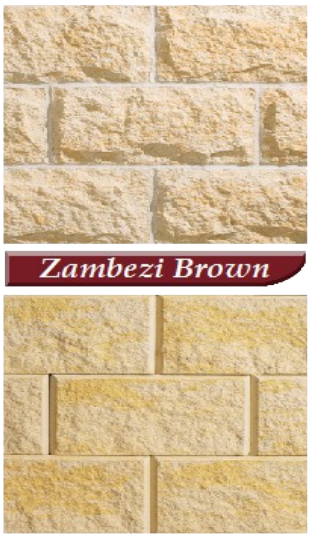
Masonry Design Guide

TYPICALL BOUNDARY WALL PANEL IN HOLLOW DENSE CONCRETE MASONRY

Sandstone

Cosmos



Zambezi Brown

Our most popular colours

Customised colours are also possible. Please note that extended lead times and minimum order quantities may apply.

BMP Masonry
WhatsApp group

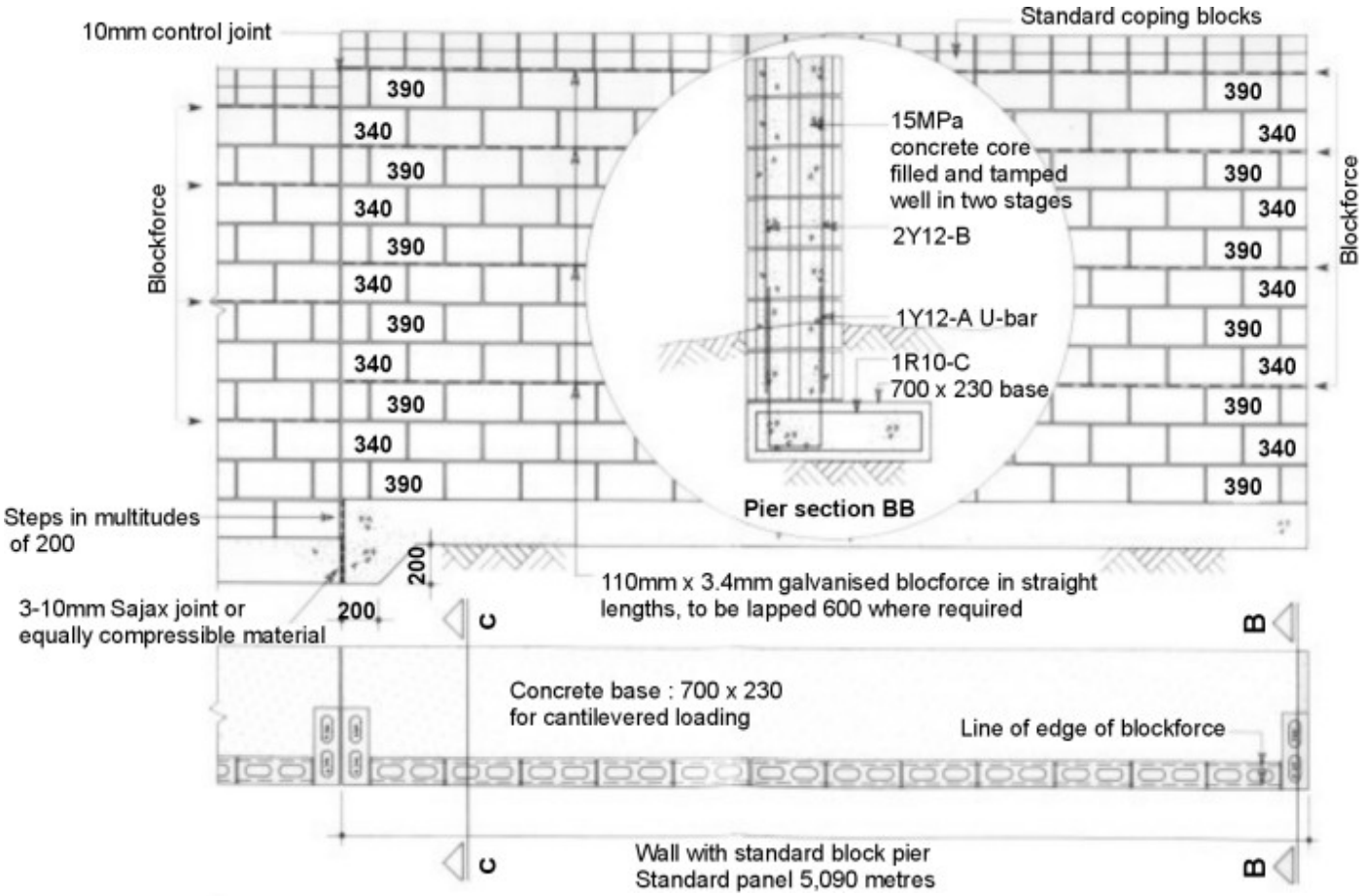
Engineered masonry walls fall outside the empirical design restrictions and provisions of the National Building Regulations.

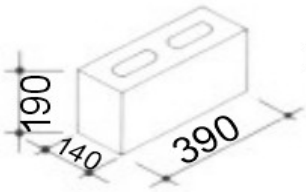
Where the height, length, shape or load-bearing capacities go beyond the empirical tables a competent engineer must submit a suitable design to the local authority for approval.

Engineered boundary walls - effective in commercial, residential and industrial situations

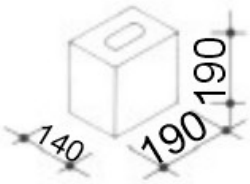
BMP Split-Face masonry produced meets architectural demands for aesthetics, but at the same time has a practical and functional use, cost effective and maintenance free.

An important aspect of free-standing walls is their ability to withstand the high wind loads that are experienced in the Cape. This wall structure is 1.8 M above ground level and can be constructed to a hight of 2.1m in 5m panels of 140mm hollow concrete masonry. This design has become standard.



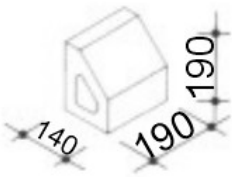


MA 140
Plain

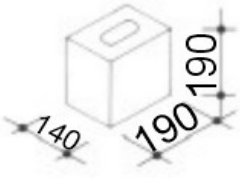


MA 140
Pier block ½

MA 140
Pier block ¾



Standard
coping block



MA 140
Pier block ½

TYPICAL BOUNDARY WALL PANEL IN HOLLOW DENSE CONCRETE MASONRY

Specifications

1. All joints to be 10mm

2. Max. length = 5190mm

3. Max. height above ground = 2100mm

Concrete mix (foundation 15MPa)

1 sack cement 2½ barrows damp sand
30 litres water 3 barrows 26mm stone

Mortar

1 sack lime 1 sack cement
3 barrows sand

Concrete mix (pier core 15MPa)

1 sack cement 2½ barrows damp sand

35 litres water 2½ barrows 13mm stone

Footings

30m 60m 100m 200m

This plan is acceptable for submission to local authorities. Simply submit this drawing with your house plan to indicate the wall position. NB: This panel is the maximum size permissible for a free-standing wall under normal urban and per-urban conditions.

Name _____

Address _____

_____

Telephone _____

E-Mail _____

BMP Architectural Masonry Products		
BOOK	Page	Section: Typical boundary wall panel in hollow dense concrete masonry
1	4	Contents: Calculate your own costs
		Part

	Quantity required: Standard wall 5m panel	Pilaster wall 5m panel	Non standard wall		Cost per 100 inc. VAT and transport
Block MA 140 Plain or Rough	127	126		R	R
Block MA 140 x 340 - ¾	22	0		R	R
Block MA 140 - ½	11	12		R	R
Coping block (or precast coping unit)	26(1)	24(1)		R	R
Pilaster block	0	11		R	R
Pilaster coping block	0	1		R	R
			Total	R	R

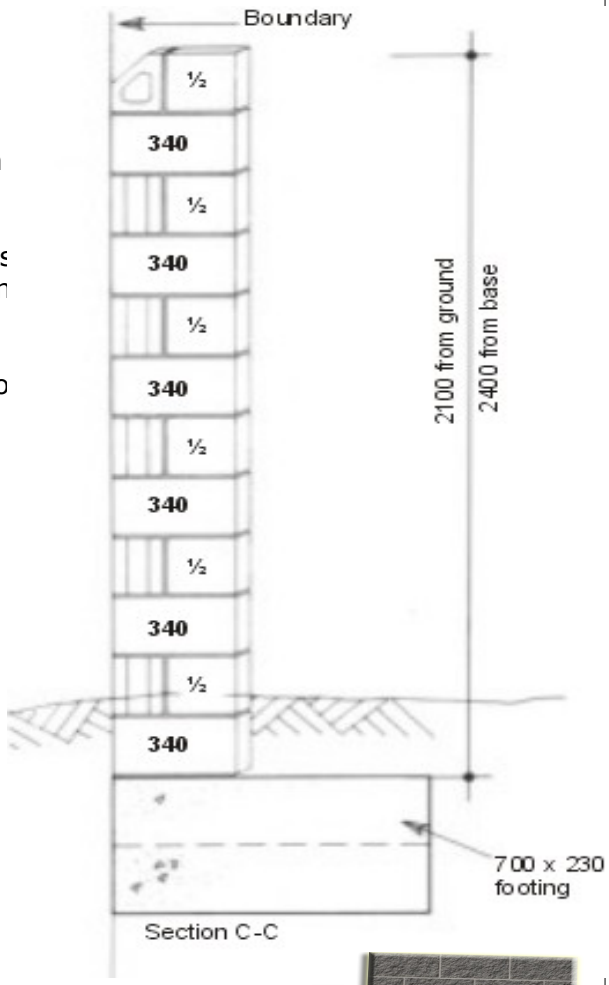
1)Determine the total length of wall or walls

2)Divide it into 5m lengths or portions of 5m lengths

3)Determine the height (up to maxim permissible as shown drawing)

4)Calculate the number of building block plus pilaster blocks calculation plan or determine number of variations of stan module)

5)Information required: Quantity of block Colours: (Sandsto Zambezi brown) Textures: (smooth or split face)



Reinforcing per panel				
No	Mark	Diam	Length	Bending
2	A	Y12	1600	270 (700 cage)
4	B	Y12	1900	Straight
2	C	R10	1650	150 (620 cage)

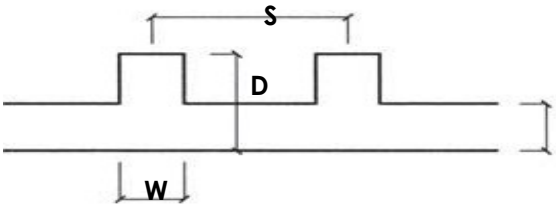
Dimensions of free-standing walls as used in boundary and garden walls using hollow masonry units are Given.

Table 4.12 Free-standing walls **(hollow units)**

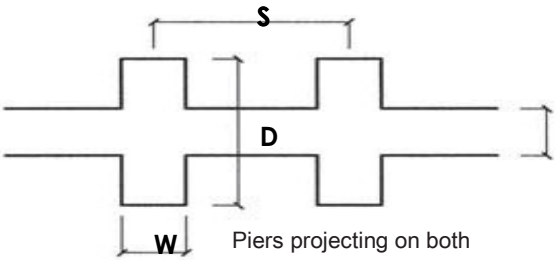
Nominal wall thickness (T), mm	Maximum height (H), m	Nominal dimensions of piers (overall depth x width D x W), mm	Maximum pier spacing (centre to centre; S),m
No Piers			
90	0,8	-	-
140	1,2	-	-
190	14	-	-
Piers projecting on one side			
90	1,2	390 x 390	1,4
90	1,7	490 x 390	1,7
140	1,4	440 x 290	2,1
140	1,5	540 x 390	2,3
190	1,6	590 x 390	2,8
Piers projecting on both sides			
90	1,0	390 x 290	1,4
140	1,4	440 x 440	2,2
190	1,7	590 x 590	2,9
Z Shaped			
90	1,6	390 x 90	1,2
90	1,8	490 x 90	1,4
140	1,8	440 x 140	2,0
140	2,1	540 x 140	2,2
190	2,3	590 x 190	2,8
Diaphragm walls			
90	1,8	290 x 190	1,4
90	2,3	390 x 190	1,4

Note:

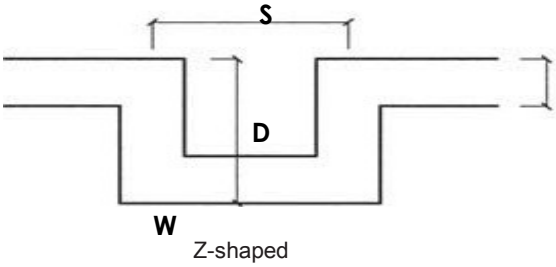
- No earth to be retained by walls.
- Piers to extend to top of wall without any reduction in size.
- Walls to terminate in a pier or a return.
- Refer to Figure 4.11 for definitions of D, H, S, T and W.



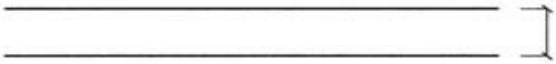
Piers projecting on one side only



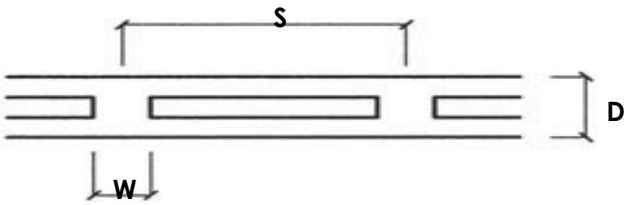
Piers projecting on both sides



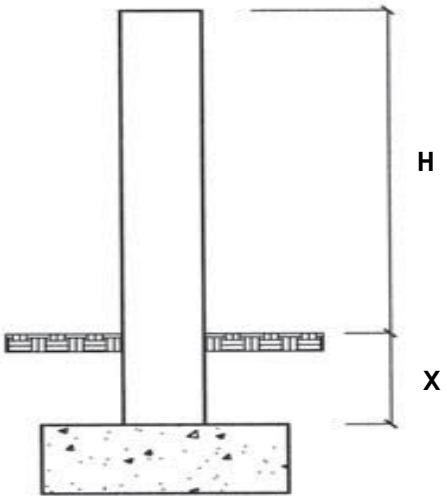
Z-shaped



No piers



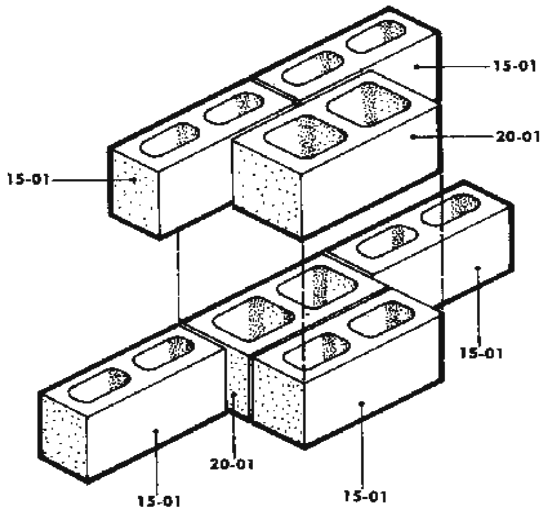
Diaphragm



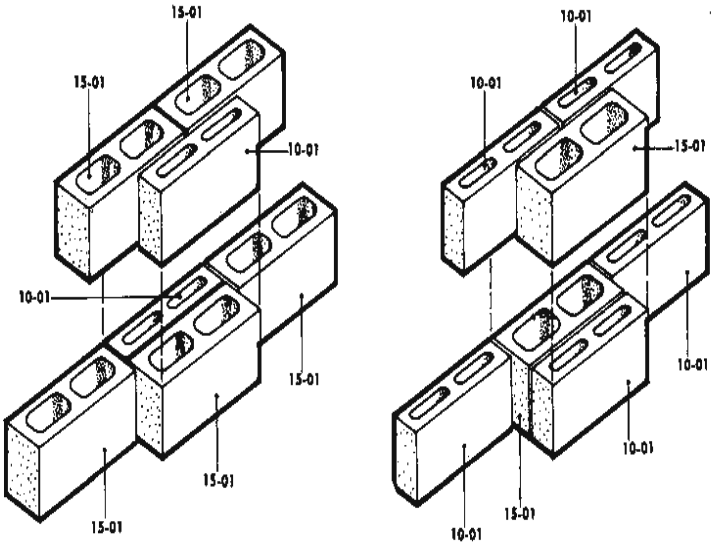
Typical section through wall

Note:

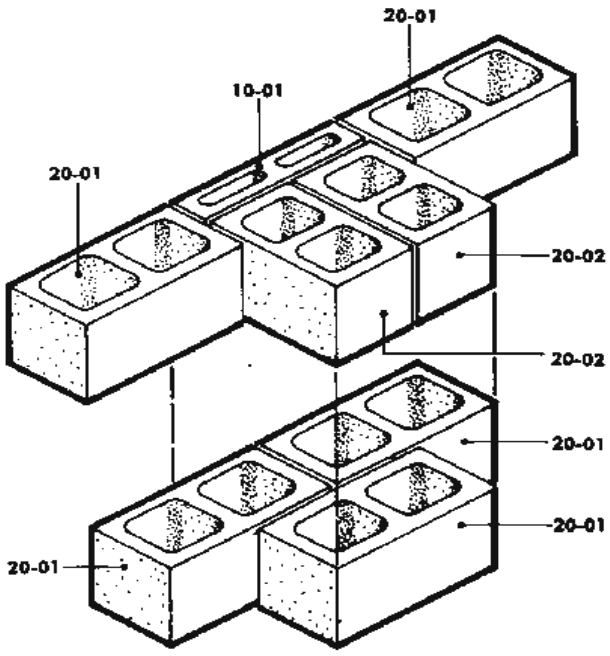
• Where x exceeds 0,3m reduce H by difference between 0 and 0,3m.



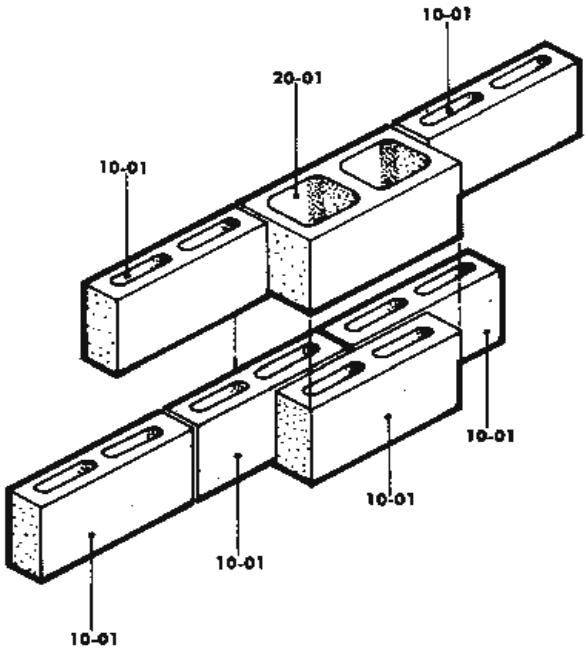
390 mm x 340 mm ENGAGED PIER



390 mm x 240 mm ENGAGED PIERS



390 mm x390 mm ENGAGED PIER



390 mm x 190 mm ENGAGED PIER

Note:
• Where x exceeds 0,3m reduce H by difference between 0 and 0,3m.

CONTROL JOINTS

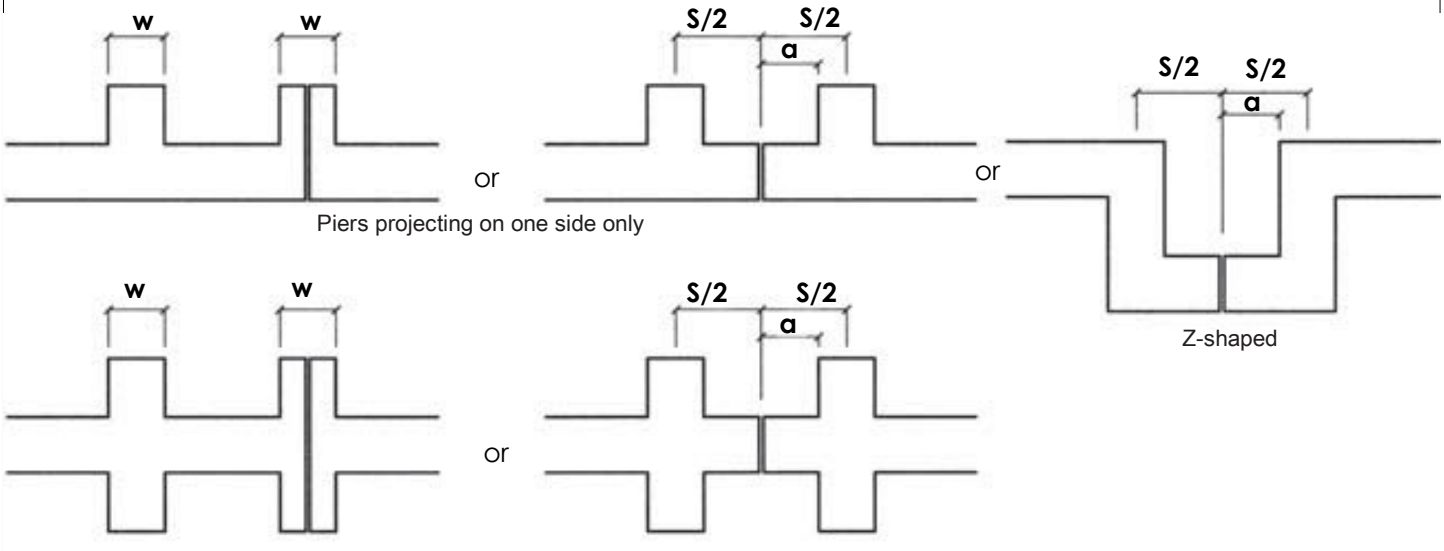
Butt joints are specified to form vertical control joints in the HBM where no lateral stability required. Reference should be made to the CMA Detailing of Concrete Masonry publications where lateral stability is required and for other details on the positioning of control joints.
Control joint location for free-standing walls is shown in Figure 4.12.

Table 4.13 Maximum vertical control joint spacing in walls (HBM Part 2, Section 3, Table 19)

Unit type	Moisture expansion %	Appropriate spacing of vertical joints 10 to 12mm wide	
		Free standing wall, m	Housing units, m
Concrete	-	10	12

Note:
• Bed joint reinforcement at vertical centres 450mm
• Bed joint reinforcement to be shown on drawings
• A Y8 bar in bond beams at centres 1200mm

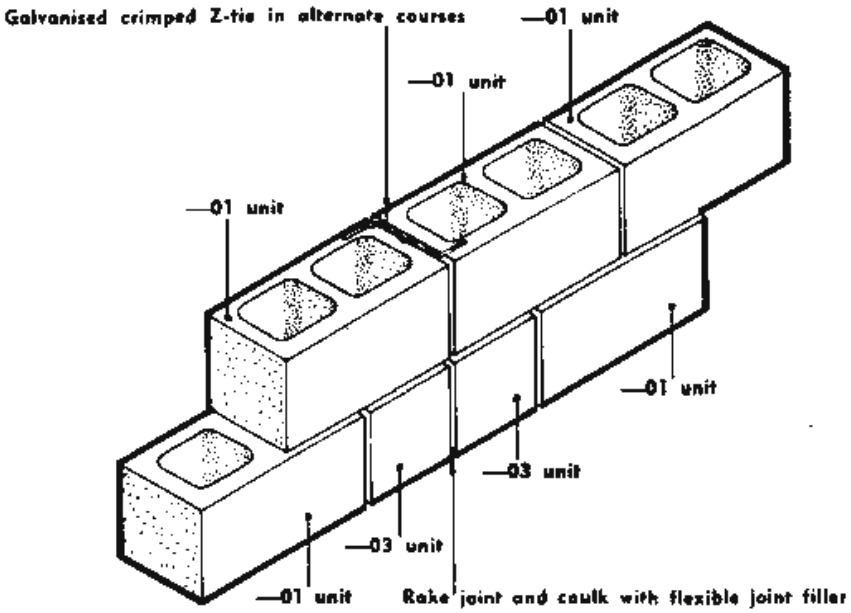
Figure 4.12 Location of control joints in free-standing walls (HBM Part 2, Section 3, Figure DM17) is required and for other details on the positioning of control joints.
Control joint location for free-standing walls is shown in Figure 4.12.



Piers projecting on one side only

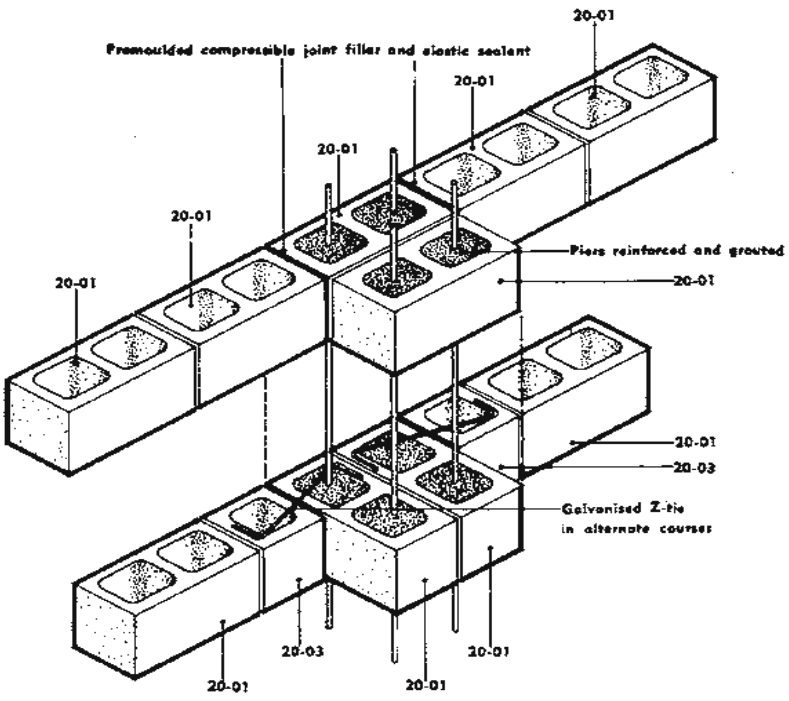
Piers projecting on both sides

Note:
• a not to exceed L. derived from Table 4.5



Detail applies to all wall thicknesses

CONTROL JOINT WITH WIRE TIE



CONTROL JOINT – BONDED PIER

BMP: BY FAR THE BEST WALLS IN AFRICA
ENGINEERED MASONRY WALLS

Boundary Walls and Fences Explained.

A Definition of Boundary Walls and Fences.
For the purposes of managing and assessing proposals in terms of their "new" policy, the City defined a boundary wall or fence as "any wall, fence or enclosing structure erected on or next to a property boundary and any other structures (including but not limited to security devices, for example spikes, electric fencing, barbed or razor wire) affixed to or on top of it."

Specifications for Boundary Walls and Fences
There is now a list of specifications for boundary fences and walls that are:

located on street boundaries,
located on boundaries of public open space,
and lateral boundaries.
These must comply with the following requirements:

Solid boundary walls may not be any higher than shall 1.8 m on street boundaries, and no higher than 2,1 m on lateral boundaries.
Palisade-type fences may not be higher than 2.1 m on either street or lateral boundaries.
Fences may not be higher than 2,1 m on street boundaries.
[Note: The National Building Regulations state that walls and fences to a maximum height of 1,8 m are regarded as "minor building work" and do not require plans. So whilst the City of Cape Town allows walls and fences to be a maximum of 2,1 m, unless they rule otherwise, plans will be required.]