

Sound Practice No. 2

Guidelines for earthquake resistant building design by Bangladesh Earthquake Society

Overview

Dhaka belongs to an active seismic zone. Despite this fact there has been little or no awareness about reducing the earthquake associated risks. Because of poor quality of construction and no quality control measures, most of the buildings in Dhaka city are thought to be vulnerable to seismic hazards. There are both non-engineered and engineered structures and in some places the density of structures and the density of people as well depict what would happen when even a moderate shaking takes place.

Much has been talked about and very less has been done so far regarding earthquake vulnerability reduction. This is partially because of lack of initiatives from the concerned organizations to develop any policy instruments.

Bangladesh Earthquake Society, considering the vulnerabilities of non-engineered and even engineered structures, has come forward to take the awareness raising campaigns into action. These two publications are expected to play significant roles in reducing seismic vulnerabilities of structures.

Significant Background information

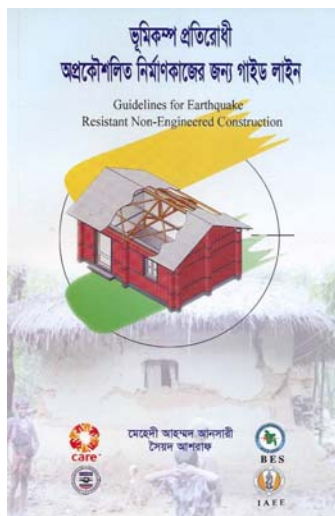
There has been an increasing concern about the seismic vulnerability of the built environment in the urban areas of Bangladesh, specially that in Dhaka City. Some incidents of recent building collapse in and around Dhaka City have provided impetus to such concern, especially about the low quality of building construction. Bangladesh Earthquake Society (BES), since its foundation, has been working on raising awareness among all groups of people and professionals involved with such concerns through organizing seminars, workshops and through publications regularly. “Guidelines for Earthquake Resistant Non-engineered Construction” and “Earthquake Resistant Design Manual” are two of their kinds that BES has brought out with a view to reducing seismic vulnerabilities of the built environment.

Sound Practice Details

Guidelines for Earthquake Resistant Non-engineered Construction

This is basically the Bengali version of the “Basic Concepts of Seismic Codes, Volume 1, Part 2 (1980)” published by International Association for Earthquake Engineering (IAEE). CARE-Bangladesh and USAID provided the financial support in publishing this guidebook in the year 2004.

Most of the household buildings in Bangladesh are still being constructed without consulting an engineer or an architect and thus leaving them greatly vulnerable to earthquakes. Even Dhaka, the capital city is largely occupied with non-engineered structures, which are thought to be causing huge human casualties once even a medium scale earthquake strikes the city.

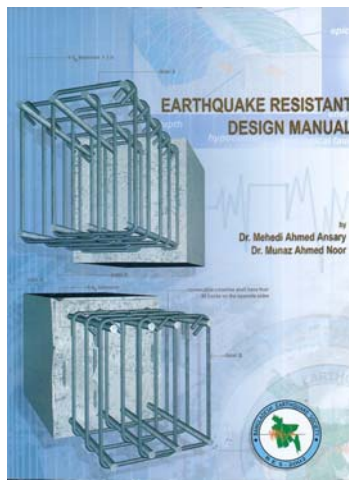


Since the practice of non-engineered construction can not be stopped all at once as it is the question of affordability of the people, and at the same time vulnerability reduction is a burning concern, this guidebook can be of great help. This book illustrates in very simple local language and with detailed sketches how bits of more effective and intelligent efforts could reduce the earthquake vulnerability of the buildings to a remarkable level. Beside tips on constructing less vulnerable new buildings, techniques on how the existing non-engineered structures can be strengthened through repair and restoration have been elaborated in this guidebook.

Earthquake Resistant Design Manual

This is a comprehensive bilingual (Bengali and English) publication targeted to fulfill the lack of awareness among engineers, architects and other professionals involved in the design and construction of buildings about the design and detailing principles to ensure that the building is safe against earthquakes. Bangladesh Earthquake Society with the financial assistance from the Canadian International Development Agency (CIDA) brought out this 185 page guidebook in the year 2006.

This guidebook is deemed to be useful in the sense that the engineered construction works that are being conducted do not always take into account the seismic vulnerabilities that they might be subjected to. This is because of the lack of awareness that an earthquake may take place anytime now. Even on the part of those who feel it necessary to construct earthquake resistant buildings may have felt the need of proper guidelines from the experts. In this respect, Earthquake Resistant Design Manual seems to be a very helpful tool for the professionals.



As a comprehensive tool Earthquake Resistant Design Manual covers almost all the technical aspects necessary for engineering constructions as well as retrofitting of existing weak structures. The whole guide book is divided into the following 6 chapters:

- Chapter 1: Earthquake (*introduction to earthquake and its properties*)
- Chapter 2: Behavior of low-rise buildings subjected to lateral loads
- Chapter 3: Seismic design loads
- Chapter 4: Detailing requirements
- Chapter 5: Quality control and quality assurance
- Chapter 6: Repair, restoration and strengthening of buildings

Relevance to Megacities

Universality/Transferability:

Both the guidebooks talk about measures considering the generic nature of structures. Hence the practice can be considered transferable to other Megacities.

Applicability:

This practice being technical in nature has no conflict with city governance.

Orientation/Focus

The focus of the practice is on reducing the seismic vulnerability of structures and thus it can play a significant role in reducing the overall risk of human casualties and property damage.

Impact/Effectiveness

The impact/effectiveness of these tools is yet to be measured since it has not been long since they got published. Yet considering the characteristics of Dhaka city and from the expert opinions it is expected that these tools, if properly followed, will positively contribute in the overall risk reduction process of the city.

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