

ANALYSIS OF THE WIDTH OF PROTECTION ZONE NEAR A WATER SUPPLY NETWORK

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Abstract

A protection zone near the water supply network belongs to the proposals of limiting negative results of potential breakages of buried water pipes. Water leaking from a damaged pipe can create swallow holes or hollows, dangerous especially in the urban areas. The proposed zone is an area on the soil surface along a buried water network, where the outflow of water could be expected after a potential failure of the pipe. The infrastructure in this zone should be carefully planned to limit the social, economic and environmental costs in the case of leakage.

The investigations included laboratory tests of a buried water pipe breakage for different cases of leak areas and values of hydraulic pressure head in a pipe as well as analysis of the obtained results and determination of a protection zone for the investigated cases on the basis of tolerance limits. The calculated values of the zone width (5 m if operating pressure is lower than 0.4 MPa, and 7 m otherwise) occurred high, mainly because of the high dispersion of the laboratory tests results. Moreover, we recommended the values of tolerance level to be assumed in calculations.

Keywords: Failure; Water network; Protection zone; Tolerance intervals.