



# Pondok Rajeg Passenger Station Reactivation

David Malaiholo<sup>(✉)</sup>, Septiana Widi, and Cahyadi Alliansi Qoyum

Indonesian Railway Polytechnic, Jalan Tirta Raya, Madiun 63132, Indonesia  
david@ppi.ac.id

**Abstract.** The reactivation of Pondok Rajeg Station has an impact on reducing congestion in the Depok area. The initial stage of reactivation of Pondok Rajeg Station requires a redesign because the condition of the station is an inactive station that is not maintained. In the re-planning of passenger stations, directed planning is needed so that the stations can be used as comfortably as possible. The purpose of this study is to determine the class of Pondok Rajeg Station based on applicable regulations and determine the dimensions of the room at Pondok Rajeg Station. The method used for this research is to determine the needs of station facilities based on the station class from the station reactivation study data. This study found that the class criteria for Pondok Rajeg Station had a credit score of 45.5 and was declared a small station. The design of Pondok Rajeg Station based on PM 29 of 2011 is that Pondok Rajeg Station has a main activity building, a supporting station building, a special service building and a platform. The facilities provided based on PM 63 of 2019 are safety facilities, security facilities, regularity facilities, comfort facilities and equality facilities. Determination of the area of the Pondok Rajeg station is obtained by knowing the existing area of the station and planning for the addition of the platform and then getting the KDB value.

**Keywords:** Reactivation · Station Class · Station Plan Area · Station Room Dimension

## 1 Introduction

A station is a train operating facility that is used to pick up and drop off passengers and goods by rail transport users. The train station has a good shape and spatial planning design, is easy to maintain and easy to operate so that train station users are comfortable using these facilities. Based on the Strategic Plan of the Jakarta and Banten Regional Railway Engineering Center, the development of the railway network is carried out on the Nambo-Cikarang-Tanjung Priok route. One of the network developments is the redevelopment of Pondok Rajeg Station which is planned to be built in 2022. In order for Pondok Rajeg Station to be used safely and comfortably, it needs to be re-planned in accordance with applicable regulations.

From the background of the problem described, there are several problems, namely, how are the existing conditions around Pondok Rajeg Station, determining the station class at Pondok Rajeg Station in accordance with PM 33 of 2011, designing Pondok Rajeg Station in accordance with PM 29 of 2011 and station facilities in accordance with PM 63 of 2019, determine the dimensions of the station room based on the 2012 Station Standardization Guidelines.

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## 2 Research Methodology

### 2.1 Station

A station is a facility used for boarding and lowering passengers, loading and unloading goods and being used as a place to transfer trains. Based on the Regulation of the Minister of Transportation Number 33 of 2011, passenger stations are equipped with facilities such as safety, security, comfort, up and down passengers, people with disabilities, public and health facilities.

### 2.2 Station Class

Passenger stations are divided into several classes, namely:

- a. Small class station,
- b. Medium class station,
- c. Great class station.

In determining the class of stations, Minister of Transportation Regulation Number 33 of 2011 explains the provisions for class division at stations such as operating facilities, number of lines, supporting facilities, number of passengers per day, number of train traffic per day, and number of goods per day. The provisions for determining the station class are as follows:

- a. If the total credit score is  $> 70$ , then the station is categorized as a large class
- b. If the total credit score is  $50 < 70$ , then the station is categorized as medium class
- c. If the total credit score is  $< 70$ , then the station is categorized as a small class

### 2.3 Station Room Needs

Each room in the station has a certain size according to the activities and service facilities in it. Determining the size of the space must consider various things with respect to capacity, utility, accessibility, safety, security and comfort for room users.

### 2.4 Building Base Coefficient

The basic coefficient of the building is the percentage comparison between the total floor area and the planned land area controlled according to the spatial plan and building layout plan.

Calculation of the green basic coefficient is as follows

$$KDB = \frac{\text{building base area}}{\text{plot area}} \times 100\%$$

## 2.5 Green Basic Coefficient

The green basic coefficient is the ratio of the green open space area of the allotment block to the area of the allotted block.

$$KDB = \frac{\text{green open area}}{\text{area of the allotment block}} \times 100\%$$

The method of this research is to determine the station class from the study of reactivation of Pondok Rajeg and GAPEKA stations. After knowing the station class, then determining the room facility requirements and room dimensions based on the 2012 Station Standardization Guidelines and designing with AutoCad and SketchUp applications to answer the problem formulation. In this study using primary data and secondary data. Primary data is data that comes from surveys at the research site. The primary data needed is a survey of the existing area of Pondok Rajeg Station and the existing condition of Pondok Rajeg Station. Secondary data is data that comes before. Secondary data needed is the study of reactivation of Pondok Rajeg Station and GAPEKA.

## 3 Result and Discussion

### 3.1 Existing Condition

Pondok Rajeg Station is an inactive station located at KM 41 + 615 Depok City, West Java. Pondok Rajeg Station has 1 active line that crosses Jakarta-Manggarai-Nambo. The existing condition of Pondok Rajeg Station is explained as follows:

- a. The condition of the station is not maintained and damaged. There was some vandalism on the station walls
- b. There is 1 active line crossing Citayam-Nambo which is crossed by electric trains and freight trains. The number of trains that pass through Pondok Rajeg Station per day is 20 krl and 15 freight trains.
- c. Communities around Pondok Rajeg station carry out trading activities.
- d. There is a level crossing in front of Pondok Rajeg Station.

From the secondary data of Pondok Rajeg Station, it is explained as follows:

- a. Number of lanes = 2.
- b. The number of potential passengers of Pondok Rajeg Station in 2041 is 4,290 people.
- c. The hotel, warehouse, and loading and unloading plans are not planned because Pondok Rajeg Station is planned to be traversed by KRL passenger trains only.
- d. Based on the 2020 GAPEKA, the number of trains passing through the station is 20 trains.
- e. Roads for pedestrians will be planned so that pedestrians at Pondok Rajeg Station feel safe when using the station.

### 3.2 Station Class

The determination of station class based on study data from Pondok Rajeg Station and GAPEKA is as follows:

- a. Operational facilities in good condition. The operational facility credit score is 25.
- b. The number of plan lines is 2. The credit score for the number of lines is 4.
- c. Supporting facilities consist of general facilities and special facilities, the total credit score for general facilities is 50 and for special facilities is 50. The credit score for supporting facilities is 7.5.
- d. The train traffic facilities per day are direct trains with a credit score of 20 and stop trains are 20. The credit score for rail traffic facilities is 4.
- e. The number of passengers per day is 4,290 people per day. The credit score for the number of passengers is 4.
- f. The number of goods per day is assumed to be below 100 tons. The credit score for the number of items per day is 1.

The total number of credits is 45.5. Based on PM 33 of 2011, the station class below the credit score of 50 is referred to as a small class station. Station space requirements are adjusted to the station class.

### 3.3 Station Design

The length of the platform is the longest series of trains. The Jabodetabek KRL circuit is 12 circuits with 1 circuit having a length of 20 m. The total platform length requirement is 240 m. The height of the platform based on PM No. 63 of 2019 is to use a high platform with a height difference of 20 cm.

The width of the platform is calculated by the following formula:

$$b = \frac{\frac{0,64m^2}{orang} \times V \times LF}{l}$$

$$b = \frac{\frac{0,64m^2}{orang} \times 429 \times 80\%}{240}$$

$$b = 0,91 \text{ meter}$$

The need for the width of the platform is still below the standard in PM 33 of 2011, therefore the width of the platform is adjusted to the applicable regulations.

The pedestrian path planning based on the 2012 Station Standardization Guidelines is as follows:

- a. The width of the pedestrian path is at least 160 cm.
- b. The height of the pedestrian path is 10 cm
- c. Pedestrian paths must be free from obstructions such as trees, signposts, twigs, building structures, drainage, and other obstructions.

**Table 1.** Station Space Requirements

No	Space Requirement	Area (m2)
1	Station Head	20
2	Train Travel Officer	18
3	Equipment	8
4	Security Officer	9
5	Janitor	6
6	Hall	60
7	Counter	6
8	Information Service	9
9	General Wait	40
10	Health Services	15
11	Public Toilet	30
12	Islamic Prayer Room	20
Total		241

Station parking planning is adjusted to the available land and smooth parking flow. For the smooth flow of parking at Pondok Rajeg Station, a roundabout route is made so that parking flows smoothly. The remaining land that can be used for parking is 63.7 m. The need for motorcycle parking is to use the 900 pattern and parallel cars.

The motor SRP value is  $0.7 \times 2$  m.

The SRP value of the car is  $2.3 \times 6$  m.

The parking requirements of Pondok Rajeg Station are as follows:

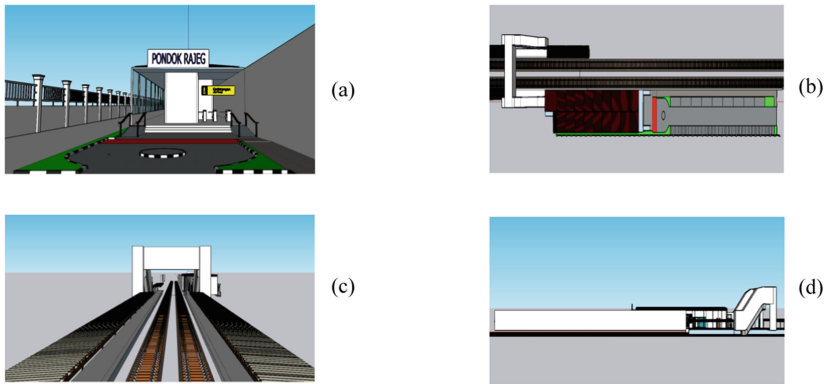
Motors:  $63.7/0.7 = 90$  motors.

Cars:  $63.7/6 = 9$  cars.

Elevator planning based on the 2012 Station Standardization Guidelines is the dimensions of the elevator are  $1.4 \times 1.4$  m and the lobby lift is  $1.85 \times 2$  meters. For pedestrian bridges, people need 2 lifts for platform 1 and platform 2. Escalator planning based on the 2012 Station Standardization Guidelines is that the width of the escalator contains 2 people in 1 escalator and the slope of the escalator is 300. The escalator for pedestrian bridges requires 4 escalators consisting of 2 platforms 1 and platform 2. For staircase planning, the height of the steps is 15 cm and the width of the steps is 30 cm.

Planning station space requirements are categorized into large, medium and small class stations. Pondok Rajeg Station is a small station. Therefore, the station space requirements are as follows Table 1.

The area of the Pondok Rajeg station is obtained by surveying the location. Coordinate data retrieval along 10 m was carried out to determine the coordinates of the location. The following are the coordinates of the existing survey of Pondok Rajeg Station. Based on the survey of the coordinates of Pondok Rajeg Station, it is found that the existing area of Pondok Rajeg Station is 1,595 square meters. The planned building



**Fig. 1.** Pondok Rajeg Station Design (a) front view, (b) top view, (c) rear view, and (d) side view.

area consists of the existing area plus the planned platform area plus the required area for pedestrian bridges.

Planned building area =  $1,595 + 910 + 58.56 + 11.32$ .

Planned building area =  $2575.2 \text{ m}^2$ .

The calculation of the plan area is obtained by knowing the design building area and the design coefficient. The planned area of Pondok Rajeg Station is as follows:

$$\begin{aligned} \text{Planned area} &= \frac{KDB}{\text{Presentase KDB}} \\ \text{Planned area} &= \frac{2575,2}{60\%} \\ \text{Planned area} &= 4.293 \text{ m}^2. \end{aligned}$$

The area of the green basic coefficient is obtained from the area of the station plan and the value of the regional green basic coefficient. The KDH area of the station is as follows:

$$\begin{aligned} \text{KDH} &= 15\% \times \text{plan area.} \\ \text{KDH} &= 15\% \times 4.293 \text{ m}^2. \\ \text{KDH} &= 642 \text{ m}^2. \end{aligned}$$

From the design of the station above, it can be described as a whole Pondok Rajeg Station in the following Fig. 1.

## 4 Conclusion

1. The existing condition at Pondok Rajeg Station is a non-active station that is not maintained.
2. station class has a credit score of 45.5, then Pondok Rajeg Station class is a small station class.
3. Pondok Rajeg Station has a main activity building, a supporting station building, a special service building and a platform. The facilities provided are safety facilities, security facilities, regularity facilities, comfort facilities and equality facilities using the help of AutoCad and SketchUp applications.

4. The dimensions of the station room are guided by the station standardization guidelines by knowing the class of the station first.

## References

1. Presidential Regulation of the Republic of Indonesia, Transportation Master Plan for Jakarta, Bogor, Depok, Tangerang, Bekasi Years 2018–2029, Jakarta, (2015).
2. Andika, R, Passenger Station Design Planning on Reactivation of the Demak-Kudus Railway Using Autodesk Revit Software, Indonesian Railway Polytechnic Madiun, (2021).
3. Directorate General of Land, Guidelines for Planning and Operation of Parking Facilities, Jakarta, Directorate of City Transport Traffic System Development, (1998)..
4. Harieq Iyandika, A, Passenger Station Design Planning for the Reactivation of the Madiun-Ponorogo Railway Using Autodesk Revit Software, Madiun Indonesian Railway Polytechnic (2021).
5. Ministry of Transportation Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 29 of 2011 concerning Technical Requirements for Buildings and Railway Stations. Jakarta, (2011).
6. Ministry of Transportation Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 33 of 2011 concerning Types, Classes and Activities at Railway Stations. Jakarta, (2011).
7. Ministry of Transportation Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 63 of 2019 concerning Minimum Service Standards, Jakarta, (2019).
8. PT KAI (Persero), Guidelines for Standardization of Railway Stations, Bandung, (2012).

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