

**BUILDING MAINTENANCE MANAGEMENT IN AMRAVATI CITY****Dr. Ashok R. Mundhada <sup>\*1</sup>****Prof. Nityanand S. Futane<sup>2</sup>****Harshwardhan M. Waware<sup>3</sup>**<sup>\*1,2</sup> Professor (Department of Civil Engineering, PRMIT&R, Badnera)<sup>3</sup> PG Student (Department of Civil Engineering, PRMCEAM, Badnera)**ABSTRACT**

The present paper examines the connection between building and property management and building management system. It provides an insight into the concept of building management. Building management is a particular economic activity, a set of property maintenance, operation, repair and maintenance. This is a legal and technical set of operations required for building maintenance and preservation of usable condition, as well as functionally required for the maintenance of the land to ensure that property is used in accordance with the purpose. The aim of the paper is to conduct a literature review of different approaches to defining building management and building maintenance. Through the analysis, common themes identified are a number of terms and their definitions that appear in studying building management and maintenance processes. The continuous growth of socially responsible building management indicates that there is a need for a more effective management system of the building lifecycle to provide sustainable residential property development.

**Keywords:**

Building Management, Maintenance, Preventive Maintenance, Residential Building, Building Information System, Building Management

**INTRODUCTION**

Building maintenance to some extent is a necessary evil for organizations holding built assets can never get rid of it. One may save a dollar from building maintenance today but it is merely false economy and it can build disastrous consequences. Moreover, the ageing trend of built assets becomes more apparent which means there will be greater needs to maintain in the future. Durability and maintainability, in this sense, are the way outs that may help maintenance, however, designing for a hundred per cent maintenance-free (i.e. perfectly durable) facility is technologically and economically enviable. In this regard, planning, designing and managing for maintainability should be studied to see if there is any scope for reducing costs, enhancing efficiency and improving facilities performance in maintenance. This paper will review literature in building maintainability to identify any gaps from earlier works. Meanwhile, novelties in Facilities Management (FM) are consulted to see if they can give a hand to improve building maintainability. A research framework of managing for maintainability in FM will then be developed. It serves a supplement to the framework developed in a sister paper (Lau and Ho, 2010) where building maintenance management and sustainable development are accented. Houses are complex man-made artifacts and can only survive by means of regular reinvestments in maintenance and adaptation. Maintenance is required to maintain a building's initial performance capacity. Without maintenance, performance will not meet the demand and eventually will drop below the limit of acceptance of residents. In practice, both the demand and the limit of acceptance will gradually rise over time as a result of improved technology, rising standards, and growing prosperity. Improvement and renewal are required to answer the accordingly rising expectations. As a result, the total life cycle costs will generally be a multiple of the initial building costs.

**LITERATURE REVIEW**

Building maintainability was born to tackle maintenance problems stemmed from design, and the provision of adequate access was an essential contributor to maintainable building design (Feldman, 1975). Subsequent research in the subject has, however, experienced two decades of glacial period until its importance to attain greater productivity was realised in Singapore (Construction 21 Steering Committee, 1999). Gaining knowledge and benchmarking

maintainability were identified as prioritised issues (De Silva et al., 2004). Defects in wet areas and façade were analysed afterwards, with design, materials, construction and maintenance identified as maintainability significant factors (Chew and De Silva, 2003; Chew and Tan, 2004; Chew, Tan and Kang, 2005). Underpinned by research findings, grading systems were developed to predict maintainability and thus assist decision-making (Chew, De Silva and Tan, 2004a; 2004b). Not only Singapore but building maintainability has also attracted attention in Nigeria where maintainability analysis of public buildings at the design phase may make mandatory (Ikpo, 2009). When achieving optimum performance and minimum life cycle cost are targeted at in the Singaporean researches, repair time is concerned in Nigeria. Accessibility, maintenance manuals, available technology, economic index and reliability are five identified facets that may affect Mean Time to Repair (MTTR) in the proposed maintainability evaluation framework. Apart from building design and benchmarking, the planning and design processes should be reviewed for they largely influence building design and hence maintainability. When buildings were designed, maintenance related factors were inadequately considered (Arditi and Nawakorwit, 1999). With a view to learn from past successful projects to reduce total project cost, Dunston and Williamson (1999) proposed to integrate maintainability into Constructability Review Process (CRP). Similar work was done by Meier and Russell (2000) who developed a model process to implement maintainability with corporate-level programme as the start. Regardless of previous works on building maintainability, managerial aspects in maintainability have not been investigated.

### OBJECTIVE OF THE STUDY

The main objectives of this study are as follows:

- To investigate the problem of Building Maintenance Management in Amravati city.
- To understand the concept of Building Maintenance management.
- To analyze and finding the remedial measure for defect in building.

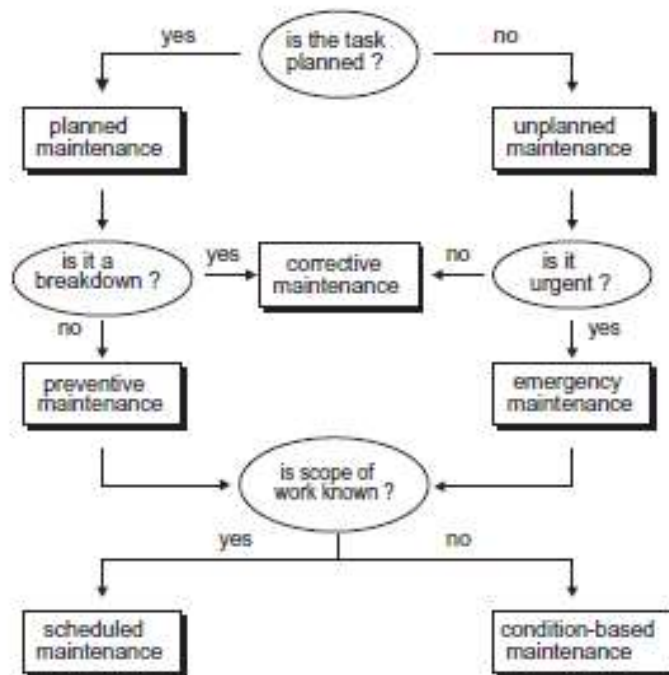


Figure 1: Decision- based types of maintenance

## RESEARCH METHODOLOGY

For this study, direct on-site investigation and the document review were combined. The visual inspection was carried out at 10 residential buildings in the Amravati city, where photographic data and detailed descriptions of the deterioration were taken. The visual inspection was combined with manual percussion where needed and in places where it could be reached. In addition, the administrative records related to the buildings that were being studied were obtained from Municipal Corporation of Amravati, in which the buildings year of construction, as well as as-built plans, dates, and results of recent inspections and other relevant information, were stated. After the analysis of the visual and documentary materials, some common trends in deterioration related to the age of the building were outlined and analyzed. In parallel, by contrasting the visual information and the data gathered from the city, some common filing problems and miscommunications between the properties and the administration were traced and systematized, leading to a consideration of a new improved way of management of the data related to building maintenance and inspections that was formulated later in this paper.

## SURVEY AND FINDING

### 1. Study Location and Context

The study is conducted in Amravati, a city located in the Maharashtra state of India. The coordinates of the city are 20.95650\_N, 77.69342\_ E. Its total area is 97.2 km<sup>2</sup>, and it presents a humid subtropical climate, Amravati City consists of 81 wards.

The following are the regions and buildings subject to the inspection.

a) Tapovan

Hospitals and housing complexes.

b) Kanta nagar

Government housing complexes.

c) Rajkamal Chowk

Department stores, markets, and housing complexes.

When condominiums and privately owned, apartments are included, several hundred mid to high-rise buildings are subject to inspection in Amravati. Each building is registered at the administrative agency, and currently, periodic inspection and reporting are being carried out based on the Building Standards Act. Inspection reports are submitted to the administrative authority on paper, and then each property's data are input into PCs and managed digitally. Investigation methods are mainly visual ones and manual percussion ones (if a target part is within reach). The information related to the inspection is later kept and stored by the administration.

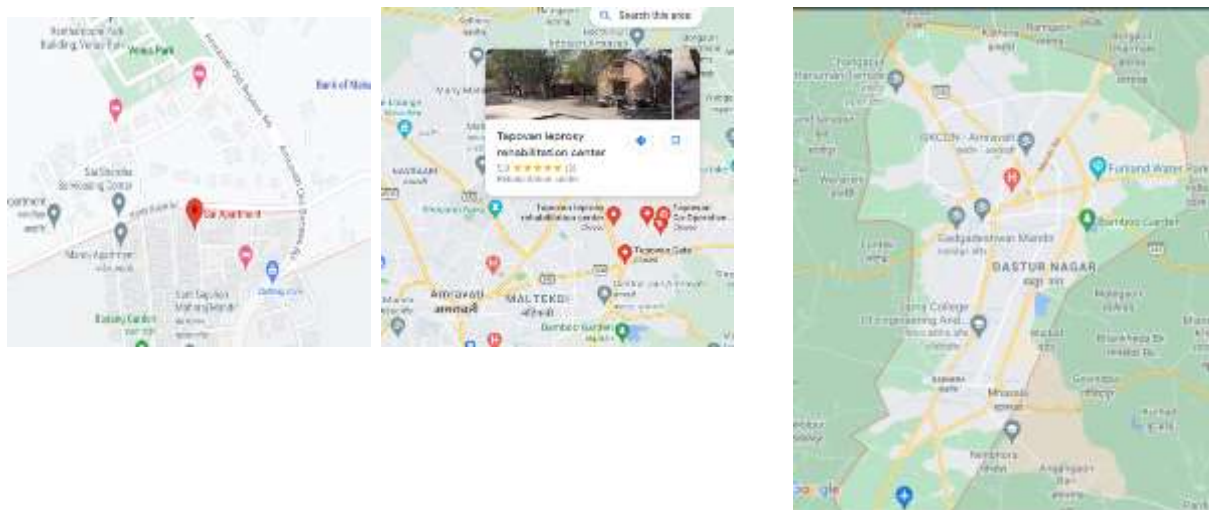


Figure 2: Amravati city map

**2. Visual Observation and Interview**

a) Tapovan

Hospitals and housing complexes

Table 1: Summary of condition survey recommendations.

<i>Element</i>	<i>Sub element</i>	<i>General condition</i>	<i>Action</i>	<i>Future action</i>
<i>External wall</i>	a) brickwork b) stonework	a) good b) good	No action needed	
<i>Windows and external door</i>	a) softwood timber b) steel or aluminium	a) fair b) good	a) paint and decorate b) -	Possible replace
<i>Roofs</i>	a) traditional b) RCC c) GI sheet	a) bad b) good c) fair	a) replace timber roof and cladding b) - c) replace	Possible replace
<i>Internal finishes</i>	a) walls b) floors c) ceiling d) paintwork	a) fair b) fair c) good d) bad	a) plastering work need b) replace c) -NA- d) repaint	Possible repairs
<i>External works</i>	a) paths b) staircase c) plastering d) paintwork	a) bad b) no staircase c) bad d) fair	a) repair b) -NA- c) replastering d) repaint	Possible future work on all external walls

b) Kanta nagar

Government housing complexes

Table 2: Summary of condition survey recommendations.

<i>Element</i>	<i>Sub element</i>	<i>General condition</i>	<i>Action</i>	<i>Future action</i>
<i>External wall</i>	a) brickwork b) stonework	a) good b) -	No action needed	
<i>Windows and external door</i>	a) softwood timber b) steel or aluminium	a) - b) good	a) -NA- b) -NA-	
<i>Roofs</i>	a) traditional b) RCC c) GI sheet	a) - b) good c) -	a) replace timber roof and cladding b) -NA- c) replace	Possible repairs
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<i>External works</i>	a) paths b) staircase c) plastering d) paintwork	a) good b) good c) bad d) fair	a) -NA- b) -NA- c) replastering d) repaint	Possible repairs

c) Rajkamal Chowk

Department stores, markets, and housing complexes.

Table 3: Summary of condition survey recommendations.

<i>Element</i>	<i>Sub element</i>	<i>General condition</i>	<i>Action</i>	<i>Future action</i>
<i>External wall</i>	a) brickwork b) stonework	a) good b) -	No action needed	
<i>Windows and external door</i>	a) softwood timber b) steel or aluminium	a) - b) good	No action needed	
<i>Roofs</i>	a) traditional b) RCC c) GI sheet	a) - b) good c) -	No action needed	
<i>Internal finishes</i>	a) walls b) floors c) ceiling d) paintwork	a) fair b) good c) good d) fair	a) plastering work need b) -NA- c) -NA- d) repaint	Possible repairs
<i>External works</i>	a) paths b) staircase c) plastering d) paintwork	a) good b) good c) good d) fair	a) -NA- b) -NA- c) -NA- d) repaint	Possible future work on all external walls

### CONCLUSION AND RECOMMENDATIONS

This paper summarizes the findings of a basic study on the level of maintenance management system undertaken for selected buildings in Amravati city as well as to evaluate the quality of services in those building. The case study result indicated that maintenance approach undertaken for building in Amravati still needs further improvements. Based on the visual observation and survey, most of the respondents are satisfied with the state of maintenance of their building. It was found that the major issues contributing to the lack of a proper maintenance program in office building are as follows:

i) There is an absence of the professional maintenance management in city such as scheduling or planned inspection concerning the services systems, building fabrics or the structural or non-structural elements.  
ii) With the lack of budget allocated for maintenance work, building administrators prefer to do corrective maintenance approach rather than preventive maintenance. Based on the interviews conducted with the building representatives, the budget allocated for repairing and maintenance works are not sufficient and is very limited. From the survey, we can conclude that most occupants in the selected case studies are satisfied with their maintenance management on buildings elements and are also satisfied with the delivery characteristics of the maintenance works. However, visual inspection on some of elements shows that they are not really in a good condition. In order to improve maintenance management, the following recommendations are suggested:

1. Prepare a guideline and established maintenance plan as a standard guideline in building that will assist the maintenance schedule and planning.
2. When doing maintenance works or repair is in progress, contractors should provide information regarding the defects to the building users so that they can gain some knowledge regarding maintenance works, the significance of maintenance and how to prolong the life of services, fabrics and building performance in the correct manner of using facilities. Building users should be encouraged to report quickly whenever they detect defects in building elements.
3. Develop a service desk where it is easier and the fastest way for occupants to report and complain any dissatisfaction towards building defects or non-functioning elements of the services.
4. Selection of external contractors should base on expertise. Repair and maintenance work by general contractor may not adhere to the required standard due to lack of expertise and experience which will cause building devaluation.

**ACKNOWLEDGEMENT**

This work has been performed in Prof. Ram Meghe College Of Engineering And Management, Badnera. I am highly thankful to Dr. A. R. Mundhada and Prof. N. S. Futane for their consistent help and guidance through the paper regarding the building maintenance management in Amravati city.

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