Architecture *Stasiungebouw* Medium Type (Case Study: Ngabean Station Yogyakarta)

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**Abstract.** Ngabean Station was built by the *Nederlandsch-Indische Spoorweg* (the first Railway company in Indonesia) in 1895-1919. The location of Ngabean Station is on Wahid Hasyim St., of Yogyakarta. Ngabean Station has been out of operation since the 1970s. Ngabean Station is included in the type typology of *Stasiungebouw* medium type. This article aims to determine the architectural characters of Ngabean Station (spatial aspects, architectural aspects, structural aspects). This research utilizes qualitative research methods with a rationalistic paradigm approach. From the results of the study, the researchers found that Ngabean Station has a type of passenger emplacement as well as luggage emplacement. Spatial space of Ngabean Station is divided into 3 zones. First, the passenger public zone is shown by the *wachtkamer*; second, administrative zones are indicated by *kantoor / kartjees*; and third, technical operational zones of the train are indicated by the *magazine*. From an architectural aspect, this station creates a balance of facades formed from a symmetrical facade system between the opposite facade walls. The facade of the front is a reflection of the rear facade, as well as the facade on the side, as indicated from the laying of door and window openings. The results of this reflection form a symmetrical layout of the openings in each facade creating the balance of the shape in the building. The building structure of the Ngabean Station is a closed frame structure which is a combination of the frame system with the construction of a buffer wall.

1. Introduction

Indonesia is a country with rail transport technology since 1864. Railway transportation is marked by the construction of the first train in Kemijen Village, Semarang [1]. Railway technology in Indonesia is even ahead of Japan. The first railroad in Japan was made in 1870 with the Tokyo line to Yokohama [2]. However in Indonesia, especially in Yogyakarta, there has been a reduction in rail transport. One of them is Line of Yogyakarta-Sewugulur which has 12 stations in the beginning, but in 2017 there are only 5 stations [3]. Five stations no longer serve as stations.

One of the five stations is Ngabean Station, which was constructed by *Nederlandsch-Indische Spoorweg* (the first railway company in Indonesia) in 1895-1919. Ngabean Station is located at Wahid Hasyim St., of Yogyakarta. Ngabean Station has been in operation since the 1970s used as a tourism car to support office managed by Yogyakarta Transport Agency. The station architecture in Java is generally divided into types of building stations, such as *haltegebouw* and *stationgebouw* [4].
According to Ikaputra, a stationgebouw type is divided into: small type, medium type, and big type (main station) (presented in Figure 1).

From the results of the previous study, it was found that Ngabean Station (Figure 2) has a type of Stasiungebouw [5]. This study is a follow-up study about character research of Ngabean Station (spatial aspect, architectural aspect, structural aspect). The study aims to reveal the characteristic architecture of the Indish station in 18 as a reference material for maintaining the preservation of historical buildings in Indonesia.

2. Methods
This research applies qualitative research method with rationalistic paradigm approach. Analysis of descriptive research results creates an overview and exposure to explore the existence of physical changes in the style of buildings on the Ngabean station. The data analysis in this study is performed by descriptive method to explain and provide an overview of the building style character at each station. Exposure is conducted by analyzing historical and environmental contexts at the station. Building information is collected with building modelling to understand the physical characteristics of the station building. Then the connection will be made to the colonial style that affects the physical characteristics of the building.

3. Discussion
3.1. Spatial System
Ngabean Station has parallel type station, indicating that the location of the station is parallel to the railroad tracks on one side; thus, the mass building extends from the north-south to the direction of the railroad tracks. The orientation of the station building faces from west to east. Ngabean Station is located in the middle of Yogyakarta city and is directly accessed to the highway. Around the station building, there are several official houses both owned by station officials and by sugar factory officers.
Ngabean Station has a type of passenger and baggage emplacements. Ngabean Station as well as train passengers also serves to distribute sugar industry production. Despite the placement of these stations to not transport factory produce, there is activity in the distribution of industrial products. This station serves to advance the sugar industry production to urban residents and to continue production to areas outside the city of Yogyakarta by passing to Tugu station passed through the railway line.

The space at Ngabean Station is arranged linearly. Therefore, the station forms a cubic building with a dominant horizontal appearance. The circulation of the building is carried out outside the building, which is on the terrace of the building facing the railway track. The terrace is also used as a platform for passengers waiting for the train. This creates the rigidity of lines arranged linearly due to the outdoor circulation space. By arranging space in parallel way, it makes the space function to be clearly defined. Different space functions will be indicated by different spaces. The layout of the placeholders is presented in the following designs (Figure 3a).

![Figure 3. (a) Ngabean Station Plan, (b) 3 zones at Ngaben Station](image)

The parallel space composition forms a linear space organization by following the direction of the train. The use of linear organizations can emphasize the existence of movements linking linear organization to the building due to the function of the building centred on the direction of the railroad movement. Every activity and function of space that occurs inside and outside the station depends on the movement of the train. This activity is divided into 3 zones (Figure 3b), including public zone for passenger, administrative zone for officer, technical zone for railway operation. Public passenger zones are indicated by wachtkamer (platform). The administrative zone of the officer is represented by the kantoor / kartjes (office). Train in the technical zone of the operation is shown by magazijn (baggage space).

Circulation inside Ngabean Station by Ching [6] is categorized by using passage through space to create flexible route configuration with the integrity of the retained space. Circulatory paths use the core / platform that runs along the station building. This circulatory line is located on the edge of the building to the west of the building. From this circular, the orientation of the room overlooking the train tracks is indicated by the entrance of each room on the side of the corridor. The form of circulation space inside Ngabean Station is a form of open space on one side. This kind of circulation conveys spatial and visual continuity with the connected space, enabling the arrival and departure activities of the train, and the associated space in this corridor are clearly visible (seen in Figure 4).
3.2. Physical System

Ngabean Station has a simple plan with rectangular shape with a linear layout, shaping the whole building as a cube (Figure 4). The length of the cubic structure of the building has a rectangular base extending along the rail track. Ngabean Station has a length of 20 m and 5 m wide, with a roof height of about 2.5 m. From observation, it is found that the proportion of Ngabean stations is proportional to the proportion of building height \( H = W \) (Figure 6). The balance of Ngabean Station’s facade is formed from a symmetrical facade system in the opposite facade wall. The front facade is a rear facade mirror and facade on the side, as seen from the laying of doors and windows. The results of this reflection form a symmetrical layout of openings in each facade and create a balance in the shape of the building.
Ngabean Station has a saddle roof with a height of 2.5 m. The roof slope level ranges from 41.5 degrees. Based on the observation, the roof formation is addressed in a response from the climate in Indonesia which has a high rainfall. For the part of the roof, there is a rather suspended hanging over 50-75 cm to prevent disturbance of rainwater. However, there is still an additional roof at each opening that serves as a truss, because the main roof is not enough to protect against rain. The materials used are wooden horses with clay tile. Clay materials on tiles are not soaked as the weather in Indonesia tends to dry. Extra roof is made of zinc material as it does not work to prevent heat from rain. In addition, the selection of lightweight materials is due to the easy roof console structure. At the top of the boarding house, it is easy to find the air inside the building (Figure 7).

The walls are white with simple ornaments that is light blue / gray. The thickness of the Ngabean Station wall is 30-40 cm which aims to drain the roof from the roof. On the surface, there is a simple wall decoration in the form of a horizontal field with a thickness of 2-5 cm and a diameter of 15-30 cm. This horizontal decoration connects the boundary line between openings to each other, presenting a line of relief in maintaining every opening height. The doors and windows openings mostly use wood materials with a combination of glass technology. The colour of this building has a tendency to cool colour tone, which is in the form of white, light blue and dark chocolate. These colours are available from the roof, walls, and openings, to wall ornaments. The use of cool colours was influenced by the style of colonial style at that time.

The Ngabean Station facility combines the rectangular formations (at doors and windows) with gilded decoration (above the decorative wall). Both are connected to horizontal lines online by adding it to the wall ornaments, portraying a perception of the line on the wall to connect the edges of the openings with gates, where harmony is formed on the face of the earth. This ornament is a half-circle.
(arch) that runs from the bottom of the visitor's door. The presence of arch ornament gives a contrast to the Ngabean Station facade.

3.3. Structure System

The building structure of Ngabean Station is a closed frame structure that is a combination of frame system with construction of buffer wall. The supporting building at Ngabean Station is a thick wall between 30-40 cm from a pair of coated bricks. Thick walls are developed to carry loads from the roof to the foundation so that the wall also functions as a bearing wall. For the foundation, exact structure and materials are unidentified.

The roof of the building uses a gable structure with a structural frame in the form of teak wood and roof cover in the form of brick tiles. Ngabean station roofing ranges from 38 to 45 degrees which is also the adjustment of colonial architecture building on climate in Indonesia having tropical weather (in the corners of the roof slope of colonial building) measuring 30 degrees. In the roof of Ngabean Station, the ornament decoration has never been found. The station roof is supported by a wooden horse connected to a ring on the surface of the wall and arranged in lines, ribs, and battens to be placed on the roof as a roof cover. In the roof structure, there is a trinity of 0.5-0.75 meters from the outer wall. The purpose of this triangular production is to prevent the influx of rainwater into the building. There is an additional roof structure on a platform terrace separated from the main roof structure. This additional roof structure is a horse-drawn structure with support on several wooden pillars at several ends.

At Ngabean Station, there are variations in the use of building materials, local materials such as wood, roof tile or modern materials such as brick, glass, tile and ceramic are pasted. The use of wood materials is on the frame and the roof easel. The brick materials are seen on the walls and on columns of the building. The roof of the building uses tile material made of clay. Building floors use ceramic tiles arranged according to room size. In the openings, there is a variation in the use of materials between wood and glass. The use of this building material is as the impact of the transition architecture development in which the construction of buildings is in the form of bricks and wood, but has penetrated the technology of glass at door and window openings. The door and window laying system is by symmetric reflection causing cross ventilation allowing air to enter and exit easily to make the comfortable temperature inside the room.

4. Conclusion

Ngabean Station has a type of passenger emplacement as well as luggage emplacement. Spatial space of Ngabean Station is divided into 3 zones. First, the passenger public zone is shown by the wachtkamer; second, administrative zones are indicated by kantoor / kartjees; and third, technical operational zones of the train are indicated by the magazine. From an architectural aspect, this station creates a balance of facades formed from a symmetrical facade system between the opposite facade walls. The facade of the front is a reflection of the rear facade, as well as the facade on the side. This is seen from the laying of door and window openings. The results of this reflection form a symmetrical layout of the openings in each facade and make the balance of the shape of the building. The building structure of the Ngabean Station is a closed frame structure which is a combination of the frame system with the construction of a buffer wall. The door and window laying system is equipped by symmetric reflection causing cross ventilation allowing air to enter and exit easily to make the comfortable temperature inside the room.

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