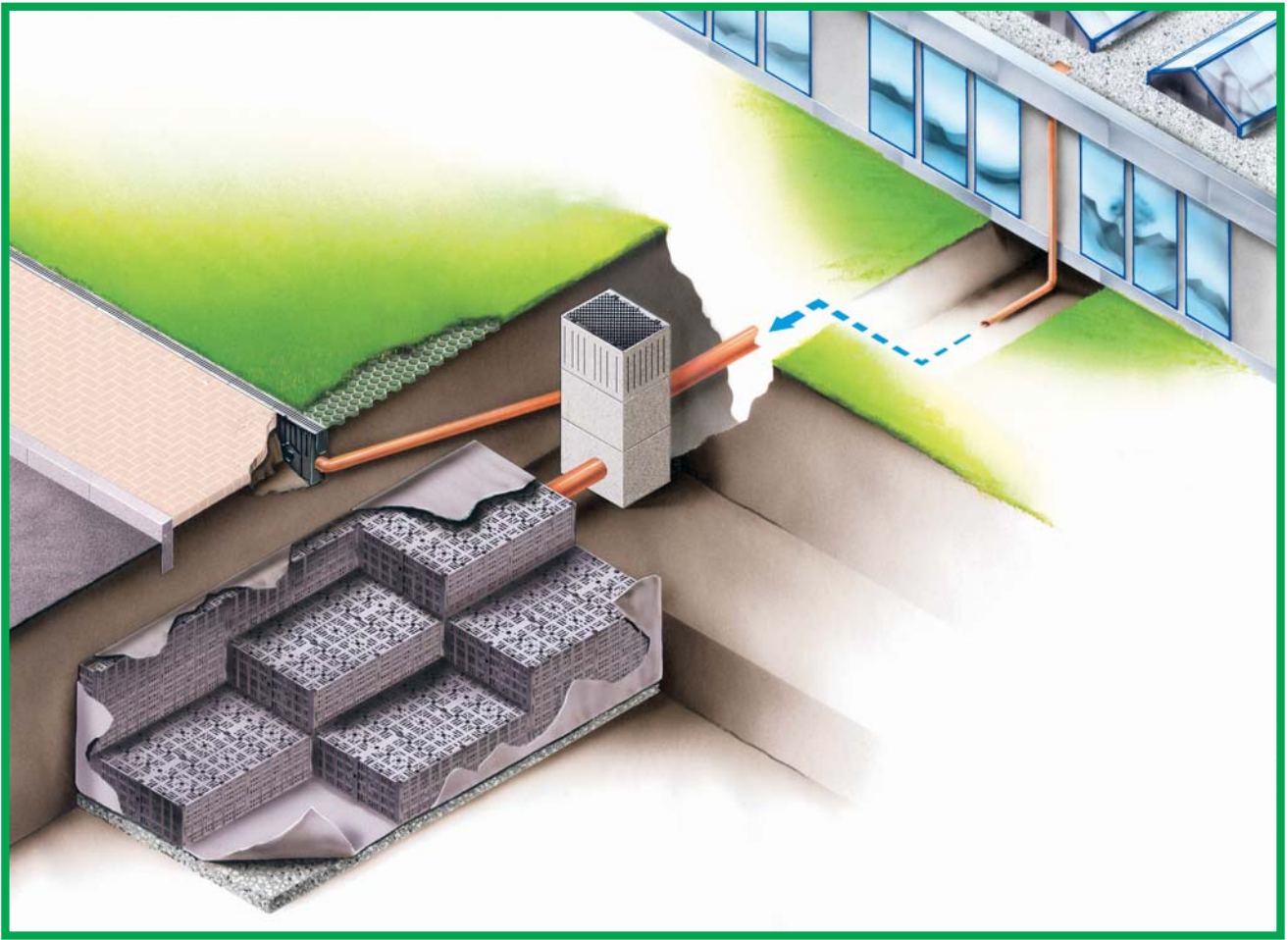


***Traffic load resistant seepage
block trench for rain falls***



RECYFIX®-Drainbloc



RECIFYX®-Drainbloc

Requirement

■ The reduction of Greenfield sites has mainly been caused by the amount of houses, commercial properties and roads that have been built in recent years. This is having a tremendous effect on the natural water cycle. Even in areas with a normal population, only about one quarter of the rainwater manages to seep into the ground. Most of it has to be led away via the sewerage system. Ailing channel net-

works with dimensions that are too small are no longer in a position to cope with such quantities of water.

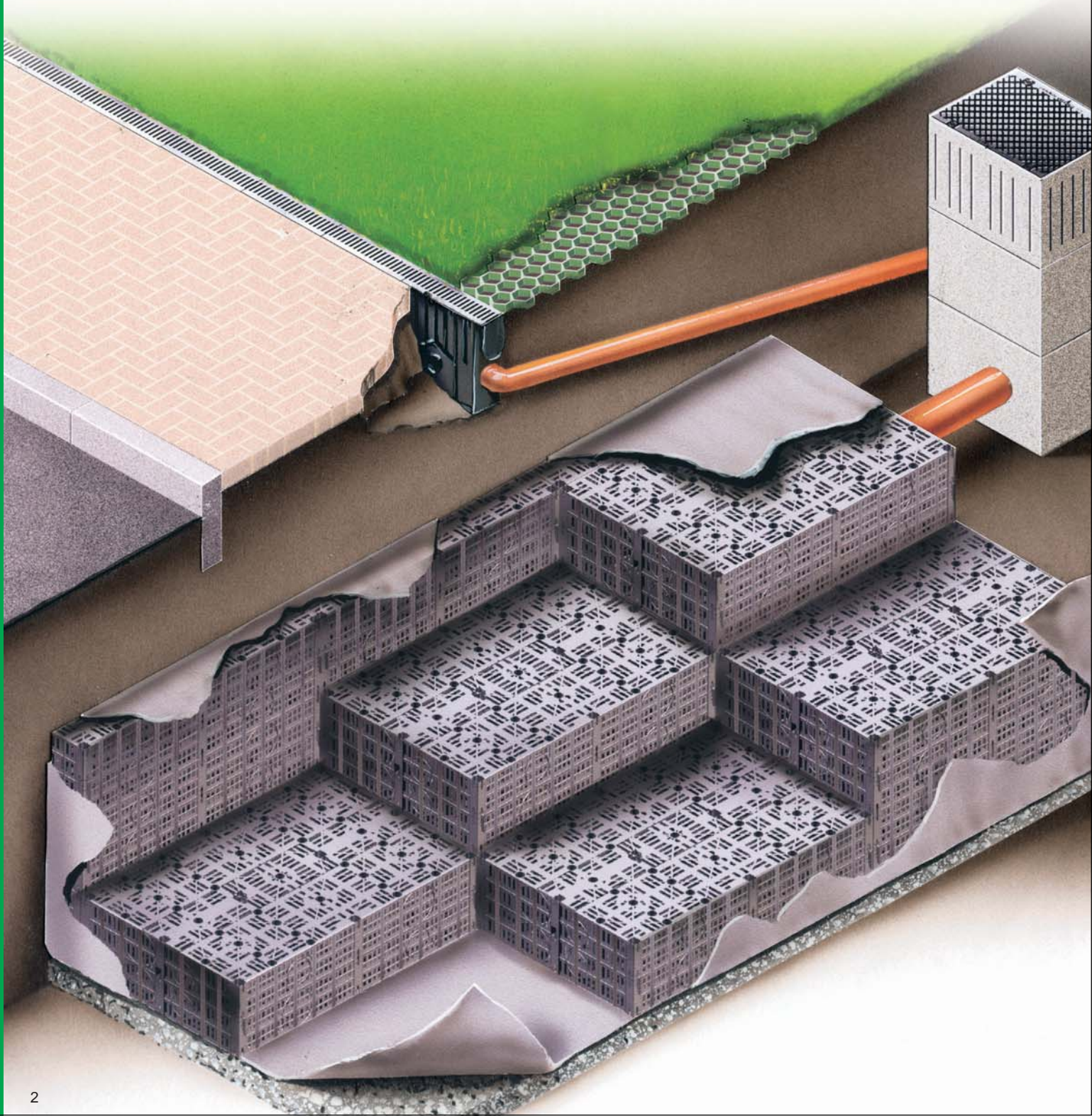
Natural ground and vegetation layers initially store rainwater and then allow the filtered water to seep into the ground over long periods of time. This process is being restricted because of construction in built up areas, causing the ground water level to

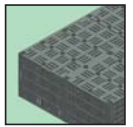
drop and the soil to dry out. Other negative effects are the increasing danger of flooding disasters and the constant cost-intensive development of sewerage systems and storage basins.

In order to counteract these developments, systems are required that store the rainwater where the precipitation occurs and gradually feed it into the natural cycle.

Solutions

■ RECIFYX-Drainbloc is a seepage block trench made from polypropylene (PP) with extremely good absorption capacity. The storage volume is approximately 95%. The system can be installed, as required, in different ranges of load - even in truck-bearing transport surfaces up to SLW 60. Each of the modules is statically tested after installation.





Application areas

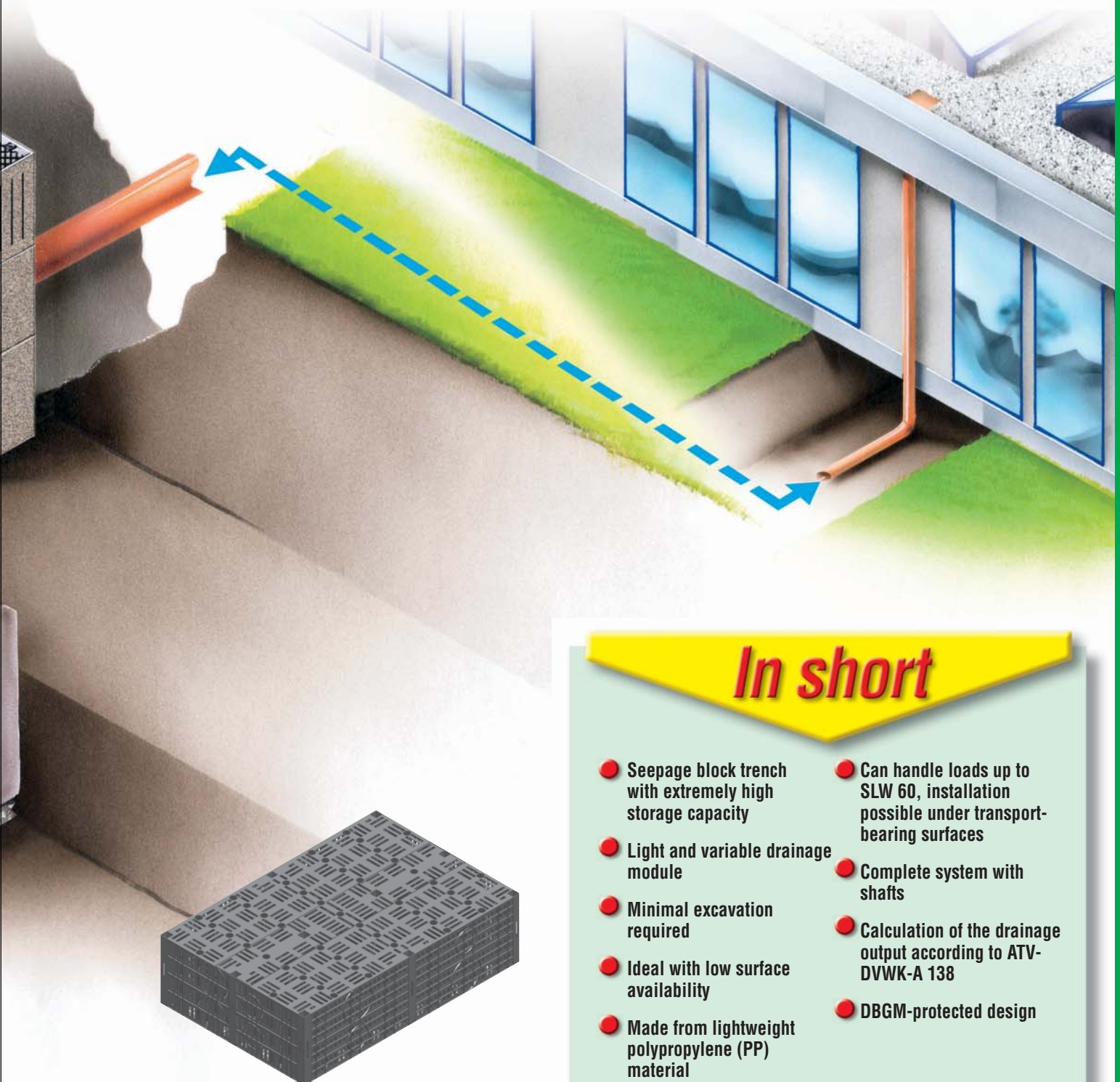
The rainwater is collected by means of seepage in accordance with worksheet ATV-DVWK-A138. Filtered water flows into the system via an inlet and distributor shaft. This shaft has a fine filter, designed to prevent contaminants from getting through.

The individual elements are compact and are connected without

the use of accessories. The trench is built up to the required size in this way.

A multifunctional outlet shaft creates an emergency overflow into the sewage system. This shaft also serves as a facility for controlling the drainage output or the level of the drain trenches and can be used as a restrictor shaft.

■ Distributed seepage solutions in commercial areas, industrial areas, particularly beneath road surfaces, e.g. RStO 01 construction class VI parking areas and other traffic-bearing areas, depending in the national building regulations.



In short

- Seepage block trench with extremely high storage capacity
- Light and variable drainage module
- Minimal excavation required
- Ideal with low surface availability
- Made from lightweight polypropylene (PP) material
- Can handle loads up to SLW 60, installation possible under transport-bearing surfaces
- Complete system with shafts
- Calculation of the drainage output according to ATV-DVWK-A 138
- DBGM-protected design

RECYFIX®-Drainbloc



RECYFIX®-Drainbloc

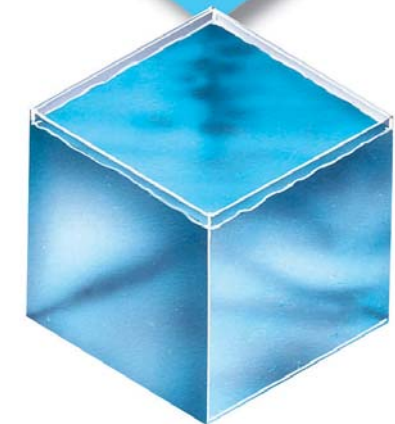
Advantages over conventional gravel drain trenches

- **Lightweight**
- **compact**
- **extremely high storage volume**

Many of the current seepage systems have a basin-like design. The considerable amount of space that is taken up and the lack of acceptance from residents make this solution less acceptable for residential and commercial areas. A more compact version consists of trenches made from underground packages of pebbles sheathed in geotextiles. The main disadvantage of these systems is the relative lack of storage capacity, since only 30% of the total volume is available for storing water. Considerably more excavation effort is required in order to obtain the same capacity as RECYFIX-Drainbloc. However, RECYFIX-Drainbloc has a storage capacity of approximately 95%. Seepage solutions can therefore be realized with much less effort. The light weight and the compact design allow the system to be installed easily without using heavy construction machinery. The space requirements are also considerably less - the surface above the RECYFIX-Drainbloc trench can even continue to be used for car parks or lawns, for example, in accordance with ATV-DVWK-A138.



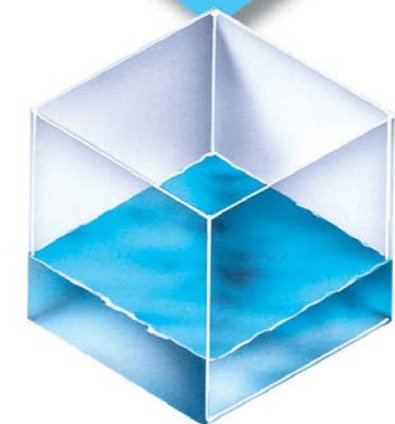
Excavation for RECYFIX-Drainbloc



Water storage with RECYFIX-Drainbloc



Excavation for conventional pebble trench



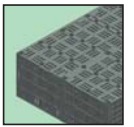
Water storage with conventional pebble trench

■ Profitability

The continuous development, operation and maintenance of sewerage systems and storage basins drives up to the costs of Local Authorities. This cost is then passed on to the local residents and businesses. Many towns and Local Authorities recommend and encourage the installation of decentralised seepage trenches on plots of land when they are being developed. This will lower the subsidies

required by local authorities therefore passing on financial benefit to the residence and local businesses.





Further advantages

■ Unique connecting technology that does not require extra fittings

In order to reach the necessary storage volume, several RECYFIX Drainbloc elements are simply plugged together. A stable connection of the single modules without accessories develops at the same time in vertical and horizontal direction. This connection technique saves expenditure and time. It was developed by Hauraton and is singular at the market.



■ Low area consumption through great stability

Assembly over several layers is possible. At SLW 60 a maximum of 4 layers can be formed; with lower loads the number of layers increases commensurate with static calculation, e.g. 7 layers for car use. This reduces the size of the installation site and the area consumption.

Trafficable for heavy goods vehicles to SLW 60



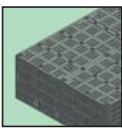
Trafficable for cars



■ High load-bearing capacity

Deployment in commercial areas means that the equipment has to withstand the weight of heavy goods vehicles. Depending on the nature of the installation, the RECYFIX-Drainbloc-Super in SLW 60 is suitable for this application.

The product is therefore especially suited to installation under surfaces that support transport, such as fire service access. With any subsequent change in the surface use, RECYFIX-Drainbloc provides double security. Surfaces originally designed to be walked on can be converted to navigable surfaces for transport given the appropriate installation.

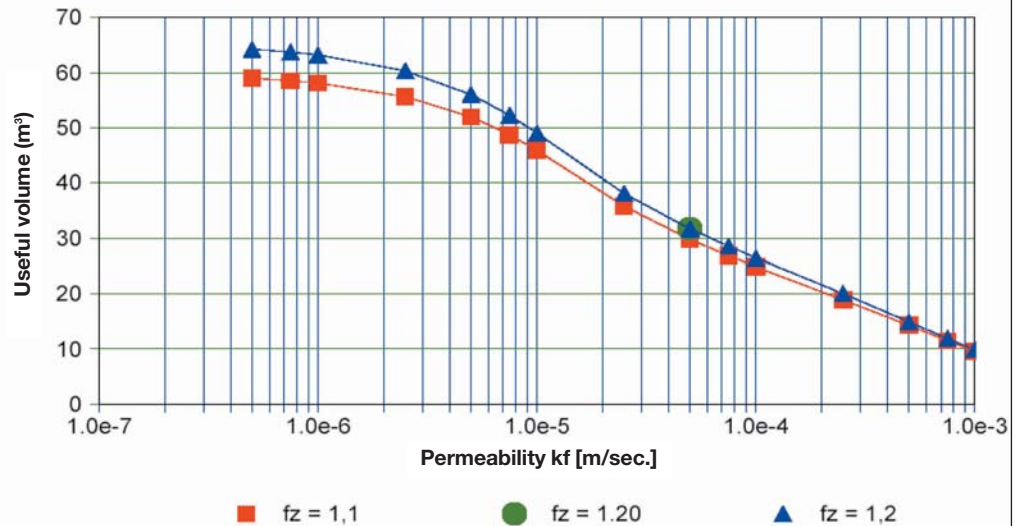


RECYFIX®-Drainbloc

■ Support with dimensioning

The dimensions of the seepage system can be calculated by Hauraton using a computer-aided calculating program as per work sheet ATV-DVWK-A135. For hydraulic calculations and technical support please contact our technical office.

Trench seepage



Measuring the seepage trench

Dimensioning a seepage trench in accordance with ATV-DVWK-A 138

Input data:

$$L = (A_u \cdot 10^{-7} \cdot r_{D(n)} \cdot D \cdot 60) / (b_R \cdot h \cdot s_{RR} \cdot (b_R + h/2) \cdot D \cdot 60 \cdot k_f/2 \cdot f_z)$$

Catchment surface area	A_E	m^2	4,000
Discharge quota as per table 2 (ATV-DVWK-A 138)	m		0,50
Impermeable area	A_u	m^2	2,000
Permeability quota of saturated zone	k_f	m/s	$1,0E-05$
Height of trench	h	m	0,99
Width of trench	b_R	m	2,4
Total storage coefficient	s_{RR}		0,95
Selected rain frequency	n	1/per annum	1
Addition factor	f_z		1,2

Local rain data

D [min]	$r_{D(n)}$ [l/(s*ha)]
45	47
60	38,9
90	28,9
120	23,4
180	17,3
240	14
360	10,4
540	7,7
720	6,3

Calculation:

L [m]
12,2
13,1
13,7
14,0
14,0
13,8
13,0
11,8
10,9

Results:

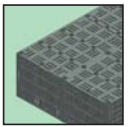
Influential duration of measuring rain	D	min	180
Influential rain quantity	$r_{D(n)}$	l/(s*ha)	17,3
Required trench length	L	m	14,0
Required trench excavation volume	$V_{R,excavation}$	m^3	31,7

■ Functional safety through the use of geo-textiles

The operation of the trench is affected if grit or soil particles are deposited on the bottom. The resulting sludge affects the seepage. In order to prevent this the entire system is wrapped in a Geotextile membrane made from GRK 3 PP fabric (surface weight: 200 g/m²).

The water is drained in a filtered state both with drainage and where shafts are used. This prevents any eluviation from the soil.





■ Complete system with delivery and discharge shafts

Delivery to the trench takes place via the inlet and distribution shaft, to which several delivery pipes can be attached. A maintenance capable filter unit removes dirt particles from the water before it enters the system.

The multifunctional outlet shaft satisfies several requirements:

Discharge, emergency overflow

If large quantities of water occur the trench fills up to the maximum level. In this case a customer-supplied overflow can lead the water into another trench or the sewerage system.

Reduction

Where the ground has poor drainage properties, a damper can be installed for improved retention and drainage, as well as for additionally desired safety.

Ventilation

The system also has to be ventilated in order to cope with suddenly-occurring large quantities of water. Venting can also take place via this shaft.

Inspection

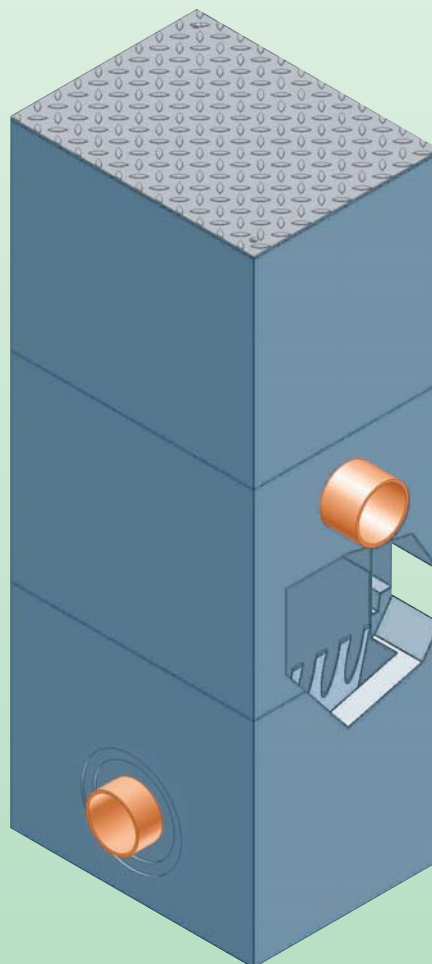
Another important function of the shaft is the monitoring of drainage output and the level of the drain trenches. No other shaft on the market offers so many features.

Both fibre glass-reinforced shafts are in 3 parts. The required height can be varied by installing several intermediate parts. Depending on load-bearing requirements, versions are available that can withstand the weight of class E 600 heavy goods vehicles and cars.

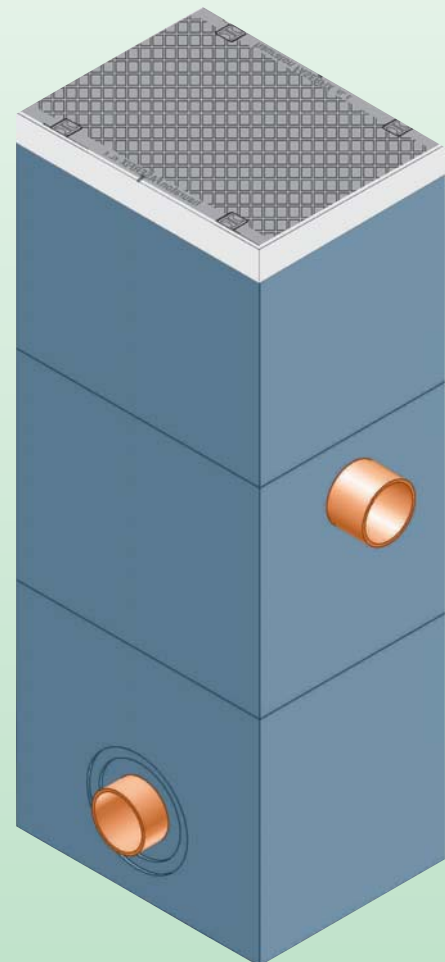
■ Pre-moulded connections

RECYFIX-Drainbloc modules and all shafts have connections for DN 100/150 pipes. This makes for simple and rational connection to industry-standard sewage pipes.

Inlet and distribution shaft



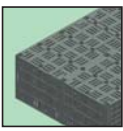
e.g. trafficable for cars



e.g. trafficable for heavy goods vehicles

Multifunction discharge shaft

- discharge
- emergency overflow
- reduction
- ventilation
- inspection



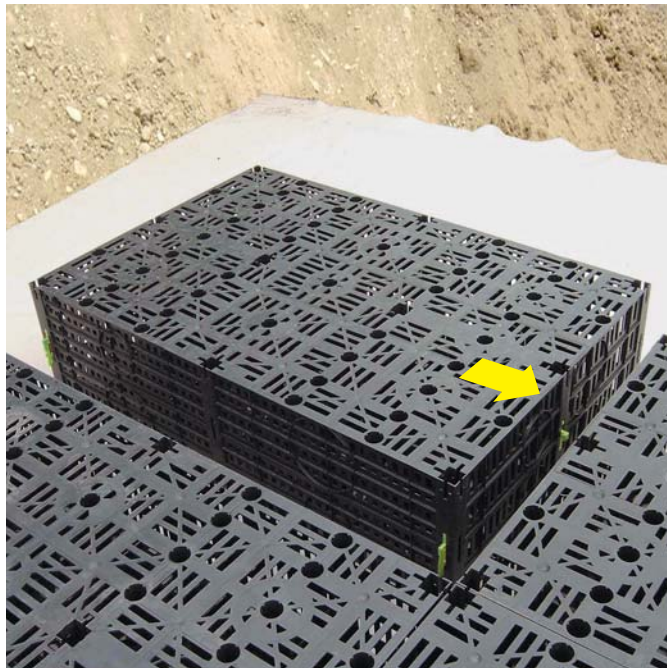
RECYFIX®-Drainbloc

Installation instructions

The installation instructions/examples are a general professional installation suggestion. Special installation types due to local ground conditions may be required in these circumstances. Engineers/Planners must be consulted and the Property-related official Regulations and Standards must be observed.

RECYFIX-Drainbloc seepage systems are suitable for basin trench seepage and trench seepage with tolerable precipitation drains in accordance with work sheet ATV-DVWK-A138, plus the relevant conditions. The number of RECYFIX-Drainbloc elements to be installed and the location thereof are oriented to the dimensioning in the above-mentioned work sheet and the traffic loads for RStO 01 construction classes and the local ground conditions.

1. Excavate a trench to the required depth and width whilst ensuring that a level base is achieved. This should include adequate working room. Depending on the nature of the ground, a filter layer must be installed and the construction of the surface must be at a depth that will achieve a frost proof layer.

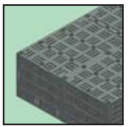


The narrow edge of the RECYFIX-Drainbloc is attached to the narrow edge of the previously laid blocks using connecting hooks.

2. Line the excavation with the recommended Geotextile with a minimum of a 50 cm overlap to ensure the Geotextile does not slip.
3. The individual modules are connected to each other using their connecting hooks, forming a continuous surface that will not slide. The outer hooks of the RECYFIX-Drainbloc point to the outer edge of the excavation when the modules are assembled. Before wrapping in Geotextile they are removed to prevent the fabric from being damaged. If several layers are placed on top of each other in rows or blocks, connecting adapters must be inserted in the square openings on top of the Drainbloc to prevent the layers from sliding. When they are laid in rows, 1 unit is required per layer and module and when laid in blocks 4 units per layer and a 2.40 x 2.40 m matrix are required. When laying is complete the modules are wrapped with Geotextile, whereby the joints must overlap.



This forms a longitudinal gap



Installation instructions

4. After the inlet and discharge shafts have been installed, they are connected to the pre-shaped pipe connections of the RECYFIX-Drainbloc by opening up the Geotextile. The edges of the fabric should be stuck down in such a way that prevents sand penetration. When laid on a surface, several supply pipes must be provided to allow water to enter evenly. If the trench venting is not connected through the shafts, a venting pipe must be attached to the RECYFIX-Drainbloc using the same method.
5. Suitable ballast material is loosely distributed on the fabric-wrapped trench to prevent it from slipping. Then the edges of the excavation are filled with layers of filtering bulk material and sealed. To perform its seepage tasks the fabric must not be damaged when the excavation is filled.
6. The minimum earth covering and the maximum installation depth are governed by the relevant volume of traffic and are specified by the property-related, computer aided measurement. In general, a safety distance of at least 6 metres from buildings without a water-proof cellar and at least 1 m from the ground water level must be maintained unless otherwise specified in official regulations. Tree distances from the trench must be half the diameter of the top of the fully-grown tree.
7. The trench must be checked through the shafts every six months. The filter bag must be cleaned when necessary, particularly after heavy rain. During installation it must be ensured that no dirt or loose soil enters the trench, since this could affect the long-term operation of the seepage system.



A little lifting and sliding of the longitudinal edge against the laid surface engages the connecting hooks.



When the RECYFIX-Drainbloc is lowered the longitudinal and narrow ends are secured and sliding is prevented.



RECYFIX®-Drainbloc

Technical Data

RECYFIX-Drainbloc

With pre-shaped connection of DN 100/150 pipes

Dimensions: L 1200 x W 800 x H 330

Weight: approx. 22.0 kg

Material: Polypropylene (PP)

Colour: Black

Load-bearing capacity: trafficable for heavy goods vehicles to SLW 60

Article no.: 96000

Connecting Adapter

For additional inter-layer slide protection

Dimensions: L 35 x W 35 x H 100 mm

Weight: approx. 50 g

Material: Polypropylene (PP)

Colour: Green

Article no.: 96110

Standard inlet and distribution shaft, 3 parts can withstand weight of cars

made from fibre glass reinforced concrete with closed galvanized bulb plate cover, consisting of upper part, middle part with filter element and DN 100/150 connecting pieces and lower part with DN 100/150 connecting piece to trench

Dimensions: L 510 x W 390 x H 1250 mm

Weight: 287.0 kg

Article no. 96200

Super inlet and distribution shaft, 3 parts can withstand weight of heavy goods vehicles

Same design as above, but with corrosion-proof steel frame, with SIDE-LOCK quick-locking-system and closed ductile iron cover, class E 600.

Dimensions: L 510 x W 390 x H 1250 mm

Weight: 289.0 kg

Article no. 96250

Multifunction discharge shaft-standard, 3 parts, can withstand weight of cars

Functions: discharge, emergency overflow, reduction, ventilation, inspection

made from fibre glass reinforced concrete with closed galvanized bulb plate cover, 3-part version consisting of upper part, middle part and lower part with 2 DN 100 connecting pieces

Dimensions: L 510 x W 390 x H 1250 mm

Weight: 282.0 kg

Article no. 96300

Multifunction discharge shaft-super, 3 parts, can withstand weight of heavy goods vehicles **Functions: discharge, emergency overflow, reduction, ventilation, inspection**

Same design as above, but with corrosion-proof steel frame, with SIDE-LOCK quick-locking-system and closed ductile iron cover, class E 600.

Dimensions: L 510 x W 390 x H 1250 mm

Weight: 284.0 kg

Article no. 96350

Intermediate part

For changing the installation height of all the above-mentioned shafts

Height: 400 mm

Weight: 82.0 kg

Article no. 4054

Geotextile, 200 g/m², by the roll

Made from GRK 3 PP fabric

Roll width 4 m, roll length 100 m

Weight: approx. 80.0 kg

Article no.: 96120

Geotextile, 200 g/m², by the metre

Made from GRK 3 PP fabric

Roll width 4 m, cut to length according to customer specification,

Weight: 200 g/m²

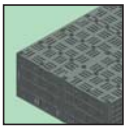
Article no.: 96130

Regulator

Static regulator for discharge and ventilation shaft, DN 100 with overflow, discharge capacity to be defined by customer in accordance with Drainbloc installation height.

Please consult manufacturer.

Article no.: 96370



Tender suggestion

1. ____ pcs. **RECYFIX-Drainbloc**
black, volume 317 l., made from PP as seepage block, suitable for seepage, retaining, storage and basin trenches with approx. 95% storage capacity, with integrated connection adapters for reliable anchoring in accordance with the DGBM, height 330 mm, length 1200 mm, width 800 mm, art.no. 96000, supply and lay as per the manufacturer's installation instructions. Can withstand weight of heavy goods vehicles to SLW 60 if suitably installed. Quality as per DIN EN ISO 9001:2000
Manufacturer: e.g. Hauraton GmbH & Co KG
Werkstrasse 13
D-76437 Rastatt
Telephone +49 (0) 72 22 9 58-0
Fax +49 (0) 72 22 9 58-1 02
Export@hauraton.de
2. ____ pcs.. **Connecting adapter**
for RECYFIX-Drainbloc, made from PP, to prevent the individual layers of RECYFIX-Drainbloc from sliding, height 100 mm, art.no. 96110. Can be laid in rows of 6 or blocks of 4, each with an area of 2.40 m x 2.40 m.
3. ____ pcs **Standard inlet and distribution shaft, can be driven on by cars**
made from fibre glass-reinforced concrete with closed galvanized bulb plate cover, 3-piece version consisting of top part, middle part with filter element and DN 100/150 connecting piece for connecting height pipe base ____ mm from top Edge of shaft and bottom part with optional DN 100/150 connecting piece to trench. Height 1250 mm, width 390 mm, length 510 mm, art.no. 96200, supply and lay as per manufacturer's installation instructions.
4. ____ pcs **Super inlet and distribution shaft, can be driven on by trucks**
made from fibre glass-reinforced concrete with corrosion-protected steel frame, with SIDE-LOCK quick-locking-system and closed ductile iron cover, class E 600. 3-piece version consisting of top part, middle part with filter element and DN 100/150 connecting piece for connecting height pipe base ____ mm from top Edge of shaft and bottom part with optional DN 100/150 connecting piece to trench. Height 1250 mm, width 390 mm, length 510 mm, art.no. 96250, supply and lay as per manufacturer's installation instructions.
5. ____ pcs. **Multifunction discharge shaft-standard, can be driven on by cars**
Functions: discharge, emergency overflow, reduction, ventilation, inspection
made from fibre glass reinforced concrete with closed galvanized stud plate cover, 3-piece version consisting of top part, middle part with filter element and DN 100/150 connecting piece for connecting height pipe base ____ mm from top Edge of shaft and bottom part with optional DN 100/150 connecting piece to trench. Height 1250 mm, width 390 mm, length 510 mm, art.no. 96300, supply and lay as per manufacturer's installation instructions
6. ____ pcs **Multifunction discharge shaft-super, can be driven on by trucks**
Functions: discharge, emergency overflow, reduction, ventilation, inspection
made from fibre glass-reinforced concrete with corrosion-protected steel frame, with SIDE-LOCK quick-locking-system and closed ductile iron cover, class E 600. 3-piece version consisting of top part, middle part with filter element and DN 100/150 connecting piece for connecting height pipe base ____ mm from top Edge of shaft and bottom part with optional DN 100/150 connecting piece to trench. Height 1250 mm, width 390 mm, length 510 mm, art.no. 96350, supply and lay as per manufacturer's installation instructions.
7. ____ pcs **Intermediate part for inlet and discharge shafts**
for construction height adjustment, made from fibre glass reinforced concrete, height 400 mm, width 390 mm, length 510 mm, art.no. 4054
8. ____ pcs **Regulator**
static regulator for discharge and ventilation shaft, DN 100 with overflow, discharge capacity in accordance with height of Drainbloc to be established by customer. Please consult the factory.
Art.no. 96370
9. ____ pcs. **Roll of Geotextile**
white, made from PP fabric, for wrapping RECYFIX-Drainbloc, mechanically secured, GRK 3, punch cut-through pressure 1750 N, effective opening size 0.12 mm, kv water permeability 8 x 10⁻³ m/s, weight 200 g/m², roll length 100 m, roll width 4 m, Art.no. 96120
10. ____ pcs. **Geotextile, by the metre**
white, made from PP fabric, for wrapping RECYFIX-Drainbloc, mechanically secured, GRK 3, punch cut-through pressure 1750 N, effective opening size 0.12 mm, kv water permeability 8 x 10⁻³ m/s, weight 200 g/m², roll length 100 m, roll width 4 m, Art.no. 96130

All tender suggestions can be downloaded on the Internet:

www.hauraton.com

Hauraton GmbH & Co KG

Werkstrasse 13, D-76437 Rastatt
Telephone +49 (0) 72 22 9 58-0
Fax +49 (0) 72 22 9 58-1 02
export@hauraton.com



Visit us on the Internet:
www.hauraton.com

Responsible specialist dealer: