Structural Audit-A Case Study of Residential Building Along Western Suburbs

INTRODUCTION

Structural audit is the overall health and performance checkup of the building like doctor check the patient. Structural audit helps to understand the status of the old building. The Audit helps to highlight & investigate all the risk areas, critical areas and whether 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 changed the user, from residential to commercial or industrial, this should bring out the impact of such a change

NEED FOR STRUCTURAL AUDIT

- To increase life of property
- 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.

OBJECTIVE OF THE STUDY

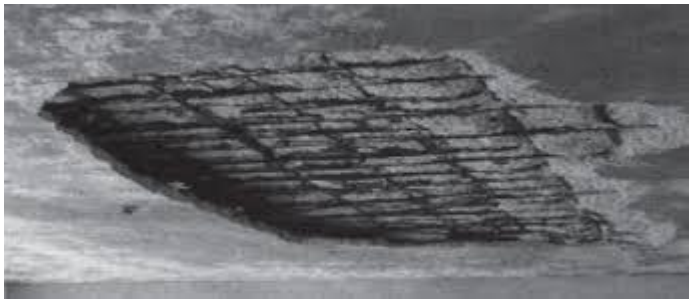
- Performing preliminary inspection of the building.
- Preparation of architectural, structural plan of the building.
- Visual inspection to highlight critical area.
- Performance of NDT tests.
- ETABS modeling of the building.
- Finding actual strength of the building.
- Suggesting remedial measures

CASE STUDY

It was designated as Bldg. No. 1 for study purpose. It is Fern Mansion opposite St Andrew Church hill road ,Bandra west. Grade of concrete used was M25. It is G+1 storeyed building. The Owners have observed corrosion related cracks on slab bottom; beams and columns hence they wanted to know the strength & quality of the concrete. Hence they appointed M/s. SIMCON CONSULTANTS PVT.LTD. For assessing the strength & integrity of concrete elements of this building by carrying out non-destructive testing

METHODS OF AUDITING

1. VISUAL INSPECTION



Need of visual inspection

- to recognize 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 in the structure, misuse which may result in overloading

2. NON DESTRUCTIVE TESTIING

- Rebound hammer test
- Carbonation test
- Halfcell potentiometer
- Ultrasonic pulse velocity test
- Core sampling test

RECOMMENDATION

REPAIRS IN MASONRY WORK

- Improper jointing work
- Remove all loose and weak masonry work which visible.
- Create proper voids in adjacent wall for locking purpose
- Take care to minimize damages to already completed masonry

- Execute repairing work carefully. If required re-do the affected portion also observe curing on all repaired work

REPAIRS IN WATERPROOFING

- Repairs in water proofing should be done by the approved agencies only External and internal ghabadi finishing after fixing therainwater pipe, should be done by the waterproofing contractor carefully with waterproofing chemical.
- If the water-proofing agency has done excess waterproofing treatment on walls of WC get rectified by the same agency, before fixing glaze tiles
- Ensure necessary precautions for the required water tightness
- All repair works should be properly cured

CONCLUSION

- According to the Visual inspection and NDT tests it is concluded that repairs are required to the buildings
- During performing NDT testings it is observed that various columns and beams whose quality and strength is doubtful for such beams and columns it is concluded that Jacketing should be done
- . According to core test, subject concrete should be classified as of M-25 grade for first level slab & of M-30 grade for first second level slab as per acceptance criteria for concrete
- According to results of carbonation test the line with the inferior quality of concrete, indicates high probability of corrosion in near future as the entire cover concrete is expected to be affected by carbonation
- As per specifications proper repairs and retrofitting should be done, to maintain building in good condition.