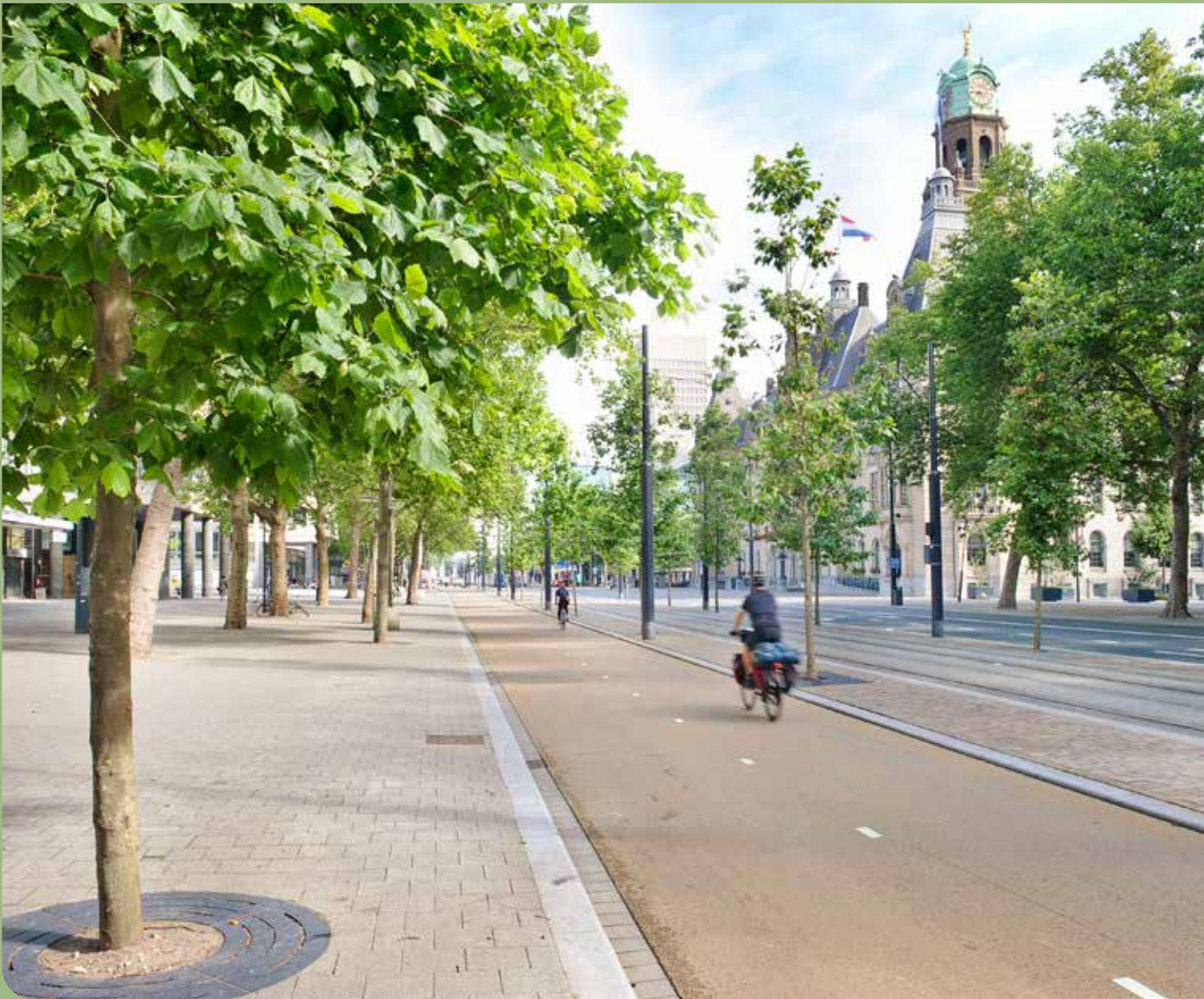




Root Protection & Guidance

Application for protection of

- Cables
- Pipelines
- Sewers
- Foundations
- Pavements
- Gardens, sports grounds, parks and playgrounds
- Ponds and swimming pools
- The trees themselves

Root Guiding or Root Barrier?

The first step in selecting the right system

The difference between Root Guiding and Root Barriers.

A root barrier has smooth sides and can be made of various materials such as non-woven fabric or HDPE.

A tree root will follow along the panel once it has reached the root barrier due to a root barrier being smooth and having no ribs to guide roots. When a root barrier is installed too close to a tree it has a de-stabilizing or 'flower pot' effect.

The root guiding panel is unique and has no alternatives. The guiding panel is provided with 90° vertical ribs; when the tree root comes into contact with the guiding panel the ribs direct root growth downwards. When the root arrives at the bottom of the panel it can proceed growing along its horizontal

or radial path (when the tree pit is correctly prepared). The guiding panel is also provided with ground locks to stop roots lifting up the system as they exit beneath. The panels also have a double

upper edge to make sure the roots cannot grow over the top edge and has a simple coupling system that enables the panels to be easily connected.

When to use Root Guiding?

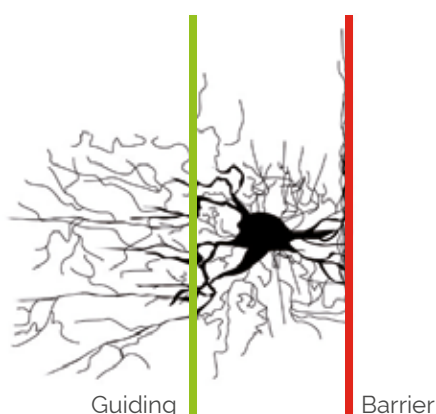
Root guidance is used at a distance of less than 2 m from the tree (this is a guideline, it is depending of the trunk flare). It is used as a protection for the road surfacing and to guarantee the necessary stability of the tree.

When to use a Root Barrier?

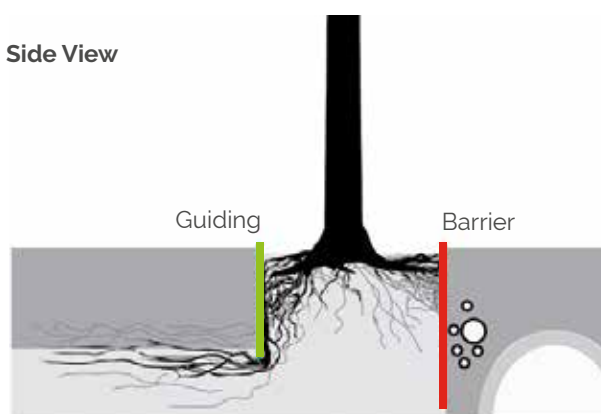
Root barriers are used to create root-free zones, for example to protect underground utility services against root growth. Root barriers can only be used if the available rotatable space is sufficient for the tree species. As a rule of thumb, we advise a minimum of 2 m between the root barrier and the tree.

Effect of Root Guiding and Root Barriers

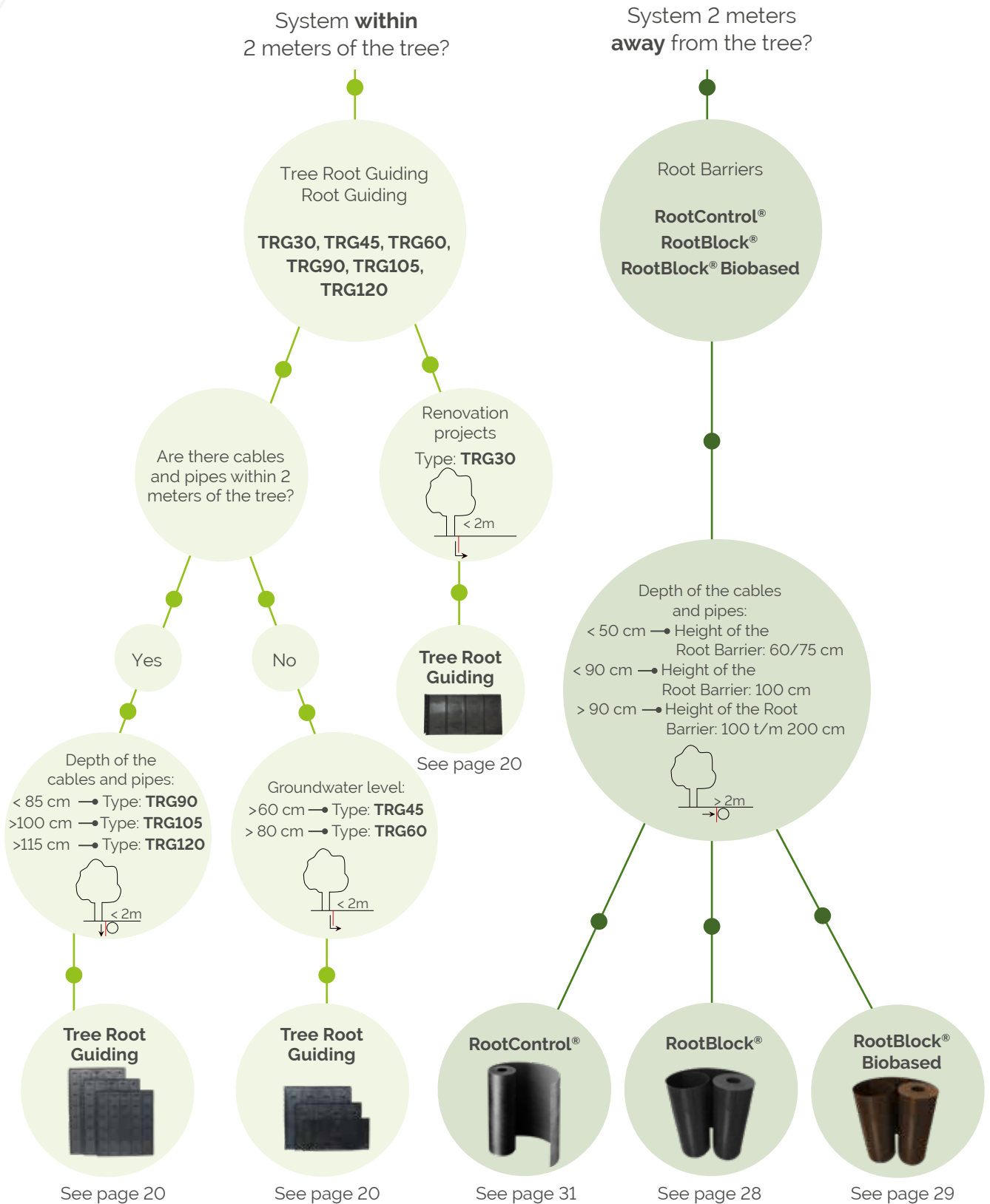
Top View



Side View



Root Guiding of Root Barrier?







Root Guiding

TRG

The GreenMax Tree Root Guide was designed to prevent root growth from lifting and damaging paving. Its panels feature special guide ribs which redirect tree roots deeper into the soil. The Root Guide can be used within two metres of the tree. Conventional root barriers do not guide roots and therefore offer no stability and limit the room to grow.

Research shows that some right-angled 90 degree guide ribs are effective enough to prevent against rotating roots and guide the roots downwards instead. To prevent roots lifting the panels, horizontal ground anchors fix the panels in place. Our panels meet all requirements of root guidance. In addition, the TRG panels are also equipped with a double top edge. The rim prevents root growth over the panels and prevents cracking entry of the screens.

Root guidance has been in use since 1976. The system has proved itself being in thousands of projects ever since. However, it is still essential to use the product in the correct way, which is very simple.

Material

TRG30, TRG45, TRG60, TRG90, TRG105 and TRG120

- High-quality recycled material (50% post-consumer)
- Injection moulded copolymer polypropylene
- Manufactured in ISO 9002 certified factories
- 90° ribs guide tree roots downwards
- Reinforced double top rib, resistant to repeated foot traffic and against spring roots to prevent overgrowth
- UV-stabiliser additive to prevent adverse effects of sunlight
- Ground anchors to prevent the panel from being pushed up out of the soil
- Produced in Europe

TRG30, TRG45 en TRG60

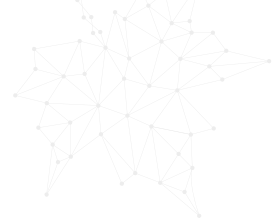
- Panels are 60 cm wide

TRG90, TRG105, en TRG120

- These panels can be interlinked in order to bridge any cables or piping encountered
- Panels are 75 cm wide

TRG45 sliding panel, TRG60 sliding panel

- A Tree Root Guiding sliding panel can be used for any tree pit dimension.
- The width of the panels: from 48 to 85 cm



Proven since 1976 - 50-year warranty.



Dimensions

Type	Panels height	Width	Thickness	Per box	Per m ¹
TRG30/LR30	30 cm	60 cm	2 mm	20 PCS	12 m ¹
TRG45/DR45	45 cm	60 cm	2 mm	20 PCS	12 m ¹
TRG60/DR60	60 cm	60 cm	2 mm	20 PCS	12 m ¹
TRG90/LR90	90 cm	75 cm	2 mm	Deliverd by piece	0,75 m ¹
TRG105/LR105	105 cm	75 cm	2 mm	Deliverd by piece	0,75 m ¹
TRG120/LR120	120 cm	75 cm	2 mm	Deliverd by piece	0,75 m ¹



Application of Root Guiding Panels all around installation



A Tree Root Guiding sliding panel can be used for any tree pit dimension. The advantage of this panel is that a nice 90° angle can be created immediately.

Type TRG45 sliding panel, TRG60 sliding panel

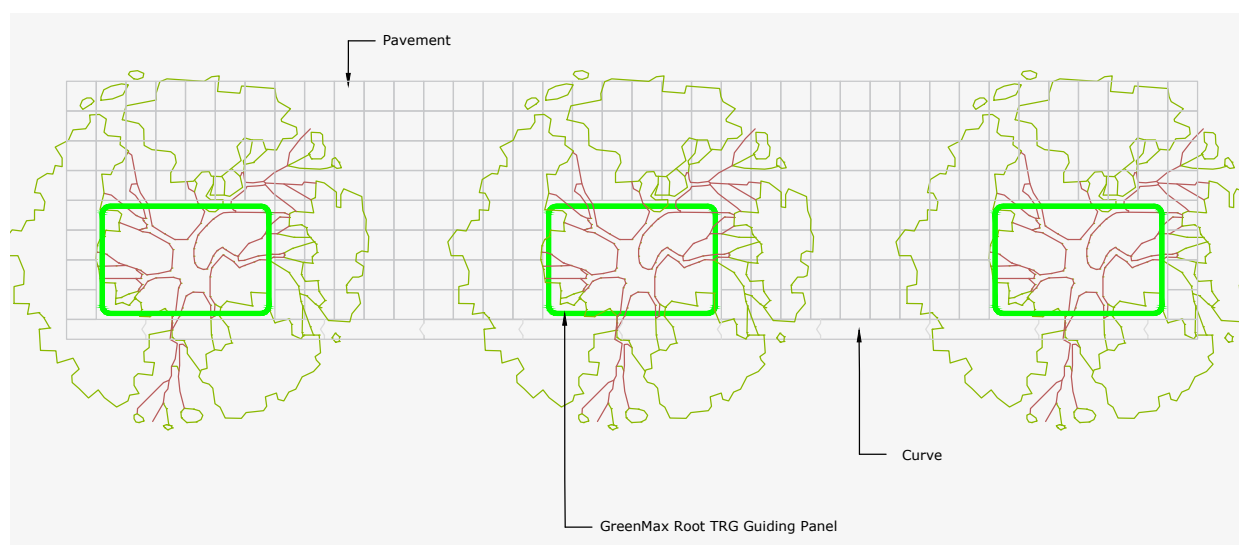
Protect the surrounding hard landscaping on all 4 sides of the tree with root guide panels. Use the maximum available space within the tree pit to ensure maximum uncompacted soil and free root space for the tree, and a good quality root guidance. Take enough space for the trunk flair as the tree grows to reach its mature size.



Afmetingen

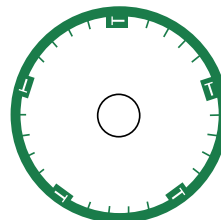
Type	Panel height	Width	Thickness	Per box
TRG45 sliding panel	45 cm	from 48 till 85 cm	2 mm	8 angles per box (suitable for 2 tree pits)
TRG60 sliding panel	60 cm	from 48 till 85 cm	2 mm	8 angles per box (suitable for 2 tree pits)

Application: all around



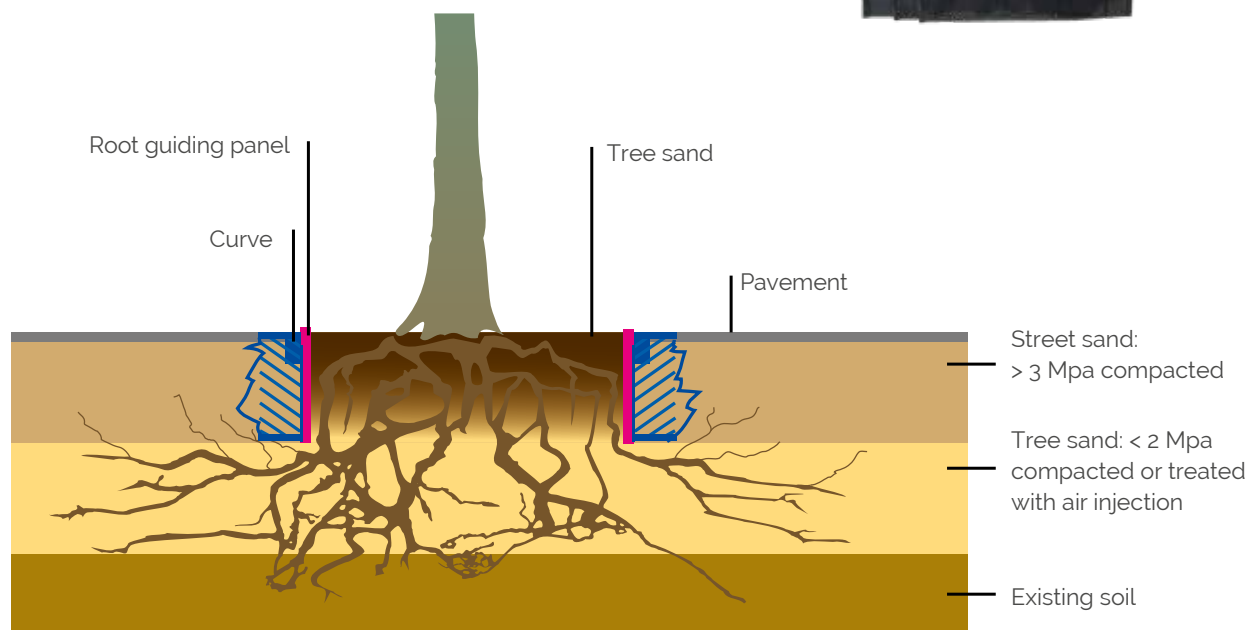


Application of low panels (30, 45 or 60 cm height)



Ø 5 Panels 96 cm
Ø 6 Panels 115 cm
Ø 8 Panels 153 cm

Diameter calculation: total length of panels divided by 3.14 cm = cm



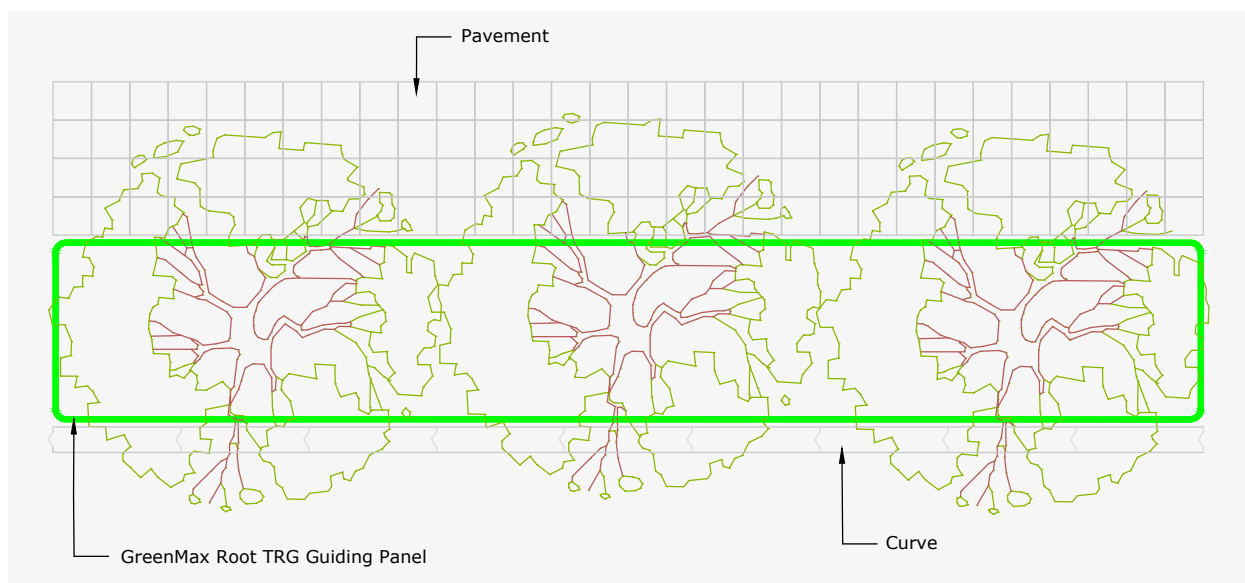
Application of Root Guiding Panels linear installation



Linear installation (all types)

With Tree Root Guiding you ensure maximum protection of the hard landscaping. By using a linear application you give the tree maximum available root space and stability, therefore improving the health of the tree. To protect the hard landscaping the root guiding can be placed directly alongside of the pavement. For cables and pipes, we use the 90, 105 and 120 cm high panels to prevent tree roots from possibly damaging these cables and/or pipes. These types are therefore applied if the trees are too close to cables and pipes. The Root Guiding panels allow the roots to grow deeper into the soil, giving the tree more stability. The roots will no longer grow under the panel when the high panels (90, 105 and 120 cm) are used, so that the cables and pipes remain well protected.

Application: linear



Other applications root barriers



Root pruning during renovation work

By some pruning of existing tree roots and the use of a TRG Root Guide you can prevent the tree eventually being removed; reducing the need for future root pruning time after time.

Using a Tree Root Guiding system means future damage to the hard landscaping will be a thing of the past. There may be the requirement for the removal of some roots, leading to a temporary decrease in stability. We recommend to seek the advice of a tree specialist or gardener, if this is necessary.

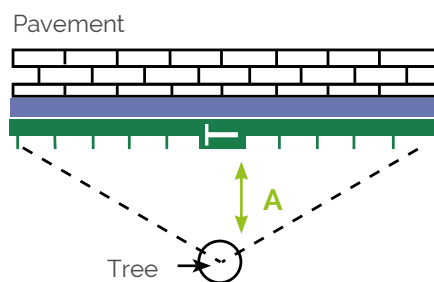
Special applications

Root Guidance can also be a solution, for protection against root damage at exceptional situations such as tennis courts, slopes, cemeteries, retaining walls etc. Because of the different dimensions GreenMax TRG panels can be used in different areas with different groundwater levels.

RootBlock®

If the wall is positioned more than 2 metres from the tree, you can also opt for a root protection wall to block tree roots. In some cases, it may be more desirable to just block tree roots by means of a root protection screen like RootBlock® or RootControl®, see pages 28 t/m 31 about root barrier.

Tree Root Guide linear installation



Minimum length of panels = $4 \times A$

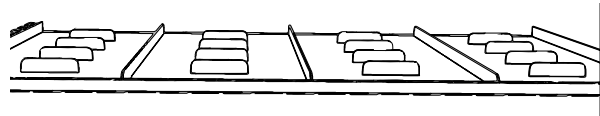
Functional requirements of root guiding panels

1

Top view of vertical guide ribs on the panel

Only a right-angle with a height of at least 10 mm will prevent roots from continuing their way horizontally along the screen. Vertical 90° guide ribs are perpendicular to the wall at a 90-degree angle. Research has shown that guide ribs at exactly 90 degrees lead the roots downwards; this is not the case with other angles.
Source: James Urban USA 1989

1



Vertical ribs exactly 90 degrees



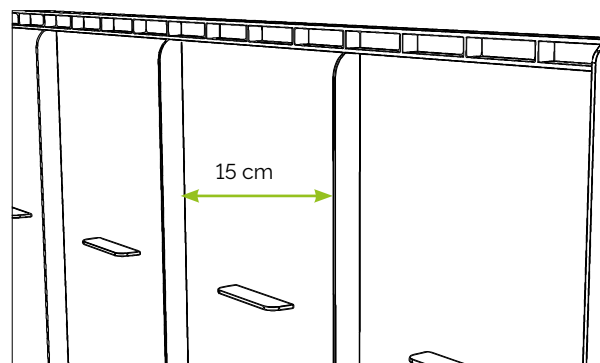
Top view: roots will be guided down vertically

2

Horizontal distance between ribs 15 cm at most, uninterrupted downwards

Research has shown that the effect is guaranteed at a distance of approximately 15 cm between the guide ribs; this guarantee has not been proven for other distances. At the end of the ribs, the root continues in its usual way. The ribs must therefore be uninterrupted from top to bottom.

2



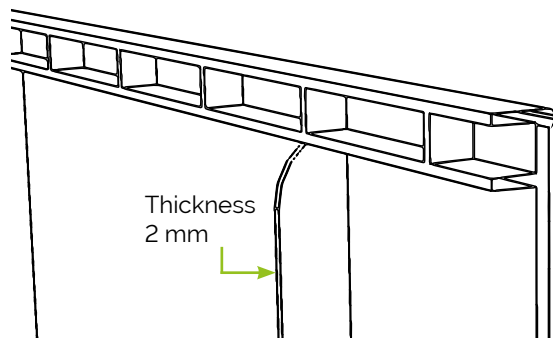
Vertical distance for ribs 15 cm
Uninterrupted ribs from top to bottom

3

Thickness of at least 2 mm

Root guide must be at least 2 mm thick to be guaranteed to withstand root penetration.

3



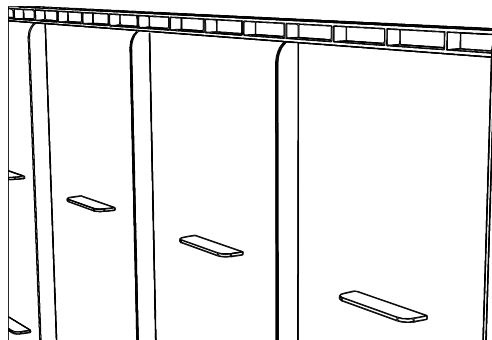


4

Ground (root) anchors ensure that the screen is not pushed up

Root growth around the horizontal ribs prevents the guide screen from being pushed upwards. The roots hold the panel, as it were. It is important that these horizontal ribs are perpendicular to the flat surface of the screen and have sufficient surface area, so that the panel does not shoot past the roots when pulled or pushed. The panel, with the side of the guide ribs and root anchors, must always face the tree. It is important for the surface (the surface that prevents it from pushing upwards) of the root anchors to be high enough and distributed across the screen. Multiple smaller anchors have proven to be more effective than a few large anchors.

4



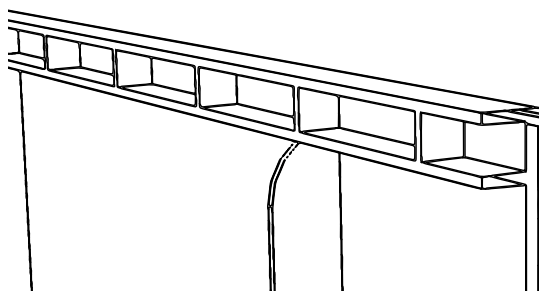
Root anchors > 40 pieces per m²
Total surface area of root anchors > 200 cm² per m²
Right angle to the flat surface

5

A double edge at the top side, to prevent root overgrowth

Root guide screens should ensure that the roots push themselves deeper into the profile. It is therefore important that the screens are always placed high enough (just visible above ground level), so that roots cannot grow over them. The panel sticks out above ground level and the sturdy double edge allows for a visually clean and tidy installation. Research (1985 USA) shows that a double edge is most effective. A sufficiently wide edge at the top already gives a reduced chance of the roots overgrowing the screen. This edge also ensures that, when walking on the screens, the edge will not be damaged, broken or cut. A broken screen provides instant escape for the roots, reducing the screen's functionality.

5



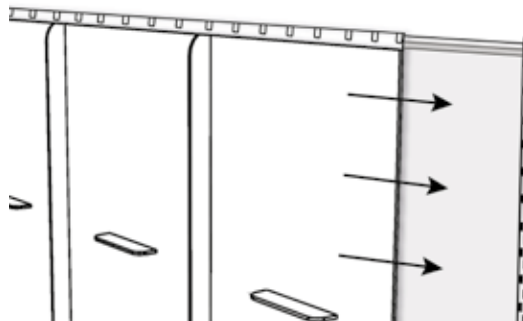
Double top edge at least 10 mm wide
and 5 to 10 mm apart

6

Application of root guidance all around: Type TRG45 Angle 90°, TRG60 Angle 90°

Protect the surrounding paving on all 4 sides of the tree with root guidance panels. Utilize the maximum available space within the tree pit to ensure maximum uncompacted soil, growing space for the tree, and effective root guidance. Allocate sufficient space (considering future mature size) for the tree's base.

6



A Tree Root Guiding panel in the shape of a 90-degree angle. The angle is connected on both sides to an expandable and retractable Tree Root Guiding panel, making it applicable for any size of planting hole at all times.



Material

- High-density polyethylene (HDPE)
- Produced from 100 % recycled material
- 100% recyclable
- Colour: black
- Long lifespan (min. 100 years)
- Clean and easy to install
- UV-resistant
- Waterproof
- Flexible
- Resistant against chemical elements and micro-organisms
- Impermeable to tree- and bamboo roots (bamboo by RootBlock® 2 mm)

Dimensions

Rolls	1 mm - 50 mtr	2 mm - 25 mtr
Height	Type	Type
50 cm	WB/BB 50/1	WB/BB 50/2
60 cm	WB/BB 60/1	WB/BB 60/2
75 cm	WB/BB 75/1	WB/BB 75/2
100 cm	WB/BB 100/1	WB/BB 100/2
150 cm	WB/BB 150/1	WB/BB 150/2
200 cm	WB/BB 200/1	WB/BB 200/2

Extra option: coupling profile
Other thicknesses/heights of root barriers available upon request

HDPE Root Barrier

RootBlock

The 1 or 2 mm thick RootBlock® is a heavy duty Root Barrier from our range (other thicknesses available upon request).

RootBlock® is suitable for any type of plant root and soil. RootBlock® is cost effective, has a high quality and long lifespan. HDPE is a clean and environmentally friendly material and it will not affect the soil unlike products made from PVC. That is why RootBlock® is 100% recyclable and re-usable.

RootBlock® 2 mm is also suitable for aggressive rooting species such as bamboo.



Coupling Profile



Material

- Polyethylene based on residual sugar cane waste
- Produced from 100% recycled material
- 100% recyclable
- Colour: brown
- Long lifespan (min. 100 years)
- Clean and easy to install
- UV-resistant
- Waterproof
- Flexible
- Resistant against chemical elements and micro-organisms
- Impermeable to tree- and bamboo roots (bamboo by RootBlock® 2 mm)

Dimensions

Rolls	1 mm - 50 mtr	2 mm - 25 mtr
Height	Type	Type
50 cm	WB/BB 50/1 BIO	WB/BB 50/2 BIO
60 cm	WB/BB 60/1 BIO	WB/BB 60/2 BIO
75 cm	WB/BB 75/1 BIO	WB/BB 75/2 BIO
100 cm	WB/BB 100/1 BIO	WB/BB 100/2 BIO
150 cm	WB/BB 150/1 BIO	WB/BB 150/2 BIO
200 cm	WB/BB 200/1 BIO	WB/BB 200/2 BIO

Extra option: coupling profile
Other thicknesses/heights of root barriers
available upon request

HDPE Root Barrier

RootBlock Biobased

RootBlock® is suitable for any type of plant root and soil. The commonly used root barrier is made from HDPE (high density polyethylene) but is also now available made from a Biobased plastic, which is produced from the waste sugar cane and is also known as 'green polyethylene'. Re-using the waste from sugar cane has meant a new and sustainable alternative to standard polyethylene can be offered.

RootBlock® Biobased is fully recyclable and the green polyethylene material can be mixed with standard HDPE.

This ensures that the Biobased RootBlock can be recycled in the same process as the PE root barriers and is re-usable many times.

The product is awarded the 'I Am Green' Logo. This logo may only be used in products that have the waste of sugar cane as a base material, using green polyethylene helps to reduce greenhouse gasses. In this way we hope to contribute to the development of the sustainable Biobased green cities.



Material

- 100% recycled material
- 100% recyclable
- Colour: grey
- Long lifespan (minimum 50 years)
- Clean and easy to install
- Waterproof
- Flexible
- Resistant to chemical elements and microorganisms



Produced from household waste



Produced from household waste

Circular RootBlock

In recent years, household waste separation has become common practice in the Netherlands. Many municipalities offer free collection of plastic packaging in transparent bags, also known as PMD bags.

Thanks to improved processes, the collected plastic in PMD bags can now be used to produce higher-quality new products, which was not always the case in the past. Our circular root barrier wall is entirely made from our household waste collected in PMD bags. Of course, after some time, this root barrier wall can also be returned with plastic waste, recycled, and reused for further production.

The various recycled products and colours result in the raw material having a grey/anthracite colour. This is simply the original colour of the material as it is supplied, without colour corrections, which may cause slight variations in colour.

RootBlock® circular is suitable for any type of root and soil. It is inexpensive to purchase, highly durable, and of the highest quality.



Material

- Polypropylene (PP), non-woven, 360 g/m²
- Double sided coating
- Colour: black
- 100% recyclable
- Warranty: minimum of 30 years
- Clean and easy to install
- Impermeable for tree roots
- Waterproof
- Flexible and strong
- Very easy to use
- Resistant to chemical elements
- Can be applied horizontally for smaller pieces
- Can be installed vertically for cables or (sewer) pipes

Dimensions

Height	Rolls	
	Length	Type
50 cm	50 m ¹	RCL 50
60 cm	50 m ¹	RCL 65
75 cm	50 m ¹	RCL 75
100 cm	50 m ¹	RCL 100
130 cm	50 m ¹	RCL 130
150 cm	50 m ¹	RCL 150
200 cm	50 m ¹	RCL 200

Extra option: coupling profile

Other thicknesses/heights of root barriers available upon request

Non-woven Root Barrier

RootControl

The RootControl® non-woven root barrier is used as a dividing wall between trees and what needs protection such as paving, sewers, pipelines, etc.

RootControl® is a lightweight and flexible material and has many possible applications.

Placing a root barrier of RootControl® has a quick return on investment. Renovation of hard landscapes and the renewal of cables and sewage pipes due to root damage are no longer necessary. Installing RootControl® ensures future damage will not occur.