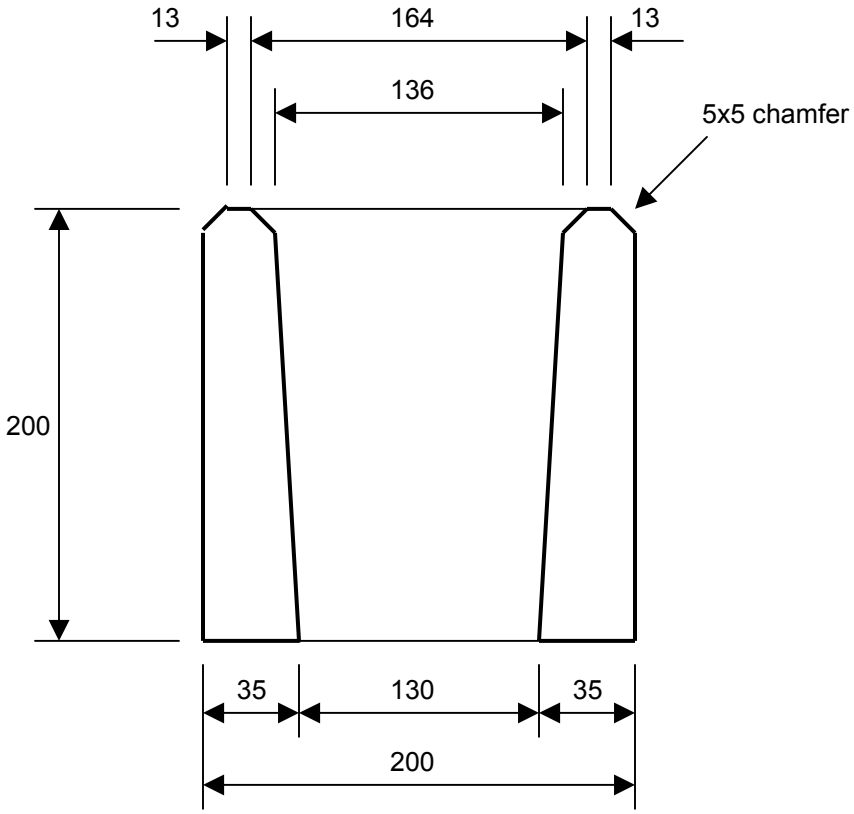
SECTION 1. 200 MORTARLESS BLOCK - CHAMFERED

1.1 Cross section dimensions & properties



CROSS SECTION THROUGH BLOCK

Properties of 200 *mortarless* masonry units:

Mortarless Block	O/A width mm	Chamfer Width (ext) mm	Chamfer Width (int) mm	Bedded Width mm	Core Width mm	A_b sq.mm./m	A_c sq.mm./m	A_d sq.mm./m	f'_{uc} MPa	f_k MPa
200	200	0	19	164	136	28000	136000	164000	15 20	7.2 8.9

The characteristic compressive strength of the masonry (f_k) shown in the above table is based on the assumption that the compressive strength of the core fill grout (i.e. cube strength) will never be less than the unconfined compressive strength of the masonry units (f'_{uc}) calculated using the mid-height cross sectional area of the face shells.

1.2 BS 5628:2005 Robustness provisions - maximum heights of *mortarless* walls and piers, and maximum lengths of *mortarless* walls

It is essential to check that all wall panels are sufficiently robust. For this purpose BS 5628 provides maximum slenderness coefficients for different configurations.

In this design manual all walls are described as three types (A, B, & C) depending on the nature of the applied load and the degree of lateral and rotational restraint at the top and bottom edges. The characteristics for each wall type are tabulated below:

	WALL OR PIER TYPE		
	A	**B**	**C**
TOP EDGE OF WALL OR TOP END OF PIER:			
Lateral restraint with enhanced resistance to lateral movement	■		
Lateral restraint with simple resistance to lateral movement		■	
Free			■
BOTTOM EDGE OF WALL OR BOTTOM END OF PIER:			
Lateral restraint with enhanced resistance to lateral movement	■		■
Lateral restraint with simple resistance to lateral movement		■	

In the above table 'enhanced resistance' means lateral and rotational restraint. For example, walls constructed off reinforced concrete slabs or footing can be assumed to have enhanced resistance to lateral movement at the bottom edge, and walls supporting concrete slabs can be assumed to have enhanced resistance to lateral restraint at the top edge. See also BS 5628-1 Clause 24.2.3.2.

Maximum heights (calculated from slenderness limits) - 200 *mortarless* walls <u>without</u> engaged piers and 200 *mortarless* piers:

Maximum height H when height governs design where H is the distance between lateral supports:

	WALL TYPE			PIER/COLUMN TYPE		
	A	**B**	**C**	**A**	**B**	**C**
H max **	7200	5400	-	5400	5400	2700

Notes:

- Maximum slenderness ratio for walls and columns = 27 (BS 5628-1 Clause 24.1 and BS 5628-2 Clause 8.3.2)
- Maximum slenderness ratio for cantilever walls and columns = 18 (BS 5628-2 Clause 8.3.2) but special consideration to deflection required if A_{st}/bd is greater than 0.5%.
- For effective height of a wall refer BS 5628-1 Clause 24.3.2.1 and BS 5628-2 Clause 8.3.2.3.
- For effective height of a column refer BS 5628-1 Clause 24.3.2.2 and BS 5628-2 Clause 8.3.2.3.
- For walls Type C in the above table that are designed to resist lateral loading, refer to BS 5628-2 Clause 8.2.3.2 for span to effective depth ratios.

Maximum lengths (calculated from slenderness limits) - 200 *mortarless* walls:

Maximum length L when length governs design:

	Length L1 *	Length L2 *	Length L3 *	Length L4 *
L max	7200	5400	2700	2200

* L_1 is the clear distance between lateral supports provided along both vertical edges of a wall panel where the lateral supports provide enhanced resistance to lateral movement. (a_h = 0.75)

L_2 is the clear distance between lateral supports provided along both vertical edges of a wall panel where the lateral supports provide simple resistance to lateral movement. (a_h = 1.0)

L_3 is the length of a wall panel that is laterally supported along one of its vertical edges (the other vertical edge free), where the lateral support provides enhanced resistance to lateral movement. (a_h = 2.0)

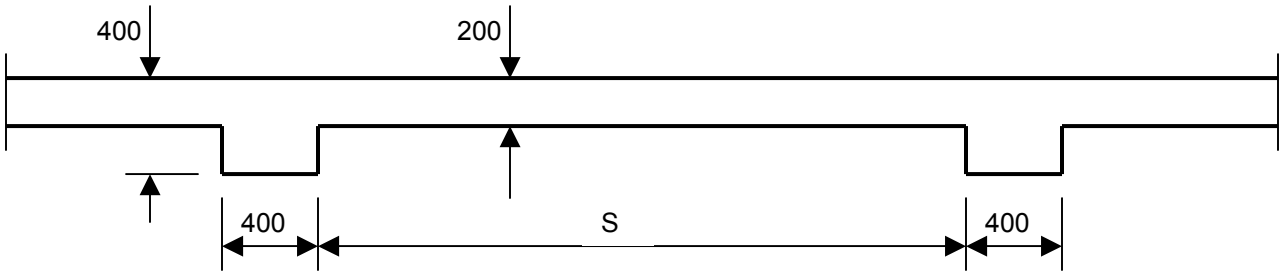
L_4 is the length of a wall panel that is laterally supported along one of its vertical edges (other vertical edge free), where the lateral support provides simple resistance to lateral movement. (a_h = 2.5)

Lengths L1, L2, L3 and L4 have been calculated in accordance with BS 5628-1 Clause 24.3.3

** If L_1, L_2 or L_3 as applicable is less than the tabulated value of L max, then H may exceed 'H max' as slenderness of wall panel is governed by length and not height.

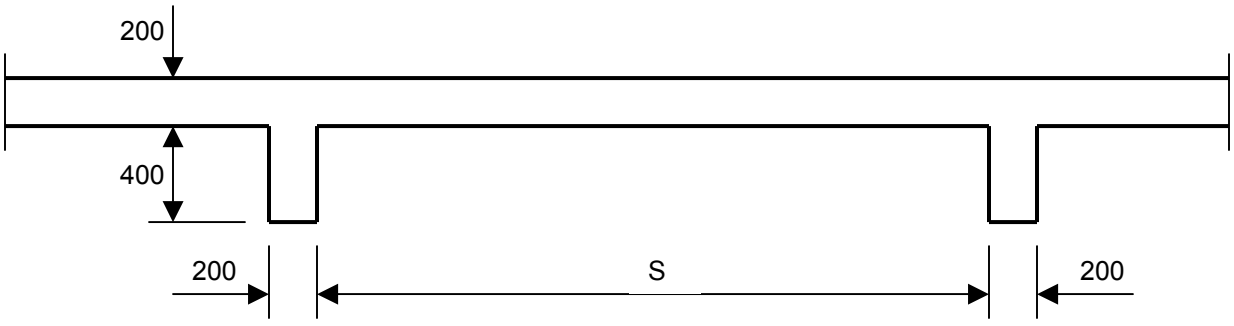
Maximum height of 200 *mortarless* walls with engaged piers, spanning vertically:

	WALL OR PIER TYPE		
	A	**B**	**C**
TOP EDGE OF WALL OR TOP END OF PIER:			
Lateral restraint with enhanced resistance to lateral movement	■		
Lateral restraint with simple resistance to lateral movement		■	
Free			■
BOTTOM EDGE OF WALL OR BOTTOM END OF PIER:			
Lateral restraint with enhanced resistance to lateral movement	■		■
Lateral restraint with simple resistance to lateral movement		■	



	***H* max (mm) for vert. spanning *mortarless* walls with 400x400 engaged piers**							
Wall	**Pier spacing S (mm)**							
Types	**2000**	**2400**	**2800**	**3600**	**4400**	**5200**	**6000**	**6800**
A	10000	9700	9200	8600	8200	8000	7600	7400
B	7400	7200	7000	7200	6400	6000	5800	5600

Linear interpolation permitted, but do not extrapolate.



	***H* max (mm) for vert. spanning *mortarless* walls with 600x200 engaged piers**							
Wall	**Pier spacing S (mm)**							
Types	**1200**	**1600**	**2000**	**2400**	**2800**	**3200**	**36000**	**3800**
A	13200	11000	9600	9200	8600	8000	7400	7200
B	9800	8200	7200	6800	6400	6000	5600	5400

Linear interpolation permitted, but do not extrapolate.