METADATA

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Abstract

The book covers issues on the design and operational control of sewage networks. It includes elements from the Greek technological experience in sewerage projects (methodologies and specifications) with parallel reference to elements from the international literature. It emphasizes the scientific principles that justify specifications and methodologies. It also incorporates several original elements. It consists of eight chapters. The first provides basic concepts and definitions, along with a brief history and general description of sewerage studies. The second chapter contains the estimation methods of wastewater discharge, with useful data, both Greek and international. The third chapter describes the standard methodology for estimating storm sewer discharge, with particular reference to Greek conditions. The fourth chapter covers the hydraulic calculations necessary for the design, adequacy control and assessment of the flow characteristics of sewers. Emphasis is placed on dealing with certain non-standard operating conditions of the conduits (e.g. very large or very small gradients and velocities), which can cause serious problems in the operation of the networks. The fifth chapter presents the most up-to-date concepts and computational methods of sewerage networks based on the overall simulation of their operation (hydrological and hydraulic). The sixth chapter covers water quality issues related to the design and operational control of the networks, such as the production and release of hydrogen sulfide in the conduits and their consequences. The seventh chapter includes technological issues, such as the choice of materials for prefabricated pipes, the method of construction of cast-in-place conduits and the corrosion protection of sewers. Finally, the eighth chapter provides information on some alternative sewer systems. Some of the original analyses included in the book are: (a) the statistical foundation and modeling of the variation of sewer discharge, (b) the development of algorithms for the numerical solution of various hydraulic problems, (c) the derivation of analytical relationships that can replace various empirical nomograms or tables of the literature (e.g. roughness as a function of the standardized flow depth in circular pipes, equation for the direct approximate calculation of the critical depth in circular conduits, equation for estimating local energy losses in sewer junctions), and (d) the systematization and c

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