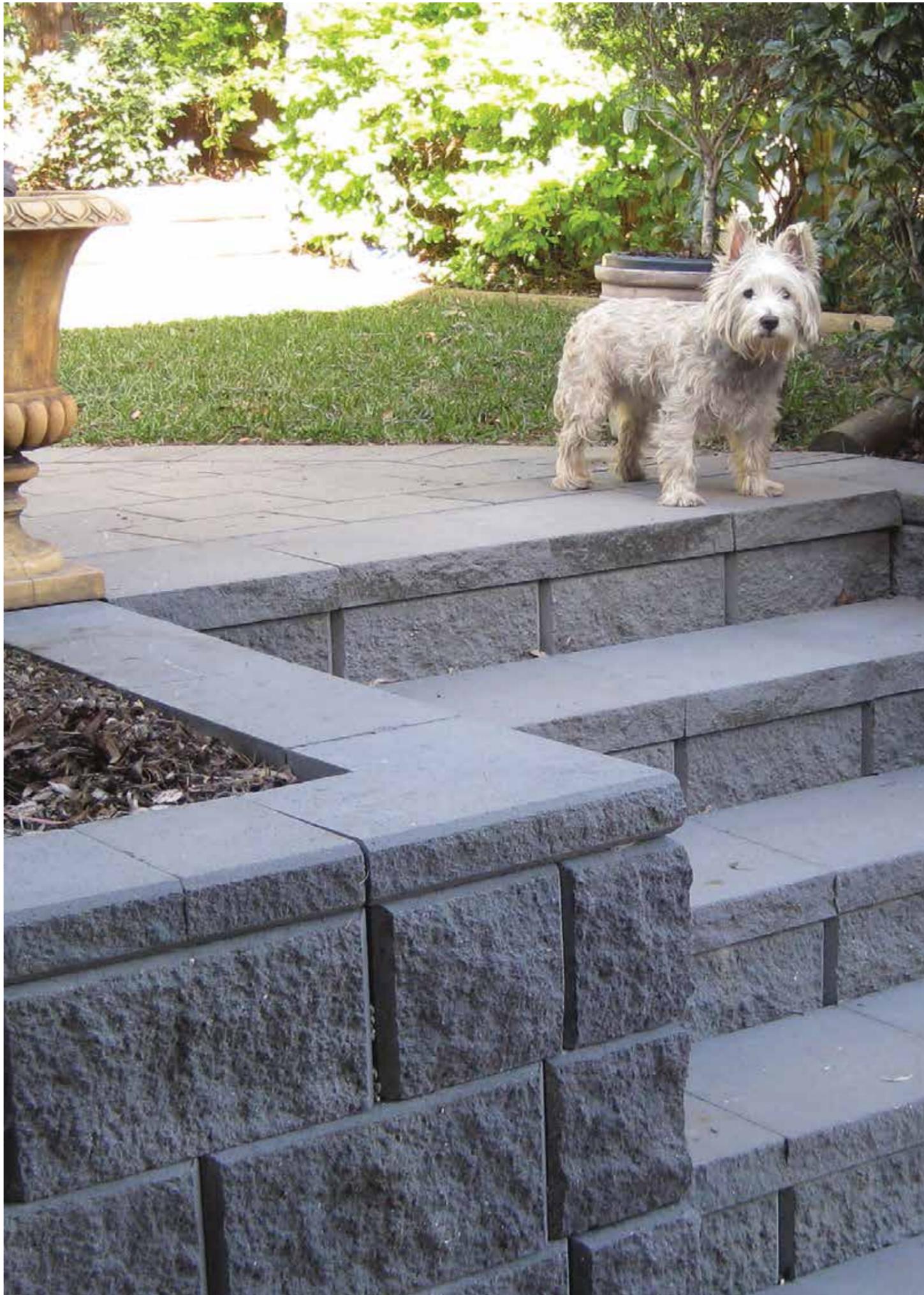


Heron Retaining Walls

Technical Information

masonry.
style and
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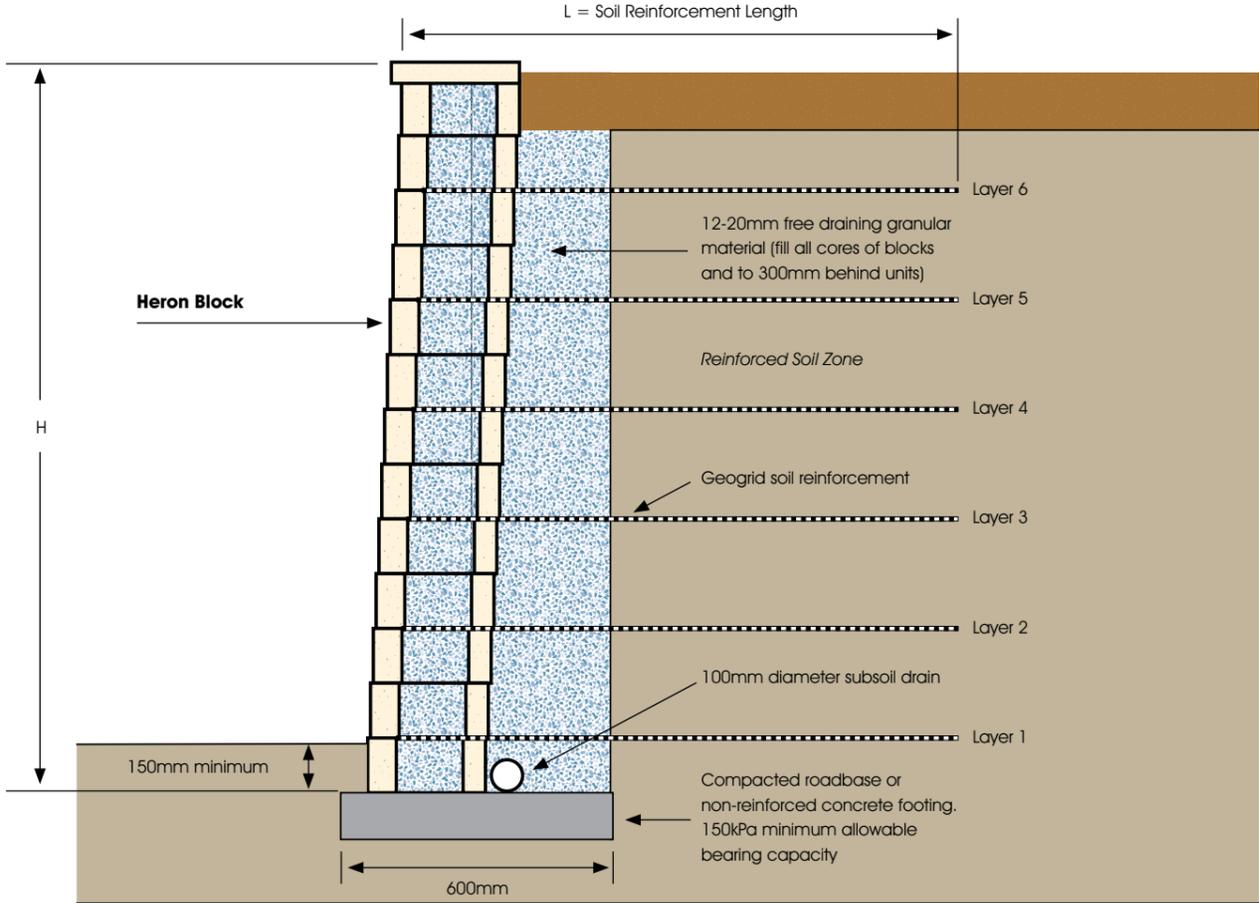
Heron Retaining Wall System

Soil Reinforced Walls: Geogrid Table

Austral Masonry's Heron segmental block retaining wall system utilizes its shape and weight in order to resist the lateral earth pressures. In combination with geogrid soil reinforcement, these walls can be built to substantial heights, without costly structural reinforced concrete footings.

Geogrid Requirements:
The length, location and grade strength of geogrid is dependent on the wall height, loading on top of the structure, and soil properties. The table below is in accordance with AS4678: 2002 - Earth Retaining Structures.

Note: Please consult with appropriate council for design and construction regulations. Councils in general require walls to be designed and certified by a suitably qualified engineer where the wall is over 500mm in height or a load such as a road, building or hydrostatic pressure is present. The suitability of the information contained in the table must be referred to a qualified consulting engineer. These tables are provided as a guide only.



Heron Wall Block
Size (mm): 390L x 245W x 198H
Weight (each): 22kg
Blocks per m²: 1m² wall - 13 blocks



Heron Capping Block
Size (mm): 390L x 245W x 90H
Weight (each): 16kg
Blocks per lineal metre: 2.56 blocks



Heron Corner Block (right hand unit shown)
Size (mm): 160L x 360W x 198H
Weight (each): 20kg
Available in left or right

Geogrid Table - Guide Only

			Geogrid Placement above Levelling Pad					Geogrid Length L (mm)			
Surcharge	Wall Height (m)	Geogrid Layers	Number of Geogrid layers					Soil Type (Ø)			
			1	2	3	4	5	6	25	30	35
5kPa Driveway Surcharge	1.0	2	0.2	0.6					1.7	1.7	1.7
	1.2	2	0.4	0.8					1.7	1.7	1.7
	1.4	2	0.4	0.8	1.2				2.0	1.7	1.7
	1.6	3	0.4	0.8	1.2				2.2	1.7	1.7
	1.8	3	0.4	0.8	1.4				2.2	1.7	1.7
	2.0	4	0.4	0.8	1.4	1.8			2.3	2.0	2.0
	2.2	4	0.4	0.8	1.4	1.8			2.5	2.0	2.0
	2.4	4	0.4	0.8	1.4	2.0			2.6	2.1	2.0
	2.6	5	0.4	0.8	1.6	2.0			2.8	2.2	2.2
	2.8	5	0.4	0.8	1.4	2.0	2.6		2.9	2.5	2.4
3.0	6	0.2	0.6	1.2	1.8	2.4	2.8	3.1	2.8	2.6	

Soil Types

- Poor ($\phi = 25^\circ$): Soils with friction angle $\geq 25^\circ$, may include sandy clays, gravelly clays and sand. Expansive clays and organic soil MUST not be used within the soil reinforced zone.
- Average ($\phi = 30^\circ$): Soils with friction angle $\geq 30^\circ$, may include gravelly sands and well graded sands.
- Good ($\phi = 35^\circ$): Soils with friction angle $\geq 35^\circ$, may include gravels, sandy gravels, weathered sandstone and crushed sandstone.

Design Considerations

- Maximum wall heights table is based on a 5kPa surcharge load acting on top of the wall as per AS4678: 2002. This table is supplied as a guide only and must be referred to a qualified professional engineer. If imposed surcharge loads above 5kPa are applied, these designs are not appropriate.
- Based on a minimum Bearing Capacity of 200kPa
- Designs assume no hydrostatic loading.
- The minimum embedment of wall below ground level is assumed to be the greater of H/20 or 100mm.
- Designs are based on Geogrid strength of 55kN/m²

Construction Steps

Step 1: Excavation and Foundations

Excavate in accordance with the specific design requirements. Bench out site to allow for full length of geogrid as per design. Excavate levelling pad trench 600mm wide by a minimum 250mm deep. This allows for a 150mm deep levelling pad + 100mm minimum block embedment.

Step 2: Levelling Pad

The footing shall be 600mm wide x 150mm deep, of compacted roadbase or un-reinforced concrete.

Step 3: First Course

The first course is to be laid on the levelling pad and aligned using a string line along the back of the units. Ensure units are levelled side to side and front to back. It is critical that the first course is accurate and level in order to ensure acceptable horizontal and vertical tolerances. Sand or mortar can be used as a levelling aid on the first course.

Step 4: Drainage Materials

Place a 100mm agricultural drainage pipe for subsoil drainage behind the first course of blocks, with a minimum fall to the drainage outlet of 1:100. Fill all the voids within the blocks and extend 300mm behind the blocks with 12- 20mm clean granular material, to the top of the first course.

Step 5: Placement of Geogrid

The geogrid must be placed between the blocks as specified on the drawings. Geogrids shall be cut to the required length. Place the next course of blocks on top of the geogrid. Gently pull taut to remove any slack in the geogrid. Secure the back end of the geogrid before repeating Step 3 and proceeding with Step 6.

Step 6: Backfill and Compaction

Place approved backfill material over the geogrids. Backfill shall be spread in a maximum of 200mm lifts, starting at the front of the wall (behind the drainage zone) to back of the soil reinforced zone. Compaction equipment must not make contact with the geogrids. Hand held plate compactors to be used within 1.5m from the front of the wall. Heavier compaction equipment may be used 1.5m away from the front of the wall face. Compaction to be 98% of Standard Maximum Dry Density. Surface drainage during and after construction of the wall shall be provided to minimise water infiltration in the compacted soil reinforced zone.

Step 7: Subsequent Courses

Repeat steps 4 through to 6. Ensure compaction lifts are kept at 200mm. Blocks need to be levelled after compacting each lift.

Step 8: Capping of wall

Install capping units and fix with concrete adhesive.

Heron Retaining Wall System - No Fines

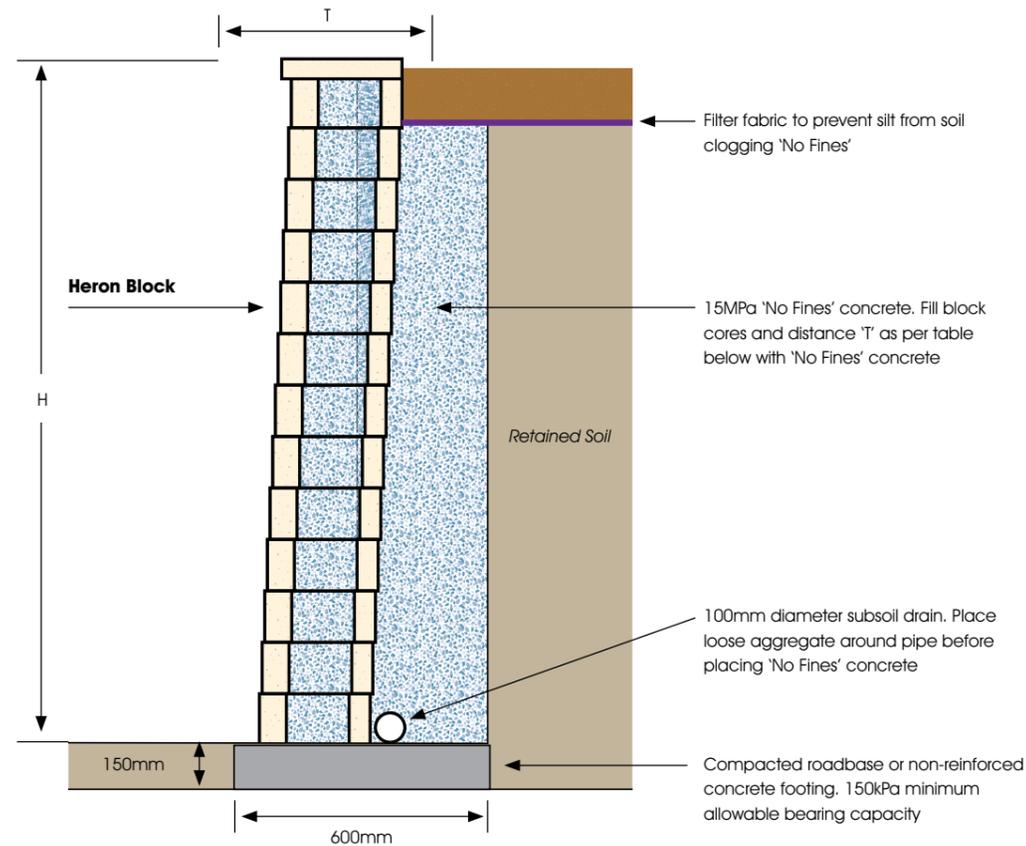
Concrete Construction Guidelines

'No Fines' concrete is ideal for cut sites and boundaries, where the use of soil reinforcement and excavation of the backfill is impractical. The use of 'No Fines' adds mass to the Heron retaining wall system allowing for the overall height to be increased from a standard gravity wall without the need for geogrid reinforcement.

'No Fines' concrete specifications:

- 15MPa concrete with a 6:1 ratio (Gravel: Cement).
- Density range: 1800kg/m³ to 2100kg/m³.
- Void ratio of the mix is expected to be between 20% to 30% and should be free draining.

NOTE: Please consult with appropriate council for design and construction regulations. Councils in general require walls to be designed and certified by a suitably qualified engineer where the wall is over 500mm in height or a load such as a road, building or hydrostatic pressure is present.



Wall Height H (mm)	Retained Soil CLAY = 26° (POOR) T (mm)	Retained Soil SAND = 30° (AVERAGE) T (mm)	Retained Soil GRAVEL = 34° (GOOD) T (mm)
900	500	500	500
1200	750	650	600
1600	950	850	800
2000	1100	1000	1000
2400	1400	1200	1100
2800	1900	1500	1400

Design Considerations

- The 'No Fines' concrete maximum wall heights table is based on a 5kPa surcharge load acting on top of the wall as per AS4678: 2002. This table is supplied as a guide only.
- For higher walls the use of geogrid soil reinforcement is recommended. Contact Austral Masonry for further details.
- This product has zero slump exerting similar pressures on the soil and formwork, as loosely poured aggregate.
- The vertical height of any pour of 'No Fines' concrete is to be limited to 3 blocks high (approx. 600mm). The concrete must be allowed to harden before pouring the next lift.
- Global stability should be checked by a suitably qualified engineer. - The design assumes no ground water to be present. For site conditions where ground water exists, the wall must be re-designed by a suitably qualified engineer.

Construction Steps

Step 1: Excavation and Levelling Pad

Excavate a trench 600mm wide by a minimum of 250mm deep (150mm depth of concrete footing + 100mm minimum block embedment). Place 25MPa non-reinforced concrete to form the footing.

Step 2: First Course

Place blocks onto levelling pad and align with string line at the rear of units. Ensure blocks are level side to side and front to back tapping gently with rubber mallet to make the necessary adjustments. It is critical the first course be level.

Step 3: 'No Fines' Concrete Backfill

Fill block cores and backfill to the specified depth with 'No Fines' concrete. The vertical height of pour must not exceed 600mm. Alternatively the wall may be propped. Ensure the face of the wall is not stained with the concrete, as once set will be difficult to remove. The back wings of the blocks need to be removed to ensure the No Fines concrete and blocks monolithic mass.

Step 4: Additional Courses

Brush any excess 'No Fines' concrete material from the top of the blocks (before it is allowed to harden). Place the next course of blocks and repeat steps 2 and 3 until the required wall height is reached.

Step 5: Placement of Geogrid

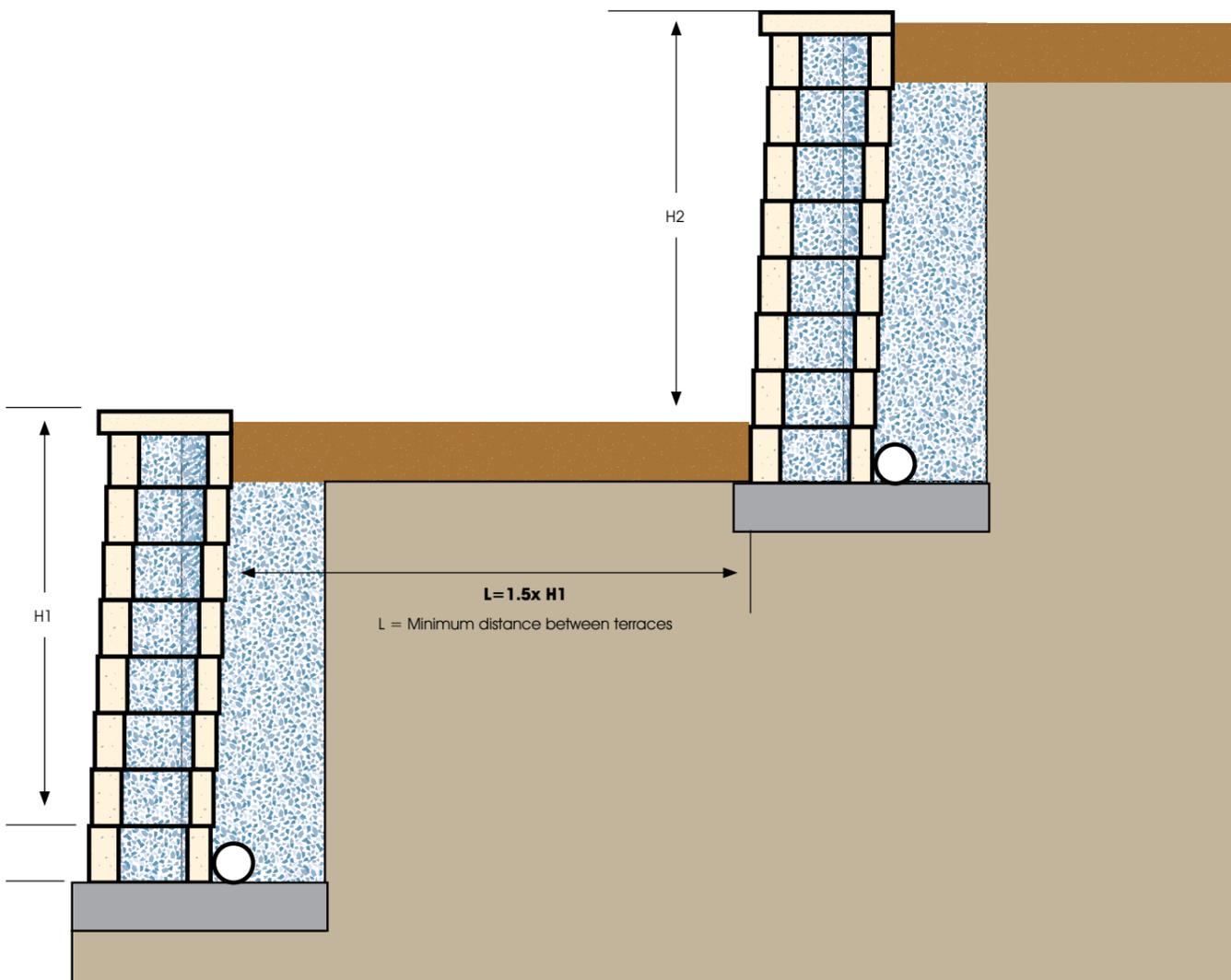
Secure capping units with a cement based flexible adhesive to finish the wall.



Heron Retaining Wall Applications

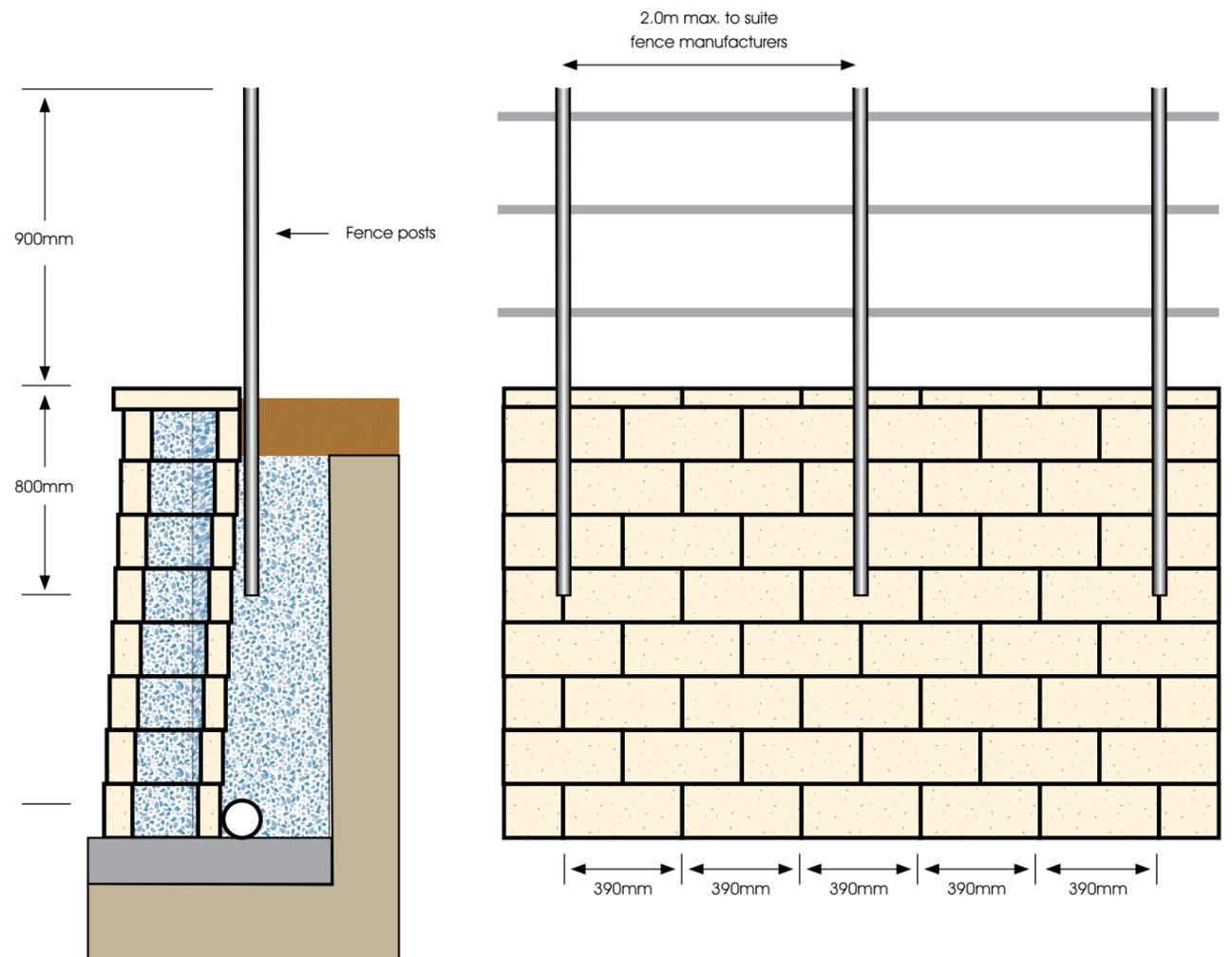
Typical Terraced Wall Application Details

- Walls may be terraced for a number of reasons. To increase the aesthetic appeal of the retaining wall, to level off a sloping site, and in some instances to reduce the single wall heights to levels where they can behave as gravity walls, thus reducing the need to use geogrid or 'no fines' concrete. In the latter instances, it is important to remember that the upper terrace wall can put pressure on the lower terrace when the walls are built close together.
- As a general rule, for the terraces to act as individual retaining walls, the minimum distance between the wall terraces must be at least 1.5 times the height of the lower wall. Note, this rule does not address global stability issues where walls are built on steep sites or in poor soils. A Global stability analysis should be undertaken by a suitably qualified engineer where such conditions may exist.
- Where insufficient room exists on site to space the terraces at 1.5 x H1, the bottom terrace must be designed to accommodate the loading from the top terrace. The design analysis may model the structure as a single wall (i.e. H1 + H2) to allow for the additional load from the upper terrace wall on the lower terrace.



Fencing Details

- When incorporating fences into the Heron Retaining wall system, the fence posts are to be placed behind the wall as shown.
- Fence posts should be embedded a minimum of 800mm from top of cap, and post encased with concrete. All other cores to be filled with gravel for drainage, or 'no fines' concrete as required. This embedment depth is for open fences only, where no wind loading is imposed on the wall and no impact loading is applied.
- Walls must be suitably designed to accommodate additional wind loading imposed on other types of closed fences; for example, increasing the embedment for the posts.





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Brickworks Building Products is one of Australia's largest and most diverse building material manufacturers.

Under the Brickworks Building Products umbrella are some of Australia's best known building materials brands.

Our products include bricks, pavers, masonry blocks, retaining wall systems, precast concrete panels, concrete and terracotta roof tiles, timber products and specialised façade systems.

With a broad product portfolio and manufacturing and sales facilities across Australia, Brickworks Building Products is uniquely placed to service the demands of the building industry.

With over 1200 staff across Australia and New Zealand, we pride ourselves on our commitment to product and service excellence and our leadership position.



Founded in 1908, Austral Bricks is Australia's largest, best-known and most efficient clay brick and paver manufacturer.

Austral Bricks add distinct style to any type of home. Their natural colours and textures enable you to create striking façade contrasts or more traditional neutral colour tones. By investing in new technology Austral Bricks now produce bricks with a variety of surface finishes, exciting colours and different sizes.

The result is a wonderful range of bricks for you to build a stylish, contemporary home.



When Bowral Bricks began production in 1922, a teenage Don Bradman was still scoring runs for the local side. Today their distinctive dry-pressed bricks are highly valued by discerning architects and builders across the country. The unique combination of traditional craftsmanship and modern technology will ensure that the Bowral Bricks brand will remain the benchmark for brick excellence for many years to come.



With a heritage reaching back to 1862, Nubrik premium-quality bricks are still moulded the traditional way on century-old presses. Their time-honoured expression of authenticity and elegance is acknowledged by architects, builders and discerning homebuyers who also value their rich colour blends, solidity and crisply-defined edges.



Since 1853, Daniel Robertson has helped build Australia with building products that combine craftsmanship with architectural excellence. In a world of mass production, where qualities are constantly compromised, Daniel Robertson premium-quality clay bricks are highly prized for their unique character, earthy appeal and individual charm.



Backed by a proud history of more than a century of brickmaking experience, NZ Brick Distributors offers New Zealand's most comprehensive range of high quality bricks and pavers in an unmatched palette of colours, textures and sizes, backed by a nation-wide sales and distribution network.



Austral Masonry is a leading manufacturer and supplier of concrete masonry products focused on providing functional but stylish solutions to the civil, residential, commercial and industrial building and construction markets.

Our passion is to create products to meet the technical and functional demands of the building industry, while also delivering architecturally striking and fashionable finishes to completed building projects. Our range of products includes standard grey concrete blocks, coloured architectural concrete blocks with a range of different finishes and a comprehensive range of retaining walls, pavers and garden edging.



In just a few years, Austral Precast has become Australia's premier supplier of high-quality, innovative and customisable precast concrete product solutions. Using state-of-the-art technology, production techniques and systems, our precast division produces a diversified range of wall, floor, column, and client-specific precast solutions. To meet the construction industry's ever-increasing demands, the company operates from five plants located along the eastern seaboard and in Western Australia.



For almost a century, Bristile Roofing has delivered stylish and innovative roofing products for Australian homes. Bristile is now one of Australia's largest manufacturers and installers of quality roof tiles and the exclusive Australian distributor of La Escandella premium-quality terracotta roof tiles from Spain. Product innovation, manufacturing expertise and first-class service guarantee a strong, low maintenance roofing solution that will look great and perform superbly for generations.



From production facilities in Western Australia, Victoria and the ACT, Auswest Timbers manufactures a diverse range of timber products. Jarrah, karri and chestnut timbers are processed into a range of decorative, seasoned products for furniture and joinery, flooring, decking, staircase components, veneers and fence screening. Green structural timbers are also processed for mine, wharf and rail track construction, as well as for floor joists, roofing timbers and roof tile battens.



Façade systems are a cost-and time-efficient approach to cladding commercial and upscale residential buildings. The Terraçade™ system, developed in Australia by Brickworks Building Products, combines the visual appeal and colourfastness of terracotta with the low maintenance and functional efficiency demanded in today's competitive market.

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BOWRAL BRICKS

Pronto Panel

1. Stock colours. Colours other than stock colours are made to order. Contact your nearest Austral Masonry office for your area's stock colours. A surcharge applies to orders less than the set minimum quantity. **2. Colour and texture variation.** The supply of raw materials can vary over time. In addition, variation can occur between product types and production batches. **3.** We reserve the right to change the details in this publication without notice. **4.** For a full set of Terms & Conditions of Sale please contact your nearest Austral Masonry sales office. **5. Important Notice.** Please consult with your local council for design regulations prior to the construction of your wall. Councils in general require those walls over 0.5m in height and/or where there is loading such as a car or house near the wall be designed and certified by a suitably qualified engineer. **6. Max wall heights disclaimer.** The gravity wall heights are maximum heights calculated in accordance with CMAA MA-53 Appendix D guidelines and a qualified engineer should confirm the suitability of the product for each application. As such, due consideration must be given to but not limited to: Cohesion. Dry backfill, no ingress of any water into the soil behind the retaining wall. All retaining walls are designed for zero surcharge unless noted otherwise. These walls are intended for structure Classification A walls only as defined in AS4678 Earth Retaining Structures as being where failure would result in minimal damage and/or loss of access. The product images shown in this brochure give a general indication of product colour for your preliminary selection. Austral Masonry recommends all customers see actual product samples at a selection centre prior to making final selections.