

THE APPLICATION OF ICONIC DESIGN IN THE ARCHITECTURAL FORM OF THE VELODROME SPORT CENTER IN SURABAYA

Aditya^{1a}, Sigit Hadi Laksono^{2a}, Ika Ratniarsih^{2b}

^{1,2,3}Architecture Study Program, Faculty of Civil Engineering and Planning, Adhi Tama Institute of Technology
Surabaya, Indonesia

Email: sigitarci@itats.ac.id

Abstract. *The development of iconic architecture has become an essential approach in creating buildings that not only serve functional needs but also embody symbolic identity. The Velodrome Sport Center in West Surabaya is designed as an architectural landmark that reflects the spirit of modern cycling sports while adopting a postmodern theme with a macro concept of hi-tech architecture. The oval form of the building is derived from the transformation of a bicycle helmet, symbolizing speed, safety, and aerodynamic efficiency, making the structure both visually dynamic and contextually meaningful.*

The research method applies a qualitative-descriptive approach through literature studies on iconic architecture, postmodern theory, and hi-tech principles. Site analysis and conceptual synthesis are conducted to align the design with the physical context, user activity, and symbolic representation. The study emphasizes the relationship between structure, form, and material – particularly the use of exposed structural elements and ACP panel facades that highlight technological expression and aesthetic identity.

The result presents a Velodrome design that stands as an architectural icon for Surabaya. The application of an oval dynamic form supported by a hi-tech structural system creates a monumental yet functional space that enhances aerodynamic performance and visual distinctiveness. Through its exposed structure and material expression, the building achieves a strong postmodern identity, representing innovation and symbolizing the progressive image of the city.

Keywords: postmodern architecture, hi-tech architecture, iconic design, velodrome, cycling sports center, architectural identity.

1. Introduction

The concept of the iconic in architecture plays a crucial role in creating visual identity and symbolic meaning within a building. In contemporary discourse, iconic architecture is increasingly understood as a medium through which cities express their cultural and technological aspirations (Bal et al., 2023; Lindsay et al., 2025). Within the context of postmodern architecture, the iconic form is not merely an aesthetic element but also a communicative device that represents the values, function, and identity of a structure. This approach emerged as a response to the rigidity and uniformity of modernist design, which often prioritized functionality over expression. Postmodernism, by contrast, embraces freedom of form, diversity of expression, and the use of symbolism and metaphor to create buildings that are both communicative and culturally resonant (Abusaada and Elshater, 2024; Jiang, 2024).

The selection of an iconic form for the Velodrome in West Surabaya is driven by the intention to establish a strong architectural identity that aligns with its function as a cycling sports center. The building's design, inspired by the transformation of a cycling helmet, was chosen due to its direct correlation with the sport it represents. This aerodynamic oval geometry not only enhances the building's symbolic and aesthetic qualities but also contributes to its technical performance through improved airflow and efficiency. Such an integration of symbolism and technology reflects the current tendency in architectural design to merge visual meaning and structural logic into a unified form (Brozovsky et al., 2024; Tenório et al., 2024). The concept resonates with the techno-aesthetic approach discussed by Vasseghipanah, where advanced materials and construction methods serve both expressive and functional purposes (Vasseghipanah and Haghiri, 2024).

Furthermore, the application of the Hi-Tech architectural concept reinforces the building's iconic character through the exposure of structural elements and the use of Aluminium Composite Panels (ACP) on the façade. These materials offer a lightweight, reflective, and modern appearance, enhancing the building's dynamic and futuristic impression (Alsabbagh et al., 2024; Hasnat et al., 2025). The interplay between the building's visible structure and its technological components exemplifies how postmodern architecture can celebrate innovation while maintaining symbolic meaning. Ultimately, the Velodrome in West Surabaya transcends its role as a sports facility to become an architectural landmark—a representation of the fusion between technological progress, urban identity, and the expressive potential of postmodern design (Cocho-Bermejo, 2025; Cucuzzella et al., 2022).

2. Method

The research methodology used in this journal is qualitative-descriptive, supported by an analytical and interpretative approach toward postmodern architectural concepts and the application of iconic and hi-tech elements in the design of the Velodrome in West Surabaya. This qualitative approach focuses on interpreting architectural meaning, symbolism, and spatial logic rather than numerical data, allowing the research to explore how design decisions communicate identity and technological expression. As emphasized, qualitative methods are particularly suitable for analyzing the visual and symbolic performance of architecture, since they enable a deeper understanding of how iconic forms operate within cultural and technological contexts (Alaily-Mattar et al., 2025).

The study aims to understand how postmodern principles are adapted through form, structure, and technology to create a design that is not only functional but also symbolic and visually distinctive. In line, who highlights the growing importance of techno-aesthetic integration in contemporary architectural discourse, this research investigates how technological components—such as exposed structures and modern façade materials—contribute to both aesthetic expression and structural performance. The research process follows three primary stages: literature review, site and contextual analysis, and conceptual synthesis (Vasseghipanah and Haghiri, 2024).

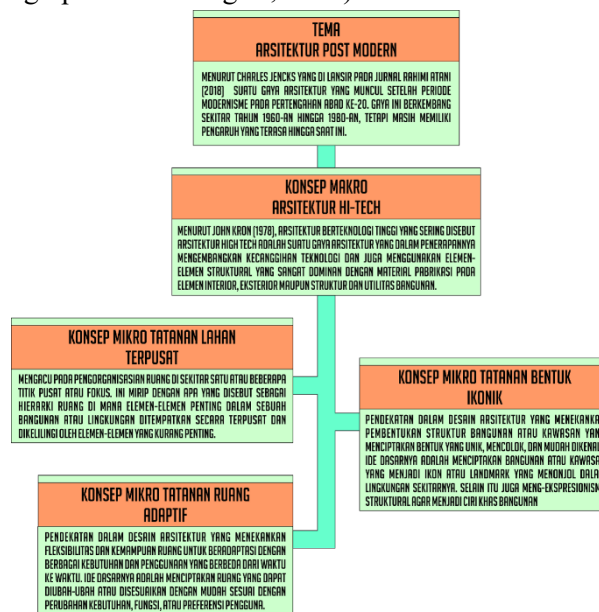


Figure 1 “Image of the applied theme table.”
Source: Personal Document

The first stage, the literature review, focuses on theories related to postmodern and hi-tech architecture, including discussions of symbolism, structural honesty, and the evolution of architectural façades. Studies such as Brozovsky and Tenório provide critical insights into the impact of digital and structural innovations in shaping modern architectural expression (Brozovsky et al., 2024; Tenório et al., 2024). Similarly, emphasize the role of Aluminium Composite Panels (ACP) in achieving lightweight, reflective, and energy-efficient façades, which directly inform the material considerations in the Velodrome’s design (Al-Kodmany and Ali, 2025; Hasnat et al., 2025).

The second stage, site and contextual analysis, examines the environmental conditions, building orientation, visual potential, and spatial relationship between form and function. This analytical stage ensures that the Velodrome does not merely stand as an isolated visual icon but is also contextually responsive. Consistent with Bal, who notes that architectural icons contribute to urban identity and public perception (Bal et al., 2023), the Velodrome’s design strategy reinforces its visual prominence while maintaining contextual harmony within Surabaya’s urban fabric.

The third stage, conceptual synthesis and design development, integrates theoretical and contextual findings into a cohesive architectural framework. This phase produces three key micro concepts: centralized land arrangement, adaptive spatial organization, and iconic form composition. The iconic form, derived from the transformation of a cycling helmet, represents the core conceptual narrative—symbolizing speed, motion, and protection. Its aerodynamic oval geometry not only reflects functional efficiency but also aligns with the theoretical framework of symbolic formalism (Jencks, 2017), which describes iconicity as the result of symbolic conceptualization, formal articulation, public legibility, and cultural legacy.

Through these methodological stages, this study demonstrates how postmodern architectural principles can be contextually and innovatively applied by merging technology, structure, and expressive form. The design of the Velodrome in West Surabaya thus represents a synthesis of theoretical understanding and practical application—uniting aesthetic value, functionality, and symbolism into an architectural work that embodies the progressive and expressive spirit of postmodernism.

3. Results and Discussion

These theoretical stages of iconicity are concretely applied to the design of the Velodrome in West Surabaya. In the conceptualization stage, the main design idea originates from the transformation of a cycling helmet, a symbol directly related to the building's function as a cycling sports center. This design use of metaphor and analogy in design stimulates architects' mental imagery and enhances the conceptual depth of architectural form (Abusaada and Elshater, 2024). The helmet, as a symbolic object, represents protection, speed, and motion—values inherently linked to the sport of cycling and reflected in the building's identity.

The oval, aerodynamic form inspired by the helmet generates a dynamic architectural mass that efficiently responds to airflow while reinforcing the symbolic connection between form and function. This approach resonates that an architectural icon must not only attract visual attention but also communicate meaning through recognizable forms tied to local identity and use (Bal et al., 2023). Furthermore, the fusion of technological expression and symbolic formalism defines contemporary techno-aesthetic practice, allowing the Velodrome to express precision and innovation through its aerodynamic geometry (Vasseghipanah and Haghiri, 2024). Thus, this stage fulfills the first principle of iconicity—an evident synthesis between form, function, and symbolism that transforms a simple metaphor into a powerful architectural statement.

3.1 Conceptualization of symbolic ideas

This stage represents the foundation of the design process — where the architectural form is infused with symbolic meaning. In the Velodrome Sport Center, the concept originates from the symbol of speed, safety, and motion found in the bicycle helmet, which becomes the metaphorical and formal inspiration for the building's overall geometry. The helmet, as both a protective and aerodynamic object, directly reflects the spirit of cycling while symbolizing human innovation and performance. This symbolic translation that metaphors and analogies serve as key cognitive tools in stimulating architectural creativity and enhancing design innovation.

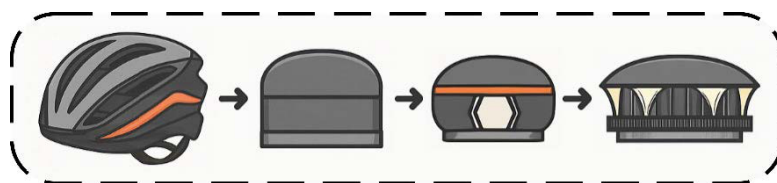


Figure 2 "Shape Transformation."
 Source: Personal Document

Within the postmodern framework, this transformation of a familiar object into a large-scale architectural form allows the building to communicate identity beyond its mere function. Architectural icons play a central role in shaping urban identity and public memory, where symbolism becomes a bridge between architecture and collective cultural meaning (Bal et al., 2023). In this context, the Velodrome not only serves as a facility for sports but also as an urban landmark that conveys the city's progressive aspirations. Furthermore, the contemporary architectural tendencies often use symbolic reinterpretation to establish morphological coherence between form, function, and urban context, a principle that is evident in the Velodrome's seamless integration of symbolic form and site orientation (Jiang, 2024).

The symbolic idea, therefore, bridges the physical domain (cycling sport) and the cultural dimension (urban identity), transforming the Velodrome into a representation of modern sportsmanship, technological progress, and civic pride. This conceptual synthesis reflects what describes as the performative aspect of iconicity, where architectural design achieves cultural resonance not only through physical visibility but through its capacity to embody symbolic narratives that extend beyond the building itself.

3.2 Formal and material articulation

This aspect focuses on how symbolic ideas are materialized into tangible architectural expressions through form, structure, and material. In the Velodrome, the Hi-Tech architectural approach serves as the main language that unites technology and aesthetics. The use of an exposed steel structure reveals transparency and honesty in design, allowing the framework to act as both a functional support and a visual statement of structural integrity. The structural legibility in contemporary long-span buildings enhances both technical performance and aesthetic clarity (Tenório et al., 2024). The aerodynamic oval form, inspired by the transformation of a bicycle helmet, embodies the essence of motion, speed, and energy, aligning perfectly with the dynamic nature of cycling sports.

Material articulation plays a crucial role in shaping the Velodrome's visual identity. The façade's Aluminium Composite Panels (ACP) further enhance this expression by emphasizing sleekness, precision, and technological advancement. ACPs are increasingly used in high-performance architectural façades due to their lightweight properties, reflectivity, and adaptability, which allow architects to create dynamic surfaces responsive to light and movement (Alsabbagh et al., 2024; Hasnat et al., 2025). This material selection reflects the building's intent to represent modernity and innovation, while its reflective surfaces establish a visual dialogue with the surrounding environment, regarding the evolution of façade typologies in contemporary practice (Cucuzzella et al., 2022).

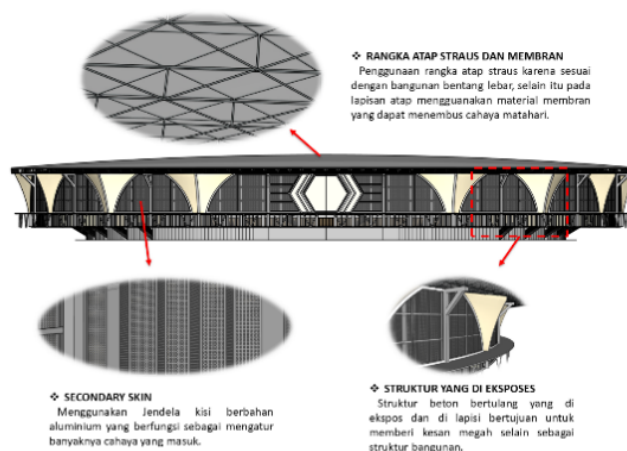


Figure 3 "Application image on building facade."
Source: Personal Document

From a postmodern perspective, this formal and material articulation transforms technical and structural elements into symbolic expressions of innovation and identity. The Velodrome is not merely a functional sports facility but an architectural statement where structure becomes ornament and engineering becomes art echoing notion of techno-aesthetics as the merging of performance and perception in architectural design (Vasseghipanah and Haghiri, 2024). The building's expressive framework, fluid geometry, and hi-tech materials together communicate a narrative of progress and creativity, positioning the Velodrome as a contemporary icon of technological beauty. Digital and structural innovation not only transforms construction efficiency but also reshapes architectural expression as a cultural artifact. Thus, the Velodrome stands as a testament to the fusion of form and function, celebrating both human ingenuity and the evolving language of postmodern hi-tech architecture.

3.3 Public legibility and visibility

An iconic building must be instantly recognizable and easily understood by the public. The Velodrome's aerodynamic form and the contrast between its sleek façade and exposed framework create a strong visual identity visible from multiple urban viewpoints. The legibility of iconic architecture is essential for strengthening urban identity and enhancing collective recognition within the city. The building's clear, streamlined form communicates its function cycling through an immediate visual metaphor. Architectural forms achieve cultural performance through their ability to capture public attention in both physical and digital spaces.

Visibility, on the other hand, is reinforced through scale, site positioning, and the integration of lighting

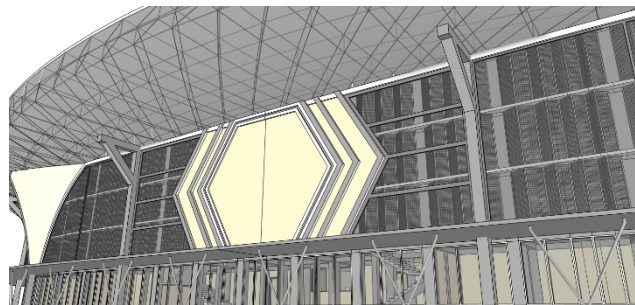


Figure 4 “The Facade Part That Makes The Building Iconic.”
Source: Personal Document

design, allowing the Velodrome to function as a civic landmark and an urban orientation point. Architectural visibility plays a crucial role in shaping urban morphology, contributing to spatial hierarchy and the perception of place within the city's visual structure. In this sense, the Velodrome's legibility and visibility work hand in hand — clarity of form ensures recognition, while its spatial prominence ensures presence. Thus, the architecture communicates effectively with both experts and everyday observers, embodying the postmodern ideal of accessibility, symbolism, and plural interpretation..

3.4 Cultural consolidation and legacy

Finally, the building's long-term cultural role defines its lasting legacy within the urban fabric of Surabaya. The Velodrome, with its iconic postmodern expression and embodiment of hi-tech architecture, stands as a powerful symbol of the city's modernization and evolving sports culture. Architectural icons play a critical role in shaping urban identity and public perception, serving not only as visual markers but also as expressions of collective aspiration. The Velodrome thus transcends its function as a sports facility. it acts as a cultural landmark that embodies civic pride, innovation, and progress. The building's distinctive oval form, inspired by the aerodynamic shape of a cycling helmet, resonates with Surabaya's aspiration toward dynamism and forward-thinking urban design.

This symbolic transformation bridges the realms of sports, technology, and art, creating a structure that manifests the “visual performance of iconic architecture” a synthesis of form, meaning, and public recognition. Through its exposed steel framework and Aluminum Composite Panel façade, the Velodrome also reflects as techno-aesthetics—the seamless integration of technological logic and aesthetic articulation in contemporary architecture. In this way, the Velodrome not only enhances the city’s skyline but also reinforces Surabaya’s image as a progressive metropolitan center where innovation and cultural identity coexist.

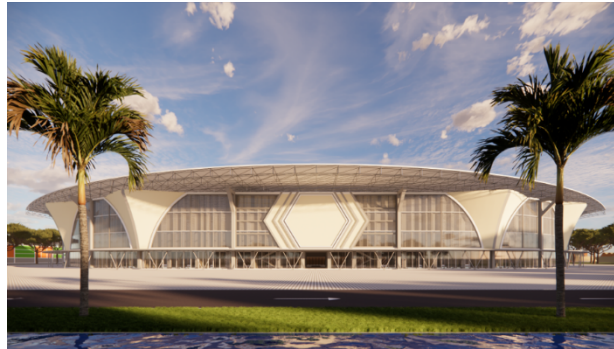


Figure 5 “Application Of Hi-Tech Architectural Elements.”
Source: Personal Document

Over time, the Velodrome’s innovative structural composition and symbolic form may inspire future architectural works in Indonesia. The development of long-span structural systems is instrumental in achieving both functional efficiency and expressive architectural character, which the Velodrome successfully demonstrates (Tenório et al., 2024). The role of advanced materials such as Aluminum Composite Panels (ACP) in promoting energy efficiency, durability, and aesthetic refinement factors that enhance the Velodrome’s lasting relevance in Indonesia’s architectural landscape (Hasnat et al., 2025).

Ultimately, the Velodrome contributes not only to Surabaya’s physical skyline but also to its collective memory and sense of place, the form and morphology of architecture significantly shape urban experience and identity. By uniting technological advancement with cultural meaning, the Velodrome establishes a new paradigm for contemporary Indonesian architecture one that values innovation, environmental responsiveness, and symbolic continuity (Jiang, 2024). In this synthesis of form, technology, and meaning, the Velodrome embodies the enduring legacy of postmodern architecture: where structure becomes symbol, and innovation becomes culture.

4. Conclusion

The conclusion of this study can be understood through the four stages of iconic architectural discussion: conceptual symbolism, formal articulation, public legibility, and cultural legacy.

At the stage of conceptual symbolism, the Velodrome Sport Center in West Surabaya successfully transforms the symbolic form of a cycling helmet into an aerodynamic architectural expression that represents speed, protection, motion, and technological advancement. This symbolic transformation strengthens the relationship between architectural form and building function, allowing the Velodrome to communicate its identity clearly as a cycling sports facility while embodying the spirit of contemporary postmodern architecture.

In terms of formal and material articulation, the application of the Hi-Tech architectural approach reinforces the building’s iconic character through the exposure of structural systems and the use of Aluminum Composite Panel (ACP) façades. The exposed structure demonstrates structural honesty and technological expression, while the ACP material enhances the lightweight, reflective, and futuristic appearance of the building. The combination of dynamic form, advanced materials, and visible structural

elements creates an architectural language that integrates aesthetics, technology, and functionality into a unified design expression.

From the aspect of public legibility and visibility, the Velodrome's recognizable oval form and strong visual presence establish the building as a clear urban landmark within the city of Surabaya. The aerodynamic geometry and expressive façade allow the public to immediately associate the building with cycling activities, making the architecture communicative and easily understood. Its strategic visual identity also contributes to strengthening the image of Surabaya as a progressive and modern metropolitan city.

Finally, in the context of cultural consolidation and legacy, the Velodrome transcends its role as a sports facility and becomes a representation of urban identity, technological progress, and civic pride. Through its symbolic and technological architectural expression, the building contributes to the cultural memory of the city while offering a new paradigm for contemporary Indonesian architecture. The study demonstrates that the integration of symbolic meaning, technological innovation, and contextual identity can produce an architectural icon that is not only functional and visually distinctive, but also culturally meaningful and enduring.

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