

Analysis Damage to the Inpres Elementary School Building Village Asilulu Central Maluku Regency

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Abstract— *Maintenance (Maintenance) is very important at a building, especially in vital buildings. Maintenance often ignored by the Regional Government until building become damaged heavy. INPRES Village Public Elementary School Building Asilulu Central Maluku Regency is facilities and infrastructure-built education _ 2013. Service period something building building is 20 years in accordance rule government. But In fact, in 2019 the Village INPRES Public Elementary School building Asilulu Already happen damage heavy. Percentage and weight damage based on Permen PU No.24/PRT/M/2008 and SNI 2847-2013. During time intervals six year, building the experience damage of 96.31%. Weight value damage work for roof 100%, ceiling 98.18%, column 50%, walls of 98.86% and installation by 100%. Calculation results weight work experience deviation price from work maintenance and work construction as big IDR 145,785,777.70 or 52.72%.*

I. INTRODUCTION

School building is one of the government's assets, so appropriateness its use and care also be not quite enough answer government . Maintenance usually done by the government covers rehabilitation, renovation, restoration so that building building the can function with ok . Maintenance on functioning vital buildings as place facility general is very important done . one _ vital building is building school as means role education _ For educate life nation , in accordance with the 1945 Constitution and Goals Educational Infrastructure . Law NO 20 of 2003 also regulates system funding education to be not quite enough answer government central and regional , as well as the community as support development infrastructure . Factor support This Not yet done in a manner equally throughout Indonesia so quality and quality education No evenly . one _ impact Not yet evenly infrastructure education like damage to buildings building SD INPRES ASILULU Elementary School , Central Maluku Regency . Classroom already _ _ experience damage , however Still used for the learning process teach , though distance from location school to Ambon city as capital Maluku province less more than 50 km. Besides That building school the new built in

2013. Impact _ the damage is very annoying comfort and safety from the students during learn , so objective For educate and increase quality education Not yet reached . However until moment This Still there is facilities and infrastructure broken education _ but Still used for the learning process teach . circumstances This influence quality and quality students' education . Room roofed class _ already leaked, however Still used as place for the learning process teach . Comfort The same very No felt by students. If happen Rain hence the learning process teach discontinued because the roof of the school leaked so it rained enter to room class , as well influential to another part of building building the . Although building building the Already broken , still used for the learning process teach as seen in figure 1. The students have to sit side by side For avoid rain and hot water incoming sun _ to room class .



Fig.1 Classroom _

In pictures 2 and 3 the roof covering is done experience effect damage _ For damage framework easel and ceiling.



Fig.2 Roof Damage



Fig.3 Ceiling damage



Fig.4 Damage column



Fig.5 Damage wall

In pictures 4 and 5, beauty and cleanliness school No appear Again consequence damage . Wall school experience cracks and paint already chipped . column experienced cracked as well as has appear reinforcement , consequently strength from column can reduced . Besides That maintenance something building often ignored by the government area specifically Central Maluku Regency . Damage this also happens in a few areas in Indonesia such as case consequence damage building school behind _ Board according to *Mahfud* consequence No he did maintenance in a manner periodically so that resulting in fatalities . Management review maintenance and maintenance _ researched by *Irika Widiasanti* and *R. Eka Murti Nugraha* say that maintenance building is very important and expected can done in a manner periodically so the funds will be used more efficient.

II. METHOD

Method used _ For studies case building SD INPRES Asilulu with *survey* field For see and know damage to buildings , also use form evaluation existing conditions , documentation images and systems data processing uses computer . Data collection was carried out at school with measure wide cracks that occur in walls and columns , check every broken room . _ Evaluation damage building building referring to Minister of Public Works No.24 of 2008, which was carried out in a manner gradually follow Hierarchy building building . Percentage classified damage _ damaged mild $\leq 30\%$, damaged moderate $\geq 30\% - 45\%$, damaged weight : $\geq 45\% - 65\%$ and totally damaged if : $\geq 65\%$. Percentage damage seen in equation (1)

$$H = \frac{G}{HT} \times 100\% \tag{1}$$

Description :

H : Weight Percentage of Damage Level

G : Price Per Work Item

HT : Total Job Price

Prices for work items taken from Unit Price Analysis Jobs (AHSP) in Central Maluku Regency in 2019

Damage building according to Minister of Public Works No. 24 of 2008 with intensity damage building can classified on three level damage , namely : Damage Allowable light on non - structural components , damage currently partly on non structure and or component roof structure , damage heavy if damage to parts big component building , fine structural as well as non- structural ones if after repaired Still can function with Good as should .

2.1 RESULTS AND DISCUSSION

A number of influencing factors _ damage building school that is the location nearby with edge beach . Distance between school and edge beach six fifteen meters. Factor wind and earthquake become reason happening damage building school . Besides from factor above , which becomes problem happening damage is No done maintenance in a manner periodically , accordingly with . At the start *survey* , found that building the ASILULU INPRES SD building was built in 2013 no maintained with ok . Until year 2020 building year building school the has experience damage with level damage to parts structure and non structure . The extent of the damage incurred varies by three room class with wide 197.93m^2 .

damage done _ building roof , frame truss , ceiling, walls , and columns resulting in a zinc roof can become rusty . Besides it's on the zinc roof No coated with anti-rust paint so damage the more big that is happen leaks , and visible the holes in the roof . Perforated roof , if happen Rain so will seep and hit the frame easel and ceiling. Consequence damage to the zinc roof factor The wind is also very influential in the area that , when in the west season often happen strong winds , which resulted level damage the more big ,

Paint on walls the building has peeling and discolored faded . Doors and windows already _ broken . Damage covering the roof, damage wall on each room experienced class _ cracks , reinforcement in columns that have appear consequence corrosion . Besides That in development will impact on the budget government , if building school will rehabilitated or built new .

Here clear seen lack of maintenance carried out by the Regional Government in management building which is asset area the . Maintenance building is very important and necessary after building the finished built and used . Maintenance This will make age building the become more long , reviewed from aspect : strength , safety , and building performance . That succeed or nope something development building can seen from age usage building .

In the use of materials used for job concrete possibility using sand the surrounding sea _ _ edge beach , because of

the reinforcement column see already experience corrosion like seen in picture 5. Use sand the pregnant sea sulfate and chloride salt , can influential against damage concrete ie reinforcement iron concrete to be rust , part dash already cut off Potential damage to concrete ie happened cracks and breaks , because salty sand _ will reduce adhesive with cement, as seen in picture 6.

The data obtained through observation field , calculation level damage to the building building school according to the volume of damage to the part structural and non-structural . Calculation of damage volume and weight damage against whole building can seen in Table 1.

In table 1. The damage that occurred has reached 96.31% and classified as damage heavy until year 2019. From weight damage so building school This No worthy Again For used as a learning process teach .

Damage heavy happen consequence from No he did maintenance in a manner periodically . On walls and roofs, and installation electricity if done maintenance two year very during six year (2013 -2019) then treatment performed _ only on painting and installation items electricity . The magnitude cost roof painting $3 \times \text{IDR } 25,3111,125.42 = \text{IDR } 75,933,376.27$. Ceiling painting $3 \times \text{IDR } 5,461,174.35 = \text{IDR } 16,383,523.04$. Painting walls $3 \times \text{IDR } 11,483,602.85 = \text{IDR } 34,450,808.54$. Amount maintenance during six year if done maintenance so the value is $\text{IDR } 130,761,719.85$. If No done maintenance so that experience damage of 96.31% then value to $\text{IDR } 276,547,497.55$. Difference mark between treatment performed _ two year once and no done maintenance until damaged heavy in the amount of $\text{IDR } 276,547,497.55 - \text{IDR } 130,761,719.85 = \text{IDR } 145,785,777.70$ or 52.72%

III. CONCLUSION

Damage to buildings Inpres Elementary School Village Asilulu as one _ means education For increase quality education students really need attention from government center , area For more increase development infrastructure education so that student can do activity Study decent teaching _ in accordance recommendation government . damage done _ caused factor location adjacent school _ with edge beach so that building experience seawater corrosion , earthquake , wind , no _ do care in a manner periodically in accordance Regulation of the Minister of Work General No.24/PRT/M/2008 so affect the volume of damage and large costs . Assessment results if done maintenance in a manner periodically to cost as big $\text{IDR } 130,761,719.85$ during period of 6 (six) years and the amount cost repair if without No done maintenance magnitude cost as big $\text{IDR } 276,547,497.55$ experience deviation cost as big $\text{IDR } 145,785,777.70$ or 52.72%.

Table 1 Damage component structure and non structure

ANALISIS KERUSAKAN BANGUNAN								
NO	Komponen Bangunan	Volume Terhadap Seluruh Bangunan	Satuan	Harga Satuan (Rp)	Kerusakan (%)			
					Volume Terhadap Kerusakan	Nilai Kerusakan (Rp)	Bobot Terhadap Item Pekerjaan (%)	Bobot Terhadap Seluruh Bangunan (%)
A	B	C	D	E	F	$G = F / C \times E$	$H = G / E \times 100\%$	$I = G / \text{Jumlah} \times 100\%$
1. Pekerjaan Persiapan								
	a. Pekerjaan Kolom	0,495	M3	Rp 17.373.391,20	0,2475	Rp 8.686.695,60	50,00	3,03
JUMLAH PER ITEM PEKERJAAN				Rp 17.373.391,20		Rp 8.686.695,60	50,00%	
2. PEKERJAAN ATAP								
	a. Penutup atap seng	849,86	M2	Rp 54.212.569,40	849,86	Rp 54.212.569,40	45,03	18,88
	b. Kuda - kuda kayu Kls I	2,52	M3	Rp 22.944.096,00	2,52	Rp 22.944.096,00	19,06	7,99
	c. Gording kayu Kls I	0,95	M3	Rp 8.896.567,50	0,95	Rp 8.896.567,50	7,39	3,10
	d. Listplank	68,98	M	Rp 7.298.084,00	68,98	Rp 7.298.084,00	6,06	2,54
	e. Bubungan atap zink	43,4	M	Rp 1.742.293,00	43,40	Rp 1.742.293,00	1,45	0,61
	f. Pengecatan atap	849,86	M2	Rp 25.311.125,42	849,86	Rp 25.311.125,42	21,02	8,81
JUMLAH PER ITEM PEKERJAAN				Rp 120.404.735,32		Rp 120.404.735,32	100,00%	
3. PEKERJAAN PLAFOND								
	a. Rangka plafond & penutup plafond	255,20	M3	Rp 46.137.608,00	250,00	Rp 45.197.500,00	87,59	15,74
	b. Cat Plafond	255,20	M2	Rp 5.461.174,35	255,20	Rp 5.461.174,35	10,58	1,90
JUMLAH PER ITEM PEKERJAAN				Rp 51.598.782,35		Rp 50.658.674,35	98,18%	
4. PEKERJAAN DINDING								
	a. Pasangan dinding batako	270,47	M2	Rp 31.667.438,16	265,80	Rp 31.120.660,56	36,28	10,84
	b. Plesteran dinding	540,94	M2	Rp 42.638.319,38	535,80	Rp 42.233.171,01	49,23	14,71
	c. Pengecatan dinding	540,94	M2	Rp 11.483.602,85	539,90	Rp 11.461.524,71	13,36	3,99
JUMLAH PER ITEM PEKERJAAN				Rp 85.789.360,39		Rp 84.815.356,28	98,86%	
5. PEKERJAAN INSTALASI LISTRIK								
	a. Titik instalasi lampu	27,00	Tuk	Rp 4.527.900,00	27,00	Rp 4.527.900,00	37,79	1,58
	b. Lampu 18 watt	27,00	Bh	Rp 3.938.625,00	27,00	Rp 3.938.625,00	32,87	1,37
	c. Stop kontak	3,00	Bh	Rp 423.375,00	3,00	Rp 423.375,00	3,53	0,15
	d. Saklar ganda	3,00	Bh	Rp 625.335,00	3,00	Rp 625.335,00	5,22	0,22
	e. Saklar tunggal	3,00	Bh	Rp 549.051,00	3,00	Rp 549.051,00	4,58	0,19
	f. KWH meter (daya 1200 watt)	1,00	Bh	Rp 1.500.000,00	1,00	Rp 1.500.000,00	12,52	0,52
	g. Mcb/secring	1,00	Unit	Rp 417.750,00	1,00	Rp 417.750,00	3,49	0,15
JUMLAH PER ITEM PEKERJAAN				Rp 11.982.036,00		Rp 11.982.036,00	100%	
JUMLAH TOTAL				Rp 287.148.305,26		Rp 276.547.497,55		96,31%
KESIMPULAN PENGAMATAN :				TINGKAT KERUSAKAN				
	Tingkat Kerusakan (%)	96,31%		RINGAN	:			< 30 %
	Jenis Perawatan	TOTAL		SEDANG	:			> 30 % - 45 %
	Luas Total Ruangan	197,91 M2		BERAT	:			> 45 % - 65 %
				TOTAL	:	96,31%		> 65 %

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