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Maintenance and Repairs in Civil Engineering Structure

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Abstract: ***In last few decades the RCC construction has been widely spread all over India. These includes construction of various structure such as Dams, Multi storey Building, flyovers, bridges, etc. It includes the investment of huge number of natural resource. The recreation of such construction with such natural resource is quite impossible, so it is essential to maintain the constructed structure. As we all know the concrete deteriorates rapidly with year by year. For dealing with it, a systematic approach should be operate properly. Proper maintenance and repairing strategy should be applied to stand our structure for long duration. All over the world the rehabilitation of structure should be integrated. So in this paper we can studied the various causes and need of the maintains works in civil engineering structure.***

Keywords: Maintenance, Repair, Rehabilitation, Multi storey, deterioration, defect, distress, renovation, etc.

1. Introduction

In civil engineering, there is a proverb "A stitch in time saves nine" which is accurately fitted. The meaning is that if we repair the damaged portion urgently then we would avoid a costly one at large stage. The prevention of damages such as cracks, deterioration, etc. is mostly kwon as Maintenance. There were many old buildings presents all over India, so it gives becomes more attention towards the rehabilitation of buildings. The cost of repairs works are much cheaper than that of to built a new structure. Concrete is the main element in construction as a construction material and it has a good life span of durability but within a duration of span concrete gets deteriorated. Factors such as wear and tear action, weather action, etc. It is necessary to inspect the structure made with reinforced concrete. Maintenance and repairs of the concrete structure is prime cause.

The main Objectives of maintenance and repairs are firstly to improve service life of the structure, secondly maintenance gives a better serviceability of elements and components of the structure. Not only the maintenance gives early detection of defects of the structure but also prevents the major deterioration which leading to collapse of building. If faults are generated in structure then repair of the fault is must be taken into an action, so that the repaired portion of particular structure can strengthen them.

The operational efficiency of a building can be improved by proper maintenance. Proper management of maintenance is responsible for smooth and efficient working of structure . Which improves the durability of structure. Maintenance and repair are not properly done then there will be leading in breakdowns, failure or collapse of certain structures. It also leads to stagnation of activities. Improper maintenance results subsequent operations. The absence of management of maintenance causes costlier in service. Hence the repair and maintenance work should be properly done.

2. Literature Review

1] “Repairs And Rehabilitation of R.C.C. Structures by Fiber Reinforced Plastic- A Review” with author name Vivek Kumar Yadav can be concluded that , as we know the repairing and rehabilitation of structure should must be important. The main purpose of this research paper to highlight the various methods and techniques are used to minimize the bad effects of wear and tear action in civil engineering structure. 2] S.S. Chandar Structural Engineer, Structural Department, MWH Global, Bajaj Brand View, Wakdewadi, Pune, Maharashtra, India was discus the various points such as scope mostly on various types of repair works and rehabilitation. The author also focus on the behavior of the structure and various retro fitting works Post retrofitting evaluation for behavior of the structure. The author can be concluded that rehabilitation is highly advice for old age buildings, so which we can save human lives. 3] Yasir Shaikh1, Vishv K. Patel2, Dhruv Patel3, Vishv D. Patel4 1, 2, 3, 4Smt. S. R. Patel Engineering College, Unjha-Patan road, Unjha 384170, Gujarat, India has reported a case study on maintenance and rehabilitation of an institutional building, in this survey the authors can done a field inspection and visual inspection and in that they found that due to thermal expansion there were so many numbers of cracks are founded in horizontal, vertical as well as diagonally. so there were important to give the repair work in overall entire building. 4] Snehal N Mandlik M.E. Student Construction and Management D Y Patil Institute of Engineering and Technology, Ambi, Pune, Maharashtra, India. The author can studied on this paper was that the restoration of residential building is having prime importance. firstly they can identify the problems, what will be the age of the building, expenses done on the maintenance, etc. 5] P.V.Bhosale, Sumant Kulkarni,P. G. Student, Department of Civil Engineering, D.Y.Patil Institute of Engineering And Technology (DYPIET) Ambi, Pune, India with research paper title named as 'Review on Repairs and Rehabilitation of Civil Structures' can be

concluded that the maintenance and restoration of old age building should be done in regular interval.

Types of Cracks:
There are generally two types of cracks are as follows:
a) Structural Cracks
b) Non Structural Cracks

Structural cracks: The Structural cracks are those cracks when they are developed which are affects the strength of the building.

Non structural cracks: The non structural cracks are those cracks when they are developed they were are not affected directly to the structure. There are some reason of non structural cracks are as follows:
a) Due to thermal expansion and contraction
b) Due to corrosion on steel
c) Due to some algae attack on concrete
d) Shrinkage is also one of the reason of non structural cracks.
e) Due to sulfate attack.

Objectives of Repairs and Rehabilitation:
There are some objectives of repair work and rehabilitation work are as follows:
a) To find out various defects in structure.
b) To identify the problem
c) To find out the causes of distress
d) To suggest some remedies on repair work

Repair of Structure
There are some services which would be done in some interval are as follows:
1) Day to day repair
2) Annual repair
3) Service repair
4) Some additional repairs

3. Methodology

The methodology of repair and rehabilitation are as follows:
1) Grouting
2) Guniting
3) Routing and sealing
4) Stitching
5) Drilling and Plugging

1) Grouting: Grouting is a technique in which material can poured into cracks and damaged parts of the structure and gives increasing in bearing capacity of structure.
2) Guniting: It is process in which the cement and sand can be mixed with appropriate amount of water and pass through an object like gun and the material goes out throughout from it.
3) Routing and sealing: It is the process or a treatment which can be used to minimize the chances of moisture reaches to the steel.
4) Stitching: It is the process in which we can drilling out the number of holes across the overall the cracks and stapled it with bars.
5) Drilling and Plugging: Drilling of cracks is that drilling out up to length of the cracks and guniting it only when the crack is straight.

4. Conclusion

The rehabilitation and repair plays prime role in civil engineering structure. If proper techniques and good quality materials are used in appropriate quantity then there is minimum requirement of repairing works. It is very important that to aware the people that they should avoid the adulteration in civil engineering structure, it affects the bearing capacity of structure. Recommendation of repair works and rehabilitation are must for old age civil engineering structure.

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