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Evolution of A Type; A Case Study of Station Buildings in West Coastline, Malaysia During the British Era (1885-1957)

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Abstract
The British intervention in Malaya resulted in the development of the railways as urgency of the expanding tin and rubber industries. This paper attempted to emphasize on the evolution of the station buildings' plan types and its train-sheds. Railways were the pioneers of modern transportation introduced by the British in 1885 in Malaya. Although the terrain was the main difficulties in railway developments, they managed to connect the lines through West Coast and East Coast lines until Singapore on the southern part and Bangkok on the northern part in the year 1931. Case studies have been conducted and the analysis on plan type evolution will be made between the station buildings in Malaysia in parallel with station buildings around the world during that time. Together with the growth of railway, the city blooms where it allows road constructions and buildings with different functions such as administrative buildings, railway station buildings and others started to fill major urban places.
Keywords: Malaysia; Station Building; Train-sheds; Evolution; Plan Types.

1. Introduction

Prior to industrial revolution, railways were the pioneers of modern transportation introduced by the British to Malaya during 1885. 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 urgency to transport the natural resources such as the tin ores resulted railway as major transportation means for distribution and people. The birth of railway station buildings came along as required facility built on the trackside for urban facilities for people and goods on railway network. Howard (2012) expressed that the colonial railway station buildings were the statements of British power and control, thus expressed through their architecture and stylistic decoration.

Kido (2013) expressed that a railway station can be defined as a place where trains load or unload passengers usually consists of the combination of a platform and a station building or shelter or any one of it. Meanwhile Shin et al. (2015) said that the railway station building is a facility built along the track used for people and goods.

Railway by definition is a permanent track composed of a line of parallel metal rails fixed to sleepers used for transportation of passengers and goods by trains. While station is a place where trains stop to pick up or let off passengers or goods on railway track. It can be concluded that, railway station is a building on a railway line where trains stop to transport passengers or goods using platforms and tracks.

Besides the main function of the railway station building is giving an access to the train, it also performs other variety of functions such as meeting places and urban landmarks. It can be stated that railway station building is an important public building. A study by Meeks (1956) stated that a railway station building has different requirements compared to other public buildings. The requirements are the specialized tracks with mechanical system, freight and passengers' transportations.

Theoretically, there are several types of railway station buildings such as terminal stations normally large and built-in city centers, substation or suburban stations are normally small and intermediate stations, and halts.

Railway station building owes its birth to necessity during the industrial revolution when the production system and economy changed as a result for the requirement of purchasing a ticket at the ticket office, proceeding to the waiting area or shelter provided as the simplest form of a station building. Classification of the building types has been made according to the passengers' circulation.

As for the definition of a railway, most of the early historians interpreted what they already understand about the term 'railway'. According to Dr Michael J. T. Lewis (1974), the eminent scholar of early railways, it is 'a prepared track which guides the wheels of the vehicles running on it so that they cannot leave the track'. Railways that fit Lewis et al. (1999) definition, it existed as far back as 6th century BC; the Greek Diolkos was a railway with a track made from stone, 6 km in length across the Peloponnese, used for transporting specially ships started from c. 600 BC until the middle of 1st Century AD. Although the definition may vary, the principle remains the same whereby railway is a linear transportation.

2. Background Study on Station Buildings

2.1. World History

The Britain or English were the monopoly owners of the railways, the station buildings were the symbols of technology advancement whereby it was equipped with wide spans of shed and various architectural styles of the building frontage. The first railways started when Stockton and Darlington Railway (1825) in **Britain** was made, no provision were made for railways' passengers without any station building. In 1830, a ticket office was built in Stockton which resembles a toll house long associated with water canals and toll-roads. Later after 1830, the first station building in Stockton was built in the form of a timber coach shed as the passenger shelter. 15th September 1830 marked the opening of the Liverpool – Manchester Railway with the length of 35 miles, the first railway to rely exclusively on steam hauled train for both, goods, and passengers. It was the first railway to be fully operated without the help of animals. In 1830, the prototype of the "modern railway" had arrived: the combination of a specialized track, the accommodation of public traffic, the conveyance of passengers as well as freights, mechanical traction, and some measure of public control (Meeks, 1956).

The spread of Industrial Revolution leads to the extensive development of railway transportation not only in Britain, also in other countries. In **United States**, construction of railways started in the year 1928. Years after the entrepreneurs were planning to build the Baltimore & Ohio Railroad in 1927. The steam railway came later in 1832 when the American changed the 'heavy' British locomotives into the 'American' prototype locomotive with a four-wheeled bogie under the forward end of the boiler, spreading the weight over more wheels.

The railways' influence was not only felt in countries that first industrialized, but it also felt beyond Europe and United States. After Great Britain, **Belgium** was the second country in Europe which involved in railway transportation. A planned railway system was achieved in Europe, under the guidance of Leopold I. Brussels – Mechelen was the first railway line to open in Belgium on 5th May 1835. Later, the history of **German** railway transportations began with the opening of Bavarian Ludwig Railway between Nuremberg and Furth on 7th of December, the same year (1835) as Belgium.

The urge of transferring coal from the mining area to the seaport, resulted in the first (21 July 1836) **Canadian** railway roads, Champlain, and St Lawrence Railroad, running through La Prairie and St. Jean Stations.

Cuba made their railway lines before Spain. While in Cuba, the first railway transportation was built for a different sector, to transport sugar canes rather than ore transportation. The first railway connects Havana to Bejucal Station having a length of 27.5 kilometers on the 19th of September 1837. Then, the **Russian** Empire, first railway built between Tsarskoye Selo and St.Petersburg, in October 1837.

This blooming railway transportation industry also influenced the Dutch to build railways in order to be competitive with the neighbouring countries. On 20 September 1839, **Netherlands** opened its first railway lines between Amsterdam and Haarlem, 16 kilometers long. Meanwhile, **Kingdom of the Two Sicilies**, 7.64 kilometers long railway line was opened between Naples and Portici Station in October 1839.

Furthermore, in August 1842, the Prussian Government, in **Poland** the Upper Silesian Railway Company, opened the first two sections of the main line. The first section was opened on 22nd May connecting Wroclaw to Olawa, the second section connected Olawa to Brzeg. In 1845, railway constructions also began in the European colonies and the South American republics. On 21st November 1845, **Jamaica** was the second state bounded to the British which received a railway system which was built to cater the sugar between Kingston Station and the Spanish Town Station which was 19 km. long.

In **Hungary**, the first railway line was opened on 15th July 1846 between the Pest and Vac Stations. Later, in **Spain** under the Spanish Empire, railway lines arrive in 1848, connecting Barcelona Station to Mataro Station.

India, one of the British Colonies, opened its first railway line from Bombay to Thane on 16th April 1853. The railways were built to transport troops in war time and to transport cotton to the factory mills in the United Kingdom. In the late 19th Century, the railway lines of India were the fourth largest railways of the world.

The **Ottoman Empire** was interested in building railways and began to build its first railway lines in the year 1833, but the first line could not be opened before 1854. This line took place between Alexandria and Kafr el-Zayyat on the Rosetta branch of the Nile on the Mediterranean coast, Egypt. The same year, 1st September 1854 in **Norway**,

the railway line between Oslo and Eidsvoll was opened for timber transportation. Meanwhile in **Australia**, the first steam railway started in 1854, whereas steam railway stretched from Melbourne to Sandridge (Port Melbourne).
In 28 October 1856 the first railway line in **Portugal** between Lisbon and Carregado was opened. Though, the first station building in Portugal was the Santa Apolonia Station building, was opened on 1st May 1865. A year later, **Argentina** started its railway line in 1857, 29th August when the train travelled from Del Parque Station, Buenos Aires to Floresta Station for 10 kilometers.
Another British Colony, **Pakistan** in 13th May 1861, opened its line between Karachi City and Kotri, 173 kilometers long, to shorten cargo transportation time from Karachi to Delhi. Meanwhile, on June 14th, 1861, the construction of first railway lines by the British spread to **Paraguay** opened its first journey from the port of Asuncion to Trinidad.
In **Finland**, the first railway line was opened between Helsinki and Hameenlinna on 31st January 1862. The track was 96 kilometers long. Later, **Ceylon** (Sri Lanka) was introduced with railways by the British in 1864. Initially, the main reason for building a railway system was to transport tea and coffee from hill plantations in the district of Kandy to the port city of Colombo. The service-connected Colombo Station and the Ambepussa Station.
Though **Serbia** started its railways earlier in the middle of 19th Century with horse drawn carriages, the formation of the Serbian Railways resulted in their first train which departed from Belgrade to Niš on 23 August 1884. Meanwhile in **Bulgaria**, began when it was under Ottoman Empire territory. It was opened between Ruse and Varna in 26th October 1866, connecting the busy ports of Ruse, Danube River and Varna, Black Sea.
There were around 26 countries from all over the world had established their railway lines as well as the station buildings from the year 1830 until 1885 for the main purpose which were to transport goods for mining industries, agricultures, and services in the fastest way possible.

2.2. Early Documentation on Station Buildings in Malaysia

Research on West Coastline station buildings have been made and throughout the process of data collections, it can be found that the National Archive, the Public Works Department (now known as Jabatan Kerja Raya) and the local authority in Malaysia did not have or kept any documents mainly on architectural parts such as station buildings original drawings, plans, elevations, and sections. It is said that the lost plans, the concerned maps, and other related information were lost during the bombing of Japanese Occupations in 1940s. It can be stated that the publications on railway station buildings in Malaysia are extremely limited and scarce. One of the earliest publications mentioning about railways written by J.A. Stanistreet (1973), titled 'The Malayan Railway' on his journeys through Malaya using the railway services. There are also few sources of historical texts that can be referred regarding railways called 'Sejarah Keretapi di Malaysia' by M.A. Fawzi Basri, (1985). Later, initiatives also being done by the Keretapi Tanah Melayu in publishing a book called 'Malayan Railways 100 Years 1885 – 1985', commemorating the 100 years of railway in services to be the preferred referrence book. Stocker (1987) described in one of the magazines called 'Majallah Arkitek' focused more on Kuala Lumpur railway station building's history and its architectural descriptions. Meanwhile Musa (1989) studied on history of railway development and its architectural elements on selected railway station buildings. Sahabuddin (2012) later examined the evolution of railway station in Kuala Lumpur in his research report for Design, Value and Architecture subject course. Then, research report writing for History and Theory of Architecture subject also can be found, Alias (2015) on British Influence to Federated Malay States Railway Stations which focused on identifying and evaluating the influence of British India in Kuala Lumpur and Ipoh Railway Station as the first two railway stations that have been built by brick. The latest journal found, Anuar (2017) emphasized more on architectural station building's facade elements and its style influenced. Measured drawing works regarding some old station buildings throughout Malaysia have been documented by students from Architectural Department of University Technology Malaysia, one of Malaysian universities for their Center for the Study of Built Environment in The Malay World known as KALAM. As can be seen, it can be stated that most of the researchers in Malaysia focused on the history and railway system development, socioeconomics, political developments, railway locomotives and services, and its styles influenced regardless on its building typologies. This paper was made to fulfil the gap concerning their building and train-sheds typologies in depth.

3. Building Typology

3.1. Plan Types

Station buildings were determined by its layout plan, certain architectural elements, and its surrounding area. From the small ticketing office as its basic needs then it grew to additional spaces such as waiting area and shelter provided to make a simplest form for a special purposes building, a station building. Large station building might include segregated waiting rooms, further office spaces, hotels, restaurants, and kiosks.
In 1846, Cesar Daly, editor of the Revue Generale de l'Architecture found that there were only four station types according to basic circulations routes of departing and arriving passengers (Meeks, 1956). The four station types were; (1) one – sided, passenger route takes place on one side of the track, (2) two – sided or twin stations, arriving

and departing routes handled on opposite sides of tracks, (3) head house type station building, allowing both arriving and departing passengers coming across each other and mixing on one platform and (4) 'L' type station building, passenger arrive at the end of the track and depart at the other side or vice versa (Figure 1).
Although Daly stated 4 types of station plans, nevertheless, Malaysian West Coastline station buildings' plan types can be categorized into two (2) main types. Firstly, one – sided plan divided into two types, one having a single platform and the other with two platforms and secondly, the head house plan. Run the text on after a punctuation mark.

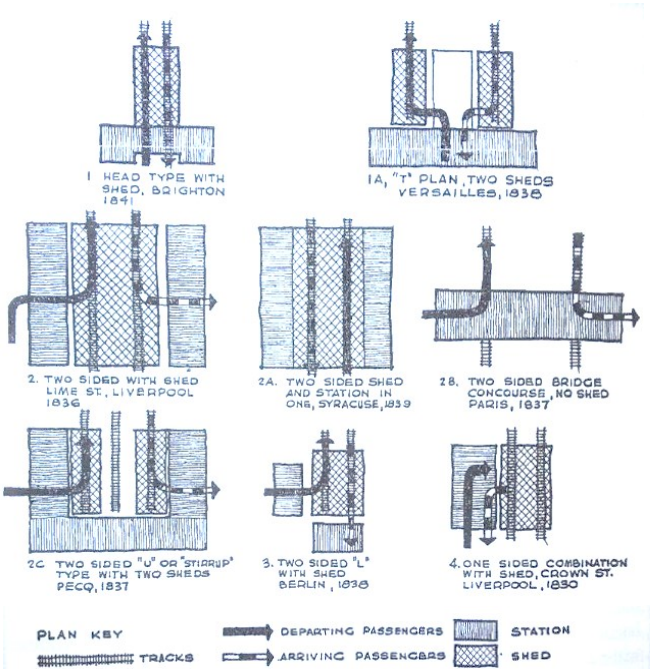

Figure 1. Early 3 types of station plan showing one – sided, two – sided and head house plan (Meeks, 1956).

3.1.1. One-sided Plan

The earlier station building in Malaysia used, one-sided station plan type as it was the most basic plan and it accommodates open waiting area, ticket office and a track. This type is basically seen all over the world. This basic plan of long rectangular buildings extending along the rail track, were built to fulfill the basic function that is to discharge goods and passengers quickly as possible when the train stopped. At the same time the covered verandah gives the needed protection for the boarding passengers.
One–sided plan type can be divided into two categories; one – sided having single platform and one – sided having two active platforms. It can be stated that most of the station buildings along the West Coast are of one–sided plan type having a single active platform. This plan provides one active platform serving both departing and arriving passengers. This building type normally complies with small station buildings in relatively small towns. Some examples of Malaysia's station buildings that fall into this category, Klang, Tapah Road, Tenang (Figure 2), Labis (Figure 3), Bekok (Figure 4), Paloh, Rengam (Figure 5), Kulai, Sungai Petani, Alor Star and Chamek. All these buildings were built with basic rectangular floor plans, some with projecting roofs extending over the platform. The major problems occurred when the passenger volume grew bigger which resulted in congested and packed platforms.

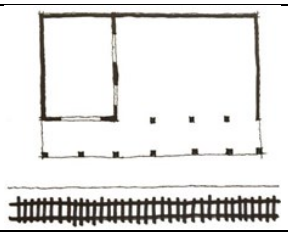

Figure 2. Schematic Plan of Tenang Station.

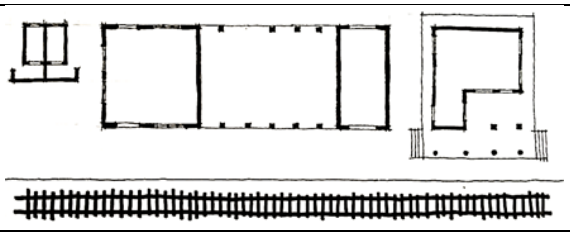

Figure 3. Schematic Plan of Labis Station.

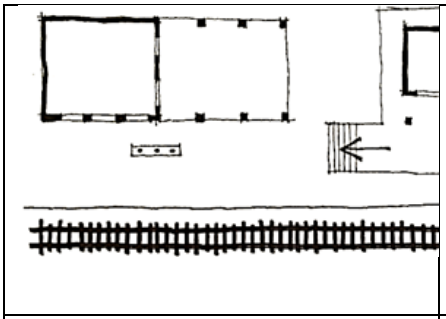

Figure 4. Schematic Plan of Bekok Station.

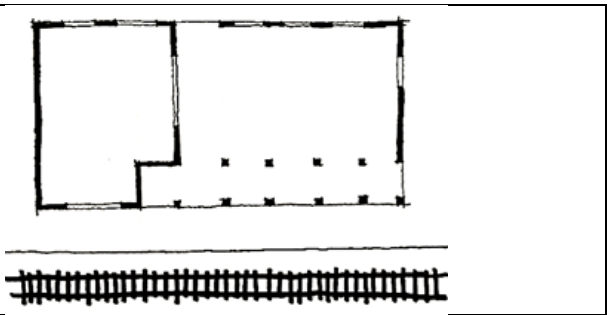

Figure 5. Schematic Plan of Rengam Station.

One-sided station building plan also can be seen in other British Colonies, such as India etc. Some examples were the Crown Street, 1830 in Liverpool and the last one-sided plan type station building in Britain, was at Newcastle Station built in 1855 (Figure 6), and Mekece (1898) Sakarya Turkey (Figure 7). Problems occurred when the station capacity grew bigger and the only one active track became full and pack. The last station building in Britain, using the one-sided plan type was at Newcastle built in 1855. The Mekece Station as seen in the photograph shows there was only a single raised platform that was attached to the building.

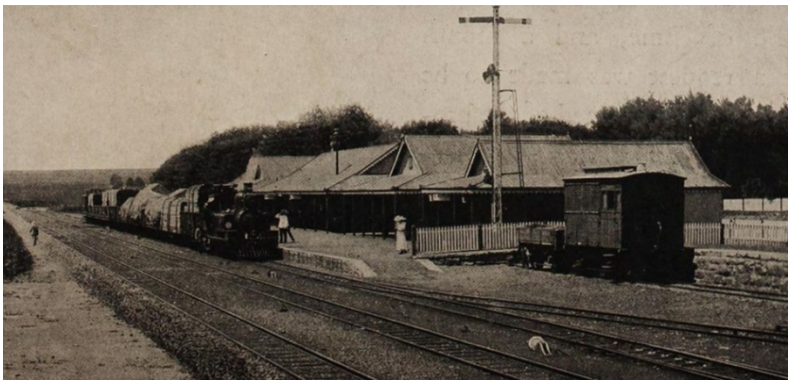

Figure 6. 1900 photographed of the one–sided station plan type of Newcastle Railway Station shows only one active platform for passengers used.

Figure 7. The one–sided station plan type of Mekece train station by the river of Sakarya shows only one active platform for passengers (Akyuz et al, 1999).

Meanwhile, there are few station buildings which are categorized as the one–sided type with two active platforms. For the one–sided type with two active platforms, mostly pedestrian bridges or underground tunnels are provided to allow departing and arriving passengers to get to their respective platforms. The station buildings, mostly incorporating rectangular plan, examples are Taiping (Figure 8), Gemas, Kluang, old Kuala Lumpur (Figure 9), Kuala Lumpur, Ipoh and Johor Bharu. As these stations are not the terminating stations, pedestrian bridges were added to connect the two platforms. Most of the stations provided pedestrian bridges to connect the two platforms and sometimes some stations do have an underground tunnel. In Britain, the first station building was the Euston Station, London and it became famous during the mid-19th century.

Figure 8. The first railway station built in Taiping; Perak used one-sided station plan type (Basri, 1985).

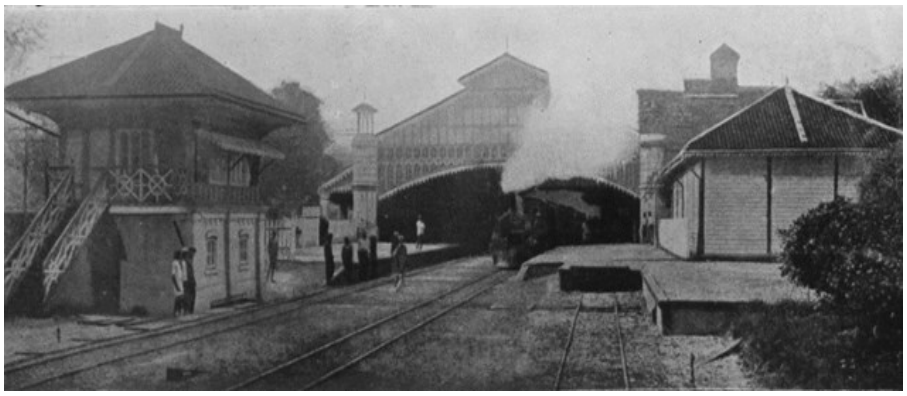

Figure 9. The old Kuala Lumpur Station that used one-sided having two platforms station plan type (Basri, 1985).

3.1.2. Head house Plan

As the station grew bigger, the head house plan type seems to be more appropriate but only one station in Malaysia has the chance in adapting this station plan type. The head house plan type allows both arriving and departing passengers to pass through each other. Both shared a common waiting hall or lounge in a single building having separated platforms for arrival and departure. The U-shaped station is one of the best examples of the head house type station building where it offers easy access and allows passengers to move freely without crossing the tracks.

The Tanjong Pagar Station was the last station built by the British in 1932 as it was the last station in the West Coastline from Padang Besar, Perlis to Tanjong Pagar, Singapore. Tanjong Pagar Station having a U-shaped plan allows all passengers to enter and exit from the head house of the building giving opportunities for the people to mingle (Figure 10). This might be inspired from the York Station (1840-1841) which also employed U-shaped station plan and became one of the most successive station (Figure 11). The U-shaped station was easily accessible permitting passengers to move around freely without having to cross tracks.

The Chhatrapati Shivaji Terminus, India also applied head house plan type, but the head house located at the side of the platforms (Figure 12). Meanwhile, the St Pancras Station London, United Kingdom (Figure 13), built in 1868, enveloped the departure and arrival platforms, had close similarities to Tanjong Pagar Station plan.

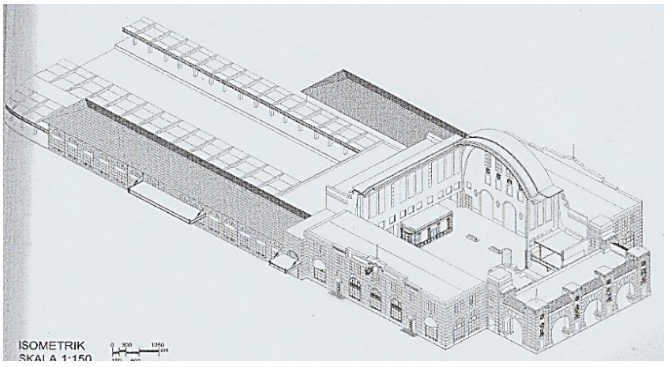

Figure 10. The Tanjong Pagar Station used head house plan type having U-shaped plan (KALAM, 2008).

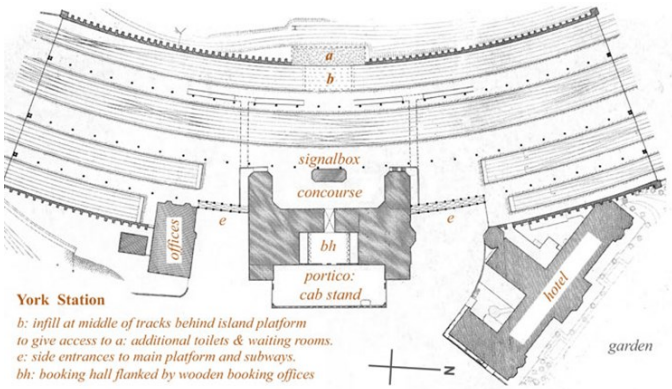

Figure 11. The U-shaped plan of the station building located in between offices and the station's hotel.

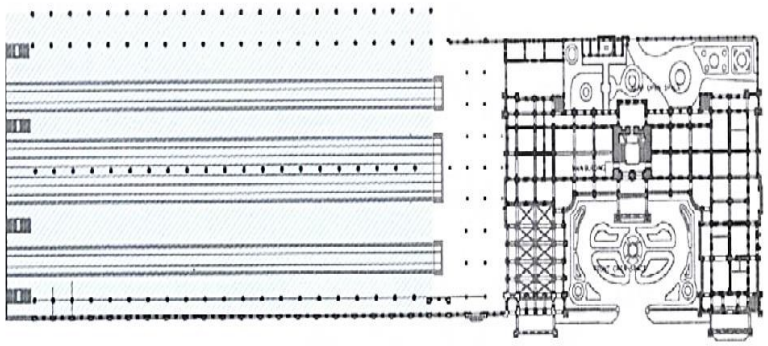

Figure 12. The head house type station of the Chhatrapati Shivaji Terminus, India.

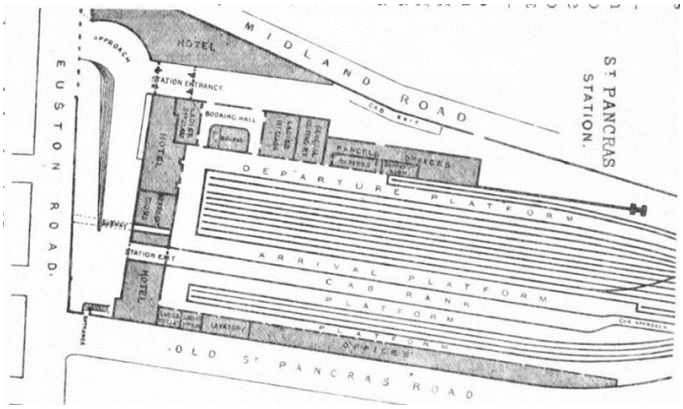

Figure 13. The head house plan type of St Pancras Station with its U-shaped plan created better accessibility.

3.2. Train-sheds

Train-sheds is a structure for shelter, either adjacent to the station building or having roof coverings over the tracks and platforms. It may also be an independent building (or structure) to cover the platform area. Train-sheds evolved from a simple wooden lean-to shed into a long spans iron and glass structures used to shelter people and trains. The evolution of train-sheds can be seen followed from the use of materials of the time having modern technology. Most of the station buildings in Malaysia do not have train-sheds that are used as the waiting area is normally a part of the station building for example Taiping, Batu Tiga, Batu Gajah, Batu Anam, Segamat, Tenang, Labis, Paloh, Nyior, Kluang, Mengkibol and Chamek.

The generous overhanging roof eaves normally seen in the station buildings could not be considered as train-sheds, as they are part of the main building.

3.2.1. Lean-to-wall and Single Structure Train-shed

The first type of the train-shed is lean-to-wall shed and single structure train-sheds. Some of the station building applied the lean-to-wall or single structure train-sheds method which covers only the platforms. But sometimes both methods were used to apply in one station building. Normally timber and steel materials were used for the structures.

The first wooden train-sheds were built with timber frame structures incorporating gable roofs and finished with red clay tiles. The structure covers the island platform only and not the overall area. This can be seen in Taiping station building.

When steel was introduced, the sheds were built in both steel and timber. The train-sheds in Gemas Station applied this combination of steel and timber train-sheds. One of the train-sheds is placed adjacent to the station building wall and the other one is placed on the island platform. The train-shed adjacent to the station building wall consists of one steel column placed on a concrete stump having a queen post. Here, two steel columns with double howe roof trusses are used. Meanwhile, at both ends of the train-shed, timber panels were placed to cover the roof sides forming a triangular front on both ends.

Similar train-shed applications can be seen in the station buildings of Britain, namely Barons Court (Figure 14) and Turnham Green (Figure 15) station buildings can be given as matching examples.

Figure 14. Barons Court stations' train-sheds with steel column and timber panels as coverings (Fieldwork, 2016).

Figure 15. Turnham Green stations' train-sheds with steel column and timber panels as coverings (Fieldwork, 2016).

Meanwhile, there are only few train-sheds totally made from steel. This is because such materials are prone to corrosion and unsuitable to Malaysian climate. The lean-to-wall steel train-shed seen can be seen in Klang Station. The double cantilevered roof trusses cover only the platform area. Ipoh Station train-sheds' applied both lean-to-wall and single structure train-sheds, each having a different truss system (Figure 16). Firstly, the lean-to-wall shed on building wall has a double pitched roof featuring extended fink trusses which creates roof lantern on the top. The roof lantern is used for lighting purposes. The fink trusses are supported by struts on both ends. In addition to the outer column, a mono double truss is attached, creating a three-tiered pitched roof. Secondly, a double post column, single structure shed covered with pitched roof was applied. It is in the middle of the tracks, on island platform. Similar fink truss system was used. Thirdly, a single post column with pitched roof was applied on the third platform. Again, fink truss system was used. Ipoh Station train sheds' applied mostly local style construction methods using steel-and-wood pitched canopies as compared to Kuala Lumpur Station train-sheds.

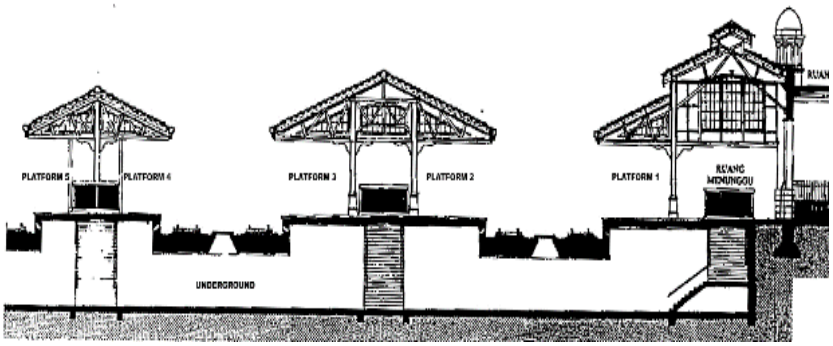

Figure 16. Ipoh Station with three different train-sheds (KALAM, 1995).

3.2.2. Long Spans Train-shed

Long spans train-shed was popularized in the middle of the nineteenth century, whereby many large station buildings started to cover bigger area; platforms and tracks. The train-shed is made of iron, steel and glass materials. This development was inspired by The Crystal Palace designed by Joseph Paxton at The Great Exhibition, London in 1851. This building has given great impact to large station building design with innovative features such as curved roofs made of iron and glass applications.

A large train-shed made of steel and a glass roof covering both; platforms and railway tracks was applied in the old Kuala Lumpur station building (Figure 17). It was the first station building that used such train-sheds. Later, it was demolished when the new Kuala Lumpur station was built. The old train-sheds had a double pitched roof. From the 1893 picture of the demolished station building shown in the catalogue, the materials used of might be steel and glass. The train-sheds resembled Preston Railway Station's train-sheds which was built during 1880 in United Kingdom (Figure 18).

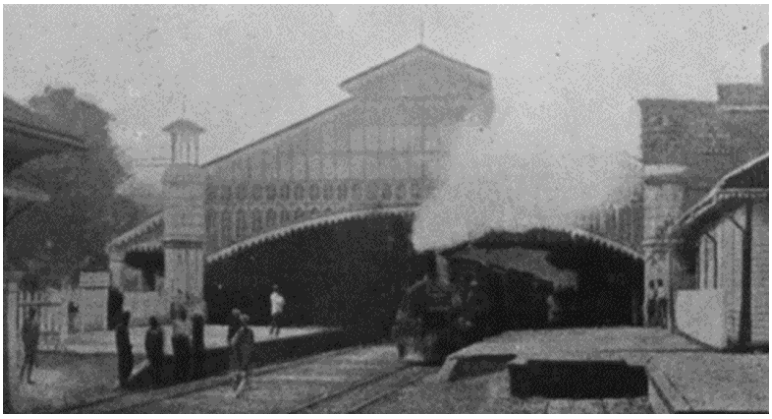

Figure 17. Old Kuala Lumpur Station train-sheds' with double pitched roof covering the whole area.

Figure 18. Preston Railway Station train-sheds' resembled the old Kuala Lumpur station train-sheds.

Meanwhile, the new Kuala Lumpur Station applied similar train-sheds, large steel-frames covering all the platforms, combinations of roof truss systems are used. A combination of fink and pratt trusses each having a roof lantern on top covers the twin sheds and tracks of the station. Kuala Lumpur Station (Figure 19) was the only station built by the British having enormous steel and glass train-sheds.

It is like one of the earliest train-sheds at Gare Montparnasse, Paris built in 1850-1852 (Figure 20). Similar symmetrical twin arches with a pylon in the middle of the island platform is used. But the composition of the trusses used were different. The trusses of the train-sheds are a combination of both stations, Gare Montparnasse, Paris and old Munchen-Hbf Station, Germany (Figure 21) as it applied pitched roof and lantern concept on top of the sheds.

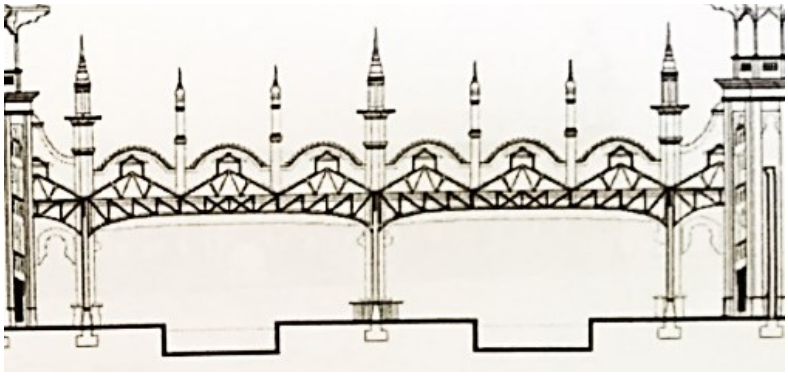

Figure 19. Close-up of Kuala Lumpur Station's train-shed (KALAM, 19??)

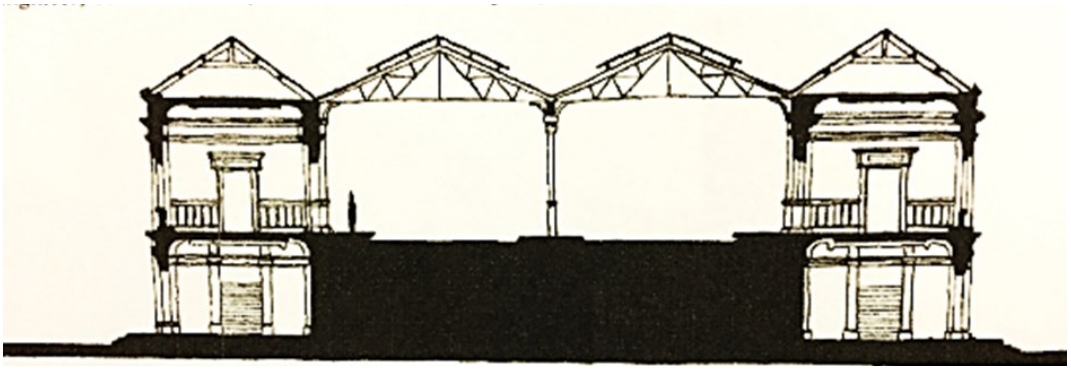

Figure 20. Gare Montparnasse, Paris showing double train-sheds (Meeks, 1956).

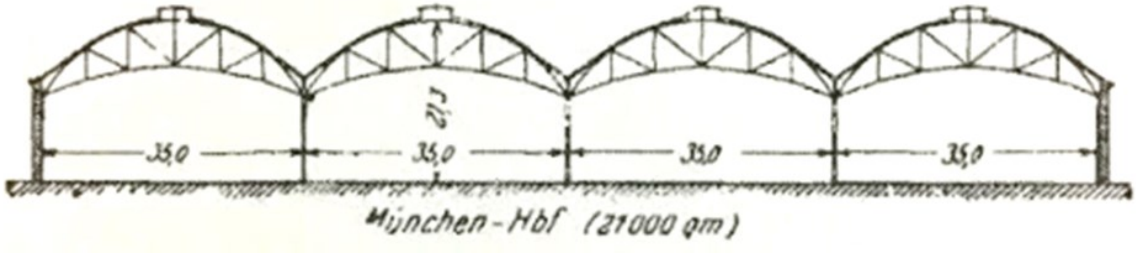

Figure 21. Section of Munchen – Hbf, Germany (Meeks, 1956).

3.2.3. Butterfly sheds

The third type of train-sheds is a butterfly sheds. Known as butterfly sheds because of its up-swept, wing-shaped roof. The butterfly shed can be seen in Kluang Station and Tanjong Pagar Station. It only covered the platforms. It is more economical compared to the previous train-sheds in terms of the usage of materials and maintenance wise. At first, it was made from steel but later, concrete was used.

The design of butterfly shed in Kluang Station (Figure 22) used a single column and can be seen in New Haven Railroad Station USA (Figure 23) and Mahalakshmi Station, India (Figure 24).

Meanwhile the design of butterfly train-sheds in Tanjong Pagar (Figure 25) used two columns to support the shed. The same butterfly shed can be seen in Munchen East Station, Germany (Figure 26).

Figure 22. Kluang Station applied concrete butterfly shed at the island platform (Fieldwork, 2016).

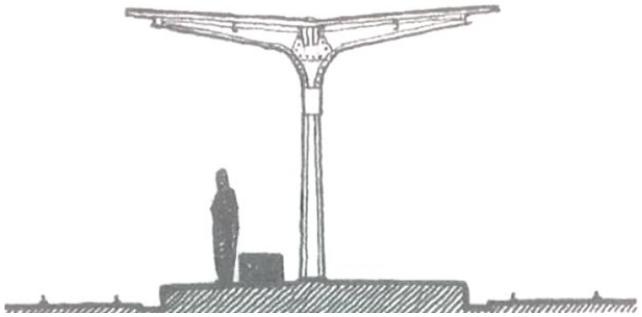

Figure 23. New Haven Railroad's butterfly shed (Meeks, 1956).

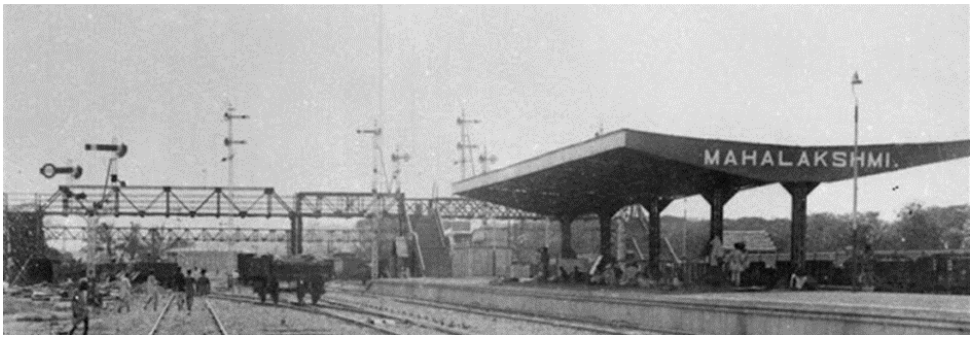

Figure 24. Mahalakshmi Station, India applied butterfly shed.

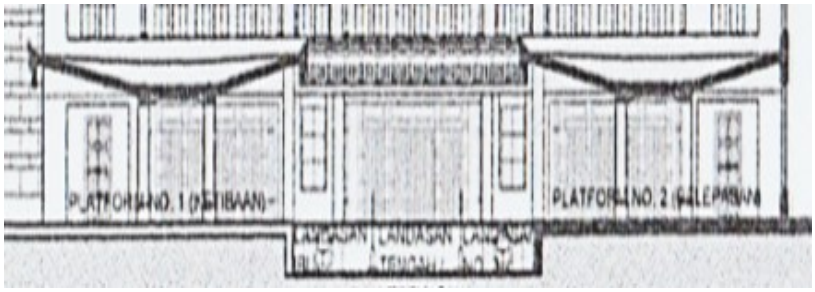

Figure 25. Butterfly train-sheds covering the platforms at Tanjong Pagar station (KALAM, 2008).

Figure 26. Munchen East Station, Germany shows the butterfly train-sheds.

4. Conclusions

Railway station buildings started its construction during 1886 by the British and ended somewhere in the middle of the 20th Century in 1957, as Malaysia gained its independence. Throughout the decades, the railway station buildings experienced upgrades and matured into a form that they may last for the next hundred years. Initially built small, the railway station buildings were equipped with necessities. The West Coastline railway station buildings' plan types can be categorized into two main types according to its evolution; 1.one – sided plan which divided into two types, one having a single platform and the other with two platforms mostly found on small and medium size station buildings and 2. head house plan, found in monumental or large size station buildings. Meanwhile the train-sheds can be divided into three types: the lean-to wall sheds, the long span train-sheds and butterfly sheds. From short span to longer span of train-sheds and later to much simpler forms of shed due to the introduction to new materials during industrial revolutions. Due to the increased in demand of the tin ores and agricultural products (rubber, pepper, cocoa) as well as the population growth, station buildings then were expanded from medium to large-sized with added facilities to fulfil the needs of ever-growing populace.

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Conflict of Interests

The Authors declare no conflict of interest.

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