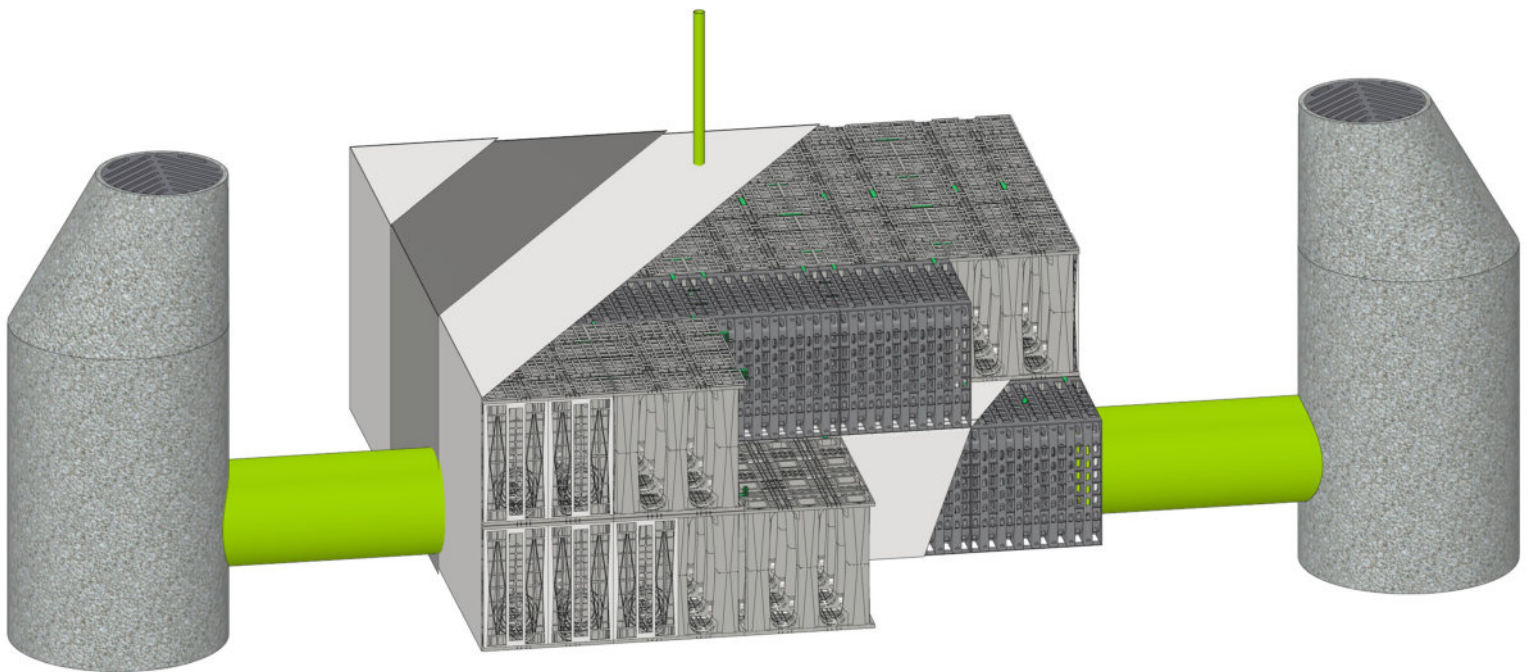




GRASPOINTNER  
Sustainable innovation.

BG-AQUA citybloq  
BG-AQUA citybloq+  
Installation Manual



Stormwater  
management system for  
infiltration & detention.

**BG-AQUA**

Modular crate systems

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# Modular Range

THE BG-AQUA CITYBLOQ SERIES IS A VERSATILE AND ROBUST UNDERGROUND MODULAR STORAGE SYSTEM THAT HELPS TO REDUCE STORM-WATER RUNOFF AND INCREASE GROUNDWATER RECHARGE. EACH MODULE IS MADE OF INJECTION MOLDED DENSITY POLYPROPYLENE (RECYCLED AND/OR VIRGIN). THE SYSTEMS INCLUDE SEPARATOR UNITS, SIDE PANELS, COVERS, END PLATES AND OTHER ACCESSORIES.

WHEN INSTALLED AS PER THE MANUFACTURER'S GUIDELINES, THE BG-AQUA PRODUCTS ARE DESIGNED TO WITHSTAND LOADS UP TO HS-20 FOR CITYBLOQ (STANDARD DUTY) AND UP TO HS-25 FOR CITYBLOQ+ (HEAVY DUTY) AFTER INSTALLATION AND BACKFILLING (LANDSCAPED AREAS, CAR PARKS & SERVICE).



For any queries please contact our technical support at [technical@bg-graspointner.com](mailto:technical@bg-graspointner.com)

## Getting Started

BG-AQUA products should be handled with care as they can be damaged by impact from other product or machinery.

The typical necessary equipment for an installation may include:

- Excavating equipment
- String-line and laser level
- Measuring tools
- Electric saw
- Rubber mallet
- Eye protection, gloves, breathing protection
- Concrete vibrator

## Health and Safety

The installation of BG-AQUA citybloq and citybloq must comply with the installation instructions and applicable laws. When excavating, it is important to follow the temporary work requirements. BG-Graspointner can provide advice on the most appropriate installation methods for BG-AQUA citybloq systems. The installation process may differ depending on the site's unique features, which require careful consideration. Therefore, it is necessary to obtain approval from the consulting engineer or installer. If you have any questions, please contact us at [technical@bg-graspointner.com](mailto:technical@bg-graspointner.com).

**The BG-AQUA citybloq system is not intended to serve as a load platform for construction traffic and should be handled accordingly.** To ensure the long-term loading performance of the BG-AQUA citybloq, it is advised to fence off the installation area with high visibility fencing during construction and prohibit any vehicular traffic from using the footprint area of the system. Additionally, after installation, it is recommended to provide sign posts that indicate the maximum loads allowable over the BG-AQUA citybloq systems.

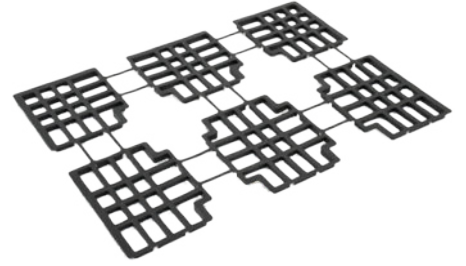
# Components



citybloq half module



citybloq side panel



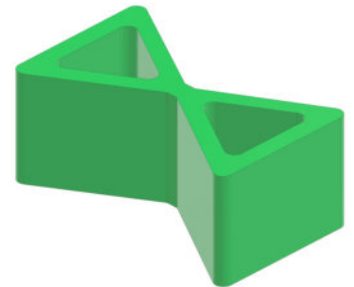
citybloq cover



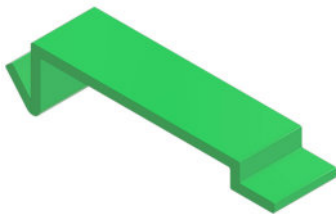
citybloq separator



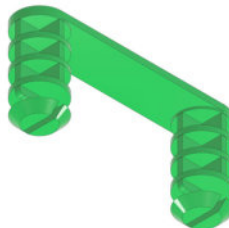
citybloq separator end plate



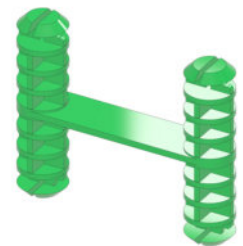
X-connector



separator clip



single clip



double clip



stack connector



## Transport & storage



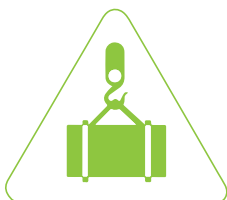
**BG-AQUA** citybloq half-modules



**BG-AQUA** citybloq separator units



BG-AQUA citybloq components can be stored outside but not longer than 12 months. The material must be protected from direct sunlight, stored in the shade or covered with bright-coloured, light-tight tarp. Material must be stored in clean area with solid flat pavement and secured against the wind. Avoid dropping units.



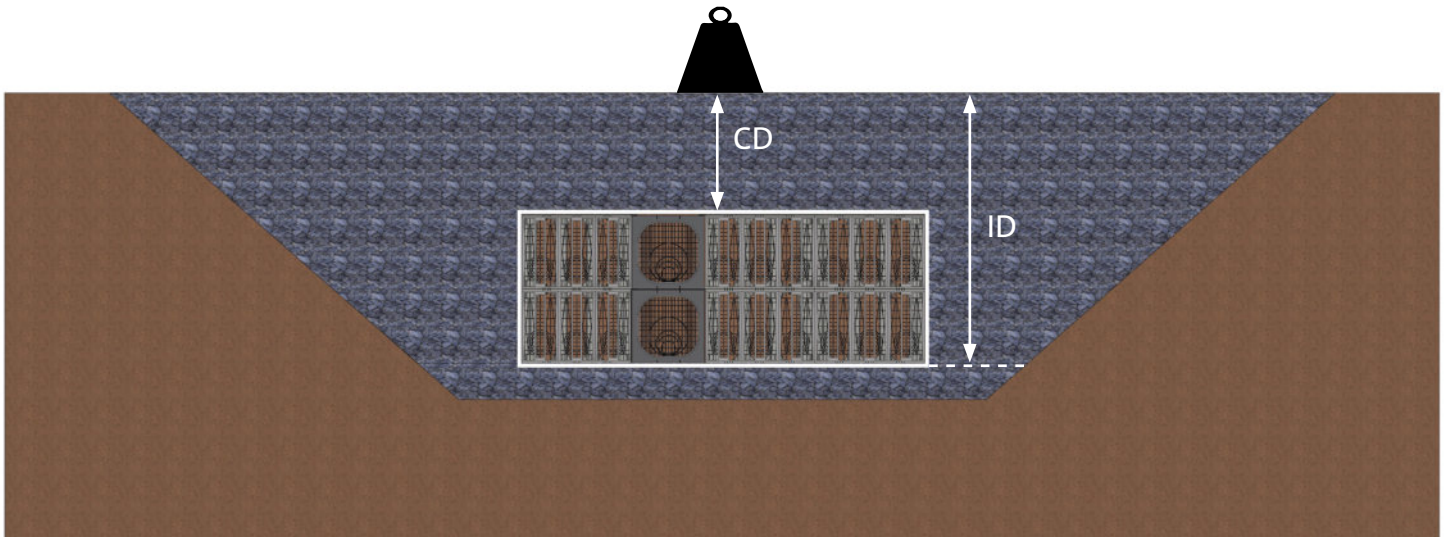
Check material for damage at reception. Damaged components must NOT be installed.




Installation with temperature under 5C° are not allowed.

Lift the half-modules pallets with approved hoisting slings and crane for easy handling.



# Installation parameters



	citybloq / citybloq+		
	Parameters	metric	imperial
 60 to / HS-25 40 to / HS-20	CD - min. cover depth	600 mm	24 in
	CD - max. cover depth	2500 mm	8 ft
	ID - max. invert depth	5000 mm *)	16 ft *)
	CD - min. cover depth	1000 mm	40 in
	CD - max. cover depth	2500 mm	8 ft
	ID - max. invert depth	5000 mm *)	16 ft *)
	CD - min. cover depth	On demand only. Please, contact: <a href="mailto:technical@bg-graspointner.com">technical@bg-graspointner.com</a>	
	CD - max. cover depth		
	ID - max. invert depth		

**table 1 - Installation parameters**

\*) For ID - max. invert depth greater than 3.5 m (12 ft), technical advise is required. Please, contact our technical department.



The BG technical team will assist you selecting the appropriate product based on your project needs.  
 Phone: +1 (514) 932 5445 / Email: [technical@bg-graspointner.com](mailto:technical@bg-graspointner.com)



IMPORTANT: ALL DIMENSIONS CITED ABOVE ARE INDICATIVE AND DEPENDENT TO EACH PROJECT UNIQUE SPECIFICITIES. THE DESIGN AND INSTALLATION OF EACH SYSTEM SHOULD ADHERE TO OR SURPASS THE MINIMUM REQUIREMENTS SET BY BG-GRASPOINTNER. WHILE BG-GRASPOINTNER PROVIDES ASSISTANCE THROUGHOUT THE DESIGN, REVIEW, AND CONSTRUCTION STAGES OF THE MODULE SYSTEM, IT IS ULTIMATELY THE CLIENT'S ENGINEER'S RESPONSIBILITY TO ENSURE THAT THE SYSTEM IS DESIGNED IN COMPLETE ACCORDANCE WITH RELEVANT ENGINEERING PRACTICES, LAWS, AND REGULATIONS, SUCH AS GROUND WATER PROTECTION.



# 1 Pit excavation & soil preparation

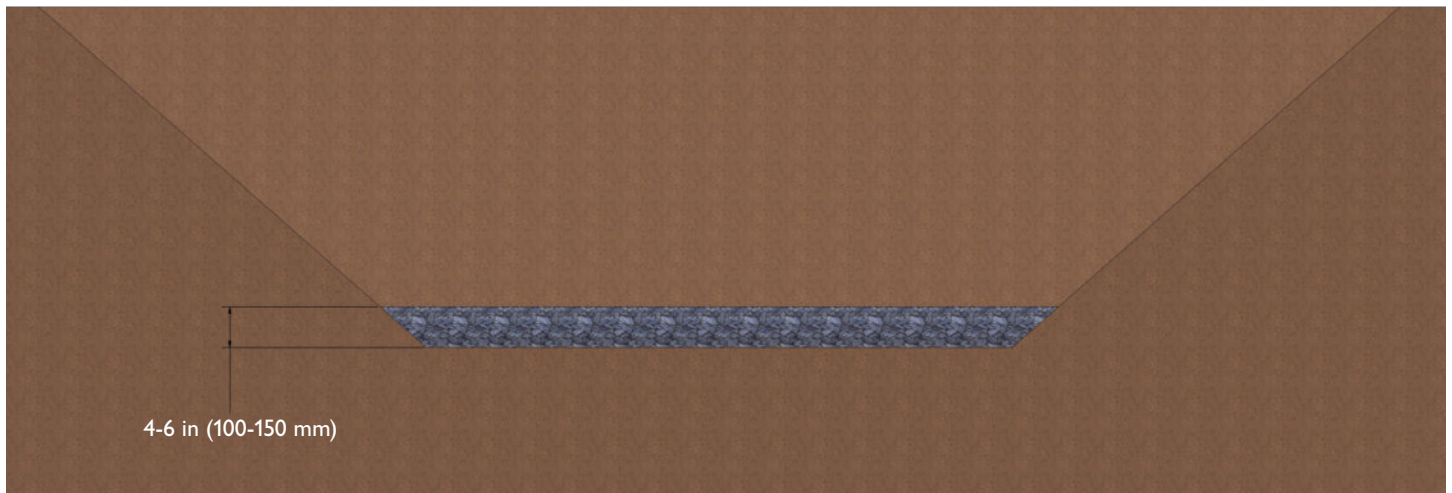
Excavate pit according to design specifications and local legal requirements. The walls of the pit must be sloped so that they pose no danger to the workers. The excavation site must be free from water during the whole excavation and installation process.

After excavating, compact the undisturbed earth base or made ground with a minimum CBR of 5%, suitable for anticipated load.

Create a levelling layer of either 4" (100 mm) of sand or approximately 6" (150 mm) of 3/4" crushed stones or pea gravel of 95% compaction above the bottom of the excavation pit. The layer must be compacted carefully and smoothed to achieve a levelled surface.



IMPORTANT: IF CRUSHED STONE OR GRAVEL IS USED, WE RECOMMEND ADDING A 2" (5 CM) FINISHING LAYER OF SAND TO ENSURE A PERFECTLY LEVEL BED FOR THE MODULAR BOXES.



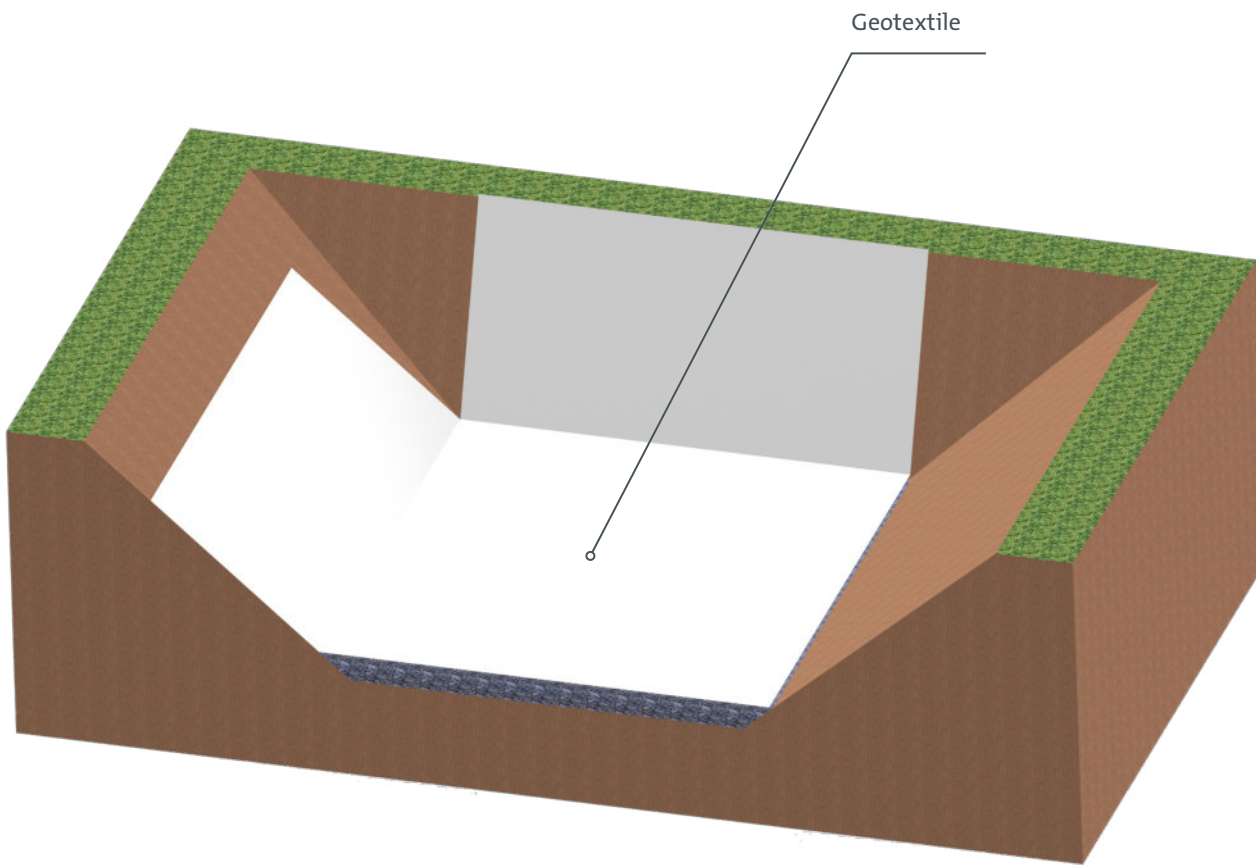
## 2 Laying system geotextile

### 2-A. Infiltration

- Prior to starting the installation of the modules, it is imperative to place the geotextile on the pit floor. The geotextile ought to possess an adequate amount of lateral excess length to enfold the entire system and must overlap at least 50 cm (20") on all edges.



**IMPORTANT: IT IS CRUCIAL THAT THE GEOTEXTILE SURFACE MUST BE ENTIRELY SEALED, DEVOID OF ANY GAPS, EVEN DURING BACKFILLING.**



Important characteristics of the geotextile	
Thickness	≥ 1/16 in (2 mm)
Geotextile class	3
Puncture resistance	2.0 kN
Characteristic opening width	0.0315 in (0.08 mm)
kf value (at 20kPa)	0.2 ft/s (6 × 10 <sup>-2</sup> m/s)
Water permeability according to EN ISO 11058	2.21 gal/s-ft <sup>2</sup> (90 L/s-m <sup>2</sup> )
Mass per unit	0.66 oz/ft <sup>2</sup> (200 g/m <sup>2</sup> )

**table 2 - Geotextile characteristics**



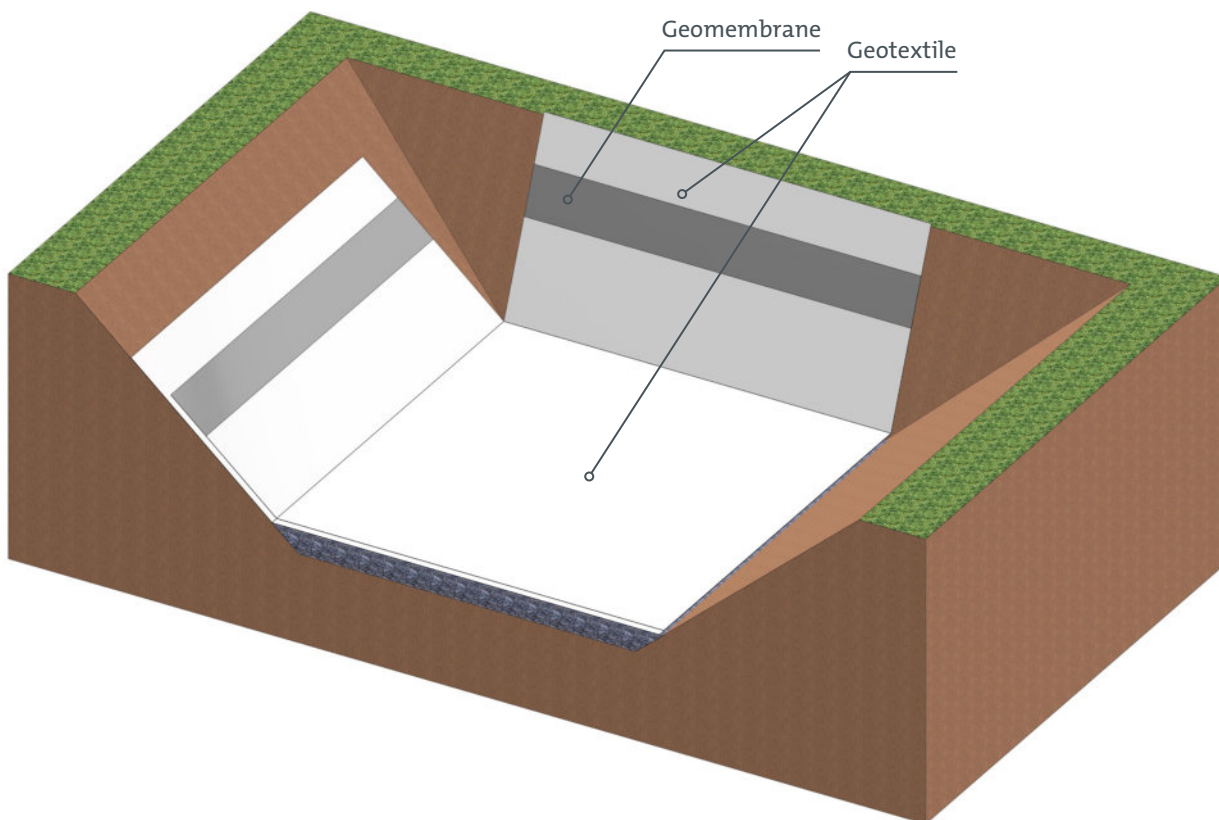


## 2-B. Retention

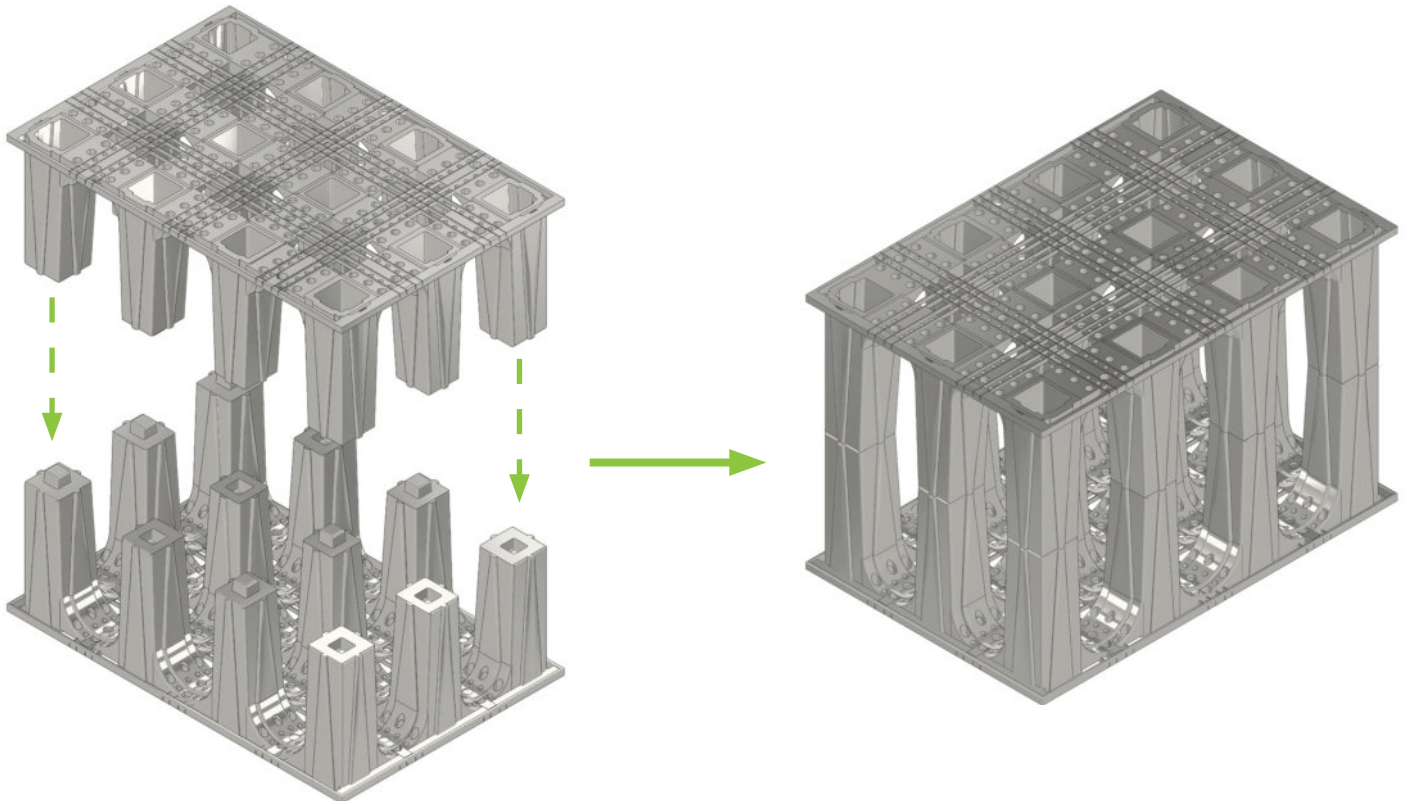
- Prior to starting the installation of the modules, it is imperative to place the geotextile on the pit floor. The geotextile ought to possess an adequate amount of lateral excess length to enfold the entire system and must overlap at least 500 mm (20") on all edges.
- Then place an approved geomembrane on top of the geotextile. This geomembrane must cover the whole system. (Note: geomembrane experts shall take care of the folding, the welding and other special requirements to ensure the system sealing)
- Finish with a last approved geotextile layer on top of the first two layers. This geotextile must cover the whole system.



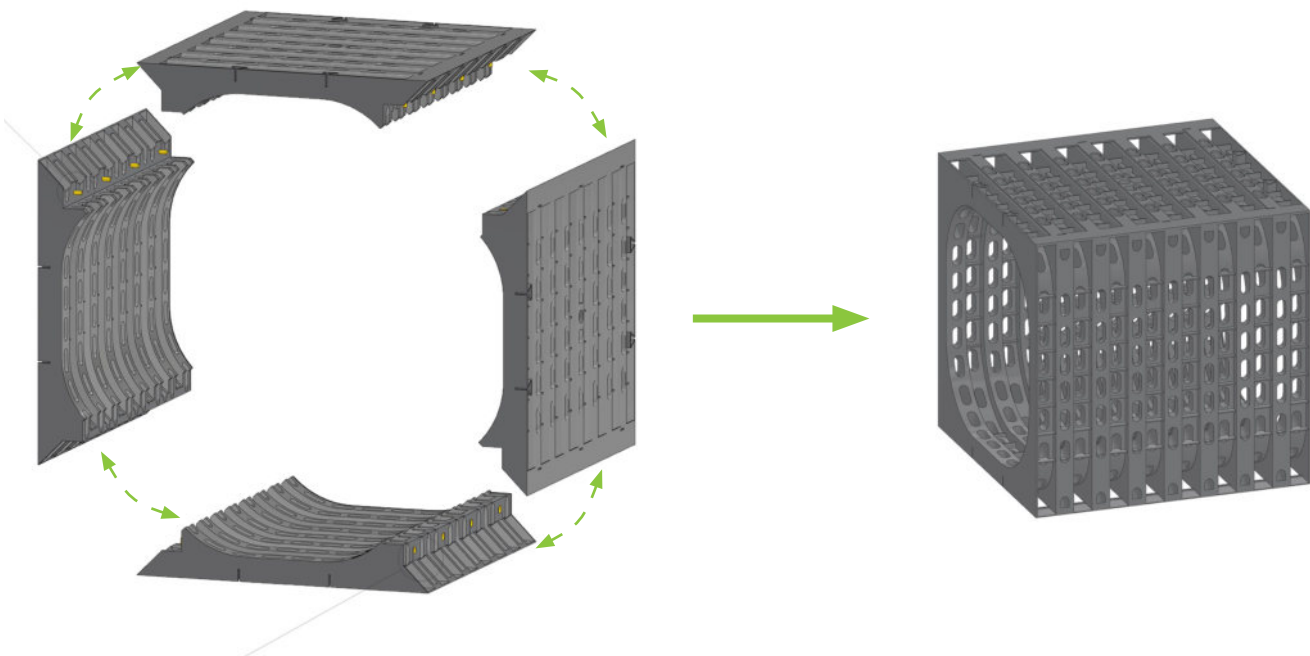
IMPORTANT: IT IS CRUCIAL THAT THE GEOTEXTILE & GEOMEMBRANE SURFACES MUST BE ENTIRELY SEALED, DEVOID OF ANY GAPS, EVEN DURING BACKFILLING. GEOMEMBRANE SPECIALIST CONSULTING IS REQUIRED.



### 3 Assembly of modules



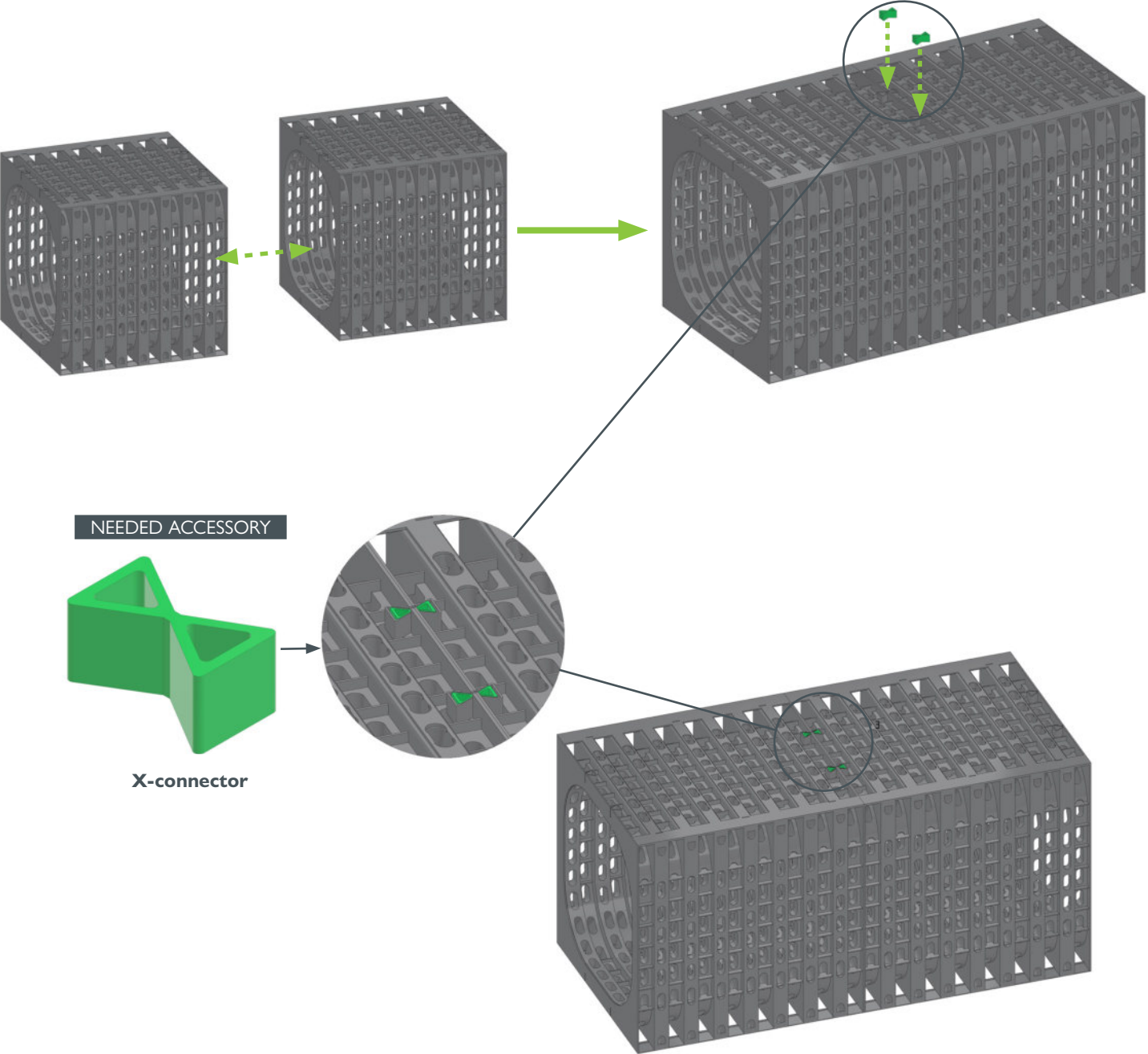
### 4 Assembly of separator units



# 5 Assembly of separator row

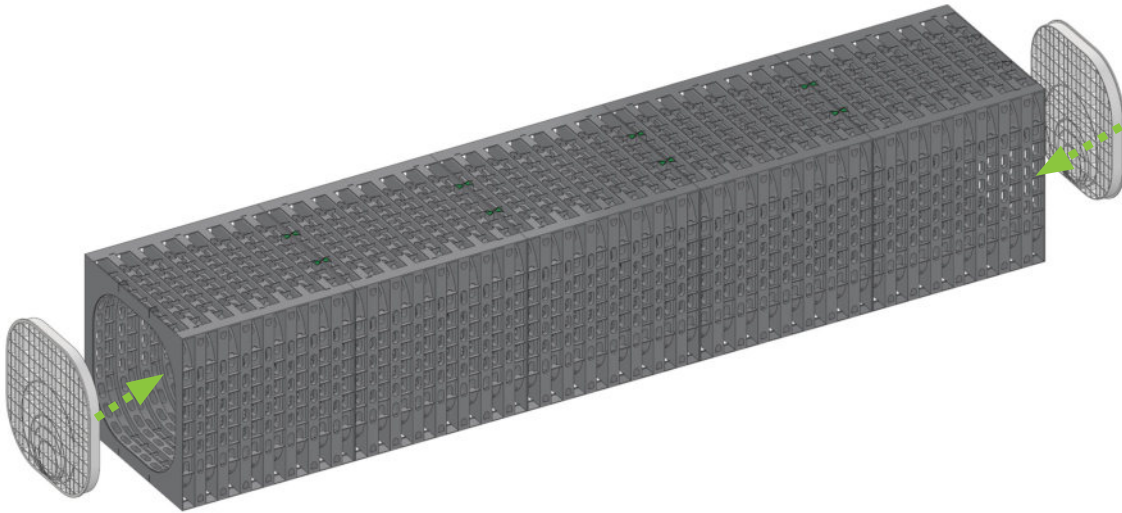
- Connect the separator units with the X-connectors (2 per connection).

▶▶ IMPORTANT: ON TOP OF THE SYSTEM GEOTEXTILE, LAY OUT ANOTHER GEOTEXTILE THAT WILL WRAP THE BG-AQUA CITYBLOQ SEPARATOR ROW.

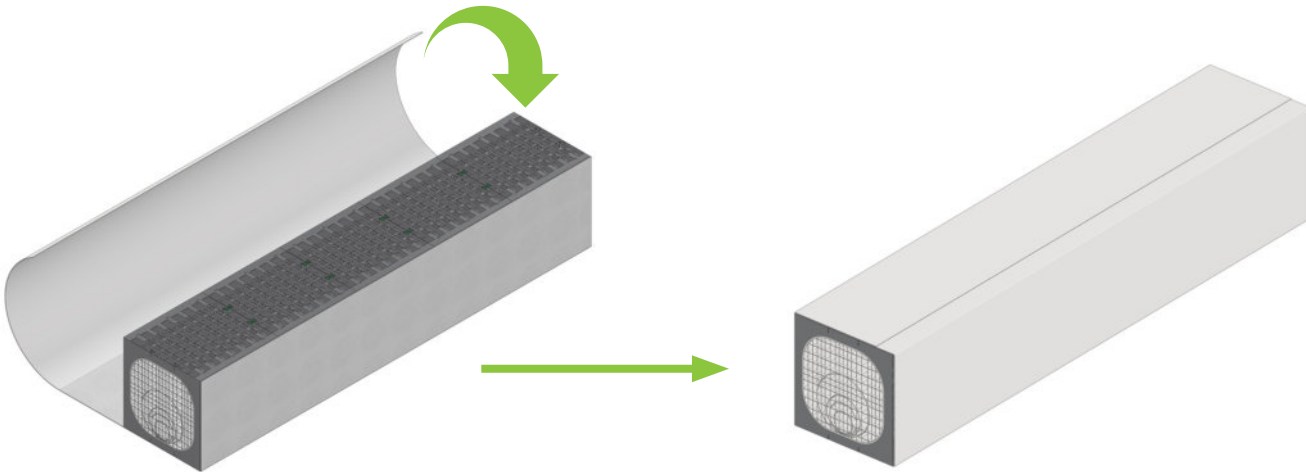


# Assembly of separator row

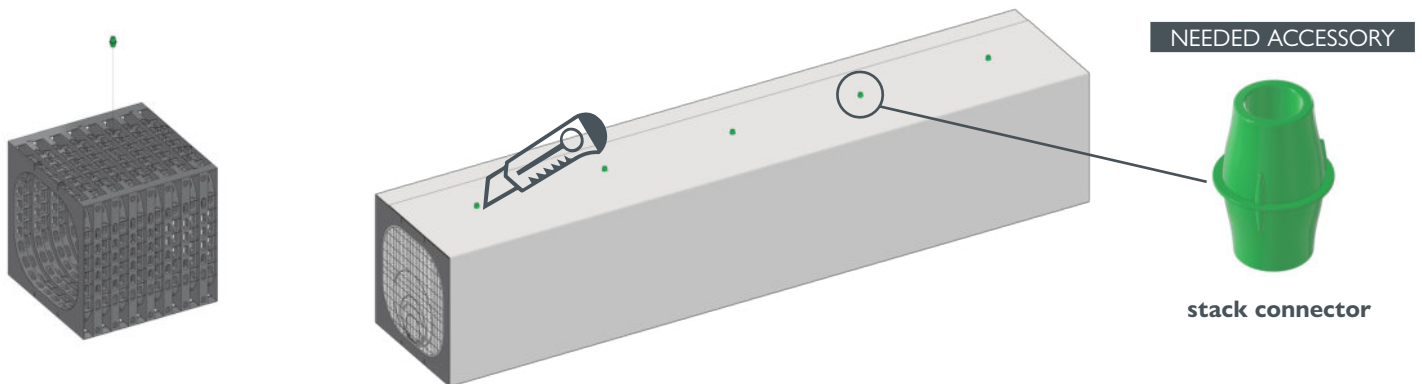
- Place the end plates at each extremity of the newly formed separator row.



- Wrap and seal the separator row with the corresponding geotextile.



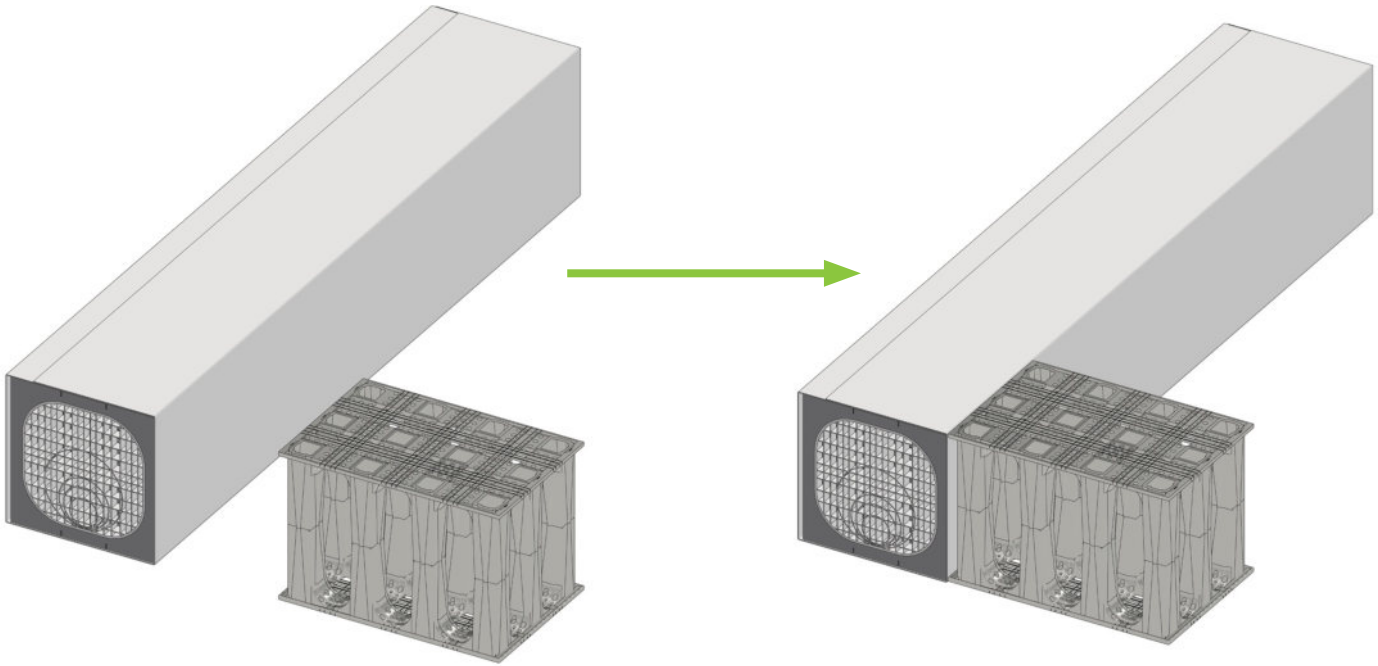
- **MULTI-LAYER SYSTEM:** place stack connectors on each separator units.



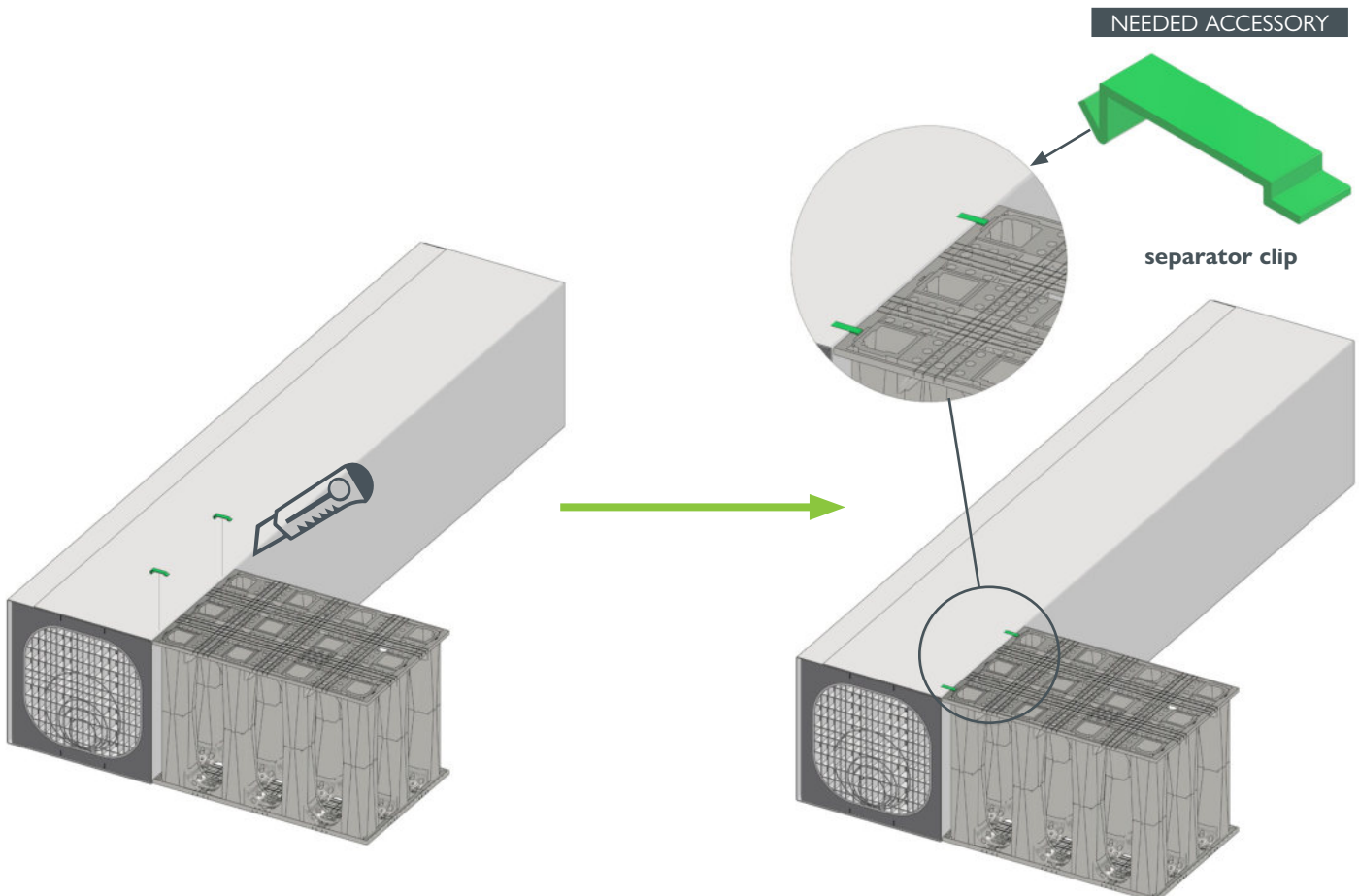


## 6 Connecting the modules

- Bring a citybloq module close to the separator row.



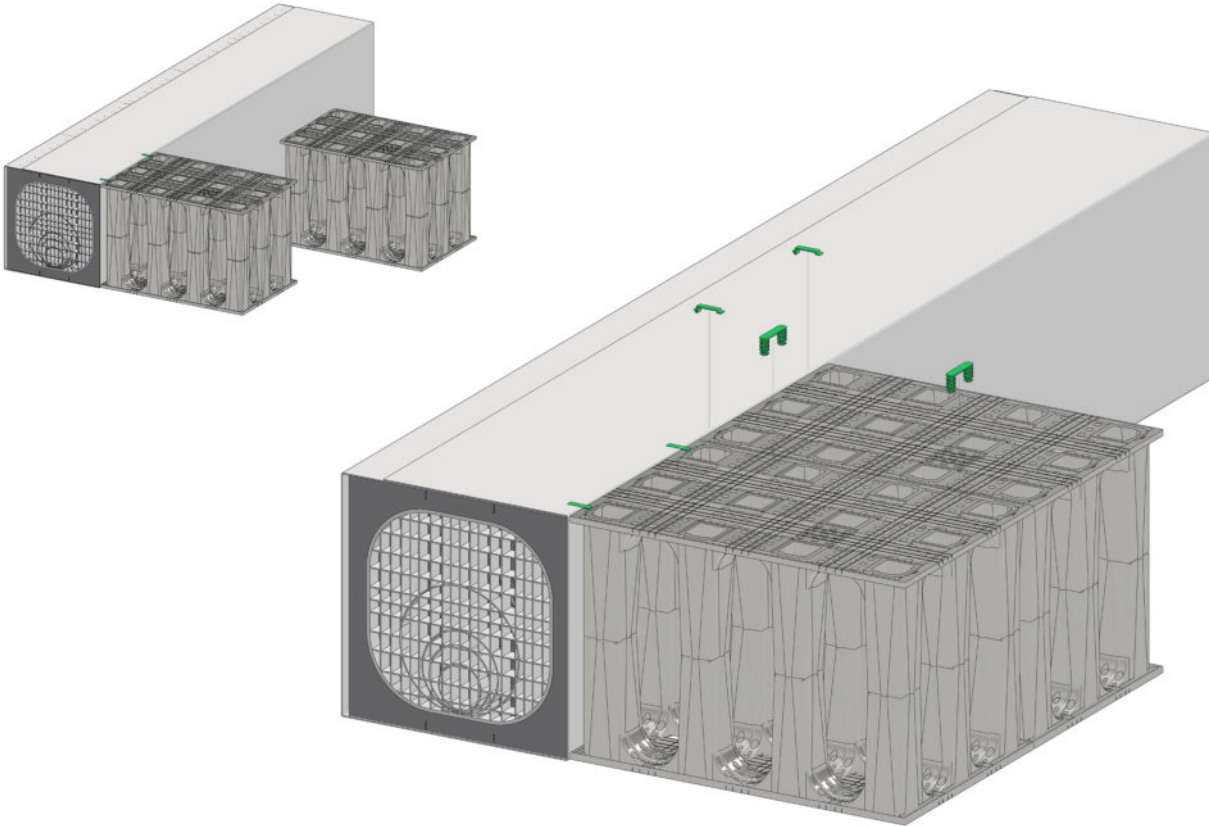
- Connect the two elements together with the separator clips (2 per connexion).



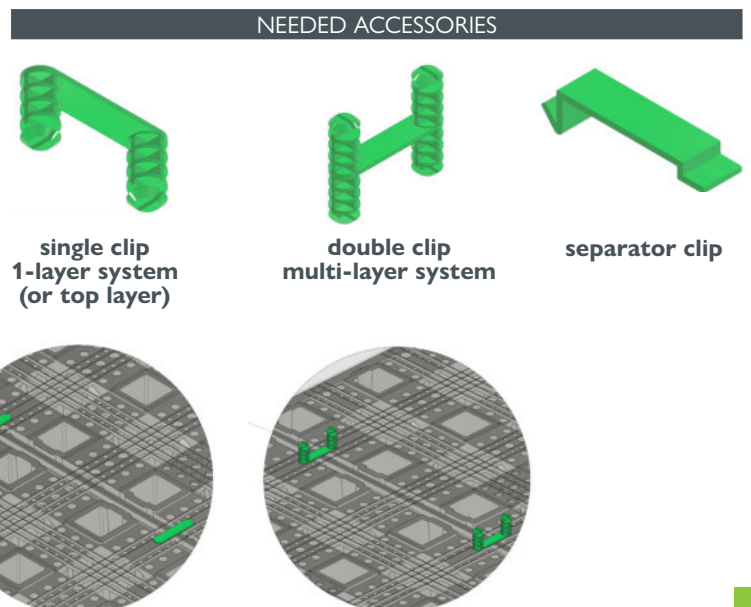
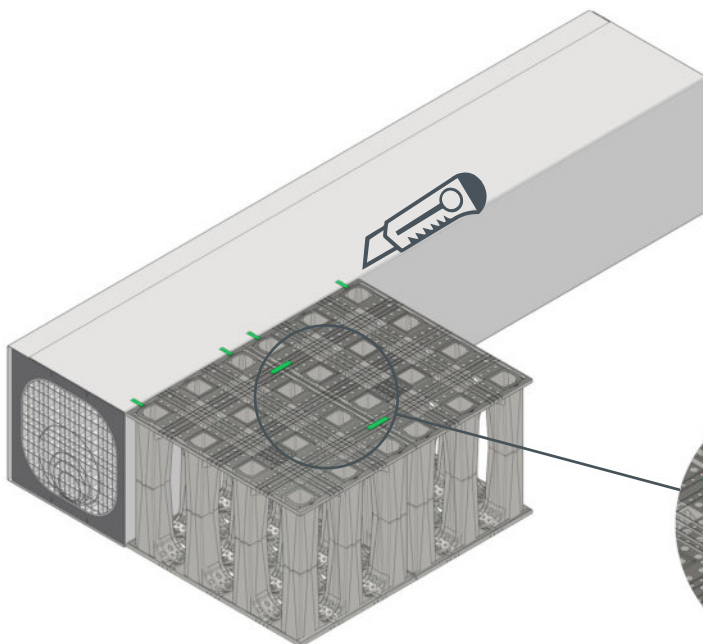


# Connecting the modules

- Bring another citybloq module close to the separator row and the first module.

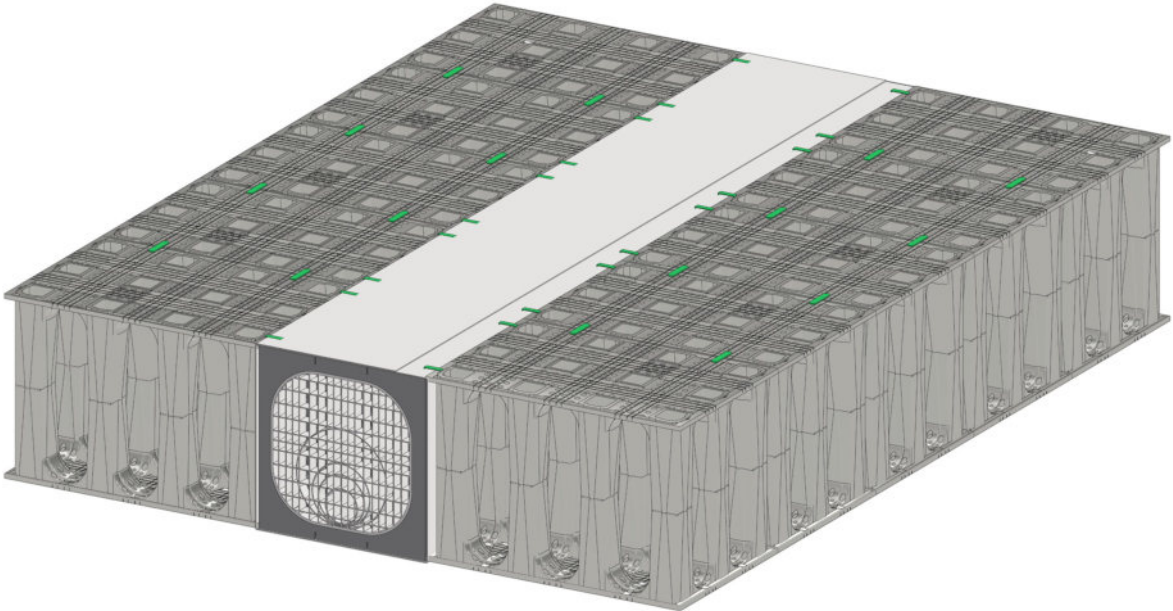


- Connect the two modules together with the single clips (2 per connection). Cutting the geotextile might be needed.
- Connect the new module to the separator row with the separator clips (2 per connection).

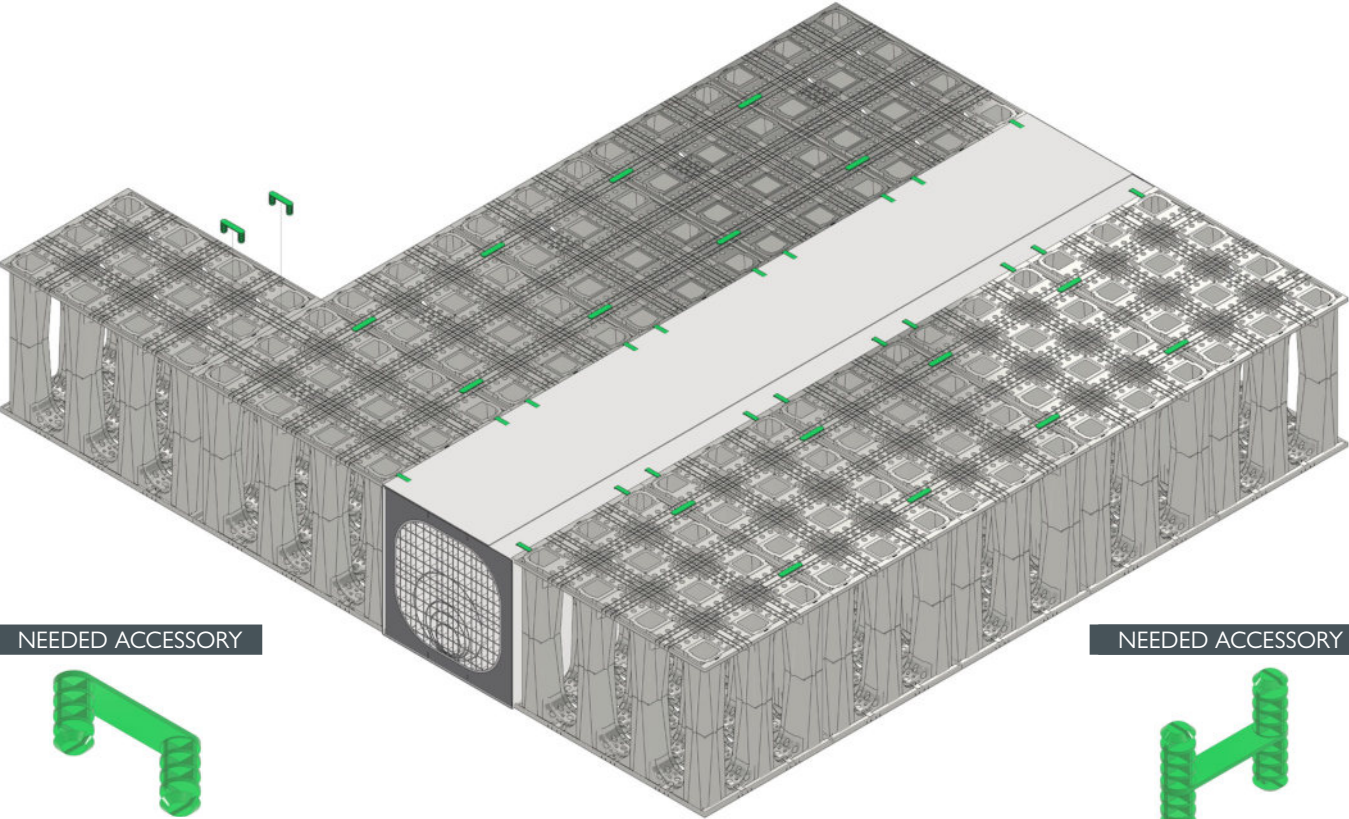


# Connecting the modules

- Repeat the steps until the separator row is covered on both sides.



- Connect adjacent citybloq modules using single clips until the first system layer is totally formed.

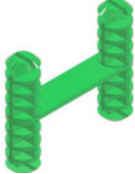


NEEDED ACCESSORY



single clip  
1-layer system  
(or top layer)

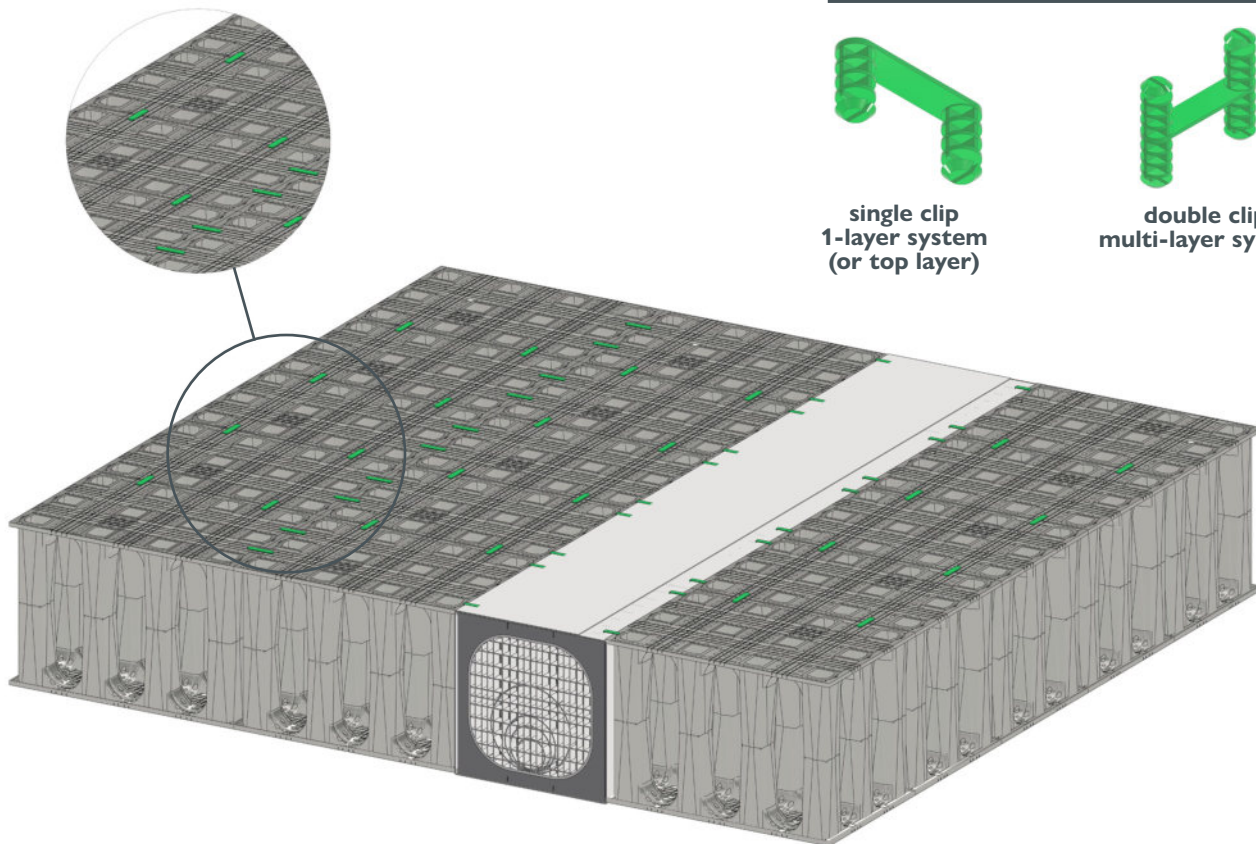
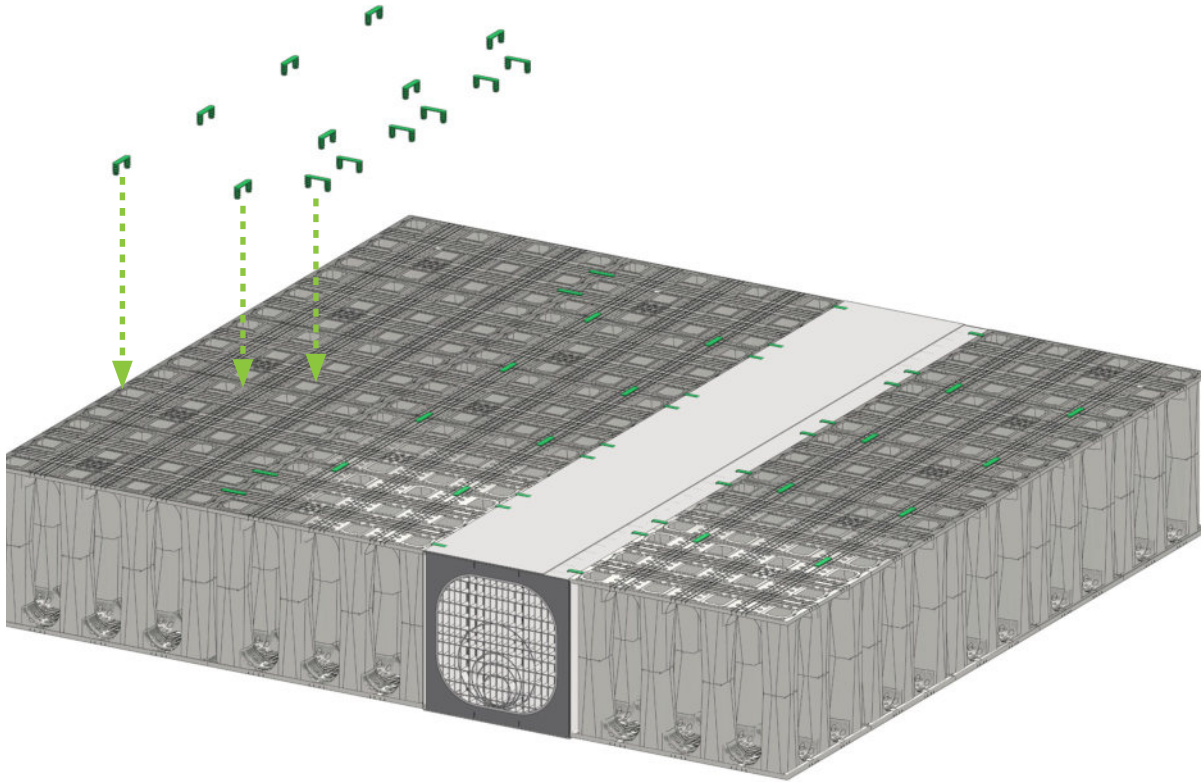
NEEDED ACCESSORY :



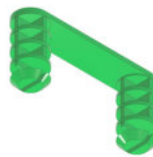
double clip  
multi-layer system



# Connecting the modules



## NEEDED ACCESSORIES



single clip  
1-layer system  
(or top layer)

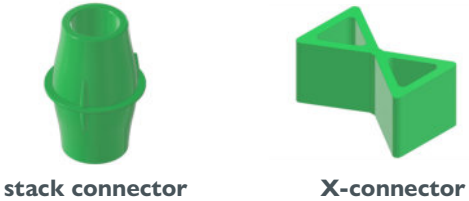
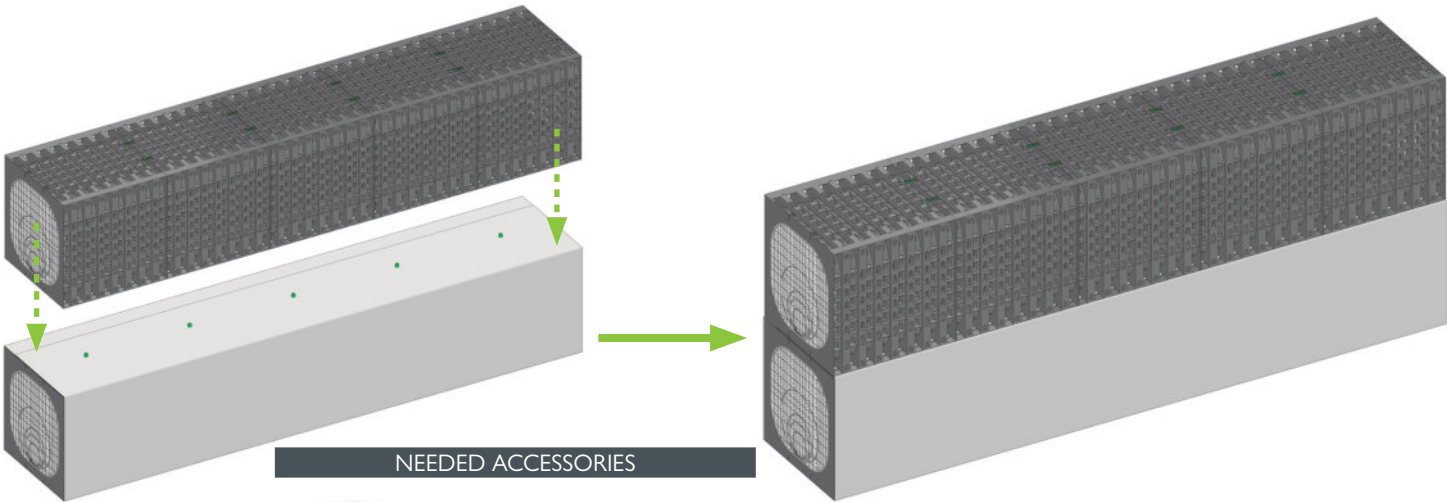


double clip  
multi-layer system

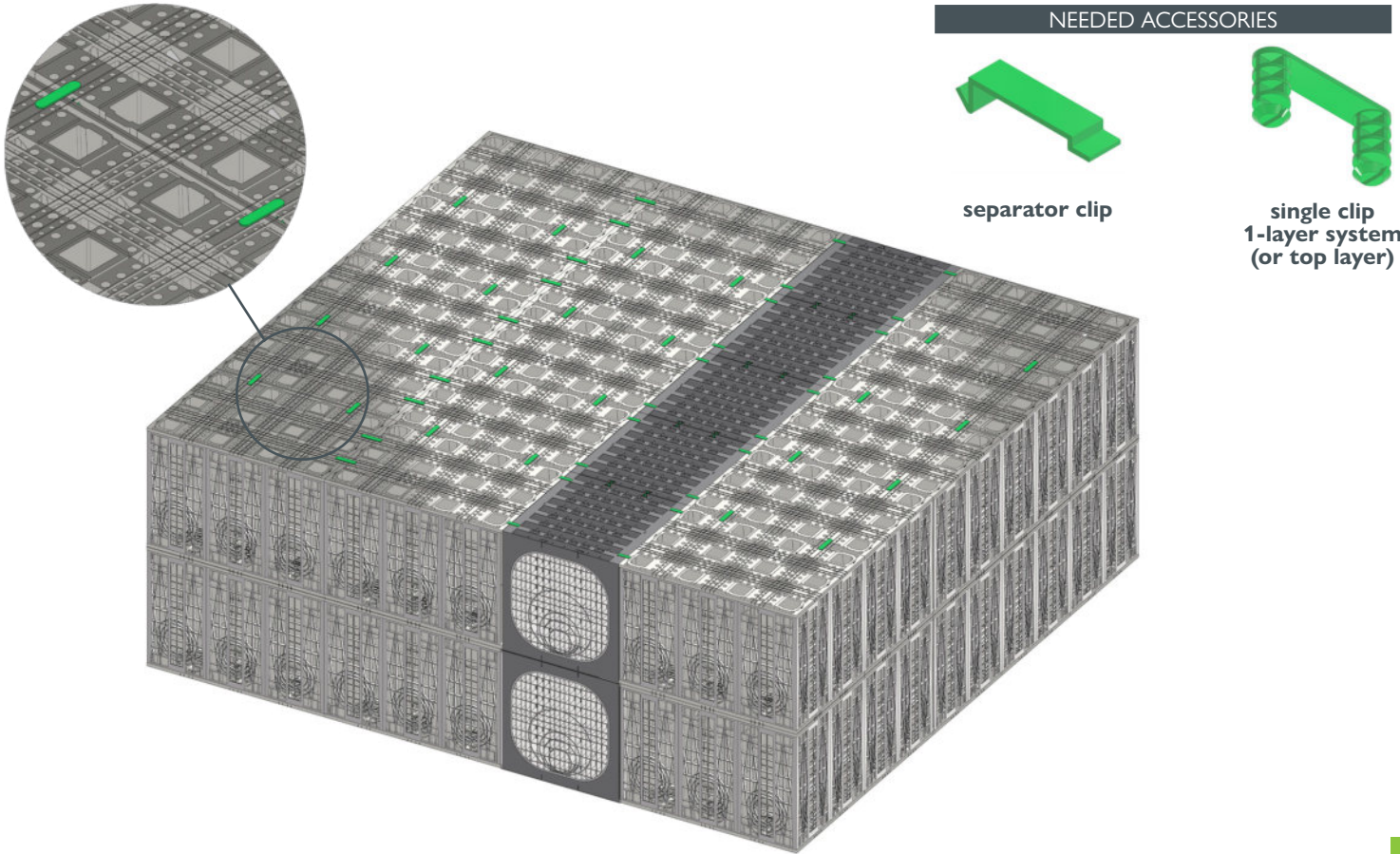


# Connecting the modules - additional layers

- Shape another separator row on top of the wrapped separator row from the first layer.



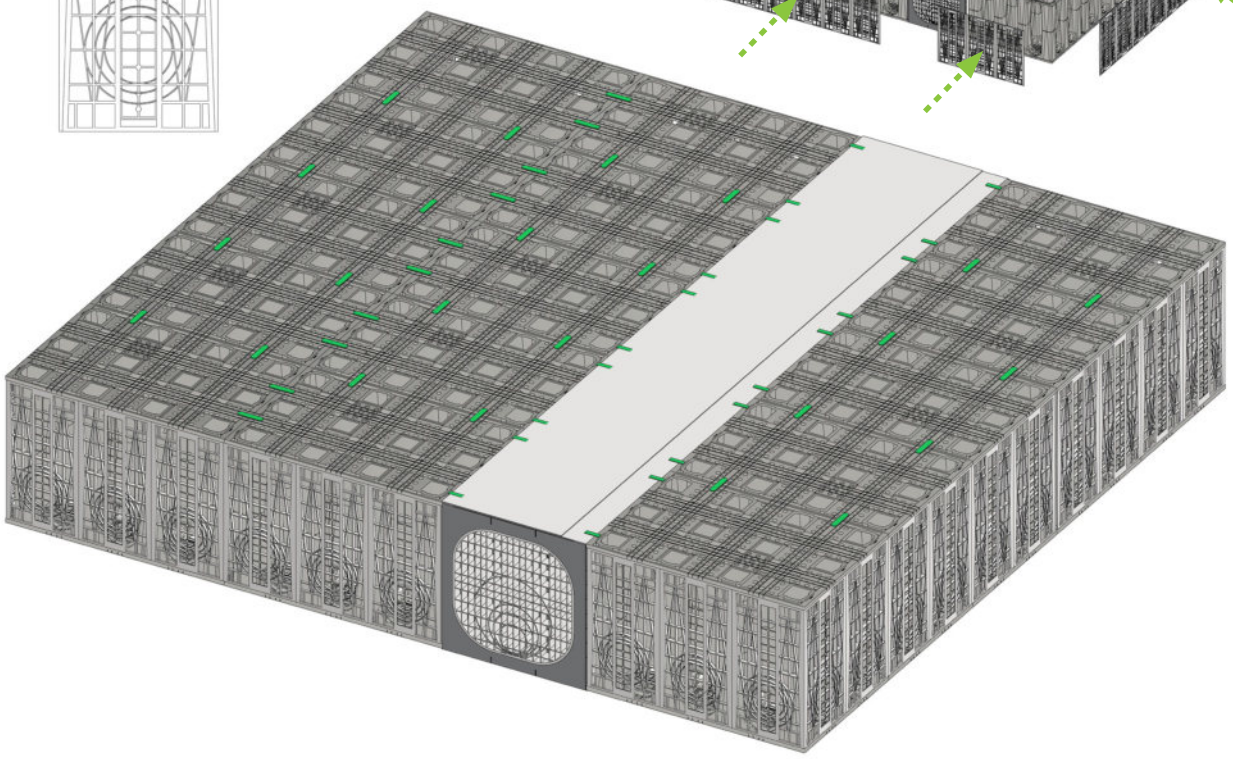
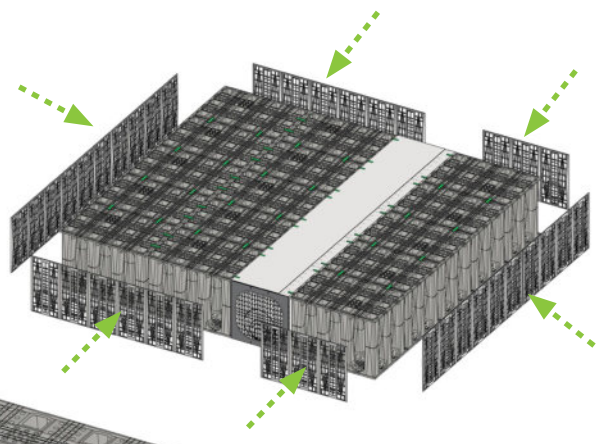
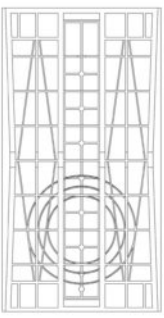
- Place the the additional citybloq modules layers as per the pages 13-16 until the last layer is formed.



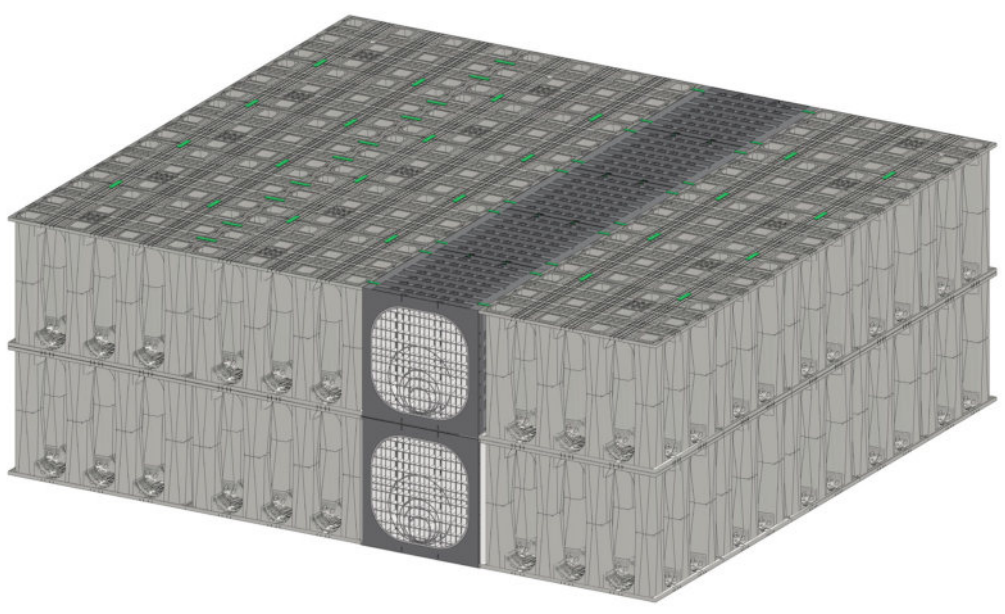


# 7 Placing the system side panels

NEEDED ACCESSORY



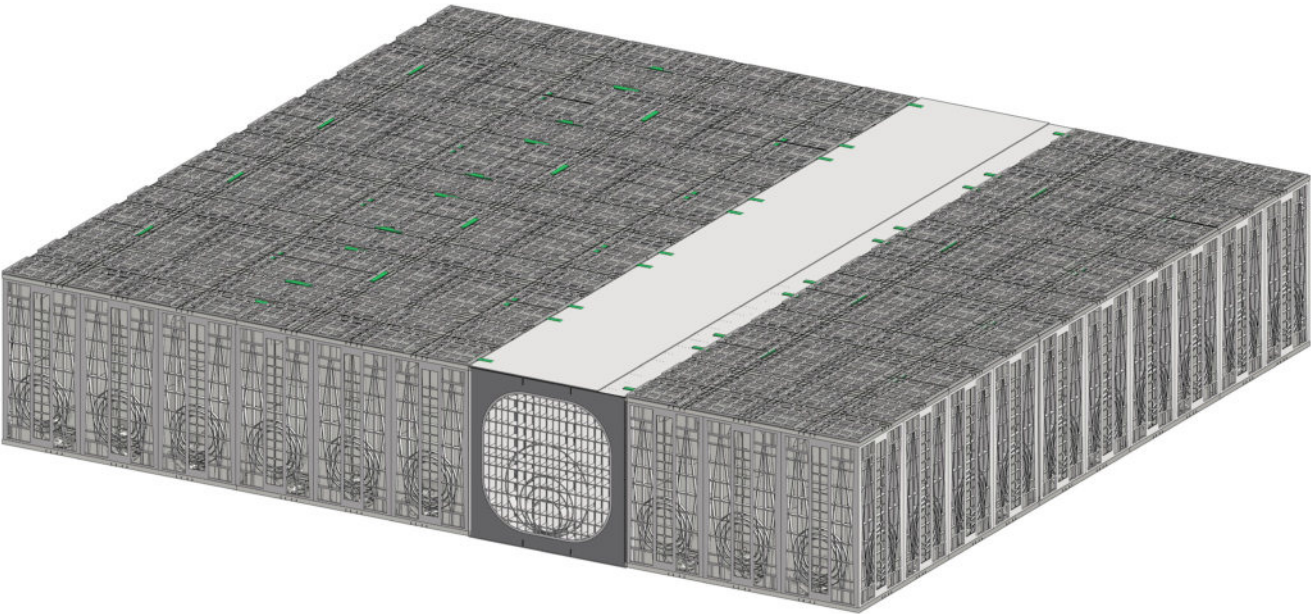
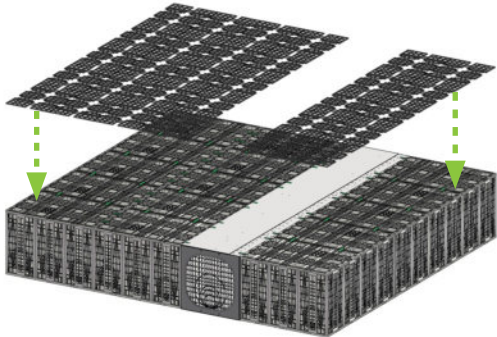
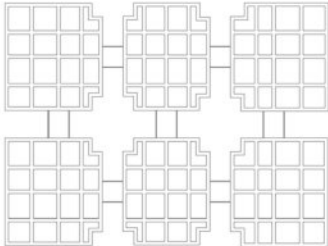
## Multi-layer system



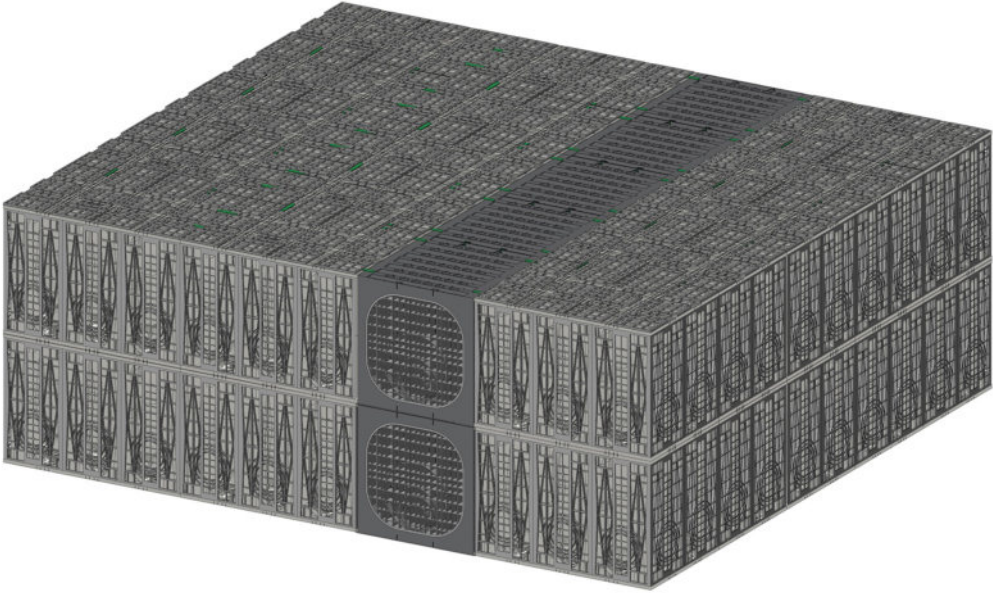


# 8 Placing the system covers

NEEDED ACCESSORY

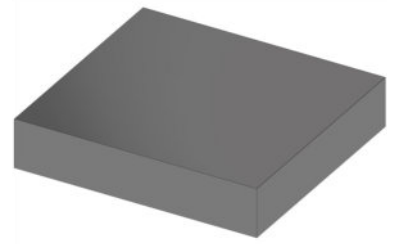
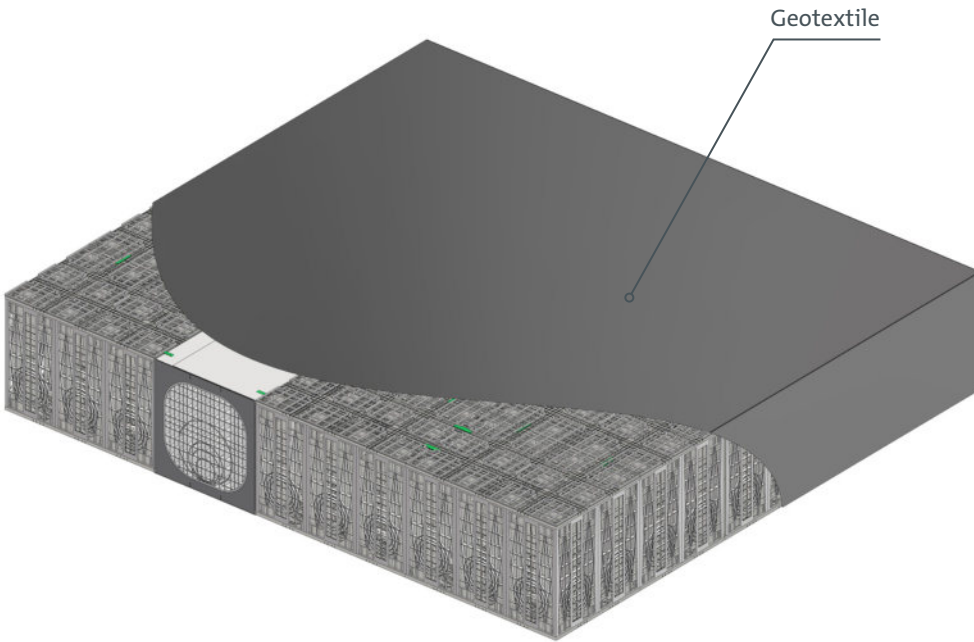


## Multi-layer system



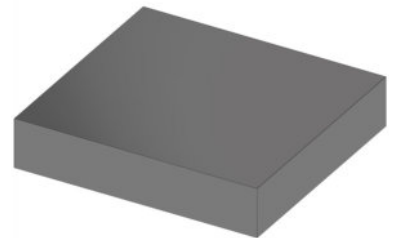
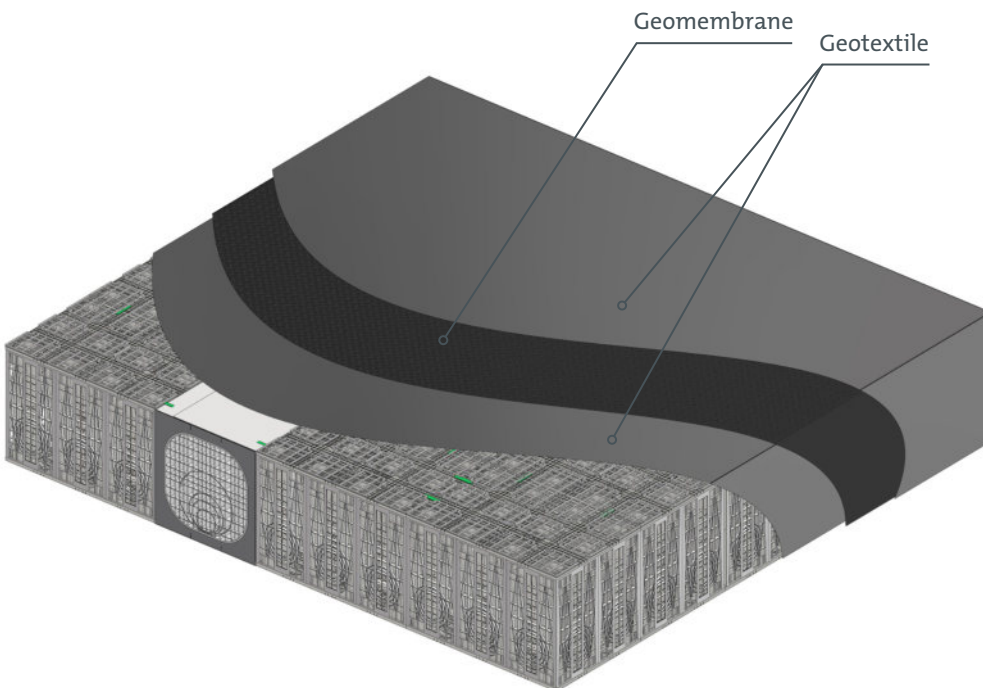
# 9 Wrapping the system

## 9-A. Infiltration



\* Note: Refer to page 8 for more details.

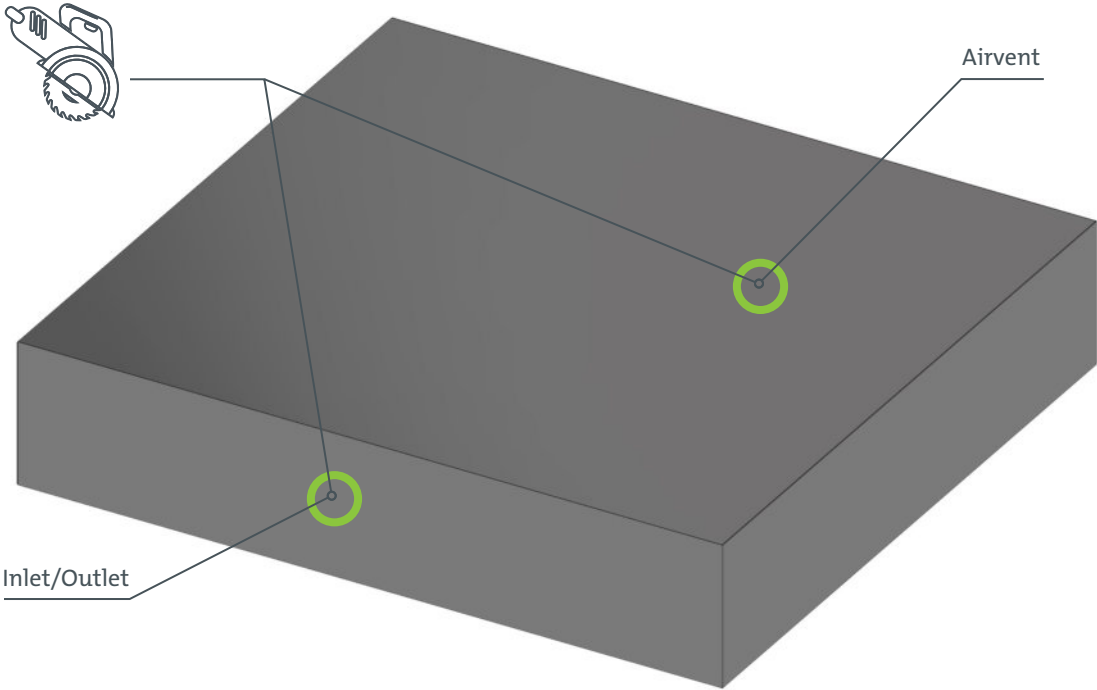
## 9-B. Retention



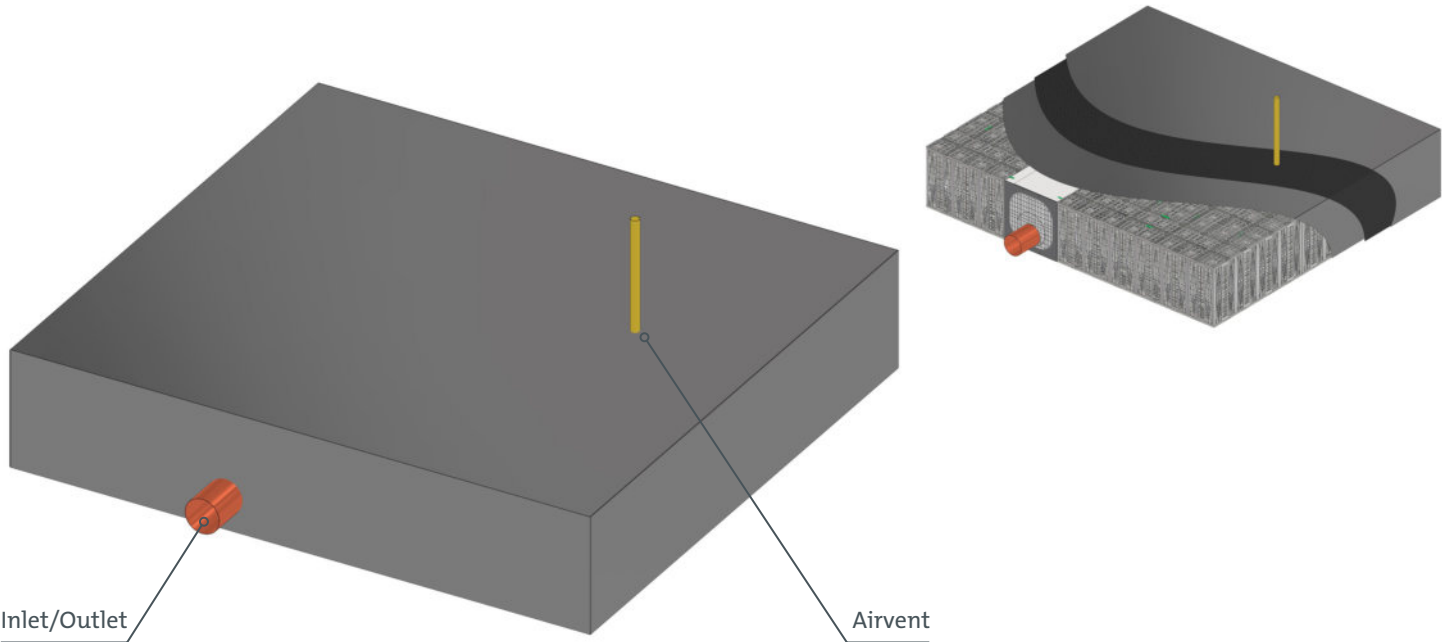
\* Note: Refer to page 9 for more details.

# 10 Pipe connection & airvent

- Cut the desired perimeters to fit the pipes at both ends of the separator row and on top of the system.



**IMPORTANT: AN AIRVENT MUST BE INSTALLED ON TOP OF THE INFILTRATION/RETENTION SYSTEM. OTHERWISE, THE AIR DISPLACED DURING FILLING OF THE SYSTEM CANNOT ESCAPE. THE SIZE OF THE AIRVENT SHOULD NOT BE LESS THAN ONE SEVENTH (1/7) OF THE INLET DIAMETER AND MUST ALSO PREVENT SMALL ANIMALS FROM ENTERING THE SYSTEM.**

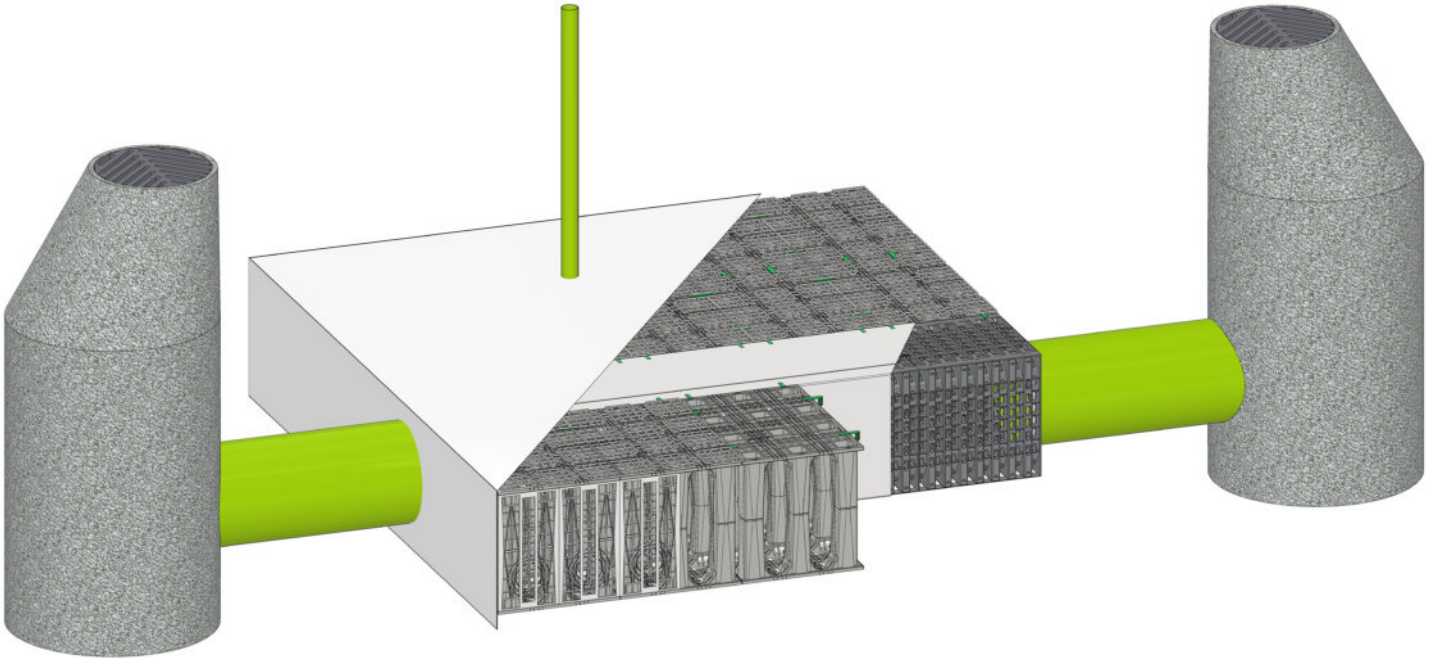




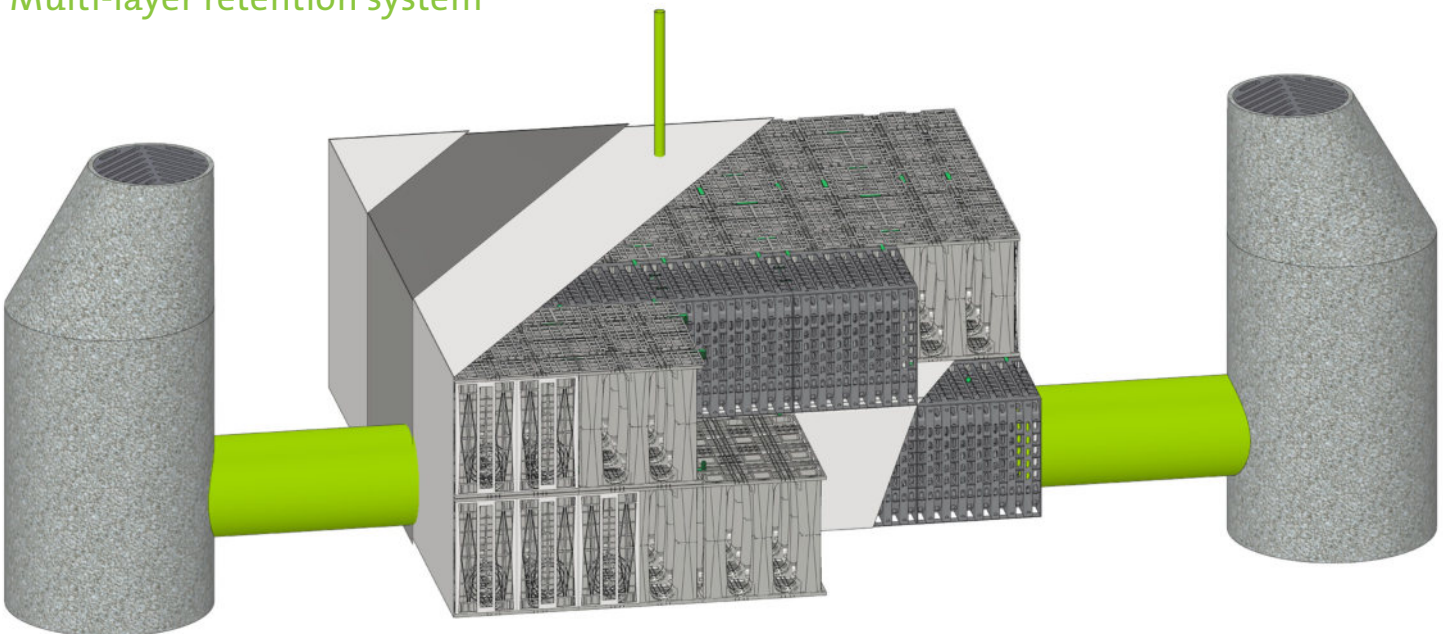
# 11 Catch basins

- Connect plastic or concrete catch basins to the infiltration/retention system's separator row by using pipes up to 500 mm (20") in diameter. The catch basins will act as both water inlets and maintenance accesses.

## 1-layer infiltration system



## Multi-layer retention system



## 12 Back & top filling

Secured cityblock units won't shift during backfilling.

Use minimum of 3/4" crushed stone at 95% compaction for backfilling:

- Sides: 12" (300 mm) minimum
- Top: 6" (150 mm) minimum

**NOTE:** *The minimum and maximum dimension for the backfill must be in accordance with the manufacturer recommendations. Refer to the table 1 on page 6.*

Use cover material as per the designer's instructions.

Distribute the backfill material evenly and compact in layers of maximum 1 foot (300 mm) using a light or medium compacting machine. Compaction level shall be larger than or equal to 95%. Be careful to not damage the modules during the compaction process.

Verify that the geotextile has not been damaged or pulled apart during the compaction process.

The permeability of the backfill must correspond to the permeability of the backfill soil.



IT IS NOT ALLOWED TO DRIVE CONSTRUCTION VEHICLES DIRECTLY ON THE MODULES!

### Use of vehicles when applying the first cover layer:

When applying the initial cover layer, vehicles such as a wheel loader or front-type mobile excavator may be utilized. It is important to note that for these vehicles, which have a maximum total weight of 15 tons (chain, 4 wheels, twin-tyres), a compacted cover of at least 12 inches (30 cm) must be placed over the infiltration/retention system. The possibility of ruts forming should also be considered. Steering maneuvers should be avoided during this construction phase.

### Use of construction vehicles:

It is feasible to drive heavy construction vehicles with a wheel load of up to 50 kN (such as HGV 30) over the cover, provided that the compacted cover's thickness is not less than 24 inches (60 cm). However, one must consider the potential formation of ruts. When dumping the earthwork material, it is crucial not to exceed the wheel load of 50 kN, and if necessary, load distribution plates must be utilized.



## 13 Compaction

**For trafficked areas**, appropriate subbase material should be used as backfill and compacted in layers no greater than 12 inches (300 mm). The compaction plant used over the top of the system must not exceed 5,000 lbs (2 300 kg) per 36 inches (900 mm) width.

**For areas that are landscaped and not meant for traffic**, it is recommended to use selected as-dug material with particle size less than 1.6 inches (40 mm) within 12 inches (300 mm) from the top of the units. Above this level, selected as-dug material may be used. The backfill should be placed and compacted in layers no greater than 12 inches (300 mm). The compaction plant used over the top of the system must not exceed 5,000 lbs (2 300 kg) per 36 inches (900 mm) width.



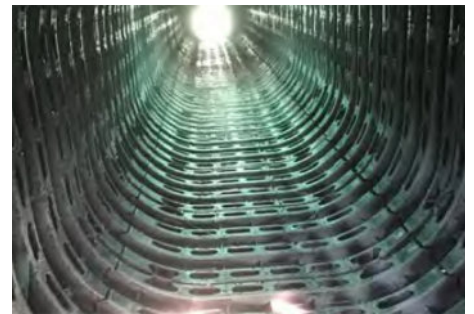
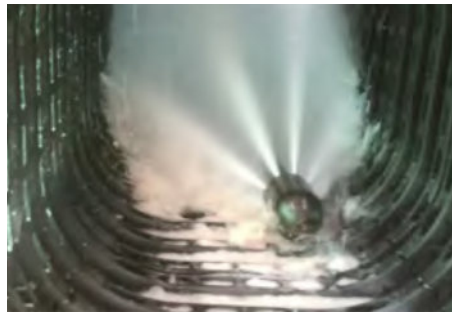
**IMPORTANT: WHEN MODULES ARE INSTALLED BENEATH A PAVED AREA, THE PAVEMENT SUB BASE MAY FORM PART OF THE BACKFILL MATERIAL. HOWEVER, IT IS CRUCIAL TO MAINTAIN A MINIMUM COVER DEPTH (see installation detail).**

## 14 Finished pavement

**Before applying the final surfacing, it is crucial to enclose the tank area with high-visibility fencing and prohibit any traffic from accessing the footprint area of the stormwater system. It is important to note that the BG-AQUA citybloq systems are not intended to serve as a load platform for construction traffic.**

## Maintenance recommendations

Neglecting the control and elimination of sediment accumulation in a sustainable stormwater system is the primary reason for system malfunction. To guarantee the efficient handling of silt within the BG-AQUA citybloq infiltration systems, it is advisable to integrate a sediment forebay. Pre-treatment before the modular tank is strongly suggested. Since sediment can contain elevated levels of pollutants, it is crucial that any extracted sediment from the system is disposed of by a licensed contractor in compliance with local regulations.



### INFILTRATION SYSTEMS

To ensure the BG-AQUA citybloq infiltration systems are performing effectively, it is recommended to conduct periodic percolation tests and compare the results with the initial data. If there's a noticeable drop in infiltration rates, it's advisable to fill the inspection chamber of the infiltration system up to the invert level of the inlet pipe. Subsequently, flushing it with water will help eliminate sediment and loosen the geotextile.

### DETENTION SYSTEMS

Before filling the detention system up to the vent pipe's invert level, it is necessary to block the outflow control device while leaving the overflow pipe unobstructed. Once filled, the system should be flushed and the water effluent removed and disposed of by a pumped tanker. The inspection team will determine the frequency of maintenance procedures for BG-AQUA citybloq systems. BG-Graspointner recommends conducting inspections twice during the first year, annually thereafter, and after significant storm events. To reduce silt accumulation, it is also recommended to use pretreatment systems upstream of the detention device.

## General disclaimer

The BG-Graspointner limited warranty applies to the BG-AQUA citybloq system manufactured and sold by BG-Graspointner. Please refer to the warranty terms and conditions provided by BG-Graspointner for detailed information regarding coverage, limitations, and any applicable conditions.

Your stormwater system  
is now ready for use

Thank you for choosing  
BG-Graspointner



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