0.030 \pm 0.20 \\
 &= 0.230 \text{ Mpa (Compression)} \\
 &= -0.169 \text{ Mpa} < 0.3 \text{ Mpa (Tension)} \quad \text{Safe}
 \end{aligned}$$

CLIENT : **Mr & Mrs Smithson, 40 Platt's Lane
London, NW3 7NT.**

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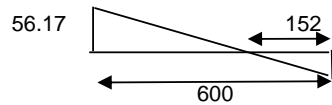
2) FOUNDATION DESIGN

Loading on Foundation - Foundation Area, $a = 0.6$ Sqm Section Modulus, $z = 0.06$ cum

Self weigh of wall = 6.81 kN
Self weigh of foundation = 4.32 kN (300 mm deep x 600 mm wide)
Total vertical Load, $P = 11.13$ kN

Bending moment about bottom of foundation $M + P \times h'$
 $= 1.538 + 2.398 \times 0.30$
 $M' = 2.26$ kNm

Check stresses at foundation bottom = $P/a \pm M'/z$
 $= 18.552 \pm 37.62$
 $= 56.17$ kN/Sqm (Compression) < 100 kN/Sqm
 $= -19.07$ kN/Sqm Tension for filled soil OK



Foundation area in tension = $152 / 600 = 0.25$ % Acceptable

Summary

Brick Wall = 220 mm Wide

Foundation Size = 600 mm wide X 300 mm Deep X length of Wall

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