

## **INSPECTION, MAINTENANCE AND REPAIR OF STRUCTURES**

### **INTRODUCTION**

A building no matter what its function is or how it was designed or built is expected to serve for a long time, typically 50 to 100 years and sometimes even more.

Every building passes through four phases namely;

1. Planning and design.
2. Construction, which is considered the most critical in a building's life.
3. Service, where the building performs the function which was intended for it.
4. End of life, which could be due to severe deterioration or because the purpose for which the building was built is no longer required.

The first two phases greatly affect the life of a building. Bad decisions in these stages affect the function of a building and could lead to an end of its life earlier than planned.

### **MAINTENANCE**

#### **What is maintenance**

Maintenance is the combination of all technical and associated administrative actions intended to retain an item in, or restore it to a, state where it can perform its required function.

Maintenance is a set of organised activities that are carried out in order to keep an item in its best operational condition with minimum cost acquired.

Activities of maintenance function could be either repair or replacement activities, which are necessary for an item to reach its acceptable productivity condition and these activities, should be carried out with a minimum possible cost.

#### **What are the types of maintenance**

1. Preventative maintenance.  
Maintenance carried out at predetermined intervals or according to predetermined criteria and intended to reduce the probability of failure and the degradation in the building and prevent minor problems from developing into major defects.
2. Corrective maintenance.  
Maintenance carried out after the occurrence of a problem or deterioration and intended to put an item into a state in which it can perform a required function.

#### **Another classification of maintenance**

1. Day to day maintenance  
maintenance activities that are carried out daily like cleaning, changing light bulbs, etc.

2. Periodical maintenance  
Maintenance that is planned and is carried out periodically according to a set schedule like servicing electrical and mechanical equipment, repainting, rust removal and reapplying primers to steel members, changing doors and windows, replacement of plumbing fixtures or pipes, etc.
3. Upgrades  
Activities that are done to add or replace some components of the building in order to enhance its performance.
4. Repair  
Activities needed to eliminate or fix a problem, repairs could be;
  - Minor
  - Major
    - Local (affecting part of the structure)
    - Global (affecting the entire structure)

**Importance of maintenance:**

1. Preserves the value of a building.
2. Prolongs the life of a building.
3. Minimizes the need for major repairs.

**Factors affecting maintenance**

1. Aging of structure  
As a structure ages it requires more maintenance.
2. Level of awareness.  
As the level of awareness increases so does the level of maintenance.
3. Shape and location of structure  
Structures with regular shape are easier to maintain than structures with irregular shape like inclined facades, arches and domes. Additionally structures located in or near aggressive environments like buildings located near the sea will require more maintenance.
4. The development of society  
Developing societies tend to focus on constructing new infrastructure, while developed societies focus on maintaining their current infrastructure.
5. Laws and regulations  
The presence of laws organizing maintenance activities and assigning liabilities increases the demand for maintenance.
6. Development of new technology  
Development of new technology facilitate the maintenance and inspection activities leading to increased maintenance. New technology also provides the need for building upgrades.

**Role of different stake holders in maintenance activities**

1. Designer

- a. Minimizes need for maintenance.
- b. Makes maintenance easy and accessible.
- 2. Owner
  - a. Gives a priority to maintenance
  - b. Allocates sufficient budget for inspection and maintenance activities.
- 3. Manager
  - a. Makes and executes an appropriate schedule for inspection and maintenance activities.
  - b. Promptly fixes any problem as they occur.
- 4. Occupant
  - a. Reports any problems.
  - b. Cooperates in maintenance activities.