



Rainwater Harvesting Installations Modern and ecological technology

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Introduction

During the nineties several thousand rainwater harvesting systems have been installed in Germany. The single components of these installations have now been improved, so that the rainwater harvesting is accepted as a progressive, ecological and permanent reliable installation technique. So far rainwater harvesting is an important part of a self-sustaining development of rainwater management. This information mentions the most important aspects of rainwater harvesting installations, so the future building owners will not be on their own regarding the planning and construction of these installations.

Which kind of rainwater harvesting is in private households?

Saving drinking water

In many regions clean drinking water can only be made available through a huge effort, and therefore it is always expensive.

Easing the burden of sewers and sewage treatment plant

During heavy rainfall flooding may peak, this may hamper the waste water disposal, and raise the costs therefore. These peaks may also cause huge damages.

Real future investments

The utilization of modern components in installations, gives a long-term possibility to reduce the consumption of drinking water and the amount of waste water.

Rainwater quality and the area of application

The excellent quality of process water is given by the installations, with a technical minimum standard.

The quality of the collected rainwater depends directly on the utilised installation technique.

Qualified fixed installations, which meet the requirements of a minimum standard, supply rainwater (also called process water), which can be used quite safely for the following mentioned purposes. Process water from such installations shows, e.g. in general a better quality than it is required by the Government for (swimming) ponds.

Utilization purposes for rainwater

The process water which can be used for toilet-flushing, garden irrigation, cleaning purposes and for the washing machine. So the consumption of drinking water can be reduced to about 50 % of the daily consumption. Due to the soft quality of this rainwater, the consumption of washing powder is also reduced.

Important components of rainwater installations

Connection of appropriate roof areas

Only roof areas should be connected. So appropriate roof materials are: clay bricks and concrete bricks.

Filtration before the tank

A filtration system is situated in front of the tank when necessary.

The selection of the filtration system depends on the constructional situation. The most common filters show a low maintenance, a good filtration capacity and high water harvesting.

Rainwater tanks

Tanks which prevent an incidence of light, and are in cool areas, are generally qualified I. Cellar/basement tanks are more likely for already existing buildings; Soil tanks are more likely for implemented new buildings.

Stream in tanks

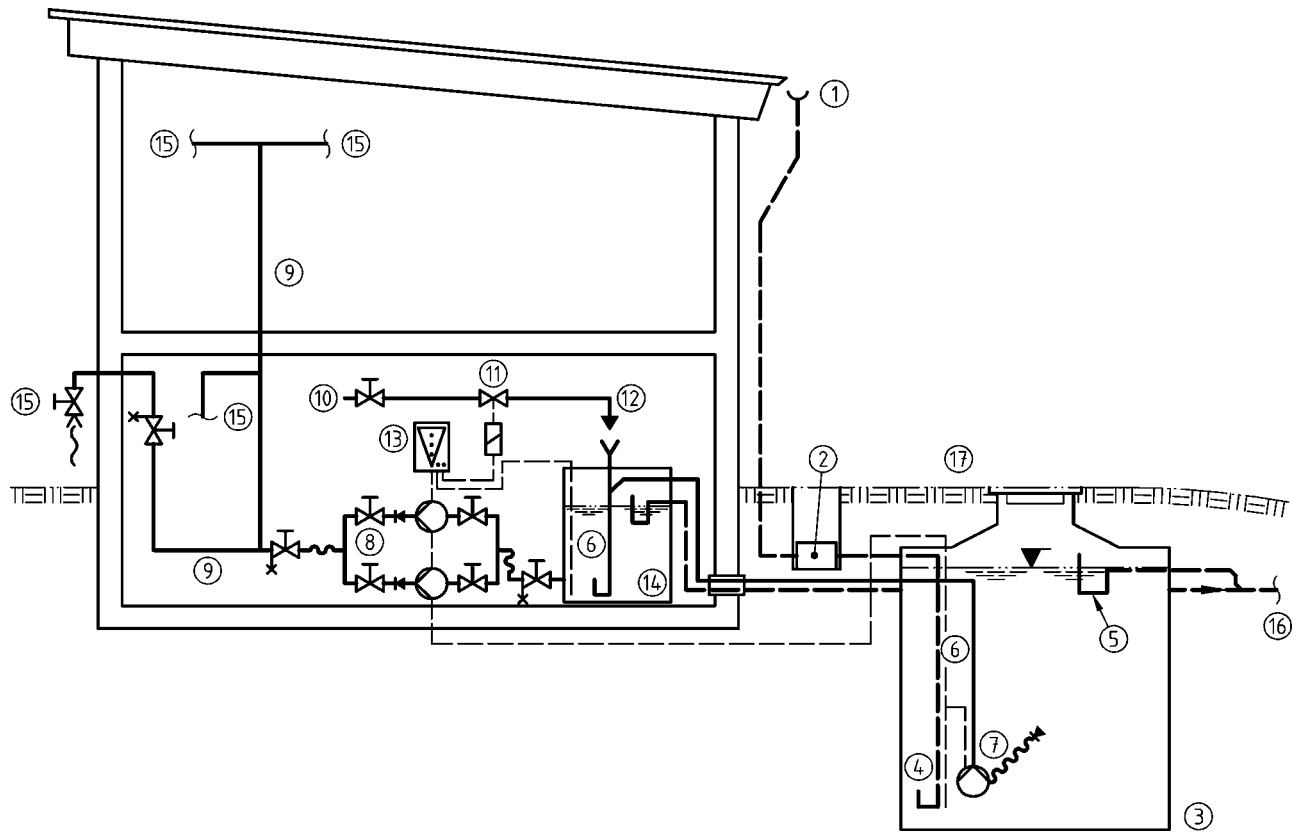
Also the stream in the tank is important for the water quality. State of the art here:

rainwater inflow in a calmed way, to prevent a swirl up of the sediment
draw of process water from layers with the cleanest water, e. g. by floating
withdrawal

sloped overflow siphon for the flush of a possible bio-film and the protection of sewer
gas

Suction line

The suction line to the process water pump should be laid so as to be continually increasing, and has to be implemented in a frost-resistant depth.



Legend

1	Gutter/downpipe	8	Process water pumps	13	System control unit
2	Filter	9	Process water lines	14	Hybrid container
3	Rainwater reservoir	10	Drinking water line	15	Removal points
4	Quiescent supply	11	Solenoid valve	16	Seepage system / sewer
5	Overflow with odor trap	12	Free outlet Type AA or Type AB according to DIN EN 1717	17	Reflux level
6	Water level recording				
7	Removal line with pump				

Quiet and a long-lasting pressure boosting installation

Requirements which concern the pressure boosting installation are noise reduction, less maintenance, longevity, corrosion resistance and low consumption of energy. Multistage centrifugal pumps – created especially for the utilization of rainwater - guarantee these requirements best of all.

Backfeed of drinking water only in free outlet

The only allowed drinking water by the lack of rain water, is the free outlet installed above the level of backed-up water. So the backfeed has to be installed above a cone /funnel (take care of the air gap!). Alternatively a supplemental feed module can be installed, which is responsible for the coordination of the installation, as well as for the increase of pressure.

Indication of the rainwater pipe work

Stipulated is a non-stop and clear indication of all process water pipes and all water tap, which should be protected against any kind of unauthorized water withdrawal. Polyethylene (PE), Polypropylene (PP) or stainless steel are recommended materials for this pipe work.

Low per-call maintenance

Most of the installation components have only to be controlled/maintained once a year. Filters in the inflow have to be inspected at a 3 monthly interval.

Approvals and regulations

Approvals/Permissions

The construction and the utilization of rainwater harvesting installations can not be forbidden, as long as the common rules have been respected.

A construction permission is not necessary in most of the cases, but the regional public water suppliers have to be informed of the construction of such an installation.

Regulations and norms/standards

For the construction and utilization of a rainwater harvesting installation only some regulations and standards have to be respected (for example in Germany the stand of DIN 1989-1 (German Industrial Standard) and DIN 1988). The main part is the strict separation of the pipe work for drinking water, and the process water pipe.

Economy/Efficiency

No general statements

General statements referring to the efficiency cannot be given. Depending on the regional conditions (water costs, sewage costs, probable financial support, and waste water charges) the amortization period is between 10 and 20 years. For the main investments for e.g. reservoir and tubes, the utilization period is much longer.

Further Informations:

www.fbr.de