Viblock

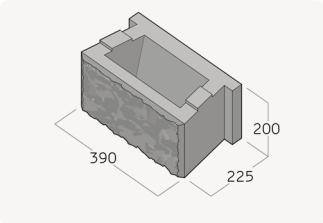
Retaining Wall System

viblock.co.nz

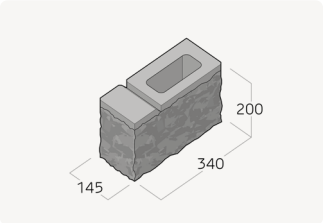
Viblock retaining wall

Can be installed up to 3m high walls with specific design. We have standard designs for smaller scale work, follow table to see if it suitable for your project;

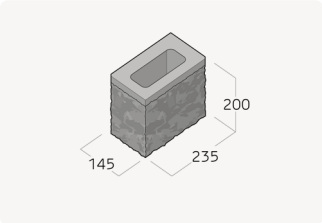
Retaining wall system



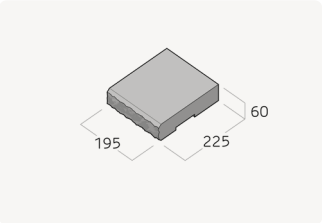
Retaining wall
Wall Block



Retaining wall
Full Corner



Retaining wall
Half Corner



Retaining wall
Capping Block

Specifications

Block height
200 mm (plus 10 mm tab height)

Block length
390 mm

Block depth (into the embankment)
225 mm

Block weight
23.5 kg

Capping block weight
12 kg

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 10–20mm crushed rock aggregate

Colours

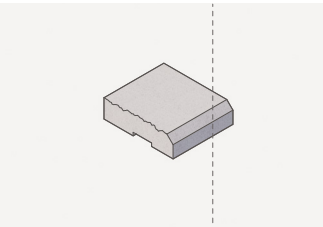
Boulder

Charcoal

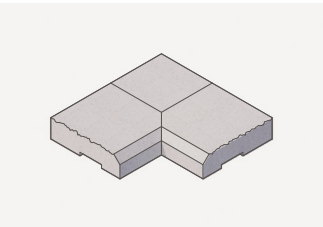
Grey

Cutting details

Internal Corner Caps - Cutting Detail

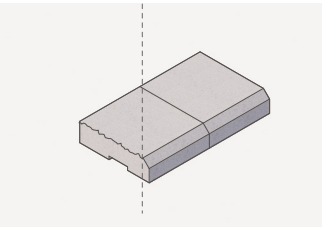


Cut Line

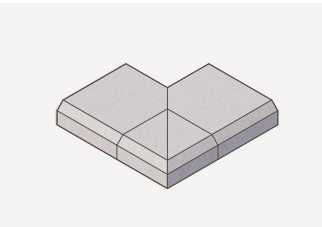


Finished Corner

External Corner Caps - Cutting Detail



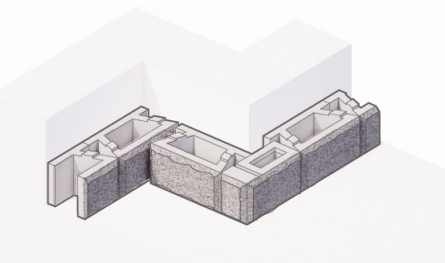
Cut Line



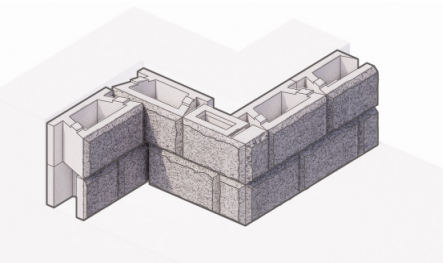
Finished Corner

Corners

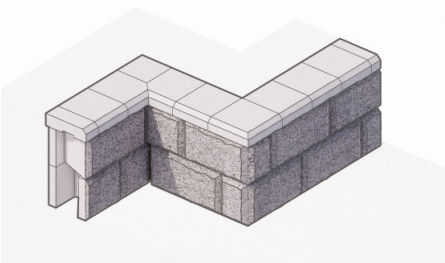
Retaining wall corners are built by fixing the purpose made corner blocks alternately to each course using adhesive. Allowances should be made for a 10mm step back per course. Lugs must be removed from the Retaining wall blocks to ensure that the corner block fits evenly. A maximum height of one metre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



First Course



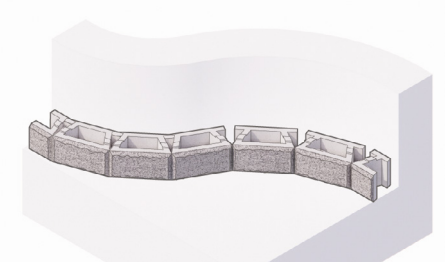
Additional Courses



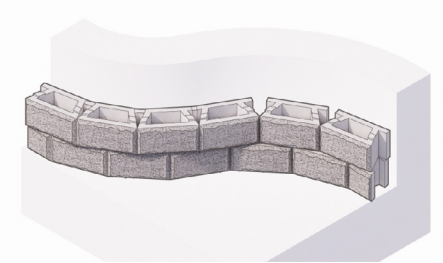
Capping

Curves

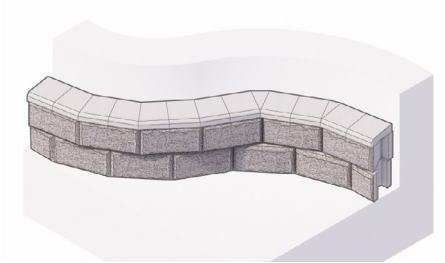
Curves and serpentine walls are easy to construct and the best guide is to lay out a garden hose and follow the profile. Be conscious that the length of courses will vary for a concave or convex wall. With fewer blocks per lineal metre of a convex wall, and more blocks per lineal metre when the wall 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 Retaining wall half blocks is 650mm and Retaining wall blocks is 1300mm. Adjust lower courses allowing for 10mm step back. Always keep the front of the blocks tightly together.



First Course



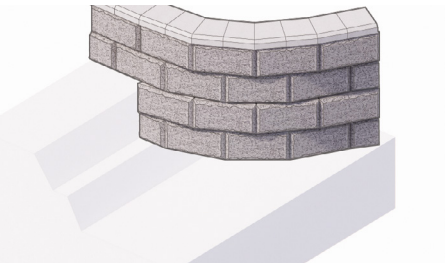
Additional Courses



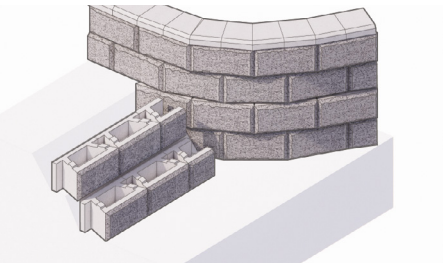
Capping

Steps

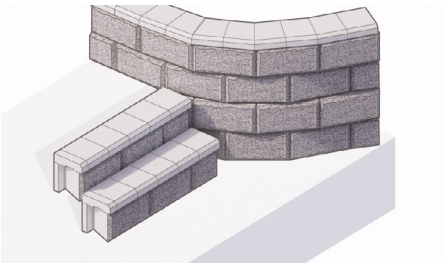
Steps must be built according to the local building code, so always check with your local building authority for the minimum requirements before commencing.



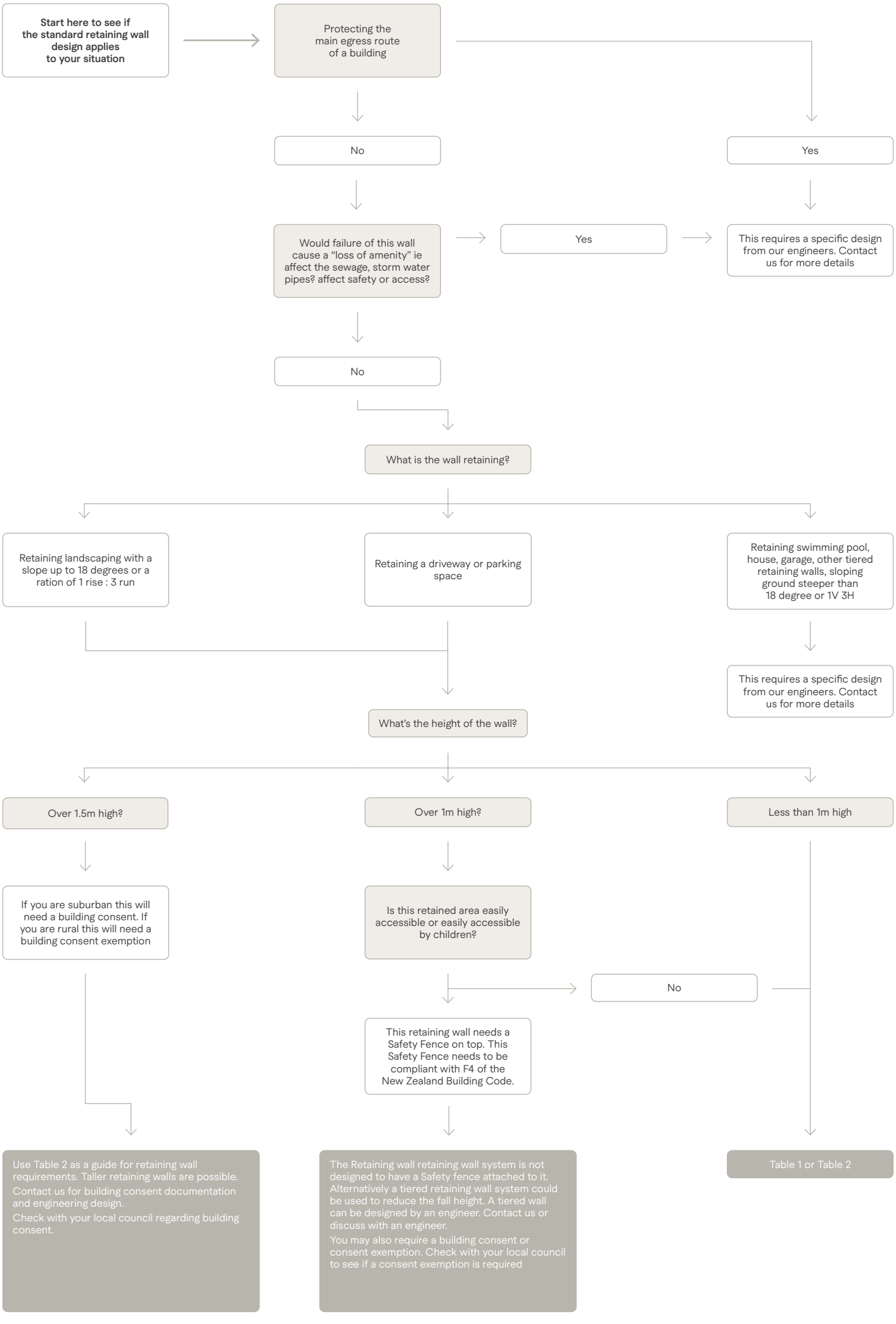
Prepare Surface



Install Blocks



Capping


Start here to see if the standard retaining wall design applies to your situation
Protecting the main egress route of a building
No
Yes
Would failure of this wall cause a “loss of amenity” ie affect the sewage, storm water pipes? affect safety or access?
Yes
This requires a specific design from our engineers. Contact us for more details
No
What is the wall retaining?
Retaining landscaping with a slope up to 18 degrees or a ration of 1 rise : 3 run
Retaining a driveway or parking space
Retaining swimming pool, house, garage, other tiered retaining walls, sloping ground steeper than 18 degree or 1V 3H
This requires a specific design from our engineers. Contact us for more details
What's the height of the wall?
Over 1.5m high?
Over 1m high?
Less than 1m high
If you are suburban this will need a building consent. If you are rural this will need a building consent exemption
Is this retained area easily accessible or easily accessible by children?
No
This retaining wall needs a Safety Fence on top. This Safety Fence needs to be compliant with F4 of the New Zealand Building Code.
Use Table 2 as a guide for retaining wall requirements. Taller retaining walls are possible.
Contact us for building consent documentation and engineering design.
Check with your local council regarding building consent.
The Retaining wall retaining wall system is not designed to have a Safety fence attached to it. Alternatively a tiered retaining wall system could be used to reduce the fall height. A tiered wall can be designed by an engineer. Contact us or discuss with an engineer.
You may also require a building consent or consent exemption. Check with your local council to see if a consent exemption is required
Table 1 or Table 2

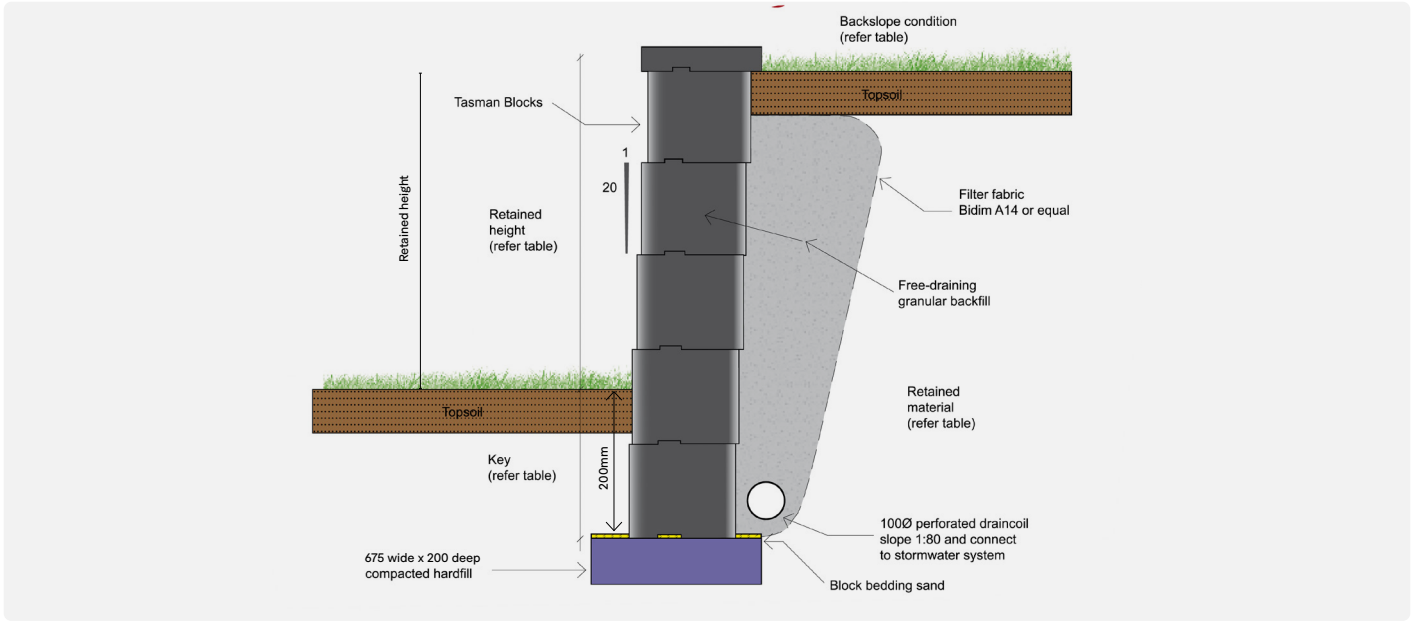


Table 1 – Unreinforced Retaining walls.

Unreinforced retaining walls use the weight and interlocking mechanism of the Retaining wall Blocks to retain an embankement.

Table 1 is applicable for soil conditions including Gravel, Silt, Sand and firm Clay soils. If you are unsure of the soil conditions please get advice.

Tailored designs of unreinforced retaining walls to specific soil and loading conditions are possible. Please contact us for engineering advice.

Back slope conditions	Retained Height (m)
Level	0.6
Slope 1V 3H	0.2
Vehicle	0.4

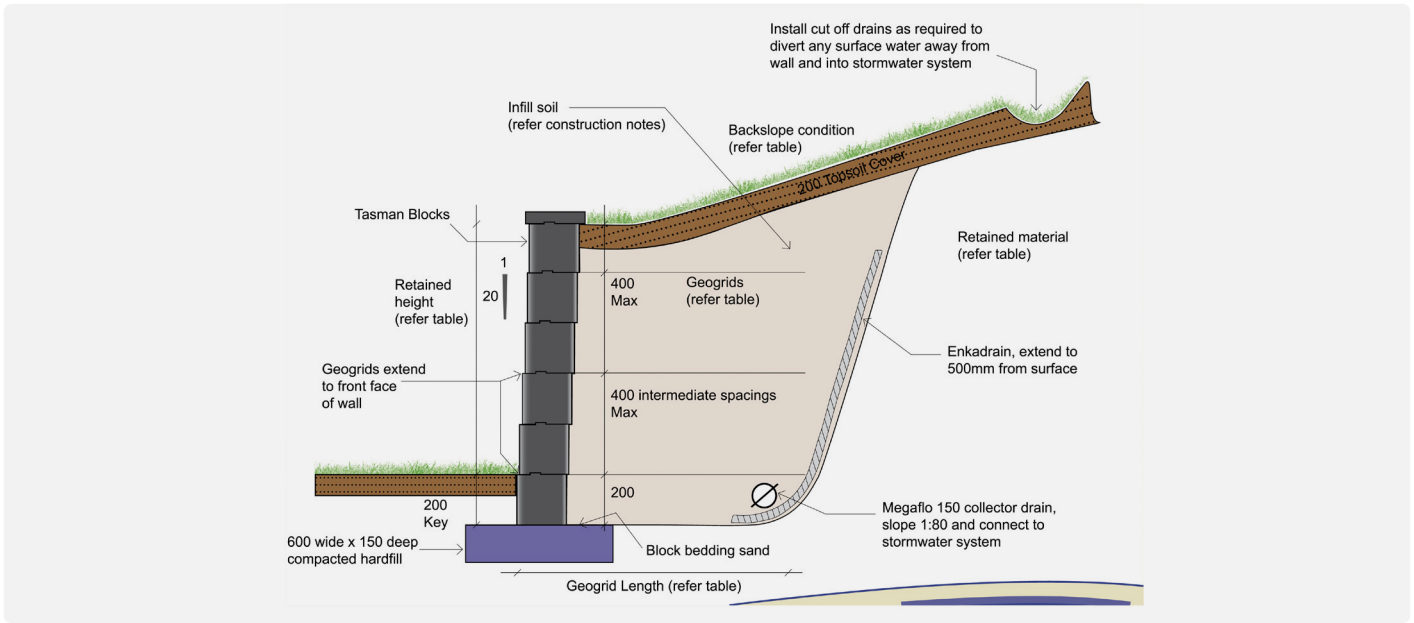


Table 2 – Reinforced Retaining walls.

Reinforced retaining walls utilise Geogrid soil reinforcement together with the Tasman block to achieve greater retained heights.

Table 2 is applicable for Sand or Stiff Clay Soil, and gravel conditions only with a level backslope. For more site specific designs including different soil and backslope conditions please contact us.

Dominant Retained Material	Retained Height (m)	Tencate Miragrid GX 40 40 Geogrid Lengths (m)
Sand or gravel	1.0	1.0
Sand or gravel	1.5	1.3
Sand or gravel	2.0	1.7
Sand or gravel	2.5	2.0

Step 1	Base preparation– excavate trench to the width and depth as specified in the design tables
Step 2	Sand bed – 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 organic materials or where there is ponding of groundwater, the material shall be removed, replaced with crushed rock, and compacted in layers not exceeding 150mm. If extensive layers of organic material are present, contact us to discuss with an engineer. Trenches shall be dewatered and cleaned prior to construction such that no softened or loosened material remains.
Step 3	Laying first course – 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, wellgraded and of low plasticity (without clay content), compacted by a platevibrator; • 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 lessthan 15 MPa.
Step 4	Drainage and backfill for unretained walls - 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. Ensure that the first course is embedded below the finished ground level. 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 / round aggregate).
Step 5	Drainage, backfill and geogrid for retained walls - Place a Maccaferri Megaflo 150 collector drain to the rear of the reinforced infill soil with an Enkadrain behind the reinforced soil extended to 500mm from the surface. Place and compact infill soil as specified in construction note 6 behind the first block layer. Clean any debris from the top of the blocks to ensure the next blocks and the geogrid layer sits perfectly. Roll the geogrid perpendicular to the wall, pull tight and cut to the required length. Ensure that the geogrid sits within 10mm of the front of the block, so that the purpose made connecting lugs can interlock. Butt join the geogrid along the length of the wall.
Step 6	Laying additional courses - Lay the next course and subsequent courses to a string line following the same procedure, as outlined in steps 4 or 5 above, e.g. clean fill to the top of the blocks, backfill in maximum 150mm layers, ensuring backfill is compacted to 95% and lay geogrids as required to every 2nd block layer.
Step 7	Laying capping units and finishing - Once backfilling and cleaning is completed, fix the purpose made Retaining wall Capping blocks with adhesive. For domestic situations, a waterproof construction adhesive is recommended. For high use areas, a 2-part epoxy is preferred. Care should be taken where possible to divert water away from the retained soil and wall face. Install cut off drains above the wall where surface water could exist and connect to site stormwater system.

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 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 signifcant loads.

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

Geogrids
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 polyethene, polyproplene or steel.

Infill Material
The soil material, placed behind the retaining wall facing and strengthened by the geogrids.

Foundation
The natural soil or rock material under a retaining wall.

Bearing Pad
The pad the Retaining wall® or Norfolk® 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.

Limitations and Liability
The design guidance and proprietary designs has been prepared by Hadley Consultants Limited and is informed by the Concrete Masonry Association of Australia Manual RW03, RW02, Module 6 of the New Zealand Building code and AS 4678.

Domestic vehicles loads are taken as 500kg/m2 maximum suitable for residential driveways only. For any heavy vehicles loads seek specific engineering advice.

All footings to be formed on good ground assumed capable of carrying 100kPa allowable bearing working stress. Seek advice if soft clay or silt exists.

Clay:
Particles passing 0.002mm sieve,

Assumed angle of shearing resistance Ø= 20°+

Silt:
Particles passing 0.06mm sieve,

articles not passing 0.002mm sieve,

Assumed angle of shearing resistance Ø = 25°+

Sand:
Particles passing 2.0 mm sieve,

Particles not passing 0.06mm sieve,

Assumed angle of shearing resistance Ø = 30°+

Gravel:
Particles passing 100 mm sieve,

Particles not passing 2.0mm sieve,

Assumed angle of shearing resistance Ø = 35°+

For retaining walls outside of the specific criteria listed above a suitably qualified and experienced engineer shall be engaged.

The guidance given above is based on current industry best practice guidance and the NZBC, it does not replace the services of professional consultant on a particular project. It is the owner’s responsibility to determine if council approval is required irrespective of height or site conditions.

It is the specifiers responsibility to determine if the chosen design is applicable for the site conditions, including soil, backslope, and backfill materials. If in doubt, ask.

The contractor is responsible for ensuring that the work is performed safely and achieves quality standards and industry best practice guidance as set out.

The contractor is to ensure that excavation work follows industry best practice guidance including that

Services are located prior to excavation.

The excavation is performed and remains open in dry weather only no significant ground water seepage is present the excavation remains open for less than two weeks. The excavation does not undermine any near by structures. The there is ground water present in the excavations engineering advice should be sought.