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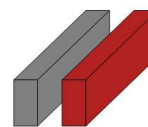
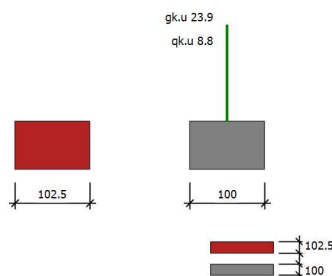
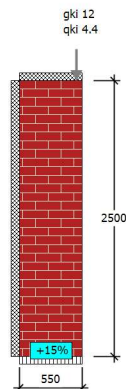
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Job Ref :
 Sheet : /
 Made by :
 Date : 28 July 2023 / Ver. 2019.06
 Checked :
 Approved :

Two Way Spanning, Vertically Loaded, Cavity Wall

Design to BS 5628 : 2005

Brief Title

**Summary of Design Data**

Wall Dimensions	h=2.500 m, hef=0.550 m, L=0.550 m, Lef=0.550 m		
Support Conditions (Outer)	Bottom Simple, Top Cont., Left Cont., Right Free		
Support Conditions (Inner)	Bottom 30% Fixed, Top Cont., Left Cont., Right Free		
Support Conditions (Weighed)	Bottom 15% Fixed, Top Cont., Left Cont., Right Free		
Cavity Wall (mm)	t1=102.5, t2=100, tef=135		
Limiting Dimensions	$\lambda = 4.1 \leq \lambda_{lim} = 27$	0.151	OK

Outer-Leaf Design

Partial Safety Factor (γ_{mc}/γ_{mf})	Construction Normal, Unit Manufacture Normal	3.5/3	Table 4a/4b
Unit Material	Clay water absorption > 12%, Standard bricks, $\gamma = 20$ kN/m ³		
	Normalised mean compressive strength 20 N/mm ²		
Mortar Material	M4/(iii), 4 N/mm ²		
Compressive Strength (fk)	Standard bricks	3.92 N/mm ²	Small Area
Section Properties	Area=1025 cm ² /m, Zp=1751 cm ³ /m		
Critical axial compressive case	1.4($\gamma_{tk} \cdot h$)		
Max local stress @	X=0 m, Y=1.5 m < fk/ γ_{mc}	0.07 N/mm ²	OK
Max axial buckling force @	X=0.275 m, Y=1.5 m averaged over width of 0.55 m	7.18 kN/m	
Capacity reduction factor top, β	ex=0.0 mm, hef=550 mm, tef=135.0 mm, t=102.5 mm	0.990	
Fr= $\beta \cdot f_k \cdot t_k / \gamma_{mc}$	0.990 x 3.92 x 102.5 / 3.5	113.7 kN/m	
Fd/Fr	7.2 / 113.7	0.063	OK

Inner-Leaf Design

Partial Safety Factor (γ_{mc}/γ_{mf})	Construction Normal, Unit Manufacture Normal	3.5/3	Table 4a/4b
Unit Material	Concrete Blocks, Solid block wall, $\gamma = 20$ kN/m ³		
	Normalised mean compressive strength 7.3 N/mm ²		
Mortar Material	M4/(iii), 4 N/mm ²		
Unit Ratio	Unit height=215, Least horizontal dimensions=100	2.15	
Compressive Strength (fk)	Solid block wall	5.01 N/mm ²	Small Area
Loads from above	Dead Load=23.9 kN/m, Live Load=8.83 kN/m		
Section Properties	Area=1000 cm ² /m, Zp=1667 cm ³ /m		
Critical axial compressive case	1.4($\gamma_{tk} \cdot h + g_k + g_{ku}$) + 1.6qk + 1.6qku		
Max local stress @	X=0 m, Y=1.5 m < fk/ γ_{mc}	0.98 N/mm ²	OK
Max axial buckling force @	X=0.275 m, Y=1.5 m averaged over width of 0.55 m	97.93 kN/m	
Capacity reduction factor top, β	ex=0.0 mm, hef=550 mm, tef=135.0 mm, t=100.0 mm	0.990	
Fr= $\beta \cdot f_k \cdot t_k / \gamma_{mc}$	0.990 x 5.01 x 100 / 3.5	141.7 kN/m	
Fd/Fr	97.9 / 141.7	0.691	OK
Point load design method	Design based on axial load take down for wall compression design.		
	No design for bending due to point loads.		
Point Load at 0.5m	gk 12 kN, qk 4.4 kN, Bearing Length 100 mm width 100 mm		
Spreader details	Spreader length 330 mm, Spreader depth 215 mm		
Bearing Stress	(1.4•12 + 1.6•4.4)•1000/(215•100)	1.11 N/mm ²	
Local Bearing Capacity	No Bearing enhancement, 1.00•fk/ γ_{mc}	1.43 N/mm ²	OK