The Façade Characters of NIS Stations in the Yogyakarta-Bantul Line

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Abstract. The development of station architecture in Indonesia was preceded by railroad transportation technology developed by the Dutch as a colonial state in the 19th century. In 1867 the Dutch government established the first line connecting Semarang to Yogyakarta. In Yogyakarta Province the development of NIS stations was driven by the growth of the sugar industry at that time. The Yogyakarta-Bantul railroad initially had 12 stations, but only five stations remained, namely Ngabean Station, Dongkelan Station, Winongo Station, Bantul Station, dan Palbapang Station. This study aimed to investigate the differences in façade characters of the Yogyakarta-Bantul NIS stations in more detail. It employed qualitative research methods with a rationalistic paradigm approach. Results revealed the characters in the transitional era where the buildings still had a terrace with simple pillars, a gable roof with a wide overhang with angles ranging from 40-45 degrees, decorative wall elements in the form of “arch” and clear geometri lines. In contrast, the stations with the post-independence Indies architecture no longer had a terrace but they had a limasan roof with angles ranging from 50-60 degrees, decorative elements of the wall in the form of simple geometric lines and stone fragments as wallcoverings. Experimental formations appeared on trapezoid-shaped doors and circular vents.

Keywords: Facade, Station, Heritage, Conservation, Architecture

1. Introduction
The development of station architecture in Indonesia was preceded by railroad transportation technology developed by the Dutch as a colonial state in the 19th century. In 1867 the Dutch government established the first line connecting Semarang to Yogyakarta [1]. The first station in Indonesia was under the NIS (Nederlandsch Indische Spoorweg Maatschappij) company or the Dutch East Indies railway company [2]. In addition, several other companies emerged after NIS, namely Semarangsche Stoomstram (SS), Semarang-Joana Stroomstram Maatschappij (SJS), Semarang Cirebon Stoomstram Mij (SCS), and Poerwodadi Goendih Stoomstram Mij (PGSM) [2]. Compared to other stations, the NIS stations were more widely known, because besides being the first stations in Indonesia they also had a historical legacy with their artistic building designs [2]. For instance, Tanjung Priuk Station Building has a dominant symmetrical shape due to the influence of cubist flow that is simple, geometric in rectangular shape and vertical lines as part of Indische Empire Style [3].

In Yogyakarta Province the development of the NIS stations was driven by the growth of the sugar industry at that time. Sleman, Bantul and Kulon Progo became one of the large sugar cane plantations, proven by 17 sugar mills from 34 plantation processing factories in those regions [4]. The trains transported passengers and carried the results of sugar cane from each sugar factory. However, since
the Japanese colonial era, a significant number of railroad lines and stations, especially in the areas of Sleman, Bantul and Kulon Progo had no longer functioned. With the non-functioning lines, numerous station buildings changed their functions from stations to buildings used by the local community. Even several buildings are extinct without trace [4]. The Yogyakarta-Bantul railroad initially had 12 stations but only five stations remained, namely Ngabean Station, Dongkelan Station, Winongo Station, Bantul Station, and Palbapang Station.

Previous research identified the influences of two different style eras on the Yogyakarta-Bantul Railway Station buildings [5]. The first era was influenced by the transitional architectural style, namely at Ngabean Station and Dongkelan Station. In the second era, station buildings had undergone changes from the original forms. These stations are influenced by Indies style in the post-independent era. They are Winongo Station, Bantul Station, and Palbapang Station. In this regard, the station characteristics of the form system are influenced by two eras both the colonial style in the transitional era and the Indies architecture in the post-independence era [5]. Based on the results of previous research, this study aimed to investigate the different façade characteristics from the Yogyakarta-Bantul Line NIS stations in more detail. The façade is the most important architectural element that can present the function and meaning of a building [6]. According to Widaningsih [7], the façade characters can be observed by making a classification through the principles of formative ideas that emphasize geometry, symmetry, contrast, rhythm, proportion and scale.

This research is beneficial to regional planning, considering that the historical values of those buildings are worth conserving, otherwise they tend to be displaced or abandoned. In addition, this research can contribute knowledge of the development of station building architecture during the Dutch colonial period. According to Deny [8] the changes resulted in the loss of valuable historical assets, especially colonial or heritage buildings as symbols of development of the city at certain times and the combination of Indo-European architecture. The architectural masterpieces provide values in shaping the identity of the city. The station buildings in Indonesia can become “focal points” for their surroundings due to their location in the city’s main arterial roads [9]. However, the current development and the problems faced in that era led to the closure of activities at small stations, such as those found on the Yogyakarta-Bantul railroad. They are now untended despite their historical values.

2. Methods
This research employed qualitative research methods with a rationalistic paradigm approach. Analysis of the results of the study was presented descriptively in an overview and explanation. Furthermore, it explored the physical changes in the building styles of the stations on the Yogyakarta-Bantul Line.

2.1 Data Collection Methods
In the data collection, the primary data was collected through surveys, observations and interviews whereas secondary data was collected through various information that included writings, newspapers, books and literature studies. The station buildings were not in the same administrative areas, thus the research was not limited administratively, but physically where former stations connected the Yogyakarta area to Bantul. From the survey results, five remaining stations were found (Figure 1) from the Yogyakarta-Sewugalur railway and became the Yogyakarta-Bantul railway. They were Ngabean Station (1), Dongkelan Station (2), Winongo Station (3), Bantul Station (4) and Palbapang Station (5).
Figure 1. Five Remaining Stations on Yogyakarta-Sewugalur Railway Currently, (1) Ngabean Station, (2) Dongkelan Station, (3) Winongo Station), (4) Bantul Station, (4) Palbapang Station

2.2 Data Analysis Methods

Analysis of the data in this study with descriptive methods both explained and provided descriptions of the building style characters at each station. It was derived from analysis of the history and environmental context at the station. To report the physical characters of the station buildings, modelling of the buildings was carried out. Then, a connection was traced to the colonial style that affected the physical characters of the buildings. Furthermore, the overlay of the analysis was presented as a basis for knowing the changes in physical characters that occurred at stations on the Yogyakarta-Bantul railroad.

3. Discussion

The development of architecture on the Yogyakarta-Bantul railroad underwent two different eras of architectural styles. In the first era, the station buildings remained with their original style when they were established. The building style was a transitional colonial architecture. Stations with this style were found at Ngabean Station and Dongkelan Station. In the second era, the station buildings had undergone changes from the original forms when they were established. The building style was influenced by the Indies architectural style after the independence era. Stations in the second era included Palbapang Station, Winongo Station, and Bantul Station. The research revealed the following results (table 1)

Table 1. Façade analysis at the Yogyakarta-Bantul Line railway stations

| Description                  | Dongkelan Station | Ngabean Station | Winongo Station | Bantul Station | Palbapang Station |
|------------------------------|-------------------|-----------------|-----------------|----------------|-------------------|
| Form of building            |                   |                 |                 |                |                   |
| Cubical building mass       | ■                 | ■               | ■               | ■              | ■                 |
| Single building mass        | ■                 | ■               | ■               | ■              | ■                 |
| Façade system with symmetrical reflection | ■     | ■               | ■               | ■              | ■                 |
| Roof                        |                   |                 |                 |                |                   |
| Roof shape                  | ■                 | ■               | ■               | ■              | ■                 |
| saddle                      | ■                 | ■               | ■               | ■              | ■                 |
| limasan                     | □                 | □               | ●               | ●              | ●                 |
| Additional roofs            | □                 | □               | ●               | ●              | ●                 |
| Wall                        |                   |                 |                 |                |                   |
| Decorative elements         |                   |                 |                 |                |                   |
| Arch form                   | ■                 | ■               | ●               | ●              | ●                 |
| Geometric shape lines       | ■                 | ■               | ●               | ●              | ●                 |
| Decorative stone fragments  | ■                 | □               | ●               | ●              | ●                 |

Note: ■ : found □ : not found
The stations on the Yogyakarta-Bantul line have a rectangular plan with linear spatial layout. This forms a cubical mass of buildings. Cubical shape is obtained based on a parallel plan of space. It is known that the shape of the cubic mass symbolizes grandeur. When the Dutch established the station buildings (19th century), they attempted to strengthen their status as a colonialist by constructing impressive buildings (grandeur). Therefore, the construction of buildings in the colonies provided magnificent images. The textures of the station buildings as a whole are solid textures formed from solid and impermeable materials, such as brick walls, river stone ornaments, as well as the use of wood in the door and window openings. Transparent glass material was found on a small portion of the buildings so it did not dominate the building texture (Table 2 and 3).

The façade of the Yogyakarta Bantul line station buildings was created from the opening of window doors and ventilation holes that formed rectangular and circle patterned openings. Then it is made in a circle so as to create unity in the buildings. The balance of the station façade is formed from a façade system that is symmetrical between opposite façade walls. The front façade is a reflection of the rear façade, and so are the side facades. This can be seen from the laying of the door and window openings. The results of this reflection form the symmetry of the layout openings in each façade and create a balance in the shape of the buildings. By mirroring this façade, the buildings have a cross ventilation system. The results of the analysis of the station building proportion revealed several proportions that influence the renaissance. The proportion of the renaissance was influenced by the European architectural works used by the Dutch in applying its culture to buildings in its colonies (Tables 2 and 3).

At Ngabean Station and Dongkelan Station, the colonial style expressions are shown with an “arch” on the building wall decorations. Unlike those two stations, at Winongo Station, Bantul Station, Palbapang Station (Indies post-independence style) an experimental form was found in the form of trapezium on the door and circular shapes on the ventilation hole. This experimental form was an expression of the jengki Indies style. The aim is to impress a change from the previous era. The shape is shown on trapezoid-shaped doors and circular vents (Tables 2 and 3).

**Table 2. Façade Analysis of Stations in the Transitional Colonial Period**
Table 3. Façade Analysis of the Stations in the Post-Independence Era

| POST INDEPENDENCE ERA - 1976 |
|-------------------------------|
| WINONGO STATION               |
| Limasan roof with steep slope |
| Experimental circular shapes are seen in the ventilation holes |
| Dimension of the door is smaller, using door/window blinds |
| The mass of cubic and massive buildings no longer uses pillars |

| BANTUL STATION                |
| Limasan roof with steep slope |
| Experimental circular shapes are seen in the ventilation holes |
| Dimension of the door is smaller, using door/window blinds |
| The mass of cubic and massive buildings no longer use pillars |

| PALBAPANG STATION             |
| Limasan roof with steep slope |
| Experimental circular shapes are seen in the ventilation holes |
| Dimension of the door is smaller, using door/window blinds |
| The main door is in the form of a rectangular wall hole |

Stations in the Yogyakarta-Bantul line have two types of roofs. First, the gable roof is found at Ngabean Station and Dongkelan Station. Second, the terraced limasan roof is found at Winongo Station, Bantul Station and Palbapang Station. The sloping roof formation found on both roofs was the response of the Dutch community in responding to the tropical climate in Indonesia. The development from the gable to the limasan roof was an adaptation of the tropical climate and traditional Javanese culture at that time. In this case, the slope angle was expected to direct rain from the roof to the ground quickly.

The adaptation of roof formations is also found on roof overhangs. The width of the roof overhangs varies at each station. Stations with saddle roofs have an overhang between 50 and 75 cm. This overhang is perceived to be less able to cope with rain splash so that an additional roof is provided at each opening in the Ngabean Station. Then, overhangs for stations with pyramid roofs range from 1.2 to 1.5 meters. This large overhang is considered sufficient to avoid rain splash so that the limasan roof station no longer needs an additional roof. The roof cover of the Yogyakarta-Bantul line stations uses a clay roof covering. This material is a type of local material used by the Dutch by looking at the development of traditional buildings around the area. The functional clay material does not absorb heat in Indonesia. Based on the above discussion, it can be concluded that the roofs of Bantul Yogyakarta train station buildings are strongly influenced by the climate and weather in Indonesia so that they affect the technology used (Table 4).
Table 4. Roof Analysis of Yogyakarta-Bantul Line Railway Stations

| THE TRANSITIONAL COLONIAL ERA | THE POST INDEPENDENCE ERA - 1976 |
|------------------------------|----------------------------------|
| DONGKELAN STATION            | NGABEAN STATION                  |
| Winongo Station              | Bantul Station                   |
| Palbapang Station            |                                 |

Yogyakarta-Bantul line stations have dominant white walls. The colors of the buildings tend to be cool tone and do not contrast with the colors of the surrounding area. The color of the station buildings is dominated by white. The white color is a characteristic of colonial architecture in Indonesia. The dominance of the white color in the colonial building was found from the Art Nouveau style of the building, De Stijl, as well as Nieuwe Bouwen that were adherents of the international colonial style. At the Yogyakarta line station two types of wall thickness were found. Wall thickness between 35-40 cm is found at Ngabean Station and Palbapang Station. The second wall thickness between 25-30 cm was found at Dongkelan Station, Winongo Station and Bantul Station. Thick walls use a pair of two bricks that serve to flow the load toward the foundation. This thickness difference is influenced by the capacity of each station. Ngabean Station and Palbapang Station have a greater number of visitors than the other three stations so that thicker walls are intended to be able to withstand greater loads. The wall surface of the Yogyakarta Bantul line station has ornaments in the form of simple horizontal lines. The width of the wall ornaments at each station is different. These horizontal lines look like horizontal lines that function as links between the window door openings so that they have regularity in the layout of the openings. In addition to the horizontal lines, the stations have a field of walls with stone fragments. This rock fragment was found at Dongkelan Station, Winongo Station, Bantul Station and Palbapang Station. The function of the stonewall this time is to protect the wall from rain splash falling to the ground. The width of the wall with stone fragments at each of these stations varies according to the station building façade (Tables 5 and 6).

Table 5. Wall Analysis of the Transitional Colonial Era Stations

Table 6. Wall Analysis of the Station in the Post-Independence Indies Era
A transformation appears in the size of the door openings from Ngabean Station to Palbapang Station. At Ngabean Station the size of the door and window openings is relatively large with the door height reaching 2.90 meters and the window height reaching 2.20 meters (Figure 2 and 3). Dongkelan Station has a door height of 3.80 meters and a window height of 2.35 meters (Figure 2 and 3). The openings of doors and windows with large sizes are the influence of the European buildings brought by the Dutch. Attractive objects were found at Winongo Station, Bantul Station and Palbapang Station. At these three stations, the openings of doors and windows have changed in dimensions. At the Winongo station the door height reached 2.06 meters and the window height reached 1.32 meters (Figure 2 and 3). At Bantul Station the door height reached 2.06 meters and the window height reached 1.32 meters (Figure 2 and 3). Finally at Palbapang station the door height reached 2.28 meters and the window height reached 1.52 meters (Figure 2 and 3). This shows the adaptation of dimensions from the dimensions of European buildings to the dimensions of Indonesian buildings.

**Figure 2.** The comparison of door dimensions at the Yogyakarta-Bantul Line NIS stations
4. Conclusion
The façade characters of the Yogyakarta-Bantul railroad NIS stations are influenced by two eras, namely the transitional colonial style and the post-independence Indies architectural style. The differences in the physical elements become the characteristics of stations (see table 7).

Regarding the characters of the stations in the transitional colonial era, there are terrace buildings with accents of simple pillars. They have saddle-shaped roofs with an overhang that is not wide ranging between 50-75 cm. The slope angle of the roof ranges between 40-45 degrees as a response to the climate in Indonesia. On the walls of the buildings, there are decorative elements in the form of clear geometric lines. An expression of colonial style is shown with an “arch” on the building wall decorations. In station buildings of this era, window door openings have adopted traditional architectural styles but with a greater proportion. The proportion of European buildings influenced that arch (see table 7).

In contrast, as regards the characters of the stations in the post-independence Indies era, the stations no longer have a terrace. The use of building pillars on the terrace is also no longer found. The roof of the building is limasan with a wide roof overhang ranging from 100-150 cm. The roof has a sharp slope that is between 50-60 degrees. On the walls of buildings, decorative elements are only simple geometric lines and river stone ornaments as wall coverings. The addition of river stone siding is the application of a local accent, which adds character to the station of this era. This station has experimental formations. This experimental form is an expression of the jenki style. The aim is to impress a change from the previous era. The shape is shown in trapezoid-shaped doors and circular vents. Window door openings have a relatively smaller proportion than the previous era. The proportion of the buildings and bodies of Indonesian people influence those window door openings (see table 7).

Figure 3. The comparison of window dimensions at Yogyakarta-Bantul Line NIS stations
Table 7. Façade characters of stations with the transitional colonial style architecture and façade characters of stations with the post-independence Indies architecture

| The building characters of the transitional colonial architectural style | The building characters of the post-independence Indies architectural style |
|---|---|
| Gable roof | Linaasan terrace roof |
| A terrace | Wide roof overhang |
| The existence of pillars | 2m x 2m |

| Wall decorative elements | Wall decorative elements |
|---|---|
| Clear geometric lines | Simpler geometric lines |

| Colonial form expression | Jengki form expression |
|---|---|
| Arch form | Circle shape |

| Changes in proportions in openings | Changes in roof slope angle and overhang widening |
|---|---|
| Door | Wider roof overhangs |
| Window | Sharper slope angles |

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