

Available online at www.sciencedirect.com

Frontiers of Architectural Research

www.elsevier.com/locate/foarSOUTHEAST
UNIVERSITY

RESEARCH ARTICLE

A study on the condition of temporary housing following disasters: Focus on container housing

Yan Hong*

School of Environment and Architecture, University of Shanghai for Science and Technology, Shanghai 200093, China

Received 15 November 2016; received in revised form 5 April 2017; accepted 18 April 2017

KEYWORDS

Temporary housing;
Disasters;
Case study;
Container housing;
Type analysis

Abstract

This study conducts an investigation on temporary housing in disaster areas and a survey on the condition of containers used as buildings. The construction of temporary housings in disaster areas using containers is proposed as an application solution. With its advantage of combination and splitting, the modularity of containers offers a wide range of implementation possibilities for container housing in disaster areas. Specific housing needs of various types of victims can be easily satisfied through the different organizations of various units.

© 2017 The Author. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Despite advanced technology, natural disasters remain an unavoidable hazard for humans. When earthquakes, tsunamis, and other natural disasters occur, collapsing housing in addition to casualties causes the most significant loss. In 2008, 3.47 million houses were destroyed during the Wenchuan earthquake in China. The loss of houses accounted for 27.4% of the total

property loss (Hong and Lee, 2009). Therefore, providing shelter for victims is an urgent and critical task.

Modular architecture is a method of construction in which interior materials, machinery, and electricity are first constructed based on cubic unit modules in the factory. These modules are then simply assembled for use and can easily be disassembled again. This type of architecture is increasingly being adopted in many areas, particularly in residential and commercial buildings, because of its rapidity and economic feasibility (Shim, 2015).

By analyzing cases of temporary housings, particularly on the application of container buildings, the current study

*Corresponding author.

E-mail address: yan7983@hotmail.com

Peer review under responsibility of Southeast University

<http://dx.doi.org/10.1016/j.foar.2017.04.005>

2095-2635/© 2017 The Author. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

explores the possible utilization of containers as temporary housings for victims of natural disasters.

As a modular architecture, container housing is intended to achieve the following effects through several research processes:

1. Temporary housing can be immediately provided to victims when disasters strike.
 - Stabilization of housing environment for disaster victims;
 - Efficient management of disaster-prone regions.
2. Assistance or rescue can be easily provided when disasters occur overseas.
 - Possibility of globalized rescue activities through the development of customized housing for each region;
 - Possibility of generating national profit through sales overseas.

2. Overview of disasters and temporary housing

2.1. Classification system for disasters

Emergency Events Database (EM-DAT) provided by the Center for Research on the Epidemiology of Disasters

(CRED), a non-profit institution, classifies disasters into several types (Table 1).

Most of the natural disasters directly cause problems of collapse of housing. Therefore, temporary shelters need to be provided to victims. Various countries employ different types of construction modes and materials for the construction of temporary housings. The adoption of these different construction modes and materials are bound to lead to different results in terms of construction duration and comfort as well as satisfaction of the victims.

2.2. Temporary housing types

The types of temporary housing vary from country to country according to various factors, such as the type of natural disasters, environmental conditions, and economic factors. Hong and Lee (2009) classified typical temporary housing types (Table 2).

Compared with steel frames and prefabricated houses, container houses have several advantages, such as assembling simplicity, a comparatively short construction period, and low costs (Lee, 2012).

The extensive application of containers as buildings provides not only temporary shelter for victims and refugees but also enables container recycling. Furthermore, the application of containers as buildings also overlaps with

Table 1 General classification of EM-DAT.

Disaster Group	Disaster Subgroup	Definition	Disaster Main Type
Natural	Geophysical	● A hazard originating from solid earth. This term is used interchangeably with the term “geological hazard”.	Earthquake, Mass movement, Volcanic activity
	Meteorological	● A hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.	Extreme temperature, Fog, Storm
	Hydrological	● A hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.	Flood, Landslide, Wave action
	Climatological	● A hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.	Drought, Glacial lake outburst, Wildfire
	Biological	● A hazard caused by the exposure to living organisms and their toxic substances (e.g., venom and mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, and mosquitoes that carry disease-causing agents, such as parasites, bacteria, or viruses (e.g., malaria).	Epidemic, Insect infestation, Animal accident
	Extraterrestrial	● A hazard caused by asteroids, meteoroids, and comets as they pass near earth, enter the Earth's atmosphere, and/or strike the Earth, and by changes in interplanetary conditions that affect the Earth's magnetosphere, ionosphere, and thermosphere.	Impact, Space weather
Technological	Industrial accident	-	Chemical spill, Collapse, explosion, Fire, Gas leak, Poisoning, Radiation
	Transport accident	-	Air, Road, Rail, Water
	Miscellaneous accident	-	Collapse, Explosion, Fire

Download English Version:

<https://daneshyari.com/en/article/6742499>

Download Persian Version:

<https://daneshyari.com/article/6742499>

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