

Understanding the Structural Audit Building

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ABSTRACT

This paper examines many aspects of structural auditing, including visual examination, non-destructive testing, core sample, and testing. It also emphasises various building repairs and retrofitting procedures that should be employed after a structural audit. As the structure matures, it need frequent maintenance and inspection in order to avoid further damage. The health and performance of a building are dependent on its maintenance quality. In order to protect the structure from environmental effects, it should be monitored on a regular basis by a professional. As a result, a structure audit is performed to assess the overall health of the building. A structure audit is a preliminary technical survey performed on a structure to recommend repair solutions.

Keywords: Au Structural Audit, Repairs

1 Introduction

In India, there are many ancient structures that have deteriorated in strength over time, posing serious risks to society and the lives of the residents and the surrounding population. Appropriate decisions should then be taken to extend the life of the building's structure and restore the desired function of the building. As a result, it is critical to demonstrate not only structural audits of existing buildings, but also to implement/maintenance/repair all civil work on a regular basis, which will enhance the life of the structural structure and the safety of the occupants. The outside and interior deterioration of a building structure is caused by low-quality materials and poor construction, as well as chemical attacks, environmental effect, and so on.

1.1 Need of structural audit of building

Every fifth year, all co-operative housing societies whose RCC buildings are more than 15 years old must have a required structural building audit performed to evaluate the existing life of the building's structure and its balanced life. According to Model Bylaw No. 77, structural auditing is a mandatory and legally obligatory obligation. It states that if a structure is 15 to 30 years old, a structural audit must be performed every 5 years, and every 3 years for buildings older than 30 years. If structural circumstances worsen, you can go for it even early.

- To preserve human lives and buildings;
- To understand the state of the building
- To identify important areas that must be repaired promptly.
- Adherence to legislative requirements
- To extend the life of a building by recommending preventative and corrective procedures such as repairs and retrofitting .



2 Methodology

Structural audit is carry out by 2 method:-

- Visual Inspection
- NDT testing (Field and lab testing)
- Visual Inspection

This approach involves personally inspecting the structural building to see if there are any cracks on the external and internal walls. Cracks in beams and columns, spalling of concrete, degradation of structure, building leaks if and gain in-depth information of foundation settlement, stratum settlement, soil settlement, and so on.

Visual inspection is required to recognise the types of structural defects, to identify any signs of material deterioration, to identify any signs of structural distress and deformation, to identify any alteration and addition to the structure, and to identify any misuse that may result in overloading.

Visual inspection scope The inspection report should include the following items, as well as pictures and drawings.

a) General building information

- Building name and address Number of storeys in each building block
- Residential, commercial, and institutional usages of a building are described.
- The building's maintenance history

b) Building Structural System

Mention the state of all building elements, such as beams, slabs, columns, balconies, canopy, false ceiling, chajja, parapet, and railings, in terms of deflection, cracks, leakages, and concrete spalling. Similarly, check the status of the water tank, staircase, elevator, and lift machine room.

c) Substructure: Column or foundation settlement, wall and floor settlement, Retaining wall deflection and cracks Soil carrying capacity can be determined via trial pits or by analysing nearby soil data.

Structure of the superstructure: Materials utilised and the structure's framing system, identification of important structural elements such as floating columns, transfer beams, thin members, corrosion of exposed steel, and so on

- Building additions or alterations
- Recognizing a change in occupancy
- Changes or additions to partition walls
- Changes or additions to loadings- stacking
- Toilets and water tanks may be modified or added.
- Changes to or additions to the balcony

c) Wetness and leaks

- Determine the presence of moisture in the walls.
- Determine the source of the leaks in the Terrace, toilets, and sinks.
- plumbing lines, drainage lines, and overhead power lines
- tanks.

Destructive and non-destructive testing Non-destructive testing must be used in addition to visual examination to determine the true strength and quality of a concrete construction. To assess the current strength and quality of concrete, a variety of non-destructive tests (NDT) for concrete members are available.

Some of these tests are extremely valuable in determining the extent of damage to RCC structures caused

by corrosion, chemical assault, fire, and other factors. These tests have been classified into four groups based on their intended function, as follows:

3 Audit Report

On the basis of the inspection, an Audit Report is created.

- Owner's name
- Address
- Contact number
- Year of construction

General Building Structural Audit Report Format Name of Structural Engineer for Audit

Table -1: General Observations

Sr. No.	Description	Remark
1	Type of bldg. structure	
2	Age of building	
3	No. of wing	
4	Mode of use	
5	No. of stories	
6	No. of flats	
7	Architectural plan available	

Table -2: Structural Observations

Sr. No.	Description	Component	Grade
1	Cracks in Structure	Beam	
		Column	
		Slab	
		Plaster	
		Wall	
2	Settlement below the ground and Above the	Foundation	
		Joint at plinth	
		Column	
		Wall	
3	Dampness in Structure	External wall	
		Toilet	
		Terrace	

4 Conclusions

Structural auditing is a very serious and important profession since it involves people's lives and socioeconomic issues. Any building should have a structural audit performed at least once every five years, and structures older than 30 years should have a structural audit performed every three years. The proper implementation of structural auditing reduces building degradation, resulting in long-term sustainability.

Periodic structural auditing and analysis for the health of existing buildings is critical for determining the current state of structures.

5 Acknowledgements

All acknowledgments (if any) should be included in a separate section before the references and may include list of peoples who contributed to the work in the manuscript but not listed in the author list, supporting grants, presentations, and so forth. The name of funding agencies should be written in full.

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