Moving toward an ‘intelligent’ shop modeling process

http://www.firstlight.cn 2008-06-30

This paper focuses on the value and challenges of implementing 3D modeling for trade shop drawings on a case study project, the new Dickinson School of Law (DSL) Building on The Pennsylvania State University campus. While planning for this project, the Construction Manager (CM) required 3D models and Building Information Models (BIM) from the specialty contractors along with the submittal of trade shop drawings. Several papers and articles have discussed the many benefits and challenges of implementing BIM for constructability and coordination. This paper specifically focuses on the 3D CAD models and the BIM assembled by the CM and all of the specialty contractors on the DSL project. The use of BIM was initiated by the CM on the project, not by the owner. The interest of the CM in the process and the value to the owner makes this a very transparent and well documented process. The process used by the CM to develop the specialty contractor packages, a breakdown of the 3D and BIM requirements by specialty contractor, the steps to begin coordination, and to carry out coordination as new trades are discussed. The evaluation of BIM usage for construction planning was determined at the end of the Schematic Design phase. The paper explores the complexities of evaluating the value of 3D or BIM for each trade, which trades were excluded from the requirement, which should submit BIM’s or 3D geometry, as well as the level of detail and embedded information required from each of the specialty contractors. Feedback from the owner, the CM, and the specialty contractors on the process and the challenges met to date are presented. A background of 3D model use on projects for Penn State, the owner, and their interest in expanding into BIM for future projects is also discussed. The use of 3D CAD and BIM shop models will serve as a first step toward having an As-Built BIM of the Dickinson School of Law (DSL). Having an example model to test and evaluate will enable Penn State’s Office of Physical Plant to establish the value of BIM in their project delivery process and facilities management as they develop future buildings.

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