



CONCRETE WALLS V5.11

Engineering Building & Infrastructure Pty Ltd

Designing as a wall (Section 10 - Column design may result in reduced capacity or buckling)

Fire resistance - Cl 5.7

Warning - $\mu_{fi} < 0.35, 0.35$ used

Fire exposed on 1 side only =	N (Y)es,(N)o	Cl 5.7.2
Lateral support on 1 side only =	N (Y)es,(N)o	Cl 5.7.2
Top lateral support requires FRL =	Y (Y)es,(N)o	Cl 5.7.2 & 3

Use load level ratio of $N^*f/\phi N_u = 0.7 =$ N (Y)es,(N)o

Load level ($\mu_{fi} = N^*f/\phi N_u$) =	0.016	
FRP for Insulation =	240 mins.	Table 5.7.1
Adequacy =	240 mins.	Table 5.7.2
Max. eff. height for FRL = $40 \cdot t_w$ (FRL of support) =	14000 mm	Cl 5.7.3
FRL =	240 mins.	

Effective Heights - Cl 11.4

No openings

Height of wall (H_w) =	4000 mm	Openings =	N (Y)es,(N)o
Length of wall ($L_1=L_w$) =	5000 mm		
Area of Wall (A_w) =	20.0 m ²		
Length of return wall for lateral restraint = $0.2 \cdot H_w$ =	800 mm		
Restraint against rotation both ends (top and bottom) =	N (Y)es,(N)o		
No. of sides with lateral support by intersecting walls =	0		

One way buckling (2 ends) - Cl 11.4(a) - Restrained by floors

Hwe = $k \cdot H_w$

Restrained against rotation top and bottom k =	0.750	Hwe =	3000 mm
Not restrained against rotation top or bottom k =	1.000	Hwe =	4000 mm

Two way buckling (3 sides) - Cl 11.4(b) - Restrained by floors and walls

Lateral support three sides $k = [1/(1+(H_w/(3 \cdot L_1))^2)] \geq 0.3 =$	0.934	Hwe =	3734 mm
(Not greater than the value obtained from One way buckling)			

Two way buckling (4 sides) - Cl 11.4(c) - Restrained by floors and walls

Lateral support four sides, $H_w \leq L_1$, $k = [1/(1+(H_w/L_1)^2)] =$	0.610	Hwe =	2439 mm
--	-------	-------	---------

Calculated k (Rotationally unrestrained, laterally supported top and bottom) = 1.000 Hwe = 4000 mm

Horizontal Crack Control - Cl 11.7.2

Where restrained from shrinkage, the total horizontal reinforcement shown below is to be used.

Degree of crack control	p	Ast	
Minor (A1 & A2)	0.0025	875	mm ²
Moderate and hidden (A1 & A2)	0.0035	1225	mm ²
Strong for appearance (A1 & A2)	0.006	2100	mm ²
For exposure classifications (B1, B2, C1, C2)	0.006	2100	mm ²