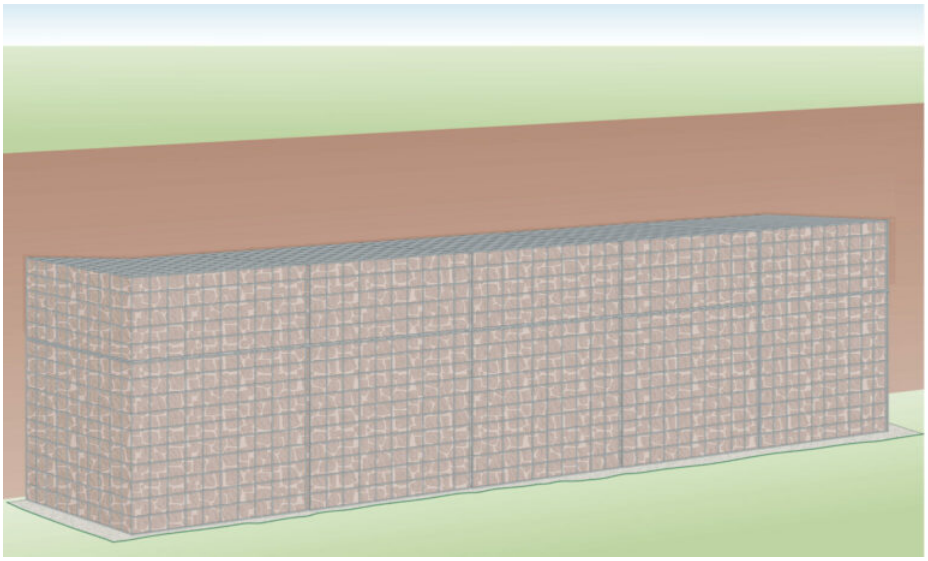
How to Build a Retaining or Freestanding Gabion Wall

Last updated 4 November 2026

Below you will find a step-by-step guide on how to build a gabion wall, including both retaining and freestanding types.

Feel free to utilise the following information as a reference. If you have any uncertainties regarding the installation of your wall, we advise reaching out to a Civil Engineer for guidance.

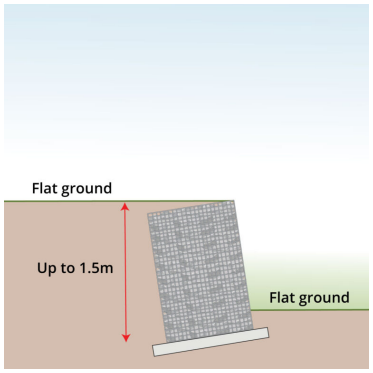
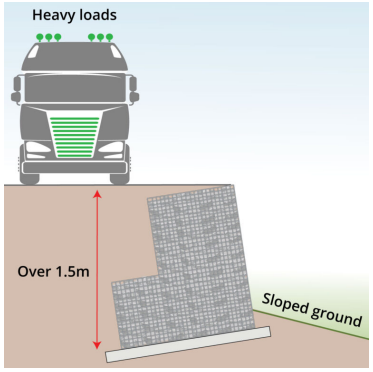


Wall Design

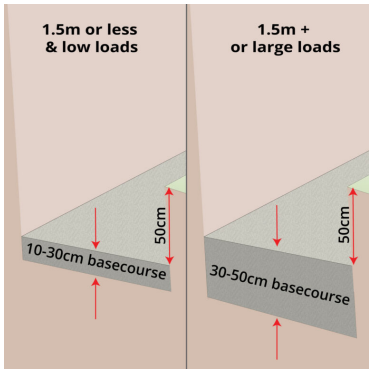
These rules apply to all our gabion projects – walls, fences, steps, pillars and seating.

- Installation Guidelines
- Retaining Wall Design
- Freestanding Wall Design

HEIGHT & LOADS

1.5m or Less & Low Loads X – Engineer required 	A retaining wall **does not** require an engineer's calculation when it meets the following criteria • It is 1.5m tall or less • It is retaining flat earth • It is not retaining heavy loads such as roads or buildings • The ground does not have a lot of groundwater
1.5m+ or Large Loads Y – Engineer required 	A retaining wall **does** require an engineer's calculation when it meets the following criteria • It is taller than 1.5m • It is retaining sloped earth • It is retaining heavy loads such as roads or buildings • The ground has a lot of groundwater
FOUNDATIONS	

Basecourse



1m or less & low loads

- Can be placed straight onto firm, level ground with no heavy loads behind it. A compacted base gives the best long-term result.
- Our founder John's garden bench has sat directly on the soil for a few years without moving Show Image
- A 45cm high gabion bench built by our team, standing directly on a lawn (photographed January 2024) Show Image
- Customer project: benches built by The Inverclyde Shed, placed directly on the ground Show Image

1.5m or less & low loads show image

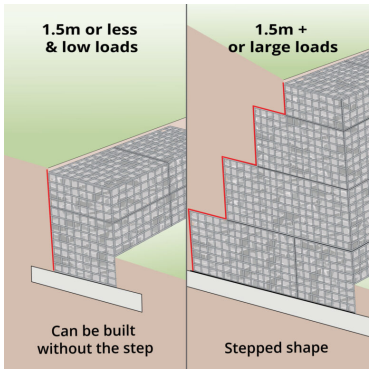
- Remove softer top soils until you get to firmer subsoil
- Replace with 10-30 cm of type 1 basecourse
- Compact the basecourse

1.5m+ or large loads Show Image

- Foundations should be 500mm below ground to prevent slipping.
- Add a 30-50cm layer of type 1 basecourse
- Compact the basecourse using a plate compactor

STABILITY

Shape



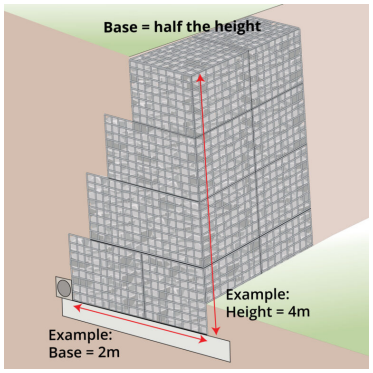
1.5m or less & low loads Show Image

- Can be built without the step, as long as the ground is flat and it is not retaining a large amount of weight, such as a road or buildings

1.5m+ or large loads Show Image

- Usually requires a stepped shape. The depth of the bottom row is half of the height.
- Consult a Structural Engineer if you are planning a non-stepped shape

2:1 Ratio



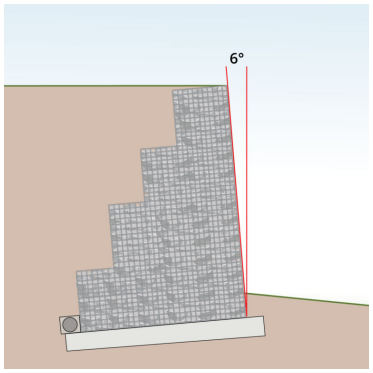
1.5m or less & low loads **Show Image**

- The height should not be more than double the size of the base; otherwise, it will not be suitable for a retaining wall.

1.5m+ or large loads **Show Image**

- If you are planning to use a 2:1 ratio and your wall is over 1.5m, you will require a Structural Engineer to check the calculations

6 Degree Slope



1.5m or less & low loads **show image**

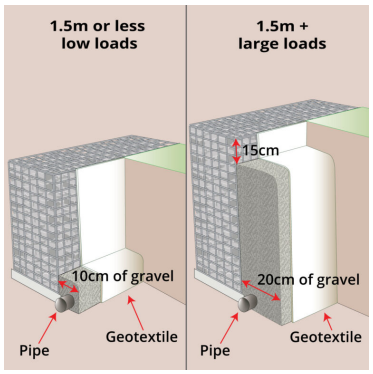
- The wall should be on a 6-degree slope leaning into the earth to improve the strength and stop slipping.

1.5m+ or large loads **Show Image**

- The wall should be on a 6-degree slope leaning into the earth to improve the strength and stop slipping.

DRAINAGE

Geotextile

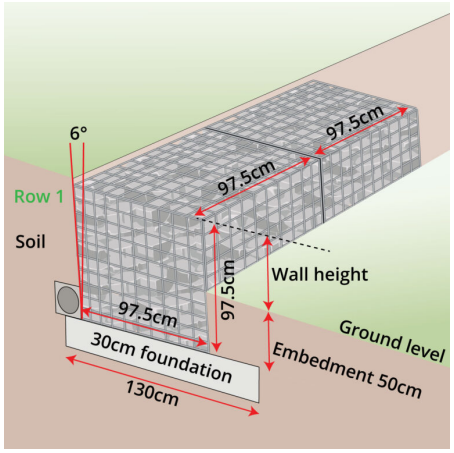
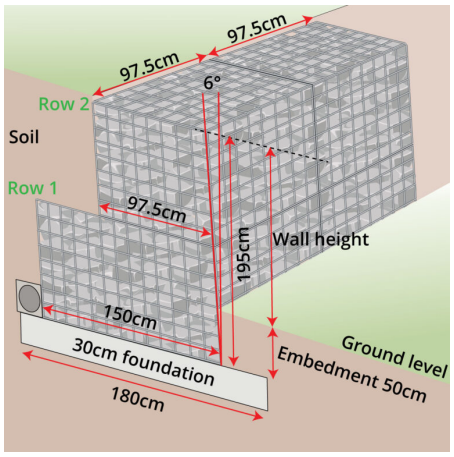


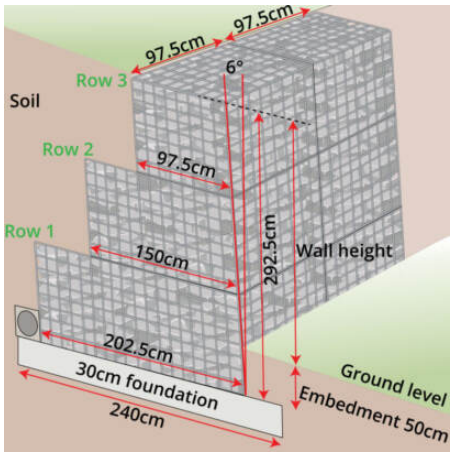
1.5m or less & low loads **show image**

- Cover the back of the cages with a geotextile or weed mat to prevent soil and earth clogging up behind.
- Install a drainage pipe, then cover it with 10cm of gravel for drainage

1.5m+ or large loads **Show Image**

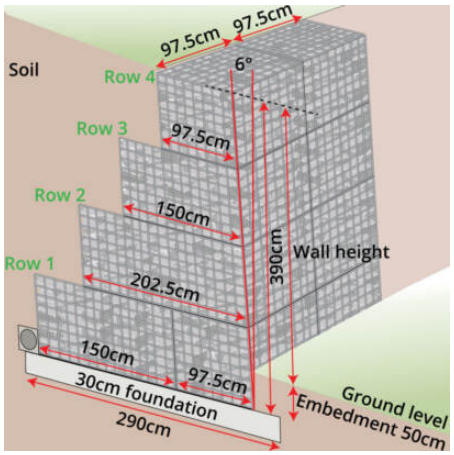
- Cover the back of the cages with a geotextile to prevent soil and earth clogging up behind.
- Install a drainage pipe, then cover the back of the wall with 20cm of gravel for drainage
- The drainage gravel should be installed within 15cm of the top

WALL HEIGHT	PRODUCTS REQUIRED
1m High Wall	
	• Use sizes 1x1x1m or 2x1x1m • All wire diameters are suitable, but we suggest 4mm+ if you would like to prevent bulging • Attach using helicoils • Save money using backfilling panels • Allow drainage using geotextile Show Image
2m High Wall	
	• Use 1x1x1m & 1.5x1x1m • All wire diameters are suitable, but we suggest 4mm+ if you would like to prevent bulging • Attach using helicoils • Save money using backfilling panels • Allow drainage using geotextile Show Image
3m High Wall	



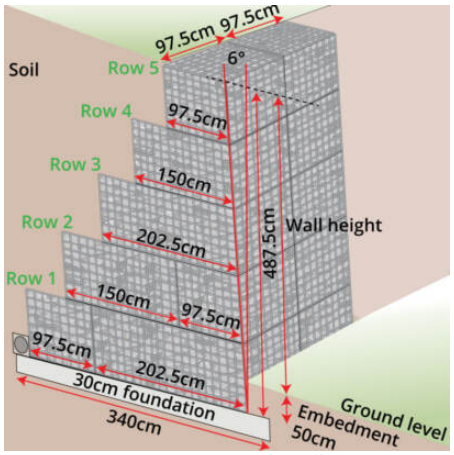
- Use 1x1x1m, 1.5x1x1 & 2x1x1m
- All wire diameters are suitable, but we suggest 4mm+ if you would like to prevent bulging
- Attach using helicoils
- Save money using backfilling panels
- Allow drainage using geotextile Show Image

4m High Wall

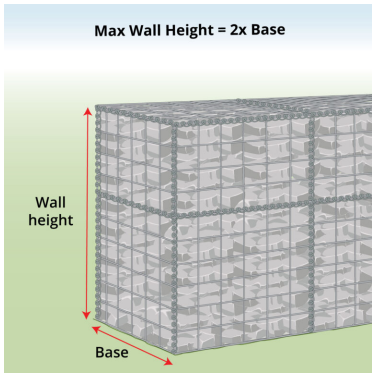
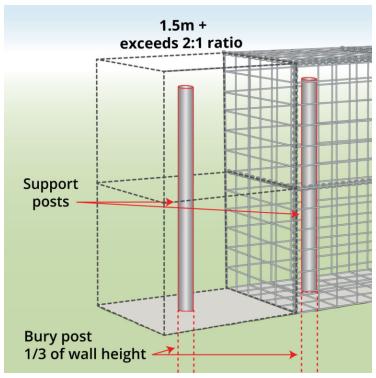


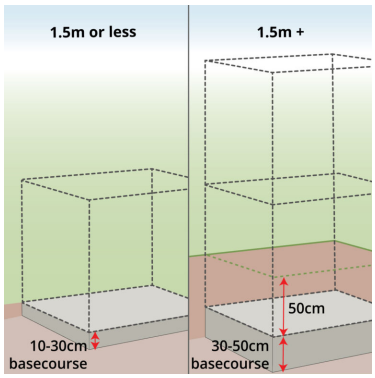
- Use 1x1x1m, 1.5x1x1 & 2x1x1m
- All wire diameters are suitable, but we suggest 4mm+ if you would like to prevent bulging
- Attach using helicoils
- Save money using backfilling panels
- Allow drainage using geotextile Show Image

5m High Wall



- Use 1x1x1m, 1.5x1x1 & 2x1x1m
- All wire diameters are suitable, but we suggest 4mm+ if you would like to prevent bulging
- Attach using helicoils
- Save money using backfilling panels
- Allow drainage using geotextile Show Image

WALL CONFIGURATION	PRODUCT REQUIREMENTS
Up to 1.5m & 2:1 Ratio	
	To ensure stability, freestanding walls should not exceed 2:1 **Customer Examples** • Example 1: H97.5cm x D97.5cm • Example 2: H1.35 x D67.5cm
Exceeds 1.5m or 2:1 Ratio	
	An internal support post is required if the wall exceeds a 2:1 ratio or 1.5m in height **How To** • The strength of the post will depend on the height and weight of the wall. For medium sized walls use the equivalent of a scaffolding post • The post should run at least two-thirds of the way up inside the gabion • The post should be sunk into the ground approx 1/3 the height of the wall • Attach the support post to the gabion with bracing wire • If your pole is hollow, you will need to plug the gap at the top to prevent water from entering. • Set the post into concrete **Customer Examples** • Example 1: H5m x D2m • Example 2: H3m x D1m • Example 3: H3m x D1m • Example 4: H2.6m x D1m
Foundation	



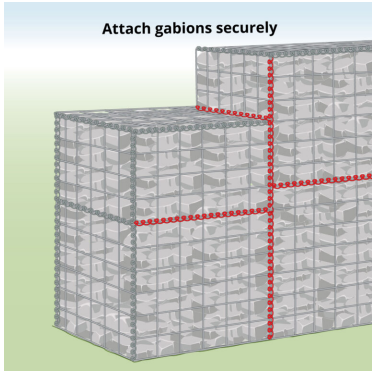
Up to 1.5m height

- Remove softer top soils until you get to firmer subsoil
- Replace with 10-30 cm of type 1 basecourse
- Compact the basecourse
- Most low-level and/or wide columns do not usually require a foundation. If your column is 1m+ or narrow you may need a concrete foundation for added stability

1.5m+ height

- Foundations should be 500mm below ground to prevent slipping.
- Add a 30-50cm layer of type 1 basecourse
- Compact the basecourse using a plate compactor

Configuration



As long as the cages are installed next to each other and they are attached securely using helicoils or lacing wire you can use different configurations

Customer Examples

- Example 1: H97.5cm x D97.5cm
- Example 2: H1.35 x D67.5cm
- Example 3: H5m x D2m
- Example 4: H3m x D1m
- Example 5: H3m x D1m
- Example 6: H2.6m x D1m

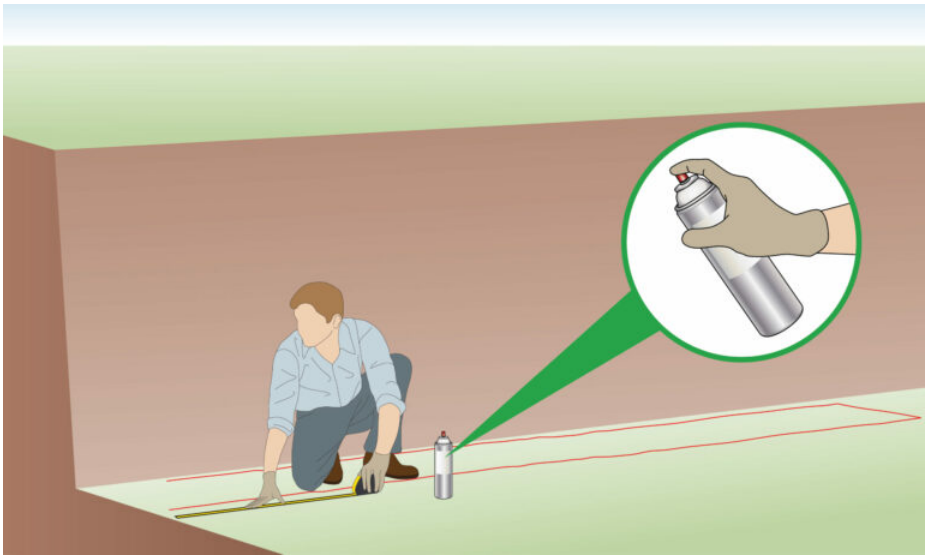
RETAINING WALL

- **Experience Required:** Hard
- **Tools Required:** Shovel, Hand tamper or plate compactor, Protective Gloves, Spray Paint, Tape Measure
- **Materials Required:** It is important to use certified gabion baskets suitable for gabion wall construction to ensure they do not break, as well as 6G gabion stone, helicoils and geotextile, plus a

perforated drainage pipe, gravel and type 1 basecourse. You can design a gabion retaining wall on our website.

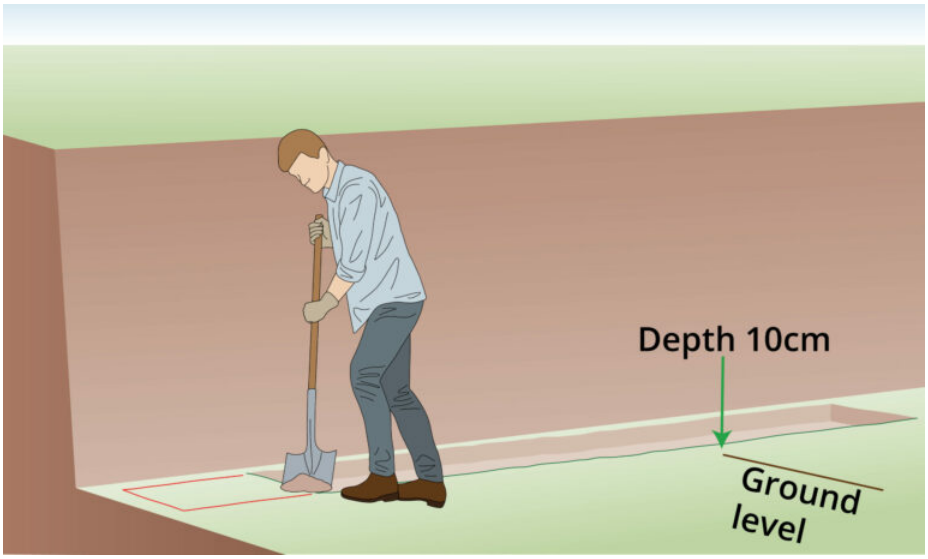
These steps show a 1.4m retaining wall: a bottom row of 97.5cm cube baskets with a row of 97.5cm x 97.5cm x 45cm baskets on top. Walls up to 1.5m that retain flat ground with light loads can be built like this without stepping. If your wall is taller than 1.5m, or is retaining sloped earth, heavy loads (such as roads or buildings) or ground with a lot of groundwater, you will need a structural engineer's design. See Wall Design above.

Step 1) Identify location



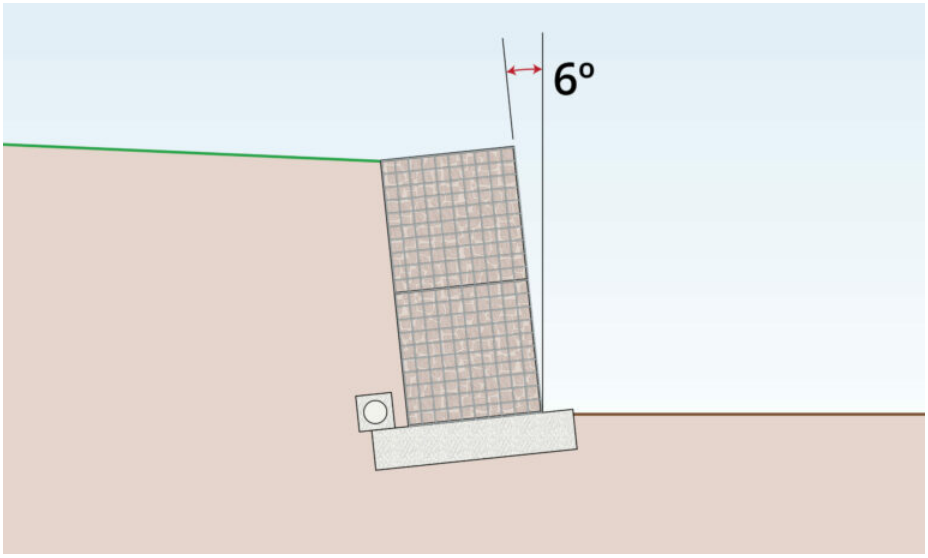
- Mark the location where you plan to construct your structure by using spray paint, rocks or alternative materials.

Step 2) Dig



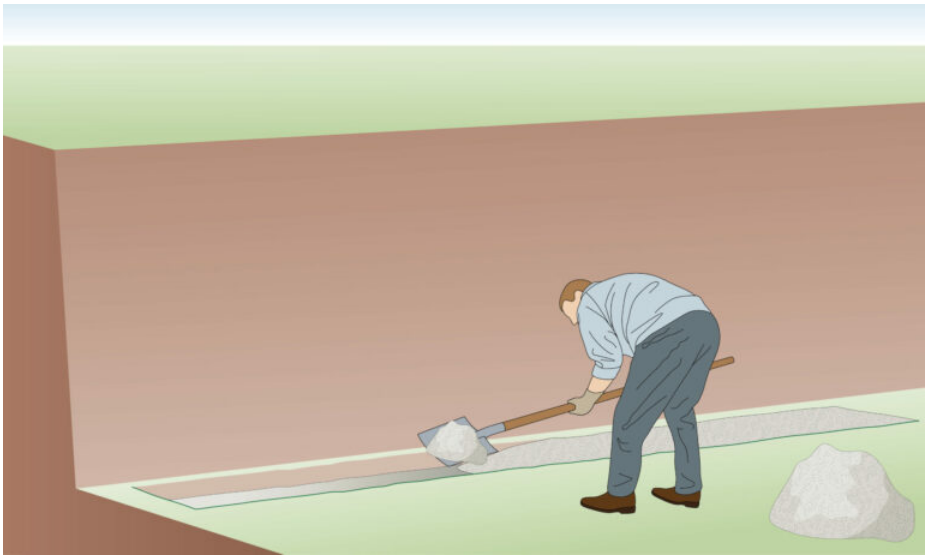
- Dig out the soft topsoil until you reach firm subsoil, leaving enough depth for 10-30cm of basecourse.
- This applies to walls of 1.5m or less with low loads, like the one in this guide. Low projects of 1m or less on firm, level ground, with no heavy loads behind them, can be placed straight onto the ground, though a compacted base gives the best long-term result.
- Walls over 1.5m or with large loads need foundations about 500mm below ground to prevent slipping. Your engineer will confirm the depth.

Step 3) 6 Degree Slope



- Shape the base with a 6-degree slope leaning back into the earth. This improves strength and stops the wall slipping.
- Every retaining wall needs the 6-degree slope, whatever its height.

Step 4) Add Gravel



- Add 10-30cm of type 1 basecourse on top of the firm subsoil.
- For walls over 1.5m or with large loads, use 30-50cm, as specified by your engineer.

Step 5) Compact Gravel

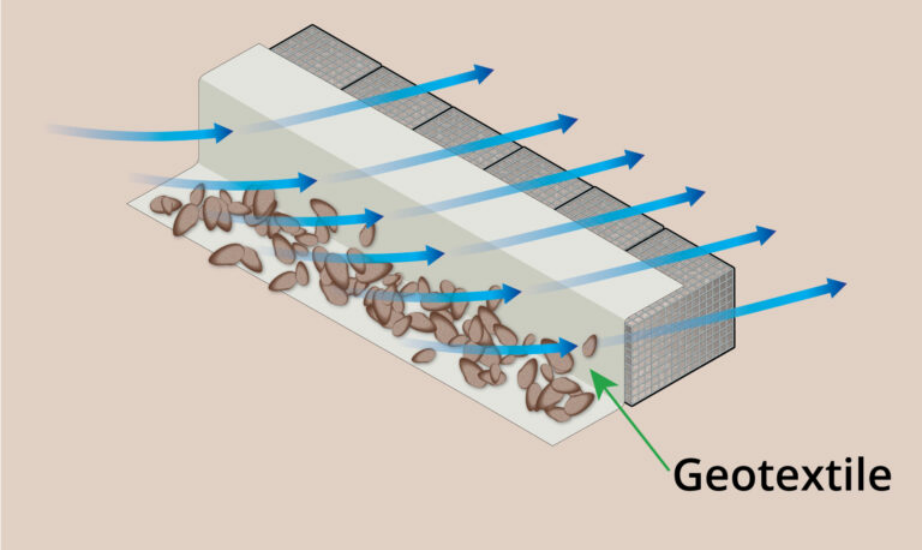


- Compact the basecourse firmly with a hand tamper or plate compactor.
- Use a plate compactor for walls over 1.5m or with large loads.

Optional) Concrete foundation

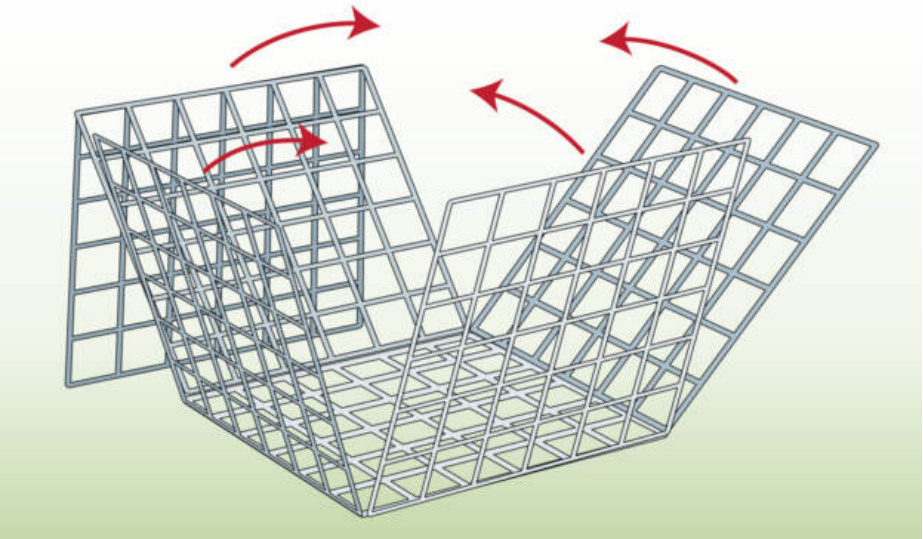
- Walls of 1.5m or less with low loads don't usually need a concrete foundation. The compacted basecourse is enough.
- If you have a lot of groundwater or weak soil, ask a structural engineer whether you need one.

Step 6) Geotextile



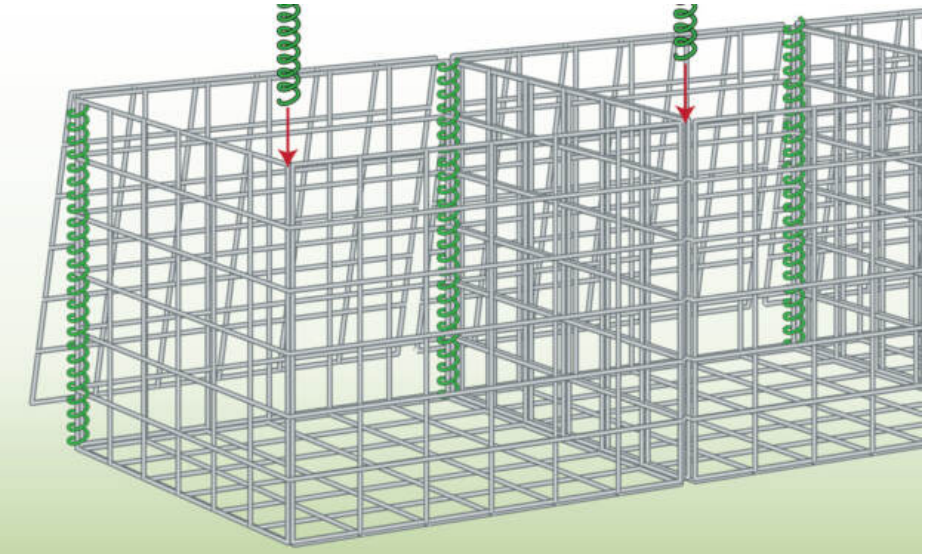
- Apply a geotextile or weed mat to the rear of the baskets to prevent soil and debris clogging up behind the structure.
- Lay a perforated drainage pipe along the base, behind the wall.
- As you build, backfill behind the baskets with 10cm of gravel (20cm for walls over 1.5m) up to within 15cm of the top. Finish with soil.

Step 7) Unfold the Baskets



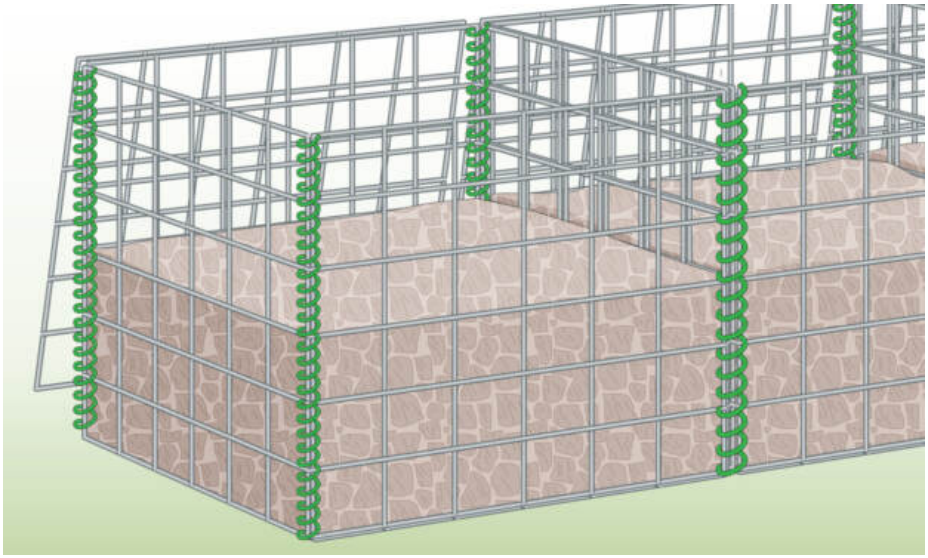
- Unfold the baskets, lifting the sides.

Step 8) Join the Cages



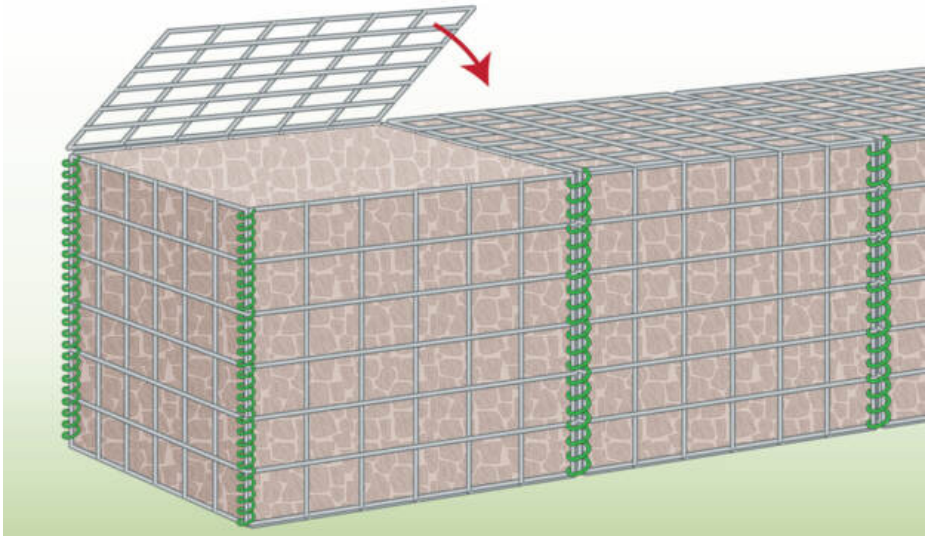
- Assemble the baskets, following the instructions.
- Join the cages with the free lacing wire supplied, or use helicoils (sold separately) for a quicker, neater finish.

Step 9) Fill with Stone



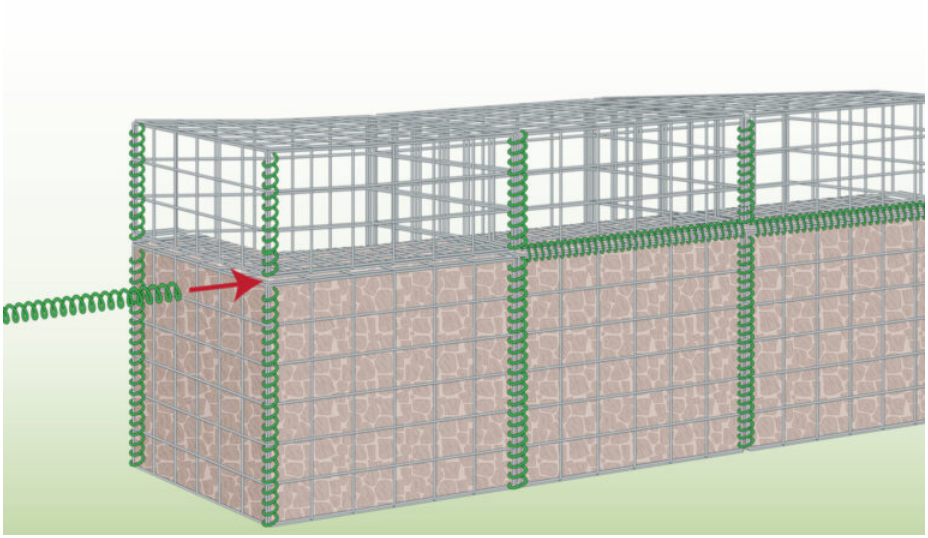
- Use the stone of your choice to fill the cages.

Step 10) Close Lids



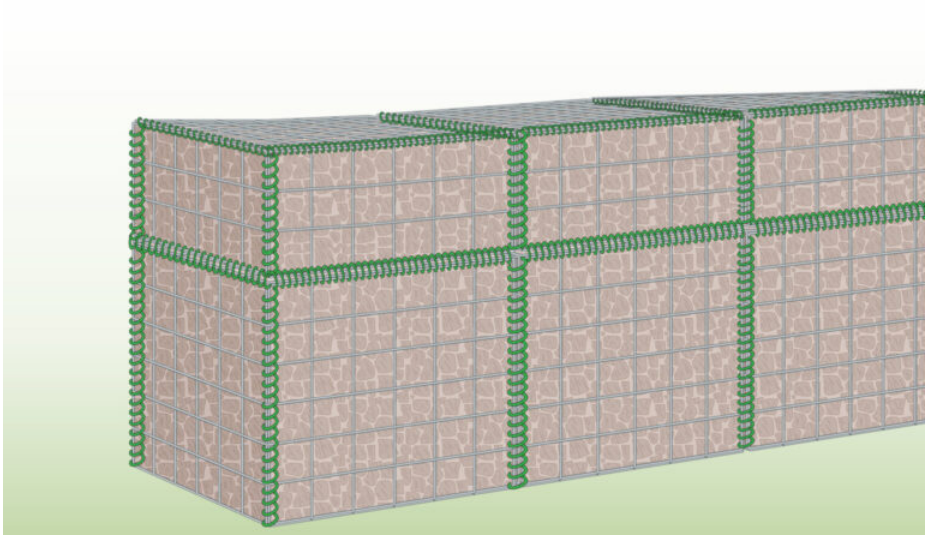
- Close your baskets, folding down the lids.

Step 11) Add Second Row



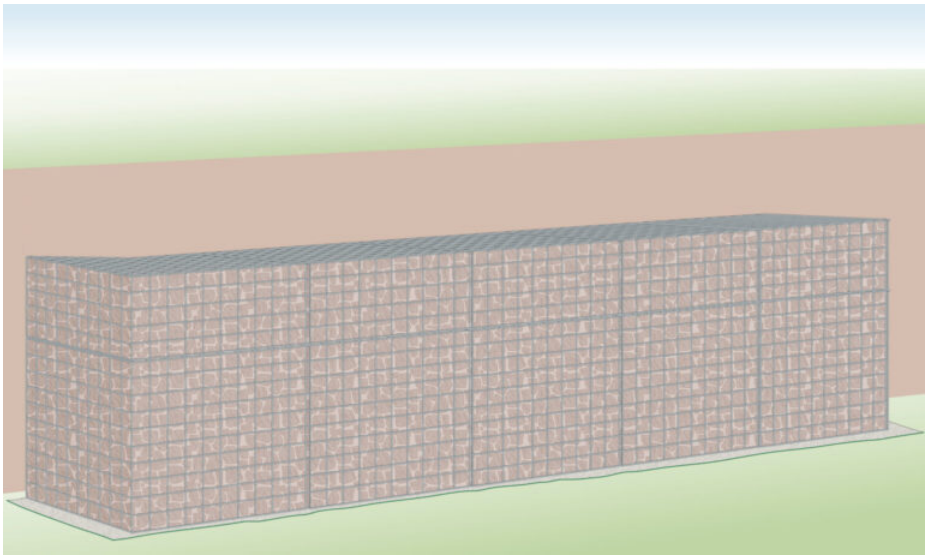
- Position the second row of 45cm high baskets on top of the first row, either in line or staggered (see In Line or Staggered? below), connecting them together using helicoils or lacing wire.

Step 12) Fill and Join



- Fill the top baskets with rocks.
- Enhance security by connecting the baskets with helicoils from front to back. You may need to cut some of them to fit the structure's depth.

Step 13) Finished Project

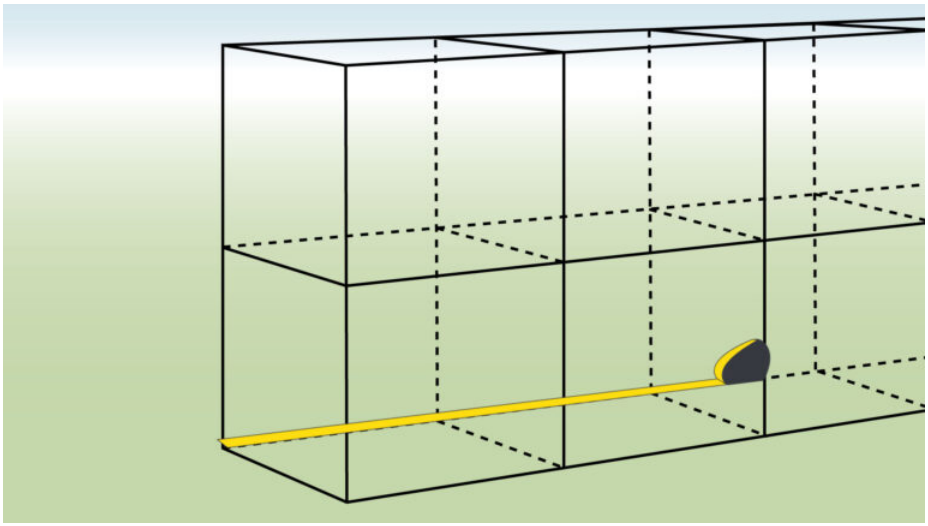


- Your 1.4m gabion retaining wall is finished!

FREESTANDING WALL

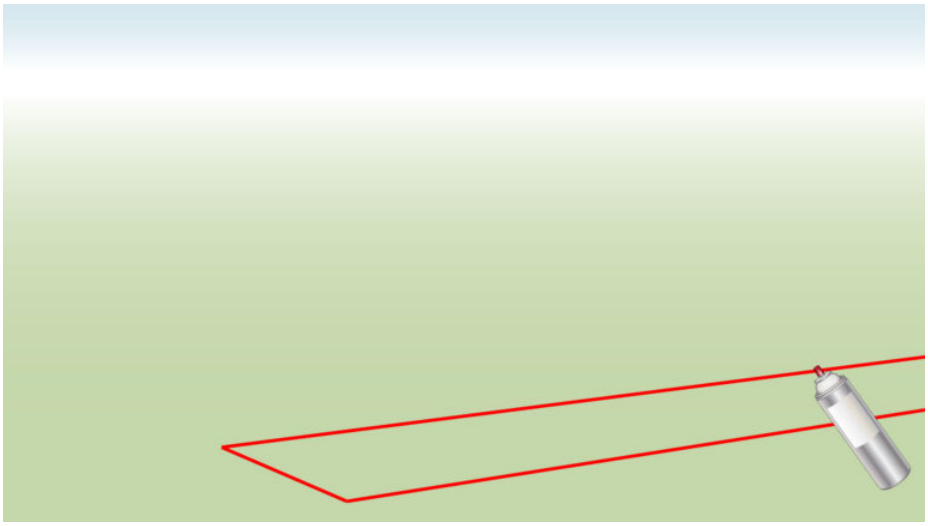
- **Experience Required:** Medium
- **Tools Required:** Protective gloves, Wire cutters, Tape measure, Spray paint, Shovel, Hand tamper or plate compactor
- **Materials Required:** Gabion baskets, Helicoils or lacing wire, Gabion stone, Geotextile, Type 1 basecourse, Support posts and concrete (walls over 1.5m)

Step 1) Measure and Plan



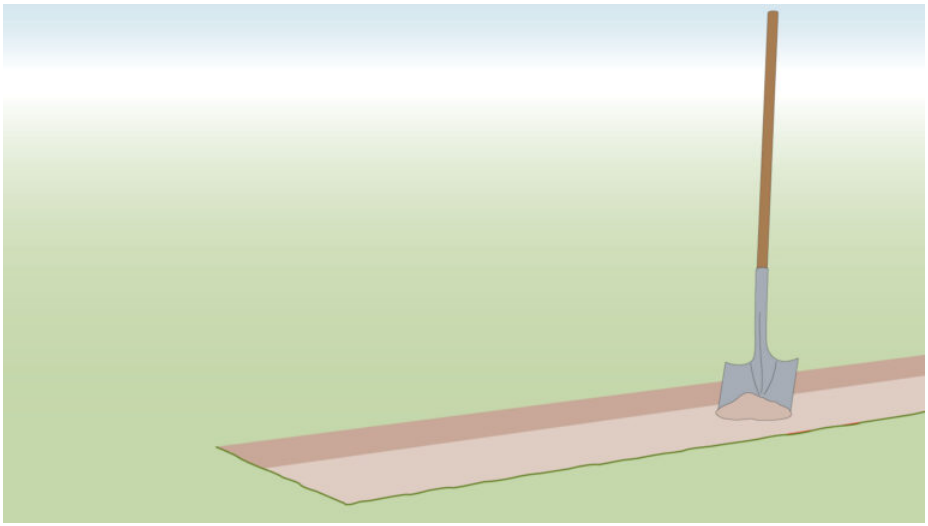
- Start by planning your freestanding structure and measuring the area.
- Keep the wall no more than twice as tall as it is deep (2:1). If it will be taller than 1.5m or more than 2:1, plan for internal support posts. See Freestanding Wall Design above.

Step 2) Mark the Location



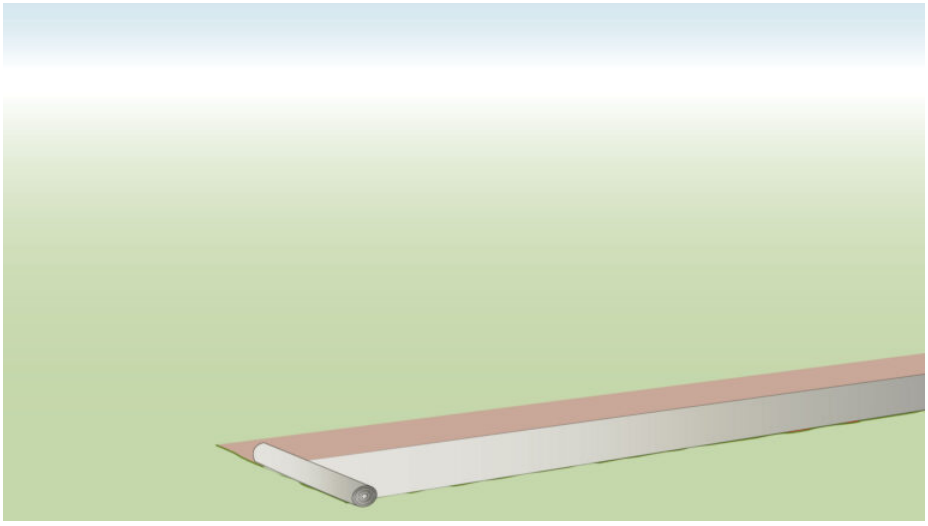
- Mark the location where you plan to build with spray paint, stones or other materials.

Step 3) Dig a Base



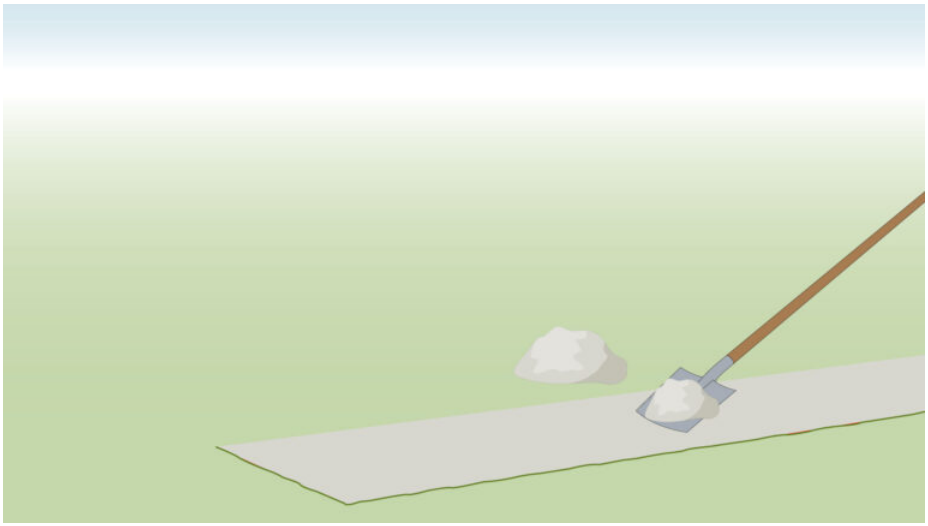
- Up to 1.5m high: dig out the soft topsoil until you reach firm subsoil. Low projects of 1m or less on firm, level ground can be placed straight onto the ground, though a compacted base gives the best long-term result.
- Over 1.5m high: dig foundations about 500mm below ground to prevent slipping.

Step 4) Add Geotextile



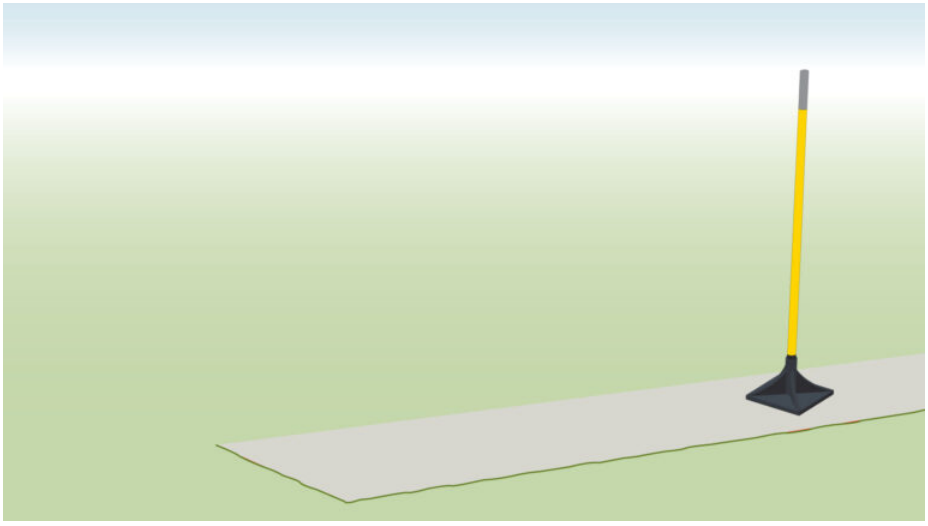
- Lay geotextile on the base to prevent weeds from growing up and through your baskets.

Step 5) Add Basecourse



- Add 10-30cm of type 1 basecourse on top of the geotextile for walls up to 1.5m, or 30-50cm for walls over 1.5m.
- Low or wide walls do not usually need a concrete foundation. If your wall is 1m+ or narrow, or the soil is weak, you may need a concrete foundation for added stability.

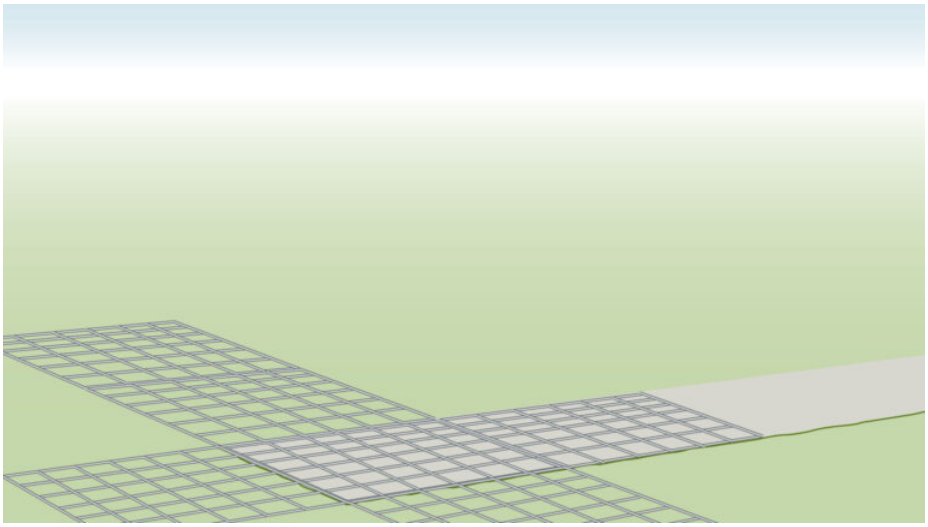
Step 6) Compact the Base



- Compact the basecourse well using a hand tamper or a plate compactor. Use a plate compactor for walls over 1.5m.

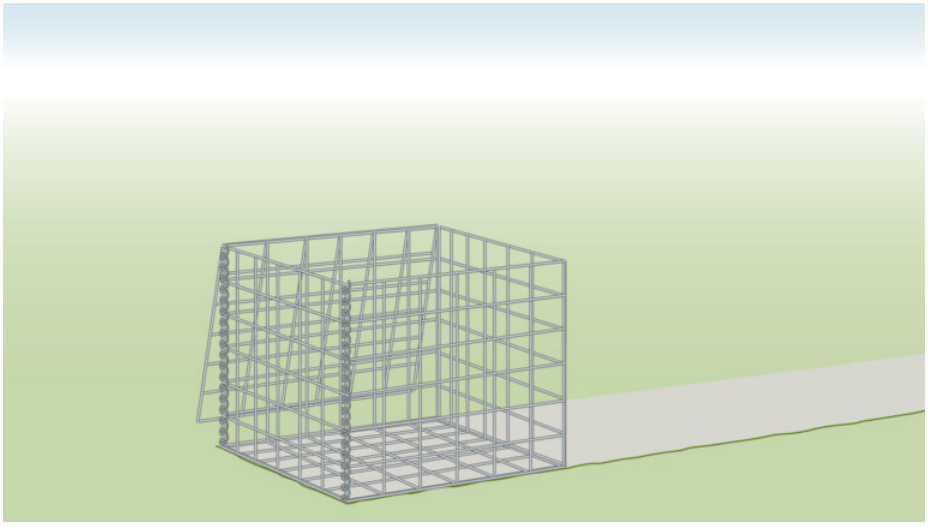
- If your wall needs support posts, set them in concrete now, sunk about a third of the wall height into the ground. Attach them to the baskets with bracing wire and plug the tops of hollow posts.

Step 7) Lay it Flat



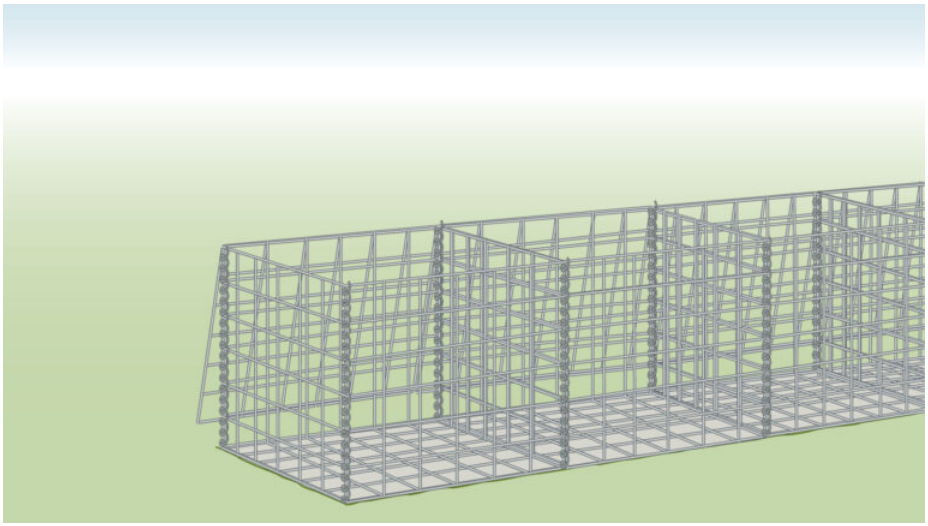
- Lay the basket flat on the ground.

Step 8) Assemble the First Basket



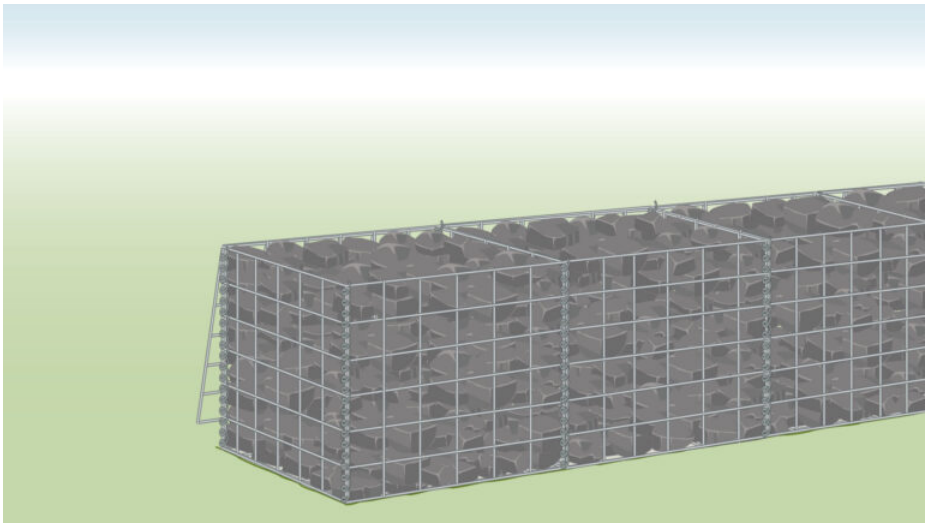
- Unfold and lift up the sides of the basket.
- Then, start assembling by securing the corners with helicoils, but leave the adjacent corners open for now.

Step 9) Repeat Assembling and Join Corners



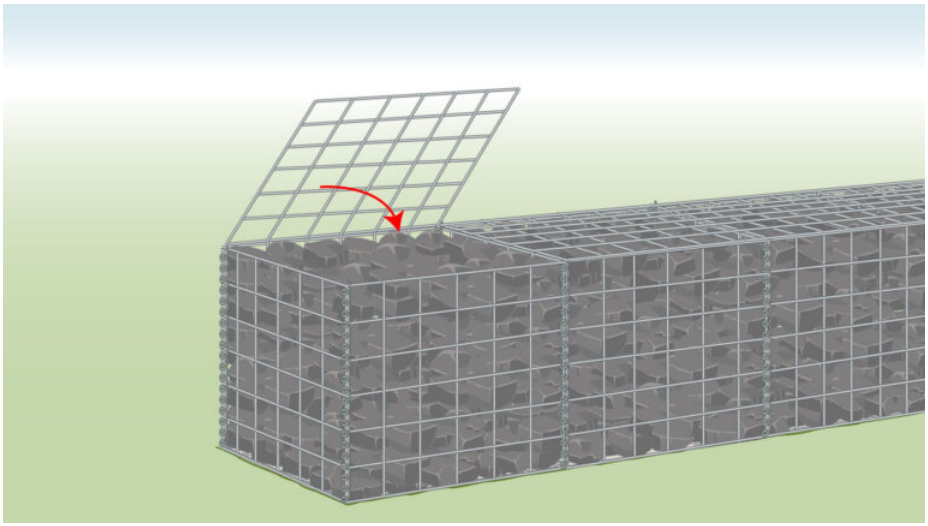
- Repeat the process for the other cages.
- Use helicoils to secure each corner and where the corners connect.

Step 10) Fill with Stone



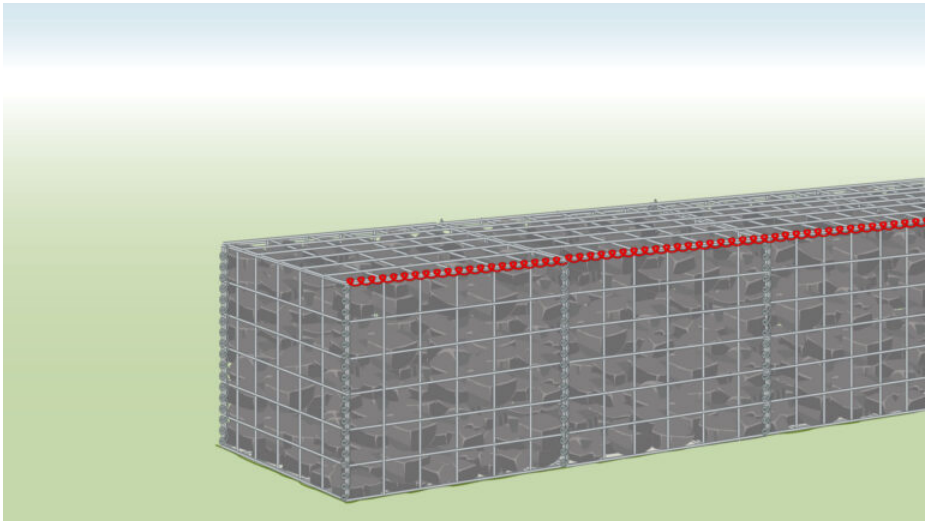
- Fill the cages with stones.

Step 11) Close Lids



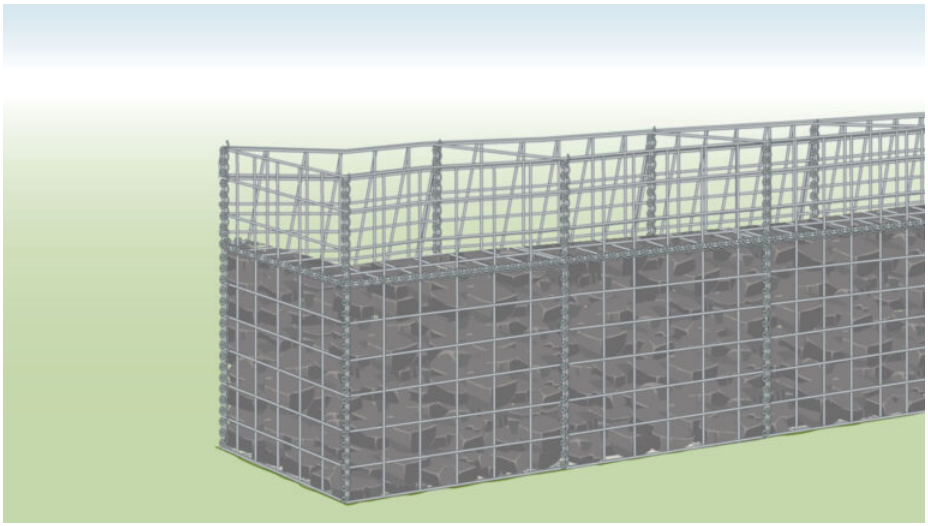
- Fold the lids down to close the baskets.

Step 12) Secure Lids, in case of 1m Structures



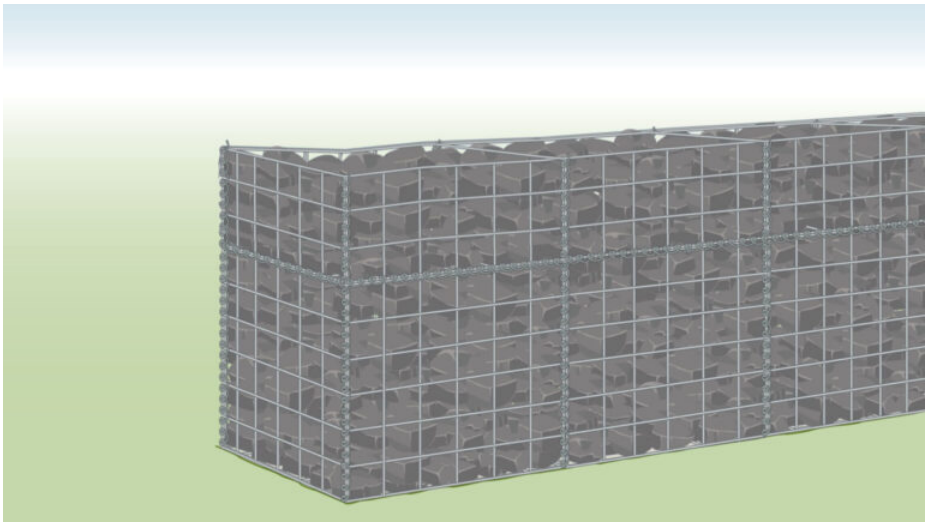
- For a 1m structure, you can secure the lids with helicoils to finish it.
- For taller installations, leave them unsecured for now.

Step 13) Add a Second Layer



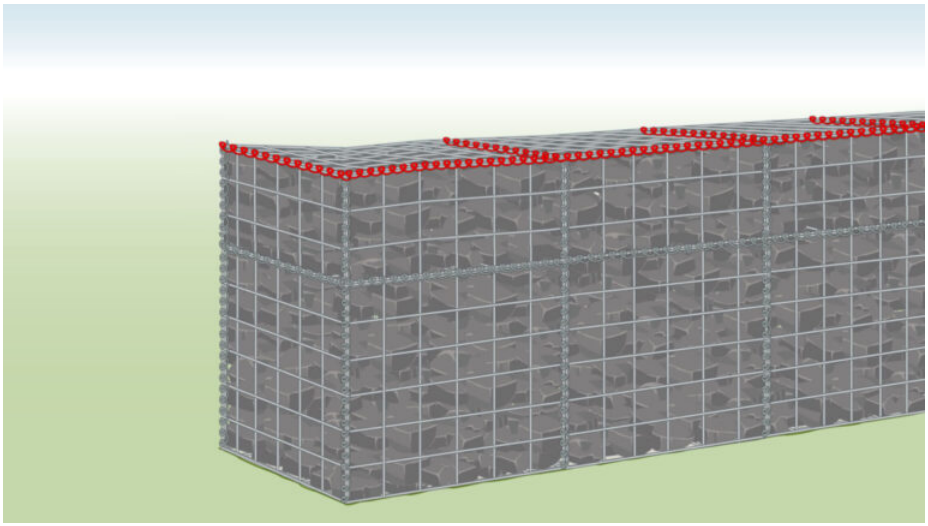
- Place the second layer of 45cm high baskets on top of the first, either in line or staggered (see In Line or Staggered? below).
- Connect them with helicoils at the front, sides, and back.

Step 14) Fill with Stone



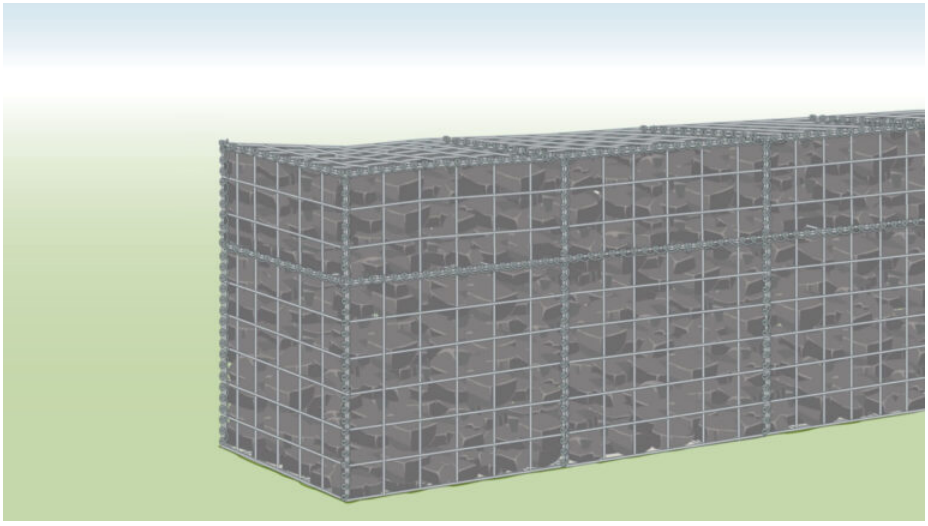
- Fill the top baskets with stones.

Step 15) Close and Secure the Lids



- Then close the lids and secure them with helicoils.

Step 16) Finished Project



- Your freestanding wall is complete.

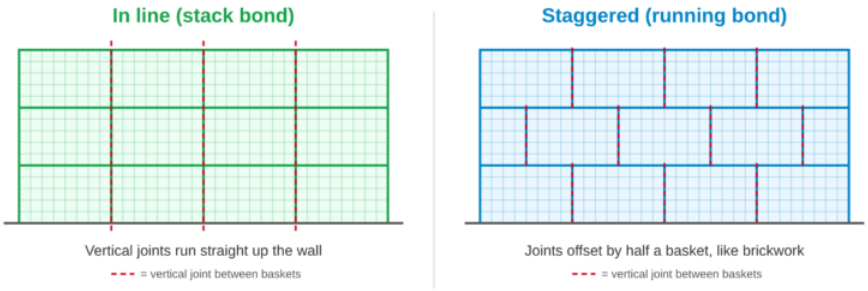
Foundation Guide

- **1m or less & low loads:** can be placed straight onto firm, level ground. A compacted base gives the best long-term result.

- **1.5m or less & low loads:** remove soft topsoil down to firm subsoil, then lay and compact 10-30cm of type 1 basecourse.
- **Over 1.5m or large loads:** foundations about 500mm below ground, with 30-50cm of type 1 basecourse compacted with a plate compactor. Retaining walls of this size need a structural engineer's design.

In Line or Staggered? How to Stack Gabion Layers

When your wall is more than one basket high, you can stack the layers in line or staggered. Both layouts are used, and our wall builder lets you design either.



- **Staggered (running bond):** the vertical joints are offset between layers, like brickwork. Some engineers specify this for retaining walls, as it spreads the load across neighbouring baskets. Use a shorter basket at each end of every other layer to keep the ends square.
- **In line (stack bond):** baskets sit directly on top of each other for clean vertical lines. Many engineer-designed walls are built this way, and it's popular for garden walls, feature walls and cladding.

Whichever layout you choose:

- Fill the baskets with angular stone that locks together.
- Join every basket securely to the ones above, below and beside it with helicoils or lacing wire, as BBA Certificate 05/4215 requires.
- For retaining walls, lean the wall back into the slope at about 6°, as shown in the steps above.
- If your wall needs an engineer (over 1.5m, sloping ground, heavy loads or a lot of groundwater), follow their drawings for the layout.

Walls built in line



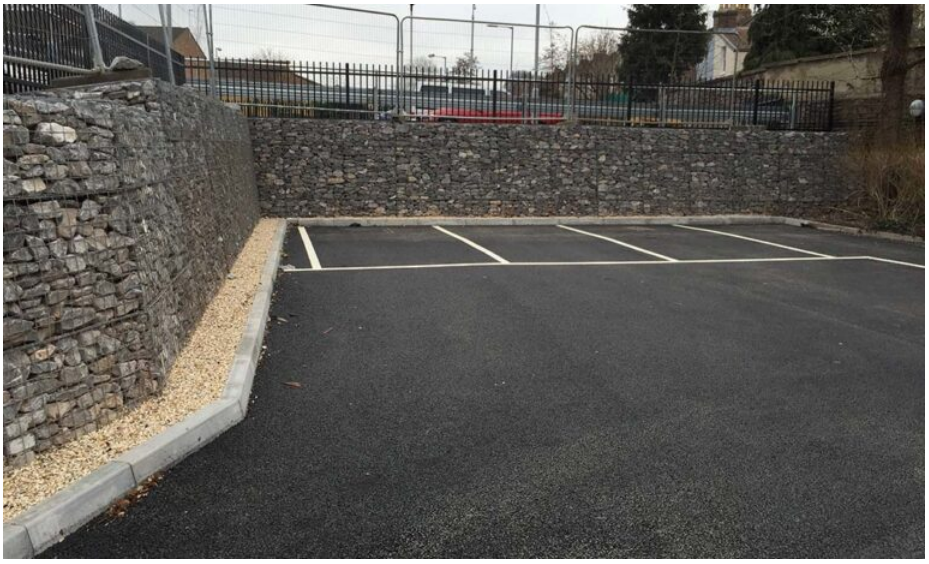
J Hayne's garden wall (August 2023): two layers built in line from our gabion cages, photographed during the build. From J Hayne's customer review.



Lisa's garden retaining wall (May 2023): a two-tier wall built in line from our 4mm made-to-measure gabions, filled with limestone. See Lisa's case study.



Castletown Way, Sunderland (2021): a three-layer garden retaining wall built in line, with a timber fence above. Project by Enviromesh, our partner company, using the same welded gabions we supply. See the case study.



Eastville Medical Centre, Bristol (2015): a 2.45m mass gravity retaining wall built in line, designed by Enviromesh using 4mm BBA-certified welded gabions filled with limestone. Project by Enviromesh, our partner company, using the same welded gabions we supply. See Enviromesh's case study.



Network Rail, Sharnbrook Embankment, Bedfordshire (2007): about 262 metres of mass gravity retaining walls beside the Midland Main Line, built in line to a design by Corus Rail Consultancy. Project by Enviromesh, our partner company, using the same welded gabions we supply. See Enviromesh's case study.



The Farmyard, Longcroft House, Yeovil (2007): a mass gravity retaining wall built in line, designed by Enviromesh. Project by Enviromesh, our partner company, using the same welded gabions we supply. See Enviromesh's case study.



Premier Inn, Uxbridge (2015): a freestanding gabion screen wall built in line, filled with granite. Project by Enviromesh, our partner company, using the same welded gabions we supply. See Enviromesh's case study.

Walls built staggered



Questmore Construction Ltd (July 2025): a three-layer retaining wall with staggered joints, built from 97 of our 1m welded gabions on a reinforced concrete foundation, in front of an old brick boundary wall. See the case study.



A gabion retaining wall with the joints staggered between layers.

Tips and Tricks

Before starting your project, it's important to plan carefully and consider a few key factors. The points below are based on our team's experience designing and installing gabion structures.

- Before beginning the process, ensure you have a detailed plan. Sketch out your structure's dimensions and layout, ensuring it fits within your space and meets your needs.
- Opt for high-quality baskets and durable stones. This will enhance the longevity and stability of your retaining construction.
- Check the stability of the soil where you plan to build. If the soil is loose or unstable, consider consulting a professional for advice on additional reinforcements.
- Adequate drainage behind a retaining wall is crucial to prevent water buildup and potential damage. Always include a drainage pipe and gravel backfill.
- Periodically check your wall for any signs of wear or damage. Addressing minor issues promptly can prevent more significant problems in the future.
- You can compact the basecourse using a hand tamper or a plate compactor as well.
- You can fill your baskets with different types of stones, or vary them, as long as they are larger than the 75mm x 75mm mesh holes. We recommend 80mm and up.

Do's and Don'ts

Do's

- Ensure the gravel base is well-compacted to provide a solid foundation for your gabion structure.
- Carefully follow the manufacturer's instructions when assembling the baskets to ensure structural integrity.
- Apply geotextile fabric behind the structure to prevent soil erosion and maintain the structure's stability.

Don'ts

- Don't skip the 6-degree slope on any retaining wall. It helps with stability.
- Avoid overfilling baskets, as this can cause bulging and instability. Fill them evenly and securely.
- Don't neglect a concrete foundation if your site has poor soil conditions or significant groundwater. It's crucial for structure stability.
- Building a retaining structure requires time and precision. Don't rush through the steps, as hasty construction can lead to structural issues.

Further Reading

- How to Install Gabion Baskets – A guide showing you how to assemble baskets.
- How to Fill Gabions – Learn how to fill cages.
- How to Lace Gabion Baskets – Step-by-step instructions on how to lace baskets.
- Gabion Learning Hub – a library of help videos

If you are planning to build a wall, do not be tempted to buy cheaper gabion baskets that might fail. We sell BBA certified gabion baskets. We also supply stone suited to filling gabion baskets.

VIDEO

Video: Watch the video on YouTube

Video: Watch the video on YouTube

Written By

This blog was created by our Technical Illustrator, Timi and reviewed by our Founder, John.

Below you'll find examples of our real-life wall builds, along with customer projects. We've opted for technical illustrations for the instructions found in this blog because they provide better clarity on mesh placement and structural details that can get lost in real-life photography.

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This is a L4m x D1m x H2m freestanding wall built by John and Erno outside our old warehouse

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This customer project shows our retaining wall guide brought to life in a real build.

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Another angle of the same customer project.

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A one-tier retaining wall installed by a customer, built using the same retaining wall principles.

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A garden retaining wall brought to life with the help of our Customer Support Specialist, Erno.

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A finished retaining wall customer project.