CONCEPT TRANSFORMATION OF DOME ARCHITECTURE IN BALI

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ABSTRACT

Dome architecture is currently a trend that is applied to buildings with various functions, especially in Bali. In this study, we will analyze the concept transformation of the dome architecture, especially those developing in Bali. The design concept analyzed is the form, function and use of materials. The purpose of this research is to provide information and education to the public about the trend of dome architecture that has developed from ancient times to the present. The research methodology used in this research is descriptive qualitative. This method begins with observations, looking at the existing conditions at the location. The results of this study are, several concept transformations of building design that apply dome architecture. The concept transformation starts from the shape of the roof on the jineng which almost resembles a dome, to the hemispherical shape that is applied to commercial buildings. The function of the building also varies, starting from the building as part of a traditional Balinese house with a function as a rice barn, then developing and adapting it to commercial buildings (villas and resorts), and becoming a vocal point in a villa/resort area. And lastly, the dome shape was displayed on the building at the G20 event which involved many leaders of other countries. The materials used are various, such as bamboo, wood, palm fiber, glass, plastic, and steel, and then back to bamboo which is a local material.

Keywords: architecture, dome, trend, transformation.

1. INTRODUCTION

The dome is one of the elements of architecture that functions as the roof of the building and is shaped like a split ball or half ball that is found in many countries. Another form of dome that is often found is a cone shape with a curved surface, resembling a plate shape with a wide base, and some are shaped like onions. At the beginning of its development, domes were found in medieval and renaissance buildings in Rome. The dome shape is often found in buildings with the function of mosques and political buildings such as minarets or kingdoms. This form is also used to add to the splendor of a building.

In Bali, without us realizing it, the dome architectural style is also applied to traditional Balinese buildings. One of the building functions that can be said to adopt a dome shape is "Jineng". Jineng is one of the buildings in a traditional Balinese house that functions as a rice storage area (rice barn). Over time, there was a change in the function of the Jineng building. Currently, Jineng functions as a commercial building in the form of a villa for rent. The materials used in this dome roof are wood and bamboo. In the modern era, dome architecture, especially in Bali, has changed in terms of shape and material. Currently the dome shape is more like a hemispherical shape with glass, plastic and tent fabrics. This form is often found in buildings with the function of residential / villas for rent. The most viral dome architecture today is the Bamboo Dome which is used as a lunch place for G20 leaders in Bali.

In this study, we will analyze the concept transformation of dome architecture, especially those developing in Bali. The parts analyzed are the form, function and use of the material. Dome architecture is currently a trend, especially in buildings with commercial functions. This study aims to provide information and education to the public about the trend of dome architecture that has developed from ancient times to the present.

2. RESEARCH METODOLOGY

The research methodology used in this research is descriptive qualitative. This method begins with observations, looking at the existing conditions at the location. After all the data is collected, the data is processed and analyzed using architectural theory in order to obtain a conclusion from this research.

3. LITERATUR REVIEW

The dome is one of the architectural elements shaped like a half ball, or like a cone whose surface is curved outwards. There are also plate domes (because of the low top and large base) and onion domes (because they almost resemble the shape of an onion). The dome will usually be placed on the highest place on the top of the building (as a roof).

Renaissance Architecture

Dome architecture began to exist since the Middle Ages in the era of Renaissance architecture. Renaissance architecture is the architecture that emerged in the period between the early 15th century and early 17th century in Europe, when there was a rebirth of classical culture, especially ancient Greek culture and ancient Roman culture. This style was first developed in Florence, with Filippo Brunelleschi as one of the innovators. The Renaissance style quickly spread to other Italian cities and then to France, Germany, Russia, England and elsewhere (Ross, 2001).

Other features of the architecture of this era include, the symmetrical arrangement of windows and doors, the extensive use of columns and Classical pilasters, triangular pediments, square aisles, arches, domes, and niches with statues.

Figure 1. St. Basilika Peter at the Vatican, Rome (Renaissance Dome Architecture)
Source: https://www.republika.co.id/

Types of dome shape:

1) Corbel Dome
   The Corbel dome is one of the earliest forms of dome found in several Paleolithic constructions. The corbel dome is not like the shape of the dome that we have thought of, in fact, you could even say, this dome is not

at all similar to the usual dome. The Corbel dome is formed by a horizontal stone construction which gradually decreases in size, to create a semi-spherical shape. As the circumference in each layer decreases, the stone circle gradually moves towards the center, supported by the previous layer until the dome shape is completely covered.

2) Onion dome
This onion-shaped dome is commonly found in eastern or eastern architecture style. An onion dome is a round dome that expands from a small base and then tapers to a peak. If you want to imagine the shape of an onion dome, you can look at the dome of the Taj Mahal or the dome used in many Orthodox churches in Russia.
3) Drum Dome
The most common dome shape is the drum dome. The drum dome has a simple semi-spherical shape that extends to a circular base, similar to the dome of the Pantheon.
4) Oval Dome
Oval domes are quite often found in Renaissance and Baroque buildings. The oval dome has an oval or ovoid base and extends upwards like a hemispherical dome.
5) Sail Dome
The Sail Dome is a type of dome with a unique shape, because unlike a drum dome, the base of this dome does not form a circle. On the other hand, the corners of the dome support the entire structure, while the other sides are also curved, creating a shape like a box sail that expands in the wind.
6) Saucer Dome
It is called the saucer dome because it has a circular foundation. In addition, unlike the drum dome, the saucer dome forms a fairly low depression, making it look more like an inverted saucer than a half sphere.
7) Scalloped or umbrella dome
The Scalloped Dome or Umbrella Dome is a dome in which the weight of the dome is supported by a vertical structure that runs from the base to the center, which divides the dome into several segments. If vertical lines distort the shape of the dome, so that each cross section is more polygonal than circular, the dome will be called a polygonal dome. Thomas Jefferson Monticello is an example of a building with a polygonal dome (Maryam Ashkan, 2012).

4. RESULTS AND DISCUSSION

a. *Jineng* (Rice Barn)

Jineng is a rice storage building with a rectangular floor plan with four pillars, with an arched gable roof (Wiriantari, 2019). Jineng is one of the buildings in a traditional Balinese house which has a function as a rice storage area (rice barn). In terms of shape, jineng cannot fully be said to adopt the dome shape on the roof. This is because only two sides of the jineng roof area are curved. This curved shape that resembles a dome has the function of giving a broad impression on the inside of the roof. On the inside of the jineng roof, it will be used as a place to store rice. There are various materials used in this jineng, namely bamboo (*sirap*), reeds, fibers, and rooftile.

Figure 2. Jineng

b. Villa with Jineng Roof Shape

In the next condition, resorts and villas, especially in Bali, began to take the form of a curved roof that resembled the dome of the Jineng building. The dome shape in some resorts is used to make the shape a vocal point in the resort area, thus giving a majestic impression to the building. In some other villas the dome shape is used as a form of space efficiency in it. This form allows the architect to design a mezzanine room that functions as a bedroom. The materials used are bamboo (original and synthetic), rooftile, and galvalume. While the upper structure uses a wooden material, bamboo and some use a steel material. The dome shape on the roof also gives an aesthetic impression to buildings with commercial functions, so they can attract tourists to stay at the villa/resort.

Figure 3. Golden Tulip Jineng Resort (left), Klumpu Bali Resort (right)
Source: https://architectaria.com/

c. Villa with Dome Roof Shape

In the current condition, dome architecture is still applied to buildings with commercial functions such as villas and resorts. Dome-shaped villas are a trend nowadays. The shape of the dome in the current building is more like a hemispherical shape, with tent fabric materials, plastic, glass, and bamboo. The structure used is a combination of stainless and steel. Meanwhile, other villas use bamboo and wood structures to give a natural impression and blend with nature.

Figure 4. Bamboo Villa in Eco Six Bali (left), Coconut Galaxy Villas (centre), New Earth Haven Eco Dome (right)
Source: https://architectaria.com/

This domed villa gives the impression of being spacious in its interior. The use of transparent glass or plastic material aims so that tourists can enjoy the view of the nature scenery outside.

d. Bamboo Dome at G20 Event

Bali as the host of the G20 event which will be held on November 15-16, 2022, presents the wealth of Indonesian local wisdom. One of them is the bamboo dome design, which is a place for lunch for the G20 leadership at Apurva Kempinski, Nusa Dua, Bali on November 15 yesterday. The theme of the selection of bamboo material comes from Gianyar Village for world leaders. The process is carried out

for almost 3 months which is divided into 2 stages of work, namely, 3 weeks in the field and 2 months in Gianyar with 100% bamboo.

This design is the result of a collaboration between architects Rubi Roesli (Bureau Architecture & Interior), Elwin Mok as Visual Creative Consultant (Celcius Creative Lab), Ashar Saputra as an expert on bamboo calculations from Gajah Mada University (UGM), PCO Pacto Convex and built by bamboo craftsmen of Gianyar village, Bali. This bamboo dome structure is 12 meters high, 32 meters in diameter, and 800 m2 wide. Designed as spacious and grand as this for a 43-seat capacity that is used as a place for lunch for G20 leaders. The design of the ornament is adapted to the G20 symbol in the form of a mountain.

The making of this bamboo dome is specifically for the G20. This bamboo dome is made environmentally friendly and made of elastic bamboo, so it can still be reused after being dismantled and will be returned to the Gianyar village for reuse.

Figure 5. Bamboo Dome at G20 Event
Source: https://alacasa.id/

Dome Shape Transformation to the Buildings in Bali

The shape of the dome adapted to the building in Bali underwent several transformations from the form, function, and materials used. Some of the transformations are:

1. At first, we can see the shape of the dome in traditional Balinese architecture, called *Jineng* (rice barn). The shape of the roof on the *jineng* has a dome shape with an outward curved shape on 2 sides of the roof. This form is designed with the aim of expanding the interior space, where this space is used as a rice barn.
2. In the next transformation, the shape of the dome-like *jineng* roof was adapted again to commercial buildings (hotels, resorts, villas). This roof shape aims to give the building a majestic impression and is used as a vocal point.
3. The current transformation of the dome shape is increasingly becoming a trend. The adapted dome shape is more like a hemispherical shape. The function of the building that adapts this form is a hotel, villa, or resort. The materials used are various, such as bamboo, glass, plastic, and tent fabrics with stainless and steel structures. The shape of the dome in the building now prioritizes aesthetics rather than function. This is what attracts tourists to stay at inns with a dome shape.
4. Bamboo Dome at the G20 event.
   This Bamboo Dome is going viral right now. This bamboo dome is a semi-permanent building that was built as a place for lunch for the G20 leaders. This bamboo dome has a very wide span and was built for 3 months using 100% bamboo material. The design concept of this bamboo dome is a return to local wisdom, by displaying local culture in Bali in particular, and Indonesia in general.

5. CONCLUSION

Dome architecture in Bali has several transformations in its design concept. From the shape of the roof on the *jineng* which almost resembles a dome, to the hemispherical shape applied to commercial buildings. The function of the building

also varies, from the building as part of a traditional balinese house with a function as a rice barn, then developing and adapting it to commercial buildings (villas and resorts), as well as becoming a vocal point in a villa or resort area. And lastly, the dome shape was applied to buildings in the G20 event which involved many leaders of other countries. The materials used are varied, from bamboo, wood, palm fiber, glass, plastic, tent fabrics, stainless and steel, and now back to using bamboo material where bamboo is a local material that has existed for a long time.

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