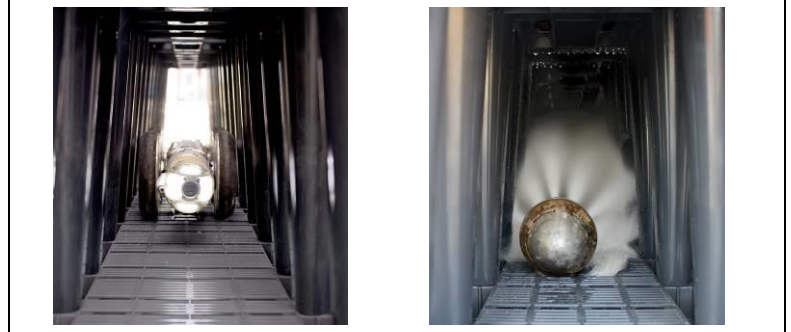


Instructions for maintenance of GRAF EcoBloc Inspect Smart

GRAF EcoBloc Inspect Smart



The points described in these instructions must be observed under all circumstances. All warranty rights are invalidated in the event of non-observance.

Separate installation instructions are enclosed in the transportation packaging for all additional articles purchased from GRAF.

The Graf EcoBloc Inspect must be checked for any damage prior to installation under all circumstances.

Missing instructions can be downloaded on www.graf.info or can be requested from GRAF.



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1. Safety Instructions

1. Safety Instructions

All work should be undertaken in compliance with the relevant accident prevention regulations according to national standards.



Only authorized and qualified personnel should install, inspect and clean the system. The following safety and installation instructions should also be noted.

Please ensure a correct storage. This means away from negative influences such as fuel, lubricants, chemicals and acids.

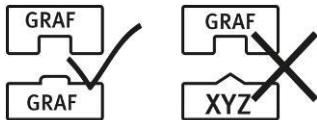


Before entering or inspecting any part of the system, make sure the complete system is out of order. **Otherwise there is a danger to life!**

The shaft cover needs to be closed at any time, except during operations at or inside the system. There is a high risk of accidents, if the shaft cover is not in position! The correct position of all covers needs to be checked regularly.



There is an increased risk of slipping on Graf EcoBloc in frosty and wet conditions.



GRAF provides an extensive range of accessories, which are all coordinated and can be combined to form complete systems. Using other manufacturer's accessories or components may result in the system's reduced performance or failure and liability for damage or costs will not be accepted.

This documentation only relates to use of the GRAF EcoBloc infiltration/attenuation systems for retaining, storing or infiltrating surface & rainwater. Any other use of the infiltration/attenuation system must be agreed with Otto GRAF GmbH from a technical, material and/or structural viewpoint.

Should special requirements apply, we would also recommend contacting architects or planners with knowledge of hydrology and geology.

The maintenance instructions of all other parts of the stormwater management system must be noticed and followed in any case. Accessories from other manufacturer's must be maintained in accordance of the manufacturer's maintenance instructions.

2. General legal information

2. General legal information

The person operating an infiltration/attenuation system, usually the owner, is bound by obligations which are laid down in European and German guidelines. Any discharge, by infiltration/attenuation system through layers of soil, of dangerous substances into the water cycle, especially the groundwater, is prohibited by the European Directives 76/464/EEC and 80/68/EEC. Operators of infiltration/attenuation systems are also bound to the German Federal Water Act (WHG) and in terms of the soil layers, the Federal Soil Protection Act and Federal Soil Protection Ordinance.

Together with local guidelines, the operator is subject to the following obligations:

- Dangerous substances such as bleach, chemical stone, cleaning fluids etc. must not enter the water cycle
- If there is a risk of dangerous substances entering the water cycle, appropriate countermeasures (treatment with filter or swale) should be taken
- Should ensure that the infiltration/attenuation system is operating correctly at all times.

An information brochure detailing the methods required (oil separators, filters, silt traps, swale etc.) for pre-treatment is usually available from the local authority or water board responsible. This will also contain information about infiltration/attenuation not requiring a licence and the licence issued under water law for infiltration/attenuation which may have to be obtained.

3. Cleaning of the connected areas

3. Cleaning of the connected areas

3.1 Treatment of the rainwater

To ensure perfect operation of the infiltration/attenuation system, filters of sufficient sizes should usually be fitted. These filters are required to be installed upstream of the infiltration/attenuation system.

In special cases, multi-stage filter systems with coarse and fine filters are used to treat the rainwater. The exposure and size of the collection surfaces can be used to determine whether a multi-stage system is needed and the size of filter required. We would be happy to help you select an appropriate filter/filter shaft. GRAF provides an extensive range of such products.

National or international guidelines or standards such as the DWA A-138 or the DWA M-153 in Germany contain sizing examples and information about filter stages upstream of infiltration/attenuation systems.

3.2 Rainwater treatment

The DWA data sheet M-153 provides various recommendations for working with rainwater. An overview is provided in Table 1.

Table 1

Groundwater intake	Retention soil filters	Sedimentation systems	Filters
Swales	Sand filters	Silt traps	Coarse filters
Surface infiltration	Ponds	Purification basins for rainwater	Fine filters
			Substrate filters

In areas with high concentrations of pollutants, several filter systems can also be combined to form one overall filter. This firstly filters out coarse particles and then retains dissolved substances.

The layers of soil which the rainwater penetrates during the infiltration process before it reaches the groundwater also have a filtering effect. A distance of one metre between the bed of the infiltration system and average groundwater level should therefore be maintained during the planning phase and/or when setting up the system in accordance with DWA A-138 or other national guidelines.

3. Cleaning of the connected areas

3.3 Catchment areas

Maintenance begins at the start of the rain cycle. A very dirty catchment area may produce an increased amount of debris for the system with high filter effort afterwards. To extend the service life of the filters, we would therefore recommend maintaining the collection surfaces to remove large pieces of dirt (leaves, grit etc.).

3.4 Maintenance of filters

All kinds of filter units, see chapter 3, require maintenance to ensure the infiltration/attenuation system operates perfectly. Perfect operation is essential to avoid damage to the infiltration/attenuation system and maintaining performance.

The pollutant levels depend on seasonal factors. During these periods, we would therefore recommend checking the filter units for overflows or full sludge and dirt buckets. Increased dirt levels will arise in the event of

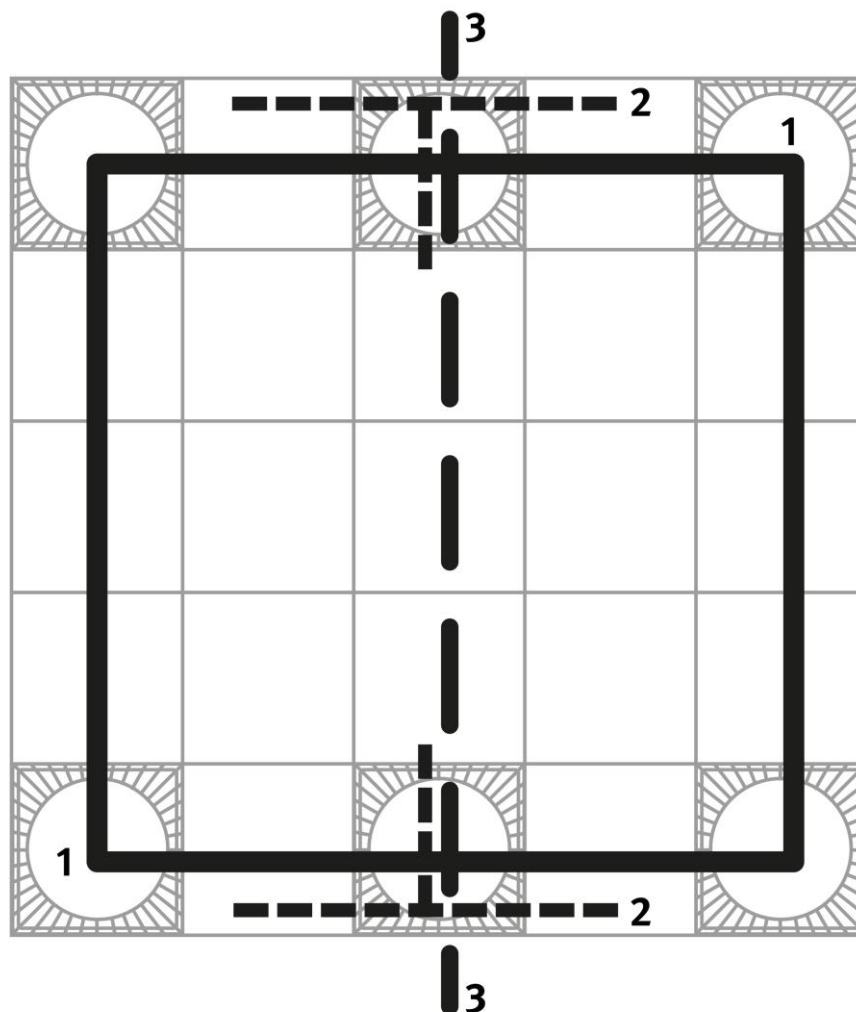
- snow melt
- build-up of grit
- high pollen levels
- heavy rainfall during storms
- autumn leaf drop

The details provided by the manufacturer on maintaining and servicing the filter units used must also be followed.

3. Cleaning of the connected areas

3.5 Inspection of the EcoBloc Smart

1. An incorrect installation or damaged parts of the infiltration/attenuation tank can be checked by inspecting the outer inspection lines of the tank.
2. The highest amount of dirt and debris will settle down inside the shafts of the inlet pipes or next to the choke drain or outlet shaft. These shafts and tank connections should be inspected and cleaned regularly.
3. The amount of pollution inside an attenuation tank can be checked by inspecting the shortest line between inlet and outlet shaft. In case of an infiltration tank, the pollution can be checked by inspecting the inlet pipes and one of the central inspection lines inside the tank.



Ways of inspection inside the infiltration/attenuation tank

3. Cleaning of the connected areas

3.6 Maintaining the infiltration system

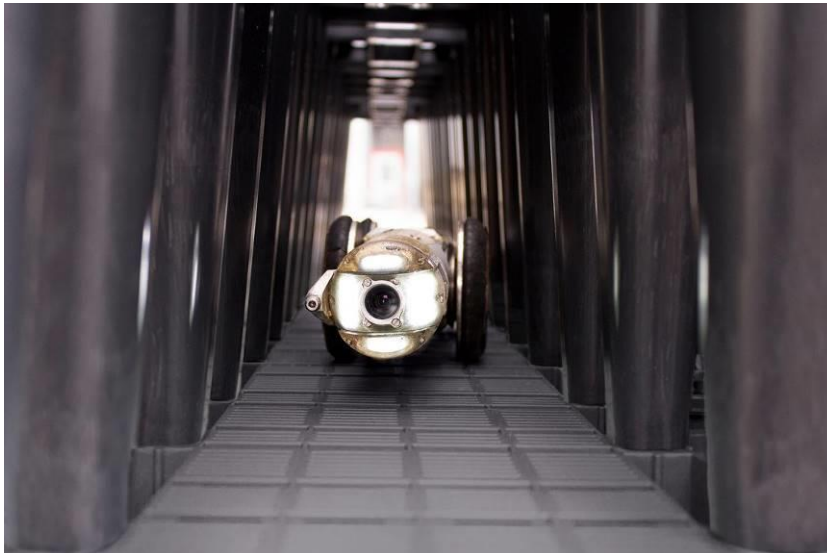
Regularly checking the infiltration/attenuation system will ensure high performance and guarantee the rapid distribution of surface & rainwater in the event of heavy, high intensity rainfall.

As described above, dirt may reduce the performance of the infiltration/attenuation system. Drops in performance can be checked using e.g. tests with a defined volume.

The volume and duration for a test can be estimated and compared using the sizing documents according to DWA A-138.

If the infiltration performance deviates by $\geq 25\%$, we would recommend using inspection equipment to check the system. Coarse particles or dirty geo textile impairing the infiltration performance can be removed with appropriate high-pressure purging probes. The general condition, for example, correct installation or changes to the system over time, can also be checked with Inspection equipment.

Local drain Inspection companies can inspect and rinse the systems.



The EcoBloc Inspect Smart is optimized for the inspection with a camera vehicle

3. Cleaning of the connected areas

3.7 Maintaining the attenuation system

The catchment areas and the filtration units of an attenuation system must be cleaned as mentioned in chapter 3.3 and 3.4.

Usually an attenuation system does not have a sedimentation or sand trap in front. Because of that and depending on the type of catchment areas, the amount of debris brought into the tank can be high. To prevent the attenuation tank of blocking, the pollution of the inlet and the outlet pipes should be controlled regularly.

In case of a higher pollution inside the inlet or outlet pipes, the shafts of the tank or even the whole attenuation tank should be cleaned by high pressure jetting.

Local drain Inspection companies can inspect and rinse the systems.



The EcoBloc Inspect Smart can be cleaned by high pressure jetting

An overview of recommended service intervals is provided in Table 2.

Table 2

Installation setup	Activity	Recommended service interval
Without any pre filtration or sedimentation	Inspection	every year
	Cleaning	every 24 months ¹
With sedimentation	Inspection	every year
	Cleaning	no regular interval ¹
With pre filtration and sedimentation	Inspection	every 5 years
	Cleaning	no cleaning necessary ²

¹ In case of a high amount of dirt brought into the system, the cleaning interval may need to be adapted

² Only if the pre filtration and the sedimentation in front of the tank is working correctly and be maintained regularly in accordance to the manufacturers service instructions

