ANALYSIS OF BASIC FACILITY NEEDS IN THE LAND AREA AT THE TANJUNG RU FERRY PORT, BANGKA BELITUNG PROVINCE

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Abstract

Tanjung Ru Ferry Port is essential as it is the only port that connects Bangka Island and Belitung Island via roll-on/roll-off ferry services. However, the condition of the onshore facilities at this port does not fully comply with the standards outlined in Minister of Transportation Decree No. 52 from 2004. Several major issues have been identified, including an inadequate waiting area, the absence of a gangway and weighbridge, and a lack of proper safety gear. This research aims to evaluate the state of onshore facilities and identify the unmet needs of these facilities. A descriptive quantitative method was employed, which included field observations, surveys, documentation, and an examination of applicable regulations. Findings reveal that most of the nine critical land facilities required are either absent or fail to meet the necessary standards.

Keyword: *Ferry Terminal, Onshore Services, Harbor Facilities, Requirements for Amenities.*

A. INTRODUCTION

According to Hananto Soewedo (2015): In the book on Ports, a port is defined as a place where ships stop which has facilities (warehousing, mooring) and facilities (guidance, loading and unloading) for the smooth distribution of logistics and the wheels of the economy. As per D. A. Lasse (2014), the laws in Indonesia define a port as an area that includes land and/or water with defined borders. This space is designated for governmental and commercial operations, accommodating the docking of vessels, the boarding and disembarking of travelers, and the loading and unloading of cargo. A port comprises a terminal and docking zones that are outfitted with safety and security measures for maritime activities, along with facilities for the transfer of goods between different modes of transportation.

Tanjung Ru Ferry Port is located in Belitung Regency, Bangka Belitung Province. Tanjung Ru Ferry Port plays a crucial role as it serves as one of the entry points to Belitung Regency and is the only port that operates roll-on-roll (RO-RO) vessels connecting Bangka and Belitung Islands. Tanjung Ru Ferry Port has two routes: Tanjung Ru-Sadai and Tanjung Ru-Nyato, facilitating travel for local residents and tourists.

The high level of public and tourist interest in visiting and conducting activities in Belitung necessitates support for the smooth operation of the port. Therefore, adequate and optimally functioning port facilities are required inland. Furthermore, providing these facilities must be a priority for users, ensuring a comfortable and satisfied experience. Ferry ports must have complete and adequate facilities and infrastructure. According to Luqman et al. (2020:58), the availability of adequate public services or facilities is crucial for the comfort and safety of the community.

In practice, many ferry port operators have not fully implemented the agreed-upon regulations regarding the provision of mandatory facilities. Tanjung Ru Ferry Port does not yet have complete basic port facilities on land, resulting in several problems including vehicles entering the ship without knowing the weight and height, passenger congestion on the vehicle entrance to the ship, pedestrian passengers walking to the dock via the trestle and irregular parking of vehicles entering the ship in the ready-to-load parking area.

To support port activities that support the smooth operation of the port, of course, facilities are needed that can guarantee the safety and security of shipping in accordance with KM No. 52 of 2004 concerning the Implementation of Ferry Ports. The provision of basic land facilities at the port greatly affects the safety and security aspects according to Sihombing (2022).

B. METHOD

This study employs a descriptive quantitative research approach. Quantitative research is a systematic and scientific method used to obtain knowledge based on valid and measurable data (Sihotang, 2023). The research instruments were designed to facilitate systematic data collection (Arikunto, 2013). The instruments used in this study include: (1) a 30-day passenger and vehicle productivity survey form, (2) a 30-day pedestrian volume survey form, and (3) a port land facilities inventory survey form.

Data were collected through primary and secondary sources. Primary data were obtained through direct observation and documentation. Observation activities included surveys of passenger and vehicle productivity, pedestrian volume, and an inventory of the main land facilities at Tanjung Ru Ferry Port. Documentation was conducted by photographing existing port facilities to support field observations. Secondary data were obtained through literature review and institutional data collection. Literature sources included books, journals, regulations, and relevant scientific publications. Institutional data, particularly five-year productivity records, were collected from BPTD Class III Bangka Belitung Province, the Bangka Belitung Provincial Transportation Agency, the Tanjung Ru Ferry Port Management Unit, and the Statistics Agency of Bangka Belitung Province.

Data were analyzed using the stages of data collection, data reduction, data presentation, and conclusion drawing as proposed by Miles and Huberman (2014). The analysis consisted of two main stages. First, the existing condition of the port's basic land facilities was assessed based on the standards stipulated in Ministerial Decree No. 52 of 2004, including passenger terminals, weighbridges, gangways, office facilities, fuel storage, utility installations, access roads, fire protection facilities, and vehicle marshalling areas. Second, the required capacity and dimensions of these facilities were analyzed using applicable regulations, including calculations for terminal areas, vehicle parking areas, gangway dimensions, weighbridge and portal requirements, fire protection facilities, generator areas, fuel storage facilities, and clean water facilities.

C. RESULTS AND DISCUSSION

1. Waiting Room Requirements

The passenger waiting area is calculated using the following formula: A1 = a.n.N.x.y

Where:

A1 = Waiting area (m^2)
a = Area required for one person (1.2 m^2/person)
n = Number of passengers on one ship
N = Number of ships arriving/departing simultaneously
x = Concentration ratio (1.0-1.6)
y = Average Fluctuation (1.2)

The number of passengers on one ship is determined based on the average number of passengers on the busiest day divided by the average passenger capacity of the ships operating on that day. Based on departure productivity data in Table 4.10, the highest number of passengers during the 30 days of operation occurred on April 6, 2026, with 217 people per two trips. The number of ships arriving and departing simultaneously was set at 1 (one) because

Tanjung Ru Port only has one dock. The following ships operated at Tanjung Ru Port on April 6, 2026.

Table 1. Ship Load Capacity Data

No	Ship Name	Load Capacity (Passenger)	Trip
1	KMP. MENUMBING RAYA	204	1
2	KMP. GORARE	82	1
Total		**286**	**2**
Average		**143**	

From the table above, it can be seen that the following formula can be used to determine the passenger concentration ratio.

$$\text{Concentration Ratio (x)} = \frac{\text{(maximum number of passengers per day/trip)}}{\text{(PNP capacity on one ship)}}$$

= (217 passengers/2 trips)/(143 passengers)
= 0.7 ~ 1.0

Therefore, the Concentration Ratio (x) is 1.0.
Therefore, from the data above, we can calculate.

A1 = a . n . N . x . y
= 1.2 m² /person . 300 passengers/ship. 1 . 1.0 . 1.2
= 432 m²

Under existing conditions, the waiting room area is 100 m², so an additional 332 m² of waiting room space is required. Based on the calculation of the waiting room area requirements, it is necessary to add 332 m² of waiting room area as well as additional chairs, additional facilities in the form of free wifi access, television, cellphone charger (charger box), and air conditioning so that passengers can comfortably wait for the ship's departure in the waiting room.

2. Analysis of Ready-to-Load Parking Lots

Based on the departure productivity data in Table 2.

Table 2. Productivity Data April 6, 2026

Time	KMP	Vehicle											Quantity
		I	II	III	IVA	IVB	VA	VB	VIA	VIB	VII	VIII	
17:00	MENUMBING RAYA	0	35	0	20	0	0	4	0	0	0	0	59
20:00	GORARE	0	0	0	0	0	0	0	0	0	2	0	2

The highest number of vehicles during the 30 operational days occurred on April 6, 2026, at 5:00 PM, with 59 mixed vehicles in a single trip. The mixed vehicles consisted of 35 class II units, 20 class IVA units, and 4 class VB units.

The number of ships arriving and departing simultaneously was set at 1 (one) because only one pier was available or in use. The parking area ready for loading can be calculated using the following formula.

a. Group II = 35 vehicles
b. Group IV = 20 vehicles
c. Group V = 4 vehicles

Total vehicle production = 59 vehicles
Therefore, the formula is: ∑(vehicle class)/(total production)
Proportion of class II vehicles = (35 vehicles)/(59 vehicles) x 100% = 59%
Proportion of class IV vehicles = (20 vehicles)/(59 vehicles) x 100% = 34%
Proportion of class V vehicles = (4 vehicles)/(59 vehicles) x 100% = 7%

To determine the number of vehicles on a ship (n), use the data from the highest number of vehicles during a 30-day productivity survey divided by the number of trips. The highest number of vehicles is 61 vehicles with 2 trips.

Number of Vehicles (n) = ∑(Most vehicles during the survey)/(Number of Trips)
= (61 Vehicles)/(2 trips)
= 30.5 ~ 31 Vehicles

Concentration Ratio (y) = ∑(Most vehicles per day/trip)/(Vehicle capacity in one ship)
= 31/19
= 1.6

Therefore, the concentration ratio (y) is 1.6.

Therefore, the parking area ready to load for each category is.

2-Ton Trucks (Group VA/VB)

A1 = a . n . N . x . y

A1 = 25 m² x (59 units x 7%) x 1 x 1.0 x 1.6

A1 = 165 m²

Passenger Vehicles (Group IVA/IVB)

A2 = a . n . N. x. y

A2 = 25 m² x (59 units x 34%) x 1 x 1.0 x 1.6

A2 = 802 m²

Motorcycles

A3 = a. n. N. x. y

A3 = 1.5 m² x (59 units x 59%) x 1 x 1.0 x 1.6

A3 = 84 m²

ATotal = 165 m² + 802 m² + 84 m²

= 1,051 m²

So, from the analysis above, the required ready-to-load parking area at Tanjung Ru Ferry Port is 1,051 m².

Ready-to-load parking is arranged according to vehicle classification to create order and tidiness. Parking is in a parallel or 180-degree pattern, following the designated positions for each vehicle class. This ensures departing vehicles line up according to the queue number assigned when purchasing tickets. This also simplifies loading, as vehicles are arranged according to their class.

3. Analysis of Passenger Access Roads (Gangways)

The results of the pedestrian volume survey can be seen in Table 3.

Table 4. Pedestrian Volume Data

Pedestrian Volume Survey Form											
Date	Pedestrian Volume (people)										
	07.00-08.00	08.00-09.00	09.00-10.00	10.00-11.00	11.00-12.00	12.00-13.00	13.00-14.00	14.00-15.00	15.00-16.00	16.00-17.00	17.00-18.00
06/04/2026	0	0	0	0	0	0	3	10	66	8	0

Based on the survey results, the highest pedestrian volume occurred on April 6, 2026, between 3:00 PM and 4:00 PM WIB, with 66 people for 60 minutes. Therefore, the pedestrian volume per minute is 1.1 = 2 people. Additional widths for calculating sidewalk widths according to local conditions can be seen in Table 2.2. The N value was taken as 1.5 because the location was busy and most passengers were carrying luggage, even though the location was not a market. Therefore, the width requirement for a dedicated passenger access road (gangway) uses the following formula.

W = [P/35] + n
= [2/35] + 1.5
= 0.057 + 1.5

= 1.55 meters

The gangway can be built directly to the movable bridge at the pier because the pier and the available vessels are small, so they don't have side ramps. Based on observations, the planned starting point for the gangway is across the street from the waiting room exit and ends at the pier. The detailed direction and length of the gangway are as follows.

Length = 107 m

Coordinates = from 2°56'10.12"S 107°31'50.45"E to 2°56'12.20"S 107°31'47.56"E

According to Section 2, paragraph (3) of the Transportation Minister's Regulation Number 103 from 2017, which pertains to the Rules and Management of Vehicles Using Ferry Services, the height of the portal structure must align with the height of the ship's deck throughout the route. Consequently, the planned weighbridge will be constructed with a portal height that aligns with the ship's deck height. The ship's deck must have a minimum height of 3. 5 meters, leading to a suggested portal height of 3. 3 meters. A gap of 20 centimeters is allocated for air clearance, ensuring that vehicles do not touch the ship's deck. The maximum allowable weight is established at 35 tons, matching the highest load capacity of the current movable bridge, subject to the condition of the pier.

Tanjung Ru Ferry Port is required to acquire brand new fire extinguisher units that are prominently displayed and readily reachable. Extinguishers weighing under 18 kg should be positioned at least 10 cm off the ground, and the upper edge of the fire extinguisher must not exceed a height of 1. 5 m from the floor. The generator area requirement for Tanjung Ru Ferry Port is made according to the space requirement for electrical facilities of 150 m2.

Based on the findings of the analysis, it has been determined that the suitable size for the waiting area at Tanjung Ru Ferry Port is 432 square meters. Within this space, there is a need for seating arrangements as well as extra amenities including complimentary wifi, a television, charging stations, and air conditioning. The analysis revealed that a dedicated area is needed for a ready-to-load parking area to allow vehicles to board the ship in an orderly manner. The effective area required for the ready-to-load parking area at Tanjung Ru Ferry Port is 1,051 m². The analysis results show that the planned length of the gangway required is 107 m and a width of 1.5 m. The weighbridge that is intended to be constructed will have the ability to handle 35 tons and will feature a portal height of 3. 3 meters. As per Article 2 paragraph (2) of PM 103 from 2017, the portal and weighbridge installations will be positioned in front of the vehicle ticket sales counter. The intention is to position the fire extinguisher in the reception area. The upper part of the fire extinguisher is situated 1. 5 meters off the ground to ensure it is easily seen and reachable if a fire occurs. The generator area for the Tanjung Ru Ferry Port is planned to be 150 m².

D. CONCLUSION

The Tanjung Ru Ferry Port has only 6 out of the 9 necessary land facilities as outlined in Ministerial Decree Number 52 of 2004: a terminal structure, administrative offices, installations for water, electricity, and telecommunications, access via road and/or rail, facilities for fire extinguishing, and a designated space for vehicles to wait prior to boarding. There are three essential facilities absent at Tanjung Ru Port: a footpath for pedestrians, bunker facilities, and a weighbridge. The Tanjung Ru Ferry Port needs certain land amenities, including a waiting area measuring 432 m², a gangway that is 1.55 m wide, a parking space of 1,051 m² ready for loading, a weighbridge capable of handling 35 tons with a portal height of 3.3 m, fire extinguisher facilities, and a generator area of 150 m².

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