Evaluation of Technical Criteria for Construction Technology Implementation of Madiun Train Station Based on Minimum Service Standards, Facilities, and Accessibility

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Abstract. The minimum service standards for train stations in Indonesian Minister of Transportation Regulation Number 63 of 2019 must be met by service providers in providing services as obligations and quality, fast, easy, affordable and quality assessments. Guidelines regarding the facilities and accessibility of buildings, especially train stations, are also required by the regulation of the Minister of Public Works, so that the existing facilities in the stations must also be adjusted for comfort, convenience, usability, and independence. The purpose of this study is to evaluate the value of the component weights of the Madiun Train Station building facilities, evaluate the minimum service standards, facilities, and accessibility of Madiun Train Station in terms of the Minister of Transportation with Minister of Public Works Regulation, and provide solutions regarding the improvement of station facilities to support technical criteria and minimum service standards on the building.

The method used in this study is the Responsive Evaluation method and statute approach in Indonesia. From the Minister of Transportation regulation, the results of interviews conducted with Madiun Train Station are in accordance with the results of field surveys; Meanwhile, according to the Regulation of the Minister of Public Works, there are exactly 50% of the requirements for facilities and accessibility of the railway station building that have not been met, on average, are facilities for people with disabilities and the visually impaired. Solutions to improve Madiun Train Station facilities and accessibility to support minimum service standards in buildings are availability of: pedestrian path; Guideline; Parking Route; Door and Handrail; Ram Detail; Stair Detail; Details of Closet, Toilet, and Position of the Shower Booth; public telephones; Equipment for Persons with Disabilities; Counter Table, sitting room furniture, and beds for the Disabled; Deaf Emergency Light Alarm, Teletext and TV text for the Deaf.

1. Introduction

Types, classes, and activities at the train station are used as a reference for evaluating building criteria components. In addition, the minimum service standards for train stations in Indonesian Minister of Transportation Regulation Number 63 of 2019 must also be adjusted, so that the determination of the type of station building class is correct. Minimum Service Standards are the minimum service standards that must be met by service providers in providing services to service users, and must also be equipped with benchmarks used as guidelines for service providers and service quality assessments as obligations and quality, fast, easy, affordable, and quality assessments. promise service. Guidelines regarding the facilities and accessibility of buildings, especially train stations, are also required by the regulation of the Minister of Public Works, so that the existing facilities in the stations must also be adjusted for comfort, convenience, usability, and independence.

From the data, Madiun Train Station is a large class that serves train trips to destinations in various big cities, an evaluation of Minimum Service Standards in Madiun Train Station is very necessary to satisfy services in the railway sector, especially at stations. This research is a development research from previous studies, but with different methods and concepts and objectives, so that this research is expected to be a renewable research that is beneficial for the government and the whole community. The previous research was written by (Risna Rismiana Sari, 2016) with the title Evaluation of Railway Station Performance Based on Minimum Service Standards using field analysis methods and questionnaire surveys and the result is that services at Yogyakarta and Lempuyangan major stations can be considered quite good. Services that need to be improved for users are increased convenience; One of the attributes that according to respondents needs to be a priority to be improved is the availability of facilities for people with disabilities (Wahyu Tamtomo Adi et al., 2017); (Fakhruriza Pradana et al., 2015) with the title Service Evaluation of Tangerang City Tangerang Station.

2. Methods

The method used in analyzing the data in this study is the Responsive Evaluation method, is the process of assessing an object by collecting various information and that information is used as a tool to determine decisions. The data used in this study are primary data, namely the form of the weight value of the building facilities component; Form of minimum service standards, facilities, and accessibility of Madiun Train Station; The results of the Madiun Train Station Condition Data, while the secondary data are Decree the Indonesian Minister of Transportation Regulation Number KP 1385 of 2020, KP 1362 of 2020, PM. 33 of 2011, PM 63 of 2019, and Indonesian Minister of Public Works Regulation Number Permen PU 30 of 2006. The steps taken in data processing are all primary data adjusted to the provisions of the Ministerial Regulations on secondary data.

The results of the data are analyzed in the following ways: Form the results of data processing Technical Requirements for Madiun Train Station Building Begin, if not appropriate, look for the right solution according to regulations; The results of the data processing of the construction component weight values to determine the type of class for Madiun Train Station according to regulations; The results of the data processing of the Minimum Service Standards form, facilities, and reliability of the Madiun Station, if they are not in accordance with the type of class, look for the right solution according to the regulations; and looking for solutions to improve Madiun Train Station building facilities according to regulations.

3. Evaluation Results

3.1. Evaluation of Class Types of Madiun Train Station Building Facilities

Based on data from PT KAI, Madiun Train Station which is located in East Java province is an Operation Area/Regional Division VII Madiun with the abbreviation Madiun Train Station with operating conditions classified as large class. To determine the class of use of the Madiun Train Station building, the calculation of the weight of the station class is carried out by referring to the Indonesian Minister of Transportation Regulation Number PM. 33 of 2011 concerning the type, class, and train station, in order to estimate whether the value of the components of the Madiun building facilities is in accordance with data from PT KAI. Data on operating facilities, number of lines, and supporting facilities were obtained from direct observation and interviews.

Through the data in Gapeka (Train Travel Chart) PT KAI in 2021 obtained data on traffic at Madiun Train Station while the number of passengers and the number of goods obtained from PT KAI internals. From the existing data, the results of the calculation of the components of the Madiun Train Station building facilities were obtained. Example of credit calculation for Madiun Train Station Criteria component: The operating facilities at Madiun Train Station have signaling, telecommunications, and electrical components. So, the Credit Score value of each component is:

1. Signal 60% of 25 Credit Score = 15 Credit Score
2. Telecommunication 20% of 25 Credit Score = 10 Credit Score
3. Electricity 20% of 25 Credit Score = 10 Credit Score

Total Value of Component Criteria Madiun Station = 35 Credit Score

In accordance with the calculation results of the Madiun Train Station Criteria Component Credit Score, which is a total of 89.6 Credit Score, then Madiun Train Station is a large class, while according to KAI data, Madiun Station is a large class, so the results of the evaluation of the station class are: appropriate.

Table 1. Calculation of Credit Scores for Madiun Station Criteria Components

No.	Facility	Component		Credit Score
1	Operating Facilities (25%)	Signal (60%)		15
		Telecommunication (20%)		10
		Electricity (20%)		10
2	Number of Routes (20%)	> 10 Routes (100%)		-
		6 - 10 Routes (70%)		14
		< 6 Routes (20%)		-
3	Supporting Facilities (15%)	Support (80%)	Parking (30%)	3,6
			Restaurant (20%)	2,4
			Shops (20%)	2,4
			Offices (20%)	2,4
			Hospitality (10%)	-
		Special (20%)	Passenger Lounge (30%)	0,9
			Vehicle Parking (20%)	0,6
			Safekeeping (15%)	-
			Warehousing (15 %)	0,45
			Unloading Goods (10%)	0,3
			ATM Room (10%)	0,3
4	Traffic Facility – per day 2 way (15%)	Train Stop (90%)	> 60 Train (100%)	-
			40 - 60 Train (70%)	9,45
			<40 Train (20%)	-
		Continous Train (10%)	> 80 Train (100%)	-
			50 - 80 T Train (70%)	-
			< 50 Train (20%)	0,3
5	Number of Passenger – per day (20%)	> 50.000 (100%)		-
		10.000 - 50.000 (70%)		14
		< 10.000 (20%)		-
6	Total Item – per day (5%)	> 150 Ton (100%)		-
		100 -150 Ton (70%)		3,5
		< 100 Ton (20%)		-
Total				**89,6**

The percentage of the components in the third column has been regulated in accordance with the Regulation of the Minister of Transportation Number 33 of 2011. The value of the credit score in the fourth column is determined from the calculation of the percentage of actual conditions at Madiun Train Station, if complete, then the second column *x* third column *x* 100%. In the calculation, the total credit score at Madiun Train Station is 89.3.

3.2. Evaluation of Class Types of Madiun Train Station Building Minimum Service Standards

The minimum service standards for train stations can be evaluated by reviewing the facilities required for station buildings in Indonesian Minister of Transportation Regulation Number PM 63 of 2019 regarding maximum service standards and also the Indonesian Minister of Public Works Regulation Number Permen PU 30 of 2006 concerning technical guidelines for facilities and accessibility in

buildings and the environment. In the regulation of the Minister of transportation, it is clear that the minimum service standard at the station must be tested periodically so that PT KAI checks and concludes in the Tabulation of Minimum Service Standards. In this case, the tabulation of the 2021 Madiun Train Station Minimum Service Standards will be evaluated whether it is in accordance with the field survey in this study. In addition, the Minimum Service Standards at stations must also refer to the regulations of the Minister of Public Works, because there are requirements regarding station buildings. For this reason, the station building is evaluated to obtain a solution regarding the improvement of Madiun Station facilities to support the technical criteria and minimum service standards in the building.

Minimum service standard data from PT KAI with survey assessments in the field has been evaluated according to the Indonesian Minister of Transportation Regulation Number PM 63 of 2019 form with a comparison table, and the results show that there are differences in assessment between PT KAI with a survey in the field by looking directly at the condition of Madiun Train Station. The difference in the percentage of fulfillment of the Minimum Service Standards in the field assessment is 6% lower, namely in the assessment of special facilities provided for passengers with special needs, the minimum area of each toilet with the provisions: 100 cm x 125 cm, and a minimum of 3 (three) suitable wheelchairs use. The results of interviews conducted with the Madiun Train Station are in accordance with the results of the field survey.

In the Indonesian Minister of Public Works Regulation Number Permen PU 30 of 2006 concerning technical guidelines for facilities and accessibility in buildings and the environment, there is an application of guidelines for facility requirements that must be met for types of business function buildings, namely train stations. The technical guidelines in the Minister of Public Works are intended to provide a reference for development activities, including technical planning and construction implementation as well as the use of buildings and the environment that are accessible to everyone by prioritizing all people including people with disabilities and the elderly, in order to realize equality, equality, position and rights. obligations and increasing the role of persons with disabilities and the elderly require adequate, integrated/inclusive and sustainable facilities, and efforts that can ultimately achieve independence and welfare for the disabled and the elderly. Evaluation of stations in terms of the Minister of Public Works is not usually carried out, so in this case, it is necessary to evaluate the station building from the guidelines of the Minister of Public Works.

The evaluation results are reviewed from the existing requirements form, then adjusted to the conditions in the field with a comparison table. From the comparison table assessment, there are exactly 50% of the facilities and accessibility requirements of the station building that have not been met, on average they are facilities for people with disabilities and the visually impaired, namely:

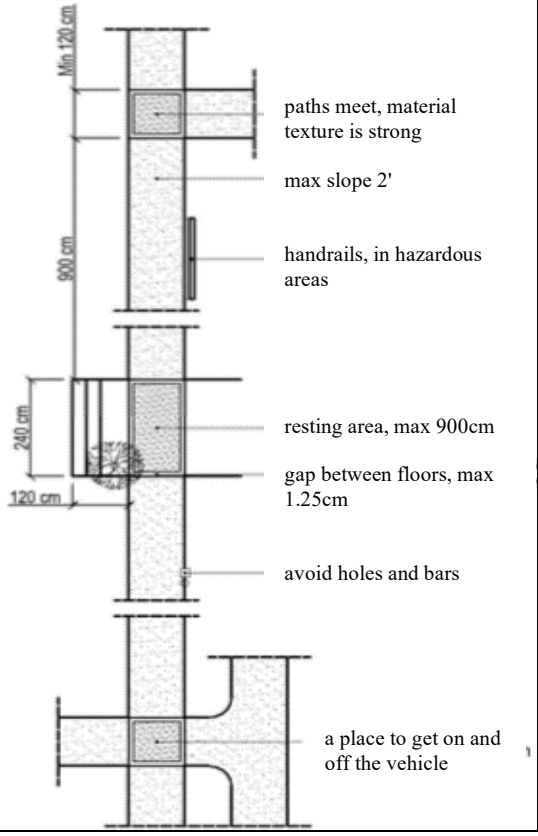
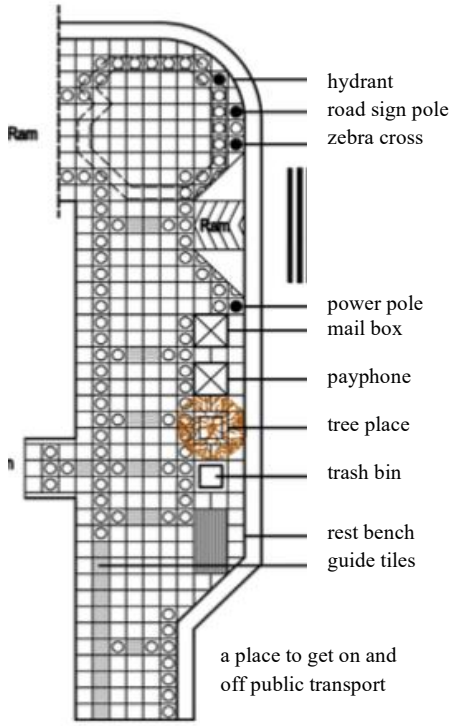
1. Paths used for walking or wheelchairs for people with disabilities independently designed based on people's needs to move safely, easily, comfortably and without obstacles
2. Paths that guide people with disabilities to walk by making use of the textures of guiding tiles and warning tiles.
3. Parking area is a parking area for vehicles driven by people with disabilities, so that a wider space is needed to get on and off wheelchairs, than the usual parking lot. While the area for Passenger Loading Zones is a place for all passengers, including people with disabilities, to get the vehicle.
4. Door is part of a site, building or room which is a place to enter and exit and is generally equipped with a cover (door leaf).
5. Ramp is a circulation path that has a field with a certain slope, as an alternative for people who cannot use stairs.
6. Facilities for vertical movement designed by taking into account the size and slope of the steps and ramps with adequate width.
7. Accessible sanitation facilities for everyone, including the disabled and the elderly in buildings or other public facilities.
8. It is a bath facility with a shower that can be used by everyone, especially for wheelchair users.
9. Communication equipment provided for all people visiting a building or public facility.

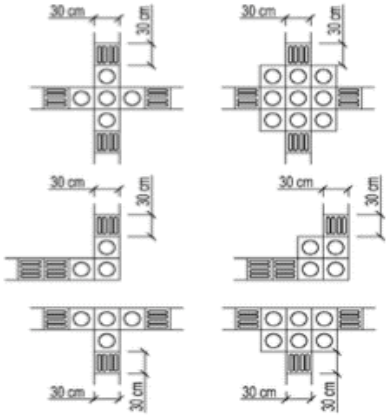
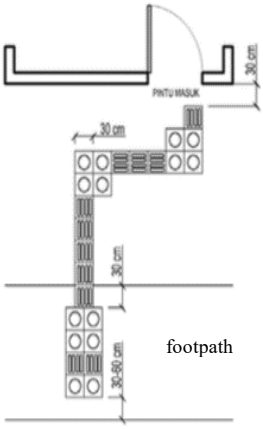
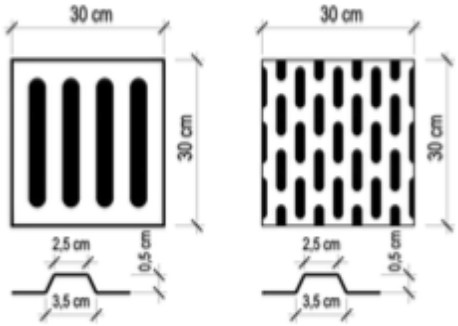
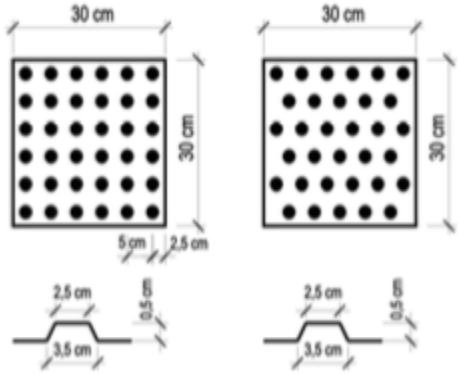
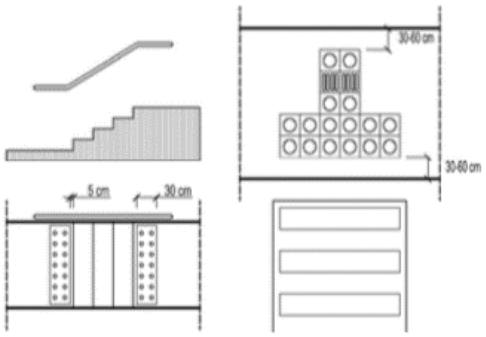
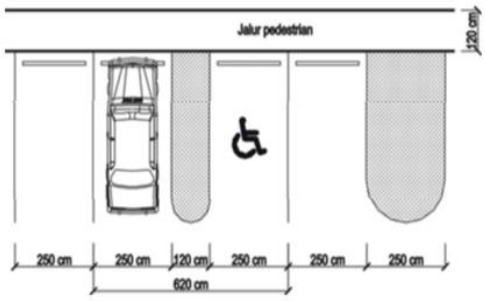
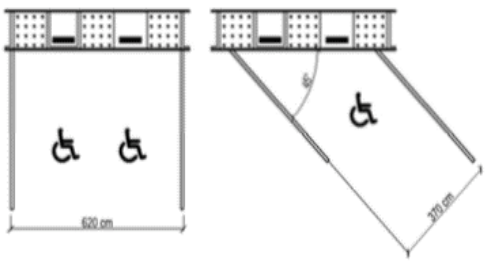
10. Are equipment and tools in buildings that can make it easier for everyone (without the exception of people with disabilities, the elderly, sick people, toddlers and pregnant women) to control certain equipment, such as alarm systems, buttons/sockets, and lighting.
11. Lay-out arrangement of building and furniture items must leave/provide sufficient space for movement and circulation for persons with disabilities.
12. Facilities and building elements used to provide information, directions, markers or directions, including multimedia information and communication devices for persons with disabilities.

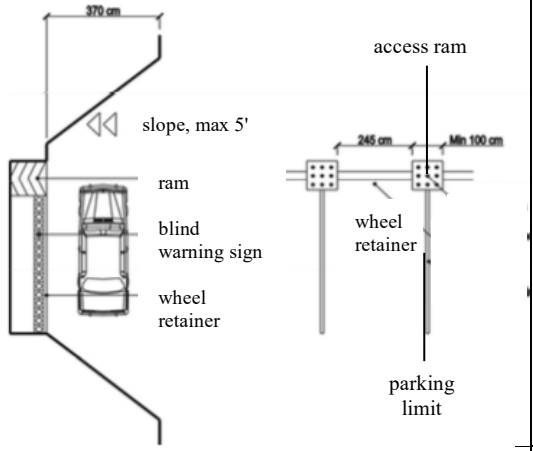
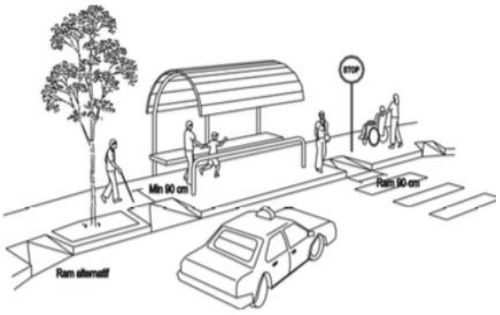
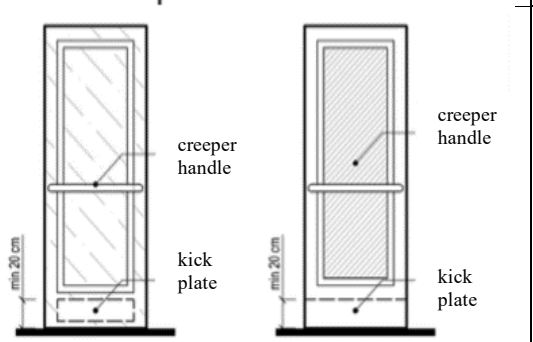
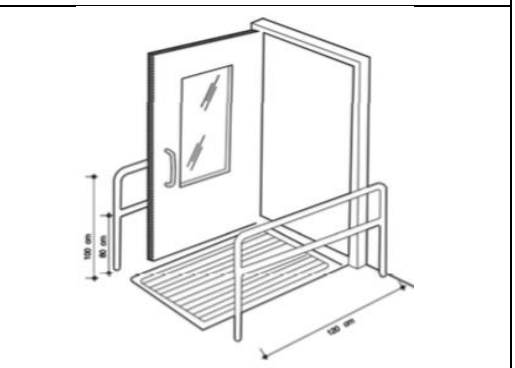
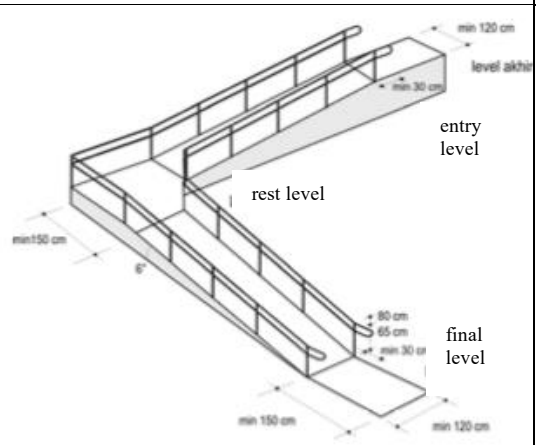
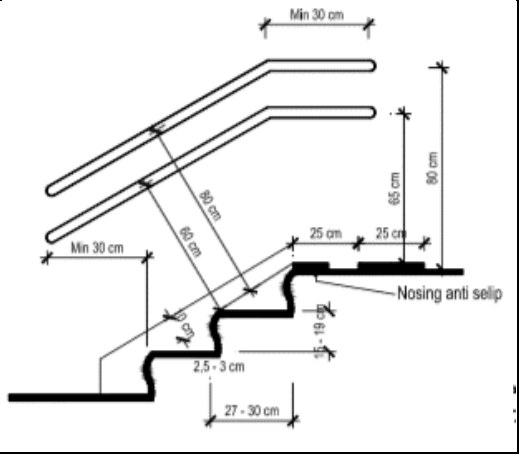
4. Solution Results

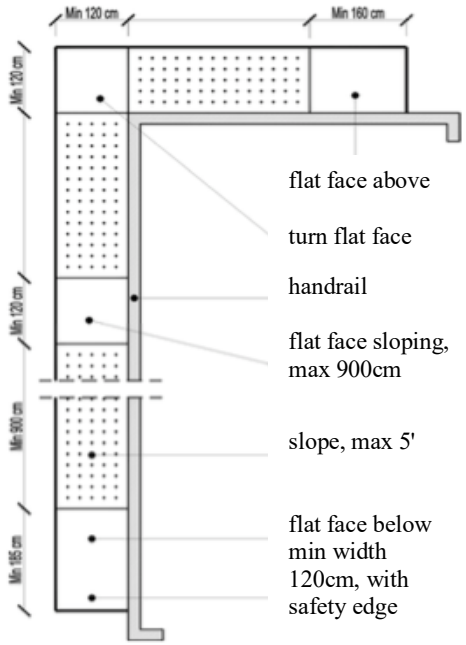
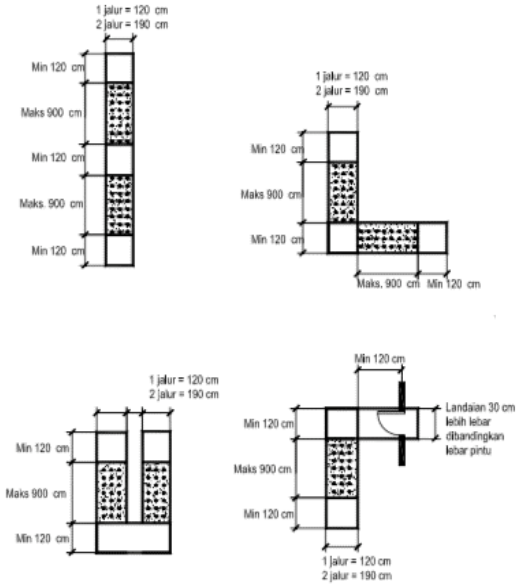
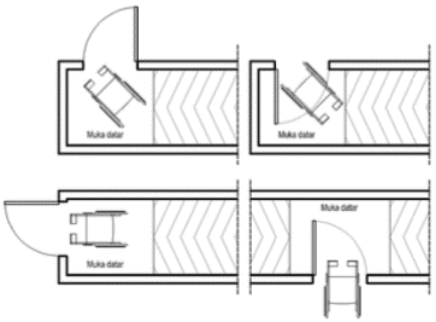
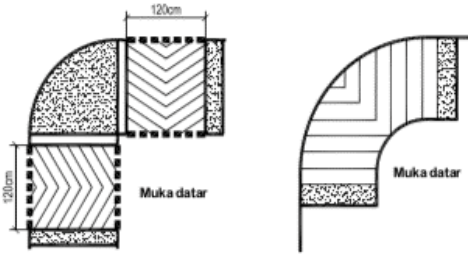
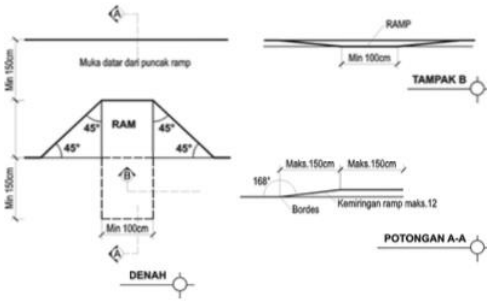
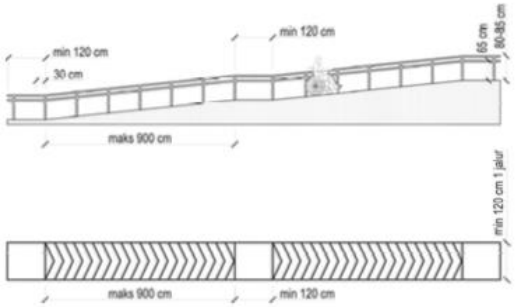
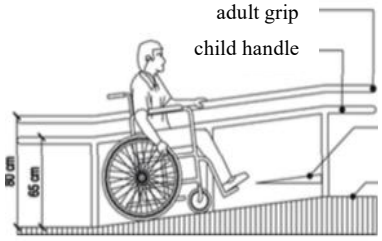
Solutions that can be done to improve the facilities of the Madiun Train Station building in accordance with regulations in Indonesia, namely Regulation of the Minister of Transportation of Indonesia Number 63 of 2019 and Number 30 of 2006 can be seen in table 2:

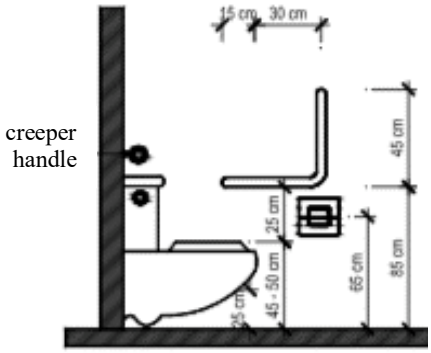
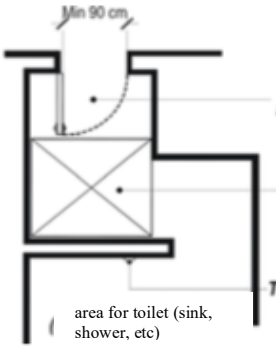
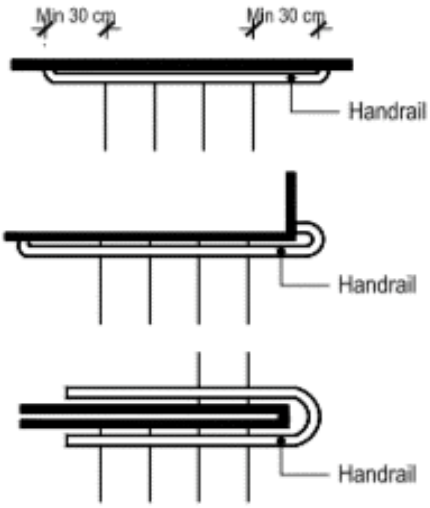
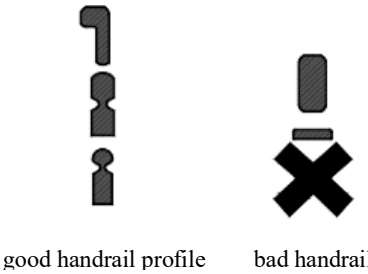
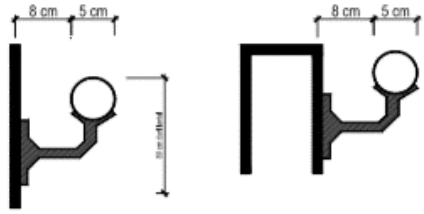
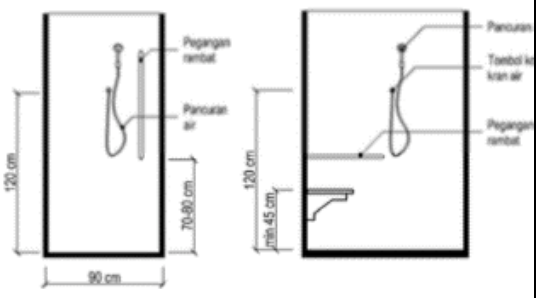
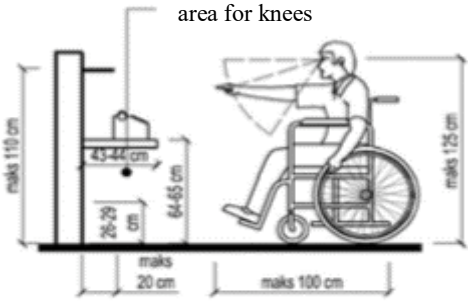
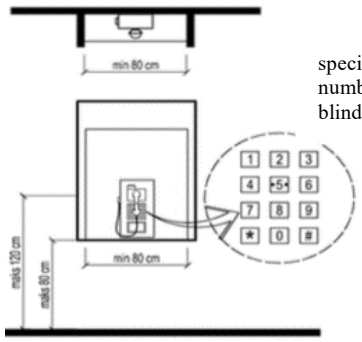
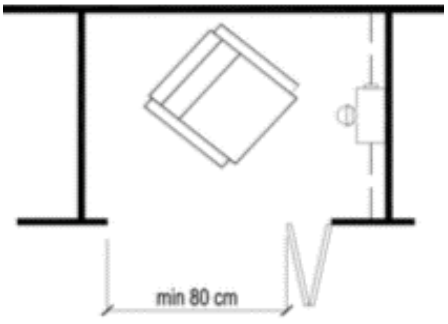
Table 2. Solutions for upgrading Madiun Train Station building facilities

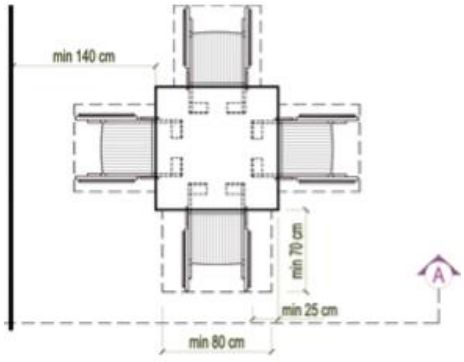
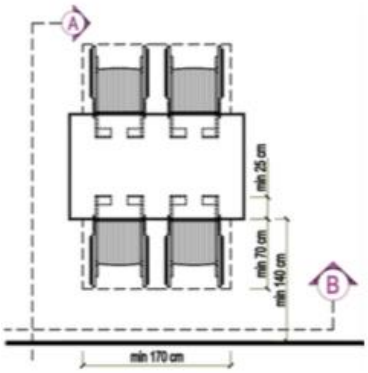
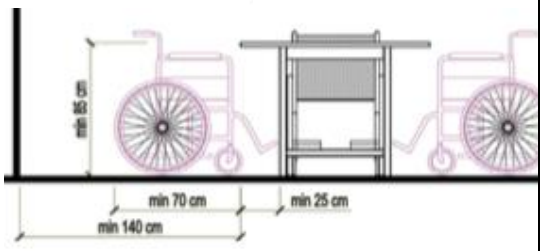
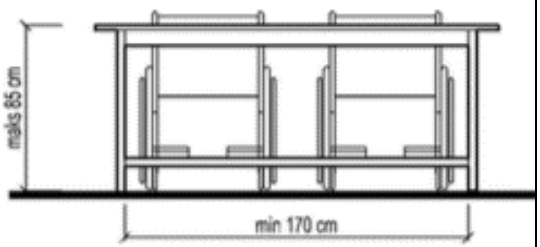
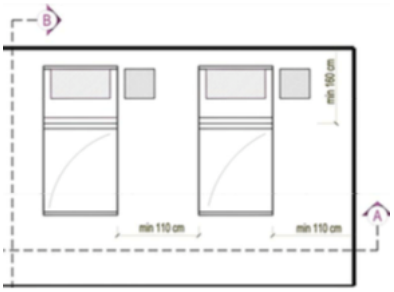
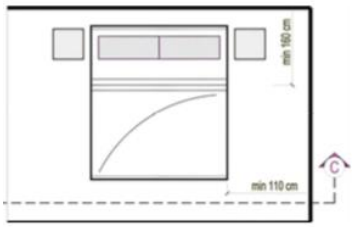
Required Items	Planning Drawing	Required Items	Planning Drawing
Pedestrian path planning		Guideline Planning Principle	

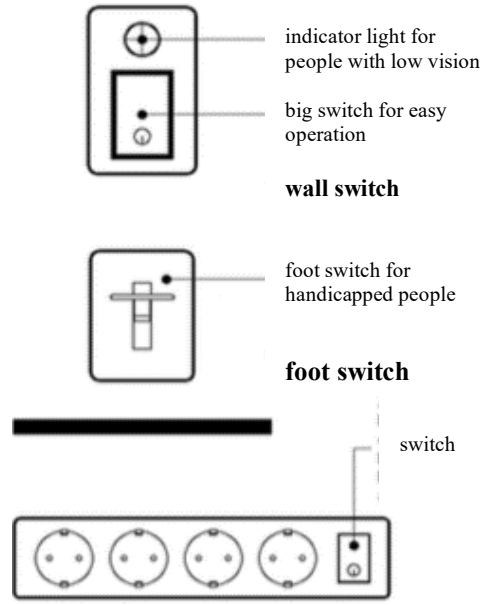
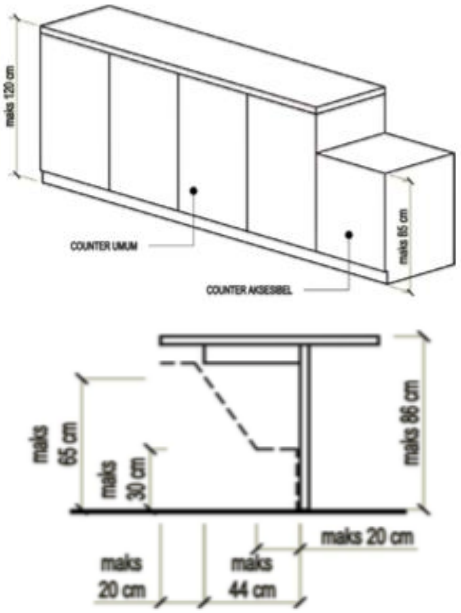
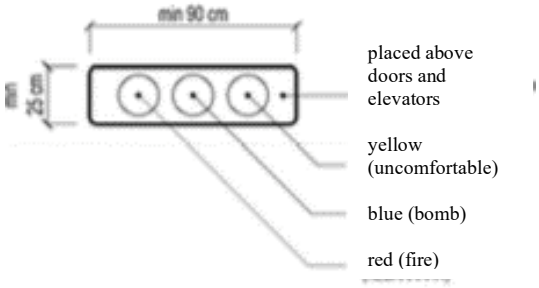
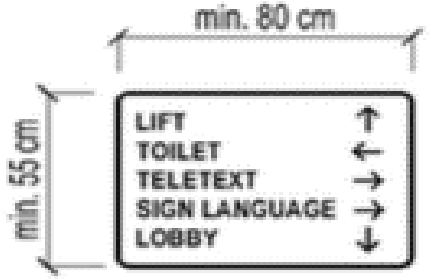
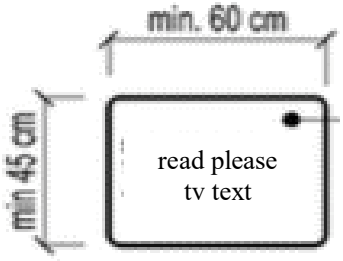
Required Items	Planning Drawing	Required Items	Planning Drawing
Guiding Path Tile Arrange-ment Principle on Turns		Guiding Path Tile Arrange-ment Principle at Entrance	
Guiding Path Tile Texture Type Usage Principle		Guiding Path Tile Texture Type Usage Principle	
Principle of Tile Arrange-ment of Guide Paths on Stairs		Principle of Accessi-bility Routes and Parking	
Typical Principles of Parking Spaces	 pedestrian path ram car wheel holder parking limit symbol, pavement material	Parking Space Variation Principle	

Required Items	Planning Drawing	Required Items	Planning Drawing
The Principle of Where to Get Off Passengers		Taxi Waiting Shelter Principles	
Principle of Door with Kick Plate		The Principle of Handrails in Front of Automatic Doors	
Ram Model Recom-mendation Principle		Typical Stairs Principle	

Required Items	Planning Drawing	Required Items	Planning Drawing
Typical Ramp Principles		Ram Model Principle	
Ram Side Width Slope Principle		The Principle of the Door at the End of the Ram	
Ram Laying Principles for Sidewalks		Ram Detail Principle for Side-walk	
Ram Slope Principle		Ram Handrail Principle	

Required Items	Planning Drawing	Required Items	Planning Drawing
Principle of Closet Placement		Toilet Circulation Size Principle	
Stair Handrail Principle		Stair Handrail Detail Principle	
		Stair Handrail Detail Principle on Wall	
Toilet Circulation Size Principle		The Principle of the Phone Handle Above	
Telephone on the Wall Principle		The Telephone in a Booth Principle	

Required Items	Planning Drawing	Required Items	Planning Drawing
Sitting Room Furniture Principles for the Disabled	 square table  rectangular table  C. 	Bedding Principles for the Disabled	 single bed  double bed  A  

Required Items	Planning Drawing	Required Items	Planning Drawing
Alternative Principles of Disabled Equipment	 c. lined switch	Principle of Counter Table Height for the Disabled	
Principle of Deaf Emergency Light Alarm		Principles of the Deaf Teletext Facility	
Principles of Deaf TV text facilities			

The proposed technical improvements in increasing the minimum service standards at the Madiun train station are facilities and accessibility for people with disabilities, namely the existence of pedestrian paths; guide line; Adjustment of Accessibility and Parking Routes, Doors and Handrails, Ram Details, Stair Details, Closet Details and Toilet sizes, and Shower Booth Positions for people with disabilities; Availability of public telephones and equipment for the disabled; Adjustment of Counter Table Details, sitting room furniture, and beds for the Disabled; Availability of Emergency Light Alarm, Teletext Facilities, and TV Text Facilities for the Deaf; The selection of the proposed improvement priorities can be carried out in subsequent studies according to the needs of train station passengers.

5. Conclusions

The conclusions of this study are:

1. The results of the evaluation of the weight value of the Madiun Train Station building facilities component in terms of PM 33 of 2011 regarding the train station class are appropriate, namely Large Class Stations with a total weight of 89.3 Credit Score, because the number of credit scores is more than 70 Credit Score.
2. The results of the evaluation of the minimum service standards for transportation of people by train and station building in terms of the Regulation of the Minister of Transportation there are differences in assessment between PT KAI with a survey in the field by looking directly at the condition of Madiun Train Station. The difference in the percentage of fulfilling Minimum Service Standards field assessments is 6% lower, namely in the assessment of special facilities provided for passengers with special needs, but the results of interviews conducted with Madiun Train Station are in accordance with the results of field surveys; Meanwhile, according to the Regulation of the Minister of Public Works, there are exactly 50% of the requirements for facilities and accessibility of the railway station building that have not been met, on average, are facilities for people with disabilities and the visually impaired.
3. Solutions to improve Madiun Train Station facilities and accessibility to support minimum service standards in buildings are: pedestrian path planning; Guideline planning; Accessibility and Parking Route Adjustment; Door and Handrail Adjustment; Ram Detail Adjustment; Stair Detail Adjustment; Adjustment of Closet Details, Toilet size, and Position of the Shower Booth; Availability of public telephones; Availability of Equipment for Persons with Disabilities; Adjustment of Counter Table Details, sitting room furniture, and beds for the Disabled; Availability of Deaf Emergency Light Alarm, Deaf Teletext Facilities, and TV text facilities for the Deaf.

6. Acknowledgment

In this study, the Indonesian Railways Polytechnic Madiun made a very large contribution because it facilitated the passage of a research. Great support comes from the Sebelas Maret University college which has educated the author as a civil engineer, and also experience working in the building field has provided substantial knowledge on the conception and/or study design, data acquisition, or data analysis and interpretation. The regulatory material in this study was obtained from the Indonesian Minister of Transportation and Public Works (PU) Regulation.

7. References

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