

ASPECTS OF MYANMAR ROYAL ARCHITECTURE IN ANCIENT MANDALAY

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Abstract: *The Royal Palace has used for the official residence of sovereign and royal officers for state functions resided by the king. It is the fact that the function of the Mandalay Old Palace is the main issue whether the meeting areas are convenient or not for users as to the architectural aspects and climatic aspects, in Yadanapon Period. According to the literature study of the royal palaces, the main theme was what architectural characters would be significantly changed in Myanmar Royal Architecture in Yadanapon Period. The royal palace in Yadanapon Period has transformed and varied in size and layout plans from former palaces due to the long period and changes of construction technologies. Myanmar Royal Palace has created and incorporated with locality of architectural characters, and ritual customs of royal ranking. The aesthetical pleasing of Mandalay Old Palace could reflect the ancient environs of Mandalay in Yadanapon Period.*

Key Words: *Royal Palace, architectural aspects, Myanmar Royal Architecture, construction technologies, the aesthetical pleasing, Mandalay Old Palace, Yadanapon Period.*

1. INTRODUCTION:

In Myanmar, the formal name of Mandalay Old Palace is “*Mya Nan San Kyaw*” in Burmese. Mandalay is one of the old cities in *Yadanapon* Period (1858.AD-1885.AD). Mandalay was founded by King *Mindon* in 1858 as a new capital. The borders of the old city of Mandalay were confined by the numbers of 144-square block with grid patterns or 144 *Pyas*. Among them, the numbers of 16 *pya* or 16 square blocks (approximately 8400 feet x 8400 feet in plot size) were extracted from the middle of the site in order to use for construction of royal palace. This area was designated “*Shwe-gyo-that-ne*”, the Royal City area. It is also said that the royal palace of Burma was regarded as the symbolic centre of the cosmological island of Mount *Meru*. Nowadays, the reconstructed *Mya Nan San Kyaw Shwenandaw* design was faithful, but the construction process incorporated both traditional and modern building techniques. Corrugated metal sheets were used for the roofing of most buildings; moreover, concrete was extensively used as a building material although the original palace was mainly built by using only teak.

2. AIM:

The aim of this paper is to point out the characteristics of Royal Architecture and Architectural Aspects of Mandalay Old Palace in *Yadanapon* Period for future generation.

3. THE OBJECTIVES OF THE STUDY:

- (i) To realize the traditional characteristics or Myanmar identity and style of Royal Architecture in *Yadanapon* Period.
- (ii) To understand the Royal Palace layouts, functional relationships and spatial relationship of Palace Buildings in that period.
- (iii) To point out the scale and proportion of main palace buildings in that period.
- (iv) To assess the aesthetic evaluation of Royal Architecture at Mandalay Old Palace.
- (v) To figure out the architectural aspects and physical aspects of Royal Palace.

4. LOCATION OF THE STUDY:

The Mandalay Old Palace is located at 21°59' N and 96°6' E, and occupied part of a plain which stretches about thirteen kilometres from the *Irrawaddy* on the west, the Shan Hills on the east, the *Madayar* river on the north, and the *Myit-nge* river on the south.^[6]

5. SCOPE AND LIMITATIONS :

This paper is primarily scoped to focus on study and analysis of the followings.

- (i) Study on the buildings of *Eastern Royal Zone* at Mandalay Old Palace which are mainly based on field surveys, literature reviews and any other related inscriptions of the subject.

C. Site Elements in the Compound of the Mandalay Old Palace

The Mandalay old palace compound is a complex building type that contains a variety of site elements. The layout of the site elements can be seen or marked in the following layout plan of Mandalay Old Palace. There are several elements can be found in the compounds of Mandalay Old Palace. Some site elements found in the palace compounds are the City Wall, the Moats and Bridges, the Gateways and Bastions, the Masonry Screens, Clock Tower, Tooth-Relic tower, *Thibaw’s* Monastery, *Hlut-daw* (Supreme Court), the Mint, and the Clusters of Royal Family’s Tombs. [5]

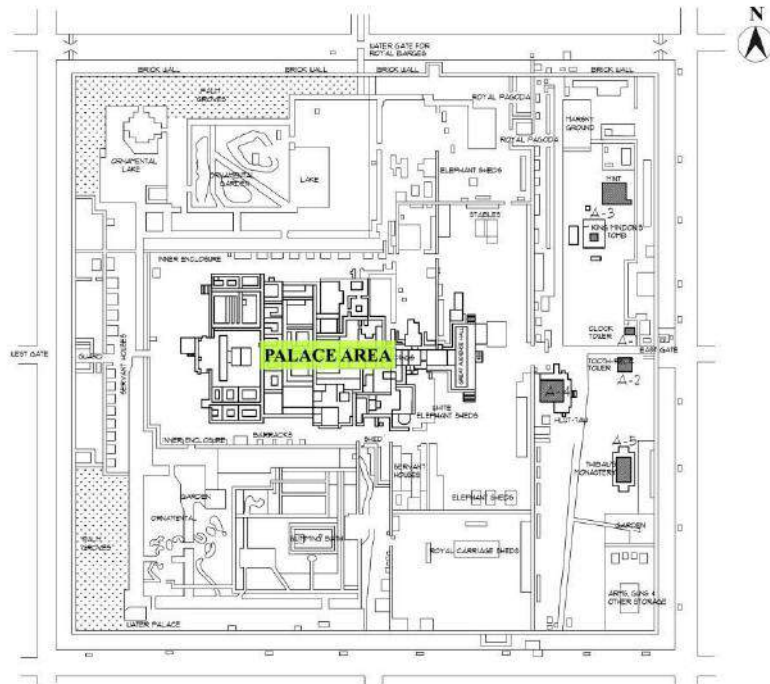


Figure 3: Site Plan in the Compound of the Mandalay Old Palace [5]

D. Zoning of Mandalay Old Palace

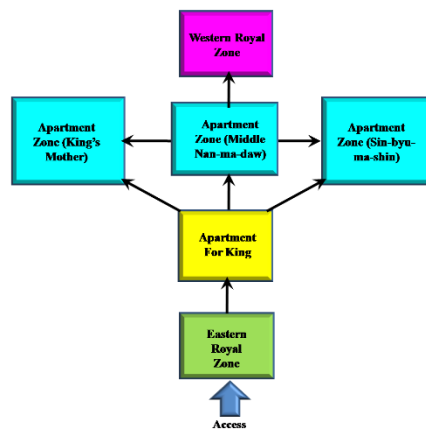


Figure 4: Zoning Diagram on the Platform of the Mandalay Old Palace

E. Building Layout of the Mandalay Old Palace

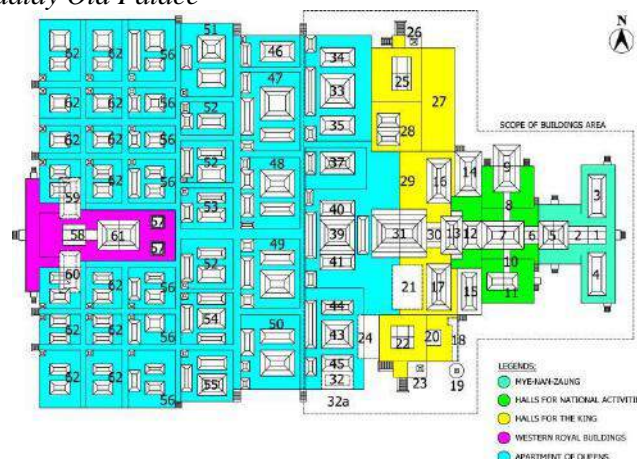


Figure 5: Building Layout & Space Utilization on the Platform of the Mandalay Old Palace

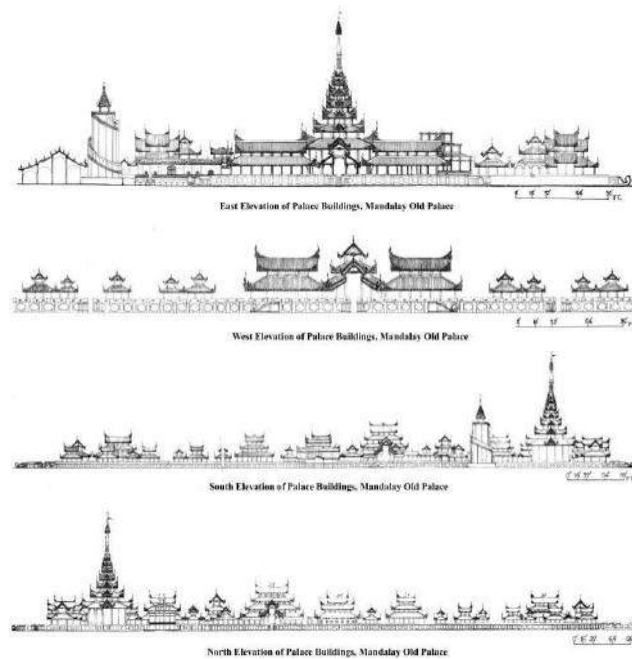


Figure 6: Elevations of the Mandalay Old Palace ^[5]

F. Types of Roof

There are two types of roof such as pitch roof and flat roof that would be seen at the Mandalay Old Palace. The classification of the roof forms are Seven-tiered Spire Roof, Three-tiered Hip Roof, Two-tiered Hip Roof, Three-tiered Roof (*Yun-htet*), and Two-tiered Gable Roof which all would be seen at the buildings on the palace platform.

G. Color Usage at the Mandalay Old Palace

There were four main color decorations that would be seen the buildings on the platform of the palace. The compartments completely gilt embellished on the buildings which was commonly used by the King, and compartments of the Chief Queens. The compartments partially gilt over red paint embellished on the *Sanu-zaung*, *Dawei Halls*, *Le-tha-zaung* and Tea Hall. The building painted red would be seen at the apartments of the lesser queens, and high tower (*Nan-Myint*). The building painted white would be seen at *oak-tikes* which were mainly constructed with brick during the reign of King *Thibaw*.

8. BUILDING MATERIAL AND CONSTRUCTION TECHNOLOGIES:

A. Building Material Usage

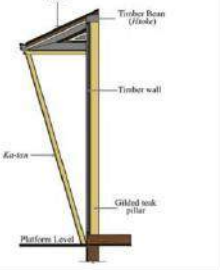
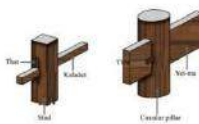
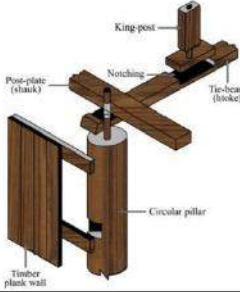

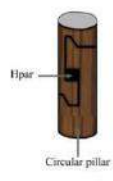
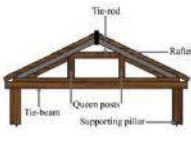
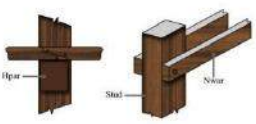
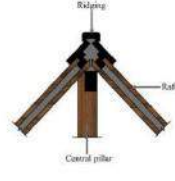
Table 1. Structural & Material Usage at the Mandalay Old Palace

Sr. No	Components or Building elements	Structure & Materials	Remarks
1	Palace Buildings Walls	Teak panel or plank Brick masonry	Some <i>Sa-nu</i> and <i>Samokes</i> devoid walls and used railing with balustrades
2	City walls	Brick with red earthen masonry	Under the base of main gates & flank gates' <i>pyat-that</i>
3	Raised Platform	Brick retaining wall	Surrounded by two brick walls, forming with the platform two enclosures
4	Floors	Timber floor	Supported with traditional wooden joists and members (<i>Yet-ma</i> , <i>Nwa</i> , <i>Kaladet</i>)
5	Roofs	Wood Shingles (Conjecture) C.G.I sheet roofing (in 1904 AD)	Except Assembly Hall, Fountain Apartment, <i>Myauk Pan-gon-oak-tike</i>
6	Columns	Circular Teak column Coated with glass mosaic column	The <i>kun-sin-taing</i> extended from the ground to the uppermost roof
7	Openings	Wooden doors & windows	Some <i>Sanu</i> and <i>Samokes</i> devoid openings
8	Structures	Timber framed structure	Except <i>Oak-tike</i>
9	Framing Systems	Post & beam system Wooden joinery work	Using <i>Sei-ywe-zetto</i> connect the extended height of pillars and length of the horizontal timber members

B. Construction Technologies

According to the study, the construction technologies of main palace buildings were mostly built with the methods of timber joinery. Likewise, there were many monasteries which were mainly constructed with wood in *Konbaung* and *Yadanapon* Period, that the construction techniques of some buildings of the Mandalay Old Palace maybe as constructed the timber joinery as the earlier monasteries or religious buildings at that time. Therefore, the author would like to highlight the conjectural construction systems of some old palace buildings in comparative with the *Konbaung* monasteries in Myanmar.

Table 2. Conjectural Construction Technologies at the Buildings of Mandalay Old Palace

No	Location	Drawings	Remarks	No	Location	Drawings	Remarks
1	Wall			4	Roofs		
	Mye-nan-pyat-that-taw-gyi		the timber walls are supported with stud and roof overhang has been supported with <i>tan-ke</i>		Tea Hall, Promenade Hall, Perfume Palace, Baung-daw-zaung		traditional wooden joinery method
2	Columns			4	Roofs		
	Apartment s of Queens & Princesses		notching improve bearing for beams and provide better contact with round poles [2]		Mye-nan-pyat-that-taw-gyi		Seven-tiered roof spire have been fabricated with timber posts & beams
	Pillar Connection (<i>Sei-ywe-set</i>)		the desire height by joining to interlock two vertical components into a single pillar	Baung-daw-zaung, Tea Hall, Royal Treasury, Perfume Palace		Purlins and rafters are supported with queen posts	
3	Floor Joists			4	Roofs		
	Consecrated water-turret, Apartment s of Queens & Princesses		traditional joinery systems on the floors of the Burmese wooden buildings [4]		Apartment of Chief Queens & Princesses		Wooden rafters and purlins

9. FINDINGS:

A pair of eyes in human has acceptable view or general field of view is 65° on each side at the *Mye-nan-pyat-that-taw-gyi*. The main function of these buildings was used to hold royal ceremonies and greeting or discussion with the king and his audiences. According to the analytical drawing, the view has been blocked with several rows of columns when the king looks his audiences from the Lion Throne. Moreover, he can't see his audiences very clearly and the last three rows of audiences won't hear the king's speech because of long distance of sound transmission. The main problem for acoustic was the impact of outdoor environment that the buildings in front of throne were semi-open space with colonnades. Most of the conference holding buildings in the palace was surrounded with railings instead of using enclosed wall; therefore, these buildings had lack of privacy and security, less of acoustic control, and visual disturbance would happen near the surrounding.

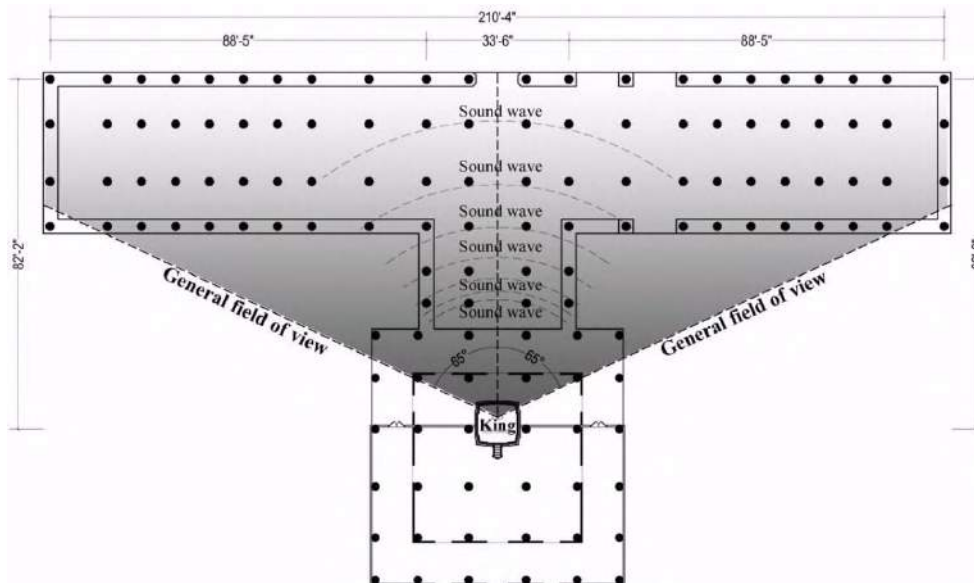


Figure 7. Field of View & Sound Transmission in *Mye-nan-pyat-that-taw-gyi*


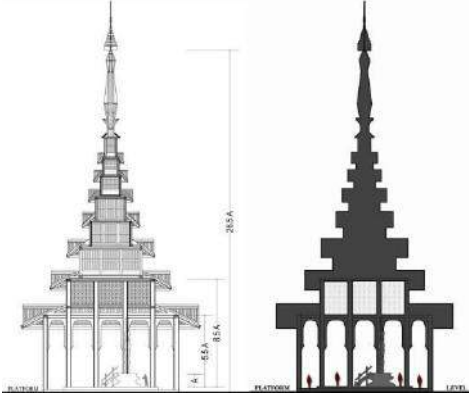

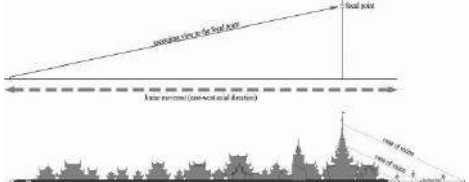
At that time, the construction technologies of the palace are mainly constructed with timber and the builders could build the narrow span with wooden pillars, that they had had many difficulties to create pillar-less space or wide span structure in the conference hall. Nonetheless, the fabricated methods of the traditional wooden post & beam systems might be resisted the impact of earthquake.

10. ANALYSIS OF AESTHETIC RESULTS:

The following design principles & design aesthetic have been evaluated and which all are primarily analysed on the Mandalay Old Palace in *Yadanapon* Period (1858-1885AD).

Table 3. Applied Design Principles at the Mandalay Old Palace

Type	Design Principles	Type	Design Principles
A	<p>Building Approach</p> <p>Frontal approach to the Royal Palace</p>	E	<p>Contrast in Direction</p> <p>Contrast in direction at the palace facade</p>
B	<p>Balance</p> <p>Symmetrical composition of Royal Palace compound</p> <p>Balance on palace facade</p>	F	<p>Proportion</p> <p>Proportion of <i>Mye-nan-pyat-that-taw-gyi</i></p> <p>Proportion of the palace facade</p>

C	<p style="text-align: center;"><i>Emphasis</i></p>  <p style="text-align: center;">Emphasis at the palace facade</p>	G	<p style="text-align: center;"><i>Human Scale</i></p>  <p style="text-align: center;">Human scale in the Mye-nan-pyat-that-taw-gyi</p>
D	<p style="text-align: center;"><i>Unity with Dominance</i></p>  <p style="text-align: center;">Unity with dominance at the palace facade</p>	H	<p style="text-align: center;"><i>View & Movement</i></p>  <p style="text-align: center;">View & Movement toward Mandalay Od Palace</p>

11. RECOMMENDATIONS:

The rectangular plan shapes are mostly found in this palace, these are not so good design as to the climatic condition of the Mandalay environ, and the plan arrangement of the royal palace should settle in the courtyard. The ratio of the recommended building plan is 1:1.3 and it is the best ratio for hot & dry climate in Mandalay. Basically, the palace design was created with centralized organization, cluster organization and grid organization. The indoor environs of the palace had good access of the direct intact of natural air flow (cross ventilation) and natural lighting. It is the fact that the palace design had to build with climate responsive design strategies, that the appropriate shading devices shall install on the building envelope so as to prevent direct sunrays pass through the open hallways.

12. CONCLUSION:

According to the learning of the royal palace in *Yadanapon* period, the palace buildings are strongly developed along the east-west axis. The buildings layout is composed of eastern royal zone, western royal zone and apartments of queens and princesses zone. The most commonly used of building materials are brick, timber, red earthen masonry and the construction technologies are applied with post & beam system for structural member, brick retaining walls at palace platform, and the joists are fabricated with wooden joinery method. As aesthetic evaluation of the palace buildings, the *Mye-nan-pyat-that-taw-gyi* is the auspicious buildings in the palace compound, it is the fact that the highest, grandest and noblest *pyat-that* with graceful proportion. The square plan-shaped of the *lay-daunt-pyat-that* is significantly built in *Yadanapon* period and the difference between its width and height proportion is one and half times that pointed to the upward direction. The focal point or the eye catching of the palace design in *Yadanapon* period is created with *Mye-nan-pyat-that-taw-gyi* and oriented with *four samokes* on each cardinal point, emphasis with frontal approach on each side.

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