

The Implementation of Floor-Area Ratio in the Eastern Corridor of Jalan Ir. H. Djuanda Bandung

L Widaningsih*, T Megayanti and R Minggra

The Department of Architecture Engineering Education, The Faculty of Technical and Vocational Education, Universitas Pendidikan Indonesia, Bandung, Indonesia

*liswida@upi.edu

Abstract. This paper investigates the changes of buildings and the patterns of spatial use in the eastern corridor of Jl. Ir. H. Juanda Bandung. The aim is to what extent the regulations related to floor-area ratio are implemented and how the space and building looks are designed. Historically, the corridor of Jl. Ir. H. Juanda as part of Dago area is designed for colonial residences, but the development of commercial activities in the city of Bandung has resulted in many changes to the area, making it a commercial area. This study used a descriptive qualitative method by conducting field observations to identify buildings located on the eastern corridor which was divided into three segments of the road. The results show that quantitatively the buildings along the eastern corridor are still in compliance with the floor-area ratio. There is only a small portion in the segment of between Jl. Cikapayang and Jl. RE Martadinata that exceeds the ratio limit. However, the ration is not the only reference to achieve the harmony in visual and the characters of the city. The characters of the corridor are determined by several parameters, such as building height, building scale and comparison visibility. These parameters should be put into consideration. Thus, more detailed regulations regarding the changes in the shape, the pattern of use of space, and the concept of contextual design are highly required.

1. Introduction

The development of urban activities can be observed through changes to the structure of the buildings and the patterns of urban space use. At least, the activity changes in social, cultural and economic communities that take place at a certain time will be followed by changes in the physical formation of the buildings that embodies the activities. Changes in the function of the buildings will be followed by the changes in forms, expressions, amount of space, building heights, and the space usage patterns.

Function is the fundamental starting point for all architectural expressions. The function of a building, therefore, will influence the architectural form. However, it is quite common that the forms and functions are not well coordinated [1]. The corridor of Jl. Ir. H. Juanda historically is an area designed for residential area, but the development of commercial activities in the city of Bandung causes the region to experience many changes that make it a commercial area. The buildings which formerly function to accommodate residential activities and later turn into the buildings that are used for commercial activities certainly change the physical structures of the buildings.

The regulations in the city become a very important part in response to any development of the city. In the detailed spatial planning of Bandung city from 2013 to 2035, Dago is categorized as a trading and service zone including sub linier trading and services. As the consequences, it is inevitable



that function of the buildings has changed from residential to commercial function. The significant changes even occur in the shape of the building, land use, and the construction of new buildings by removing the old parts. The aim of this study is to examine the extent to which the implementation of the regulations related to FAR influences the changes and how the space and building looks are formed.

2. Methods

The study was conducted along the eastern corridor of Ir. H. Juanda Bandung from the intersection of Jl. Dago to the intersection of Jl. RE. Martadinata. The approach used in this study was a qualitative descriptive by analyzing physical data of the buildings, identifying each component and focusing the analysis on two samples of buildings.

3. Results and discussion

3.1. The rule implementation of Floor-Area Ratio (FAR)

Jalan Ir. Juanda, physically, is a road connecting Bandung City Center to the northern area of the city that provides opportunities and potentials for commercial activities. Its position that connects various sides of the city allows ease for the region to be accessed from all points. As a result, to this, Jalan Ir. H. Juanda is attractive for investors to develop businesses, especially trading activities in the region.

The corridor is mapped into three segments. This mapping is based on the likelihood in the changes and the movement patterns in the area which move from the southern part of the road. The intensity of commercial activities in the segment between Jl. Cikapayang and Jl. RE. Martadinata (Figure 1) is higher than another road segment which previously leads to the northern part of area. The movement patterns continue on the next road segment, between Jl. Cikapayang and Jl. Teuku Umar, in which the intensity level of commercial activities is not as high as in the previous segment. Meanwhile, the commercial activities from Jl. Dipati Ukur to Jl. Teuku Umar have lower intensity than the previous segment.

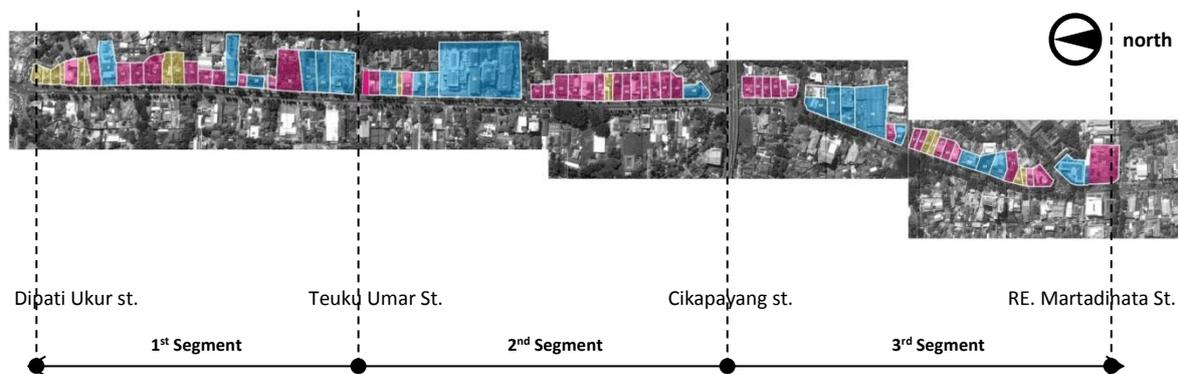


Figure 1. The Corridor of Jl. Ir. H. Juanda, and the segmented areas for the study. Source: Research document

Building and environment regulations are intended to safeguard the security, public health, environmental comfort, and welfare in general. The regulations are used by local governments to control the use of land, buildings, and the use of infrastructure facilities [2]. With the implementation of building and environment regulations, it is expected that quality of urban physical and environmental protection can be guarded by the government or local authorities with a system of regulating the land use and building ratio in an area. The regulations used in planning land use in an area are embodied in Detail Spatial Planning of the city, which include the zoning scheme as well as the decision of the building intensity in the form of building coverage ratio (BCR) and Floor-Area Ratio (FAR)

According to the spatial planning for the city of Bandung, FAR is the percentage rate of the comparison between the width of entire floor area of the building and the width of spacious land planning controlled by appropriate spatial planning and building and environmental management plan. It is a rule that is applied to monitor the extent of the building which will affect the maximum height of buildings in a region. The technique applied to the FAR is performed by calculating the mathematical relationship between the width of the building and that of land area. Building design assessment is a requirement before the government give a permission to start the construction. If the FAR calculation is not in accordance with the rules, then the construction permit is not granted. The advantages of the FAR application are greater mainly in a very broad zone with the development of high buildings [3]



Figure 2. Skyline simulation in the eastern corridor of Dago, illustrated based on segment of the current study. Source: research document

The application of FAR rule has many advantages because of its flexibility [3]. Its application will not affect the shape of the building and the area of the floor of the building. FAR also does not restrict certain forms, and supports a wide range of innovations in building design. Furthermore, the application of the ratio has various advantages, including applicable to all types of land structure; applicable to different land proportionally; and efficient to quickly calculate the entire capacity of the building. Nonetheless, the rule of the FAR cannot be independent. It must be applied in conjunction with other legislation, such as the maximum limit of floor height, BCR, as well as the building demarcation lines so that the comfort of the environment can be maintained [2].

The corridor of Jl. Ir H. Juanda, or better known as Dago area, is located in the north of Bandung and included into Cibeunying region. As stated in detailed spatial planning for Bandung city, the purpose of Cibeunying region is to be Travel polis that focuses on culinary tourism center. It is motivated by the development of tourism activities in Bandung, particularly with the increasing trend in culinary and fashion as a major activity of the economy in the region. Furthermore, the eastern corridor of Jl. Ir. H. Juanda, which is the focus of the current study, is identified as a trading zone, including sub-zone of linear trading and services. According to the city's spatial planning, a zone is defined as a region or area that has specific functions and characteristics, while a sub-zone is a part of a zone that has specific functions and characteristics that are more detailed than the zone

As stated in the rules of Bandung spatial planning in the years of 2015-2035, Jl. Ir. H. Juanda is categorized as the primary collector road [4]. The rule of FAR set to an area is different to one another, and is applied in accordance with the designation of the zones and subzones. In a trading zone with linear trading and service subzone in the corridors of Jl. Ir. H. Juanda, the FAR is 2.8 at the maximum. It means that the width of building that can be constructed is 2.8 times the land width owned. The maximum floor area for retail agglomeration (shopping center/mall) is 40,000 m² and a single retail/store is 2,500 m². To illustrate, if the corridor Jl. Ir. H. Juanda has a land area of 1,000

m², the total building area that can be built is 2,800 m². However, this does not apply if the designation of the building is used as a single store. Based on the rule of the typology single store, the store requires maximum building floor area of 2,500 m².

Based on the field observations that pictured in figure 3, the entire buildings in Segment 1 are still in accordance with the requirements set out in the city's spatial plan, which focuses Dago area as a center of linear trade and services. In Segment 2, approximately 5% of 23 building plots observed are not in accordance with the rules required. Meanwhile, in Segment 3, 10% of 29 plots observed conform to the required rules.

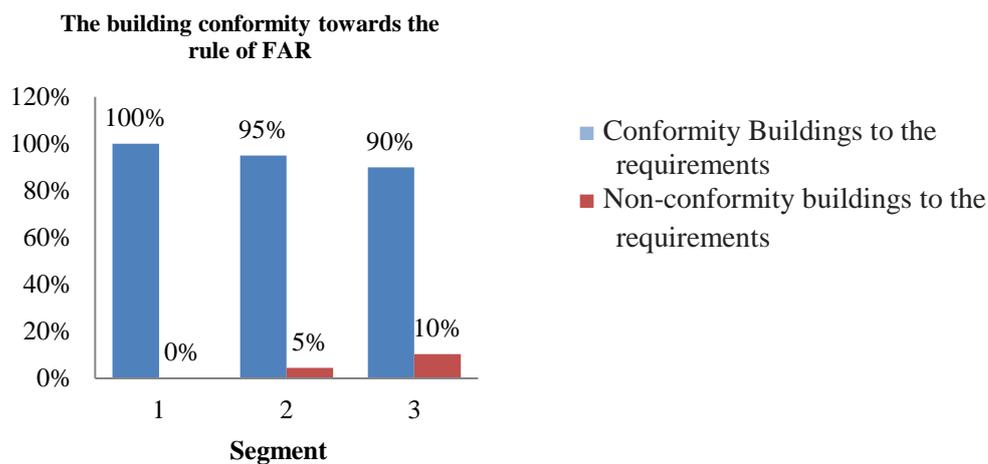


Figure 3. The building conformity to the FAR.

Source: research document

3.2. Space organization and building looks

Based on the observation in the eastern corridor of Jl. Ir. H. Juanda, there are several parameters related to the height of buildings that affect the visual aesthetic value, such as the scale of the building and a comparison of visibility. These parameters are specifically observed in some sample buildings

The scale that spatially compares the height of the element and the width of the element itself may give an impression that is common to people in it [5]. Zahnd also provides a standard scale of the building in the corridor in creating a narrow, neutral, and broad scale corridor (figure 4). In the case of the corridor of Jl. Ir H. Juanda, the rule of FAR indirectly determines the quality scale corridors.

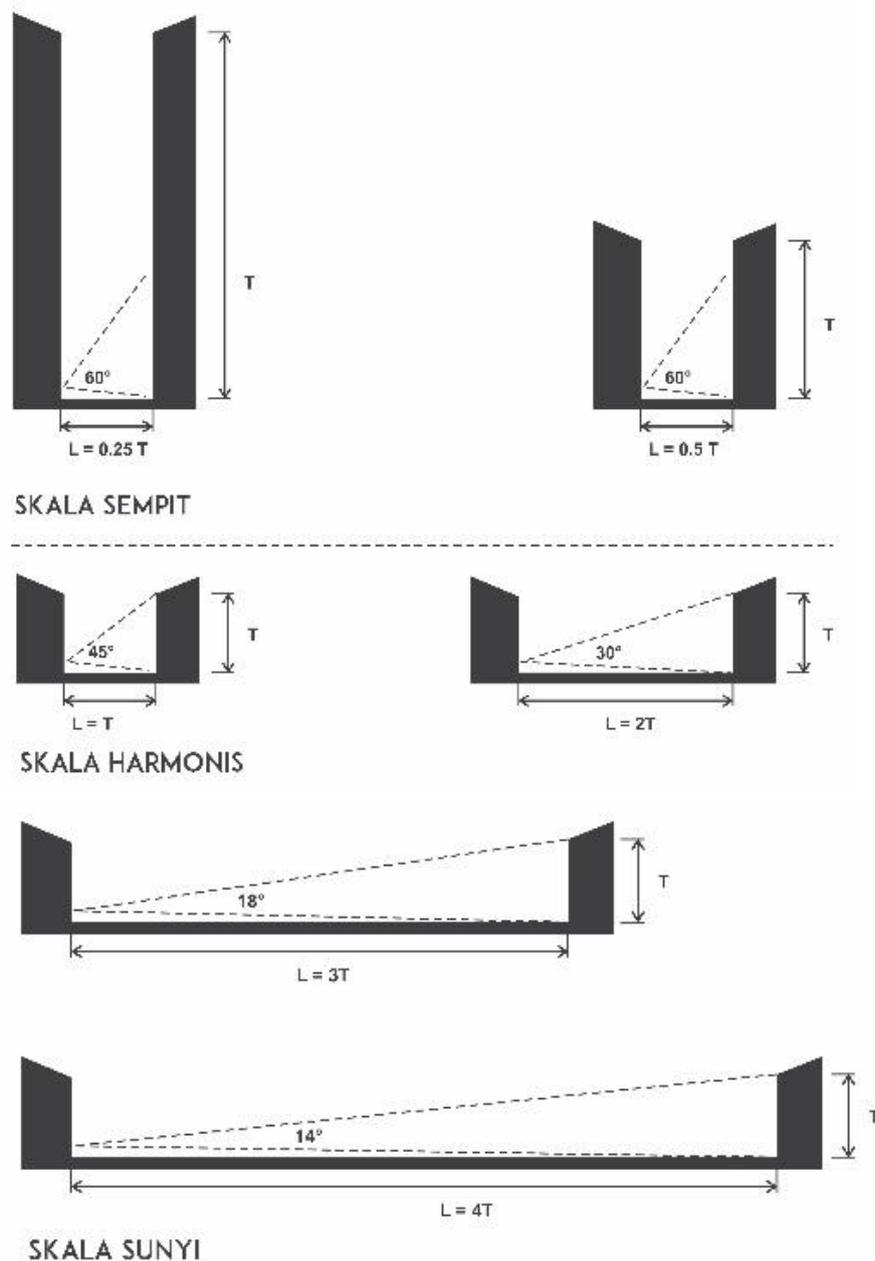


Figure 4. (a) The scale of city and visibility towards building mass. Source: [5]

Apart from scale, visibility also affects humans towards building experience and perception of the space. The measured parameter is the ratio between the distance of the mass of the building and the height of the mass of the building itself [6].

3.3. Forms processing and building height

To further deepen the analysis, observations were focused on two samples of buildings: BCA Building (figure 5a), and the Four Point Hotel (figure 5b). BCA building is a refurbishment building which is done by the physical restoration of the earlier building (first floor), function infiltration and a new space program that adapts the shape of early buildings, and extensions of a new five-storey building at the back of the earlier building. The concept of building refurbishment is a form of building

improvements that can be done for various purposes. Some studies apply the concept of building refurbishment to use energy more [7] and to renovate historical buildings for the purpose of conservation, aesthetic requirements, structures, and others [8]. The buildings as a result of the restoration are functioned as the lobby, teller and customer service, while for the additional building is for administrative building.

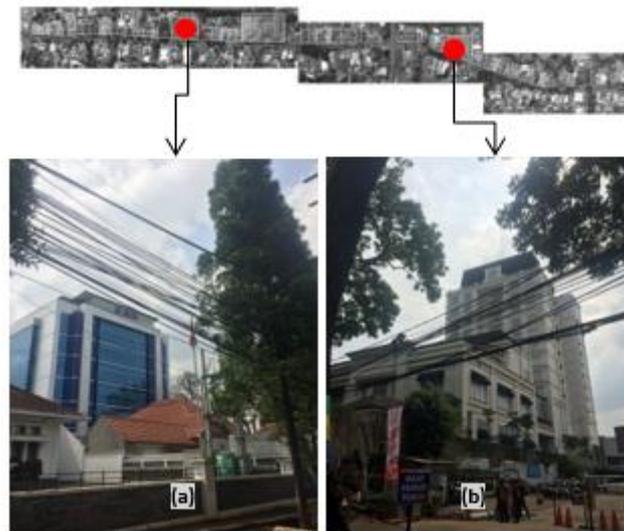


Figure 5. (a) BCA Building; (b) Four Point Hotel.

Source: Research documents

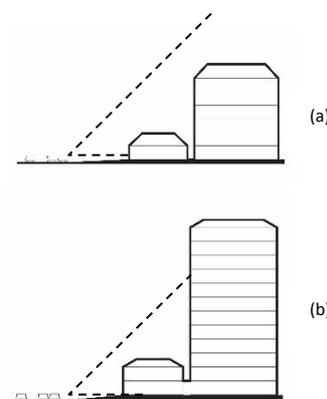


Figure 6. The scheme of comparison scale between the ratio of the shape of the buildings and visibility from the road towards (a) BCA Building; (b) Four Point Hotel Building.

Source: Research documents

From the shape composition point of view, Four Point Hotel building consists of two adjacent main building mass. It consists of a small two-floor building mass, and a mass of tall building behind the site which consists of 12 floors. The front one is made up of public functions, such as the lobby and restaurant, and the back consists of a private function.

Both BCA building and Four Point Hotel building were selected as the samples of newly completed buildings built in 2016, and of multi-storey buildings category. Based on the analysis and observation, the design of both buildings positions a higher mass of the building located at the back of the site. At this point, floor area ratio of BCA and Four Point hotel buildings are concentrated on the second building that located at the back of the site (figure 6). This configuration creates a balanced

visibility ratio from the street to the building on top of the building and ideal perception of space. Smaller building mass with less space functions as a facade, which thus allows the higher building to be visible from the street. The division of floor area ratio used in both buildings becomes a good precedent in the design of multi-storey buildings.

4. Conclusion

The city's detailed spatial plan in years 2015-2035 has set the category for Jl. Ir. H. Juanda as a trade zone and services, including sub linear trade and services. The maximum set FAR is 2.8, indicating that the building area can be built 2.8 times the size of land owned. Under the rules of FAR, quantitatively the buildings along the eastern corridor are still in compliance with the limits of FAR. Only a small number of buildings in the segment between Jl. Cikapayang and Jl. RE Martadinata exceed the limit of FAR

In the context of visual aesthetics and order of the area, the characteristics of corridor are formed by several parameters, such as building height, building scale and comparative visibility. In the case of the corridor, the rule of FAR indirectly determines the quality of corridor scale.

For future development of urban areas, applying the rule of FAR is not sufficient. More detailed regulations are required regarding the changes in the shape, the pattern of space use, and the concept of contextual design. The concept of building refurbishment which is applied by the physical restoration of the initial building would be one model that can be applied to synergize and shape the character of the city area.

References

- [1] Krier R 2010 *Architectural Composition* New York: Edition Axel Menges
- [2] Kumar A 2015 Approach to formulate setback regulations for Indian hill towns *Int J Sustain Built Environ. The Gulf Organisation for Research and Development* **4** 1 91–99
- [3] Beach P, Noble M A, Noble A G and Costa F J 2000 *Floor area ratio as an urban development tool*. 127–139
- [4] Rencana Detail Tata Ruang Kota Bandung 2015-2035
- [5] Zahnd M 2006 *Perancangan Kota Secara Terpadu* Semarang: Kanisius
- [6] Spreiregen P D 1965 *Urban design: the architecture of towns and cities* New York: Mcgraw-hill Inc
- [7] Kamaruzzaman S N, Lou E C W, Zainon N, Mohamed Z N S and Wong P F 2016 Environmental assessment schemes for non-domestic building refurbishment in the Malaysian context *Ecol Indic.* **69** 548–558
- [8] Ascione F, Cheche N, De Masi R F, Minichiello F and Vanoli G P 2015 Design the refurbishment of historic buildings with the cost-optimal methodology: The case study of a XV century Italian building *Energy Build. Elsevier B V* **99** 162–176