Tasman® Retaining Wall

EVALUATION AND INSTALLATION GUIDE

Landscaping

BUILD WITH Selkirk

Tasman® Retaining Wall

Evaluation and Installation Guide

This installation guide demonstrates the basics on how to construct:
A. Tasman® - Segmental Concrete Gravity Retaining Walls up to 900mm high (Gravity)
B. Tasman® - Segmental Concrete Reinforced Soil Retaining Walls over 1 metre high (Reinforced)
C. Tasman® - Segmental Concrete Gravity Retaining Walls with No-fines Concrete over 1 metre high (No-fines Concrete)

This is a guide only, to help determine whether a gravity, soil reinforced or no-fines concrete retaining wall is the most appropriate for your situation, and the preparation necessary to achieve the end result.

This guide is not a design manual for soil reinforced or no-fines concrete retaining walls.
The information provided in no way replaces the services of professional consultants on a particular project.
No liability can therefore be accepted by Selkirk Group of Companies.

Tasman® Retaining Wall Colours

OATMEAL

BLUESTONE

Colours shown may vary to actual product due to the limitations of photography and printing.

Tasman®

The maximum permissible height for straight Tasman retaining walls is 660mm (three courses and one cap) and serpentine Tasman retaining walls is 860mm (four courses and one cap).

Tasman walls intended to support higher embankments must comply with AS 4678 “Earth retaining structures” and the advice of a competent civil engineer should be sought.

The following limitations comply with the requirements of Concrete Masonry Association of Australia Manual MA53 “Segmental Concrete Gravity Retaining Walls” Appendix E. This design may be used to determine the permissible height of retaining walls satisfying the following criteria. For retaining walls outside these criteria, the design shall be determined using engineering analysis similar to that shown in the worked example, Appendix A, by qualified and experienced civil or structural engineers with a comprehensive working knowledge of soil mechanics and structural analysis and design.

Details of the Tasman System	
Block Height	200 mm (plus 10mm tab height)
Block length	390 mm
Block depth (into the embankment)	245 mm
Block weight	24 kg
Capping block weight	6.5 kg
Number of Blocks per m^2	13 per m^2
Setback distance per block	10 mm
Wall slope	3 degrees (10 in 225)
Infill behind and within the facing blocks	Compacted 10 to 20 mm crushed rock aggregate
Bearing pad	Compacted 10 to 20 mm crushed rock aggregate
Drainage pipe	100 mm diameter PVC agricultural pipe with sock

TASMAN GRAND WALL BLOCK

- 390L x 200H x 245D mm
- 24kg per unit

TASMAN PREMIUM CORNER UNIT

- 245L x 200H x 160D mm
- 15kg per unit
- Right & Left hand units available

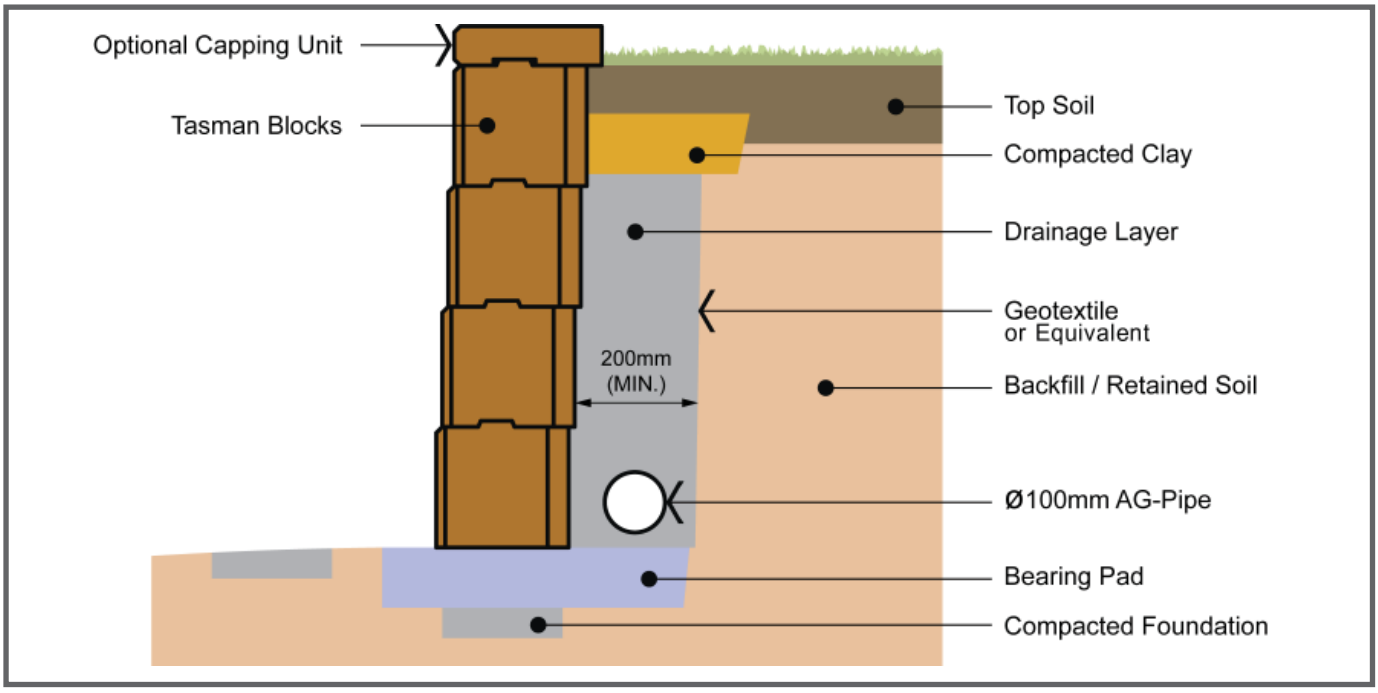
TASMAN GRAND CORNER UNIT - 360mm

- 360L x 200H x 160D mm
- 23kg per unit
- Right & Left hand units available

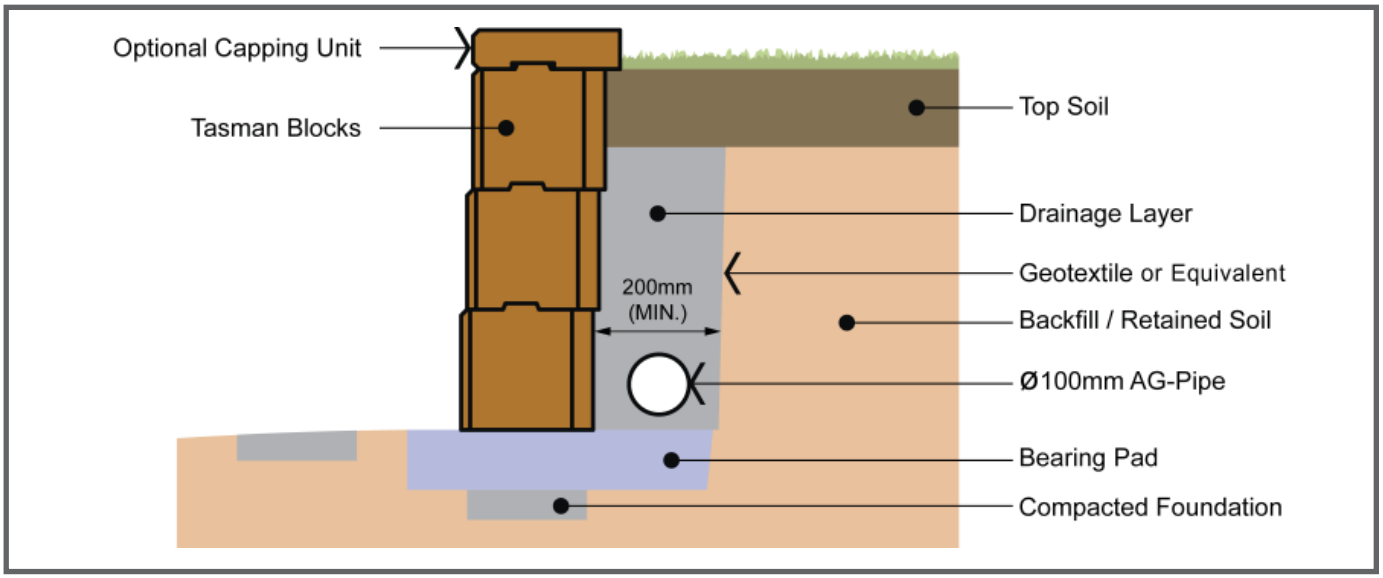
TASMAN CAPPING BLOCK

- 230L x 60H x 255D mm
- 6.5kg per unit

Tasman Curved and Serpentine Gravity Retaining Walls up to 860mm High



Tasman Straight Gravity Retaining Walls up to 660mm High



The limits of application are as follows:

- All retaining walls shall comply with AS 4678 Structure Classification A (Available from SAI Global Publishing www.sai-global.com/).
- Permissible height for straight walls is 660mm (three courses and one cap) and serpentine walls is 860mm (four courses and one cap).
- All retaining walls are designed for level backfill. If the backfill has a slope greater than 1 in 8, engineering advice should be sought.
- This design does not apply to terraced retaining walls.
- This design is not suitable for imposed loads. If imposed loads are expected, the retaining wall should be designed by engineering analysis similar to that in the worked example, in CMAA Manual MA53 Appendix A (Available from The Concrete Masonry Association of Australia www.cmaa.com.au).
- This design is not suitable for situations with excessive water run-off.
- This design applies to retaining walls with a compacted crushed rock levelling pad, 600 mm wide x 150 mm deep (The addition of portland cement is recommended to avoid erosion over the long term).

Notes

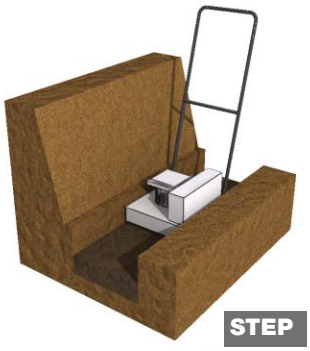
Structure Classification A retaining structures under 800 mm high are outside the scope of AS 4678.
The criteria for Tasman gravity retaining walls under 800mm is based on MA53 of the Concrete Masonry Association of Australia.

For all retaining walls it is the owner's responsibility to determine if council approval is required, irrespective of height or site conditions.

A. Installing Segmental Concrete Gravity Retaining Walls Tasman

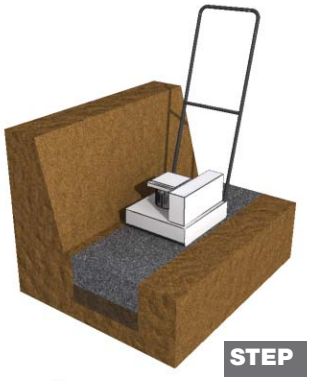
STEP 1 BUILDING CODES

Check with your local council to ensure all local Building Codes are complied with.



STEP 2 FOUNDATION

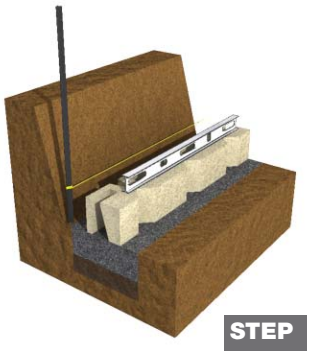
The foundation material shall be compacted by several passes of a mechanical plate vibrator. Where there are significant variations of foundation material or compaction soft spots, or where there is ponding of ground water, the material shall be removed, replaced and compacted in layers not exceeding 150 mm. Trenches shall be dewatered and cleaned prior to construction, such that no softened or loosened material remains.



STEP 3 BEARING PAD

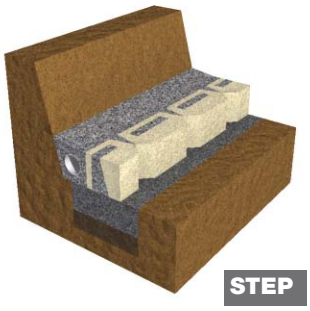
The facing shall be built on a bearing pad, not less than 150 mm thick, consisting of one of the following options:

- Compacted crushed rock, well-graded and of low plasticity (without clay content), compacted by a plate vibrator;
- Cement-stabilized crushed rock, with an additional 5% by mass of GP Portland cement thoroughly mixed, moistened and compacted by a plate vibrator; or
- Lean-mix concrete with a compressive strength of not less than 15 MPa.



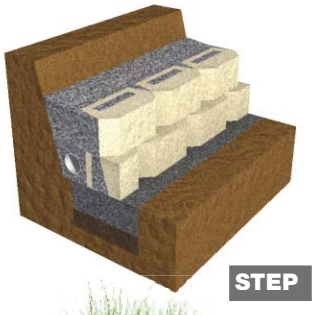
STEP 4 FIRST COURSE

Spread 25mm of metal dust with an additional 5% by mass of GP Portland cement over the compacted base. The first course is now bedded into the metal dust. The use of a level and string line is recommended to ensure the first course is laid correctly. Ensure each block is also well filled with free-draining material. (eg crushed rock aggregate / blue metal).



STEP 5 DRAINAGE AND BACKFILL

Place 100 mm diameter PVC agricultural pipe with sock behind the wall, with a 1 in 100 fall. Backfill behind the courses of blocks to a width of approx. 200mm - 300mm using 10 - 20mm free draining material (eg crushed rock aggregate / blue metal). Ensure each block is also well filled with free-draining material.



STEP 6 LAYING ADDITIONAL COURS-

Clean any debris from the top of the wall to ensure the next block sits perfectly.
Lay the next course and subsequent courses to a string line following the same procedure, as outlined previously in step 5.

STEP 7 CAPPING UNITS

Once backfilling and cleaning is completed, fix the purpose made capping blocks. For Tasman capping blocks in domestic situations, a waterproof construction adhesive is recommended. For high use areas, a 2-part epoxy is preferred. Please note no adhesive required for Norfolk.

Note: The criteria for Tasman® Gravity Retaining walls are based on MA53 of the Concrete Masonry Association of Australia

B. Installing Tasman® Segmental Concrete, Reinforced Soil Retaining Wall

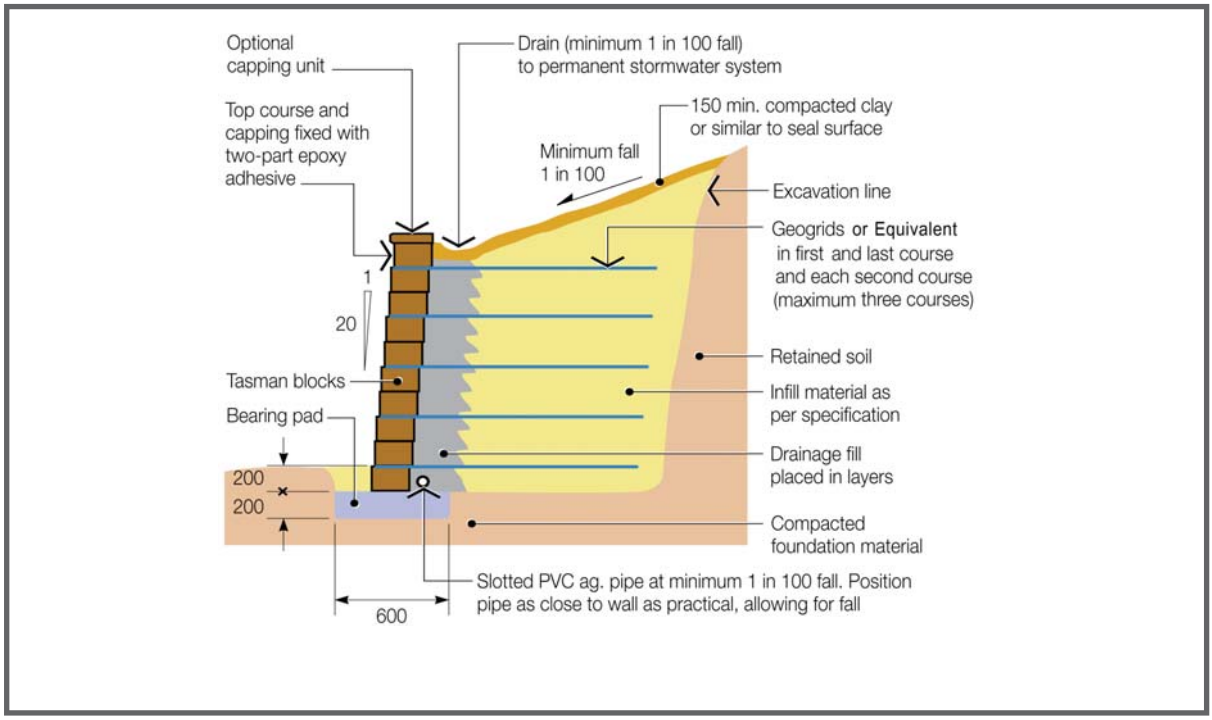
STEP 1 BUILDING CODES

Check with your local council to ensure all local Building Codes are complied with.

STEP 2 FOR WALLS UP TO 3m

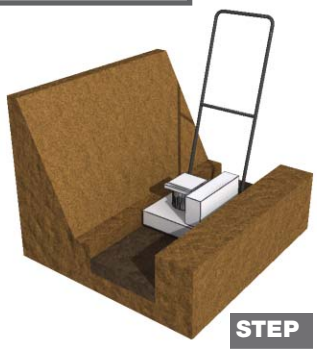
Engage a qualified civil engineer with a comprehensive working knowledge of soil mechanics and structural analysis and design. The design should comply with AS 4678 “Earth retaining structures”.

Walls over 3m high must be designed by a qualified and experienced civil or structural engineer with a comprehensive working knowledge of soil mechanics and structural analysis and design. It may be a council requirement to have the retaining wall certified and supervised by a civil or structural engineer.



STEP 3 FOUNDATION

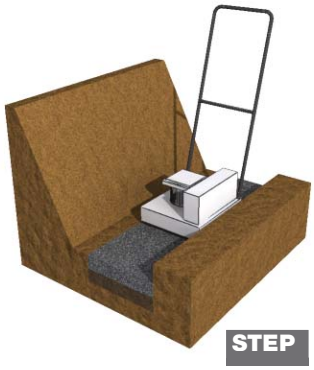
The foundation material shall be compacted by several passes of a mechanical plate vibrator. Where there are significant variations of foundation material or compaction soft spots, or where there is ponding of ground water, the material shall be removed, replaced and compacted in layers as per engineer’s advice. Trenches shall be dewatered and cleaned prior to construction, such that no softened or loosened material remains. See example.



STEP 4 BEARING PAD

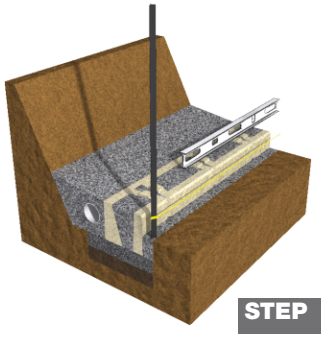
The facing shall be built on a bearing pad, as per engineers advice, consisting of one of the following options:

- Compacted crushed rock, well-graded and of low plasticity (without clay content), compacted by a plate vibrator;
- Cement-stabilized crushed rock, with an additional 5% by mass of GP Portland cement thoroughly mixed, moistened and compacted by a plate vibrator; or
- Lean-mix concrete with a compressive strength of not less than 15 MPa.



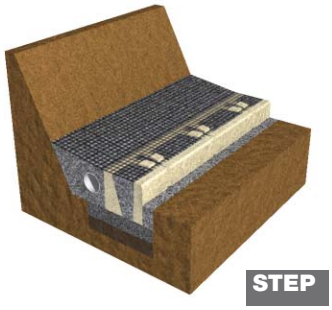
STEP 5 DRAINAGE, BACKFILL AND THE FIRST COURSE OF TASMAN

Ensure the first course is embedded below the finished ground level.
Place 100 mm diameter PVC agricultural pipe with sock behind the wall, with a 1 in 100 fall. The agricultural pipe should be connected to a PVC storm water pipe and brought through the front of the wall at intervals not exceeding 30m. It should be connected to a PVC storm water system at the lower end of each run, where practical, and must drain positively away from the base of the retaining wall.
Backfill behind the courses of blocks to a width of not less than 300mm using 10-20 mm free draining material (eg crushed rock aggregate / blue metal). Ensure each block is also well filled with free-draining material. Back fill behind the drainage layer with the specified backfill in a maximum of 200mm layers.
Compaction rate of 95% must be achieved (use only hand operated plate compactors close to the wall). Soft or wet clay must not be used to backfill. The use of a level and string line is recommended to ensure the first course is laid correctly.



STEP 6 LAYING GEOGRID OR EQUIVALENT

Clean any debris from the top of the block wall to ensure the next block and or the geogrid or equivalent layer sits perfectly. Roll the geogrid or equivalent perpendicular to the wall, pull tight, stake in place and cut to the required length. Ensure that the geogrid sits within 15mm of the face of the block, so that the purpose made connecting lugs can interlock. Butt join the geogrid along the length of the wall. Place the next course on top of the geogrid or equivalent.



STEP 7 LAYING ADDITIONAL COURS-

Lay the next course and subsequent courses to a string line following the procedures outlined previously i.e. Clean any debris from the top of the block wall to ensure the next block and or the geogrid or equivalent layer sits perfectly. Backfill behind the course of blocks to a width of not less than 300mm using 10-20 mm free draining material (eg crushed rock aggregate / blue metal). Ensure each block is also well filled with free-draining material.
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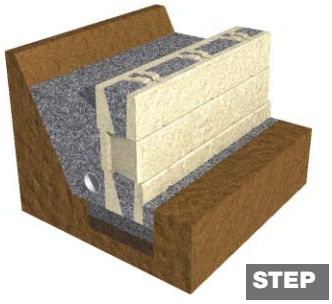
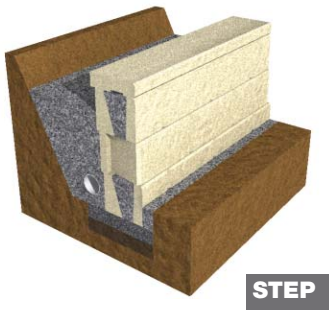


STEP 8 CAPPING

The capping block shall be fixed by a flexible two-part epoxy-based adhesive .



STEP 9 SURFACE DRAINAGE

The whole of the disturbed fill surface should be sealed by at least 150mm of compacted clay and properly drained. Alternative means, such as bentonite layers or PVC membranes may be employed, provided they do not introduce potential slip planes into the surface material.

C. Installing Tasman No-fines Concrete Retaining Walls

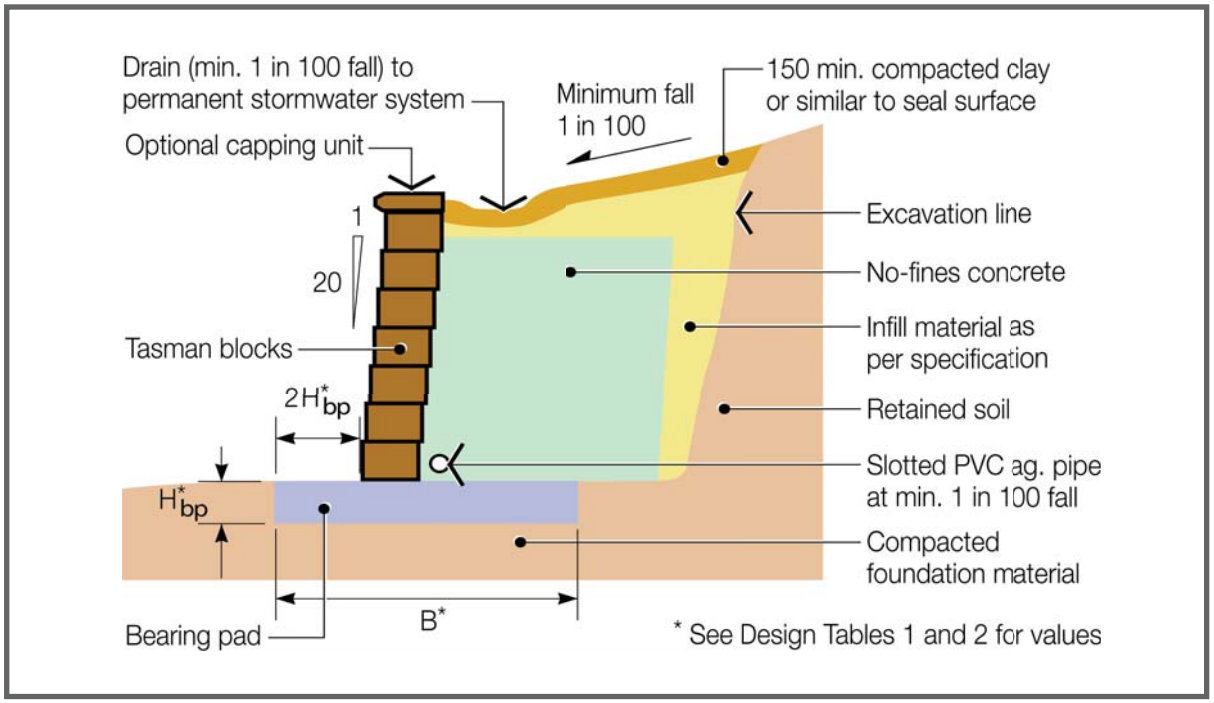
STEP 1 BUILDING CODES

Check with your local council to ensure all local Building Codes are complied with.

STEP 2 FOR WALLS UP TO 3m

Engage a qualified civil engineer with a comprehensive working knowledge of soil mechanics and structural analysis and design. The design should comply with AS 4678 “Earth retaining structures”.

Walls over 3m high must be designed by a qualified and experienced civil or structural engineer with a comprehensive working knowledge of soil mechanics and structural analysis and design. It may be a council requirement to have the retaining wall certified and supervised by a civil or structural engineer.

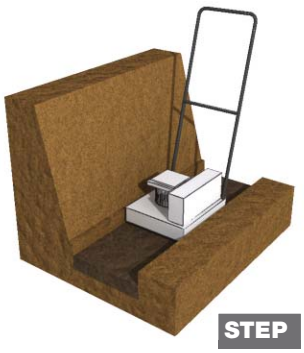


Specification of No-fines Concrete infill

No-fines concrete shall be free-draining, allowing water to pass readily through it to the drainage system. No-fines concrete shall have a bulk density not less than 1800kg/m³ and an aggregate to GP cement ratio not greater than 6:1 (by volume).

STEP 3 FOUNDATION

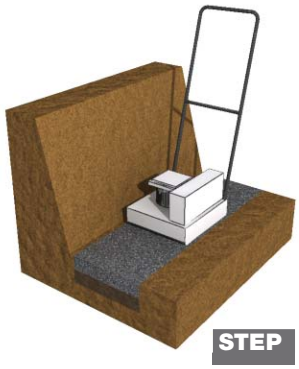
The foundation material shall be compacted by several passes of a mechanical plate vibrator. Where there are significant variations of foundation material or compaction soft spots, or where there is ponding of ground water, the material shall be removed, replaced and compacted in layers as per engineer’s advice. Trenches shall be dewatered and cleaned prior to construction, such that no softened or loosened material remains. See example.



STEP 4 BEARING PAD

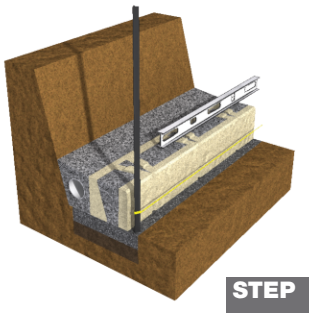
The facing shall be built on a bearing pad, as per engineers advice, consisting of one of the following options:

- Compacted crushed rock, well-graded and of low plasticity (without clay content), compacted by a plate vibrator;
- Cement-stabilized crushed rock, with an additional 5% by mass of GP Portland cement thoroughly mixed, moistened and compacted by a plate vibrator; or
- Lean-mix concrete with a compressive strength of not less than 15 MPa.



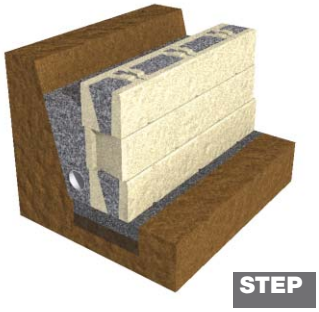
STEP 5 DRAINAGE, BACKFILL AND THE FIRST COURSE OF TASMAN

Place 100 mm diameter PVC agricultural pipe with sock behind the wall, with a 1 in 100 fall. The agricultural pipe should be connected to a PVC storm water pipe and brought through the front of the wall at intervals not exceeding 30m. It should be connected to a PVC storm water system at the lower end of each run, where practical, and must drain positively away from the base of the retaining wall.
Backfill behind the course of blocks to a width of not less than 300mm using no-fines concrete. Ensure each block is also well filled with no-fines concrete. Back fill behind the drainage layer with the specified backfill in a maximum of 200mm layers.
Compaction rate of 95% must be achieved (use only hand operated plate compactors close to the wall). Soft or wet clay must not be used to backfill. The use of a level and string line is recommended to ensure the first course is laid correctly.



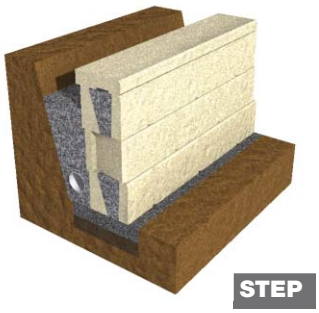
STEP 6 LAYING ADDITIONAL COURSES

Lay the next course and subsequent courses to a string line following the procedures outlined previously i.e. Clean any debris from the top of the block wall to ensure the next block sits perfectly. Backfill behind the course of blocks to a width of not less than 300mm using no-fines concrete. Ensure each block is also well filled with no-fines concrete.
Back fill behind the drainage layer with the specified backfill in a maximum of 200mm layers. Compaction rate of 95% must be achieved (use only hand operated plate compactors close to the wall). Soft or wet clay must not be used to backfill.



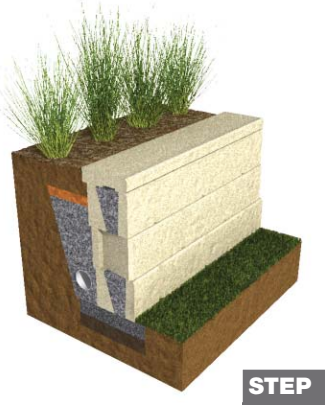
STEP 7 CAPPING

The capping block shall be fixed by a flexible two-part epoxy-based adhesive.



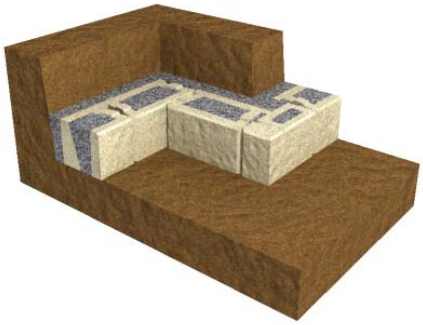
STEP 8 SURFACE DRAINAGE

The whole of the disturbed fill surface should be sealed by at least 150mm of compacted clay and properly drained. Alternative means such as bentonite layers or PVC membranes may be employed, provided they do not introduce potential slip planes into the surface material.

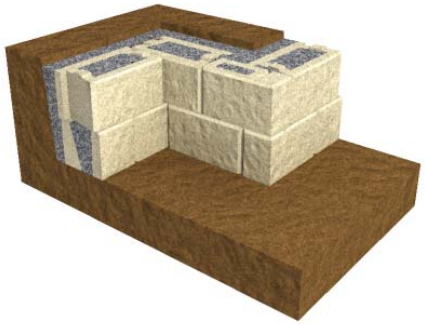


Tasman® Corners

Tasman corners are built by fixing the purpose made corner blocks alternately to each course using adhesive. Allowances should be made for a 10mm step back per course.
Lugs must be removed from the Tasman Blocks to ensure that the corner block fits evenly.
A maximum height of one metre is recommended when using corner blocks.



- First Course -



- Additional Courses -

- Capping -

Tasman® Curves

Curves and serpentine walls are easy to construct and the best guide is to lay out a garden hose and follow the profile. Be conscious that the length of courses will vary for a concave or convex wall. With fewer blocks per lineal metre of a convex, and more blocks per lineal metre when the wall is concave. For convex curved walls knock the back fin off the block with a hammer. For concave walls simply position blocks. The minimum radius for the top course of Tasman half blocks is 650mm and Tasman blocks is 1300mm. Adjust lower courses allowing for 10mm step back.
Always keep the front of the blocks tightly together.

- First Course -

- Additional Courses -

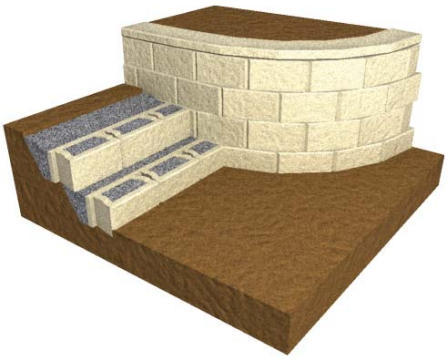
- Capping -

Steps

Tasman

Steps must be built according to the local building code, so always check with your local building authority for the minimum requirements before commencing.

- Prepare Surface -

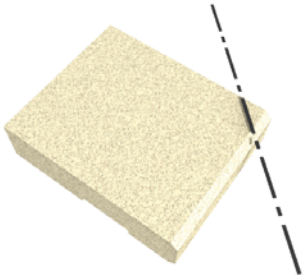


- Install Blocks -

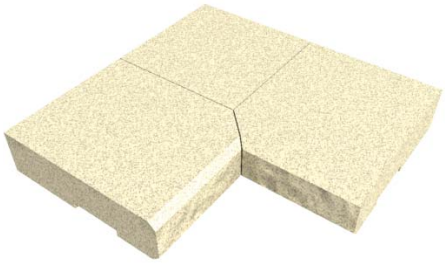
- Capping -

Corner Caps - Cutting

Tasman - Internal

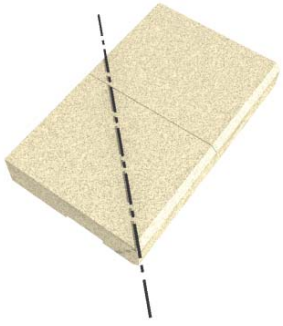


- Cut Line -

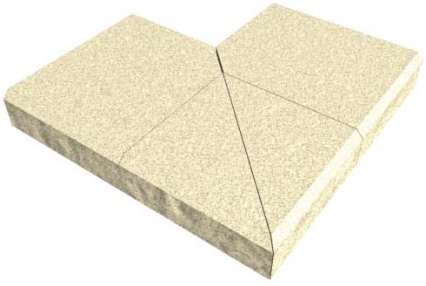


- Finished Corner -

Tasman - External



- Cut Line -



- Finished Corner -

Glossary

Gravity Retaining Walls

Gravity retaining walls depend on the weight of their mass to resist pressures from behind and will often have a slight batter set back, to improve stability by leaning back into the retained soil.

Soil Reinforced Retaining Walls

Soil reinforced retaining walls incorporate geogrids or equivalent into the soil structure to create a segmental concrete reinforced soil structure. Such systems can be constructed several metres high and accommodate significant loads.

No-Fines Concrete Retaining Wall

No-fines concrete retaining walls use no-fines concrete as a mass behind the concrete facing units to reinforce the soil structure to create a segmental concrete reinforced soil structure. Such systems can be constructed several metres high and accommodate significant loads.

Serpentine Wall

The serpentine wall derives its name from its curving shape, which is in the form of a snake.

Geogrids or Equivalents

Layers of metal or plastic material, which when constructed in horizontal planes in a soil mass, strengthen the soil. The most common geogrids are open “mesh” consisting of polyester, high-density polythene, polypropylene or steel.

Infill Material

The soil material, placed behind the retaining wall facing and strengthened by the geogrids or equivalent.

Foundation

The natural soil or rock material under a retaining wall.

Bearing Pad

The pad the Tasman® blocks are built on.

Drainage Fill

The crushed rock, gravel or similar material placed behind a retaining wall to convey groundwater away from the wall foundations. It is commonly used in conjunction with other drainage media, such as agricultural pipes.

Selkirk offers a wide range of materials, for Landscaping, Residential and Commercial projects.

• Retaining Wall • Garden Edging • Concrete Pavers •
• Large Format Pavers • Clay Pavers • Pressed Bricks •
• Extruded Bricks • Concrete Block • Light Weight Lining Board •

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