THE ARCHITECTURE OF AMBITION IN JAKARTA'S VERTICAL CITY

Thamrin Nine is not merely Jakarta's most ambitious development, it is a recalibration of how cities in Southeast Asia might confront sustainability, density, climate and complexity through architecture, engineering and data.

There is a temptation, when confronted with a development like Thamrin Nine, to begin with its statistics. Height, scale, capacity are all numbers that impress, certainly, but ultimately obscure something more important. What defines this project is not simply its magnitude, but its intent.

Jakarta is a city of contradictions. It is both expansive and compressed, vibrant yet burdened, a place where growth often outpaces infrastructure. Within this context, Thamrin Nine does not position itself as an isolated icon, but as a response, a deliberate attempt to rethink how density is organised and experienced.

RETHINKING THE MIXED-USE EXPERIENCE IN SOUTHEAST ASIA

The language of mixed-use development has long been a staple of Southeast Asian urbanism. It is, on paper, an elegant solution to density, stacking offices, residences, retail and hospitality into a single vertical composition.

In practice, however, it often becomes an exercise in proximity rather than integration. Functions sit adjacent to one another, connected by circulation cores and podiums, yet rarely engaging in any meaningful way. The result is often a vertical zoning diagram masquerading as urbanism.

Thamrin Nine sets out, quite deliberately, to challenge that model. Traditional mixed-use developments tend to prioritise destination – what a user arrives to consume, whether that be work, retail or leisure. Thamrin Nine, by contrast, is organised around activity.

"We wanted to take a different approach. Instead of focusing on what people come to get, we focused on what people come to do. This meant expanding the breadth and depth of uses within the complex and designing the experience around movement, activities and accessibility," Michael Wiener, Design Director for PT Putragaya Wahana explains.

The distinction here is subtle but critical. Expanding uses is not, in itself, novel. What is different is the insistence that these uses operate as an interconnected system rather than a collection of parts. Offices do not simply sit above retail, nor do hospitality functions remain isolated within their own vertical domain. Instead, the development is conceived as a layered environment in which programmes overlap, interact and reinforce one another.

This approach becomes particularly evident in the range of functions embedded within the project. A 4,500-seat live performance venue, extensive MICE facilities, residential units, indoor and outdoor sports and recreation spaces, and pedestrian-oriented public areas are all integrated into the masterplan. These elements are not treated as supplementary amenities but as essential components of a continuous urban condition. Together, they create a spectrum of activities that extends beyond the typical work-live-play triad into something more nuanced and dynamic.

FROM SYMBOL TO RESPONSIBILITY

In many large-scale developments, sustainability is introduced as an overlay, a set of strategies applied after the architectural language has already been defined. At Thamrin Nine, the approach is fundamentally different. Performance is not an addition to the design; it is the structure through which the design is realised.

Wiener makes this position explicit: "We see environmental sustainability and user satisfaction as closely connected. When spaces are more comfortable, intuitive and efficient, they benefit users and support stronger long-term value for owners and the city."

That logic informed the decision to pursue Singapore's BCA Green Mark certification, a benchmark, Wiener notes, "reflected Southeast Asia's priorities well, especially its emphasis on energy efficiency and water management."

Crucially, this was not a late-stage ambition. "Because the two objectives were interlinked, sustainability was embedded from the outset," he explains.

Embedding sustainability early has a tangible impact on how systems are conceived and integrated. The building envelope, for instance, is not simply an aesthetic skin but a critical component of energy performance. Curtain wall design is evaluated in terms of thermal performance, solar gain and daylight optimisation, reducing the load placed on mechanical cooling systems. By controlling how heat enters the building, the façade becomes the first line of defence in managing Jakarta's climate.

This, in turn, directly influences the MVAC strategy. With reduced heat gain, mechanical systems can operate more efficiently, maintaining comfort while consuming less energy. Wiener notes that Green Mark requirements influenced decisions across "curtain wall design and MVAC strategy to building controls, water management and site grading."

The integration of building controls further reinforces this system-wide approach. Rather than operating as isolated mechanical components, systems are coordinated through advanced control frameworks that regulate temperature, airflow and energy use in real time. This ensures that performance is not static but responsive, adapting to occupancy patterns and environmental conditions throughout the day.

Sustainability at Thamrin Nine extends beyond energy performance. Water management is treated with equal rigour. In a city where infrastructure is under pressure, Thamrin Nine incorporates extensive water harvesting systems that collect both building and site runoff. This reduces reliance on municipal supply while contributing to a more resilient urban water cycle.

The introduction of an organic bio-digestion water treatment plant extends this strategy further. By treating and returning clean water for both site and city use, the development operates not just as a consumer of resources but as a contributor to the broader urban system. Additional initiatives, such as working with tenants to collect and recycle used cooking oil, address environmental challenges beyond the building itself, reducing strain on Jakarta's overloaded sewer network.

"We view environmental sustainability as good business. Sustainable design delivers a better experience for users and greater economic performance through lower operating costs over time. This approach guided our decisions around high efficiency curtain walls, MVAC systems, building controls, lifts, escalators and other core systems," he adds. "Based on the systems installed, we are expecting a reduction of up to 20 percent in cooling and lighting costs," he notes.

Ali Badreddine, Vice President and General Manager at Johnson Controls reinforces this perspective: "ROI is delivered through reduced energy consumption, fewer unplanned outages and longer equipment life."

ENGINEERING PERFORMANCE IN THE VERTICAL EXTREME

Jakarta's climate is not forgiving. High humidity, persistent heat and dense urban conditions create a complex environment for building systems.

Badreddine describes the challenge succinctly: "High humidity, consistently warm temperatures and the operational complexity of a large mixed-use environment meant the cooling system had to perform efficiently and reliably under constant variability."

This variability is not incidental. It defines the operational reality of the building. Offices, hotels, public spaces and recreational areas each generate different load profiles, shifting throughout the day and across seasons. To respond to this, the engineering approach focused on ensuring that "the plant, controls and distribution strategy could support the broad range of commercial, hospitality and public spaces within Thamrin Nine."

As Badreddine notes, this marked "Johnson Controls' first chiller plant optimisation project in Indonesia", a point that underscores not only the technical ambition of the development, but also its role as a testing ground for advanced cooling strategies within one of Southeast Asia's most demanding climates.

That ambition is further reflected in the physical placement of the system itself. In conventional high-rise developments, cooling infrastructure is typically located closer to ground level, where access, maintenance and distribution are more straightforward.

At Thamrin Nine, however, the chiller plant is located on Level 55 of the Autograph Tower, making it the highest chiller plant installation in Indonesia and Southeast Asia.

Rather than treating this as a constraint, the design leverages height as an opportunity to rethink how cooling infrastructure can be distributed and optimised within a supertall building. The plant on Level 55 serves the mid and high zones of the tower, from Level 37 upwards, effectively dividing the building into operational strata that can be managed more efficiently.

The integration of the Luminary Tower's cooling plant adds another layer to this ecosystem. Designed and supplied by Johnson Controls, it uses premium efficiency YORK chillers supported by optimisation through the Metasys building management system. "Together, these plants form an integrated cooling ecosystem that is matched to how the development operates," explains Badreddine.

The plant employs an ultra-low pressure drop piping design with smooth bends and elbows to reduce losses and help achieve the Green Mark Platinum target of below 0.58 kW per ton of refrigeration. Equipment selection further reinforces this performance-driven approach. Based on the building's load profile, the Johnson Controls YORK YK H9 compressor centrifugal chiller was chosen for its efficiency and suitability at this capacity. The final configuration, combining three 878TR centrifugal chillers with one 475TR screw chiller, introduces a layered strategy for both performance and resilience.

Badreddine explains that this configuration "allows a single 878TR chiller to support both office and hospitality requirements while helping the owner optimise CAPEX without sacrificing reliability."

This vertical distribution is not simply a matter of convenience; it is a response to the physical realities of moving chilled water through a supertall structure. As Badreddine explains, "At 382.9 metres, vertical scale affects how cooling behaves across floors, from pressure differences to how loads shift between zones."

In practical terms, pressure differences in a building of this height can become significant. Without careful zoning, systems would either overcompensate, consuming unnecessary energy, or underperform, compromising

comfort. By segmenting the tower and positioning the chiller plant strategically, the system reduces the distance over which cooling must be delivered, stabilising pressure and improving efficiency.

The design of the plant itself reflects a similar attention to detail. An ultra-low pressure drop piping system, with smooth bends and elbows, minimises resistance within the network. This seemingly minor refinement has measurable impact, reducing the energy required to circulate chilled water and contributing to the project's ability to meet the Green Mark Platinum target of below 0.58 kW per ton of refrigeration.

The significance of this lies in how mixed-use developments behave in reality. Offices and hotels do not peak at the same time. Office loads are typically highest during working hours, while hospitality demand fluctuates throughout the day and into the night. By designing a system that can flex across these different patterns, the development avoids the need to oversize equipment for worst-case scenarios.

This is where redundancy becomes more than a safety measure. In many buildings, redundancy is treated as a passive backup, additional capacity that sits idle until something fails. At Thamrin Nine, redundancy is active and strategic. The ability for a single chiller to support multiple functions allows the system to operate more efficiently under varying conditions, while still maintaining reliability.

This balance between efficiency and resilience is critical in a development of this scale. A failure in cooling infrastructure would not simply affect a single programme, but potentially disrupt offices, hotels and public spaces simultaneously. The system must therefore be robust enough to handle both operational variability and unexpected events.

MANAGING HEAT AND HUMIDITY INDOORS

In a tropical environment, temperature control alone is insufficient. Humidity must also be managed to maintain indoor air quality and prevent mould growth.

"AHUs and FCUs were selected and sized to manage both sensible and latent load, enabling the system to remove moisture effectively rather than relying on temperature control alone. Johnson Controls also applied coil design principles to balance effective dehumidification with the elevated chilled water supply temperatures required for a more efficient chiller plant. This helps limit condensation, which is one of the main contributors to mould growth in warm environments," Badreddine explains.

"Since Thamrin Nine includes offices, hospitality spaces, sports halls and public zones, each area required a tailored IAQ approach. Higher activity or higher footfall zones were configured differently from quieter office floors or guest rooms. Real time monitoring gives the facility team visibility into indoor conditions so they can intervene early if humidity or temperature starts to drift."

ENERGY PERFORMANCE AND BENCHMARKING

Thamrin Nine achieves up to 30 percent energy reduction, a significant figure in the context of Jakarta's climate. "The up-to-30 percent reduction is the result of designing for real conditions," Badreddine states.

The system was engineered to meet below 0.58 kW/TR, with performance sustained through continuous monitoring and optimisation. The Green Mark consultant, G Energy Global, noted that the combination of their sustainability framework and Johnson Controls' optimisation enabled the building to exceed 30 percent energy savings and meet the required efficiency threshold.

DATA, PREDICTIVE INTELLIGENCE AND THE SHIFT TO PROACTIVE OPERATIONS

At Thamrin Nine, the intelligence of the building lies not only in its physical systems, but in how those systems are monitored, interpreted and continuously refined. The integration of Johnson Controls' Metasys Building Management System, alongside the broader Energy Management System and optimisation layer, introduces a shift in how performance is understood and maintained over time.

Rather than relying on reactive maintenance, where issues are addressed only after they emerge, the system operates on a predictive basis. As Badreddine explains, "the controls strategy looks at how temperature, occupancy, time of day and weather influence demand, and adjusts sequencing and setpoints accordingly."

This approach allows the building to anticipate changes in load behaviour before they become problematic. In practical terms, cooling output can be adjusted in advance of peak occupancy, rather than ramping up in response to rising temperatures or discomfort. The result is a more stable internal environment, achieved with less energy expenditure.

For facility teams, this represents a fundamental shift in day-to-day operations. Instead of responding to alarms or system failures, operators are presented with a continuous stream of performance data that highlights emerging patterns. Subtle deviations, such as sensor drift or early signs of equipment fouling, can be identified and addressed before they escalate into larger issues. As Badreddine notes, this capability "allows the facility team to intervene before there is any impact on guest experience," reducing unplanned maintenance and supporting consistent performance across critical spaces.

The structure of data ownership further reinforces this operational clarity. At Thamrin Nine, the building owner retains full ownership of all performance data, while Johnson Controls provides the analytical framework that translates that data into actionable insight.

"The EMS sits alongside the base building management system, and together they give the facility team a clear view of how the plant is performing across different load conditions," Badreddine explains.

This collaborative model ensures that decision-making remains both informed and grounded in operational reality. Insights generated by the system are not abstract metrics, but practical indicators that guide adjustments in sequencing, setpoints and maintenance strategies.

Importantly, this digital infrastructure is not static. The advanced instrumentation and analytics embedded within the development establish a foundation for future enhancements, including the potential integration of more advanced optimisation tools or AI-driven digital twin models.

EMBODIED CARBON AND FUTURE PHASES

While the current phase focuses on operational efficiency, there is growing attention to embodied carbon and lifecycle considerations.

"Johnson Controls is active in addressing embodied carbon across the built environment, including advancing the use of low carbon steel, material transparency, and lifecycle based design approaches," Badreddine explains.

He adds that "the building's strong digital foundation positions it well to incorporate embodied carbon assessment, material optimisation, and circularity considerations in future phases."

LESSONS FOR ASEAN MEGACITIES

Beyond its architectural and engineering achievements, Thamrin Nine positions itself as a response to the broader challenges facing Jakarta as a rapidly densifying city. Heat, congestion and air quality are not abstract concerns but daily realities, shaping how people move, work and inhabit urban space. In this context, the project's significance lies not only in what it contains, but in how it engages with the city around it.

As Wiener observes, "Jakarta continues to face heat, congestion and air quality challenges. Well-connected, activity-based districts like Thamrin Nine can support the wider urban fabric by concentrating amenities in walkable, transit-linked areas."

Equally important is how this internal complexity connects to the city beyond. Thamrin Nine is positioned at the centre of a transit-oriented district anchored by the Dukuh Atas MRT Station, "and that connectivity was fundamental to our urban vision," says Wiener.

This concentration of functions is critical. By bringing together offices, hospitality, residential units, cultural venues and public spaces within a single, transit-oriented environment, the development reduces the need for fragmented, cross-city movement. The emphasis on walkability and accessibility allows users to navigate between different activities without relying heavily on private vehicles, contributing, even in incremental ways, to easing congestion and reducing emissions.

"This and other actions go beyond what was required for Green Mark and demonstrate Thamrin Nine's commitment to improving the city as a whole," Wiener notes.

In this sense, Thamrin Nine operates as both a building and a prototype. It demonstrates what is achievable when sustainability, user experience and long-term operational thinking are aligned from the outset. As one of the first developments in Indonesia to adopt the Singapore BCA Green Mark Platinum standard, it also establishes a precedent for how international benchmarks can be applied within Jakarta's specific climatic and urban context.

"We believe Thamrin Nine demonstrates what is achievable when sustainability, user experience and long-term operational thinking are aligned from the beginning," Wiener states.

As Jakarta continues to grow vertically and in density, developments like Thamrin Nine contribute to a broader regional conversation. By demonstrating that a development of this scale can deliver high levels of performance within a tropical, high-density environment, it challenges assumptions about what is feasible in Southeast Asian cities.

It suggests that the standards often associated with cities such as Singapore, Hong Kong and Tokyo can be adapted and realised within Indonesia, not as imported models, but as locally grounded solutions. Ultimately, the future of Thamrin Nine lies not only in its continued operation, but in its ability to inform what comes next.

As Wiener reflects, "If Thamrin Nine represents a new benchmark, the next step is to continue broadening the definition of mixed use so that future developments contribute even more directly to liveability, sustainability and the city experience."

THAMRIN NINE

Design Architect commercial:
KPF, New York City

Design Architect (residential):
WATG, Singapore

Architects of Record:
PAI, Jakarta and Airmas, Jakarta

Structural Engineers:
Magnusson Klemencic, Seattle and Wiratman, Jakarta

Landscape Designer:
Coopers Hill, Singapore

Water Feature Designer:
Fluidity, Los Angeles

Interior Designers (hospitality):
GA, London and HBA, Singapore and KKS, Singapore

Interior Designer (retail):
Genius Loci, Jakarta

Façade Engineering:
Meinhardt, Singapore

MEP Engineers:
Meinhardt, Singapore and Jakarta

Sustainability Consultant:
G-Energy, Jakarta and Singapore