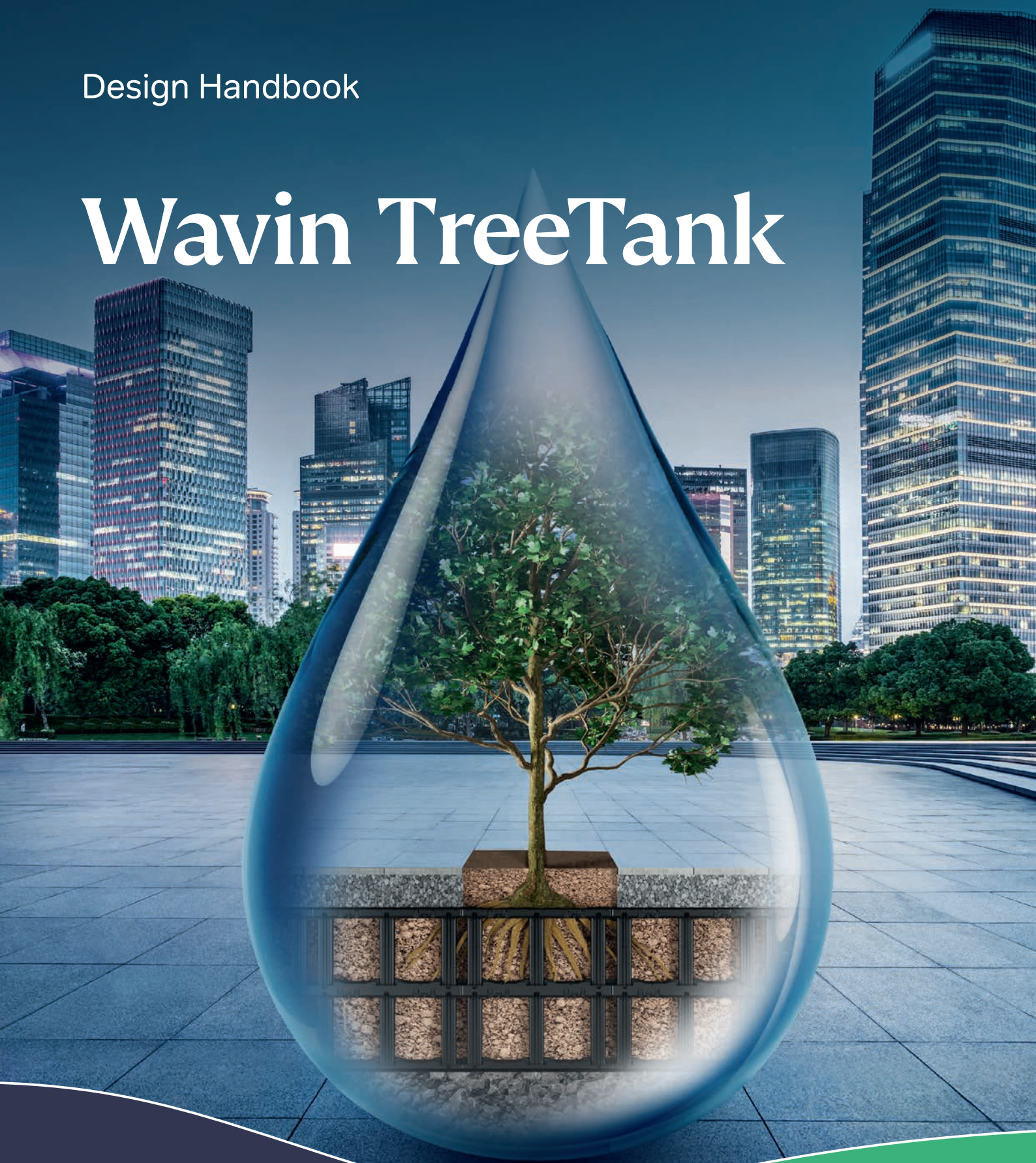
Design Handbook

Wavin TreeTank



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Designing for Urban Climate Resilience

How Grey Infrastructure can support a Green ideology

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1 Smart Blue-Green Roofs
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Wavin TreeTank

Design Handbook

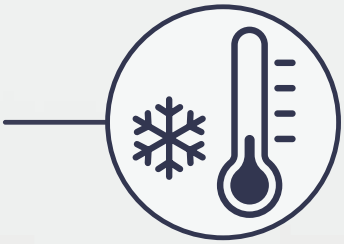
1. Introduction

Climate Resilience in cities and urban areas

As cities expand and the climate continues to change—with more intense rainfall, extreme heat, and extended droughts—there is an urgent need to rethink urban design. Trees are essential in enhancing local climates, helping cool the air and reduce pollution. They also help counter the urban heat island effect and can be part of the surface water management chain.

Wavin TreeTank – Benefits of Urban Trees

Strategic placement of trees in urban areas can **cool** the air by between 2 °C and 8 °C. Fighting the urban heat island effect.[1]



Air quality:
Urban trees are excellent filters for urban pollutants and fine particulates.

Mature trees regulate water flow and improve **water quality**.

With their **shade**, trees minimize evaporation of water from lawns, and as they transpire, humidity increases, requiring less watering.

[1] Forest Research, Air temperature regulation by urban trees and green infrastructure
[2] Greener Earth Alliance, How do trees absorb carbon and how much?
[3] Bridgend County Borough Council, Green infrastructure benefits
[4] Buildings & Cities Journal, Impact of 2050 tree shading strategies on building cooling demands

Trees provide habitat, food and protection to plants and animals, increasing urban **biodiversity**.

A tree can **absorb** up to **20-25 kg of CO_2** per year under average conditions, isolate carbon and consequently mitigate climate change.[2]

Happiness:
spending time near trees improves physical and mental wellbeing by increasing energy level and speed of recovery, while decreasing blood pressure and stress.

Landscaping, especially with trees, can **increase property values by 18%**.[3]

Trees properly placed around buildings can **reduce air conditioning** needs by **48%**.[4]

2. Installation Guidelines

Wavin TreeTank installed

1. Growing media
2. TreeTank
3. Steel mesh
4. Securing strap
5. Side panel
6. Vent pipe
7. Base plate
8. Geotextile

2. Installation Guidelines

Setting the ground

1. General

Wavin TreeTank is constructed entirely from 100% post-consumer recycled polypropylene, a material that has been widely and reliably used in infrastructure applications for many years.

TreeTank's design features outer walls on all sides. These form a protective shell around the tree growing media, shielding it from the pressure of the pavement and traffic above. These vertical walls prevent direct contact between the surrounding soil and the tree substrate, while allowing the free flow of water into—and out of—the structure. They also function as retaining walls separating the compacted fill around the tank and uncompacted infilled growing media, preventing soil subsidence.

2. System

- Wavin TreeTank consists of three primary components: main unit, base plate and side panels.
- These components are designed for easy assembly into a dedicated tree growth area.
- The structure's perimeter is formed by self-supporting side panels, while the interior remains open, with no internal dividing walls between the units.
- This design allows straightforward filling with the designated growing media and easy integration of cables and piping.
- All components are produced by state-of-the art injection moulding, using 100% recycled post-consumer recycled polypropylene. This material is recoverable and recyclable at end of life.
- Main unit features ergonomic hand grips for easy handling.
- All components connect using patented integrated connectors—for safe, fast and easy installation.
- Each main unit includes two removable covers featuring twist to release / locks. These are easily removed to allow filling with growing media and then replaced to provide a stable top deck.

3. Performance

Wavin TreeTank is designed to withstand heavy traffic. To ensure proper load distribution, the minimum cover requirements for the loads should be met.

Wheel load (tonnes)	Axle load (tonnes)	Minimum cover depth (m)
0-1.5	0-3	0.3
6	12	0.5
10	20	0.65

4. Installation

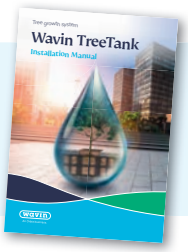
Installation of Wavin Treetank is relatively straightforward, providing some basic rules are followed.

- When planning the installation always allow an additional 500mm working space around the entire TreeTank footprint.
- The system should be installed on a level base. Any protruding or sharp objects, such as stones or old roots, should be removed prior to installation.
- A geotextile separation layer should be placed beneath the tree tank, with enough material allowed to wrap up the sides and on to the top of the installation. When complete, the whole TreeTank system should be enclosed in the geotextile.
- If specified in the design, a steel reinforcement mesh should be positioned on top of the geotextile separation layer and beneath the TreeTank. This should extend at least 300mm beyond the tree opening on all sides.
- Side panels should be placed around the entire perimeter of the tree tank; these are important in protecting the growing media from lateral loads.
- When filling with growing media it is recommended a 70mm air gap be allowed between the top of the growing media and the underside of the top deck of the tank. This allows for root aeration, and can be achieved through the natural settlement of the growing media after filling is complete.
- An aeration pipe to the surface should be included in the construction.
- Backfilling around the TreeTank should be done in layers. Each layer should be compacted prior to placing the next layer.
- If required, Wavin TreeTank can be easily opened, dismantled and reassembled without damaging the structure.

5. Design

- Our technical team is here to help with your Wavin TreeTank design.
- A stability assessment and strength check for the expected loads (including during construction) should be undertaken by a competent structural engineer.
- The TreeTank system is easily configurable to install around underground obstructions and utilities.
- Installation depth is flexible, with configurations available in one layer (630mm) or two layers (1230mm).

For detailed installation instructions – see TreeTank Installation Manual.



3. Product Specifications

Wavin TreeTank Solution

The Wavin TreeTank system is composed of several integrated components, each engineered to support optimal growth conditions for trees while ensuring structural stability.

The system includes the following elements:

1. Base unit

- Comprises six vertical load carrying pillars connected by a top plate.
- Integrated connectors allow base units to be linked together, essential for overall stability.
- The top plate includes two openings (365 × 244 × 80 mm) to allow substrate filling.
- For safety, the unit is delivered with pre-installed covers in these openings.

2. Bottom plate

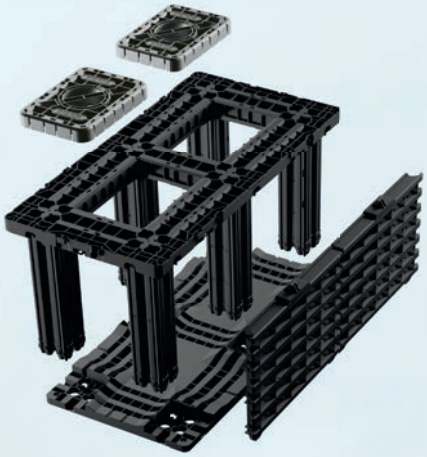
- The bottom plate ensures that vertical forces are evenly distributed across the ground.
- It is designed to easily connect with the vertical pillars of the base unit.

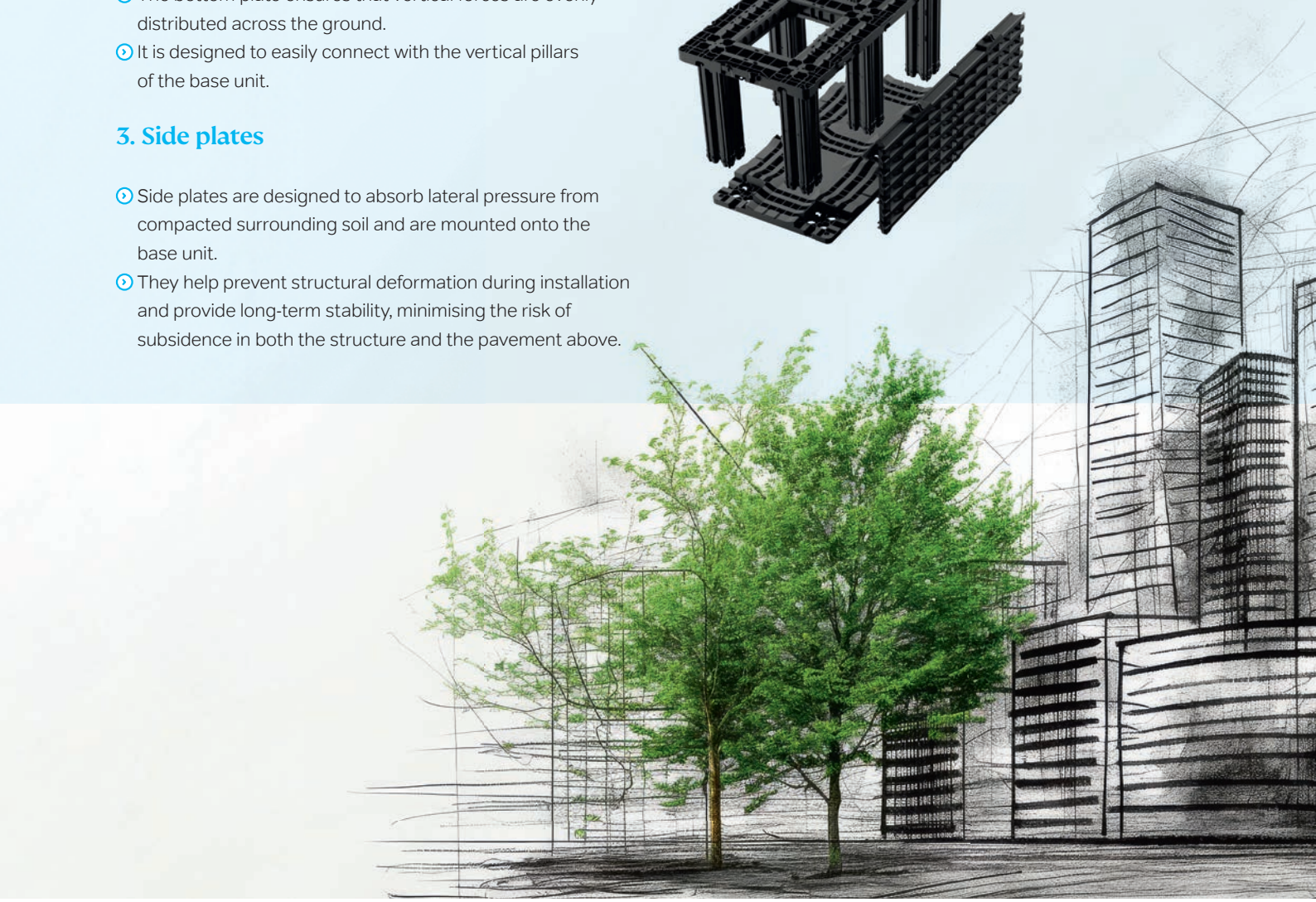
3. Side plates

- Side plates are designed to absorb lateral pressure from compacted surrounding soil and are mounted onto the base unit.
- They help prevent structural deformation during installation and provide long-term stability, minimising the risk of subsidence in both the structure and the pavement above.

4. Filler cover

- Designed to safely close the filler apertures in the base unit.
- Includes a twist-lock mechanism to secure the cover in place, eliminating trip hazards, while allowing for easy removal during substrate filling.
- Structural stability calculation assumes the covers are reinstalled after filling.





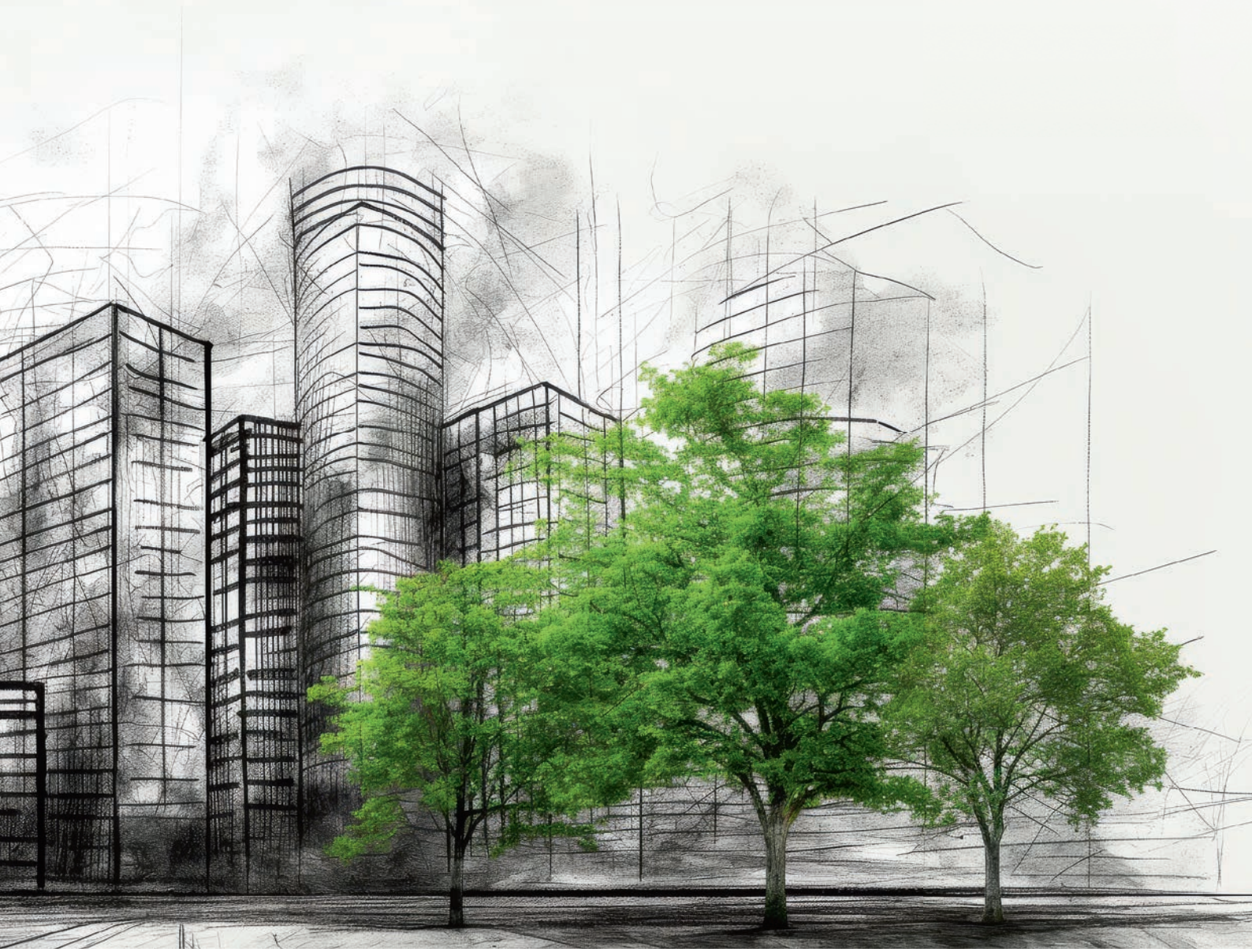
Installation Requirements

Wavin TreeTank should be installed in accordance with the layout plan prepared by the project design and approved during the site meeting. The plan should include a stability calculation for the underground structure, clearly detailing the expected vertical and lateral loads as well as the long-term resistance of the system.

Environmental Performance

To demonstrate the sustainability credentials of the product, an Environmental Product Declaration (EPD) should be submitted. The EPD must be based on a Life Cycle Assessment (LCA) conducted in accordance with ISO 14040 and ISO 14044 standards.

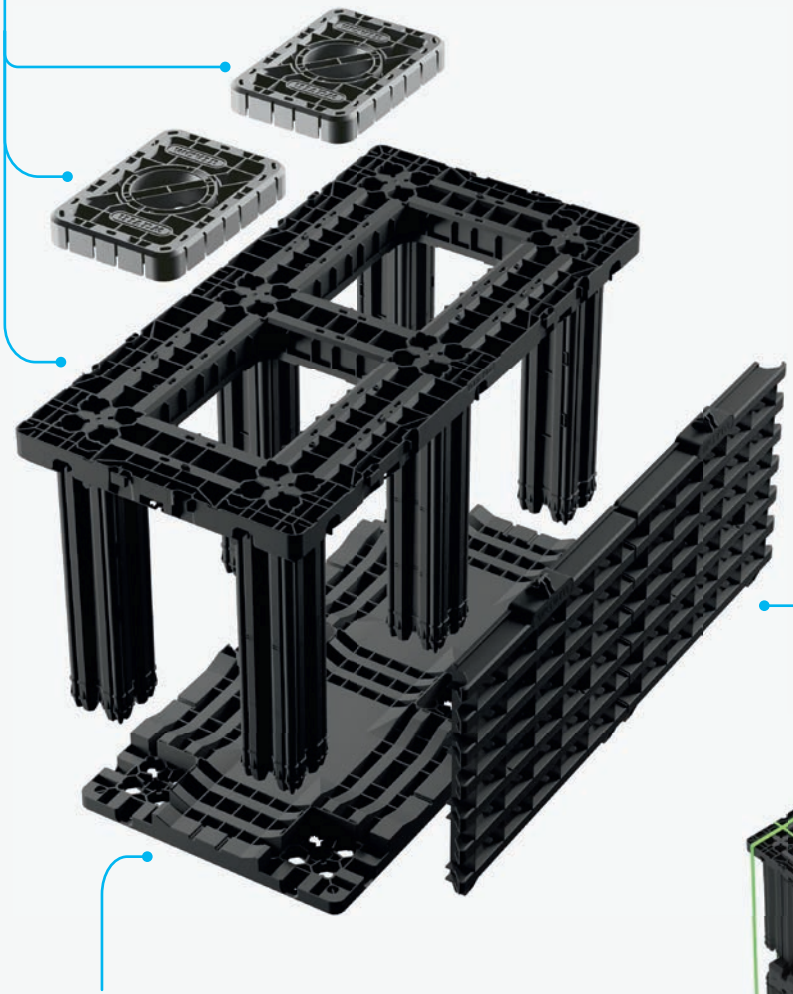
EPDs must be developed in accordance with the applicable Product Category Rules (PCRs), which define the calculation methods and reporting formats. These rules ensure that EPDs within the same product category are consistent and comparable, and disclose the same types of environmental information.



3. Product Specifications

TreeTank Components

TreeTank Base Unit (incl. 2 Lids)
› Dimension: 1200 x 600 x 600 mm
› Weight: 14 kg



TreeTank Side Plate
› Dimension: 1184 x 543 x 50 mm
› Weight: 2.8 kg

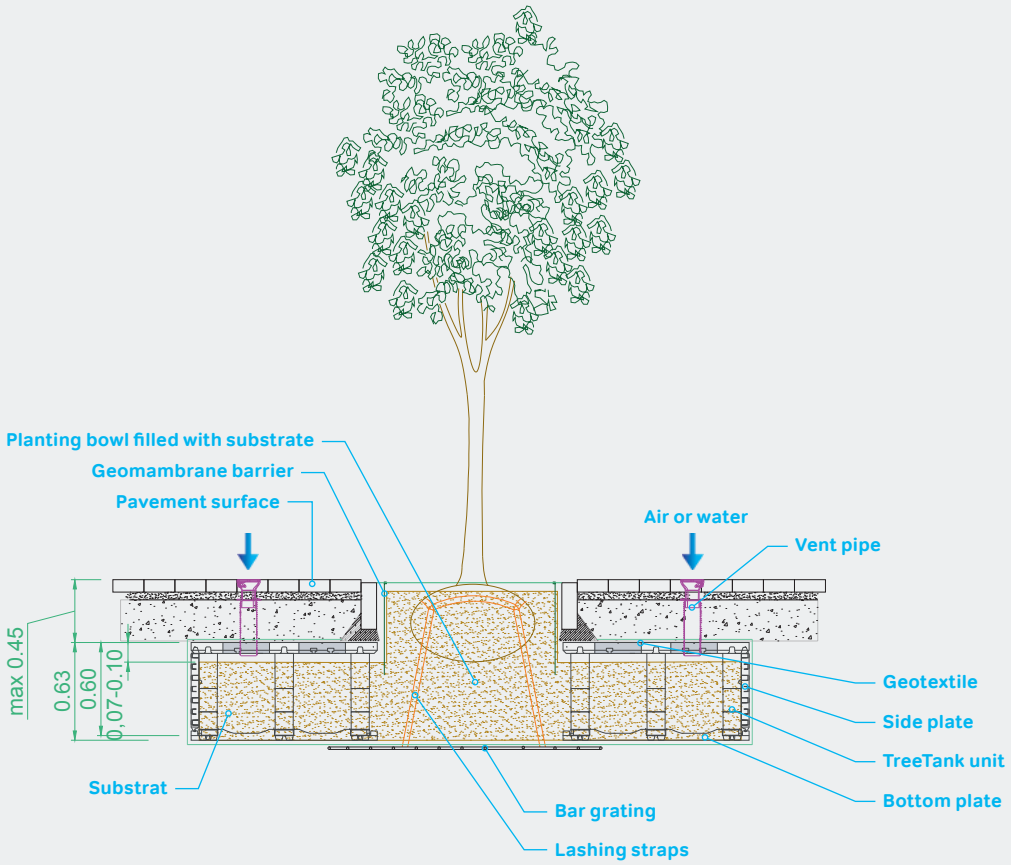
TreeTank Base Plate
› Dimension: 1200 x 600 x 70 mm
› Weight: 4,7 kg

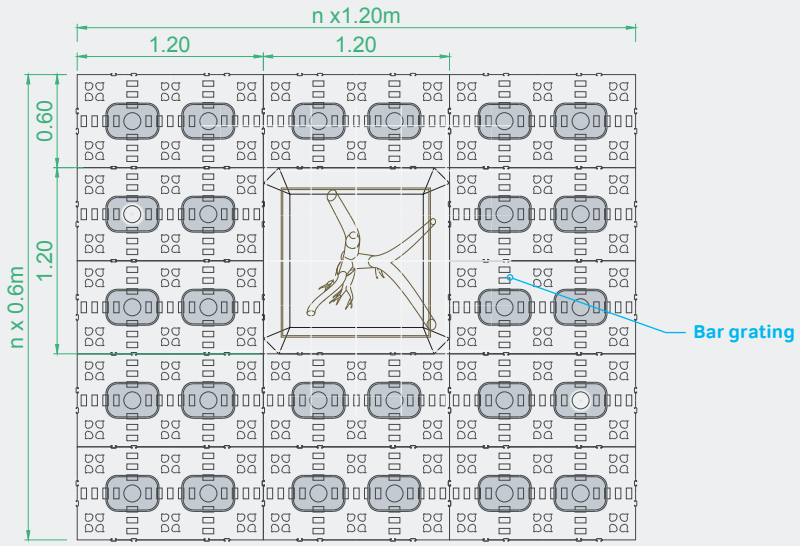
TreeTank Package
› Dimension: 1200 x 2400 x 2400 mm
› 32 Units per package (~ 13 m^3)

For detailed product information – see Wavin TreeTank Portfolio overview and Product Data Sheets.

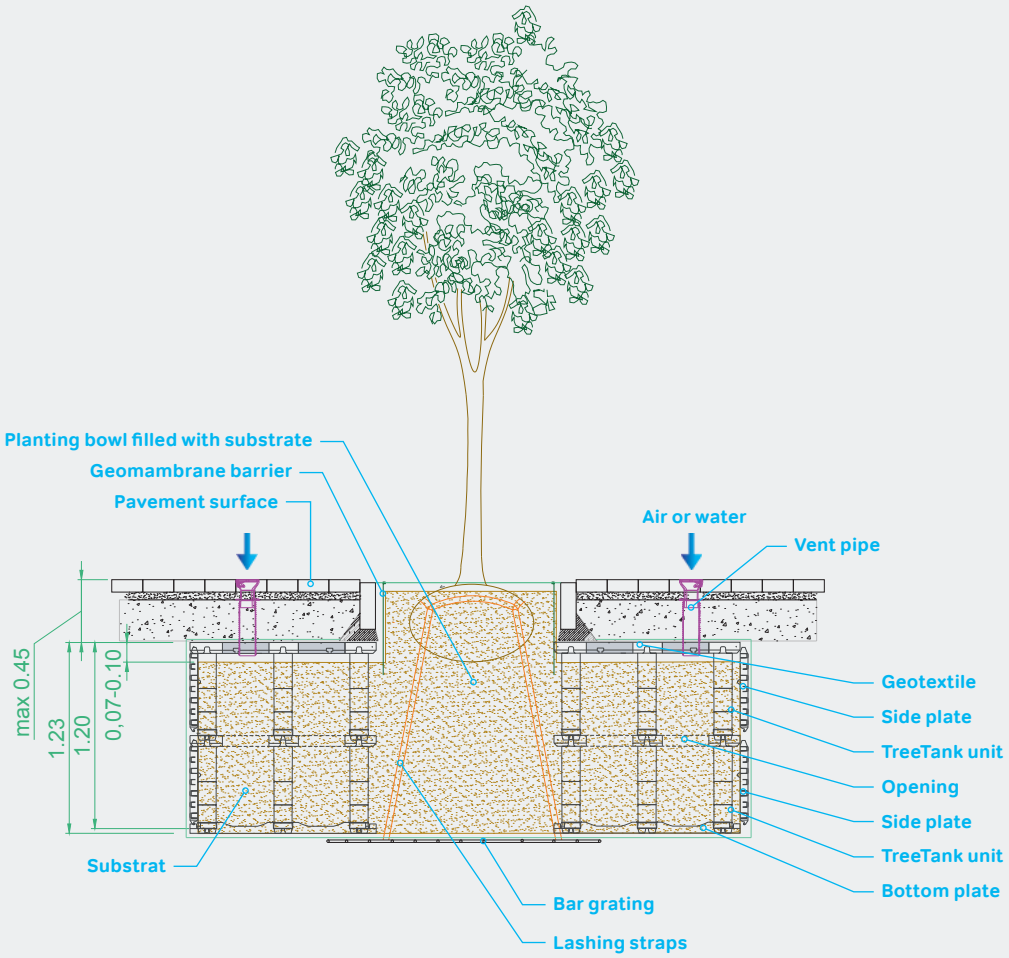
4. Standard Details

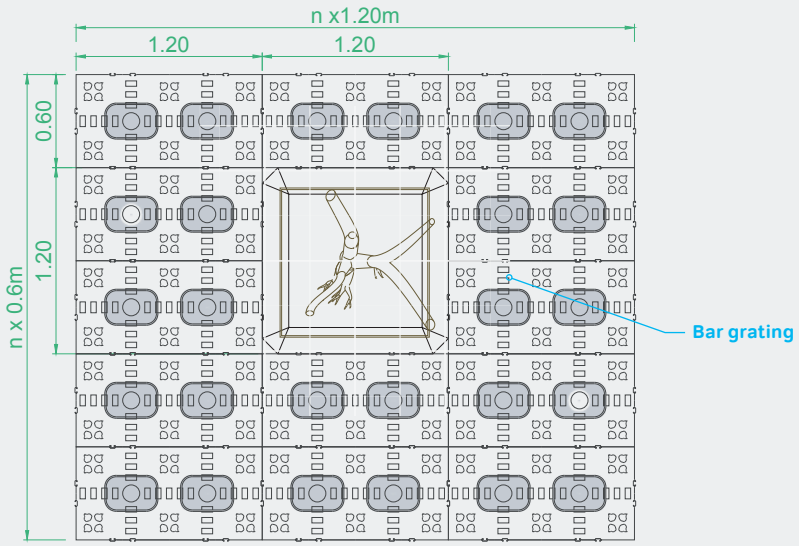
One-layer TreeTank system





Two-layer TreeTank system






For information you can find more information on our website:
Scan for more insights on Wavin TreeTank.

Sustainably designed: the modular system for optimum tree growth.

Wavin TreeTank provides...

- **A protection zone for the roots:**
  enabling obstruction-free growth, corresponding to the size of the tree
- **Loose, well-aerated soil:**
  the elimination of soil compaction supports for nutrient transport
- **Rich supply of nutrients:**
  with 0.50 m^3 nutrient-rich soil per m^2 tree crown projection
- **Sufficient water supply:**
  combined with Wavin's proven irrigation system, the soil remains moist even during dry spells
- **Enough oxygen:**
  a continuous and reliable soil aeration is ensured

Discover our broad portfolio at wavin.com

- Urban climate resilience solutions
- Waste water drainage
- Indoor climate solutions
- Drinking water distribution

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Wavin is part of Orbia, a community of companies working together to tackle some of the world's most complex challenges.
We are bound by a common purpose:
To Advance Life Around the World.

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