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## THE DETAILED DESCRIPTION OF RESIDENTIAL DEFECTS IN YEARS 2010 – 2011 OF CITRA GARDEN RESIDENCE IN INDONESIA

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**Abstract.** The detailed description of residential defects in years 2010 – 2011 of *Citra* Garden Residence in Indonesia was studied. Defect data were collected from interviews that have been carried out to the field supervisor and to the customer service in *Citra* Garden Residence. The defects observed were mainly on leakage that comes from the tile, natural stone walls, concrete roof, while the defects in addition to leakage is the wall, the painting, the floor and the ceramic wall, the plafond, the stairs, the roof, wood window & door frame, aluminum window & door frame, fence door & garage, wood stone, railing/grill, the floor and the ceramic wall spotted and sanitary. The data were processed and analyzed by using SPSS (Statistical Program for Social Science) software program to obtain statistical overview of the many types of defects for each category (minor, moderate, and serious) and the timing of the defects (Before Hand Over, During Hand-Over and After Hand-Over). The results showed that for the year 2010, the occurrence of defects in *Citra* Garden Residence were of moderate non-structural defects = 40.95%, of moderate structural defects = 23.334%, of minor non-structural defects = 21.904%, and of minor structural defect = 13.809%. There were neither serious structural defects nor serious non-structural defects occurred. The defects for the year 2011 were of moderate non-structural defects = 37.582%, of minor non-structural defects = 26.813%, of moderate structural defects = 21.538%, and of minor structural defects = 14.067%. Neither serious structural defects nor serious non-structural defects were found.

### Introduction

As one of the exclusive residential in West Jakarta, Indonesia, *Citra* Garden Residence, always strives to provide the best services to the costumers, one of which is the customer is given the opportunity to complain the quality of their houses in the period before hand-over, hand-over and post hand-over, if there is a defects and what types of the defects that occurs. Defects produce economic and temporal deviations in construction projects. Although learning from past experiences can help reduce defects and their consequences, usually data is not easily available, or is poorly structured and difficult to analyze [1, 8, 9]. Generally, the defects data obtained from the data consumer complaints as well as in *Citra* Garden Residence, Indonesia. The complaint should be submitted in 3 period of time, that is before hand over (inviting time) or before the warranty period, hand over period (3 to 6 months after the handover) and post-hand over period (over 3 or 6 months). If a complaint is submitted at the time before hand over and hand over period, the consumer is not obligated to pay the cost of repairing the defects of the house. But if a complaint is submitted to the time post hand over, then the consumer should pay to the contractor or subcontractor appointed to the developer to fix the defects that occur.

Subsequently, approach to research done by the literature review from many authors such as Composing Team, *PU* department (2007) [2], Kristianto Usman and Restita Winandi (2009) [3], Macarulla et al (2012) [1], Hamad Aljassmi and Sangwon Han (2012) [4], Forcada et al (2012) [5]

and Abdul Rahman et al (2012) [6] to formulate the classification of residential defects, especially in *Citra Garden Residence*, then, defect classification is shown in the following table [7]:

Table 1. The Defect Classification in *Citra Garden Residence*

NO	The Type of The Defect	The Level of The Defect	The Timing of The Defect
1	Structural	Minor	Before Hand Over
			Hand Over
			Post-Hand Over
		Moderate	Before Hand Over
			Hand Over
			Post-Hand Over
		Serious	Before Hand Over
			Hand Over
			Post-Hand Over
2	Non Structural	Minor	Before Hand Over
			Hand Over
			Post-Hand Over
		Moderate	Before Hand Over
			Hand Over
			Post-Hand Over
		Serious	Before Hand Over
			Hand Over
			Post-Hand Over

From the customer complaint form, then defect classification can be done based on the table above. Through implementation of classification of the defect, will be expected to be input to the contractors who worked on the construction of houses, particularly in *Citra Garden Residence*. So that they can improve the quality of their work become better, and at the same time to minimize losses due to the cost of repair work they have to do due to defects. And for developers, can be input to select good contractor who will build a house in the residential projects. Based on this contextual backdrop, then the aim of this research is to identify the defect classification in detail based on the timing of the defect in *Citra Garden Residence*, especially in years 2010 – 2011. The Classification of Residential Defects (Case Study: *Citra Garden Residence* in Indonesia) using data on customer complaints in year 2012 has been published [7]. This paper will report on the detailed description of residential defects using data on customer complaints in years 2010 – 2011 of *Citra Garden Residence* in Indonesia.

## Research Approach

### The Timing and The Category of Residential Defects in *Citra Garden Residence*

Based on interviews that have been carried out to the field supervisor and to the customer service in *Citra Garden Residence*, obtained information that leakage to defects warranty is given 6 months after the hand-over, whereas the defects awarded in addition to leakage 3 months warranty since the hand-over. The leakage is coming from the tile, natural stone walls, concrete roof, while the defects in addition to leakage is the wall, the painting, the floor and the ceramic wall, the plafond, the stairs, the roof, wood window & door frame, aluminum window & door frame, fence door & garage, railing/grill, the floor and the ceramic wall spotted and sanitary.

While the defects categories are based on a literature study of previous researchers who are competent in civil engineering and related parties such as the Ministry of Public Works Republic of Indonesia. It is intended that the determination of the structural and non-structural defects and

determining the extent of damage minor, moderate and serious to be more objective. Structural defects is defects to buildings associated with major structures such as foundations, walls and roofs. While the non-structural defects is defects to buildings that are not associated with major structures such as painting, door accessories, flooring, plumbing, and others. The level of defect to the building consists of three levels, namely minor, moderate and serious. Minor defect if the defect does not reduce the function of the building and pose no danger at all like the smooth walls cracked, peeling paint, and others. Moderate defect is defect that can interfere with the function of buildings and interfere with building occupants, such as leaks, the walls are not square, sanitary defect and others. While the serious defect is a very disturbing kind of defect can even endanger the safety function of the building occupants, such as wall split and collapsed, roofs damaged buildings, foundation collapsed due to unstable soil structure, and so on.

### Data Collection

Based on the data obtained from the Customer Service in *Citra* Garden Residence, then performed the classification of the defect according to housing units that hand over especially in years 2010 and 2011. The data obtained that the occupants of the house (year 2010 handover) complains about the physical condition of their house 42 housing units, whereas in 2011 there are 74 housing units, then collected in the form of data summary, and obtained by using SPSS statistical overview of the many types of defects percentage for each category (minor, moderate, and serious) and the timing of the defect (Before Hand Over, Hand-Over and Post Hand-Over).

Table 2. Data Summary of The Classification of House Defects in year 2010

NO	THE TYPE OF THE DEFECT	THE TIMING OF THE DEFECT				
		BEFORE HAND OVER	HAND OVER	POST-HAND OVER	TOTAL	%
1	Minor Structural Defect	7	20	2	29	13.809%
2	Moderate Structural Defect	5	34	10	49	23.334%
3	Serious Structural Defect	0	0	0	0	0
4	Minor Non-Structural Defect	7	33	6	46	21.904%
5	Moderate Non-Structural Defect	21	54	11	86	40.953%
6	Serious Non-Structural Defect	0	0	0	0	0
TOTAL		40	141	29	210	100%
%		19.048%	67.143%	13.809%	100%	

Table 3. Data Summary of The Classification of House Defects in 2011

NO	THE TYPE OF THE DEFECT	THE TIMING OF THE DEFECT				
		BEFORE HAND OVER	HAND OVER	POST-HAND OVER	TOTAL	%
1	Minor Structural Defect	14	47	3	64	14.067 %
2	Moderate Structural Defect	6	80	12	98	21.538 %
3	Serious Structural Defect	0	0	0	0	0
4	Minor Non-Structural Defect	11	90	21	122	26.813 %
5	Moderate Non-Structural Defect	18	116	37	171	37.582 %
6	Serious Non-Structural Defect	0	0	0	0	0
TOTAL		49	333	73	455	100%
%		10.769%	73.186%	16.045%	100%	

**Result and Discussion**

From the data summary of the classification of house defects in *Citra* Garden Residence, for the year 2010, the occurrence of defects in *Citra* Garden Residence were of moderate non-structural defects = 40.95%, of moderate structural defects = 23.334%, of minor non-structural defects = 21.904%, and of minor structural defect = 13.809%. There were neither serious structural defects nor serious non-structural defects occurred. The defects for the year 2011 were of moderate non-structural defects = 37.582%, of minor non-structural defects = 26.813%, of moderate structural defects = 21.538%, and of minor structural defects = 14.067%. Neither serious structural defects nor serious non-structural defects were found.

Additionally, the comparison of the defect type in year 2010 and year 2011 can be shown in Fig. 1, below.

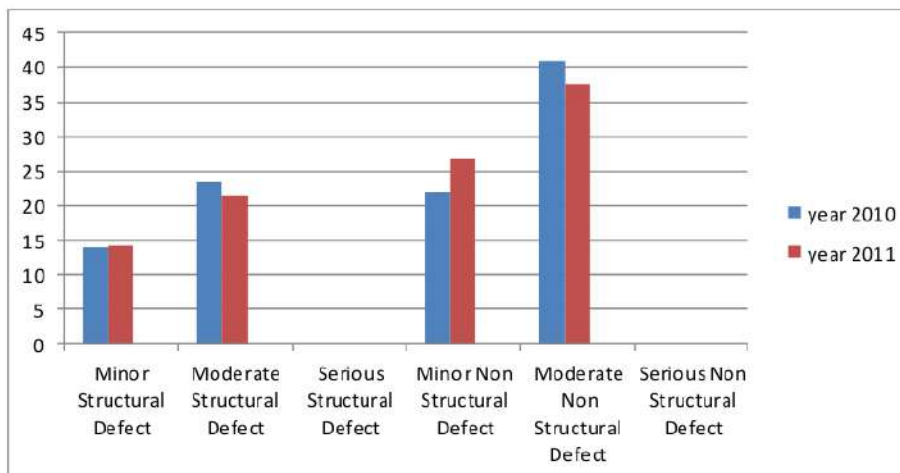


Figure 1. The Comparison of The Defect Type in Year 2010 and Year 2011.

This information will be useful as an input for the contractors working on the construction of *Citra Garden Residence* in order to further enhance their performance in building residential homes. Additionally, for developers, it would be useful as an input for the improvement of the quality of residential house so as to enhance customer satisfaction in housing.

### Conclusion

From the study of detailed description of residential defects in years 2010 – 2011 of *Citra Garden Residence* in Indonesia, it can be concluded that for the year 2010, the occurrence of defects in *Citra Garden Residence* were of moderate non-structural defects = 40.95%, of moderate structural defects = 23.334%, of minor non-structural defects = 21.904%, and of minor structural defect = 13.809%. There were neither serious structural defects nor serious non-structural defects occurred. The defects for the year 2011 were of moderate non-structural defects = 37.582%, of minor non-structural defects = 26.813%, of moderate structural defects = 21.538%, and of minor structural defects = 14.067%. Neither serious structural defects nor serious non-structural defects were found.

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