

An Architectural Study on the Railway Station Buildings in Malaysia during British Era, 1885-1957

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Abstract— This paper attempted on emphasize on the station buildings façade elements. Station buildings were essential part of the transportation that reflected the technology. Comparative analysis on architectural styles will also be made between the railway station buildings of Malaysia and any railway station buildings which have similarities. The Malay Peninsula which is strategically situated between the Straits of Malacca and the South China Sea makes it an ideal location for trade. Malacca became an important trading port whereby merchants from around the world stopover to exchange various products. The Portuguese ruled Malacca for 130 years (1511–1641) and for the next century and a half (1641–1824), the Dutch endeavoured to maintain an economic monopoly along the coasts of Malaya. Malacca came permanently under British rule under the Anglo-Dutch Treaty, 1824. Up to Malaysian independence in 1957, Malaya saw a great influx of Chinese and Indian migrants as workers to support its growing industrial needs facilitated by the British. The growing tin ore mining and rubber industry resulted as the reason of the development of the railways as urgency to transport it from one place to another. The existence of railway transportation becomes more significant when the city started to bloom and the British started to build grandeur buildings that have different functions; administrative buildings, town and city halls, railway stations, public works department, courts, and post offices.

Keywords—Malaysia, railway station, architectural design, façade elements.

I. INTRODUCTION

BEFORE the modern technology was introduced in Malaysia, people used natural resources such as animals and rivers to transport things from one place to another. It varied enormously from with different types of animals and vehicles such as elephants, bullock carts (two or four wheeled vehicles pulled by a bullock), sampan (flat bottomed wooden boat), jinrikisha (light two wheeled hooded vehicle pulled by a man), gharry (horse-drawn cab), cycle rickshaws, bicycles, motor bicycles, tricycles and motorcars. Railways were the pioneers of modern transportation introduced by the British during 1885 in Malaya. According to Lewis, “railway is a prepared track which guides the wheels of the vehicles running on it that they cannot leave the track”, [1]. The extensive use of railways with wooden rails and vehicles dated to around the 15th century. Wooden railways were used for larger loads and other purposes by the 18th century, [2].

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Although the definition may vary, the principle remains the same whereby railway is a linear transport feature. Railway by definition is composed of a parallel permanent track of metal rails which fixed to sleepers in order to transport passengers and goods in train, [3]. While, station is a place where trains stop to pick up or let off passengers or goods on a railway track. It can be concluded that, railway station is a building on a railway line where trains stop to transport passengers or goods with platforms and tracks.

Railway station building can be classified as the building for special purposes types as it need different requirement and referred more to necessity. Specialized tracks, the conveyance of freight, the conveyance of passengers, and mechanical traction are four main conditions for building a station, [4]. During the early eras of railways, there was no direct precedent with respect to either the function or the design of railway stations. The basic or a better description which comprises all the needs and requirements were the ticket office, the waiting area and the tracks which are parallel to the building. There were no specific requirements in building the railway station for the floor plan as it developed from the need and the circulations to move passengers and train safely and efficiently.

II. HISTORICAL BACKGROUND OF MALAYSIAN RAILWAYS

Railways in Malaysia started in 1885. According to Amarjit Kaur on her articles pages 41 dated 1985, ‘Tracking the Roots and Routes of KTM’, the developments of railway lines can be categorized in three broad phases which distinguished in the growth of the railway system corresponding to three stages of British political involvement in the Peninsula [5]. The first phase developments started on 1885-1896 whereby the short distance of railway lines being connected from the center of mining of the rural area to the port. While the second phase of railway development starts 1897-1909, connects the railway lines from north to the south of Malaya. During 1910- 1931, the third phase started when new sector called ‘agriculture’ merged resulting on the development of railway lines until the east coast of Malaya.

It started when the Perak state by the Perak State Railway built the first railway line in Malaya and it was opened between Taiping and Port Weld (Kuala Sepetang), on June 1885. After a years later, in September 1886, the Selangor Government Railway opened the line from Kuala Lumpur to Bukit Kuda (Klang) with a distance of 19 ½ miles. Other states such as Negeri Sembilan, Pahang and Johor also start to plan and construct their own railway lines.

A very important event happened on 1896, when the formation of the Federated Malay States led to the formation of the Federated Malay States Railway (FMSR) happened in 1901 by the merging of the Federated Malay States namely Perak, Selangor, Negeri Sembilan and Pahang.

In 1918, a basic linkage of railway lines throughout the Malaya existed until Bangkok, Siam and Singapore (Fig. 1). In the year 1931, the railway lines in the Peninsula Malaysia can all be connected via The West Coast and East Coast line until Singapore and Bangkok. Together with the growth of railway, road network also continued to grow extensively from major urban place to villages.

During the Japanese Invasion in 1941 until 1946, the Federated Malay States Railways suffered damages such as removal and dismantling of railways, bombing, and some several locomotives were transferred for the use at Thailand-Burma railway. After the war, the FMSR continued to operate as an entity for three years under the British Military Administration and Malayan Union. In 1948, it was renamed as the Malayan Railway Administration (Malayan Railway, MR) as the Malayan Union is reinstating as the Federation of Malaya. It is then again being rebranded in 1962, as 'Keretapi Tanah Melayu' with a Malay translation of the name, Malayan Railway.



Fig. 1 Map of FMSR and their connections in 1918 shows the complete linkages of West Coast line and half of the East Coast line still under constructions (Annual Report 1919 of FMSR)

III. ARCHITECTURAL STYLES AND FAÇADE ELEMENTS

A visual quality is very important whereby various architectural styles being applied to the station buildings to persistently make an appearance of the picturesque aesthetic. The station building activities in Malaysia started in 1886, late 19th Century, and ends somewhere in the middle of 20th Century. During that particular time, many architectural styles must have influenced the architects in designing these station buildings and there might be various difficulties interpreting these complicated and mixed architectural styles.

As a matter of facts, distinctive façades elements help to gain a memory of the past and recognize distinctive features of the buildings. Some of these elements are the façade walls, domes, columns, towers, arches and arcades, windows, balustrade, parapet and the finial.

A. Façade Walls

A wall is a structure that carries load, provides shelter and security to a building or an area. Normally, the earlier station buildings or small station buildings used an open plan concept made with timber which only provides walls at the ticketing area and an office. Later, more station buildings being made with bricks and also combination of both. In Ipoh Station building, the decorative effect of voussoir stones and the repetition of keystones over arches. This white wash façade walls finish gives an effect of neoclassical architectural styles to the building. While in Tanjong Pagar Station, Singapore gives the effect of rustication from its grey wash wall finishes.

B. Domes

Dome defines as hemispherical structure evolved from the arch, usually forming a ceiling or a roof. It appeared only to small buildings such as round huts and tombs which mostly found in the ancient Middle East, India and the Mediterranean [6]. One of the most important station buildings in Malaysia, Kuala Lumpur Station has domes located at every corner of the building and some of them are together with the staircases. The dome also known as chhattri, a dome raised by eight multifoil arches surmounted with finial and pinnacles surrounded at the edge of the dome-based. Chhatris which means umbrella usually refers to a small, canopied structure placed at the junctions of fortification, or as decorative elements at roof level on mosque, tomb or other building [7]. While according to Radzinowicz, 2009, chhattri is a Hindustani word that means a pavilion or kiosk that may stand on its own and widely used in palaces and also forts which will be purely decorative and normally have no utility [8]. Chhattri can be seen at every corner of the Diwan-i-Khas and the Rang Mahal of the Red Fort Complexes, India built in 1648 (Fig. 2).

Different type of dome has been applied in Kuala Lumpur Station (Fig. 3). While in Ipoh Station, the dome applied differs from the latter station. A large white wash hemispherical dome surmounted with overhang eaves with support brackets located above the projecting porticos in the middle of the building façade (Fig. 4). The other two smaller domes were located at both corner of the building and the walls were finished with quoins (Fig. 5). The third station that

also applied dome in their design, Johor Bharu Station which located at the center of the building surmounted with finial on top of it (Fig. 6). Onion dome was located at the top of the tower of Seremban Station building surmounted with a moon shaped finial (Fig. 7).



Fig. 2 Dome chhatris with finial and 8 pinnacles



Fig. 3 Dome



Fig. 4 Main dome located at the centre of the building



Fig. 5 Smaller domes



Fig. 6 Dome located on top of the tower mounted with finial



Fig. 7 Onion dome with moon shaped finial

C. Columns

Column is a supporting pillar especially one consisting of a usually round shaft, a capital and a base [9]. Few column types have been detected and can be divided into five, (1) timber column with spandrels, (2) steel column with timber spandrels, (3) concrete column with steel spandrels, (4) eggs and darts molding and (5) Muqarnas or stalactite molding. Taiping Station, Kluang Station and Sungai Petani Station used the square timber columns with spandrels incorporated with it. Although it was categorized in the same column, it still differs between each other's as different decorative elements of the spandrels were applied into the columns. Taiping Station used timber columns with steel spandrels of triangular and round shape in the middle of it (Fig. 8 (a)). This kind of spandrels has been found similar to Kew Station building in

London (Fig. 8 (b)). Meanwhile in Kluang Station, steel spandrels on its square timber column being added for the signage purposes. There's no decoration applied at the timber column of Sungai Petani Station only curvilinear spandrels supporting the column. Steel columns with timber spandrels been applied at Gemas Station. In Gemas Station, at both ends of the train-sheds' columns, the steel columns been wrapped with timber finishes to create vernacular effects. Furthermore, Alor Setar Station (Fig. 9 (a)) having a concrete column with steel decorations placed on top of it. It was triangular shaped spandrels. Using quite similar decorative ornamentations to Alor Setar Station but made from all timber, column and its spandrels in Seremban Station (Fig. 9 (b)). The egg and dart moldings been used mostly in all of their columns at Ipoh Station (Fig. 10). The egg and dart moulding is a common ornamentation in Neoclassical Style which was originated from Ancient Greek. While at Kuala Lumpur Station, the architect introduced the muqarnas or stalactite column molding (Fig. 11 (a)). This influenced from Islamic Architecture as it can be seen in the columns of the Alhambra Palace, Granada in Spain (Fig. 11 (b)) and in Taj Mahal, India (Fig. 11 (c)).



Fig. 8 (a) shows similarity on columns with spandrels at Taiping Station, Malaysia with (b) Kew Garden Station, Britain



Fig. 9 (a) Alor Setar Station shows some similar motifs found in (b) Seremban Station



Fig. 10 The column capital of egg and darts molding



Fig. 11 (a) Muqarnas capital seen on Kuala Lumpur Station (b) also similar to columns at Alhambra Palace, Spain and (c) Taj Mahal, India

D. Towers

Tower by definition is a structure or building characterized by its relatively great height as compared with its horizontal dimension which might be freestanding or a part of a building [10]. Tower is one of the distinctive features where normally distinguished by its height. There are many types of tower such as clock tower, minaret, defensive tower, bell tower and also tower with other purposes. Towers also often topped with spire or finial which built with many forms. It can be said that the station buildings in Malaysia normally used tower minaret, clock tower and also staircases tower. Kuala Lumpur Station had staircases tower whereby an octagonal tower that contains stairwell mounted with chhatris (Fig. 12).

The staircases towers were located at every corner of the station building. Keyhole arches were used for the design of the staircase's balustrades. Despite the Ipoh Station, the towers more like a minaret tower connecting the edge of projecting porticoes. The tower mounted with dome on top of eight columns (Fig. 13). Clock tower normally appeared in places which were rich in symbolism associated with economic and political factors [11]. Three station buildings have clock tower in its buildings, Seremban Station (Fig. 14), Alor Setar Station (Fig. 15) and Johor Bharu Station (Fig. 16). Clock tower of the Alor Star Station was built in square as part

of it and located in the middle of the building. The outer skin was surrounded with half circle wooden sheets creating a fish scales appearance. It was mounted with pyramidal roof with dentils trim cornice and finished with finial. The clock was placed on both sides of the planes that facing the main road and the tracks. While, gable windows were placed on the other two planes of the tower. According to the measured drawing for Johor Bahru Station, the clock still exists on its place but during the site visit, the clock already being uninstalled from its place.

E. Arches

Arch is a construction that spans an opening and usually s pointed arch, pointed horseshoe arch, horseshoe arch, ogee arch, Voussoir arch, and segmental arch. Four types of different arches were used in the Kuala Lumpur Station building (Fig. 17). One of the arches being implemented was horseshoe arch. Horseshoe arch was the first adaptation and invention by the Muslim and been employed in the Umayyad Mosque of Damascus (Fig. 18) during 706-715 [12]. It became famous when it was then introduced in the Great Mosque of Cordoba in Spain, 756-796 (Fig. 19). Then, the second type of arches, pointed horseshoe arches dominated along the colonnaded corridor of the building. A series of double pointed horseshoe arches located at the ground floor while, a series of quadruplet of pointed horseshoe arches were located at the first floor of Kuala Lumpur Railway Station building. The third arch used was Ogee arch. It was located at the ground floor of the projecting porticoes.



Fig. 12 Staircases tower at Kuala Lumpur Station



Fig. 13 Minaret tower at Ipoh Station

The fourth type of the arches, multifoil arch was originated from the Andalusian architecture when they implemented the arches in the Great Mosque of Cordoba, Spain, (Fig. 19). The multifoil arch was invented in order to gain and maximize the headroom height [13]. The multifoil arches being implemented at the chhatris or pavilions which were located at every corner of the building. In Ipoh Station different type of arches, Voussoir round arches adapted in the station building (Fig. 20). Voussoir round arches dominated most of Ipoh station building creating a characteristics of Neoclassical styles architecture. The same arch style also being implemented in Tanjong Pagar Station but the grey wall finishes created rustic effects towards the building.

F. Windows

Window is an opening, generally on the external wall of a building which to transmit ventilation and light. The important aesthetic contribution on window made into a building is the reflected in the range of design that being developed. Few types of window being used in station buildings of the West Coastline, Malaysia. Small station buildings normally used the Malay vernacular types of window which are made of timber casement window with timber louvered on top of it as ventilation but now mostly being changed to glass because of

the usage of air-conditioned (Fig. 21). As compared to the bigger station buildings located in the main cities, the types of window follow the building architectural styles. In Kuala Lumpur Station, horseshoe shaped windows applied on its façade (Fig. 22). Characterized by its horseshoe arch, it was much used in Andalusian architecture. While in Ipoh Station building, Palladian windows were used. The Palladian window consisted a central arched opening with two smaller rectangular openings on either side (Fig. 20). There are also casement windows with round (Fig. 23 (a)) and triangular pediment trims (Fig. 23 (b)). Besides, in Tanjong Pagar Station building, Voussoir circular arch shaped window with keystone and some details ornamentations are used. Two small faced lion figurines with eggs and darts moldings, dentils were applied on it (Fig. 24).



Fig. 14 Seremban Station's clock tower



Fig. 15 Alor Setar Station's clock tower



Fig. 16 Johor Bharu Station's clock tower



Fig. 19 Combinations of arches in Great Mosque of Cordoba, Spain



Fig. 17 Ground floor shows ogee arches, horseshoe arches and pointed horseshoe arches while the first floor shows double horseshoe arches and pointed horseshoe arches. At the roof top where there are dome chhattri which supported by multifoil arches



Fig. 20 Voussoir round arches in Ipoh Station



Fig. 18 Horseshoe arches, Umayyad Mosque, Syria



Fig. 21 The upper window part has been changed into glass to suit the usage of the air-conditioned

G. Balustrades

Balustrade also found as one of the façade elements in a building. Balustrade is a row of small columns topped by a rail which normally found in staircases, terraces and sometimes in parapet wall. It derived from the form's constituent posts, called balusters; a name coined in 17th-century Italy for the bulbous item's that resembles blossoming pomegranate

flowers [14]. In Kuala Lumpur Station, keyhole arches were used at the balustrade of the stairway. While a series of octagonal shapes were applied along the balustrade corridor. Different approached in Alor Star Station, as they are using the flora motifs for its concrete balustrade to synchronize with the finial and decorative columns. On the other hand, Ipoh Station applied the segmented bulbous balustrade along the corridor and the parapet wall. A southern-cross design was used at the balcony of Johor Bharu Station.

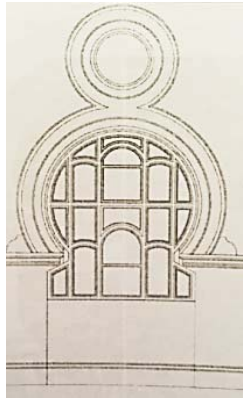


Fig. 22 The horseshoe shaped window at Kuala Lumpur Railway Station



Fig. 23 (a) Circular and (b) triangular pediment as a window trims in Ipoh Railway Station



Fig. 24 Voussoir circular arch window with lion figurines, dentils and eggs and darts molding as detailing

H. Parapet

The other façade element, the parapet is as a low wall or railing to protect the edge of a platform, roof, or bridge, [9]. In Kuala Lumpur Station, there were two types of parapet walls located at their projecting porticoes, one is the arch parapet with miniature chattris on both sides act as pinnacles (Fig. 25). The second type, a battlement having a series of horse-shoe arches forming a colonnade (Fig. 26). The design of the columns reflects of those Greek orders. A miniature chattris acts as a pinnacle also employed in parapets at every angle surmounted with a finial. While in Ipoh Station, the pitched roof covered with red clay tiles in front of which battlement comprises a segmental or triangular pediment with dentil trim surrounded with turned balustrades similar to classical Corinthian balustrades. The balustrades act as a parapet wall to a building.



Fig. 25 Parapet wall with miniature chattris acts as a pinnacle (VOT 69651, KALAM)

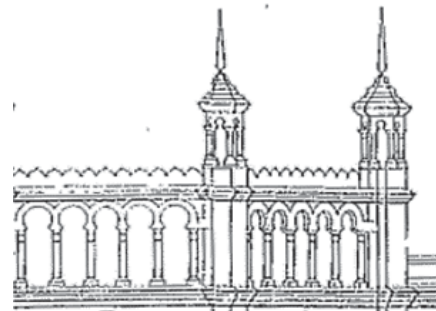


Fig. 26 A battlement having a series of horse-shoe arches forming a colonnade with chattris at the edge (VOT 69651, KALAM)

I. Finial

The finial is a decorative element in the upper termination of a pinnacle, gable end, buttress, canopy, or spire [6]. In Taiping Station, the finial was similar to vernacular finial which also known as 'tunjuk langit' in Malay languages (Fig. 27). It is normally being used as one of the roof elements in traditional Malay houses (Fig. 28). There are various shapes of 'tunjuk langit' and the one being used in Taiping Station are the most common design of them. Another decorative finial element in Alor Setar Station, (Fig. 29) was used in the form of idealized flowers, made from wrought iron, symbolized Malaysia's national flower, hibiscus (Fig. 30). Meanwhile, the finial at Johor Bahru Station (Fig. 16) and Tanjong Pagar Station, Singapore looks more like a flag pole.

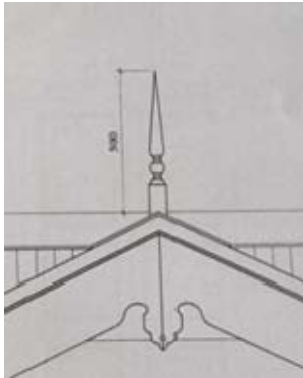


Fig. 27 Taiping Station's finial at the porch, (AW51.A/07/08, KALAM)



Fig. 28 One of the Malay house using almost similar finial



Fig. 29 Finial made from wrought iron symbolize Hibiscus flower



Fig. 30 Hibiscus flower

IV. CONCLUSIONS

The station buildings activities started in 1886, late 19th Century, and ends somewhere in the middle of 20th Century. It begins with small station buildings improving into medium size and then lastly to large station buildings in order to fulfill the overgrowing populations and their needs. During 1885 until 1957, many architectural styles must have influenced the architects in designing these station buildings and there might be various difficulties in interpreting the architectural styles of the buildings. Almost all of the station buildings were designed by the British architects and Public Works Department at that time whereby most of the architects have experienced working in India, the British Empire Headquarters.

It can be concluded that there was a mixture of architectural styles as they tried to balance all of it with Malay vernacular style, 19th Century British architectural styles; the Georgian architecture which includes Neoclassical and Palladian, Indian architectural styles as well as Islamic architectural styles. Most of the researchers relate the connections on so called architecture movement by the British, Indo-Saracenic architecture which essentially a combination of oriental elements such as domes, towers, and minarets, multifoil arches with Victorian Neo Gothic. Also, not to forget the Georgian and Palladian styles that normally being adapted on governmental buildings as a new hybrid with the combination from Islamic architecture. In Malaysia, the decorative elements and ornamentations became lesser because of no expertise in native Indian architecture labours. The merged of the Asian exotic elements with, Islamic architecture and the 19th to 20th Century British architecture makes Malaysia still looking forward for their national identity in architectural styles.

REFERENCES

- [1] Lewis, M J T, *Early Wooden Railways*. London: Routledge & Kegan Paul, 1974.
- [2] A. Coulls, "Railways as World Heritage Sites". Occasional Paper for the World Heritage Convention, International Council on Monuments and Sites (ICOMOS), 1999.
- [3] Collins, Harper. "Collins online dictionary", 2017.
- [4] C. L.V. Meeks, "The Railway Station. An Architectural History" New Haven: Yale University Press, 1956.
- [5] A. Kaur, "Tracking the Roots and Routes of KTM". Malayan Railway 100 Years 1885-1985, AMW Communications Management, 1985
- [6] Britannica, E., "Encyclopaedia Britannica", 1998.
- [7] R.N. Dhar, "Art and Architecture of South Asia Changes and Continuity". Cyber Tech Publications, 2011. p.178.
- [8] D. Radzinowicz, "The Glory of the Sultans; Islamic Architecture in India". Flammarion S.A., 2009.
- [9] Webster, Merriam. "Merriam-Webster online dictionary", 2006.
- [10] C.M. Harris, "Dictionary of Architecture and Construction Fourth Edition". The McGraw-Hill Companies, Inc. eBook version: 0-07-145237-0, 2006.
- [11] W. Hung, "Monumentality of Time: Giant Clocks, the Drum Tower, the Clock Tower", 2003. p128.
- [12] M.S. Briggs, "Muhammadan Architecture in Egypt and Palestine". Clarendon Press, Oxford, 1924.
- [13] R. Saoud, "The Arch That Never Sleeps". Foundation for Science Technology and Civilisations, 2002.
- [14] M. Owens, "What is a Balustrade". The Architectural Digest, July Issue.