



CAUSES OF DETERIORATION OF BUILDINGS

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ABSTRACT

Any building component will develop damages whenever the stresses in the components exceeds its strength. The stresses are produced due to many factors like loading on the structure, foundation settlement, chemical action etc. Due to the distress in buildings usually on the form of cracks, a building's strength may get deteriorated and finally the whole building can fail or get damaged. So it is important to know the reasons for distress in buildings and steps must be taken to rectify them to avoid further damage. Deterioration in buildings can be caused due to several factors like structural reasons and those due to environmental agents like water, moisture, air etc. Deterioration of buildings can either be a very slow and gradual process or it can be sudden depending on the factors which cause damage. Any material which is not attended properly is bound to deteriorate. In case of a building, nonmaintenance will lead to deterioration and result in serious damage. The durability of structures can be prolonged by proper maintenance and by proper use of materials of construction and good construction practices.

CAUSES OF DISTRESS

The various factors of distress can be broadly classified into

(a) Structural (b) Nonstructural

Structural distress are those which are due to several factors like incorrect methods of construction, overloading of structures .



Nonstructural distress are those due to internally induced stresses in building materials. This type of distress may not directly result in weakening of the structure but may lead to cracks through which moisture may penetrate and may lead to corrosion in reinforcement and thus render the structure unsafe. Nonstructural damages may not directly affect the safety of the building but may provide an impression of faulty work or a feeling of instability.

The cracks developed may range from very fine cracks to very wide cracks depending upon the width of the cracks developed. Cracks may be only superficial or they may extend to more than one layer of materials. Thin cracks are less damaging to the structure compared to a fewer number of wider cracks. The three basic symptoms of distress in concrete are cracking, spalling and disintegration.

CAUSES OF DISTRESS DUE TO OVERLOADING

Following are types of distress produced due to overloading:

- Excessive cracking due to flexure
- Shear and diagonal tension cracking
- Compression failure
- Spalling of concrete surface due excess compression and bulging
- Settlement of foundation
- Cracking in slabs

OTHER COMMON TYPES OF DISTRESS IN CONCRETE MEMBERS

In addition to the distresses caused due to overloading, following types of distress are also noted in the buildings:

- Corrosion of reinforcement



- Alkali and sulphate attack
- Displacement of the entire system
- Deformation of components
- Malfunctioning of expansion joints
- Dampness
- Efflorescence
- Stains
- Recurrent surface dampness
- Separation cracks at junctions of R.C elements and brick wall

DEFECTS IN STEEL STRUCTURES

Steel structures may be subjected to the following type of failures

- Rusting
- Excessive deflection
- Buckling and bending
- Twisting
- Lateral bending

DISTRESS IN STRUCTURES CAUSED DURING CONSTRUCTION

This type of distress may be attributed to

- local settlement of subgrade
- movement of formwork
- vibrations



- premature removal of form works
- temperature stresses due to difference in temperature between the inside of building and its environment
- absorption of moisture by concrete
- aggressive action of chemicals etc
- poor design details

This type of damages can cause the following;

- (1) Leakage through joints
- (2) Inadequate drainage
- (3) Inefficient drainage slopes
- (4) Excessive shear stresses in columns, piers etc
- (5) Incompatibility of materials of sections

CONCLUSION

There are a lot of causes which cause the damage of structures. Sufficient care should be taken during every stage of construction and also the maintenance of the structures is also important to protect the structures from such damages

Also is important the correct use of materials and amount of sufficient curing etc. to prolong the life of the structure.