

Study of the 'Surface Structure' and 'Deep Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" in Jakarta

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Abstract The fundamental issue concerning churches in Jakarta today is the loss of the sacred value of buildings, especially since the construction of church architecture in Indonesia still imitates and adheres to Westernism from colonialism. The Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", Jakarta, was chosen in this study, because it is the main Catholic church in Indonesia and is a witness to the historical heritage of the Dutch colonial period. This research sets out a qualitative research method that employs a theoretical study approach to analysing the church building's surface structure, deep structure and direction of church building development. The novelty in this research is the idea of a design guideline for Catholic churches in Indonesia, which comes from the study of 'Surface Structure' and 'Deep Structure', in the form of structural form diagrams and Catholic church architectural theory. This is fundamental because the study of Catholic church architecture often focuses on styles, architectural styles, and decorative elements and does not even touch on *Nusantara* architecture. The findings of this theoretical study, based on qualitative research, indicate that Catholic church architecture must pay due consideration to the principles of tropical architecture that are applicable in this context: 1) Spatial structure, namely the composition of the physical structure, hierarchy, and spatial strata reflected in the volume as a spatial experience; 2) Landscape as a transitional space

between humans and their creations; and 3) Architectural elements that direct the signs and symbols of the faith.

Keywords Architectural Elements, Cathedral Church, 'Deep Structure', *Nusantara* Church, 'Surface Structure'

1. Introduction

Starting from political power and dominant Dutch colonial Figures who were Catholic, the construction of the first house of worship for the Dutch Indies Catholics was carried out under the leadership of the Roman Catholic Church in 1801, which is now named the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" [1]. The growth of Catholics in Jakarta encourages the growth of churches in Jakarta, which adopt them in unity with schools, monks, dioceses, and public spaces [2].

The phenomenon of Jakarta's development demands the elimination of city boundaries and an increase in spatial productivity, which leads to the loss of the sacredness of church architecture with "forced" development [3], as an example, in the form of placing churches in shophouses that are not under the liturgy of the Catholic church. Moreover, the current issue of Indonesian church architecture should not apply a church style that

superficially represents a certain era and country (for example, gothic style, carved ornaments, etc.) but needs to reflect the principles and uniqueness of locality by combining inheritance. The main church (The Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*") has the principles of *Nusantara* architecture and is a response to the city's development.

Based on this phenomenon, we will look for research gaps in whether this building is based on the spatial space inside to transform into an expression of building form [4].

2. Materials and Methods

2.1. Theoretical Review

2.1.1. The Essence of the Church as Sacred Architecture

Church comes from the Old English word *Cirice*, which means a separate place for those who believe in Christianity and also means the collectivity of Christianity. *Ekklesia* from Greece is also the definitive root of the church, which means meeting or congregation [5]. Ancient Gothic *kyriakon doma*, means the house of God, where *kryos* is the ruler, God [6]. Meanwhile, these two definitive roots are transformed into a basic understanding of the church, a place of worship for Christians or Catholics in the form of liturgy and religious traditions. From Old English, church means one of a Christian group that has beliefs and forms of worship, so that the church can be understood both as an organization and an architectural vessel; from here, the church can become both the subject and object of religion. Apart from determining its form, there is a duality in the meaning of the church as a public place and a sacred place. The church exists between dualities: public space and sacred space, as well as between the community and physical form [7].

As a public space, the church has become an urban catalyst in openly inviting the general public through serving the people. One of the church's goals is to expand by spreading the gospel through its holy book. "Therefore, go and make disciples of all nations and baptize them in the name of the Father and the Son and the Holy Spirit, and make them do all that I have commanded you" in Matthew 28: 19-20, sounds like God's commandments through the church to people [8]. Meanwhile, the sacredness of the church contradicts the concept of religious expansion, which is often associated with the exclusivity of a church with high religious qualities and minimal intervention from the general public.

The church is a sacred architecture because of its existence, which is intended to be a place of purification for believers through baptism [9]. The concept of sacred forms in the architecture of the Catholic church (see Figure 1) is very important to understand deeply [10]. The concept

of sacredness is formed from the liturgical process, which is interpreted by the existence of a relational relationship between function and the sacredness of its form [11]. Light can give a sacred impression, especially at the altar, and is the centre of natural forces as the climax of the church building [12]. The mass of the church building is centred towards the top as if directing us to God to support sacredness [13, 14].



Figure 1. Main Corridor of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*". Source: <http://www.image.google.com>, accessed on 29 January 2019

Baptism is not only meant as a ritual of validating a person as part of the Christian community, but it is also a procession of rebirth in a human from his mortal self to his former self [15]. As a sacred architecture, the church not only functions as a place of worship for certain people, it is also an act of becoming, which seeks to become holy [16]. This can be seen from several efforts by certain governments to build churches to both signify and "sanctify" the city territory and make it a "new" part of the city [15].

Therefore, in the context of sacred architecture, the church cannot simply be understood as a place of worship for Catholics. The church has a specific order and agenda with a long history of changing powers from various countries, organizations, and subjects [17]. However, this is increasingly felt to fade with the development of the times through capitalism, liberalism, and globalization, with the loss of city boundaries and the freedom of city people to choose. The next question must be about the church's role in the contemporary context. The sanctity of the church as a forum will determine the perspective of the people and the laity on the meaning of Catholic beliefs.

2.1.2. The Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*"

The Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" was built in 1810 as a simple chapel near Jl. Monday. Governor-General Daendels designated this chapel as a facility for the ministry of the Apostolic

Prefecture, which is the territory of the Catholic Church under the leadership of the Roman Catholic Church. This is part of the development of the politicization of the Netherlands, which is predominantly Catholic [18]. The change of power from Daendels to Commissioner-General Ghisignies aligns with the growth and needs of Catholics in Jakarta. Ghisignies mandated Ir. Tromp as an architect who constructed a 35 x 17-meter church named the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" with the inauguration in 1829. This church underwent several major renovations, namely in 1859 and 1890, which damaged the construction of the building. It was later rebuilt in 1900 with the title Cathedral Church. These events show the structural, architectural, and organizational transformations of the Cathedral Church, including the transformation of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" in a century and its comparisons with several architectural precedents for the Cathedral Church in the West.

It cannot be denied that the Cathedral Church is positioned as a mecca in the Catholic church architecture of a region or country. The styles, shapes, and elements of cathedral churches worldwide share several common threads due to colonialization, development at certain times, and, in particular, the influence of the structure of the Archdiocese of Rome. Starting from a chapel and becoming a one-story church with one corridor, now the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" is a two-story church with a cross-shaped corridor. Some of these components are the architectural principles of the dominant Cathedral Church in Europe (see Figure 2). As a post-colonial country, Indonesia has a derivative of Western architecture with a passion for studying and transcending it to create independent Indonesian architecture [19].

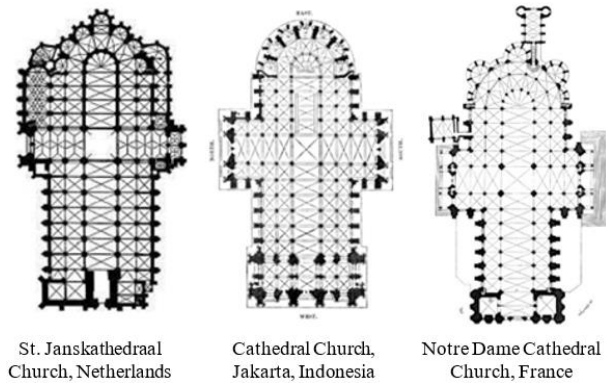


Figure 2. Comparison of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" with the Dutch and French Cathedrals Church. Source: <http://image.google.com>, accessed on 29 January 2019

2.1.3. The Catholic Church from the Perspective of *Nusantara* Architecture

Nusantara architecture is neither Western nor Eastern architecture; *Nusantara* architecture is another architecture which transcends the two polar oppositions, transcends modernity and tradition by defining "Indonesian architecture" as an aspiration of a hybrid, a cross-cultural production [19]. This argument aligns with the most influential Dutch architect in Indonesia, Van Rommond, who paved the way by placing the *Nusantara* architecture as "another architecture", where it should be separated from Western knowledge. Gunawan Tjahjono and Josef Prijotomo believe that the essence of *Nusantara* architecture is shady architecture, where taking shelter does not mean hiding or being isolated and lost from the environment; on the contrary, it opens itself up to the surrounding environment [20].

Church architecture as part of religion is a manifestation of limitation, an ethical boundary that defines what is acceptable and what is not [15, 21]. This contradicts the "unlimited" *Nusantara* architecture. As the embodiment of *Nusantara* architecture, the church should have made itself a place of shelter and protection for the people. The *Nusantara* church is a church that reduces to the smallest elements to form a roof as a shade, a column as a retaining structure, and a floor for activities to be carried out [2]; on the other hand, the *Nusantara* church expands itself from a building into an informal people's organization, a public space for the community, a playground for children, and a spiritual landscape for believers. It does not aim to make it a form of the splendour or luxury of a certain religious heyday; on the other hand, the *Nusantara* church should be an environmental catalyst by inviting rather than limiting, open rather than fencing, bowing rather than elevating and shading rather than isolating [11]. With this, the *Nusantara* church becomes another whole that moves from the Western church architecture but still heeds the principles taught for the survival of a community (see Figure 3) [22].





Figure 3. Left: *Nusantara Church* in Indonesia; Right: Church in the West. Source: <http://image.google.com>, accessed on 29 January 2019

2.1.4. Catholic Church from the Perspective of Southeast Asian Architecture

The Catholic Church in Southeast Asia is a church that considers the tropical climate, such as the Cathedral Church "*Santa Maria Pelindung diangkat ke Surga*". It can be seen in other churches, too.

a) Manila Cathedral Church (Minor Basilica of the Immaculate Conception)—Philippines. This church is one of the Philippines' oldest and most important Catholic churches. It is dedicated to Our Lady of the Immaculate Conception. The cathedral was built in 1581 and finally completed in 1958 [23] (see Figure 4).



Figure 4. Manila Cathedral Church, Philippines. Source: Minor Basilica and Metropolitan Cathedral of the Immaculate Conception, Manila (Dan) - Flickr.jpg [24]

b). St Joseph's Church, Victoria Street. The Portuguese mission built the church between 1906 and 1912 in the Gothic style. The church has been a huge part of Singapore's cultural heritage, and it's been restored quite a bit, and finished in 2022 [25] (see Figure 5).



Figure 5. St Joseph's Church, Victoria Street, Singapore. Source: Iglesia de San José Singapur, 2023-08-17, DD 16.jpg [26]

c). St. Anthony's Catholic Church, Kuala Lumpur, Malaysia. The Roman Catholic Church of St Anthony, located within the Archdiocese of Kuala Lumpur, was formally inaugurated on 21 September 1913, following a ceremonial blessing by the relevant authorities. Even though the church building was erected only in 1913, the parish was established in 1911. The distinctive Gothic architecture, characterised by its intricate stained glass and pointed arches, is a significant landmark that draws considerable interest from visitors. The resonance of the church bells accentuates the grandeur of the church structure [27] (see Figure 6).



Figure 6. St. Anthony's Catholic Church, Kuala Lumpur, Malaysia. Source: Welcome to the Church of St. Anthony [27]

2.2. Methodology

This research sets out a qualitative research method that employs a theoretical study approach to analysing the church building's surface structure, deep structure and direction of church building development. 'Surface Structure', and 'Deep Structure' are the methods used in investigating, identifying, and analyzing the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", through the timeline of church types in Indonesia, the precedence comparing the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" (globally-local) with embraced churches, deconstructing Cathedral Church elements from the environmental complex scale to architectural elements (walls, floors, doors, and the roof) [28] so that they can be formulated as guidelines for church planning in Jakarta and Indonesia. The investigation examines 1) External structure, 2) 'Deep Structure'; and 3) The development directions of 'Surface Structure' and 'Deep Structure'.

3. Results and Discussion

3.1. The 'Surface Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*"

The 'Surface Structure' is the outermost part that

encloses a building. The 'Surface Structure' is in direct contact with the architecture or the surrounding environment. This structure layer expresses activities in the building that represent the local context. As a cover, the 'Surface Structure' in the church context can have two opposite characteristics, namely, 1) Honest in representing the structure in the church or 2) Being a massive structure that isolates the sacredness of the 'Deep Structure' [29].

The Western Church, as a spiritual architecture, aims to maintain sacredness on the inside, sometimes using the 'Surface Structure' as a barrier between the outer and inner spaces. In this context, church architecture separates itself through 'Surface Structure'. Not infrequently, to represent the glorious era of Catholicism, the 'Surface Structure' has a meaning of symbolism and supremacy that does not fit the context of the city. This could mean that the church is a holy place that limits the city's mortality to an end when it crosses its door. However, the external structure also meant that the church was separate from the city, an anti-city church.

The Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", the 'Surface Structure' components can be identified with the naked eye through the neo-gothic architectural style and the use of grey plastered brick material by masons from Kwongfu, China (see Figure 7).



Figure 7. The exterior of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*". Source: Authors, 2019

However, these components can still be broken down into several architectural elements: towers, facades, doors, windows, walls, columns, and roofs. The 'Surface Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" not only functions to form the 'Deep Structure' but also functions as ornamentation and iconic element of the building, which is in line with the neo-gothic flow (see Figure 8). In the macro context, the 'Surface Structure' of the Cathedral Church affects the overall urban fabric by forming a spiritual wall through a disconnection with the surrounding context (see Figure 9).

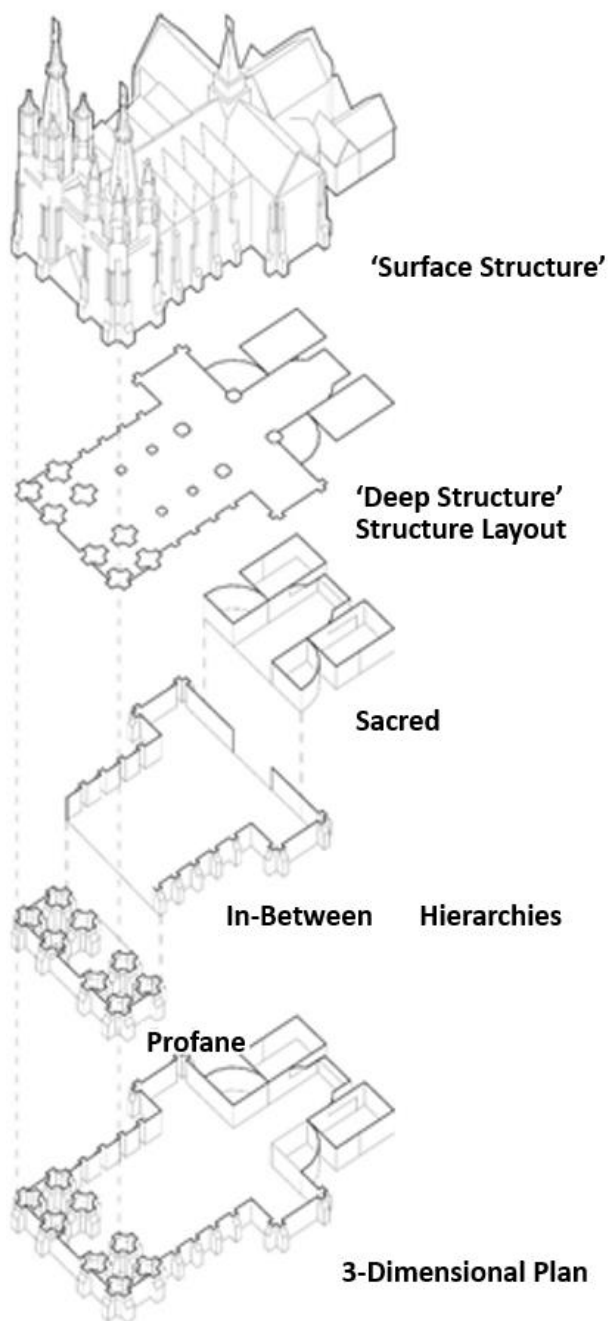


Figure 8. Separation of the 'Surface Structure' and the 'Deep Structure' of the Church of Cathedral "Santa Maria Pelindung diangkat ke Surga". Source: Authors, 2019

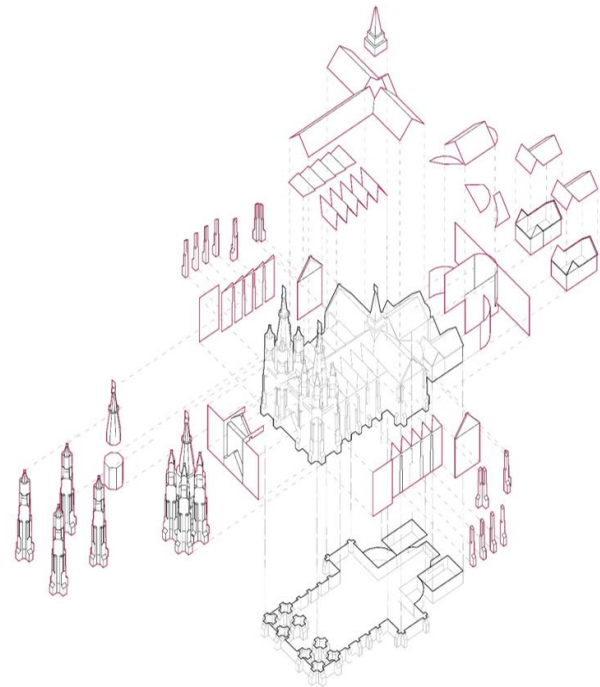


Figure 9. Surface Structure of the Church of Cathedral "Santa Maria Pelindung diangkat ke Surga". Source: Authors, 2019

The surface structure expresses the spatial space inside, the location of the altar position (Nave) is in the East, if in the morning then in the structure of the inner space especially in the Altar (Nave) there is light entering from sunlight, where the lighting on the Altar has a symbolic meaning as a representation of the light of Christ and the divine presence. This natural lighting can form contrast, dramatization, light balance, and visual hierarchy that directs the congregation's attention to the altar as the worship centre [12].

This morphology was adopted from several previous European churches, especially in Italy and France. Still, in these two countries, the church is an integrated structure with the city by placing a plaza in front of the church, determining the religious axis, and attaching spiritual architectural functions. This should be considered in the development of the Church of Cathedral "Santa Maria Pelindung diangkat ke Surga", as an orientation for church construction and a cardinal direction for the Catholic religious structure.

3.2. The Deep Structure of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*"

The deep structure of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" can be identified by separating itself from the 'Surface Structure' and dividing it into physical structures and church hierarchies. The entire physical structure of the Cathedral is divided into separate structures (columns) and integrated structures (beam and *poché*). In contrast, the hierarchical structure is divided

into geometric orders, hierarchical orders, and circulation. Although not completely structural, several components affect the 'Deep Structure' of the Cathedral, namely zoning, mass, and furniture as non-permanent elements. By revealing, analyzing, and identifying the components of the 'Deep Structure', the principles and essence of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" architecture will be achieved, which can be formulated as a guide for church development (see Figure 10).

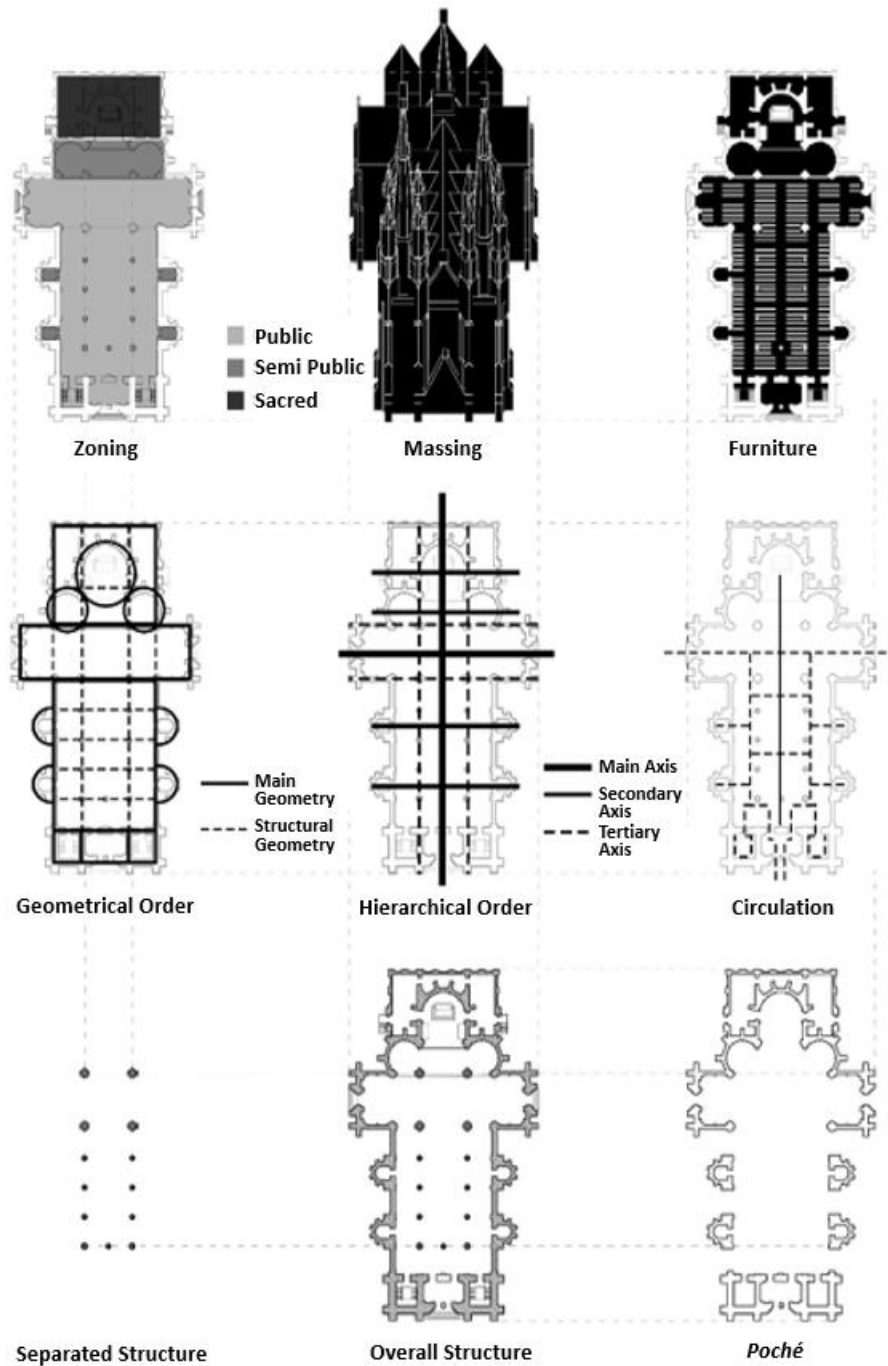


Figure 10. 'Deep Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*". Source: Authors, 2019

In a structural system, a separate structure (column) with a grid system plays a role in supporting the mass structure, but this is different from *poch é* as a structure that becomes a wall as well as a structure that unites the 'Surface Structure' and the 'Deep Structure'; *poch é* can be said to be an intermediate structure. Continuing to the hierarchical structure, the geometric order is formed by the main geometry, which forms the cross outline from a combination of circles on the altar and side *poch é* of the church, and structural geometry that connects the main geometries according to the structural grid. The hierarchical order in the context of the axis is constructed by: 1) the main axis is in the form of a cross with an intersection from the West (entrance) to the East (altar) and from the North-South (side entrance of the church) as an orientation of the hierarchy and the embodiment of Catholic ritualization in the church; 2) the secondary axis that crosses the four points connecting the eight semicircular *poch é* in view and lighting; 3) the tertiary axis as an outline of the basic shape of the building which is formed from the main axis and the secondary axis for the physical orientation of the building; 4) the construction of the building is such that thick brick walls are located on all sides. This results in the building being closed off from natural lighting and noise from outside. The presence of

dense and massive brick walls results in the expression of the surface structure reflecting the spatial expression of the deep structure; 5) the deep structure of the cathedral church, "*Santa Maria Pelindung diangkat ke Surga*", is reflected in its surface structure. The liturgical expression of this Catholic church (deep structure) is characterised by its adherence to the concept of ideograms [13].

The circulation of the building follows the hierarchical order and the building axis as well as the axis and arrangement of furniture, with the placement of stairs at each entrance to increase the position of the church compared to the surrounding environment and access to the church mezzanine from the *poch é* towers on the right and left of the foyer in front of the church. The zoning of the Cathedral Church is divided into the ritualization process and the sacrament of the church, which places the congregation at the front to the centre of the church as a public zone, a *poch é* for placing candles, and a statue to pray for the private but open to the public and the distance to the church altar as semi-public, then the sacred zone at altar and space at the back of the altar (the three zoning divisions are mapped during the church worship ritual). The last component, church furniture, is divided into two: the wooden chairs of the people and the altar table.

Table 1. Cathedral Church respondents were sampled from users and observers.

No	Research variable	Sacred	Neutral	Not Sacred
A	The Indicator of the Liturgical Function of the Cathedral Church (Interior)			
1	The presence of symbols in the form of sculptures and paintings on the inside adds to the sanctity	88.0%	10.8%	1.2%
2	Sanctuary (altar) is higher than others to feel sacred impressions	92.8%	7.0%	0.2%
3	The natural lighting on the altar gives a sacred impression	87.3%	10.5%	2.2%
4	Liturgical procession with an elongated axis and perpendicular to the Altar, gives a sacral impression during the liturgical procession	82.2%	16.3%	1.5%
5	Above the Altar, brighter than others, it will give a sacred impression	90.7%	6.7%	2.6%
6	The height of the building gives a monumental impression as God's house	85.2%	13.3%	1.5%
a	The average percentage of liturgical functions (Interior)	87.7%	10.8%	1.5%
B	The indicator of form expression result based on liturgical function (Exterior)			
1	The sacred expression is still obtained if it is outside the site	75.0%	18.7%	6.3%
2	The sacred expression is still obtained if it is on the site	70.2%	22.6%	7.2%
3	The symmetrical form expresses the sacredness	78.6%	18.4%	3.0%
4	The symbol of Saint Patron Mary can add to the sanctity of this church	83.4%	14.8%	1.8%
5	This Cathedral Church follows an ideogram	38.6%	45.2%	16.1%
b	The average percentage of form expression (Exterior)	69.2%	23.9%	6.9%
c	The total average percentage of liturgical functions and form expressions	78.4%	17.4%	4.2%

Source: Sacred Indicators of the Jakarta Cathedral Church, Indonesia, before the Second Vatican Council [30]

From the nine structural components in the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", several essences can be broken down and gathered, which will become the basis for a series of guidelines for church development in Jakarta and Indonesia, which will first be integrated with the local context. The validation that gives a sacred value to the Cathedral Church "*Santa Maria Pelindung diangkat ke Surga*" indicates the impression of sacred with a holy value of 78.4% from 331 respondents [30], which suggests that the surface structure and deep structure can be a guideline for the development of contemporary churches in Jakarta, Indonesia and Southeast Asia (See Table 1).

3.3. The Development Direction of 'Surface Structure' and 'Deep Structure' for the Next Church Building

The construction of the church, incorporating architectural elements of the archipelago, is exemplified by the Church of the Holy Cross. The architectural style of the archipelago draws from Javanese architecture, specifically the '*Pendopo* /Hall', which was designed by the architect and Catholic church priest, Romo Mangun Wijaya. The design incorporates Catholic church symbols and demonstrates meticulous attention to the spatial configuration of the deep structure sublimated on the surface structure [11] (see Figure 11).

The study of the 'Surface Structure' and the 'Deep Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" analyzes, identifies, and projects the possible development of the type of church in the future. This projection places the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" as a development guide that can be created under the context, the needs of the Catholic community, and no less importantly, the principles of *Nusantara* architecture. Therefore, there are some fundamental guidelines from the analysis of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", namely:

- **By zoning**, there is a zonal gradient from the front door to the altar, from the public (Narthex) to → semi-public (Nave) → sacred (Sanctuary), with a linear axis.
- **Hierarchically**, some main geometric axes and orders lead to the altar from several sides, and these

axes do not have to be crossed but are oriented towards the altar as the focal point of religious rituals.

- **Structurally**, there is a need for a structure that does not interfere with the seating position or the view of the temple altar. Structures integrated with architectural elements are utilized through *poché* as a medium informing structural and elemental spaces.

Then, it is necessary to consider several implementations of *Nusantara* architecture:

- **Walls or facades** of massive churches can be reduced by a pivot system or folding windows with the aim of opening and inviting light, especially at the Altar.
- **Landscaping** around can be united with the church as a ritualized sequence for a place of rest under the church liturgy. The garden can increase the sanctity of the church space as a representation of nature.
- **Orientation** is linear to the Altar.
- **Ornamentation** churches that use certain styles can be removed and further enhance the use of materials and landscape design as new church building icons.
- **Poché** can be developed as a unified structure, architectural elements, and space, as well as part of integrated furniture, to be able to form a prayer room structure that does not close itself off from the church.
- **A wide-span structure** or similar structures that reduce the number of columns in the centre of the church building need to be considered so as not to disturb the vista and the axis between the public zone (Narthex) to the sacred (Sanctuary).
- **The presence of natural light in the altar** indicates positive outcomes for the congregation. The orientation of the altar towards the east ensures that the congregation is exposed to natural light, which is believed to have a favourable influence on their spiritual well-being.
- **Symbols**, Catholic church buildings will have the symbol of the Patron Saint, the Stations of the Cross, the Pieta statue, which essentially reminds us of Jesus' struggle to liberate and save humanity.
- **The ideogram** may be defined as the three-dimensional liturgical process of the Catholic Church.

This guideline is recommended for architects, church administrators, stakeholders, and Catholic church observers to design Catholic churches.

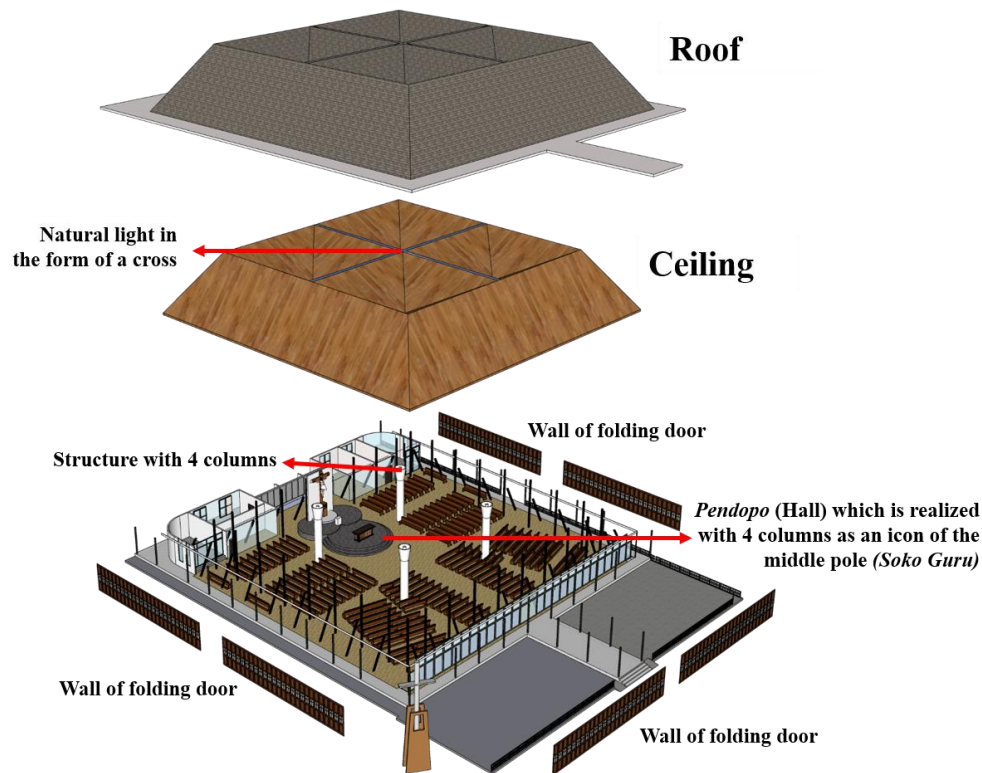


Figure 11. Catholic Church with Vernacular Architecture "Salib Suci". Source: Function-Form Relation of Neo-Vernacular Architecture of *Salib Suci* Church, Jakarta, Indonesia [11]

4. Conclusions

This research focuses on the study of the 'Surface Structure' and 'Deep Structure' of the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*", which investigates, identifies, and projects the 'Surface Structure' and the 'Deep Structure' of the church. The direction of the development of the 'Surface Structure' and structures in the cathedral church found that sacredness lies in the spatial experience, determined by the volume formed by the physical structure or, in other words, from the liturgical procession, which expresses the spatial sacred form. This elaboration has enabled the development of several aspects of novelty, which will inform future church guidelines and contemporary and vernacular architecture in Indonesia and Southeast Asia. These aspects include the zoning system, hierarchy and structure.

Studying the 'Surface Structure' and 'Deep Structure' that describes the Church of Cathedral "*Santa Maria Pelindung diangkat ke Surga*" opens up various opportunities for the specific development of church elements. Moreover, with this guideline, it is hoped that the next churches in Jakarta, Indonesia and Southeast Asia will be able to escape the shackles of the Western style and pay heed to ethnicity through its closeness to nature and position the church as a centre of activity equal to its community.

The research method of surface structure and deep structure can be carried out for Catholic churches and other places of worship. The findings of this theoretical study,

drawn from qualitative research, indicate that Catholic church architecture must pay due heed to the principles of tropical architecture applicable in this context: 1) Spatial structure, namely the composition of the physical structure, hierarchy, and spatial strata reflected in the volume as a spatial experience; 2) Landscape as a transitional space between humans and their creations; and 3) Architectural elements that direct the signs and symbols of the faith.

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REFERENCES

- [1] A. Heuken, 200 Years of the Catholic Church in Jakarta (200 Tahun Gereja Katolik di Jakarta), Jakarta: Cipta Loka Caraka, 2007.
- [2] Y. B. Mangunwijaya, Introduction to the Science of Architectural Forms, Their Philosophical Foundations and Practical Examples (Pengantar ke Ilmu Budaya Bentuk Arsitektur Sendi-sendi Filsafatnya Beserta Contoh-contoh Praktis), Jakarta: Gramedia Pustaka Utama, 2009.

- [3] Y. D. Srisadono, "The Concept of Sacred Space in Catholic Church Architecture (Konsep Sacred Space dalam Arsitektur Gereja Katolik)," *Melintas*, vol. 28, no. 2, pp. 182-206, 2012.
- [4] R. Trisno, D. Husin, F. Lianto and C. E. Hartoyo, "The Concept of Tent as a Temporary Architecture in the Millennium Era," *Space and Culture*, vol. 28, no. 2, pp. 252 - 262, 2025.
- [5] P. Simamora, "The Liturgical Meaning of Church Architecture: Exterior and Interior (Makna Liturgis Arsitektur Gereja: Eksterior dan Interior)," Fakultas Teknik Universitas Atma Jaya, Yogyakarta, 2014.
- [6] S. Huwaida, "Building Style of Gereja Katedral Jakarta (Gaya Bangunan Gereja Katedral Jakarta)," Fakultas Ilmu Pengetahuan Budaya, Program Studi Belanda, Depok, 2016.
- [7] M. A. Milton, "A Theology of Sacred Space: The Necessary Response to the Call to Sacred Assembly," 18 April 2024. [Online]. Available: <https://michaelamilton.substack.com/p/a-theology-of-sacred-space-e4a>. [Accessed 20 May 2025].
- [8] M. Chrisylla, "Symbolism in the Architectural Design of the Gereja Katolik Santo Petrus and the Gereja Katolik Santa Perawan Maria Tujuh Kedukaan in the City of Bandung," *ARTEKS: Jurnal Teknik Arsitektur*, vol. 1, no. 1, pp. 1-14, 2016.
- [9] N. Fitriyana, "A Brief History of the Early Church (Sejarah Singkat Gereja Perdana)," *Jurnal Ilmu Agama UIN Raden Fatah (JIA)*, vol. 15, no. 1, pp. 1-19, 2014.
- [10] R. Trisno and F. Lianto, "Catholic Church is the Divinity Symbol with the Case Study of Santa Theresia Church in Jakarta, Indonesia," *International Journal of Engineering and Technology (IJET)*, vol. 10, no. 3, pp. 865-872, 2018.
- [11] R. Trisno and F. Lianto, "Function-Form Relation of Neo-Vernacular Architecture of Salib Suci Church, Jakarta, Indonesia," *ISVS e-journal*, vol. 7, no. 1, pp. 49-54, 2020.
- [12] A. Meirose, "Light, Making the Intangible Tangible in Sacred Spaces," Ball State University Muncie, Indiana, 2008.
- [13] G. A. T. Hakim, P. Salura and A. L. Lukman, "Relationship between Architectural Design and Sacred Atmosphere in Reformed Church Case Study: GRII Bandung," *Arteks*, vol. 9, no. 3, pp. 465-475, 2024.
- [14] L. Utami, F. Lianto and M. Choandi, "Mother Teresa Catholic Church in Lippo Cikarang (Gereja Katolik Ibu Teresa di Lippo Cikarang)," *Jurnal kajian Teknologi*, vol. 10, no. 3, pp. 166-174, 2014.
- [15] P. V. Aureli and M. S. Giudici, *Rituals and Walls: The Architecture of Sacred Space*, London: AA Agendas. Architectural Association Publications, 2016.
- [16] M. Eliade, *The Sacred and the Profane*, Yogyakarta: Fajar Pustaka Baru, 2002.
- [17] L. Jones, *The Hermeneutics of Sacred Architecture: Hermeneutical Calisthenics, a Morphology of Ritual-architectural Priorities*, Cambridge, Mass, United States: Harvard University Press, 2000.
- [18] J. M. Laurens, "The Relationship between Form-Meaning Perceptual in Catholic Church Architecture in Indonesia (Relasi Bentuk-Makna Perseptual pada Arsitektur Gereja Katolik di Indonesia)," in *Forum Diskusi - Metodologi Penelitian Arsitektur*, Yogyakarta, 2013.
- [19] A. Kusno, H. Van Bergeijk and C. Hein, *Gunawan Tjahjono & Josef Prijotomo: Postcolonial Traditionality. Inaugural Speeches in the Built Environment: Global and Contextualised*, Delft: Delft University of Technology, 2017.
- [20] J. Prijotomo, *The Ups and Downs of Architecture in Indonesia (Pasang Surut Arsitektur Indonesia)*, Surabaya: Wastu Lanas Grafika, 2008.
- [21] D. R. Hoffman, *Seeking the Sacred in Contemporary Religious Architecture*, Ohio: The Kent State University Press, 2010.
- [22] K. Kusbiantoro, "The Relationship between Diversity, Spirit of Place, Primordial Religious Instinct, and Trans-Gender Architecture of Pohsarang Church: A Phenomenological Study," Universitas Katolik Parahyangan, Bandung, 2014.
- [23] M. Ramos Jr, "Manila Cathedral: An Architectural Revolution," 2016. [Online]. Available: <https://manilacathedral.com.ph/history>. [Accessed 29 April 2025].
- [24] Dan, "Minor Basilica and Metropolitan Cathedral of the Immaculate Conception, Manila (Dan) - Flickr.jpg," 5 May 2018. [Online]. Available: https://commons.wikimedia.org/wiki/File:Minor_Basilica_and_Metropolitan_Cathedral_of_the_Immaculate_Conception,_Manila_%28Dan%29_-_Flickr.jpg. [Accessed 29 April 2025].
- [25] F. J. Lopez and F. D. Lim, "Saint Joseph's Church, Victoria Street," 2023. [Online]. Available: https://en.wikipedia.org/wiki/Saint_Joseph%27s_Church%2C_Victoria_Street?utm_source=chatgpt.com. [Accessed 29 April 2025].
- [26] D. Delso, "Iglesia de San José Singapur, 2023-08-17, DD 16.jpg," 17 August 2023. [Online]. Available: https://commons.wikimedia.org/wiki/File:Iglesia_de_San_Jos%C3%A9,_Singapur,_2023-08-17,_DD_16.jpg. [Accessed 29 April 2025].
- [27] F. D. C. Devadass and P. Priest, "stanthonykl.com," Welcome to the Church of St. Anthony, 2025. [Online]. Available: <https://www.stanthonykl.com/about-us>. [Accessed 29 April 2025].
- [28] T. Thiis-Evensen, *Archetype in Architecture*, Norway: Norwegian University Press, 1987.
- [29] M. T. Evans, "The Sacred: Differentiating, Clarifying and Extending Concepts," *Review of Religious Research*, vol. 45, no. 1, pp. 32-47, 2003.
- [30] R. Trisno, F. Lianto, F. Liauw, D. Tangyong, I. M. W. Gegel and Y. Hata, "Sacred Indicators of the Jakarta Cathedral Church, Indonesia, before the Second Vatican Council," *Journal of Hunan University (Natural Sciences)*, vol. 49, no. 2, pp. 22-33, 2022.