

The Classification of Residential Defects (Case Study: Citra Garden Residence in Indonesia)

by Nurlaelah U. Sudjadi

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The Classification of Residential Defects (Case Study: Citra Garden Residence in Indonesia)

Nurlaelah^{1,a} and U. Sudjadi^{2,b}

¹Department of Civil Engineering, Diponegoro University, Jl. Hayam Wuruk 5-7, Semarang 50275 Indonesia.

²Department of Mechanical Engineering, Mercu Buana University, Jakarta 11650, Indonesia.

^anurlaelah_73@yahoo.com, ^busmannunung@yahoo.com

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Abstract. The classification of residential defects (case study: Citra Garden Residence in Indonesia) was studied. This study aims to more satisfied customers. The study begins with the literature review to formulate the classification of house defects. Then classify the defect of house into two, namely the classification of house defects based on period of post hand over, and the classification of house defects based on category of the defects. Further studies followed by dividing the classification of house defects based on period of post-hand over into three parts, namely before hand over period (inviting time), hand over period, and post-hand over period. The next step is to check the complaint report from the customer service in Citra Garden Residence in Indonesia to quantificate the defects of the house. The classification of house defects based on category of the defects divided into two, namely structural defect (minor, moderate, serious), and nonstructural defect (minor, moderate, serious). The next step is also to check the complaint report from the customer service in Citra Garden Residence in Indonesia to quantificate the defects of the house. The results show that complaint hand over in the level minor defect is the highest complaint. Complaint in the serious defect is the lowest complaint.

Introduction

One of the human base needed of their life is the requirement of the dwelling i.e a house that has a function as a medium of family building. A house that has built in the residential community is the place to inhabited and completed with many expedient that is physically base equipment n the residential community such as drink water supply, waste for landfills, electricity, telephone, and the road might be function for the settlement as what it is. The development of the residential always connected with advisability to inhabited for humanbeeing. The house with advisability to inhabited could be inspect from the quality of the house. If the quality is good, such as not many defects of the house that has built from the contractor, and it will be distributed comfortable and satisfaction aspect for the customers. But if the quality is not good, then the customers becoming increasingly dissatisfied.

Defects can have a significant impact on construction performance. A defect is not usually an outcome of a single cause, but rather occurs when multiple interrelated causes combine, forming a defect's pathway. Because defects may occur through numerous pathways, the risk of causes can vary in terms of the number (i.e., frequency) of pathways that they take part in and impact (i.e., magnitude) of the contribution they provide for the formation of these pathways [1]. The most common defects identified at handover by customers were incomplete tile grouting and incorrect fixtures and fittings in toilets. In addition, failure to apply second coats of paint to walls was deemed a problematic issue. Typical surface/appearance defects were found to include floor or wall unevenness, stains, mess, small cracks and marks mainly caused by lack of protection. In areas where fixture and fittings and finishes were a similar nature, such as the kitchen and bathroom, defect types also arose [2].

The defects can happen in the newly house in the residence area, and it will be responsible of the developer, they are for about 6 months guarantee for the leakage work and 3 months for the civil

work (such as painting, wall crack, utility work, and so on). It means that the customer can complaint about their quality of the house that they had bought from the developer. Furthermore, The developer turn over the work of the defects to the contractor. Then, the contractor must do the work according to the complaints report and the customer did not have to pay to the contractor or the developer for the repair work. But, if the defects happened over 3 months for the civil work and 6 months for the leakage work, it will not be responsible of the developer or the contractor. Generally, the customer can complaint for the quality of their house over the guarantee time (3 – 6 months) to the developer, but they have to pay about the work to the worker who will do the defects work.

Generally, The defects of the house happened in the low cost housing. It could be understand, because, usually the material that used to built the house is poor in quality. Besides that, the worker or the contractor who built the house did not have good experience in construction projects. But In fact, The defects of the house happened in the high cost housing (luxurious residence) that have over 1000,000,000 Indonesia Rupiah or 100,000 US Dollars price per-unit of the house. More over, the defects happened on post-handover. The preface survey in Citra Garden Residence find that the defects happended in 3 phase, they are: 1. Before Post-Handover Period or They usually called Inviting Time before Post Hand-Over, 2. Post-Handover Period, and 3. After Post-Handover Period. It indicate that the quality of the contractor's work have to improve to build the house.

The quality in construction management project is the capability to carry out the projects and to produce the product (building) or service according to user regulation, just in time, appropriate to the cost and enable to have much benefits. It means that, to build the good quality of the house, it will be needed the Quality Management System that the contractor have to do. And with the result that the complaint (the defect) of the house will be decreased.

The Defects of The House in Citra Garden Residence

One of the exclusive residential in West Jakarta, Indonesia is Citra Garden Residence that has been built since 1984 until now. In 2012, The development of the residential project distributed to 3 area, they are Citra 2A, Citra 6, and Citra 7. The table 1 below shows the number of the post-hand over houses to the customers at January to December Period in 2012.

Table 1: The Number of The Post-Hand Over in Citra Garden Residence in 2012

No	Area	The Amount of The Post-Hand Over House
1	Citra 2A	7
2	Citra 6	64
3	Citra 7	96
Total		167

Source: Customer Service, Citra Garden Residence, 2012

Every customer who buy the unit of the house in Citra Garden Residence can complaint about the quality of the house. The Customer Service will give them a form to fill up about the complaint. The complaint is divided in 2 category, i.e., 1. Work Complaint, 2. Material Complaint. The detail of the 2 category of the complaint can be seen in Table 2 below:

Table 2: Detail of The Category of The Complaint in Citra Garden Residence

No	Category of The Complaint	Detail of The Category of The Complaint
I	Work Complaint	The Leakage
		The Wall
		The Painting
		The Floor and The Ceramic Wall
		The Plafond
		The Stairs

		The Roof
II	Material Complaint	Wood Window & Door Frame
		Aluminium Window & Door Frame
		Fence Door & Garage
		Woodstone
		Prestone
		Railing/ Grill
		The Floor and The Ceramic Wall Spotted
		Sanitair Problem

Source: Customer Service, Citra Garden Residence, 2012

The detail of the category of the complaint above is the data of the defects that will be analyzed. Based on Introduction, so we try to formulate about the problems of this paper:

1. What is the classification of house defects in Citra Garden Residence based on data mining of customer complaint?
 2. How many defects of the house based on period of post-hand over of the house?
 3. How many defects of the house based on category of the defects?
- Then, we try to gain objectives i.e.,:
1. To formulate the classification of house defects in Citra Garden Residence based on data mining of customer complaint.
 2. To quantification the defects of the house based on period of post-hand over of the house.
 3. To quantification the defects of the house based on category of the defect.

Research Approach

Many literature explain about the defects of the house, and the most comprehensive definition has been provided by Watt (1999) [3] who defined a defect as a “failing or shortcoming in the function, performance, statutory or user requirements of a building, and might manifest itself within the structure, fabric, services or other facilities of the affected building”. An immediate way to reduce and/or eliminate post hand-over defects is to ensure that quality controls and inspections are implemented during design and construction (AECCTI, (1993); J. Georgiou (1999) [8]; Chong and Low (2005) [9]; Mills et al. (2009); Forcada et al. (2012) [2,6]). The classification of the defects clustered by 3 categories, i.e., 1. Minor Defects, 2. Moderate Defects, and 3. Serious Defects. Constraint of the defects categories is divided in 3 group, they are: 1. Structural Defects, 2. Non Structural Defects, 3. Utilities Defects. (Usman and Winandi, 2009) [4]. And according to *Ditjen Cipta Karya* (2006) [5], The defects of the house is divided in 2 categories, i.e., :

1. Structural Defects (Minor Defects, Moderate Defects and Serious Defects), the defects of structural components such as the column, the wall and the sloof.
2. Architectural Defects (Minor Defects, Moderate Defects and Serious Defects), the defects of architectural design such as the painting, the wood window and door frame, the plafond.

J. Georgiou (1999) [8] in Macarulla et al (2012) [6] suggests classifying defects into major and minor categories, taking into account the severity, classifying the defect as technical, aesthetic or functional. Technical meaning when the workmanship or material of an element reduces its capacity to fulfill the functional performance of a structure, aesthetic, when the appearance of a material or building element is adversely affected or functional, when a dwelling fails to function in its intended manner.

In this paper, as noted above, the definition of a defect proposed by Watt (1999) is adopted [3]. And Literature Review from several author is purposed as the basis to develop the classification of house defect as shown in Table 3 below.

Tabel 3: Literature Review to formulate The Classification of House Defect

No	Title of The Book/ Journal	Author	Year
1	The Systems of Evaluation and Maintenance of Structural and Arschitectural on Public Building [5]	Composing Team, PU Departement and JICA, Bandung	2007
2	The Analysis of Management of Maintenance Building in Gampung University [4]	Kristianto Usman and Restita Winandi	2009
3	Standardizing Housing Defects: Classification, Validation and Benefits [2, 6]	Marcel Macarulla, Nuria Forcada, Miquel Casals, Marta Gangoellés, Alba Fuertes and Xavier Roca	2012
4	13 Analysis of Causes of Construction Defects Using Fault Trees and Risk Importance Measures [1]	Hamad Aljassmi and Sangwon Han	2012
5	Assessment of Residential Defects at Post-Handover [6]	Nuria Forcada, Marcel Macarulla and Peter E.D Love	2012
6	10 Defects in Affordable Housing Projects in Klang Valley, Malaysia [7]	Hamzah Abdul Rahman, Chen Wang, Lincoln C. Wood, You Min Khoo	2012

The Research Approach of this paper can be seen in this figure 1 below:

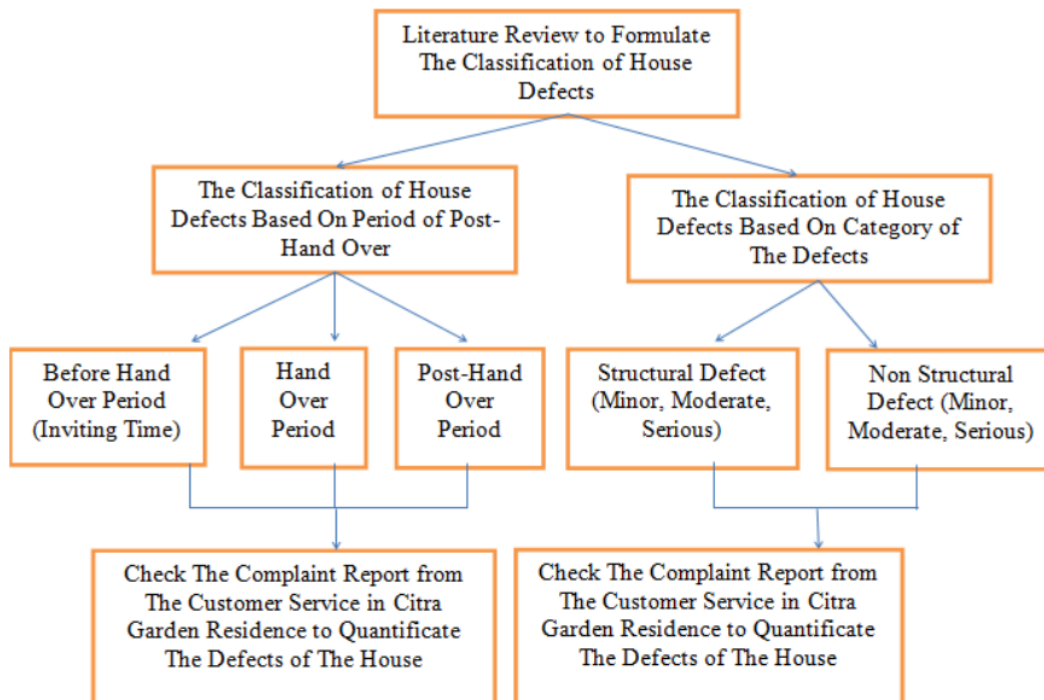


Figure 1. Research Approach

In order to get easier to classified the defects of the house, we can use the form like table below:

NO	The Kind of The Defect	The Level of The Defect	The Time of The Defect	Component of The Defect	Category 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		

Data Collection

From the customer complaint for 19 in Citra Garden Residence in 2012, data was collated. It is similar to J. Georgiou (1999) [8], Mills et al. (2009) and Forcada et al. (2012) [2, 6]. These databases contained about the house and the detail of the category of the defects that post hand over in 2010, 2011 and 2012. Furthermore in this paper, it will be attention for the house that post hand over in 2012. But not all customer who buy the house in Citra Garden Residence complaint about their house. Usually the customer will complaint if they will be occupied the house, and the customer will not complaint if they will not be occupied the house. It could be understand, because, they buy the house in order to invest their money and they will sell the house later.

The detail of the customer complaint that post hand over in 2012 can be seen in Table 4 below:

Table 4 : The Detail of The Customer Complaint that Post Hand Over in 2012

No	Area	The Month of Post Hand Over	The Number of The Post Hand Over	The Number of The House of The Complaint	The Percentage of The House of The Complaint
1	Citra 2A	January	1	-	-
		February	-	-	-
		March	-	-	-
		April	1	-	-
		Mei	2	-	-
		June	1	-	-
		July	1	-	-
		August	-	-	-
		September	-	-	-
		October	-	-	-
		November	1	-	-
		December	-	-	-
TOTAL			7	-	-
2	Citra 6	January	3	2	66,67%
		February	5	1	20%
		March	8	4	50%
		April	16	7	43,75%
		Mei	5	2	40%
		June	12	6	50%
		July	3	3	100%
		August	3	2	66,67%
		September	-	-	-
		October	4	3	75%
		November	2	2	100%
		December	3	-	0%
TOTAL			64	32	50%
3	Citra 7	January	-	-	-
		February	-	-	-
		March	2	-	0%
		April	13	-	0%
		Mei	6	1	16,67%

	June	10	-	0%
	July	9	3	33,33%
	August	2	-	0%
	September	8	-	0%
	October	22	14	63,64%
	November	10	4	40%
	December	14	8	57,14%
	TOTAL	94	30	31,91%

⁸ The Statistical Package for The Social Sciences for Windows (Version 16) was used to analyzed these data bases.

Results and Discussion

Based on the customer complaint report in 2012 (from january – december), an analysis of the defect data revealed according to the number of the complaint after the classification process using the form as described in some graphic below:

I. The Level of The Defect (Minor, Moderate, Serious)

A. Structural Defect

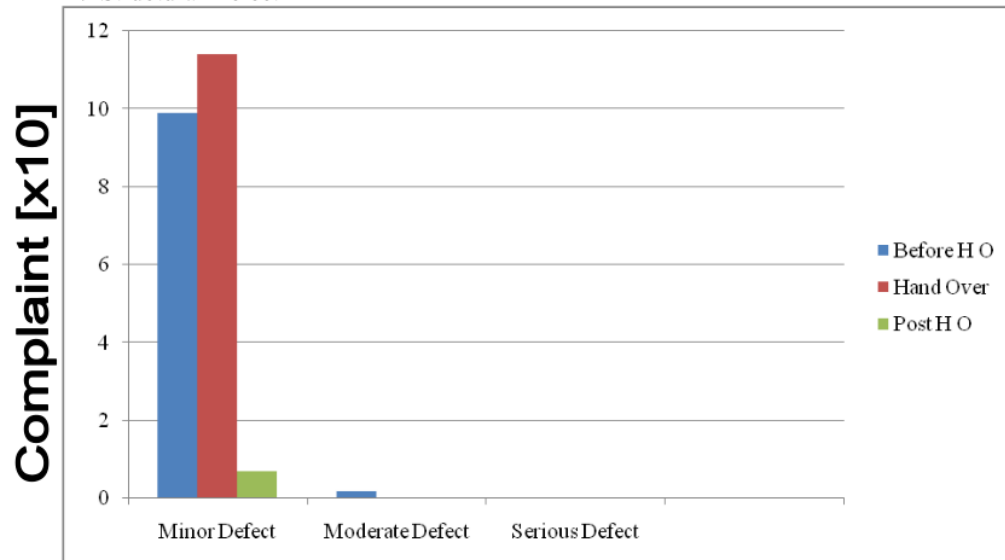


Figure 2. Complaint versus the level of the defect for structural defect

Minor Defect

99 Complaint Before Hand Over, 114 Complaint Hand Over, 7 Complaint Post Hand Over

Moderate Defect

2 Complaint Before Hand Over

Serious Defect

0 Complaint

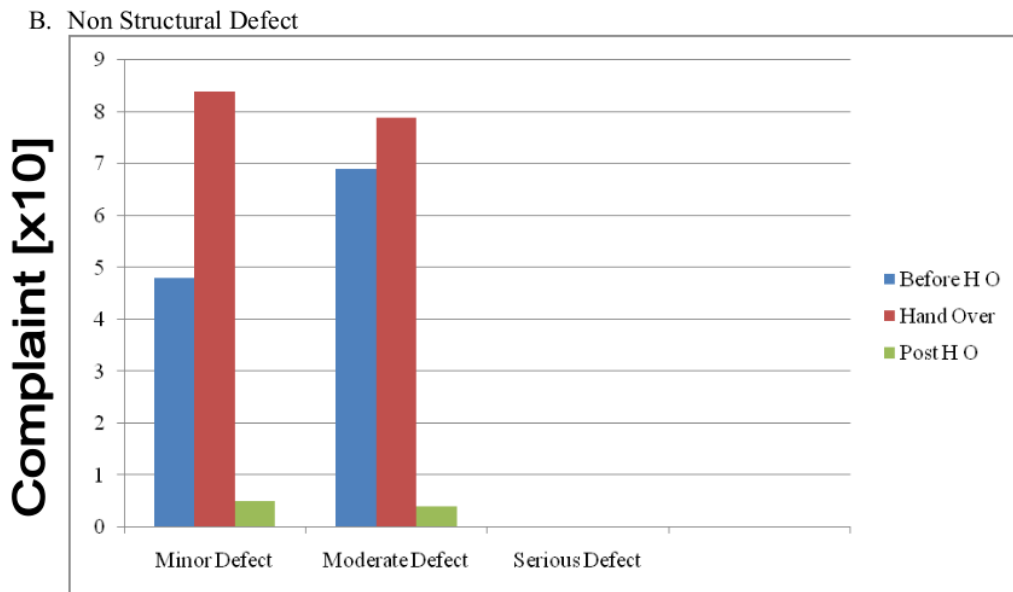


Figure 3. Complaint versus the level of the defect for non structural defect

Minor Defect

48 Complaint Before Hand Over, 84 Complaint Hand Over, 5 Complaint Post Hand Over

Moderate Defect

69 Complaint Before Hand Over, 79 Complaint Hand Over, 4 Complaint Post Hand Over

Serious Defect

0 Complaint

II. The Time of The Defect Happen (Before Hand Over, Hand Over and Post Hand Over)

A. Structural Defects

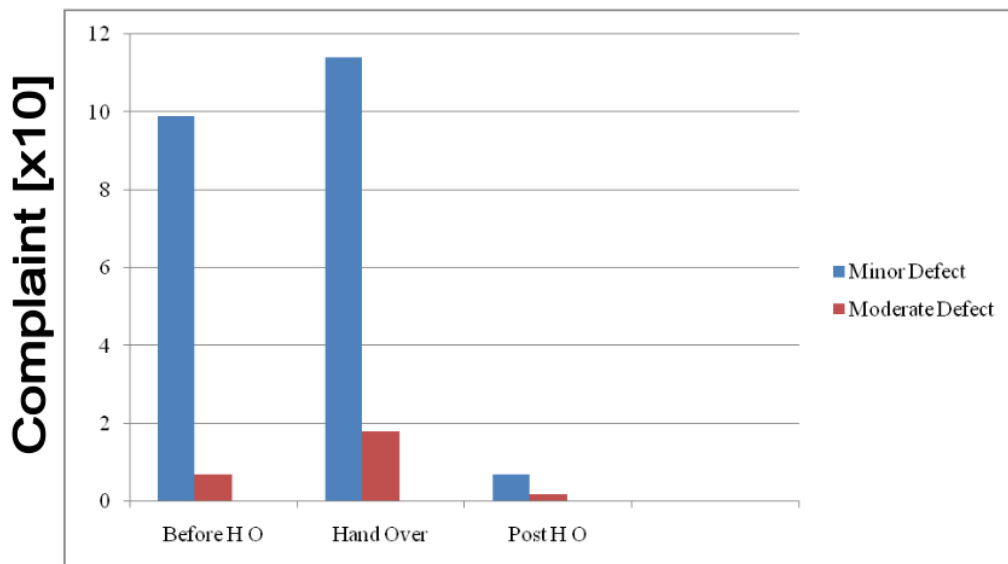


Figure 4. Complaint versus the time of the defect happen for structural defect

Before Hand Over

99 Complaint Minor Defect, 7 Moderate Complaint Defect

Hand Over

114 Complaint Minor Defect, 18 Moderate Complaint Defect

Post Hand Over

7 Complaint Minor Defect, 2 Moderate Complaint Defect

B). Non Structural Defect

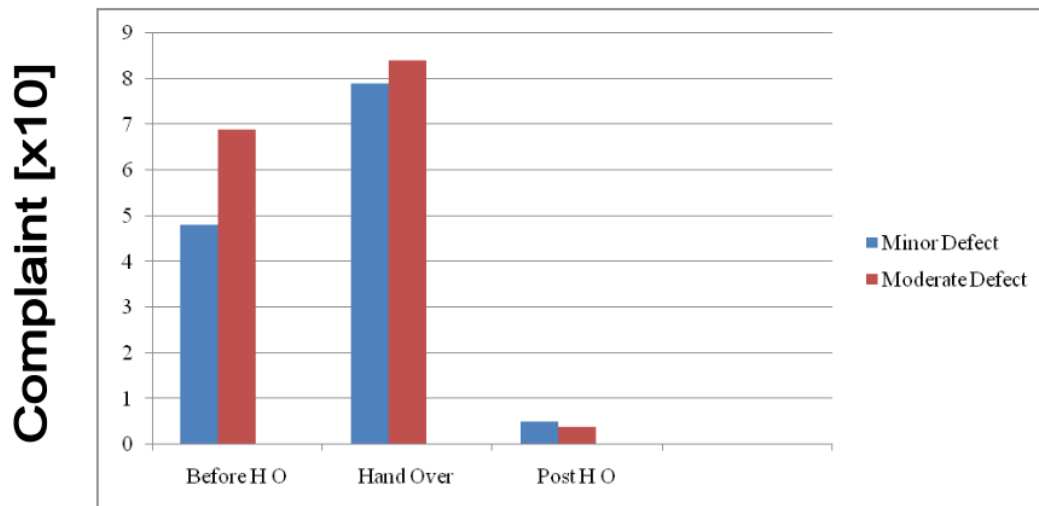


Figure 5. Complaint versus the time of the defect happen for non structural defect

Before Hand Over

48 Complaint Minor Defect, 69 Moderate Complaint Defect

Hand Over

84 Complaint Minor Defect, 79 Moderate Complaint Defect

Post Hand Over

5 Complaint Minor Defect, 4 Moderate Complaint Defect

Figure 2 is show complaint versus the level of the defect for structural defect. Figure 3 is show complaint versus the level of the defect for non structural defect. Figure 4 is figure about complaint versus the time of the defect happen for structural defect. Complaint versus the time of the defect happen for non structural defect is shown in figure 5. From figures 2-5, we concluded that complaint hand over in the level minor defect is the highest complaint. Complaint in the serious defect is the lowest complaint.

Conclusion

The classification of residential defects (case study: Citra Garden Residence in Indonesia) was studied. This study aims to more satisfied customers. The study begins with the literature review to formulate the classification of house defects. Then classify the defect of house into two, namely the classification of house defects based on period of post hand over, and the classification of house defects based on category of the defects. The results are as follows, complaint hand over in the level minor defect is the highest complaint. Complaint in the serious defect is the lowest complaint.

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