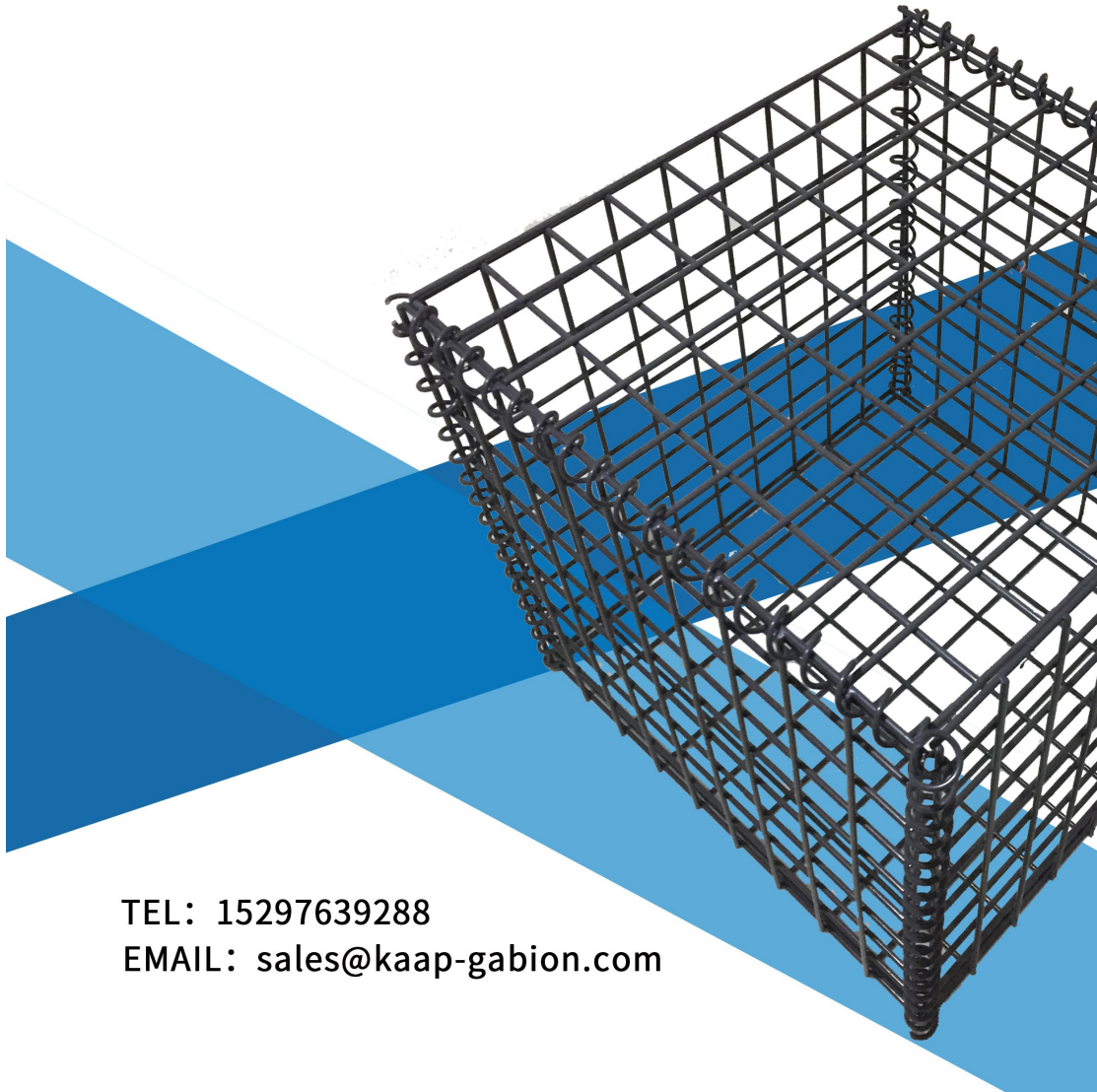


## WELDED GABION

### Gabion Standard Design



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## Gabion Standard Design

KAAP WIRE MESH are not structural engineers. The designs on this page are suggestions based on industry standard designs. Gabion wall designs are very robust, these designs in general are the basis for any designs produced by structural engineers. However, there are ground types and situations where the designs will not be sufficient. If your situation involves having a building, road etc on top of it or you are putting them on very soft clay then it would be advised to contact a structural engineer.

A structural engineer will require.

- a. A topographic survey to conclude wall height and any slope surcharge which could similarly influence the gabion arrangement.
- b. Proposed wall location.
- c. Ground investigation to conclude retained and foundation soils and associated geotechnical parameters.

This is an additional cost and we can direct you to a consultant if you require.

The designs given on this page should not be used as a substitute for taking detailed and specific advice from a structural engineer. The recommendations and advice are given without liability on the part of KAAP WIRE MESH and should not be relied upon for any action or inaction.

KAAP WIRE MESH shall not be liable to compensate any other party for any loss, including any consequential loss, arising from following the standard designs.

## Standard Designs

The standard designs for gabion baskets are very robust, "Belt & Braces". In the welded mesh variety sold by ourselves, we (at KAAP WIRE MESH) have never seen a failure of a wall installed and filled correctly.

Affect of load behind wall:

A load such as a carpark for normal vehicles adds a surcharge of 2.5K/N which should not cause any issues with the standard designs.

A road behind the wall which allowed access to HGVs would increase the surcharge to 10K/N, we would advise you take advice from a consultant if this is the case or if a building is within 3m of the retained wall, this distance depends on the soil conditions.

Footings/foundation:

Building regulations suggest that a 500mm trench be dug to get below the frost layer, this

also provides a toe in to stop the baskets slipping. Another reason for this is that the top soil contains organic matter that may rot or compress. The majority of installations for short walls are started at ground level, it is down to the customer to make a decision on site looking at the ground conditions.

The worst material for gabion walls to sit on is soft clay, if the ground is likely to sink under baskets weight, a gabion retaining wall may not be possible.

100-200mm of hardcore (type 1) should be compacted with a vibrating plate as a footing for the gabion wall. If 200mm was put in the 500mm deep trench the baskets would start 300mm below ground.

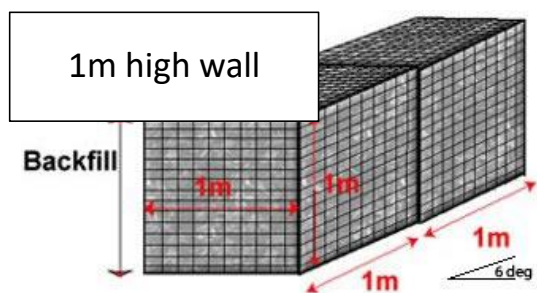
Baskets should be leant back at 6 degrees.

The Face of a gabion wall can be flushed or stepped. On taller walls baskets are stepped back to equalise the pressure between the heel and toe of the wall.

Gabions can be cut on site to achieve your required dimensions.

The standard thickness for walls up to 3m in height is 3mm. 4mm is the architectural spec, 5mm is what we would refer to as the military spec or for use on higher walls.

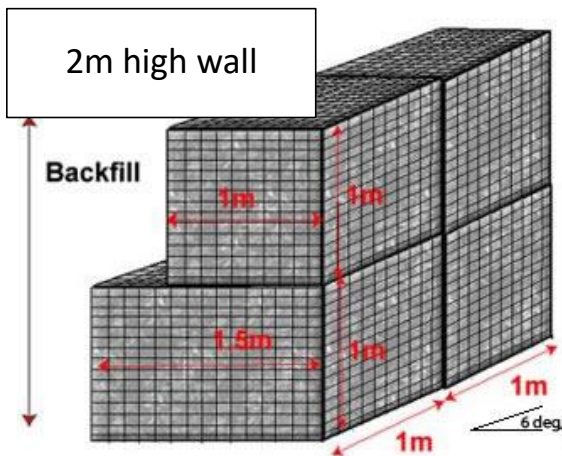
For inexperienced installers we recommend adding a 4mm face for walls 3m and below, this reduces the risk of bulging.



A 1m high wall is very simple it can be made of 1m x 1m x 1m or 2m x 1m x 1m baskets. The smaller is recommended if the length you have to cover is small as it will reduce transport costs. We can also use 1/2m deep baskets this will save on the cost of fill but will reduce the strength

of the wall and is recommended only in situations where the bank is fairly stable. You can also use 1m high walls for terracing a garden in steps. We also provide sets of steps for this scenario.

It is standard to use 3mm wire thickness as the baskets have little weight exerted on them. A cost saving option is to put a false partition in the front of the basket. This way the front can be hand layed with a high quality stone like slate. the back can then be backfilled with a low quality material for example reclaimed brick.



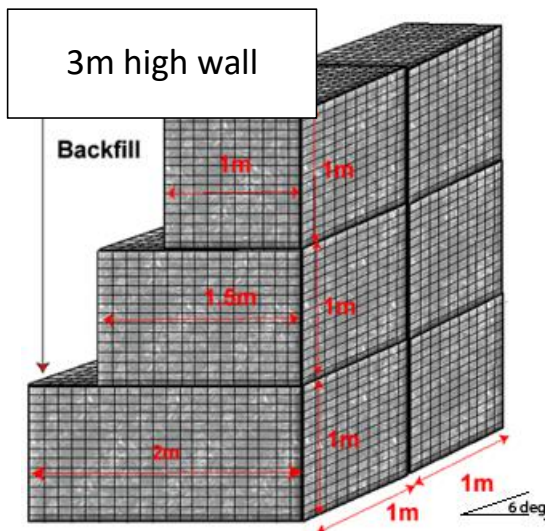
Gabion baskets are a mass retaining system thus, the higher the area that needs retaining, the heavier the wall must be. The standard design for a gabion wall is a pyramid. In general, for every 1m increase in wall height, the bottom row basket depth should be increased by half a meter.

For a 2m high wall the bottom row should

be 1.5m deep and the top row should be 1m deep.

It is still standard to use 3mm wire thickness for both rows.

This can be made more stable by setting the top baskets slightly further back.



In this example the top 2 rows are the same as a 2m wall but with a .5m increase in the depth of the bottom row.

The bottom row is 2 meters deep middle row 1.5m deep and top row 1m deep. Normally we use 2m x 1m x 1m baskets bottom row 1.5m x 1m x 1m baskets in the middle row and 1m x 1m x 1m or preferably 2m x 1m x 1m baskets going sideways on the top row.

At this height there is quite a lot of weight

exerted on the bottom row and unless the bracing ties are installed correctly there is a possibility that the face of the bottom row might bulge out. You may prefer to use 4mm thick wire on the bottom row rather than risk this. If the look of the wall is important than we would then put a 4mm thick face on the 3mm thick top row baskets. This will save on costs of having all baskets in 4mm.

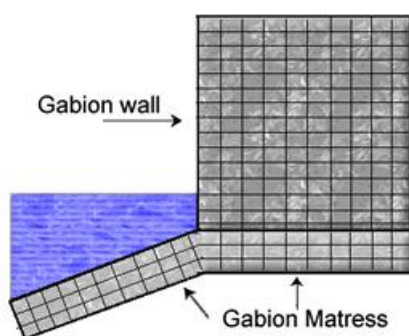
Any higher than 3m you can still use the same principal of increasing the depth by .5m but it may be preferable to stagger the baskets back and getting a structural engineer to assess the stability of the site would be a preferable option.

Curved wall: Staggered effect using 1m or better .5m wide baskets

There are 2 types of curved walls inside and outside bends. When the wall curves around you when looking at it (inside bend ) this can be achieved easily using standard baskets angled away from each other. The wedge shaped gaps that are left are fixed using extra panels that are cut to size and wired in on site.

Outside curves are more difficult and require the gabion to be tapered inwards. This is achieved by taking the side panels off the baskets and sitting the baskets within each other. The lids can be folded or overlapped.

## River erosion



Depending on the depth and speed of the river, different designs are appropriate. In general there is a worry that the river will undercut the baskets if using a standard wall. It is normal to use a gabion mattress (a short basket normally 3m x 2m x .3m high) that goes into the stream and underneath a standard wall. The standard wall does the retaining whilst the mattress stops the foundations being eroded.

## Flood Protection

Gabion Baskets are permeable so that water can come through them, this stops a build up of water behind them and the ground becoming waterlogged. It is possible to stop water coming through by lining the baskets with a geotextile material, such as Terram. You can have a thin cladding wall basket in front of this so it is not visible. The flood protection offered is only as good as the installation and all joints must be sealed. Care must also be taken to ensure the plastic isn't torn or damaged. Water can still get around the sides of the baskets. This is only suitable in specific location.