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INTRODUCTION

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- ❑ All elements of buildings deteriorate at a greater or lesser rate dependent generally on:
 - ✓ Material and methods of construction
 - ✓ Environmental conditions, and
 - ✓ The use of the buildings
- ❑ Property owners normally make an effort to keep maintenance expenditure to a minimum, ignoring or misunderstanding the adverse long term effect of such decisions.

INTRODUCTION

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- ❑ The objectives of building construction are mainly concerned with the:
 - ✓ **Stability** of buildings,
 - ✓ The **weather tightness**,
 - ✓ **Internal comfort** level,
 - ✓ The optimum **use of the building** and
 - ✓ Its **longer serviceable life**.
- ❑ In order to achieve these objectives, it is necessary to **carry out periodic and planned maintenance**, at regular intervals.

DEFINITION OF MAINTENANCE

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- ❑ The term maintenance comes from the French verb “maintenir”, which connotes to hold.
- ❑ In general, Maintenance means to **hold, keep, sustain** or **preserve** the building or structure to an **acceptable standard of serviceability**.
- ❑ Building maintenance is therefore the act of maintaining the building in its serviceable condition.
- ❑ Another definition “Maintenance is synonymous with **controlling** the condition of the building.

OBJECTIVES OF MAINTENANCE

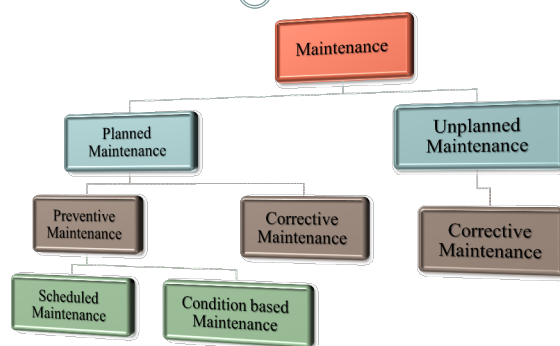
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The main objectives of maintenance are:

- **To preserve** buildings and its services in good serviceable condition
- **To restore** buildings and its services in its original standard, when deterioration occurs due to any reason.
- **To make improvements** in serviceability whenever required.
- **To sustain** the utility value
- **To prevent** and **slow down** the rate of deteriorations of structures
- **To enhance** serviceability of the structures.

TYPES OF MAINTENANCE

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TYPES OF MAINTENANCE

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- ❑ **Planned Maintenance:** “The maintenance organized and carried out with forethought, control and the use of records to a predetermined plan.”
- ❑ **Unplanned Maintenance:** “The maintenance carried out to no predetermined plan.”
- ❑ **Preventive Maintenance:** “The maintenance carried at pre-determined intervals or corresponding to prescribed criteria and intended to reduce the probability of failure or the performance degradation of an item.”

TYPES OF MAINTENANCE

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Condition-based maintenance: “The preventive maintenance initiated as a result of knowledge of the condition of an item from routine or continuous monitoring.”

Scheduled maintenance: “The preventive maintenance carried out to a predetermined interval of time, number of operations etc.

❑ **Corrective Maintenance:** “The maintenance carried out after a failure has occurred and intended to restore an item to a state in which it can perform its required function.”

In general maintenance classification could be as:

1. Major repair or restoration
2. Periodic maintenance
3. Routine or day-to-day maintenance

PRINCIPAL CRITERIA'S INFLUENCING THE DECISION TO CARRY OUT MAINTENANCE

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❑ There are various factors which influence the decision to carry out preventive or corrective maintenance.

❑ Therefore, it is necessary to consider these factors for effective maintenance of building structures :

- i. Costs
- ii. Age of property
- iii. Availability of Physical resources
- iv. Urgency
- v. Future use
- vi. Social considerations

ASSESSING MAINTENANCE PRIORITIES

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❑ There are some formulated **maintenance priority guidelines** to be used for financial stringency on how monies are to be spent. Typical is the following approaches, adopted by different country codes:

- i. Work required for **health and safety**, such as emergency exits and fire precautions
- ii. Work required to **preserve the structure**, such as essential roof repairs and external paintings.
- iii. Work required for **occupational efficiency**, such as increased lighting.
- iv. **Amenity work**, mainly internal, such as interior decorations.

MAINTENANCE MANAGEMENT

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❑ **Maintenance management** is considered as an act of **dealing, planning, controlling, directing** and **guiding** maintenance team for keeping the production process components in good working condition.

❑ Maintenance management involves the following basic functions:

- a) **Planning** and **designing** of maintenance system
- b) **Coordinating, communicating** and **controlling** of maintenance jobs
- c) **Motivating, directing** and **guiding** maintenance team

MAINTENANCE MANAGEMENT

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Planning and designing of maintenance system

This would include organizing the maintenance department by ensuring availability of all the ***maintenance process components*** (men, machines, materials, and work instruction) of adequate quality and quantity at the required time.

Coordinating, communicating and controlling of maintenance

Controlling is a continuous process of ***inspection, measuring, and comparing*** with the planned targets and standards.

Motivating, directing and guiding maintenance team

This is an important management function of maintenance team leader to inspire ***loyalty, effectiveness, quality, efficiency, pride and sense of commitment*** to the goals of organization.

NATURE OF MAINTENANCE

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Main components of maintenance are:

- I. Servicing*
- II. Rectification*
- III. Replacement*
- IV. Renovation*

Servicing:

- ☐ A cleaning operation undertaken at regular intervals of varying frequency and is sometimes termed day to day maintenance.
- ☐ Typical frequencies could be:
 - Floor swept daily and polished weekly
 - Windows washed monthly
 - Painting for decoration and protection every 1-5 years.

NATURE OF MAINTENANCE

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Rectification:

- ☐ Objective of rectification is to ensure that components and materials are suitable for their purpose and are correctly installed.
- ☐ Occurs early in the life of the building and arises from:
 - Default in design,
 - Inherent faults or unsuitability of components,
 - Damage of goods in transit or installation and
 - Incorrect assembly.

NATURE OF MAINTENANCE

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Replacement:

- ☐ Replacement is inevitable because service conditions cause materials to decay at different rates.
- ☐ Most replacement work is carried out not so much from Physical breakdown of the materials or element as from deterioration of appearance.
- ☐ Replacement can be reduced by the use of better quality of materials and components.

Renovation:

- ☐ It consists of work done to restore a structure, service and equipment by a major overhaul to the original design and specification, or to improve on the original design.