بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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MONA MAGHRABY

USING 5D MODELLING IN CONSTRUCTABILITY ASSESSMENT OF TRADITIONAL STRUCTURES

By

Mohamed Moataz El-Marashly

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
STRUCTURAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

USING 5D MODELLING IN CONSTRUCTABILITY ASSESSMENT OF TRADITIONAL STRUCTURES

Key Words:
Constructability; Assessment; BIM; SMART; AHP

Summary:
Constructability Assessment application is necessary in all construction projects because it reduces conflicts, increases productivity and most importantly saves time as well as cost; resulting in practical and financial benefits. Construction sector is crucial to driving growth in the domestic economy and it`s a key to government`s plan for successful reforms. Unfortunately, the construction industry is unpredictable and there are many factors that can impact the project delivery success if they were overlooked. Therefore, the owner/designer/contractor must make sure that the project is constructible in the best possible manner and it is preferable to involve all the project parties since the beginning in integrated project delivery (IPD) approach. This research proposes a constructability assessment tool using 5D Building Information Modelling (BIM) incorporating selected 23 constructability factors. The platform helps giving an alert during all the project phases about the areas of concern which should be strengthened to enhance the constructability score. Two decision making techniques were used in the research to determine the overall constructability score of the project within the provided evaluation scheme. Constructability factors weightages are calculated using Analytic Hierarchy Process (AHP) and the utility values are calculated using Simple Multi Attribute Rating Technique (SMART).

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Mohamed Moataz Abdelrheim El-Marashly Date:

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Nomenclature

BIM: Building Information Modelling
AHP: Analytic Hierarchy Process
SMART: Simple Multi Attribute Rating Technique
IPD: Integrated Project Delivery
BAC: Building and Construction Authority
BCA: Building and Control Act
BDAS: Building Design Appraisal System
CII: Construction Industry Institute
MEP: Mechanical, Electrical and Plumbing
HVAC: Heating, Ventilation and Air Conditioning