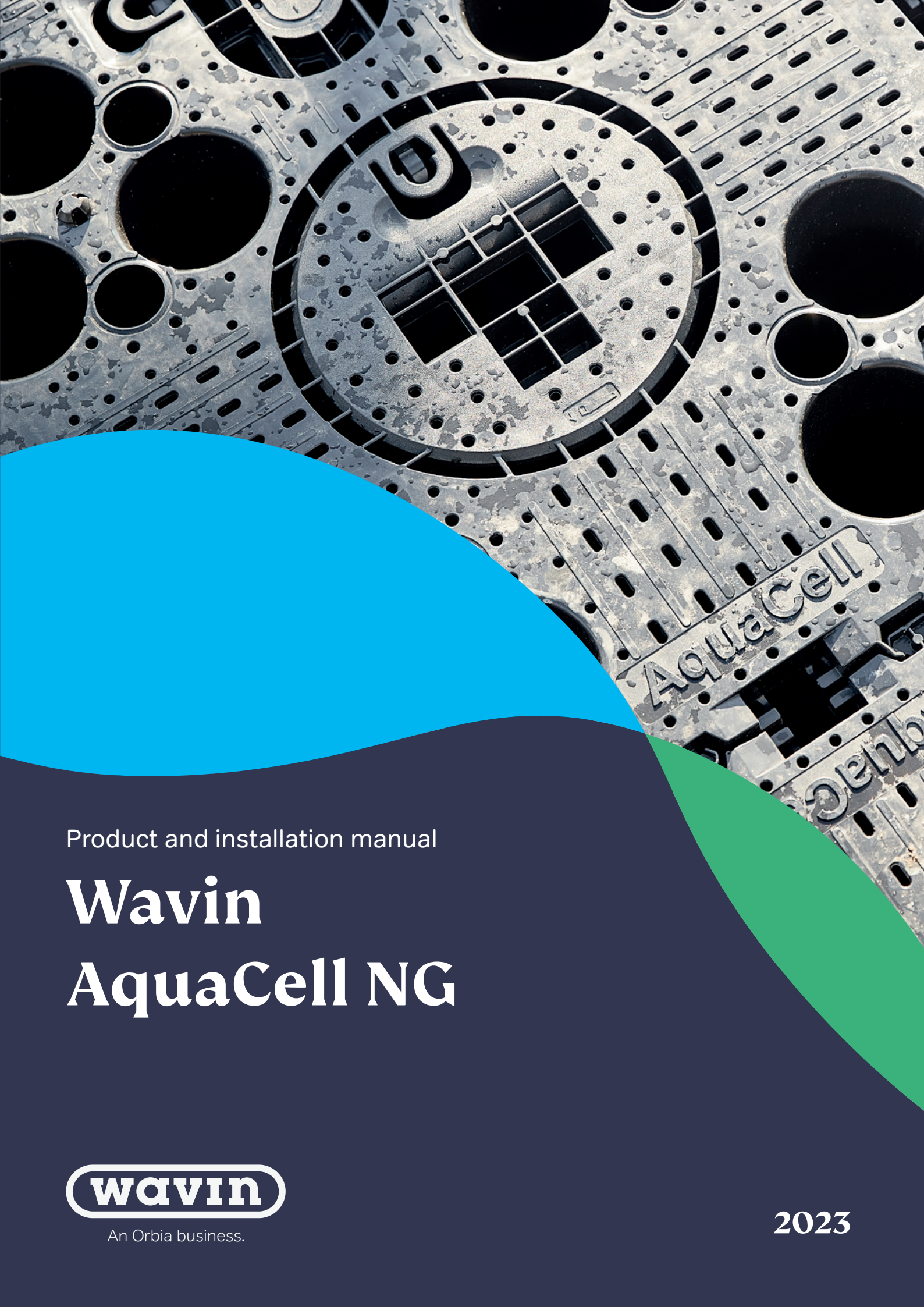




Product and installation manual

Wavin

AquaCell NG



An Orbia business.

2023

AquaCell NG – setting new standards for sustainability

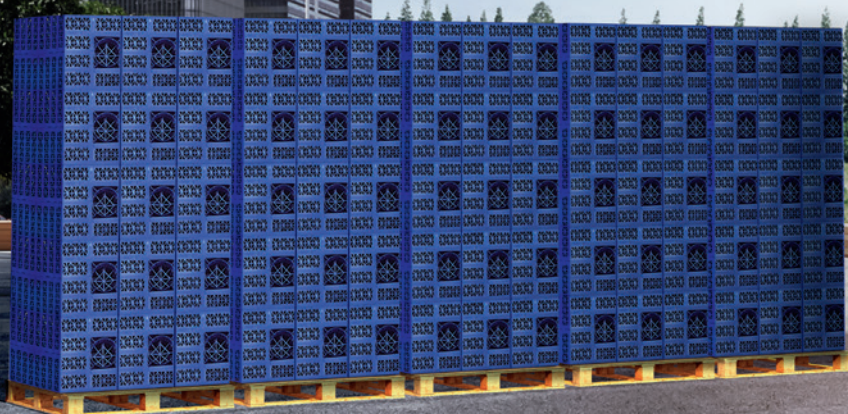
Wavin's AquaCell NG infiltration / attenuation units are made from 100% recycled and 100% recyclable polypropylene (PP).

These new generation units' stackable design means up to four times more product is delivered in every truck; This means...

- a significant reduction of CO2 emissions:
- 75% less deliveries to site

- less space required for storage on site and...
- More units per pallet mean reduced material handling on site.

The push-fit installation with integrated connectors helps to dramatically speed up installation whilst reducing the risk to your teams installing the system.



Stackable design allows up to four times more storage volume per truck when compared to AquaCell Core-R

Wavin AquaCell NG Installation

AquaCell NG		
Dimensions	Length (mm)	1200
	Width (mm)	600
	Height (mm)	400
	Gross volume (m ³)	0.288
	Void ratio %	95%
	Storage volume (m ³)	0.276
Connections	Pipe connections	OsmaDrain 110 – 160mm UltraRib 150, 225, 300mm TwinWall 150, 225, 300mm
Transportation and Handling	Weight per unit (kg)	11.4
	Units per pallet	28
	Units per truck	1,176
	m ³ per truck	338
Installation	Handling	Integrated ergonomic hand grips
	Connectors	Fully integrated
	Pipe connections	Plug and clip system
	Geotextile clips	Integrated
	Installation speed (m ³ per day)	160 – 200
Accessibility	Vertical Access	250mm Ø
	Inspection channel width	200mm
	Open floor area	54%
Material	Material	Recycled PP
	Colour	Black
Certification	BBA	BBA
	European standards	BS EN 17152-1
Loading	Vertical	44 tonnes m ²
	Lateral	11 tonnes m ²
Window of application	Pedestrian	
	Minimum Cover (m)	0.3m
	Max Depth (m)	4.48m
	Car park (9 tonnes)	
	Minimum Cover (m)	0.85m
	Max Depth (m)	3.98m

Wavin AquaCell NG

Design guidance

Infiltration or attenuation?

The AquaCell range can be used either as:

- A soakaway whereby the units will be installed in suitable pervious soils so the units can be wrapped in a geotextile to allow infiltration of the stormwater into the surrounding ground, or
- As an attenuation tank in impervious ground (e.g. clay) where infiltration is not possible, here the units are encapsulated in a geomembrane (which is in turn wrapped in a protective geotextile layer) so that the structure can hold the stormwater temporarily until local drainage flows can accept it for normal disposal at a permissible outflow rate.

Site assessment

Ground conditions may be established as part of a geotechnical assessment. This may include tests for infiltration and ground water level.

If there is no confirmation that such assessments have been conducted, or resulting conclusions are unavailable, a trial pit will be required in accordance with BRE 365.

For further information and guidance, please contact Wavin Technical Design Team.

Infiltration (soakaways)

According to the principals of SuDS, wherever possible stormwater should be drained back into the ground via a soakaway as the first priority. A site must meet BOTH of the following criteria for infiltration to be possible:

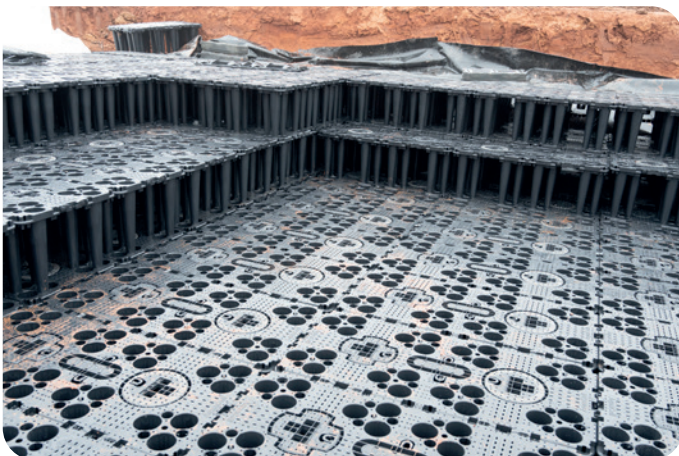
- The underlying soil surrounding the proposed installation is sufficiently permeable
- The seasonally high-water table is a minimum of 1 metre below the base of the proposed installation

If either of these criteria is not met, or cannot be confirmed for any reason, a soakaway system may not be suitable for the application, in which case a storage tank must be used.

Attenuation (storage tanks)

A storage tank may be designed to be online or offline. However, if the site is subject to groundwater or a high water table, it is important to ensure that the tank is not vulnerable to flotation. Sufficient weight from soil, or other covering placed over the AquaCell units, must be sufficient to counter any buoyancy uplift force from the rising groundwater level.

Large scale AquaCell NG storage tank installation



Wavin AquaCell NG

Design guidance

Structural Design

Structural design requires careful consideration of loading factors specific to each location – see CIRIA C680 or CIRIA C737 for further guidance (we recommend using the BPF Guide Designing Geocellular Drainage Systems to CIRIA Report C737 alongside.)

The AquaCell NG unit has been designed to have specific loading capacities that define the maximum depth parameters for which it is suitable.

The minimum depth of cover varies according to whether or not the installation will be subject to trafficking by vehicles.

However, in some situations, installations may have to be located with greater cover depths. Reasons may include:

- Deep-running drainage network
- Other buried services running above tank location
- Installation into banked/ sloping ground
- Upper layer of clay preventing infiltration

The table shows a summary of typical cover depths and installation depths as an indicative guide.

In trafficked applications it is recommended that the height of any tank should not exceed 2.025m (5 units). If you require a tank that exceeds this, please contact Wavin Technical Design for guidance:

T: 0800 038 0088 E: technical.design@wavin.co.uk

Soil Type	Soil Weight kN/m ³	Angle of Internal Friction ϕ (degrees)	Landscaped Areas	Vehicle Mass <9 tonnes	Vehicle Mass <44 tonnes
			Maximum depth (m)		
Consolidated Stiff Clay	20	24	3.49	3.24	2.99
Silty Sandy Clay	19	26	3.94	3.67	3.41
Loose Sand and Gravel	18	30	4.82	4.54	4.26
Medium Dense Sand and Gravel	19	34	5.36	5.10	4.83
Dense Sand and Gravel	20	38	5.21	4.96	4.71
			Minimum cover depth (m)		
			0.3	0.72	1.46

Wavin AquaCell NG

Instructions for installation

1.1. General characteristics

The AquaCell is a below ground (rain)water storage system which can be used in two different applications namely as an:

1. Infiltration system:

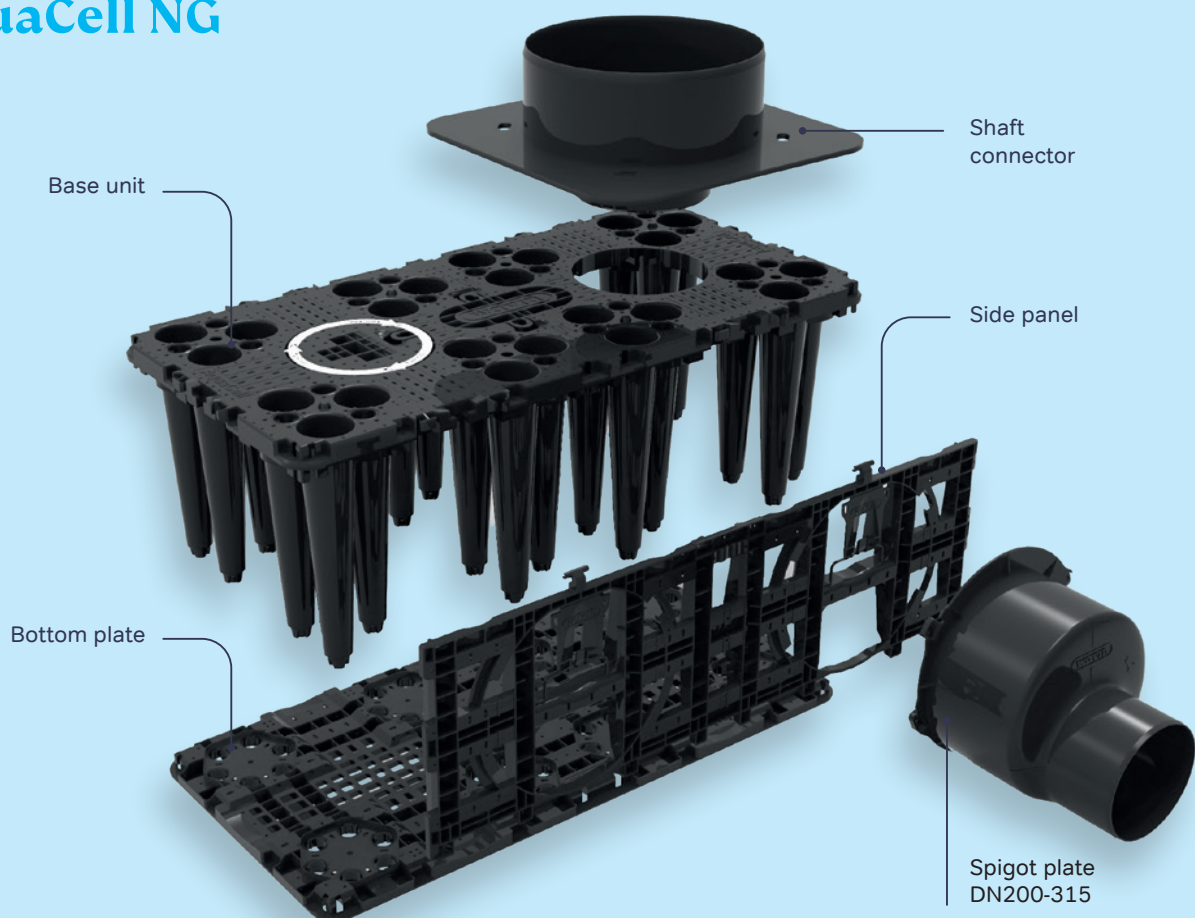
- Objective:
—temporary storage to allow the gradual infiltration of water into the soil.
- Solution:
—Wavin AquaCell system wrapped in a geotextile.

2. Attenuation system:

- Objective:
—temporary water storage and management to return the water to the existing network.
- Solution:
—Wavin AquaCell covered in a geomembrane seal, which is in protected by a geotextile around it.



AquaCell NG



1. Wavin AquaCell NG

Properties:

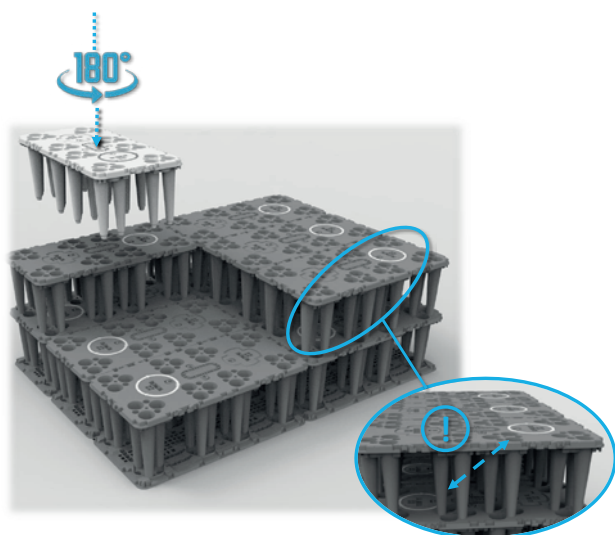
Base Unit	Material	Recycled PP (Polypropylene)
	Dimensions (mm)	1200x600x425 (LxWxH)
	Volume (Gross)	0.288m ³
	Volume (Net)	0.275m ³
	Void rate	96%
	Weight (kg)	11.4
	Pipe connections	110mm, 160mm, 225mm & 300mm
Bottom plate	Material	PP (Polypropylene)
	Dimensions (mm)	1200x600x35 (LxWxH)
	Weight (kg)	3.6
Side plate	Material	Recycled PP (Polypropylene)
	Dimensions (mm)	1155x373x50 (LxWxH)
	Weight	2.3
DN200-315 Spigot plate	Material	Recycled PP (Polypropylene)
	Dimensions (mm)	360x360x318 (LxWxH)
	Weight (kg)	1.3

IMPORTANT Regarding Orientation:

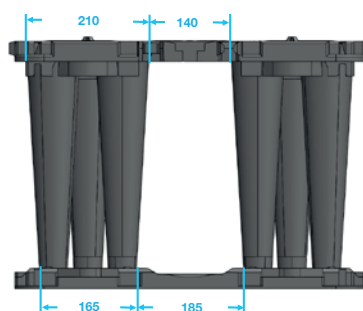
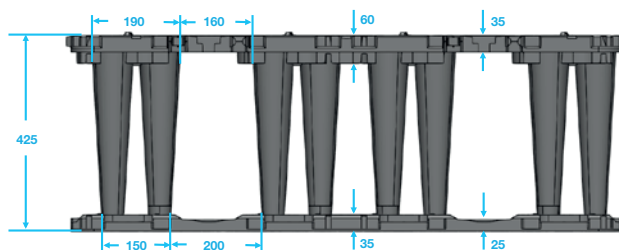
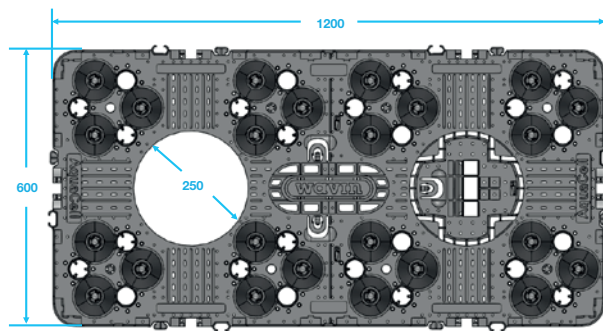
The base unit has a ring on top, which is used for the visual orientation of the product.

It is important to know that when the circle shape on the top of the unit is positioned above the circle of the unit below, the units will fall into each other, in the same way they are stacked on the pallet.

With a multi layer system it is important that all the circles are horizontally in line with each row of units. When installing the layer on top of an existing layer, the circle of the next unit should NOT be oriented directly above the circle of the base unit underneath but in the opposite direction, above the plus.



1.2. Dimensions

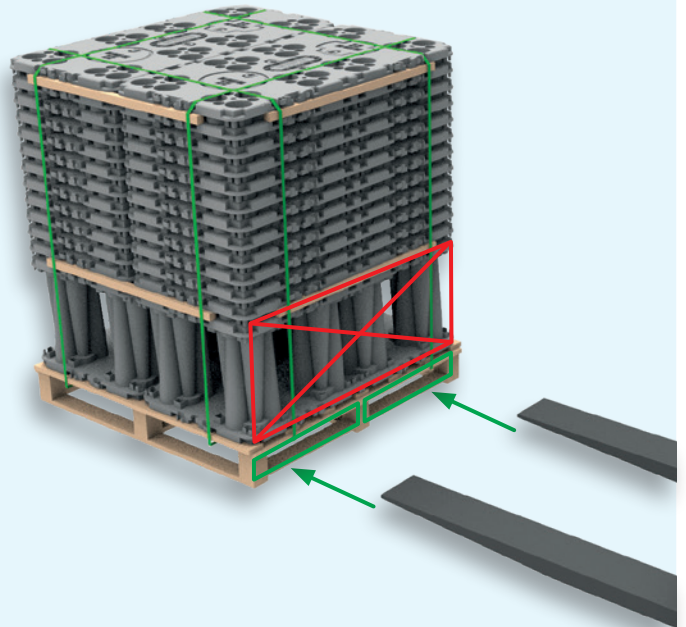


1.3. Destacking package and handling AquaCell NG

Handling by excavator or forklift:

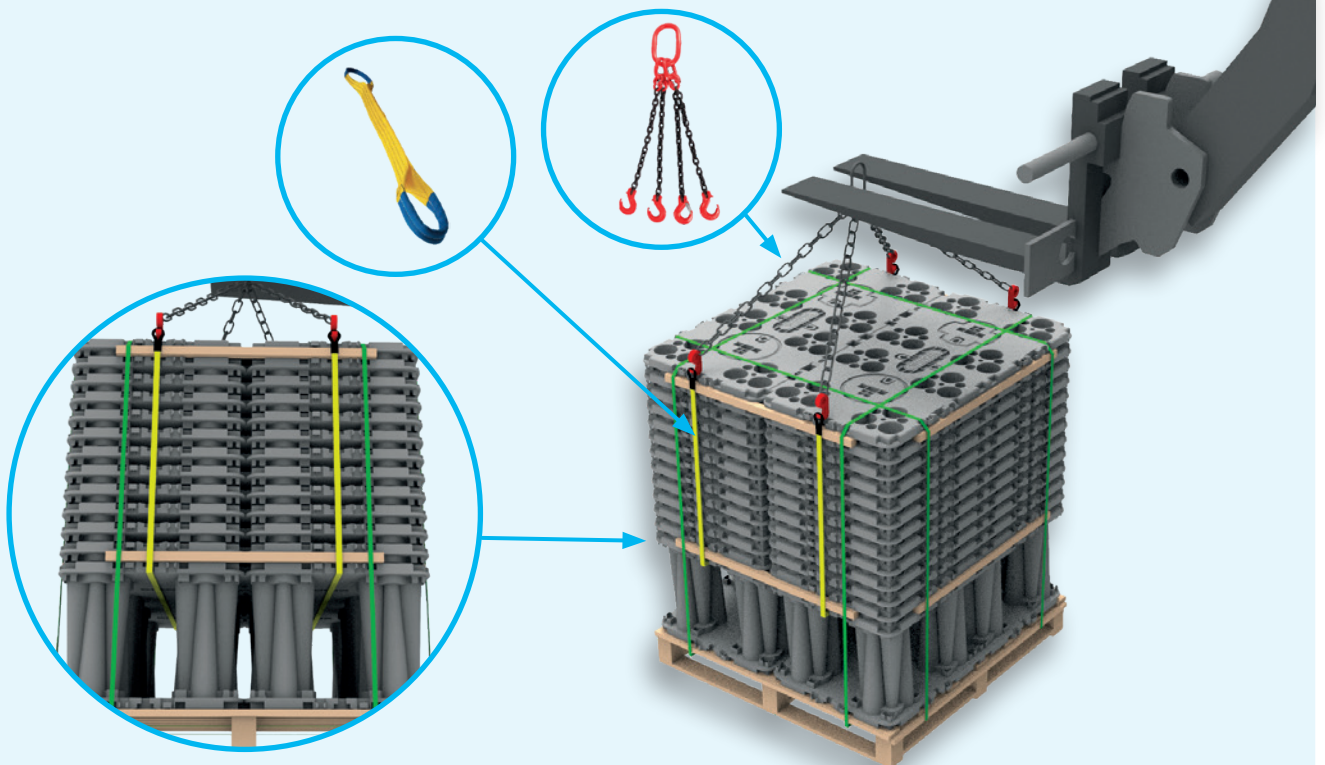
The AquaCell units are stacked 28 pieces per pallet.

The pallets can be lifted with forks on an excavator or forklift by positioning these forks in the openings of the pallets (see pictures):

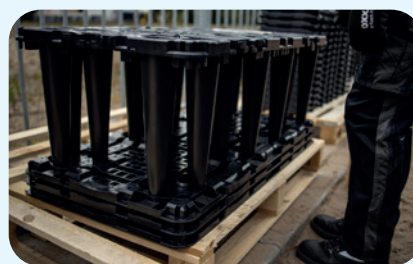
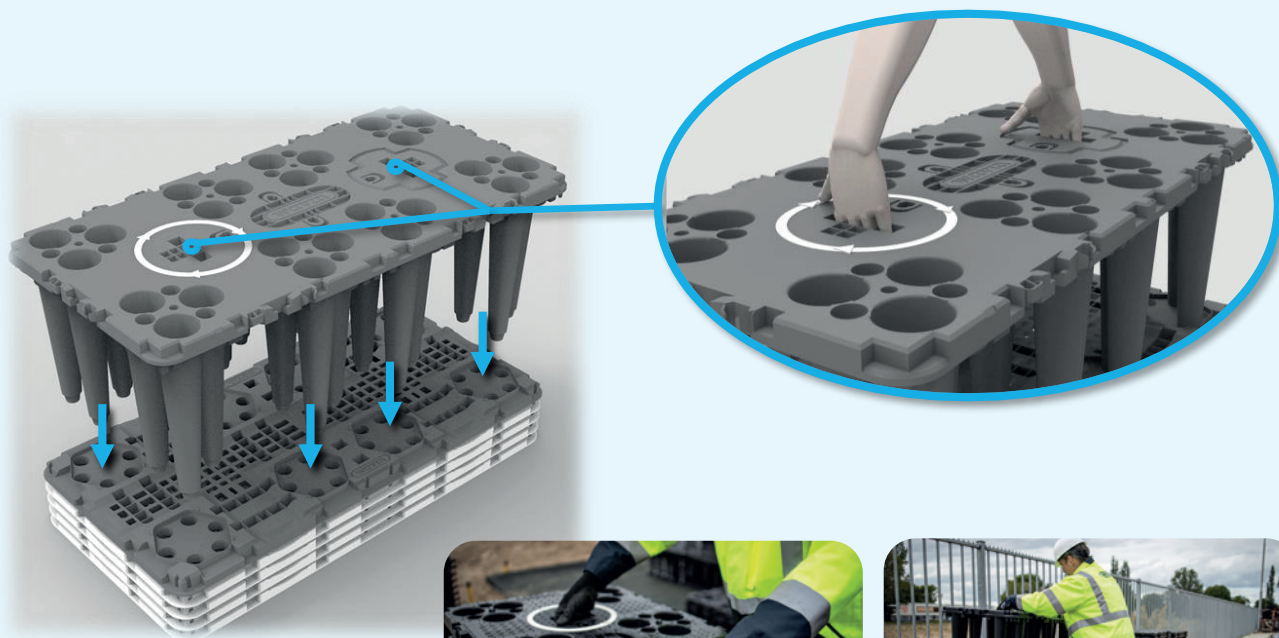


Handling with excavator or crane:

The pallets can also be lifted with slings positioned as indicated in the pictures. It is important that the sling is long enough that hooks are above the stack, not to damage the products.



The AquaCell NG Base unit has a low weight (11,4 kg) and is equipped with integrated handgrips for ergonomic handling.



For dismounting of the bottom layer of the stack pull firmly on one short side of the unit while keeping a foot on the bottom layer.



2. Installation instructions

For the total installation of the AquaCell NG the following steps have to be performed:

Step 1

Excavate the trench to the required depth ensuring that the plan area is slightly greater than that of the AquaCell NG units.

Lay 100mm of suitable bedding material.

Remove protruding (sharp) objects (e.g. stones) which can damage the geotextile/membrane).



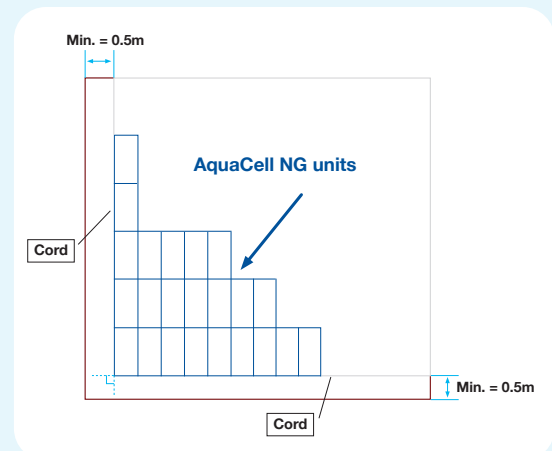
Step 3

Install the geotextile / geomembrane on the bottom of the trench. Lay the geotextile/Geomembrane over the base and the up the sides of the trench.



Step 4

Install and outline (perpendicular) a thin cord to ensure a straight system.



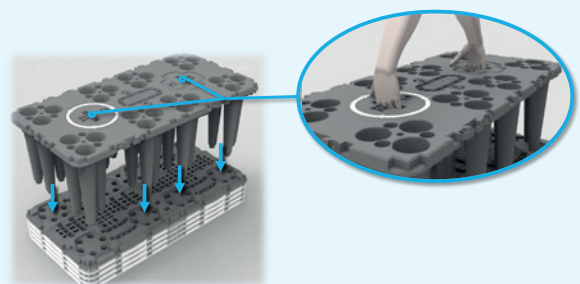
Step 2

Level and Compact.



Step 5

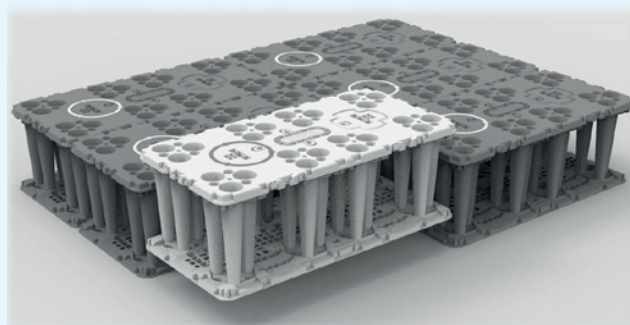
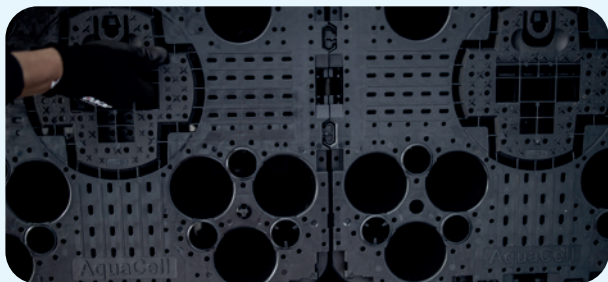
Bottom layer: Mount the bottom plate to the AquaCell unit (make sure an audible “click” is heard to ensure a proper connection) and place this unit in the outlined corner on the bottom of the trench.



Step 6a

Bottom layer: Place the next (outer) units (including a pre-mounted bottom plates) next to the installed units by sliding the integrated connectors into each other.

Note: Check the orientation of AquaCell NG (as above).



Repeat this until the full bottom layer is installed.

Step 6b

Vertical inspection: When vertical access through the unit is required, the round plate / “Circle” or “Cross” on top of the AquaCell NG unit must be cut. The cutting lines are marked by a “hand saw” logo. A saw with a blade length of a least 8cm is required.

Note: Make sure that the round “circle” plate or “cross” of each unit of each layer below the vertical access is cut.



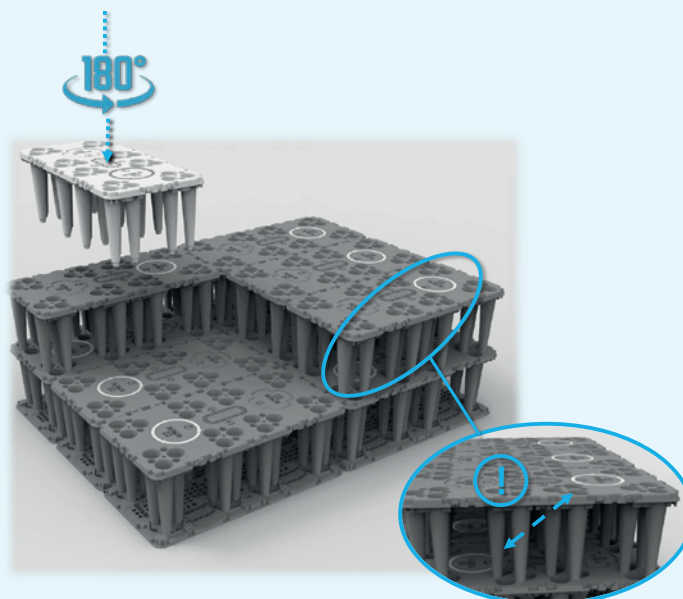
Step 7

Next layer(s): Mount the AquaCell NG (without bottom plate) directly on top of bottom layer unit(s). Each of the pillars will fall into position and click in the top directly on top of the bottom layer of the unit below.

Note 1: Keep in mind the orientation of the white circle (white circle above white circle is NOT possible!).

Note 2: The integrated connectors will slide into each other (vertically).

Note 3: It may be necessary to walk on top of previously laid AquaCell NG units. Care should be taken not to damage the edges of the units.

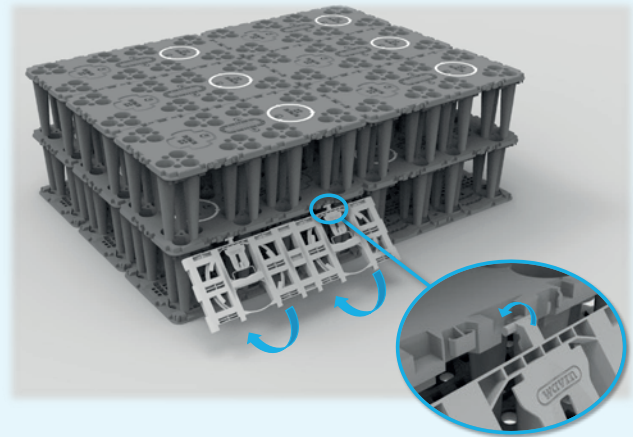


Repeat this for all the layers until all units are installed.

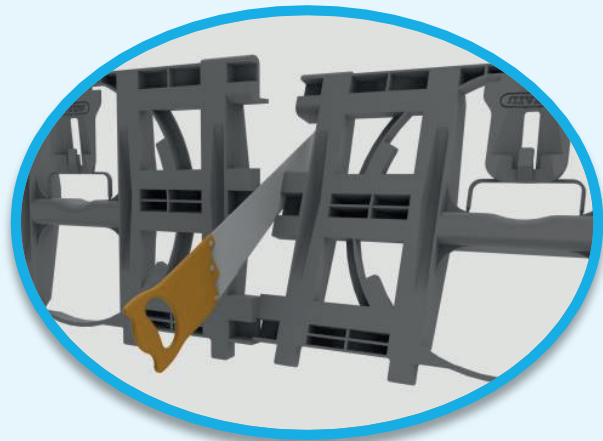
2. Installation instructions

Step 8

Side panels: The following step is to install the side panels by putting the hinge pins of the side panel into the hinge pockets the units under an angle. Next the panels can be hinged against the pillars of the AquaCell NG unit. The panel will snap to the unit.



Repeat this step until all side panels are installed and the system is fully closed except at the location where the inlet and outlet must be placed.

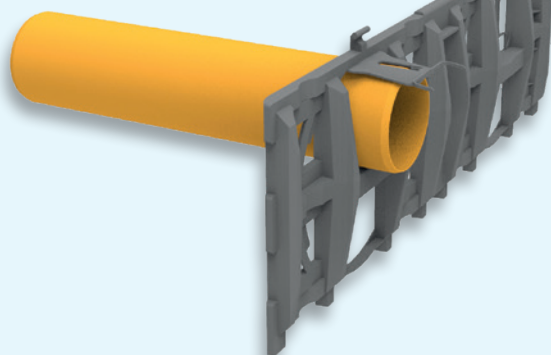
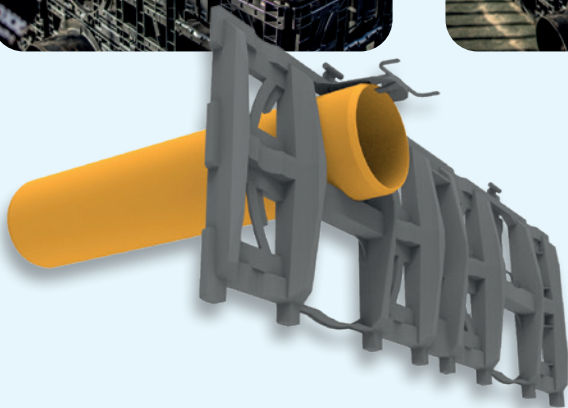


Note 1: In case of the need of a half sidepanel, the sidepanel must be cut.

Note 2: After cutting there is a left and right version. Be sure that the rounded edge of the half panel is positioned towards the corner of the system (not the cutted edge!) or depending on the length of the side, put the half panel in between two uncut panels.

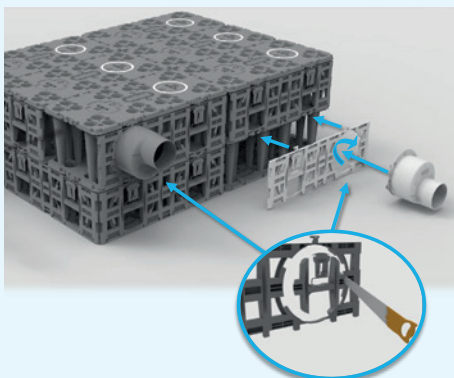
Step 9a

Connection 160mm: Each side panel has two standard DN160 Inlets with integrated pipe stopper. The two sprues of the pipe stopper can be cut/broken to activate this pipe stopper.



Step 9b

Connection 160mm: Each side panel also has two preformed openings that can be cut by a jigsaw. Next, the Inlet connector with spigot DN200 and DN315 can be connected by positioning and rotating until clicked into place. (Bayonet like).



2. Installation instructions

Step 10

Wrap the AquaCell NG Structure:
For soakaways - wrap and overlap the geotextile covering the entire AquaCell NG structure.

For attenuation tanks – wrap the geomembrane around the AquaCell NG structure and seal to manufacturer's recommendations**. Then wrap and overlay the geotextile, to protect the membrane.

**The geomembrane should be designed to survive the rigours of construction, this is typically at least 0.5mm thick. Joints should be sealed using proprietary welding techniques.



Step 11

Lay 100mm of coarse sand or non angular granular material between the trench walls and the AquaCell NG structure and compact.

Step 12

If installing integral vertical inspection shafts, directly onto the top surface of the AquaCell NG Tank structure, then ensure all pre-formed cut out sections are removed (on every level inside the structure).

Install Vertical adaptor within preformed cut out and seal to manufacturers recommendations.

Step 13

Lay 100mm of coarse sand or non angular granular material over the geotextile/geomembrane and compact. Backfill with suitable material.



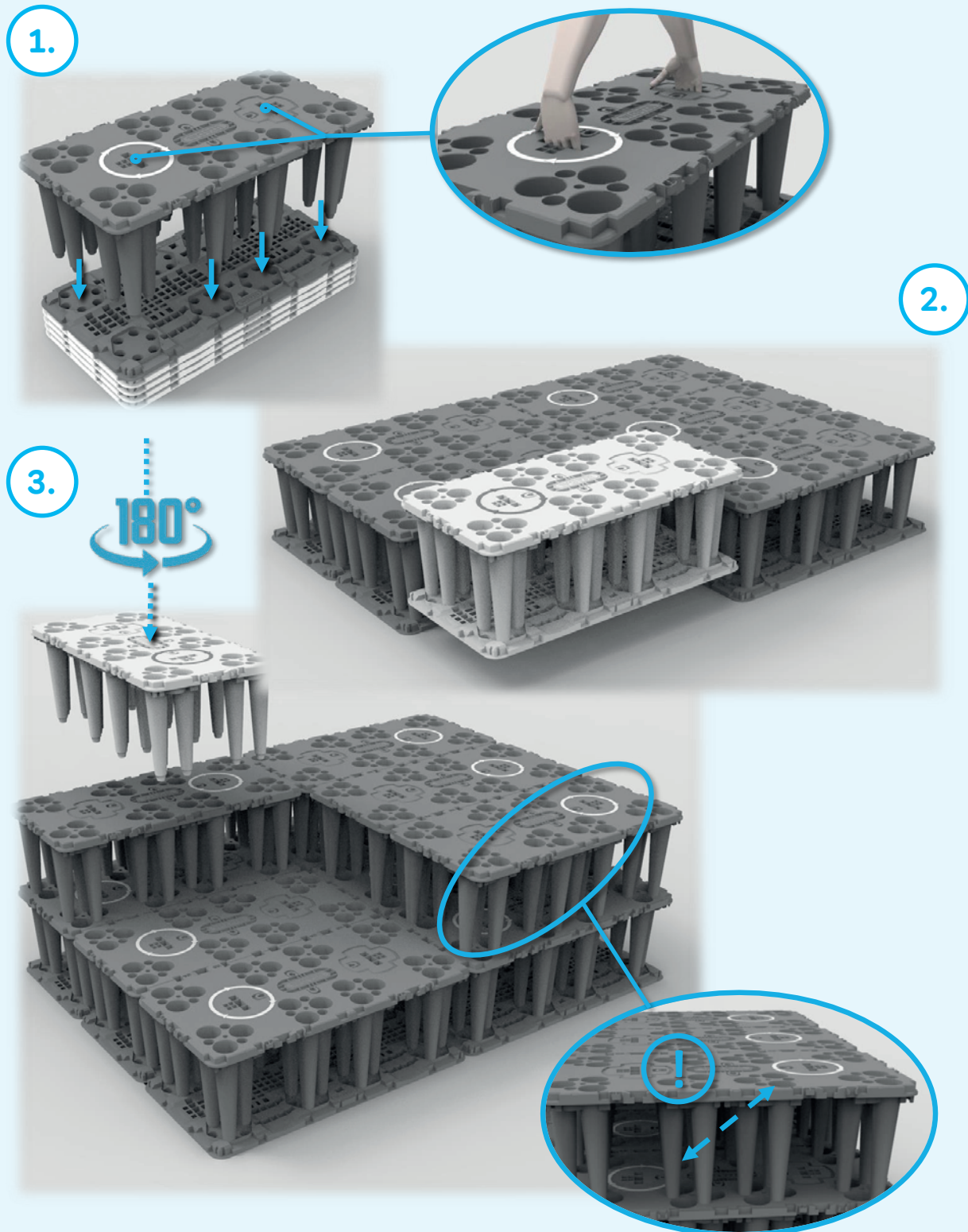
Construction Loads

Construction plant such as excavators can impose significant loads on any AquaCell NG unit. The following guidelines should be observed:

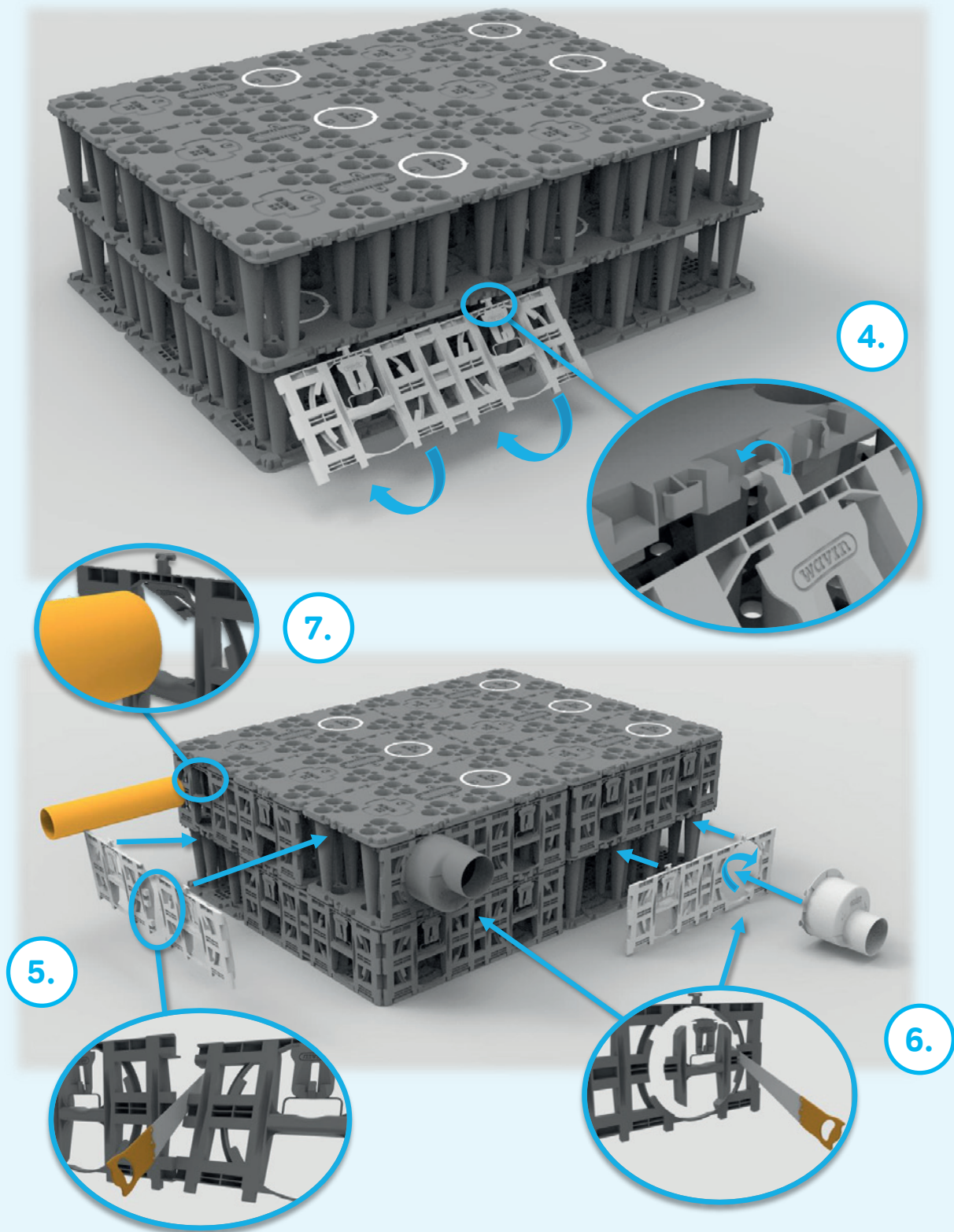
- Tracked excavators (not exceeding 21 tonnes weight) should be used to place fill over the AquaCell units when the geotextile or geomembrane wrapping has been completed
- At least 300mm of fill should be placed before the excavators or trucks delivering the backfill are allowed to traffic over the installed units
- Compaction plant used over the AquaCell NG units should not exceed 2300kg/metre width. This will allow the compaction of Type 1 sub-base in 150mm layers over the units in accordance with the Specification for Highways Works

- All other construction plant should be prevented from trafficking over the system once it is installed and surfacing completed, unless a site-specific assessment demonstrates that is acceptable
- In particular cranes should not be used over, or place their outriggers over the system

3. Schematical installation instructions



3. Schematical installation instructions





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