



## Detailed Study and Investigation on Different Types of Cracks and Rectifying by Various Methods

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### ABSTRACT

Cracking is one of the major challenge faced by Civil Engineer Cracking in structures is common occurrence and engineers are often required to look into their causes and to carry out suitable repairs and remedial measures. For repairs and remedies to be effective, it is essential that the engineer should have proper understanding of various causes of cracking.. It will also be necessary for the engineer to know as to when the cracks first came to notice and whether the cracks are structural or non-structural.

Structural cracks are those which create lot of threats and are due to Poor Quality & Material, overloading and these may endanger the safety of a building. Non-structural cracks which are due to moisture changes, thermal variations, elastic deformation, creep, chemical reaction, foundation movement and settlement of soil, vegetation, etc. Non-structural cracks can occur due to various reasons poor workmanship, improper curing etc. In this work a basic study is done cracks on wall and remedial measures to eliminate cracks lot of references were studied and practically cracks were measured and eradicated

**Keyword--**Self-healing, bacteria-based, cracks repair

### I. INTRODUCTION

Modern structures are comparatively tall and slender, have thin walls, are designed for higher stresses and are built at a fast pace. These structures are, therefore, more crack-prone as compared with old structures which used to be low, had thick walls, were lightly stressed and were built at a slow pace. Moreover, moisture from rain can easily reach the inside and spoil the finish of a modern building which has thin walls.

Crack formation in concrete is a phenomenon that can hardly be complete avoided due to for example shrinkage reactions of setting concrete and tensile stresses occurring in set structures. Smaller crack does not create more problems. Although such micro cracks do not affect strength properties of structures they do on the other hand contribute to material porosity and permeability. Movement harmful solution in concrete

cause degradation and premature corrosion of the embedded steel reinforcement. In several studies indications have been found that concrete structures have a certain capacity for autonomous healing of such micro cracks.

### II. CRACK INVESTIGATION

Some of the cracks were practically investigated as shown in fig 1 to fig 5. Cracks on wall and at joints are more important.

#### REMEDIAL MEASURES FOR PREVENTION OF CRACKS

Common defects in buildings due to negligence:

These can be classified based on it position and it nature of construction as under:

- a. Improper layout
- b. Improper orientation of buildings, far & setbacks
- c. Casual decision for foundation
- d. Casual decision of plinth level
- e. Improper construction of wall
- f. Construction joint between old/new wall and dissimilar structure.
- g. Defective RCC work.
- h. Improper slope of floors in rooms and bathrooms
- i. Cracks in the plastering.
- j. Breakage of wall & plastering by installation of electrical insulation.
- k. Improper drainage and sewage line.
- l. Defects in wooden doors, window and ventilators.
- m. Defects painting and distempering

### III. IMPROPER LAYOUT

Normally layouts are given by lay men who are not technically sound and efficient. In Later stage the following difficulties may arise due to defective layout of building.

- a. Properly squaring of building corner.
- b. Even thickness of courses in building.

- c. Straightness of wall
- d. Levels of the buildings.
- e. Gradient of the sewage live.
- f. Gradient of road and connection to the main road
- i. Construction must be provided in between dissimilar works right from the bottom.

**IV. REMEDIAL MEASURES**



**Fig.1. Measurement of crack angle using compass**

**V. IMPROPER BONDING OF DISIMILAR MATERAIL AND AT JUNCTION OF THE WALLS**

It is because of not proper bonding of masonry in super structure. Bonding is a process of arranging bricks and mortars to tie them together in a mass of brick work.

It is a weak portion of brick work and should not be continuous in two successive courses. At some places some vertical cracks in masonry are seen near the joints of two angled wall and near the corner of walls. At the time of construction building masonry work of one wall is taken at a time and bricks/ stone of each layer is left cantilevered outside the surface of this wall. nature of crack development is shown in fig 2 and fig 3



**Fig.2. cracks at wall**



**Fig.3. cracks at wall junction**



**Fig.4. Measurement of cracks**

Fig 4 and fig 5 shows the measuring of crack and it can be eliminated by using grouting and epoxy method. Jacketing ,stitching are other methods which are widely used. Wall cracks were investigated and in almost all the works epoxy grouting was followed, same

techniques were followed but a mesh was used as a connecting agent. self healing agent also plays a vital role in crack rectification.



**Fig.5. Measurement of inclined cracks**

## VI. REMEDIAL MEASURES

- Construction of wall on these location should be done simultaneously on both the location
- Proper packing and jointing should be done

## VII. CONCLUSION

The conclusion of this study is cracks can be prevented in advance if proper material and workmanship is done. In this work various types of cracks were studied and rectified practically by various methods such as stitching, jacking and grouting. Cracks can be eradicated if proper construction and quality control is maintained. Main cause of crack is poor workmanship. From the semi theoretical study Epoxy grouting with mesh can be used as good techniques for crack remedy.

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