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STUDY AND ASSESSMENT FOR DAMAGES AND MAINTENACE MANAGEMENT OF RESIDENTIAL AND INDUSTRIAL BUILDING

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Abstract: The population in our countries in metro cities increases rapidly due to which the residential building requirements also increases in metro city to fulfill the basic need of house for peoples .Due to which the building construction growth expands from last 10 years .But the building maintenance management plays key role in functioning of building .There is a building to meet the user's time limit. The special purpose of maintenance is to exaggerate the bad life of the building through Deterioration, decay and failure. Building maintenance management is the complex process of planning, directing, managing and managing resources for the livelihood of a building's functional operation. This research focuses on the most important form of management systems and reveals the state of the art. Seen through case studies, it is promising to make clear decisions due to structural strength monitoring in management systems, which are essential for profit owners struggling with limited resources. Buildings are widely expanded in all over the world. So, its repair and maintenance is necessary for the safety, effective and economy of industrial building and as well as workers who are working in it. Maintenance involves operational and functional checks, servicing, repair and replacing of necessary devices, equipment, machinery, building infrastructure, and supporting utilities in industrial business, governmental and residential installation.

In Residential building many defects are occurred such as cracks, vegetation, structural cracks in wall, defective flooring, paint, cracks on internal road, improper drainage, gap in shed, improper cutting, cracks in foundation of machine etc. The early stage damage identification and its remedial action on it will be save the time and cost of user. This conditional evaluation will be evaluated in this project by taking suitable case study in Pune metro city. This study analysis the root cause of damage or repair work which will helpful to avoid the same mistake in future projects. This study will also exanimate the need of effective Maintenance management for residential building.

Keywords **-** Building. Repair, Maintenance, Conditional assessment.

1. INTRODUCTION

Repair is the process of restoration of broken damages, failed device, equipment, repairs. Some types of repair such as patching up of defects such as cracks and fall of plaster, repairing doors, windows, replacement of glass panes. Checking and repairing electric wire. Maintenance it is work undertakes to improve every facility in every part of residential building. It is the service and surroundings accepted standards and to sustain utility values of the facility.

1.1 Objective of Maintenance

It is to preserve in good condition building and services, when deterioration occurs due to any reason it is inevitable to restore it to its original standards, to make improvement whenever required. A good maintenance team has to ensure safety, efficiency and reliability. Maintenance, Repairs and operations involves maintaining, repairing and replacing if industrial, business, government and residential installations. In maintenance there are types such as preventive maintenance, corrective maintenance, Predictive maintenance. Building in disrepair or unsanitary condition, unauthorized building works are potential hazards to the public. In any residential building many types of defects are occurred such as attack by pollutants, defects occurred in various forms and the different extends in all types of building, irrespective of age, use of unsuitable construction details, Natural deterioration defective concrete, or loose plaster in ceiling and etc.

1.2 **Problem Statement:**

In residential as well as industrial building many problems occurred related to repair and maintenance work. If any defect is suddenly occurred in the industry at that time requirement of labours is not fulfil within the sufficient time. So avoid this problems we have develop a new system or technology which is Repair and Maintenance application. In many times residential and industries are not focusing on the regular maintenance and its creating a big problem. And sometimes accident occurs and employees facing a injury and sometimes death happened. So for minimizing this type of problem need a regular maintenance and our system will help to work on it

1.3 Objectives of Paper:

- To study the need of condition evaluation and maintenance management for residential building by sites visit
- By conditional evaluation to study the different root causes for requirement of maintenance in early as well as old age of buildings for suitable case study by using the modern structural audit equipments
- To give remedial measures to overcome these problems for strengthens the structure and Study the different Maintenance Techniques

2. LITERATURE REVIEW

The main aim is carrying out the literature review is to gather the information and be more understanding on the topic of this research. Relevant journals, paperwork, thesis, articles and book that related to the topic "Approach towards the repair and maintenance of industrial building" had been looking for and help in carrying out literature review.

Jorge M. Simoes, (2020) This literature review examined issues relevant to the different facets of maintenance activities, resources, measures, and measurement in manufacturing organizations. Based on the findings of the study, it is concluded that the area of maintenance performance and management is in need of more future systematic research efforts aimed at solidifying theoretical constructs and promoting the utilization of more practical applications

Jaladanki Sasidhar, (2017) From the case studies and also from the surveys taken from the engineers and contractors it has been concluded that many of the engineers and contractors are not using any management systems for the management of materials, manpower, machinery and also it has been concluded that the percentage of delays due to lack of management systems varies according to the type of the project. So by using the management systems the delays in any project can be reduced in turn the cost gets reduced and also for the purpose the computer based management system has been designed and given to the engineers and contractors.

Iveta Pukite (2016) The present paper examines the connection between building and property management and building management system. The main aim of maintenance is to protect a building at its preliminary stage and to retain the value of investments in the property. During the management process, owners of building have to resolve several issues, such as how to organise building management effectively and in compliance with the existing regulations. The aim of paper is to conduct a literature review of different approaches to defining building management and building maintenance which are examined in various scientific publications.

Kajol Mevawala , (2016) The purpose of this paper is to justify the latest techniques, advanced materials and various requirements of repairing work to obstruct the deterioration which is necessary and economical than to reconstruct the building. After analysing the problem of building, we can apply the appropriate repair methods like Guniting, Routng and Epoxy Inj

3. IMPORTANCE OF MAINTENANCE:

It is the process that has been done to prevent the deterioration in the building whilst also to repair the damages in happen in the building. The damages happen in the building when some part of the building cannot functional well. There are many types of damages in the building such as the electric system, water supply, floor, roof, the drainage system and wall. This problem might be solving by doing the building maintenance to repair or to restore the equipment that cannot functional well. The problem occurs in the building will affect the tenant in the building, that why the maintenance process is very important to make sure the tenants feel convenience and safe to use the building.

4. ROLE OF MAINTENANCE MANAGEMENT:

1) Building maintenance usually practice in every countries and it is very important in every development to have maintenance management. In general, the meaning of building maintenance is the work done by someone who expertise to keep the building maintain and to make sure that every part of building is well improve. In order to maintain the building, it also wan too keeps the value of the building and to upgrade its services and surrounds. The building maintenance also necessary in this country because by carried out the maintenance in the building it will maintain the value of the building, safe for resident who live in the building and the building can be used for extended period of time.

2) The process of efficiency in building maintenance practices must be concern because building maintenance is very important to make sure that the building is well maintenance. The process of maintenance of building is to make sure that the all the facilities in the building is functional and give convenience to the users in the building.

Assuring efficiency in building maintenance practice is very important every because without efficiency in building maintenance, the operation of the building cannot be functional well. There are many advantages of efficiency in building maintenance such as many problems will be avoided if all the work done by the building management is efficient and follow the standard and the guideline provided.

3) Firstly, in efficiency of the building maintenance, to make sure that the building maintenance is efficiency, the management can use the planned management. There are two type of planned maintenance which is preventive and corrective. Planned preventive maintenance is the work done directly to prevent the failure of the facility and amenities in the building in order to make sure that the facilities can continue operation.

4) We can schedule all planned work so that the maintenance work will go smoothly and can ensure the damages can be monitored by the anticipate staff. This type of strategies is referring to the planned maintenance and it is performing with a predetermined plan at regular. By using this he preventive maintenance, the maintenance can be planned and perform when it convenience to the building users.

5) Then, the advantages use this type of strategy maintenance is can reduce the maintenance cost by avoid the cost of consequential damage. The health and the safety of user can be improved by using preventive maintenance Secondly, to assuring the efficiency in building maintenance practice, the management of the building should perform the accurate cost estimating to certify the lowest cost for the building maintenance. In determining the low cost for the building maintenance, the management of the building should accurately track the costs of all maintenance work.

6) The maintenance management also can use the in house resources like to do the maintenance work so that the cost can be minimize. It may cause higher cost if use the external resources to solve the problem of damages in the buildings and it may take a long time to resolve the entire problem. Then, to make the building maintenance is done efficiently, we must maintain a proper level of material and spare parts to make easier to repair the damages equipment.

7) Then, the maintenance of building also can perform in daily operation. It can be very efficiently building maintenance practice because it will maintain a proper presentable facility. The external parts of the building will be done every day by the staff in charge in that time. The cleaning service of floor for example, must be clean every day in order to bring a good image to the building itself.

8) Furthermore, the regular inspection also and maintenance also can be practice to detect the deteriorated building element. By practice the daily operation, it will overcome the inadequate maintenance in the building. So that the building will be efficiently maintain in daily operation by the building management.

5. DATA ANALYSIS: CONDITION ASSESSMENT AS A MAINTENANCE MANAGEMENT TOOL:

It was suggested that a large use of formal status assessment should be made to protect public property from any waste. Many agencies have undertaken condition assessment programs that serve as a model and teach useful lessons to improve the effectiveness of maintenance and repair operations. The committee review of these programs is the basis for the following recommendations on the effective use of scope, clinical evaluation and condition assessment as a management tool. The scope of the conditional assessment may be limited to identifying 1 specific condition in the building or it may be a planned inclusive assessment of the building. Depth of depth estimation may vary. Comprehensive assessment programs that address entire buildings and multiple buildings can be simple, visual, walk-through-assessments, or they can be intensive studies using a variety of technical analysis methods. In general, the scope of the conditional assessment should be tailored to the property owner's information needs. The time required to collect data, analyze and develop large amounts of data is expensive. The only way to control the time of cost evaluation and status evaluation is to clarify the scope of the effort. Potential problems need to be identified in advance to prevent deterioration, potential damage to adjacent materials or systems and component failure and should therefore be a primary goal in the design of a condition assessment program. During the evaluation of the situation, the system and material are checked for complete signs of error, failure or subtler features that the condition is not normal. The checklists who assist the inspectors in the identification process are often aligned with the criteria and procedures underlying the assessments. Individuals trained to identify and diagnose problem symptoms should conduct the evaluation process standardized and on a daily basis. Such features are often inaccurate or meaningless to users or even build administrators, who do not understand the importance of significant staining, material buckling or even minor cracks. Poor design decisions and incorrect construction can cause problems soon after the building is put into service. This often happens at intervals between different manufacturers or suppliers of components, especially through different systems or components. Estimates of such interfaces are not fully understood or understood during the design process. Later, during construction, problems in compatibility or scope increase due to solutions for field engineering. Condition assessment should clearly focus on these interfaces.

After the survey to determine the symptoms of problems or defects, the next step in the condition assessment is, in fact, a clinical analysis to determine if there is a problem, the nature and extent of the problem and the corrective action required. . Selected. The remaining useful life of a component should be estimated. Funding decisions need to be made frequently, based on which the problems become more serious. Effective status estimates are based on such estimates, which then become the basis for establishing the repair part of the maintenance and repair budget. Clinical analysis should be based on logical, standardized, professionally developed approaches that effectively and accurately assess identified defects. Misdiagnosis or unconfirmed predictions can be costly and dangerous.

6. EFFECTIVE USE OF CONDITION ASSESSMENT

Field-level surveys in situation assessment, collecting and using significant amounts of data and trained personnel, exercise is expensive. Care must be taken to ensure that the evaluation program is effective in reducing backlog and minimizing ownership costs. Cost control is achieved by controlling the scope of good planning and evaluation. Decisions must be made on what aspects of the building should be inspected and at what level to be assessed. Standardization of inspection and clinical analysis is the most important tool for controlling the cost of a condition assessment program. Fixed checklists or guidelines are the basis for such authentication and the data collected is consistent from one building to another and is summarized to represent the largest number of buildings in the entire list. Systematization improves data authentication and allows for easy identification of errors, gaps or anomalies in the data collection process. More standardized assessment programs will be more useful to the entire community of building owners or managers as the basis for statistical analysis and the development of better management models for building management systems.

Survey:

Condition assessment and evaluation usually take place at two levels:

Preliminary

Detailed

Preliminary investigation:

If we have enough information to assess the safety of the building at the initial testing level, we cannot advise a detailed investigation that involves significant costs and time.

There are basically three parts and stages:

Design Displaying information and details about design, construction, use and maintenance in the past.

Visual inspection of the situation on the site and recording of crisis details.

Analysis of protection against regulations in construction codes or specified performance standards.

Building safety needs to be rapidly assessed in order to make decisions about moving unsafe buildings to avoid the consequences of natural disasters such as earthquakes. Overview of building solution or differential disposal Land failures can be observed for the following reasons:

Soil liquefaction (under moderate and severe earthquakes)

Monsoon or earthquake under earthquake

Under surface defect under building (remote possibility) Some types of damage due to land failure can be seen in figs.

Fig.1 Damage of building due to ground failure

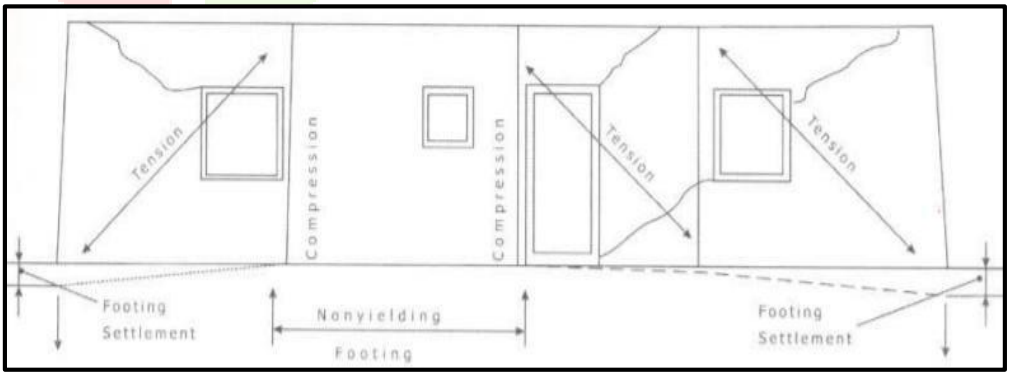
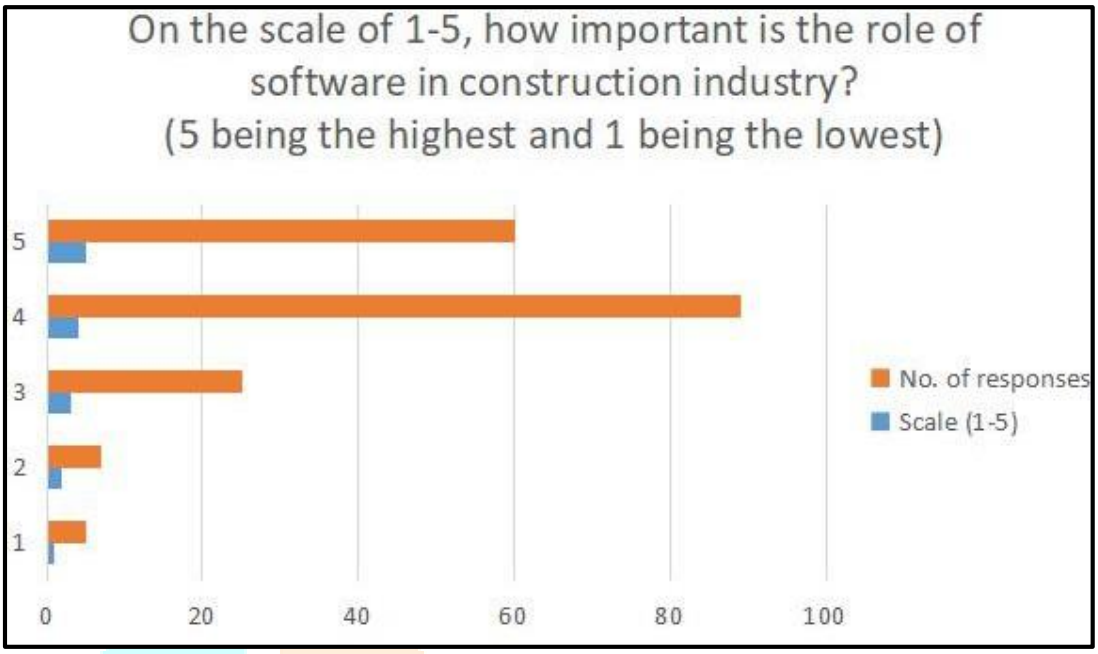


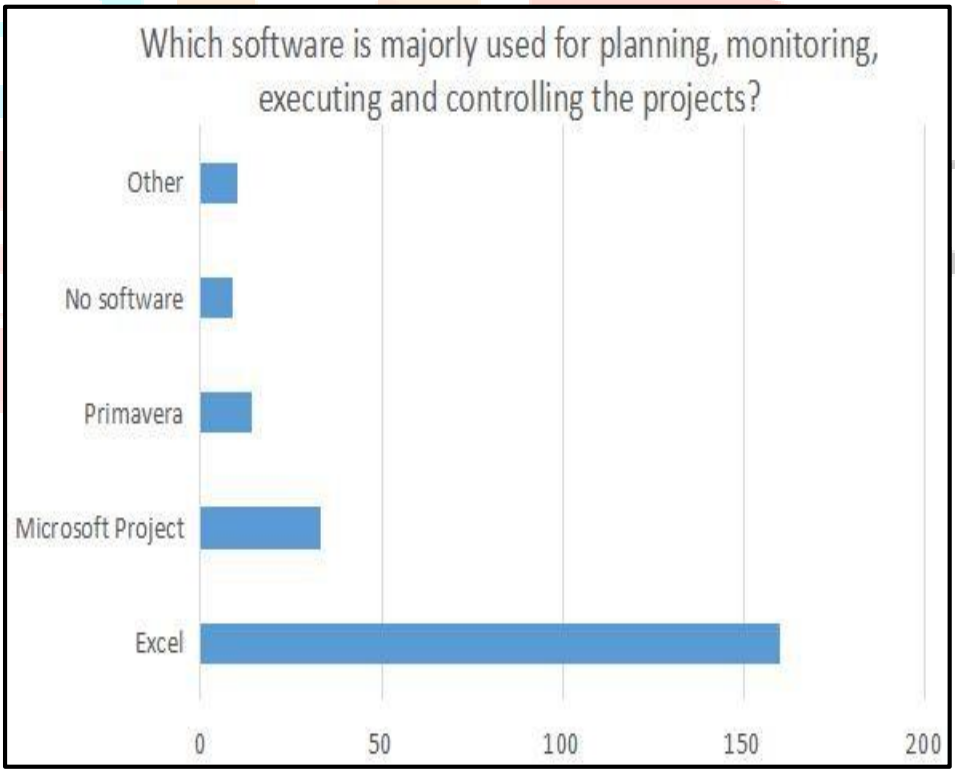
Fig.2 Diagrammatic explanation of diagonal tension crack due to differential settlement

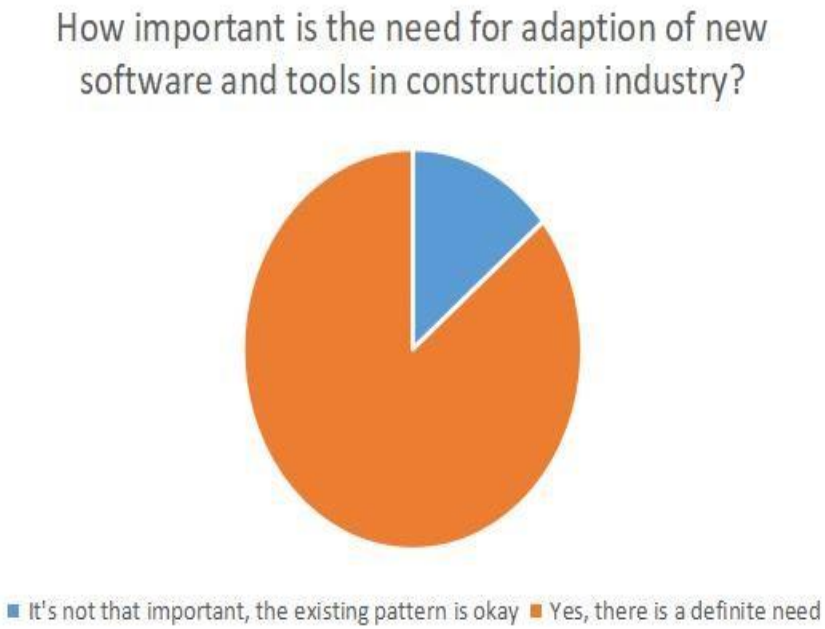
Detailed Investigations:

Traditional methods and techniques for project management in the construction sector: It has been found that most construction industries in India use Microsoft Excel for project planning, monitoring and control. The entire schedule is done in Excel and the project is tracked accordingly.

There are few common questions below which are needed to be answered:







7. NEED AND ACTIONS:

When structural drawings and structural details of the system (including the specifications of the material used) and the building giving its foundation layout are not available, a detailed investigation of the entire construction system in addition to the detailed structure should be carried out. Various members and systems. The type, location and severity of the damage or risk. Measurements can be made on an existing building to pay attention to the dimensions of the structural elements. Representative construction members are required to perform structural materials, such as concrete, steel reinforcement and masonry properties, conduct non-destructive testing on the ground (NDT) and conduct laboratory research on samples collected from the field. Soil profile and its classification details should be obtained by collecting data or conducting necessary geotechnical tests. These details are necessary to evaluate the safety of the building and to recommend retrofitting or reinforcement measures.

8. CONCLUSION:

The maintenance works is becoming necessary to ensure the serviceability and safety of the constructed facilities. The first step for improvement and development of maintenance is identifying and evaluating the current practice. Therefore, the purpose of this research is to find out the common problems facing the operation and maintenance public industry. In order to explore the current status of the building maintenance in Pune , Repair and Rehabilitation is an Art of Civil Engineering work which enables to extend the service life of a structure. Repair and Rehabilitation is defined as the process of achieving the original state of structure when it undergoes any sort of defects or deterioration or destruction. Restoration of structure is an ultimate aim of Repair and Rehabilitation where it plays a major role by maximizing the functional utility of the structure.

In light of the limited budgets that complicate decisions about capital restoration projects, many buildings are aging and maintaining their healthy operations has become a big challenge. Such decisions are largely based on accurate status assessment. The main objective of this thesis is to develop a comprehensive framework for inspection and condition assessment, which can overcome the shortcomings of traditional methods for examining and assessing the structural condition of infrastructure.

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