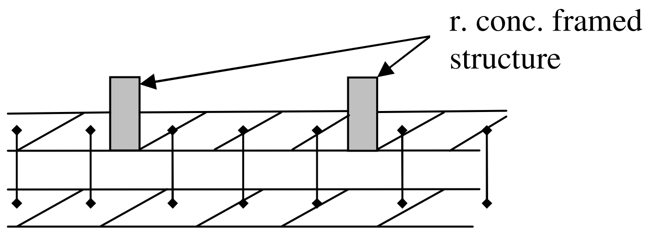
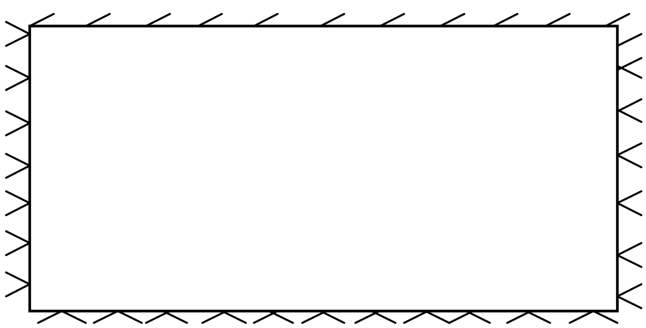
REFERENCE	CALCULATIONS	OUTPUT



2 No. 100 thick leaves ex 440 x 100 x 215 solid concrete blocks. 100 insulated cavity with stainless steel wall ties.
Manufacturing control of units is Category I
M4 general purpose mortar – prescribed mix of 1:1:6
Class 5 (Normal) executive control will be used.

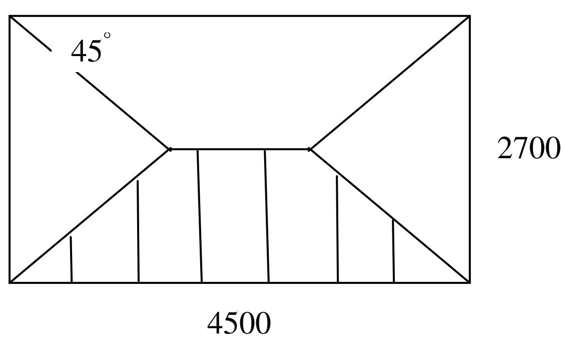
The panel is 4.5m long and 2.7m high and is located in the top storey of a multi-storey framed structure.

Neglecting the self weight of the panel check that it is capable of withstanding a <u>characteristic</u> wind load of 1.0 kN/m^2



Assumed boundary conditions:
simply supported along the top edge and continuous along the bottom and sides.

REFERENCE	CALCULATIONS	OUTPUT
Annex F (3)	**Panel slenderness** t = 100 mm	
5.5.1.3 (3)	$t_{ef} = \sqrt[3]{(k_{tef}\,t_1^3 + t_2^3)}$ **E (5.11)**	
	where $k_{tef} = E_1/E_2$ where E_1 refers to the outer leaf	
Ire NA	k_{tef} = 1	
	Then t_{ef} = = $\sqrt[3]{(1)(100)^3 + (100)^3}$ = 126 mm	
Fig F1	h/t_{ef} = 2.7/0.126 = 21.43 l/t_{ef} = 4.5/0.126 = 35.71	√ OK (by inspection of Fig F1)
	Ultimate design moment	
Ire NA Tab NA.5	$\mu = f_{xk1}/f_{xk2}$ = 0.25/0.5 = 0.5	μ = 0.5
	h/l = 2.7/4.5 = 0.6	
Annex E + Fig E1	Bending moment coefficient, α_2 = 0.0202 (say 0.02) (*Panel H*)	α_2 = 0.02
5.5.5 (7)	M = M_{Ed2} = $\alpha_2\,\gamma_f\,W_k\,l^2$ per unit height	
IS EN 1990 + Ire NA Tab NA.3	γ_f = 1.5 (wind load is the primary action) Then M_{Ed2} = (0.02)(1.5) W_k $(4.5)^2$ kNm/m height = 0.608 x 10^6 W_k Nmm/m height	M_{Ed2} = 0.608 x 10^6 W_k Nmm/m height
	Moment of resistance	
6.3.1 (3)	$M_{Rd} = f_{xd}\,Z$ **E (6.15)**	
	M_{Rd} = M_{Rd2} = $(f_{xk2}/\gamma_M)(Z)$	
2.4.1 (1)P + Ire NA Tab NA.1	γ_M = 2.7	
	Z = $bd^2/6$ = $(1000)(100)^2/6$ = 1.67 x 10^6 mm^3 /m	
	Then M_{Rd2} = (0.5)/(2.7)/(1.67 x 10^6) = 0.31 x 10^6 Nmm/m height	

REFERENCE	CALCULATIONS	OUTPUT
	Assuming the cavity wall ties are stiff enough to transmit the full compressive force across the cavity.	
	Then total moment of resistance = $(0.31 \times 10^6) \times 2$	M_{Rd} = 0.62×10^6 Nmm/m height
	= 0.62×10^6 Nmm/m height	
	$M_{Ed2} = 0.608 \times 10^6\ W_k = 0.62 \times 10^6$	
	From which $W_k = 1.02$ kN/m^2 > 1 kN/m^2	Wall √ OK in flexure
6.2	**Shear**	
	Assumed pressure distribution due to the wind load	
		
	Total load to base support = $\gamma_f\ W_k$ * (loaded area)	
	= (1.5)(1.0){1/2[4.5 + (4.5 – 2.7)]2.7/2}	
	= (1.5)(1.0)(4.253) = 6.38 kN	
	Take as UDL along the base	
	Then the design shear force per m run	
	V_{Ed} = 6.38/4.5 = 1.42 kN/m	
	Then applied design shear stress, f_{vd}	
	= $(1.42 \times 10^3)/(100 + 100)(1000)$ = 0.0071 N/mm^2	f_{vd} = 0.0071 N/mm^2

REFERENCE	CALCULATIONS	OUTPUT
3.6.2 (3)	$f_{vk} = f_{vko} + 0.4\sigma_d$ **E (3.5)**	
	$f_{vk} = f_{vko}$ (self weight ignored)	
Ire NA Tab NA.4	$= 0.15$ N/mm^2 minimum	
	$f_{vd} = 0.15/\gamma_M = 0.15/2.5 = 0.06$ N/mm^2 $>$ 0.0071 N/mm^2	Wall √ OK in shear
		Wall √ OK