Root barrier or directive system? How to choose the right solution?

Damage caused by tree roots

Research from the University of Hanover shows the following results:

- 34% of trees with a trunk diameter of 11-20 cm gives lift up
- 84% of trees with a diameter of more than 50 cm gives lift up
- Severed roots multiply themselves, which results in more lift up
- Compressed roots show extra growth, which increases lift up
- Roots are very opportunistic and make use of any possibility to escape restricted rooting areas
- Root growth often finds a place in between two different soil structures, i.e. between a very compacted and an un-compacted soil layer
- In the upper strongly compacted soil layer there is often little root growth
- Stability roots can be found in most cases in the second soil layer, under the upper compacted soil layer, but even these roots cause lift up
- Lift up can also take place in areas where the tree seems to have enough space to grow next to a green area

Root barrier of HDPE

Root guiding

In our increasingly urbanised environment root growth annually causes serious damage to our roads, pavements and underground infrastructure. To prevent these problems we are using more and more systems to stop the unwanted root growth. There are two groups of root panels to solve these problems: the root directive system and root barriers. The two systems may seem alike but they perform very different functions. But how do we choose the right system?

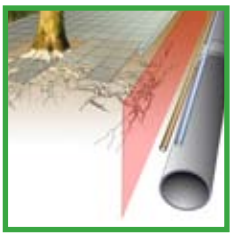
The difference between the root guiding system and root barriers

A root barrier has smooth sides and can be made of different materials such as Non-Woven fabric or HDPE. A tree root will keep on circling along the panel once it has reached the root barrier due to the fact a root barrier has no ability to guide roots. When a root barrier is installed too near to a tree the tree has no possibility to stabilize (flower pot effect).
The root guiding panel is unique to which there are no alternatives the guiding panel is provided with 90° vertical ribs. When the root comes into contact with the guiding panel these ribs direct the root growth downwards. As the root arrives the bottom of the panel it can proceed growing along its horizontal or radial path. The guiding panel is also provided with ground locks which avoid roots lifting up the system as they exit beneath.
The panels also have a double upper edge makes sure that roots, if any, can not grow over the top edge and a simple coupling system that enables the panels to be connected easily.

Root guiding

When to choose which system?

Root growth is influenced by the presence of nutrients and un-compacted space,we can stop roots and/or guide them to a place where they can not damage roads, pavement and underground infrastructure.



Root barrier

When to use a root barrier?
A root barrier is used to create a root free zone i.e. in order to protect underground utilities against root growth. A root barrier can only be used when the available space is sufficient.
As a rule of thumb: the distance between the barrier and the tree foot should be at least 2 meter this will depend on the diameter of the mature tree foot.
Use the following calculation method to determine the right distance between the root barrier and the tree foot: the minimum distance between the root barrier and tree foot is three times the diameter of the mature tree foot.
For column trees this distance can be less because of a lower wind resistance.

Why root guiding?
IThis system can be placed completely around the root ball and will prevent the flower pot effect while promoting stability. Only when it is possible to offer the root system enough soil volume of a mature tree, and with a minimum distance of at least 2m1 at all sides of the tree; should you consider using the root block in this way.

When to use a guiding system?
If a panel is to be installed with a distance of less than 2 meter from the tree (indication, see above) in order to protect i.e. roads: a guiding system should be used to guarantee the trees stability. Lift up by tree roots is prevented which results in huge savings in the cost of road maintenance.
The panels with a height of 30, 45 and 60 cm are most commonly used and in situations where cables, pipes and other utilities need to be protected a height of 90 or 120 cm may be necessary.

Points of attention when a system has been chosen:

Height of the panel
The choice of the right panel height depends on:
1) the depth of the protected area/object
2) the ground water level
   Most roots do not grow in a zone with a lot of water or in ground water. Therefore we advice you to make sure there is a distance of at least 20 cm between the bottom of the panel and the ground water level.

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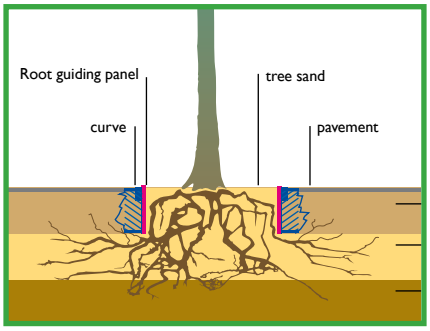
Guiding nature!

Installation above grade
The guiding panels and the vertically installed root barriers need to be installed 1 to 2 cm above grade to avoid roots to grow over the system. For bamboo please use 5 cm. When this is aesthetically not an option and the panel will be placed at grade, please make sure to cut away rhizomes which may grow over the panel.

Compact the soil behind the guiding panel
The soil behind the guiding panel needs to be compacted this will help to avoid upward root growth after reaching the bottom of then panel.



Street sand: 3 Mpa compacted

Tree sand: < 2 Mpa compacted

Existing layer

Soil composition
The composition of the soil is very important while creating the plant hole in order to give the tree the possibility to grow well

DeepRoot guiding panels are made of polypropylene. They are 2,16 mm thick and 60 cm wide.
Available in 30/45/60/90/120 cm high. (LR30/DR45/DR60/LR90/LR120)

GREENMAX has the following root barriers:

HDPE:
- RootBlock Plus – with coupling, 5 m long and 2 mm thick
  Available heights: 50/60/75/100/150/200/250/300 cm (RB50 up to RB300)
- RootBlock – 50 m long and 1 mm thick
  Available heights: 50/60/75/100/150 (WB/BB50/1 up to WB/BB150/1)
- RootBlock – 25 m long and 2 mm thick
  Available heights: 50/60/75/100/150 (WB/BB50/2 up to WB/BB150/2)

Geotextile 325 g/m2:
- RootCommander
  Available heights: 50/65/100/130/200 cm

Situation	DeepRoot Guiding System	RootBlock Root Barrier	RootCommander Geotextile Barrier
	LR30, DR45, DR60, LR90, LR120	RB50 t/m RB300 WB/BB 50/1- 150/1 WB/BB 50/2 -150/2	RC50 - RC200
Bamboo		Completely encircle the bamboo plant	
Trees	LR30, DR45, DR60 Surrounding installation when there is pavement on all sides or linear installation (f.e. in shoulders) with a distance of less than 2 m till the tree foot, depth max. 60 cm; the best option for a stable tree with healthy roots for the protection of roads and foot paths.	Best option for a complete root free zone on one or two sides. Use only with a minimum distance of 2m to the tree foot (depending on the tree foot diameter). With a maximum depth of 3 m.	For those who prefer a geotextile, this is a good choice to create a complete root free zone on one or two sides. This can only be used with a minimum distance to the tree of 2m (depending on the tree foot diameter). With a maximum depth of 2 m.
Cables, pipes and sewer systems	LR90 and LR120 for a linear installation next to trees with a distance of less than 2 m till the tree foot.	Horizontal and vertical protection with a minimum distance of 2m to the tree foot, up to a depth of 3 m.	Can be installed horizontally and vertically with a minimum distance from the tree of 2 m, up to a depth of 2 m.
Foundations			
Golf green		Keeps sprinkling water longer, avoids drying out and prevents root growth on the green.	

HELP WITH CALCULATIONS:
WHILE USING ROOT BARRIER SYSTEMS THE MINIMUM DISTANCE BETWEEN THE TREE FOOT AND THE ROOT BARRIER SHOULD BE: MINIMUM 3 X (DIAMETER OF THE FOOT OF THE TREE IN AN ADULT STATE)

IF THIS SPACE IS NOT AVAILABLE: USE A GUIDING SYSTEM.

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