Design, Installation and Maintenance Manual

Wavin Certaro Lamella HDS

Drop by Drop

for a cleaner future

Wavin Certaro Lamella HDS

The next generation in stormwater treatment

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An Orbia business.

What modern water treatment looks like

Certaro Lamella HDS

Design, Installation and Maintenance Manual

Introduction

Introduction

Protecting water at source

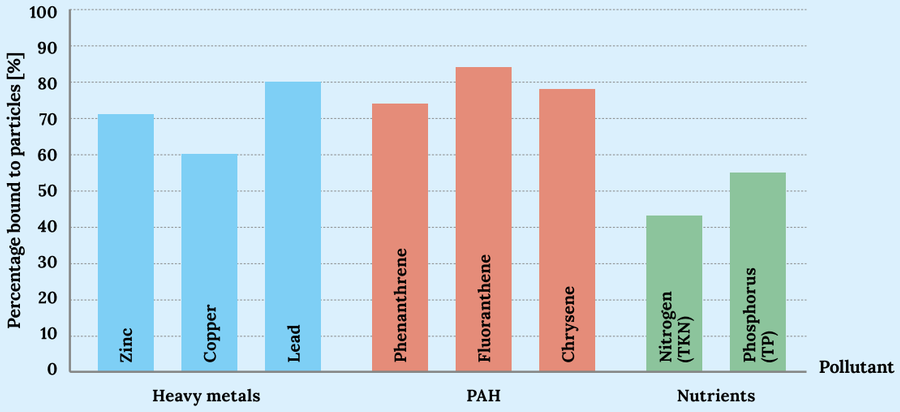
Water is the foundation of life – vital for people, ecosystems, and the environment. In its purest form, it often arrives as rain, freely given and naturally clean. Yet, the moment it touches the urban landscape, rainwater transforms into stormwater runoff, carrying with it a complex mix of pollutants. In cities, impervious surfaces like roads, rooftops, and parking lots prevent rain from soaking into the ground. Instead, it flows across these surfaces, collecting a wide range of contaminants.

Much of this pollution is particle-bound, meaning it attaches to sediment and fine particles that are easily transported by runoff. These pollutants pose a serious threat to water quality, aquatic life, and urban drainage systems. To protect water quality and preserve its natural integrity, we must act decisively to prevent the spread of these pollutants at their source.

RANGE OF CONTAMINANTS

- **From roads and highways:** Common pollutants include oil and grease, heavy metals, and particulate matter from tyre wear.
- **From rooftops and sidewalks:** Stormwater runoff may carry organic debris, bird and animal fecal matter.
- **From residential areas:** Runoff may contain nutrients and chemicals from fertilizers and pesticides, as well as pet waste and household cleaning products.
- **From industrial zones and construction sites:** sediment, hydrocarbons and vehicle fluids.

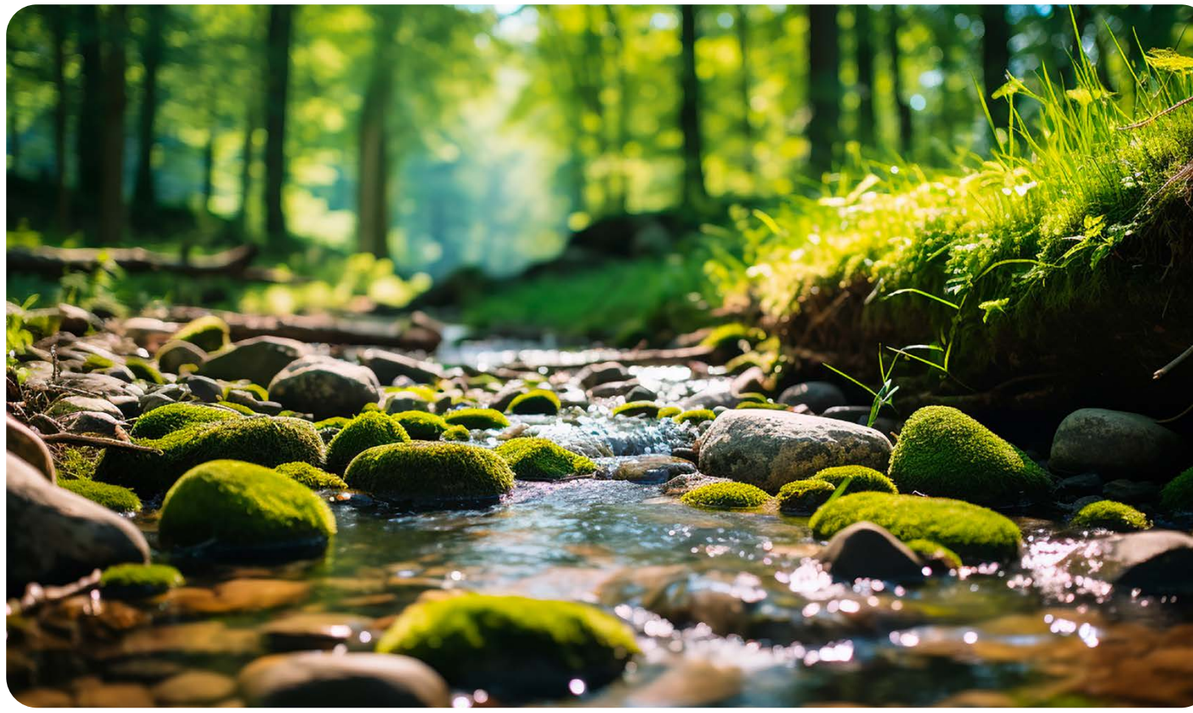
FRACTIONS OF VARIOUS CONTAMINANTS BOUND TO STORMWATER RUNOFF SEDIMENT



Source: Boogaard, et al. 2014 (https://doi.org/10.3390/challe5010112)

The role of sediment separation

Capturing sediment is a critical first step in stormwater treatment. By removing suspended solids, we also intercept the pollutants bound to them – such as heavy metals and hydrocarbons – before they reach groundwater or natural water bodies.

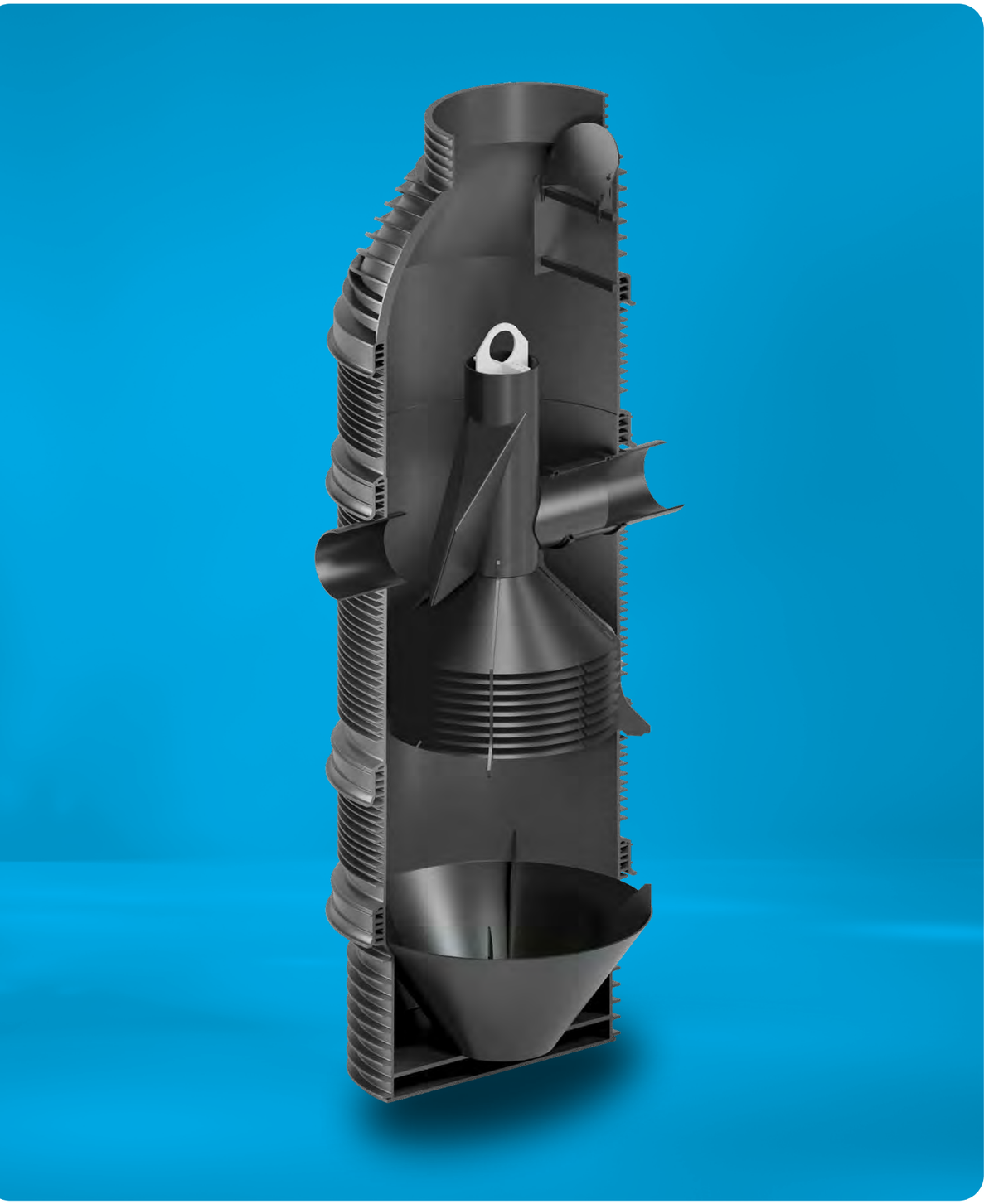


SEDIMENT SEPARATORS

- **Improve water quality** by filtering out coarse and fine particles.
- **Reduce pollutant loads** in receiving waters.
- **Serve as an effective pre-treatment** for further stormwater reuse or infiltration.

Introduction

Introducing the Certaro Lamella HDS



To meet the growing demand for efficient and low-maintenance stormwater treatment, Wavin has developed the Certaro Lamella HDS – a compact, high-performance sediment separator. Designed to treat runoff from areas up to 6,000m2 with a chamber 1,000 mm in diameter, it offers:

- **HIGH REMOVAL EFFICIENCY**
  for fine sediment and particle-bound pollutants.
- **SMALL FOOTPRINT**
  based on a Tegra DN 1000 chamber.
- **EASY MAINTENANCE**
  comparable to cleaning a standard road gully.

This document outlines the design principles, performance characteristics, and application guidelines for integrating the Certaro Lamella HDS into urban drainage systems, helping cities protect their most valuable resource: **clean water.**

Design

Wavin Certaro Lamella HDS

- For large areas
- For confined spaces
- For normally soiled / contaminated surfaces
- Retention of light liquids

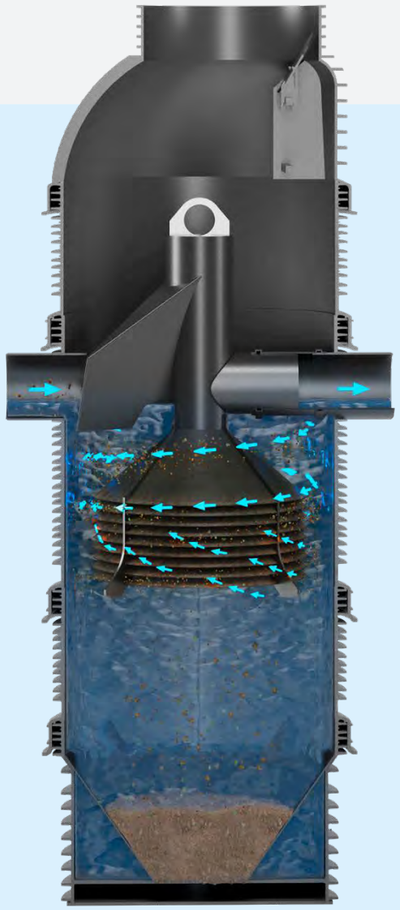
Design

Application

For the design of sediment separation systems in urban storm-water management, it is recommended to follow the principles outlined in the **Ciria C753 SuDS Manual and British Water Code of Practice (BW CoP). The BW CoP is derived from the German guideline DWA-A 102.** This standard provides a robust framework for ensuring effective pollutant removal under varying hydraulic and environmental conditions.
DWA-A 102 assumes the use of advanced flow separation technology that prevents the re-suspension of settled sediments during high-flow events. This ensures that even during peak stormwater inflows, captured sediments remain securely retained within the system.

System performance is validated through standardized testing under controlled conditions:

- **Runoff rates:** 5, 10, 15, 31.5 and 110 l/s/ha.
- **Sediment type:** Tests use a representative sediment known as AFS (Artificial Fine Sediment), which reflects typical urban particle size distributions and is equivalent to Total Suspended Solids (TSS) in UK terminology.
- **Sediment volume** is aligned with the rainfall intensity distribution for each test.
- **Efficiency metrics:** TSS (2 – 404 µm): total sediment removal efficiency on annual basis.



As the connected runoff area increases, removal efficiency decreases.
Test data is available upon request.
For information please contact:
Technical.design.uk@Wavin.com

The DWA-A 102 is based on German rainfall patterns, but these rainfall intensities have been derived as per the British Water Code of Practice to align with those intensities specified in the Ciria SuDS Manual and accepted UK rainfall patterns.

Design

Product configurations

The Certaro Lamella HDS can be configured for 3 variables:

- **Invert level**
- **Sludge sump volume**
- **Optional bypass**

INVERT LEVEL

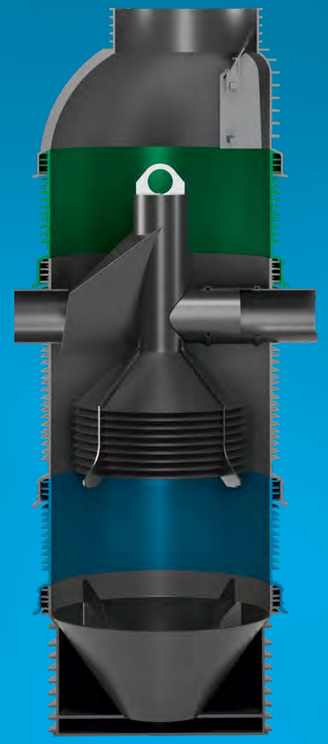
The minimum invert level is 1,039 mm below the top of the product. The height of the cover solution over the chamber should be added to this number. The invert depth can be extended with maximum 2 riser rings of 1 metre. The size of the riser rings can vary from 125 mm to 1,000 mm, in steps of 125 mm.
This allows for a maximum invert level of 3,039 mm.
The image shows the invert level with a 500 mm riser ring (see image in green).

The standard size of the inlet is DN 250. In case of connection with smaller diameter pipes, reducers may be applied.

SLUDGE SUMP VOLUME

The sludge volume of the Certaro Lamella HDS is at least 320 litre and can be extended by adding a riser ring of up to 1 metre (see image in blue). This will result in a 1,120 litre sludge sump. For balancing installation depth and maximum sludge volume the riser can be applied smaller sizes, available in steps of 125 mm.

In case of incidental spill of oil there is a 170 litre retention volume on top of the lamella. This is to isolate light liquids, which should be removed immediately following an oil spill incident. It should not be considered as an oil separator according EN 858.



OPTIONAL BYPASS

The Certaro Lamella HDS can be applied without bypass or with a bypass at a flow rate of 20 or 40 l/s.

The system is tested to ensure that settled particles do not get flushed out (resuspended and carried away) when water flows through it at a rate of 20 l/s (equivalent for 100 l/s/ha for 2,000 m²). In this case less than 0,5% of the sediment is resuspended and flushes out. In case of frequent higher flow rates, the level of resuspension may increase and a bypass for flows > 20 l/s should be considered.

Situations where this may be applicable are projects where:
- Areas larger than the system is tested for are connected.
- The location has more frequent heavy rainfall than referenced.

Extreme rainfall may also lead to pressure build up in the upstream water system due to the hydraulic resistance of the sediment separator. Ultimately this may lead to flood problems. To prevent pressure build up in these conditions a bypass of 40 l/s is recommended.

TECHNICAL INFORMATION

Chamber outside /inside diameter [mm]	1,180 / 1,000
Min/Max Height [mm]	2,377 / 5,377
Weight recycled PE chamber shaft [kg]	100
Weight Bottom (nominal weight) [kg]	76
Weight Lamella cone (nominal weight) [kg]	43
Weight riser per 500 mm length (nominal weight) [kg]	42
Sludge trap volume [l] (min/max/recommended based on 500 mm riser)	320 / 1,120 / 720
Floating matter retention volume [l]	170
Inlet/outlet diameter [mm]	250 / 250
Min./Max. invert depth [m]*	1.1 – 3.1
Min./Max. installation depth [m]*	2.4 – 5.4
Design run-off area (based on DWA-A102) [m²]	1,000 to 6,000
Filter performance with design run-off area, TSS	Available upon request
Treatment capacity flow rate [l/s]	Available upon request
Hydraulic capacity flow rate [l/s]	Available upon request
Bypass optional, commencing at flow rate [l/s]	20 / 40
Loading	Acc. cover solution, product unloaded
General Material	Recycled PE
Colour	Black
Testing	According to DWA-A 102 by IKT and British Water Code of Practice
Certification/Approvals	Pending

* excluding additional depth for cover solution

Installation

Installation

Components

If you would like to install our device in a pre-cast concrete chamber (PCC) and require the necessary components for delivery, please reach out to our Technical team at **Technical.design.uk@Wavin.com**

The Certaro Lamella HDS is delivered as:

1. a stack of bottom, middle part and top without seals
2. a stack of optional riser shafts according to the ordered configuration
3. seal between each component

Parts:

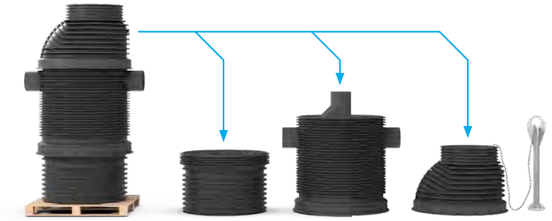
1. Top cone
2. Seal
3. Optional top riser shaft
4. Filter shaft
5. Plug with chain
6. Optional riser shaft sump volume
7. Base

Installation steps

1. Unstacking

Before installing the shafts, all components must be checked for damage and contamination. Contaminated sealing elements and shaft components must be cleaned. Damaged components must be replaced if necessary.

The Certaro Lamella HDS is delivered as a stack, but not assembled. Seals have to be installed during installation. When preparing for installation, all components need to be separated. When removing the cone, first detach the chain connected to the maintenance plug. Note its position for later re-insertion into the device.



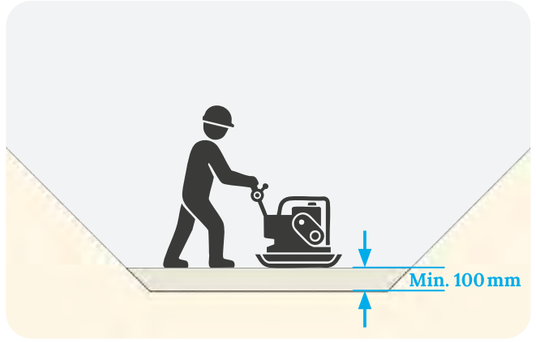
Lifting instructions

Lifting of the components should be done with appropriate lifting equipment. The shafts can NOT be lifted from the in and outlets, but have to be lifted with a sling around the device. Lifting from the outlets can damage the outlets and result in unsafe lifting situations.

2. Prepare surface

The support surface (trench or ditch) of the Tegra base must be made in accordance with EN 1610 "Type 1 bedding."

The support for the Tegra base must be formed by a compacted blinding layer of at least 100 mm thick. Make sure the surface is flat and level.



Installation

Installation steps

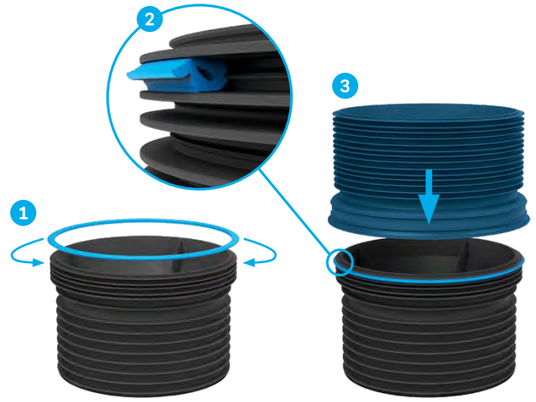
3. Install and level base (+option shaft 1)

The Tegra base must be positioned in accordance with the planning specifications. Embed the Tegra base in the bedding, then backfill the base and compact the sides by foot.
This is done to stabilize the base.

A DN 1000 sealing ring must be used to connect the shaft base and the shaft pipe. Before inserting the sealing ring, the shaft base must be cleaned. The sealing ring must be installed in the first groove of the base or shaft. Refer to the picture 2 and the attached label on the sealing ring.

The sealing element must be installed between the first and second rib of the Tegra base. The correct direction and correct positioning centrally between the ribs must be ensured. Before installing the next element, the DN 1000 sealing ring must be evenly lubricated.

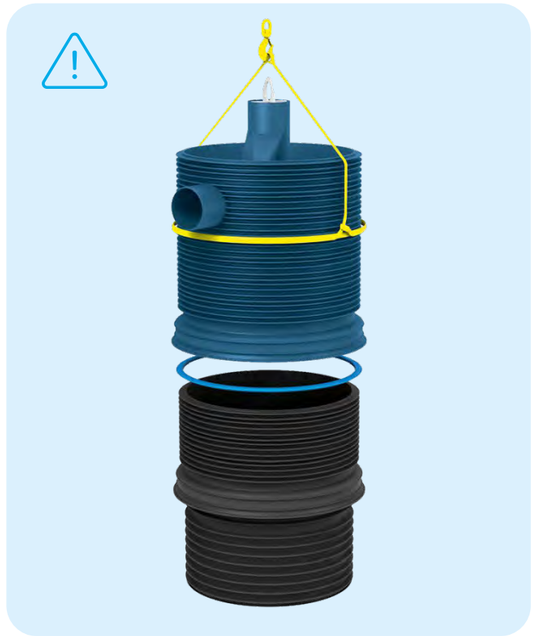
The optional bottom riser shaft (in blue) must be placed on the Tegra base without tilting. If assembly is assisted by hydraulic equipment (excavator or similar), a wooden block or sheet needs to be used to protect the components during installation.



4. Lift and position filter shaft

The filter shaft (in blue) must be installed in the same way as section 3 Safe lifting has to be done with a sling around the shaft. Lifting from the outlets must be avoided.

When positioning the shaft, consider the inlet and outlet position marked with IN and OUT.



5. Backfill and compact halfway

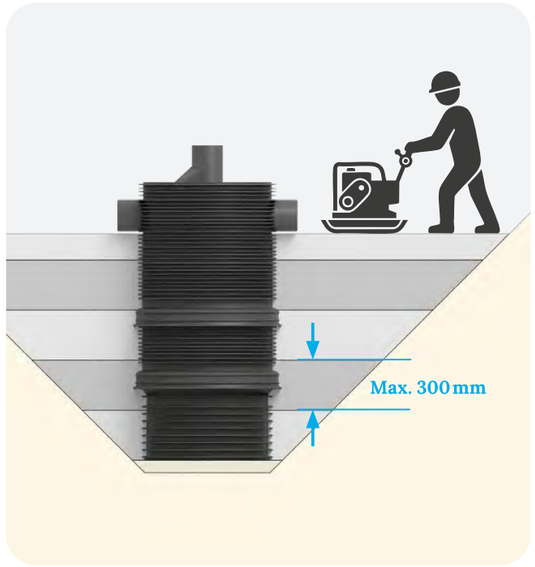
Backfill and compact the trench halfway according the EN 1610 ”Construction and testing of drains and sewers” evenly with layers (max. 300 mm) of side-filling around the base until 100 – 200 mm below the inlet and outlet.

Prevent sand falling into the chamber during backfilling, e.g. by placing a plastic cover or wooden plate on top of the shaft.

The appropriate degree of soil compacting should correspond with the existing soil and water conditions and future external load.

It is advised to compact soil at the minimum level of:
- 90% Proctor (SP) for non-trafficked areas,
- 95% Proctor (SP) for roads with limited traffic load,
- 98% Proctor (SP) for roads with heavy traffic load.

In the case of a high level of ground water it is advised to increase the degree of soil compacting to the minimum level of 95% Proctor (SP) for non-traffic area, and 98% Proctor (SP) for traffic areas.



Connect the inlet and outlet pipe, taking care to install the pipes with a correct slope. Couplers should be used to connect with standard DN 250 pipes. Reducers can be used to connect smaller diameters.

Installation

Installation steps

6. Install optional top riser shaft(s)

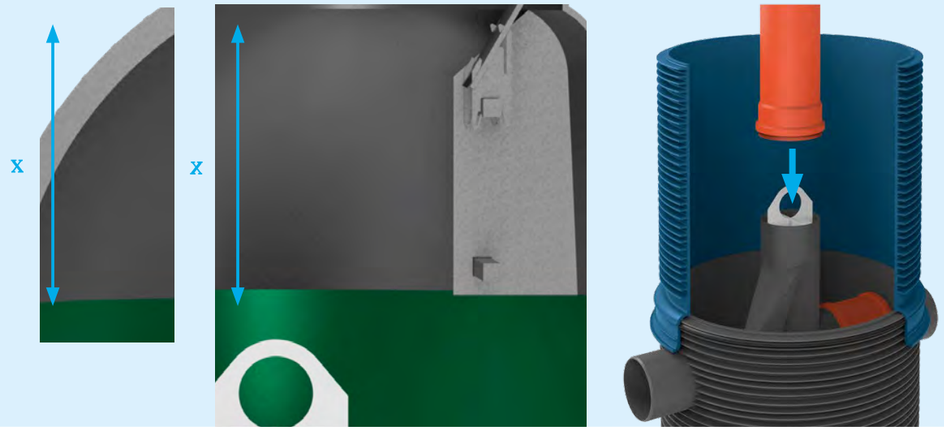
The optional top riser shaft(s) (in blue) must be installed in the same way as described in section 3.

To match the required invert level, he top riser shafts can be cut to length at marked points at intervals of 125 mm according to the installation depth. To do this, the pipe must be cut between two smaller double ribs, using a saw. Afterwards it needs to be deburred.

Optional: If more than a 500 mm top riser shafts is used, the centre access pipe needs to be extended with the supplied extension pipe. This is to ensure accessibility in deeper installations.

The delivered extension pipe always needs to be cut to length. The total pipe length is equal to the total length of the top riser shafts. Always shorten the spigot side of the pipe, as the socket is needed for installation.

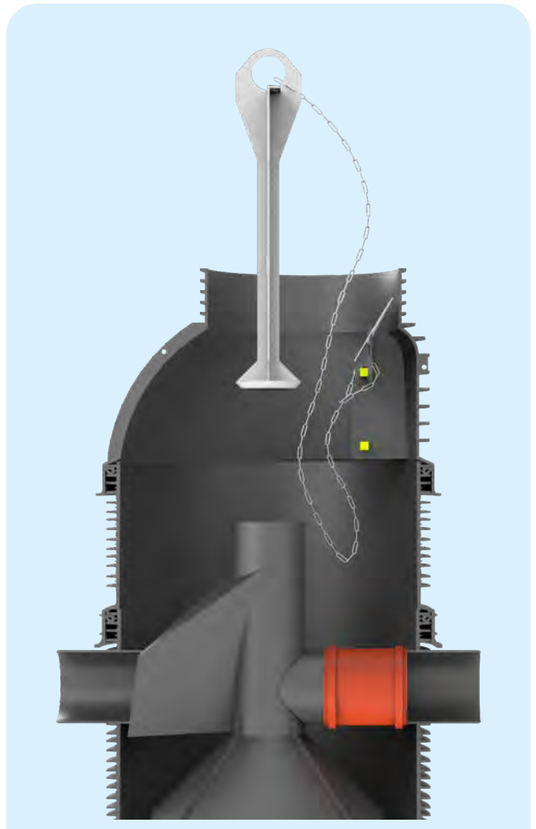
The extension pipe needs to be installed on the access pipe. Lubricate the seal with a suitable lubricant before installation.



7. Install cone + plug + chain

The cone must be installed according to the instructions in section 3. If necessary, the DN 600 shaft portion of the cone can be shortened up to 80 mm

After installation of the cone, the plug must be installed. The chain must be connected to the plug on one side, and the top stairs in the cone on the other side. If the centre pipe has been extended in step 6, the chain must run through the extended pipe.



Installation

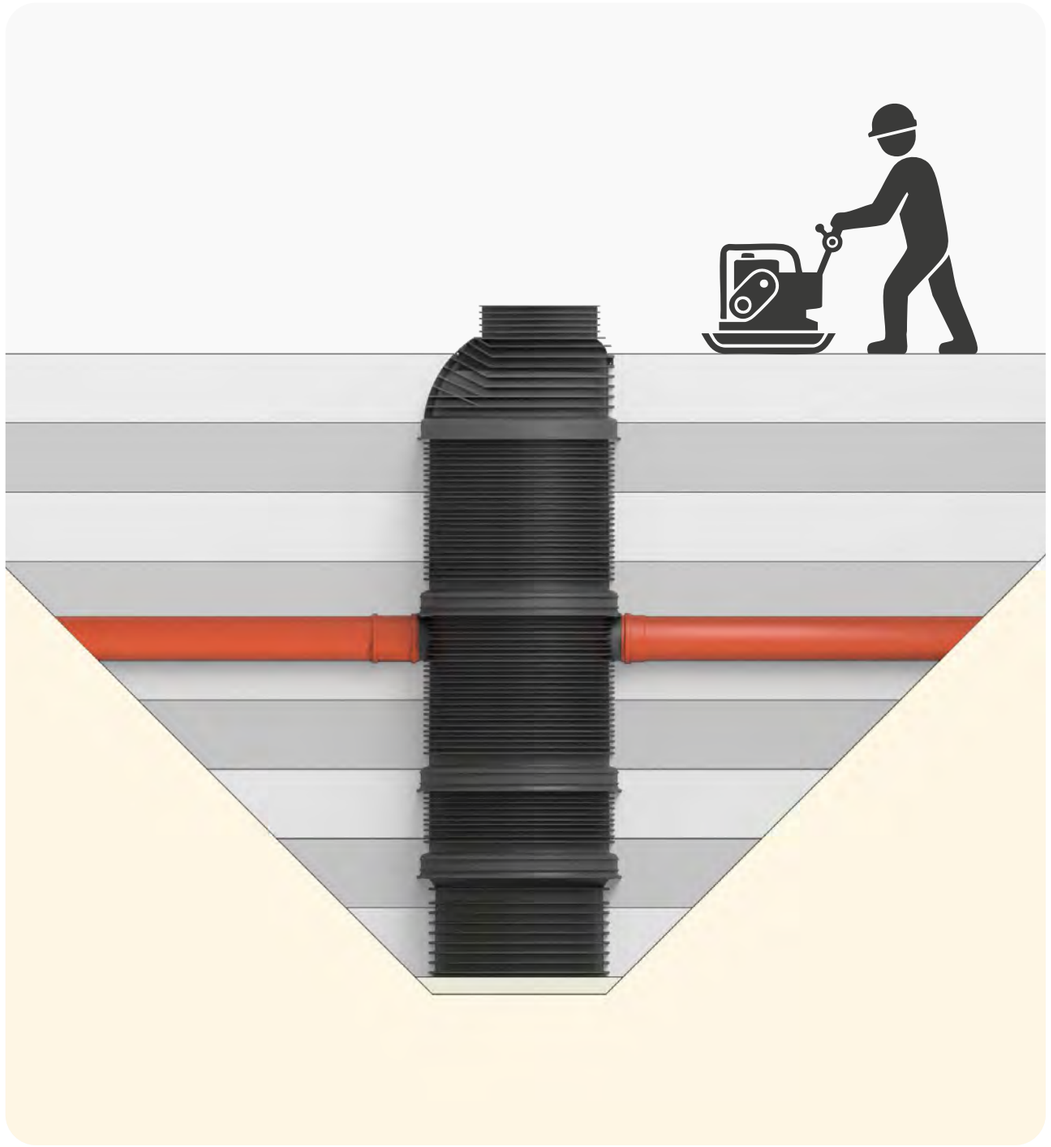
Installation steps

8. Final backfill and compact

Backfill and compact the remaining trench according EN 1610. Considering the right compaction levels according to the application area, as described in Section 5.

9. Cover solutions

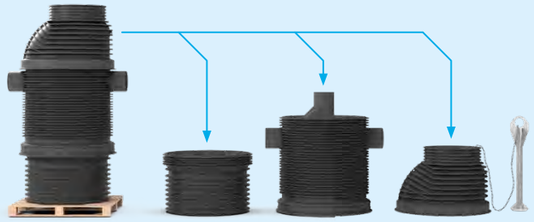
For the cover solutions, please refer to the local solutions. The cover should be closed, to avoid dirt flowing into the chamber.



Installation

Quick start installation guide

1



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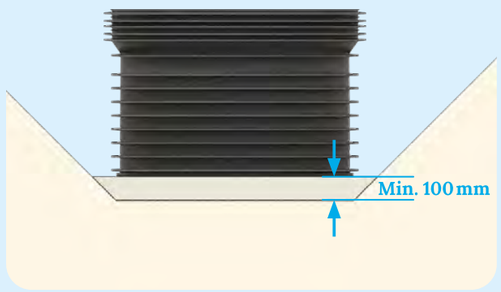

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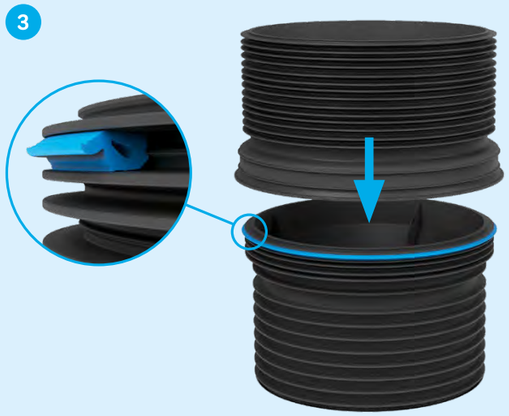

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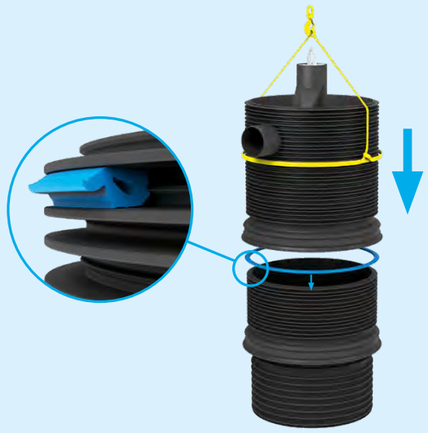

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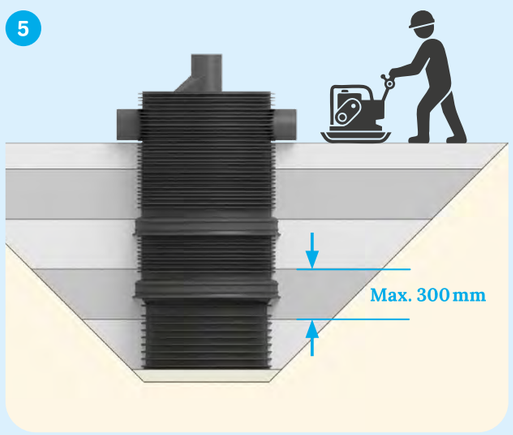

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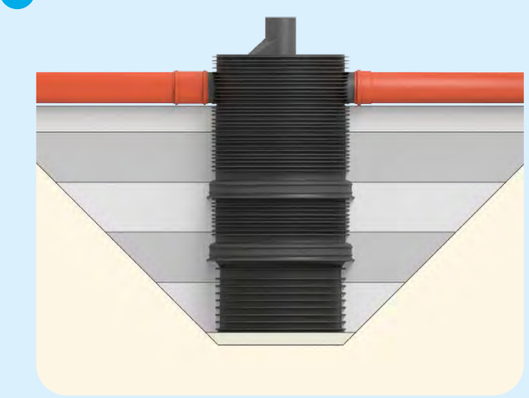

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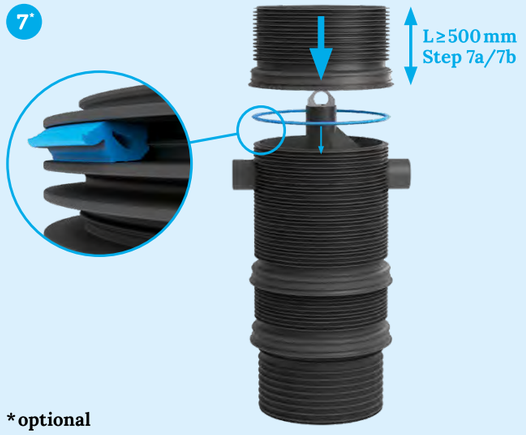

*optional

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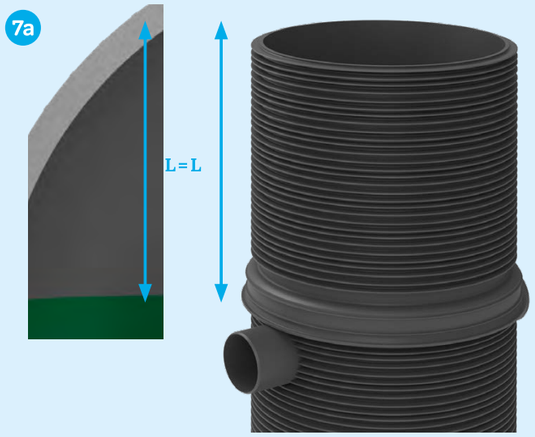

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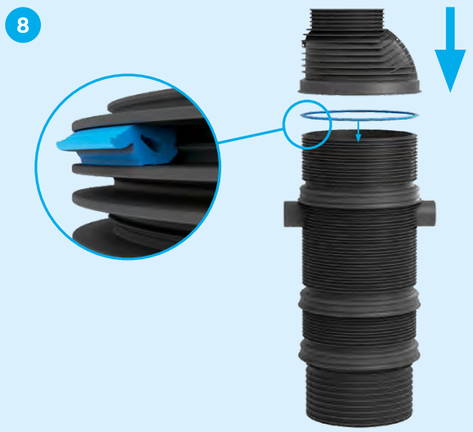

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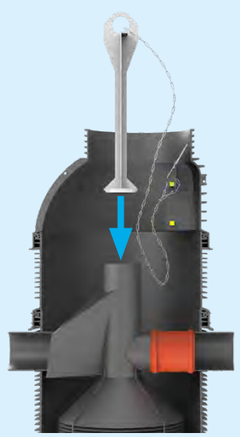

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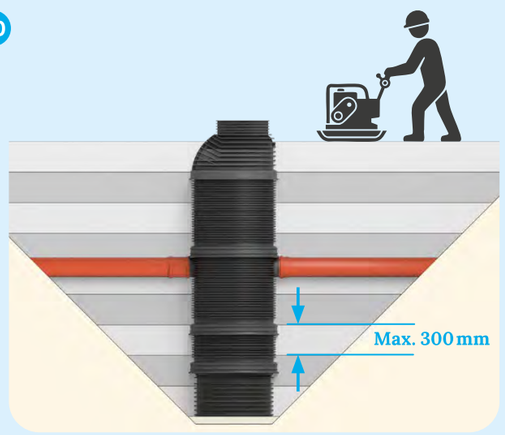


Maintenance

Maintenance

General

It is recommended to clean the Certaro Lamella HDS sedimentation chamber after installation. In particular, dirt and foreign objects that entered the system during the construction phase must be removed before commissioning to ensure proper functionality.

The first inspection is recommended approximately six months after commissioning. During this inspection, the correct commissioning is reviewed again, and the degree of sedimentation of dirt particles is determined in order to define future cleaning intervals.
It should be avoided that the sludge volume reaches the level of the lamella.

The cleaning intervals should be adjusted if necessary based on the level of contamination. To ensure safe operation, at least one inspection per year should be conducted.

Maintenance

Maintenance steps

1. Step

The Certaro Lamella HDS has a sludge volume at the bottom part of the device, that can be accessed through the internal centre shaft pipe. Due to conical bottom shape all sludge can be removed through the central access. Do not access system otherwise.

2. Remove plug

Remove cover and take out the white maintenance plug. If needed, use the chain to pull out the plug.

3. Clean

- **For standard maintenance:**
  Insert the suction hose in the centre shaft pipe and empty the sludge sump volume at the bottom of the chamber.
- **For major maintenance:**
  Clean the lamella pack by high pressure jetting the lamellas from the centre shaft. The collected debris from the lamellas will be flushed into the sludge sump.

After cleaning the pressure washer, the sump should be emptied again by suctioning from the centre pipe.

4. Return plug & close

Return the maintenance plug in the centre shaft pipe and close the cover.
Ready.

Appendix

FAQ

#1 How deep can the device be installed?

- The maximum installation depth for the Certaro Lamella HDS is **5 metres**.

#2 Is the device resistant to traffic load?

- Yes, the device can bear **heavy traffic** up to 60 tonnes, given the proper cover solution with load distribution ring is applied.

#3 Does the device need to be filled with water after installation and maintenance?

- It is not mandatory to fill the device with water after Installation or cleaning, but it is recommended to do so. **Filling the device ensures that the device is fully operational.**

#4 Can the device be installed below the groundwater table?

- Yes, the device can be installed below the groundwater table with a **maximum waterlevel of 5 metres**.

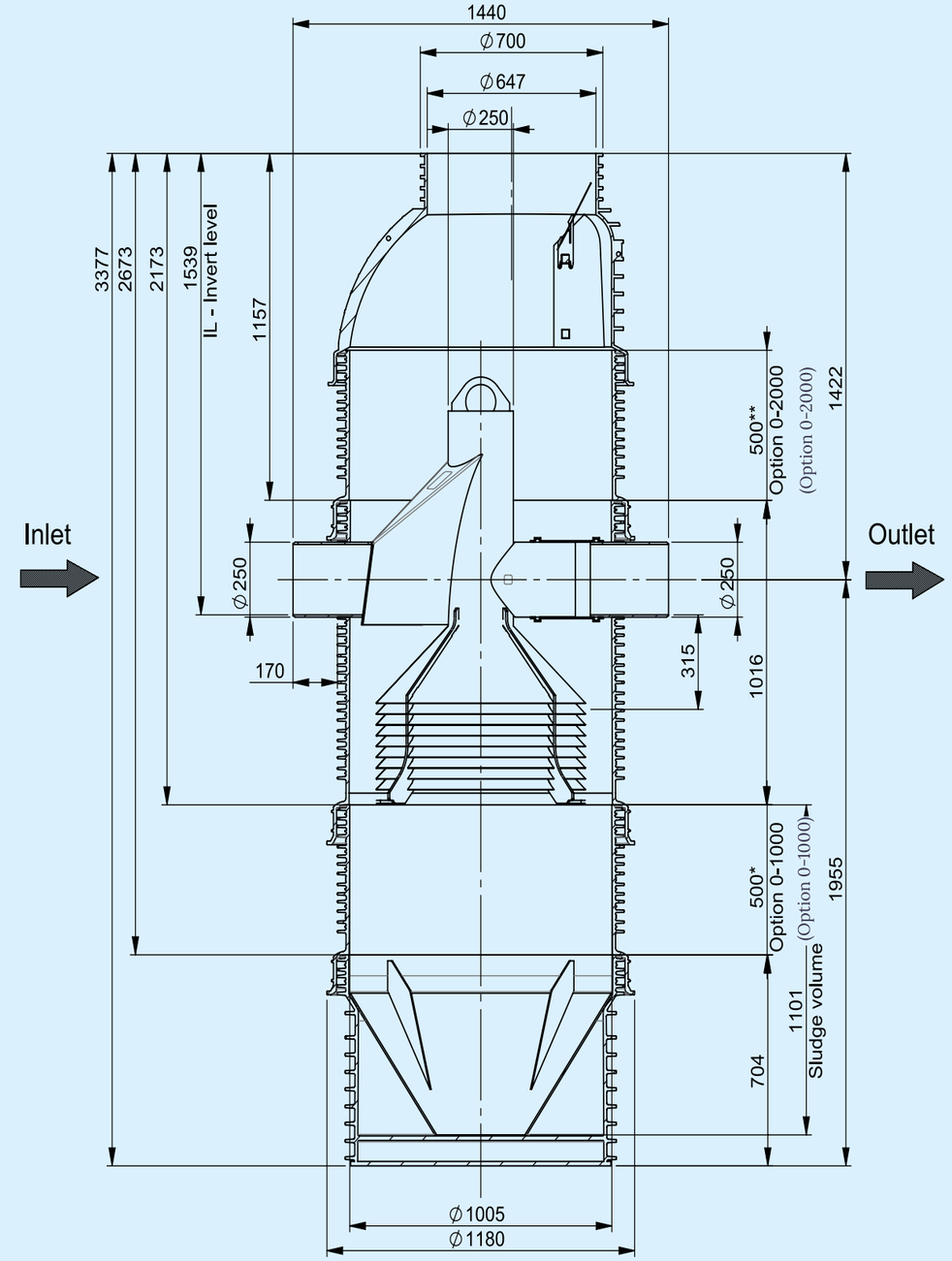
#5 How often is it needed to clean the device?

- The cleaning interval depends on many factors and can not be predicted. We recommend the first inspection approximately **6 months after installation**. And at least **one inspection per year**.

#6 Does the device flush-out?

- The Certaro Lamella HDS is very efficient in retaining captured sediment. **During peak rain intensities the device effectively retains almost all captured sediment.**

Technical Drawing



Better begins after.

Wavin Rainwater Treatment.

See Water Differently with us.

At Wavin, we believe in the power of water to shape better cities. Discover how innovative solutions turn every drop of rain into a resource – supporting healthier, greener, and more resilient urban spaces.

SCAN HERE for more information

wavin

orbia

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.

Orbia's Building and Infrastructure business Wavin is an innovative solutions provider for the global building and infrastructure industry. Backed by more than 60 years of product development experience, Wavin is advancing life around the world by building healthy, sustainable environments for global citizens. Whether it's to improve the distribution of clean drinking water, to make sanitation accessible for everyone, to create climate resilient cities, or to design comfortable living spaces, Wavin collaborates with municipal leaders, engineers, contractors, and installers to help future-proof communities, buildings and homes. Wavin has 12,000+ employees around 65 production sites worldwide, serving over 80 countries through a global sales and distribution network.

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