



Evaluation of Durable Protective Systems for Sewage Structures

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Summary

In consequence of the growing environmental awareness with regard to the handling of the resource “water” the concentration of aggressive substances in sewage systems increases continually. The construction materials used for these structures until now will therefore not only be exposed to mechanical and physical loads but to chemical loads at a progressive rate.

To achieve a service life of sewage systems of approximately 100 years the Emscher-genossenschaft and the Lippeverband carried out extensive processing works and material tests to determine the resistance of potential construction materials and elements to the expected mechanical and chemical loads. Based on the comparison of the attained results, recommendations have been derived to select the most durable protective systems.

Keywords : sewage structures, mechanical and chemical loads, biogenous sulphoric acid corrosion, protective systems, durability

1. Introduction

Since the end of the 1980's the Emscher-genossenschaft and the Lippeverband (EG/LV) strive for the aim of completely releasing the river Emscher and its affluents in the industrial centre of the Ruhr-district of waste water on an overall length of 338 km as well as improving the rivers and rivulets ecologically as far as possible.

The estimated investments of approximately 4.4 billion € for the modification of the existing waste water system basically contain structural measures such as the construction of decentralized waste water treatment plants, the constitution of new sewers with a planned overall length of approximately 400 km, the construction of facilities for rainwater treatment and the subsequent nature-orientated change of the watercourses, which are then free of waste water.

In consideration of a required service life of sewage systems of approximately 100 years the sewage structures must be durably protected to mechanical and chemical loads.

In order to meet this requirements extensive processing works and material tests have been made to select capable protective systems of the spectrum of possible materials in consideration of the locally and strongly differing structural and waste water-specific boundary conditions.