

STRUCTURAL AUDIT REPORT

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Abstract - Structural audit is that the technical survey of the building so as to see its strength and stability. Structural audit is that the commencement in repairing procedure of the building. Structural audit is generally recommended for older buildings. Structural audit was initial introduced by Indian society of structural engineers. Structural audit helps in improving the safety, efficiency and gives idea about the strength of the structure by detailed technical inspection. In present study attempt have been made to carry out structural audit of the old RCC building by carrying out site inspection, performing NDT on the structure (if needed). After checking strength and stability by visual inspection of the structural members suitable recommendations are given in order to retrofit unsafe structural component. Finally structural audit report is ready for the building.

Keywords- Visual Inspection, Non Destructive Test, Suggestions/Conclusion on basis of Audit & Non Destructive Test Report, Structural Assessment Methodology.

I. INTRODUCTION

Structural audit is that the overall health and performance health check of the building like doctor check the patient. Structural audit helps to know the standing of the previous building. The Audit helps to spotlight & investigate all the chance areas, crucial areas and whether or not the building. Needs immediate attention. It cover the structural analysis of the existing frame and highlight the weak structural areas for static, wind & earthquake loads. If the bldg has modified the user, from residential to industrial or industrial, this could bring out the impact of such amendment.

Need For Structural Audit

Structural audit is carried out in order to

- To increase life of Building.
- To know the health of building and its Expected life.
- To check actual reliability of the structure.
- In order to recommend rehabilitation techniques.
- In order to highlight the critical areas and repair them immediately.

- For structural audit certificate required by municipality and other authorities.

Structural audit involves through examination of the building that involves.

Noting all visible defects, highlighting critical area of defects. Diagnosis of damage. Carrying out necessary Non Destructive Test, (if needed) suggesting measures.

Object of Audit

- Performing preliminary visual inspection of the building.
 - Visual inspection of all flats (internal) to highlight critical area.
 - Visual inspection of staircase, lobby, OHT to highlight critical area.
 - Performance of Non Destructive Test.
 - Finding actual strength of the building.
 - Preparing Audit Report including expert comments on condition of the building and board outline of scheme of repairs / restoration, If needed.
- Suggesting Methodology of Repair/Restoration.

II. PREAMBLE

Observation of distresses in the form of corrosion cracks on columns, beam, Slabs, concrete delamination due to corrosion, leakages/seepage from external side as well as internal side, cracks on plaster, etc. To know the present structural condition of the building & attend the distresses by repairing the same.

Structure

- The Building is Ground + 04 upper floors.
- The Building is RCC frame structure.
- The Building is more than 30 years old.
- The Building is Residential unit.

III. METHODOLOGY

Visual survey of the building was carried out externally & internally up to humanly possible heights to observe structural distresses such as bulging of columns, sagging of beams, deflection of slab, corrosion related distresses and seepage etc. and same were recorded in the form of the notes.

Internal Observation

In this building is thoroughly inspected external as well as internally. Each flat is thoroughly inspected internally, At the same time staircase, lobby, Terrace, OHT, UGT also inspected thoroughly, in terms of Structural distress, leakages.

Internal observation marks flatwise.

Staircase Observation

In this staircase inspected in terms of structural point of view.

Terrace Observation

In this Terrace condition check in terms of waterproofing and leakage.

Non Destructive Test:

- In this section test carried out –
- **Rebound Hammer test** to estimate likely compressive strength of cover concrete.
- **Ultrasonic Pulse Velocity Test** to determine the integrity of concrete.
- **Carbonation test** to assess loss of alkalinity of cover concrete, if any.
- **Resistivity Test** to assess likelihood of reinforcement corrosion.

IV. CONCLUSIONS & SUGGESTION ON BASIC OF STRUCTURAL AUDIT:

1. The corrosion (structural) cracks are observed at some places at columns & beams, chajja. At some location cracks are too wider and may tend to be of serious concern. This needs attention at the earliest & is strongly recommended to undertake major repairs of the building, so that the building will continue to remain safe & stable for occupation.
2. All the corrosion distresses shall be attended by using the application of **Polymer**

ModifiedMortar.

3. At some locations columns & beams, slab, chajja are in severely distressed condition due to extensive corrosion of reinforcement steel, Rebar exposed and may demand structural strengthening by using **Micro-concrete / Polymer Mortar treatment**.
4. Leakages & seepage help in enhancing the rate of corrosion of reinforcement. It is required that these shall be arrested on priority to avoid further damage to the structural elements.
5. Leakage through external wall are observed at some locations, it is recommended that, Patch Plastering /repairing work/ Re-plastering work to be done for building with using waterproofing compound.
6. At some locations plumbing lines are damage / leaked & are causes of dampness / leakages at external as well as internal wall, it is recommended that need to be replace plumbing lines.
7. Once the structural repair work is finished, external plaster to be tapped using light weight hammer & the de bonded plaster to be removed & new plaster to be done in patchwork. Also the bond coat to be applied between the joint of old & new plaster.
8. External plaster seems massive seepages /dampness at some location, so it is recommended to be done new plaster with using waterproofing compound.
9. Finally, the external surface shall be painted with superior quality paint which can protect the building from rain water ingress & carbonation effect for long time.
10. It is strongly recommended that, remove all damped load from Terrace.
11. It is strongly recommended that to undertake major repair of chajja, as it is in bad condition.
12. It is strongly recommended that, remove all common passage window grill immediately, as grill in bad condition.

V. LIMITATIONS

The report is based upon the visual observations carried out upto humanly possible heights.

VI. IMPORTANT NOTES

- The observation & findings presented in this report are applicable to the date of visual survey.
- It needs to be noted that our scope of work ends after submission of this audit report. We do not undertake any responsibility for any involvement in any type of litigation / legal matters arising out of these remarks of this structural audit.

VII. REFERENCE

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