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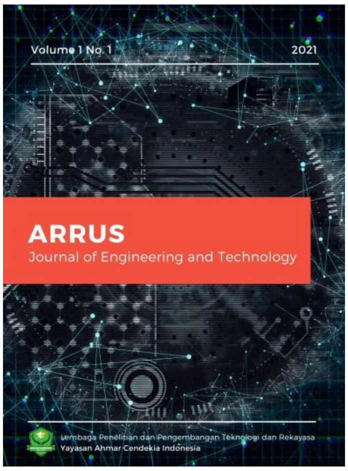

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RESEARCH ARTICLE

Assessment Of The Reliability Of The DPRD Building Of East Kalimantan Province

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Abstract: The East Kalimantan Provincial Parliament Building Complex was established 35 years ago. Building D of the East Kalimantan Provincial Parliament was inaugurated by the Governor of East Kalimantan H. Suwarna on January 11, 2004. Building D is more than 21 years old and needs to be re-examined The level of building reliability refers to Government Regulation No. 16 of 2021 which is a derivative regulation of Law Number 28 of 2002 concerning Buildings stating that buildings must be managed administratively and also technically, periodic inspections of the reliability of all or part of the building, components, building materials, and/or infrastructure and facilities within a certain period of time to declare the feasibility of function buildings. This study is to determine the level of building reliability from the aspects of architects, structures, utilities, and fire protection, accessibility, and also building layout and environment in the DPRD Building Complex Area, especially Building D of East Kalimantan Province. Qualitative and Quantitative Methods by conducting visual observations, surveys (measuring, taking samples by means of Non-Destructive Test), Counting, Interviews and Questionnaires as well as Project Documents (As Build Drawing), etc. The data was analyzed using descriptive statistics, laws and regulations and the assessment of reliability score values referring to the Journal of Building Reliability of the Mandiyo Priyo Building, Ibnu Herlambang Wijadmiko 2011. The criteria used to determine the reliability of the building are reliable for a score of 95-100, Less Reliable for a score of 75-<95, Unreliable for a score of <75. The research results in the reliability of Architects of 80% (less reliable), reliability of Structures of 96% (reliable), reliability of Utilities & Fire Protection of 83% (unreliable), reliability of accessibility of 84% (less reliable), reliability of Building and Environment of 100% (reliable). Therefore, from the recapitulation of the reliability assessment of the building D of the East Kalimantan Provincial DPRD, a reliability value of 88% (less reliable).

Keywords: Building Reliability, DPRD Building, East Kalimantan Province.

1. INTRODUCTION

The East Kalimantan Provincial DPRD Building Complex has stood for 35 years. Building D of the East Kalimantan Provincial DPRD was inaugurated by the Governor of East Kalimantan, H. Suwarna, on January 11, 2004. Building D, which is over 21 years old, needs to have its building reliability level reassessed, referring to Government Regulation No. 16 of 2021, which is a derivative rule of Law Number 28 of 2002 concerning Buildings. This regulation states that buildings must be managed administratively and technically, with periodic inspections of the reliability of all or part of the building, its components, building

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materials, and/or infrastructure and facilities at certain intervals to declare the feasibility of the building's function.

Minister of Public Works Regulation No. 29/PRT/M/2006 defines a building as a physical form of construction work that is integrated with its location, wholly or partially above and/or in the ground and/or water, functioning as a place for human activities, whether for residence, religious activities, business activities, social, cultural, or special activities. Meanwhile, maintenance is the activity of maintaining the reliability of the building along with its infrastructure and facilities to ensure it always functions properly. Periodic inspection is the activity of inspecting the reliability of all or part of the building, its components, building materials, and/or infrastructure and facilities at certain intervals to declare the feasibility of the building's function.

Building D of the East Kalimantan Provincial DPRD, which is over 21 years old, needs special attention in terms of maintenance and periodic inspections. These inspections aim to ensure the feasibility of the building's structure, user safety, and minimize the risk of damage that could be hazardous. Regular inspections, in accordance with applicable regulations, are necessary to maintain the building's function and lifespan in accordance with safety and comfort standards.

Based on the background and problem identification, the following problems can be formulated:

(1). What aspects influence the reliability assessment of Building D of the East Kalimantan Provincial DPRD?

(2). What is the reliability level of Building D of the East Kalimantan Provincial DPRD?

(3). How much does it cost to restore the proper function of Building D of the East Kalimantan Provincial DPRD?

The objectives of this research are as follows:

(1). To identify the aspects that influence the reliability assessment of Building D of the East Kalimantan Provincial DPRD.

(2). To determine the reliability level of Building D of the East Kalimantan Provincial DPRD.

(3). To determine the costs required to restore the proper function of Building D of the East Kalimantan Provincial DPRD.

Administrative and technical requirements must comply with the building's function. Administrative requirements include land rights status, building ownership status, and building construction permits. Meanwhile, technical building requirements include building layout requirements and building reliability requirements. Building reliability refers to the condition of the building that meets the requirements for safety, health, comfort, and ease of use in accordance with the established functional needs.

To evaluate the physical reliability of the building, in order to realize a reliable building, reliability criteria are used in accordance with the technical guidelines for building reliability inspection procedures, Minister of Public Works Regulation No. 29/PRT/M/2006, Minister of Public Works Regulation No. 16/PRT/M/2010, Minister of Public Works Regulation No. 22/PRT/M/2018, and Minister of Public Works Regulation No. 16/PRT/M/2021, which are derived from Law No. 28 of 2002, as well as the 2011 General Electrical Installation Requirements.

The physical reliability criteria of a building include several aspects:

(1). Architectural Aspect: The inspection of architectural aspects is limited to the building's finishing, both inside and outside. The assessment includes the building's function against plan conformity, interior assessment including floor, wall, door,

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window, and ceiling finishing, and exterior assessment including wall, floor, and fence finishing. (Taurino & Wiyanto, 2022)

(2). Structural Aspect: The building reliability requirements in the structural aspect are regulated in Minister of Public Works Regulation No. 29/PRT/M/2006 concerning construction detail guidelines, type, intensity, and working method of loads. Every building structure must be designed to be strong and stable in bearing loads/load combinations and meet serviceability requirements in accordance with existing regulations during the planned service life. Building function, location, durability, and construction feasibility must also be considered. (Taurino & Wiyanto, 2022)

(3). Utility Aspect: Another aspect reviewed in the building reliability assessment is the utility aspect. Building utilities are essential to complement the building, especially multi-story buildings. The completeness of utilities in a building will ensure the safety and comfort of the occupants or users of the building. Building utilities consist of various components, namely fire prevention installation systems, vertical transportation systems, plumbing systems, electrical installation systems, air conditioning systems, lightning protection installation systems, and communication installation systems. (Taurino & Wiyanto, 2022)

(4). Accessibility Aspect: Evaluations are carried out on the accessibility element systems found in the building object, in accordance with the provisions of Minister of Public Works Regulation No. 30/PRT/M/2006 concerning Technical Guidelines for Facilities and Accessibility in Buildings and Environments. The assessment includes room size, pedestrian paths, parking areas, ramps, stairs, etc. (Taurino & Wiyanto, 2022)

(5). Building and Environmental Layout Aspect: The building and environmental layout condition value is a certain value based on the conditions in each part of the building and environmental layout. There are 3 items assessed in the building and environmental layout aspect in building reliability inspections, namely Building Base Coefficient (KDB), Building Floor Coefficient (KLB), and Green Base Coefficient (KDH). (Taurino & Wiyanto, 2022)

2. Research Method and Materials

This research employs qualitative and quantitative methods. Data were obtained from data sources and surveys conducted at Building D of the Regional People's Representative Council (DPRD) of East Kalimantan Province. The data used comprises two types:

(1). Primary Data, obtained through:
   (a). Measurement, Non-Destructive Test data collection, calculations, survey form completion, and visual documentation of the research object.
   (b). Interviews with building owners, questionnaire completion, and survey form completion.

(2). Secondary Data, consisting of historical data regarding land ownership status, right-of-use permits, building ownership, and working drawing documents.

The collected data were processed and analyzed using descriptive statistical methods. The analysis was conducted by assigning scores to the field survey results, guided by the technical guidelines for building reliability inspection procedures.

In the sampling technique, researchers used purposive sampling, simple random sampling, and probability sampling. Purposive sampling is a sample determination technique with specific considerations. This sample was used in interviews (qualitative research). Therefore, the researcher determined the characteristics used in this study. The sample used by the researcher had provisions, namely for parties involved in the management of construction activities, which are implementing contractors, planning consultants, supervising consultants, and the owner of building D of the DPRD of East Kalimantan Province, with reference from the organizational structure, totaling 26 people.

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Simple random sampling is the selection of sample members from a population randomly without considering the strata in that population. This sample was used in questionnaires (quantitative research). Therefore, the researcher determined the sample for building users, which is 2 people from each room in Building D of the DPRD of East Kalimantan Province.

Probability sampling, specifically cluster sampling, is a sampling method where the building is divided into several clusters, such as floors or specific structural areas (e.g., columns, beams, or walls), which are considered to have relatively homogeneous characteristics within those clusters. From the existing clusters, researchers randomly select several clusters as samples for testing. This method allows researchers to save time and costs because it is not necessary to examine every part of the building, only a few representative clusters. After the data from the selected clusters are collected, researchers can conduct an analysis to assess the overall structural reliability of the building. The results of this analysis can then be generalized with a certain level of accuracy, although there is a risk of inaccuracy if the selected clusters do not adequately represent the entire building population.

The measurable data collection method in this research uses the Non-Destructive Testing (NDT) approach, which is an examination method that does not cause damage, either structurally or non-structurally. This method is used to test the quality of concrete or other constructions without damaging them, so they remain intact after testing. In contrast, destructive testing methods involve damaging structural elements to obtain test data. Some of the NDT tools and techniques used include the Ultrasonic Pulse Velocity Test (UPVT), Schmidt Hammer Test, Rebar Scanner, Mega Ohm Meter, as well as mechanical system performance tests such as pumps and air conditioners. Each method has a different purpose and working principle to identify structural conditions in detail and accurately.

Data collection techniques are used to gather data according to research procedures to obtain the necessary data. Data collection techniques are the most strategic steps in research. Data collection is conducted to obtain information needed to achieve the research objectives. Data collection techniques in this research use (1) documentation, (2) observation, (3) interviews, (4) questionnaires, and (5) measurable data, which can be explained as follows:

(1). Documentation

Documentation is a method of reviewing and processing data from pre-existing documents. In data collection techniques using the documentation method, it is used to gather images of field conditions.

(2). Observation

Observation is a data collection technique to observe matters related to the work process. In this research, researchers conduct direct observations to obtain facts in the field.

(3). Interviews

Interviews in research occur when researchers ask questions to informants with the aim of gathering information. In interviews, the research sample used is purposive sampling. In this sample, researchers determine the characteristics used to facilitate the research. The population and sample are parties involved in the management of construction activities to be interviewed, namely implementing contractors, planning consultants, supervising consultants, and the owner of Building D of the DPRD of East Kalimantan Province, with reference from the organizational structure, totaling 26 people. Data processing by researchers in interviews and questionnaires is as follows:

(a). Creating questions to be asked to informants.
(b). Asking questions according to the content of the questions that have been made, which is a total of 10 questions related to building reliability factors to 26 informants.
(c). Recording the interview results presented by informants and analyzing these interview results.
(d). Conducting observations and documenting directly in the field.

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(4). Questionnaires

Questionnaires are research that uses data collection methods by distributing questionnaires to respondents related to a list of statements about the problems being researched and asking respondents to answer the list of statements. The method used is a closed questionnaire. The instrument used to measure research variables uses a 5-point Likert scale. Respondent answers are in the form of choices from five alternatives, namely:

- SB = Very Good with Score 5
- B = Good with Score 4
- C = Sufficient with Score 3
- K = Poor with Score 2
- SK = Very Poor with Score 1

In questionnaires, the sample used is simple random sampling, which is the selection of sample members from a population randomly without considering the strata in that population. Therefore, researchers determined a sample of 26 people. Data processing by researchers in interviews and questionnaires is as follows:

- Creating questionnaire forms to be used as assessments in building reliability analysis, namely assessments related to architecture, structure, utilities and fire protection, accessibility, and building and environmental layout.
- Distributing questionnaire forms to 26 respondents.
- Subsequently, validity and reliability tests are conducted according to the provisions.

(5). Measurable Data

Measurable data is obtained through direct measurements in the field, covering aspects that can be calculated, such as building dimensions, material strength, or project progress in percentages. This technique involves the use of measuring tools to obtain objective quantitative data that can be statistically processed. Data collection uses Non-Destructive Testing (NDT).

(6). Validity Test

Validity Testing Criteria are validity tests that correlate each indicator item score with the total construct score. The significance level used is 0.05. The testing criteria are H0 is accepted if r count > r table (the measuring instrument used is valid), and H0 is rejected if r statistic ≤ r table (the measuring instrument used is not valid).

(7). Reliability Test

In this research, the Cronbach's Alpha method is used. The calculation uses Cronbach's Alpha formula, which is accepted if the r count > 5% r table. After being tested and declared valid, the questionnaire can be used and analyzed. Documenting image conditions according to the actual conditions in the field.

The assessment results show the category of the level of reliability of the building being assessed. The category of reliability level is divided into 3, namely Reliable, Less Reliable, and Not Reliable. The following is Figure 1 which is a research framework that is generally carried out:

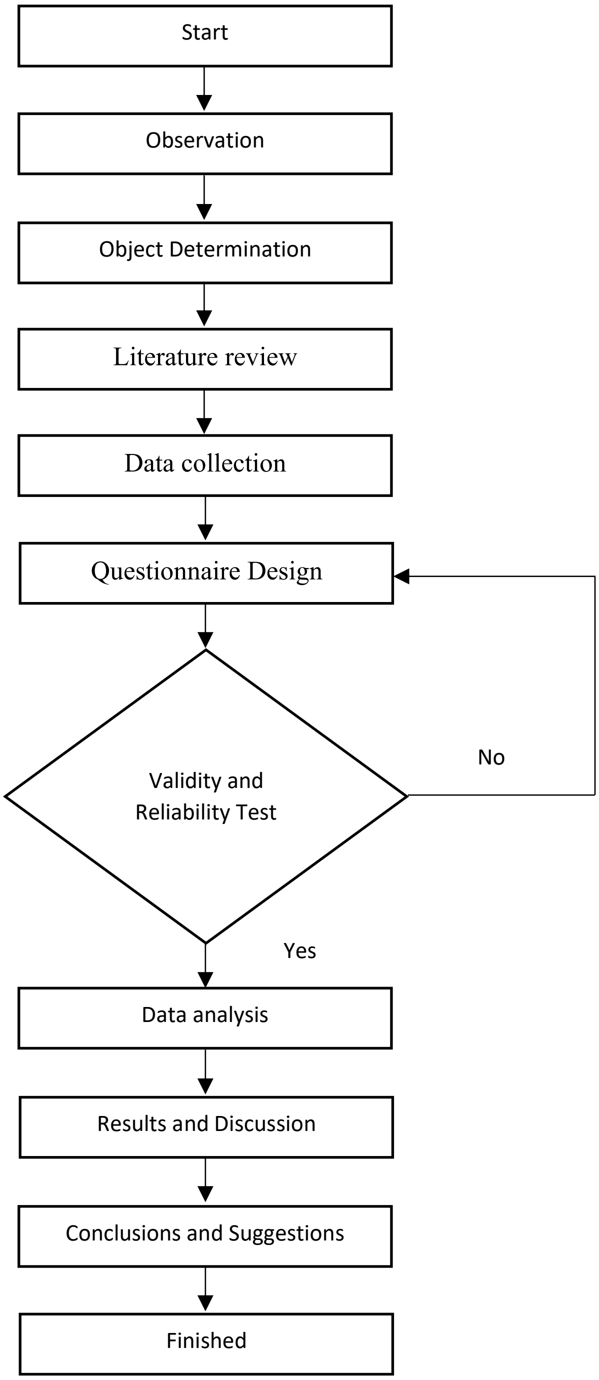

Figure 1: Research Framework Flowchart

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Analysis Framework

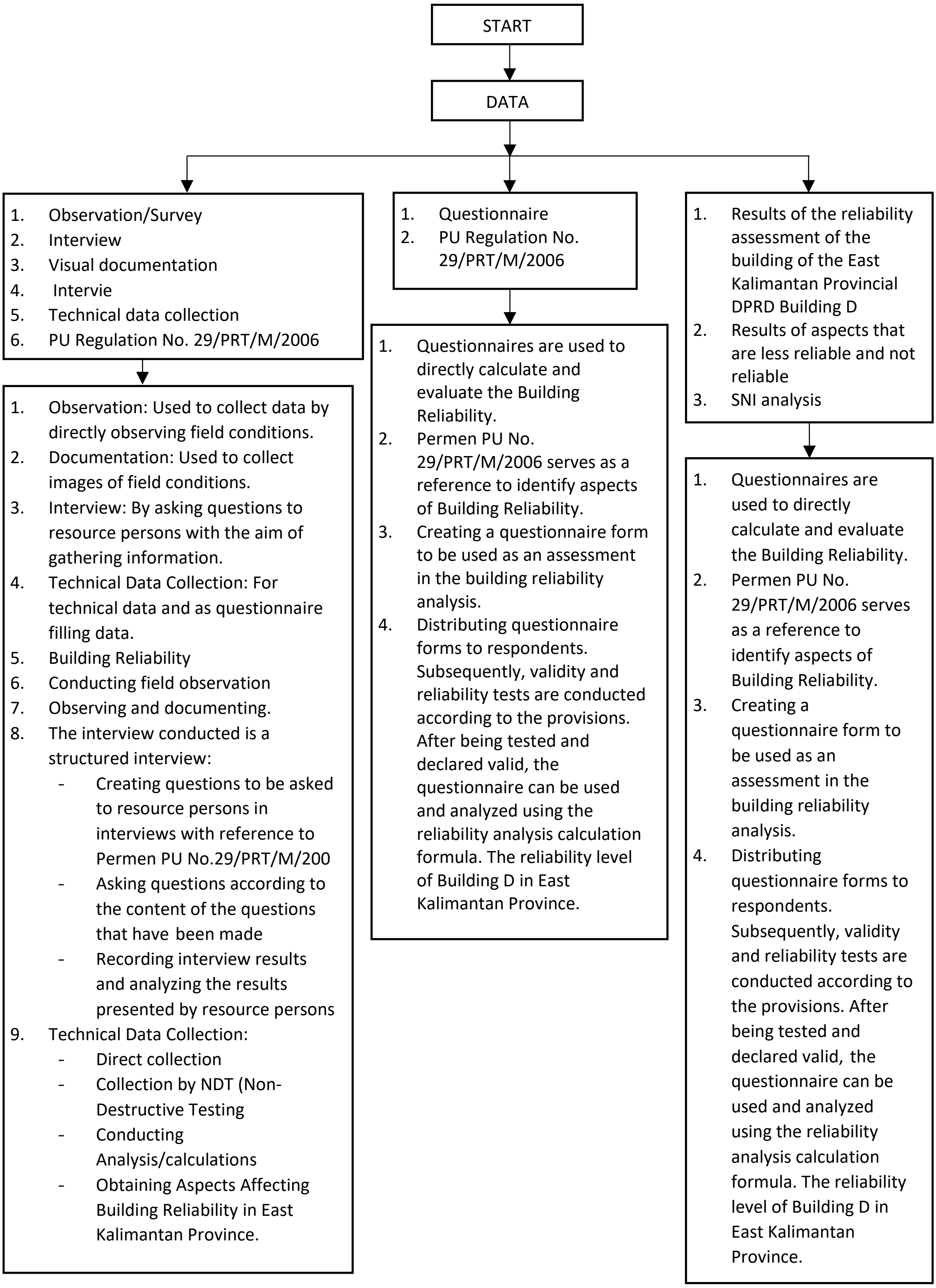

Figure 2: Analysis Framework Flowchart

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3. Results and Discussion

The administrative requirements for buildings serve specifically as an initial step in examining building reliability, and generally aim to ensure administrative order in spatial utilization regulations and construction order. Building D of the East Kalimantan Provincial DPRD is located within a complex of buildings in the East Kalimantan Provincial DPRD area, which possesses the required complete documents and permits.

The data analysis from this research is conducted qualitatively and quantitatively. In the interviews, the research sample used is Purposive Sampling, with samples being parties involved in managing construction activities, including the implementing contractor, planning consultant, supervising consultant, Public Works Department, and Building Owner, based on the organizational structure, totaling 26 people.

Table 1. Number of Sources

No	Source person	Amount
1	Planning Consultant	3 people
2	Supervisory Consultant	5 people
3	Implementing Contractor	11 people
4	Building Owner	3 people
5	PU Department	4 people
	Total Sources	26 people

Source: Research results, 2025

Table 2. Respondent Characteristics

Characteristics	Information	Amount	Presentase
Gender	A. Woman	3 people	12%
	B. Man	23 people	88%
	Total	**26** people	**100%**
Age	A. 21-30 Tahun	7 people	27%
	B. 31-40 Tahun	4 people	15%
	C. 41-50 Tahun	10 people	39%
	D. 51- 60 Tahun	5 people	19%
	Total	**26** people	**100%**
Profession	A. Planning Consultant	3 people	12%
	B. Supervisory Consultant	5 people	19%
	C. Implementing Contractor	11 people	42%
	D. Building Owner	3 people	12%
	E. PU Department	4 people	15%
	Total	**26** people	**100%**

Source: Research Results, 2025

3.1. Reliability of Architectural Aspects

The results of processing architectural aspect data are displayed in full in figure 3.

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No	Komponen	Kondisi Kefungsian Komponen	Kriteria Penilaian					Bobot					Total Bobot
			SB	B	C	K	SK	5	4	3	2	1	
1	Ruang Dalam	Pelapis muka lantai	11	12	3			55	48	9			112
2		Plasteran lantai	4	19	3			20	76	9			105
3		Pelapis muka dinding	2	20	2	2		10	80	6	4		100
4		Plasteran dinding	4	20	1	1		20	80	3	2		105
5		Kosen, pintu dan jendela	7	13	5	1		35	52	15	2		104
6		Lapisan muka langit - langit	12	8	5	1		60	32	15	2		109
7	Ruang Luar	Penutup atap	8	13	3	2		40	52	9	4		105
8		Pelapis muka dinding luar	8	14	2	2		40	56	6	4		106
9		Plasteran dinding luar	6	15	3	2		30	60	9	4		103
10		Pelapis muka lantai luar	7	11	6	2		35	44	18	4		101
11		Plasteran lantai luar	10	8	5	3		50	32	15	6		103
12		Pelapis muka langit - langit	7	13	5	1		35	52	15	2		104
TOTAL (∑bobot)													1257

Figure 3. The results of processing architectural aspect data
Source: Research Results, 2025

Calculation of reliability related to architecture, is explained as follows:

Before starting the calculation, weighting is done as in the table above, namely with the formula:

Weighting Calculation	= T x Pn
T	= Total number of respondents who chose
Pn	= Likert scale score option

Example:

Floor surface coating with a very good (VG) criterion, with a value of 5, is chosen by 11 respondents. Therefore, the weighting is:

Weighting = T x Pn = 11 x 5 = 55

Subsequently, other components are calculated using the same method. After that, all weightings are summed according to their respective components, so that the final result of the total weighting is summed, resulting in the total architectural weighting (∑weight).

Given:

- Highest weight value = 5
- Lowest weight value = 1
- Number of Components = 12 components
- Total Respondents = 26 people
- Total Architectural Weight (∑weight) = 1257

Solution:

Calculation for 1 Component

Maximum weight = highest weight value × respondents = 5 × 26 = 130

Minimum weight = lowest weight value × respondents = 1 × 26 = 26

Calculation for 12 Components, to calculate in the reliability formula

Total maximum weight = maximum weight × number of components = 130 × 12 = 1560

Total minimum weight = minimum weight × number of components = 26 × 12 = 312

(a). Reliability Calculations

In this calculation, the maximum weight is used as a reference to calculate architectural reliability, where with this maximum weight, the calculation result is known to be 100%. Therefore, the formula for reliability assessment is:

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K = ∑weight / (Total maximum weight) × 100% = 1257 / 1560 × 100% = 80%

The final result of architectural reliability is 80%, which falls into the less reliable category (75 - < 95%).

3.2. Reliability of Structural Aspects

The results of data processing of the Structure aspect are displayed in full in table 4.

No	Kondisi Kefungsian Komponen	Kriteria Penilaian (✓)					Bobot					Total Bobot
		SB	B	C	K	SK	5	4	3	2	1	
A	STRUKTUR UTAMA											
1	Pondasi	20	6				100	24				124
2	Kolom Struktur	22	4				110	16				126
3	Balok Struktur	20	6				100	24				124
4	Joint Kolom-Balok	21	5				105	20				125
5	Plat Lantai	16	10				80	40				120
6	Plat Atap	19	7				95	28				123
7	Penggantung Langit-langit	25	1				125	4				129
B	STRUKTUR PELENGKAP											
1	Plat/ Balok Tangga	20	6				100	24				124
2	Balok Anak	24	2				120	8				128
3	Lain-lain (balok canopy, plat luifel)	23	3				115	12				127
TOTAL (∑bobot)												1250

Figure 4. The results of data processing of the Structure aspect
Source: Research Results, 2025

(a). Calculation of structural reliability is explained as follows:

Before starting the calculation, weighting is done as shown in the table above using the formula:

Weighting = T x Pn
T = Total number of respondents who chose
Pn = Likert scale score option

Example:

Foundation with a very good (VG) criterion, with a value of 5, is chosen by 22 respondents. Therefore, the weighting is:

Weighting = T x Pn = 22 x 5 = 110

Subsequently, other components are calculated using the same method. After that, all weightings are summed according to their respective components, so that the final result of the total weighting is summed, resulting in the total structural weight (∑weight).

Given:

Highest weight value = 5
Lowest weight value = 1
Number of Component = 10 components
Total Respondents = 26 people
Total Architectural Weight (∑weight) = 1250

Solution:

Calculation for 1 Component

Maximum weight = highest weight value × respondents = 5 × 26 = 130

Minimum weight = lowest weight value × respondents = 1 × 26 = 26

Calculation for 10 Components, to calculate in the reliability formula

Total maximum weight = maximum weight × number of components = 130 × 10 = 1300

Total minimum weight = minimum weight × number of components = 26 × 10 = 260

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(b). Reliability Calculation

In this calculation, the maximum weight is used as a reference to calculate architectural reliability, where with this maximum weight, the calculation result is known to be 100%. Therefore, the formula for reliability assessment is:

$$K = \sum weight / (\text{Total maximum weight}) \times 100\% = 1250 / 1300 \times 100\% = 96\%$$

The final result of structural reliability is 96%, which falls into the reliable category (95 - 100%).

3.3. Reliability of Utility and Fire Protection Aspects

The results of the Utility and Fire Protection aspects data processing are displayed in full in figure 5

No	Kondisi Kefungsian Komponen	Kriteria Penilaian (✓)					Bobot					Total Bobot
		SB	B	C	K	SK	5	4	3	2	1	
A.	SISTEM PENCEGAHAN KEBAKARAN											
1	Sistem Alarm Kebakaran	3	17	3	3		15	68	9	6		98
2	Gas Pemadam	3	18	2	3		15	72	6	6		99
3	Tabung PAR	3	15	6	2		15	60	18	4		97
B.	TRANSPORTASI VERTIKAL											
1	Elevator/Lift : Ada / Tidak ada	9	14	3			45	56	9			110
	ATAU :											
1	Tangga biasa	8	14	4			40	56	12			108
C.	PLAMBING											
1	Air Bersih	8	14	4			40	56	12			108
2	Air Kotor	7	14	4	1		35	56	12	2		105
D.	INSTALASI LISTRIK											
1	Sumber Daya PLN	16	7	3			80	28	9			117
2	Sumber Daya Generator (Genset)	13	9	4			65	36	12			113
E.	INSTALASI TATA UDARA											
1	Sistem Pendingin Langsung (media udara)	11	11	4			55	44	12			111
2	Sistem Pendingin Tak Langsung (media air)	8	12	4	1	1	40	48	12	2	1	103
F.	PENANGKAL PETIR											
No	Kondisi Kefungsian Komponen	Kriteria Penilaian (✓)					Bobot					Total Bobot
		SB	B	C	K	SK	5	4	3	2	1	
1	Sistem Utama Proteksi Petir	9	15	2			45	60	6			111
2	Instalasi Proteksi Petir	10	13	3			50	52	9			111
G.	INSTALASI KOMUNIKASI											
1	Instalasi Telepon	12	10	4			60	40	12			112
2	Instalasi Tata Suara	14	10	2			70	40	6			116
	TOTAL (∑bobot)											1616

Figure 5. The results of the Utility and Fire Protection aspects
Source: Research Results, 2025

The calculation of utility and fire protection reliability is explained as follows:

Before starting the calculation, weighting is done as shown in the table above using the formula:

Weighting = T x Pn
T = Total number of respondents who chose
Pn = Likert scale score option

Example:

A fire alarm system with a very good (VG) criterion, with a value of 5, is chosen by 3 respondents. Therefore, the weighting is:

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Weighting = T x Pn = 3 x 5 = 15

Subsequently, other components are calculated using the same method. After that, all weightings are summed according to their respective components, so that the final result of the total weighting is summed, resulting in the total utility and fire protection weight (∑weight).

Given:

Highest weight valu	= 5
Lowest weight value	= 1
Number of Components	= 15 components
Total Respondents	= 26 people
Total Utility & Fire Protection Weight (∑weight)	= 1620

Solution:

Calculation for 1 Component

Maximum weight = highest weight value × respondents = 5 × 26 = 130

Minimum weight = lowest weight value × respondents = 1 × 26 = 26

Calculation for 15 Components, to calculate in the reliability formula

Total maximum weight = maximum weight × number of components = 130 × 15 = 1950

Total minimum weight = minimum weight × number of components = 26 × 15 = 390

(a). Reliability Calculation

In this calculation, the maximum weight is used as a reference to calculate architectural reliability, where with this maximum weight, the calculation result is known to be 100%. Therefore, the formula for reliability assessment is:

K = ∑weight / (Total maximum weight) × 100% = 1616 / 1950 × 100% = 83%

The final result of utility and fire protection reliability is 83%, which falls into the unreliable category (< 95%).`

3.4. Accessibility Aspect Reliability

The results of data processing for the Accessibility aspect are displayed in full in figure 6.

No	Kondisi Kefungsian Komponen	Kriteria Penilaian (✓)					Bobot					Total Bobot
		SB	B	C	K	SK	5	4	3	2	1	
1	Ukuran dasar ruangan	12	13	1			60	52	3			115
2	Jalur pedestrian dan RAM	8	12	6			40	48	18			106
3	Area parkir	6	16	4			30	64	12			106
4	Perlengkapan dan peralatan control	7	13	5	1		35	52	15	2		104
5	Toilet	6	15	5			30	60	15			105
6	Pintu	7	15	4			35	60	12			107
7	Lift	16	7	3			80	28	9			117
8	Telepon	10	13	2	1		50	52	6	2		110
9	Tangga	9	14	3			45	56	9			110
TOTAL (∑bobot)												980

Table 6. The results of data processing for the Accessibility aspect
Source: Research Results, 2025

Reliability calculation related to accessibility is explained as follows:

Before starting the calculation, weights are assigned as in the table above using the following formula:

Weight Assignment = T x Pn
T = Total number of respondents who chose

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Pn = Likert scale score choice

For example, the basic room size with a very good (SB) criterion with a value of 5 is chosen by 12 respondents, then the weight assignment is:

Weight Assignment = T x Pn = 12 x 5 = 60.

Furthermore, other components are calculated in the same way, then all weight assignments are summed according to their respective components so that the final result of the overall total weight is summed to produce the total accessibility weight (∑weight).

Known:

Highest weight value	= 5
Lowest weight value	= 1
Number of Components	= 9 components
Total Respondents	= 26 people
Total Accessibility Weight (∑weight)	= 980.

Solution:

Max weight = highest weight value × respondents = 5 × 26 = 130 Min weight = lowest weight value × respondents = 1 × 26 = 26

Calculation for 12 Components, to calculate in the reliability formula: Total max weight = max weight × number of components = 130 × 9 = 1170 Total min weight = min weight × number of components = 26 × 9 = 234

(a). Reliability Calculation

In this calculation, the max weight is used as a reference to calculate architectural reliability, where with this max weight, the calculation result is known to be 100%. So the formula for reliability assessment is:

K=∑weight/(Total max weight)= ×100%= 980/1170 ×100%=84%.

The final result of the reliability related to accessibility is 84%, which is considered less reliable (75 – < 95%).

3.5. Reliability of Building and Environmental Aspects

The results of data processing on Building and Environmental Layout aspects are displayed in full in figure 7.

No	Item Yang Dinilai	Kriteria Penilaian		Bobot	
		Ya	Tidak	5	1
	KESESUAIAN DENGAN DOKUMEN RENCANA KOTA				
1	Bangunan Gedung D DPRD Provinsi Kalimantan Timur memenuhi syarat Koefisien Dasar Bangunan (KDB) yaitu maksimum 50%	26	0	130	1
2	Bangunan Gedung D DPRD Provinsi Kalimantan Timur memenuhi syarat Koefisien Lantai Bangunan (KLB) yaitu maksimum 250%	26	0	130	1
3	Bangunan Gedung D DPRD Provinsi Kalimantan Timur memenuhi syarat Kawasan Daerah Hijau (KDH) yaitu minimum 25%	26	0	130	1
	TOTAL			390	1

Figure 7. The results of data processing on Building and Environmental Layout aspects
Source: Research Results, 2025

The reliability calculation related to building layout and environment layout is explained as follows:

Before starting the calculation, weights are assigned as in the table above using the following formula:

Weight Assignment = T x Pn

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T = Total number of respondents who chose
Pn = Likert scale score choice

For example

Respondents who chose the East Kalimantan Province Building D meet the Building Coverage Ratio (BCR) requirement of a maximum of 50% with 'Yes' with a value of 5, chosen by 26 respondents, then the weight assignment is: Weight Assignment = T x Pn = 26 x 5 = 130.

Furthermore, other components are calculated in the same way, then all weight assignments are summed according to their respective components so that the final result of the overall total weight is summed to produce the total building and environment layout weight (∑weight).

Known:

Highest weight value	= 5
Lowest weight value	= 1
Number of Components	= 3 components
Total Respondents	= 26 people
Total Architectural Weight (∑weight)	= 390

Solution:

Calculation for 1 Component:

Max weight = highest weight value × respondents = 5 × 26 = 130 Min weight = lowest weight value × respondents = 0 × 26 = 0

Calculation for 12 Components, to calculate in the reliability formula: Total max weight = max weight × number of components = 130 × 3 = 390 Total min weight = min weight × number of components = 26 × 3 = 26

(a). Reliability Calculation

In this calculation, the max weight is used as a reference to calculate architectural reliability, where with this max weight, the calculation result is known to be 100%. So the formula for reliability assessment is:

$$K=\sum weight/(Total\ max\ weight)= \times 100\%= 390/390 \times 100\%=100\%.$$

The final result of the reliability related to building and environment layout is 100% reliable (< 75%).

3.6. Validity Test and Reliability Test

It can be seen in the Architecture, Structure, Utilities and Fire Protection, Accessibility, and Building and Environment Layout variables table that the Pearson correlation value is more than 0.349. This indicates that the statements in the questionnaire have met the valid requirements and are able to reveal what is measured by the questionnaire.

Based on the calculation results of each variable, the Cronbach's Alpha value of each variable in table 8 obtained results that were above 0.60. This means that all research instruments are reliable because each respondent's answers are considered consistent or stable over time. This form concerns assessments related to architecture, structure, utilities and fire protection, accessibility, and building and environmental layout. The results of the questionnaire that have been calculated will be presented in the table below.

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Table. 3: Results of Validity Test and Reliability Test

Variable	Indicator	*Pearson Correlation*	Information	*Cronbach's Alpha*	Information
Architecture (X1)	X1.1	0.791	Valid	0.934	Reliable
	X1.2	0.732	Valid		
	X1.3	0.830	Valid		
	X1.4	0.691	Valid		
	X1.5	0.601	Valid		
	X1.6	0.747	Valid		
	X1.7	0.839	Valid		
	X1.8	0.882	Valid		
	X1.9	0.752	Valid		
	X1.10	0.770	Valid		
	X1.11	0.818	Valid		
	X1.12	0.779	Valid		
Structure (X2)	X2.1	0.643	Valid	0.847	Reliable
	X2.2	0.744	Valid		
	X2.3	0.753	Valid		
	X2.4	0.802	Valid		
	X2.5	0.854	Valid		
	X2.6	0.508	Valid		
	X2.7	0.490	Valid		
	X2.8	0.643	Valid		
	X2.9	0.591	Valid		
	X2.10	0.488	Valid		
Utilities and Fire Protection (X3)	X3.1	0.864	Valid	0.943	Reliable
	X3.2	0.877	Valid		
	X3.3	0.822	Valid		
	X3.4	0.703	Valid		
	X3.5	0.710	Valid		
	X3.6	0.697	Valid		
	X3.7	0.860	Valid		
	X3.8	0.822	Valid		
	X3.9	0.832	Valid		
	X3.10	0.845	Valid		
	X3.11	0.588	Valid		
	X3.12	0.685	Valid		
	X3.13	0.756	Valid		
	X3.14	0.577	Valid		
	X3.15	0.650	Valid		
Accessibility (X4)	X4.1	0.624	Valid	0.844	Reliable
	X4.2	0.617	Valid		
	X4.3	0.425	Valid		
	X4.4	0.676	Valid		
	X4.5	0.733	Valid		
	X4.6	0.679	Valid		
	X4.7	0.778	Valid		
	X4.8	0.743	Valid		
	X4.9	0.723	Valid		
Building and Environmental Planning (X5)	X5.1	0.496	Valid	0.783	Reliable
	X5.2	0.685	Valid		
	X5.3	0.458	Valid		

Source: Research Results, 2025

3.7. Building Reliability Assessment

(a). Building Reliability Classification

Building reliability can be classified into 3, namely Reliable, Less Reliable, and Unreliable buildings as in the table below (table 4).

Table 4: Building Reliability Classification

	Reliable	Less Reliable	Not Reliable
Architecture	≥95%-100%	≥75% sampai <95%	<75%
Structure	≥95%-100%	≥ 85% sampai <95%	<85%
Utility	≥99%-100%	≥ 95% sampai <99%	<95%
Accessibility	≥95%-100%	≥75% sampai <95%	<75%
Building and Environmental Planning	≥95%-100%	≥75% sampai <95%	<75%
Total	≥95%-100%	≥75% sampai <95%	<75%

Source: (Ibnu Herlambang Sujatmiko, Mandiyo Priyo, 2011)

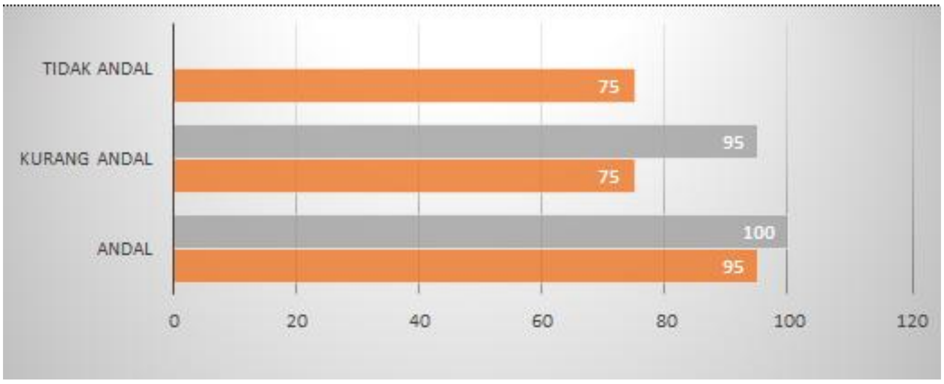

Figure 8. Reliability Value Graph

Table 5. Reliability Values of Building D of the DPRD of East Kalimantan Province

No	Realibility Factors	Value	Range	Description
1.	Architecture	80%	(75 - < 95%)	Less Reliable
2.	Structure	96%	(95 – 100%)	Reliable
3.	Utilities and Fire Protection	83%	(< 95 %)	Not Reliable
4.	Accebility	84%	(75 – < 95%)	Less Reliable
5.	Building and Environment Layout	100%	(< 75 %)	Reliable

Source: Priyo, M., & Sujatmiko, I. H., 2011

From the data above, the total value of the five reliability factors (architecture, structure, utilities and fire protection, accessibility, as well as building and environmental layout) is obtained, namely a weight value of 44 with an average of 88%, so the reliability of the East Kalimantan Provincial DPRD Building D is included as less reliable (75 - <95%).

4. Conclusion

Based on the reliability assessment conducted with 5 aspects of reliability assessment:

(1). The overall Building reliability value is 88% with a Less Reliable category.
(2). The respective values for each aspect are:
  (a). The Architectural aspect has a reliability value of 88% (Less Reliable)
  (b). The Structural aspect has a reliability value of 96% (Reliable)
  (c). The Utilities & Fire Protection aspect has a reliability value of 83% (Not Reliable)
  (d). The Accessibility aspect has a reliability value of 84%, Less Reliable category.
  (e). The Building and Environment Layout aspect has a reliability value of 100%, Reliable.

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(3). The cost required to rehabilitate the entire Building to be Reliable/functionally viable is Rp. 25,720,513,191.74.

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