RESEARCH INVENTY: International Journal of Engineering and Science
ISBN: 2319-6483, ISSN: 2278-4721, Vol. 2, Issue 1
(January 2013), PP 58-64
www.researchinventy.com

Optimizing the use of space and dimensions of the ideal house in housing *Singgasana Pradana (SP)* in Indonesia for well-established families

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Abstract *- A lot of new houses in the housing area, it built and sold to the public in the city of Bandung. Bandung is the capital of West Java province, the third-largest city in Indonesia after Jakarta and Surabaya based on its population. In the year 2007, British Council makes the town Bandung as a pilot project for the town of most creative in East Asia. Until the year 2012, many of the houses built by developers in the Bandung city. Some housing continues to expand the area of housing, one of them is housing SP. Survey conducted at housing SP owning wide of building 200 sqm. House building enthused by well established productive family. Its problem emerged when happened by a lot of change in dwelling space, only 32%, which can be accepted by a consumer. This research used the method qualitative, comparing between functional space criterion theory with the fact that happened at a study object. The findings are useful for the development of architectural design provided by the developer to the community and the environment.*

Keywords: *housing, economy, optimal.*

I. INTRODUCTION

The real estate developers build houses first before purchased and owned by the consumer. Developer developed the wide its housing area step by step, as does housing *SP* in Bandung city, Indonesia. Housing *SP* built in the year 1995, what wide nowadays its farm has reached 58 hectares, and consisted of some block of house building (Fig. 1).

Figure 1*: Location of SP housing (google earth 2012)*

The research focus at building broadly of about 200 sqm floor. This house sold by family owning adequate earnings and stabilize. Activity of family and buyer habit cause the change in its own room and even remodel their house [1]. Some reference of house literature broadly building of about 200 sqm floor area in the reality own the space which always is of equal [2].

That consists of by the space for the guest, sitting area, eating area, parent sleep, and child, garage, kitchen, toilet, warehouse, and a maid. The survey conducted at house blocks in *Cakrabuana* street.

In these blocks, there are two types of houses, namely the type of *Carnation* and *Rose* type (Fig. 2). The difference lies in the use of the garage. Garage in the *Rose* type used for two cars and on the *Carnation* type for one car, broadly house building which relative is of equal.
Houses in *Cakrabuana* street woke up by developer amount to 25 houses *(100%).* The new design made by the owners' wishes (12%). Carry out building renovation (56%).

Figure 2: *Block research on Cakrabuana road (survey 2012)*

The following amount: Fourteen houses of its Eight as originally design house kept (32%); Three houses built with a new design. Preliminary observations indicate a failure in the design of the architecture due to 32% that can be accepted by the buyer. This research aim to know a requirement of all dwellers of space requirement will and spacious of wanted building. Become detectable of optimality of building and space requirement in ideal design architecture.

II. RESEARCH METOD

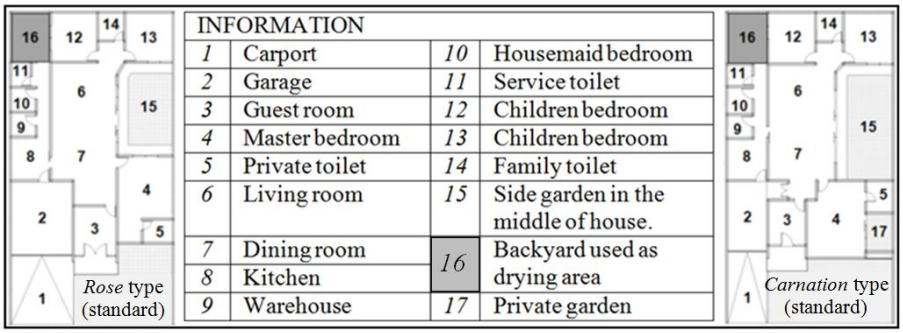
Research conducted by using a method qualitative, passing some activity step, that is:

* Perform initial survey to all houses.
* Conduct surveys to the fourteen houses that a change in the building.

Not all dwellers of the shooting permit, but they give the reason the addition of information. A number of five houses gave permission for shooting. Nine other houses do not allow picture taking, but has the physical changes that are similar to the five houses. This research is building physical description allied with desire of its dweller, so that can give theoretical input about optimally a requirement of an ideal house.

III. OPTIMIZING THE USE OF SPACE FOR HOUSE TYPE CARNATION AND HOUSE TYPE ROSE.

The room plan of type *Carnation* and type *Rose* (Figure 3) in housing *SP*, have the same space requirement with an area approximately 200 sqm floor, as marketed by another housing [2].



INFORMATION			
1	Carport	10	Housemaid bedroom
2	Garage	11	Service toilet
3	Guest room	12	Children bedroom
4	Master bedroom	13	Children bedroom
5	Private toilet	14	Family toilet
6	Living room	15	Side garden in the middle of house.
7	Dining room	16	Backyard used as drying area
8	Kitchen		
9	Warehouse	17	Private garden

Figure 3: *Typical floor plan designed (source: survey 2012)*

Ideal space needs in the family businesses that have boys and girls, is to set up two bedrooms for children, and a garage, plus another room for the family. In general, families earning not want to require the number of children that a lot.

The family has always had a car for transportation to work, at least two cars. Vehicle occupants safely parked in the front yard, security in this housing well maintained. Following in description result of survey from five permitted by a house is its photograph.

III.1. Case study of the first house.

The first house is *Carnation* type, dwelt by five people, that is: father, mother, two boys and one adolescent. In the first house, there is room dismantled and then made the new building to the top floor (Fig. 4).

Building on the upper floor to the used as by room of *A, C, D, E*, and as preparation for children grew up later. The changes occurred in the ground floor space (Fig 5). Namely: Enlarging a room *1*; Unpacking room *8, 9, 10, 11*; Unpacking room *16* being the room *a, b*; As well as making the loft building (Fig 6), that is room *A, B, C, D, E*, on the top floor.

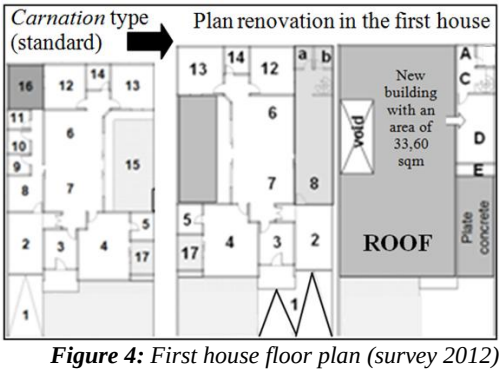


Figure 4: *First house floor plan (survey 2012)*

Figure 5: *Changes on the ground floor (survey 2012)*

Figure 6: *Additional room upstairs (survey 2012)*

III.2. Case study of the second house.

The second house is *Rose* type, dwelt by five people, that is: father, mother, one son (married), one adolescent, and daughter-inlaw. There is room dismantled and then made the new building to the top floor (Fig. 7). Make outbuilding to the top floor used as the room A, B, C, D.

The changes occurred in the ground floor space (Fig 8). Namely: Enlarging a room *1*; Unpacking room *10, 11*; Unpacking room *16* being the room *a, c*; As well as making the loft building (Fig 9), that is room *A, B, C, D*, on the top floor.

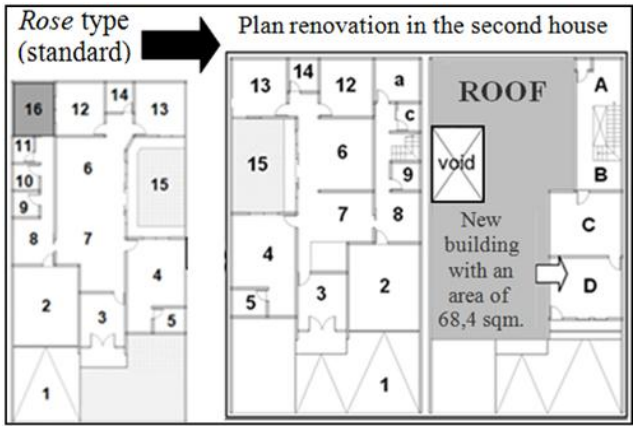


Figure 7: Second house floor plan (survey 2012)

Figure 8: Changes on the ground floor (survey 2012)

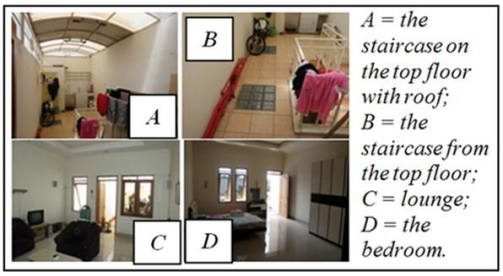


Figure 9: Additional room upper floor (survey 2012)

III.3. Case study of the third house.

The third house is *Carnation* type, dwelt by four people, that is: father, mother, two adolescent. There is room dismantled and then made the new building to the top floor (Fig. 10). Building on the upper floor to the used as by room of *A, A1 (toilet), A2 (garden), A3(the basking clothing), B, C, D,* namely toilets, stairs, sitting room, collection room. The changes occurred in the ground floor space (Fig 11). Namely: Enlarging a room *1*; Unpacking room *16*; As well as making the loft building (Fig 12), that is room *A, B, C, D*, on the top floor.

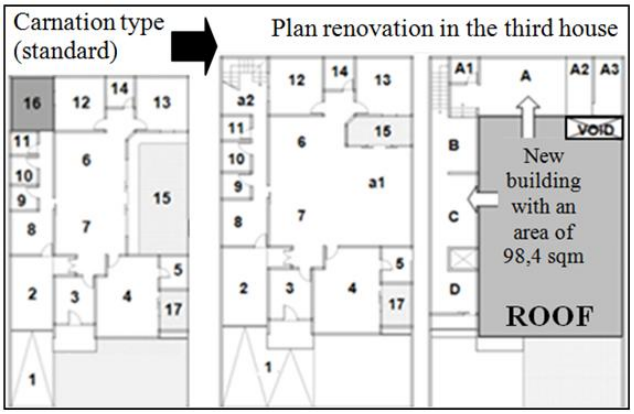


Figure 10: Third house floor plan (survey 2012)

Figure 11: Change on the ground floor (survey 2012)

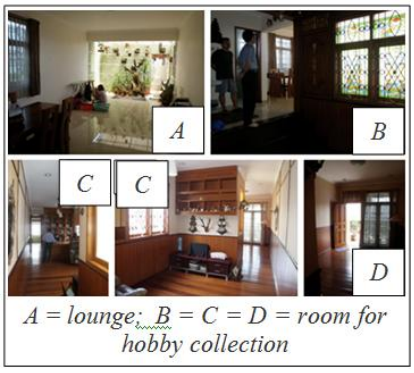


Figure 12: Additional rooms in upper floor(survey 2012)

III.4. Case study of the fourth house.

The fourth house is *Rose* type, dwelt by three people, that is: father, mother, two boys. One son married and not living together. There is room dismantled and then made the new building to the top floor (Fig. 13). Building on the upper floor to the used as by room of *A, B, C, D, E*, namely toilets, stairs, and bedroom used by the family, and as preparation for children grew up later. Previously, bed room in upper floor used by a child with its wife. After establishing its economics, that young family moves to other houses. The changes occurred in the ground floor space (Fig 14). Namely: Enlarging a room *1*; Unpacking room *8, 9, 10, 11*; Unpacking room *16* being the stair room; As well as making the loft building (Fig 15), that is room *A, B, C, D, E*, on the top floor.

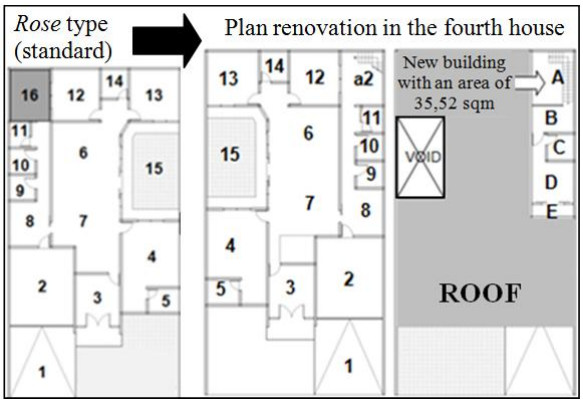


Figure 13: Fourth house floor plan (survey 2012)

Figure 14: Change on the ground floor (Survey 2012)

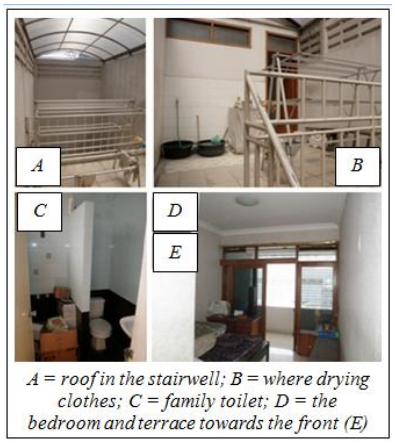


Figure 15: Additional rooms on the top floor (Survey 2012)

III.5. Case study of the fifth house.

The fifth house is *Rose* type, dwelt by five people, that is: father, mother, one boy (married) with his wife, and one adolescent. There is room dismantled and then made the new building to the top floor (Fig. 16). Building on the upper floor to the used as by room of *A, B, C*, namely: toilets, stairs, and bedroom used by the family, and as preparation for children grew up later. The changes occurred in the ground floor space (Fig 17). Namely: Enlarging a room *1*; Unpacking room *16* being the stair room; As well as making the loft building (Fig 18), that is room *A, B, C*, on the top floor.

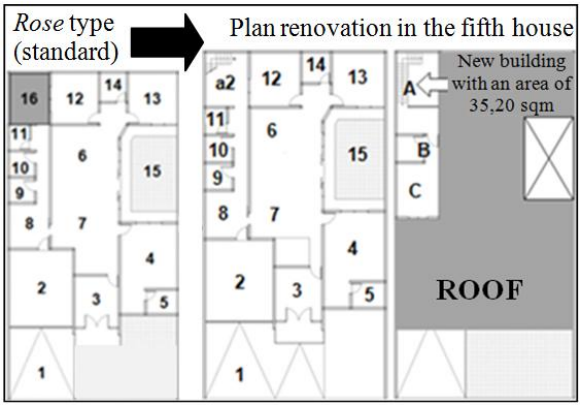


Figure 16: Fifth house floor plan (survey 2012)

Figure 17: Change on the ground floor (Survey 2012)

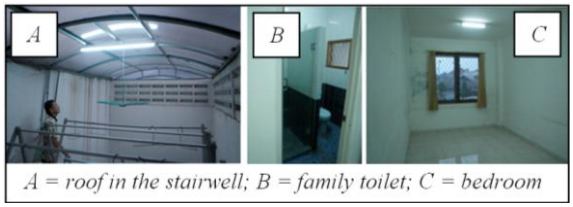


Figure 18: Additional rooms on the top floor (Survey 2012)

IV. OPTIMIZING ANALYSIS OF THE USE OF ROOM

Optimizing the use of the room depending on the activities carried out in the room [3]. The room to be optimal, if used in accordance with its function and its use does not interfere with other indoor activities. Optimization of space to the analysis is spaces added by the homeowner that cause physical changes to the building, include: Carport and garage; The service, which consists of warehouses, toilet service, maid's room, and a drying room; New spaces on the upper floors.

IV.Optimal function of carport and garage

Carport and garage, served as a saving's vehicle, especially a car on the territory of a residential building plot. Carport and garage have similarities and differences, namely: Similarly, both the garage and carport serves as a place to store cars and motorcycles; The difference is evident in its physical form, the garage as an enclosed space so that the vehicle is not visible from the outside of the building, as well as safe from the weather, while carport as open space so easily seen from outside the building, usually on the front page of the building, and only partially protected from the weather [4].

Based on usage, garage used all the time; Carport, used if no garage; When existing garage and carport still made well, it's possible that the capacity of the garage is not adequate.

All the houses in the survey have a driveway to the garage, and also used as a carport. Based on this view, can be formulated optimal or not optimal understanding of the use of space for a carport and garage.

Carport called optimal, if: *(A)* There is no garage; *(B)* Capacity garage inadequate; *(C)* Capacity carport for the car so it does not interfere with circulation adequate garage; **Garage called optimal**, if: *(1)* Used according to its function, *(2)* Used according to its capacity.

Garage is a family-owned store motor vehicle, and guests can enter this area if invited by family members [3]. Found deviation function uses the garage for other functions that occur in the first, fourth and fifth houses houses, as follows:

The first house, that capacity one-car garage, turned out to have two cars. As for itself, garage utilized also as a place keeps hardboard wrap food. It shows the use of the garage that is no longer appropriate to its function.

The fourth house, that capacity two-car garage, turned out to have two cars. However, garage used also as a place to eat, place of hardboard place bale, and also save the motorcycle. It shows the use of the garage that is no longer appropriate to its function.

The fifth house, that capacity one-car garage, turned out to have three cars. All three cars kept in carport. Garage used as a place of work to collect and process waste plastic bottles. Physically, the optimal use of carport and garage of five houses can be seen in the table (Table 1).

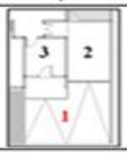
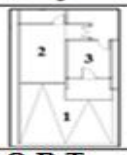
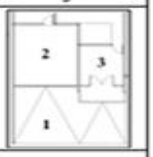
		HOUSE				
		1	2	3	4	5
						
		CARPORT				
OPTIMALIZE						
	1	NOT OPTIMUM				
	2	NOT OPTIMUM	OPTIMUM	OPTIMUM	NOT OPTIMUM	NOT OPTIMUM
	3					
		GARAGE				
OPTIMALIZE						
	1	NOT OPTIMUM	OPTIMUM	OPTIMUM	NOT OPTIMUM	NOT OPTIMUM
	2					

Table 1: Optimization the use of carport and garage (survey 2012)

IV. The optimization of space services (warehouses, toilet service, maid's room, and a drying room).

Service spaces have been no changes in **the third, fourth, and fifth**. **The first house** is a total change, the second house minor changes (fig. 19)

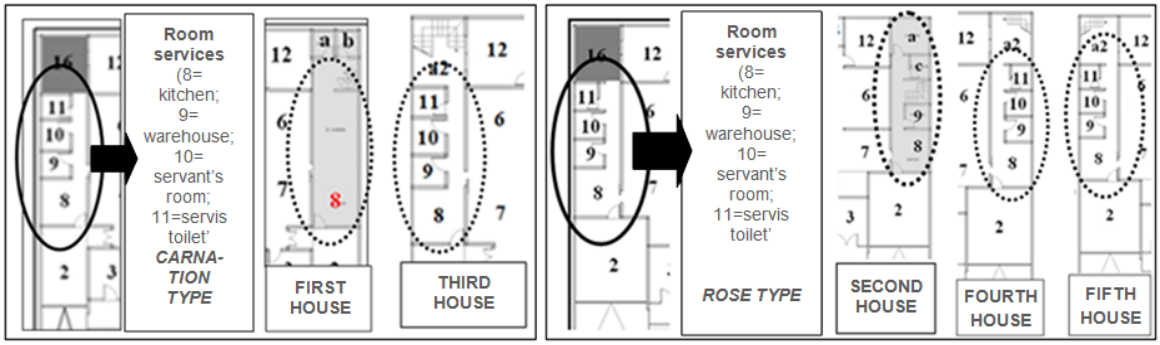


Figure 19: Development to rooms that required service (survey 2012)

The first house is a total change, kitchens revamped interior that blends a clean kitchen with dining area. While the dining room long been used as an adjunct of the living room. At the back of the dining room, the newly placed spiral staircase to the top floor and the room maid (fig. 20)

Figure 20: The new dining room into one with pantry (survey 2012)

Major change lay in the open space at the rear of the terrace next to the bedroom *(12)*, used as a basking clothes. A room which open to the first become closed by a roof with the existence of stair to the upper floor. Master bedroom family as a private space to comply with optimal space requirements. Because broad enough room to put the sleeping bunks for two people, a clothes cupboard and other furniture requirements are necessary. Optimal and also for health because room become enough get sunshine and air circulation going into outer space. Given design is optimal, because each bedroom overlooking the garden that serves as an open space. Consequently the bedroom *(12)* to be not optimal anymore use. Now do not happen again to the outside air ventilation in this bedroom *(12).* So that made technical solutions, That is by putting a roof on the bottom room a rooster who helps the circulation of air to outside air. And usage of the transparent roof capable to continue boldly of sun. Furthermore, reduce the heat to the sun and no dazzle to the eye.

The first house and second amended plan to serve the place, but the need for warehouse space and helpers remain prepared. Habits of the people of Indonesia who are working around the clock outside the house, either for work or school. Coupled with tropical climatic conditions, which make the room from the outside becomes dusty, dirty, that need to be cleaned. Make residents think for hires a housekeeper or not.

The first houses employ domestic servants who do not stay overnight.

The second and third house use baby sitter who also worked as a maid who lived in the house, because they have a child under 5 years of age. A Baby sitter who keeps the child slept in the bedroom of a child. During working baby sitter only permit to use the just ministrant bathroom.

The fourth and fifth houses do not employ a maid.

Maid's room at the first house, fourth, and fifth, made by as an additional warehouse. From the research conducted, it can be concluded that the maid's room is no longer appropriate to use sleep aid. Houses with an area of approximately 200 sqm, it can still be managed solely by family members without a maid. Servant who works in a house by this area more amounts to clean the clothes or take care of the child. Because of this, unused maid's room with the object of study so it tends to be used as an additional warehouse. Supporting optimal use maid bathroom only used by outsiders, so that the privacy of family members in applying the private bathroom stay awake.

IV. Optimization used new rooms on the top floor.

The stairs to the upper floor which made the owners are in the room no *16* which was originally a garden.

Space stairs to the upper floor for the closed by the roof. There is, which have a transparent roof to because the rooms in an upper floor also used to place the clothes which are in putting to the sun. Others also as lighting in the stairwell [5]. There is also a space enclosed by a roof with flat ceiling from gypsum in the third House.

In the third house, the drying chamber is open to the outside air. It created the toilet upstairs, except for a second house. All space the upper floor is representing addition space needed by dweller. That is for the parents of these families, the child's interests, as well as for investment. Homeowners think that, if enough space, it will be easier to use themselves or sell again later.

CONCLUSION

There are eight kinds of changes, namely:

1. The family settled in Indonesia should have only three children, so simply provided a three-bedroom in the family house. It turns out in practice needed extra room for a single bed.
2. Building area of about 200 sqm still be taken care of by the family itself, so it simply needs a maid did not stay. No need bedroom maid, who needed at most a maid toilet.
3. Change of room addition to the upper floor for causing to do not optimal use of the bedroom *(12)* in the ground floor.
4. So the necessary technical solutions for the bedroom *(12)* were quite light by sunlight and air circulation can occur outside of.
5. Changes in function space as in a garage into a dining room, it is only temporary.
6. Additional room on the floor above, only: one toilet for family, one lounge, one bedroom, and space for drying. Drying chamber preferably transparent roof that does not depend on the weather.
7. The addition room by making new buildings and located on the top floor, resulting in the addition of extra spaces, such as toilet and sitting room again. Building broad on the first house increased by 33.5 m2 (18.1%);Second houses increased by 68.4 m2 (34.72%); The fourth and fifth increased by 35.52 m2 (18.04%). In addition, there is a hobby room desired by owner on the third house, up to widely buildings increased by 98.4 m2 (53.72%). This suggests not optimal spacious room additions made by the owner.
8. In essence, it only required the addition of one room only, namely: a bedroom with a size 4,00 x4,00 sqm or 16 sqm. In *Carnation* type increased 8.65% so wide to 201 m2, on the *Rose* type by 8.1%, so the extent to 213 m2.

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