

BIM approach applied to urban tunneling interferences

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ABSTRACT

Interferences management induced on buildings during underground works -including the excavation of a metro tunnel- is a topic that must be carefully studied and analysed. The paper provides a proposal for the creation of a BIM model by which it is possible to control, over time, the influencing parameters, to visualize subsidence values and foreseen harmful events for building falling in the subsidence basin of an excavation machine. The method is based on the creation of a model which allows to graphically monitor the subsidence to which the buildings may be subjected through the attribution of predefined thresholds. In the same way, in the model, the parameters linked to the excavation machine itself are also checked. This control is useful to predict the formation of chimneys that could damage buildings structures and façades. To import all the data in the 3D model, specific scripts have been written using the software Dynamo, to semi-automatically connect an Excel file with a Revit model. This method will be then applied to a specific case study, a portion of the central section of the new M4 metro line in Milan, built with EPB type TBM machines. To provide indications of the measures to be adopted if the different thresholds are reached, guidelines for interference management are subsequently proposed. The conclusion of the paper shows how the model, together with the guidelines, with the necessary implementations and modifications, is to be considered valid for the management of the same topic in other works.

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