HBIM FOR SUSTAINABLE REUSE

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Abstract

Increasing the environmental sustainability of a historic building with limited possibilities of changing its appearance and without endangering its cultural value, is normally seen as an infeasible process. A non - profit organization in the environmental sustainability sector, Green Building Council (GBC) Italia, is actively dealing with this subject, publishing the protocol for obtaining the certification for the sustainable heritage renovation (GBC Historic Building Certification). The complex process of obtaining this Certification implies well defined and organized means. Building Information Modelling (BIM) offers a holistic approach for organizing and managing the large amount of data. It is recently being applied in the management of the historic assets as well, as the so – called Historical Building Information Modelling (HBIM). Thus, the feasibility of implementing HBIM in environmentally sustainable historic building restoration is researched within this dissertation. First, the current trends of using BIM in heritage renovation, as well as sustainable building design are reviewed. Then, the GBC Historic Building Certification rules and information requests were assessed in the context of BIM application. The assessment resulted in a holistic BIM workflow for the process of GBC Historic building Certification. It enabled further focus of its integration in the newly introduced thematic area of the green building certification – the Historic Value. Historic Value thematic area is the basis for the certification project development. It includes the identification of the buildings' cultural value and the general intervention possibilities, by collecting the relevant information and making the decisions based on the investigative analysis results. A BIM workflow for accomplishing its procedural requests has been proposed as a result. Detailed elaboration was made for the first prerequisite of this thematic area – Prerequisite 1: Preliminary analysis. The specific deliverable requested for its achievement, the "Historic Building Identity card" was explored in detail, by categorizing the requested information types and mapping them to BIM content. The final result is a proposal of a BIM framework for creating the deliverable documentation. It involves information management procedure for creating the documentation for the requested deliverable – "Historic Building identity card", with focus on interoperability and

data preservation. The outcome of its implementation is a BIM authoring tool file populated with the initial information on starting the project. Information is structured using the standard for open - data exchange (IFC). The framework is designed as a basic principle that can be followed for the further extension on the complete certification project. Framework demonstration was performed on a case study – a model of the section of Paço dos Duques in Guimaraes, Portugal.

Dissertation:
https://bimaplus.org/wp-content/uploads/2020/10/2020-JelenaZuric-Dissertation_compressed.pdf

Presentation video:
https://youtu.be/4KuGc_-FGA4

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