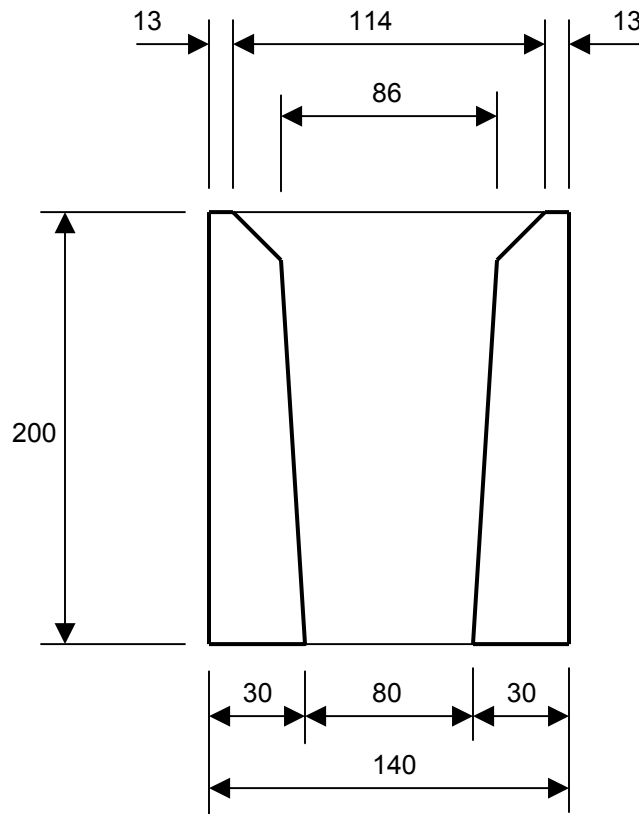


SECTION 1. 140 MORTARLESS BLOCK - UNCHAMERED

1.1 Cross section dimensions & properties



Cross Section – 140 mortarless block

Properties of 140 *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'_m MPa
140	140	0	14	114	86	28000	86000	114000	15 20	8.1 9.3

Basic compressive capacity (F_o) of 140 *mortarless* masonry:

Mortarless Block	f'_{uc} MPa	f'_m MPa	F_o (kN/m)		
			Grout strength (28 day cylinder strength)		
			15 MPa	20 MPa	25 MPa
140	15	8.1	286	311	311
	20	9.3	301	330	355

1.2 Maximum heights and lengths of *mortarless* walls to satisfy robustness provisions

It is essential to check that all wall panels are sufficiently robust. For this purpose AS 3700 provides maximum slenderness coefficients for different configurations.

In this Section of the design manual all walls are described as four types (A, B, C & D) 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	D
TOP EDGE OF WALL OR TOP END OF PIER:				
Lateral support	■	■		
Partial rotational restraint	■			
Supporting slab across full width	■			
Free			■	■
BOTTOM EDGE OF WALL OR BOTTOM END OF PIER:				
Lateral support	■	■	■	■
Partial rotational restraint	■	■	■	■
Reinforcement anchored into slab or footing			■	

Maximum heights (calculated from slenderness limits) - walls without engaged piers and free-standing piers:

Maximum height H when height governs design:

Walls and piers reinforced* vertically

	WALL TYPE				PIER TYPE
	A	B	C	D	B
H_{max}^{***}	6700	5000	1600	800	4200

Maximum lengths (calculated from slenderness limits):

Maximum length L when length governs design:

Walls reinforced* horizontally

	Length L_1^{**}	Length L_2^{**}	Length L_3^{**}
L_{max}	5000	3200	2200

* Reinforced means meeting the minimum requirements for reinforcement.

** L_1 refers to the length of a wall panel that is laterally supported along both of its vertical edges.

L_2 refers to the length of a wall panel that is laterally supported along one of its vertical edges (other vertical edge free) and with reinforcement continuous past the support

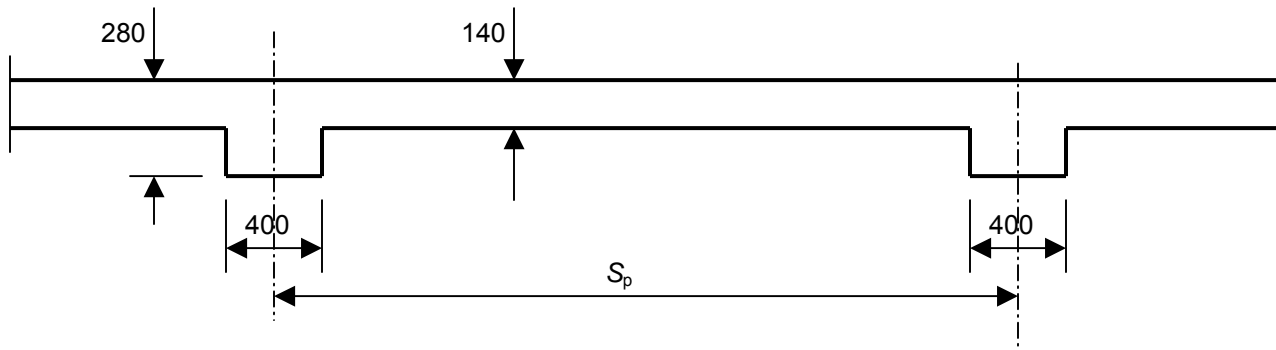
L_3 refers to the length of a wall panel that is laterally supported along one of its vertical edges (other vertical edge free)

*** 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.

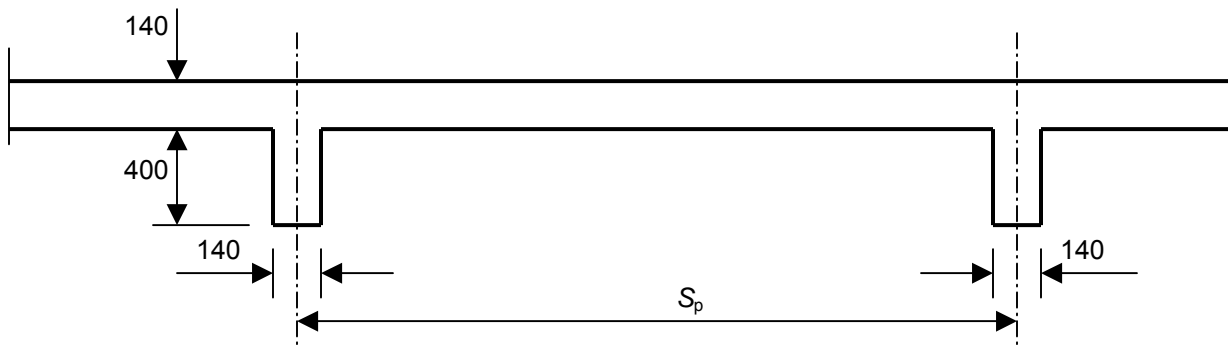
Note that lateral supports to vertical edges must be designed in accordance with AS 3700 Clause 2.6.3, and this requires that the horizontal design load acting on the member or system providing lateral support be the greater of the following:

- the sum of the simple static reactions to any applied horizontal forces, plus 2.5% of the design vertical load on the wall panel.
- The reaction from 0.4kPa acting on the appropriate tributary area of the supported masonry wall panel.

140 mortarless walls with engaged piers (spanning vertically):



Wall Types	<i>H</i> max (mm) for vert. spanning mortarless walls with 400x280 engaged piers							
	Vertically reinforced				Unreinforced vertically			
	Pier spacing S_p (mm)				Pier spacing S_p (mm)			
	2400	3200	4000	4800	2400	3200	4000	4800
A	9400	8700	8000	7600	7000	6500	6000	5800
B	7000	6500	6000	5800	5200	4900	4500	4300
C	2300	2100	2000	1900	NOT APPLICABLE			
D	1100	1100	1000	900	1100	1100	1000	900



Wall Types	<i>H</i> max (mm) for vert. spanning mortarless walls with 540x140 engaged piers							
	Vertically reinforced				Unreinforced			
	Pier spacing S_p (mm)				Pier spacing S_p (mm)			
	1200	2000	2800	3600	1200	2000	2800	3600
A	10800	8200	6700	6700	8100	6200	5000	5000
B	8100	6200	5000	5000	6800	6400	6000	5600
C	2700	2000	1600	1600	NOT APPLICABLE			
D	1300	1000	800	800	1300	1000	800	800