POLITECNICO DI TORINO

Honors thesis

DEGREE IN SUSTAINABILITY DESIGN

HBIM: from survey to parametric modeling. The case study of 'Torino Smistamento' roundhouse

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This thesis fits into an international research field about 3D modeling in order to evaluate the Building Information Model performance as a platform for representation and sharing of the Cultural Heritage.
One of the primary purposes is to validate the HBIM documents is to guarantee the geometric precision of the model.
This work represent an actuable workflow based on HBIM approach to model the complex architectural shapes of the cultural heritage, based on a TLS survey.
The analyzed case study is a property of the Ferrovie dello Stato, built in the beginning of 19th century and now abandoned, originally used for storage of locomotives, for which it has been proposed a specific intervention.

Fig. 1. Perspective birdseye view of the roundhouse, taken from Google Earth, Turin, acquisition date: 08/07/16, 45°02'28.66"N 7°40'00.37"E elev. 239m alt. 353m.

Modeling an historical building needs the creation of parametric objects library, starting from the existent architectural elements. The traduction of these informations into a model, and so finding the operative methodology, is a primary purpose of the research.
A key to for a good realization of a Building is the evaluation of the model's quality; in this research the focus is to compare the numeric model with the reference point cloud, obtaining an impartial check of the metrical precision. This precision could be attached as a parameter to the single object of the model, making the renstitution more reliable.

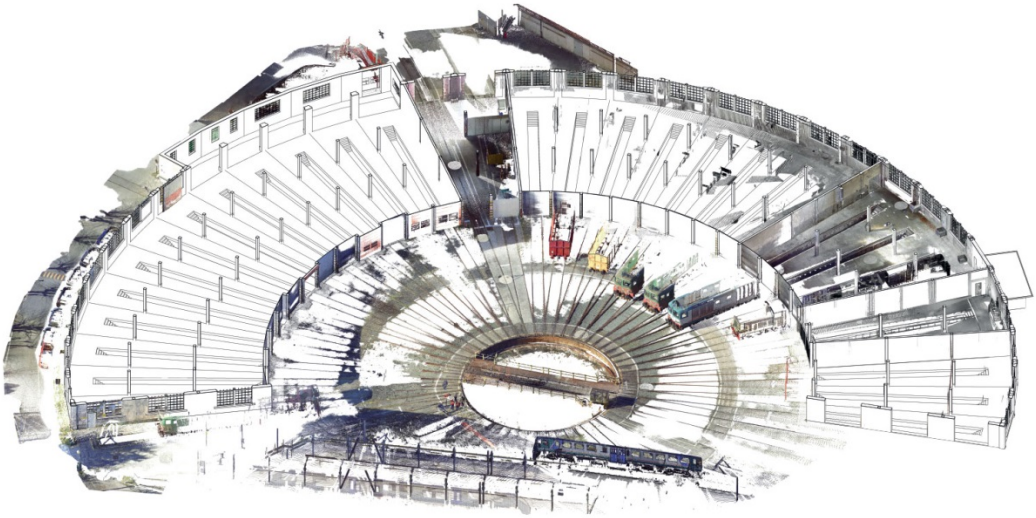

Fig. 2. Isometric section: overlaying between HBIM model and point cloud.

HBIM is a method that could contain information from all the branch of knowledge, particularly for the renovation and the conservation. An in-depth analisis in order to create the parametric objects, has been the one about the decay pathologies: it's been found the habitual ways of the traditional representation leading to find a methodology to insert the same information into a BIM model.

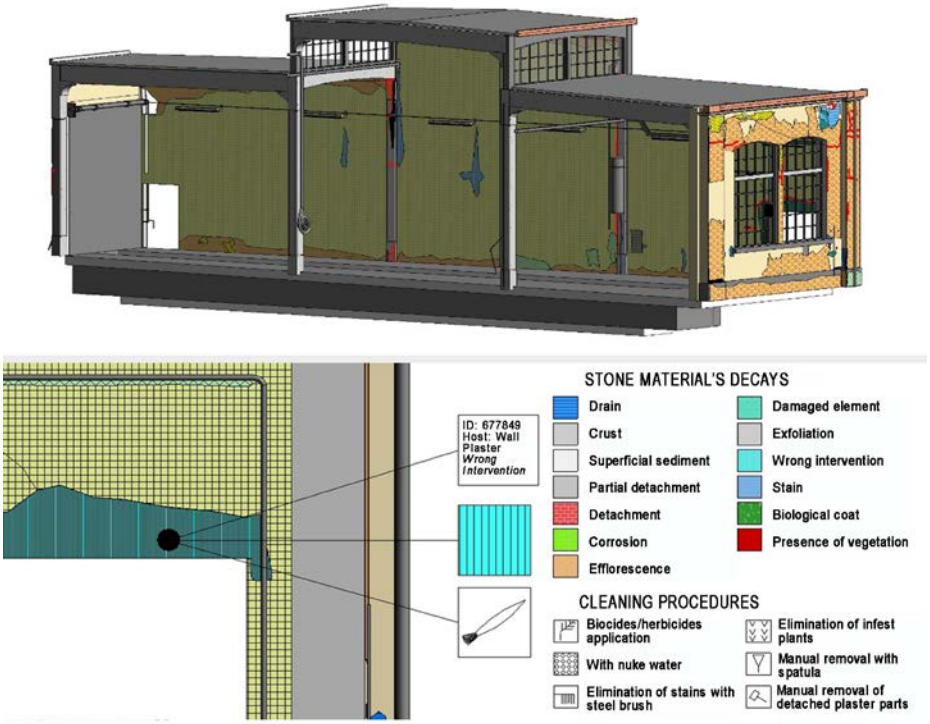

Fig. 3. On the top: isometric view of the modulus combined with the 3D representation of the decays. Below, sample labels applied to a 3D decay, with the corresponding legend.

Furthermore, has been considered the sharing of the data and the collaboration, laying the foundations for the development of a template and testing new ways for the public fruition of the model.

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