GERMAN ATV RULES AND STANDARDS

WASTEWATER - WASTE

STANDARD
ATV - A 128E

Standards for the Dimensioning and Design of Stormwater Structures in Combined Sewers

April 1992

ABWASSER • ABFALL • GEWÄSSERSCHUTZ
GERMAN ASSOCIATION FOR THE WATER ENVIRONMENT

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The Standard presented here has been prepared within the framework of the ATV committee work, taking into account the ATV Standard A 400 "Principles for the Preparation of Rules and Standards" in the Rules and Standards Wastewater/Wastes, in the January. 1994 .version. With regard to the application of the Rules and Standards, Para. 1 of Point 5 of A 400 includes the following statement "The Rules and Standards are freely available to everyone. An obligation to apply them can result for reasons of legal regulations, contracts or other legal grounds. Whosoever applies them is responsible for the correct application in specific cases. Through the application of the Rules and Standards no one avoids responsibility for his own actions. However, for the user, prima facie evidence shows that he has taken the necessary care.

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Contents

1 Scope of Application and Terms

These Standards apply for structures with overflows in the overall system of a combined wastewater sewer system within the catchment area of sewage treatment plants. It replaces the previous ATV Standard A 128 from 1977/1.

Structures with overflows in combined systems are structures with an overflow into a lake or river such as, for example, stormwater overflows (SO), stormwater tanks with overflows (STO) and sewers with storage capacity and overflow (SSCO).

Stormwater holding tanks (SHT) are dealt with in ATV Standard A 117.

Stormwater sedimentation tanks (SST) serve for the treatment of stormwater with separate systems. They are also not dealt with here. Information is given in the ATV Working Report in "Korrespondenz Abwasser" (1980), Vol. 1.

2 Objective of Stormwater Treatment

For water management and cost reasons the priority task of the planning of measures for wastewater collection and stormwater treatment is the avoidance of stormwater overflow into the sewer system wherever this is possible. For the remaining discharges, for technical water management and economic reasons, stormwater structures with overflow are located in combined wastewater sewers.

With precipitation run-off, high pollutant loads can occur which, with discharge into lakes and rivers, could load these heavily. Although the loadings appear only temporarily these can exceed those from the effluents of sewage treatment plants several times over during rainfall run-off. The task of stormwater treatment is so to limit the rainfall run-off into the sewage treatment plants that there the desired effluent values are maintained and, at the same time, the surge-type loadings of the lakes and rivers remain within acceptable limits. The aim of stormwater treatment must be the best possible reduction of the total emissions from stormwater overflows and sewage treatment plants within the scope of water management requirements. An effective protection of lakes and rivers and of sewage treatment plants from excessive loadings is to be expected if the necessary stormwater treatment takes place according to the criteria of these Standards.

2.1 Principles

The objective can be achieved with various formulations - from discharge avoidance to substance retention. Stormwater overflows are fundamentally to be assessed together with the sewage treatment plant for interrelated catchment areas of a section of a lake or river. Requirements on the sewage treatment plant run-offs and on the stormwater overflow installations should be matched in their effectiveness for the lake or river.

The regional and network specific quantities precipitation, flow time, gradients, sewage storage capacity, heavy pollutants and areas drained with a separate system have a considerable influence on the overflow quantity and concentration. These are therefore taken into account.

2.2 Method of Approach

Having taken into account the given possibilities of discharge reduction or discharge avoidance, both prerelieved and non-prerelieved overflow structures are to be dimensioned for the remaining discharges. The effectiveness of a stormwater treatment here depends not only on the available storage volume but also particularly on the arrangement, design and operation of the installations (Chaps. 4 and 5).

Basically, there two procedures available for the dimensioning and verification of the objective of the stormwater treatment:

- simplified dimensioning procedure using diagrams (Chap. 8.1),
- verification procedure using pollutant load lculations (Chap. 8.2).