Consider the design vertical load resistance of load bearing cavity masonry

to BS 5628-1:2005, with eccentricity determined using the appendix b method:

Determine the Slenderness Ratio:

Enter the thickness of leaf 1, t1 [mm]: 140

Enter the thickness of leaf 2, t2 [mm]: 102.5

Therefore, effective thickness, Teff = 2(t1 + t2) / 3 = 161.667mm

Please input the height of the Wall [mm]: 3500

Please enter the restraint conditions of the wall (Simple / Partial / Enhanced ): e

Therefore, effective height, Heff = 0.75 \* 3500 = 2625mm

And therefore the Slenderness Ratio, SR = Heff/Teff = 2625 / 161.667 = 16.2371

SR < 27 and therefore within the scope of BS 5628-1.

Determine the Partial Safety Factor :

Please input normal or special CONSTRUCTION control (N/S): n

Please input normal or special MANUFACTURE control (N/S): s

And therefore the Partial Safety Factor to be adopted, PSF = 3.1

Determine the ultimate loading:

Please enter the applied line loading at the top of the wall:

Leaf 1,

Eccentric,

Dead load [kN/m]: 5

Live load [kN/m]: 6

Concentric,

Dead load [kN/m]: 12

Live load [kN/m]: 13

Leaf 2,

Eccentric,

Dead load [kN/m]: 6

Live load [kN/m]: 5

Concentric,

Dead load [kN/m]: 48

Live load [kN/m]: 22

Ultimate line load over wall, Leaf 1: 54.2kN/m

Ultimate Line load over wall, Leaf 2: 118.8kN/m

Please enter the self-weight of masonry,

Leaf 1 [kN/m^3]: 15

Leaf 2 [kN/m^3]: 21

Therefore, the self-weight at 0.4H => 1.4m,

Leaf 1: 2.94kN/m

Leaf 2: 3.0135kN/m

Consider load concentrations due to openings:

Please enter the length of wall considered, L [mm]: 1550

Please enter the width of opening 1 [mm]: 1200

Please enter the bearing length of the member forming opening 1 [mm]: 150

Please enter the width of opening 2 [mm]: 900

Please enter the bearing length of the member forming opening 2 [mm]: 100

Both load spreads lap.

Considering the load concentration from both load spreads lapping.

Ultimate line load in Leaf 1: 95.5566 kN/m

Ultimate line load in Leaf 2: 204.646 kN/m

Consider a load capacity reduction due to eccentricity & slenderness:

Loaded eccentricity of Leaf 1: 7.12963 mm

Loaded eccentricity of Leaf 2: 5.125 mm

Accidental eccentricity of Leaf 1: 13.2792 mm

Accidental eccentricity of Leaf 2: 9.72229 mm

Total Eccentricity at 0.4H from the top of Leaf 1: 17.557 mm

Total Eccentricity at 0.4H from the top of Leaf 2: 12.7973 mm

Maximum Eccentricity of Leaf 1: 17.557 mm

Maximum Eccentricity of Leaf 2: 12.7973 mm

Capacity Reduction Factor to Leaf 1, Beta: 0.824104

Capacity Reduction Factor to Leaf 2, Beta: 0.825326

Determine Small Area Factor:

Area of Leaf 1 = 0.217000m^2 > 0.2m^2 and hence small area factors are ignored.

SAF = 1

Area of Leaf 2 = 0.158875m^2 < 0.2m^2,

Therefore we will need to consider a small area factor.

SAF = 0.7 + (1.5\*Area) = 0.938312

Determine Minimum required masonry strength:

Minimum required masonry strength to Leaf 1, Fk = 2.56751N/mm2

Minimum required masonry strength to Leaf 2, Fk = 7.99223N/mm2

Do you want to save the output (y/n)? y

Please enter the file name [\*.txt]: ExampleWallDesign

The file will be saved in the location of the executable \*.exe file

The program has written to the file without error.

Press ENTER to continue...