Retaining wall design and price guide

2022-2023

RetainingWall Solutions

retainingwallsolutions.co.uk

RetainingWall Solutions

Retaining Walls Solutions is the number one educational resource for people looking to learn more about retaining walls.

Our website and downloadable resources have been built to support those who need help when it comes to the design, supply or construction of a retaining wall. Whilst Retaining Wall Solutions may have a digital face, we also have a friendly team who are happy to support customers over the phone or email.

MAKE ENQUIRY

Contents

Everything you need to know to select the right retaining wall solution that suits your budget is included in this guide. If you need help selecting the right option, get in touch.

Bob Evans
Director, Retaining Wall Solutions

Basic design principles

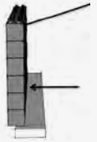
The following modes of failure are considered during the design of any retaining wall; **overturning**, **bearing capacity**, **sliding**, **slope stability** and **shear**.

Our solutions are based on a range of retaining wall types, we currently have designs for: king post, L shape precast concrete, reinforced block, stepoc masonry concrete bloc, masonry, gabion basket, inclined concrete block, concrete criblock, timber criblock, keystone, porcupine, chevloc and Geoweb®.

Below shows the core functions and basic modes of failure for a retaining wall.

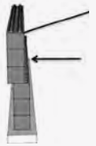
Stable wall with no load

A stable wall that has not moved by overturning, shearing or slippage.



Shear at base

The material being retained creates a horizontal force that causes slippage.



Shear on block course

The material being retained creates a force that causes slippage of a block course.

Overturning at base

The material being retained creates a force that causes toppling of the wall at the base.

Overturning on block course

The material being retained creates a force that causes toppling of the wall at a block course.

Bearing capacity and earth slippage

The weight of the wall can cause settlement and global earth slippage.

King post retaining wall

King posts panels can be plain concrete or textured.

King post retaining wall can be used to replace failed retaining walls by building them in front of the failed wall as they are very slim.

MAKE ENQUIRY

Cantilever retaining walls

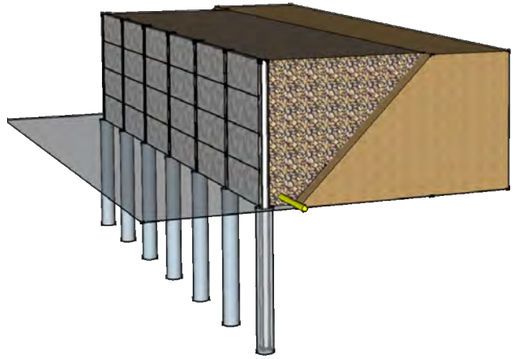
King post introduction

King posts are ideal for housing projects as well as industrial and commercial use.

King post retaining walls are very economical because they do not require a lot of excavation work and they are relatively slim as far as retaining walls go.

In simple terms, a king post retaining wall is a structural fence that holds back earth. The design principle is a cantilever post and the post is normally a steel column encased in concrete or driven into the ground. The type of soil will determine the depth required for the posts.

Once the king post retaining wall has been designed, the installation can be carried out by a specialist contractor or by hiring in the plant and using a local contractor.



The example wall 2m high with 152mm x 152mm steel posts painted black on the front face.

Steel king posts

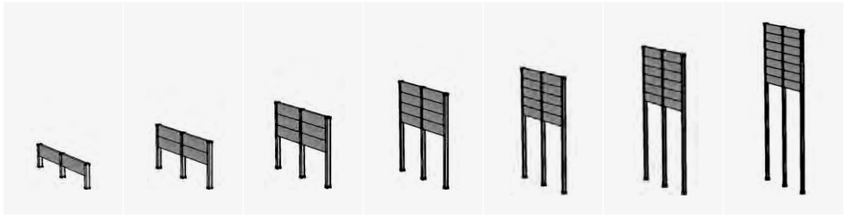
- The steel post sections can be hot dipped galvanised to prevent corrosion. Galvanising offers a modern style wall boasting a lifespan of 40-60 years.
- When the post is being encased in concrete no protection is required. The posts can be painted above ground to prevent corrosion. We recommend a resin-based paint system to give a longer lifespan.

King post panels

- The concrete infill panels are also structural as they must take the load and resist bending. The concrete infill panels are reinforced with steel to give them maximum structural stability. It's essential to have the king post retaining wall designed to ensure it works for the long term.
- The panel for a king post retaining wall can be made from timber or concrete. Concrete panels can be plain smooth concrete, textured or even colour textured.
- The size of the panels differs from supplier to supplier. They are normally 1m or 1.5m in height, from 1m to 3m in length and 100mm, 150mm, 180mm, 200mm or 250mm in thickness. The size of the panel depends on the height of the wall and any design constraints.
- If the face of the retaining wall is not being seen, concrete lintels from a local builders merchant can be used. Timber panels are normally railway sleepers.

King post design guide

Height (m)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
Post centers (mm)	2000	2000	2000	2000	2000	2000	2000
Post section	152 × 152 UC	152 × 152 UC	152 × 152 UC	203 × 203 UC	203 × 203 UC	203 × 203 UC	254 × 254 UC
Post weight (kg)	23	23	30	46	60	86	107
Post embedment (m)	0.5	1.0	1.5	2.5	3.5	4.5	5.5
Post length (m)	1.0	2.0	3.0	4.5	6.0	7.5	9.0
Post hole diameter (mm)	450	450	450	450	450	450	450
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

The soil profile will determine the post depth and section size during the design process.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

King post budget table

The table below shows budget rates for a king post retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	0.5	1.0	1.5	2.0	2.5	3.0	3.5
Labour (£)	80	55	55	55	55	55	55
Plant (£)	350	200	160	115	90	75	60
Materials (£)	210	190	200	230	265	330	375
Supply and install (£)	**640**	**445**	**415**	**400**	**410**	**460**	**490**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100m × £55 = **£11,000**

PLANT 2m × 100m × £115 = **£23,000**

MATERIALS 2m × 100m × £230 = **£46,000**

SUPPLY & INSTALL 2m × 100m × £400 = **£80,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

L shape retaining wall

L shape panels can be plain concrete, textured or have stone cast into them to deliver attractive finishes.

Precast L shape retaining walls are an economical solution and very fast to build. Lifting plant is needed to place them.

MAKE ENQUIRY

Cantilever retaining walls

L shape introduction

Precast L shape retaining walls are ideal for fast construction and are mostly used on industrial and commercial projects

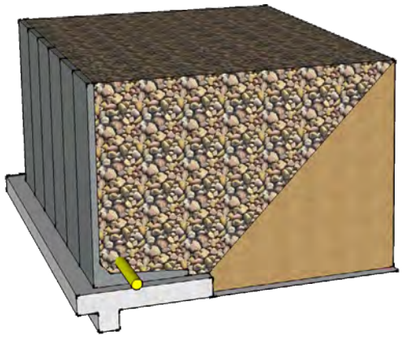
An L shaped precast retaining wall uses a cantilever design. The foot or base of the structure is the fulcrum.

The mass and geometry of the structure resists the overturning and sliding forces.

Steel reinforcement is used within the precast element of the structure to absorb the bending stresses.

The primary stress of the structure is at the elbow joint.

Resin anchor holding down bolts are normally supplied by the manufacture. The size of bolt depends on the size of the units.



2m high bolt down unit bolted down to a foundation with a key that stops the foundation from sliding.

Unit types

- Bolt down retaining walls, as the term implies, are bolted down to the foundation. Bolting down the units stops them from slipping or overturning from the foundation. The extra mass and shape of the foundation is part of the structural design.
- Cast-in retaining walls are designed to deliver greater load cases. The base of the unit is shorter, with extended reinforcement. The base is then connected to the foundation.

Foundation types

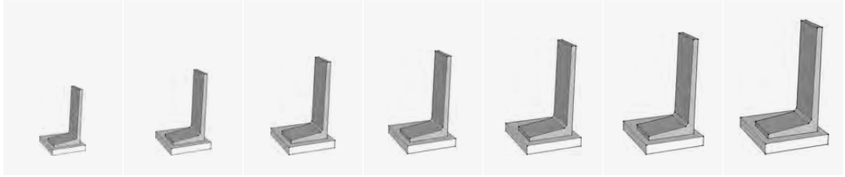
- The foundation type and design will depend on the L shape unit being used and the soil conditions for support and retention.
- Bolt down. The unit is bolted down to a foundation that resists overturning and slip when the unit is loaded.
- Cast-in unit. The L shape is connected to a foundation using extended re-bar. The cast-in unit can be used for high loads.
- Foundation shape and size depend on the load case for the wall, together with the soil type.

Bolt down type.

Cast in type.

L shape design guide

Height (m)	1.2	2.0	2.4	3.0	4.0	5.0	6.0
Width (mm)	700	1000	1200	1500	2000	2500	3000
Length (mm)	1000	1000	1000	1000	1000	1000	1000
Unit weight (kg)	600	800	900	1250	2310	3290	6000
Base width (mm)	1100	1400	1600	2000	2000	3000	3500
Base depth (mm)	250	300	300	350	400	500	600
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

L shape budget table

The table below shows budget rates for a L shape retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.2	2.0	2.4	3.0	4.0	5.0	6.0
Labour (£)	77	58	52	52	40	40	45
Plant (£)	78	49	54	45	45	45	40
Materials (£)	280	230	254	288	285	285	395
Supply and install (£)	**435**	**337**	**360**	**385**	**370**	**370**	**480**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100m × £58 = **£11,600**

PLANT 2m x 100m × £49 = **£9,800**

MATERIALS 2m × 100m × £230 = **£46,000**

SUPPLY & INSTALL 2m × 100m × £337 = **£67,400**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Reinforced block retaining wall

The block finish can be smooth plain concrete or they can be textured and coloured.

The walls are relatively simple to build by a competent contractor. Lifting plant is required as the blocks are over 1.5t in weight.

MAKE ENQUIRY

Reinforced block introduction

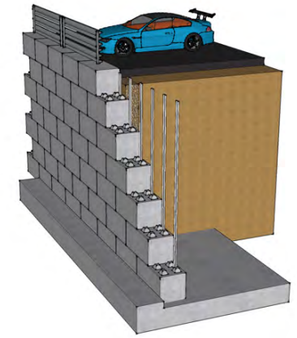
Reinforced block walls are ideal for industrial and commercial projects.

Reinforced block walls are the most economical solution for interlocking concrete block walls over 3m in height.

The wall construction is very fast when compared with traditional construction.

The wall is reinforced using bars that thread through the blocks into the foundation.

The foundation and the wall act together as a cantilever giving the structure stability and strength.



5.6m high reinforced block wall using 800mm x 800mm blocks.

Blocks

- **600mm blocks:** The block is 600mm wide x 600mm high x 1800mm, 1500mm, 1200mm, 900mm or 600mm long. The walls are built to a modular of 600mm. Each standard block builds 1.08 m^2 of the wall.

  600mm blocks are used for wall heights from 1.8m to 4.8m as you can see in the table on the next page.

- **800mm blocks:** The block is 600mm wide x 600mm high x 1800mm, 1500mm, 1200mm, 900mm or 600mm long. The walls are built to a modular of 600mm. Each standard block builds 1.08 m^2 of the wall.

  600mm blocks are used for wall heights from 1.8m to 4.8m as you can see in the table on the next page.

General

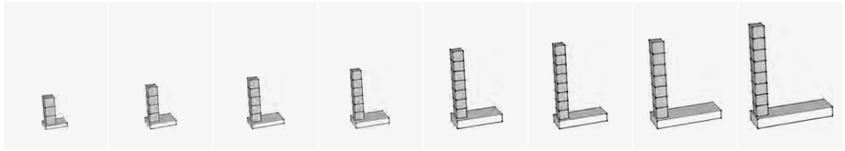
- The blocks are made from high-strength (50N/mm^2) concrete, using natural stone and aggregates. This allows the blocks to have high levels of durability.
- Each block has its own lifting pin cast into it for the use of a quick release lifting clutch.

600mm block (1555kg).

800mm block (2450kg).

Reinforced block design guide

Height (m)	1.8	2.4	3.0	3.6	4.2	4.8	5.6	6.4
Block size (mm)	600	600	600	600	600	600	800	800
Base width (mm)	1400	1800	2200	2400	2800	3200	4800	5600
Base depth (mm)	200	300	300	400	500	500	600	700
Rebar toe	A393	A393	A393	B785	B785	B785	B785	H16 @ 200
Rebar heel	A393	A393	B785	H16 @ 200	H16 @ 200	H20 @ 200	H20 @ 200	H25 @ 200
Pocket rebar	1 H25	1 H25	1 H25	1 H25	2 H25	2 H25	1 H40	2 H40
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Reinforced block budget table

The table below shows budget rates for a reinforced block retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.8	2.4	3.0	3.6	4.2	4.8	5.6	6.4
Labour (£)	45	45	45	45	50	50	60	75
Plant (£)	30	30	30	30	30	30	30	30
Materials (£)	280	280	280	290	320	400	420	495
Supply and install (£)	**355**	**355**	**355**	**365**	**400**	**480**	**510**	**600**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

3m high × 100m long

LABOUR	3m × 100m x £45 = **£13,500**
PLANT	3m × 100m x £30 = **£9,000**
MATERIALS	3m × 100m x £280 = **£84,000**
SUPPLY & INSTALL	3m × 100m x £355 = **£106,500**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Stepoc masonry retaining wall

Stepoc walls are ideal when access to the site is limited for heavy plant as the walls can be built by hand.

Stepoc walls can be built using a competent local contractor, following a structural engineer's drawing and steel reinforcement detailing.

MAKE ENQUIRY

Stepoc masonry introduction

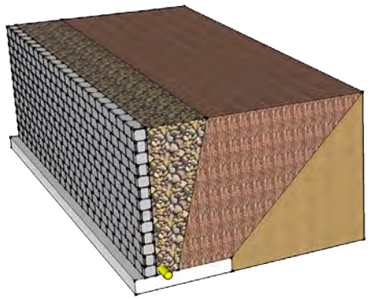
Stepoc walls are ideal for basement construction, flood defence walls and general use.

There are a number of methods to construct a reinforced masonry retaining wall. The Stepoc method has been designed to be economical, fast to build and easy to design.

The Stepoc masonry retaining wall system are constructed using a formwork block that can be laid dry. The blocks are hollow, they have been designed to incorporate reinforcement bars and are filled with concrete.

Stepoc is an ideal solution for retaining walls within buildings and locations where heavy plant cannot gain access. The method of construction is less expensive and much faster than traditional cast in-site construction.

Stepoc comes in three widths 200mm, 256mm and 325mm.



3m high stepoc wall constructed on a raft to form a cantilever retaining wall.

Block sizes

- The block sizes for the 200mm and 256mm are 440mm long x 215mm high, and the 325mm block is 325mm long x 215mm high.
- The pour height so the laid blocks do not lose stability are:

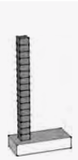
  200mm 8 courses = 1.8m
  256mm 10 courses = 2.25m
  325mm 10 courses = 2.25m

Quantity ordering

- There are 11.11 blocks per m^2 for the 200mm and 256mm block types and 13.67 blocks per m^2 for the 325mm block type.
- The number of third/half-length standard, plain end and (for 200mm and 256mm Stepoc) third length plain end blocks are then calculated for the corners, end details and other junctions such as openings and then subtracted from the full-length standard block quantity.
- We can calculate the Stepoc block order for you and can obtain a delivered to site price on request.

Pouring concrete into the block cavity.

Stepoc masonry design guide

Height (m)	0.9	1.35	1.8	2.25	2.7	3.15	3.6
Number of courses	4	6	8	10	12	14	16
Wall type	Step 200	Step 200	Step 200	Step 256	Step 256	Step 256	Step 325
Base width (mm)	1000	1100	1200	1250	1650	2350	2425
Base depth (mm)	200	200	250	250	300	350	350
Wall bar	10/200 6/200	10/200 6/200	16/200 6/200	10/133 6/200	12/133 6/200	20/133 6/200	12/163 6/225
Top base steel	A252	A252	A252	A393	A393	12/200 12/200	12/200 12/200
Bottom base steel	A252	A252	A252	A393	A393	12/200 12/200	12/200 12/200
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5
							

Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Stepoc masonry budget table

The table below shows budget rates for a stepoc retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	0.9	1.35	1.8	2.25	2.7	3.15	3.6
Labour (£)	90	75	75	70	75	90	95
Plant (£)	100	70	55	45	40	35	40
Materials (£)	310	205	200	210	215	260	265
Supply and install (£)	**500**	**350**	**330**	**325**	**330**	**385**	**400**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

1.8m high × 100m long

LABOUR 1.8m × 100m × £75 = **£13,500**

PLANT 1.8m × 100m × £55 = **£9,900**

MATERIALS 1.8m × 100m × £200 = **£36,000**

SUPPLY & INSTALL 1.8m × 100m × £330 = **£59,400**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Concrete block retaining wall

Concrete blocks can be used to build piling mats.

Concrete gravity retaining walls are very fast to build and, if planned well, can be built directly from the delivery wagon using a Hiab.

MAKE ENQUIRY

Concrete block introduction

Concrete gravity retaining walls are ideal for commercial and industrial retaining walls.

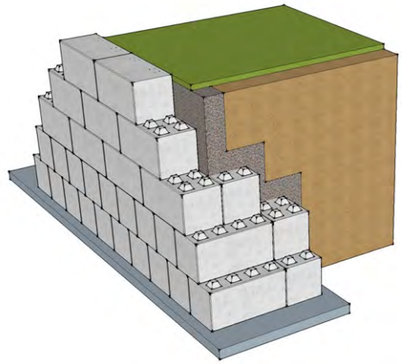
A concrete block gravity retaining wall is built using 600mm x 600mm or 800mm x 800mm concrete interlocking blocks.

The blocks are stacked on top of each other to form a heavy mass that resists the forces of the retained earth.

For a wall 1.2m or 1.6m two block wall can be built.

Above this height more blocks are required at the base to give more mass.

A land drain is required to remove any water from the back of the wall that would cause hydrostatic pressure.



A 4m high concrete block retaining wall using 800mm x 800mm interlocking concrete blocks.

Blocks

- **600mm blocks:** The block is 600mm wide x 600mm high x 1800mm, 1500mm, 1200mm, 900mm or 600mm long. The walls are built to a modular of 600mm. Each standard block builds 1.08m² of the wall.

  600mm blocks are used for wall heights 1.2m, 1.8m, and 3.0m as you can see in the table on the next page.

- **800mm blocks:** The block is 800mm wide x 800mm high x 1600mm or 800mm long. Each standard block builds 1.28 m² of the wall.

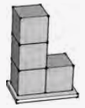
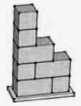
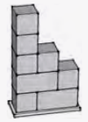
  800mm blocks are used for wall heights 1.6m, 2.4m, 3.2m, and 4.0m as you can see in the table on the next page.

Block finishes

- Standard finish on the blocks are plain, smooth concrete.
- Textures fixtures include rock, slate, timber and many others.

Stone textured finish.

Concrete block design guide

Height (m)	1.2	1.6	1.8	2.4	3.0	3.2	4.0
Block size (mm)	600	800	600	800	600	800	800
Based width (mm)	800	1000	1400	1800	2600	2600	2600
Based depth (mm)	100	100	100	100	100	100	100
Surcharge	2.5kn/m²	2.5kn/m²	2.5kn/m²	2.5kn/m²	2.5kn/m²	2.5kn/m²	2.5kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5
							

Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Concrete block budget table

The table below shows budget rates for a gravity concrete block retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.2	1.6	1.8	2.4	3.0	3.2	4.0
Labour (£)	30	25	30	30	40	40	40
Plant (£)	45	30	35	35	35	35	35
Materials (£)	200	220	230	290	300	370	415
Supply and install (£)	**275**	**275**	**295**	**355**	**375**	**445**	**490**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

1.8m high × 100m long

LABOUR 1.8m × 100m × £30 = **£5,400**

PLANT 1.8m × 100m × £35 = **£6,300**

MATERIALS 1.8m × 100m × £230 = **£41,400**

SUPPLY & INSTALL 1.8m × 100m × £295 = **£53,100**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Masonry retaining wall

Masonry retaining walls can look very attractive when designed using brick and stone.

Masonry retaining walls can be built by a local builder. No specialist equipment or techniques are required, just the skills of a bricklayer.

MAKE ENQUIRY

Gravity retaining walls

Masonry introduction

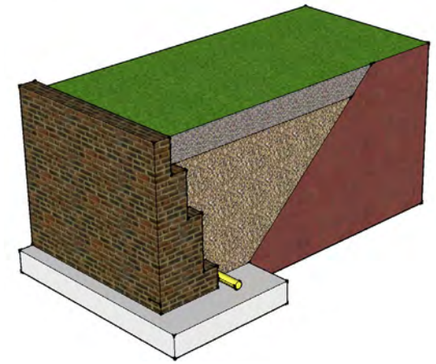
Masonry retaining walls are ideal for gardens and housing projects.

A traditional gravity masonry retaining wall uses the mass of the brickwork/masonry to retain the earth behind it and resist overturning and slip forces.

A masonry retaining wall can be built using a number of materials, including brick, concrete blocks, and stone.

Most masonry retaining walls fail because they have not been designed correctly.

Victorian railway engineers used this type of wall construction when they built large retaining walls for the railways; you can still see them today.



2.1m high brick built retaining wall. The wall at the base is much wider than the top to give the wall the mass required to stop overturning.

Design

- The example in our design table uses class A engineering bricks that work well.
- The mass or weight of the bricks, blocks or stone will determine the size of the wall required.

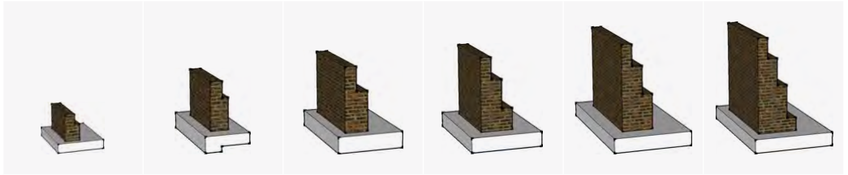
Hydrostatic pressure

- The back of the wall needs to be filled with free draining fill such as gravel or similar material.
- It is essential to allow any water at the back of the retaining wall to flow away to stop any hydrostatic pressure built up. Fitting a land drain at the back of the wall or forming weep holes through the wall are two solutions to remove any excess water.
- A build-up of water behind the wall causes hydrostatic pressure that can cause the wall to fail.

Masonry garden wall finished in stone.

Masonry design guide

Height (m)	0.6	0.9	1.2	1.5	1.8	2.1
Brick type	Class A	Class A	Class A	Class A	Class A	Class A
Step width (mm)	112	112	215	215	215	215
Base width (mm)	1050	1050	1250	1500	1700	1800
Base depth (mm)	200	200	300	300	300	300
Base top steel	None	None	A393	A393	B785	B785
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Masonry budget table

The table below shows budget rates for a masonry retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	0.6	0.9	1.2	1.5	1.8	2.1
Labour (£)	155	155	155	175	175	175
Plant (£)	145	145	150	150	150	150
Materials (£)	160	160	165	180	190	200
Supply and install (£)	**460**	**460**	**470**	**505**	**515**	**525**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR	1.8m × 100m × £175 = **£31,500**
PLANT	1.8m × 100m × £150 = **£27,000**
MATERIALS	1.8m × 100m × £190 = **£34,200**
SUPPLY & INSTALL	1.8m × 100m × £515 = **£92,700**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Gabion basket retaining wall

Stones to the front of the basket can be selected and placed to provide a neat finish.

Gabion basket retaining walls are easily built by a local contractor and DIY. They are very labour intensive when the stone is to be packed by hand to form a good front face.

MAKE ENQUIRY

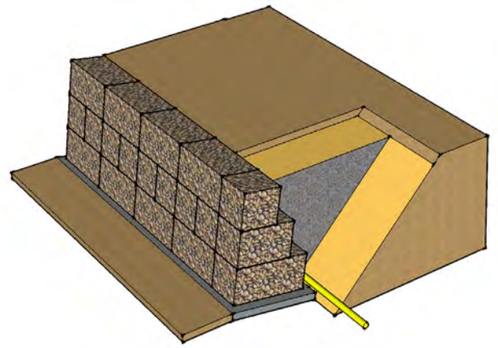
Gabion basket introduction

Gabion basket retaining walls are ideal for gardens and are used in highway, rail construction, river protection and landscaping projects.

A gabion basket gravity wall consists of a steel basket made from wire, then filled with stone. The basket holds the stone in position, and the weight of the stone gives the wall mass that resists the forces of the retained earth.

The life expectancy is determined by the quality and thickness of the steel wire

Gabion basket walls are thicker at the base and taper off as the wall increases. This is because more mass is required at the base of the wall in the design.



3m high gabion basket retaining wall.

Gabion basket

- The selection of the gabion basket sizes will depend upon the design of the wall. A number of block sizes may be used to achieve the most effective design.
- Standard gabion basket sizes are:

  1.5m x 1m x 1m
  1m x 1m x 2m
  1m x 1m x 1m
  0.5m x 0.5m x 2m
  0.5m x 0.5m x 1m

Gabion wire

- The wire to make the gabion baskets are either 3mm, 4mm or 5mm gauge. The wire is triple zinc coated, plastic and zinc coated or made using stainless steel for long life.
- The selection of the wire thickness and type will depend on the design life and location of the wall. For example, a coastal location will require a heavy gauge of wire.
- Gabion infill stone to be angular and placed flat to minimise voids and provide a dense, stable mass.

Stone finished face.

Basket construction.

Gabion basket design guide

Height (m)	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Wire type	4mm Galfan	4mm Galfan	4mm Galfan	4mm Galfan	4mm Galfan	4mm Galfan	4mm Galfan
Stone type	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Base width (mm)	1300	1300	1800	1800	2400	2900	2400
Base depth (mm)	150	150	150	150	200	200	200
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5

Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Gabion basket budget table

The table below shows budget rates for a gabion basket retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Labour (£)	90	80	75	75	80	85	90
Plant (£)	90	65	60	85	85	80	75
Materials (£)	190	165	170	175	210	220	250
Supply and install (£)	**370**	**310**	**305**	**335**	**375**	**385**	**415**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR	2m × 100 × £75 = **£15,000**
PLANT	2m × 100 × £60 = **£12,000**
MATERIALS	2m × 100 × £170 = **£34,000**
SUPPLY & INSTALL	2m × 100 × £305 = **£61,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Inclined concrete block retaining wall

Inclined concrete blocks can be made more attractive using a textured finish or a textured and coloured finish to look like stone, slate or timber.

Concrete inclined block walls are straightforward and quickly built by a local contractor. Lifting equipment and good access are needed as the block weighs over 1.5 ton.

MAKE ENQUIRY

Inclined concrete block introduction

Inclined concrete block retaining walls are ideal when the budget is tight, and the retaining wall is for practical use.

The inclined concrete block retaining wall is similar to a gabion basket retaining wall design, except the volume is smaller as concrete has a higher mass than stone-filled gabion baskets.

An inclined block retaining wall is an economical solution as it uses the inclined blocks and gravity to add resistance to the forces trying to push the wall over.

Overall inclined concrete block retaining walls are one of the most economical solutions.

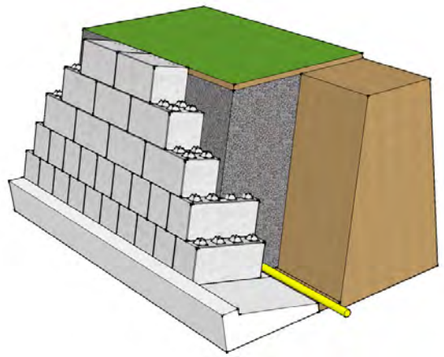
Blocks

- **600mm blocks:** The block is 600mm wide x 600mm high x 1800mm, 1500mm, 1200mm, 900mm or 600mm long. The walls are built to a modular of 600mm. Each standard block builds 1.08m² of the wall.

  600mm blocks are used for wall heights from 1.8m to 4.8m as you can see in the table on the next page.

- **800mm blocks:** The block is 800mm wide x 800mm high x 1600mm or 800mm long. Each standard block builds 1.28m² of the wall.

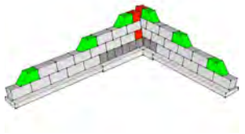
  800mm blocks are used for wall heights from 5.6m to 6.4m as you can see in the table on the next page.



4m high inclined concrete block retaining wall.

Case story

The example below is a inclined retaining wall designed for Rampsbeck Hotel in the Lake District. The solution was more economical than other types, and the contractor wanted to build fast as they were traveling from Devon.

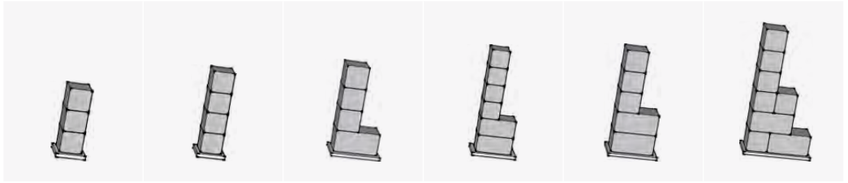


3D sketch of wall.

Inclined concrete block wall.

Inclined concrete block design guide

Height (m)	1.8	2.4	3.2	3.6	4.0	4.8
Block size (mm)	600	600	800	600	800	800
Base width (mm)	1000	1000	2000	1800	2000	2800
Base depth (mm)	100-275	100-275	100-350	100-400	100-450	100-600
Base rebar	A393	A393	A393	A393	A393	A393
Wall incline	10^0	10^0	10^0	10^0	10^0	10^0
Surcharge	5kn/m²	5kn/m²	5kn/m²	5kn/m²	5kn/m²	5kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Inclined concrete block budget table

The table below shows budget rates for a inclined concrete block retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.8	2.4	3.2	3.6	4.0	4.8
Labour (£)	35	35	40	40	40	40
Plant (£)	45	40	40	40	40	45
Materials (£)	185	175	290	250	310	375
Supply and install (£)	**265**	**250**	**370**	**330**	**390**	**460**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2.4m high × 100m long

LABOUR	2.4m × 100m × £35 = **£8,400**
PLANT	2.4m × 100m × £40 = **£9,600**
MATERIALS	2.4m × 100m × £175 = **£42,000**
SUPPLY & INSTALL	2.4m × 100m × £250 = **£60,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Concrete criblock retaining wall

Concrete criblock retaining walls can look quite attractive. Grow bags can be built into the front of the cribs to grow plants or grasses.

Concrete criblock walls are typically built by a specialist contractor. A local contractor with some training can also construct them.

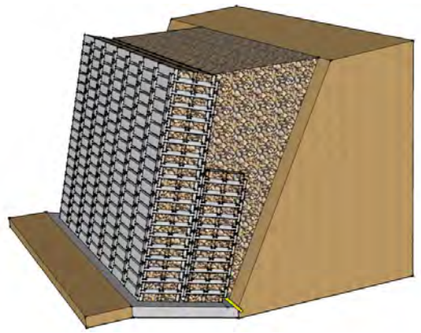
MAKE ENQUIRY

Concrete criblock introduction

Concrete criblock retaining walls are ideal for high retaining structures over 3m high. They are used in highways, rail and housing projects.

A criblock retaining wall is built using precast concrete elements. They are made into cribs (frames) 1.2m wide x 0.6m, 0.9m, 1.2m and 1.5m deep. Each crib is approximately 200mm high and filled with stone.

The design principle is gravity, and the design is similar to a gabion basket, except the precast concrete elements add a little more mass.



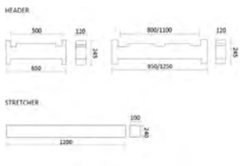
6m high concrete criblock retaining wall with double cribs at the bottom.

Precast elements

- The precast elements to make the cribs are called stretchers and headers. Stretchers run the length of the wall. Headers run from the front to the back on the wall.
- The stretchers and headers lock into each other using notches built into the headers.
- Stretchers are 1.2m long whereas headers are 0.65m, 0.95m, and 1.25m long.

Design

- Free draining fill is required to backfill behind the criblock structure with a land drain at the bottom to reduce any risk from hydrostatic pressure.
- The higher the wall design, the wider the frames need to be at the bottom of the wall.
- Criblock walls are typically inclined to allow gravity to reduce the wall's mass and keep the design economical.
- The precast concrete stretcher and header details are shown below.

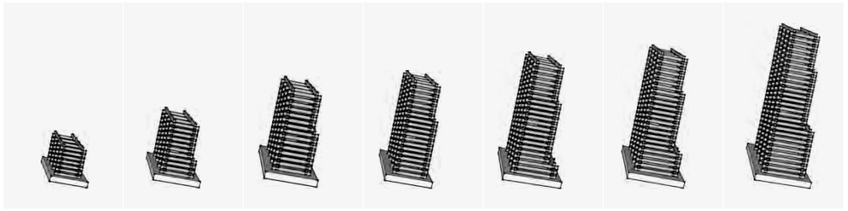


Header and stretch dimensions.

Concrete cribs before stone fill.

Concrete criblock design guide

Height (m)	1.2	1.8	2.4	3.0	3.6	4.0	5.0
Crib type	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete
Stone type	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Base width (mm)	800	800	1400	1600	1800	1900	2000
Base depth (mm)	200	300	400	400	500	500	500
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Concrete criblock budget table

The table below shows budget rates for a concrete criblock retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.2	1.8	2.4	3.0	3.6	4.0	5.0
Labour (£)	125	125	125	125	125	125	125
Plant (£)	120	110	110	105	105	105	105
Materials (£)	250	235	345	240	350	350	370
Supply and install (£)	**495**	**470**	**580**	**470**	**580**	**580**	**600**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2.4m high × 100m long

LABOUR 2.4m × 100m × £125 = **£30,000**

PLANT 2.4m × 100m × £110 = **£26,400**

MATERIALS 2.4m × 100m × £345 = **£82,800**

SUPPLY & INSTALL 2.4m × 100m × £580 = **£139,200**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Timber criblock retaining wall

Timber criblock retaining walls can look quite attractive.

Timber criblock is more economical than concrete criblock but has a shorter life span.

Timber criblock walls are simple to build with training or can be built using a specialist contractor.

MAKE ENQUIRY

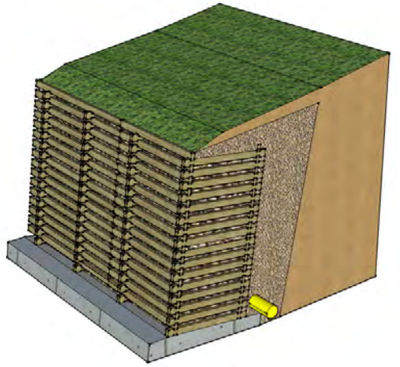
Timber criblock introduction

Timber criblock retaining walls are ideal for high retaining structures over 3m high. They are used in housing projects mainly.

A timber criblock retaining wall is built using timber and stone. The timber is made into cribs (frames) 1.2m wide x 0.6m, 0.9m, 1.2m and 1.5m deep. Each crib is approximately 200mm high and are filled with stone.

The design principle is gravity, and the design is similar to a gabion basket.

Timber criblock has a short life span. Although the timber is treated, we have seen failure within fifteen years.



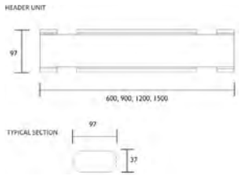
2.0m high timber criblock wall.

Timber units

- The timber units to make the cribs are called stretchers and headers. Stretchers run the length of the wall. Headers run from the front to the back on the wall. The stretchers and headers lock into each other using notches built into the headers.
- Stretchers are 2.4m long whereas headers are 0.6, 0.9, 1.2 and 1.5m long.

Design

- Free draining fill is required to backfill behind the criblock structure with a land drain at the bottom to reduce any risk from hydrostatic pressure.
- The higher the wall design, the wider the frames need to be at the bottom of the wall.
- Criblock walls are typically inclined to allow gravity to reduce the wall's mass and keep the design economical.

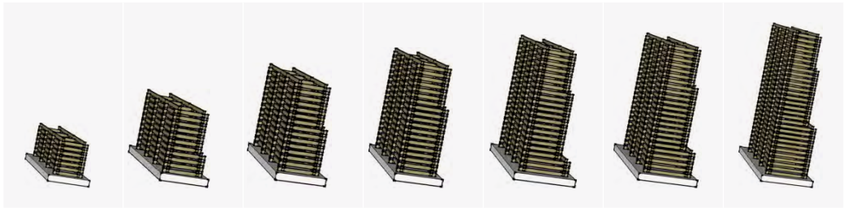


Header and stretch dimensions.

Timber criblock wall.

Timber criblock design guide

Height (m)	1.2	1.8	2.4	3.0	3.6	4.0	5.0
Crib type	Timber	Timber	Timber	Timber	Timber	Timber	Timber
Stone type	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Base width (mm)	800	800	1400	1600	1800	1900	2000
Base depth (mm)	200	300	400	400	500	500	500
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Timber criblock budget table

The table below shows budget rates for a timber criblock retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.2	1.8	2.4	3.0	3.6	4.0	5.0
Labour (£)	110	110	110	110	110	110	110
Plant (£)	85	70	60	60	60	60	60
Materials (£)	200	200	200	210	215	215	225
Supply and install (£)	**395**	**380**	**370**	**380**	**385**	**385**	**395**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2.4m high × 100m long

LABOUR	2.4m × 100m × £110 = **£26,400**
PLANT	2.4m × 100m × £60 = **£14,400**
MATERIALS	2.4m × 100m × £200 = **£48,000**
SUPPLY & INSTALL	2.4m × 100m × £370 = **£88,800**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Keystone block retaining wall

Keystone retaining walls are built using artificial stone blocks made from concrete. The blocks come in several colours and look attractive for gardens.

Keystone retaining walls are built dry and can be constructed by a local contractor or DIY with some training.

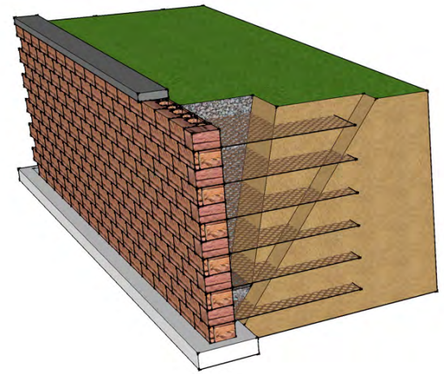
MAKE ENQUIRY

Keystone block introduction

Keystone retaining walls are ideal for gardens and landscaping projects in the housing and commercial market sectors.

Keystone blocks are 455mm long x 200mm high x 300mm deep and made by compressing a concrete mix into a mould. The blocks come in several colours, including Hamstone, Bathstone, Terracotta, Black, and Russet.

The walls can be built vertical or inclined. Walls under 0.75m can be built just using the blocks. Walls over 0.75m to 2m can be built using the blocks with a concrete backfill. Walls 2m to 10m require a soil reinforcement design.



3m high keystone wall built using soil reinforcement.

Gravity design

- The foundation is constructed with a kicker that the first block sits against. The kicker stops the blocks from slipping on the foundation.
- The soil in front of the foundation and the ground friction prevents the foundation from slipping. The mass and geometry of the wall resist overturning.

Reinforced soil design

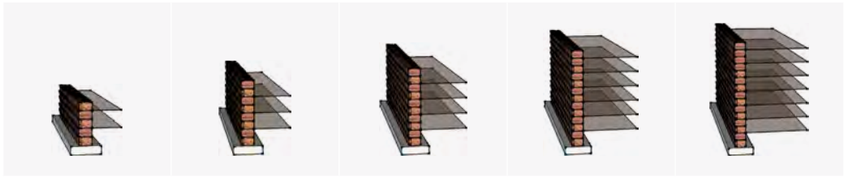
- The foundation is the same as the gravity design to prevent slippage.
- Soil is excavated from behind the wall to a width defined by design.
- A geogrid is placed under every other block course. The geogrid strength and length will be designed using the soil type and wall height.
- The geogrid stops the soil from slipping and acts as a single mass. The soil mass and geometry prevent the wall from overturning.

Keystone wall in construction.

Keystone block with geogrid.

Keystone block design guide

Height (m)	1.0	1.5	2.0	2.5	3.0
Block height (mm)	200	200	200	200	200
Geogrid length (mm)	1000	1200	1500	1800	2100
Base width (mm)	900	900	900	900	900
Base depth (mm)	150	150	150	150	150
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Keystone block budget table

The table below shows budget rates for a keystone retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.0	1.5	2.0	2.5	3.0
Labour (£)	70	60	55	50	45
Plant (£)	65	50	50	60	60
Materials (£)	175	160	150	140	135
Supply and install (£)	**310**	**270**	**255**	**250**	**240**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100m × £55 = **£11,000**

PLANT 2m × 100m × £50 = **£10,000**

MATERIALS 2m × 100m × £150 = **£30,000**

SUPPLY & INSTALL 2m × 100m × £255 = **£51,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Porcupine block retaining wall

Porcupine retaining walls are built using artificial stone blocks made from concrete. The blocks come in several colours and look attractive for gardens.

Porcupine retaining walls are built dry and can be constructed by a local contractor or DIY with some training.

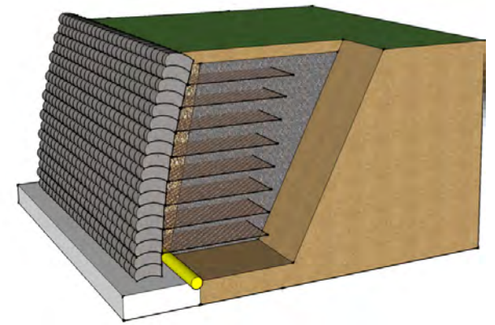
MAKE ENQUIRY

Porcupine block introduction

Porcupine retaining walls are ideal for gardens and landscaping projects in the housing and commercial market sectors.

Porcupine blocks are 200mm long x 150mm high x 330mm deep and made by compressing a concrete mix into a mould. The blocks come in several colours, including Standard, Buff, Charcoal, and Red.

The walls can be built vertical or inclined. Walls under 0.75m can be built just using the blocks. Walls over 0.75m to 2m can be built using the blocks with a concrete backfill. Walls 2m to 10m require a soil reinforcement design.



3m high Chevloc retaining wall with soil reinforcement.

Gravity design

- The foundation is constructed with a kicker that the first block sits against. The kicker stops the blocks from slipping on the foundation.
- The soil in front of the foundation and the ground friction prevents the foundation from slipping. The mass and geometry of the wall resist overturning.

Reinforced soil design

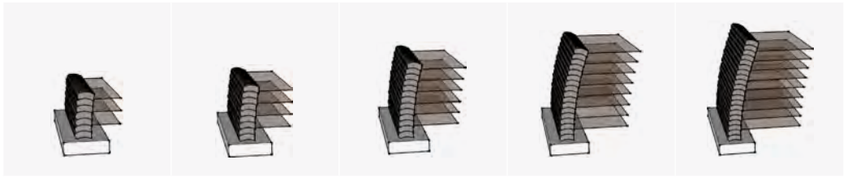
- The foundation is the same as the gravity design to prevent slippage.
- Soil is excavated from behind the wall to a width defined by design.
- A geogrid is placed under every other block course. The geogrid strength and length will be designed using the soil type and wall height.
- The geogrid stops the soil from slipping and acts as a single mass. The soil mass and geometry prevent the wall from overturning.

Porcupine block.

Porcupine garden wall.

Porcupine block design guide

Height (m)	1.0	1.5	2.0	2.5	3.0
Block height (mm)	150	150	150	150	150
Geogrid length (mm)	1000	1200	1500	1800	2100
Base width (mm)	900	900	900	900	900
Base depth (mm)	150	150	150	150	150
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Porcupine block budget table

The table below shows budget rates for a porcupine retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.0	1.5	2.0	2.5	3.0
Labour (£)	85	70	60	55	50
Plant (£)	70	50	65	60	60
Materials (£)	280	250	235	225	225
Supply and install (£)	**435**	**370**	**360**	**340**	**335**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100m × £60 = **£12,000**

PLANT 2m × 100m × £65 = **£13,000**

MATERIALS 2m × 100m × £235 = **£47,000**

SUPPLY & INSTALL 2m × 100m × £360 = **£72,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Chevloc block retaining wall

Chevloc retaining walls are built using artificial stone blocks made from concrete. The blocks come in several colours and look attractive for gardens.

Chevloc retaining walls are built dry and can be constructed by a local contractor or DIY with some training.

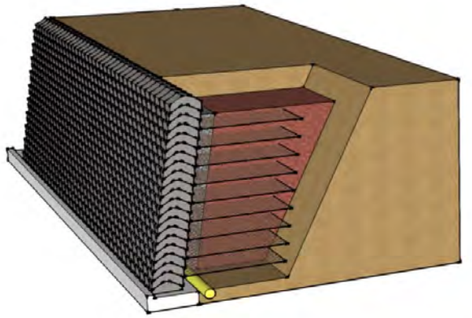
MAKE ENQUIRY

Chevloc block introduction

Chevloc retaining walls are ideal for gardens and landscaping projects in the housing and commercial market sectors.

Chevloc blocks are 250mm long x 150mm high x 440mm deep and made by compressing a concrete mix into a mould. The blocks come in several colours, including Standard, Buff, Charcoal, and Red.

The walls can be built vertical or inclined. Walls under 0.75m can be built just using the blocks. Walls over 0.75m to 2m can be built using the blocks with a concrete backfill. Walls 2m to 10m require a soil reinforcement design.



3m high Chevloc wall with soil reinforcement.

Gravity design

- The foundation is constructed with a kicker that the first block sits against. The kicker stops the blocks from slipping on the foundation.
- The soil in front of the foundation and the ground friction prevents the foundation from slipping. The mass and geometry of the wall resist overturning.

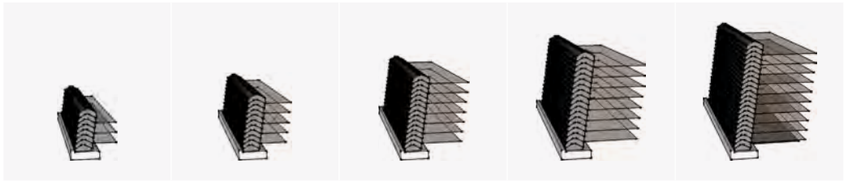
Reinforced soil design

- The foundation is the same as the gravity design to prevent slippage.
- Soil is excavated from behind the wall to a width defined by design.
- A geogrid is placed under every other block course. The geogrid strength and length will be designed using the soil type and wall height.
- The geogrid stops the soil from slipping and acts as a single mass. The soil mass and geometry prevent the wall from overturning.

Stone finished face.

Chevloc block design guide

Height (m)	1.0	1.5	2.0	2.5	3.0
Block height (mm)	150	150	150	150	150
Geogrid length (mm)	1000	1200	1500	1800	2100
Base width (mm)	900	900	900	900	900
Base depth (mm)	150	150	150	150	150
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Chevloc block budget table

The table below shows budget rates for a chevloc retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.0	1.5	2.0	2.5	3.0
Labour (£)	90	70	60	55	50
Plant (£)	70	55	65	75	65
Materials (£)	325	300	280	270	265
Supply and install (£)	**485**	**425**	**405**	**400**	**380**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100 × £60 = **£12,000**

PLANT 2m × 100 × £65 = **£13,000**

MATERIALS 2m × 100 × £280 = **£56,000**

SUPPLY & INSTALL 2m × 100 × £405 = **£81,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Geoweb® reinforced retaining wall

Geoweb® retaining walls are grass and plant covered and blend into the environment.

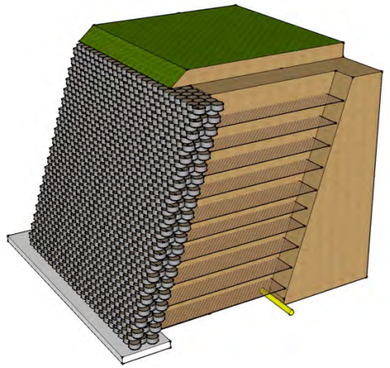
The Geoweb® mat is very light, and the wall can be built using a local contractor and even DIY with some basic training.

MAKE ENQUIRY

Geoweb® reinforced wall introduction

Geoweb® retaining walls are ideal when the budget is low and can be built in gardens, landscaping, and large civil engineering projects.

A Geoweb® retaining wall is an open cell plastic mat filled with earth to create a gravity retaining wall. Geoweb® walls can be built using a gravity design to 1m. After 1m, the design changes to a soil-reinforced design.



» 6m high Geoweb® retaining wall using soil reinforcement.

Vegetation solution

- The system creates an environment where plants and grasses grow within the retaining wall suface.
- The vegetation system helps collect stormwater runoff. Soil-filled front cells allow grasses to grow and establish, creating a green wall.

Geoweb® design

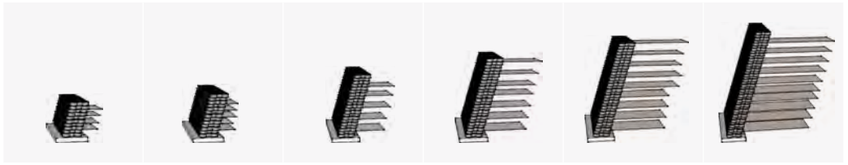
- Geoweb® can belaid of well consolidated ground.
- Soil is excavated from behind the wall to a width defined by design.
- A geogrid is placed under every 3/4 course. The geogrid strength and length will be designed using the soil type and wall height.
- The geogrid stops the soil from slipping and acts as a single mass. The soil mass and geometry prevent the wall from overturning.

» Geoweb® wall before seeding.

» Geoweb® wall after seeding.

Geoweb® reinforced wall design guide

Height (m)	1.5	2.0	3.0	4.0	5.0	6.0
Geoweb® depth (mm)	900	900	900	900	900	900
Geoweb® length (mm)	1200	1500	2100	2800	3500	4200
Base width (mm)	1500	1500	1500	1500	1500	1500
Base depth (mm)	150	150	150	150	150	150
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Geoweb® reinforced wall budget table

The table below shows budget rates for a Geoweb® retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	1.5	2.0	3.0	4.0	5.0	6.0
Labour (£)	70	75	80	90	95	110
Plant (£)	20	25	35	45	50	60
Materials (£)	175	175	170	170	170	170
Supply and install (£)	**265**	**275**	**285**	**305**	**315**	**340**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR	2m × 100 x £75 = **£15,000**
PLANT	2m × 100 x £25 = **£5,000**
MATERIALS	2m × 100 x £175 = **£35,000**
SUPPLY & INSTALL	2m × 100 x £275 = **£55,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Aquacast retaining wall

Aquacast is a W-shaped rock faced precast concrete block orginally designed for flood defence walls.

The wall is built dry and is easy to build using a local contractor and for small projects DIY.

MAKE ENQUIRY

River protection

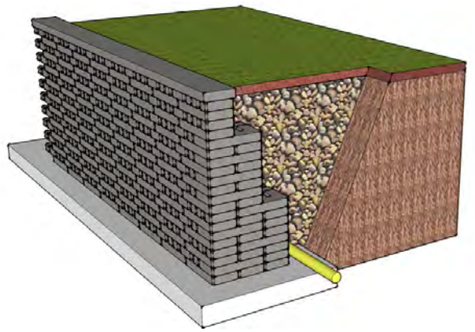
Aquacast introduction

Aquacast is ideal for river protection projects as the blocks can be placed by hand in challenging locations.

The W shaped Aquacast is 800mm long, 400mm wide and 125mm deep.

Each block weighs 85kg and can be lifted using a small lifting grab. They are made from fibre-reinforced concrete to give high strength and durability.

The blocks are constructed using a fibre-reinforced concrete cast in a W shape. The design gives the Aquacast block lots of flexibility.



2.5m high Aquacast retaining wall structure.

Gravity design

- The foundation is constructed with a kicker that the first block sits against. The kicker stops the blocks from slipping on the foundation.
- The soil in front of the foundation and the ground friction prevents the foundation from slipping. The mass and geometry of the wall resist overturning.

Layout option

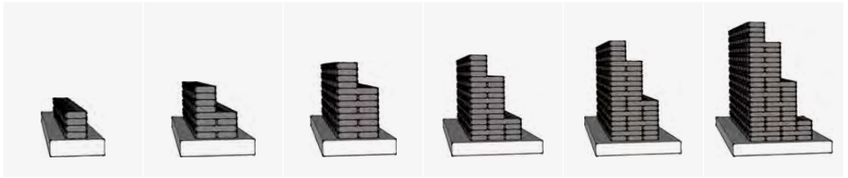
- The slot design within the block provides structural holes for a piling option. Aquacast blocks are useful for rapid construction, including landslides and support walls for subsided road embankments.
- The blocks are designed to be placed on top of each other and bonded or opposite each other forming a pocket for reinforcement.
- The block can be laid at ninety degrees from each other to form a zig-zag pattern. Watch the video to see how they can be put together.

Aquacast outfall wall.

Aquacast zig zag formation.

Aquacast design guide

Height (m)	0.5	1.0	1.5	2.0	2.5	3.0
Block depth (mm)	125	125	125	125	125	125
Wall width (mm)	400	800	800	1200	1200	1600
Base width (mm)	1000	1400	1700	2100	2100	2500
Base depth (mm)	300	300	300	300	300	300
Base top steel	A393	A393	A393	A393	A393	A393
Base bottom steel	A393	A393	A393	A393	A393	A393
Surcharge	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²	10kn/m²
Factor of safety	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5	M=1.5



Indicative designs based upon a base material with allowable bearing pressure of **>200kPa**.

Retained material is assumed to be well graded, granular backfill with the back of wall drainage or weep holes to relieve hydrostatic pressure.

Please note All indicative information presented in this table is based upon assumed loading and ground conditions and will be subject to change following detailed, site-specific design.

Aquacast budget table

The table below shows budget rates for a Aquacast retaining wall 50m in length. The scale of the project will effect the rates.

Some retaining wall types can be built on a do-it-yourself basis whilst others need specialist contractors and equipment. The rates in the table below are based on a contractor build and show cost estimates per m².

Height (m)	0.5	1.0	1.5	2.0	2.5	3.0
Labour (£)	120	100	90	100	105	115
Plant (£)	85	60	50	50	50	55
Materials (£)	260	300	285	325	350	400
Supply and install (£)	**465**	**460**	**425**	**475**	**505**	**570**

Rates include

- Foundation
- Supply and installation of retaining wall
- Delivery to site

Rates exclude

- Earth works to form working space and back fill of wall on completion
- Excavating in hard ground
- Drain behind the wall
- Design
- VAT

Example budget calculation

To work out a price, select the **height of wall** you require and run down to the **total rate**.

2m high × 100m long

LABOUR 2m × 100m × £100 = **£20,000**

PLANT 2m × 100m × £50 = **£10,000**

MATERIALS 2m × 100m × £325 = **£65,000**

SUPPLY & INSTALL 2m × 100m × £475 = **£95,000**

The pricing above is based upon an estimation. To firm up your budget, please get in touch.

MAKE ENQUIRY

Please note The rates will change for the scale of the project, location and any site constraints. Only use the rates as a guide to build a project budget and to compare with other retaining wall types.

Gallery

King post with textured concrete panel retaining wall

Stepoc basement retaining wall

Porcupine garden retaining wall

Keystone retaining wall

Gallery continued

Chevloc retaining wall

Stone filled gabion basket retaining wall

Geoweb® reinforced wall

Aqacast highway and river protection retaining wall

Gallery continued

Brick cladded stepoc hollow block retaining wall

Keystone garden retaining wall

Concrete criblock retaining wall

Stone clad masonry garden retaining wall

Gallery continued

Timber criblock retaining wall

Gravity concrete block sea defense wall

Concrete hollow block retaining wall

Brickwork masonry retaining wall

Glossary of terms

Base width	The design width of the foundation base.
Base depth	The design depth of the foundation base
Bearing capacity	The weight of the wall and earth is supported by the base. The ground bearing capacity needs to be checked to ensure any settlement is within limits.
Height of wall	The effective height of the retaining wall.
Overturning	The material being retained creates a force (moment) that causes toppling of the wall. The weight of a gravity retaining wall resists this moment.
Pocket rebar	The vertical bar diameter and number of bars within each pocket.
Rebar toe	The bar diameter and spacing of the base toe reinforcement.
Rebar heel	The bar diameter and spacing of the base heel reinforcement.
Sliding	The material being retained creates a horizontal force that can cause the retaining wall to slide. This is resisted by the friction between the wall and earth beneath and the embedment of the wall.
Stability	The earth around the wall requires adequate strength to avoid an overall slip failure.
Surcharge	The vertical load expressed as a uniformly distributed area load at the top of the wall.
Wall incline	The angle of the inclined wall. We can design for various wall inclines that may result in different block requirements.

Please use the glossary of terms above to help you read the design tables if you are not sure about a term.

ASK QUESTION

Let us help

Our **design service** allows you to utilise our experience and knowledge in order to select the best retaining wall solution for your project whereas our **supply/build services** are there to help support you once you have an approved design.

When making any enquiry remember to leave key information about:

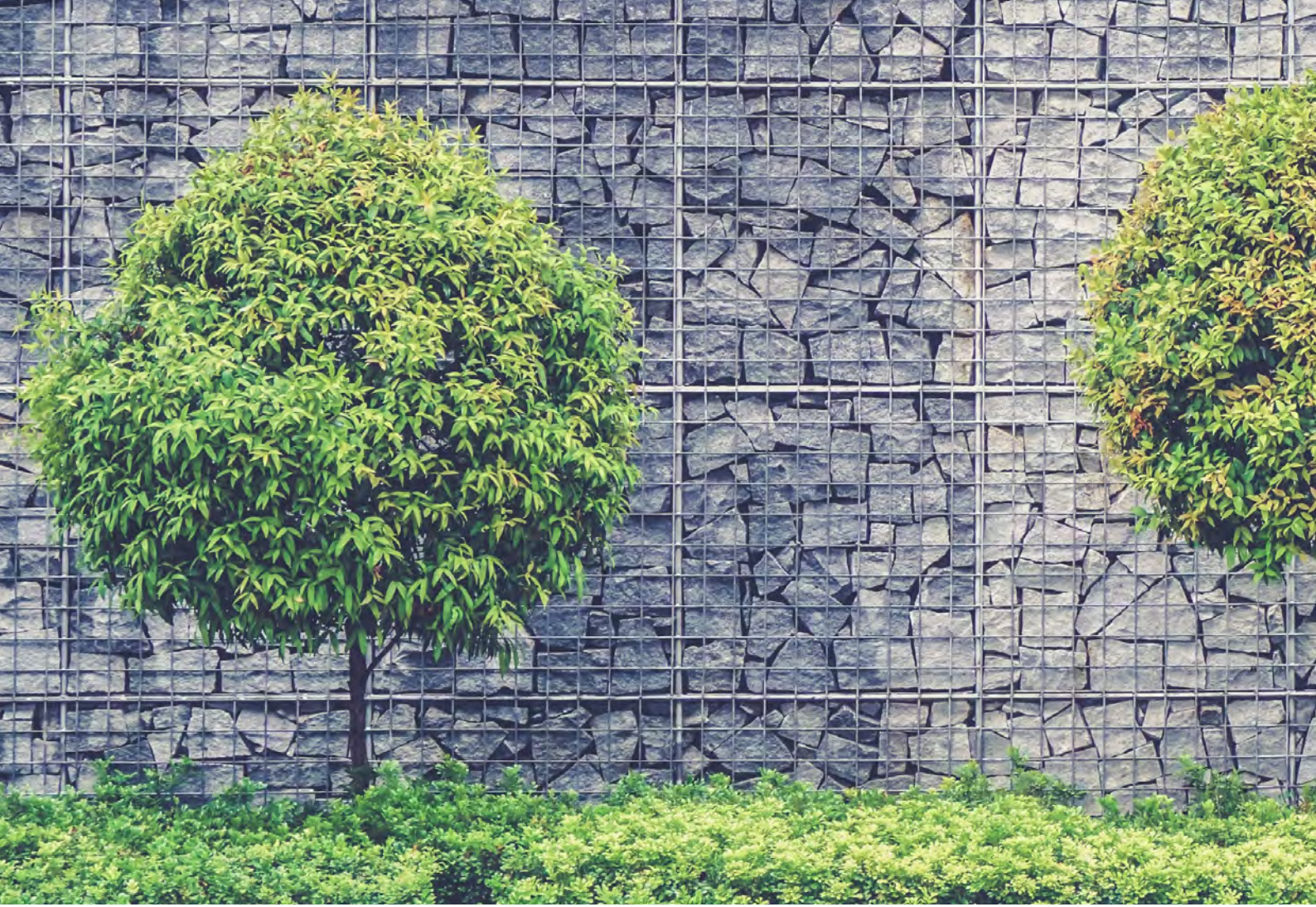
- Your project postcode
- The wall type you would like to build
- Length / height of the wall

In addition, it would be great if you had:

- A soil investigation report
- Drawing plans or photos we can look at
- Any specific loads on the top of the wall
- Details of what the higher ground going to be used for

Get in touch today with us today by email on **support@retainingwallsolutions.co.uk** or by using the button below.

MAKE ENQUIRY



RetainingWall Solutions

Get in touch
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