



LANDSCAPING SOLUTIONS



INSPIRATION. IMAGINATION. IDEAS.



SO MANY IDEAS

AND YET, WE'VE BARELY SCRATCHED THE SURFACE.

A few years ago, landscaping seemed to be a lot simpler. Your outdoor design usually reflected the style of your home or the area you lived in. Modern, classic, rural or urban. English, European or perhaps Californian. The products on offer were limited and therefore, so were your options.

These days, things have certainly changed! When it comes to landscaping, pretty much anything goes and the range of products available is so vast. So where do you begin?

Here, that's where. In this brochure, you'll find dozens of ideas, guidelines and handy hints to get your imagination started, as well as plenty of hard-wearing, good-looking products from Firth to turn your plans into reality. From Designer Concrete™ to pavers to retaining walls, as New Zealand's largest and only national manufacturer of concrete solutions, we've got the lot.

Whatever your lifestyle, whatever your personal style, on the following pages you'll find the inspiration to make it your own style.

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LANDSCAPE TO ENTERTAIN

Firstly, what time of day do you plan to use your entertainment area? Does it get the morning or evening sun? If it's an extremely sunny area avoid using reflective or very light coloured pavers or concrete as they can create a lot of glare!

On the other hand, if it's a darker, more shaded area, lighter surfaces or the use of white pebbles make the area seem much brighter and warmer.

In larger areas, go for a more expansive look with big pavers, a large table and chairs and less plants – sculptural or large potted plants look good in a big space. In smaller areas, choose smaller pavers in simple colour schemes to avoid clutter.

And think about the visual impact of the area you and your guests will be looking at. Do you have a fabulous view to frame, or do you need to create one – perhaps with an interesting sculpture, planting arrangement or wall?

For entertaining in the evening, think about incorporating an outdoor fire or pizza oven into your design. You can also build extra-wide walls on raised planters around your courtyard to provide extra seating for guests.

Another option for regular entertaining is heated Designer Concrete. Your contractor can lay heated cables under the concrete to heat it – or even under outdoor tables or bench tops for warm alfresco dining. Heated concrete is also handy if you live in cold climates to melt snow and keep paths clear.



LANDSCAPE TO ESCAPE

If privacy and seclusion is what you have in mind, or if your outdoor living space is small, here are a few ideas to create your own backyard sanctuary.

Use retaining walls to define areas and create smaller 'rooms' within your outdoor living space. You can link these rooms using paths of pavers or stepping stones through areas of garden.

Raised gardens can also help create smaller, more intimate spaces, as will planting the area with plenty of lush, hanging foliage. Fragrant plants are fantastic in small courtyards as you're more likely to appreciate them.

Another idea is to create sunken areas using retaining walls or even walls of Designer Concrete. Then create safe, attractive steps in the area using textured pavers or a combination of pavers and pebbles.

In a small garden, it pays to keep your colour scheme simple. Green and white is popular and looks lush yet simple. Likewise it helps to choose pavers, retaining walls or concrete in just one or two colours.

If your backyard oasis includes a pool or spa, it's a good idea to use textured pavers or exposed aggregate Designer Concrete around wet areas to prevent slipping.



If you've got children (or grandchildren), your biggest priority may be designing a safe, fun play area that will grow with them.

If your kids are young, create a smaller 'playroom' where you can see them from the kitchen window - preferably covered, so they can still go outside on rainy days. Designer Concrete makes a strong, hard-wearing surface for kids to play on all year round.

In high traffic areas such as pathways or driveways (especially on the shady side of the house) you'll need a durable, non-slip surface such as textured pavers or pavers laid in a grid-like pattern. And make sure stepping-stones are close together for little legs.

Are kids going to be running around barefoot? If so, choose a flat, smoother style of paver or Designer Concrete, or a soft grass and make sure there's plenty of space.

Designer Concrete mixed with small pebbles or shells creates a 'rounded' texture without any sharp edges for kids to walk on.

Pavers are perfect as a border for a large grass lawn and make edges easier to mow. If you've got a boggy, clay lawn, think about replacing it with a 'sand lawn' - grass that's especially designed to grow on sand, resulting in a soft lawn that drains easily.

LANDSCAPE TO PLAY

PAVERS

IDEAS TO FIRE YOUR IMAGINATION



These days, Firth pavers come in so many shapes, sizes, textures and colours, it's easy to think outside the square.

Pavers are ideal for driveways, courtyards, paths, pools, borders; you name it. The combinations are infinite and you can vary your colour range to create visual interest.

Pavers are also a very affordable way to improve your outdoor living area. You can lay them yourself and better still, you can lay them in any weather – just prepare the area (see instructions on page 15), place the pavers and you're done.

As you'll see from the photos on these pages, pavers let you design a unique outdoor living environment that's an expression of your personality – and your home.

Inspiration

Pavers are excellent for creating curves around gardens, lawns etc, defining borders and linking different areas. They're also good for framing lawns to create a neat appearance and importantly, making lawns easier to mow!

Smaller pavers are very versatile. A circle or square of

small pavers is a great way to showcase and protect plants, sculptures or feature trees. Larger sized pavers are ideal for courtyards, entrances, and wash-down areas.

If you're keen on a more traditional look, go for classic patterns such as Herringbone or Basketweave. For a modern look, choose larger pavers with flat, symmetrical, clean lines. Laying pavers in a grid pattern will create safer, easier access for wheelchairs, pushchairs etc.

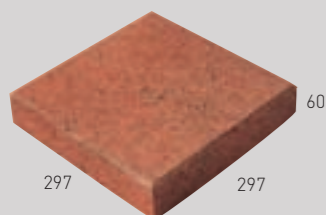
Try contrasting light and dark pavers to create visual interest – a checkerboard effect can look fantastic in a courtyard. Pavers also look stunning when contrasted with grass, pebbles or shells.

HELPFUL HINTS

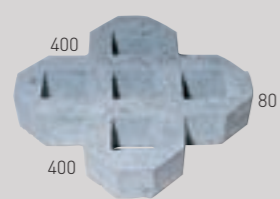
- Lighter coloured pavers are reflective so they're ideal in shady spots.
- Darker colours add contrast and interest into your garden design. They trap heat on sunny days and release heat at night, so they're perfect for entertainment areas.
- In high traffic areas and in wet areas such as around pools, choose textured pavers to avoid slipping.
- Once you've laid your pavers and when fully dried, seal them to help them last longer, preventing efflorescence, staining and to protect the integrity of the paver.
- To keep pavers free from moss and mildew, spray regularly with a pre-emergent spray.

THERE'S PLENTY TO CHOOSE FROM

DOMESTIC AND RESIDENTIAL DRIVEWAYS



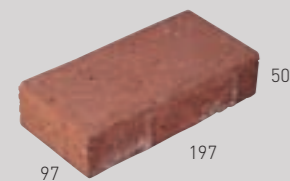
Boulevard® Paver:
per m² = 11



Grass Paver™:
per m² = 6
Note: Available in Natural only.



Mountable Kerb:
per lineal metre = 2.2



Holland® Paver:
per m² = 50



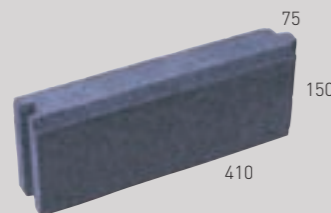
GobiBlock®:
per m² = 24
Note: Available in Natural only.



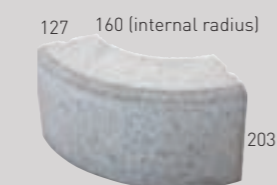
Road Kerb:
per lineal metre = 2.3



Classic Cobblestone™:
per m² = 22
Note: May be rumbled to order.

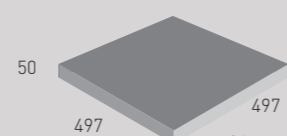


Euro Kerb:
per lineal metre = 2.4

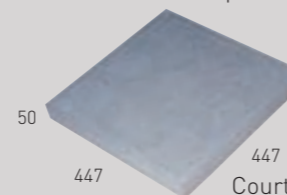


Radius Kerb:

PATIOS AND PATHS



Chancery® Paver:
per m² = 4



Courtyard Flagstone™:
per m² = 5



Walkway Paver™:
per m² = 22



Palermo® Paver*:
per m² = 5

LET'S PAVE THE WAY

GOOD PLANNING PAYS OFF

Choose a paver suitable for the job, mark out area to be paved (using a string-line or spray paint), calculate the area and order sufficient pavers. Remember, there will be some material loss in cutting and this needs to be accounted for when estimating.

Note: Paver number per m² is based on an average joint size of 3mm.

Determine and mark the final level, considering run-off from buildings, downpipes and adjacent sections. Building regulations require paving to be a minimum height below

the floor level. Check your local building regulations.

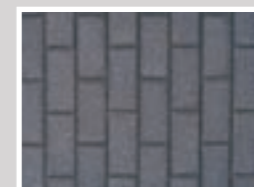
Allow a slope of 30mm per metre for good run-off (minimum of 15mm per metre) to avoid ponding. Add interest to your paving by laying a "soldier course" and/or "chasers". A chaser is a row of pavers, usually of a contrasting colour laid in the opposite direction immediately inside the soldier course.

By using a square and modular large format paver such as Boulevard, Courtyard Flagstone, Chancery Paver or Palermo the size of your paved area visually increases.

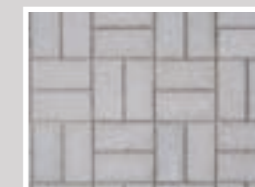
CHOOSE A LAYING PATTERN THAT SUITS YOU



45° Herringbone
Suitable for vehicle use when laid at 45° to traffic direction.



Stretcherbond
Suitable for patios, courtyards or paths.

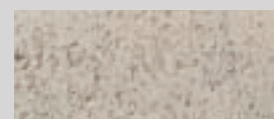


Basketweave
Suitable for patios, courtyards or paths.

Paver dimensions are actual sizes. NB: Number of pavers per m² includes an average joint size of 3mm.

* Palermo paver must be sealed once laid as it is a honed product. All Palermo pavers are delivered unsealed. It is the responsibility of the installer to seal Palermo.

PAVING COLOUR RANGE



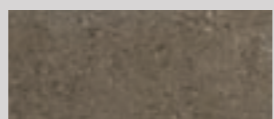
Cream Sands
Courtyard Flagstone



Autumn Leaves
Boulevard Paver
Chancery Paver
Classic Cobblestone
Courtyard Flagstone
Holland (50mm) Paver
Walkway Paver



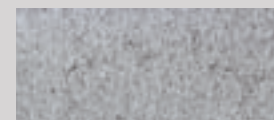
Terracotta
Boulevard Paver
Chancery Paver*
Classic Cobblestone
Courtyard Flagstone
Euro Kerb
Holland (50mm) Paver
Walkway Paver



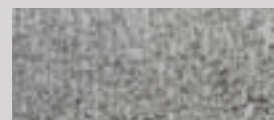
Fossil
Boulevard Paver
Chancery Paver
Classic Cobblestone
Courtyard Flagstone
Holland (50mm) Paver
Walkway Paver



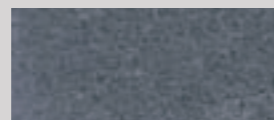
Warm Earth
Classic Cobblestone
Holland (50mm) Paver
Walkway Paver



Natural
Boulevard Paver
Chancery Paver
Classic Cobblestone
Courtyard Flagstone
Euro Kerb
Gobi Block
Grass Paver
Holland (50mm) Paver
Walkway Paver



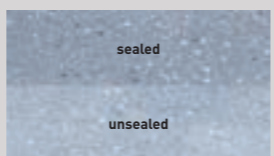
Graphite
Boulevard Paver
Chancery Paver
Classic Cobblestone
Courtyard Flagstone
Holland (50mm) Paver
Walkway Paver



Black Sands
Boulevard Paver
Chancery Paver
Classic Cobblestone
Courtyard Flagstone
Euro Kerb
Holland (50mm) Paver
Walkway Paver



Chiaro
Palermo**



Mezzanotte
Palermo**

* Available in the North Island only
** Palermo paver must be sealed once laid as it is a honed product - all Palermo pavers are delivered unsealed. It is the responsibility of the installer to seal Palermo.

A range of Architectural Paving colours are available regionally on a Made-to-Order basis. Bullnose and Roma pavers are now available on a Made-to-Order basis only. Colour range may change from time to time. For current range of colours visit www.firth.co.nz or contact Firth Information Service on 0800 800 576.

While every care has been taken to obtain an accurate representation, the colours shown here are subject to the limitations of the colour printing process. Visit your nearest Firth paving stockist to view samples before ordering. To ensure a uniform colour finish, we recommend you purchase pavers from one location, preferably from the same batch as minor colour variations do occur due to natural variance in raw materials. If your job will use more than one pallet of pavers, "mix and match" units from each pallet to ensure a uniform mix of colours. Pavers may also display a "whitening" otherwise known as efflorescence. **Sealing the paving will enhance durability, colour and the ease of cleaning and maintenance. Always use sealers in accordance with the manufacturers instructions.**



DESIGNER CONCRETE™

HARD-WEARING. HARD TO RESIST.



These days, the common concrete driveway or path has given way to super-stylish Designer Concrete of every colour, texture, shape and size under the sun.

Designer Concrete is durable, easy to maintain and extremely versatile. You can mix and match colours and textures with pavers, pebbles, wood to create a unique and inspirational outdoor space which matches your home and environmental influences.

Concrete is perfect for paths, driveways, entertainment areas, children's play areas. You can choose coloured concrete, exposed aggregate concrete, stamped concrete - the possibilities are only limited by your imagination!

Better still, concrete lasts for years, is easy to maintain and is quiet underfoot and under wheels. No wonder it's proving hard to resist for so many designers.

Inspiration

If you live in a coastal area, match your home to your environment by mixing shells into your concrete. On a steeper site or in shady, damp spots, choose an exposed aggregate concrete (where the surface layer is washed away leaving the rocks or pebbles slightly exposed) to increase traction.

You can cut out diamonds or circles in concrete driveways to add visual interest - or insert paving details such as pebbles or contrasting pavers. By contrasting a smooth coloured concrete with a rough exposed aggregate mix, you can create sharply defined borders and interesting textures.

Darker colours in entertainment areas will absorb heat during the day, then release heat at night. Lighter coloured concrete will help lighten and warm a darker home.

HELPFUL HINTS

- To maintain concrete, spray at least once a year for moss and mould.
- Always use low-pressure to wash concrete as high-pressure water-blasting breaks down the concrete.
- You can design your concrete surface to channel water away from your home using clever contouring and drainage.
- Use a sealer when concrete is laid to add sheen, highlight colour, protect the aggregate and help prevent stains such as oil leaks.

RETAINING WALLS

FRAME YOUR LANDSCAPE



Nowadays, retaining walls tend to be an integral part of any garden design. Firth retaining walls are perfect for creating a focal point in your garden, highlighting a special feature or levelling off areas so you can have a magnificent lawn.

Retaining walls are great for creating terracing where space is limited. On a steep site, they give your garden structure, highlight natural features, and help control soil erosion. You can also use them to elevate garden beds, showcase specimen trees and improve drainage and soil.

Best of all, they're low maintenance, easy to transport and build and they last for years! With so many colours, shapes and sizes to choose from, Firth retaining walls can literally take you to new heights of landscaping design.

Inspiration

Retaining walls are great for defining areas. For example, on a sloping site, you might build a flat courtyard next to the house, then use retaining walls to raise the lawn level behind it, with wide steps between the two.

For shading or screening, retaining walls create instant height. They're ideal for canopy trees such as weeping cherry when you need immediate easy access underneath (rather than waiting for them to grow!).

Cascading plants can be quickly grown to soften the appearance of retaining walls, or they look great with distinctive, sculptural plants such as agaves or flaxes. Play with curves and shapes to match your landscape, or to match a modern home, try concrete masonry (block and plaster) walls with a smooth, painted finish. In entertainment areas, a low, wide wall made from concrete masonry or a capped, chunky stone provides extra seating for guests.



HELPFUL HINTS

- Terraced retaining walls will let more light into an area rather than one, high wall.
- Raised beds showcase plants and are better for vegetable gardens in particular, as they improve drainage.
- The modular shape and design of Firth retaining walls means you can install them yourself (as long as you're reasonably strong!).
- Retaining walls require little maintenance but if you need to clean them, use a pre-emergent spray and low-pressure water.

A RANGE OF STYLES AND COLOURS TO SUIT EVERYONE

Firth® Border Stone™, Windsor™, Meadow Stone™, Diamond Pro™ and Diamond Pro Stone Cut™ make it easy to create stylish and practical retaining walls. No mortar, fiddly pins or jointers mean no fuss as the blocks lock together with a unique rear lip.

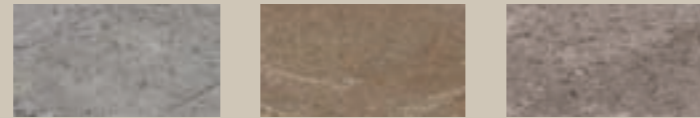
Border Stone is ideal to create raised gardens up to 450mm* high, whilst Windsor is appropriate for terraced gardens and retaining walls up to 900mm* high. Meadow Stone achieves the look of natural stone also building a wall up to 900mm* and Diamond Pro and Diamond Pro Stone Cut is perfect for those heavy duty walls up to 1.2 metres*, depending on existing ground conditions, and up to 10 metres with appropriate engineering.**

Both Diamond Pro, Diamond Pro Stone Cut and Meadow Stone incorporate capping units to complete your landscaping project. All Firth retaining wall blocks are available in a range of colours to suit your garden design.

COLOURS

While every care has been taken to obtain an accurate representation, the colours shown here are subject to the limitations of the colour printing process. Visit your nearest Firth Distributor to view samples before ordering. If your wall uses more than one pallet of blocks, "mix and match" blocks from each pallet to ensure a uniform mix of colours.

Colours Available



Rockface Sandstone Granite

To ensure a uniform colour finish, we recommend that you purchase your blocks from one location, preferably from the same batch as minor colour variations do occur due to natural variance in raw materials. Blocks may also display a "whitening" otherwise known as efflorescence. This is a characteristic of many natural products and does diminish over time.

CHECK WITH YOUR COUNCIL

Before you start any landscaping or building project, it's important you make sure the finished job will comply with the appropriate building codes and council regulations. For full information on the regulations applying to your area, call the Engineer's office at your local council.

*Firth retaining wall systems can be used up to these specified total heights without any soil reinforcement provided the following soil conditions are present:
 1. Slopes or other wall terraces are not present above or below the wall.
 2. Site soils are clean sand and gravel.
 3. No surcharge loads are present.

**Firth retaining wall systems can be built to heights exceeding those mentioned above with engineering design. For further information on engineered walls, call Firth on 0800 800 576.

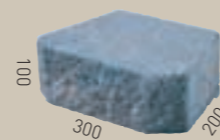
BORDER STONE

Per lineal metre 4.65
 Weight: 6kg
 Setback: 14mm
 Maximum wall height: 450mm



WINDSOR

Per m² 33
 Weight: 12.5kg
 Setback: 20mm
 Maximum wall height: 900mm



MEADOW STONE 3-PIECE SYSTEM

Coverage: Large unit: 0.0622m²
 Medium unit: 0.0390m²
 Small unit: 0.0232m²
 Setback: 25mm
 Maximum wall height: 900mm

NB: Meadow Stone is available in Rockface & Sandstone colours only.



Small Block
 Weight: 9kg



Medium Block
 Weight: 16kg



Capping Unit
 Weight: 25kg



Large Block
 Weight: 23kg

DIAMOND PRO / DIAMOND PRO STONE CUT

Per m² 11
 Weight: 32kg
 Setback: 25mm
 Maximum wall height: 1.2metres

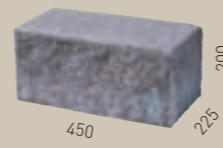
(depending on existing ground conditions)
 Note: Can be built to heights exceeding 1.2 with engineering design.



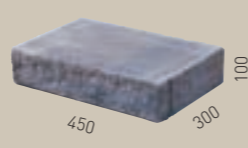
Bevelled Unit



Stone Cut Unit



Corner Unit
 Weight: 45kg



Capping Unit
 Weight: 30kg

NB: Dimensions are measured from outside corner to outside corner.

PAVERS INFORMATION



CALCULATE THE EXCAVATION DEPTH

The maximum aggregate size should be less than 1/3 the depth of the required base course. So if 100mm of base course is required, use gravel with a maximum aggregate size of 33mm. This will allow better compaction of individual layers. On a very weak clay subgrade, a geotextile fabric will prevent clay from pushing up into the base material.

The paved area will need excavation to the combined depth of your pavers, bedding sand and base course required (refer to the Required Excavation Depth example).

Calculate the required excavation depth by taking into account the base course needed and the thickness of your pavers.

BASE COURSE REQUIRED

Driveways (light vehicle traffic)	100mm granular base material
Pedestrian use only	50mm granular base material

Note: As per NZS 3116:2002. For driveways with medium traffic, i.e. four wheel drive vehicles, add 50%.

REQUIRED EXCAVATION DEPTH EXAMPLE

Paver thickness	50mm
Base Sand	30mm
Base Course	100mm
Excavation Depth (total)	180mm

1. EXCAVATE AND PREPARE THE SUB-GRADE

Remove all top soil and excavate to the required depth. If the excavated surface (sub-grade) requires filling to reach the desired level, use existing organic free material if available. Fill in and compact in layers of no more than 100mm, and compact using a plate compactor or rammer. The finished sub-grade should match the exact contour chosen for the final paving, within a tolerance of +0 to -20mm at any point.



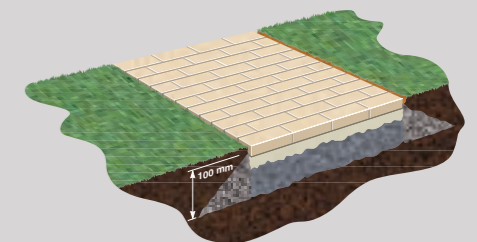
2. PREPARE THE BASE COURSE

The base course should comprise of granular material with hard durable particles free from organic material. Fill in and compact in layers of no more than 100mm and compact to a uniform dense condition, especially around manholes and kerbs. If the texture of the finished base course allows bedding sand to drain through, seal the base course with a fine shingle i.e. GAP7 before proceeding. The finished base course should match the exact contour chosen for the final paving, within a tolerance of +0 to -10mm at any point.



3. PLACE THE EDGE RESTRAINTS

Edge restraints add strength by preventing sideways movement of pavers. Where present, existing paths or structures will suffice, but if not, edge restraints must be laid. Firth Euro Kerbs are suitable for this. An alternative to this is "haunching", where the outer pavers are held by concrete, starting approximately half way down the side of the pavers and angled downwards at 45 degrees to a further depth of 100mm (see diagram to the right). Haunching should be undertaken after compaction. Use a temporary constraint until the haunching is in place.



4. PREPARE THE SAND BASE

Bedding sand provides support for the pavers but will not hide irregularities in the base course or sub-grade. It should be well-graded and damp but not wet. Only spread enough sand for the pavers you'll lay in one session. Store sand for later use in a covered pile to maintain its moisture level. Use runners and straight edges to aid screeding. Two methods of bedding sand preparation can be used. The first may be used only for Boulevard, Holland or Classic Cobblestone Pavers. In this method the final compacted sand depth once the pavers are laid out should be 30mm. Start with 35 to 40mm to achieve the desired sand thickness. Since the degree by which your sand compacts will vary, experiment with a paver and rubber mallet to see what depth will produce a 30mm compacted layer.

The second method may be used on all Firth paver/flagstones. Here the sand bedding is spread and fully compacted by several passes of a plate compactor. The top surface of the compacted sand is screeded back to a thickness of 25mm. A 5mm layer of uniform box sand is then screeded or loosely scattered over the top of the precompact sand.

5. LAY THE PAVERS

Starting from the straightest convenient edge, start laying your pavers in accordance with your chosen pattern. Avoid laying downhill if possible. Maintaining a nominal joint of 3mm between pavers is essential to allow sand penetration and paving performance.

If you need to cut pavers for edge filling, use a concrete saw or paving splitter (available from hire centres) or a bolster chisel for smaller areas. Keep vehicles off the paved area until complete and if a loaded wheelbarrow has to cross it, lay timber running boards.

6. COMPACT THE PAVERS

For smaller areas use a rubber mallet to compact. For larger areas use a plate compactor, available from most hire centres. A minimum of 3 passes each at 90° is recommended. Extra care must be taken when compacting Chancery Pavers, Courtyard Flagstones, Palermo Pavers, Grass Pavers or Gobi Blocks. Carpet may be required when compacting these pavers to help prevent them from cracking. Alternatively a rubber mallet may be used. Contact Firth Information Service on 0800 800 576 for more information.

Once the pavers are compacted, sweep dry joint sand such as Dricon PaveSand™ or Dricon PaveLock® (following the instructions on the bag)* into the joints. Go over with a plate vibrator again and repeat the process until all joints are filled.

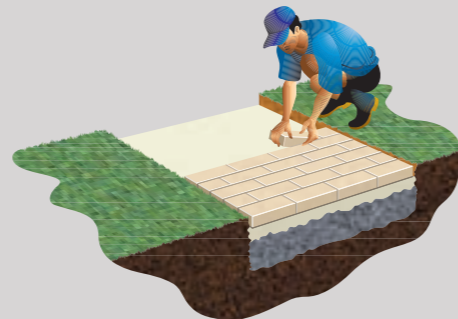
Grass Pavers and Gobi Blocks don't require jointing sand. Once compacted into place, spread topsoil and sow grass seed or for a different look fill the voids with decorative pebbles.

* If used in damp conditions or not swept clean, surface contamination (staining) may result. Please try a small area first.

7. FINISHING TOUCHES

Joints in pavements with a high traffic volume will seal quite quickly and little further maintenance will be necessary. For areas such as patios or paths where pavers may be vacuum cleaned or washed regularly, joints may need periodic topping up.

To maintain a just laid look, a variety of sealers are available on the market. Talk to your local Firth distributor about the paving sealers that they stock. Unsealed paving will weather naturally making colours appear less intense.



RETAINING WALLS

INFORMATION

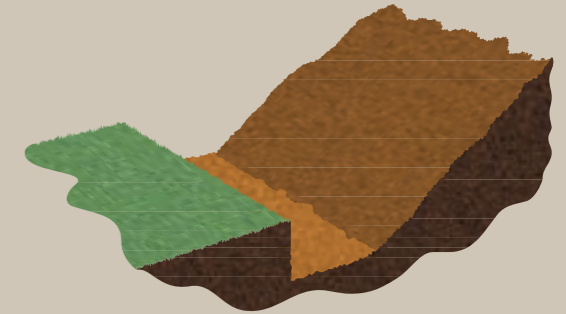


1. EXCAVATE

Dig out the area behind where your wall will go to allow for backfill. Then dig a trench along the line of your wall's planned base to the width and depth shown in the table.

Trench Size

System:	Width	Depth for 3 layers or less	Depth for 4 layers or more
Border Stone	440mm	200mm	250mm
Windsor	500mm	200mm	250mm
Meadow Stone	500mm	225mm	300mm
Diamond Pro	600mm	250mm	350mm
Diamond Pro Stone Cut	600mm	250mm	350mm



2. CREATE A LEVEL BASE

Compact the soil in the base of your trench. Then add compactable base course (fine gravel) to the trench and compact until firm and level. Check this both ways with a level and stringline to make sure your wall will be built on a good foundation.

Required Base Course

System:	Depth
Border Stone	150mm
Windsor	150mm
Meadow Stone	150mm
Diamond Pro	150mm
Diamond Pro Stone Cut	150mm

NB: Depends on existing ground conditions. Contact Firth Information Service on 0800 800 576 for more information.



3. LAY THE FIRST LAYER

Getting the first layer perfectly level is **critical** to the accuracy of the rest of your wall. Chisel the locator lips off the wall units for the first layer prior to laying. Place the first layer of retaining wall units on your prepared base. Make sure each unit is in full contact with the base material, and the finished layer is level from side to side and front to back. Stringline the back of the first layer to verify straightness. On sloping sites always start building your retaining wall at the lowest point and work uphill.



DRAINAGE

If you are going over 3 layers, place a drainage coil (100mm diameter) behind the first "above ground" layer of the wall. Extend the coil away from the wall to ensure good drainage. Connect the coil to the nearest silt trap.

4. CONTINUE LAYING AND BACKFILLING

Make sure the top of each layer of wall units is perfectly level and free of aggregate and soil (use a brush) before laying your next layer of blocks. Lay subsequent layers of your Firth retaining wall units by pulling each unit forward so that its lip engages with the units below. Each unit should be offset by half a unit below to maintain a "running bond" pattern. As each layer is finished, backfill with free drainage aggregate extending out 300mm and compact. Do not use topsoil or clay material as backfill. As you build your wall, fill the cavity behind it. Ensure all cavities within each unit and gaps between are filled with free drainage aggregate. Backfilling and compaction should be carried out in 150mm to 200mm layers.



5. FINISHING TOUCHES

Once your wall reaches the desired height, use the compactor to firmly compact and fill behind the wall. Do not use the compactor on the wall itself. If using either Diamond Pro, Diamond Pro Stone Cut or Meadow Stone, affix the capping units to the top of the wall using a building adhesive.

If you plan to have a garden level with the top of your wall, backfill and compact to below the desired depth of your bed then add topsoil to the wall level.



CURVED WALLS AND CORNERS

For each Firth retaining wall system, there is a different minimum radius for inside and outside curves. These are illustrated below.

Remember when planning a curve the radius will be different to the layer below, due to each layer's setback (the depth of the locator lip). For inside curves the minimum radius applies to the bottom level of wall units. For outside curves, the minimum radius applies to the top level of wall units since these will form the tightest curve. For 90° corners Diamond Pro and Diamond Pro Stone Cut have a specially designed corner unit to ensure a neat finish. To construct 90° corners with any other units you will need to split units to fit.

SPLITTING

Depending on the design of your wall you may need to cut some wall units. To split a unit with a hammer and chisel, score the unit on all sides and pound the chisel on the score line until the unit splits. Alternatively a circular saw with a masonry blade or hydraulic splitter can be used.

EXAMPLE

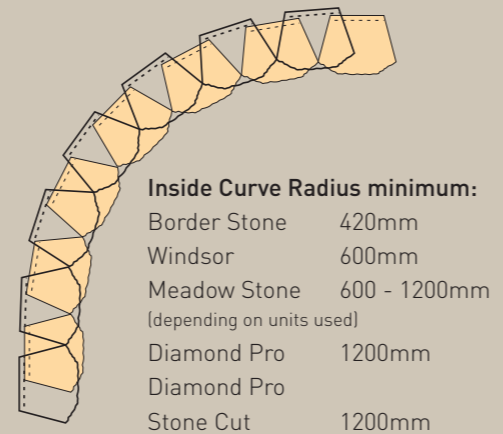
Calculating the Inside Curve Radius for a Border Stone Wall 3 Layers High:

- **Bottom Radius required for set-out > Minimum Inside Curve Radius**
= 420mm
- **Top Radius that will be achieved = Bottom Radius + (No. Layers x Setback)**
= 420mm + (3 x 14)
= 462mm

Calculating the Outside Curve Radius for a Diamond Pro and Diamond Pro Stone Cut Wall 6 Layers High:

- **Top Radius > Minimum Outside Radius**
= 1200mm
- **Bottom Radius required for set-out = Top Radius + (No. Layers x Setback)**
= 1200mm + (6 x 25)
= 1350mm

NB: Both the Inside & Outside Curve Radii are measured at the external face of the units.



Inside Curve Radius minimum:

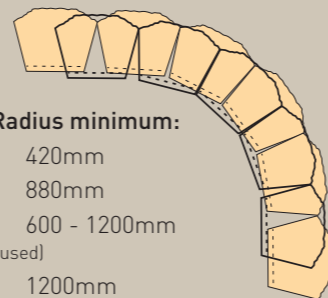
Border Stone	420mm
Windsor	600mm
Meadow Stone	600 - 1200mm (depending on units used)
Diamond Pro	1200mm
Diamond Pro Stone Cut	1200mm

Setbacks:

Border Stone	14mm
Windsor	20mm
Meadow Stone	25mm
Diamond Pro	25mm
Diamond Pro Stone Cut	25mm

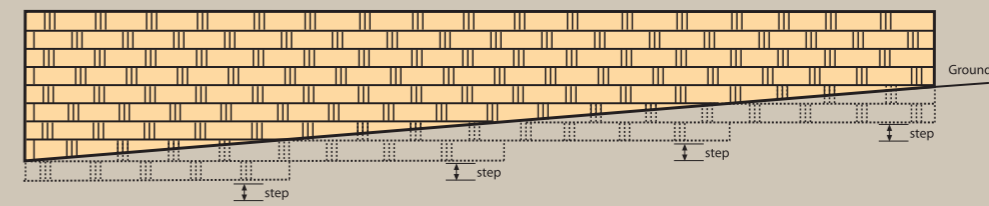
Outside Curve Radius minimum:

Border Stone	420mm
Windsor	880mm
Meadow Stone	600 - 1200mm (depending on units used)
Diamond Pro	1200mm
Diamond Pro Stone Cut	1200mm

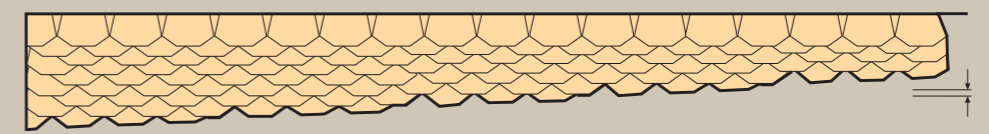


SLOPING SITES AND TERRACED WALLS

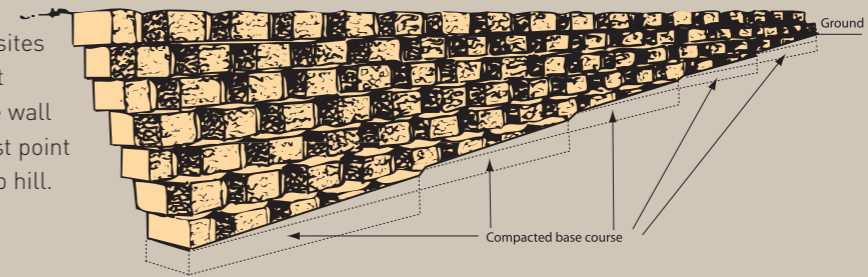
Elevation on wall



Plan on wall



On sloping sites always start building the wall at the lowest point and work up hill.



Step up each course:

Border Stone	100mm
Windsor	100mm
Meadow Stone	150mm
Diamond Pro	200mm
Diamond Pro Stone Cut	200mm

When laying base course on a slope it is important to adjust the base course alignment for the setback created by each step up.

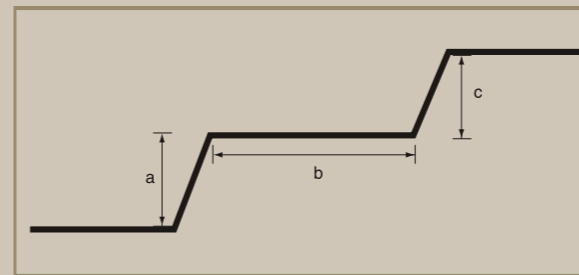
Setback:

Border Stone	14mm
Windsor	20mm
Meadow Stone	25mm
Diamond Pro	25mm
Diamond Pro Stone Cut	25mm

TERRACING

You can use Firth Retaining Walls to create a series of two or more terraces, providing you follow these design principles:

1. The height of the upper wall must never be greater than the height of the lower wall.
2. The horizontal distance from the top of the lower wall to the base of the upper wall must be at least twice the height of the lower wall.
3. The maximum height of any individual wall is, 450mm for Border Stone, 900mm for Windsor, 900mm for Meadow Stone and 1200mm depending on existing ground conditions for Diamond Pro, Diamond Pro Stone Cut. For walls not complying with this, specific engineering design must be obtained.



b must be at least twice a.
c must be less than a.

Note: The area immediately above and below the finished retaining wall must be flat. If this is not the case the slope may be unstable and specific engineering will be required. Contact Firth on 0800 800 576 for advice.

ESTIMATING TABLES

System	Number per m ²
Border Stone	4.65 per lineal metre
Windsor	33
Meadow Stone	Coverage: Large Unit: 0.0622m ² Medium Unit: 0.0390m ² Small Unit: 0.0232m ²
Diamond Pro	11
Diamond Pro Stone Cut	11

For circular gardens and tree rings use the following estimating tables.

BORDER STONE

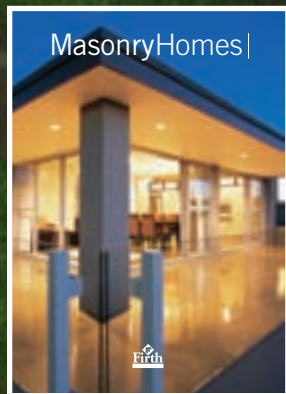
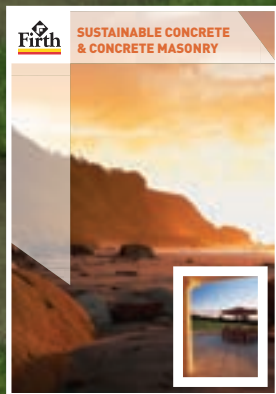
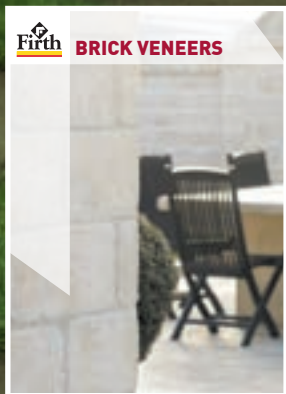
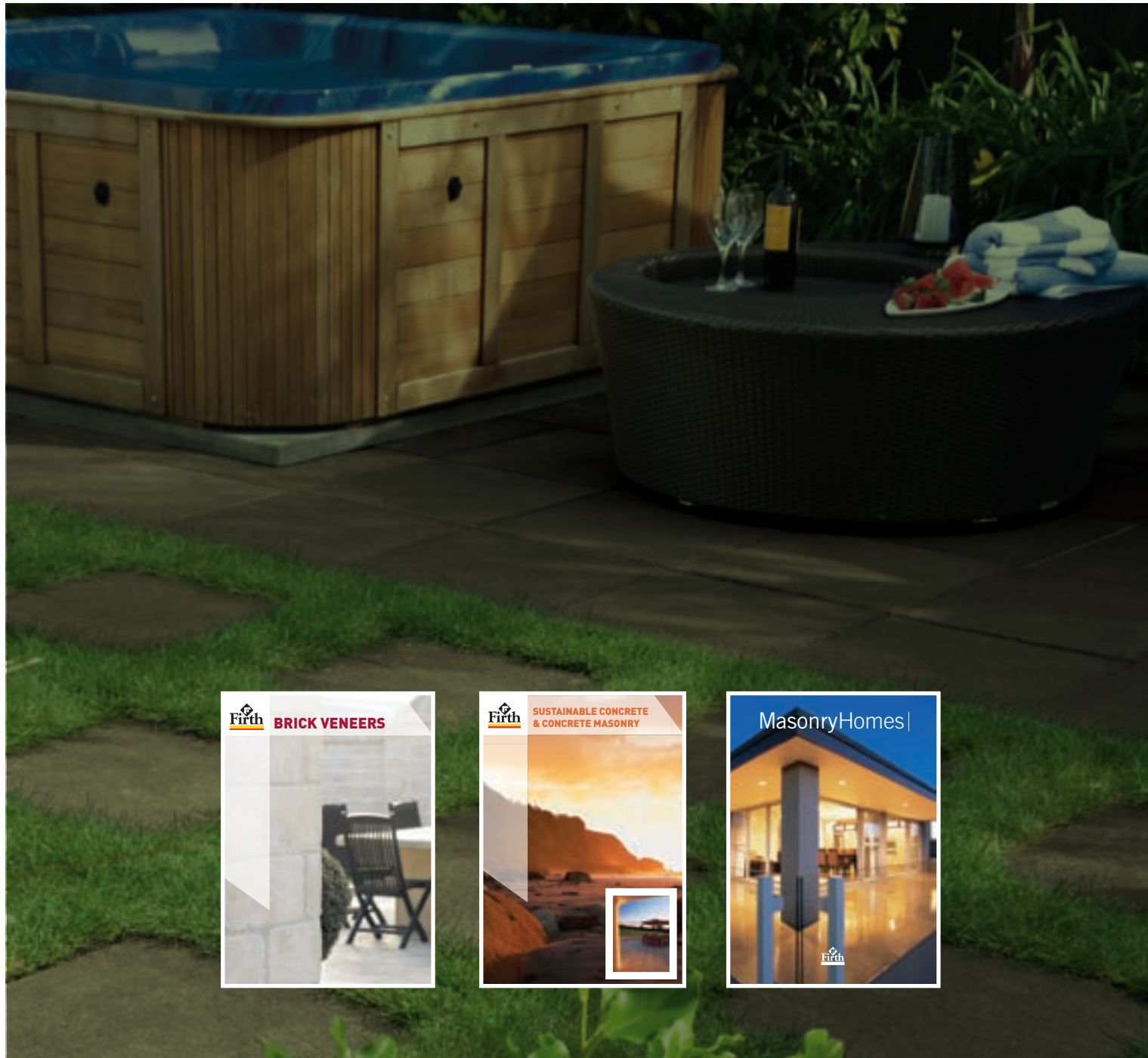
Diameter Top Ring	2 layers	3 layers	4 layers	5 layers
1 metre	31	47	64	81
1.5 metres	45	69	93	118
2 metres	60	91	122	154
2.5 metres	75	113	152	191
3 metres	89	134	180	227
4 metres	119	179	240	301
5 metres	148	223	298	374
6 metres	177	266	356	446

WINDSOR

Diameter Top Ring	2 layers	3 layers	4 layers	5 layers
1.5 metres	33	50	68	86
2 metres	43	65	88	112
2.5 metres	54	82	110	139
3 metres	64	97	130	164
4 metres	85	128	172	216
5 metres	106	160	214	269
6 metres	127	191	256	321

MEADOW STONE

For best results, use the Meadow Stone 150mm and 250mm pieces for tree rings that have a radius of 600mm to 1.2m (top layer) and all three Meadow Stone pieces on tree rings that have a radius of 1.2m or more (top layer).



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