



STRATA KNOWLEDGE

# MANDATORY INSPECTION REGULATIONS FOR AGEING BUILDINGS: AN ANALYSIS OF INTERNATIONAL TRENDS

**Mandatory Inspection Regulations for Ageing Buildings:  
An Analysis of International Trends**

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## Introduction

Strata schemes are becoming increasingly more complex. Most schemes being developed are larger, have more amenities, and owners corporations must comply with more regulations than ever before. Governing a strata scheme is not an easy task. It is evident that lot owners collectively need to be better equipped to make decisions about their strata scheme. Rarely are owners corporations held to account for poor decision-making. Even more concerning is when laws are ignored because compliance may lead to a financial imposition. Deterrent based penalties for non-compliance are essentially non-existent in strata legislation. Unfortunately, as witnessed in many jurisdictions, ignoring obligations, particularly involving building maintenance, can endanger the safety of residents and the public. There are now too many examples worldwide where tragedies have resulted due to a lack of building care. Buildings deteriorate over time, and it is essential that building maintenance is prioritised. Alarming, the building maintenance provisions in Australian strata legislation are arguably superficial compared to other compliance requirements that are unlikely to result in physical harm.

Obligations placed on owners corporations to, at the very least, maintain the common property has been a central tenet of legislation regulating strata-type properties in many jurisdictions. In Australia, the duty was first recognised in the 1961 New South Wales Conveyancing (Strata Titles) Act requiring bodies corporate to keep the common property in a state of good and serviceable repair and properly maintained.<sup>1</sup> Although today, variations exist across the jurisdictions in terms of this duty's ambit, it is a compliance obligation placed solely on owners corporations, relatively free from government oversight or intervention.<sup>2</sup> The government-led interventionist approach seen in other countries has not been a feature in Australia.

Many mandated inspection regimes, particularly in the U.S.A, have concentrated on building facades. The concern being that dislodged materials or elements on the exterior of a building could cause death or injury to the public. A visit to New York City demonstrates the regime in practice, with thousands of buildings encased in scaffolding as they are inspected and repaired. Fewer jurisdictions have required more comprehensive, holistic inspections of ageing buildings until recently. The main catalyst for change was the 2021 partial collapse of Champlain Towers South in Miami, Florida. Although the causes and contributors of the collapse are still under investigation by the National Institute of Standards and Technology, there has been a spate of legal reforms aimed at mandating inspections for ageing residential buildings.

As Australian strata properties grapple with both systemic building defects and concerns around the lack of building repair and maintenance, it is timely to investigate, evaluate and discuss whether similar reforms should be introduced in Australia. This research project is an international cross-jurisdictional analysis of the current regulations that require strata-type buildings to be inspected during the lifecycle (post any initial defect inspection).

### The underlying rationales for the implantation of mandatory inspections

To date, there has been limited research investigating mandatory building inspections for ageing buildings. However, several papers have discussed the rationale for the

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<sup>1</sup> s 15(1)(f).

<sup>2</sup> It should be noted that some Australian state governments (agencies) have undertaken building inspections related to specific issues, for example, combustible cladding. There are also fire safety inspections in most states requiring buildings to lodge an annual statement with prescribed authorities.

implementation of these inspection regimes. General dilapidation, where owners have failed to adequately maintain and repair the building, and high incidents of falling objects from building facades, appear to be the most prevalent reasons for the imposition of mandatory inspection regimes.

Building dilapidation has been an acute and widespread problem in Hong Kong with concrete spalling, water leaking, structural and non-structural cracking noted as common failures in building over 30 years of age. The construction boom in the early 1970s has been viewed as the source of the problem.<sup>3</sup> A Task Force on Building Safety and Preventive Maintenance reported that between 1990 and 2001, at least 101 people died as a result of building-related accidents in private housing.

In 2003, the outbreak of Severe Acute Respiratory Syndrome (SARS) in Hong Kong heightened concerns regarding building neglect.<sup>4</sup> As a result, the Housing, Planning and Lands Bureau initiated a public consultation process on building management and maintenance. Essentially two propositions were outlined in the consultation process. The first being the retention of the existing framework, where building owners retain sole responsibility for maintenance and repairs. The second was the introduction of a mandatory building inspection program. Public feedback confirmed that the first proposition was not feasible if Hong Kong aspired to be a safer and hygienic living environment. According to Chan et al, financial constraints, a lack of skill and knowledge, and low awareness of maintenance obligations have contributed to building care inaction.<sup>5</sup> The second proposition, to introduce a mandatory inspection program, was supported by the majority of respondents.<sup>6</sup>

Nine years after the initial consultation, the Mandatory Building Inspection Scheme (MBIS) was implemented. The focus of the MBIS is on building elements essential to public safety. In conjunction with the MBIS, there is a Voluntary Building Assessment Scheme (VBAS), an initiative recognising well-managed and properly maintained buildings. Mandatory building inspections are exempted for buildings receiving a satisfactory safety rating under the VBAS.<sup>7</sup>

High incidents of falling facade parts on older buildings has led to the introduction of a mandatory inspection scheme in Singapore. According to Chew, within a three-year period, there were 90 reported incidents of falling debris off buildings.<sup>8</sup>

There was an inspection program (recertification) in the county the Champlain Towers South building was located. However, the collapse instigated a state-wide regulatory response which included the unanimous passing of Senate Bill 4-D in 2022. The Bill created a mandatory structural inspection scheme for condominiums and cooperatives in Florida. The Bill also directed the Florida Building Commission to complete two assignments. The first entailed a review of the inspection requirements laid out in the Bill and to make recommendations. The second was to provide recommendations for the adoption of

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<sup>3</sup> Daniel Chan, Henry Hung, Albert Chan, Tony Lo, 'Overview of the Development and Implementation of the Mandatory Building Inspection Scheme (MBIS) in Hong Kong' (2014) 4(1) *Built Environment Project and Asset Management* 71.

<sup>4</sup> Housing, Planning and Lands Bureau, Report on the Public Consultation on Building Management and Maintenance - Full Consultation Report ([https://www.devb.gov.hk/en/publications\\_and\\_press\\_releases/Consultation\\_Papers\\_Reports/bmm\\_cr/report\\_index/full\\_report/index.html#1](https://www.devb.gov.hk/en/publications_and_press_releases/Consultation_Papers_Reports/bmm_cr/report_index/full_report/index.html#1))

<sup>5</sup> Chan (n 3).

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Michael Chew, 'Façade inspection for falling objects from tall buildings in Singapore' (2023) 41(6) *International Journal of Building Pathology and Adaptation* 162.

structural and life safety standards for maintaining and inspecting all building types over three stories.<sup>9</sup>

As part of the assignments, the Building Commission in conjunction with the University of Florida, undertook a research project assessing the current inspection regimes in Miami-Dade and Broward counties. Property valuation data and completed standardised inspection forms provided the framework for data categorisation and analysis.<sup>10</sup> One important aspect of this study was to determine whether buildings closer to the coast were exposed to harsher environmental conditions and therefore required different inspection protocols.<sup>11</sup> It is important to note that the study included all building types, not just condominiums and co-operatives.

In summary, the study found that:

- Of the 40-year inspection reports analysed, 26% of all buildings indicated that some type of repair was required. A slightly lower percentage (22%) was evident in more recent inspections. Residential condominiums had a higher percentage of buildings requiring repair (e.g. over 30% on both recent and 40-year inspections).
- There was a slight difference between the buildings closer to the coast in terms of repair requirements than those further away.
- Most buildings were reported to have concrete in good condition with 25% of recent inspections reported as either fair or poor.
- Balconies tended to experience high rates of deterioration due to exposure (especially ocean facing buildings).
- Significant cracking was reported in 13% of the buildings in the 40-year inspection reports.
- Visible corrosion was observed in 22% of the buildings in the 40-year inspection reports.
- The roof cladding systems were reported to have a lower percentage of good ratings (34%) in the 40-year inspections compared to the most recent inspections.

Table 1: Comparison between inspection metrics reported in the 40-year and most recent inspection reports<sup>12</sup>

Inspection Metric Percent	40-Year Inspection Reports	Most Recent Inspection Reports
Repairs required	26%	22%
General concrete condition fair or poor	23%	25%
Concrete with significant cracking	13%	12%
Concrete with visible corrosion	22%	16%
Balconies fair or poor	17%	12%
Guards fair or poor	7%	5%
Roof structural systems fair or poor	25%	28%
Roof cladding fair or poor	24%	27%

<sup>9</sup> Ron DeSantis, Melanie Griffin, James Schock, Florida Building Commission 'Recommendations on milestone structural inspection requirements' (2022).

<sup>10</sup> Jennifer A. Bridge, Christopher Ferraro, Thomas Sputo, Forrest Masters, 'Assessment of Inspection Reporting and Building Conditions in South Florida' (Miami-Dade and Broward Counties), Final Report (2022).

<sup>11</sup> Ibid

<sup>12</sup> Table reproduced directly from Bridget (n 10) report.

Floor system fair or poor	15%	19%
Window general condition fair or poor	39%	37%

The authors of the report noted that there was some evidence to support the conclusion that buildings located closer to the coast require more repairs. However, they were unable to determine at what age in the building's lifecycle an inspection should be undertaken. Further, they were unable to determine whether earlier inspections (prior to 40 years of age) were likely to result in safer buildings. They were of the view however that earlier inspections would promote more proactivity in terms of maintenance. Importantly, the study found that subsequent inspections (every 10 years) after the initial inspection reduced the need for repairs (approx. 5%).

Unfortunately, the analysis and reporting does not clearly segregate the data relating to condominiums and cooperatives for each structure assessed. Although the report highlights that condominiums and cooperatives had more repair requirements than other building types, detail was lacking.

### Community Associations Institute (CAI) Policy

CAI is a membership-based organisation in the U.S.A that, amongst other things, advocates on behalf of common interest developments (strata schemes). CAI has issued a policy statement that advocates for initial and recurring inspections for buildings owned and maintained by an association. CAI's position is that the first inspection acts as a baseline measure for subsequent inspections and that this should occur within the first five years of occupancy. Following inspections should occur at the 10 year and 20 year marks post occupancy and then every five years.<sup>13</sup>

### Research Method and Analysis

Regulations mandating inspections for ageing buildings of twelve English speaking jurisdictions were reviewed and evaluated for this study. Ten of the jurisdictions were situated in the U.S.A (state, county and city) with Hong Kong and Singapore making up the sample. Table 2 outlines the jurisdictions reviewed and the regulation date (either inception or when the regulation takes effect).

Table 2: Jurisdictions reviewed by location and regulation date

<b>USA</b>	<b>Date</b>	<b>Asia</b>	<b>Date</b>
California	2025	Singapore	2022
Florida	2023	Hong Kong	2012
New Jersey	2024		
Miami-Dade County	1975		
New York City	1998		
Chicago	1996		
San Francisco	2016		
Boston	1995		
Cincinnati	2016		
Cleveland	2016		

Tables 4 and 5 provide a summary of the core regulation attributes for each jurisdiction.

<sup>13</sup> Community Associations Institute: <https://www.caionline.org/AboutCAI/Pages/default.aspx>

Each jurisdiction reviewed has created its own unique inspection program. The legal requirements are embedded in either national or state legislation, or in building codes, ordinances, or city rules. The Miami-Dade County recertification program is the oldest program reviewed which commenced in 1975, with significant reforms in 2022. The majority of jurisdictions (8) commenced their inspection programs after 2015 with three commencing after the collapse of Champlain Towers South in 2022. Aside from the Miami-Dade recertification program, all of the older inspection programs (6 jurisdictions) are focused solely on exterior wall or facade inspections. Following is a comparative analysis of eight core regulatory areas reviewed:

### *1. Regulatory purpose*

Unsurprisingly, safety and /or structural stability is at the heart of the inspection regulations for most of the jurisdictions specifying a purpose. These purposes are achieved by ensuring that the specific building elements, subject to the inspection (e.g. facade, structure, identified constructions systems) are maintained as buildings age. For example, Florida's new legislation states:

The Legislature finds that maintaining the structural integrity of a building throughout the life of the building is of paramount importance in order to ensure that buildings are structurally sound so as to not pose a threat to the public health, safety, or welfare. As such, the Legislature finds that the imposition of a statewide structural inspection program for aging condominium and cooperative buildings in this state is necessary to ensure that such buildings are safe for continued use.

### *2. Target buildings and exemptions*

All but one jurisdiction places parameters on the type of building targeted for inspection. Most parameters are based on the number of storeys (e.g. must exceed specified storeys (3, 4, 5 or 6) or building height (e.g. must exceed 13, 18, 21, 23 or 24 metres). New Jersey, the most recent regulation, determines inclusion based on the building materials used. That is:

Residential condominium or cooperative buildings that have a primary load bearing system that is comprised of a concrete, masonry, steel, or hybrid structure including, without limitation, heavy timber and buildings with podium decks.

The majority of regulations either implicitly or explicitly exclude single-story dwellings, duplexes and townhouses.

### *3. Inspection cycle*

There is considerable variation across the jurisdictions in terms of when the mandated inspections are to occur. Generally, there is an initial inspection followed by more frequent routine inspections. Five jurisdictions (Hong Kong, Florida, San Francisco, Miami-Dade, Cleveland) require an initial inspection when a building reaches 30 years followed by either five-yearly (only one jurisdiction) or 10 yearly follow-up inspections. New York and Boston require facade inspections to be undertaken every five years and Chicago every four, eight or 12 years depending on the building's classification which is based on the material used on the facade (e.g. if the facade is terra cotta, the inspection will be every four years). The jurisdictions that have recently undertaken reforms in this area, apply the following inspection cycles:

- a. Singapore – for facade inspections, every seven years once the building reaches 20 years and for structural inspections every 10 years for residential buildings;

- b. California – at least one every nine years;
- c. Florida – at 30 years and then every 10 years. However, local agencies can reduce the initial period to 25 years for buildings with specific environmental conditions (e.g. close to the coastline);
- d. New Jersey – at 15 years or 60 days after observable damage to the primary load bearing system is observed;
- e. Miami-Dade (new provisions 2022) – prescribed buildings built between 1983 and 1997 within 4.8 kms of the coastline must be certified by 31/12/24 and then every 10 years; prescribed buildings built after 1998 and within 4.8 kms of coastline must be certified when the building reaches 25 years and then every 10 years; all other buildings built between 1983 and 1992 must be inspected by 21/12/24 and then every 10 years; and for all other buildings built on or after 1993, when the building reaches 30 years and then every 10 years.

A number of the recently reformed jurisdictions require baseline evaluations within a specified time frame (e.g. before 2026).

#### 4. Type of inspection and scope

Most regulations incorporate two inspection phases. An initial visual inspection and then if warranted a more detailed, critical examination. The regulations in Singapore and Hong Kong require approval from the Commissioner or building authority before a more detailed inspection can be undertaken. The nature and extent of the building elements and components to be inspected is prescribed in all regulations. Table 3 highlights the areas in which the inspections are concentrated. For most of the facade inspections, attachments (such as pipes, balustrades, fire escapes, hanging air conditioners, windows etc) are included in the inspection. Hong Kong and Miami-Dade County provide the most comprehensive building inspection requirements.

Table 3: Inspection type by jurisdiction

Jurisdiction	Façade	Structural	Comprehensive
Singapore	√	√	
Hong Kong			√
California		√ (and waterproofing systems)	
Florida		√	
New Jersey		√	
New York City	√		
Miami-Dade County			√
Chicago	√		
San Francisco	√		
Boston	√		
Cincinnati	√		
Cleveland	√		

#### 5. Inspection procedures

The majority of regulations require an engineer or architect to be engaged to perform the inspection. Some of the regulations refer to specific standards or guidelines that must be followed when conducting the inspection. Generally, the initial visual inspection is to make a qualitative assessment of the condition of the elements subject to the inspection. That is, whether there are safety concerns and if so, the extent of the safety issue. For facade



inspections in particular, scaffolding is often required, and the use of specific technology is allowed (e.g. drones, automated scanning equipment). Five of the regulations reviewed specifically provide for more detailed inspections. Often the trigger for the further inspection is based on the opinion of the engineer or architect. For example, in Singapore the provision states that:

If the appointed engineer suspects or is of the opinion that there is a defect, deformation or deterioration in the structure after the initial inspection and is of the opinion that a full structural investigation is required to ascertain the cause and appropriate measures to rectify...then a full structural investigation will take place.

In Florida, the regulation states:

If any structural deterioration is identified, then a phase 2 inspection is required and may involve destructive testing. The phase 2 inspection must be undertaken within 180 days of the phase 1 report being submitted. The investigation may be as extensive or limited as necessary to fully assess the structural distress and recommend a repair program.

## *6. Reporting requirements*

Generally, the reporting requirements in each jurisdiction follow a similar pathway. A written report must be submitted to an authority within a prescribed time frame with an overview of the inspection conducted and details of the building or facade condition. In some jurisdictions, a designation must be included (e.g. 'safe', 'safe with ordinary repairs and maintenance', 'unsafe' or 'unsafe and imminently hazardous'). Recommendations for repairs and/or maintenance must be outlined in the report. Some regulations include a prescribed form or extensively detail the information that must be included in the report. For example, Cincinnati requires each inspection report to include:

The name and address of the building and building owner; the name, business address, and phone number of the professional preparing the report; a site plan of the building; a description of the building, including the number of stories, height, plan dimensions, age, and type of exterior wall construction, describing cornices, soffits, or similar overhangs or features; photographs or drawings of all elevations of the building; a detailed description of the facade examination in narrative form, including start and completion dates; a designation of the building facade's status by the professional as "safe," "safe with ordinary repair and maintenance," "unsafe," or "unsafe and imminently hazardous" ; drawings or photographs describing the locations and extent of all significant distress or deteriorated conditions observed in the facade; a description of recommended repair work and precautionary measures that should be taken to safeguard the public, emergency responders, and building occupants, if any, and the recommended completion date of such work; where appropriate, a comparison of conditions of the building facade with conditions observed during previous examinations of the same facade; a recommendation for future examination if earlier than the time period specified; other documents, notes, summaries etc.

## *7. Rectification requirements*

The rectification requirements appear dependent on the condition of the elements as reported. If unsafe conditions are reported, most jurisdictions require immediate works that are either preventive or corrective and include reinspection protocols. Generally, there is a requirement placed on the building owner to rectify within a prescribed period. For example, Hong Kong and Florida require building owners to carry out repair works within 12 months after receiving the written inspection report.

## *8. Regulatory oversight and penalties*

Most of the jurisdictions impose a penalty for regulatory non-compliance. Singapore has the most punitive financial penalties: for building owners who obstruct or hinder an engineer or competent person from performing their duty (max. \$5,000); for failing to carry out recommendations (max. \$20,000); and failing to appoint an engineer or competent person (max. \$20,000). In addition, section 9(1) of the Building Maintenance and Strata Management Act 2004, states that:

Any person responsible for an exterior feature of a building who, without reasonable excuse, fails to keep or maintain the exterior feature in such manner as to be securely fixed to the building and as will prevent any collapse, partly or wholly, of the exterior feature or its support shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$10,000 or to imprisonment for a term not exceeding 12 months or to both.

In Hong Kong, the building authority may carry out an inspection and undertake works if a building owner does not comply with a notice. The costs associated with the inspection and works along with a surcharge (max. 20%) can be recovered as a debt due to the Government.

Table 4: Regulation summaries of mandated building inspections for ageing buildings<sup>14</sup>

Country / State / City	Singapore	Hong Kong	California	Florida	New Jersey	New York City
Title of Building Inspection Scheme	Periodic Façade Inspection (PFI) & Periodic Structural Inspection (PSI)	Mandatory Building Inspection Scheme (MBIS)	Not specified	Milestone Inspections	Not specified	Facade Inspection Safety Program
Relevant regulation/s	Building Control Act 1989 (S. 26-29)  Building Control (Periodic Inspection of Buildings and Building Facades) Regulations 2021 (S. 3-17)	Building (Amendment) Ordinance 2011 (S. 30A – 30F)  Building (Inspection and Repair) Regulation 2011	California Code, Civil Code (§5551)	FL Stat § 553.899 (2022)	NJ A4384 (2022)	The Rules of the City of New York – Maintenance of Buildings: §103-04
Year of inception / takes effect	2022	2012	2025	2023	2024	1998
Regulatory purpose (summary)	Ensure the structural stability and integrity of buildings.	Prevent buildings becoming unsafe.	Not specified in review legislation.	Maintain structural integrity, ensure buildings are structurally sound and don't pose a threat to public health, safety, and welfare.	Maintain structural integrity.	Maintain building's exterior walls in safe condition.
Target buildings	Buildings over 13 metres from ground to highest roof point.	Buildings exceeding 3 storeys (buildings are selected by a panel for inclusion based on several factors – age, condition, management, potential risk to public, building clusters. A statutory notice is provided to building	Buildings containing 3 or more multifamily dwelling units.	Buildings that are 3 storeys or more.	Buildings defined by the law as “covered buildings” - residential condominium or cooperative buildings that have a primary load bearing system that is comprised of a concrete, masonry, steel, or hybrid structure	Buildings greater than 6 stories.

<sup>14</sup> Table template based on Table III. Comparison of various building inspection schemes in different cities in Chan (n 3).

		owner).			including, without limitation, heavy timber and buildings with podium decks.	
Exemptions	Houses, semi-detached, townhouses, buildings less than 13 metres.	Buildings not exceeding 3 storeys.			Standard wood framed buildings (e.g. single family or townhouses).	
Inspection cycle	PFI - every 7 years for buildings 20 years plus in age PSI – every 10 years for residential buildings (sole purpose) and every 5 years for commercial buildings.	At 30 years (from issuance of occupation permit). A further statutory notice to inspect same part of building can't be served within 10 years from the original notice.	At least once every 9 years	At 30 years (from issuance of certificate of occupancy) and then every 10 years.  Local agencies can reduce period to 25 years for buildings with specific environmental conditions (e.g. close to coast).	For buildings older than 15 years, the association must obtain an initial "baseline" structural evaluation by a structural engineer within two years of January 8, 2024.  For all other buildings, at 15 years (from issuance of certificate of occupancy) or 60 days after observable damage to primary load bearing system.	Every 5 years
Type of inspection/s	Facade Inspection and Structural Inspection	Prescribed inspection (common parts and external walls)	Visual inspection of exterior elevated elements	Milestone inspection	Initial structural inspection	Critical examination
Scope of inspection items	Facade – the exterior of the building or any external feature attached.  Structural – all structural elements	Building structures, fire safety provisions, drainage systems, fixtures and installations (e.g. gates, skylights, fences, balustrades etc) Non-structural items (fins, grilles, louvers) Curtain walls Appendages, arch.	Load-bearing components with associated water-proofing systems (incl. flashings, membranes, coatings, sealants).	Load-bearing elements and primary structural members (i.e. a structural element designed to provide support and stability for the vertical or lateral loads of the overall structure) and systems (i.e. an assemblage of	Building components forming the primary load-bearing system (i.e. the assemblage of structural components within a building – comprised of columns, beams or bracing). The foundation and attached balconies are included	Exterior walls (facade) and appurtenances (e.g. fire escapes, exterior fixtures, ladders to rooftops, flagpoles, signs, parapets, railing, copings, window frames, balcony and terrace enclosures, flower boxes, satellite

		projections and fixtures.		primary structural members).	in the inspection.	dishes, cell phone towers etc).
Inspection procedure	<p>Visual inspection (Structure) – Engineer must carry out visual survey of the building condition, the loading on the structure and determine if any works have been carried out without approval.</p> <p>If the appointed engineer suspects or is of the opinion that there is a defect, deformation or deterioration in the structure after the initial inspection and is of the opinion that a full structural investigation is required to ascertain the cause and appropriate measures to rectify, then with the approval of the Commissioner, a full structural investigation will take place.</p> <p>Full structural investigation – required obtaining full history of building (designs, construction, maintenance), reviewing structural plans and calculations, carrying out tests on structural</p>	<p>Prescribed inspection – an examination must be carried by reference to standards to: ascertain whether the building is safe or could be dangerous, identify any defect or deficiency, and propose repairs.</p> <p>If during the prescribed inspection, a registered inspector identifies any serious defect constituting structural instability or a serious health hazard, or the extent of the defect cannot be ascertained, a detailed examination may be conducted. The Building Authority must endorse this further investigation and receive a proposal from the registered inspector that includes specific information – the purpose of conducting the further investigation, the proposed scope, methods and particulars, a summary of the defects subject to the further investigation (with annotated photos and marked-up plan).</p>	<p>Visual inspection – prior to conducting the visual inspection, the inspector must generate a random list of the locations for each type of exterior elevated element (all elements that the association has responsibility maintaining). The inspector performs the visual inspection based on the list generated.</p> <p>If during the inspection, the Inspector observes conditions indicating water has passed into waterproofing system, then the inspector may conduct a further inspection.</p>	<p>Milestone inspection (phase 1) – must be completed within 180 days of notice. A licensed engineer or architect must undertake a visual inspection of habitable and non-habitable areas of the building and provide a qualitative assessment of the structural condition.</p> <p>If any structural deterioration is identified, then a phase 2 inspection is required and may involve destructive testing. The phase 2 inspection must be undertaken within 180 days the phase 1 report is submitted. The investigation may be as extensive or limited as necessary to fully assess the structural distress and recommend a repair program.</p>	<p>Initial structural inspection - must be performed by licensed engineers and architects and adhere to industry best practices and standards</p>	<p>The Qualified Exterior Wall Inspector (QEWI) designs the inspection program based on the building and must include the methods to be employed. The inspection program must be based on considerations of type of construction, age of components, facade exposure, history of maintenance and repairs. Methods used to examine the building must permit a complete inspection. Scaffolding is preferred but other measures may be used including e.g. drones.</p>

	<p>elements and materials.</p> <p>Visual inspection (Facade) - Similar process as outlined for the Structural Inspection but prescribes methods, technology and equipment that can be used in the visual inspection (e.g. drone, automated scanning equipment) and trigger for full inspection is if the competent person is of the opinion that there are signs of excessive erosion, corrosion, wear, fatigue, stress or strain in the facade that might give rise to the occurrence of facade collapse or death or injury to individuals or damage to other property (within or outside the building).</p>					
Reporting requirements	<p>After carrying out either a visual inspection or a full investigation (structural and facade) the appointed engineer or competent person must prepare a report detailing the condition of the building or facade and recommendations (if necessary) to</p>	<p>Within 7 days of the prescribed inspection, the appointed inspector must submit to the Building Authority a report that details the methods used in the inspection, the findings and test results, an assessment of the findings and if</p>	<p>After carrying out the inspection, the inspector must issue a written report that identifies the building components comprising the load-bearing components and associated waterproofing system, the current physical condition of the</p>	<p>After carrying out phase 1 or 2 milestone inspections, the architect or engineer must submit a copy of the report with a separate summary (minimum findings and recommendations) to the association and the local government. The</p>	<p>After carrying out the structural inspection, the inspector must issue a written report, to the municipal appointing authority, describing the condition of the load-bearing system. The report must include with specificity any required maintenance and</p>	<p>The inspector must file a written report with the department describing the result of the critical examination, clearly documenting all conditions. A separate report must be prepared and filed for each building and provided to the building owner. The</p>

	<p>undertake building works necessary to ensure the structural stability or integrity of any part of the building or facade.</p>	<p>applicable, a proposal for repairs to render the building safe.</p> <p>Within 14 days after completion of repairs, the inspector must submit to the building authority a completion report detailing the repair works undertaken and materials used and a statement that in the opinion of the inspector the building has been rendered safe.</p>	<p>components and system including whether there is an immediate threat to health and safety of residents, the expected future performance and remaining useful life of the components and system and recommendations for any necessary repairs or replacement.</p>	<p>report be signed, indicate the manner and type of inspection undertaken, identify any substantial structural deterioration, describe the extent of the deterioration, and identify recommendations for repair. The report must state whether unsafe or dangerous conditions were observed, recommend any remedial or preventative repair for any items that are damaged, and identify and describe any items requiring further inspection.</p>	<p>repairs needed, determine when the next inspection shall be performed. The report must be prepared in accordance with the protocols established by the American Society of Civil Engineers, provide any information or guidance necessary to maintain the structural integrity of a covered building and if maintenance is required, specify with reasonable detail the required corrective maintenance.</p>	<p>report must include an executive overview (findings and recommendations) and a determine whether the building is safe, SWARMP (safe within a repair and maintenance program) or unsafe. The report must include prescribed information (e.g. name of building, address, description of building, certificate of occupant number etc), a detailed description of the distress, settlements repairs or revisions to exterior enclosures since the previous report, a detailed description of the procedures used in making the critical examination, the extent and location of the physical examinations performed, detailed of contractors etc involved in examination, a location diagram, dated photo documentation, a description, classification and mapping of each significant condition observed, an analysis of the causes of the conditions reported</p>
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						unsafe or SWARMP, a detailed status report of maintenance work performed up to the date of submission, a comparison of current and past examinations, recommendations for repairs or maintenance and date for completion, a list and description of work permits required to complete works.
Rectification requirements	If recommendation are reported, the owner must carry out such measures or works in the prescribed time period.	If recommendations are reported, the owner must carry out a repair in accordance with the Ordinance (i.e. within 12 months for schemes with an OC).	If the inspector advises that the element poses an immediate threat to the safety of occupants, the association must take preventive measures immediately including preventing occupant access.	After the association receives the report, it must commence repairs within 365 days.	Not specified in reviewed legislation.	If a report identifies an unsafe condition, the building owner must immediately commence repairs or reinforcements. All unsafe conditions must be corrected within 90 days from the submission of the report.
Regulatory oversight & penalties	<p>A person who hinders, obstructs or delays an engineer or competent person from performing their duty is guilty of an offence – max. \$5,000.</p> <p>Failure to carry out recommendations – max. \$20,000.</p> <p>Failure to appoint engineer or competent person is guilty of offence – max. \$20,000.</p>	<p>If a notice is not complied with, the Building Authority may carry out an inspection and repair any required works that the Authority considers necessary. The cost of inspection and works, together with a surcharge (max. 20%) is recoverable as a debt due to the Government.</p> <p>Any person who fails to comply with a notice</p>	Local enforcement agencies have the ability to recover enforcement costs associated with rectification.	Local enforcement agencies may prescribe time limits and penalties with respect to compliance.	Not specified in reviewed legislation.	<p>An owner who fails to file the inspection report will be liable for a civil penalty of \$5,000 per year.</p> <p>An owner who submits a late filing will be liable for a civil penalty of \$1,000 per month.</p> <p>An owner who fails to correct an unsafe condition will be liable for a civil penalty until</p>



		commits an offence and is liable for a conviction (fine \$5,000 for each day offence has continued & 3 months imprisonment).				the unsafe condition is corrected - \$1,000 per month.
Related department involved	Building and Construction Authority – Commissioner of Building Control	Buildings Department	Local government authority	Local government authority	Local government authority	City of New York, Department of Buildings

Table 5: Localised regulation summaries of mandated building inspections for ageing buildings

Country / State / City	Miami Dade County (Fl.)	Chicago (IL.)	San Francisco (Cal.)	Boston (Mas.)	Cincinnati (Oh.)	Cleveland (Oh.)
Title of Building Inspection Scheme	Recertification	Exterior Wall Program	Facade Inspection and Maintenance Program	Boston Facade Ordinance Inspections	Facade and Fire Escape Inspection Program	Not specified
Relevant regulation	Miami-Dade County Code, Building Code, §8-11 (Existing Buildings)	City of Chicago Rules – Maintenance of high-rise exterior walls and enclosures	Building Code, Building Facade Inspection and Maintenance, Ordinance no. 67-16	City of Boston, Municipal Code, Building Regulations, 9-9.12	Cincinnati Building Code, General Inspection Programs Code, Chapter 1127	Codified Ordinances of the City of Cleveland, Building Code, Chapter 3143 - Exterior Walls and Appurtenances.
Year of inception	1975	1996	2016	1995	2016	2016
Regulatory purpose (summary)	Determine the general structural condition of a building or structure which affects safety	Not specified in the regulations reviewed	Promote public safety and welfare by reducing the risk of death or injury that may result from the effects of deterioration on exterior facades of buildings	Not specified in the regulations reviewed	Ensure that the facades of tall buildings of advanced age are maintained in a safe condition and do not pose public safety hazards	Maintain a building's exterior walls and appurtenances in a safe condition
Target	All buildings	Buildings more than 80	Buildings 5 stories or	Buildings more than 70	Buildings at least 5	Any structure that is 5

buildings		feet (24 metres) above ground	more	feet (21 metres) or classified as a high-rise structure	stories or at least 60 feet (18 metres) above ground (whichever is less)	stories or 75 feet (23 metres) above ground (whichever is shorter)
Exemptions	Single-family residences, duplexes and minor structures				1,2,3 family residential buildings	
Inspection cycle	<p>New provision: 2022</p> <p>Condominiums 3 stories or taller built between 1983 and 1997 within 3 miles (4.8km) of the coastline must be certified by 31/12/24 and then every 10 years.</p> <p>Condominiums 3 stories or taller built after 1998 within 3 miles (4.8km) of the coastline must be certified when building reaches 25 years and then every 10 years.</p> <p>All other buildings built between 1983 and 1992 must be inspected by 21/12/24 and then every 10 years or for building built on or after 1993, when the building reaches 30 years and then every 10 years.</p> <p>Previous requirement: Buildings in existence for 40 years or longer</p>	<p>Critical inspection every 4, 8 or 12 years depending on building categorisation (e.g. terra cotta facade = every 4 years, aluminium and glass curtain wall system = every 12 years). Ongoing inspections every 2 years.</p> <p>Inspections of fire escapes, water tank supports, antenna towers, canopies, metal cornices, sign supports, flag poles, and other metal structures susceptible to deterioration due to weather are required to be inspected every 5 years.</p>	<p>At 30 years (from issuance of Certificate of Final Completion) and then every 10 years</p> <p>If facade elements exhibit significant damage or failure during the normal passage of time, then the property owner is required to obtain an inspection within 60 days.</p>	Every 5 years	At 15 years (post construction) and then every 5, 8 or 12 years depending on building categorisation	At 30 years and then every 5 years

	and then every 10 years. This requirement still applies to building built prior to 1982 and previously inspected.					
Type of inspection/s	Visual inspection - Recertification of building and components.	Visual inspection and critical examination of exterior walls (facade) inspection.	General and detailed inspections of exterior walls (facade) inspection.	Periodic inspection - exterior walls (facade) inspection.	Visual inspection - Exterior walls (facade) inspection.	Critical inspection - Exterior walls (facade) inspection.
Scope of inspection items	Any part, material or assembly of a building or structure which affects the safety of the building or structure and/or which supports any dead or designed live load, and the general condition of its electrical systems	The examination is limited to the surface of the exterior wall where the appurtenances (e.g. fire escapes, balconies, chimneys, hanging air conditions) are in contact with the wall and their impact if any on the integrity of the wall (short form).  If it is discovered that conditions impact the integrity of the exterior wall, the professional must inform the owner and conduct a critical examination. This examination is a closer inspection and the professional must categorise the exterior wall as “unsafe and imminently hazardous” “safe with a repair and maintenance program” or “safe condition”.	Elements to be included in inspection: facade elements, attached equipment (e.g. communication, pipes), decorative elements (e.g. balustrades), signs, fire escapes, flagpoles, vertical extensions, lights and other fixtures, hanging air conditioners, other elements that could pose a safety hazard.	All exterior walls and appurtenances.	All areas on the exterior of the building except for horizontal roof areas. The facade includes: all walls, windows, balconies, cornices, parapets and appurtenances.	All exterior walls and appurtenances  Such inspection shall meet or exceed the general inspection standards under the ASTM Standards for Periodic Inspection of Building Facades for Unsafe Conditions contained in Designation E2270-14.
Inspection	Inspection procedures shall conform, in	In performing a critical examination, the	Inspections and maintenance must be	Prior to any new inspection, the	The examination shall include: a close-up	A qualified inspector must undertake the

<p>procedure</p>	<p>general, with the minimum inspection procedural guidelines as issued by the Board of Rules and Appeals.</p> <p>Visual inspection - Must be conducted throughout all habitable and non-habitable areas of the building, as deemed necessary, by the inspecting professional to establish compliance. Surface imperfections such as cracks, distortion, sagging, excessive deflections, significant misalignment, signs of leakage and peeling of finishes should be viewed critically as indications of possible difficulty.</p> <p>If once visually examined it is revealed that there are critical issues, then testing procedures and quantitative analysis will be required.</p>	<p>professional must conduct or supervise a close-up visual examination to determine whether an exterior wall and enclosure should be characterised as "unsafe and imminently hazardous"; "safe with a repair and maintenance program"; or "safe condition."</p> <p>A close-up visual examination must make physical contact with those portions of the exterior wall reachable by hand or tool while utilising scaffolding, boatswain chairs, or lifts at a minimum of one (1) representative drop on each public way spanning no less than twenty-four (24) feet. If any repairs are required, only scaffolding shall be used.</p>	<p>conducted in accordance with procedures to be detailed in an Administrative Bulletin adopted by the Department based on ASTM E 2270 Standard Practice for Periodic Inspection of Building Façades for Unsafe Conditions.</p>	<p>registered professional must review previous reports, inspections, and evidence of repairs made in the past five (5) year period.</p> <p>The inspection must be conducted by the professional to determine the extent of the inspection required, based upon the known history of the building, the nature of the materials used, and the conditions observed.</p> <p>The registered professional shall determine methods employed in the inspection and the methods used to inspect a building shall permit a physical, hands-on inspection of the building. The registered professional may use other methods of inspection as deemed appropriate, including the use of digital imaging, video and drone technology appropriate to complete a comprehensive inspection, except that a physical inspection from</p>	<p>visual examination of the building to be performed from a platform or device which allows an inspection of the facade area which can be reached by one scaffold drop per elevation. Other methods may include photographic magnification techniques, remote observation equipment or infra-red or thermography cameras, which can demonstrate reasonable reliability and which may be approved in addition to the close-up visual examination by the director on a case-by-case basis.</p> <p>A remote examination of those facade areas which are not accessible during the close-up visual examination.</p> <p>A complete review of the most recently prepared inspection report.</p> <p>A complete review of the pertinent drawings</p>	<p>inspection. Such inspection shall meet or exceed the general inspection standards under the ASTM Standards for Periodic Inspection of Building Facades for Unsafe Conditions contained in Designation E2270-14. Any areas found to be deficient in the general inspection shall require a detailed inspection.</p>
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				<p>a scaffold or other observation platform is required for a representative sample of the exterior wall.</p> <p>During the course of the inspection, photographs shall be taken and/or sketches made to properly document the location of all conditions observed that are either unsafe or safe with a repair and maintenance program.</p>	<p>and specifications of the building to determine the specified designs of the facades on the building.</p> <p>A complete review of the drawings, specifications, and maintenance reports on previous repair work performed on the facades.</p> <p>Documentation of the condition of the facades through photographs and drawings.</p> <p>Identification of any wall areas that are bowed, bulged, displaced or leaning inward or outward and, where such defects exist, an examination of the condition of a sufficient number of metal ties, anchors and shelf angles that support the wall at these locations.</p> <p>Examination of the substrate of wall areas with external visible distress.</p>	
Reporting requirements	After carrying out a visual inspection, the engineer or architect	All critical examination reports shall include the following information:	The professional undertaking the inspection must prepare	The inspection report shall be a written report by the architect or	Each professional conducting an examination must	The report must document the condition of the exterior walls and

	<p>must provide a written report within 90 days from the date of the rectification notice.</p> <p>Each report shall include a statement to the effect that the building or structure is structurally safe, unsafe, safe with qualifications, or has been made safe.</p> <p>The report is in the form of a prescribed form (14 pages). The form details the areas requiring completion: the building description (e.g. address, owner, use, floors, structures), inspections (inspector, licensing, dates, description of testing, repairs required, status in terms of continued occupation, supporting data (photos, diagrams etc), foundation information (drainage, description of cracks etc), present condition of overall structure, masonry bearing walls (spalling, rebar corrosion etc), floor and roof system, steel framing system, windows and exterior</p>	<p>Name and address of building; site plan of building; principal building occupancy and type of mixed use; complete name, mailing address and phone number for the owner, name, business address and phone number of professional preparing the critical examination report; description of building, including: number of stories; height, plan dimensions, age and type of exterior wall construction, describing cornices, soffits or similar overhangs or features; overall photographs or drawings of all elevations of the building; detailed description of the critical examination in narrative form, that must include characterisation of the building as: "unsafe and imminently hazardous", "safe with a repair and maintenance program" or "safe"; the start and the completion dates of the exam; drawings or photographs to describe the locations and extent of all significant distress</p>	<p>an inspection report in conformity with Section 1604E and the Administrative Bulletin adopted.</p>	<p>engineer certifying the results of the examination clearly documenting the condition of the exterior walls and appurtenances. The report shall include a record of all significant deterioration, unsafe conditions and movement observed as well as a statement regarding the water tightness of the exterior surfaces.</p>	<p>prepare a written inspection report to document the findings of the examination.</p> <p>Each inspection report shall include: the name and address of the building and building owner; the name, business address, and phone number of the professional preparing the report; a site plan of the building; a description of the building, including the number of stories, height, plan dimensions, age, and type of exterior wall construction, describing cornices, soffits, or similar overhangs or features; overall photographs or drawings of all elevations of the building; a detailed description of the facade examination in narrative form, including start and completion dates; a designation of the building facade's status by the professional as "safe," "safe with ordinary repair and maintenance," "unsafe,"</p>	<p>appurtenances as either safe, unsafe, or safe with a repair and maintenance program and document all significant deterioration, unsafe conditions, and movement observed, in sufficient detail so that a comparison of successive reports will indicate any change of condition. Building demographic information must be included and a complete description of inspections conducted based on ASTM E2270-14, including the locations of and descriptions the general inspection areas and any of detailed inspection areas.</p>
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	doors, building facade inspection, parking garages.	or deteriorated conditions observed in the exterior walls.			or "unsafe and imminently hazardous" ; drawings or photographs describing the locations and extent of all significant distress or deteriorated conditions observed in the facade; a description of recommended repair work and precautionary measures that should be taken to safeguard the public, emergency responders, and building occupants, if any, and the recommended completion date of such work; where appropriate, a comparison of conditions of the building facade with conditions observed during previous examinations of the same facade; a recommendation for future examination if earlier than the time period specified; other documents, notes, summaries etc.	
<b>Rectification requirements</b>	In the event that repairs or modifications are found to be necessary resulting from the	Upon determining that an exterior wall is in an unsafe and imminently hazardous condition,	Within 60 days of receipt of an inspection report, the Department shall confirm receipt of	Within twenty-four (24) hours of being notified of an unsafe condition by a registered	Any professional retained to provide an inspection report must	Upon the discovery of an unsafe condition relating to the exterior walls or appurtenances,

	<p>recertification inspection, the owner shall have a total of 150 days from the date of Notice of Required Inspection in which to complete indicated repairs or modifications.</p>	<p>the owner and professional must promptly notify the Department. It is the responsibility of the professional to personally examine the condition and determine the appropriate repair or stabilisation procedures. The owner of the building shall promptly begin repairs or stabilisation of an unsafe and imminently hazardous condition.</p>	<p>the report, provide review comments, if any, and confirm timelines and other requirements for maintenance actions and subsequent inspections.</p>	<p>professional, the owner of a building shall take any actions necessary to protect public safety, such as erecting sidewalk sheds, fences, and/or safety netting. Such actions shall be considered as an effort to remedy an emergency situation and appropriate permit applications shall be submitted within the next three (3) days to the Commissioner.</p> <p>Within ten (10) days of the receipt or filing of a report identifying an unsafe condition, the owner of a building shall commence work to correct the condition and work shall continue without interruption until the unsafe condition has been corrected, unless there has been an unforeseen delay (e.g. weather, labour strike). Work to correct an unsafe condition shall take priority over any other permitted work at the building. Within two (2) weeks after the unsafe condition has been corrected, the</p>	<p>notify the director of any determination that a building facade, or part thereof, is "unsafe and imminently hazardous" within one business day of making the determination.</p> <p>The director shall review each report and issue orders to make needed repairs based on each respective building status as follows:  Buildings Determined "Safe." Buildings Determined "Safe With an Ordinary Repair and Maintenance Program."  - the director shall order that the repairs and maintenance recommended in the report be performed within the timeframe recommended and that the owner or person in control submit a report no later than 30 days thereafter indicating that the repairs and maintenance conform to the recommendations.  Buildings Determined "Unsafe." - order that the recommended repairs and maintenance be</p>	<p>the owner shall notify the Director of Building and Housing immediately in writing of such condition, and immediately begin repair, reinforcement or precautionary measures, with the required permits, to abate the unsafe condition to ensure public safety.</p>
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				<p>registered professional shall reinspect the building and file with the Commissioner a detailed amended report stating the condition of the building.</p> <p>Conditions That Are Safe with a Repair and Maintenance Program. The owner of the building is responsible for ensuring that the conditions described in the report as “safe with a repair and maintenance program” are repaired and the actions identified by the registered professional are completed within the time frame designated by the registered professional or by such time necessary to prevent a condition from becoming an unsafe condition, whichever is sooner.</p>	<p>performed within the recommended timeframe and that the owner or person in control retain a professional and submit a report within 30 days thereafter indicating that the repairs and maintenance conform to the recommendations. Buildings Determined "Unsafe and Imminently Hazardous." - The director shall further order the following: That appropriate precautionary measures be taken by the owner prior to a scheduled city inspection to prevent further deterioration and to make the building safe to the public, emergency responders, and building occupants.</p>	
Regulatory oversight and penalties	If the property owner fails to obtain the recertification within the timeframe required, the property is referred to the Unsafe Structures	Penalties for violations shall be provided in the Municipal Code of Chicago.	The Director shall implement the procedures when any of the requirements for facade inspection, reporting, mitigation,	Any owner requiring an exterior wall certificate who fails to have the structure inspected or fail to file the inspection report with the required	Whoever fails to comply with an order shall be liable for a Class D Civil Offense for an initial offense. For each subsequent offense	In addition to any other method of enforcement provided for in Chapter 3103, whoever violates any provision of this chapter is guilty of a

	Section and an enforcement case is opened. Unsafe Structures monitors the recertification process thereafter including posting the building unsafe; issuance of a Notice of Violation; referral to the Unsafe Structures Board; and review of Board Order timelines for compliance and repairs, orders to vacate, collections of enforcement cost and any other action deemed necessary.		repair, or maintenance are not met in a timely manner.	fee shall be punished by a fine of one hundred (\$100.00) dollars for each day that such violation shall continue.	occurring within one year after having once been notified of an initial offense, any person who fails to comply with an order shall be liable for a Class E Civil Offense. Each additional day that a person fails to comply with an order of the director shall constitute a separate civil offense.	misdemeanour of the first degree. Each day during which noncompliance or a violation continues shall constitute a separate offense. Organizations convicted of an offense shall be fined.
Related department involved	Miami-Dade County Department of Regulatory and Economic Resources	City of Chicago, Department of Buildings	Department of Building Inspections	Inspectional Services Department	Department of Buildings	Department of Building and Housing

## Discussion

More than half of the strata buildings in Australia are over 20 years old.<sup>15</sup> Therefore, it is critical that Australian state and territory governments consider the introduction of mandatory inspection programs for ageing strata buildings. It is evident that more and more jurisdictions around the world will consider and implement these types of inspections in the future. Although ad hoc reforms should be discouraged until in-depth research and evaluation can be carried out, it is a subject that should be placed on reform agendas. This cross-jurisdictional analysis provides a good starting point for any evaluation. Given that building defects have infected much of the Australian strata stock built in the last 20 years, it is appropriate to consider more comprehensive inspection programs (as opposed to facade inspections). Singapore, Hong Kong and Florida (including Miami-Dade County) offer a framework that may be suitable in Australia and should be further explored. Simple replication should be avoided until research is conducted that evaluates these existing programs and considers Australian construction practices. Although we have an understanding of the most problematic construction defects in new strata schemes (particularly on the east coast), there is limited research on the most common repair and maintenance issues in ageing buildings and the extent to which they are a result of unrectified or poorly rectified construction defects. Such an analysis would be essential in determining the building elements that should be inspected.

Research should be undertaken that examines the:

- extent of owners corporations that comply with the statutory obligation to (repair and) maintain the common property;
- current condition of strata buildings by age and location;
- extent of unresolved construction defects on long-term building maintenance;
- type of environmental conditions that may exacerbate or accelerate maintenance issues;
- types of technologies available to assist in the assessment of maintenance failures; and
- feasibility (resourcing) of these types of inspection programs. To lessen any immediate resourcing burdens, prioritising buildings based on determined risk factors (such as the construction methods / products used) may be more practical.

Evaluating the impact of Hong Kong's Voluntary Building Assessment Scheme would also be a worthwhile exercise in determining whether such an initiative has a material effect on maintenance proactivity.

Paper note: The author of this paper is currently completing a research project that is exploring building rectification processes and practices in strata and community title schemes. One of the aims is to determine how effective owners corporations are at making decisions regarding complex repair and maintenance works and the potential barriers that prevent successful outcomes.

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<sup>15</sup> Hazel Easthope, Danielle Hynes, Yi Lu, Reg Wade, 'Australasian Strata Insights 2022, City Futures Research Centre (2023) UNSW Sydney.