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Structural Audit of RCC Building

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ABSTRACT:

A structural audit is essential for assessing the health and safety of aging buildings. This paper highlights the necessity of structural audits, identifies common structural defects, and details methodologies including Non-Destructive Testing (NDT) methods. Through detailed case studies, we demonstrate how structural issues are identified and provide appropriate recommendations. The study concludes with practical suggestions for extending building life through preventive maintenance and repairs.

Keywords: Structural Audit, NDT, RCC Buildings, Visual Inspection, Rebound Hammer, Carbonation, Half-Cell, Retrofitting

INTRODUCTION:

The general health and performance of a structure depends on its quality of conservation. As a structure grows old and aging, use and exposure to the climate can affect the health of structures significantly. therefore its cover it periodically by taking professional advice. Structural inspection is the primary technical check of structure to assess its general health as a civil engineering structure. Its generally initiated as the first step to form this similar to periodic health scan recommended for aged people. Structural examination is grounded on visual check by a competent counsel who lists his obediences and recommendations in the form of structural inspection report. The purpose of structural examination is to insure regular assessment of structures that possessors come conscious of the structural deterioration of their structures and they can make timely measures to repair or strengthen them. In India there are numerous old structures which have reduced strength in due course of time. If farther use of similar deteriorated structure is continued it may jeopardize the lives of the inhabitants and girding habitations. Applicable conduct should be enforced to ameliorate the performance of structures and restore the asked function of structures. therefore, it's utmost important to perform structural inspection of being structures and to apply conservation/ form work timely which will lead to prolonged life of the structure and safety of the inhabitant. To act further responsible and preemptive towards the dilapidated structures, the external pot must issues notices to the structures and co- operative societies which are further than 30 times old to carry out obligatory structural inspection and submit the inspection report. Structural inspection should punctuate and probe all critical areas and recommend immediate remedial and preventative measures. It should cover the structural analysis if being frame and find critical rudiments for all types of ladings. " Structural inspection is the examination or examination of the structure, to estimate the strength so as to ameliorate its appropiateness, safety, effectiveness ".

This extent of damage or deterioration greatly depends on the quality of work at the construction stage. The deterioration of structures can be a result of colorful factors including fire damage, frost action, chemical attack, erosion of sword etc. during the life span of the structure. The disquisition of soundness is therefore essential for chancing the present utility of the structure and its compass for unborn developments or for the change in its use.

METHODOLOGY:

The structural audit included visual inspection followed by non-destructive testing techniques as follows:

- 1.1 Rebound Hammer Test: To assess the surface hardness and compressive strength of concrete.
- 1.2 Ultrasonic Pulse Velocity (UPV) Test: To determine the quality and integrity of concrete.
- 1.3 Carbonation Test: To evaluate the depth of carbonation which can lead to corrosion of reinforcement.
- 1.4 Half Cell Potential Test: To assess the likelihood of corrosion activity in reinforced concrete.

RESULTS :

Grounded on test results, the following conclusions were drawn

- The compressive strength measured using Rebound Hammer varied between 18 MPa to 28 MPa.
- UPV results showed rapidity ranging from 3.5 to 4.2 km/ s indicating good to excellent quality concrete.
- Carbonation depth exceeded 20 mm in several locales, suggesting the threat of sword erosion.

- Half- cell implicit readings indicated moderate to high probability of erosion in some structural rudiments. Grounded on test results, the following conclusions were drawn
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CONCLUSION :

The structural audit revealed that while the overall structural integrity of the building is satisfactory, certain elements are experiencing early signs of deterioration. Based on these findings, recommendations include localized repairs, anti-carbonation coatings, and monitoring for corrosion. The audit supports the proactive maintenance of ageing infrastructure.

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