

Modern Engineering Approach Measures to Dilapidation of Buildings and their Remedies

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Abstract

Buildings are usually constructed with certain purpose and with an estimated life span, both physically and economically. The physical and economical aspect must not be the same, because a building may be physically sound, but it's economic life must have expired. It may also be true that a building must has been rendered physically unfit for use, but it's economic life may not have expired. This paper examined the modern approach to dilapidation of buildings and their proper remedies.

Keywords: modern approach, dilapidation, buildings, remedies

INTRODUCTION

Dilapidation is the term usually used to describe or denote the decay of a building or damage or waste, or state and condition of the premises of buildings. It can also be said to be the environment in which the building is situated or located, in which the building becomes unfit for use by the occupants. Dilapidation also mean decay, or waste state of disrepair caused in buildings due to the continuous neglect in the maintenance and the repair as willfully or otherwise unattended to; be carry out by the professionals concerned.

Dilapidation of buildings means that the physical lives of buildings are tending to be expired. i.e, the buildings are approaching a condition in which it would render it unit for use. Such condition of the buildings may occur due to various reasons that can be discovered by the professionals. It may be due to natural decay, or whatever may be the material used, with the passage of the time, the universal phenomenon of ageing as it is applicable to building structures.

DISCUSSION

A building is said to be in dilapidation when such a building has under gone very severe damages due to decay of different parts of the members, majorly known structural members like beams, columns, slabs, foundations, roof members, e.t.c, and causing serious in balance to load transfer system, due to this decay, the external appearance of the structure may severely be affected and giving an unpleasant ugly look to the physical appearance.

The Life Span of a Building

The life span of a building is generally classified into three dimensions. These three dimensions have been approved as three major classes into which buildings should generally be assessed.

They are:

- (1) **Physical life span:-** a building is constructed with assumed certain life span till a structure is structurally sound, this period is the one called its physical life which most of the time is assumed to be 70years.
- (2) **Functional life span:-** the fulfillment of the original intended functions in life, for which the building was constructed or build is what is called its functional life.
- (3) **Economic life span:-** the period after which the maintenance cost of the building becomes exorbitant, or when the building has crossed its economic life. The cost of maintenance against its replacement is the best indicator of economic viability of the building.
 - The economic and physical life span of any building is generally accepted not to be same. In most causes, a building may be physically sound, but its economic life span has expired.

Causes of Dilapidation of Buildings

The reasons or causes of decay (Dilapidation) of buildings, especially in Nigeria context are fully discussed below:-

- (i) **Natural decay and ageing:** This is a natural occurrence. Every material used in a building has a definite life span to remain in its functional condition. After this period, the parts in the building will give way and the building will gradually drift towards dilapidated condition.
- (ii) **Inadequate or no maintenance:** inadequate or no maintenance includes- disrepair or delay in repair as the main cause of dilapidation of a building. Actual proper maintenance and prompt repair or replacement of decayed or even damaged of building parts of a structure could defer early decay and dilapidation of building.
- (iii) **Misuse of building:** bad use of building or misuse of buildings can aggravate damage of a building and expedite dilapidation e.g. using a residential building for a commercial purpose or use, internal alteration for convenience e.t.c.
- (iv) **Use of inferior materials:** it is very clear that inferior construction material will have less life span and lesser strength than standard materials. When this happen, this in due course will lead towards deterioration.
- (v) **Bad workmanship:** bad workmanship will usually cause reduction in building life span, and also may cause in balance in the load bearing system and cause unforeseen stresses leading to the early decay of the structure.
- (vi) **Physical influence:** physical influence of any kind could cause injury and aggravate damage and decay and would expedite dilapidation.
- (vii) **Effect of aggressive environment:** aggressive environment like strong salty wind as common in sea – shore atmosphere polluted with smoke and aggressive chemical, grasses, e.t.c., will cause damage to building in various ways. Any aggressive chemical entering a building through the cracks would accelerate corrosion and expedite dilapidation
- (viii) **Force major (unforeseen factors):** these are floods, storms, earth quake, fire and warfare, etc may cause serious damages to buildings, that would lead to destruction.

Factor mitigating against the dilapidation of buildings

The agents responsible for dilapidation of building are the ones discussed under the causes, but they vary according to their ability to cause damage. These agents do not cause dilapidation at the same rate, but at different times. The dilapidation of a building in a given time depends on the severity of the exposure condition of the structure to the aggressive environment which again depends on the location of the structure

The causes under force majeure are unknown factors. The severity of the attack due to these factors cannot be foreseen. The structure located in an industrial area is very much prone to carbonation of concrete due to presence of carbon dioxide in the atmosphere with the result of rapid rusting. The location of a structure in a marine environment invites severe exposure condition due to salt attack and would aggravates dilapidation of the structure. in addition, the location of a structure near the sea, water or in the marine environment would cause variation in the severity of the exposure condition and consequently causes variation in the degree of dilapidation in a given time. There are places which are prone to strong winds and also very strong storms, e.g sea shore.

The structure located in these places will be subjected to abrasive action due to the blowing of sand, which will show sign of dilapidation early in comparison to structures that are located nearby or else where.

Consideration of demolition of buildings

In general terms, a building would be considered for demolition and complete removal under the following consideration:

- (i) When the building has outlived its designed and expected life span and finally stands unsafe. The structural strength of the members will be so reduced that they cannot be repaired or strengthened to become safe.
- (ii) When building has become functional obsolete.
- (iii) When the building has become economically obsolete
- (iv) When the depreciation value of the building has become equal to or less than the scrap value
- (v) When after inspection and special structural inspection and investigation, the structural Engineer has come to a concluding remark that the building is unsafe and it is generally beyond repair.

Rehabilitation of Dilapidated Buildings

Any dilapidated building proposed for rehabilitation need to be examined thoroughly especially the structural members. The foundation members need to be examined first, whether it is still sound and there is no sign of settlement of cracks within the foundations. In addition, other important members to be examined as parts of structural members are columns, beams, lintels, arches, roofs and floors, and load bearing walls. The cause to be thoroughly examined and their structural strength should be evaluated, taking into consideration the age factors. Examination and extermination will have to be made to assess the extent of damages of the non structural members as parts of the building, both internally and externally.

The Inspection of the building will finally reveal the extent of the building dilapidation or the degree of dilapidation with a guide to arrive at the conclusion. If the building is repairable and can be restored to its functional condition, an action to threat effects would be taking. The physical assessment of the building would also provide information required for estimation of the probable cost of repairs. At the end of inspection, if considered that a building be rehabilitated, the question of economy would have be written out. In cases of ordinary buildings, the cost of rehabilitation would have to be worked out and the economic viability to be giving consideration in the same way as that of new projects.

CONCLUSION

Buildings are generally known to be structures that are usually despaired and build with certain purposes in mind. They provide services physically and economically within the designated life span approved for their uses. Strict compliance to the conditions that would make the buildings to complete their life span lies in the hands of the designers (Architects, Engineers, and Contractors and the owners or the users). The situation of many dilapidated buildings in Nigeria, both in cities and towns needs to be addressed by the government and the professionals, especially in the construction sectors, in order to stop the wastage of materials and the cash involved in the purchase of construction materials at on different building projects within the country.

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