



Development of Sediment Deposition Height Capacity Equation in Sewer Networks

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Sediment characteristics and transport processes in sewers are markedly different from river. There is a wide range of particle densities and smaller particle size variation in sewers. Sediment supply and the available erodible material are more limited in sewers, and the diverse hydraulic characteristics in sewer systems are more unsteady. Prevention of sewer sediment accumulation, which can cause major sewer operational problems, is imperative and has been an immense concern for engineers. The effects of sediment formation in sewer systems, an appropriate sediment transport modelling with the ability to determine the location and depth of sediment deposit is needed. It is necessary to design efficiently considering the transfer and settling phenomena of the sediment coming into the sewer systems. During transport in the sewer, the minimum shear flow velocity and possible shear stress at which the sediment is transported smoothly.

However, the interaction of sediment and fluid within the sewer systems has been very complex and the rigorous theoretical handling of this problem has not been developed. It is derived from the empirical values obtained from the river bed. The basic theory that particles float is based on the balance between sedimentation of particles by gravity and turbulent diffusion of fluids. There are many variables related. Representative parameters include complex phenomena due to collisions between particles, particles and fluids, and interactions between particles and tube walls. In general, the main parameters that form the boundary between the main transport and sediment are particle size, density, volume fraction, pipe diameter and gravity. As the particle size and volume concentration increase, the minimum feed rate increases and the same tendency is observed for the change of the capillary diameter.

Based on this tendency, this study has developed a sediment deposition height capacity formula to take into consideration the sewer discharge capacity. The main objective in undertaking this research is the assessment of the sediment scouring and transporting capacity of the discharged.

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