Research objectives

Post et al. (2016) have shown that most failures of sewer systems occur in the anterior part of the sewer system. This anterior part consists of lateral house connections and gully pots. This research will mainly focus on the maintenance in that part of the sewer system. Proactive maintenance is used to prevent flooding, but proactive maintenance can only be provided in a cost efficient way if enough information or knowledge is available.

Currently, the physical phenomena of transportation and accumulation of solids in sewer systems are not fully understood.

The objective of this research is to increase the knowledge on solid transport and accumulation of solids from streets. These enter the sewer system via gully pots during wet weather conditions.

Project outline

Introduction

Sewer systems have two inputs, namely wastewater and storm water. Both streams consist almost entirely of water, but the small amount of entrained solids give raise to a wide range of problems.

The two main problems caused by these solids are accumulation and pollution. Accumulation occurs at all places in sewer systems. This leads to restrictions and blockages, which causes, according to Fraser and Ashley (1999), premature spills.

These events do not only cause nuisance, but also environmental damage and health risks, because these solids are highly polluted, according to Fulcher (1994).

One of the sources of these solids are the solids that accumulate on streets. Especially the small particles on streets get mobile during wet weather conditions, as shown by Grottker (1987). These mobilised particles enter the sewer system via gully pots.

Approach

The research will be divided in five research questions:

RQ 1 What solids are transported to gully pots?

RQ 2 What solids got retained in gully pots?

RQ 3 What physical mechanism influences the retention efficiency of gully pots?

RQ 4 Does street sweeping decrease the amount of solids transported to gully pots?
RQ 5 Does the amount of removed solids from main sewers increase by increasing the cleaning frequency?

These research questions will be answered by the results of five different experiments. The relation between the research questions and the five experiments is shown in the figure below.

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**Scientific relevance**

This project will give insight in the accumulation and transportation of small particles. These phenomena are important in many different research fields. The tests that will be performed will increase the knowledge of these phenomena in the world of sewer systems.

**Social relevance**

By increasing the knowledge on accumulation and transportation of sewer solids, the maintenance programme can be improved. This will decrease the costs and improve the serviceability of the sewer system. This reduces environmental damage, health risks and nuisance.

**Research partners**

The project is part of the Dutch “Kennisprogramma Urban Drainage” (Knowledge Programme Urban Drainage). The involved parties are: ARCADIS, Deltares, Gemeente Almere, Gemeente Breda, Gemeente ’s-Gravenhage, Gemeentewerken Rotterdam, Gemeente Utrecht, GMB Rioleringstechniek, KWR Watercycle Research Institute, Platform Water Vallei en Eem, Royal HaskoningDHV, Stichting RIONED, STOWA, Sweco Nederland, Tauw, vandervalk+degroot, Waterboard De Dommel, Waternet and Witteveen+Bos.
Literature

Ref Type: Conference Proceeding

