



Study on the Development of Horizontal & Vertical Residential Houses in Banten Province with the Approach of the Elements of Local Awareness in Buildings

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Abstract- Banten Provincial Government is planning the construction of flats and row houses in several locations in Banten Province. However, the flats and row houses that will be realized are currently being developed a prototype for each of these dwellings. So that the flats and row houses that will be built according to the needs of the residents in them. Therefore, it is necessary to design simple rental flats or row houses that can support the needs of the community in terms of social and living comfort. Research objectives of the study of Prototype Development of Horizontal and Vertical Residential Types are needed in order to meet the needs of decent and affordable housing but meet the comfort requirements. security and health within the scope of regional potential heterogeneity, particularly the potential for building materials, culture, and physical characteristics of the area. This study will serve as the basis for the study of the Development of Prototype Types of Horizontal and Vertical Residential Houses. The research method used is to adopt the Target Oriented Planning approach, which is a planning thought that is more emphasized solely on the goals & objectives that will be achieved in the future. As for the planning of this prototype, the target referred to here is the design prototype of a simple rental apartment that meets the building function criteria for occupant activities, architectural performance criteria and responsiveness to the social economic considerations of prospective residents, in this case low-income people from research to determine the best alternative in handling slum settlements through the development of Prototype Types of Horizontal and Vertical Residential Houses that are in accordance with environmental conditions in each Regency / City in Banten Province.

Keywords- Flat, Row House, Prototype, Horizontal, Vertical, Residential

I. INTRODUCTION

Banten Provincial Government is planning the construction of flats and row houses in several locations in Banten Province. However, the flats and row houses that will be realized are currently being developed a prototype for each of these dwellings. So that the flats and row houses that will be built according to the needs of the residents in them. Therefore, it is

necessary to design a simple rental apartment or row house that can support the needs of the community in terms of social and living comfort.

The design with a prototype approach is carried out by considering the number of similar buildings that will be built quite a lot. The building design model, in this case the flats, for example with a prototype approach is aimed at accelerating the procurement of houses, done by:

A. Making a drawing of the original form / basic design of the flats which includes:

- a. Architectural drawings include: building mass, ground floor plan, floor plan 1, typical floor plan 2-etc., views, sections, details.
- b. Structural drawings include: substructure / foundation, superstructure, details.
- c. Mechanical and electrical drawings include:
 - Electric network,
 - Clean Water Channels,
 - Sewer,
 - Lightning rod,
 - Telephone,
 - Tv Networks, Special Installations, Fire Extinguishers
 - Garbage disposal, etc.

B. An explanation of the Work Plan and Conditions

All of the design drawings above are original / basic form documents, then for other Flats designs you can use the prototype design, namely using the document by reusing / repetitively. The prototype design is carried out by means of the original / basic drawings that can be used again / repeatedly for Flats in other locations / places.

This approach adopts a Transforming Tradition method that was developed in an effort to maintain the tradition that is applied in the context of design. The method used in the Transforming Tradition theory as a controlling parameter to see the transformation form of the Transforming Tradition theory

is the **ATUMICS** method which stands for **Artefact - Technique - Utility - Material- Icon- Concept - Shape**.

This theoretical approach is carried out to study artifacts, namely the Bandung City Hall Office, in order to see how the local architectural concept in this case Banten province is applied. It examines how local content elements are transformed to suit their time. The first process in transforming building artifacts is to determine a "pre-code" which is also a control tool. How to transform can be done with the following steps:

- a. A visual statement with a conceptual approach to problems using three-dimensional images.
- b. Perform transformation evaluation, both in terms of function / use, form, and image.

Analysis means categorizing, structuring, manipulating and summarizing data to obtain answers to research questions (Kerlinger, 2006: 217), therefore the method of analysis can be called a method used to process and test data against research questions using certain procedures.

Research conducted by Adam Sapta Maulida Based on data quoted from the Bandung City Statistics Agency (2015), the total population in Bandung is 2,470,802 residents with a population growth rate of 9.2%. This means that the population in Bandung every year increases by around 227,313 people. This phenomenon causes the city of Bandung to experience a population density issue due to the high population growth rate while the available land is getting smaller. This raises other problems related to the provision of shelter or housing, especially for low-income people. One area that experiences population density issues is Tamansari Village, Bandung Wetan District, Bandung City. Tamansari Village is listed as the village with the highest population in Bandung Wetan District with a population of 23,972 people or around 77.82% of the total population in Bandung Wetan District. Regarding the issue of overcrowding in this sub-district, the Bandung City Government made a program to build a series of houses with the theme of flats in 11 neighborhoods and 12 residents of the Tamansari Village. Rumah Susun is a vertical housing typology that resembles an apartment but is designed with the strengthening of the theme and context of the locality in which the apartment is built. Flats are planned and designed by applying an inclusive theme. The purpose of applying this theme to housing is to make the Tamansari flat become a more humane living space across genders, ages and abilities.

In this activity, the planning method used adopts the Target Oriented Planning approach, which is a planning thought that is more emphasized solely on the goals & objectives that will be achieved in the future. As for the planning of this prototype, the target referred to here is the design prototype of a Simple Rental Flats - a row house that meets the building function criteria - occupant activities, performance / performance criteria - architectural criteria and is responsive to socio-

economic considerations of prospective residents, in this case are low-income people.

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II. FORMULATION OF THE PROBLEM

Humans have 3 basic needs, one of which is a house or a place to live. The house plays an important role in community life as a place to live and a means of fostering a family. Indonesia is a country that has a low-income population of around 200 million people and this figure will continue to increase to 260 million in 2020 (Tanuwidjaja et al, 2009). This increase has resulted in the emergence of slum settlements, both in regencies and cities. Therefore, the government has launched the "1,000 Flats Tower" program in several big cities, one of which is Banten Province.

III. RESEARCH PURPOSE

Determining the best alternative in handling slum settlements through the development of Prototype Types of Horizontal and Vertical Residential Houses in accordance with environmental conditions in each Regency / City in Banten Province.

IV. RESEARCH METHODS

In this study, the planning method used adopts the Target Oriented Planning approach, which is a planning thinking that is more emphasized solely on the goals & objectives that will be achieved in the future. As for the planning of this prototype, the target referred to here is the design prototype of a Simple Rental Flats - a row house that meets the building function criteria - occupant activities, performance / performance criteria - architectural criteria and is responsive to socio-economic considerations of prospective residents, in this case is a Low Income Society.

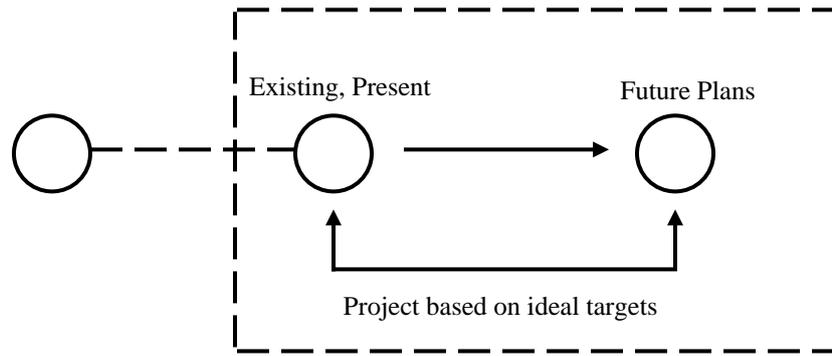


Figure 1. Prototype of simple rental apartment & row house for Banten province

To get an overview of the current conditions as a basis for designing a better future vertical-horizontal housing prototype, it is necessary to evaluate the vertical-horizontal housing that has been built and occupied which of course has been designed in accordance with the applicable NSPM. Because of that, the Post Occupancy Evaluation Method is deemed necessary.

V. LITERATURE REVIEW

The basic approaches that must be considered in this investigation survey of horizontal and vertical house designs are as follows:

1. **Functional Aspects.** Row Houses and Simple Rental Flats are horizontal & vertical forms of housing which have a building along with various supporting facilities for its residents. The basic functional approach focuses on the actors of the activity, the type of activity, the activity process, the type of capacity facility, the amount of space.

2. **Performance & Technical Aspects.** Row Houses and Simple Rental Flats require a complete range of building facilities and are used to support the achievement of the elements of comfort, safety, convenience, communication and mobility from inside and outside the building. therefore, it is necessary to approach a building utility system that is good and in accordance with the needs.

3. **Technical aspects related to the main activities that take place in rowhouses and Simple Rental Flats are residential activities, therefore there is a need for an approach to fulfill the elements of security and building safety by taking into account the choice of structural-modular systems & building materials / materials, the right kind of benefits.**

4. **Architectural Aspects.** The architectural aspects used in the planning of row houses and simple rental flats apply:

- a. Development of simple healthy houses & simple high-rise Flats and also directions from the Ministry of Industry,
- b. The appearance / face of the building will refer to energy-efficient architecture, a green architecture that pays attention to contextual issues with an image that is comfortable, safe and affordable and accommodates architecture & local wisdom.

5. **Social - Economic Aspects.** In designing a prototype, it needs to be based on the socio-economic considerations of the people who will inhabit this house, namely:

- a. The economic aspects used in the planning of row houses and simple rental flats are viewed from the efficiency of construction cost financing, the affordability of the potential occupants / users of the house.
- b. The social aspect, planning this prototype is very important to consider the social conditions, the contribution of social capital and the culture of living which are likely to experience slight changes.

This theoretical approach is carried out to study artifacts, namely the Bandung City Hall Office, in order to see how the local architectural concept in this case Banten province is applied. It examines how local content elements are transformed to suit their time. The first process in transforming building artifacts is to determine a "pre-code" which is also a control tool. How to transform can be done with the following steps:

The main principle of the ATUMICS method is about the arrangement, combination, integration, or mixture of the basic elements of tradition and modernity.

1. **Artefact (A)**, refers to an object that is the center of this study, namely Vertical Houses (Simple Rental Flats) - Horizontal Houses (Row Houses). The other six words, namely Technique (T), Utility (U), Material (M), Icon (I), Concept (C), and Shape (S) reflect the six basic elements of building artifacts / objects that will adopt traditional transformations. local.

2. **Technique (T)** describes all kinds of technical knowledge, such as manufacturing techniques, production techniques, or how artefacts are finally formed either through processes, history, or other things that influence them. Engineering also means technology, which refers to all the means and processes in realizing the use of existing potentials.

3. **Utility (U)** used as a functional tool for an object. utility or function has always been linked to the form. Judging from the semantic definition, function has two definitions, namely in the context of use and in the context of the product / object. For example, a carved chair, in the product / object context, the

chair serves as a means of sitting, and in other contexts a chair made with high quality carving art will show the class or level of the user.

4. Material (M) refers to any physical form of things that can be made. In the field of architecture & interior, this aspect is usually emphasized on the final result of a product / building object (chairs, tables, doors, carvings, walls, floors, etc.).

5. Icon (I) refers to symbolic forms which can be derived from nature (flora and fauna), geography, ornaments, decorations, colors, myths, people, and artifacts. The role of the 'icon' element is to provide an iconic sign and symbolic meaning to an object.

6. Concept (C) refers to the factors behind the formation of an object. Concepts are measured qualitatively (habits, norms, beliefs, characteristics, feelings, emotions, spirituality, values, ideology, and culture).

7. Shape (S) refers to the shape, performance, and visual and physical properties of an object, which includes analyzing the size and proportion.

VI. DISCUSSION RESULT

The design components for the design of the Simple Rental Flats that have been determined are related to several design provisions as follows:

1. Criteria for Determination of Location and Land Conditions
2. Criteria for Site Plan, Block Plan and Building Form
3. Criteria for Building Architecture
 - a. Reflects its function as a residence
 - b. Balanced, harmonious and in harmony with the environment, beautiful but not excessive
 - c. Efficient use of resources in utilization, easy maintenance
 - d. Pay attention to safety and security
 - e. Meet the demands of the local socio-culture
 - f. The space must meet the requirements for ventilation, lighting, sound and smell to protect occupants.
 - g. Natural ventilation uses a cross-air exchange system with a vent size of at least 1% of the floor area of the space concerned. And when using artificial ventilation with a mechanical system it must work continuously.
 - h. Natural lighting uses one or more light holes whose width is calculated from the sky light component, reflection from outside - inside, while artificial lighting must meet the requirements, namely min. 50 lux for work and 20 lux for other spaces (stairs, hallways / corridors).

As for the architectural design provisions for Simple Rental Flats include the following aspects:

- a. Apartment units
 - b. Shared Parts and Common Objects
 - c. Residential Unit Standard
 - d. Corridor / Hallway
 - e. Stairs (General - Emergency) & Ramp Window
 - f. Selabasah & Kitchen
 - g. Building material
 - h. Inner Space
4. Building Structure includes: lower structure (sub structure, upper structure, building envelope, detailing, construction method).
 5. Mechanical, Electrical and Plumbing include: Fire Extinguishing Systems, Electrical systems, Lightning Protection and Plumbing Systems
 6. Public infrastructure includes: roads, street lighting, solid waste management, green open spaces / parks / landscapes, parking, calculation of parking area requirements.

A. Overview of Banten Traditional Architecture

The traditional house of Banten Banten is a province located on the western tip of Java Island. This province is the result of the expansion of the West Java region which was only inaugurated in 2000. Although administratively Banten province is still relatively young, it does not mean that the people of this province are still culturally backward. Banten society's civilization itself had been built long before this province was formed. One proof of this is the existence of a traditional Banten house design originating from the Baduy culture of the West Banten. This traditional house called Sulah Nyanda is called a unique house because it has a design that blends in with nature.

B. Traditional House Structure

Judging from the structure of the building, this Banten traditional house as a whole is made of materials derived from nature. Bamboo is the main ingredient in the process of constructing this traditional house, while stone, wood, and fibers are complementary to it. Stone is used as the foundation for the foundation. The stone used is a flat stone that is large in size so that it can be buried in the ground. The stone that is usually obtained from this time is used to prevent the house poles from decaying quickly. For information, wooden house poles will easily porous when directly in contact with the ground. Laying the foundation on a traditional Banten house is not done by damaging the soil structure. If the land where the house is built has sloping contours, then the foundation will adjust accordingly. This is what makes the height of the house supports cannot be equated. The pillar of the house itself comes from a large wooden block. The wood used for the posts must be strong and durable wood such as teak, mahogany, or acacia wood. Strong wood on a pole is very necessary for the

resistance of the house because the pole is a place to support the roof frame as well as the floor frame.



Figure 2. Banten Traditional House

For walls, this traditional house generally uses woven bamboo called bilik. The use of a booth provides coolness for the occupants of the house because air circulation can easily enter and exit through the wicker gap. This is the reason why this Banten traditional house has no windows. Meanwhile, for the floor, planks are used which are arranged parallel or bamboo that has been made flat (palupuh). The roof of this house uses bamboo and palm fibers. The bamboo slats are used as the roof frame, while the fibers are used as the roof. The fibers can also be replaced with alang-alang leaves that have been woven together.

C. Division of Space

The traditional house of Sulah Nyanda is still used as the main residential design for the Baduy tribe in West Banten. To support this function, the typical Banten house is divided into several rooms, namely sosoro (front), tepas (center), and ipah (back).

1. Sosoro located at the front of the house. In Indonesian it can also be called a terrace. This section is used to receive guests, a place to relax, as well as a place for women's activities in the morning, for example weaving.

2. Tepas. This room is used for family gatherings, feasting, relaxing, and sleeping at night.

3. Ipah. This room is located at the back and is used as a place to store food supplies as well as a place to cook.

D. Concept of Vertical Building / Simple Rental Flats

In finding architectural solutions to existing problems, an approach is carried out by paying attention to the following aspects:

a. Functional:

Conduct an analysis of activities related to:

b. Residential Function

As the main function of the area, it must be able to coordinate all functions of residential activities.

c. Social Functions

This area can provide a friendly open space for the people of Banten Province in particular, as a forum for social interaction for the community.

d. Integrate with the Environment

The area must be able to make a good contribution to the surrounding environment.

e. Visitor behavior

In this case, everything about building design must pay attention (oriented) to all the characteristics of building users such as pedestrians, motorists, street vendors, etc.

f. Typological

The building must reflect the typology of the Banten architectural building in accordance with the local traditional architectural and residential functions.



Figure 3. Land Location for Simple Rental Flats / vertical buildings

Based on the classification of users and activities in the Study of Prototype Development of Horizontal & Vertical Residential Houses in Banten Province, space is needed as follows:

- Multipurpose Meeting Room

Intended as a large-scale meeting room, among others; seminars, Deliberations, Public Discussions, and other activities.

- Area Waiting Room

The zone of residence of area watchdogs must be taken into account so as not to interfere with other functions, but with easily accessible accessibility.

- Open space / open plaza

As a forum for interaction between local communities and domestic and local tourists.

- Green Park

Acting as area conditioning and playing a role in improving air quality in the surrounding environment.

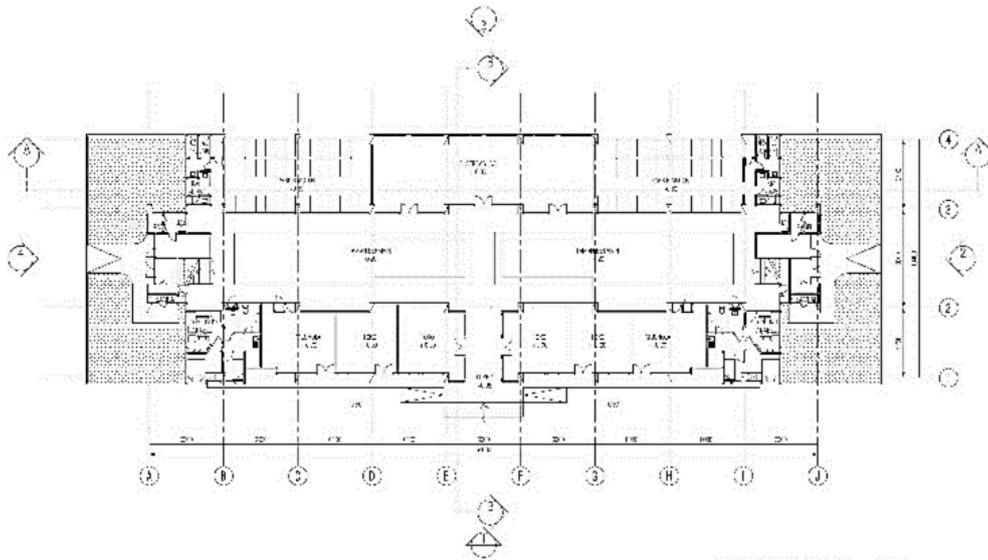


Figure 4. A typical floor plan of a flat for rent



Figure 5. The form of the apartment building for rent is simple & façade elements using local wisdom using typical banten batik

E. The concept of building a horizontal house / row house

In the Study of the Development of a Prototype of Horizontal & Vertical Residential Houses in Banten Province, the design criteria must be considered, namely as follows:

- Physical Footprint
- Urban Aspects
- Environmental impact aspects

- Land Aspects
- Physical Building

The things that are important to note in building design are as follows:

- a. Building Mass Arrangement
- b. Home Architectural Appearance
- c. Building Orientation
- d. Building Materials
- e. Interior Layout
- f. Room Function

It is advisable to implement a design module so as to achieve the determination of the size / size associated with space requirements (column free), structural efficiency, standard materials in Indonesia, furniture and space for movement.

- g. Material

The use of special materials for indoors, following the stipulated finishing material requirements.

It is also possible to designate the use of special materials for special rooms. As far as possible, efforts will be made to use domestically produced materials.

- Maintenance

The building maintenance system should be based on the technical capabilities currently available. To the extent possible avoid maintenance systems that require very special and too diverse tools. Maintenance methods must be efficient and fast. And for special rooms it is necessary to design a special maintenance system as well.

This design must achieve integration between designs such as Architecture, Civil and Structures, Mechanical Electrical, Interior and Landscape which as a whole must be harmonious,

aesthetically pleasing and functional and meet security and safety requirements.

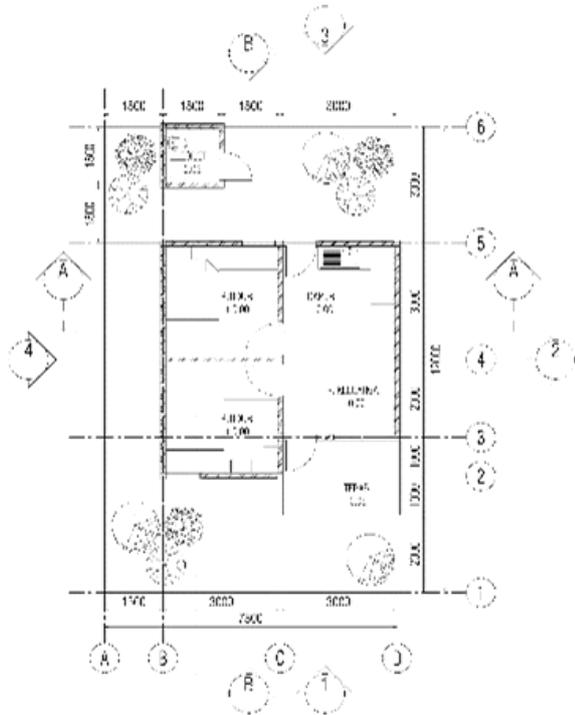


Figure 6. Typical floor plans of horizontal houses / row houses & facades use the local wisdom of Banten, namely the typical batik of Banten

VII. CONCLUSION

Banten Provincial Government is planning the construction of flats and row houses in several locations in Banten Province. However, the flats and row houses that will be realized are currently being developed a prototype for each of these dwellings. So that the flats and row houses that will be built according to the needs of the residents in them. Therefore, it is necessary to design a simple rental apartment or row house that can support the needs of the community in terms of social and living comfort.

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