

**DEVELOPMENT OF NATIONAL GUIDELINES FOR  
SEISMIC ANALYSIS AND DESIGN OF (ENGINEERED)  
BUILDINGS IN SRI LANKA**

Hiththara Gedara Shyamini Rasangika Kularathna

(128031D)



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University of Moratuwa

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# DEVELOPING NATIONAL GUIDELINES FOR SEISMIC ANALYSIS AND DESIGN OF (ENGINEERED) BUILDINGS IN SRI LANKA

## Abstract

Sri Lanka was believed to have no seismic threat compared to other natural disasters such as landslides, floods, droughts which often cause widespread devastations. However, it has now been realized that Sri Lanka can no longer be considered as isolated from seismic threat following recent past events occurred in and around island. Designers of structures in Sri Lanka often used to avoid seismic consideration in the design procedure essentially of buildings as Sri Lanka is located within the Indo-Australian plate and thus, the chances of inter-plate type earthquakes which take place at the plate boundaries causing significant damages are remote. However, it is possible to take place intra-plate type earthquakes at any place within the tectonic plate. A notable example of a damaging intra-plate earthquake is the devastating Gujarat Earthquake in 2001.

The only available document for the purpose of seismic design of buildings in Sri Lanka is “Earthquake resistant detailing for buildings in Sri Lanka” published by the Society of Structural Engineers, Sri Lanka. The present study is therefore aimed to provide advice on how all of these factors would affect the need for seismic design in Sri Lanka and provide guidance on suitable analysis and design procedures for buildings when the seismic consideration is explicitly warranted for a structure.

The proposed guidelines in this study are based on Euro Code 8 (EN 1998-1: 2004): “Design of Structures for Earthquake Resistance”. Euro Code 8 was selected for this purpose because it allows national choices in defining seismic characteristics such as peak ground accelerations, response spectra etc. in the seismic design procedure. It also allows national choices in selecting analysis and design procedures of buildings to resist seismic events. Therefore, this study mainly focuses on these national choices and suitable values are proposed and discussed depending on the available limited seismic data in Sri Lanka. Whenever there is no enough data, suitable approaches are given comparing similar seismic codes such as IS 1893-1: 2002 and AS 1170.4: 2007.

Finally, two case studies are carried out in order to present how the developed guidelines are used in the seismic design procedure of buildings specifically in Sri Lanka. The two buildings selected for this purpose represent buildings with high consequences of failure during an earthquake so that it clearly shows the significance of seismic consideration in the design procedure of buildings.

**Key words:** *intra-plate earthquake, seismic design guidelines, Sri Lankan National Annex to EC 8*

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