

**SEGMENTAL RETAINING WALL SYSTEMS**  
**TECHNICAL SPECIFICATIONS**



# Adbri Masonry

Adbri Masonry is Australia's leading masonry manufacturer supplying quality concrete bricks, blocks, pavers, retaining walls, erosion control products architectural masonry solutions and reconstituted stone veneers from 15 sites throughout New South Wales, Queensland, Victoria, South Australia and Tasmania. Adbri Masonry is a wholly owned subsidiary of Adelaide Brighton Limited, a leading integrated construction materials and lime producing group of companies and a member of the S&P/ASX 200 Index.

Adbri Masonry first produced concrete Besser™ blocks in 1957 and since then has traded as many household brand names including Besser, Rocla Pavers and Masonry, Pioneer Building Products, Hanson Building Products Pty Ltd and C&M Brick before rebranding as Adbri Masonry in 2009.

In addition to supplying a full collection of quality concrete building and landscaping products, there are range of valuable benefits to working with Adbri Masonry including;

- ✓ Access to our Contracting Services Team (in-house design, supply, installation and certification team for commercial projects).
- ✓ Confidence that all product lines are tested for quality in our N.A.T.A accredited laboratory
- ✓ Our commitment to environmental sustainability and environmental building products.
- ✓ Support from experienced in-house engineers who can provide technical advice and design solutions for civil, commercial and industrial projects
- ✓ Service from dedicated architectural and engineering consultants
- ✓ The benefit of dealing with knowledgeable local sales teams
- ✓ The ability to create customised product and colour solutions specific to individual projects *(conditions apply)*.

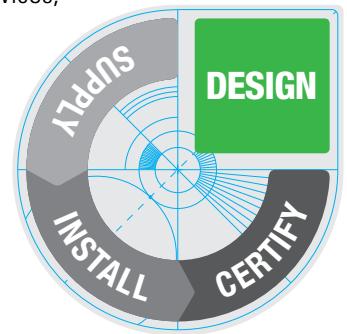


# Contracting Services

Adbri Masonry's Contracting Services Division has been providing solutions in the market for over 20 years. They offer a range of construction and project management services, including a complete design, supply, install and certification package for segmental retaining walls, pavements, erosion control and wall cladding products.

Operating on the East Coast the Adbri Masonry team can provide the following civil contracting services;

- ✓ The supply and installation of concrete masonry products
- ✓ Preliminary design and technical assistance
- ✓ Preliminary costings
- ✓ Certified design
- ✓ Ongoing project management



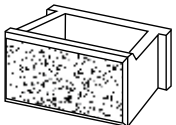
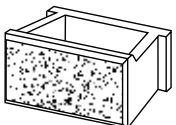
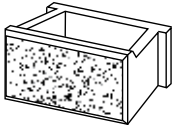
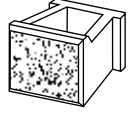
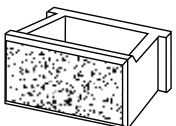
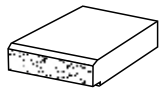
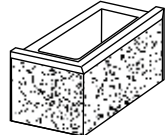
*By utilising these services, the quality and structural adequacy of the finished project can be professionally managed and officially certified on your behalf.*

QLD Building License Number - 61929

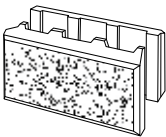
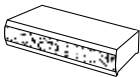
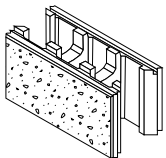
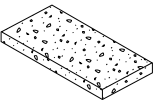
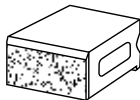
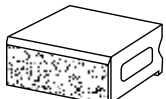
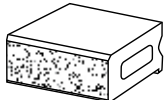
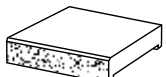
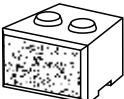
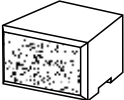


Please Note: These services are limited to commercial and industrial projects and are not available for residential works.

# Quick Reference Guide

	Product	Dimensions w x d x h (mm)	No per m <sup>2</sup>	No per tonne	Unit Weight (kg)	Maximum Heights			Setback
						Residential Gravity Walls	No Fines	Geogrid	
	Allan Block™ Aussie	435 x 240 x 200	11.5	34	29.4	800mm	2600mm	N/A	6°
	Allan Block™ Aussie Vertical	435 x 240 x 200	11.5	34	29.4	600mm	2600mm	N/A	1°
	Allan Block™ Classic	435 x 305 x 200	11.5	32	31.25	1000mm	2600mm	12000mm	6°
	Allan Block™ Junior	216 x 240 x 200	23	68	14.7	600mm	2600mm	N/A	1° or 6°
	Allan Block™ Vertical	435 x 305 x 200	11.5	32	31.25	800mm	2600mm	8000mm	1°
	Allan Block™ Split Cap	216 x 310 x 80	4.6L/m	86	11.6	-	-	-	-
	Allan Block™ Corner	400 x 195 x 200	-	45	22.2	-	-	-	-

Nominated maximum heights are based on designs provided in this literature. Should you have any taller walls or walls that fall outside the scope of the provided designs, please contact Adbri Masonry for assistance.

	Product	Dimensions w x d x h (mm)	No per m <sup>2</sup>	No per tonne	Unit Weight (kg)	Maximum Heights			Setback
						Residential Gravity Walls	No Fines	Geogrid	
	Versawall® Standard Unit	400 x 220 x 200	12.5	62.5	21.5	800mm	1400mm	N/A	0°
	Versawall® Capping Unit	300 x 240 x 60	3.3L/m	106	9.6	-	-	-	-
	Versastone® Standard Unit	400 x 190 x 200	12.5	65	15.3	600mm	1400mm	N/A	0°
	Versastone® Capping Unit	390 x 190 x 40	2.5L/m	143	7.00	-	-	-	-
	Wallstone®	200 x 220 x 150	33	69	15	750mm	N/A	N/A	0 or 4.5°
	Wallstone® Grande	300 x 220 x 150	22	103	9.7				0 or 4.5°
	Wallstone® Urban	300 x 220 x 150	22	103	9.7				0 or 4.5°
	Wallstone® Split Capping	300 x 240 x 60	3.3 L/m	106	9.4				
	Miniwall®	182 x 182 x 125	44 Semi Solid 51 Solid	227.28	4.4	500mm	875mm	N/A	0°
	Minicap™	182 x 182 x 125	8 L/m	227.28	4.4				





The designs provided in this brochure are for gravity retaining wall systems designed in accordance with the requirements of AS4678 “Earth-retaining Structures”.

In some instances, designs have been provided utilising no fines concrete (NFC) behind the retaining wall units to provide additional stability for the wall system, and increase the maximum permissible design height.

The designs provided with no fines concrete are done within the limits of economy. Excessive amounts of no fines concrete (NFC) are expensive, and for our larger retaining wall systems it will become more cost effective to utilise a Geogrid reinforced wall system.

***For information on Geogrid reinforced walls, please refer to page 44.***

*This brochure has been prepared by Adbri Masonry. All designs in this brochure have been checked and approved by Arlene Nardone, RPEQ 7777 and Wayne Holt CPEng, NPER, RPEQ 5510.*

**Disclaimer:**

It is the responsibility of the customer to ensure that all assumed properties (Note 2 of Technical Parameters) are achieved on site, and that all retaining walls are installed as per requirements of designs and cross sectional details. Adbri Masonry accepts no liability for any walls outside the scope of designs included in this brochure, or for installation of the products contained within.

# 1.0 Technical Parameters

1. Designed in accordance with the following standards unless noted otherwise.
2. The soil types and properties assumed in design are:

<b>AS4678:2002</b>	Earth retaining structures
<b>AS1170.1:2002</b>	Loading Code
<b>AS3700:2011</b>	Masonry Code
<b>AS2870:1996</b>	Residential Slabs and Footings
<b>Concrete</b>	Grade N20, min. 80mm slump, 20mm max. aggregate.
<b>Aggregate</b>	12 - 20mm max.
<b>No Fines Concrete</b>	6:1 ratio by volume of 20mm max size clean aggregate and cement. Water content should be such that the cement slurry evenly coats the aggregate and retains a wet/glossy appearance without excess slurry running off. This is typically around 40 litres per 100kg of cement

Material	Unit Weight (kN/m <sup>3</sup> )	Internal Friction Angle (°)	Cohesive Strength
Insitu Material - Type 1	19	30	0
Insitu Material - Type 2	19	25	0
Gravel Backfill	19	37	0
Concrete	24	N/A	0
CGM	18	37	0
Foundation Replacement Zones	19	42	0
No Fines Concrete (NFC)	19	N/A	N/A

**Type 1** soil denotes a sandy type material or better.

**Type 2** soil denotes a clay, silty clay or sandy clay material exhibiting stiffness / firmness with maximum medium reactivity.

**Notes:** Where depth of aggregate exceeds 300mm, the aggregate infill material is deemed to be the material being retained. If natural material on site does not meet or exceed the 25° or 30° internal friction angle, you must use a foundation replacement zone and a H/2 aggregate infill material. NFC designs will not be applicable and further engineering advice will be required. A geotechnical engineer will be able to assist you in evaluating your in-situ material.

No design consideration has been given for rock excavation. With the assumed founding soil properties, the allowable bearing capacity under a normal load has been taken at 100kPa.

The properties of the materials should be checked by a geotechnical engineer if doubt exists. Design has been based on assumed average conditions for a gravity retaining wall and is considered applicable to soils where the site is classified as S, M, H or E with “ys” less than 70mm, where the wall is founded on natural undisturbed material. The infill of the wall must be compacted to ensure against rotation of the wall backwards.

3. These details are not applicable to the following designs and require the specific design input of a registered professional engineer:
  - (a) Wall heights greater than shown in the tables
  - (b) Surface slopes greater than 1V:4H at top of wall (14°).
  - (c) Site ground slopes greater than 1V:4H at toe of wall (14°).
  - (d) Retained material properties differing from those assumed in the design.
  - (e) Walls founded on fill.
  - (f) Rock encountered in excavation of area for infill material.
  - (g) Site classified as “E” Ys greater than 70mm or “P”. For “E” sites where Ys exceeds 70mm a geotechnical engineer should be engaged. For “P” sites, you must ensure that a safe bearing capacity of 100kPa is achieved, and satisfy yourself that no long term settlement will occur.
  - (h) Site has major drainage or seepage problems, is subject to water forces including flooding, or groundwater exists.
  - (i) Lack of global stability. Global stability should be checked by a qualified geotechnical engineer.
  - (j) The founding material has a bearing capacity less than 100kPa.
  - (k) Where the possibility of failure of the toe of the wall exists due to location of building or service pipe trenches in front of the wall prior to or after construction of the retaining wall.
  - (l) Where fences are detailed to be installed at the top of the wall which do not comply with the fence post installation detail included in this brochure.
  - (m) Where replacement material zones are not able to be installed as detailed in the design tables.
  - (n) Surcharge loads are higher than values nominated in design tables.
4. These conditions must be met for residential walls denoted by \* as shown in design tables for residential walls to 1200mm max height:
  - (a) All retaining walls are designed to CMAA document MA53 (Segmental Concrete Gravity Retaining Walls Design and Construction Guide).
  - (b) All retaining walls shall comply with AS4678 Structure Classification A.
  - (c) These tables are only applicable to retaining walls that incorporate a low permeability surface membrane and drainage system such that there can be no ingress of any water into the soil behind the retaining wall.
  - (d) Structures that do not incorporate a low permeability surface membrane and drainage system such that there can be no ingress of any water into the soil behind the retaining wall are deemed to be outside the scope of this brochure.
  - (e) These tables are applicable to cuts in insitu soils. The tables are not applicable to cohesive fill.
  - (f) All retaining walls are designed for a maximum surcharge load of 2.5 kPa. If surcharge loads greater than 2.5 kPa are expected, these designs will not be appropriate.
  - (g) CGM levelling pads consist of at least 5% cement-stabilised crushed rock with dimensions as detailed. Before the bottom course is positioned, the footing should be moistened to ensure bond between block and footing.
  - (h) These walls have been designed in accordance with Rankine Bell Methodology.
5. The segmental retaining wall units in this brochure, with the exception of the Landmark system, have keys which are utilised for locating purposes only and are therefore not subject to the dimensional tolerances outlined in table 2.3 of AS4455.3:2008 “Segmental Retaining Wall Units”. The Landmark system has been independently tested to ensure integrity of the structural key for the purpose of constructing geogrid reinforced walls up to 20m in height.

## 2.0 General Notes

1. Wall construction to be executed in accordance with the requirements of this brochure.
2. The walls have been designed for the following surcharge loads :
  - 1kPa (for garden walls) to 800mm maximum height.
  - 2.5kPa for walls between 800mm and 1500mm in height.
  - 5 kPa for walls exceeding 1500mm in height.
  - No Dead Loads have been allowed for.
  - Cohesion  $c=4\text{kPa}$  for residential walls denoted by \* :Where there are any variations to the materials, soil conditions, loadings, drainage, geometry of the site or retaining wall, a registered engineer should be engaged to design the wall.
3. Where a fence is required at the top of the wall, the fence shall be installed in accordance with the detail in this manual.
4. Structures such as building footings, swimming pools, other retaining walls, storage facilities or solid panel fencing and loads such as from motor vehicle access must be kept clear such that the load is not placed within a line projected behind the wall from the founding level at 1V:1.5H for Type 1 soils and 1V:2H for Type 2 soils. Where structures or driveways do intrude within this line a registered professional engineer should be engaged to design the wall.
5. Precautions must be taken where other building work or service trenches are excavated around the retaining wall, as it may be necessary to use bridging foundations or other alternatives.
6. In all wall units with voids, stability depends on the blocks remaining filled. For all the wall units, the first course should be installed with an embedment into the levelling pad and placed to give firm even bearings on the leveling pad, level front to back and side to side.
7. The base of the leveling pad excavation should be firm, dry and free of loose material. Any disturbed ground at the base of the trench should be compacted prior to footing construction. All retained material must be compacted by firm tamping using appropriate compaction equipment. Materials in front of the wall should be founding soil or equivalent and thoroughly compacted immediately after the wall is out of the ground.
8. If the insitu material is equal to or exceeds the properties of the proposed infill material, then the insitu material shall be substituted for the infill material.
9. Precautions should be taken if cutting back the existing bank to ensure such excavation does not destabilize the footing of another structure.
10. Walls may be constructed to greater heights in specific applications with special engineering design.
11. Check with your local council whether building approval is required.
12. It is recommended that the top course is adhered to the next course with a suitable waterproof construction adhesive as a precautionary measure. Check with manufacturer of adhesive for suitability of use.
13. Where these walls impose loads on other structures those other structures must be checked for strength and stability.
14. Where a foundation replacement zone is detailed, this will denote the removal of natural material where detailed, and replacement with CBR45 road base compacted to 98% Standard Relative Dry Density (RDD).
15. External interface friction angle is calculated as being equal to 2/3 of the internal interface friction angle.
16. Subsoil drains should be flushed at regular intervals to ensure continuous proper functioning of the retaining wall drainage system.
17. Subsoil drains shall have outlet points at maximum 20m centres for dry application and maximum 5m centres for wet application.



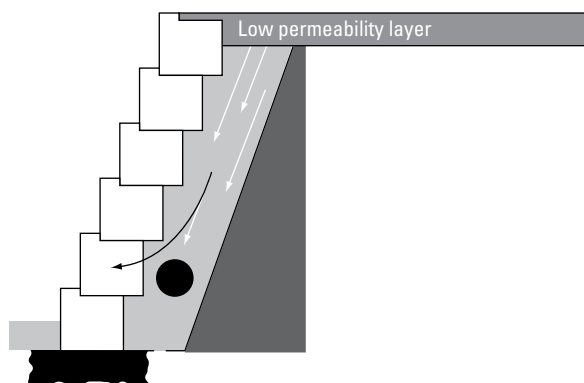
## 3.0 Typical Details for Segmental Retaining Walls

### 3.1 DRAINAGE OF BACKFILL

(Detailed using Eden units, but information is applicable to all product types)  
Before a segmental retaining wall is constructed consideration must be given to the need for and the means of drainage. Each individual site needs to be assessed and measures taken appropriate to the source and the volume of water expected behind the wall. The following general guidelines will assist

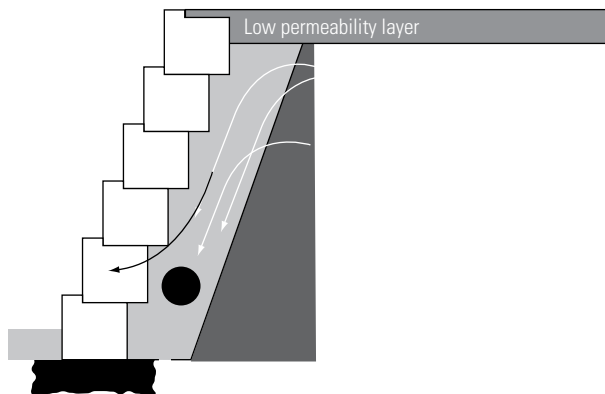
in deciding on the type of drainage required, but are not intended to replace professional advice.

In the event of heavy rain before planting is established, the top of the wall should be covered with plastic sheets or tarpaulins to prevent the soil being scoured out



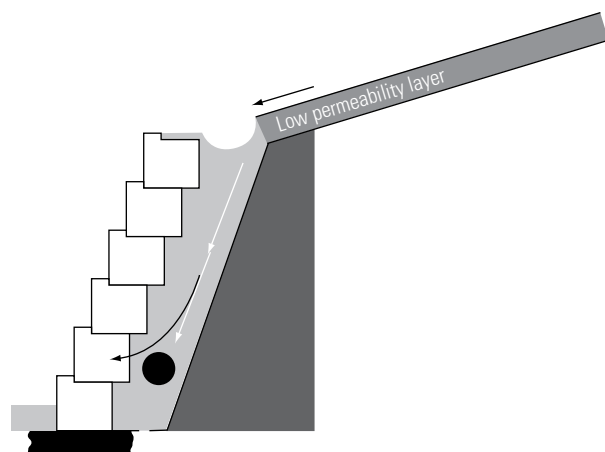
#### A. Only direct rain on backfill

Where there is a small width of backfill, it is sufficient that the backfill be composed of drainage aggregate to permit drainage through the wall. Where there is a large width of backfill, it must be sealed with a low permeability layer eg. clay layer, concrete slab etc, to prevent the backfill becoming saturated.



#### B. Sub-soil seepage entering backfill

In this case it will be necessary to intercept the water and direct it away. This can usually be achieved by providing a layer of gravel behind the wall to collect the water, and an agricultural pipe at the base to carry the water away.

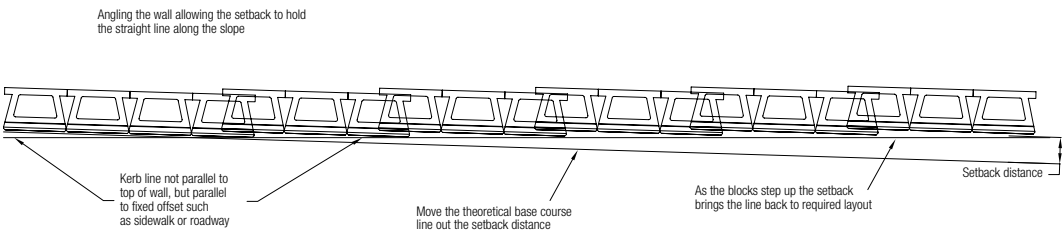


#### C. Areas of heavy rainfall or surface run-off water

In this case the surface must be sealed with a low permeability layer to prevent saturation of the backfill and a surface drain provided to direct water away in order to prevent scouring.

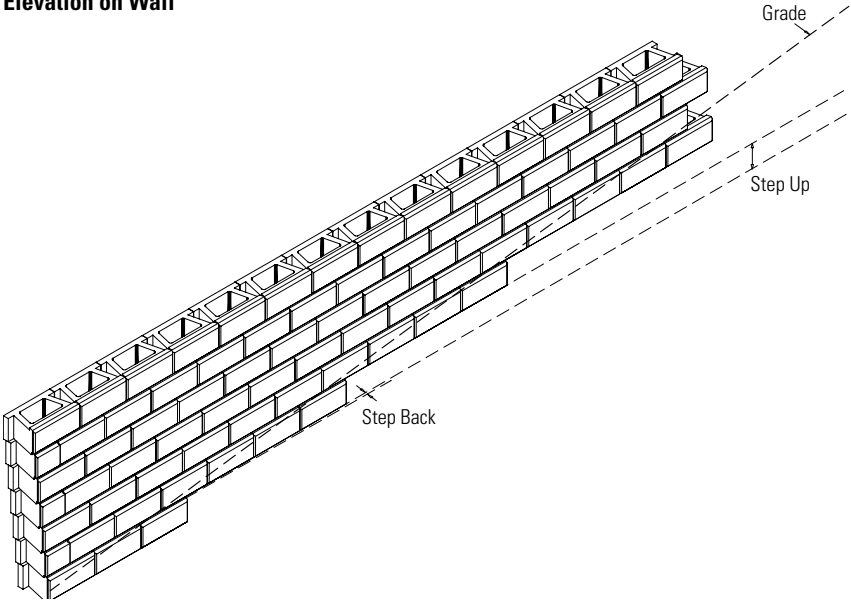
3.2 SET OUT ON SLOPING SITES

Plan on Wall



Offset the line in basecourse (each step back)	
AB Aussie	21mm
AB Aussie Vertical	3.5mm
AB Classic	21mm
AB Junior	21mm
AB Vertical	3.5mm
Versawall®	0mm
Wallstone®	0 or 12mm
Miniwall®	0mm

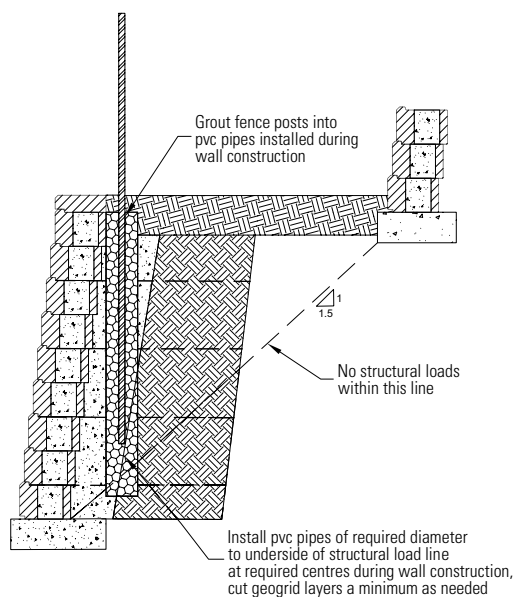
Elevation on Wall



Product	Step back (each course)	Step up (each course)
AB Aussie	21mm	200mm
AB Aussie Vertical	3.5mm	200mm
AB Classic	21mm	200mm
AB Junior	21mm	200mm
AB Vertical	3.5mm	200mm
Wallstone®	0 or 12mm	150mm
Versawall®	0mm	200mm
Miniwall®	0mm	125mm

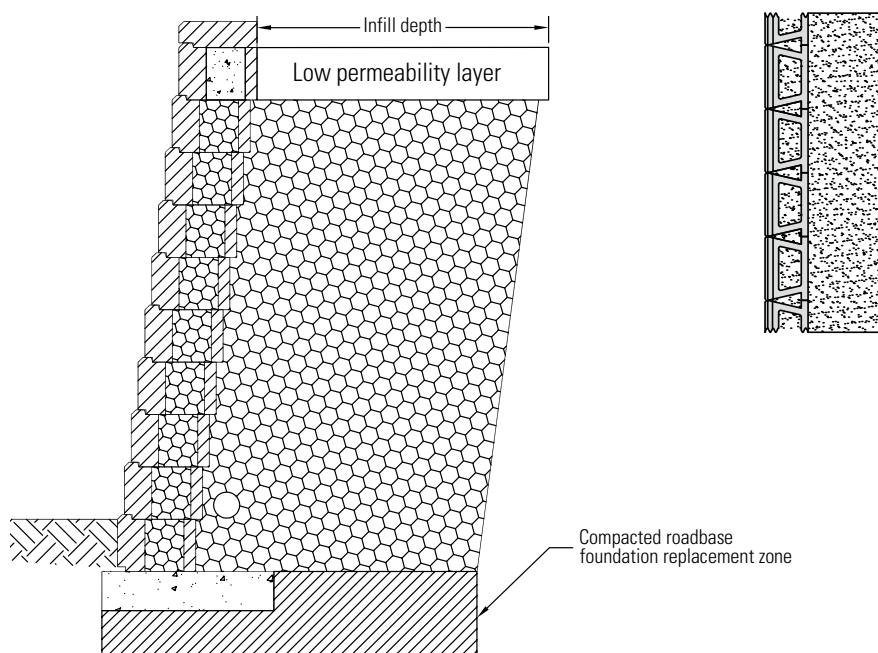


### 3.3 TYPICAL FENCE POST DETAIL



Fence posts may be driven once wall is installed, however they must remain at least 500mm off rear of wall. This applies where aggregate is used as infill material, or where the width of no fines concrete does not encroach on fence location

### 3.4 TYPICAL NO FINES CONCRETE INSTALLATION DETAILS

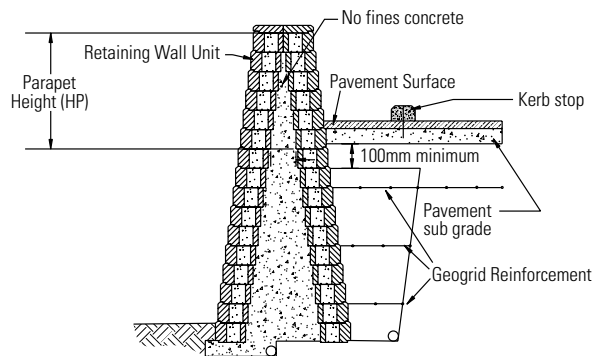


Place no fines concrete in single block lifts of 200mm or less (depending upon height of block). Ensure no fines is manipulated into V shaped void between units to ensure adequate bond between block and concrete mass.

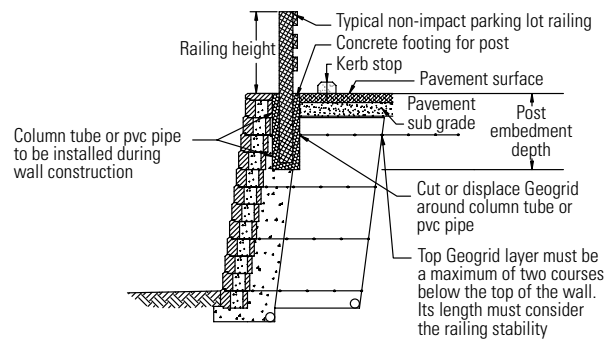
If units are cored through, the no fines concrete must also completely fill the cored section of the block.

### 3.5 MISCELLANEOUS DESIGN DETAILS

#### Double Wall Parapet



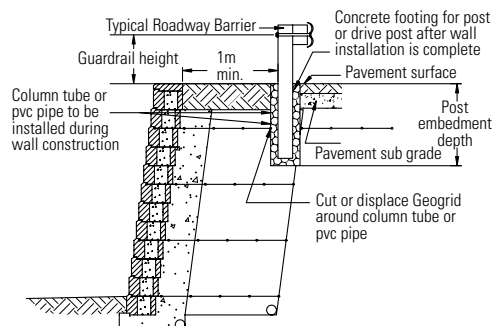
#### Non-impact Parking Railing



This detail does not account for extreme vehicle impact

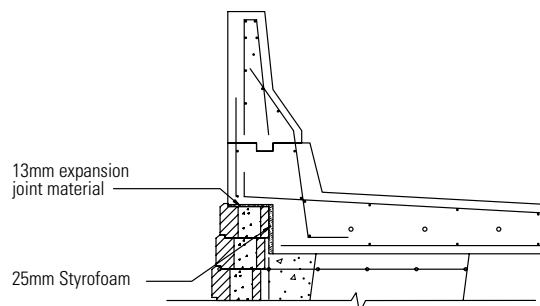
Parking Railing design and construction requires site specific analysis for every wall case. Please contact Adbri Masonry or a qualified local engineer for assistance

#### Impact Roadway or Parking Guard Rail



#### Cantilevered Jersey Barrier

Ensure that Jersey Barrier Design is in accordance with local government specifications

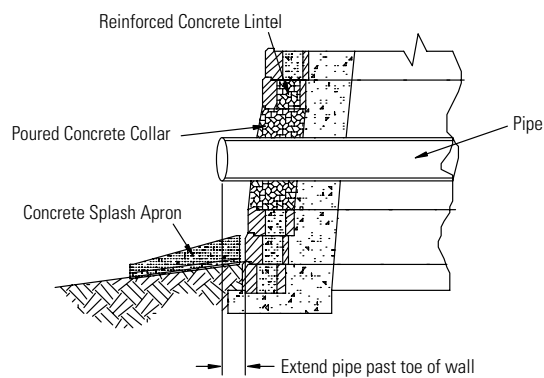


#### Concrete Construction Notes

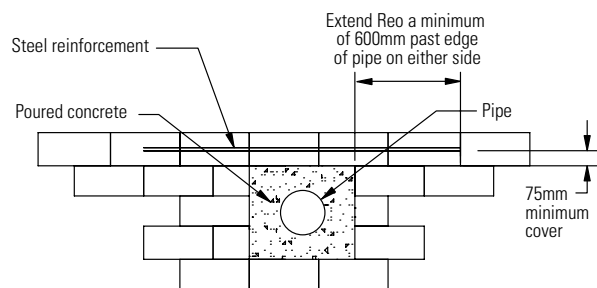
1. Positive bond breaker and expansion joint material must be provided between cast in place slab and Retaining Wall Units.
2. Concrete minimum compressive strength  $f'c = 24$  MPa minimum tensile strength  $f_y = 45$  MPa.
3. Caulk expansion joint.
4. Expansion joints are at 9m on centre maximum and 9m on centre minimum.
5. Control joints are at 3m on centre.



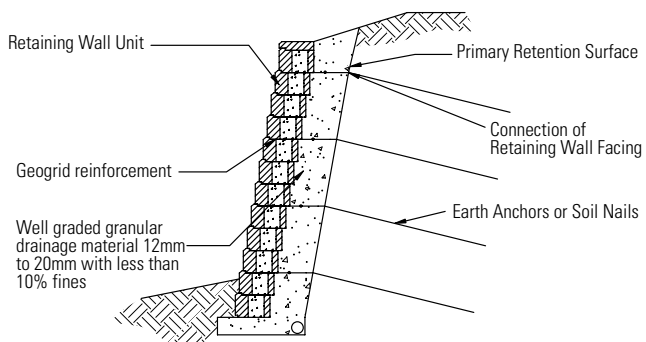
### Concrete Collar Storm Water Pipe Outlet Section View



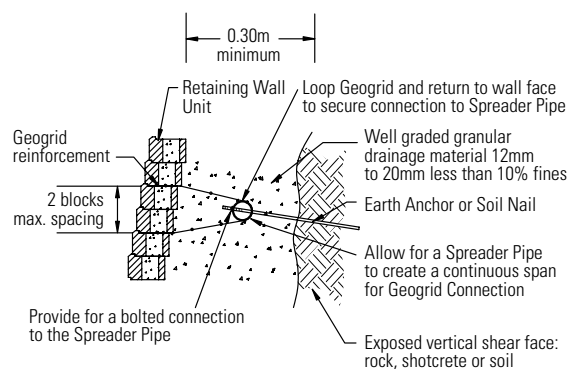
### Concrete Collar Storm Water Pipe Outlet Elevation View



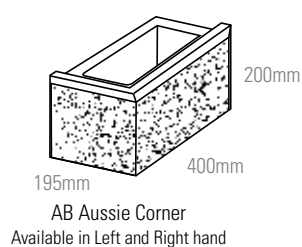
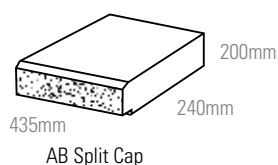
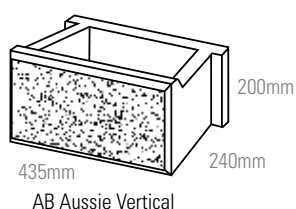
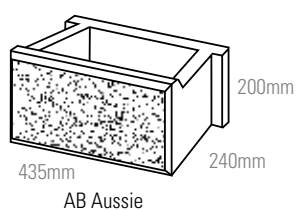
### Veneer Typical Section



### Facing to Earth Anchor Tiebacks



## 4.01 ALLAN BLOCK™ AUSSIE



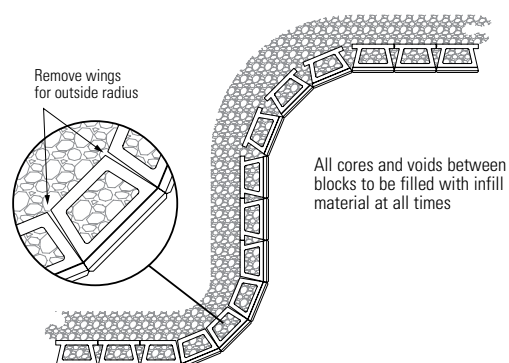
### Allan Block™ Aussie Technical Data

No. Per m <sup>2</sup> of Wall	11.5
Approx Weight	29.4kg
Setback	6°

### Allan Block™ Aussie Vertical Technical Data

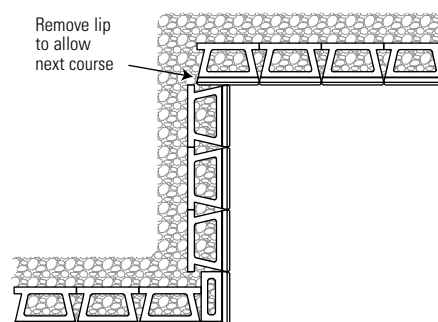
No. Per m <sup>2</sup> of Wall	11.5
Approx Weight	29.4kg
Setback	1°

## Allan Block™ Curves Detail

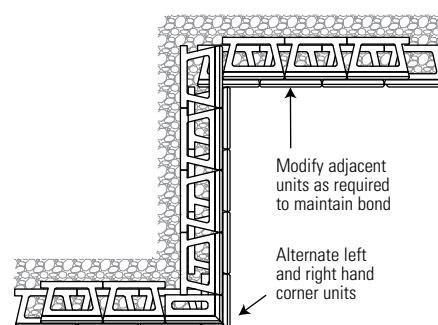


## Allan Block™ Corners Detail

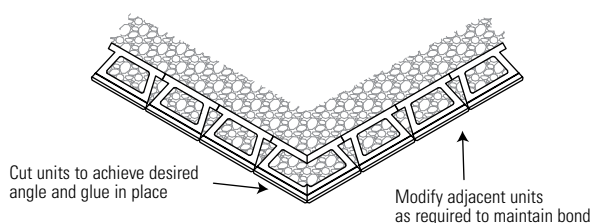
### Right Angles - First Course



### Right Angles - Second Course

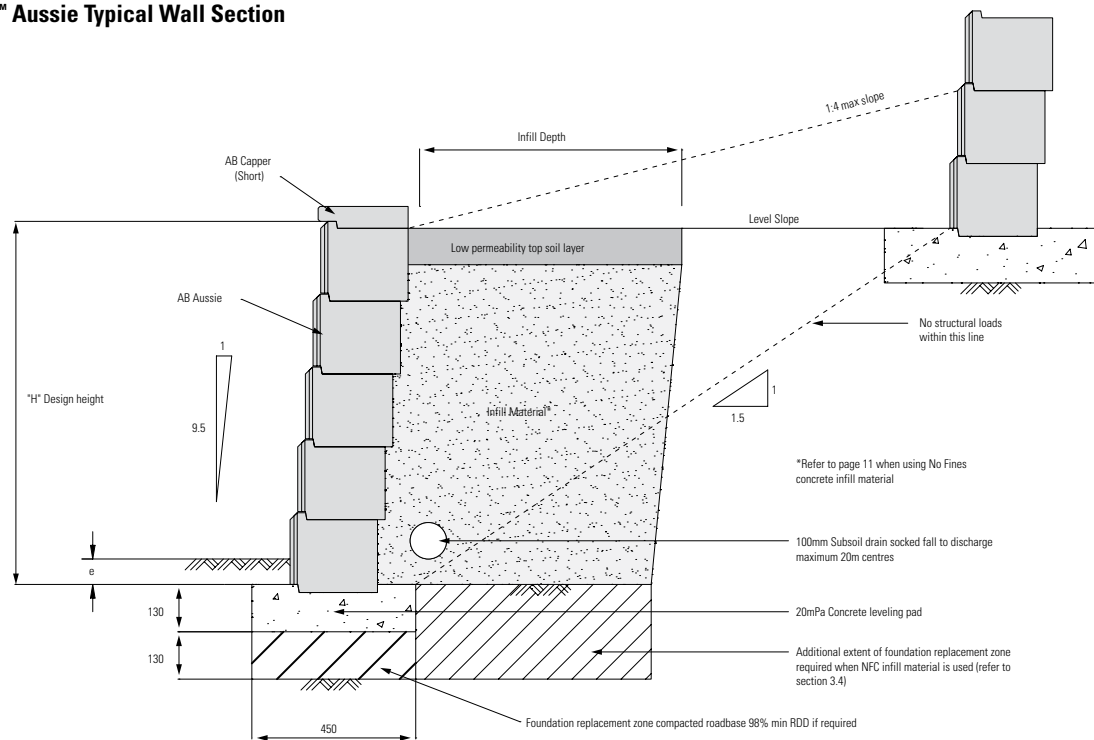


### Outside angles other than 90°

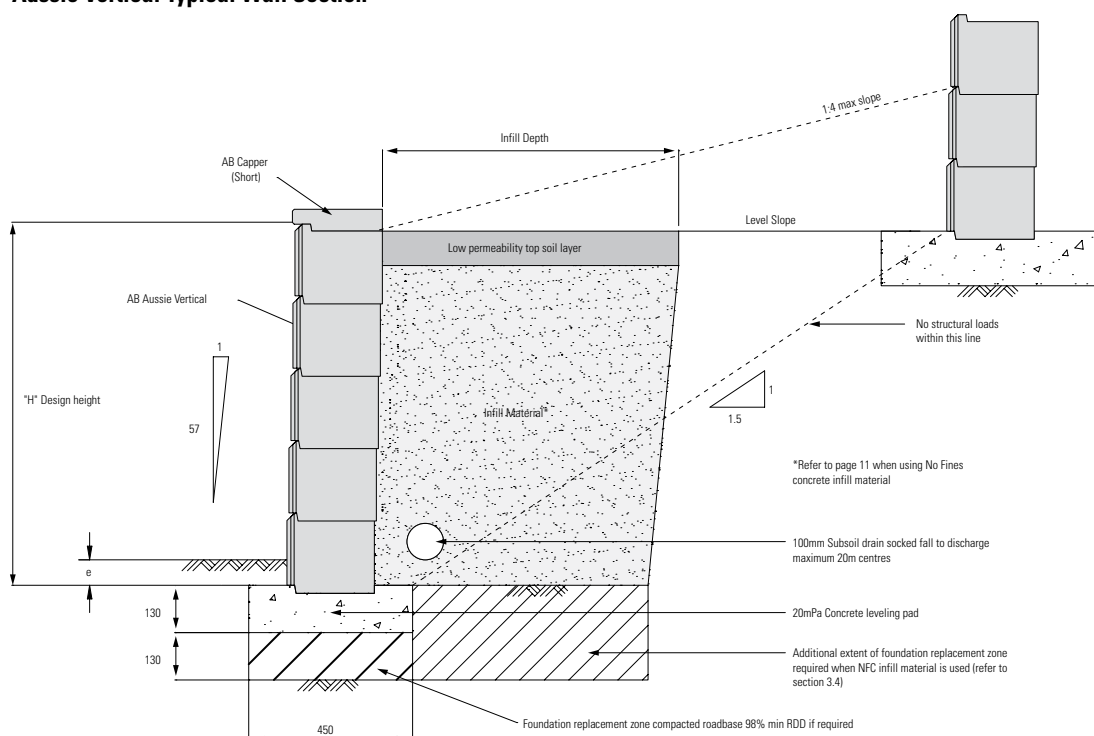




## Allan Block™ Aussie Typical Wall Section



## Allan Block™ Aussie Vertical Typical Wall Section



## ALLAN BLOCK™ AUSSIE RETAINING WALL DESIGN HEIGHTS

*Residential Retaining Walls (includes residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	800	1050
2400	Level	5	Replacement Zone	NFC	750	1000
2200	Level	5	Replacement Zone	NFC	700	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	550	750
1600	Level	5	Replacement Zone	NFC	500	700
1400	Level	2.5	Replacement Zone	NFC	350	500
1200	Level	2.5	Replacement Zone	NFC	300	400
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Replacement Zone	Aggregate	300	300
600	Level	1	Replacement Zone	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1000	1350
2200	1:4 Maximum	5	Replacement Zone	NFC	900	1250
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1150
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	500	750
1200	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	500
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Replacement Zone	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

## ALLAN BLOCK™ AUSSIE RETAINING WALL DESIGN HEIGHTS

### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	800	1050
2400	Level	5	Replacement Zone	NFC	750	1000
2200	Level	5	Replacement Zone	NFC	700	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	550	750
1600	Level	5	Replacement Zone	NFC	500	700
1400	Level	2.5	Replacement Zone	NFC	350	500
1200	Level	2.5	Replacement Zone	NFC	300	400
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Replacement Zone	Aggregate	300	300
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1000	1350
2200	1:4 Maximum	5	Replacement Zone	NFC	900	1250
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1150
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	500	750
1200	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	500
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Natural Material	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.



## ALLAN BLOCK™ AUSSIE VERTICAL RETAINING WALL DESIGN HEIGHTS

*Residential Retaining Walls (includes residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	950	1150
2400	Level	5	Replacement Zone	NFC	900	1050
2200	Level	5	Replacement Zone	NFC	800	1000
2000	Level	5	Replacement Zone	NFC	750	900
1800	Level	5	Replacement Zone	NFC	650	850
1600	Level	5	Replacement Zone	NFC	600	750
1400	Level	2.5	Replacement Zone	NFC	450	550
1200	Level	2.5	Replacement Zone	NFC	350	450
1000	Level	2.5	Replacement Zone	NFC	300	350
800	Level	1	Replacement Zone	Aggregate	400	400
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1100	1500
2200	1:4 Maximum	5	Replacement Zone	NFC	1050	1400
2000	1:4 Maximum	5	Replacement Zone	NFC	950	1300
1800	1:4 Maximum	5	Replacement Zone	NFC	900	1200
1600	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1400	1:4 Maximum	2.5	Replacement Zone	NFC	600	800
1200	1:4 Maximum	2.5	Replacement Zone	NFC	500	700
1000	1:4 Maximum	2.5	Replacement Zone	NFC	400	600
800	1:4 Maximum	1	Replacement Zone	NFC	300	450
600	1:4 Maximum	1	Replacement Zone	NFC	300	350
400	1:4 Maximum	1	Replacement Zone	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

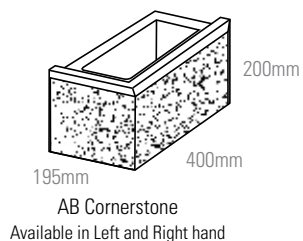
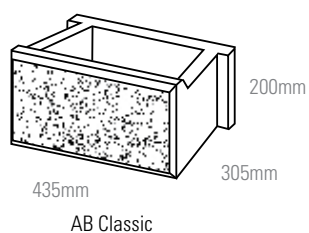
## ALLAN BLOCK™ AUSSIE VERTICAL RETAINING WALL DESIGN HEIGHTS

### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	950	1150
2400	Level	5	Replacement Zone	NFC	900	1050
2200	Level	5	Replacement Zone	NFC	800	1000
2000	Level	5	Replacement Zone	NFC	750	900
1800	Level	5	Replacement Zone	NFC	650	850
1600	Level	5	Replacement Zone	NFC	600	750
1400	Level	2.5	Replacement Zone	NFC	450	550
1200	Level	2.5	Replacement Zone	NFC	350	450
1000	Level	2.5	Replacement Zone	NFC	300	350
800	Level	1	Replacement Zone	Aggregate	400	400
600	Level	1	Replacement Zone	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1100	1500
2200	1:4 Maximum	5	Replacement Zone	NFC	1050	1400
2000	1:4 Maximum	5	Replacement Zone	NFC	950	1300
1800	1:4 Maximum	5	Replacement Zone	NFC	900	1200
1600	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1400	1:4 Maximum	2.5	Replacement Zone	NFC	600	800
1200	1:4 Maximum	2.5	Replacement Zone	NFC	500	700
1000	1:4 Maximum	2.5	Replacement Zone	NFC	400	600
800	1:4 Maximum	1	Replacement Zone	NFC	300	450
600	1:4 Maximum	1	Replacement Zone	NFC	300	300
400	1:4 Maximum	1	Replacement Zone	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

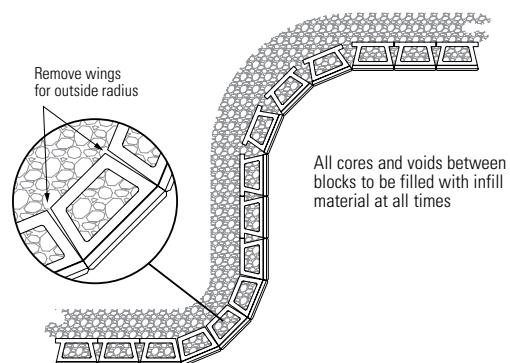
## 4.02 ALLAN BLOCK™ CLASSIC



### Allan Block™ Classic Technical Data

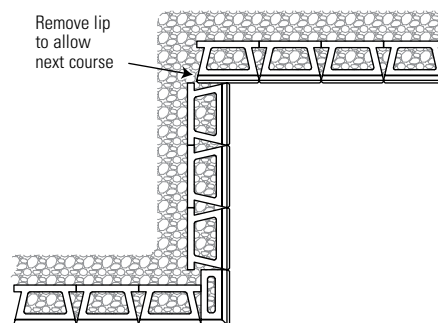
No. Per m <sup>2</sup> of Wall	11.5
Approx Weight	31.25kg
Setback	6°

## Allan Block™ Curves Detail

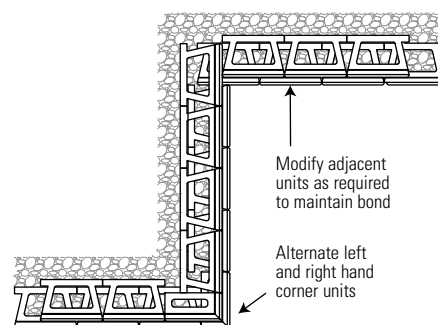


## Allan Block™ Corners Detail

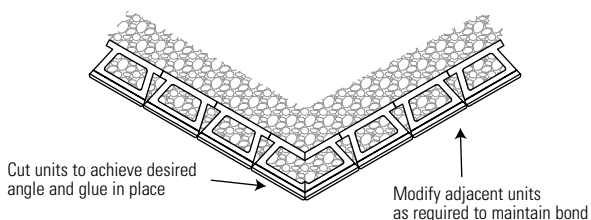
### Right Angles - First Course



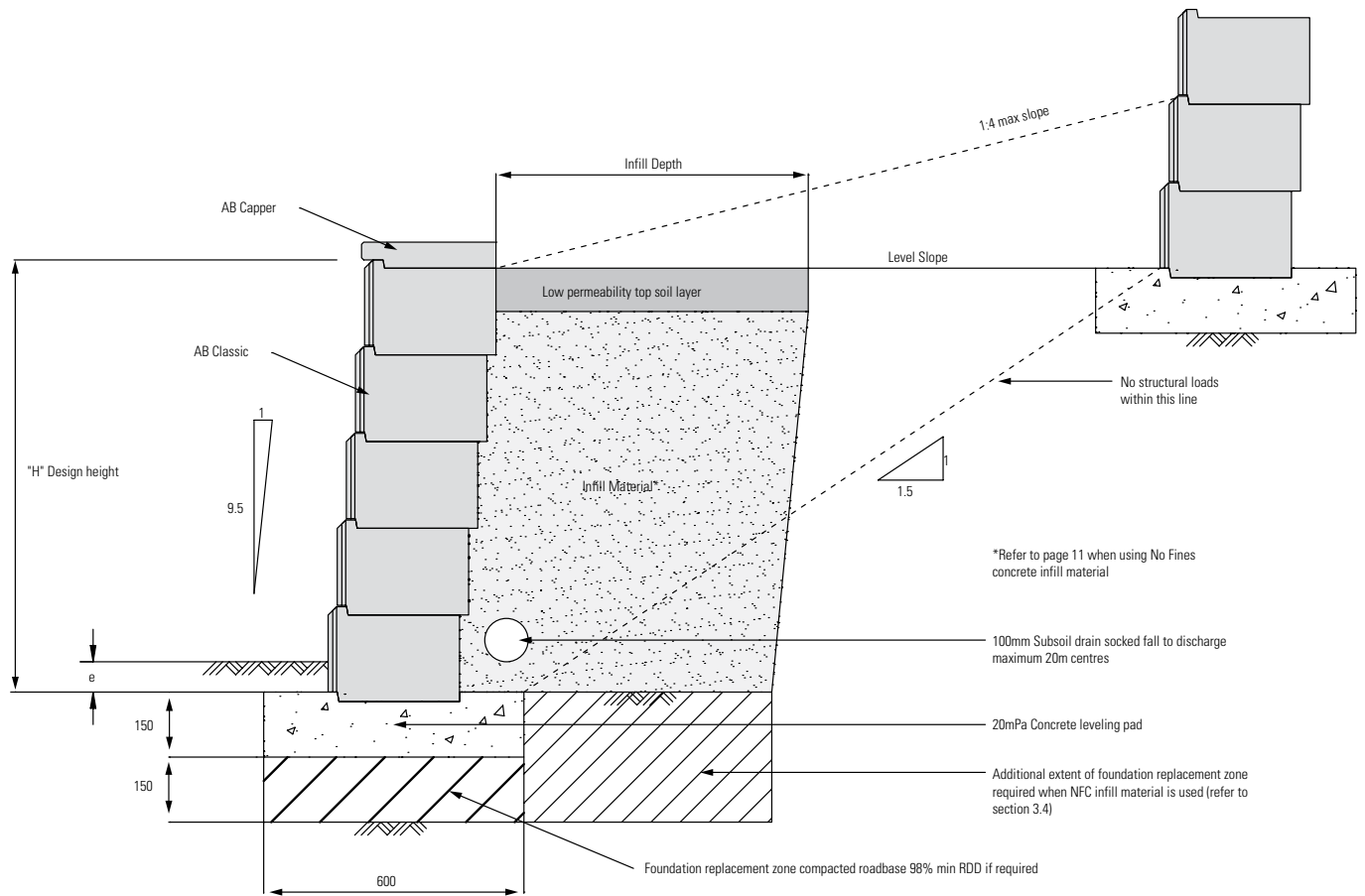
### Right Angles - Second Course



### Outside angles other than 90°



## Allan Block™ Classic Typical Wall Section





## ALLAN BLOCK™ CLASSIC RETAINING WALL DESIGN HEIGHTS

*Residential Retaining Walls (includes residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	750	950
2400	Level	5	Replacement Zone	NFC	700	900
2200	Level	5	Replacement Zone	NFC	600	800
2000	Level	5	Replacement Zone	NFC	550	750
1800	Level	5	Replacement Zone	NFC	500	650
1600	Level	5	Replacement Zone	NFC	450	600
1400	Level	2.5	Replacement Zone	NFC	300	400
1200	Level	2.5	Replacement Zone	NFC	300	300
1000	Level	2.5	Natural Material	Aggregate	300	300
800	Level	1	Natural Material	Aggregate	300	300
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	900	1250
2200	1:4 Maximum	5	Replacement Zone	NFC	850	1200
2000	1:4 Maximum	5	Replacement Zone	NFC	750	1100
1800	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1600	1:4 Maximum	5	Replacement Zone	NFC	600	900
1400	1:4 Maximum	2.5	Replacement Zone	NFC	400	600
1200	1:4 Maximum	2.5	Replacement Zone	NFC	300	500
1000	1:4 Maximum	2.5	Replacement Zone	Aggregate	500	500
800	1:4 Maximum	1	Natural Material	Aggregate	400	400
600	1:4 Maximum	1	Natural Material	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

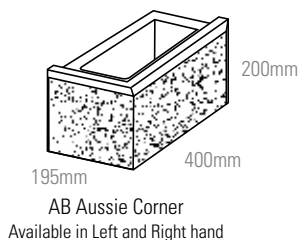
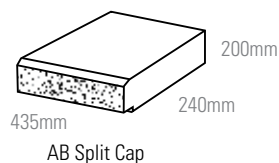
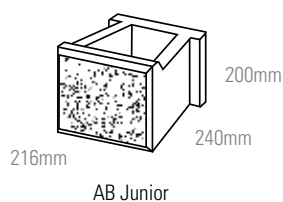
## ALLAN BLOCK™ CLASSIC RETAINING WALL DESIGN HEIGHTS

### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	750	950
2400	Level	5	Replacement Zone	NFC	700	900
2200	Level	5	Replacement Zone	NFC	600	800
2000	Level	5	Replacement Zone	NFC	550	750
1800	Level	5	Replacement Zone	NFC	500	650
1600	Level	5	Replacement Zone	NFC	450	600
1400	Level	2.5	Replacement Zone	NFC	300	400
1200	Level	2.5	Replacement Zone	NFC	300	300
1000	Level	2.5	Replacement Zone	Aggregate	300	300
800	Level	1	Replacement Zone	Aggregate	300	300
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	900	1250
2200	1:4 Maximum	5	Replacement Zone	NFC	850	1200
2000	1:4 Maximum	5	Replacement Zone	NFC	750	1100
1800	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1600	1:4 Maximum	5	Replacement Zone	NFC	600	900
1400	1:4 Maximum	2.5	Replacement Zone	NFC	400	600
1200	1:4 Maximum	2.5	Replacement Zone	NFC	300	500
1000	1:4 Maximum	2.5	Replacement Zone	Aggregate	500	500
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Natural Material	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

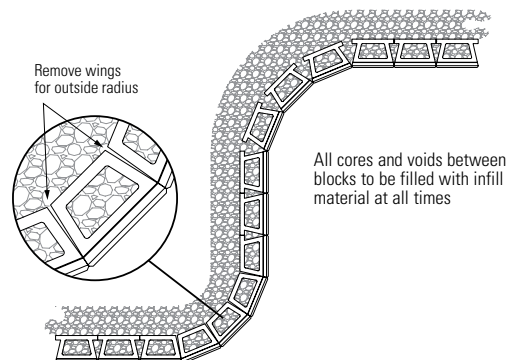
#### 4.03 ALLAN BLOCK™ JUNIOR



##### Allan Block™ Junior Technical Data

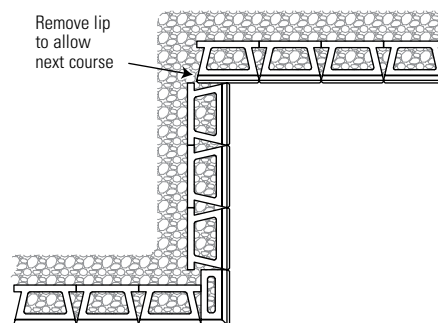
No. Per m <sup>2</sup> of Wall	23
Approx Weight	14.7kg
Setback	1.4° or 6°

#### Allan Block™ Curves Detail

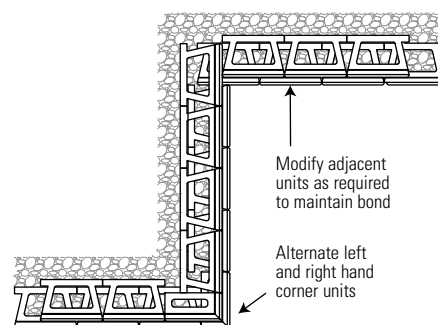


#### Allan Block™ Corners Detail

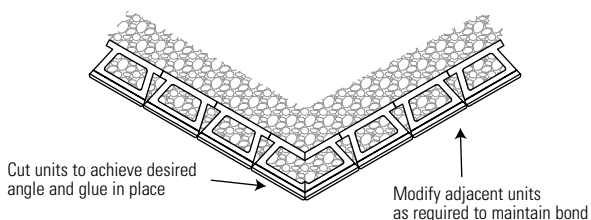
##### Right Angles - First Course



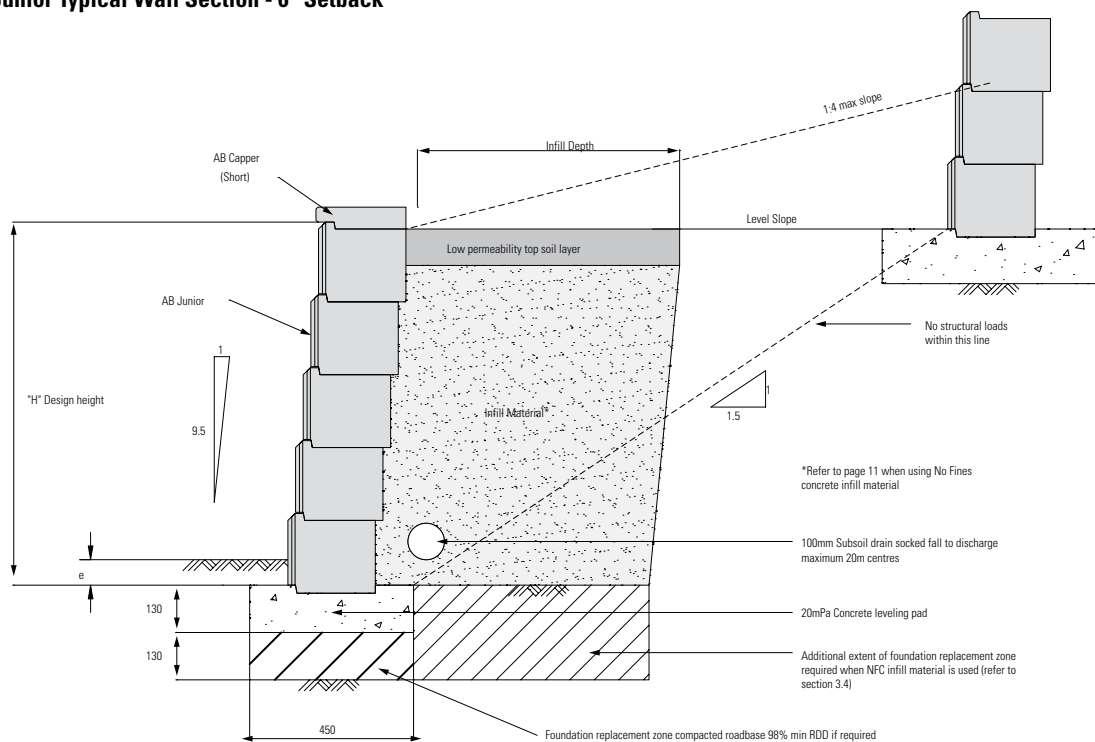
##### Right Angles - Second Course



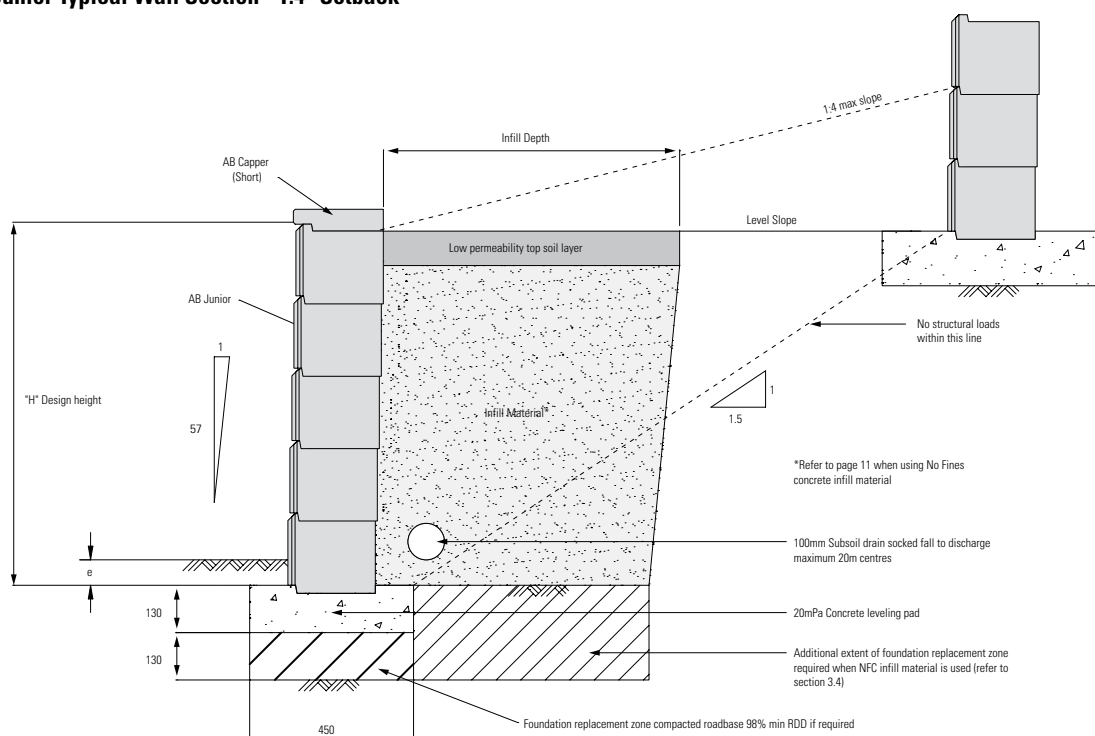
##### Outside angles other than 90°



## Allan Block™ Junior Typical Wall Section - 6° Setback



## Allan Block™ Junior Typical Wall Section - 1.4° Setback





## ALLAN BLOCK™ JUNIOR RETAINING WALL DESIGN HEIGHTS

*Residential Retaining Walls (includes residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	800	1050
2400	Level	5	Replacement Zone	NFC	750	1000
2200	Level	5	Replacement Zone	NFC	700	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	550	750
1600	Level	5	Replacement Zone	NFC	500	700
1400	Level	2.5	Replacement Zone	NFC	350	500
1200	Level	2.5	Replacement Zone	NFC	300	400
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Replacement Zone	Aggregate	400	400
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1000	1350
2200	1:4 Maximum	5	Replacement Zone	NFC	950	1250
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1150
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	500	750
1200	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	500
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Natural Material	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

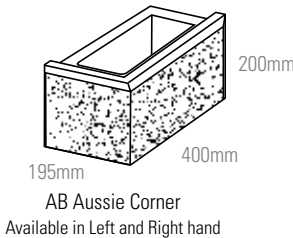
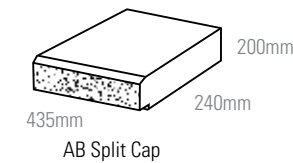
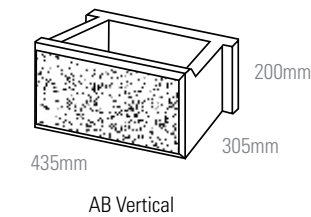
## ALLAN BLOCK™ JUNIOR RETAINING WALL DESIGN HEIGHTS

### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	800	1050
2400	Level	5	Replacement Zone	NFC	750	1000
2200	Level	5	Replacement Zone	NFC	700	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	550	750
1600	Level	5	Replacement Zone	NFC	500	700
1400	Level	2.5	Replacement Zone	NFC	350	500
1200	Level	2.5	Replacement Zone	NFC	300	400
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Replacement Zone	Aggregate	300	300
600	Level	1	Replacement Zone	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1000	1350
2200	1:4 Maximum	5	Replacement Zone	NFC	950	1250
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1150
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	500	750
1200	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	500
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Replacement Zone	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

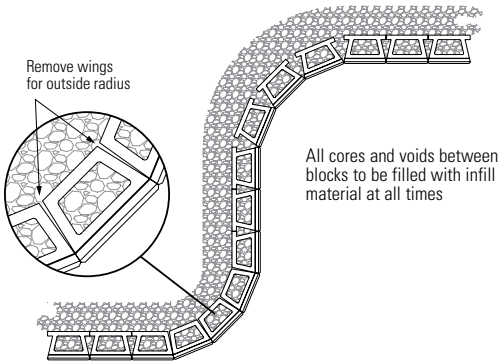
4.05 ALLAN BLOCK™ VERTICAL



Allan Block™ Vertical Technical Data

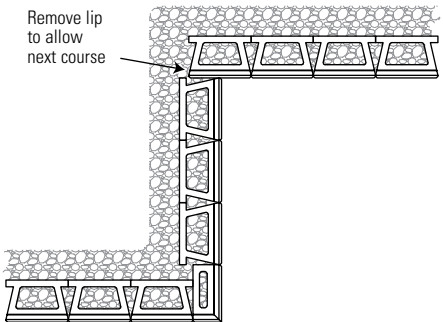
No. Per m <sup>2</sup> of Wall	11.5
Approx Weight	31.25kg
Setback	1°

Allan Block™ Curves Detail

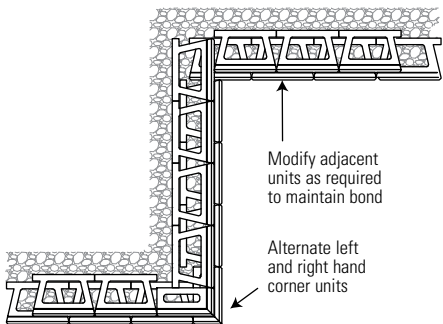


Allan Block™ Corners Detail

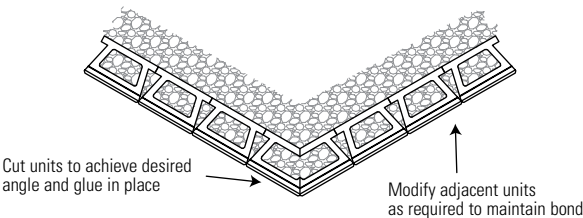
Right Angles - First Course



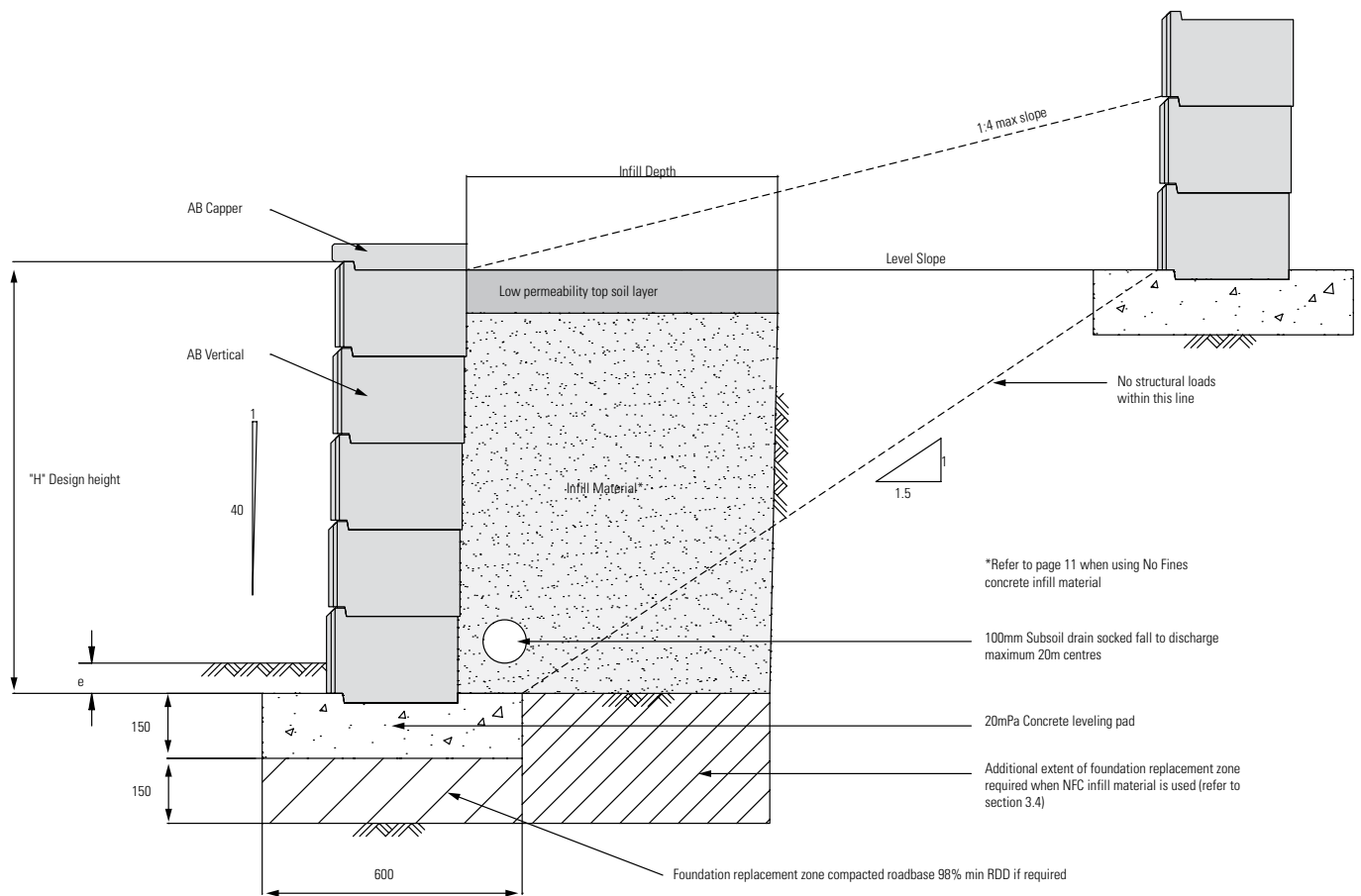
Right Angles - Second Course



Outside angles other than 90°



## Allan Block™ Vertical Typical Wall Section





## ALLAN BLOCK™ VERTICAL RETAINING WALL DESIGN HEIGHTS

*Residential Retaining Walls (includes residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	900	1050
2400	Level	5	Replacement Zone	NFC	800	1000
2200	Level	5	Replacement Zone	NFC	750	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	600	750
1600	Level	5	Replacement Zone	NFC	500	650
1400	Level	2.5	Replacement Zone	NFC	350	450
1200	Level	2.5	Replacement Zone	NFC	300	350
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Natural Material	Aggregate	300	300
600	Level	1	Natural Material	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1050	1400
2200	1:4 Maximum	5	Replacement Zone	NFC	950	1300
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1200
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	450	700
1200	1:4 Maximum	2.5	Replacement Zone	NFC	350	600
1000	1:4 Maximum	2.5	Replacement Zone	NFC	300	450
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	-
600	1:4 Maximum	1	Replacement Zone	Aggregate	300	-
400	1:4 Maximum	1	Natural Material	Aggregate	300	-

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

## ALLAN BLOCK™ VERTICAL RETAINING WALL DESIGN HEIGHTS

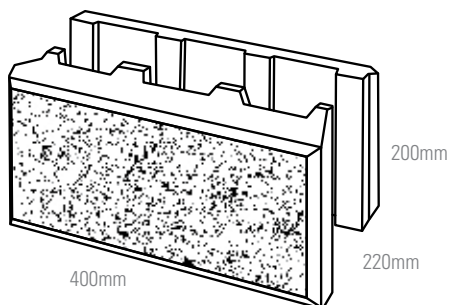
### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
2600	Level	5	Replacement Zone	NFC	900	1050
2400	Level	5	Replacement Zone	NFC	800	1000
2200	Level	5	Replacement Zone	NFC	750	900
2000	Level	5	Replacement Zone	NFC	650	850
1800	Level	5	Replacement Zone	NFC	600	750
1600	Level	5	Replacement Zone	NFC	500	650
1400	Level	2.5	Replacement Zone	NFC	350	450
1200	Level	2.5	Replacement Zone	NFC	300	350
1000	Level	2.5	Replacement Zone	NFC	300	300
800	Level	1	Replacement Zone	Aggregate	400	300
600	Level	1	Replacement Zone	Aggregate	300	300
400	Level	1	Natural Material	Aggregate	300	300
2400	1:4 Maximum	5	Replacement Zone	NFC	1050	1400
2200	1:4 Maximum	5	Replacement Zone	NFC	950	1300
2000	1:4 Maximum	5	Replacement Zone	NFC	850	1200
1800	1:4 Maximum	5	Replacement Zone	NFC	800	1100
1600	1:4 Maximum	5	Replacement Zone	NFC	700	1000
1400	1:4 Maximum	2.5	Replacement Zone	NFC	450	700
1200	1:4 Maximum	2.5	Replacement Zone	NFC	350	600
1000	1:4 Maximum	2.5	Replacement Zone	NFC	300	450
800	1:4 Maximum	1	Replacement Zone	Aggregate	400	400
600	1:4 Maximum	1	Replacement Zone	Aggregate	300	300
400	1:4 Maximum	1	Natural Material	Aggregate	300	300

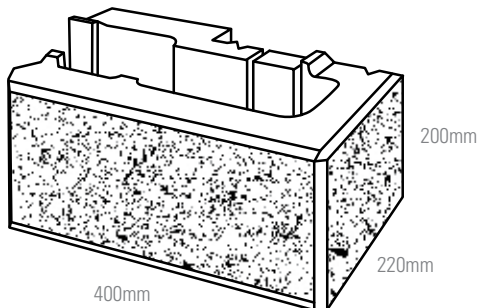
NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

#### 4.06 VERSAWALL®

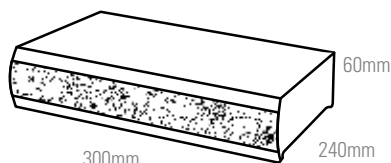
Versawall® can create pure vertical walls without reinforcement up to 800mm in height. The wall units can also be used with no fines concrete infill material to achieve greater heights.



Versawall®



Versawall® Corner

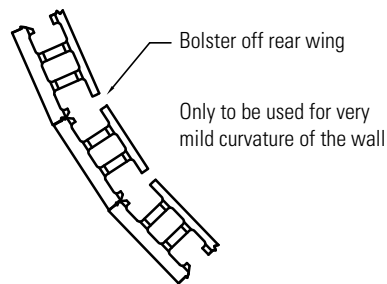


Versawall® Cap

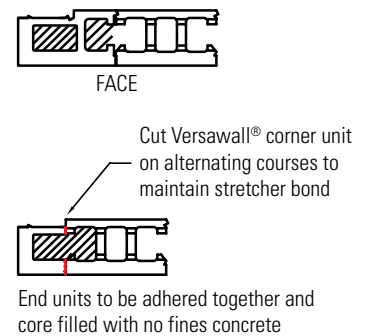
#### Versawall® Technical Data

No. Per m <sup>2</sup> of Wall	12.5
Approx Weight	21.3kg
No. Per Lm of Wall	3.33
Setback	0°

#### Versawall® Curves Detail

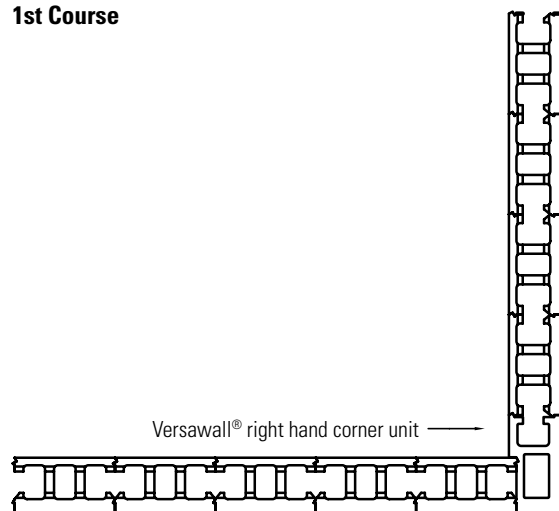


#### Versawall® Stop End Detail



#### Versawall® Corners Detail

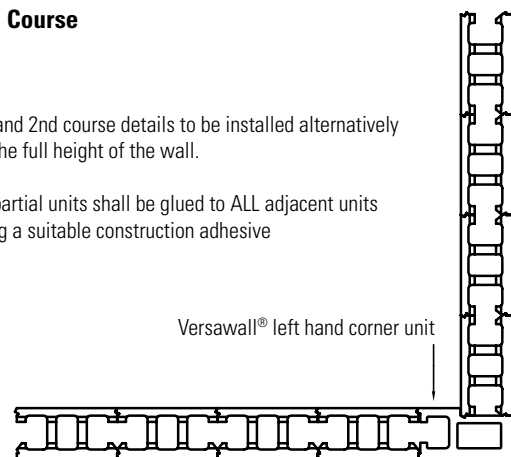
##### 1st Course



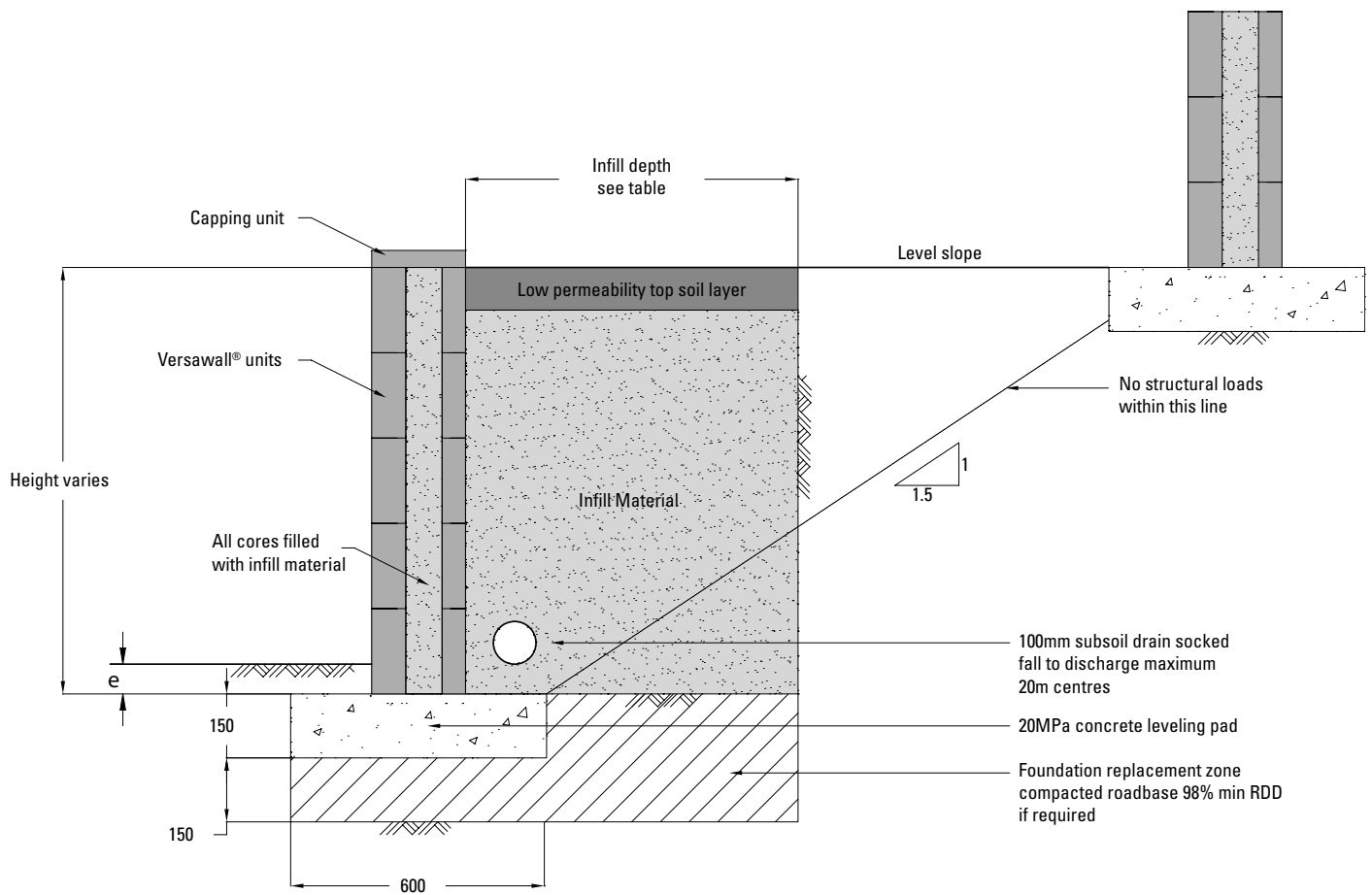
##### 2nd Course

1st and 2nd course details to be installed alternatively for the full height of the wall.

All partial units shall be glued to ALL adjacent units using a suitable construction adhesive



## Versawall® Typical Wall Section





## VERSAWALL® RETAINING WALL DESIGN HEIGHTS

### *Residential Retaining Walls (including residential subdivisions)*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1400	Level	2.5	Replacement Zone	NFC	450	550
1200	Level	2.5	Replacement Zone	NFC	350	500
1000	Level	2.5	Replacement Zone	NFC	300	400
800**	Level	1	Natural Material	Aggregate	300	300
600**	Level	1	Natural Material	Aggregate	300	300
1400	1:4 Maximum	2.5	Replacement Zone	NFC	550	800
1200	1:4 Maximum	2.5	Replacement Zone	NFC	500	700
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	550
800	1:4 Maximum	2.5	Replacement Zone	NFC	300	450
600	1:4 Maximum	2.5	Replacement Zone	NFC	300	300

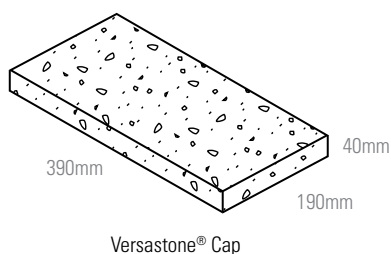
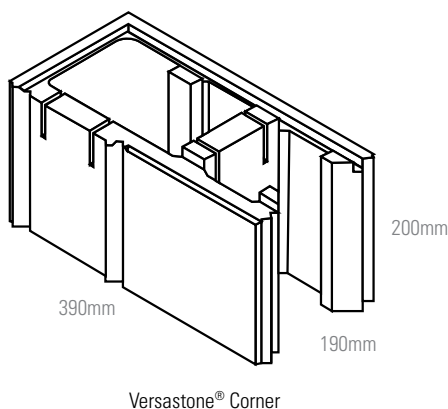
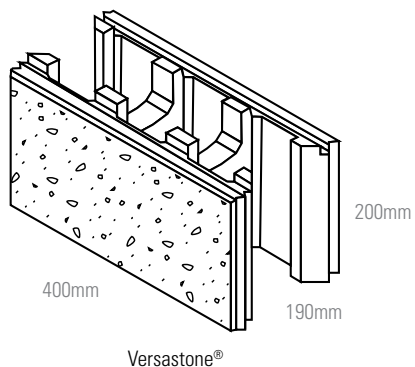
### *Commercial Retaining Walls*

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1400	Level	2.5	Replacement Zone	NFC	450	550
1200	Level	2.5	Replacement Zone	NFC	350	500
1000	Level	2.5	Replacement Zone	NFC	300	400
800	Level	2.5	Natural Material	NFC	300	300
600	Level	2.5	Natural Material	Aggregate	300	300
1400	1:4 Maximum	2.5	Replacement Zone	NFC	550	800
1200	1:4 Maximum	2.5	Replacement Zone	NFC	500	700
1000	1:4 Maximum	2.5	Natural Material	NFC	350	550
800	1:4 Maximum	2.5	Natural Material	NFC	300	450
600	1:4 Maximum	2.5	Natural Material	NFC	300	300

\* Refer to section 4 of Technical Parameters for Conditions.

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

#### 4.10 VERSASTONE®

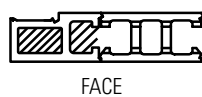


#### Versastone® Technical Data

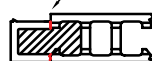
No. Per m <sup>2</sup> of Wall	12.5
Approx Weight	15.27kg
No. Per Lm of Wall	2.5
Setback	0°

**PLEASE NOTE VERSASTONE® IS NOT RECOMMENDED FOR CURVED WALLS**

#### Versastone® Stop End Detail



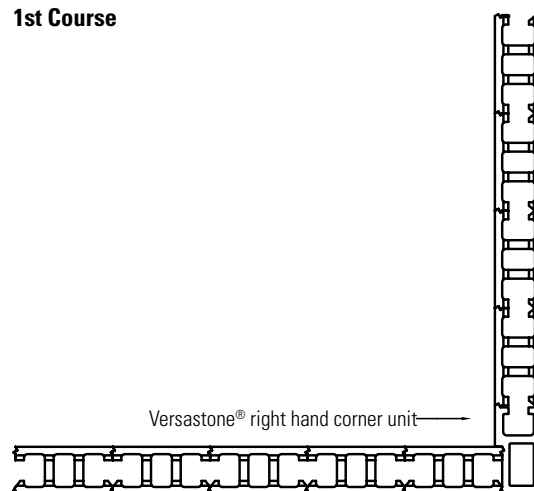
Cut Versastone® corner unit on alternating courses to maintain stretcher bond



End units to be adhered together and core filled with no fines concrete

#### Versastone® Corners Detail

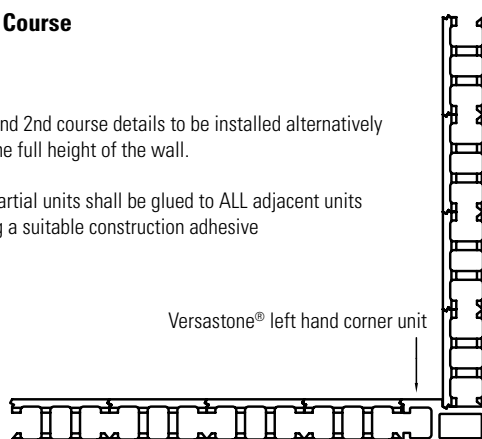
##### 1st Course



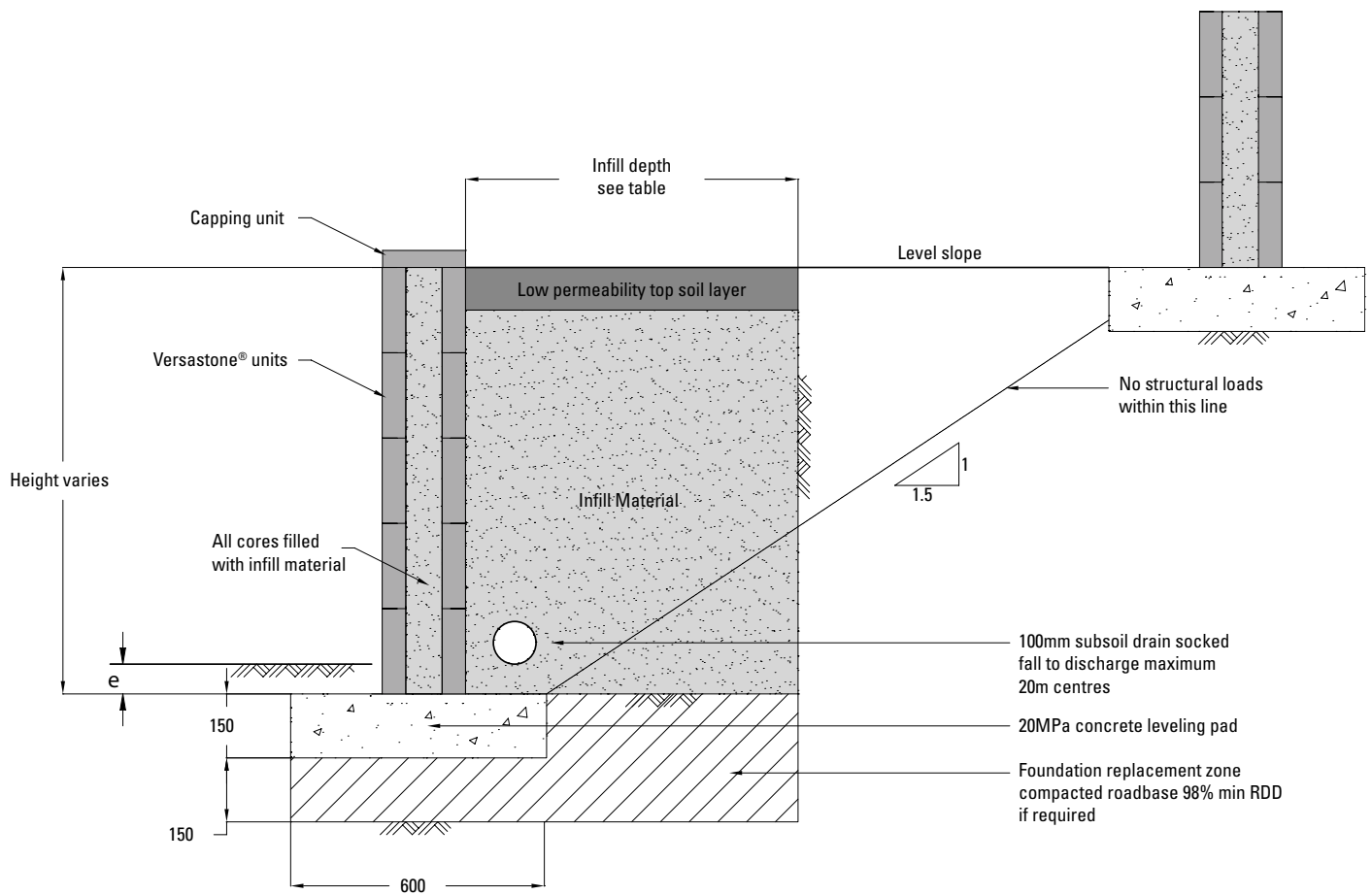
##### 2nd Course

1st and 2nd course details to be installed alternatively for the full height of the wall.

All partial units shall be glued to ALL adjacent units using a suitable construction adhesive



## Versastone® Typical Wall Section



## VERSASTONE® RETAINING WALL DESIGN HEIGHTS

### Residential Retaining Walls (including residential subdivisions)

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1400	Level	2.5	Replacement Zone	NFC	475	575
1200	Level	2.5	Replacement Zone	NFC	375	525
1000	Level	2.5	Replacement Zone	NFC	325	425
800**	Level	2.5	Replacement Zone	NFC	300	325
600**	Level	1	Natural Material	Aggregate	300	300
1400	1:4 Maximum	2.5	Replacement Zone	NFC	575	825
1200	1:4 Maximum	2.5	Replacement Zone	NFC	525	725
1000	1:4 Maximum	2.5	Replacement Zone	NFC	375	575
800	1:4 Maximum	2.5	Replacement Zone	NFC	325	475
600	1:4 Maximum	2.5	Replacement Zone	NFC	300	325

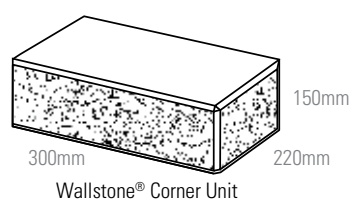
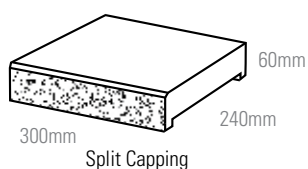
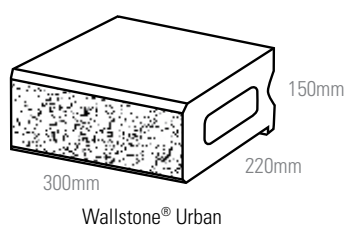
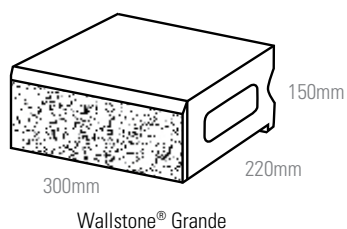
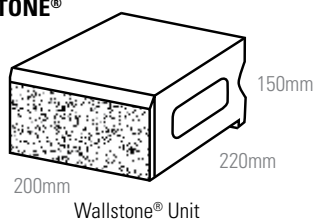
### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1400	Level	2.5	Replacement Zone	NFC	450	550
1200	Level	2.5	Replacement Zone	NFC	350	500
1000	Level	2.5	Replacement Zone	NFC	300	400
800	Level	2.5	Replacement Zone	NFC	300	300
600	Level	2.5	Natural Material	Aggregate	300	300
1400	1:4 Maximum	2.5	Replacement Zone	NFC	550	800
1200	1:4 Maximum	2.5	Replacement Zone	NFC	500	700
1000	1:4 Maximum	2.5	Replacement Zone	NFC	350	550
800	1:4 Maximum	2.5	Replacement Zone	NFC	300	450
600	1:4 Maximum	2.5	Replacement Zone	NFC	300	300

\* Refer to section 4 of Technical Parameters for Conditions.

NFC denotes the used of No Fines Concrete. Refer to page 8 for clarification of Type 1 and Type 2 soils.

## 4.07 WALLSTONE®



### Wallstone® Technical Data

No. Per m <sup>2</sup> of Wall	33
Approx Weight	9.7kg
Setback	0° or 4.5°

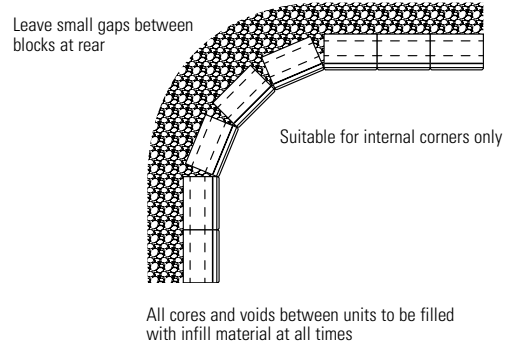
### Wallstone® Grande/Wallstone® Urban Technical Data

No. Per m <sup>2</sup> of Wall	22.2
Approx Weight	15.1kg
Setback	0° or 4.5°

### Split Capping Technical Data

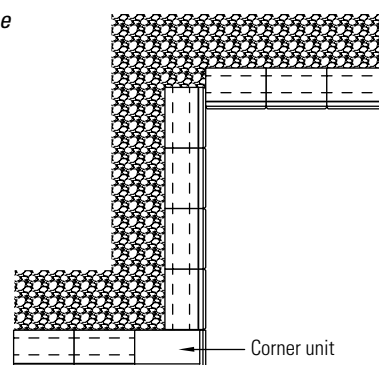
No. Per Lm of Wall	3.33
Approx Weight	9.4kg

## Wallstone® Curves Detail

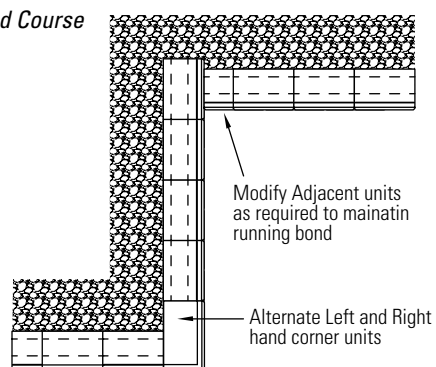


## Wallstone® Corners Detail

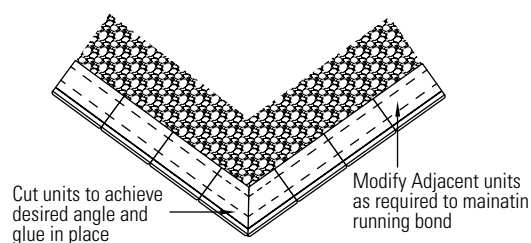
### Right Angles - First Course



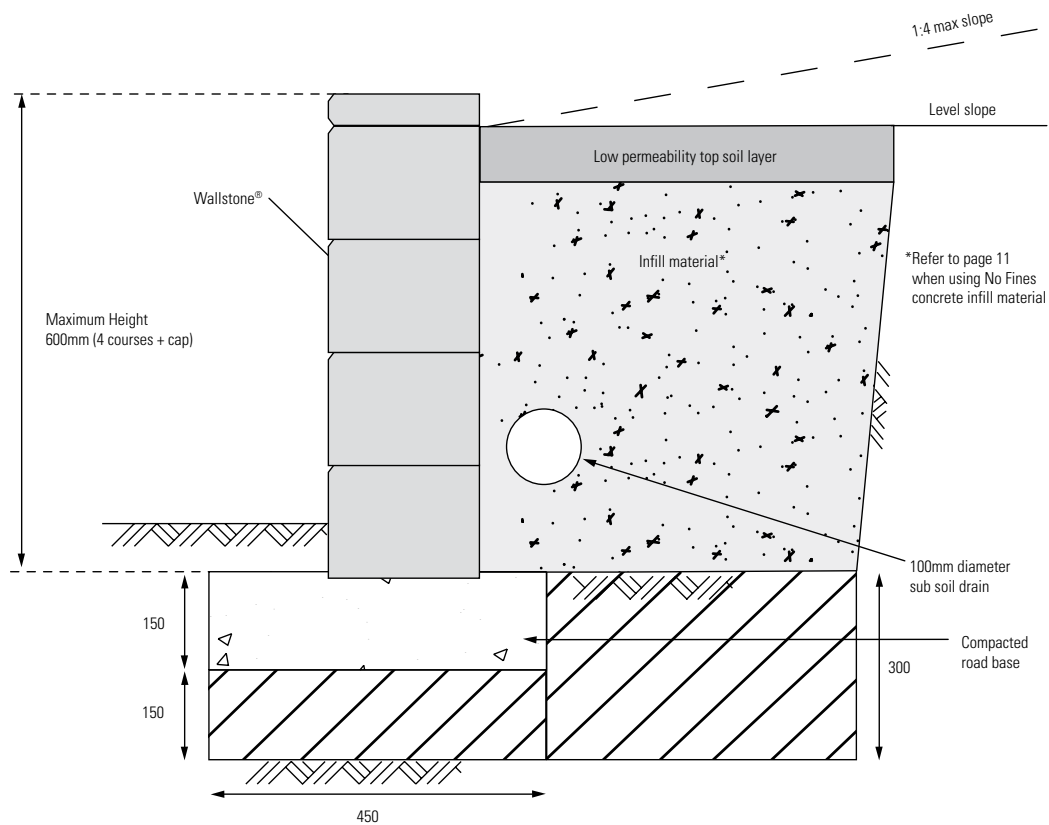
### Right Angles - Second Course



### Outside angles other than 90°



## Wallstone® Typical Wall Section - Vertical Walls





## WALLSTONE® RETAINING WALL DESIGN HEIGHTS - VERTICAL WALLS

### Residential Retaining Walls (including residential subdivisions)

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1050	Level	2.5	Replacement Zone	NFC	400	450
900	Level	2.5	Replacement Zone	NFC	300	350
750	Level	1	Replacement Zone	NFC	300	300
600**	Level	1	Natural Material	Aggregate	300	300
450**	Level	1	Natural Material	Aggregate	300	300
1050	1:4 Maximum	2.5	Replacement Zone	NFC	450	650
900	1:4 Maximum	2.5	Replacement Zone	NFC	400	550
750	1:4 Maximum	1	Replacement Zone	NFC	300	350
60	1:4 Maximum	1	Replacement Zone	NFC	300	300
450	1:4 Maximum	1	Replacement Zone	NFC	300	300

### Commercial Retaining Walls

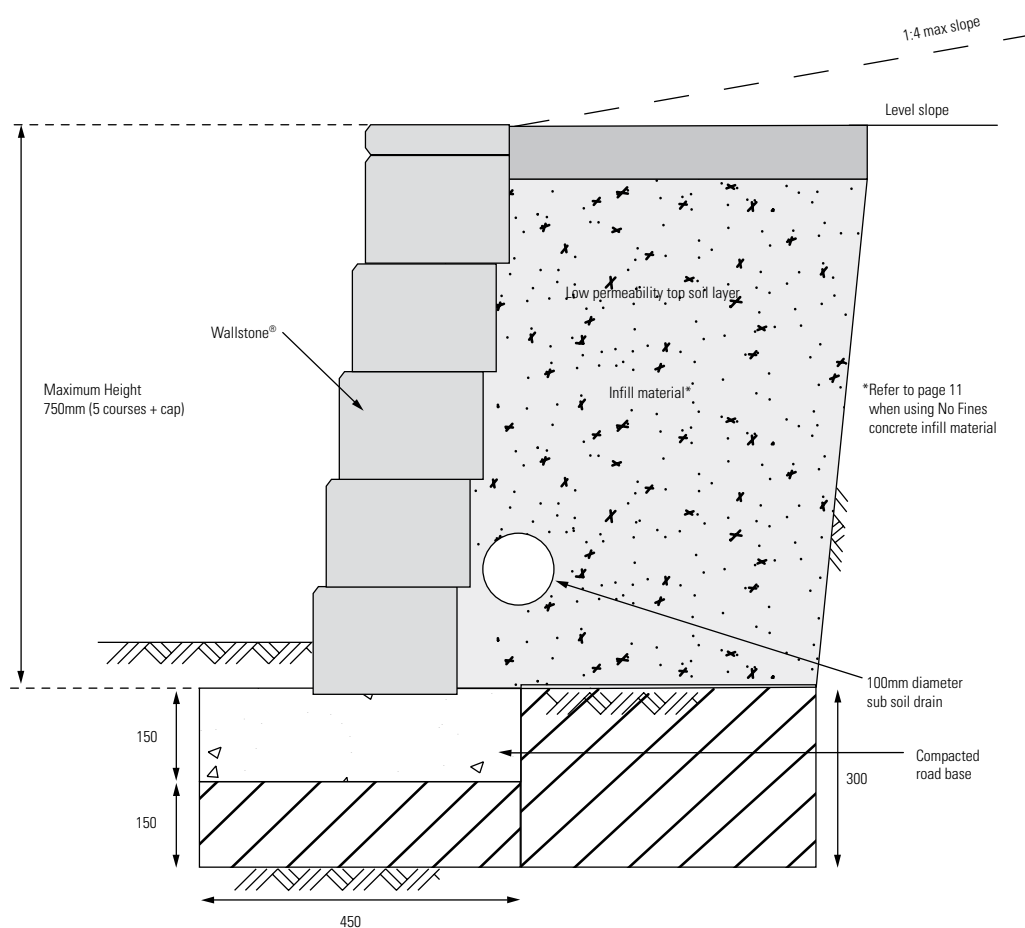
Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1050	Level	2.5	Replacement Zone	NFC	400	450
900	Level	2.5	Replacement Zone	NFC	300	350
750	Level	1	Replacement Zone	NFC	300	300
600	Level	1	Replacement Zone	NFC	300	300
450	Level	1	Replacement Zone	NFC	300	300
1050	1:4 Maximum	2.5	Replacement Zone	NFC	450	650
900	1:4 Maximum	2.5	Replacement Zone	NFC	400	550
750	1:4 Maximum	1	Replacement Zone	NFC	300	350
600	1:4 Maximum	1	Replacement Zone	NFC	300	300
450	1:4 Maximum	1	Replacement Zone	NFC	300	300

\*\* Refer to section 4 of Technical Parameters for Conditions.

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

Where Wallstone® units are used with No Fine Concrete, a brick tie at no more than 400mm x 400mm spacings should be utilised between the blocks and the No Fines Concrete mass to ensure the bond.

## Wallstone® Typical Wall Section - Setback Walls



## WALLSTONE® RETAINING WALL DESIGN HEIGHTS - SETBACK WALLS

### Residential Retaining Walls (including residential subdivisions)

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1050	Level	2.5	Replacement Zone	NFC	300	400
900	Level	2.5	Replacement Zone	NFC	300	300
750	Level	1	Natural Material	Aggregate	300	300
600**	Level	1	Natural Material	Aggregate	300	300
450**	Level	1	Natural Material	Aggregate	300	300
1050	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
900	1:4 Maximum	2.5	Replacement Zone	NFC	350	600
750	1:4 Maximum	1	Replacement Zone	NFC	300	500
60	1:4 Maximum	1	Replacement Zone	NFC	300	300
450	1:4 Maximum	1	Replacement Zone	NFC	300	300

### Commercial Retaining Walls

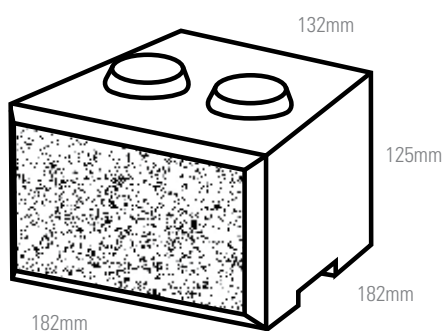
Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
1050	Level	2.5	Replacement Zone	NFC	300	400
900	Level	2.5	Replacement Zone	NFC	300	300
750	Level	1	Replacement Zone	NFC	300	300
600	Level	1	Replacement Zone	NFC	300	300
450	Level	1	Replacement Zone	Aggregate	300	300
1050	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
900	1:4 Maximum	2.5	Replacement Zone	NFC	350	600
750	1:4 Maximum	1	Replacement Zone	NFC	300	500
600	1:4 Maximum	1	Replacement Zone	NFC	300	300
450	1:4 Maximum	1	Replacement Zone	NFC	300	300

\*\* Refer to section 4 of Technical Parameters for Conditions.

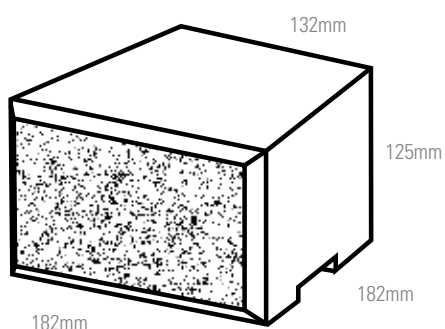
NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

Where Wallstone® units are used with No Fine Concrete, a brick tie at no more than 400mm x 400mm spacings should be utilised between the blocks and the No Fines Concrete mass to ensure the bond.

## 4.08 MINIWALL®



Miniwall®

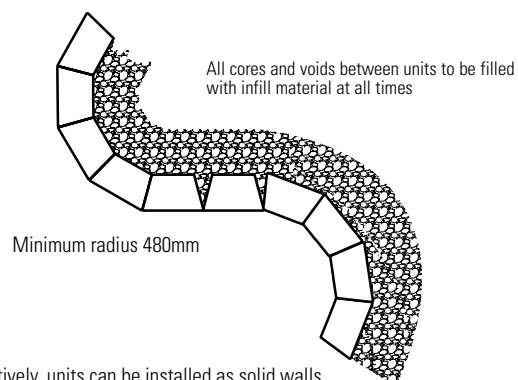


Minicap™

### Miniwall® Technical Data

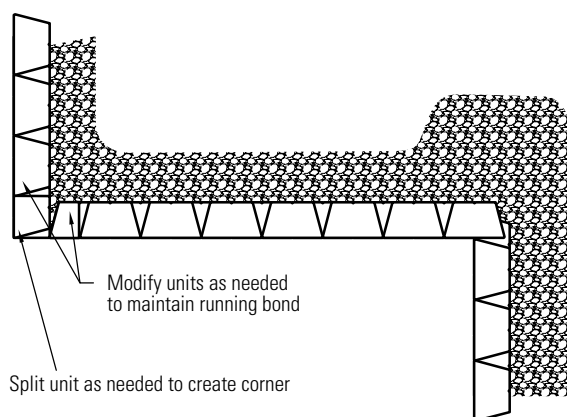
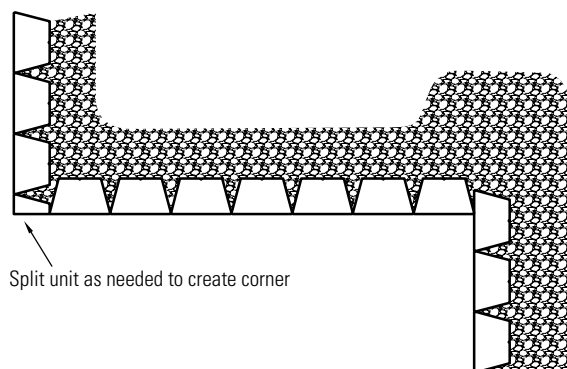
No. Per m <sup>2</sup> of Wall	44 Semi Solid Wall 51 Solid Wall
Approx Weight	4.4kg
Setback	0°

## Miniwall® Curves Detail

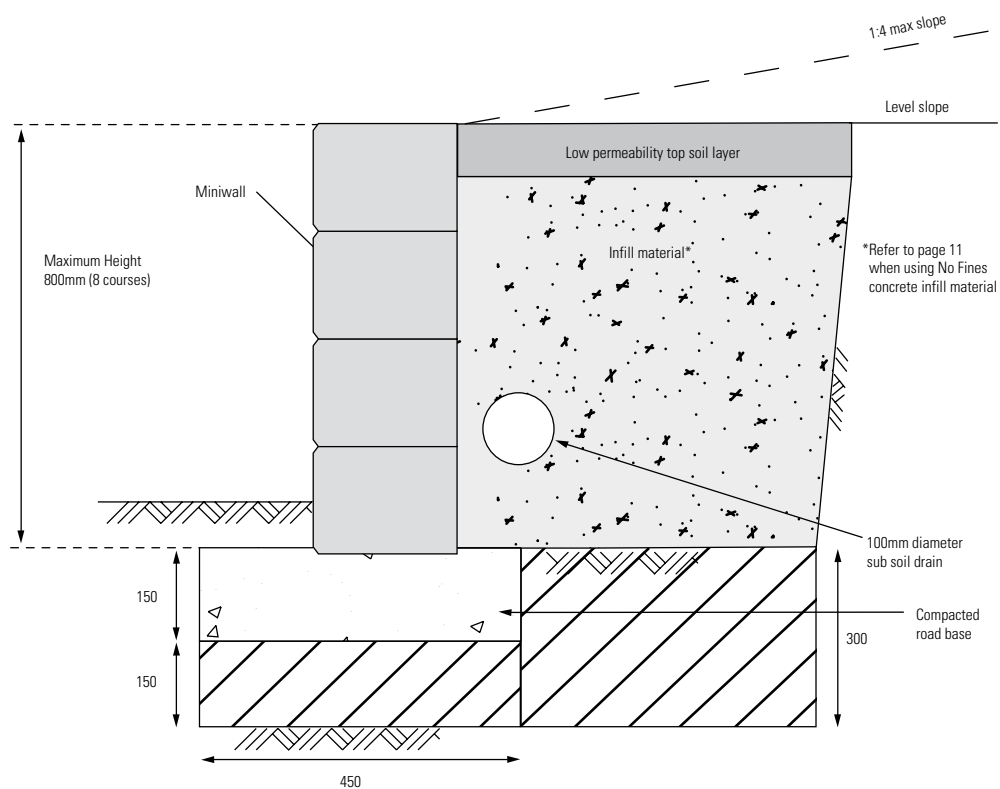


Alternatively, units can be installed as solid walls with wide face forward for external curves, or narrow face forward for internal curves.

## Miniwall® Corners Detail



## Miniwall® Typical Wall Section



## MINIWALL® RETAINING WALL DESIGN HEIGHTS

### Residential Retaining Walls (including residential subdivisions)

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
875	Level	2.5	Replacement Zone	NFC	300	400
750	Level	1	Replacement Zone	NFC	300	300
625	Level	1	Replacement Zone	NFC	300	300
500**	Level	1	Natural Material	Aggregate	300	300
375**	Level	1	Natural Material	Aggregate	300	300
875	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
750	1:4 Maximum	1	Replacement Zone	NFC	300	550
625	1:4 Maximum	1	Replacement Zone	NFC	300	350
500	1:4 Maximum	1	Replacement Zone	NFC	300	300
375	1:4 Maximum	1	Replacement Zone	NFC	300	300

### Commercial Retaining Walls

Design Height 'H' (mm)	Surface Slope	Surcharge Load (kPa)	Foundation Material	Infill Material	Infill Material Depth (mm)	
					Type 1	Type 2
875	Level	2.5	Replacement Zone	NFC	300	400
750	Level	1	Replacement Zone	NFC	300	300
625	Level	1	Replacement Zone	NFC	300	300
500	Level	1	Replacement Zone	NFC	300	300
375	Level	1	Replacement Zone	NFC	300	300
875	1:4 Maximum	2.5	Replacement Zone	NFC	400	650
750	1:4 Maximum	1	Replacement Zone	NFC	300	550
625	1:4 Maximum	1	Replacement Zone	NFC	300	350
500	1:4 Maximum	1	Replacement Zone	NFC	300	300
375	1:4 Maximum	1	Replacement Zone	NFC	300	300

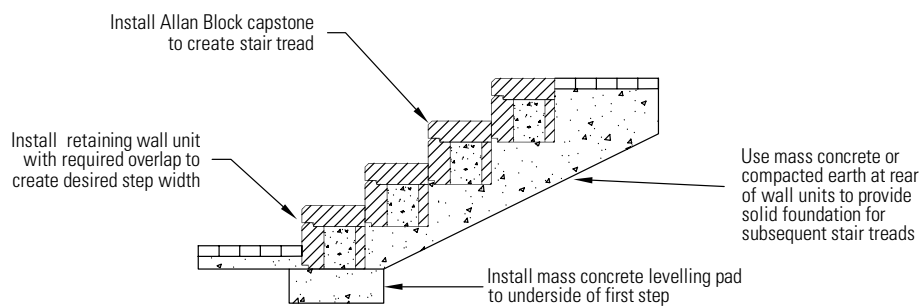
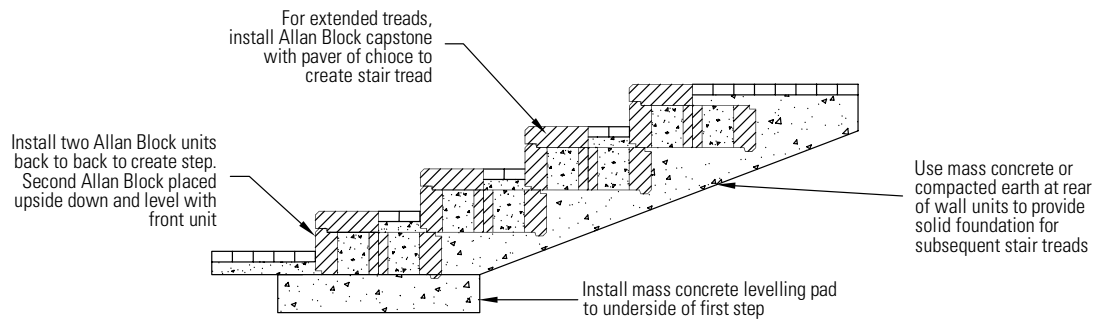
\*\* Refer to section 4 of Technical Parameters for Conditions.

NFC denotes the used of No Fines Concrete. Refer to page 7 for clarification of Type 1 and Type 2 soils.

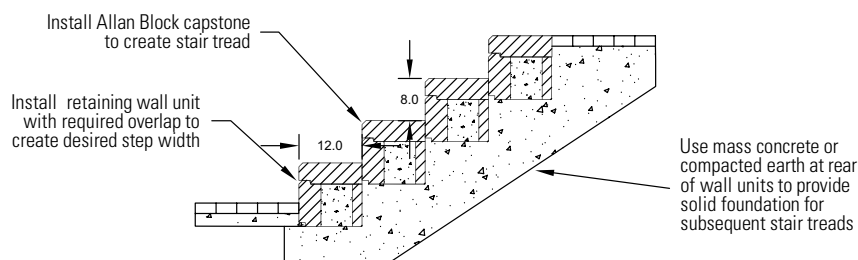
Where Miniwall® units are used with No Fine Concrete, and the rear face of the miniwall® units is solid, a brick tie at no more than 400mm x 400mm spacings should be utilised between the blocks and the No Fines Concrete mass to ensure the bond.



## 5.0 Typical Details for Creating Steps and Stairs



*Note: To create stair tread using ADBRI Masonry large format of choice paver, remove Allan Block top lip using a masonry saw*



**Permissible Step Dimensions (in accordance with BCA requirements)**

R		G		2R + G	
Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
190	115	355	250	700	550

**NOTE** - Adbri designs are for step tread dimensions and layout only, and do not consider handrail or landing platform requirements. Consult relevant Australian Standards.

## 6.0 Overview of Geogrid Reinforced Walls

Reinforced soil retaining walls are essentially gravity wall structures that depend on the mass of the reinforced soil zone behind the retaining wall units to resist destabilising forces due to retained soil and surcharge loadings.

AB Classic or AB Vertical masonry segmental blocks in combination with polyester Geogrid provides a proven aesthetically pleasing and cost effective method of constructing high retaining walls.

Geogrid provides connection of the reinforced soil to the Adbri Masonry segmental retaining wall blocks. The combination of retaining wall blocks with Geogrid has the capacity to form a mechanical connection.

Geogrid was chosen as the preferred reinforcing element because of its light, flexible nature, ease of handling, superior creep resistance and long term load carrying capacity compared to other products on the market, and its maintained strength/creep characteristics when subjected to elevated surface temperatures commonly experienced in block retaining system applications.

AB Classic or AB Vertical blocks units feature "cast in" shear keys which provide automatic setback corresponding to the blocks selected and do not require the use of

additional dowels to provide block shear capacity. AB Classic or AB Vertical blocks, due to their unique construction, are extremely quick and easy to lay. They come in a variety of face finishes and a wide array of colour options to complement existing surroundings. Special colours can be formulated to match into existing works or create that special effect.

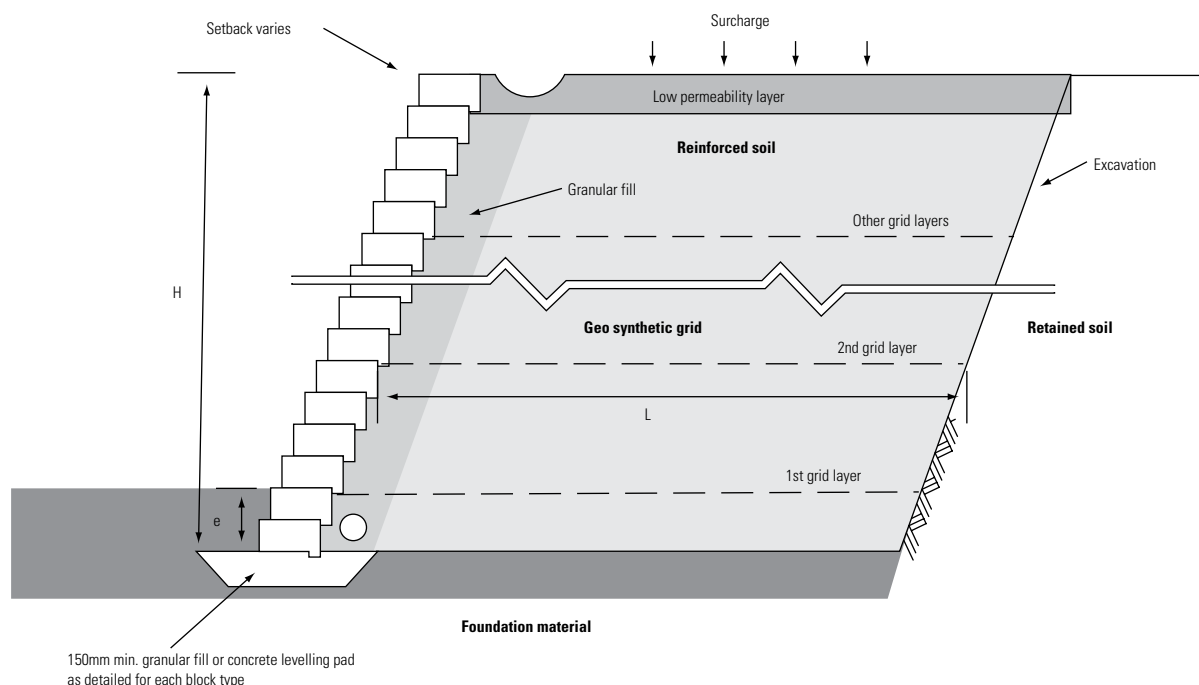
The combination of retaining wall blocks with Geogrid has been accepted by major construction authorities in Australia for use in structures with a design life of 100 years.

Retaining wall design software is available free of charge to engineers to allow the optimum use of Geogrid and retaining wall products. We can also provide contracting services for all types of retaining wall projects.

AB Classic is an R57 and MRS11.06 approved product.

For a copy of the Allan Block™ Program go to [adbrimasonry.com.au](http://adbrimasonry.com.au) and send a request to the company. The program is AutoCAD compatible.

### Reinforced Wall Cross Section



## Other Adbri Masonry Solutions



Designer Paving



Versaloc® Walling System



Industrial Masonry

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## Allan Block™ Segmental Retaining Wall Systems

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