

Spiritual Architecture in the Context of Java

Rudy Trisno, Karen Claudia & Fermanto Lianto*

Department of Architecture,

Tarumanagara University, Indonesia

*Corresponding Author: fermantol@ft.untar.ac.id

Abstract

Since pre-modern times, architecture has acted as a medium between the sky and the earth: the sacred and the profane. After rationalism took over architecture, the genius loci apparent in traditional architecture began to disappear. In the case of Indonesia, in Jakarta, the capital city has suppressed traces of cultural identity, replacing them with a monotonous cityscape and spiritual architecture has been lost. This paper employs typology to extract cultural values from the collective unconsciousness of the people of Indonesia, which this paper argues enables architecture to bring these ideas into reality. An insight into traditional Javanese architecture shows a methodology that can synthesize transcendent in architecture consisting of; harmony between mass and emptiness, Nature and Humans, light and shadow, and space and time. The paper concludes that unity between dualities are important in designing spiritual architecture.

Keywords: Context, Genius Loci, Locality, Spiritual Architecture, Traditional Javanese Architecture

Introduction

Modern architecture reflects the rationalist worldview that dominated art and architecture since the beginning of the 20th century. Rationalism is expressed in modern architecture through its function and shapes. Modernism is meant only to fulfill its practical purposes, like the saying 'form follows function'. It disassociates from the past styles not as a side effect but as an intended goal. Modern architects believe that rationalism based on mathematics and the laws of Nature could create a universal architecture. This approach ensures that intangible elements such as human spirit will not be considered during the design process (Lobell, 2008).

However, just as modernism was looking into physical sciences for an objective architecture, the physical sciences themselves were retreating from objectivity (Lobell, 2008), from Einstein's theory of relativity, quantum physics that undermined causality, to Godel's proving the incompleteness and inconsistency of all mathematical systems (Bronowski, 1971). Indeed, after the 60s, Modernism had lost a sense of continuity (Hien, 1998). Nevertheless, functionalism and economic rationality still dominate. Vital cultural elements such as history and environmental characteristics have been rejected. As a result, cities all appear similar without the distinctive features they once possessed (Frampton, 1991).

Unsurprisingly, Jakarta, Indonesia's capital had lost any trace of culture in its course towards modernism. The skyline that is composed of international style skyscrapers appear almost like in other cities around the world. This condition poses a problem: how to return the *genius loci* or spirit of place that's contextual to Java? This research investigates how elements of the transcendent could be infused into architectural design, thereby returning its *genius loci*.

Theoretical background

Spirituality blurs the line between the sacred and the profane. It refers to an individualized, experiential connection to the transcendent (Russo-Netzer, 2018). The transcendent could be

materialized through art and architecture. Art and architecture are symbols of the human unconscious (Marcus, 1971). Symbols are used to explain abstract concepts that can't be explained (Jung, 1964). People need symbols because of the gap between consciousness and unconsciousness that has widened since the rational age (Wilber, 1979). Therefore, symbols could bridge the conscious and the unconscious (May, 1960). Architecture, in the context of adjustment, functions as symbols that communicate cultural values (Trisno, et al., 2019). A place is considered sacred because of its connection to the transcendent or the dead. Man uses physical objects as symbols to mark it as a sacred space, separate from the profane.

Spiritual architecture mediates the sacred and the profane using the form as symbols to materialize a culture's abstract values, beliefs, worldview, rituals, etc. These ideas manifest particularly in eastern Philosophies profusely, and some of the architects philosophies who adopt similar notions.

a. Eastern Philosophy

The Eastern, specifically for the Japanese, the concept of space is derived from two postulates taken from the Buddhist texts, that is 'form is an illusion' and 'form is emptiness.' It's explained using the cosmic principle *Ri*, depicted as a black circle, representing the absolute reality, and *Ji*, the white circle that represents the relative reality. The white circle is always present wherever the black circle is, even though it doesn't exist. The black peripheral align gives the idea of a circle. Takuan Soho writes, "Between heaven and earth, there is something called *Ri*. This *Ri* has no form and is empty. Because of its emptiness, it cannot be seen with the eyes. *Ri* is the foundation that evolves into *Ji*" (Dumoulin, 1988).

The Japanese word for space, *ma*, means a gap between two elements or intervals between two phenomena. It's not a positive entity or a geometrical concept, but a negative space or empty void between two tangible things (Kurokawa, 1988). It is dependent on the events that occur in it. The concept is more akin to space-time than space itself. *Ma* only emerges when the observer, people, experience it or is conscious of it (Antariksa, 2001). Solid is something surrounded by nothing, and the void is nothingness. Solid without void would mean the loss of visible form (Chang, 1981). This philosophical concept influenced Japanese architecture and subsequently adopted by contemporary architecture by using symbolism (Antariksa, 2001).

b. Tadao Ando

Tadao Ando combines the abstract and the real to create spirituality in architecture. Ando tries to give meaning to a symbol that is architecture (Hien, 1998). To do that, he returns to the beginning. He adds meaning to modern compositional language and technology by retaining regional rituals, characteristics and values.

Ando's themes include Nature, *shintai*, and geometry. Originally, *shintai* is a place or thing in which the gods, or *kami*, reside in. Ando uses the word *shintai* to mean form as flesh and spirit. He uses this as a design principle, where the presence of a spirit should be felt in the building. His principle of Nature deals with the modulation of light and shadow in relation to urbanism. Nature is used as a medium to stimulate the spirit. Light, being part of Nature, acts as a giver of soul and spirit to an otherwise lifeless building (Hien, 1998).

Ando seeks to create situations where Man and Nature can commune (Ando, 1989). He states that space adapts to the changes in Nature (Baek, 2009). Ando responds to chaotic urban surroundings by placing the courtyards inside, enclosed by concrete walls, like in the Kidosaki House. The ones situated in Nature often integrates into the building by opening out to it, as in the Children's Museum, Hyogo, or burrowing into it as in the Forest of Tombs Museum, Kumamoto and Chikatsu-Asuka Historical Museum, Osaka (Frampton, 1991). Ando said, "I don't believe architecture has to speak too much. It should remain silent and let Nature in the guise of sunlight and wind." In its relationship with Nature, architecture must be kept within the framework of time (Baek, 2009). The signs of the passing of time, such as the changing of seasons, hours of the day, rainfall, etc., should be apparent in the building.

Nature and *shintai* affect the geometry in Ando's buildings. He tries to separate form from function to search for a meaning and an original form. His principle of geometry deals with

spatial composition, minimalist form, material and texture. The simple form could enrich space. Logic and rational reasoning bring architecture uninhabitable. Despite being a necessary tool to create space, abstract geometry doesn't help unite Man with the built environment but destroys their relationship instead. It is used to contrast Nature and shows the logical side of the design (Hien, 1998). Ando argues that since modernism is part of history, it can't be separated from their context (Frampton, 1991), Therefore, it must be inserted into the design.

c. Louis Kahn

Louis Kahn illustrated his design principles through the metaphor of Silence and Light. Silence refers to the immeasurable, while Light refers to the measurable. Between Silence and Light lies the Treasury of Shadows, that is the physical world. Art originates from the Order of Shadows, between the abstract and the real. The order represents a state beyond the oneness of Silence and Light. This concept is also found in Lao Tzu's philosophy, referred to as Tao, and in Heidegger's theory of Being. Because of Man's preoccupation with the measurable and the rational, we have forgotten the Order, Tao or Being.

Kahn thought of architecture as a spiritual journey. The architect's task is to build a bridge bringing Silence into Light then materialize it into the physical world. He used the metaphor of institutions to explain the purpose of a building. For a building to have a spirit, it must have a desire to be. Desire is the quality from within oneself to change from one state to another. For example, the purpose of a house is to live in, and the school is for studying, etc.

He differentiates between Form and Design. Form here means a material or building's desire to be, that can be answered by asking 'What does this building, or material want to be?' Design refers to the desire or intuition of the architect. On implementing architecture, there must be both Form and Design. Kahn's approach to understanding Form is by studying ancient architecture. The concept of a timeless Form is like Jung's concept of the collective unconscious and archetype and methodology as a design method (Lobell, 2008). The manifestation of form depends on the cultural context and the time period.

'All material in nature, the mountains and the streams and the air and we, are made of Light which has been spent, and this crumpled mass called material casts a shadow, and the shadow belongs to the light... This prevailing luminous source can be visualized as becoming a wild dance of flame that settles and spends itself into the material. Material, I believe, is spent light. The material begins when the light stops. Light is of immense importance to architecture; it is the revealer of architecture.' (Lobell, 2008, p. 22) Quoted from Louis Kahn.

Ancient architecture uses thick masonry walls with openings that reflect light from their sides and the light sculpted as it entered the room. Modern architecture with its thin materials and overuse of glass does not provide such modulation of light. Kahn tried to return that modulation of light found in ancient architecture. Raw materials without finishing are mainly used to honor the 'desire' of the materials (Lobell, 2008). Concrete, a modern material, is usually chosen as the main material in their building. Its absence of color is a perfect canvas for light, shadow, wind, water, and Nature.

A combination of the abstract and the real could create a spiritual architecture. Archetypes and typology of the region are translated into a model, using a modern language of composition and technology to narrate timeless ideas. The form that is uncovered from 'type' consists of a mass and void that only emerges when the observer experiences it. It is bound by time and the events that occur in it.

Nature brings life into Man-made structures. Spiritual buildings actively respond to Nature and its surroundings. It is not cut off from the natural world and signifies the passing of time. Light is a part of Nature and is an essential part of it. It reveals form and is what makes things visible. Light casts a shadow when it hits a mass. It marks the beginning of the material. Therefore, light is essential in materializing abstraction.

From the explorations on the philosophies above, it is argued that harmony between; a) mass and void; b) Nature and Man; c) light and shadow; and d) space and time could be used as a methodology to synthesize the transcendent in the otherwise monotonous spaces. An insight into traditional Javanese architecture shows a methodology that can synthesize transcendent in architecture consisting of; harmony between mass and emptiness, Nature and Humans, light and shadow, and space and time.

3. Traditional Javanese Architecture

Traditional architecture that's built using a prototype is laced with symbolic meanings (Lobell, 2008). Transcendental elements are apparent in traditional Indonesian and Javanese architecture. According to this view, other than functioning as shade, the house is a place for self-actualization. As Tjahjono points out, Studying traditional houses can give an in-depth look at their culture (Tjahjono, 1998).

a. Mass and Void

The form is made from mass and void. Form that is extracted from traditional architecture typologies are symbols of a culture's values, beliefs, and worldview. To find the best context for traditional architecture, it must be traced in order to know the type that appears throughout the history of spiritual architecture in Java.

Natural places such as caves or man-made excavations were the first to be separated from 'homogenous profane space' to be used as shade or rituals. The first cave architecture is used as a burial ceremony that is then replicated as a medium between the dead and the living (Barrie, 1996). During the Megalithic period, dolmens are constructed for similar purposes.

The cave began to evolve into mounds, as seen in Buddhist architecture in the form of stupas. Stupas were originally used to store the remains of Buddha, but then became Buddhist temples that are used for worship and for meditation (Curl, 2000). After Hinduism and Buddhism arrived in Indonesia, stupa and Buddhist temples became *Candi*. The *Candi* is seen as a resting place of the Gods and represents Mt Meru, the original dwelling place of the Gods. Its plan is in the shape of a mandala, and its elevation represents three spiritual realms in Buddhist cosmology, that is *Bhurloka*, *Bhuvarloka*, and *Svarloka* (Soekmono, 1995). The Mandala itself is an *imago mundi*, and its center symbolizes the *axis mundi*, that is the point of convergence between the heavens and the earth, and the four cardinal directions. The mass started as a hemispherical mound that became a stepped pyramid (*Punden berundak*) (Trisno & Lianto, 2020).

Candi and Hindu or Buddhist temples usually symbolize the cave and the mountain. The mountain acts as a bond between the earth; a profane realm of humans, and the heavens; the dwelling place of the sacred. In Javanese culture, the Gods are invited down to altars, instead of sending offerings up to the heavens, making the mountain or temples act as a ladder for Gods to climb down (Domenig, 2014).

The artifact *Alu* and *Pesung*, which functions as a pestle and mortar symbolizes the Hindu cosmological concept of duality *Lingga* and *Yoni*. *Lingga* is the masculine aspect of the pair, while *Yoni* represents femininity. Together, it symbolizes harmony, balance, and the concept of birth, destruction, and rebirth. However, the form is, *Lingga* is characterized by a vertical axis that represents the connection between the sky and the earth. It could also mean the connection between abstraction and the real. *Yoni* is characterized by a horizontal axis that represents the past and the present, or causality (Sunoto, 2017).

The *Omah* is a place where the micro cosmos, that is Man, and the macro cosmos, that is the universe and a universal spirit. For the Javanese, their house is thought of as an *axis mundi* and *imago mundi* (Eliade, 1959; Tjahjono, 1989). The *Pendopo*'s form is traditionally used for multiple functions, including mosques. The roof also symbolizes a mountain, even though it's not directly derived from the *Candi* form. There's no distinction between form and function (Figure 1).

After a while, mosques started to adopt the Byzantine style, which originally functioned as a church but then transformed into mosques after the rise of the Ottoman empire. Byzantium style

churches, according to Eliade, symbolizes the heavens with its dome aligned to the four cardinal directions (Eliade, 1959). Right beneath the dome is where God reveals himself (Davies, 1952).

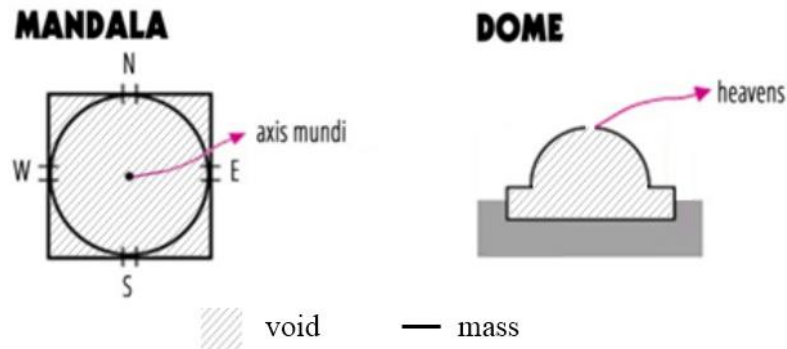


Fig.1: Symbolism of form taken from traditional architecture
Source: Author, 2019

b. Nature and Man

Man holds an important role in shaping the environment. Nature, Man, and local culture are connected in building local architecture. Because cultures are tied with local values and worldviews, the philosophy *Sangkan paraning dumadi* plays a part in how Javanese architecture responds to Nature (Rachmawati & Mappajaya, 2012). *Sangkan paraning dumadi* could be explained as the beginning and end of all creations, and essentially the purpose and way of life. For the Javanese, the beginning and the end is God. The cosmos is a manifestation of God. Man, and the cosmos are interconnected. It explains the unity between Man, God, and the cosmos and provides a guide on how to maintain harmony between Man, Nature, and the cosmos (Suseno, 2003).

Traditional architecture is a result of adapting to Nature and climate (Prijetomo, 2010). Harmony is always maintained with the cosmos by respecting the site and Nature surrounding it (Tjahjono, 1989). From the direction of the wind, angle of sunlight, rainfall, or even the moon signifies the passing of time. Nature that is infused into the man-made building experiences through the observer's senses.

Traditional Javanese architecture maintains its connection with Nature. The composition of windows allows cross-ventilation (Koerniawan & Suhendri, 2016), while the roof openings allow stack ventilation and reduce heating underneath the roof space (Karyono, 2016). Crevices and gaps between building materials, which is usually wood or bamboo help release heat. Building orientation, which is usually aligned to the north-south axis allow proper airflow (Asriningpuri & Rochimah, 2018). The roof usually has wide overhangs to provide extra shade from direct sunlight (Figure 2).

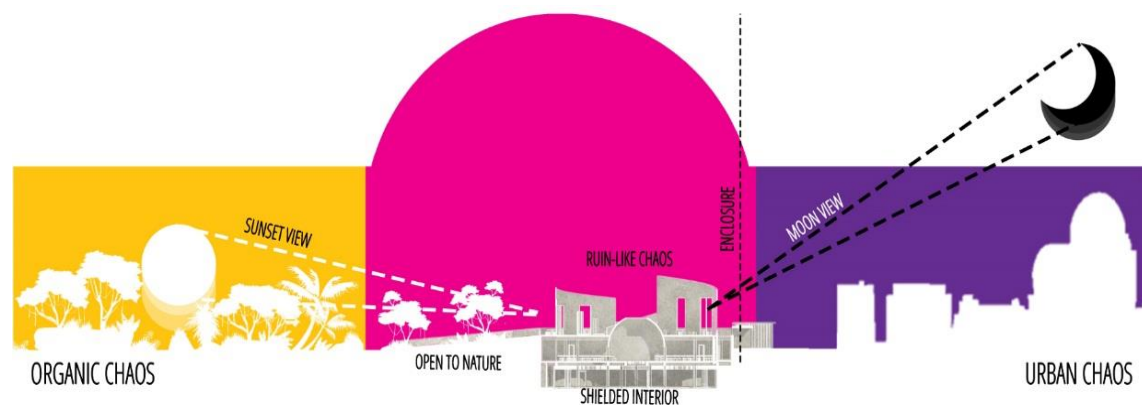


Fig.2: Man-made building's response to its surrounding
Source: Author, 2019

c. Light and Shadow

Light is an instrument that brings life and soul into the building (Baek, 2009). In traditional Javanese houses, spaces are laid out according to a spatial hierarchy based on light (Tjahjono, 1989). The *Pendopo*, which is at the front of the house is an open space that consists of columns and a roof without surrounding walls. It is therefore, the brightest area of the house and is the most profane. The *Pringgitan* area provides modulation of light in its function as a shadow play performance area. It acts as a transitional area between the sacred and profane. The *Dalem*, the most sacred area is dark and is lit only by light from the doorway. To create a spiritual atmosphere, the surface area of the audio-visual buffer must be greater than the opening (Trisno & Lianto, 2018). Therefore, the *Dalem* effectively creates a spiritual atmosphere because the surface area of the door is less than the walls.

The *Sentong tengah* located at the heart of the *Dalem* is believed to be the medium for the unification of *Ibu Bumi*, that is the earth, and *Bapa Langit*, that is the sky (Tjahjono, 1989) symbolizing birth. This could be traced to Hindu cosmology apparent in Hindu temples. The *Garbhagriha*, the center of the temple where the gods reside literally translates into womb and house. It's the cave in the side of Mt. Meru, the axis *Mundi*. The cave symbolizes the womb that gave birth to the world. It is enshrouded by darkness, and lighted with only a few lamps. The darkness symbolizes chaos out of which the universe emerges. Placing chamber in the center, protected by thick stone walls means that the chaos is contained, protected, and preserved. The converging beam of light that meets the center, along with its function for cleansing rituals, parallels the death, rebirth, and rejuvenation of the universe (Malville, 2014). While traditional Javanese houses don't provide the modulation of light that appeared in Ando's and Kahn's works because of its light materials, temples with its thick stone walls do (Figure 3).

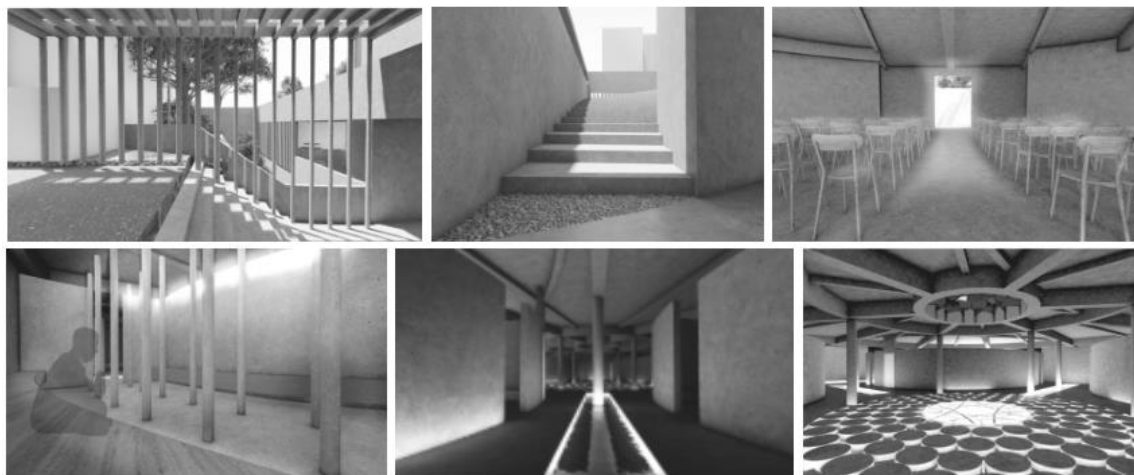


Fig.3: Spatial hierarchy based on light
Source: Author, 2019

d. Space and Time

For the Javanese, the house is a space or a composition of space where the geometric concept of space is not relevant. Therefore, space in terms of Javanese homes encompasses the aspect of the place, time, and rituals (Tjahjono, 1998; Kartono, 2005). Ando also states that spiritual architecture must show signs of the passing of time (Baek, 2009).

Architecture is experienced through a journey of the senses, specifically sight and movement. Movement, spatial sequence, and time create the fourth dimension of our perceptual realm (Barrie, 1996). The sacred architecture uses symbolic narration in line with rituals to reach a connection with the transcendent. There is always a path between the profane and the sacred, from the outside realm to the inside (Barrie, 2010).

Traditional Javanese houses use a linear path according to a hierarchy of light. The gate and porch act as a medium between the outdoor and the indoor. The *Pendopo* is where guests gather while the *Pringgitan* is for shadow puppet, or *Wayang*, performances for close friends and family. The *Dalem* is the family's living spaces and is the most sacred place, especially the *Sentong*

tengah, that is usually emptied out for the gods' dwelling space. The additional structure on the side or back of the house that is the *Gandok* is used as a toilet and kitchen.

Spatial configuration in Javanese houses appears to have elements of dualism or binary opposition. Elements of binary opposition are apparent between the outdoor and the indoor, left and right, resting and activity area, and male and female spirit. The division of male and female is evident in the *Dalem* area, where the *Sentong kanan* is reserved for male, and *Sentong kiri* for females. In wedding ceremonies, the bride and groom are seated in the *Sentong tengah*, with male and female guests divided on the right and left respectively (Kartono, 2005).

This division can also be found in events of *Wayang* performances, where the screen is placed across the *Pringgitan*. The puppeteer and equipment, along with male audiences, sits in the *Pendopo*, while female audiences watch from the *Emperan*, which is in the front area of the *Dalem*. This configuration emulates cosmic dualities found in Hindu-Buddhist philosophies. The female audience, watching only shadows, symbolizes the realm of the imagination or illusion, while the male audience symbolizes the real world (Figure 4). The *Wayang* performances are also divided between the left/west and the right/east. The puppets are placed on respective sides, according to the nature of its characters. The left is reserved for evil characters and the right for good (Kartono, 2005).

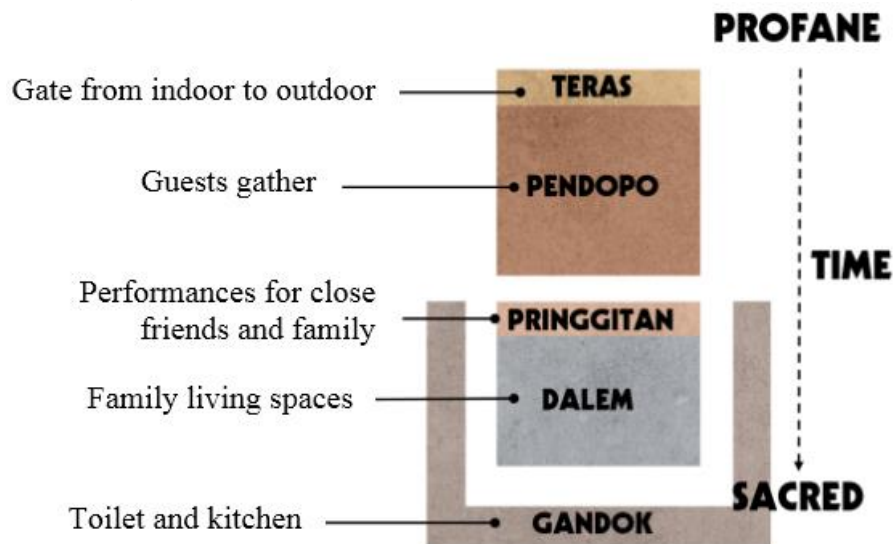


Fig.4: Spatial hierarchy according to a symbolic narrative

Source: Author,

In traditional Hindu-Buddhist architecture, the radial and circumambulating path is mostly used because of the mandala shaped plan. The radial path consists of a square that is quartered to symbolize the four quarters of the world, while the meeting point of the line is the *Axis mundi*. The circumambulating path, like in Borobudur temple symbolizes a respectful, gradual approach to the divine as one barely closing into the center or sometimes never reaching the center (Barrie, 2010).

Conclusions

Spiritual architecture brings abstract ideas into reality, using symbols to mediate the sacred and the profane. Traditional Javanese architecture could be employed to uncover timeless ideas, values, and beliefs of Indonesian culture that are buried in the collective unconscious. The process of bringing these ideas into reality, or type into the model, is dependent on the cultural context and time period.

Form emerges when the observer is conscious of mass and void. Form is materialized abstract ideas. Common form in Javanese typology is the hemispherical mound or stepped pyramid that symbolizes a mountain, the resting place of the gods and the connection between the

sky and the earth. The plan is usually in the shape of a mandala, which is an *Imago mundi* with an *Axis mundi* in the center.

Traditional Javanese houses respect Nature and the surrounding environment in accordance with the philosophy *Sangkan paraning dumadi*, which emphasize the harmony between Man, Nature, and the Cosmos. It's designed to let Nature in, in the form of wind and sunlight. Light is an essential part of Nature that breathes life into the building and reveals form. Javanese houses are laid out according to a spatial hierarchy based on light, with the *Dalem* being the darkest and the most sacred. This can be traced to the *Garbhagriha* of Hindu temples that is a replica of the cave inside Mt. Meru. Its darkness represents chaos out of which the universe emerges. The converging beam of light that meets the center symbolizes rebirth. The thick walls of the temple allow modulation of light like Kahn's works.

The Javanese concept of space is like that of the Buddhist. Space encompasses the aspect of the place, time, and rituals. Its spatial sequence creates a symbolic narration that is a path between the profane and the sacred. It starts with a gate and porch that separates the outside realm with the inside, then continues to the *Pendopo*, *Pringgitan* then *Dalem*, laying out a linear path from the profane to the sacred. Traditional Hindu-Buddhist architecture in Java consists of a radial or circumambulating path because of its mandala shaped plan. The meeting point of the radial path symbolizes the *Axis mundi* while the circumambulating path symbolizes a gradual approach to the divine.

This paper argues that harmony between mass and void, Nature and Man, light and shadow, and space and time can create spiritual architecture. The conclusion and finding are that harmony between dualities is essential in the design process of traditional Javanese spiritual architecture, in as much as in any good architecture that lends itself to creating spirituality. In the context of Jakarta, where such spirituality has been lost in the pursuit of modernism, a return to the roots of Javanese Architecture could pave the way to derive authenticity and identity as well as spirituality and cultural affinity which it is currently lacking and appears to continue to erode.

References:

- Ando, T. (1989) How to Deal with the Hopelessly Stagnant State of Contemporary Modern Architecture. In: *Tadao Ando, The Yale Studio and Current Works*. New York: Rizolli.
- Antariksa, T. (2001) Space in Japanese Zen Buddhist Architecture. *Dimensi Teknik Arsitektur*, 29(1), pp. 75-84.
- Asriningpuri, H. & Rochimah, E. (2018) *The Sundanese and Javanese House Local Wisdom to Respond to the Climate Changes*. s.l., s.n.
- Baek, J. (2009) *Nothingness: Tadao Ando's Christian Sacred Space*. New York: Routledge.
- Barrie, T. (1996) *Spiritual Path, Sacred Place. Myth, Ritual and Meaning in Architecture*. Boulder: Shambhala.
- Barrie, T. (2010) *The Sacred in Between. The Mediating Roles of Architecture*. New York: Routledge.
- Bronowski, J. (1971) *The Identity of Man (Great Minds)*. New York: American Museum of Natural History.
- Chang, A. I. T. (1981) *The Tao of Architecture*. New Jersey: Princeton University Press.
- Curl, J. S. (2000) *A Dictionary of Architecture and Landscape Architecture*. Oxford: Oxford University Press.
- Davies, J. G. (1952) *The Origin and Development of Early Christian Church Architecture*. London: SCM Press.
- Domenig, G. (2014) *Religion and Architecture in Premodern Indonesia. Studies in Spatial Anthropology*. Leiden: Brill.
- Dumoulin, H. (1988) *Zen Buddhism: A History, Japan*. New York: Macmillan Publishing Company.
- Eliade, M. (1959) *The Sacred and the Profane*. New York: Harvest Book.
- Frampton, K. (1991) *Tadao Ando*. New York: The Museum of Modern Art.
- Hien, P. (1998) *Abstraction and Transcendence: Nature, Shintai, and Geometry in the Architecture of Tadao Ando*, Cincinnati: University of Cincinnati.

- Jung, C. (1964) *Man and His Symbols*. New York: Doubleday.
- Kartono, J. L. (2005) Konsep Ruang Tradisional Jawa dalam Konteks Budaya. *Dimensi Interior*, 3(2), pp. 124-136.
- Karyono, T. H. (2016) *Arsitektur Tropis*. Jakarta: Erlangga.
- Koerniawan, M. D. & Suhendri, (2016) *Investigation of Indonesian Traditional Houses through CFD Simulation*. Bandung, UPI Publication Center.
- Kurokawa, K. (1988) *Rediscovering Japanese Space*. Tokyo: Weatherhill.
- Lobell, J. (2008) *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn*. 2nd ed. Boulder: Shambhala.
- Malville, J. M. (2014) Cosmologies of India. In: *Encyclopaedia of the History of Science, Technology and Medicine in Non-Western Cultures*. Dordrecht: Springer Science + Business Media.
- Marcus, C. C. (1971) *The House as a Symbol of Self*. Berkeley: University of California.
- May, R. (1960) *Symbolism in Religion and Literature*. New York: George Braziller.
- Prijotomo, J. (2010) *Arsitektur Nusantara: Arsitektur Naungan, Bukan Lindungan*. Ternate: Universitas Khairun.
- Rachmawati, M. & Mappajaya, A. (2012) Local Wisdom in Java's Architecture (Studied in Nature, Technology and Humanity). *Academic Research International*, 3(1), pp. 449-455.
- Russo-Netzer, P. (2018) Spiritual Development. In: M. E. A. K. L. F. & J. E. L. M.H. Bornstein, ed. *SAGE Encyclopedia of Life span Human Development*. California: SAGE Publications.
- Soekmono, R. (1995) *The Javanese Candi: Function and Meaning*. Leiden: E.J. Brill.
- Sunoto, (2017) Lingga Yoni Jejak Peradaban Masyarakat (Jawa, Bali) dari Perspektif Positivistik. *Bahasa dan Seni*, 45(2), pp. 155-169.
- Suseno, F. M. (2003) *Etika Jawa. Sebuah Analisa Falsafi tentang Kebijakan Hidup Jawa*. Jakarta: Gramedia Pustaka.
- Tjahjono, G. (1989) *Cosmos, Center and Duality in Javanese Architectural Tradition: The Symbolic dimensions of house shapes in Kotagede and surroundings*. Berkeley: University of California.
- Tjahjono, G. (1998) *Architecture. Indonesian Heritage*. Singapore: Archipelago Press.
- Trisno, R., Hanli, N., Kasimun, P. R. & Lianto, F. (2019) The Meaning of Means: Semiology in Architecture Case Study: Villa Savoye. *International Journal of Civil Engineering and Technology (IJCIET)*, 10(2), pp. 653-660.
- Trisno, R. & Lianto, F. (2018) The Meaning of Natural Lighting on Altar Case Study: Cathedral Church and the Church of the Light. *International Journal of Civil Engineering and Technology (IJCIET)*, 9(12), pp. 209-213.
- Trisno, R. & Lianto, F. (2020) A Liturgical Relation with the Spatial Configuration and Architectural Form of The Catholic Church. *International Journal on Advanced Science Engineering Information Technology*, 10(2), pp. 843-851.
- Wilber, K. (1979) *No Boundary*. Boston: Shambhala.