

**GUIDELINES AND STANDARD CHECKLIST TO
ASSESS THE EXISTING
NONSTRUCTURAL RISKS
IN
THE SCHOOL BUILDINGS**

Introduction

All buildings can be divided into two types of components: Non-Structural and Structural components: These guidelines identify potential earthquake hazard associated with non-structural components of each building school campus. The primary intent of this guide is to explain the sources of non-structural earthquake damage in simple terms and to provide information on effective methods of reducing the potential risks. The recommendation contained in this guideline are intended to reduce the potential hazard but can't completely eliminate them.

1.2 The guidelines are specially intended primarily for use by a lay audience: departmental heads of school, teachers, students, office managers, maintenance personnel etc.

1.3 The guidelines attempt to give a general overview of the subject, help in identifying potential hazard and presumes that the advice will be applied wisely and that expert assistance will be obtained where necessary.

1.4 In fact, much of the risk to non-structural components can be mitigated with relatively low cost and within the existing capacities of the school management.

2. **Defining Terminology:** The two terms commonly used in earthquake engineering are.

2.1 Non-Structural: The non-structural portions of a building include all parts of a building and its contents with the exception of its structural element. In other words, everything except the columns, floors, beams etc.

2.1(a) Structural: The structural portions of a building that is designed to carry the weight of the building, earthquake, wind and other forces of nature. These load bearing elements include: Load Bearing masonry walls, RC columns, beams, slabs and foundations etc. For engineered constructions the structure is typically designed and analysed in details by a structural engineer.

2.2 **Non-Structural elements**

(a) Architectural components – The non-structural building elements include: stone wall cladding, broken sun shade, spalling of cracked cement plaster etc.

(b) “Building contents” includes all of items that user bring into a building: desks, furniture, appliances, electronics, computers, equipments, coolers/air conditioners, inventory, files cabinets, water tanks, generators, acid items, stored inventories, library stocks, kitchen facilities, moveable wooden partition etc.

(c) Typically, non-structural items are not analyzed by engineers/ architects/ interior designers. Mostly they are purchased by the owner/user after the construction is finished without the involvement of any design professional.

(d) In general, non-structural components and building contents may become hazards when they slide, break, fall or tip over during earthquake.

(e) Securing the non-structural components and building contents improve safety and security of the school facility during an earthquake emergency by:

- i. Reducing the potential for injuries and fatalities
- ii. Helping to maintain safe and clear exit ways for evacuation and to access the building
- iii. Reducing the potential for chemical spills, fires and gas leaks
- iv. Protect school equipments and educational materials.
- v. Increase the community’s ability to keep the school open in case of disaster.
- vi. To provide facility to district administration.
- vii. Enable children to return to school and limit educational disruption.

2.3 Significance of Non-Structural Damage

The primary focus of this guideline is to help the students, teachers, building maintenance personnel, Principal etc to understand which non-structural items are most vulnerable in an earthquake and most likely to cause personal injury, costly property damage, or loss of function, if they are damaged.