# Repair And Rehabilitation of Historical Buildings

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***Abstract*—Buildings and other structures have a certain useful life, which depends on the specifications adopted. This document is about the repairing work and rehabilitation techniques of the historical buildings around the world. The topic covers all those techniques used for rehabilitating the structures.**

## I.INTRODUCTION

The need to improve the ability of an existing building to withstand from weathering action, chemical attack, embedded metals, alkali-aggregate reactivity, fire, due to overload, seismic forces, etc. arises usually from the evidence of damage and poor behavior. The old buildings in which ancient temples, monuments, heritage buildings and some residential buildings are included and need some maintenance of repair due to which the regain of strength, durability and stability of those buildings should be done. Hence the need for the rehabilitation of buildings is necessary. Hence, here some specifications are discussed about repair and rehabilitation of residential buildings.

## II.REPAIR AND REHABILITATION

**A.** *Repair:*
The purpose of repair of historical buildings is to retain the architectural shape of the building. The structural strength of the building can also bet retained for several years. The objective of any repair should be to produce rehabilitation – which means a repair carried out relatively low cost, with a limited and predictable degree of change with time and without premature deterioration and/or distress throughout its intended life and purpose.

**B.** *Rehabilitation:*
Structural rehabilitation involves the upgrading or changing of a building's foundation in support of changes in the building's owners, its use, design goals or regulatory requirements. In every case it is determined that it is cheaper to rehabilitate the structure and make the building improvements instead of demolishing and constructing a new building in the allotted space.

## III.CAUSES OF DETERIORATION

It is within the lifetime of more senior engineers that concrete has become a prominent material and for many uses the principal material, in civil engineering construction. When properly made and used, it has proven itself able to withstand a large variety of conditions of service and to be adaptable to most diverse requirements.

**C.** *Deterioration due to environmental effect:*
The main weathering processes are due to the combined action of rainwater and atmospheric pollutants (particularly the carbonaceous particles due to combustion) deposited on the surface of the monument. The way in which the surface is wetted is very important: in fact, as hart drizzle can activate the dry deposit without washing it away, and i n this case the pH of rain droplets is of secondary importance; on the other hand, showers supply abundant water which favors dissolution of the stone and removal of the solute, resulting in thinning of the original rock. Another important factor is the dynamic regime (i. e. laminar or turbulent) of the water flowing over the surface of the monument.

**D.** *New functional or loading equipments:*
The widely used techniques and functional equipment used in rehabilitation of buildings are,

- **Epoxy injection**: Epoxy injection is an economical method of repairing non-moving cracks in concrete walls, slabs, columns and piers as it is capable of restoring the concrete to its pre-cracked strength.

- **Routing and sealing:** This method, the crack is made wider at the surface with a saw or grinder, and then the groove is filled with a flexible sealant.

- **Stitching:** This method is done to provide a permanent structural repairs solution for masonry repairs and cracked wall reinforcement.

- **Drilling and Plugging:** This technique is only applicable when cracks run in reasonable straight lines and are accessible
at one end. This method is mostly used to repair vertical cracks in retaining walls.

- **Gravity filling:** Low viscosity monomers and resins can be used to seal cracks with surface widths of 0.001 to 0.08 in. by gravity filling. High molecular weight methacrylates, urethanes, and some low viscosity epoxies have been used successfully.

## IV.ROOF LEKAGES

Water leaks are exceedingly detrimental to the health of high rise buildings. Water could enter the building envelope through different paths – from damp construction materials during the construction stage, through leaking roofs, basements, water features, wet areas and leaking water installations. Concrete being a permeable material, leaking water will find its way in and spread easily. If the source of the water leakage is left unattended, it can cause significant structural damage that often needs very expensive rectification to structural elements.

Recent reports and studies worldwide identified water leaks as the most common defect in buildings. Water leak is the major cause of early onset of corrosion and concrete deterioration. Initiation of corrosion and depassivation of reinforcement is only possible in the presence of water, oxygen and corrosive agents such as chlorides and carbon dioxide. Leaking water in reinforced concrete acts as a perfect electrolyte that is one of the basic elements for corrosion to occur. The role of leaking water and air borne salts in inducing concrete corrosion is well documented. Water leakages in buildings result mainly due to inadequate construction design, inferior materials, poor workmanship and deterioration of building materials.

**E.** *Replacement of damaged roofs:*

**F.** *Refill of sealent:*

**G.** *Lead flashing:*

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