### **Degradation of Cultural Heritage Buildings**

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#### Abstract

Preservation of cultural heritage buildings is an action in maintaining the sustainability of architectural diversity in Indonesia. Indonesia, which is a former colony of the European nation, certainly has cultural ties with European nations who have inhabited this country, where during these times, Europeans will experience a natural adaptation process which indirectly brings their culture into Indonesia, especially the city of Surakarta, one of which is in its architectural form. In the process of adaptation, a cultural assimilation occurred which caused European buildings in Indonesia to have different characteristics from European buildings in Europe. With the independence of the Indonesian nation, the ownership and function of these buildings were transferred, either to the Indonesian government or to private or individual property.

Conservation means all the processes of looking after a place so as to retain its cultural significance. It includes maintenance and may according to circumstances include preservation, restoration, reconstruction and adaptation and will be commonly a combination of more that one of these (Burra Charter, 1981).

This research is designed to be used as a guide in maintaining cultural heritage buildings for the owners or users of cultural heritage buildings with European architectural characteristics, with the hope that it will help preserve the important value contained in a building and a sustainable architecture. The method used in this study is a descriptive analytical method of European-style cultural heritage buildings in Surakarta with a level of maintenance approach to these cultural heritage buildings.

Keywords: Preservation, Culture, Architecture, Sustainable, Heritage Building

#### Introduction

#### **1.** Sustainable Conservation

After Indonesia's independence, the management of cultural heritage, such as fort and offices ex-colonial buildings was carried out by the Indonesian people. However, the management policy did not change significantly. The 1931 Monumenten Ordonnantie remains the foundation. Cultural heritage is increasingly a state affair, which is why all researchers and management officials are civil servants (Tanudirjo; 2003). In general, they interpret cultural heritage in a "formal" manner as referred to in the 1931 MO which has emphasized its importance from a scientific perspective. In fact, society certainly has its own meaning that is more

diverse and generally practical. As a result, efforts to manage cultural heritage in Indonesia are often marked by conflicts of interest between the community and the government (Tanudirjo; 1998). Until postindependence, Monumenten Ordonnantie was no longer used. The absence of regulations governing cultural heritage has created a gap in the high number of cases of damage and destruction in many locations during the Old Order and the New Order.

The enactment of Law of the Republic of Indonesia Number 11 of 2010 concerning Cultural Heritage provides a new perspective for us as the nation's children in understanding how to care for cultural heritage. The law also explains the meaning of the word preservation as it answers the present need for the sustainability of cultural heritage for the future. Preservation is an effort to manage heritage through selective research, planning, protection, maintenance, utilization, supervision and / or development activities to maintain continuity, harmony, and carrying capacity in responding to the dynamics of the times to build a higher quality national life.

#### 2. Meaning of Cultural Heritage

Along with the passage of time and the dynamics of community development, the challenges to the Cultural Heritage are increasing. The potential for negative impacts on the physical preservation of the Cultural Heritage becomes significant. Factors that cause the decline in the continuity of this Cultural Conservation, such as a decrease in the physical quality of the Cultural Conservation due to the type and nature of the material and its age, damage caused by supporting environmental factors, land use change by dismantling the Cabar Budaya Building, lack of understanding of the owner, development and improper use controlled, as well as threats caused by natural factors such as weather fluctuations or earthquakes.

In the context of the importance of cultural heritage in the realm of conservation activities in accordance with the law, there are objectives that are important reasons for preservation, namely:

- 1. Preserving the nation's cultural heritage and human heritage;
- 2. Increasing the dignity of the nation through Cultural Conservation;

- 3. Strengthening the national personality;
- 4. Improve people's welfare; and
- 5. Promote the nation's cultural heritage to the international community.

## **3.** Meaning of Conservation and Preservation

There are two terms that are sometimes almost the same in implementation in the field, namely conservation and preservation. In general, conservation is the treatment by means of preserving a Cultural Heritage that has been damaged and / or weathered, carried out using traditional or modern techniques to prevent further damage.(Burra Charter,1981) Or in simple terms, conservation can also be defined as maintenance and protection measures that are carried out regularly to prevent damage and destruction by preserving them.

Meanwhile, preservation is an act of caring for the Cultural Heritage by overcoming the influence of environmental factors that can threaten the condition of its care. In this case preservation is a preventive action (prevention). Conservation generally means preservation (Burra Charter, 1981), however, in the realm of experts, conservation actually has a series of meanings with different implications. The term conservation commonly used by cultural heritage preservation actors refers to the 1981 Charter of the International Council of Monuments and Sites (ICOMOS), namely: Charter for the Conservation of Places of Cultural Significance, Burra, Australia. This charter is better known as the Burra Charter.

No.	Kegiatan	Tingkat Perubahan			
		Tidak ada	Sedikit	Banyak	Total
Ĩ.	Konservasi				
2.	Preservasi		_		<u></u>
3.	Restorasi		•	• 4	-
4.	Rekonstruksi	_		•	
5.	Adaptasi/Revitalisasi	-			
б.	Demolisi	-			

 Table 1 : The Differences of Conservation Implementation

In the Burra Charter, the concept of conservation is all conservation activities in accordance with the agreement formulated in the charter. Conservation is the concept of the process of managing a place or space or object so that the cultural meaning contained therein is well preserved. This understanding actually needs to be expanded more specifically, namely the maintenance of morphology (physical form) and its function.

The conservation or preservation efforts of cultural heritage that have been carried out from the past to the present have basically the same goal, namely preservation for the benefit of extracting cultural values and processes that have occurred in the past and their development until now as well as the preservation of cultural heritage objects. Because of its value to a historical event that has occurred in the past. The preservation of cultural heritage objects requires the involvement of many parties and the most important thing is the involvement of the community, especially in cultural heritage that is still in use (living monuments). The preservation of living monuments is sometimes more difficult to control, this is due to the owner's lack of understanding, limited costs, or other things that underlie the non-preservation of cultural heritage. Therefore, Law Number 11 of 2010 concerning Cultural Heritage provides an explanation of the protection efforts in outline for Cultural Heritage which are based the Rescue. Security. on Zoning. Maintenance, and Restoration of Cultural Heritage.

• Rescue

Rescue is an effort to prevent and / or overcome Cultural Conservation from damage, destruction or destruction.

• Security

Security is an effort to protect and prevent Cultural Conservation from threats and / or disturbances.

Zoning

Zoning is the determination of the spatial boundaries of Cultural Conservation Sites and Cultural Conservation Areas as needed.

Maintenance

Maintenance is an effort to maintain and care for the physical condition of the

Cultural Conservation to remain sustainable.

Restoration

Restoration is an effort to restore the physical condition of the damaged Cultural Conservation Object, Cultural Conservation Building and Cultural Conservation Structure according to the originality of the material, shape, layout and / or working technique to extend its life.

#### Methods

The method used in this study is a descriptive analytical method of Europeanstyle cultural heritage buildings in Surakarta with a level of maintenance approach to these cultural heritage buildings. So it is hoped that the results of this study can assess the level of maintenance of cultural heritage buildings, and obtain solutions regarding how to care for cultural heritage buildings, both in general and specifically for cultural heritage buildings.

#### Discussion

## 1. Local Heritage Building (Made of Wood)

Local Cultural Heritage Buildings are authentic architectural works of the archipelago. The characteristic of this building is the use of simple materials, such as wood, bamboo and so on. The construction technique is also simple, only using joints in the same material, or using materials from natural materials.

The local Cultural Heritage building is usually a traditional house building from each region in Indonesia. It has a concept with the local wisdom of each region and has a different form, the result of an adjustment response to the conditions of the surrounding area. Like Rumah Banjar from Kalimantan, it has a local structure and has a high floor height, this is due to their response to the shape of the soil which is peat soil.



Figure 1 : Models of Local Heritage Building

An example is Javanese architecture, which is a local architectural style in Java. In its development, Javanese architecture is a style that has meaning or philosophy. In Javanese human philosophy regarding architectural containers or public buildings or residences, Javanese architecture has the concept of shelter architecture (Prijotomo, 2008; 3). This seems to be based on information obtained in the traditional Javanese sumer, namely Kawruh Kalang (anonymous 1, tt) which says "tiyang sumusup ing griya punika saged kaupamakaken ngaub ing sangandhaping kajeng ageng" which means, 'people who enter the house building like taking

shelter (taking shelter) under a tree (of intention) is big '.

Frick (1997; 113), in relation to the purification stages, the embodiment of traditional Javanese roofs can be grouped into three groups.

- 1. A roof used by ordinary people. The shape of this roof is simple, such as village roofs and limasans.
- 2. The roof commonly used by the nobility is the joglo roof and its development.
- 3. A roof that is only used for sacred buildings such as mosques or temples, namely the Tajug. This roof is not commonly used for the roof of residential buildings.



Figure 2 : Plans of Javanese Heritage Building

## 2. Assimilasion Heritage Building (Made of Brick)

In the beginning, architecture is something that was built by humans to meet the need for protection from natural forces such as weather, danger, or natural disasters. Along with the development of times and technology, the existence of architecture is getting wider and has various forms. To fulfill the need for architectural aspects such as material, shape, structure, and context, it is necessary to endeavor an appropriate construction so that these various aspects can be accommodated in one harmonious whole. The architectural style that has developed in Surakarta is divided into namely; Local Architecture, four. European Architecture (colonial, Neo-Classical), Mixed Architecture (Indische and Post-Modern Empire style) Architecture. In classifying buildings with European architecture in Surakarta, it is necessary to have an understanding of the character of the buildings. How to recognize it can be by observing the style of the building, construction design, ornaments, the background of the owner and / or architect, or other things that can



be used as parameters. Some of the heritage buildings of European society and people who lived during the Indische phase were built in strategic locations, either built in a European community area or built in a scattered manner.



Figure 3 : Models of Assimilation Heritage Building

The fact of the development of modern cities in the city of Surakarta today, actually many buildings and / or buildings with European architectural styles in Surakarta have been destroyed. The various factors that caused the destruction had an impact on decreasing references to European-style buildings in Surakarta. Until now, the representation of buildings with European architectural styles in Surakarta is that of buildings in Indis and colonial styles with neoclassical style which also experienced a decline in quality due to the era.

Milano in Handinoto (2012). Architectural features that represent the Indische Empire Style include: The plan is fully symmetrical, in the middle there is a "central room" consisting of the main bedroom and other bedrooms. The "central room" is directly connected to the front and back porches (voor galerij and achter galerij). The veranda is usually very wide and at the ends are rows of pillars in Greek style (Tuscan, Doric, Ionic, Composite, Corinthian). The kitchen, bathroom, warehouse and other facilities are a separate part of the main building and are located at the rear. Sometimes beside the main building there is a pavilion.

In general, the following is an explanation of the characteristic European building components, both in terms of material authenticity, shape, layout, and workmanship techniques.

1. Facade Components and Ornaments

The characteristics of the Indies building are contained in the building facade. The word facade comes from the word facies, Latin for face, and refers to the outer wall of a building or in other names it is called a veranda. Also, the presence of ventilation boven spaces displayed at the top of the wall reflects the need for air circulation in Indis buildings. The facade of an Indies building is a play on architectural elements that are usually seen in the details of the ornaments that adorn the facades of buildings such as pillars, wide doors, decorative motifs on the doors, decorations on the ceiling, to the high level of the roof.



Figure 4 : Models of Façade Components on Heritage Building

#### 2. Floor Material Components

In general, every European building is built with an elevation of the floor so that when going into the building you will find stair traps. Looking at the materials used on the floor has become an important choice by previous building owners. The use of imported flooring materials can also interpret the financial strength of the initial building owner. From the identification, it is known that the commonly used floor materials include:

- Tiles (motif, terrazzo, waffle)
- Marble and Granite
- Ceramics



Figure 5: Models of Floor Material Components on Heritage Building

#### 3. Wall Material Components

A cultural heritage building or cultural heritage is called brick if the component  $\geq$  70% uses red brick either as plastered walls or exposed walls. The brick pattern as a wall is generally installed in a "Kop-Strek" formation. The red brick material is generally made from the formulation of clay, sand and water which in the

combustion process requires a combustion rate of between 600 ° C to 800 ° C. The advantages of building walls made of red brick are that the walls are not flammable, resistant to wind loads, and easy maintenance. Other wall window components are frames, ventilation boards, and canopies that are attached to the wall.



Figure 6: Models of Wall Material Components on Heritage Building

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## 3. The process of degradation of cultural heritage

Basically, all objects in this world, including cultural heritage, will experience degradation and even eventually experience a process of weathering into soil (soiling process). Along with a long journey time, the interaction of objects with the environment will result in natural aging. Moreover, cultural heritage is limited in form, quantity and type and is nonrenewable. And not infrequently, cultural heritage material that reaches us is not intact and in a fragile condition.

The long flow of time from the past causes cultural heritage to be easily damaged and weathered. Given this, there are 3 processes that underlie the occurrence of degradation, namely the degradation factor, the degradation process and accumulated degradation.

All objects in the natural environment are not always in intact condition, including objects, buildings, and cultural heritage structures. Cultural Conservation can be damaged due to several factors, including:



- 1. Internal factors, namely factors related to existing conditions cultural heritage itself, including: age, building design, the structure of the building, the bearing capacity of the soil, the nature of the material or material, and besides that it can also be interpreted as a related factor with the natural properties of the basic ingredients used for objects cultural heritage. Within a certain period of time, factors internal is a source of "innate weakness" building structure, so that it can affect solidity building.
- 2. External factors, namely factors related to environmental conditions around the cultural heritage, including: biotic elements (humans, animals, and plants), abiotic (climate, environment, and natural disasters), chemical elements (chemical reactions of chemicals or organic of animals) substances and environmental factors (such as demolition, penetration development and acts of vandalism)



Figure 7: The Degradation Process on Heritage Building

In the process, degradation can be categorized into 3 models, namely mechanical, physical and chemical.

 Mechanical damage to building wall materials caused by static or dynamic forces on the building or forces from within the brick material. Styles can be caused by earthquakes, pressure / building loads, instability of subgrade / foundation which causes deformation, symptoms that appear to be, cracks, tilt, rupture and stretching on building components or structures.

2. Physical damage is a type of material damage caused by physical factors such as temperature, humidity, wind, water rain, evaporation, symptoms that can be seen include peeling, cracking and wearing out. Example: physical damage to a cultural heritage building such as the cohesion caused reaction by water entering the pores of the wall, when the

air temperature decreases and the volume increases, it will result in cracks in the wall plaster.

3. Chemical and biological damage occurs due to factors chemical reactions that are present from the physical reaction process. This reaction can be influenced by water factors and from biological factors. For example, a biological symptom that often occurs is the presence of water getting into the pores of the wall resulting in moisture levels high so that it presents a microcosmic like moss or ferns that live attached to the walls. High humidity also triggers the presence of harmful animals such as termites, rats, cockroaches and birds. Reaction example These chemicals are like damage to the walls due to bat dirt which cumulatively can damage the paint color on the walls.

The degradation process that occurs results in a decrease in the quality of materials and buildings, especially in cultural heritage buildings that are more than 50 years old. The preservation of a cultural heritage building is also directly proportional with the presence of various potential threats and disturbances. In general, the threat of construction damage caused by Internal and external factors in a cultural heritage building are classified into 2, architectural and structural damage.

1. Examples of damage due to internal factors

Damage caused by the bearing capacity of the soil, the walls are peeled off due to old materials that cannot withstand the times.

2. Examples of damage due to external factors

Damage caused by water, biological, chemical, environment.

• Water

Damage caused by water usually comes from the intensity of rainwater and capillary water entering on pores of walls and floors of buildings. Presence of water without being balanced with a sewer system sufficiently presents a variety of risks to buildings. Water that is not immediately collected creates overflow water can enter between the roofs and wet the wooden construction, causing an impact on the weathering of the structure wooden roof. The content of rainwater which carries chemical elements also has an impact on the structure of the gutter or roof made of zinc. Chemical elements in the form of nitric acid, carbon, sulfuric acid, salt, and H<sup>2</sup>0 in the long term make corrosion and rust on zinc and iron materials.

Capillary water also has a negative impact on the walls and floors of buildings. Capillary water can emerge from rain water or a leak in the Air Conditioner pipe. The water capillary enters the wall pores which cumulatively, and is supported by a decrease in temperature at that location, which results in an increase in the volume of the wall pores. More and more the time the water is absorbed in the masonry will have a negative impact on the adhesion of the plaster. Damage that can occur such as changes in the surface texture of the stucco and cracks appear in the stucco. Apart from that, the walls were damp also trrs the life of microorganisms such as mosses and ferns on the walls.

• Biological

The small threat posed by biological processes is indicated by the presence of disturbances caused by biotic factors. These threats usually come naturally and can be handled fairly easily. Examples of disturbances that often occur are the presence of plant microcosmic bodies which often stick to building walls and roofs of buildings.

• Chemical

The threat of chemical damage can arise from the presence of biological factors such as microorganisms such as termites to bats and birds. The threat of damage arises when the process is chaotic starting with the feces produced by these animals. The damage caused from the dirt is more architectural properties such as destroying the color of the walls or floors of buildings.

Conclusion

The existence of cultural heritage buildings becomes threatened when the surrounding environment changes. Nowadays, changes in the environment of cultural heritage buildings are rife due to various factors such as the economy or land use interests. In various cases, it is often the cultural heritage building to be the loser. This situation causes the atmosphere of the building environment to be disturbed and has a direct impact on existence. Uncontrolled land use results in reducing the attractiveness or allure of cultural heritage buildings as one of the city's icons. Thus, in order to avoid adverse events occurring in cultural heritage buildings, it is necessary to prepare disaster mitigation efforts and Disaster Risk Management for each building. The preparation of mitigation preparations is compiled on an ongoing basis and refers to case studies at each location building. This is because the potential for disasters due to environmental changes in each cultural heritage building is different from each other.

In preservation directions, there are 2 models of treatment of cultural heritage buildings, namely preservation and conservation. Preservation (in that context area) is the activity of maintaining the physical formation of a place in existing conditions and slowing down the physical formation from the breakdown process. Preservation (in context which is limited) is part of the care and maintenance the point is to maintain the present state of building and cultural heritage environment so that the reliability of its function is properly maintained. While conservation is the concept of the process of managing a place or space or object so that the cultural meaning contained therein is preserved well.

After understanding about the degradation process can occur in cultural heritage buildings. So it is necessary to make a technical direction in maintaining cultural heritage buildings. The following are the steps for the direction of the building cultural heritage :

# 1. To determine the direction of preservation of the reserve building culture

This building preservation directive is prepared to provide guidance to owners / users of buildings designated as Cultural Conservation / included in the list of Cultural Conservation. For buildings that have been registered as cultural heritage by the government legalized through A regional regulation on the determination of cultural heritage is then carried out study of cultural heritage objects by the Department of Culture or by the TACB (Cultural Heritage Expert).

The handling method for arranging the preservation of buildings between cultural heritage buildings owned by the government or privately owned. General direction for preservation of cultural heritage buildings has the same direction namely striving for the building in order still sustainable. In practice, there is a diagram about preservation preparation stages.

- 2. Directions in designing conservation activities when cultural heritage buildings experience physical damage to buildings
  - 1. In planning a preservation / conservation activity in a cultural heritage building, it must start at this stage planning.
  - 2. Determine the direction of the policy to be carried out, whether it will carry out rehabilitation, revitalization, and adaptation as well as periodic monitoring of cultural heritage buildings.
  - 3. data collection of damage that occurred and documentation of the building to make it easier whencarry out the reconstruction phase.
  - 4. Check each original material whether it is still feasible wear or do not meet the standard of structural strength
  - 5. Compilation of the planning of the Budget Plan and Detail Engineering Design (DED).
  - 6. To set priority for the conservation stage (if staged construction is to be carried out).

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