ASSESSMENT ON TRANSIT ORIENTED DEVELOPMENT PONDOK CINA ACCORDING TO GBCI

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ABSTRACT

TOD is designed for public transport passengers and pedestrians to provide comfort and safety in creating a healthy lifestyle. Green Building Council Indonesia (GBCI) is needed as a reference and assessment to optimize building design. The purpose of this paper is to determine the extent of the green building concept applied, calculate the met and unmet Greenship criteria, also measure the GBCI Greenship predicate obtained. The data collection method used is project data and data analysis with the index scale method on Greenship New Building version 1.2. The results showed that in Appropriate Land Use categories credit are 11 points of 17 maximum points with percentage 64,71%, the Efficiency and Energy Conservation categories credit is 1 point of 26 maximum points with percentage 3,85%, the Water Conservation categories credit are 9 points of 21 maximum points with percentage 42,86%, the Source and Material Cycle categories credit are 2 points of 2 maximum points with percentage 100%, the Health and Safety Space categories credit are 4 points of 5 maximum points with percentage 80%, and the Building Environmental Management categories credit are 4 points of 6 maximum points with percentage 66,67%. The final results of TOD Pondok Cina Project are 31 points of 77 maximum points with percentage 40,26% which categorized as Building with Bronze predicate.

Keywords: Green Building; Green Building Council Indonesia (GBCI); Greenship for New Building Version 1.2

INTRODUCTION

Transit Oriented Development (TOD) has been widely recognized as a concept that answers the needs of the transit area. The area around the transit point is a potential area for development. This is related to the ease of access offered by areas close to transit facilities and activities that may be generated by transit activities in the area (Huang, 2021).

The formulation of the research problem includes: Whether the criteria contained in the Greenship category have been met in the TOD Pondok Cina project?; How is the effort to assess the Green Building concept at TOD Pondok Cina?; What parameters are used to measure the concept Green Building at TOD Pondok Cina? (Nurwidyaningrum, 2019).

The limitations of the problem to be discussed in this study are: the criteria studied are using the existing criteria in Greenship New Building Version 1.2 GBCI at the Recognisi Design (DR) for the TOD Pondok Cina project; does not perform landscape area calculations with regulations PU No. 5/PRT/M/2008 about RTH Pasal 2.3.1, Energy consumption calculations using software, OTTV value calculation by SNI 03-6389-2011, Calculation of light intensity, Calculation of CO_2 emission reduction (Priadmaja, 2018).

The objectives of this study include: Knowing the Green Building assessment using Greenship made by GBCI in the Project TOD Pondok Cina; Calculating the GBCI Greenship Criteria that have been met and those that have not been met by TOD Pondok Cina; Analyzing the Green Building predicate/rating according to the GBCI Greenship obtained by the TOD Pondok Cina Project (Trepci et al. 2020).

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The implementation of Green Building not only provides ecological benefits but also has economic value because it can reduce building operational and maintenance costs. An environmentally friendly building (Green Building) is a building that applies environmental principles in its design, construction, operation, and management and important aspects of handling the impacts of climate change (Wimala et al. 2016).

Design Recognition Stage (DR), with a maximum score of 77 points. At this stage, the project team has the opportunity to receive a provisional award for the project at the design and planning finalization stage based on the Greenship assessment tool. This stage is passed as long as the building is still in the planning stage.

The criteria on the GBCI greenship are: Prerequisite criteria are criteria that exist in each category and must be met before further assessment; Credit criteria are criteria that exist in each category and do not have to be met; Bonus criteria are criteria that allow the provision of added value. Besides not having to be fulfilled (Purwaningsih et al. 2018).

According to the GBCI Greenship Rating Tools, the 100% achievement based on the Greenship assessment tool for the Design Recognition Stage is 77 points. This figure is the basis for determining the percentage of achievement. Following are the rankings that can be achieved, namely Platinum with a percentage of 73% with a minimum score of 56 points; Gold with a percentage of 57% with a minimum score of 43 points; Silver with a percentage of 46% with a minimum score of 35 points; Bronze with a percentage of 35% with a minimum score of 27 points.

Abdul Kamarzuki in Jakarta February 15, 2019 conveyed the aim of developing a TOD that diverts some private car users or public land transportation to rail-based public transportation, because the main objective of this development concept is to reduce congestion due to the use of private vehicles, rail-based public transportation is the main thing, besides being able to carry passengers in large capacities, high frequency headways can also increase the mobility of people in the area, but the development of this TOD must also be followed by the development of areas around the TOD area (Arsindo, 2019).

METHODS

The research was conducted at the Pondok Cina TOD construction project.

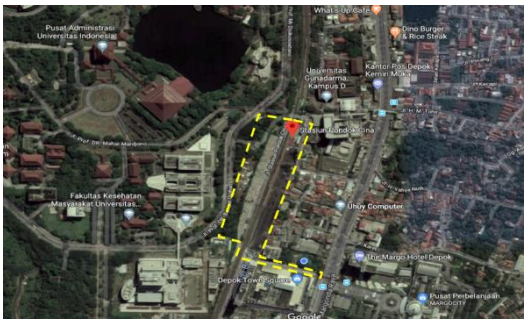

Figure 1. Location of the Pondok Cina TOD Project

The research is focused on the assessment of the New Building Version 1.2 greenship that occurred in the TOD Pondok Cina construction project (Citaningrum, 2018).

The stages carried out in this research are Phase I is the preparation stage. steps taken are identifying and formulating problems, determining research objectives, digging literature, and making checklist forms as data collection instruments; Phase II This is called the stage of finding data and collecting data; Stage III Recapitulation of data that has been collected, and scoring against the criteria that have been met by the project, as well as calculating the point value of each scope of the criteria; Stage IV This is called the

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data analysis stage. The steps taken were processing the results of the assessment from the recapitulated data to obtain the predicate results; Stage V The stage of discussing the results of the data that has been analyzed. The steps taken are discussing and describing the results of the analysis regarding the evaluation of the greenship criteria, drawing conclusions, and providing suggestions. The following is a picture of the research flow diagram.

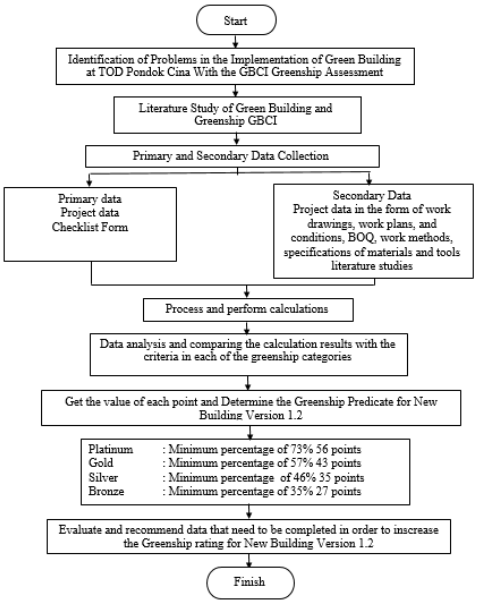

Figure 2. Research Flowchart

The data collection methods are:
The primary data in this study are data obtained by the authors of the TOD Pondok Cina project which is related to the GBCI Greenship assessment criteria data. Written notes, cell phones, and image documentation tools were used to complement data collection. Primary data is obtained from the following activities: a) Collecting Project Data regarding general project data, technical data, plan drawings, calculation data, implementation methods, data on specifications for tools and materials used, volume plans of work, location of the closest existing facilities in the building as well as surrounding buildings and other data Checklist form where the primary data are obtained from TOD Pondok Cina then presented in the form of a form checklist to find out the criteria Greenship New Building Version 1.2 GBCI has been and what has not been filled by TOD Pondok Cina (Prasaji et al. 2012).

RESULTS AND DISCUSSION

After doing the analysis Eligibility has obtained the results of the due diligence are shown in the table following.

Table 1. Building Feasibility

Criteria	Appropriateness	
	Fulfilled	Unfulfilled
Minimum Building Area is 2500 m²	√	
The availability of building data to be accessed by GBC Indonesia is related to the certification process		√
The function of the building is by the land allotment based on the local RTRW	√	
Ownership of AMDAL and/or Environmental Management Effort (UKL) / Environmental Monitoring Effort (UPL) plans	√	
The building's compliance with fire safety standards	√	
The building conforms to earthquake resistance standards	√	
The building conforms to earthquake resistance standards	√	

In Table 1 Feasibility Test (Eligibility) there are 6 (six) criteria has met the standard of due diligence, and 1 (one) criterion has not been fulfilled.

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit and index results in categories Appropriate Site Development as follows (Peraturan Daerah Kota Depok Nomor 13 Tahun 2013).

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Table 2. Summary of Appropriate Site Development (ASD)

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
ASD P	Basic Green Area	P	√		
ASD 1	Site Selection	1	√		1
		2	√		1
ASD 2	Community Accesibility	1	√		1
		2	√		1
		3	√		2
		4		√	0
ASD 3	Public Transportation	1	√		1
		2	√		1
ASD 4	Bicycle Facility	1		√	0
		2		√	0
ASD 5	Site Landscaping	1A		√	0
		1B		√	0
		2		√	0
ASD 6	Micro Climate	1A/1B		√	0
		2		√	0
		3A/3B	√		1
ASD 7	Stormwater Management	1A/1B	√		1
		2	√		1
		3		√	0
Total Indexs					11

In the Appropriate Site Development (ASD) on the pre-requisite criteria fill the green base area, and on credit, criteria obtained a total index of 11 (eleven) points. Land use category is a form of a design business a building that pays attention to the field of facilities and infrastructure in form of resource efficiency.

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit, and index results in categories Energy Efficiency and Conservation as following (Peraturan Daerah Kota Depok Nomor 10 Tahun 2010).

Table 3. Summary of Energy Efficiency and Conservation (EEC) points

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
EEC P1	Electrical Sub Metering	P	√		
EEC P2	OTTV Calculation	P		√	0
EEC 1	Energy Efficiency Measures	1A/1B/1C		√	0
EEC 2	Natural Lighting	1		√	0
		2		√	0
EEC 3	Ventilation	1	√		1
EEC 4	Climate Change Impact	1		√	0
EEC 5	On Site Renewable Energy	1		√	0
Total Indexs					1

In the category of Energy Efficiency and Conservation (EEC) on the prerequisite, criteria have met the installation sub-meter, and on credit, criteria obtained a total index of 1 (one) point. Energy Efficiency and Conservation Category is a concept that manages energy use better and deep savings use of electrical energy (Inayati et al. 2017).

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit and index results in categories Water Conservation as follows.

Table 4.Summary of Water Conservation (WAC)

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
WAC P1	Water Metering	P	√		
WAC P2	Water Calculation	P		√	
WAC 1	Water Use Reduction	1		√	0
		2			0
WAC 2	Water Fixtures	1A/1B/1C	√		3
WAC 3	Water Recycling	1A/1B	√		2
WAC 4	Alternative Water Resources	1A/1B/1C		√	1
WAC 5	Rainwater Harvesting	1A/1B/1C	√		3
WAC 6	Water Efficiency Landscaping	1			0
		2			0
Total Indexs					9

In the category of Water Conservation (WAC) on the prerequisite, criteria have met water meter, and on credit, criteria obtained a total index of 9 (nine) points. The Water Conservation category is a managing concept of better water use and savings in water usage clean (Hajji et al. 2018).

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit, and index results in categories Source and Material Cycles as following.

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Table 5. Summary of the points earned in Material Resources and Cycle (MRC)

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
MRC P	Fundamental Refrigerant	P	√		
MRC 1	Building and Material Reuse	1A/1B		√	0
MRC 2	Environmentally Friendly Material	1		√	0
		2		√	0
		3		√	0
MRC 3	Non ODS Usage	1		√	0
MRC 4	Certified Wood	1		√	0
		2		√	0
MRC 5	Prefab Material	1	√		1
MRC 6	Regional Material	1	√		1
		2		√	0
Total Indexs					2

In the Material Resources and Cycle (MRC) category on the prerequisite, criteria have met the fundamental refrigerant, and on the credit, criteria obtained a total index of 2 (two) points. Source Category and A matter cycle is a formed effort in the use of materials environmentally friendly building (Suparwoko & Taufani, 2017).

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit, and index results in categories Indoor Health and Comfort as follows.

Table 6. Summary of the points Indoor Health and Comfort (IHC)

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
IHC P	Outdoor Air Introduction	P	√		
IHC 1	CO_2 Monitoring	1		√	0
IHC 2	Environmental Tobacco Smoke Control	2	√		2
IHC 3	Chemical Pollutant	1	√		1
		2		√	0
		3		√	0
IHC 4	Outside View	1	√		1
IHC 5	Visual Comfort	1		√	0
IHC 6	Thermal Comfort	1		√	0
IHC 7	Acoustic Level	1		√	0
Total Indexs					4

In the category Indoor Health and Comfort (IHC) on the prerequisite criteria have met the introduction of outside air, and on criteria, credit obtained total index 4 (four) points. Category Indoor Health and Comfort is a form of business to control healthy and comfortable air quality (Peraturan Daerah Kota Depok Nomor 1 Tahun 2015).

Obtaining points from the results of the analysis on any prerequisite criteria, criteria credit, and index results in categories Building Environment Management as follows.

Table 7. Summary of the points earned for Building Environmental Management (BEM)

Code	Criteria	Benchmark	Fulfilled	Unfulfilled	Index
BEM P	Basic Waste Management	P	√		
BEM 1	GP as a Member of Project Team	1		√	0
BEM 2	Pollution of Construction Activity	1	√		1
		2	√		1
BEM 3	Advanced Waste Management	1	√		1
		2	√		1
BEM 4	Proper Commisioning	1		√	0
		2		√	0
BEM 5	Green Building Submission Data	1		√	0
		2		√	0
BEM 6	Fit Out Agreement	1		√	0
BEM 7	Occupant Survey	1		√	0
Total Indexs					4

In the category Building Environment Management on criteria, the prerequisite has met the basics waste management, and on criteria, credit obtained total index 4 (four) points. Building Environment Management Category is a form of an effort to encourage management garbage and also building using an environmentally friendly building. Total points earned on each categories can be seen in the following table (Dong, 2021).

Table 8. Total points

Categori	Total Value		
	Credit	Bonus	Percentage
Appropriate Site Development	11	-	14,29 %
Energy Efficiency and Conservation	1	0	1,30 %
Water Conservation	9	-	11,69 %
Material Resources and Cycle	2	-	2,60 %
Indoor Health and Comfort	4	-	5,19 %
Building Environment Management	4	-	5,19 %
Total	31	0	40,26 %

Based on the data obtained from the Pondok Cina TOD project and calculating the GBCI greenship

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assessment using the data checklist method that has been met and that which has not been fulfilled by the Pondok Cina TOD project, the total index results are in the Appropriate Land Use category with a credit score of 11 points from 17 maximum points. and a percentage of 64.71%, in the Energy Efficiency and Conservation category with a credit score of 1 point out of 26 maximum points and a percentage of 3.85%, in the Water Conservation category a credit score of 9 points from 21 points maximum and a percentage of 42.86%, in the category Source and Material Cycle credit score of 2 points from 2 maximum points and a percentage of 100%, in the category of Health and Safety in Space, a credit score of 4 points out of 5 maximum points and a percentage of 80%, in the Building Environmental Management category, a credit score of 4 points from 6 points maximum and the percentage is 66.67%.

CONCLUSION

The final result of the scoring is the point earned obtained by the TOD Pondok Cina project are 31 (thirty-one) points with a percentage of 40.26% where can be categorized as a building Bronze predicate. The Green Building has been implemented with the GBCI greenship assessment although there are a few criteria on the GBCI greenship not fulfilled by TOD Pondok Cina.

Meanwhile, the final results of the acquisition assessment points earned by the TOD Pondok Cina project are showing results which are good because it can fulfill almost half of the total points the maximum that can be categorized as a Bronze predicate building. This research can be suggested to be further research where can be one reference for Green Building assessment in buildings that will be built and green building assessments using GBCI standards at an advanced or final stage.

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