

Street Furniture in Batam: Inspirations from Natural and Cultural Inheritance

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抽象的

该应用项目的目标是在巴淡岛设计一种街道家具。通过探索街道家具的价值和实施 4D 设计流程，我们试图将“自然设计”的理念融入当地的历史环境。通过自然设计的概念方法，我们提出了 3 种不同类型的想法，可以反映巴淡岛的文化传承特征，包括当地材料、环境氛围和文化传统。无不呼应博物学者对于自然设计的论述，期待完成产品原型进行后续评测。

关键词

自然设计、设计过程、文化传承

Abstract

The goal of the application project aims to design a street furniture in Batam. By exploring the value of street furniture and implementing 4D design processes, we try to incorporate the “natural design” idea to meets local historical environments. Through the conceptual approach of natural design, we proposed 3 different types of ideas which could reflect the characteristics of cultural inheritance in Batam, including local materials, environmental atmosphere, and cultural traditions. All of them echo the discourse of naturalist scholars for natural design, and we are looking forward to complete the product prototypes for follow-up evaluation.

Keywords

Natural Design, Design Process, Culture Inheritance

1. Introduction

Cities have become the residence for humans, until now, for that, cities are a huge deal and because of that, it needs a design that well thought out (Ab Rahman et al., 2018). In our daily lives, we often interact with the outside environment, do activities in the public area, enjoy and use the facilities in the public area. Chairs on the side of the road, street lights, and paths in the park are street furniture designed for a specific purpose. Streets furnitures are daily used by public, and therefore it have the closest contact and a dynamic interaction with human and also environment itself (Allameh & Heidari, 2020). The large number of Indonesian activities carried out outside the room, makes the presence of street furniture very needed and helpful.

However, not all cities in Indonesia are equipped with adequate street furniture. In Batam itself, not all pedestrian street areas are equipped with street furniture or have public areas with street furniture that support the area. For making a good and suitable pedestrian street, there are some important criteria, like safety, fun, comfort the user, and also have attractive design (Kurniawan, 2019). All of that criteria can be fulfilled with the design of street furniture, how the design can bring comfort, fun, safe to use, and also can attract all of people to use the facilities or maybe come to that area. Besides that, ergonomic design also need to used, in order to overcome the challenge of human comfort (Vengala et al., 2020). Street furniture in Indonesia generally comes from materials such as wood and steel, or maybe concrete, etc (Olusegun et al., 2012). The

choice of this material depends on the properties desired for the street furniture being

made. However, there are materials with advantages over other materials, and they are also growing widely in Indonesia. Bamboo is a material with many advantages and can be considered for use in making street furniture. Also, bamboo is a representative example of resources from nature that possess superior mechanical durability and flexibility (Sun et al., 2015). Due to lack of street furniture in Batam that suit for all of the activities that people's do here, required a design of street furniture that will make things easier, make people more comfortable to come to pedestrian or public area, with considering all of the important criteria before. By using bamboo material that flexible and have high durability, will make a good design for the suitable, fun, attractive street furniture. If there's a lot of street furniture in Batam that comfort and suit with people activities, the street, public area, and the city will be more alive more orderly, also the people who use that will be helped, and glad to come, using the public facilities. Public facilities like street furniture should be considering about the nature too, the environment around it. Besides fulfill people's need, street furniture should be think whether it can create an ideal environment, for citizens and for nature (Feng, 2020). Green Architecture is one of solution to create an ideal environment, it is a architectural planning approach that attempt to minimize dangerous effects to human health, and environment (Rachmayanti & Roesli, 2014). To provide a public place that fulfill all of people's need and also good for environment, designing a natural street furniture in public space and pedestrian street will be needed. With innovative natural street furniture in Batam City that provide all the criteria and need of people's and environment, it will make Batam a city a better place to lives in the future.

2. Literature Review of Street Furniture

2.1. Street Furniture

Street Furniture is one of the important components that is always attached to urban places. All objects and facilities in public areas are classified as street furniture. This component is one of the many important components in the urban landscape that helps or even regulates human actions and activities in public space. Even though it is relatively small and is often seen as a complementary object, street furniture has a very important role in the city environment, going hand in hand with architecture and life in the environment. Street Furniture can also form an identity or image of a city (Wan, 2007).

2.2. Functions of Street Furniture

Street furniture can be analyzed through four functions.

1. Basic: This function can be recognized easily by the public. Directly, street furniture provides practical use including safety, convenience, information service, and protection.
2. Environmental: Enhances and complements the environment through its quantity, spatial arrangement, and appearance, etc.
3. Decorative: Beautifies and decorates the environment through its design (color, style, form, etc.). It can be analyzed through two levels: (a) coordination with atmosphere and the characteristic of the environment, and (b) aesthetic appearance.
4. Complex: Combining different functions in one design. For example, traffic lights can be combined with road signs and street lamps (Wan, 2007).

2.3. Material for Street Furniture

In its manufacture, almost all street furniture uses materials that are easy to maintain and also have a life-force or durability with a long period of time and the costs of making or maintenance are not too big. Because of this, furniture must be selected and arranged based on site analysis and also targets to be achieved, so that street furniture can function efficiently (Olusegun et al., 2012). Things that can be considered in designing street furniture such as placement based on the same color tone with the surrounding area, the needs of the community, or with the aim of becoming an art form.

The most popular material used are wood and steel, and many other materials such as stone, concrete, recycled plastic and etc. The choice of this material depends on the properties desired in the street furniture that will be made later. Does the street furniture to be made must be heat resistant, does it have to be waterproof, do you want to prioritize strength and durability, do you want street furniture that is anti-vandalism, and so on (Olusegun et al., 2012). Of the various types of materials commonly used in street furniture, there is one alternative material that has never been used in general to make street furniture, namely bamboo.

2.4. Bamboo for Street Furniture

For centuries, Indonesian cultures relied on bamboo for shelter, material for products such as furniture and also musical instruments. The research found that 11% of the bamboo's total species located in Indonesia, and grown in almost all areas in Indonesia, including Sumatra. Bamboo also has several advantages, including cheap, easy to process, and also environmentally friendly. Besides that, bamboo also has a life force of more than 40 years (Sofiana et al., 2018). Bamboo has also been used for building material in China and India for thousands of years, yet its potential contribution to sustainable natural resource management has only recently been recognized.

Although some types of bamboo can adapt to various environments, most types require relatively humid and warm conditions (eg. mean annual temperature of at least 15-20°C and annual precipitation of at least 1000-1500 mm) (Ridge, 2008).

3. Method

The method used in this research is descriptive-qualitative method in order to obtain data about the material for the furniture that is bamboo, from cases study. The data will be used for defining and designing a natural street furniture.

3.1 Define

In this phase, the goals are to define the material that will be used for the street furniture which is bamboo. Understanding the characteristics of bamboo, how to process the material and how to maintenance it when it became the furniture. After defining all the things, then will be determined how the material will be process become a natural street furniture, and make that can be used and suit with Batam City natural conditions.

3.2 Design

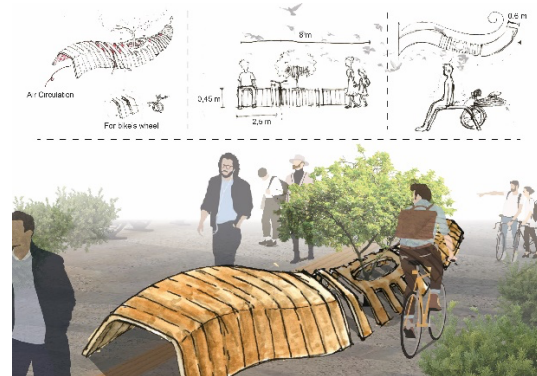
The purpose at this phase is to create a natural concept design using bamboo, which is will be suit in Batam city. Design concept process started by doing the research on how bamboo can be formed, and then adapt it with people habit and think more how bamboo can be a natural comfy furniture in the street that suit in Batam City. Concept then be depicted with street condition in Batam City.

4. Result and Discussion

The use of bamboo as a material for furniture needs to continuously done, since the bamboo is a plant that is have a relatively short term of planting, sustainable, effortless processed with simple equipment, and also become the cultural roots of Indonesian society (Sofiana et al., 2018). The sustainable design emphasizes on how to improving people's life quality (Xia & Yang, 2018), therefore by designing and creating a natural street furniture that suit in Batam City, gradually will improve people's life quality. Considering the condition of environment in Batam City that now green areas are decreasing, less of public area that close with nature, there are 3 natural street furniture designed from bamboo that suit in Batam City and will solve the problem and also make Batam a sustainable city by improving nature environment. These designs formed with 3 different main point and inspiration, design 1 the Dynamic Natural Bench inspired from natural environment and culture in Batam City, then design 2, Nature Checkpoint formed by observe condition surrounding the street and people's habit in Batam, and the last design, Bamboo Lights

inspired from the natural material, how to make design by using a whole of the material itself.

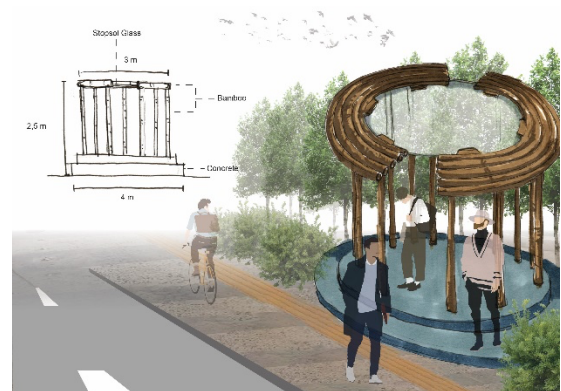
2.5. Concept 1 (Dynamic Natural Bench)



For make this design tangible in Batam City, bench will be manufactured by metal for frame and structure at once, and then on the surface will be used bamboo that has been processed to become resistant to heat and water. Because of the tree that planted in the middle of the bench and the bamboo that arranged spaced apart, it will make a good air circulation for bamboo and also help bamboo avoid the heat directly. The “U” shape will be made with same size, arranged like a wave pattern, to characterize Batam City, that is coastal. Its 45 centimeters on height, 60 centimeters on wide and total 8 meters on length. The both sides that made ramps, designed for bring convenience on user leg while sit there. The space that arranged near the small tree area also can be used for bicycle parking (put the tire inside).

For maintenance, the surface should be cleaned by dry cloth once a week, and if it's the rainy season, it should be cleaned maybe twice a week to ensure the durability. This natural street furniture will be more long lasting if it placed in park there is a lot of trees that deter it from sun heat directly.

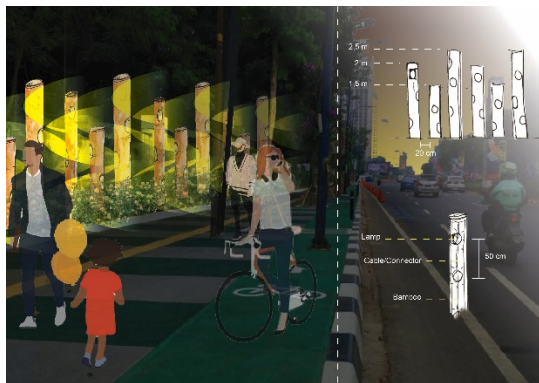
2.6. Concept 2: The Nature Stopover



This is design of a place that have function as waiting area or like *checkpoint*. It's so hot when we walk in pedestrian street in Batam at noon, due to decreasing of green area in Batam. So this place will help people that often or maybe all day doing activities outside, person that use pedestrian street routinely. This *stopover* will protect them when its rain or it's a very hot day, and placed in the middle of between the bus stops. This design use bamboo for the structure and concrete for the floor. Same as bench, this design using bamboo that have been processed to be resistant to heat and water, and being paint, for intensify the durability, because it will directly exposed to the sun, and water when its rain. Curve bamboo on top designed to be canopy and also in it there's a clamp to grab the stopsol glass. Its 2,5 meters on height, 3 meters on wide horizontaly (4 meters total with concrete area). And 1,5 meters (2 meters total with concrete area) on wide vertically. By using bamboo, that furniture will shown nature in that pedestrian area, and if it added with trees and some bushes, it will looks like one. It will be an attractive-helpful nature street furniture in Batam City.

For maintenance, treatment for bamboo is same like bench, bamboo should be cleaned by dry cloth once a week and twice a week or more in rainy season. For the concrete it just need to be swept routinely and for the glass on top, it just need to be cleaned by wash it and dry it.

2.7. Concept 3 (Bamboo Lights)



This design provided a attractive and helpful light on pedestrian street in Batam when night. Some of pedestrian street in Batam not provided with street lights, so the people just helped by vehicles light on street. The bamboo material will be used for the cover and the lights will be inside the bamboo. To make this natural street furniture tangible, it needs a kind of big bamboo and also a mechanism like street lights. The intensity of lights can be adjusted according to people's need. This bamboo lights will be placed on the side of pedestrian street. These bamboo lights that placed along the pedestrian street can be a identity of that area. With bamboo lights that placed with trees around it, it will make a unique attraction in Batam City, the lights will

not just irradiate the street but also the trees and nature environment around it.

For maintenance, the lamp should be checked once or maybe twice a week. Then for the bamboo, because it placed around the trees that cover the bamboo from direct sunlight and rain, so it can be cleaned once a week with dry cloth and cleaned the inside part with feather duster for clear up the dust.

5. Conclusion

Natural Street Furniture is a important component in public space that take a important role to make a city a better place to live. With a street furniture that not just help, provide what people's need, but also nature, the environment, it will helped a city become a better place. Used of bamboo in Batam City for natural street furniture is kinda hard to be realized because of the characteristics of bamboo and the city environment that have differences, but it still can be realized by innovative and right treatment. By using bamboo as material for street furniture in Batam, it will help environment that now lack of natural areas with a more minimal cost, but have a huge impact for people and also environment.

Used of bamboo for furniture already proved in years, with all of its advantages, bamboo can be a good long lasting natural furniture. These 3 design made by defining the material, bamboo's structure and characteristics, and then fit it with Batam environment and climate. Although there are some characteristics that's not suit, but with gathering and doing research about manufacturing process on bamboo and how to cover the shortage, these three natural street furniture have become idea that tangible to build in Batam. With this idea, hopefully it will make Batam a city that have special identity of its natural environment.

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