

Author's Accepted Manuscript

Structural Response of Modular Buildings – An Overview

Andrew W Lacey, Wensu Chen, Hong Hao, Kaiming Bi



PII: S2352-7102(17)30365-0
DOI: <https://doi.org/10.1016/j.job.2017.12.008>
Reference: JOBE380

To appear in: *Journal of Building Engineering*

Received date: 8 July 2017
Revised date: 7 December 2017
Accepted date: 7 December 2017

Cite this article as: Andrew W Lacey, Wensu Chen, Hong Hao and Kaiming Bi, Structural Response of Modular Buildings – An Overview, *Journal of Building Engineering*, <https://doi.org/10.1016/j.job.2017.12.008>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Structural Response of Modular Buildings – An Overview

Andrew W Lacey^a, Wensu Chen^a, Hong Hao^{a*}, and Kaiming Bi^a

^a*Centre for Infrastructure Monitoring and Protection, School of Civil and Mechanical Engineering, Curtin University, Kent Street, Bentley, WA 6102, Australia*

* hong.hao@curtin.edu.au

Prefabrication by off-site manufacturing leads to a reduced overall construction schedule, improved quality, and reduced resource wastage. Modular building is therefore increasingly popular and promoted. With the recent promotion a number of relevant studies have been completed, however, a review of the design, construction, and performance of modular buildings under different loading conditions is lacking. This paper presents a state-of-the-art review of modular building structures. First, structural forms and construction materials are presented as a brief introduction to the modular structures. Modular building is shown to refer not to a single structure type, but a variety of structural systems and materials. These modular structures might perform differently to similar traditional structures and the structural performance is highly dependent on inter- and intra-module connections. The structural response of modules to different hazards is then considered, followed by the current design practice and methodology. As a currently developing area there is great potential for innovation in modular structures and several key research areas are identified for further work.

Keywords: modular building, prefabrication, off-site fabrication, multi-hazard

1. Introduction

Modular building is a construction technique whereby building modules are prefabricated off-site. It is a type of off-site fabrication referring specifically to volumetric units which may be a structural element of a building [1-4]. Modular building refers to the application of a variety of structural systems and building materials, rather than a single type of structure. Prefabrication by off-site manufacturing leads to a reduced overall construction schedule, improved quality, and reduced resource wastage [5-7]. The disadvantages include the lack of design guidance and

Download English Version:

<https://daneshyari.com/en/article/6749953>

Download Persian Version:

<https://daneshyari.com/article/6749953>

[Daneshyari.com](https://daneshyari.com)