ISOQUICK®

Raft Foundation System

Installation Guide

Part 1-Site Preparation

Isoquick Installation Guide

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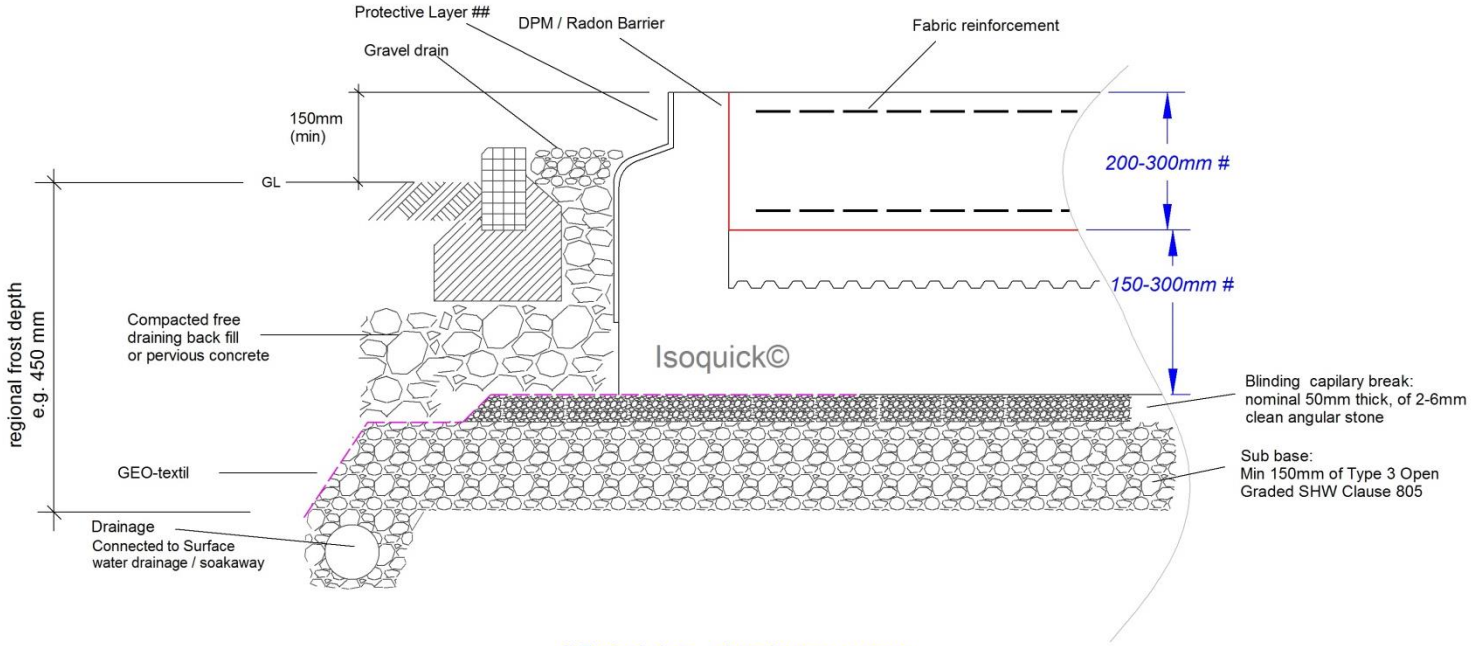
Introduction and overview 1

ISOQUICK® foundations are designed as a flat raft, where the loads from the walls and roof are spread out over a wide area.



Typical sizes, other sizes on request

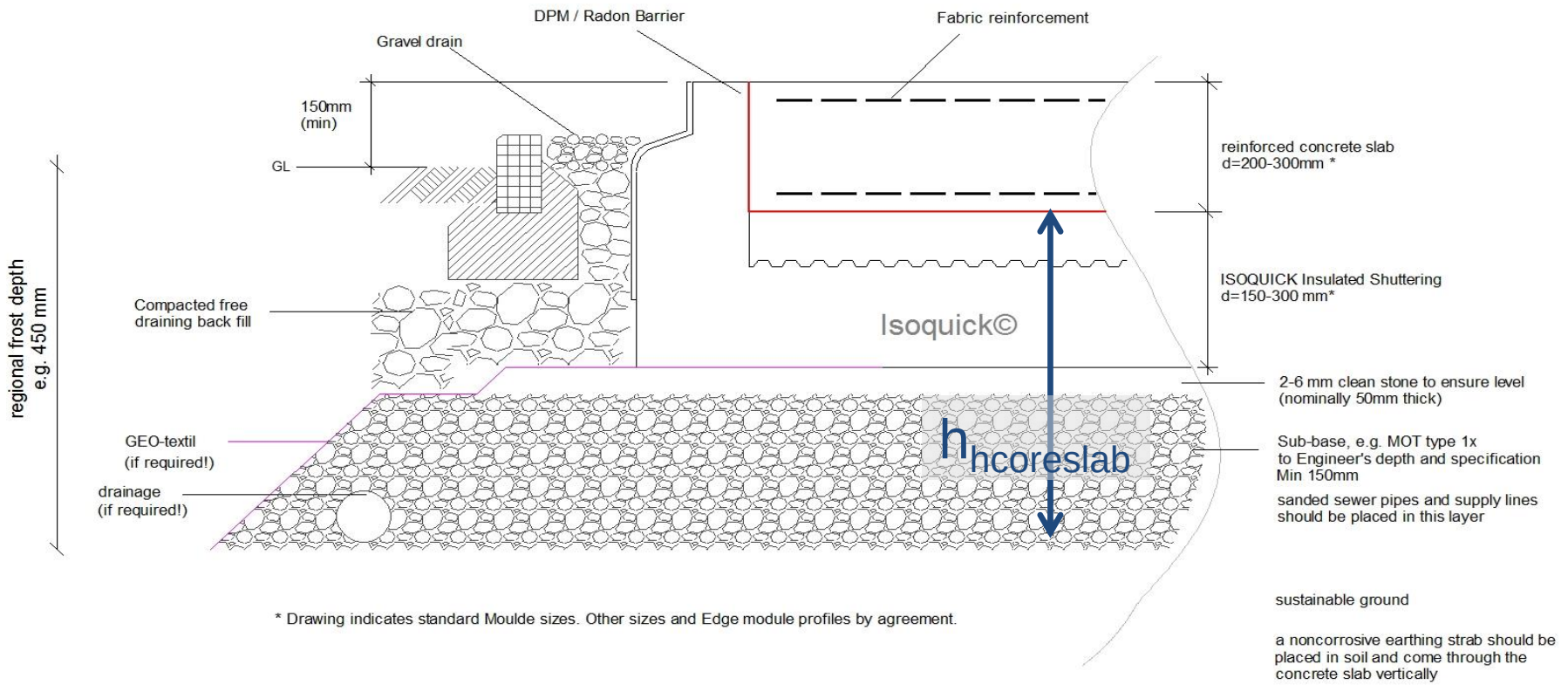
Protective layer, e.g.
Water resistent Polymer render (e.g. Aquabase)
Cementious slurry (e.g. Aquamat elastic)
Solvent free bitument, reinforced with Fibreglass scrim

Here we see a typical sectional detail. There area number of things to point out;

1) You'll notice the slab is flat without any thickening at the edge. This is deliberate, and I'll explain why later.
2) The Dpm and/or radon barrier is placed on top of the insulation, where it is less likely to get damaged
3) Under the Isoquick is a 50mm layer of 2-6mm clean stone, not sand.
4) Under the clean stone is the engineered fill.
5) The picture shows a land drain. Where ever possible the water table should be kept below the top of the sub base material.

Introduction and overview 2

ISOQUICK® foundations are designed as a flat raft, where the loads from the walls and roof are spread out over a wide area.



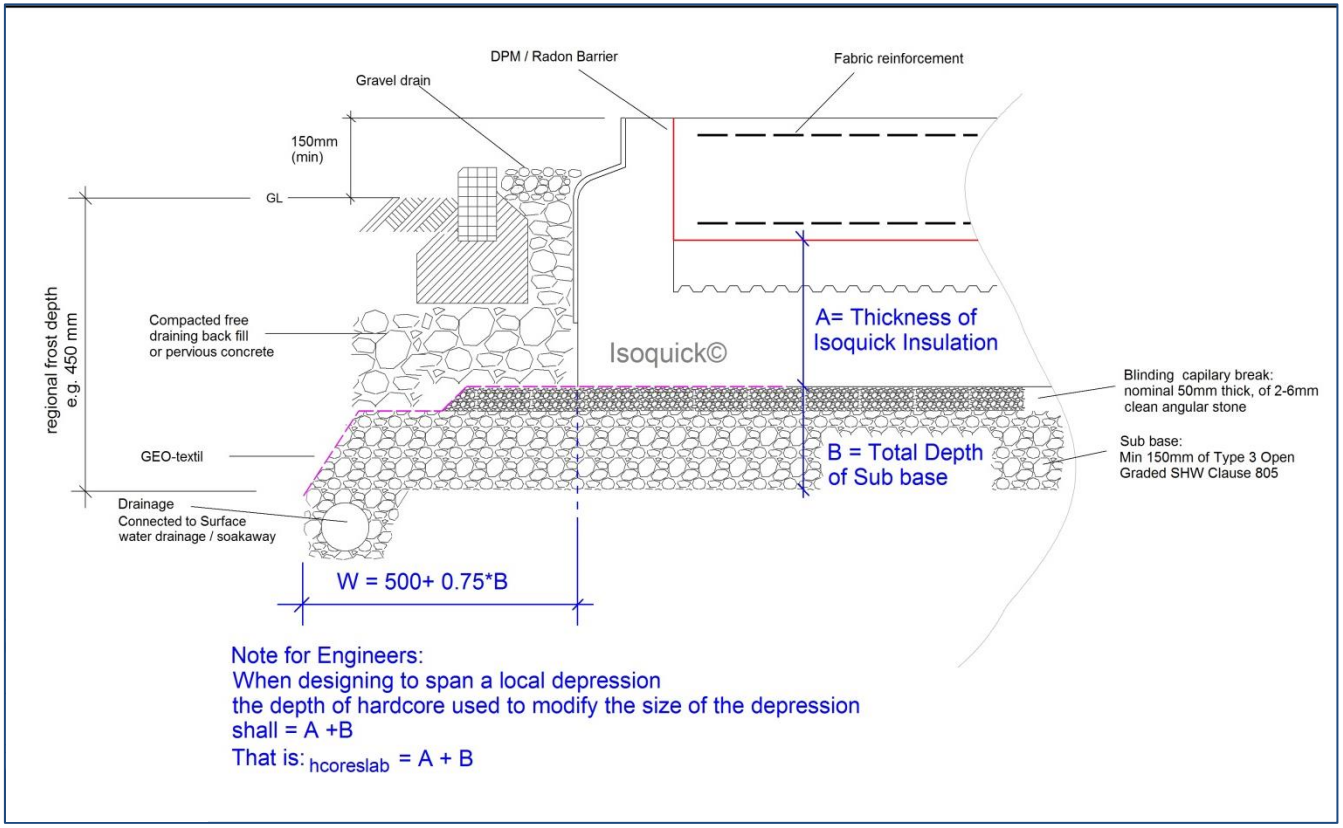
Rafts are designed to span potential spot spots in the ground.
To work out how much steel is required to achieve this, the size of the potential hole is reduced due to the engineered fill.
For an Isoquick raft the depth of fill = the total depth of insulation + blinding + Stone

Sub base area

The stone base should extend out beyond the edge of the slab. How far it extends is relative to the depth of the fill material.

Make sure you dig out enough room.

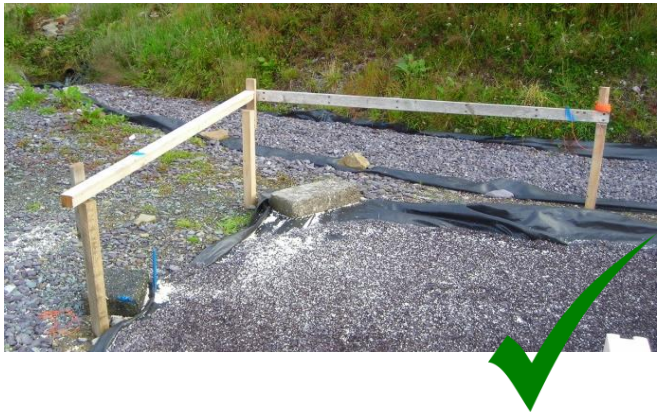
If the site practicalities make this impossible, consult your engineer, a retaining footing may be required.



Marking out

Before you start digging it is important to mark the site out properly. Good sturdy marking out points will;

- Ensure you excavate in the right place,
- That you excavate only what you need to
- Help ensure you get any pipe and services in the right place.



These profiles are a good height and distance from the corner of the slab.

- Mark the site out with profile boards, so that you can run a string line across the site about 5cm above the level of the concrete slab. The string should indicate the edge of the concrete
- Position the profile boards far enough away from the edge of the foundation to allow excavation without inference. Remember the, stone and the Isoquick edge module will extend beyond the edge of the slab.
- Use similar profiles to mark out the position of dusts and services



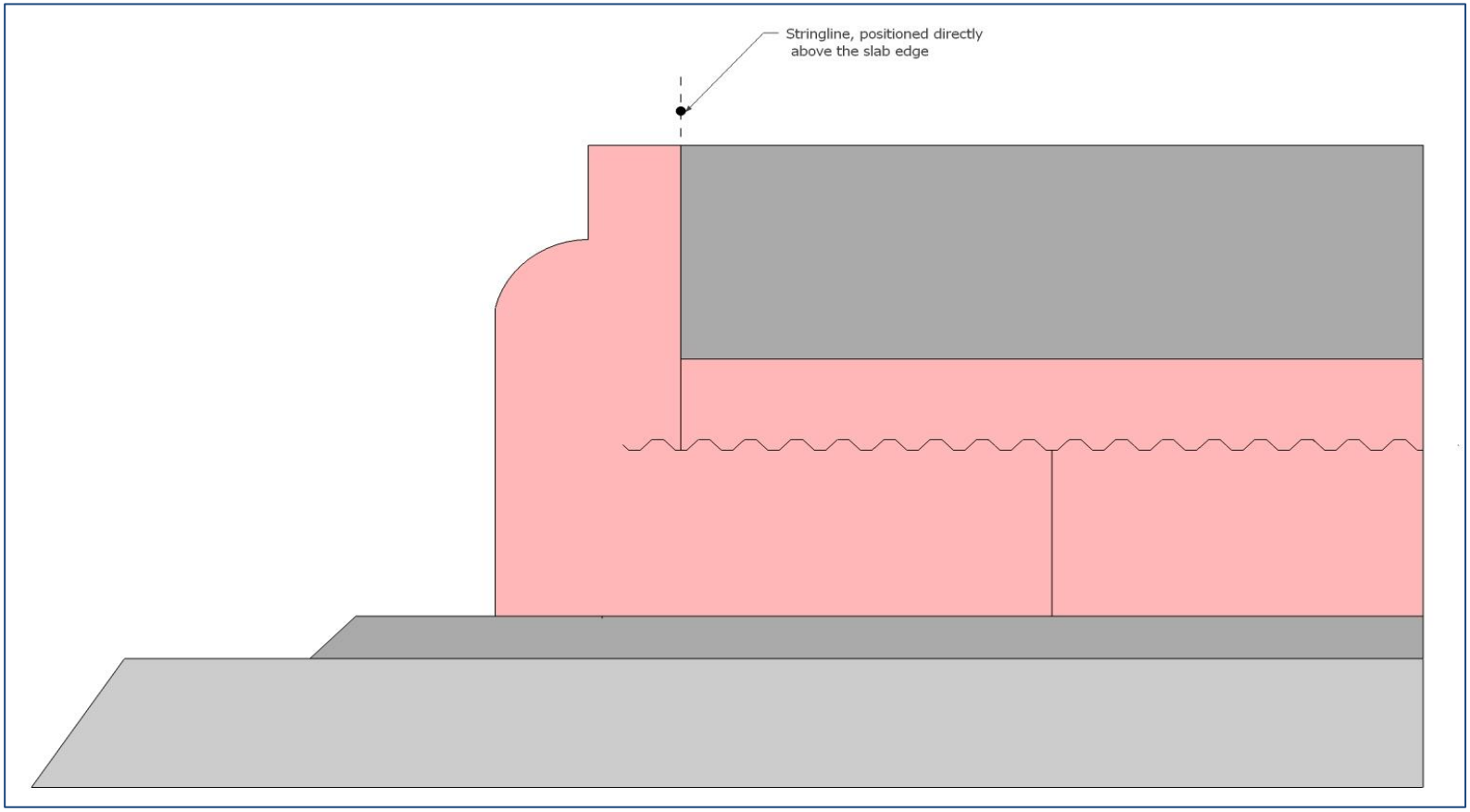
These profiles are far too low.

Positioning String lines

Having got your base properly prepared, layout your string lines.

The string should run approximately 50mm above the edge of the concrete.

It is always worth double checking your strings are set straight and square, and that the pipes are in the right place, relative to the slab edge before your start installing.



Digging out

- The soil is stripped to the same depth across the site, and then the base is compacted.

- The depth will depend on the bearing capacity of the soil and if it is clay you will need to take into account the risk of heave caused by trees.



Soft spots



●If you find a soft spot is must be removed and replaced with compacted fill before continuing



●If the site is stepped, your engineer may allow you to step the excavations, but confirm 1st.

Sub base materials

Our Preferred materials is

Type 3 Limestone (also sometimes known as Type 1x)
40mm unbound mixture used for sub-base applications as per the Specification for Highway Works, Clause 805.
Generally open graded with a reduced amount of fines (not zero fines) which improves drainage when compared with Type 1. Can also be made of recycled (crushed) concrete.



6F5 Recycled (Formerly 6F2 Recycled)
Typically used for where deeper fill is required, under a capping layer of Type 3



Type 1
Well graded Type 1 contains a good mix of angular aggregate sized from 63mm down to dust, however, most of the aggregate content is less than 32mm in size. Quarried or Recycled versions available. The dust content reduces ability to drain water away



20/40 Limestone or Granite
Crushed rock with low fines content that forms a hard wearing and well drained surface when compacted. Ideal for use on sites with flowing water or variable water table.



Brick Rubble
Unclassified brick rubble should NOT be used.



Laying the sub base

The sub base material;

- Needs to conform to the engineering specification provided by the engineer.

- It should be laid in layers and each layer compacted properly



Sub base compaction

The thickness of each layer and how many passes are required to compact it will depend on the type of roller/compactor used.

e.g. A 1500kg/m vibrating roller should only compact layers up to 150mm thick, and each layer will require 16 passes over it.

TABLE 8/4: (02/16) **Compaction Requirements for Unbound Mixtures**

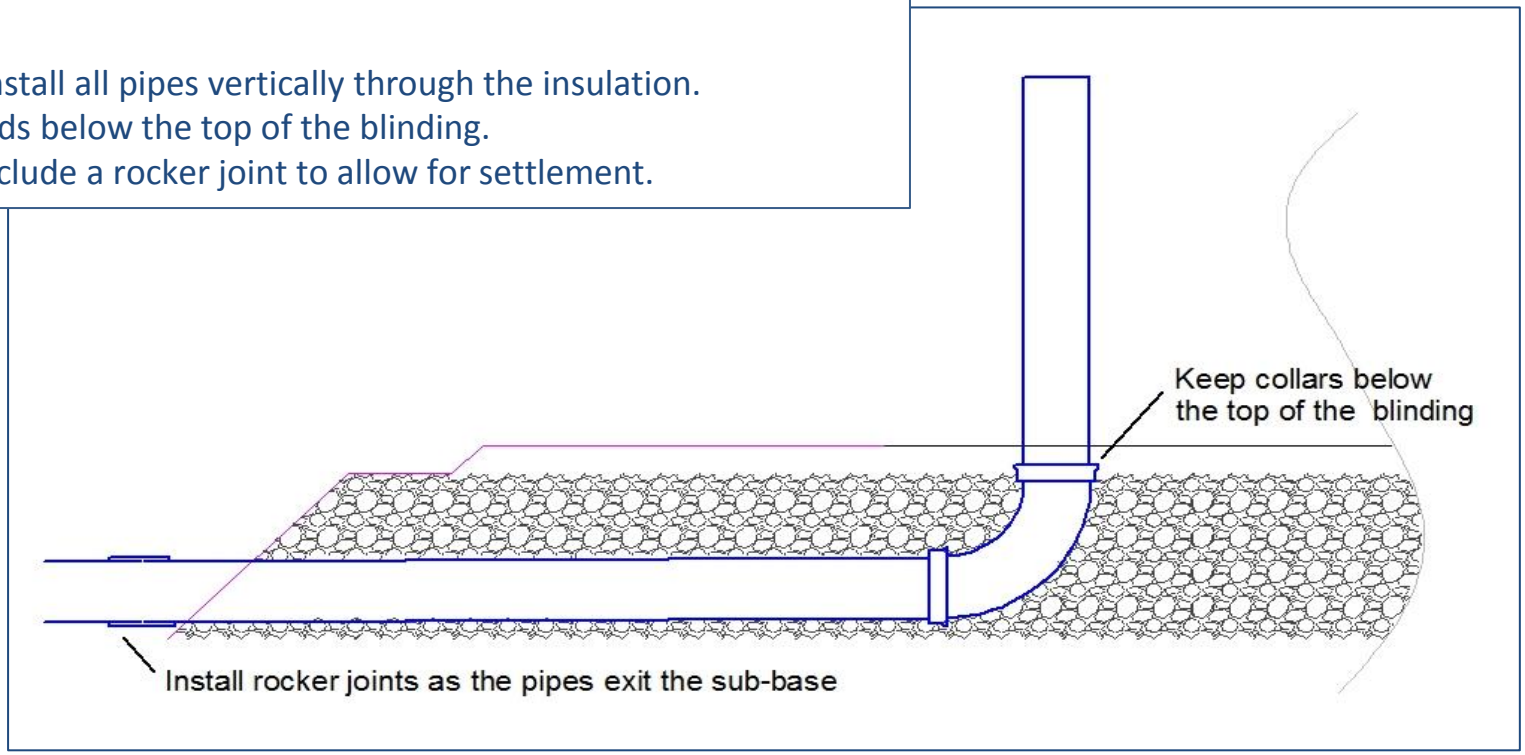
Type of Compaction Plant	Category	Number of passes for layers not exceeding the following compacted thicknesses:		
		110 mm	150 mm	225 mm
Smooth-wheeled roller (or vibratory roller operating without vibration)	Mass per metre width of roll:			
	over 2700 kg up to 5400 kg	16	unsuitable	unsuitable
	over 5400 g	8	16	unsuitable
Pneumatic-tyred roller	Mass per wheel:			
	over 4000 kg up to 6000 kg	12	unsuitable	unsuitable
	over 6000 kg up to 8000 kg	12	unsuitable	unsuitable
	over 8000 kg up to 12000 kg	10	16	unsuitable
	over 12000 kg	8	12	unsuitable
Vibratory roller	Mass per metre width of vibrating roll:			
	over 700 kg up to 1300 kg	16	unsuitable	unsuitable
	over 1300 kg up to 1800 kg	6	16	unsuitable
	over 1800 kg up to 2300 kg	4	6	10
	over 2300 kg up to 2900 kg	3	5	9
	over 2900 kg up to 3600 kg	3	5	8
	over 3600 kg up to 4300 kg	2	4	7
	over 4300 kg up to 5000 kg	2	4	6
	over 5000 kg	2	3	5
Vibrating-plate compactor	Mass per square metre of base plate:			
	over 1400 kg/m² up to 1800 kg/m²	8	unsuitable	unsuitable
	over 1800 kg/m² up to 2100 kg/m²	5	8	unsuitable
	over 2100 kg/m²	3	6	10
Vibro-tamper	Mass:			
	over 50 kg up to 65 kg	4	8	unsuitable
	over 65 kg up to 75 kg	3	6	10
	over 75 kg	2	4	8
Power rammer	Mass:			
	100 kg-500 kg	5	8	unsuitable
	over 500 kg	5	8	12

Installing drains and services

Usually the drains and ducts are installed after the sub base is compacted. This will require excavating the trenches for the pipes into the sub-base, using the narrowest machine bucket or drainage spade available.

Laying the pipes after the stone, protects them from being damaged when the stone is compacted.

Wherever possible install all pipes vertically through the insulation.
Keep collars and bends below the top of the blinding.
Rigid pipes should include a rocker joint to allow for settlement.



Blinding materials

Our Preferred materials is

2/6mm Limestone
Typically used as the bedding layer in permeable paving systems, it is angular in shape and free draining.
It does not contain dust.
It lays easily, does not move when rained on, and will create a capillary break under the insulation to help keep it dry.
Granite or angular gravel can be used as alternatives.





Not Recommended

Sand (0-4mm)
Due to the small grain size sand will allow water to be wicked upwards, resulting in the insulation sitting in a damp environment. Which can reduce the thermal performance.

On a practical level, if it rains on the exposed sand all your hard work will be un-done.



Pea Shingle
The rounded nature of the material prevents it from binding together properly



Blinding layer

The blinding layer must be flat, level & free draining.

A flat and level blinding will ensure the insulation is properly supported and avoid concentrated point loads which can crush the insulation.

Never lay the insulation directly on the sub base.

It should also extend at least 150mm beyond the edge of the bottom of the Isoquick.

The tolerance on the level of the blinding needs to be tighter than the tolerance on the level of the concrete.
You want the concrete +/-5, aim for +/-3 on the blinding.
This is a screeding operation.

Note: many laser level are not accurate enough over the distance across site.
Consider using an Optical (dumpy) level.



Screeding the blinding: hand tools

The right equipment makes screeding the grit blinding much easier and faster.

Method 1: Suitable for most sites:

Lay a dab of motar onto the sub base, and place a flat wooden board (approx 300mm square) on top of the mortar. Using a dumpy level on top of the board, squash the mortar to the finished blinding level. (remember to allow for the thickness of the board).
Place more dabs of mortar to create a grid on pads on 2-3m centres.

Once dry, spread the grit between the pads, and roughly level. Lay your straight edges from dab to dab and screed level.

For Screeding tools try

https://www.expresstools.co.uk/shop/block-paving/block-paving-screeding.html

https://www.baron-mixer.com/en/screed-roller-bar/





Method 2: Suitable for most sites:

Spread the grit in lines about 150-300mm wide across the site, the lines should be about 2-3m apart.
Lay round screed rails on to the grit and tap into the grit until the top off the rail is at the correct level.

Spread the rest of the grit between the rails ad roughly level.

Screed level.

Remember:
Mainly laser levels are only accurate to +/-3mm over 30m, so on larger sites you may need a more accurate optical level

Screeding the blinding: by machine

For larger sites consider automatic systems:

These work off professional grade lasers to control the screed level as they are driven across the surface.



Probst Levelking

For automatic systems try

Probst Levelking attachement or

http://www.dialadigger.co.uk/blec-machinery-hire.htm



Blec Laser grader

ISOQUICK® - Ready to install



The Insulated Raft

ISOQUICK®

For more info visit

www.isoquick.co.uk