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Development of Building Reliability System Based on Regulation of the Minister of Public Work Number: 24/PRT/M/2008

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Abstract:- The aims of study include obtaining a system for the assessment and maintenance of state building assets of the Government in Jember Regency which supports the reliability of the building according to the criteria in the SLF; obtaining a program that supports the application of the Assessment and Maintenance System for state building assets of the Government in Jember Regency and knowing the results of the assessment and Maintenance System Program for the State Building asset of the Government in Jember Regency that has been made in the Case Study Object in 3 City District areas in Jember Regency. The research is a quantitative descriptive. The objects of this research are state buildings in 3 urban sub-districts in Jember Regency. Methods of data analysis using descriptive analysis and Confimatory Factor Analysis (CFA). The results showed that the assessment and maintenance system for the state building assets of the Government in Jember Regency which supports the reliability of the building according to the criteria in the SLF shows that all components of reliability, including architectural components, building structures, utilities and environmental housekeeping are appropriate, while the accessibility components are re-weighted. . The results of the criteria show that all components are reliable. Programs that support the application of the Assessment and Maintenance System for the state building assets of the Government in Jember Regencyare created using a systematic maintenance system table according to each component. The results of the implementation of the Government of Jember Regency's asset assessment and maintenance system program that has been made in the Case Study Object in 3 Kota Subdistricts in Jember Regency still have shortcomings and need improvement. This still needs improvement and there are no standard suggestions for maintenance and repair measures for buildings, especially priorities for utility, architectural and structural components.

Keywords:- *Assessment, Architecture, Structural, Utility, Accessibility, Housekeeping and Maintenance.*

I. INTRODUCTION

The enactment of Law Number 28 of 2002 concerning Buildings, Government Regulation Number 36 of 2005 concerning Implementing Regulations of Law Number 28 of 2002 concerning Buildings and the passing of Jember Regency Regional Regulation Number 09 of 2015 concerning Buildings, need to be followed up to collecting data on state buildings owned by Government of Jember Regency to support the implementation of regional development.Based on the conditions before the issuance of the regional regulation on buildings, the Regional Government of Jember Regency through the Public Housing, Settlement Areas and CiptaKarya Offices has not received a formal or juridical mandate in recording and analyzing building conditions. According to AdjarPrajudi, the Director of Building Management at the Directorate General of Human Settlements of the PUPR Ministry, regional building regulations are important as a controlling instrument for development, both preventive and curative. This is intended so that development in the regions runs orderly, harmoniously, and in harmony with the environment according to the arrangements in spatial planning. Based on the technical aspects, it can guarantee the reliability of buildings in the area in terms of safety, health, comfort and convenience.

Complete and accurate supporting data is required in the framework of planning, implementing and controlling the construction of state buildings in Jember Regency. The data includes, among others, physical conditions, building use, data on land status / history. The data on these state buildings will then be used as the basis for planning, developing, maintaining or even developing the Regional Original Revenue (PAD) of the Government of Jember Regency. In the 2017 Fiscal Year the Government of Jember Regency carried out the work of collecting data on State Buildings belonging to the Government of Jember Regency. The data resulting from this data collection will then be used as the basis for the preparation of a state building management information system.

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On the other hand, guidelines on the Building Function Acceptable Certificate have been issued since 9 August 2007 through the Minister of Public Works Regulation Number 25 / PRT / M / 2007 which aims to realize building reliability in administrative and technical terms. These guidelines include; the suitability of the building with its function and the suitability of the building with the structure and environment. In accordance with the mandate of Government Regulation Number 36 of 2005, the Government requires the enactment of a Building Function Acceptable Certificate (SLF) in 2010 for every public building in metro and large cities. Building SLF must also be implemented by 2020 in all medium and small cities. Currently, some of the main buildings belonging to the government are still not in accordance with the correct building construction rules as mandated in Law Number 20 of 2002. To meet the criteria in the SLF, the building managers should be required to start preparing themselves. The implementation of data collection on state buildings owned by Government of Jember Regency is intended to ascertain the current condition of state-owned buildings, in this case government assets in terms of the number of state buildings of the Government of Jember Regency. The criteria used are physical condition, area, ownership status of the building and land, person in charge, ongoing maintenance, adequacy of technical requirements, licensing status and so on.

The objectives of the activities to collect data on buildings belonging to the State owned by Government of Jember Regency are: (a). Registering all buildings for the purposes of a building information system which aims to find out general data, technical data and data on the status / history of land and / or buildings, (b). Knowing the wealth of government assets, the need for planning and development and maintenance as well as local government data collection and (c). Facilitate the steps of the Government of Jember Regency in determining policies on the status of the state building.

The aims of study were 1) Obtaining a System for Assessment and Maintenance of State building assets of the Government of Jember Regency that supports the reliability of buildings according to the criteria in SLF, 2) Obtaining programs that support the application of the Assessment and Maintenance System for state buildings as assets of the Government of Jember Regency, 3) Knowing Results of the Assessment and Maintenance System Program for the State Building of Government of Jember Regency assets that have been made in the Case Study Objects in 3 City District areas in Jember Regency.

II. LITERATURE REVIEW

➢ *Building maintenance*

Building maintenance is something that needs to be considered by building owners or managers to ensure the comfort and safety of building users. Building maintenance is an important factor in maintaining the sustainability of the building in the future. In creating a building maintenance management system it is important to identify the damage that occurred in the building first. In a study of boarding buildings, technical campuses and medical campuses at a university in Malaysia, it was found that the maintenance of the existing buildings was not optimal and was not well planned. (Gunawan, 2005).

Concrete structure assessment needs to be done to maintain the reliability of the building. Assessment methods must be planned effectively so that corrective action can be taken appropriately. The condition of each component of the structure can be used as a numerical assessment (in numbers). The numerical assessment is made based on the condition of the structure and the effects it causes. The role of each component and its damage to the structure is also the weight of the numerical evaluation. One of the systems used to evaluate the condition of concrete structures that are vulnerable to tropical climates is the Condition Index (CI) method. This method was first developed by the U.S Army corps of Engineers. Assessment is based on measured physical damage. CI is represented by a quantitative rating between 0 and 100. The index serves as a guide for immediate corrective action and further evaluation. Calculating the CI value is a method that is quite close to the value of expert opinion. The condition assessment system using the CI method will provide efficient handling. This method has been used to monitor the state of coastal structures in Malaysia. (Hartoto, 2009).

Certificate of Acceptability or SLF is a building reliability standard issued by Government. Starting from 2010, SLF will become a mandatory document for every building, whether new or long established. The provisions on SLF which are regulated in Law Number 28 of 2002, were issued by Government to ensure the safety of building users. Guidelines on the Building Function Acceptable Certificate itself, have been issued since 9 August 2007, through the Minister of Public Works Regulation Number 25 / PRT / M / 2007. The certificate will be given by a team of experts who will soon be formed by the National Construction Services Development Agency. This Functional Certificate must be owned by the manager of the new building. The old building is also required to have a certificate when renewing the five-year license to the Regional Government. This certificate is the culmination of all existing licenses in the central and regional governments. Until now, only 19 district governments / cities that have responded to the plan to enforce the certificate, while 16 other district / city governments are currently discussing with the legislature. District / city governments that are more ready to impose a Certificate of Worthy Function are especially urban areas that have many multistory buildings (Riana, 2012). For Jember Regency, the Jember Regency

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Regional Regulation Number 09 of 2015 concerning Buildings is passed and needs to be followed up by Government of Jember Regency to collect data on state buildings owned by Government of Jember Regency to support the implementation of regional development.

➢ *Building maintenance systems*

The building maintenance system is in accordance with the 2009 SLF training organized by the Indonesian Building Maintenance Expert Association, including; (Supriyatna, 2008)

1. Architectural Components

Architectural components consist of building exterior components and building interior components. The exterior components include; outer walls, outer doors and windows, roof coverings, listplanks and gutters. damage that is often found in buildings including; leaking roofs, cracked walls, mossy / moldy walls, broken / weathered door windows, weathered electricity planks, clogged / leaking gutters, faded paint. Interior components include; walls & partitions, floor coverings, ceilings, wall coverings, sanitary ware, decorative elements. damage that is often found in buildings including; cracked walls, faded paint, damaged floors, broken ceilings, chalky / rusted sanitary equipment, equipment not functioning.

2. Structural Components

Structural components include; column and shear wall, beam and floor plate, roof truss / roof plate. bad things that affect structural components include; wrong implementation, implementation not in accordance with technical specifications, implementation not in accordance with standard procedures, impact of natural disasters or fire. The damages that are often encountered in the field include; decrease in foundation, sloping foundation, damage to foundation due to tree roots, damage to foundation due to differential settlement, damage to concrete due to sliding molds, damage to concrete due to corrosion, damage to wood due to shrinkage and living things (termites and fungi).

3. Mechanical, Electrical and Utility Components

The maintenance function is to maintain the performance of systems, machines and equipment in accordance with existing specifications, extend useful life, ensure user safety, save costs. maintenance activities include; inspection, repair and overhaul, these three things are maintenance history.

The maintenance type consists of; breakdown maintenance, preventive maintenance, corrective maintenance, predictive maintenance. In breakdown maintenance repairs are not carried out until a machine / equipment fails to function. Preventive maintenance is a maintenance program carried out to reduce or prevent damage. In corrective maintenance, care is done to correct existing problems. Predictive maintenance is the prevention of failure of equipment, systems, through monitoring the condition of the equipment using vibration, infrared, ultra sound, lubricating oil data, so that equipment maintenance needs can be determined. Components in mechanical, electrical and building utility maintenance include maintenance of clean water supply systems, maintenance of sewage systems, maintenance of electrical installations, maintenance of elevators, fire fighting systems and air conditioning maintenance (Susilo, 2009)

4. Outer Space Components

Outer spatial components include; Neighborhood paths / roads, parking areas, landscaping, gates & fences, gutters / drainage, outdoor lighting. damage that is often found on environmental footpaths and parking lots including; cracked or uneven surfaces, crumbled surfaces, sticking out surfaces, eroded outer layers, damaged / missing signs. Elements in landscaping include softscape, hardscape, landscape, and furniture. The things that are often encountered are; grass is not maintained, trees are withered and infertile, parks are full of dirt or rubbish, plaza surfaces have collapsed, plaza surfaces are sticking out, the outer layer is eroded, trash cans and seats are damaged, directions are damaged.

5. Accessibility Components

Includes access roads, exits, hirizontal relations between spaces, vertical relationships in buildings and vertical transportation facilities, as well as providing evacuation access for building users, including the ease of finding, finding, and using rescue tools in an emergency for residents and especially for persons disabled, elderly, and pregnant women, especially for public service buildings.

6. Housekeeping Management System

Housekeeping management, also known as house keeping, is a home or building maintenance management that aims to maintain cleanliness, beauty, health, order and security. scope of work in housekeeping management includes; maintenance of building exteriors, building interiors, furniture and sanitation, and controlling pests. The scope of cleaning work services in the housekeeping management system is in accordance with the 2009 SLF training, which was delivered by the Chairperson of the Expertise Certification Agency for the Indonesian Building Maintenance Expert Association, including; Routine work, Special cleaning work, General cleaning, Daily cleaning, Immediate cleaning, Periodic cleaning. A checklist for building maintenance, including; indoor air quality,

III. METHOD

The objects of this research are state buildings in 3 urban sub-districts in Jember Regency. These buildings are a manifestation of public services in Jember Regency. This research is a research with quantitative descriptive method by processing descriptive data and quantitative data (Best, 1982). Data analysis was carried out in stages 1) Analyzing the sub-components in the Building Reliability System Development Based on the Regulation of the minister of public work number:24/PRT/M/2008; 2) Creating a building maintenance and repair system in 3 sub-districts of Jember Regency; 3) Creating a program that helps assessments and provides a system for building maintenance and repair of buildings in 3 sub-districts of Jember Regency in accordance

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with building conditions and 4) Making priority programs for handling the maintenance and / or maintenance of state buildings in 3 urban sub-districts in Jember Regency using the Confirmatory Factor Analysis (CFA) with alternative end results, namely (1). Maintenance, (2).Care and (3). Reconstruction and 5) Making conclusions and suggestions

IV. RESULT AND DISCUSSION

- *Systems and Methods for Assessment and Maintenance of State Buildings, Jember Regency Government Assets that Support Building Reliability in Accordance with Building Assessment Criteria*

The building reliability assessment component in 3 urban sub-districts in Jember Regency is made by referring to the Building Function Acceptable Certificate (SLF) issued by the Ministry of Public Works (Kementrian PU). Buildings in 3 urban sub-districts in Jember Regency have certain characteristics with special components, so it is necessary to create a special program to assess the reliability of these buildings. The building reliability assessment program in 3 urban sub-districts in Jember Regency is made on the basis of the components of the SLF Form, then each existing component is reviewed and then adjusted to the existing buildings in 3 urban sub-districts in Jember Regency.

The building reliability assessment form in SLF Building has 5 components that are assessed including Architectural, Structural, Utilities, Accessibility and Spatial and Building Layout. The five components each have a certain weight as a measure of the reliability of the building. As a building with a special function, buildings in 3 urban sub-districts in Jember Regency have certain components that have been determined in the Job Description List that has been determined by the Ministry of Public Works.

The analysis was carried out on each sub-component of the assessor, namely the Analysis on the Architectural, Structural, Utility, Accessibility and Spatial Planning and Building Components. The analysis was carried out by comparing the components contained in the SLF Building Form with the components contained in buildings in 3 urban sub-districts in Jember Regency. This comparison will show the components of the assessment and weighting that are in accordance with the conditions of the building in 3 urban sub-districts in Jember Regency.If the components in the SLF Form match the building conditions in 3 urban sub-districts in Jember Regency, there is no need to re-weigh them. Weights used in building appraisals In 3 urban sub-districts in Jember Regency can directly use the weights that are in the SLF Building Form. However, if the components in the SLF Form do not match the building conditions in 3 urban sub-districts in Jember Regency, it is weighted again. Re-weighting is done by distributing the weight of the sub components proportionally.Based on the analysis that has been carried out, for the Sub-Component Sub-component, all components are in accordance with the SLF Form, so there is no need for re-weighting.

Based on the results of data analysis, it is known that the differences in the sub-components including the sub-components that are in the accessibility component between the SLF Building and the SLF in 3 urban districts in Jember Regency have changed. The difference in the sub-components of the building is due to differences in the technical specifications of the plans in 3 urban sub-districts in Jember Regency with the SLF Gedung.

Component	Weighting		
	Patrang	Kaliwates	Sumber sari
Architecture	10	10	10
Structure	30	30	30
Utilities	50	50	50
Accessibility	5	5	5
Building and Environmental Planning	5	5	5
Total Constraints	100	100	100

Table 1:- Result of Building Reliability Assessment in Jember City

- *Analysis of building maintenance systems in 3 urban districts in Jember Regency*

Analysis of the building maintenance system in 3 urban sub-districts in Jember Regency is compiled based on the results of components that have been previously analyzed. The analysis carried out includes analysis of architectural, structural, utility, accessibility and spatial and building components based on the Regulation of the minister of public work number:24/PRT/M/2008

Priority program for handling the maintenance and / or maintenance of state buildings in 3 urban sub-districts in Jember Regency using the Confirmatory Factor Analysis (CFA) method with an alternative final result, namely (1). Maintenance, (2).Care and (3).Reconstruction.

Analysis of the building maintenance system in 3 urban sub-districts in Jember Regency is compiled based on the results of components that have been previously analyzed. The analysis carried out includes analysis of architectural, structural, utility, accessibility and spatial and building components based on the Regulation of the minister

of public work number:24/PRT/M/2008. After the building maintenance and repair system table is carried out, with reference to a literature study regarding the Development of a Building Reliability System Based on the Regulation of the minister of public work number:24/PRT/M/2008, maintenance and building maintenance measures are taken.

Based on the CFA analysis, it shows that there are only 3 factors that have an Eigenvalue> 1.The first factor has an Eigenvalue value of 5.891, the second factor has an Eigenvalue value of 4.032, the third factor has an Eigenvalue value of 2.946, the fourth factor has a value of 2.252, the fifth factor has a value of 1.831 , the sixth is 1.583, the seventh has a value of 1.284, the eighth has a value of 1.100 and the ninth has a value of 1.023. So from the existing 33 variables, only 9 factors were formed that represented them.

At the factor rotation stage, there is a cut off point rule so that a variable can be included in a factor. The limiting figure is 0.50. According to Ghozali (2002: 258) if a certain variable has the highest factor loading value for a particular factor among other factors, but the value of the factor loading is less than 0.50 then the variable cannot be included in any factor or in other words the variable must be excluded. of the model. Based on the Rotated Component Matrix, the variables are grouped into factors. There are 9 (eight) variables that meet the minimum standard of limiting numbers so that the variables fall into 9 (eight) components and must form a model. This is done based on the factor loading value.

After the process of grouping the variables based on factor rotation, the next step is to interpret the factors. In factor analysis, variables that have experienced extraction are grouped and named according to the variables covered by the factor. Sometimes the naming of factors is not correct because of the difficulty in generalizing the existing variables, however, a factor must be given a name that reflects the content of the factor as much as possible. The nine factors are:

The formed factor is a priority for building maintenance based on its components as follows.
Priority 1 = Clean Water Source, Number of Bathrooms, Number of Bathrooms,
Number of Toilets, Septic Tank Capacity (Utility 1)
Priority 2 = Building Name, Building Function, Building Floor Area (Architecture 1)
Priority 3 = Ceramic Type, Column type (Structure 1)
Priority 4 = Number of Lights Used, Number of Lights Damaged (Accessibility)
Priority 5 = Ceramic Size, Wall Material (Structure 2)
Priority 6 = source of electricity, Lightning Protection
Priority 7 = Number of Building Floors, Height of Buildings (Architecture 2)
Priority 8 = Type of Foundation Structure, Roof Condition (Architecture 3)
Priority 9 = Land Ownership Status (Administrative)

Based on the results of the factor analysis, the maintenance and maintenance systems are prioritized on 9 components each for which an appropriate maintenance program will be recommended. Regulation of the minister of public work number:24/PRT/M/2008 Dated December 30, 2008 described the maintenance method based on each component in the maintenance system described earlier.

V. CONCLUTION AND RECOMENDATION

Based on the results of data analysis, several conclusions can be explained as follows. 1) The Jember Regency Government's asset rating and maintenance system that supports building reliability according to the criteria in the SLF shows that all reliability components, including architectural components, building structures, utilities and environmental housekeeping are appropriate, while the accessibility components are recalculated. The results of the criteria show that all components are reliable; 2) Programs that support the application of the Assessment and Maintenance System for the State building assets of the Jember Regency Government are created using a systematic maintenance system table according to each component. The Assessment and Maintenance System for state buildings as assets of the Jember Regency Government shows that the reliability value of the building is reliable even though there must be good maintenance. This is due to the fact that in order to meet reliability, a Code of Action for Maintenance and Repair of Buildings has been made in the program so that the appropriate maintenance method will be determined in the maintenance system of 3 buildings in Jember City; 3) The results of the implementation of the Jember Regency Government asset assessment and maintenance system program that has been made in the Case Study Objects in 3 Kota Subdistricts in Jember Regency still have shortcomings and need improvement. This still needs improvement and there are no standard suggestions for maintenance and repair measures for buildings, especially priorities for utility, architectural and structural components based on the results of CFA analysis.

Suggestions that can be put forward include 1) It is necessary to conduct a more in-depth evaluation and study of the assessment criteria in the SLF Building, especially in architectural and structural components; 2) It is necessary to clarify in the regulations regarding the components of building maintenance, the regulations should be more standardized in maintenance; 3) It is necessary to check and update periodically on the System; 4) Maintenance and Repair of buildings in 3 sub-districts of the city in Jember Regency with science and technology and 5) Priority for maintenance on components that really need maintenance so that damage does not occur.

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