

DECISION ANALYSIS USING VIRTUAL FIRST-RUN STUDY OF A VISCOUS DAMPING WALL SYSTEM

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ABSTRACT

Although Building Information Modeling (BIM) practices such as 3D modeling, 4D simulation, clash detection, model-based analysis, model-based scheduling and estimating have been widely utilized by the A/E/C industry, there is insufficient guidance on the application of BIM to assist the team in integrating product design and process design to meet target value in an Integrated Project Delivery (IPD) environment. This paper investigates the possibility of performing a virtual first-run study (VFRS) during a project's design phase. VFRS is a first-run study carried out in a virtual environment, where objects of study are created in a computer model in three dimensions, and those objects are linked to process and resource data to represent the process of construction.

The paper describes a case study of employing VFRS, process mapping, and Choosing By Advantages to choose a method for the installation of Viscous Damping Walls at the Cathedral Hill Hospital Project in San Francisco. The paper concludes by proposing an integrated framework for the efficient application of VFRS to support project teams on constructability review, construction planning, and operation design.

KEY WORDS

Virtual first-run study (vfrs), bim, work structuring, choosing by advantages.

INTRODUCTION

Researchers have analyzed the effectiveness of 4D models on different areas of design and construction. For example, Hartmann and Fischer (2007) evaluated the use of 4D models for constructability review. Kamat and Martinez (2001) and Li et al. (2008) evaluated the application of 4D models on planning construction operations. Akinci et al. (2002) studied the use of 4D models for planning work space and site logistics. However, with the integrated project delivery approach in a Lean Project Delivery System, the cross-functional project team needs a framework on how to structure coordination meetings that take full advantage of 4D simulation. The challenge is to incorporate innovative ideas generated from the meeting to both product design and

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