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Merdeka PNB118 Case Study: Adding Value to the Growing City | Merdeka PNB 118 案例分析：为不断进步的城市注入新价值



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Karl is a founding director of Fender Katsalidis, which has gained a reputation as one of Australia's leading design firms working throughout Australia and internationally. As design director, he has been involved in major projects, including Eureka Tower and most recently Australia 108, two of the tallest buildings in Australia. Karl has previously been a State Chapter and National President of the Australian Institute of Architects and is current Board Member of the Institute Foundation.

卡尔范德是Fender Katsalidis 建筑事务所创始人总监之一，该事务所在澳洲全国及国际有着卓越声誉是澳洲最有名的设计事务所之一。身为设计总监，他一直参与重大项目，包括尤里卡塔和最近的澳大利亚108这澳大利亚最高的建筑之二。卡尔此前担任过澳大利亚建筑师协会的国家分会的主席，现任研究院基金会董事会成员。



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Before joining PNB Merdeka Ventures as a Chief Executive Officer (CEO), Mr. Aziz Tengku Mahmud was the Head of Property Development of Sime Darby Property Bhd. He is the president of FIABCI-Malaysia and a member of the CTBUH, Institution of Engineers Malaysia and Malaysian Institute of Management.

在担任PNB默迪卡创投首席执行官（CEO）之前，他是森那美产业有限公司的房地产开发的负责人。他是世界不动产联盟马来西亚地区总经理，也是CTBUH、马来西亚工程师协会、马来西亚管理机构协会的成员。



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Mr. Ramstedt's career has included the development of large corporate campuses as well as the management of high-rises, R&D centers and high-tech manufacturing facilities within the United States and several locations abroad. He has held various senior level positions in operations, purchasing, estimating and preconstruction.

蓝斯特 该大型开发案包括指标性的118层高的默迪卡PNB118大楼。他的职业生涯包括在美国和其他几个国外地区的大型产业园区的发展和高层建筑、研发中心、高科技生产设施的项目管理。他曾任管理、采购、预算、投标等部门的高阶职位。



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他是马来西亚首都吉隆坡独立遗产大厦项目的设计和工程经理。作为一名注册建筑师，他在西雅图和纽约开始职业生涯，并曾在纽约参与过许多教育、医疗和实验室项目。他是美国建筑师学会和LEED AP的成员。

Abstract | 摘要

Tall buildings embody objectives ranging from pure business to nation building. The KL118 Tower in particular represents these objectives and more as it successfully knits together cultural and social needs into the urban fabric to revitalize a historically significant, but sometimes forgotten neighborhood, and creates a model of urban living. The completion of this project will demonstrate the client's and designer's vision of creating an urban, sculptural testament to the aspirations of the Malaysian people. KL118's dynamically intertwining geometries represent the complete weaving of culture and community. Complex community and regulatory, cultural and commercial challenges are balanced to make this project a model city within a city. Values are enriched by weaving best practices in environmental, transport, connectivity and livability within the tower. The development extends and expands on the surrounding metropolis, and enhances and demonstrates future ambitions.

Keywords: Kuala Lumpur, Malaysia, Merdeka PNB118, PNB Merdeka Ventures, Warisan Merdeka

高层建筑有着从纯粹商业到民族建筑的多样目标。KL118塔尤其代表了这些目标，它更将文化和社会需求结合编织到城市肌理里以复兴历史价值，但有时忽略了社区，创造出新的城市生活模式。该项目的完成将阐述客户和设计师创造城市的、雕塑的圣约以激励鼓舞马来西亚人的愿景。KL118的动态交织的几何形状代表着文化和社会的完全编织。复杂的社会和法规、文化和商业挑战得到平衡，并使这个项目成为一个在城市内的城市模型。其价值被编织在塔内的环境、交通、连通性和宜居性的最佳实践丰富了。该开发项目向周边大都市延伸并扩大，增强并展示未来的野心。

关键词：吉隆坡、马来西亚、默迪卡 PNB118、PNB Merdeka Ventures、独立遗产大厦

"As a part of the Greater Kuala Lumpur initiatives under the Economic Transformation Program that the government launched in 2010, the Warisan Merdeka urban renewal development project will generate primary and secondary economic spin-offs for our country." – Prime Minister Dato' Sri Mohd Najib bin Tun Abdul Razak

“正如政府在2010提出的经济转型计划中所包含的大吉隆坡倡议，Warisan Merdeka 都市更新发展计划将为马来西亚的经济创造更多更新的契机” 马来西亚首相，拿督斯里哈吉穆罕默德·纳吉·敦哈吉阿都·拉萨

开发计划简介

Merdeka PNB 118 为Warian Merdeka 复合式开发计划的中心项目，势将城为吉隆坡的象徵。Permodalan Nasional Berhad (PNB) 於2000购入这占地19英亩的基地后，Warisan Merdeka 便以3阶段开发方式进行，并将于2024年完成。这片广大的基地包含了马来西亚于1957宣布独立的场地、极具历史价值的独立运动场 (Stadium Merdeka)以及1962完工的国家体育馆 (Stadium Negara)。过去60年这块土地曾用于民生，教育及文化等用途；有一段时间是公园，90年代后期，在一个半途而废的发展开发计划失败后，这块土地便荒废了。PNB 当初取得这块土地，主要任务便是保留马来西亚独立的遗产并同时为这地区注入新的活力（图1）。

Introduction of the Development

Destined to be the next great icon of Kuala Lumpur, Merdeka PNB118 is the centerpiece of the Warisan Merdeka mixed-use development. Situated on a 19-acre parcel of land purchased by Permodalan Nasional Berhad (PNB) in 2000, Warisan Merdeka is being constructed in three stages and is expected to be fully complete in 2024. The site includes the historic Stadium Merdeka, the venue for the celebration of Malaya's Independence (Merdeka) in 1957 and Stadium Negara, built in 1962. For the past 60 years, the site and neighborhood have

been used for a variety of civic, educational and cultural functions. A public park existed for a time, but it was abandoned in the late 1990's as part of an unrealized redevelopment effort. PNB took ownership of the site with a mandate to preserve the legacy of Malaysian independence while revitalizing the area (Figure 1).

Warisan Merdeka is envisioned to be an integrated live-work development. As many as 3,000 residents will live in the development's residential towers which are integrated into the podium surrounding Merdeka PNB118. An estimated 12,000 coworkers will interact primarily in the tower, working in a 21st century collaborative environment. An additional transient population of over 20,000 visitors at a time will see concerts and events at the two on-site historic stadiums, participate in occasions at the 2,000 person capacity ballroom or experience the retail mall. Many more will stroll, play or just relax in the new forecourt of the linear park. Together, the historic stadiums, observation deck, museum, ballroom and linear park form a cluster of entertainment and social opportunities that will engage visitors of all types.

Historic Context

Stadium Merdeka underwent an award-winning restoration in 2007 that was made possible by the site's historic significance. However, questions of area's commercial viability have hampered subsequent restoration plans for Stadium Negara and its environs, which are currently being revisited. The Warisan Merdeka development strives to honor the site's historic legacy while bolstering its economic potential. The positioning of Merdeka PNB118 on axis with Stadium Negara, but off center from Stadium Merdeka, created an opportunity for a new civic public space. The resultant linear park creates the link between the location of Malaysia's independence and what will now be a new icon of Malaysia. As a significant marker, the tower will be a recognizable, desirable and an awe-inspiring address, a sculptural testament to the future-forward aspirations of the nation of Malaysia and its citizens (Figure 2).

"This project will preserve two of our great heritage buildings, namely the Merdeka Stadium and National Stadium (Negara), proving that it is entirely possible for modern, contemporary architecture with avant-garde features to co-exist harmoniously with rich, historical buildings, where both the old and the new ones

Warisan Merdeka 的愿景是成为一个融合工作与生活的发展计划。计划中与 Merdeka PNB 118 周边建筑合为一体的住宅大楼将可容纳3000个居民。而塔楼本身将有多达12,000的人，身处于一个21世纪的多元而共同的环境。民众可以参加在两个总共可以容纳20,000人的体育场举办的演唱会及其他活动，或到有2000人座位的宴会厅参加宴会，或到购物商场。民众也可在附近的带状公园散步，休闲。富有历史意义的体育场，塔楼的观景楼，博物馆，宴会厅及带状公园总合起来将会构成一个娱乐及社交的群集，吸引各式各样的游客。

历史背景

由于其历史的重要性，独立运动场得以在2007年完成了一次获殊荣的翻修工程。然而对于该区域商业价值的疑虑，使得翻修国家体育馆及其周边的计划无法随之进行，而现在才有机会重新评估。Warisan Merdeka 开发案将致力于荣耀该地区的历史传承，同时重振其经济潜力。Merdeka PNB 118 大楼与国家体育馆位于同一轴线上，大楼的中心线与独立体育场之间则形成了一个新的公共空间。这个带状公园将链接这个国家宣告独立的地点与新的国家象征。这栋高楼将会是一个象征，一个满怀期望以及鼓励人心的地址，一个启发马来西亚及其人民展望外来的精神地标（图2）。

“这个计划将保存两个伟大的历史建筑；独立运动场及国家体育馆，证明当代，前卫的建筑设计可以与满载历史的建筑物和谐共存，新与旧，互相辉映，丰富彼此”马来西亚首相，拿督斯里哈吉穆罕默德·纳吉·敦哈吉阿都·拉萨



Figure 1. Tower Day View (Source: PMV/Fender Katsalidis)
图1. 塔楼日景（来源：PMV/Fender Katsalidis）



Figure 2. Warisan Merdeka Site Plan (Source: PMV/Fender Katsalidis)
图2. 独立遗产大厦基地平面（来源：PMV/Fender Katsalidis）

complementing and enhancing each other” – Prime Minister Dato’ Sri Mohd Najib bin Tun Abdul Razak

Nation Building Case

“The government will continue its prudent spending by prioritizing high-impact projects that people-centric philosophy economy and help sustain the role of private investment as an important contributor to the country’s growth.” – Prime Minister Dato’ Sri Mohd Najib bin Tun Abdul Razak

Permodalan Nasional Berhad (PNB) was established on 17 March 1978 as one of the instruments of the New Economic Policy to help rectify the economic imbalance in the Malaysian society. PNB has emerged as one of Malaysia’s premier investment institutions and is also one of the unique investment organizations in the world, with a diversified portfolio of interests that include asset management, unit trust, institutional property trusts and property management. As the economic development of Malaysia has progressed, so too has PNB, opening up opportunities for all Malaysian’s of all races and from all walks of life and income strata to participate in unit trust investment. PNB provides a unique blend of the commercial strategies and social philosophy in what is sometimes termed a “Social Entrepreneur” – the achievement of lasting social change using business strategies and practices. Merdeka PNB118 will embody this ethos as it is built for more than a single corporate purpose, but for all Malaysians as well.

“The development will also provide added value with the expected creation of over 10,000 jobs and business opportunities for over 100 skills.” – Chairman of PNB, Tun Ahmad Sarji Abdul Hamid

Merdeka PNB118 punctuates Malaysia’s path to becoming a fully developed nation by 2020, a path begun in part with the completion of Kuala Lumpur’s iconic Petronas Twin Towers in the late 1990’s. Positioned near the key monument of Malaysia’s independence, the tower will act as a guardian of Malaysia’s national history. The collaborative international development of this project reinforces the idea of Kuala Lumpur as a Global City and, by balancing its skyline, adds to Kuala Lumpur’s attractiveness as an international investment and tourism destination (Figure 3).

“The prismatic form of this unique, futuristic tower is an urban scaled



Figure 3. Tower Night View (Source: PMV/Fender Katsalidis)
图3. 塔楼夜景 (来源: PMV/Fender Katsalidis)

国家建筑专案

“政府将继续审慎优先投资重点计划，以达成人民为中心的经济体制并支持私人投资来贡献国家的成长”马来西亚首相，拿督斯里哈吉穆罕默德·纳吉·敦哈吉阿都·拉萨

Permodalan Nasional Berhad (PNB) 於1978年3月17日成立。它是属于新经济政策下的机构之一，致力於改革马来西亚社会中经济的失衡。PNB逐渐演变成马来西亚的主要投资机构，也是世界上相当独特的投资组织，拥有多元的投资组合包括资产管理，单位信托，机构财产信托及物产管理。随着马来西亚的经济发展，PNB也随之扩张，提供各种族，社会阶层及收入的民众投资单位信托的机会。PMB以其独特的融合商业策略及社会哲学来成就所

谓”社会企业” –使用商业策略及方式来延续社会转型。Merdeka PNB 118 也会将这样的精神具体化；它不仅为单一企业而设，也是为整个马来西亚所建造。

“这个开发案也创造附加价值，包括提供10,000个工作以及给超过100种职能的新商机” PNB 主席，敦阿末沙吉阿部哈密

Merdeka PNB 118 是马来西亚在2020年迈向已开发国家的重要指标，这条道路於90年末吉隆坡的地标，Petronas 双子星塔完工开始。由位紧邻象徵国家独立的纪念地标，这栋大楼将被视为国家历史的守护者。而这项由许多国家参与的开发案也强化吉隆坡为国际都市的印象，而其改变的天际线，更能吸引国际的投资与观光（图3）。

sculptural testament to the foresight of Malaysia and it's galvanizing of all people into a shared national dream. Comprising a series of dynamically intertwining geometries that represent the complex weaving of cultural and community, it will be a startling and powerful symbol of the Malaysian nation." - Karl Fender, Fender Katsalidis Architects

Urban Fabric

The Golden Triangle of Kuala Lumpur, now known as Kuala Lumpur City Centre (KLCC), will have a tower triptych, made up of Merdeka PNB118, The Petronas Twin Towers and The KL Tower. The Kuala Lumpur City Centre edge will be effectively extended past an existing rail corridor to the birthplace of the nation. Merdeka PNB118, with its position on the new skyline, will complement the existing and future supertall towers in Kuala Lumpur and become a marker for a district that is central to Malaysian history and identity and a beacon of independence. The site is also adjacent to the heritage core of Chinatown along with the long-standing cluster of educational institutions such as the historic Victoria Institution.

Traffic and transit are key considerations in the planning of the Warisan Merdeka development. City ordinances require 8000+ parking spaces for a project of this size, and these were accommodated with a flexible use strategy whereby the same spaces can be used for stadium events, mall weekend excursions or office commuters depending on the time of day or the day of the week. The project links to the city's

expanding public transportation network, incorporating connections to two existing Light Rail Transit (LRT) stations (with a third connection a short distance away through Chinatown), two monorail stops (one directly connected to the new Linear Park) as well as its own direct connection to a new Mass Rapid Transit (MRT) Merdeka station. Planned pedestrian connectivity to the neighboring Chinatown, Plaza Rakyat and other nearby future developments provides opportunities for alternatives to individual vehicular use to and from the site.

Extensive infrastructure improvements are planned for the development, which include 11km of new or improved roadways, tunnels and flyovers along with over 100,000 square meters of road improvements. Extensive water and sewer upgrades, two new major electrical service feeds and telecommunication connections will result in over 41,000 meters of new utility lines. These upgrades will earn the development Malaysia Cyber Centre status, for incubating new and emerging business ventures, and will transform this district from a fringe area, occasionally used for concerts and events at the existing stadiums, to a new vital commercial and tourist destination. Effectively, PNB is giving the site back to the people by building megatall. (Figure 4)

The Warisan Merdeka Development

The first phase of the Warisan Merdeka Development project consists of Merdeka PNB118 and a new luxury-shopping destination. Construction of the first phase is already underway and will be completed in

“这栋棱型，独特且充满现代感的大楼是预言一个新马来西亚的都会建筑宣言，并将全国人民一起融入这个共同的理想。大楼复杂交织的几何线条，象征这个国家多元的种族及文化的融合。它将是马来西亚强大且闪耀的象征” 卡尔·范德，Fender Katsalidis Architect

都会面貌

吉隆坡的金三角，也是熟知的吉隆坡世中心(KLCC) 将会一幅高楼三连画，由 Merdeka PNB 118, Petronas 双子星塔以及 KL Tower 所构成。吉隆坡市中心版图也因此扩展，跨越既有铁道，奔向国家起始之地。市府单位规定以本计划的规模，并须要有至少8000个停车位来容纳不同的使用者，包括体育场及商场及办公大楼在不同时间的需求。这个专案也跟吉隆坡的扩建中大众运输系统作链接，包括两个轻运量系统(LRT) 车站（另穿过中国城不远处即可链接第三个车站），两个单轨系统车站（其中一个直接链接带状公园），另外兴建中新的重运量系统(MRT)会设立一个车站与本专案直接链接。另外还有计划新的行人通道链接邻近的中国城，Plaza Rakyat 及附近即将进行的新开发案。提供访客更多停车的选择。

本开发案也有完善的基础道路工程来配合。其中包括总长超过11公里新建或改善的平面道路，高架道路及隧道，另有超过100,000平方公尺的道路改良。供水及污水管线的改善计划，两条新的供电线路及新的电信网路总合将超过41公里。这样大规模的基础设施改善，将使本开发案晋升为马来西亚资讯网路中心，并将这个原本只有在有活动才会有人气的都市边缘地带，转换成一个充满活力的商业及旅游景点。实际上，PNB盖了一座超高楼，而把人潮带回来（图4）。

Warisan Merdeka 开发案

本开发案的第一期为Merdeka PNB 118 及一个崭新豪华的购物中心。第一期工程正在施工中，并将于2020年完工。塔楼中心线与独立体育场之间所形成的空间，将打造成一个构思自马来西亚景观及水文的带状公园。带状公园的一端链接塔楼，另一端则是一个博物馆，作为进入富含历史意义的运动场的入口。在独立运动场正前方的带状公园为一弹性设计的空间。其互动式设计的



Figure 4. Infrastructure Network (Source: PMV)
图4. 基础设施网络 (来源: PMV)



Figure 5. Linear Park Views (Source: PMV/Sasaki Associates)
图5. 线性公园的景致 (来源: PMV/Sasaki Associates)

2020. The positioning of the tower off-axis from Stadium Merdeka provided the opportunity for the creation of a new Linear Park whose influences are Malaysia's varied landscape and waterways. The iconic Merdeka PNB118 anchors one end of the linear park and the other end is anchored by a future Museum, all of which harmoniously act as a new entry precinct to Historic Stadium Merdeka. The surface of the Linear Park in front of the stadium was designed to be a flexible open space with interactive water-features that can be turned off to expand the open area as needed to accommodate events (Figure 5).

Merdeka PNB118 Tower

The 630-meter-tall Merdeka PNB118 will be among the tallest towers in Asia. As the future headquarters of one of Malaysia's most important public investment companies, Merdeka PNB118 represents and reinforces the PNB's stated values: "To build the culture of a modern and progressive organization, we have formulated a set of values that reflect the rich tradition and dedication to excellence that we passionately believe in and uphold at all times." All decisions regarding the project were made with the overriding idea that this project needed to be a sound investment that could deliver robust financial returns back to the PNB shareholders. Operationally, the tower is designed to allow PNB to take advantage of efficiencies that will be achieved by consolidating staff, departments and subsidiaries under one roof and to recruit and retain the best talent.

"Construction of this project will further enhance the investment value of PNB's real estate asset classes, in order to

generate long term stable returns." – Chairman of PNB, Tun Ahmad Sarji Abdul Hamid

PNB's dream was not merely to house all its operations under one roof, but to foster an environment for the connectivity, social interaction, discovery, and life needs of PNB's employees and the community at large. This project provides premium class "A" office to promote productivity; state of the art meeting spaces for 21st century interaction; top end accommodation with desirable guest spaces and amenities; a destination restaurant higher and more impressive than all others in Kuala Lumpur; public access to a multi-level observation deck experience; private and exclusive spaces for the most important heads of states and CEO's; and retail experiences that keep people engaged and coming back again and again.

Programmatically, Merdeka PNB118 is comprised of 83 office floors and 17 hotel floors. The hotel floors will house a total of approximately 230 guest rooms (Figure 6). The remaining 18 floors are dedicated mechanical and electrical plants, ancillary and support spaces including the destination restaurant, sky-lobbies, and a public observation deck. The majority of the tower is purpose-built for PNB as they and their group of companies will occupy 60 of the office floors, while the remaining 23 floors will be available to lease by local and international companies. The net lettable area of the 83 floors of office is approximately 1.7 million square feet. A spire soaring 120 meters, which functions as a communications beacon, crowns the tower. The glass reinforced paneling system of the spire, which shrouds the communications equipment, is perforated for wind

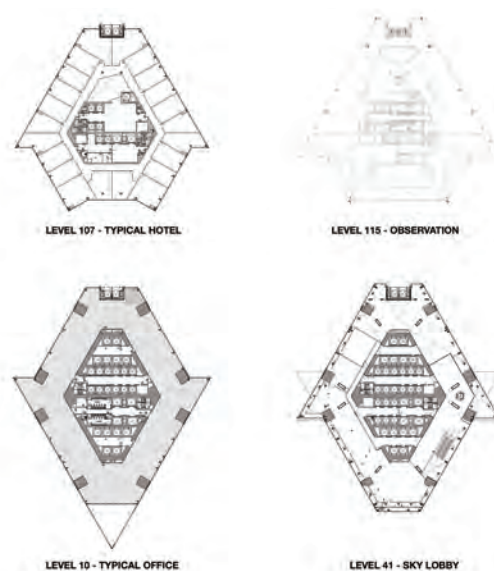


Figure 6. Typical Floor Plans (Source: PMV/Fender Katsalidis)
图6. 典型的楼层平面图 (来源: PMV/Fender Katsalidis)

亲水设施可以随时关闭, 来配合运动场的活动 (图5)。

Merdeka PNB 118 Tower

总高度达630米的Merdeka PNB 118完工后将会是亚洲最高大楼之一。对于将企业总部设在这栋大楼的PNB而言, Merdeka PNB 118 呈现且强化了PNB 的核心价值” 用丰富的传统以及我们对追求卓越的执著信念, 来建立一个与时俱进的组织文化”。所有关于这个计划的决定, 都将基于一个最终信念, 那就是这个计划必须是一个合宜的投资, 能够带给PNB的投资人稳健的投资报酬。从营运的角度来看, 这栋大楼可以让PNB有效率的将所有相关企业整合在同一建筑之内, 延揽最好的人才。

“这个计划的兴建将更加强化PNB 在地产事业的投资, 并得到长期稳健的投资报酬” PNB 主席, 敦阿末沙吉阿部哈密

PNB 的愿景不单只是将所有企业营运搬进同一大楼而已, 更重要的是能为员工及这个社区的民众打造一个提供链接, 社交活动, 启发且丰富生活的环境。这个计划将提供一个提升效率的A级办公大楼, 最先进21世纪交流型态的会议空间, 最顶级的酒店及设施, 一个吉隆坡最高景色最壮观的餐厅, 一般民众可以参观的观景楼层, 为重要领导人物及企业总裁打造私密聚会场所, 还有一个让人一再造访的高级购物商场。

Merdeka PNB 118 总共有83个办公室楼层及容纳约230间客房的17个饭店楼层。其余17个楼层则是机电机房及供应餐厅, 电梯转换厅及观景楼层服务需要的设施空间 (图6)。PNB及集团底下的其他公司将进驻使用60个办公室楼层, 其余

performance and is materially designed to minimize radio frequency interference (Figure 7).

The tower consists of a reinforced concrete core with eight mega-columns as well as concrete fin walls at the base. A structural steel system comprised of six belt truss zones, three outrigger zones, composite floor decks and extensive roof framing make up the main structure. The superstructure is supported by a four-meter-thick raft foundation slab and 137 cast-in-place bored piles, each 2.2 meters in diameter and extending 60 meters in length. There are 936 cast-in-place bored piles which serve as the foundation for the car park and podium structure (Figure 8).

Features of the Tower

The tower is designed as a crystalline form, fashioned in glass from the diamond motif derived from a traditional Malay songket pattern outline employed in both plan and elevation. The diagonal elements formed are reflected by structural elements within to marry internal and external expression. The triangular motif permeates the site as a unifying element. The Malay geometry adds layers of reference and meaning and, intertwined with the retail mall and linear park

的23个楼层将开放其他本地或国际公司承租。这83个办公室楼层总合计有进一百七十万平方英尺可租空间。塔楼屋顶有高达120米，作为通讯电塔的塔尖直入云霄。塔尖的外围则以透孔玻璃纤维版片包覆，以隔离塔尖里面的电子设备。这种种版片可以减少受风应力并将对电波的干扰降至最低（图7）。

Merdeka PNB 118 主要是钢筋混凝土结构；其中心为六边型的RC核心筒，搭配外围八支巨柱以及地下室的剪力墙。钢构部分则有六组belt trusses，其中三组搭配out riggers，屋顶结构，塔尖已及复合式楼版。大楼基础则是由137支直径2.2米，深度达60米的基桩加上厚达4米的基础版所构成。围绕大楼外围另外有936支基桩用来地下室停车场及其上的购物商场跟其他建筑物（图8）。

塔楼特色

塔楼的轮廓基调为菱型，搭配玻璃帷幕，线条在垂直及水平面上不断交错所形成如钻石的主题，其灵感则是来自于来自马来西亚一种传统纺织品(Songket)的图案。这个外观上的对角线条跟建筑结构合为一体。这个菱型的基调渗透至计划的各个角落而成为一个主题元素。这个代表马来西亚文化的几何图案，以及象征马来西亚地理及水文的景观设计，将塔楼，商场及带状公园交织串连，并赋予意义及链接。

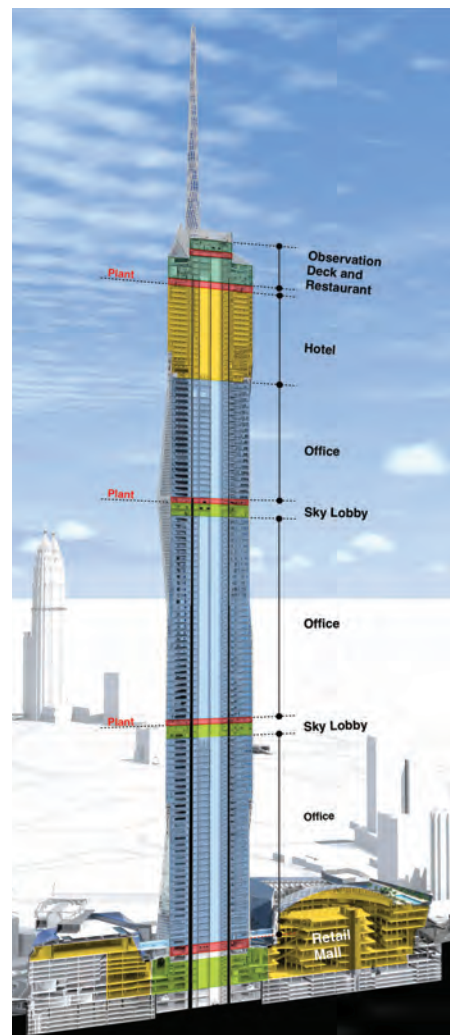


Figure 7. Tower Section (Source: PMV/Fender Katsalidis)
图7. 塔楼剖面 (来源: PMV/Fender Katsalidis)

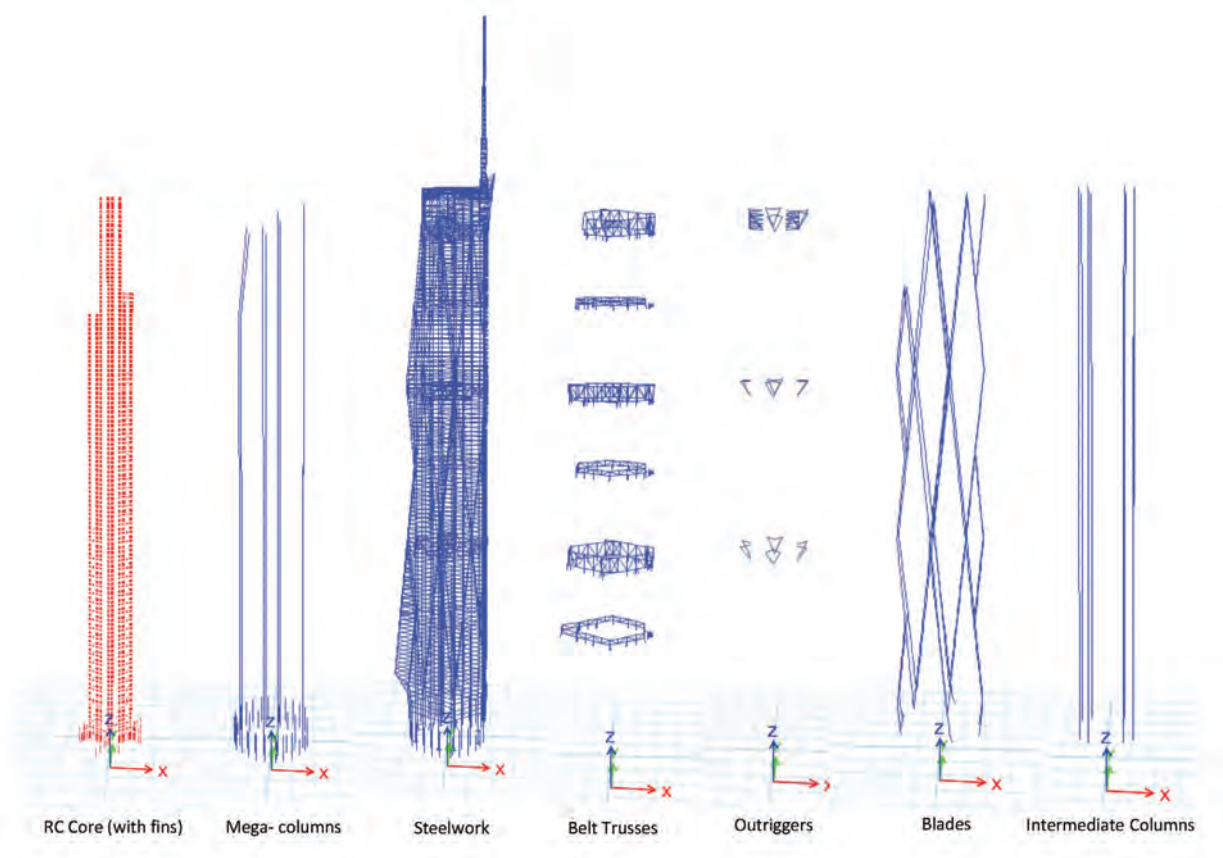


Figure 8. Structural System (Source: PMV/LERA/RBG/ARUP)
图8. 结构体系 (来源: PMV/LERA/RBG/ARUP)

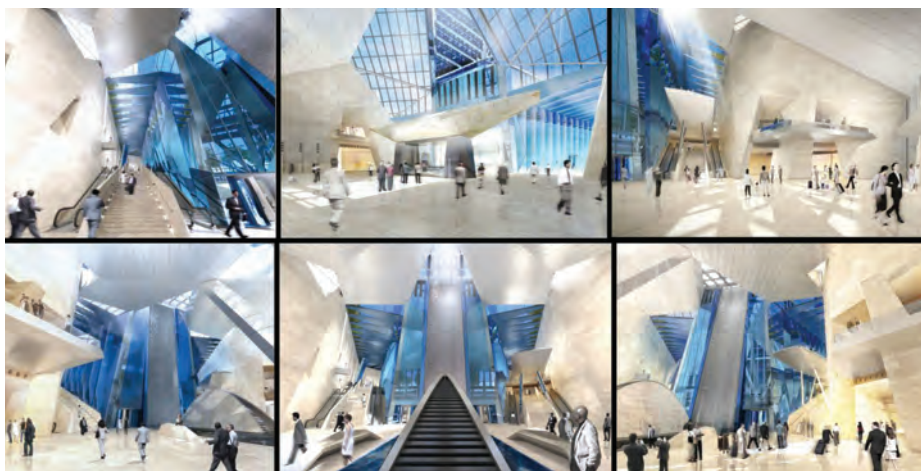


Figure 9. Main Lobby (Source: PMV/Fender Katsalidis)
图9. 大厦主楼大厅 (来源: PMV/Fender Katsalidis)

themes and together with the ground plan, reference Malaysia's landscape and waterways.

The personal experience of Merdeka PNB118 begins with north and south lobbies, naturally lit by sweeping skylites and 25m+ high ceilings connected by glazed galleries. The experience is further enriched by the resolution of the site's 10m difference in elevation. High-speed double-deck shuttles and local lifts connect three main zones with two sky deck transfer points. One of the signature features of the tower is the 36-story atrium which places an awe inspiring exclamation point on the tower office lobby while connecting all of the zone 1 offices visually up to the glass floor at the first skydeck (Figure 9).

A lower level hotel lobby welcomes guests and is served by a direct shuttle connection to an upper hotel lobby at Level 75. The hotel interiors provide commanding views from guest rooms located more than 100 floors above the ground. Hotel guests and other business users in the building are treated to one of the highest spa/pools available in the world, executive meeting centres and private event spaces all with six-star service.

Public visitors to Merdeka PNB118 arrive to experience the grandness of the tower at the lower lobby, where separate entrances to the observation deck from the exterior and retail mall exist. After the arrival experience, an escalator brings the visitors to the lift lobby before boarding the top of a double-deck scenic lift. The direct journey to the observation deck traverses up 115 floors, taking about 65 seconds and providing a breathtaking view of Kuala Lumpur City Centre through the glass at the front of the shaft. Guests for the destination restaurant are whisked directly to their 114th floor destination, one floor below the observation deck, with passengers treated to the same

spectacular view of Kuala Lumpur. At the observation deck arrival, visitors have three floors to explore, including two outdoor decks. Once at the top, sightseers will have an unrivaled 360-degree view of Kuala Lumpur and the Klang Valley. On departure, the same lifts express the visitors down the tower to a pedestrian bridge that allows exit at the top of the retail mall (Figure 10).

Introduction of the Retail Mall

The retail mall includes direct connections on multiple levels to the Merdeka PNB118 tower lobbies, exterior entries on three sides and directly underground to a new MRT station. Its multiple connections and perforated space allow for the collection

从走进Merdeka PNB 118 南北两侧大厅开始, 参访者便可立刻体验到这栋大楼的独特。迎面而来的是自然采光的大厅, 其上为整面的玻璃天窗, 高超过25米的天花与两侧的玻璃走廊连接。两侧的大厅有10米的高差使得其中的链接更加丰富。大楼配有高速的双层直达电梯, 两个电梯转运层将大楼分为三区域, 各区域有电梯於其间楼层运行。36层楼高的中庭是塔楼一个非常独特的设计, 从大厅可以看到所有低层楼区的办公室玻璃墙以及第一个电梯转换层的玻璃地板 (图9)。

饭店则从较低的北侧大厅进入, 访客可搭乘快速电梯直达位于75楼的饭店专属大厅。超过100楼高的饭店客房提供了居高临下的壮阔视野。饭店住客及其他访客可以使用世界最高的游泳池及顶级spa。饭店另有六星级服务的会议中心, 提高专业人士隐密的聚会场所。

一般访客则由北侧的大厅进入Merdeka PNB 118, 由这里可以通往景观楼层及旁边的购物商场。访客可以使用电扶梯到上层的电梯厅, 然后搭乘上层景观电梯直奔位于115楼的景台。在这段约65秒的行程, 访客将可透过玻璃帷幕, 欣赏吉隆坡市中心的景色。双层电梯的下层将访客带到位于114楼的景观餐厅。观景台共有三层楼, 其中两层有户外露台, 将提供访客无以伦比, 360度的绝佳视野, 可俯瞰整个吉隆坡及巴生谷。访客离开时将搭乘相同的电梯回到8楼, 再经由一座行人天桥通往旁边的购物商场顶楼 (图10)。



Figure 10. Interior Views (Source: PMV/Fender Katsalidis/GA Design Intl)
图10. 室内环境 (来源: PMV/Fender Katsalidis/GA Design Intl)

and social interaction of shoppers, stadium crowds, and office workers alike (Figure 11).

Contained within its 140,000 square meters will be more than 300 tenancies including restaurants, cinemas, groceries and department stores. The key feature of the mall will be the 88-meter diameter dome and an open racetrack floor plan that will allow natural light to reach all levels of the 7-story space. Shoppers will be bathed in natural light with focus on the tower through the dome. Diners and others are treated to a protected but open multi-level alfresco restaurant themed plaza, also acting as the link between the adjacent Stadium Negara, Stadium Merdeka, The Retail Mall and the new Merdeka MRT station (Figure 12).

Sustainable Development

The challenges of building sustainably in a tropical region are complicated by the extreme of building megatall. At Merdeka PNB118, PNB chose to test the efficiency of the project against three international and local sustainability guiding systems: LEED (USA), GBI (Malaysia) and GreenRE (Malaysia) with a goal for the tower to be the first Malaysian building to simultaneously meet Platinum accreditations in all three systems. Additional sustainable goals have been set to guide the design of the retail mall.

The focus for this project is on smart, best practice design with features that are practical as well as economically viable. The project has focused on thoughtful material selection including sourcing materials that are regional or recycled. MEP concepts include efficient energy use systems; solar hydronic panels to provide hot water to the hotel; combining

购物商场简介

购物商场与塔楼的大厅都有直接链接，其三边与路面连通，另北侧地下室与新的捷运车站直接贯连。便利的交通链接与开放式的空间，很自然的结合了商场人潮，塔楼上班族以及参加体育场活动的群众（图11）。

商场的总面积达14万平方米，包含了餐厅，电影院，超市，百货公司及其他总计超过300家厂商。商场的中要设计亮点为一直径达88米的玻璃拱顶，配合如椭圆形赛车道的楼层配置，让自然光得以充满这7层楼的空间。而商场的访客也可以透过这玻璃拱顶，仰望壮观的Merdeka PNB 118。位于商场及国家运动场旁边的空间，将为前来用餐的访客打造一个露天式的主题餐饮区，并将捷运车站，商场及两座体育场链接起来（图12）。

永续经营的开发计划

在热带地区兴建一个可以永续经营的超高大楼是一个极大的挑战。Merdeka PNB 118选择面对这个挑战，并计划依据三个国际及本地的永续性建筑指导系统：LEED（美国）、GBI（马来西亚）及GreenRE（马来西亚），来增进塔楼设计及施工的效率，并以成为马来西亚第一个拿到这三种认证系统白金证书的建筑为目标。购物商场也设定了另外的永续性发展目标。

为了达到永续经营的目的，本专案一直将设计重点放在，智能及最佳实务设计，尽可能采用务实且经济的方式执行。所需建筑材料也考量采用当地或回收再生的材料。机电设计采用高效能源使用系统；塔楼屋顶装设的太阳能板可以供应饭店所需的热度；将停车场排气风扇的气流导入空



Figure 11. Retail Mall Interior View (Source: PMV/The Buchan Group)
图11. 零售商场内景（来源：PMV/The Buchan Group）

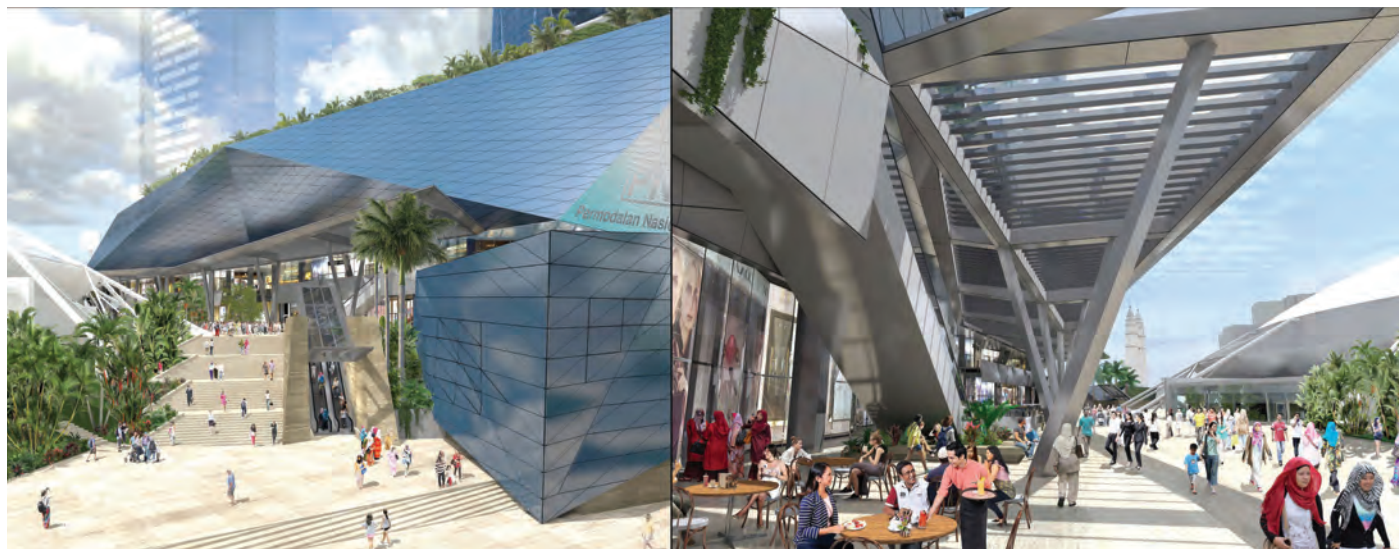


Figure 12. Retail Mall Outdoor Dining (Source: PMV/Fender Katsalidis)
图12. 零售商场户外用餐（来源：PMV/Fender Katsalidis）

the air flow from the car park exhaust fans for use as airflow within the cooling towers; regenerative power capture from the lifts; efficient under floor air delivery systems; water efficient fixtures and gray water and rain water collection systems which can be used for cooling tower make up water, flushing toilets or irrigation; water efficient landscaping and a development wide distributed district cooling system coupled with 7,000 tons of thermal energy storage. Additionally, energy efficient high performance coated insulated unitized curtain wall systems with selected motorized automatic sun shades are utilized as appropriate for the climate.

The Execution

To meet these challenges, PNB assembled a multinational design team of leading tall building experts in their respective fields, embodying international best practices. The procurement of the designers, specialty consultants and project management, required looking beyond the typical tall tower execution. Specialists included structure, wind, traffic and pedestrian movement, interior and event space design, fire, acoustics, vertical transportation, mechanical and electrical systems, infrastructure and numerous peer reviewers.

Careful design management was crucial to bridge the geographical divide of the thousands of kilometers (and nine time zones) separating the team members and bring the various technical practices together in close coordination. Local authorities had to be guided through the idiosyncratic and special challenges of creating a structure far beyond normal code practice. The team had to maintain both discreetness and transparency so that procurement was thorough and fair.

Although Kuala Lumpur has many high-rise towers, buildings of this extreme size are very rare. The project's primary peer, the Petronas Twin Towers, was a special case whose many international-class features did not directly influence local codes and practices in the years since its inception. Construction practices in Kuala Lumpur are focused primarily on smaller scale projects where manual labor is preferred over industrial systems and prefabrication. The local codes do not envision the type of tower being built. Because of the height and size of the tower, strict adherence to local codes is not possible. Life safety systems, vertical transportation, stack effect, wind and seismic considerations

调冷却塔; 利用电梯下降时产生的电力; 大楼办公室冷气由高架地板传送; 使用省水器材以及回收非污水与收集雨水并再使用; 节水的景观设计; 一个供应整个开发计划的区域供冷系统搭配一个7000吨容量的地下储水池。另外大楼外墙为高效能镀膜隔热的帷幕墙系统, 并设有自动遮阳帘来应付炎热终年如夏的气候。

专案执行

为了迎接这个挑战, PNB找来在超高层建筑的各种不同领域的顶尖专家, 组成了一个跨国的设计团队, 将最好的实务经验运用在Merdeka PNB 118。选择团队设计单位, 专长顾问及专案管理的条件比一般高楼专案要更高出许多, 这当中包括许多高度分工专业的顾问如结构, 风动力学, 交通及人群移动分析, 演出场地设计, 消防, 隔音, 电梯, 机械, 电机, 基础设施及同业审核。

由于这个跨国设计团队的成员分散在9个不同时区, 彼此相隔达数千公里, 唯有审慎的管理协调, 才能超越时间空间的距离, 来有效整合所有的设计。与当地主管的沟通及引导跳脱一般建筑审理的方式及相关法规也是经常要面对的。专案团队在采购程序上也要保持谨慎透明, 以达到严谨与公正。

吉隆坡虽然高楼林立, 但规模如本案者, 少之又少。最常被拿来与本案比较的Petronas 双子星大楼, 在其完工后这么长的时间, 它所使用的一些工法及国际实务经验, 并没有改变及影响当地规范及实务。吉隆坡当地的营造实务依旧习惯以低廉劳力, 句限在小型的案子。当地法规并未预见类似本案的超高大楼, 现有法规常有过时且不适用的窘境。因此要完全按照本地规范, 来完成本案是不可能的。如本案的生命安全系统, 电梯, 烟囱效应, 风及地震设计, 都必须以特殊专案方法, 跳脱现有规范来审理。马来西亚的建筑法规(UBBL), 是在1984年颁布, 并参考采用美国, 欧洲及澳洲的规范所制定。

UBBL包含了当地的惯用方法与法规, 但无法完全规范如Merdeka 118 PNB这样的专案的所有项目与范围。以生命安全系统来说, 本案同时采用当地规范及2009国际建筑规范。这一点UBBL选择视而不见。IBC 也采纳许多其他国家的建筑标准, 如电梯的ASME A17.1, NFPA的消防规范。就结构方面则采用了美国规范包括规范建筑载重的ASCE 7-05, 结构混凝土的ACI 318 M-08, 钢构的AISC 360-05。电梯规范则是以1970颁布的马来西亚工厂即机械为主, 并参考欧洲的EN-81-1及EN115-1 还有美国的ASME A17.1。

无障碍空间则是以当地规范MS1184并参考澳洲, 美国及欧洲规范, 来补其不足的地方。

结论

在90年代后期, Petronas 双子星大楼完成后, 吉隆坡发展的非常快且广泛。然而这段时间新建的建筑物多为20-30层的办公与住宅大楼, 与市中心渐行渐远。Warisan Merdeka 开发计划, 尤其是指标的Merdeka PNB 118, 将扩大吉隆坡的发展, 丰富城市的天际线, 并串连欣欣向荣的市中心商业区。

Merdeka PNB 118 是一栋有使命的超高楼: 一栋以马来西亚人民为核心的指标性大楼。这个未来吉隆坡的新地标将会是马来西亚最高楼, 荣耀国家的历史, 带领国家走向光明的未来。

“当有人提到指标性的大楼, 这到底指的是甚么? 甚么样的条件使得这栋楼具有指标性? 是设计? 形状, 还是其中的故事与历史? 或许对这个案子而言, 这些都是对的。但是还有期望, 追求卓越的理想以及建造一个令人缅怀, 长远的, 可以定义马来西亚的伟大建筑的决心” 马来西亚首相, 拿督斯里哈吉穆罕默德·纳吉·敦哈吉阿都·拉萨

needed to be considered in isolation from the typical practices employed in Kuala Lumpur. The local codes, i.e., the Malaysia Uniform Building By-Laws (UBBL) of 1984, were adopted as the base case, supplemented by European, Australian and USA standards where appropriate to bring together the best international practice into a single development.

UBBL contains the local customs and regulations, but does not necessarily address all aspects of a tall building such as Merdeka PNB118. For life safety, a combination of performance and prescriptive based design was used based on requirements of the local UBBL and the 2009 International Building Codes (IBC). Where the UBBL is silent on such issues, the IBC requirements are incorporated. IBC incorporates reference codes such as ASME A17.1 for Lifts, NFPA for other fire protection schemes. For structure, American codes such as ASCE 7-05 for building loads, ACI 318M-08 for structural concrete, AISC 360-05 for structural steel and IBC for seismic loads were adopted. Vertical transportation is governed by the Malaysian Factories and Machinery Regulations of 1970, supplemented by European codes EN81-1, EN115-1 and American codes ASME A17.1. Accessibility is governed by Malaysian Code of Practice on Access for Disabled Persons, MS 1184 and supplemented by Australian and American codes, such as ANSI A117.1 and European Code EN81-70 where the Malaysian code is silent.

Conclusion

The City of Kuala Lumpur has grown extensively since the construction of the Petronas Twin Towers in the late 1990's. The new buildings developed after this time have typically been 20–30 story commercial and residential towers which create a background fabric sprawling out from the centre. The Warisan Merdeka Development, specifically the iconic Merdeka PNB118, will expand the scale of Kuala Lumpur's growth, adding additional definition to the city skyline while tying together the burgeoning CBD.

Merdeka PNB118 is a building with a conscience: an iconic tower with the people of Malaysia as its core. This new landmark in Kuala Lumpur will be the tallest tower in Malaysia, honoring its past and serving as a beacon to the nation's bright future.

"When someone mentions an iconic tower, what exactly does it mean? What is it that makes a tower iconic? The design? The shape? The story or history that lies behind the development? Perhaps, in this case, it may be all of those things. But it is also the aspiration, the desire for excellence and the determination to build something memorable and lasting, something that can define a new Malaysia"
– Prime Minister Dato' Sri Mohd Najib bin Tun Abdul Razak