

**MasterSeries Free Trial Version**

Trial Version

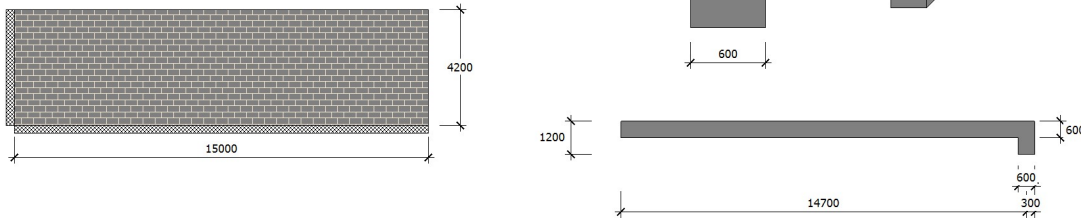
For evaluation purposes only  
Not to be used commercially

Job Ref : 600mm wall 15m long x 4.2m hig  
Sheet : 1 /10002  
Made by : R Evans  
Date : 03 September 2016 / Ver. 2016.07  
Checked : R Evans  
Approved :

Tel: +44 (028) 9036 5950

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## Free Standing, Vertically and Laterally Loaded, Stiffened Single-leaf Wall Design to BS 5628 : 2005 Brief Title

**Summary of Design Data**

Wall Dimensions	h=4.200 m, hef=8.400 m, L=15.000 m, Lef=15.000 m		
Support Conditions	Bottom Cont., Top Free, Left Cont., Right Free		
Lateral Loads	$W_x=1.0 \text{ kN/m}^2$		
Single-leaf Wall (mm)	t=600, tp=1200, wp=600, ccp=1575, K=1.4, tef=840		
Limiting Dimensions	$\lambda=10 \leq \lambda_{lim}=27$ , $h \leq 12 \text{ tef}$	0.417	OK

**Wall Design**

Partial Safety Factor ( $\gamma_{mc}/\gamma_{mf}$ )	Normal manufacturing, Normal construction	3.5/3	Table 4a/4b
Material	Concrete blocks, $\gamma=24 \text{ kN/m}^3$		
Units and Mortar Strength	7 N/mm <sup>2</sup> , Mortar designation M4(iii)		
Blocks Ratio	Unit height=600, Least horizontal dimensions=600	1.00	
Compressive Strength (fk)	Solid Concrete block wall	35.0 N/mm <sup>2</sup>	from test
Effective Width (bef)	H=4.2 m, t=600, tp=1200, wp=600, ccp=1575	1575 mm	
Section Properties Wall	Area=8286 cm <sup>2</sup> /m, Zb=114970 cm <sup>3</sup> /m		
Flexural Strength fkb (Parallel)	fkb=0.15, gd=0.101 N/mm <sup>2</sup> , fkb=fkb+0.9 gd. $\gamma_{mf}$	0.422 N/mm <sup>2</sup>	Table 3
Capacity reduction factor, $\beta$	ex=0.0 mm, hef=8400 mm, tef=840.0 mm, t=600.0 mm	0.990	
$Fr=\beta \cdot fk \cdot tk / \gamma_{mc}$	0.990x35.0x600/3.5	5940.0 kN/m	
Fd/Fr	1.4( $\gamma_{tk} \cdot h$ )=84.7/5940.0	0.014	OK
Bending Moment Coefficient	Free Standing	0.500	
$Mr=fkb \cdot Zb / \gamma_{mf}$	0.422x114970/3	16.179 kN.m/m	

**Design for Lateral Loads**

Design Lateral Load Wd	1.4 $W_x$	1.400 kN/m <sup>2</sup>	
$Md=\alpha \cdot W_x \cdot h^2$	0.500x1.400x4.200 <sup>2</sup>	12.348 kN.m/m	
$Ut=Md/Mr$	12.348/16.179	0.763	OK

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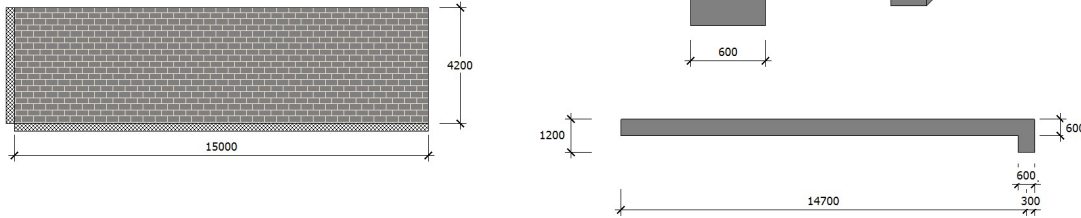
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Support Conditions	Bottom Cont., Top Free, Left Cont., Right Free		
Lateral Loads	W <sub>x</sub> =1.0 kN/m <sup>2</sup>		
Single-leaf Wall (mm)	t=600, t <sub>p</sub> =1200, w <sub>p</sub> =600, c <sub>cp</sub> =1575, K=1.4, t <sub>ef</sub> =840		
Limiting Dimensions	λ=10 < λ <sub>lim</sub> =27, h <= 12 t <sub>ef</sub>	0.417	OK

**Wall Design**

Partial Safety Factor (γ <sub>mc</sub> /γ <sub>mf</sub> )	Normal manufacturing, Normal construction	3.5/3	Table 4a/4b
Material	Concrete blocks, γ=24 kN/m <sup>3</sup>		
Units and Mortar Strength	7 N/mm <sup>2</sup> , Mortar designation M4(iii)		
Blocks Ratio	Unit height=600, Least horizontal dimensions=600	1.00	
Compressive Strength (f <sub>k</sub> )	Solid Concrete block wall	35.0 N/mm <sup>2</sup>	from test
Effective Width (b <sub>ef</sub> )	H=4.2 m, t=600, t <sub>p</sub> =1200, w <sub>p</sub> =600, c <sub>cp</sub> =1575	1575 mm	
Section Properties Wall	Area=8286 cm <sup>2</sup> /m, Z <sub>b</sub> =114970 cm <sup>3</sup> /m		
Flexural Strength f <sub>kb</sub> (Parallel)	f <sub>kb</sub> =0.15, g <sub>d</sub> =0.101 N/mm <sup>2</sup> , f <sub>kb</sub> =f <sub>kb</sub> +0.9 g <sub>d</sub> γ <sub>mf</sub>	0.422 N/mm <sup>2</sup>	Table 3
Capacity reduction factor, β	e <sub>x</sub> =0.0 mm, h <sub>ef</sub> =8400 mm, t <sub>ef</sub> =840.0 mm, t=600.0 mm	0.990	
Fr=β.f <sub>k</sub> .t <sub>k</sub> /γ <sub>mc</sub>	0.990x35.0x600/3.5	5940.0 kN/m	
F <sub>d</sub> /Fr	1.4(γ <sub>tk</sub> .h)=84.7/5940.0	0.014	OK
Bending Moment Coefficient	Free Standing	0.500	
M <sub>r</sub> =f <sub>kb</sub> .Z <sub>b</sub> /γ <sub>mf</sub>	0.422x114970/3	16.179 kN.m/m	

**Design for Lateral Loads**

Design Lateral Load W <sub>d</sub>	1.4 W <sub>x</sub>	1.400 kN/m <sup>2</sup>	
M <sub>d</sub> =α.W <sub>x</sub> .h <sup>2</sup>	0.500x1.400x4.200 <sup>2</sup>	12.348 kN.m/m	
U <sub>t</sub> =M <sub>d</sub> /M <sub>r</sub>	12.348/16.179	0.763	OK

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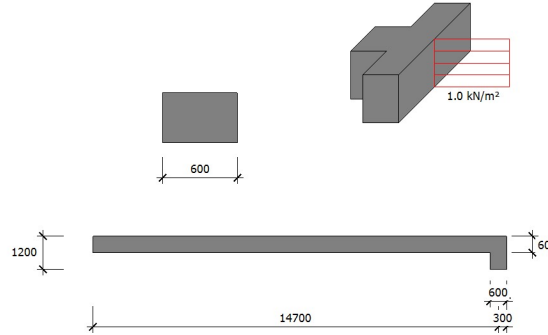
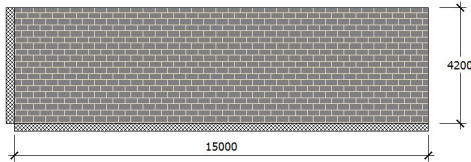
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Fd/Fr	1.4( $\gamma_{tk} \cdot h$ )=84.7/5940.0	0.014	OK
Bending Moment Coefficient	Free Standing	0.500	
Mr=fkb.Zb/ $\gamma_{mf}$	0.422x114970/3	16.179 kN.m/m	

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Design Lateral Load Wd	1.4 Wx	1.400 kN/m <sup>2</sup>	
Md= $\alpha \cdot W_x \cdot h^2$	0.500x1.400x4.200 <sup>2</sup>	12.348 kN.m/m	
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