

GERMAN
DWA Rules and Standards

Standard DWA-A 118E

**Hydraulic Dimensioning and Verification
of Drain and Sewer Systems**

March 2006



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The German Association for Water, Wastewater and Waste (DWA) is intensively involved with the development of reliable and sustainable water management. Being a politically and economically independent organisation it operates specifically in the areas of water management, wastewater, waste and soil protection.

In Europe the DWA is the association in this field with the greatest number of members and, due to its specialist competence, it holds a special position with regard to standardisation, professional training and information of the public. The members, approximately 14,000 represent specialists and managers from municipalities, universities, consulting engineers, authorities and businesses.

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Foreword

Standard ATV-A-118 was first published in 1956 under the title “Standards for the calculation of stormwater and combined wastewater sewers”. In 1977 it was republished in a revised edition with the title “Standards for the hydraulic calculation of domestic and industrial wastewater, stormwater and combined wastewater sewers” (ATV 1977).

A renewed revision was started in 1994. This was occasioned by European standardisation as common standard specifications for drain and sewer systems had been developed. In addition to taking into account the specifications of the standard series DIN EN 752 on flooding protection, technical development, additional knowledge and the increasing employment of computer calculations were also included in the revision. In particular, a survey of 580 towns and communities and of 340 engineer offices on the then current application practice of sewer calculations, carried out in 1994 (ATV 1996), has also been included. Thanks to the collaboration of specialist colleagues, the experiences of neighbouring countries have also been included with the revision.

Standard ATV-DVWK-A 198E “Standardisation and Derivation of Dimensioning Values for Wastewater Facilities” appeared in April 2003. The definitions made in this Standard with regard to the systematic of short symbols were the reason for the editorial revision.

In each application case the available local and project-specific characteristics are to be checked as to whether the rules listed below can be applied without limitation. They may be supplemented or replaced by other approaches if appropriate knowledge or experience is available. In general, there is an absolute necessity to consider the water management characteristics and requirements as a whole.

The inclusion of the overall concept of the residential and urban drainage with the hydraulic calculation of drain and sewer systems is as an absolute must. This concerns both measures for the management of rainwater as well as the loading of surface receiving waters with runoff and combined water discharges.

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User Notes

This Standard has been produced by a group of technical, scientific and economic experts, working in an honorary capacity and applying the rules and procedures of the DWA and the Standard ATV-DVWK-A 400. Based on judicial precedent, there exists an actual presumption that this document is textually and technically correct and also generally recognised.

Any party is free to make use of this Standard. However, the application of its contents may also be made an obligation under the terms of legal or administrative regulations, or of a contract, or for some other legal reason.

This Standard is an important, but not the sole, source of information for solutions to technical problems. Applying information given here does not relieve the user of responsibility for his own actions or for correctly applying this information in specific cases. This holds true in particular when it comes to respecting the margins laid down in this Standard.

1 Scope

This DWA Standard concerns the dimensioning and verification of drain and sewer systems, which are mainly operated as gravity systems and which serve for the discharge of domestic and industrial wastewater, surface water and combined wastewater.

Its range of validity, in accordance with the standard specification series DIN EN 752 "Drain and sewer systems outside buildings", ranges from the point where wastewater leaves the building and/or roof drainage system or flows into road gullies up to the point where the wastewater is discharged into a wastewater treatment plant or receiving waters. Drains and sewers below buildings are included here provided that they do not form part of the building drainage system¹⁾. Statements in Chaps. 3 to 6 refer, in the first instance, to public drainage systems. It applies, by extension, also for the drainage of larger private surface units (commercial/industrial concerns, housing developments).

For the basic elements of the hydraulic calculation of sewer cross-sections and open profiles Standard DWA-A 110 is to be observed. Standard ATV-A 111 [Translators note: not yet available in English] applies for stormwater overflow discharge facilities; for other special structures Standard ATV-A 112 [Translators note: not yet available in English].

1) Facilities for the drainage of buildings fall under the scope of the standard specification series DIN EN 12056 "Gravity drainage systems inside buildings". Rules for private property drainage facilities of larger surface units are taken up in DIN 1986.

Special forms of drainage and their dimensioning are, for example, listed in DIN EN 1091, DIN EN 1671, in Standards ATV-A 116E, DWA-A 116-1E and DWA-A 138E.

The dimensioning of storage and retention facilities in drainage networks is part of Standard DWA-A 117E, those for stormwater overflow discharge structures are regulated in Standard ATV-A 128E. The design and equipping of stormwater tanks both in combined and separate systems takes place in Standard ATV-A 166 examples and notes are to be found in Advisory Leaflet ATV-DVWK-M 176 [not available in English].

2 Terms

2.1 Definitions

Technical terms used in the following text are mainly contained in DIN EN 752-1 "Drain and sewer systems outside buildings; Generalities and definitions" and in DIN 4045 as well as in Standard ATV-DVWK-A 198E. The most important are listed below.

Runoff coefficient (Standard ATV-DVWK-A 198E)

Application-related ratio to quantify the runoff-influencing part of the rainwater.