A

PLANTING INSTRUCTIONS | ANCHORING TREES

TREE PITS

Tree pits need to be sufficiently wide. The surrounding soil should be loose, especially in the upper third. This is the area where the most intensive root growth will take place.

Whilst digging the tree pits, separate the topsoil (about 30 - 35 cm), the topsoil is rich in humus. When planting tree use the topsoil first, the rest can be used to fill up the rest of the pit.

In new tree pits you can avoid the formation of toxic gases by not putting the topsoil deeper than 35 cm from the surface. For the base of the pit you should use sterile, water permeable subsoil.

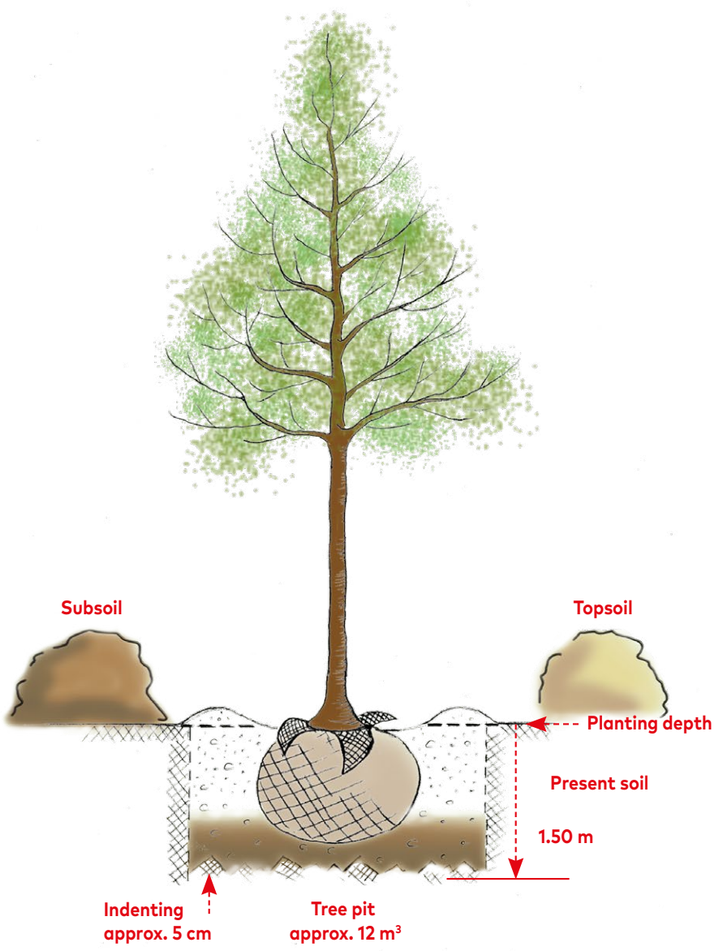
To avoid the tree from sinking deeper in the months after planting, you either compress the subsoil manually every 30 cm, depending on the kind of filling, or fill the new tree-pit with about 100 mm of water and you let it dry for several days. Soil additives and soil ameliorants should be used on the recommendation of the land-scape architect.

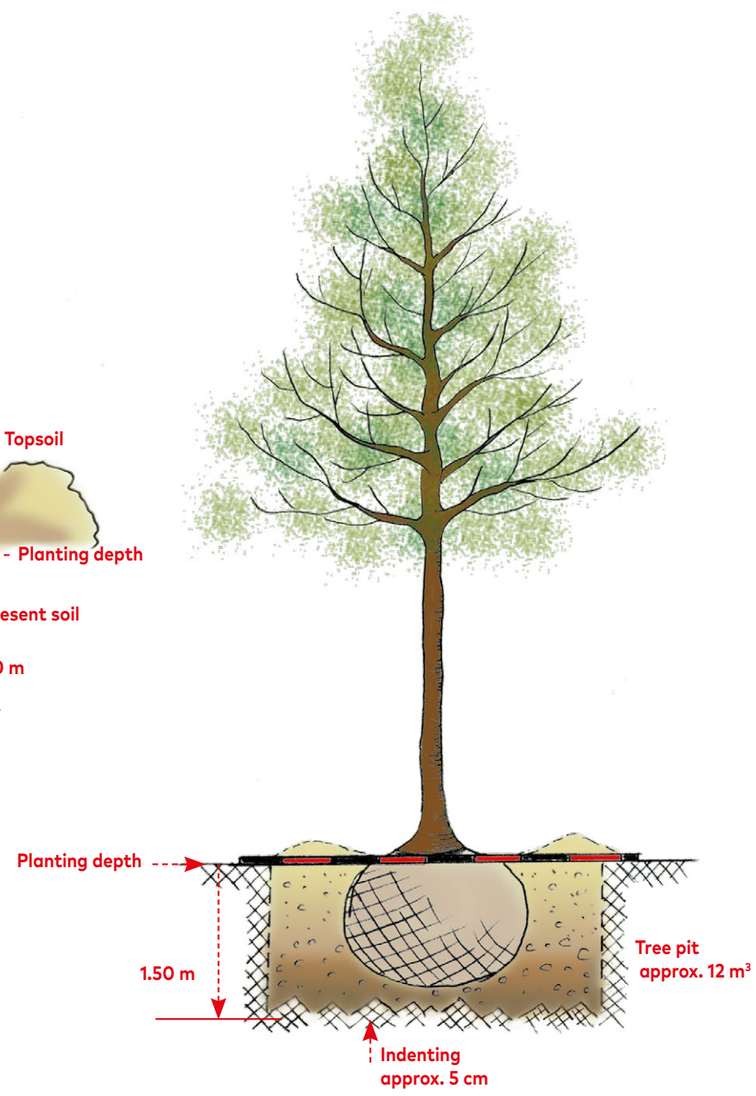
For regrowth it is essential that the final level of the rootball isn't deeper than it was in the nursery. Trees planted higher will regrow, trees planted deeper will suffer from suffocation and die soon.

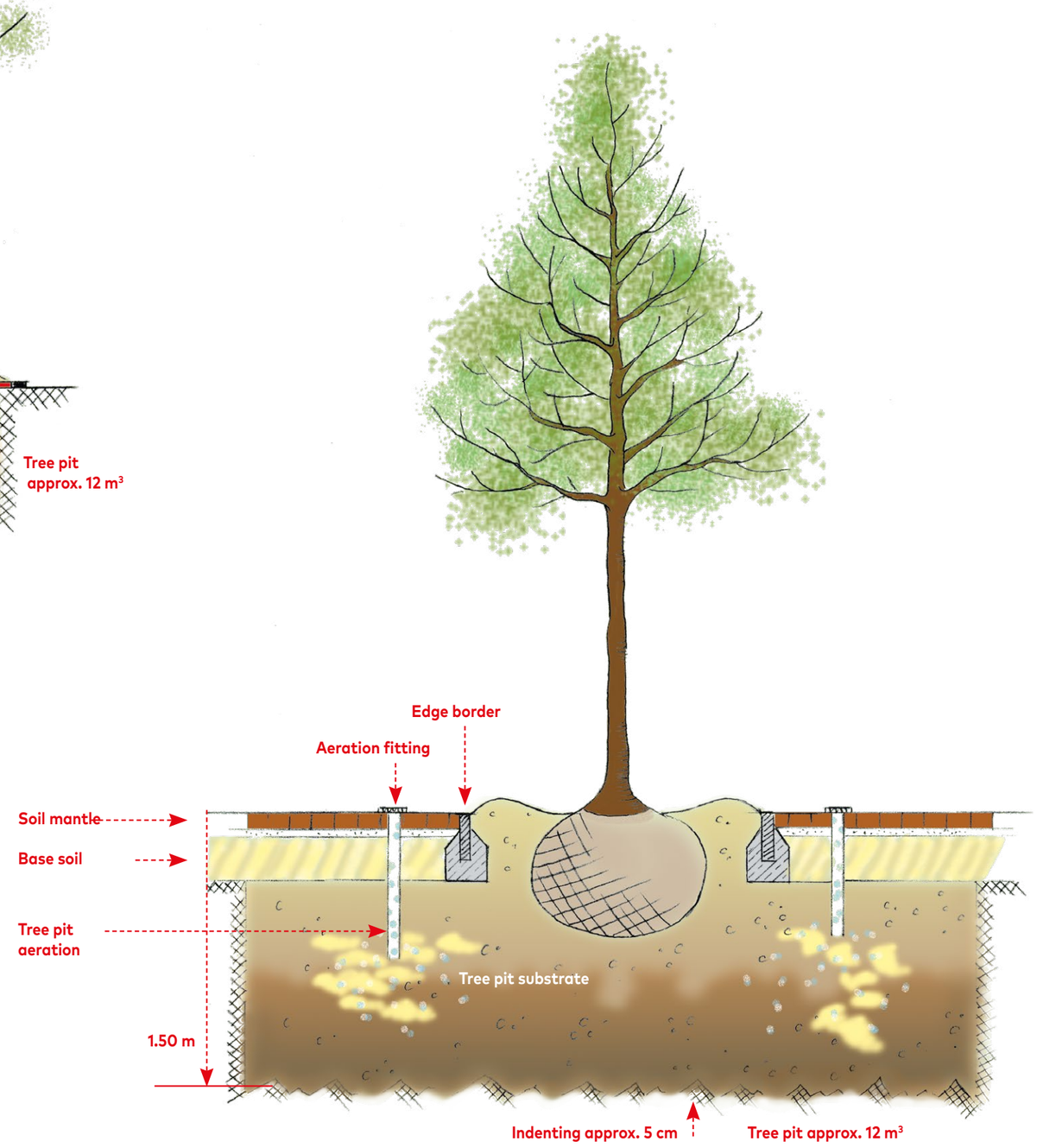
Therefor; when placing the tree in the new planting hole, check that the rootball is about 3 cm higher than the position in the nursery.

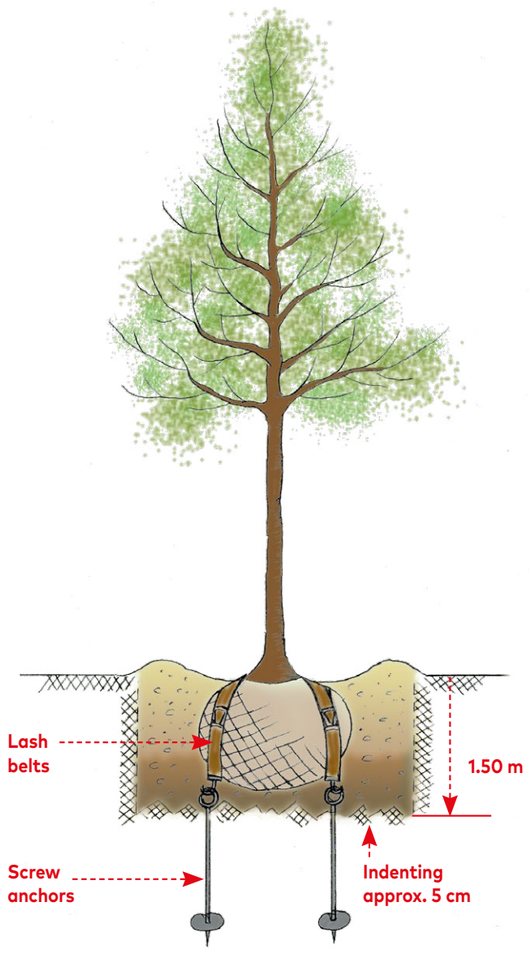
The rootball mesh used in our nursery consists of easily degraded material that should not be removed when planting the tree. The rootball holds all soil nice and compact around the finest roots.

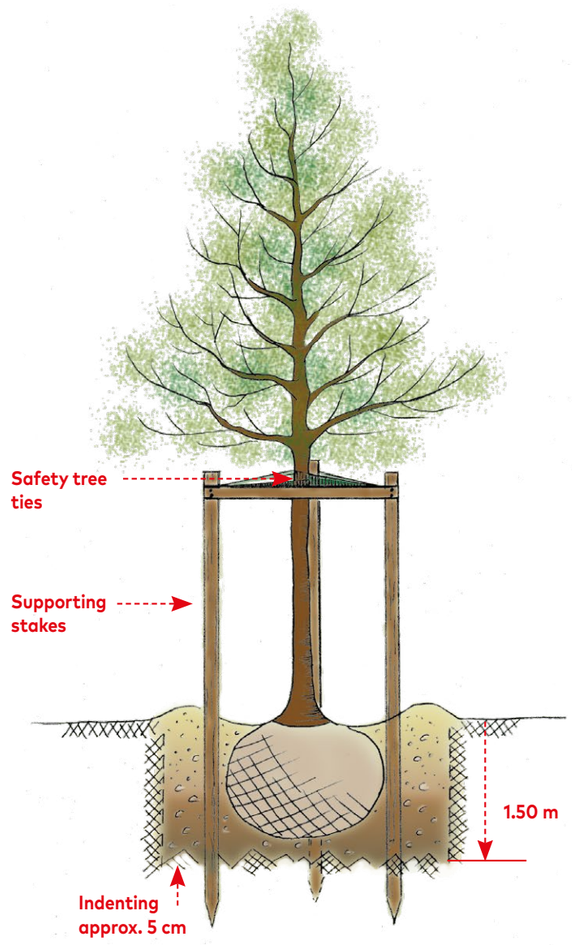
These roots shouldn't break, because they are needed for the tree in order to absorb water and nutrients. The upper side of the rootball mesh should be cut open.











ANCHORING TREES

There are many different ways to anchor plants against wind. Protection is necessary, so that the rootball doesn't move after planting. By moving, new roots coming out of the rootball will break, and the regrowth is slowed down.

Depending on the plant species, size and location you can choose between; a suitable framework of supporting stakes or underground anchoring systems. Ideally a combination of both is used.

In order to avoid injuries on the stem and rootball, only straps with a wide supporting surface (at least 4 cm) should be used.

Local conditions need to be considered and instruction of the supervising engineers to be followed.

LOCATION REQUIREMENTS

When planting a new tree, select a site where the tree can grow appropriately for its species and reach a high age.

The natural site conditions don't always meet the tree's requirements regarding water and nutrients. The composition of the local soil or used substrate are of crucial importance for tree growth.

Solitary trees in free nature for example demand a soil area of at least 200 m³ that can be easily penetrated by roots, as well as a depth of at least 1.50 m.

If this space is not available, measures need to be taken to optimize the site.

When planting trees in areas with traffic or other technical use, an area volume of at least 12 m³ must be made available. The tree pit doesn't need to be deeper than 1.50 m.

Different tree pit techniques are used as follows:

1. The tree pit will not be hard covered, there is no important load on the surface. This means that no foundations are required for the ground or substrate.

2. The tree pit will be used partially or completely as a traffic area. This means that foundations are required for the ground and substrate.

Therefor various techniques of aeration and water supply have been developed.

LAPPEN NURSERIES

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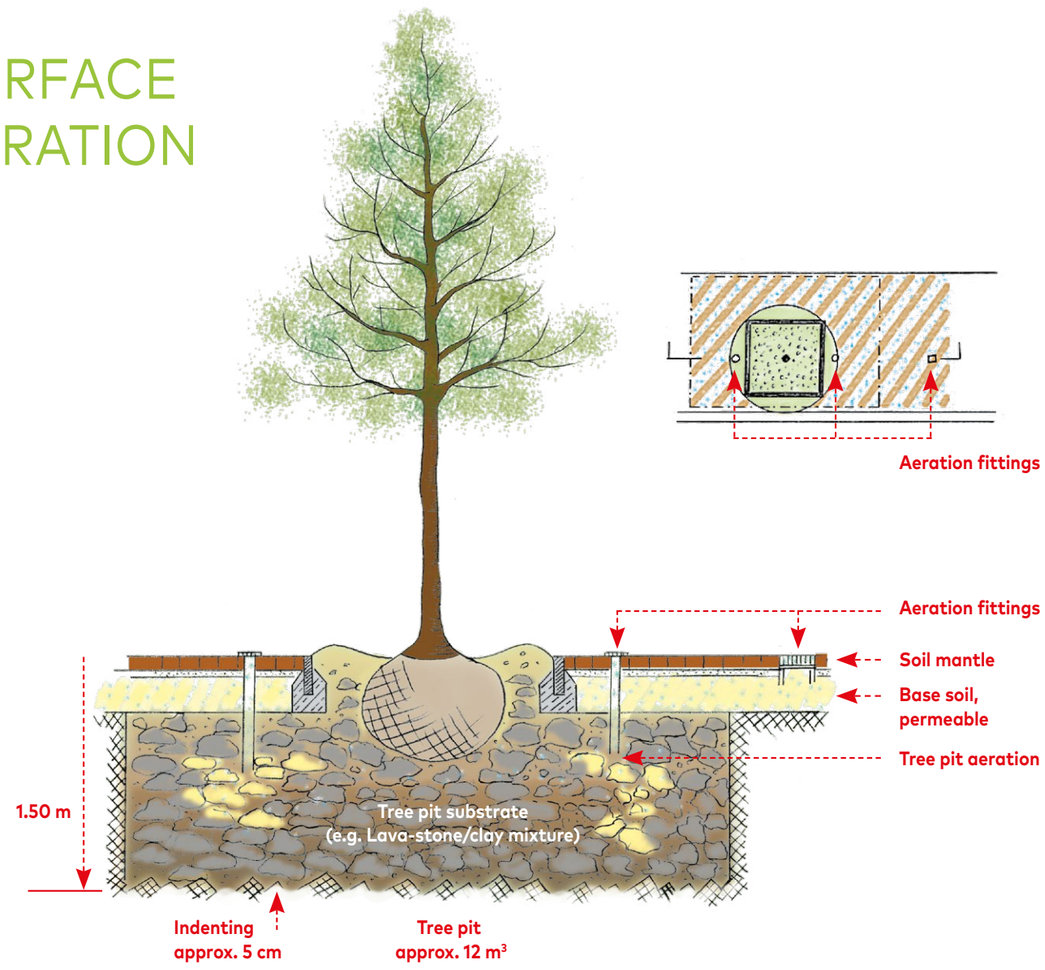
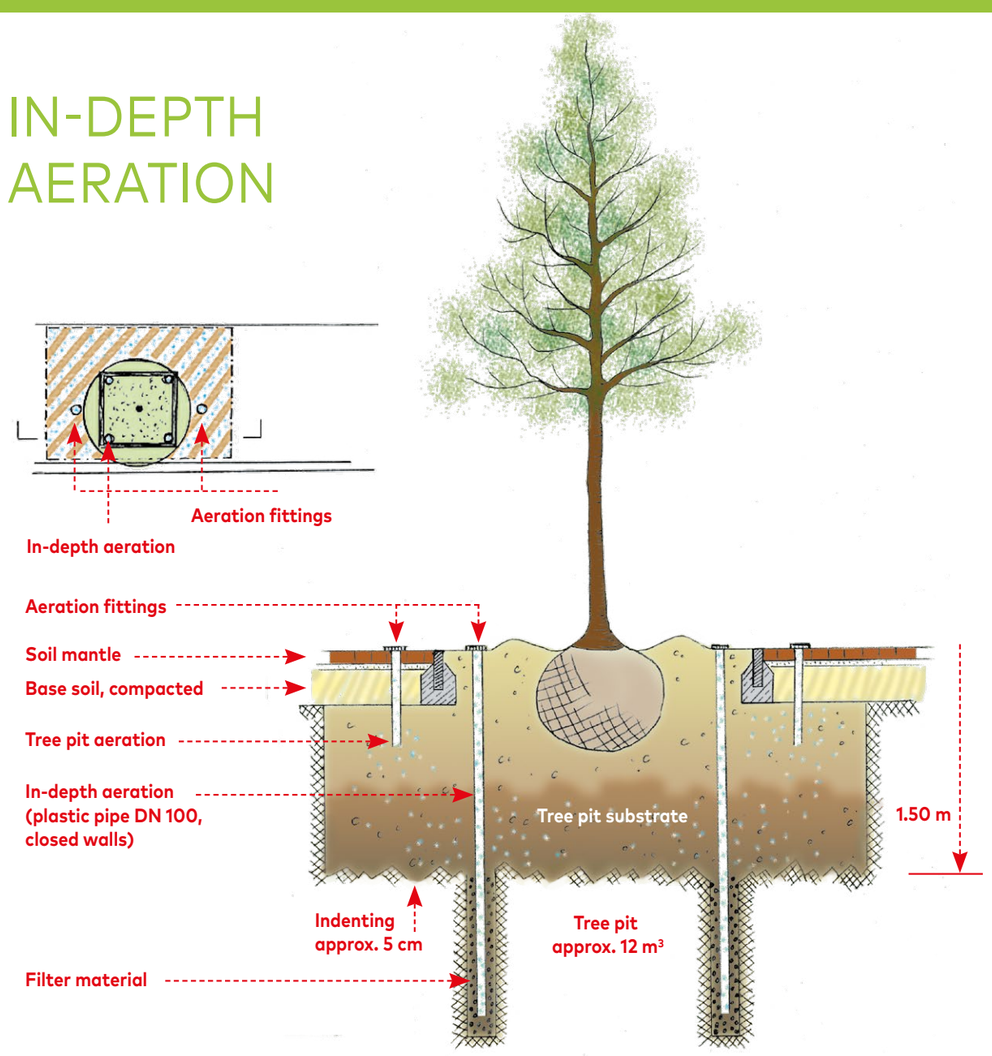
TECHNIQUES FOR AERATING THE SOIL | WATERING INSTRUCTIONS

SURFACE AERATION



IN-DEPTH AERATION



Permanent in-depth aeration makes it possible to plant in built-up areas, e.g. city streets. The constant vibrations caused by traffic and the construction works prior to planting can compact the soil, which prevents adequate aeration of the roots.

The French engineer Xavier Marié (Technical Planning Bureau „Sol Paysage") has developed a method using open-pore lava stones (grain size 5/30) to create cavities in the mixed soil to provide the roots of sufficient air.

The lava stones also form a supporting structure in the soil substrate. The cavities will fill up with loose soil and always remain permeable. A 60 % share of lava stones is advised; lava does not have any affect on the pH of the soil.

In 2000, during reconstruction work (TCSP) in the town of Saint-Quentin-en-Yvelines (Ile de France region), 1000 Tilia europaea `Pallida Type Lappen´ were planted along the main traffic roads using this method. In spite of the high traffic volume, this project has proven the success even after 20 years.

A trial with trees of the same type in our tree nursery confirmed this success.

Surface aeration is only possible with top soil materials permeable to air and water. This kind of aeration allows roots to grow in the surrounding soil both vertically and horizontally.

The air system consists of using so-called drain sets (at least 2 sets per tree) Drains need to be positioned in such a way that penetrating water cannot damage the roots. The spacing between the drain sets should not exceed 5 m.

In case it is not possible to use the surface for aeration, limited volumes of soil allowing root growth are optimized by using so-called in-depth aeration. This kind of aeration guides the tree roots deeper into the soil. This technique has been tried out successfully by the town of Münster.

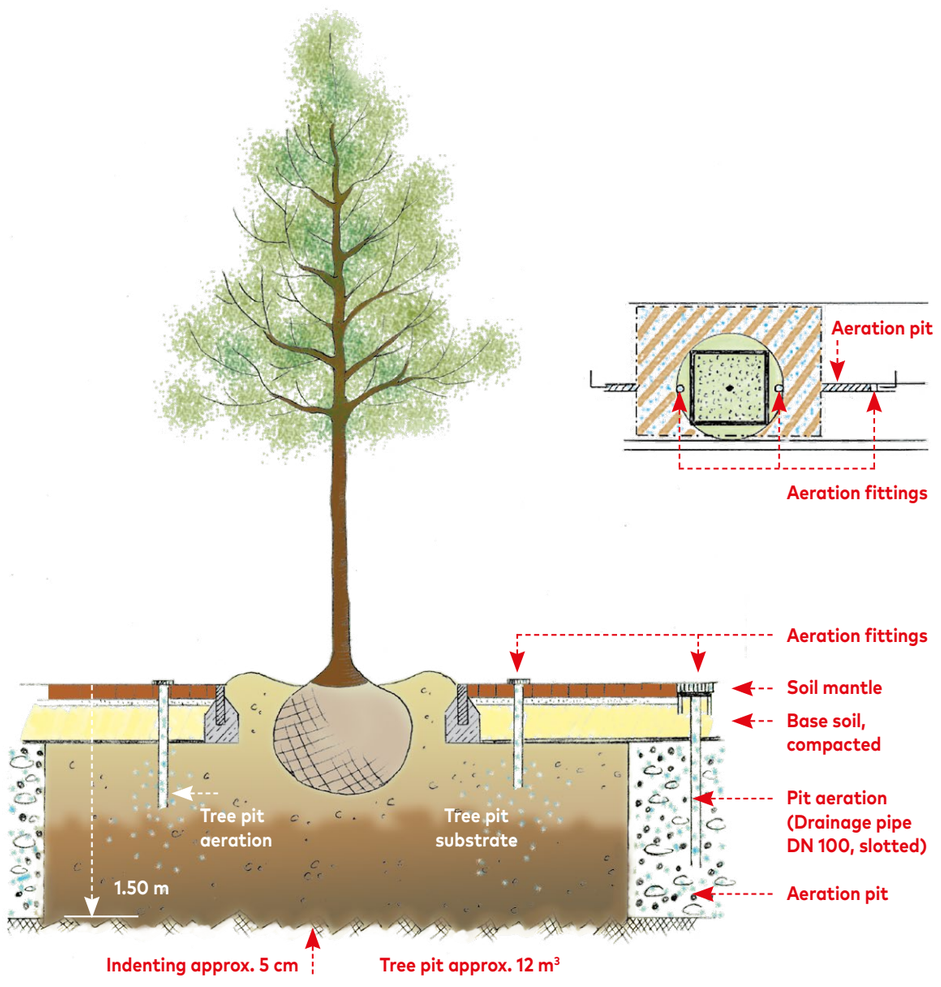
At least 4 holes are drilled with a diameter of minimum 30 cm and a depth of 1.5 m. The holes are drilled in the bottom of the tree pit. Impermeable layers of soil immediately below this should be penetrated to arrive at a total depth of approx. 3 m.

Drainage pipes are inserted into the drilled holes and surrounded with open-pore filter material (grain size 5/25). The pipes remain open.

Closed-walled plastic pipes DN 100 should be used inside the tree pit; these remain empty and should be connected to the drainage pipe. It is also possible to use a continuous pipe with slots in the area of the deep holes.

The aeration system is connected to the surface with final elements covered by grating.

PIT AERATION



Pit aeration is recommended for pavements and cycling tracks, so-called `sealed´ traffic areas.

Below the sealed surface, pit-shaped aeration bodies are directly connected to the tree pit.

The pit should be at least 30 cm wide and at least as deep as the bottom of the planting pit.

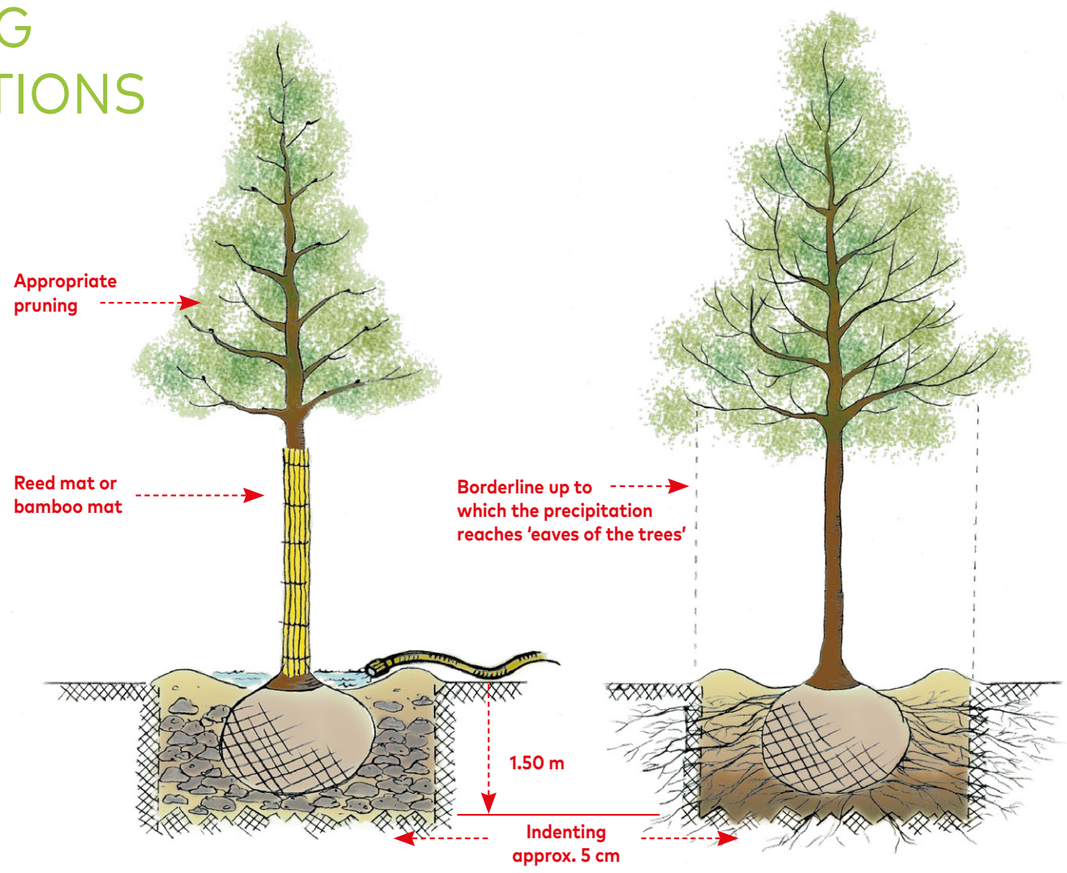
Filter material of grain size 8/45 is used.

Vertical plastic pipes (e.g. drainage pipes DN 100) make the connection between the surface and the bottom of the planting pit, with pipe spacing no more than 5 m.

The air intake consists of drainage sets, installed in a way penetrating water cannot damage the roots.

This kind of aeration is used to improve root development inside the tree pit.

WATERING INSTRUCTIONS



In order to ensure a good regrowth of the tree watering is essential. A low dam around the rootball keeps the water from flowing away. The ideal irrigation dam is twice as wide the rootball diameter. According to the size of the tree the height of the dam is between 12 cm and 30 cm. In general this irrigation bowl should be maintained for two years.

Newly planted trees should always be watered right away. In this way the soil in the pit can settle and cling around the rootball. At the same time the water makes up for the water-losses during transportation and storage.

We have observed that the greatest need for water always occurs during spring, but also during the second growth phase (Lammas growth, starting around the 24th of June a few days after the longest day of the year). During average weather and site conditions 7-days between watering have proven to be best.

Furthermore we recommend to sufficiently protect the stems of high stem trees against damage from sunburn which is caused by the sun during winter and summer.

In the Lappen nurseries reed or bamboo mats have proven especially successful since they are quickly and easily installed, they guarantee a really effective heat insulation for the stem as well as a good protection against evaporation. These mats also allow wind to cool the stems down.

In the rootballs of regularly transplanted nursery plants one will find more roots than soil. The rootball is always by far smaller than the canopy of the tree ('eaves of the tree'). Falling rain cannot reach the rootball. Therefore every newly planted tree needs to be watered until the new hair roots have grown beyond the canopy which will take up to three years.

Immediately after planting, the tree should be pruned appropriately by qualified staff.

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