Célérité de l'onde de coup de bélier dans les conduites enterrées

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Description

In this work, we are interested in the effect of the external load exerted by the soil on the celerity of propagation of water hammer wave in the case of buried pipes. A modelling of the mechanical behaviour of the pipe is proposed in order to define the deformability of pipe section. The study is carried out on simple and multiple wall pipes. To take into account the effect of surrounding soil, we suppose that this latter behaves as a cylinder with an infinite thickness and functioning as an elastic spring. In order to make obvious the effect of the external load on the increasing of wave celerity, we present numerical examples using different pipe materials and the diameter to thickness ratios currently used in practice. The results are presented as percentage of celerity increasing in comparison to the case of free pipes.