



INDIAN SOCIETY
OF
STRUCTURAL ENGINEERS

office copy.

ISSE

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Date: 23/03/09.

To,
The Chief Engineer (D.P.),
MCGM. Head Office,
Mahapalika Marg, Mumbai 400 001.

Sub: Structural Audit Format.
Ref: Our discussion in City Engineer's office on 12/03/09.

Respected Sir,

This has reference to the discussions undersigned had with Shri Kalesaheb in his office on 12/03/09. During the discussion he suggested to submit the Structural Audit format to you for perusal and approval.

With that reference enclosed herewith a format for structural audit. We feel that it is more appropriate to term it as "condition survey report" rather than Structural Audit.

We request you to kindly formulate the norms as suggested above for the sake of clarity.

If you suggest we can have a joint meeting with ISSE either in your office or some other venue before finalizing the same.

Thanking you.

For Indian Society of Structural Engineers

mmandgaonkar

(Mrs. Nandgaonkar M.M.)
Advisory Trustee & treasurer

c. c. to

City Engineer, MCGM.
Head Office, Annex Bldg, 5TH Floor,
Mahapalika Marg, Mumbai 400 001.

Structural Audit of the Buildings

The general health and performance of a building depends on its quality of maintenance. As a building grows old, ageing, use (or misuse) and exposure to the environment can affect the health of the building significantly. Therefore, it is advisable to monitor it periodically by taking a professional opinion. Structural Audit is a preliminary technical survey of a building to assess its general health as a civil engineering structure. It is usually initiated as the first step for repair. This is similar to the periodic health checkup recommended for older people.

General Guidelines for the Structural Audit

Indian Society of Structural Engineers (ISSE) has evolved the General Guidelines for Structural Audit Report as given below, which will give the purpose for which the audit is to be conducted. It is more appropriate to term it as “condition survey report” rather than Structural Audit.

Details of Structure

1.	Date of Inspection	:	
2.	Date of previous inspection report		
3.	Name of Building		
4.	Year of construction of building		
5.	Drawings available Copy of structural drawing / Architectural is available / not available	:	
6.	Mode of use Office / Residential / commercial.		
7.	Type of structure RCC framed / Steel frame / load bearing masonry	:	

8.	No. of floors for building / Wings / Flats	:	
9.	No. Of lifts	:	
10.	Type of underground, overhead water tanks.	:	
11.	Last repairs and painting done.		Structural repair: Terrace water proofing External plaster Plumbing and drainage Pavement around bldg.
12.	Any immediate repairs required.		No / Yes (As mentioned)
13.	Present condition of the building.		Satisfactory Not Satisfactory – Minor damage / Major Damage / Severe damage Dilapidated / Unsafe

Areas to be assessed during the visual inspection of the building: -

Photograph of damaged area and marking on the plan is preferable and can be attached with the report. (Feed back forms from occupants are desirable.)

1. The structural layout of the building.
2. Exterior condition of the building
 - External walls / facades at various locations.
 - Columns / beams / slabs.
 - External plumbing / pipelines.
 - Over-head water-tanks.

- Terrace / parapet walls / coping.
- Chajjas.
- 3. Condition of Common Areas:
 - Staircases / lift wells / common passages
- 4. Interior condition of the building / flats
 - Additional and alteration to the original plan
 - Columns / beams / slabs.
 - Toilet leakages / the loft slabs.
 - Leakage at the sunken portion in kitchen.
 - Window frames.
 - Seepage from flooring and the dampness on the walls (for ground floor)
 - Separation cracks between wall and beam & column
 - Flooring.

The Structural Audit Report should indicate all the above observations, conclusions & general remedial measures to be taken for safety of the building.

However, the limitations of the Report include:

- i) The report is based on visual inspection of the accessible area and the data provided by the client only. The aim is to have a preliminary health check-up of a building. This report should not be treated stability certificate for the building.
- ii) In absence of design data & as built RCC detailed drawings, the resistance of the structure for earthquake forces / wind forces cannot be assessed.
- iii) It may not be possible to identify the distresses in the structure below ground level. Detailed investigations if needed are to be carried out separately.
- iv) After visual inspection if it is found, that non-destructive tests are necessary, these tests should be carried out separately.

- 7
- v) If any repairs are desirable, further detailed investigation may be separately carried out to determine the method of rehabilitation and its cost estimate.
 - vi) Area covered by false ceiling and behind the furniture like cupboards, showcases even laminations can not be inspected and we can not comment on those hidden areas.
 - vii) Sometimes engineers are not allowed to enter and inspect the flat or if at all they are allowed the occupant tries to avoid showing the flat areas by telling him that he does not have any problem.

Civil / structural engineers registered on the panel of structural engineers of Municipal Corporations will conduct this 'Structural Audit' in case of the structures, which are in the limits of Municipal Corporations.

In case of the other structures, such Structural Audit shall be carried out by the Members of IEI / ISSE having 10 years professional experience.

The responsibility of a structural engineer is to submit a report to the society, covering the points mentioned in the format. The responsibility of taking any further actions based on the report rests entirely with the managing committee of the society.

General guidelines as preventive maintenance while carrying out any alterations in the flat: -

- a. It is advisable to carry out all the interior decoration through the qualified architect/interior designer with knowledge about structures, plumbing & electrical. The interior designer should submit the actual working drawings to the society with proper certification by structural engineer who is holding a registration of Mumbai Municipal Corporation.
- b. No structural member i.e. beams/columns/slabs should be tampered during interior changes under any circumstances.

- 7
- c. Any cracks, leakages should be rectified immediately in consultation with a structural engineer.
 - d. Do not raise the floor level for any aesthetic reason if it adds considerable dead load to the slab.
 - e. No lofts should be constructed adding the load to the existing beams and columns.
 - f. Water supply lines and drainage lines should not be changed in haphazard manner.
 - g. Change in position and lines for wet areas must be avoided. Addition of wet areas should be done with proper care and without adding extra load to the floor.
 - h. If a new partition wall is to be added it must be of lighter material like lightweight blocks and not with the solid bricks and the work should be carried out in consultation with structural engineer.
 - i. All the pipelines, electrical cables and gas lines are to be checked regularly and should not be concealed by damaging the structural members like columns, beams and slabs.

External painting: -

External painting should be done periodically every 4-5 years with patch repairs if needed is a good maintenance practice.