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LOW-COST STRATA MAINTENANCE ISSUES AND COST IMPACT

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Abstract
The economic and social developments in Malaysia have encouraged internal migration of locals from rural to urban areas, in response to this migration, the government initiates high-rise developments for housing to fulfil these movements. Maintenance work practices aims to benefit the building's operational age. Maintenance includes all building elements including the façade, flooring, plumbing, electrical and structural maintenance. The aim of this study is to identify the most common maintenance issue that occurred and reported within selected strata schemes. The objective is to identify maintenance issues as reported and observed by strata management bodies and which have the highest cost impact according to the management bodies. A survey involving 50 strata management bodies within the Klang Valley amongst low and medium low-cost strata schemes were conducted and analysed. The result shows that the top three most common maintenance issues are clogged plumbing roofing structure, leakage, and sewer pipe maintenance whilst maintenance with highest cost impacts are relating to general repair, maintenance works and general electrical supply maintenance. Other problems include small but repetitive repairs such as corridor lightings, drainage clogging, leakages and other works that generally affect the residents' use and enjoyment of the common properties.

Keyword: residential strata, strata management, maintenance issue, cost impact

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INTRODUCTION

The economic and social developments in Malaysia have encouraged internal migration of locals from rural to urban areas, in response to this migration, the government initiates high-rise developments for housing to fulfil these movements. This strata concept was introduced in the National Land Code 1965 (NLC/KTN) in accordance to a referred model of the New South Wales Conveyancing (Strata Titles) Act 1961, Australia. The strata ownership concept allows scattered ownership in respect to accessory parcels, phases and division and unification of parcels, which however was not included under the NLC's provisions, but was later included under the Strata Titles Act 1985.

As of 2017, after 32 years of enforcement of Strata Titles Act 1985, a total of 1,282,156 strata titles were registered throughout the Peninsular of Malaysia. This is an increased record in comparison to after 4 years of STA enforcements of only 20,000 registered strata titles. This increase shows the significance of having a well-developed strata law to ensure efficient transactions of strata properties indirectly resulting to increase the national income potential through stamp duty, parcel and assessment taxes.

LITERATURE REVIEW

Common Facilities

The increasing number of purchasers opting to own strata properties; thus, it is equally important for the strata owners and tenants to understand the difference between a shared facility, ancillary parcels and outside of strata schemes. Distinguishing between these elements is crucial in identifying which facility and amenities fall under the responsibilities of the strata owners and which falls under the responsibilities of the strata management bodies.

There are 3 elements to a strata scheme, namely the common property, the parcel and the outside of strata scheme. The main focused element for this study is the common property, consisting items like the roof, water tank, gutter, rainwater down pipe, external wall. Sewer pipe, apron and drainage, common use window, retaining wall, playground, fence, sewer pipe, manhole, garbage house, prayer hall, hall, lift, staircase and corridor. The table below shows the simplified illustration that differentiates between the 3 strata elements.

Table 1: Elements of strata building

Common property
(i) Roof leakage
(ii) Water tank leakage
(iii) Gutter leakage
(iv) Rainwater down pipe leakage
(v) External Wall damages (crack, painting, etc)
(vi) Sewer pipe leakage

(vii)	Crack on apron / drainage
(viii)	Common use window
(ix)	Retaining wall
(x)	Playground
(xi)	Fence
(xii)	Sewer pipe
(xiii)	Manhole
(xiv)	Garbage house / hall and prayer hall
(xv)	Lift
(xvi)	Staircase & Corridor
Parcel	
(i)	Internal Wall damages (crack, painting, etc)
(ii)	Floor leakage
(iii)	Pipe leakage / clogged
(iv)	Units' window
Outside of Strata Scheme	
(i)	Outside the compound fences
(ii)	External Slopes
Items in this element is under the maintenance and management of the local authority or the related service provider	

Source: Infographic KPKT (n.d)

Building Maintenance

Maintenance is a practice that is performed to benefit the building's life cycle and an attempt to prolong the building's operational age. Building maintenance is defined as the combination of technical and administrative actions, inclusive of supervisions, and actions to perform maintenance works. Maintenance works can either be a repair, prevention and replacement works, whichever is necessary for the facilities to be in an acceptable operational condition within minimum and / or efficient cost (Jaini et al., 2022; Zawawi et al., 2016).

Facilities maintenance includes all building elements like the facades, flooring, plumbing, electrical and structural maintenance. In other words, maintenance and repair works are inclusive of works that include reasonable measure to ensure and/or improve the use and enjoyment of strata owners, to remove any nuisance, as well as ensuring that the properties are in good state and serviceable repair. An efficient maintenance management involves strategic planning by the management body and each corporation would commonly have an established own management procedure to ensure overall cost efficiency and well-planned maintenance works. Each maintenance involves the following components (El-Haram & Horner, 2002; Jaini et al., 2022):

I. General management
II. Staff management

III. Financial management
IV. Contractor
V. Technical and technology
VI. Building
VII. Awareness

The above components contribute to the overall budget planning for maintenance works. Hence strategic information storing and budget allocation for maintenance resources are extremely important especially with the knowledge on maintenance works with higher cost impacts as well as its repair and maintenance frequencies.

The core function of the strata managing bodies, i.e., the Joint Management Body (JMB) and Management Committee (MC) comprises to maintain and manage facilities and amenities especially the common shared properties (KPKT, 2020). Maintaining property incorporates technical and administrative activities towards maintaining and restoring the original condition of the building, ensuring that all building components inclusive of the structure, function and aesthetics are equally taken care of (Kampamba et al., 2020).

Quality records can prevent misplacement and loss of records especially for managers that confirm manual record keeping. The COB's effort to transit from manual system to an electronic or computerized benefitted both the COB in monitoring the management bodies activities as well as easing the management bodies, record keeping, which will also improve the data reliability (Norolazmi et al., 2018).

Issues in strata maintenance

According to another study done on strata management, it was concluded that enforcement actions taken against defaulters are related to matters of finance, either due sum of maintenance fee or failure to contribute to sinking funds. The following table shows the summarised enforcements taken:

Table 2: Summary of enforcements taken between 2017 to 2020

	Description / Offences	Number of Cases
1	Procedure **on recovery of sums due**	22,862
2	Failure to comply to services of any person or agent to maintain and manage common property	4,151
3	Strata Roll	1,229
4	Criminal penalty for failure to comply with award	652
5	Duties and powers of developer during developer's management period	545
6	Parcel owners to pay Charges and contribution to the sinking fund	500

	Description / Offences	Number of Cases
7	Failure of developer to convene first annual general meeting of joint management body	175
8	Failure to comply to duties of joint management body in relation to accounts	131
	Total	**30,245**

Source: (Ainul Ashiqin et al., 2022)

The poor collection of maintenance fee influences the management body's ability to procure resources. Poor fee collection causes shortage of financial resources especially in resourcing for skilled personnel for administrative purpose, as well as technical works for labour, material and equipment (Kampamba et al., 2020). Fee collection significantly affects the overall maintenance and management budgeting in delivering efficient building maintenance, consequently reduces prolonged budget shortages, constraints and cost overruns (Gala Mong et al., 2018).

Other than issues in financial resources, other top three most critical issues in maintaining and managing high-rise residential building are; (i) managing expectations of strata owners to JMB is more complex and challenging; (ii) managing bodies' difficulties in getting support from strata owners; and (iii) poorly planned future maintenance (Abas et al., 2021). Managing expectations can be seen through the strata owners' / tenants' satisfaction level towards the overall maintenance and management which is often hard to satisfy. Whilst having high expectations, strata management bodies simultaneously have difficulties in receiving the support from residents, either through contribution of maintenance fee or attendance in annual general meetings.

Similarly, conclusions from the said study are further supported in another study conducted by Noor Suzilawati et al., (2021), Table 3 and Wahi et al. (2018), Table 4, both studies showing consistencies between the damage frequencies and satisfaction level on maintenance of related facilities.

Table 3: RII Frequency of damages

Types	**Rank (RII value)**
Vandalism	1 (0.910)
Water tank leaking	2 (0.905)
Pipes leaking or clogged	3 (0.900)
Damages to surau /hall	4 (0.890)
Roof leaks	4 (0.890)
Clogged manholes	5 (0.885)
Poor garbage houses	6 (0.875)
Clogged rainwater down pipes	7 (0.860)
Poorly maintained or damaged playgrounds	7 (0.860)

Clogged perimeter drains	8 (0.855)
Cracks in wall	8 (0.855)
Between floor/wall leaks.	9 (0.840)

Source: Noor Suzilawati et al. (2021)

Table 4 Satisfaction level on high rise low cost housing issues

Types	**Rank (RII value)**
Roof leakage	1 (0.742)
Criminal cases	2 (0.702)
Noise	3 (0.586)
Corridor lighting	4 (0.559)
Drainage system	5 (0.531)
Internal ventilation	6 (0.479)
Fire door	7 (0.459)
Corridor spaces	8 (0.452)
Staircase condition	9 (0.444)
Safety walking under uncovered corridor	10 (0.418)
Material quality	11 (0.403)
House design	12 (0.398)
Plumbing system	13 (0.384)
House workmanship	14 (0.381)
Handicap facilities	15 (0.365)
Lift numbers	16 (0.354)
Lift size	17 (0.352)
Lift maintenance	18 (0.342)

Source: (Wahi et al., 2018)

Whilst the study in Table 3 and Table 4 shows a different set of maintenance elements, some items or elements are considered common. Though different terms were used between the two studies, criminal cases and vandalism, roof leaks, and drainage systems showed significance (high RII value) in both studies.

Aside from poorly planned maintenance or generally poor support from the residents, another contributing issue resides even before the building's occupancy with operating management bodies that is during the planning and the construction period. This would explain the initial quality of the facilities provided that results in frequencies of damages and the future incurred maintenance cost. Developers inclusive the design and construction team should be actively involved during the construction stage starting from the pre planning, design until the construction as their input and experience has great influence on the overall building quality, subsequently affecting the building's life cycle cost (Abas et al., 2021; Kampamba et al., 2020). Such involvement should be able to

improve documentation and to reduce issues for management bodies to plan more strategic maintenance plannings with the support of full details on the facilities and warranties provided. Lateef (2009) has further suggested that a value-based maintenance management can significantly be improved through controlled construction quality. This study will further investigate the most common maintenance issue and which maintenance and repair work has the most cost impacts.

RESEARCH METHODOLOGY

This paper is based on strata managements' experiences in managing and maintaining strata properties. The survey was distributed via online and face to face survey sessions with representatives of 50 management bodies involving 50 strata low and low-medium cost strata schemes within the Klang valley area. The strata management were enquired on the most frequent maintenance issues regarding the common facilities within their respective strata schemes. based on the itemised maintenance works, the management bodies were also enquired on which of the maintenance works incurred the higher cost by comparison.

ANALYSIS AND DISCUSSION

Responses from 50 representatives of strata management bodies were analysed. Table 5 shows the distribution of respondents involved in this study.

Table 5: Management Bodies' Background

Variables	Components	Percentage (%)
Management Body	Joint Management Body (JMB)	48%
	Management Committee (MC)	50%
	Managing Agent	2%
Local Authority	MB Kajang	21
	MB Shah Alam	12
	MB Petaling	17
Type of Strata Scheme	Low Cost	31
	Low Medium Cost	19
No.of Blocks	1-5 Blocks	44
	6-10 Blocks	4
	10> Blocks	2
No. of Units	1-200 Units	30
	201 – 400 Units	9
	401 – 600 Units	8
	601 – 800 Units	2
	801 > Units	1
No.of Lifts	No Lifts	37

Variables	Components	Percentage (%)
	1-4 Lifts	11
	5> Lifts	2

Source: Author (2022)

The respondents were questioned on the frequencies of repair and maintenance works on elements in shared strata properties in the questionnaire form. Based on the responses given, between least frequent to most frequent, the Relative Importance Index (RII) was calculated and the results are shown in the table below.

Table 6: Items requiring most frequent to least repairs and maintenance works using RII (According to Management Bodies)

Item	RII	Rank
Clogged Plumbing	0.745	1
Roofing	0.715	2
Sewer Pipe	0.705	3
Manhole	0.700	4
Leakage	0.665	5
General Drainage	0.615	6
Vandalism	0.595	7
Rainwater down pipe	0.580	8
Unit windows	0.390	9
Compound Fencing	0.360	10

Source: Author (2022)

Fifteen (10) elements of shared properties were included as variables according to KPKT's classification of shared strata properties. Based on the result, the highest RII score is 0,745 which is the clogged plumbing, second highest relates to repair and roofing maintenance at RII value of 0.715 and the third highest RII value is 0.705 that is repair and maintenance for sewer pipe. On the bright side, it can be primarily concluded that the strata compound safety is at an acceptable state as they require least repair, which shows minimal to zero break-ins or damages, on both compound fencing and unit windows at RII Further of 0.390 and 0.360 respectively.

Further to the above question, the respondents (management bodies) were questioned on which of the maintenance works has the highest cost impact by comparison. The respondents were asked to evaluate within scale of 1=least cost to 4=highest cost. The result of the question is presented in the following table.

Table 7: Cost impact on Maintenance and Management using RII (According to management bodies)

Maintenance work	RII	Rank
General repair and maintenance work	0.850	1
General Electrical Supply	0.820	2
Management Office Costs	0.810	3
Auditing Fee	0.805	4
Staffing	0.800	5
Electrical system Maintenance	0.795	6
Waste management	0.780	7
Sewage System	0.760	8
Cleaning Service	0.755	9
Maintenance of Fire Fighting System	0.750	10
Information Board / Signage	0.700	11
Parking Space	0.665	12
Landscape Area	0.600	13
Security Body	0.590	14
Elevator	0.575	15
Air Conditioning System	0.495	16

Source: Author (2022)

Maintenance work with the highest cost impact are the general repair and maintenance works (RII = 0.850), this includes works that has immediate effects towards the residents' use and/or enjoyment throughout their strata dwelling. Secondly is the general electrical supply works (RII = 0.820) that includes corridor and staircase lightings, common properties' electrical outlet plugs. The third highest maintenance incurred cost (RII,= 0.810) is regarding maintaining the operation of the management office. Maintaining the management office consists of matters of both direct and indirect costs, hence justifies the cost incurred in maintaining the management office.

The result in Table 7 also indicates maintenance work that has the least cost significance are maintenance of air-conditioner (RII = 0.495), and Elevator maintenance (RII = 0.575). The result for elevator maintenance is on lower RII due to the majority of the responses being from low-cost strata without elevators provided within the strata schemes. Similarly, most low-cost strata schemes do not provide air conditioning in the common facilities, hence explains the contrast the commonly reported, elevators being one of the most critical maintenance issues, due to its cost.

CONCLUSION

The results of this study consistent with studies that shows one of the most critical and common maintenance issue is relating to plumbing and clogging issues,

though it may contrast from another study that shows lifts maintenance as critical issue, the same scenario cannot be imposed on this study as majority of the respondents came from strata schemes without elevator / lifts services, hence similar issue is out of the question.

Based on this study, it can also be concluded that small but repetitive repairs and maintenance has significant cost implications towards cost of maintenance. General repairs the likes of repairing damages caused by vandalism, poor lighting quality, inclusive of common repairs relating to overall use and enjoyment of the strata residents, cumulatively has significant cost impact in maintaining and managing strata properties. Small but repetitive repairs and maintenance is also a result of poor maintenance planning on the management's side. Well documented information, construction and product details plays a significant role in ensuring strategic maintenance plannings. Such documentation and information storing starts from the involvement of related professionals from the design until the construction stage, to ensure the quality of constructed and installed facilities and tools are to code and are able to result in efficient life cycle cost as well as to prolong the building's life span as a whole. COB playing its role in ensuring that the strata management bodies (JMB / MC / Managing agents) to play their roles in efficient management and maintenance of the strata properties goes a long way, especially at the current growth rate of residential strata properties.

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