



Design of the Main Gate of Institut Teknologi Kalimantan Based on Wayfinding

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Received: 01/February/2026

Accepted: 24/August/2026

Revised: 23/August/2026

Published: 31/August/2026

To cite this article:

Juliansyah, H., Membala, S., Oktaffenti, D & Putri, S.T (2026). Design of The Main Gate of Institut Teknologi Kalimantan Based on Wayfinding. *SPECTA Journal of Technology*, 10(2), 269-282. [10.35718/specta.v10i2.8481930](https://doi.org/10.35718/specta.v10i2.8481930)

Abstract

This study aims to design the main gate of Institut Teknologi Kalimantan (ITK) as a symbol of institutional identity and a starting point for the campus wayfinding system. The research employs a qualitative descriptive approach through field observations, precedent studies, identification of institutional values, and interviews with campus stakeholders. Observations were conducted to understand existing site conditions and accessibility, while precedent studies of several national and international campuses provided references for gate design. The analysis of institutional values emphasizes visual elements such as logos, color schemes, and typography, whereas interviews with campus leadership reinforce the dual function of the gate as both a landmark and a navigational system. The analytical results were systematically compared to yield a design synthesis. The findings indicate that the ITK gate design must integrate four main dimensions: institutional visual identity, navigational functionality, landscape integration, and security aspects. The synthesis of all stages generates a gate concept that is modern, futuristic, and contextual, serving a strategic role as a physical entrance as well as a symbolic representation of the campus. This study contributes to the development of campus gate design that functions not only as an entry point, but also strengthens the institution's image and enhances spatial orientation for users.

Keywords: campus gate, wayfinding, institutional identity, ITK, architectural design

1. Introduction

Institut Teknologi Kalimantan (ITK) is a public university located in Balikpapan, East Kalimantan. Its strategic position toward several ports, the airport, and main routes to the city center places ITK within a vital corridor connecting various regions in East Kalimantan (RTRW Kota Balikpapan, 2023–2043). As a campus situated in a rapidly growing area, particularly with the development of the Capital City of Nusantara (IKN), the design development of ITK's main gate becomes a crucial element that serves not only as physical access, but also as a representation of the institution's identity and the starting point for the campus orientation system.

The ITK campus sits on an area of ±57.9 hectares, comprising Rectorate and Office Building A, Faculty Buildings B, C, and D, Academic Lecture Buildings E, F, and G, Laboratory Buildings 1 and 2, a mosque, and student dormitories. The vast and decentralized spatial distribution of these buildings demands an effective wayfinding system so that students, academic staff, and visitors can easily identify locations and determine directions. However, in practice, campus development is carried out in phases according to budget availability, resulting in a wayfinding system that has not been comprehensively designed. According to Hantari (2020), this condition is common in many universities in Indonesia, where physical construction often precedes spatial navigation planning. In the architectural context, wayfinding is a strategic approach that holistically integrates spatial design, information systems, and user experience. Wayfinding is defined as the process by which individuals identify their position in a space and navigate through information gathering and decision-making (Arthur & Passini, 1992; Hantari, 2020). Implementing wayfinding principles in campus gate design allows for the creation of an intuitive, efficient, and aesthetically pleasing orientation system. In this regard, the gate functions not merely as a visual marker, but also as a navigational tool that facilitates mobility and reinforces the institutional image.

Along with the growing number of faculties and study programs at ITK, the construction of buildings and facilities continues to meet academic and operational demands. Initial observations indicate that the directional signage system at ITK remains suboptimal, as evidenced by new visitors struggling to identify locations and navigate the campus environment. Within this context, the main gate holds strategic potential as the initial element of an effective wayfinding system. According to Lynch (1960) in *The Image of the City*, spatial elements such as paths, edges, districts, nodes, and landmarks play a crucial role in forming the mental image of a place. A campus gate can serve as both a node and a landmark that reinforces spatial orientation and the campus's visual identity (Dharmawan & Rachmaniyah, 2021).

Previous literature demonstrates that campus gate designs in Indonesia generally emphasize different aspects. The study on the IPB University gate focused on traffic performance and intersection capacity (Pratomo & Hidayat, 2019), whereas the revitalization of the ITB Ganesha gate highlighted heritage aspects and material sustainability (Hapsari et al., 2022). On the other hand, international research by Arthur & Passini (1992) highlighted user disorientation in complex educational buildings due to intricate spatial morphology, yet it did not link the gate as an initial orientation solution. From this comparison, a research gap exists in that few studies have integrated wayfinding principles into campus gate design as a primary orientation element and institutional identity marker.

This study aims to describe the design process of ITK's main gate by integrating architectural design principles and wayfinding systems. The research also seeks to explain the spatial, visual, and functional considerations underlying the gate's development, thereby yielding a design that is not only visually iconic, but also inclusive, safe, and contextual with respect to the campus environment and the local culture of Kalimantan.

2. Methods

This study employs a qualitative descriptive approach aimed at designing the main gate of Institut Teknologi Kalimantan (ITK) based on wayfinding principles. This approach was selected as it enables the integration of functional, aesthetic, contextual, and institutional value aspects within architectural design (Creswell, 2014).

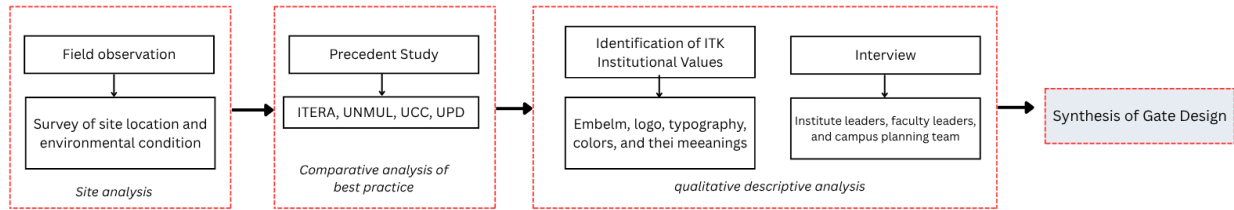


Figure 1. Research Flowchart
Source: Authors Analysis, 2025

2.1. Field Observation

The first stage was conducted through direct observation in the campus's primary access area. This observation encompassed a survey of the site and environmental conditions, including the road network, as well as a risk analysis for flooding and landslides. The objective of this stage was to understand the physical context and environmental characteristics that would influence gate design decisions. The observation results served as the foundation for the site analysis to determine the relationship between the gate and the circulation systems of both the campus and the city (Groat & Wang, 2013).

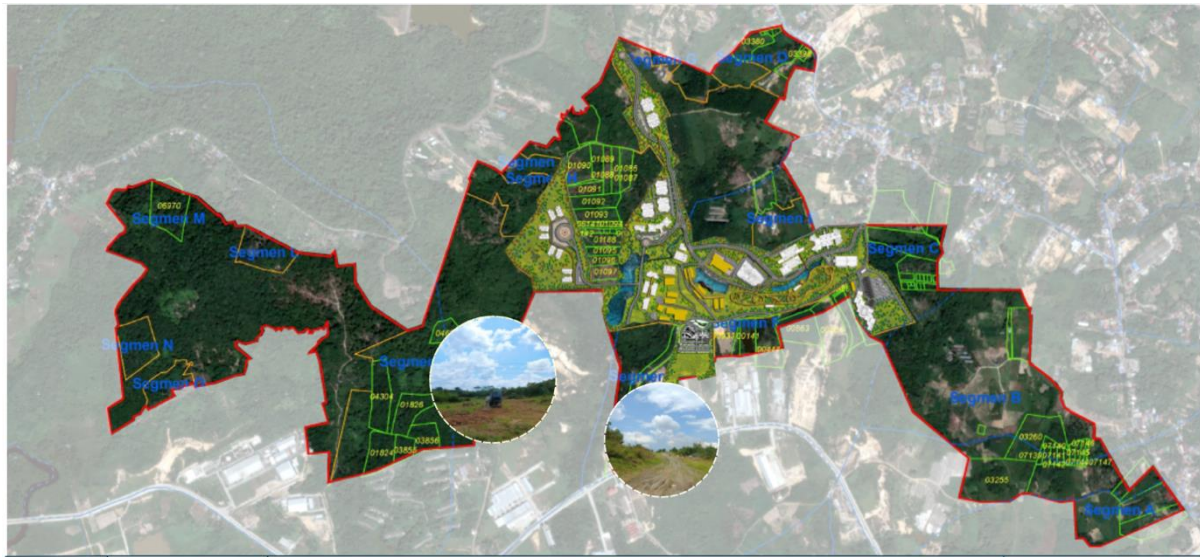


Figure 2. Research Area
Source: Authors Analysis, 2025

2.2. Precedent Study

The second stage involved precedent studies of four universities: Institut Teknologi Sumatera (ITERA), Universitas Mulawarman (UNMUL), University of Cape Coast (UCC), and University of the Philippines Diliman (UPD). The selection of these campuses as precedent studies was based on criteria concerning identity representation, landscape integration, and navigational functionality, thereby providing a relevant comparative overview. A comparative analysis was conducted to identify best practices in campus design, serving as a reference in formulating the design principles for the ITK gate (Hapsari et al., 2022).

2.3. Identification of ITK Institutional Values

The third stage focused on a symbolic analysis of ITK's visual identity elements, such as its emblem, logo, typography, colors, and their underlying meanings. This analysis was conducted to comprehend the institutional values intended to be represented through the gate design. This process employed a qualitative descriptive analysis approach by interpreting the symbolic meanings embedded in the campus's visual elements, enabling their translation into architectural forms that reflect ITK's academic character and futuristic technology (Lynch, 1960; Arthur & Passini, 1992). In accordance with the appendix of the Regulation of the Minister of Higher Education, Science, and Technology Number 36

of 2025 concerning the Statute of Institut Teknologi Kalimantan, the ITK campus gate design adheres to the provisions stipulated therein.

2.3.1. Emblem



Figure 3. Emblem

Source: Authors Analysis, 2025

- a) Institut Teknologi Kalimantan (ITK) features an emblem consisting of two rhinoceros hornbill heads, curved wings, and an open book.
- b) The upright and dominant hornbill heads emphasize confidence, intellectuality, leadership, and intelligence in developing advanced ideas for high-quality technology-based innovation and research. The hornbill is an important symbol in Kalimantan's Dayak culture, regarded as a representation of wisdom, freedom, and courage. It also symbolizes a close connection to nature and environmental sustainability.
- c) The curved wings symbolize creativity, adaptability, and continuous positive growth.
- d) The open book represents a source of knowledge, intelligence, and high-quality technology. The floral crown signifies excellence in quality and nobility in preserving and loving the environment.
- e) The six wing feathers symbolize ITK's establishment date, while the total of ten elements across the wings and hornbill heads represents the month of ITK's establishment, which is October.

2.3.2. Typographic Logo

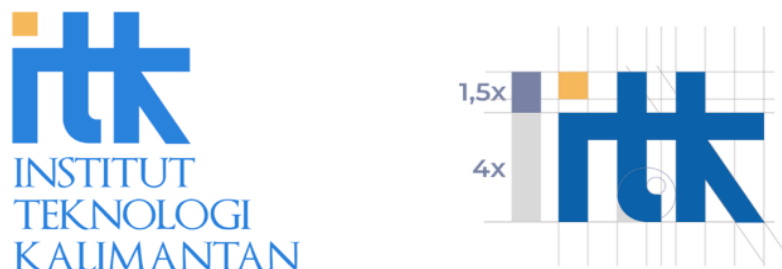


Figure 4. Typographic Logo

Source: Authors Analysis, 2025

This typographic logo serves as an alternative logo for ITK's promotional purposes within more casual contexts. It is utilized across various communication media, including souvenirs and official ITK merchandise. The logo was meticulously designed with careful consideration of both visual aesthetics and functional aspects.

2.3.3. Color and Their Symbolic Meanings

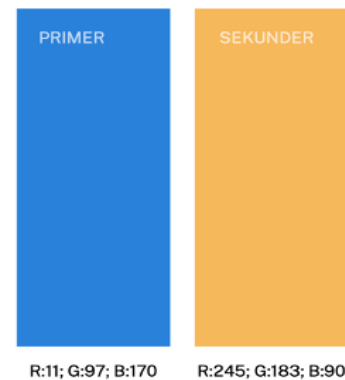


Figure 5. Institution Colors
Source: Authors Analysis, 2025

#2982DC (ITK Blue)

Symbolizes intellectuality, technology, and trust. The color blue reflects steadfast professionalism, symbolizing ITK's commitment to becoming a reliable center of innovation and knowledge.

F5B75A (ITK Yellow)

Symbolizes enthusiasm, creativity, and optimism. The color yellow represents youthful energy, a spirit of change, and hope for a bright future.

2.3.4. Faculty Identity Colors



Figure 6. Faculty Identity Colors
Source: Authors Analysis, 2025

FSTI (Faculty of Science and Information Technology) - #2F4DD3 (Bright Blue)

FRTI (Faculty of Engineering and Industrial Technology) - #D51919 (Red)

FPB (Faculty of Sustainable Development) - #009900 (Green)

Each faculty possesses its own supporting identity color that reinforces a sense of solidarity without superseding ITK's primary color scheme. The application of faculty colors must maintain harmony with the primary palette to preserve visual unity.

3. Result and discussion

The analysis of existing conditions in the study area reveals distinct characteristics, categorized into three segments. Segment 1, located on the existing southern side, features a compacted soil pavement condition with a width of approximately 6 meters and serves as the primary vehicular route from TPK Kariangau Road. Segment 2 functions as a transition area with a narrower width (around 3 meters), accommodating pedestrian and light vehicular traffic. Meanwhile, Segment 3, situated in the northern

section, leads directly toward the campus area, characterized by relatively good pavement conditions and denser surrounding vegetation.



Figure 7. Existing Condition Analysis of Research Field
Source: Authors Analysis, 2025

Furthermore, the flood risk analysis indicates that existing conditions fall into the moderate to vulnerable categories, particularly in Segments 1 and 2, which are situated in low-elevation areas near the primary drainage channel. This condition underscores the necessity for an improved drainage system and an elevated gate podium capable of anticipating water accumulation during high-intensity rainfall (Ikram & Sudibyo, 2025). Meanwhile, the landslide risk is relatively low in Segments 1 and 2, but increases in Segment 3, which is located in an area with steeper contours and dense vegetation. Consequently, the design of the gate and the identity tower must account for soil stability and an appropriate foundation system aligned with the topographic characteristics (Groat & Wang, 2013). Figure 1 illustrates the division of the access route into three segments based on physical conditions, each possessing distinct characteristics regarding width, length, and surface pavement type. Photographic documentation on the right panel substantiates the field findings by demonstrating variations in existing conditions, ranging from compacted soil paths to areas with dense vegetation and steep terrain.



Figure 8. Road Characteristics Analysis
Source: Authors Analysis, 2025

In addition, **Table 1** summarizes the measurements and observation results. These data serve as the foundational considerations for the design of the gate and access system, particularly regarding soil stability, safety, and integration with the topographic characteristics of the area.

Table 1. Road Condition Characteristics

Segmen	Panjang Jalan	Lebar Jalan	Karakteristik
Segment 1	314meter	6meter	The primary access route from the TPK Kariangau Road entrance, consisting of compacted soil pavement.
Segment 2	116meter	3meter	A pathway serving as a pedestrian walkway.
Segment 3	356meter	6meter	Compacted soil pavement with potential for conversion into a public transport route.

Source: Authors Analysis, 2025

Following the analysis of the existing conditions within the ITK campus area, precedent studies were conducted to gain insights and design references from other campus gates with similar characteristics. These precedent studies were carried out as part of a comparative process to identify best practices in campus gate design capable of integrating accessibility, institutional identity, and spatial orientation, as summarized in the table below.

Table 2. Precedent Studies

Lembaga	Karakter Gerbang	Identitas Visual	Integrasi Lanskap
Institut Teknologi Sumatera (ITERA)			
	Modern, minimalist, and clean.	Institution identity displayed in a contemporary way.	Green Landscapes and Public Spaces that supporting air circulation.
Universitas Mulawarman (UNMUL)			
	Symetry, monumental, with natural and vegetation composition.	Institution identity in a capital, bold and italic yellow color.	Dense vegetation, tropical forest typology and natural airflow.
Universitas Cape Coast (UCC)			
	Formal and functional inspection front gate.	Horizontal billboard beam displaying institution identity.	Integrated roundabout with landscapes and roadway identity.
Universitas Filipina Diliman			
	Iconic open gate displaying Oblation figure as landmark.	“University Avenue” road signage as institution identity.	Green colored gate, open, and harmonically plotted.

Source: Authors Analysis, 2025

Based on the identification results from the precedent studies of the four benchmark campuses, an effective campus gate design must fulfill four interconnected main dimensions:

1. **Institutional Visual Identity:** Encompasses the clarity of the name, symbols, and architectural elements that represent the campus character. This dimension functions to reinforce the institutional image and enhance the campus's visibility as a higher education institution.
2. **Navigational Functionality (Directional Orientation):** Relates to user orientation clarity, connectivity with the road network, and the support of directional signage systems. This element ensures that the gate serves as the starting point of a wayfinding system that guides mobility within the campus grounds.
3. **Landscape Integration and Environmental Context:** Emphasizes design harmony with local vegetation, climate, and topography. This integration is vital so that the gate operates not merely as a physical structure, but also as part of a landscape ecosystem in harmony with its surroundings.
4. **Physical Functionality and Security:** Includes traffic management, accessibility, and entry access control systems. This dimension ensures that the gate functions optimally as a control point for campus mobility and security.

From these comparative results, a conceptual research framework was established, built upon two main pillars: Institutional Identity and Integrated Wayfinding Systems.

Table 3. Conceptual Research Framework

Conceptual Pillars	Subcomponents	Research Aims
Institutional Identity	Campus name, logo, brand color, and architectural mass.	To enhance the campus's visibility and reinforce its image as a higher education institution.
Integrated Wayfinding Systems	Directional signage, pedestrian pathways, landmarks, and visual connectivity.	To facilitate user navigation and orientation from the campus entrance point.

Source: Authors Analysis, 2025

The framework derived from the previous case studies serves as the foundation for designing ITK's main gate. The gate is positioned not merely as a physical entry point, but also as a strategic element that shapes the spatial experience, reinforces institutional identity, and supports the overall campus navigation system. Furthermore, the findings from the precedent studies align with the results of interviews conducted with ITK stakeholders, including the vice rector, the planning team, and faculty leaders. They emphasized that the campus gate must fulfill a dual function, serving not only as an entrance but also as a symbol of institutional identity and the starting point for the directional system. This perspective reinforces the finding that the gate is a strategic element in establishing visual identity and facilitating spatial orientation.

Overall, the interview results corroborate the conclusions of the precedent studies, underscoring that the ITK gate must be designed by integrating institutional identity and an integrated wayfinding system as the primary design foundation. Moreover, the design transformation illustrated in **Figure 9** depicts the step-by-step development of the gate form a basic structure inspired by the roof slope of ITK buildings to a monumental architectural mass with blue and yellow facades that reflect the campus identity.

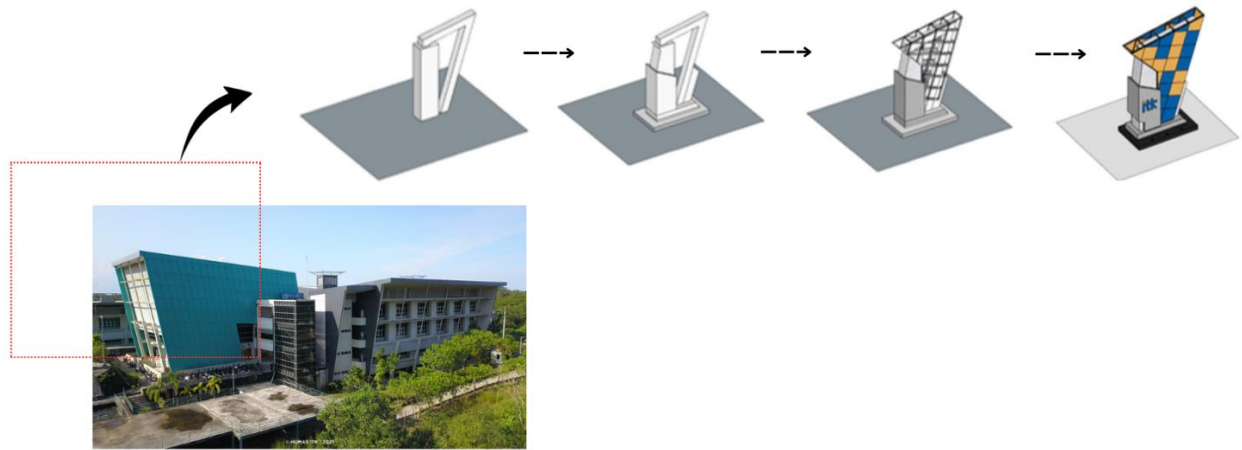


Figure 9. Mass Transformation of ITK Campus Gate Design

Source: Authors Analysis, 2025

The gate design of the Institut Teknologi Kalimantan (ITK) campus was developed through a progressive series of design transformations. The process initiated with a foundational form, an inclined structure inspired by the roof slope of ITK buildings which subsequently evolved into a monumental architectural mass, culminating in a refined facade finished with blue and yellow Aluminum Composite Panels (ACP) to mirror the campus identity.

1. Conceptual Phase

The conceptual phase utilizes a basic inclined form to generate a dynamic and futuristic gesture, aligning with wayfinding principles that emphasize form legibility and visual orientation (Hantari, 2020).

2. Functional Phase

The addition of concrete massing and a tiered podium reinforces the sense of monumentality while introducing a transitional public realm. This element complies with public open space standards as regulated in the Regulation of the Minister of Public Works and Housing Number 20 of 2021 concerning Special Function Buildings (Ikram & Sudibyo, 2025).

3. Construction Phase

The installation of a hollow steel framing system as the substructure for the ACP facade marks the transition from visual concepts to a practical construction system. This method supports sustainable design principles through the application of lightweight and weather-resistant materials.

4. Refinement Phase

The application of blue and yellow ACP panels, the integration of the ITK logo, and the incorporation of LED strip lighting enhance the campus identity and elevate the gate's visibility as a primary landmark. This is consistent with campus signage and wayfinding studies that emphasize visual integration with orientation systems.

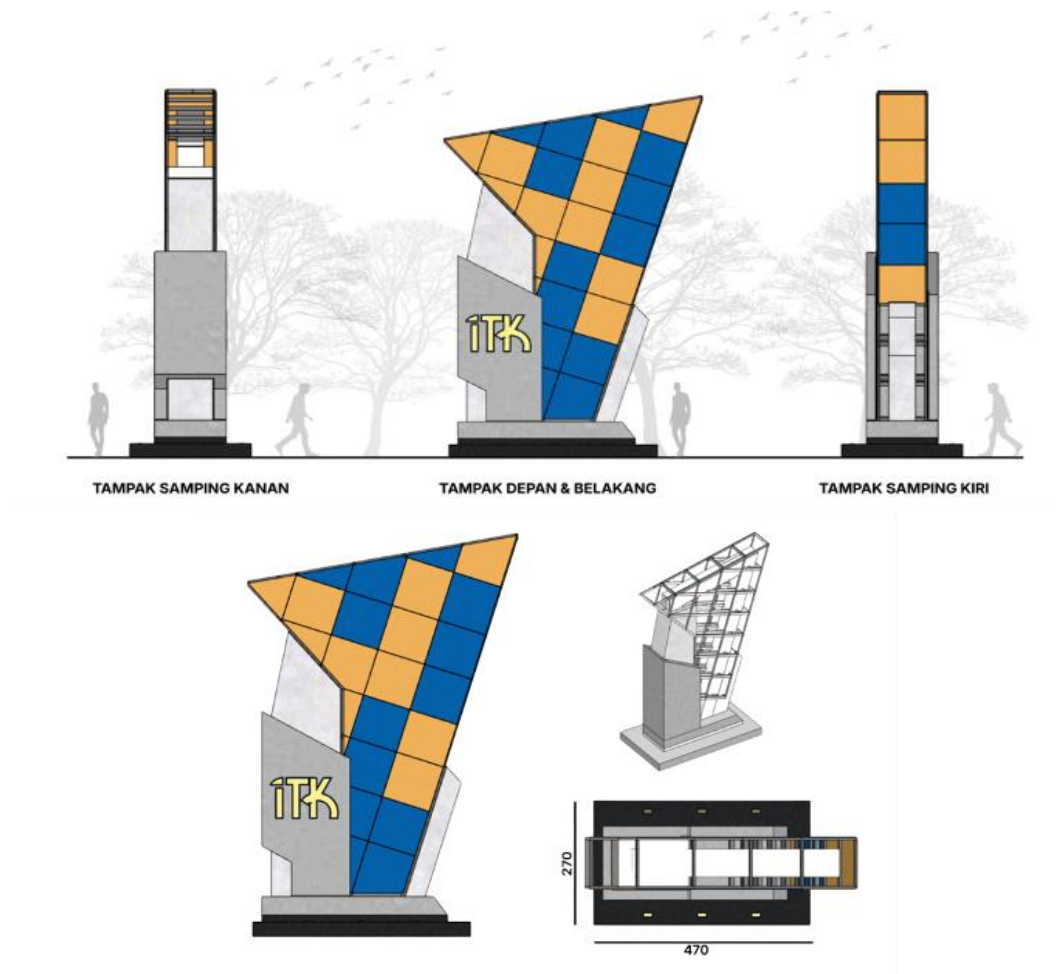


Figure 10. Campus Gate Design Visualization
Source: Authors Analysis, 2025

From a technical perspective, the primary structure utilizes reinforced concrete columns (150x100 cm for the main columns and 60x60 cm for the inclined columns), clad with 100x100 cm ACP facade panels supported by a hollow steel framing system. The integration of LED strip lighting along the inner corners enhances both night-time security and aesthetic appeal.

The design of the ITK Tower was subsequently developed as a spatial continuation of the main campus gate, serving as a vertical landmark that reinforces the wayfinding system and institutional identity. According to wayfinding studies, the presence of a distinct vertical landmark plays a pivotal role in aiding user orientation and consolidating the identity of an educational precinct (Nugroho et al., 2024). The design process initiated with the formation of a 3x3-meter base footprint, which was progressively developed into a 12-meter-high structure. The tower height was specified to ensure its effectiveness as an easily recognizable landmark from a distance, aligning with the principles of visual legibility in wayfinding systems (Ikram & Sudibyo, 2025).

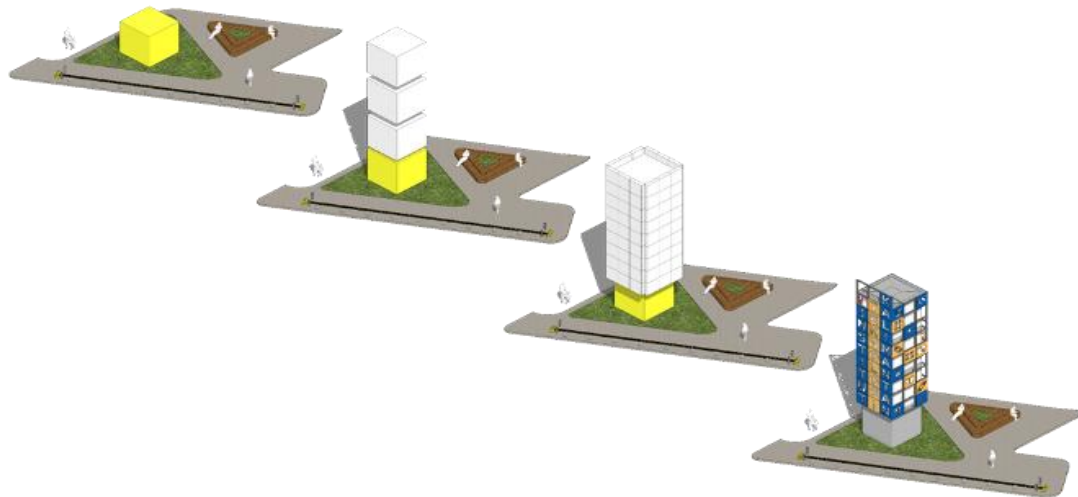


Figure 11. ITK Tower Design Transformation

Source: Authors Analysis, 2025

Furthermore, the tower is designed as a four-story structure. The ground floor functions as a control room housing electrical panels and campus landscape management operations, while the second through fourth floors serve as light emitters utilizing ETFE membrane materials embedded with LED lighting. This lighting integration supports ambient illumination while reinforcing the campus's visual identity at night (Fatriansyah et al., 2021).

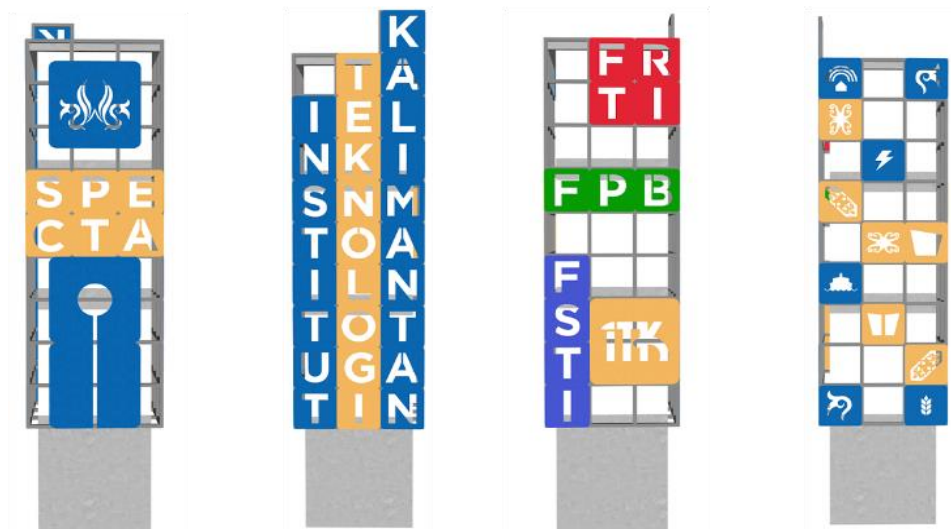


Figure 12. ITK Tower Elevation

Source: Authors Analysis, 2025

All four sides of the tower are designed with a secondary skin that conveys ITK's symbolism. The southern facade features the inscription “INSTITUT TEKNOLOGI KALIMANTAN” as the primary identifier. The eastern facade displays symbols representing ITK's four research centers, six Kalimantan cultural elements (the *Talawang* shield, rhinoceros hornbill, and *Batang Garing* tree of life), as well as representations of existing campus buildings. The northern facade features the slogan “SPECTA” alongside the updated ITK logo and a pointilist motif serving as a photo spot for visitors. The western facade displays the ITK logo along with its established faculties: the Faculty of Industrial Technology and Engineering (FRTI, designated in red), the Faculty of Sustainable Development (FPB, in green), and the Faculty of Science and Information Technology (FSTI, in bright blue).

The primary structure utilizes a cantilever system with reinforced concrete columns and beams, finished with exposed materials coated in a clear protective layer. The facade applies Aluminum Composite Panels (ACP) in sizes of 120x120 cm and 240x240 cm, supported by 10x10 cm hollow steel framing finished with polyurethane (*duco*) paint. The internal ETFE membrane layer is embedded with LED lighting to facilitate illumination functions.

The design extends to the development of a security post and automated gate barrier strategically positioned in front of the gate, ensuring complete visibility of inbound and outbound vehicular lanes. The placement and orientation of the security post are configured to maintain unobstructed circulation flow while serving as the primary control point for visitors and vehicles. Automated gate barriers are installed along the vehicular lanes, equipped with sensor systems, RFID, and digital access control. This integrated system enables selective access management, enhances site security, and delivers an efficient, orderly entry experience for users.



Figure 13. Security Officer Post Design

Source: Authors Analysis, 2025

Visually, the security post and gate barrier elements are seamlessly integrated into the overall gate composition. Supporting landscape features, such as trees, street lighting, and outdoor seating areas, further enhance a welcoming and orderly atmosphere. The addition of directional signage integrated with street lighting reinforces institutional identity and strengthens visual orientation functionality. Consequently, the design outcomes demonstrate that the security post and gate barriers serve not merely as technical components, but as integral elements of the campus's wayfinding system and spatial imageability.

Overall, the design of the gate, tower, security post, and gate barriers forms a cohesive composition that supports the campus wayfinding system. These elements function not only as physical infrastructure,

but also as visual communication media that reinforce institutional identity, facilitate mobility, and embody the academic spirit as well as the local wisdom of East Kalimantan.

4. Conclusion

This study demonstrates that the integrated design of the main gate, the ITK Tower, the security post, and gate barriers successfully fulfills wayfinding principles, institutional identity, security, and contextual responsiveness to the campus environment. The gate serves not only as a physical entry point but also as a symbolic representation of ITK's vision, mission, and academic culture. The ITK Tower enhances spatial legibility through a vertical landmark that conveys symbols of research, local culture, and university slogans. Furthermore, the security post and gate barriers ensure an effective security and access control system while remaining visually integrated with the overall gate composition.

From a technical perspective, the design complies with special-function building regulations through the application of durable materials, energy-efficient lighting systems, and inclusive circulation patterns. Symbolically, the incorporation of the logo, slogans, and local ornamentation reinforces the academic image while consolidating ITK's institutional identity. These findings highlight that the gate and tower are not merely architectural objects, but multifunctional visual communication media that integrate orientation, security, aesthetics, and cultural representation. Wayfinding-based design has proven effective in creating inclusive, secure, and meaningful transitional spaces, while providing an iconic infrastructure that represents ITK's academic spirit, innovation, and local wisdom (Fatriansyah et al., 2021; Qian & Yang, 2018).

Acknowledgments

The authors express their deepest gratitude to the Institute for Research and Community Services (LPPM) ITK for the financial support that made this research possible. Sincere appreciation is also extended to the ITK Smart City Laboratory for providing the platform, facilities, and guidance throughout the design and experimental processes. Furthermore, the authors would like to thank the campus stakeholders involved in the design process for their valuable input and collaboration. Special recognition goes to the research team, comprising faculty members and students, whose intensive collaboration across all research stages from conceptualization to the preparation of the final report was instrumental to this project.

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