



Cracks in the Compact City:

Tackling defects in multi-unit strata housing

Final Project Report

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Executive Summary

Research Context

1. As planners and developers have embraced higher density housing development in Australian cities, there have been growing concerns about the quality of multi-unit strata titled (**MUST**) developments, with building defects the subject of considerable debate in the building professions and the media. Despite multiple reviews and inquiries, it took the emergency evacuation of two apartment complexes in Sydney in 2018/2019 to prompt significant regulatory reform in NSW (see **Chapter 2**).
2. While research has shown defects to be a chronic issue in the *house* building sector, the issue of *apartment* quality and defects has received less academic attention (see **Chapter 3**). The few existing Australian studies indicate a significant incidence of defects in MUST developments, exacerbated by governance, regulatory, legal and financial difficulties for residents. These studies also highlight challenges in collecting accurate data about the prevalence of defects in MUST housing.

3. Research in this area is made more complex by a lack of clarity around how ‘defects’ and ‘defective work’ are defined and identified (see **Chapter 4**). This report adopts a definition of a defective building as:

a building that is not fit for its purpose due to a failing or shortcoming in the function, performance, statutory or user requirements of the building, where the failing or shortcoming has existed since construction or been triggered later on by faulty original construction or design.

However, when interpreting the findings it is important to keep in mind the inconsistencies in defining defects in both theory and practice.

4. While empirical evidence regarding defects in MUST developments is limited, research shows that the MUST development model entails many factors that can generate poor quality outcomes. Principal amongst these is the lack of consumer input in the outcomes (see **section 3.2**). Whereas in other construction contexts, such as a commercial building, the client has oversight as the project proceeds, in the MUST sector, individual purchasers have little involvement until after completion. This means only public agencies provide independent oversight of these developments. If these agencies are not closely enforcing quality standards, developers are incentivised to complete quickly and cheaply (often resulting in lower quality), contrary to the purchasers’ interest in receiving a high-quality building (**‘split incentives’**). This market model also gives rise to **‘information asymmetries’**, where one party is better informed than the other – in this case, developers are more informed about building quality than buyers. Buyers are not well-placed to identify poor quality work, distorting the market and undermining its performance.

Research Design

5. This research aimed to address the data ‘vacuum’ on MUST defects, providing new empirical evidence of the extent of building defects in MUST housing in Sydney (**Stage 1**), and examining the systemic features of the development process that create the problem (**Stage 2**). **Chapter 5** discusses these stages in detail.
6. **Stage 1** used a random 50% sample of all MUST schemes registered in the local government areas of Sydney, Parramatta and Canterbury-Bankstown between 2008-2017. This sample accounted for one tenth of all schemes registered in the study period across the Sydney metropolitan area, totalling 635 schemes. To collect data on our schemes, we approached 30 government and industry organisations and searched seven publicly-accessible data sources over 18 months. This labour-intensive, multi-source approach aimed to collect as many data points as possible about each scheme, understanding that no one source would provide a complete picture of a building’s defects history.

7. **Stage 2** involved interviews with 66 practitioners and stakeholders involved in strata development, management and defect rectification. Participants included engineers, certifiers, rectification experts, government officials, academics, strata managers and inspectors, builders, subcontractors, developers, construction industry peak bodies, insurers, architects, building designers and lawyers. The aim was to ensure a diverse mix of perspectives and a comprehensive picture of the extent of the problem, what causes defects and how they can be prevented.

Availability of quantitative data

8. **Chapter 6** presents and discusses our data. Stage 1 produced over 2000 pieces of data relevant to our sample. We anticipated encountering obstacles in collating material about defects, but the situation was worse than anticipated. Information on building defects is scarce and spread widely. Bodies that hold potentially relevant information include local and state government departments, private certifiers, contractors and subcontractors, builders, developers, rectification firms, strata managers, owners corporations (**OCs**), tribunals and courts, law firms, strata inspectors, construction and strata insurers and real estate agents. Building a comprehensive database of existing defects requires liaising with each party individually and dealing with complex confidentiality issues, which often prevent data access.
9. Even when data is available, it is often inconsistent in both content and format. For example, there were notable variations for both strata inspection reports and defects reports, not just in style, content and intended audience, but also in how key information was classified, with similar defects categorised differently by different providers. This made comparisons difficult.
10. Data robustness is also a concern. While defects reports were our most comprehensive source of data, their robustness depends on the skill of the consultant, and whether destructive testing is possible. Some serious defects (including leaks, fire protection system flaws and electrical wiring faults) may not be visible, meaning a defects report based only on a visual inspection is necessarily incomplete. Robustness is also an issue in strata inspection reports, due to the quality of record-keeping by OCs and strata managers, and the skills of strata inspectors. We found significant variation in format and comprehensiveness; 12% of reports reviewed did not consider the issue of defects at all.

Prevalence and severity of defects

11. Our data indicates defects are common. We have evidence of at least one defect for 26% of the schemes in our dataset, however due to scarce data this is likely to be a poor estimate of true defect prevalence – we cannot tell how much the numbers reflect (lack of) reporting. To better ascertain prevalence, we can restrict analysis to those schemes for which we have what we consider ‘more robust’ data (314 schemes). Of schemes with more robust data, 51% have evidence of at least one defect, and 12% have evidence of at least ten types of defects (see **section 6.3**).
12. The most prevalent types of defects in our dataset reflect past findings, especially regarding the ‘big three’ of water, cracking and fire safety issues (estimated at 42%, 26% and 17% respectively for our ‘more robust data’ schemes). The prevalence of water-related defects is concerning considering that past research shows these are amongst the most expensive to fix. Some cracks may be only cosmetic, but others affect structural integrity. Fire issues were less prevalent than expected (based on previous research), which may be due to different categorisation in documents (e.g. as door defects). This may also be because fire defects tend to remain hidden until there is destructive investigation or unrelated rectification work. Notably, these findings largely reflect early occupation certificate audit data from the NSW Office of the Building Commissioner (**OBC**), whose analysis showed issues with waterproofing (53%), structural concerns (44%) and fire safety (45%) in buildings reviewed under the new inspection scheme.
13. Regarding defect severity, we can turn to NSW case law and Home Building Compensation Fund (**HBCF**) claims datasets. In the case law dataset, the median of costs estimates and ordered payouts is \$500,000, with the largest figure mentioned \$14.3 million. The HBCF dataset covers all NSW multi-unit buildings of

three or fewer storeys with builders insurance policies taken out between 2010 and 2020. For almost one in fifty policies (1.8%), the builder has disappeared/become insolvent, work is incomplete/defective, and *icare* has estimated the rectification cost at more than \$10,000 per unit. In four cases, rectification is estimated to cost more than the original contract value, and in 1.4% of all schemes the figure is at least 10% of the contract value. Evidently, large sums are being spent to litigate and rectify building defects in MUST developments in NSW by owners, contractors and insurers. While we cannot be sure of the ratio between cosmetic and more significant defects, our data refutes the argument that major/concerning defects are rare and the defects 'crisis' is simply an exaggeration of cosmetic issues.

14. The views of our expert interviewees aligned with the findings from our Stage 1 data analysis (see **section 6.4**). Only three of 66 interviewees felt defects in the MUST sector were not a large or growing problem in NSW. Those who disagreed suggested that defect prevalence was on par with international rates, and any perceived increases were due to increased apartment supply, with defect rates constant. On the other hand, many other experts felt the scale and severity of the problem was not widely appreciated.

Information breakdowns, lack of transparency, and their effects

15. Information asymmetries and lack of data are frustrating for researchers, but also cause for greater concern. Because of the vulnerability of MUST consumers, information transparency is even *more* important than in other construction contexts (e.g. commercial buildings). Transparent and accurate information can help mitigate weaknesses in the MUST model, enabling purchasers to exercise their market power more effectively, regulators to regulate more effectively, and third parties (financiers and insurers) to drive quality outcomes by accurately pricing risk. At present, the system is not doing this. The interview data reveals the causes and effects of these information breakdowns, detailed in **Chapter 7**.
16. The interviews highlight information breakdowns at all points in the MUST development and sale process. Of all participants in the MUST development process, development teams should have the clearest visibility of building quality issues. However, our interviews indicated that this is not always the case (**section 7.1**). Information may be lost because it is not required (or checked) by audit mechanisms, with documentation often the first to fall to pressures for speed and reduced costs. Upfront design and documentation may be lacking, especially in design and construct (**D&C**) contracts. Furthermore, tendering with minimum documentation allows (and may incentivise) cost cutting, while leading to gaps in records and mistakes that could be avoided. In other circumstances the issue is 'document overload', where important information (including about defects) can get lost in the 'noise' of thousands of documents. This raises an important point – 'information' is not synonymous with 'documentation'. Reforms must ensure that *relevant*, robust information is given to owners, not reams of meaningless paperwork.
17. More formal feedback systems are also needed. Unless litigation or complaints arise, most industry players do not have formal mechanisms to track mistakes and improve. While some defects stem from system failures and the complexity of larger projects, many can be attributed to a failure to invest in processes and experienced staff to ensure work is completed and documented adequately and effectively. Developers are in a position of relative power as project drivers, meaning they can put in place systems to gather better information. At present, cost and time pressures disincentivise this. Reforms must drive a shift in culture to support new information processes being implemented and monitored properly.
18. A concerning finding has been the extent to which governments in NSW have lacked the information necessary to regulate the construction industry and adequately address building defects (**section 7.2**). The need for more detailed reporting to government, and better data management by government, is a recurring theme in recent reports into building quality, both in NSW and nationally. Unfortunately, little was done to address this in NSW until the creation of the OBC. This has facilitated information asymmetry failures across both the construction industry and the strata sector, with limited regulatory control allowing culture and capacity failings to flourish.

19. A key cause of government data blindness identified by interviewees has been the dominant deregulatory ethos that has prevailed in government since the 1990s. The argument for deregulation is that it allows housing to be produced quickly and more affordably. However, the flow-on effect on government's capacity to monitor performance has been less widely acknowledged. The resources put towards creating the OBC, including a new team of building inspectors, is an important step towards addressing this 'hollowing out' of regulatory capacities. However, interviewees noted that other government agencies with responsibility for construction and planning oversight remain under-resourced, making it difficult to collect and act on information to ensure better outcomes industry-wide.
20. Even where governments have collected industry information through regulatory processes, they have not always made good use of this data, and there have been issues with sharing it across internal 'silos'. Recent moves to digitise information will help make information sharing and government record-keeping more effective and efficient. This needs to remain a focus for the longer term, as efforts to improve policy-making and enforcement will falter if relevant information is not effectively collected, managed or shared.
21. Underpinning the government's retreat from strong regulatory oversight has been an expectation that industry would self-regulate. Parts of the industry have clearly failed to do this, but the system should also provide third-party industry oversight, most notably by way of insurers and financiers. Our interviews highlighted ways in which these industry players have chosen not to, or been unable to adequately assess and disincentivize risks associated with poor building quality (**section 7.3**). As a result, financiers and insurers have not exercised their market power to require developers to produce high quality buildings.
22. Regarding construction insurance, the industry has minimised risk by not providing coverage for buildings above three storeys, thus shifting the burden onto consumers. For buildings up to three storeys, the government insurer is responsible for providing construction insurance, and has attempted to improve standards through audits and oversight of phoenixing activity. Even with these protections, however, the scheme has required government underwriting. Access to more data about a developer's track record would be a valuable tool to better assess risks and adjust premiums to reflect the likelihood of claims.

Information available to purchasers

23. Given these widespread shortcomings in information collection and management, it is inevitable that purchasers have poor visibility of quality issues. Purchasers are the most vulnerable parties in the MUST property development and sale process, and the system should be focused on providing information transparency to support purchasers. Instead, almost nobody in the current system is incentivised to provide detailed information to them (**section 7.4**).
24. Currently, the strata inspection report is the main mechanism for purchasers of existing apartments to understand the building's condition, carrying significant weight in enabling an informed decision. Unfortunately, this sector is largely unregulated and report quality varies significantly, while purchasers may not be able to distinguish a poor strata inspection report from an effective report. In addition, shortcomings in reporting and document management by OCs and strata managers mean strata inspectors cannot always access key information.
25. While strata inspection reports are often imperfect, they do provide some insight for purchasers of existing apartments; purchasers of new apartments have to rely solely on the developer for information (**section 7.5**). Developers should be obligated to give new purchasers comprehensive standard format information, including key material collated throughout the development process. While obligations to hand over documentation already exist, they are poorly enforced, and there is limited oversight of the accuracy and adequacy of information provided to purchasers.
26. While the new Strata Building Bond Inspection Scheme (**SBBIS**) should help increase the information available to new apartment owners, interviewees raised concerns about how this scheme works in practice. The reliance on visual inspections means issues like water leaks and fire safety flaws may go

undetected, especially given the first inspection occurs before many defects become apparent. The scheme also fails to require inspectors to produce or cost a scope of works, meaning owners may not have adequate information to ensure quality rectification work. Reforms are needed to ensure the defects inspection process provides consumers with the protection they need.

Why information failures have flourished and what can be done

27. Three key themes emerge as to why information failures have been allowed to flourish: *poor culture* (a lack of care and/or pressures to maximise profit); *poor capacity* (a lack of required skill or experience); and *poor control* (a lack of adequate regulatory oversight). These three issues also underpin the rise in defective work in the first place. These issues play off and reinforce each other. A lack of control means little incentive to improve a poor culture, which in turn means less attention paid to ensuring adequate capacity. Poor capacity means fewer workers onsite with the experience to ensure a good culture. While unravelling these interlinked drivers can be challenging, understanding their interplay is essential, as it helps explain the motivations for certain behaviours. This in turn highlights the type of multilayered change required to reset industry culture, worker capacity and regulatory control levers to ensure quality outcomes.
28. **Chapter 8** reviews recent regulatory changes in NSW, and considers further steps. As well as driving improvements to building quality, many of the new reforms will improve the availability and quality of information about new construction. Transparency initiatives within government, such as the creation of a public register of Occupation Certificate audit scheme orders, are particularly welcome. There have also been clear improvements to information-sharing between government departments, and improvements to consumer accessibility of relevant information online.
29. While these developments are pleasing, more work remains. Enforcement of the requirement on developers to provide comprehensive and user-friendly information to new purchasers (e.g. a building manual) would help address consumers' disadvantaged position. Greater attention to improving standards among strata managers and strata inspectors would also help support better access to relevant information for consumers. And greater consistency in defect reporting and stronger reporting processes for rectification work would help drive better outcomes for consumers dealing with defective work. Recommendations to address these outstanding issues are summarised in **Chapter 10**.
30. The NSW OBC has achieved a great deal in a relatively short period, but lasting cultural change and capacity building will take time. As such, it is essential that government continues to resource building compliance and oversight mechanisms in the long term. This should be supported by ongoing efforts to facilitate greater oversight by third parties, including consumers, researchers and finance industry participants, so government does not bear the burden of overseeing the industry alone. While improving access to relevant information is not a panacea for the building quality issues currently plaguing MUST development in NSW, it is an important part of supporting and strengthening the overall reform process.
31. Finally, this research highlights once more the importance of remaining focused on ensuring the physical, emotional and financial wellbeing of MUST consumers and residents. They are both the most vulnerable participants in the MUST development model, and the ones who will live with the legacy of our city-building strategies for decades to come. They deserve safe, comfortable, affordable homes, and should be able to trust in the industry and the government to provide them.

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Table of Abbreviations

ABS:	Australian Bureau of Statistics
ACP:	Aluminium Composite Panel
ARC:	Australian Research Council
BCA:	Building Code of Australia
BPB:	Building Professionals Board
CHP:	Community Housing Provider
DA:	Development Application
DBP Act:	<i>Design and Building Practitioners Act 2020</i> (NSW)
D&C:	Design and Construct (contracts)
DPIE:	Department of Planning, Industry and Environment (NSW)
EP&A Act:	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
GIPA:	<i>Government Information (Public Access) Act 2009</i> (NSW)
HB Act:	<i>Home Building Act 1989</i> (NSW)
HBCF:	Home Building Compensation Fund
LGA:	Local Government Area
MUST:	Multi-Unit Strata-Titled
NCAT:	NSW Civil and Administrative Tribunal
NCC:	National Construction Code
NDA:	Non-Disclosure Agreement
OBC:	Office of the Building Commissioner
OC:	Owners' Corporation
PAC:	Public Accountability Committee (of the NSW Parliament)
PCA:	Plumbing Code of Australia
RAB Act:	<i>Residential Apartment Buildings (Compliance and Enforcement Powers) Act 2020</i> (NSW)
SBBIS:	Strata Building Bond and Inspection Scheme
SPV:	Special Purpose Vehicle
SSM Act:	<i>Strata Schemes Management Act 2015</i> (NSW)

1. Introduction

This research was designed to address the serious and persistent strata industry concerns about building defects in the trillion-dollar multi-unit strata-titled (**MUST**) apartment buildings sector. Since 2006, City Futures has worked with strata industry stakeholders – the people who manage, maintain, and insure apartment buildings after they are built and sold, and represent the people who live in them – to develop and fulfil a comprehensive research agenda. Together this group has produced cutting-edge work examining a range of issues in strata-titled housing, including [resident demographics](#), [governance and management](#), [development, renewal](#), [major repairs](#) and [sustainable retrofits](#), and the [experience of living in strata](#). Throughout this period, building defects had been raised as an issue of serious concern for the group, and by 2016 had emerged as the number one priority for the next stage of our research. For these strata stakeholders, there had been growing concerns about the incidence and costs of post-development apartment defects for some time. For this reason, they were particularly keen to assess how prevalent and serious building defects in strata buildings were, and to identify key causes and possible solutions.

Given this support from strata industry stakeholders, you would be forgiven for thinking that the issue of apartment building defects had been a constant concern of building regulators and the development industry for some time. By contrast, however, part of the reason these partners funded this research was that they felt insufficient interest had been paid to quality issues over the last two decades. During this period, the main focus of governments across Australia, but especially in NSW, has been to build more, build quicker and build higher, with a decade or more of planning and regulatory reforms all pushing the high-rise button. Few of the strata industry stakeholders' concerns about quality saw the light of day in media or on the agendas of politicians and policymakers. Despite several detailed and comprehensive reports on apartment defects being produced in the preceding decade, little had changed. Beyond some tightening of fire safety regulations, these reports had been lost in the bureaucratic system.

Then, in late December 2018, the newly-completed Opal Tower in Sydney's Olympic Park was evacuated when cracking noises caused concerns that the tower may collapse. Following on the heels of the tragic Grenfell Tower fire in London a year earlier, as well as the Lacrosse building fire in Melbourne, the risks of defective apartment construction became harder to ignore. The NSW Government was kickstarted into action, introducing a high-profile new Building Commissioner in 2019 followed by several far-reaching pieces of legislation in 2020. A major thrust of these reforms is to reshape the culture of the building and development sector to squeeze out poor performance and improve building quality. These reforms are still working their way through the system, and it will be some years before their impact can be fully assessed. The main focus of the changes driven by the Office of the Building Commissioner (**OBC**) has been on the procurement and construction stages of the apartment supply chain, aiming to 'build out' defects at source. This is clearly of critical importance and focuses correctly on the immediate source of the problem.

Recognising the substantial efforts now going into the OBC's work to ensure defects are minimised at source, we have focused our attention on the consumer side of the equation. This is important, because while the current reforms focus on newly built apartments, defects in existing apartment stock will remain an issue for many years, both for existing and future owners and residents of apartments. Moreover, the more we delved into understanding the development process to pinpoint why building defects occur, the more apparent it became that there remains a broader problem with how our apartment market currently operates: the extreme scarcity of building quality information available to buyers of new and existing apartments.

This is central to the apartment defect issue. Transparent, accurate information for consumers is a major component of any fully functioning market, making 'lemons' more difficult to sell and reducing incentives to build them. But in the contemporary apartment market, buyers have little access to the information they need to make considered decisions about what to buy, especially when buying off-the-plan. Buyers must rely on word-of-mouth advice in the short time they have to make up their minds before settlement, and inevitably, many have little real idea what they are buying into. Even for buyers of existing apartments, information in strata inspection reports and contract documents is compromised by the lack of systematic information available about many buildings – a problem which compounds after buildings are completed. In other words, beyond the issue of defects themselves sits a broader issue: the fact that we have limited knowledge (and documentation) of where defects are, and how bad they are. This is a problem that will continue to undermine

the apartment market for years to come, even if the Building Commissioner's reforms succeed in preventing any new defective buildings coming onto the market.

The concept of 'information asymmetry' – borrowed from behavioural economics, and referring to imperfect markets where a buyer has access to significantly less information than a seller – is a useful conceptual device to apply to the problem of apartment defects. We have explored this through a series of in-depth interviews with a wide range of experts and practitioners involved in apartment design, development, management and defect remediation, as well as lawyers, insurers and academics. These interviews provide crucial insights into the systemic origin of defects, as well as potential solutions to the information asymmetry problem.

We also sought to establish the extent of the defects problem. Although defects stories are now frequently reported in the media, the actual scale of the issue has remained elusive. What proportion of the apartment stock has major defects that impact significantly on residents? Despite recent efforts to stamp defects out, little hard data exists on this key question. We pieced together a picture of the scale of the defects issue from a wide range of sources for a random sample of apartment buildings in three Sydney local government areas. This proved extremely difficult, due to the scarcity of robust information available.

While those contributing data to our research have been overwhelmingly helpful and willing to share what information they could, the lack of accessible and consistent information on defects and their rectification has presented significant obstacles. We concluded that 'data blindness' was prevalent for all key stakeholders in the apartment market – not just consumers, but also regulators and industry participants. Consumers, however, have the least power or capacity to protect themselves against the risks this data blindness creates, and are therefore most vulnerable to poor outcomes.

In addition, our data collection efforts were also hampered by there being no generally accepted definition of what constitutes a 'defect'. We spent some time considering this rather basic matter in order to formulate our own definition of a defective building:

a building that is not fit for its purpose due to a failing or shortcoming in the function, performance, statutory or user requirements of the building, where the failing or shortcoming has existed since construction or been triggered later on by faulty original construction or design.

This extends beyond the current legislative definitions of defective work in NSW; our research makes clear that these have left many owners without recourse for dealing with defects that cause significant costs and genuine distress. While others may quibble with our definition, the bigger issue remains that there is no settled definition for what is and is not defective work, once again highlighting the opacity that surrounds this issue.

Given these findings, this report sets out a range of measures that would start to rebalance the information asymmetry problem in favour of consumers. Much of this depends on good information being provided in the first place. A number of the Building Commissioner's proposals – including widespread reporting of defects to government, industry rating tools to make good quality developers easier to identify, and efforts to digitise and open access to government-held data about building quality – will support such change. But there is more to do. Additional steps are needed to prevent information falling through the cracks: requiring developers to produce comprehensive, consumer-friendly building documentation; ensuring ongoing resourcing for a building regulator; making defect and inspection processes more consumer-focussed (including imposing more rigorous inspection methods for all new buildings); strengthening strata record-keeping and inspection processes; and continuing to improve government information collection, sharing and digitisation. To support these steps, we offer 30 recommendations that we believe add value to the OBC's reform agenda by improving information transparency, both during the development process and for the remainder of a building's life.

While the focus of this research has been on NSW, we hope the value of this report does not stop at the state border. We expect its findings will be of much broader value in supporting policy and practice reforms to the apartment sector across the rest of Australia, and overseas. The growth in apartment development is a global phenomenon. The many millions of people now living in MUST housing need to be able to trust that the homes they are buying or renting will not let them and their neighbours down. To have that trust, they need to have access to the best possible information when making the difficult and expensive choice about where to live. This report offers recommendations as to how this might be best achieved.

2. Background to the defects problem

This research has been undertaken in the context of sustained growth in the development of multi-unit strata titled (**MUST**) apartment buildings in Australian cities, especially in the eastern states. As both planners and developers have embraced higher density housing development, there have been growing concerns about the quality of MUST developments. Over the past decade we have seen multiple calls for reform of the MUST development model, as building defects have become the subject of considerable debate in the building professions and the mainstream media. The issue came to a head in NSW after the emergency evacuation of two apartment complexes in Sydney in late 2018/early 2019, which prompted a flurry of media attention and subsequent regulatory action. This section provides a brief overview of the underlying development context, and the key reform proposals and regulatory processes underway in NSW.

2.1. Development context

In Australia, the most common form of multi-unit property ownership is strata title. This section provides a brief overview of what owning a strata-titled property entails, and the role of strata in Sydney's housing landscape.

2.1.1. Explanation of strata title

In strata-titled developments (called 'strata schemes' in NSW), each unit (e.g. apartment, townhouse, commercial office or shop) within a strata scheme (e.g. a building, building complex or housing estate) can be bought and sold separately. These units are called 'lots' in the relevant NSW legislation, the *Strata Schemes Development Act 2015* (NSW) and the *Strata Schemes Management Act 2015* (NSW) (**SSM Act**). Upon purchasing a lot in a strata scheme, lot owners automatically become part of the collective governing body of their strata scheme known as an 'owners corporation' (**OC**). Membership of lot owners in the OC is automatic and lot owners cannot opt out. The OC owns the shared property in the strata scheme (known as 'common property'). In apartment buildings in NSW, this includes the buildings themselves (the boundary between lot and common property in strata-titled apartments in NSW is the inner surface of the wall, the upper surface of the floor and the under surface of the ceiling, see SSM Act s.6) and their associated infrastructure and amenities (such as heating, ventilation and air conditioning and plumbing systems, lifts, pools, gardens, car parks etc.). The OC (and hence all lot owners) is responsible under law for the management, maintenance and repair of common property in their strata schemes (SSM Act s.9). The OC elects a group of volunteer owners to represent the interests of the corporation as a whole. Those elected form the 'strata committee' and can make decisions on behalf of all owners (however some decisions must be made by all owners, see SSM Act s.36). It is also common for OCs to hire a paid strata manager to assist with the management of the scheme (SSM Act s.11).

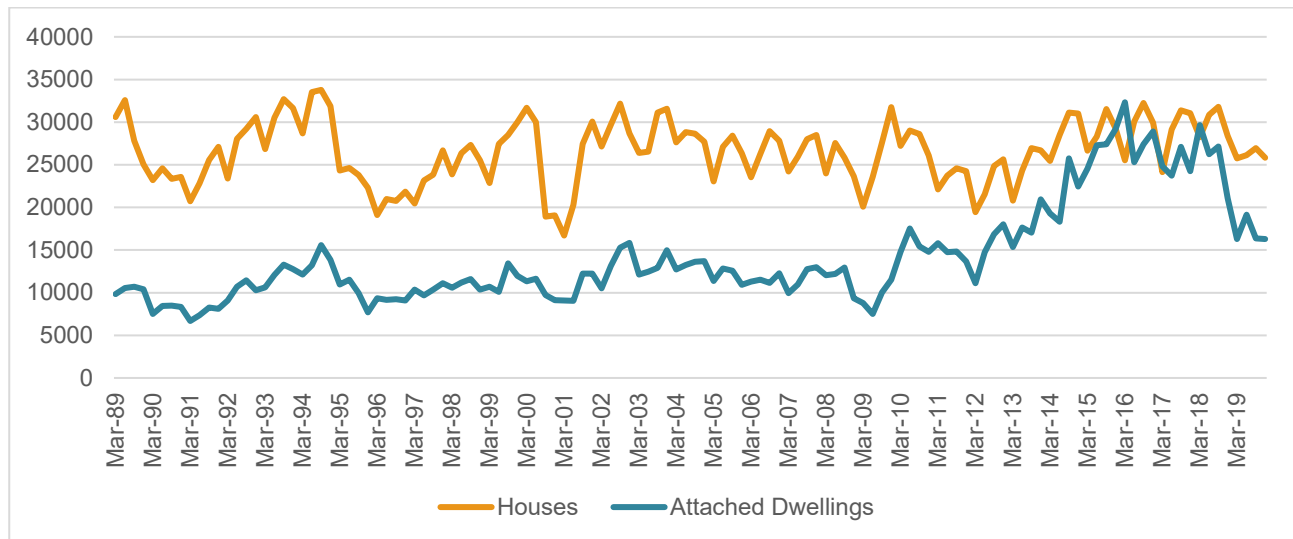
This means that there are essentially two layers of ownership in a strata scheme: the collectively owned property (the land, buildings and common areas), and the individually owned property (the interior of each apartment). Similar 'dualistic' (van der Merwe 1994) forms of ownership exist around the world under different names including condominium, *propiedad horizontal* and *copropriété* (Easthope 2019). The dualistic nature of strata ownership has important consequences when addressing building defects, because the responsibilities for identifying and rectifying defects are split between defects in lot property (the responsibility of individual owners) and defects in common property (the responsibility of the OC). This complexity is increased when defects in common property damage the property of lot owners and vice versa.

2.1.2. Sydney strata landscape

MUST residential development has reached record levels in Australia with attached dwelling commencements exceeding house commencements for the first time in the March quarter of 2016 (ABS 2020). Nationally, multi-unit development accounted for half of all residential development in 2015-16 compared to just over a quarter in 2009. Ninety percent of this growth was in major urban areas (Rosewall & Shoory 2017), with attached and detached dwelling commencements remaining on par until 2018 (see Figure 1 below). The earliest growth in multi-unit development was seen in NSW, which has seen a sustained boom in attached dwellings for much of the last two decades (see Figure 2 below). The 2016 Census of Population and Housing reported that over the past 25 years, the number of occupied apartments in Australia increased by 78% to 1,214,372 dwellings

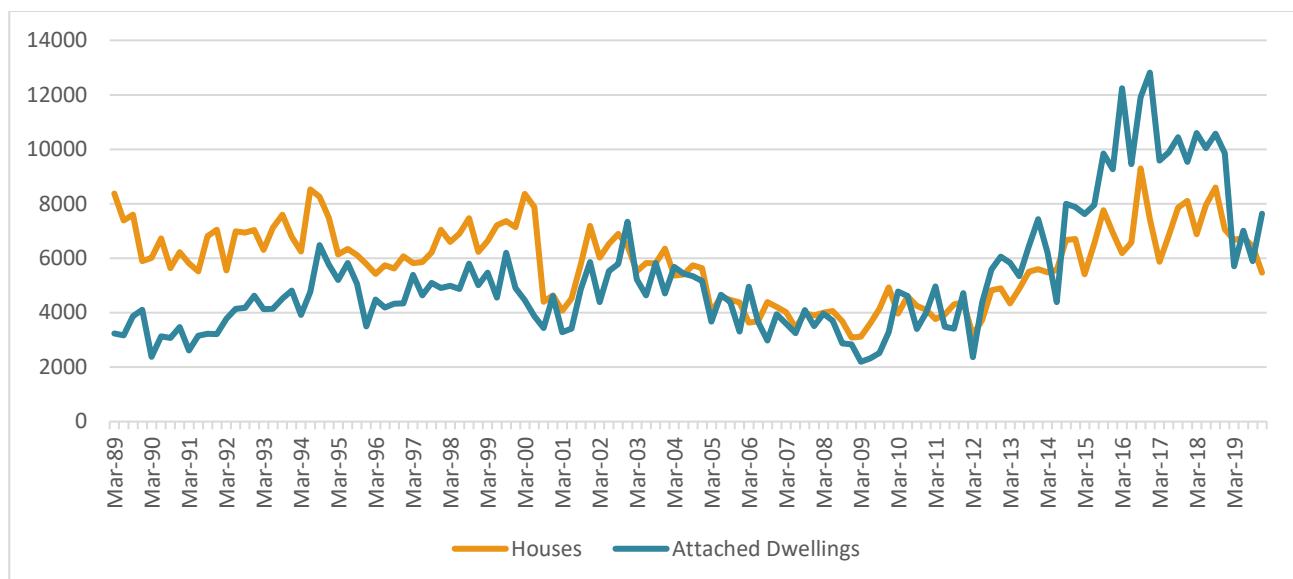
(ABS 2017). By 2016, 28% of all Sydney dwellings were apartments, as were 15% of Melbourne's and 12% of Brisbane's (ABS 2016).

Figure 1 Dwelling Starts, Australia



Source: ABS Building Activity 8752.0

Figure 2 Dwelling Starts, NSW



Source: ABS Building Activity 8752.0

The growth of the MUST sector across Australia saw \$31.7 billion of new apartment commencement in 2018-2019, with the insured value of MUST properties now over \$1 trillion (Easthope et al. 2020). Predictions suggest that by 2033 half the NSW population will own or live in MUST housing or work in businesses associated with the MUST sector (NSW Fair Trading 2013).

In addition to becoming more numerous, MUST apartments are also getting taller. By 2016, almost 40 per cent of all occupied apartments in Australia were within blocks of four or more storeys, compared with less than 20 per cent in 1996 (Jones et al. 2019).

The human impact of this growth of apartment building has been profound. With 9 per cent of all people in Australia living in a private apartment (Easthope et al. 2020), there is now around one occupied apartment for every five occupied separate houses in Australia, compared with one to every seven in 1991 (Easthope et al. 2020; ABS 2017). In NSW, 1 in 5 households already live in a private apartment (Easthope et al. 2020).

Continuing increases in Australia's population (focussed into capital cities), higher wages, smaller family sizes and strong international in-migration have contributed to strong demand for MUST housing. In the short term, the impacts of the Covid-19 pandemic on international migration and economic growth mean that we are likely to see a slowing of MUST property building in Australia. However, so long as the twin policy drivers of urban consolidation and population growth continue to receive support, we can expect renewed growth in the MUST sector in the future.

2.2. Political/regulatory context

The contemporary public debate about defects in MUST apartments in NSW can be traced back to at least 2012, when an apartment fire at Bankstown in Sydney killed one person and severely injured another (Cuneo et al. 2012). Since then, other defects-related tragedies in Sydney have included a balcony collapse in Lane Cove that seriously injured an entire family (Levy 2013), and the failure of a balustrade in Macquarie Park that resulted in the death of a resident (Longhetti et al. 2015). Another addition to this list occurred in 2016, when the roof of a new apartment block in Lidcombe was blown away during a gale (Ford 2016), with residents fortunate to escape serious injury. Meanwhile, the Lacrosse and Neo cladding fires in Melbourne in 2014 and 2019 respectively (Dunstan 2019) also kept building defects in the public eye and helped to prompt state and federal governments to commission important reports into building quality issues. However, it was not until after the 2017 Grenfell Tower tragedy in London (which killed 72 people), followed by the evacuations of Sydney's Opal Tower (December 2018) and Mascot Towers (June 2019), that significant political attention and public resources were directed towards the issue in NSW.

Helping to create the momentum for this change has been a series of reports and inquiries commissioned over the past 5 years, all of which have highlighted the extent and systemic nature of construction industry problems, both in Australia and internationally. The key reports are summarised below.

2.2.1. Key reports and inquiries

The NSW Government's initial response to the Bankstown fire and the growing numbers of incidents reported in the press around apartment quality and safety was to commission Michael Lambert, a former Secretary of NSW Treasury, to produce the Independent Review of the *Building Professionals Act 2005* (NSW Government 2015). The report examined the regulation and certification of buildings in NSW and revealed numerous breaches of the building code, illegal building practices and breaches of fire safety requirements. Key areas of concern included: "complex, hard to understand or navigate, prescriptive and inflexible legislation and regulation" (p.13); "fragmented and under-resourced administration of building regulation" (pp.13-14); and "a lack of clarity about the roles, responsibilities, functions and accountability of private certifiers" (p.14). While the NSW government moved promptly to tighten up on certification of fire safety systems in high rise buildings after the report's release in 2015, the rest of the nearly 150 recommendations largely languished.

It was not until after a second major fire highlighted major problems with combustible cladding in MUST buildings (the 2014 Lacrosse fire in Melbourne's Docklands) that the Federal Government instigated a Senate Inquiry into the economic and safety impacts of non-compliant building materials in construction, which began in June 2015. Progress was slow, and the Inquiry lapsed in May 2016 before being re-established in October 2016. It was ongoing at the time of the UK's Grenfell Tower tragedy in June 2017, which significantly elevated public and political concerns about the quality and safety of high-rise apartments around the world, particularly in relation to combustible cladding.

In the UK, the government commissioned Dame Judith Hackitt to investigate the causes of the Grenfell disaster. The *Independent Review of Building Regulations and Fire Safety: Final Report* (Hackitt 2018) cited systemic and cultural failures in the construction industry and regulatory system governing high rise buildings, which reflected many of the findings of the earlier Lambert Report in NSW. These included:

- widespread ignorance of regulations and standards;
- indifference to quality in preference for speed and low cost;
- lack of clarity over roles and responsibilities for poor quality exacerbated by industry fragmentation between procurement, design, construction and operational professionals;
- patchy competence;

- poor product testing and labelling;
- inadequate community consultation and involvement in design;
- poor record keeping;
- ambiguous and inconsistent regulations; information asymmetries between building owners, occupiers and developers; and
- inadequate regulatory oversight and enforcement.

The Hackitt report findings contributed to the UK government's 2020 decision to create a new £1 billion Building Safety Fund to speed-up the removal of dangerous cladding and other unsafe materials in high-rise residential buildings. The establishment of a new national construction products regulator was also announced in January 2021, in response to the revelations from the ongoing Grenfell Inquiry that manufacturers were knowingly ignoring safety rules. The regulator will have the power to test and remove any product from the market that presents a significant safety risk and prosecute companies who flout product safety rules (Ministry of Housing, Communities & Local Government, Scully, & Jenrick 2021).

While this was playing out in the UK, the Grenfell fire also prompted movement from policymakers and regulators in Australia. In August 2017, the Federal Government's Building Ministers' Forum commissioned Professor Peter Shergold AC and Ms Bronwyn Weir to produce the *Building Confidence* report (Shergold & Weir 2018), which examined compliance and enforcement problems within building and construction systems across Australia that were affecting the implementation of the National Construction Code. The Shergold Weir report (2018) concluded that "the nature and extent of the problems put to us are significant and concerning" (p.1). It set out 24 recommendations involving widespread changes to current regulatory approaches. All but one of these recommendations aligned with issues already raised in the earlier Lambert Report (see Lambert 2019), many of which were yet to be actioned by the NSW Government. The NSW Government was more responsive to the Shergold Weir report, however, offering its support for 'the vast majority' of the 24 recommendations (NSW Fair Trading 2019).

Shortly afterward, the Commonwealth Senate Inquiry handed down its final report titled *Non-conforming building products: the need for a coherent and robust regulatory regime* (Parliament of Australia, Senate Economics References Committee 2018). This report found that there had been a serious breakdown in the regulation and oversight of non-conforming and non-compliant building products. In particular, the report highlighted the weakness in the regulatory regime, including the certification process and the disjointed regulation of the use of building products, both manufactured in Australia and overseas. It also found that deregulation and privatisation of building certification processes and the absence of proper regulatory controls, coupled with the increase in aluminium composite panelling importation, had led to the proliferation and installation of non-compliant building products. Importantly, the report was critical of the lack of timely government response to the Lacrosse fire, as well as any meaningful resolution between governments on steps forward to deal with the proliferation of combustible cladding. Finally, the report supported compliance concerns raised in the Shergold Weir report.

Most recently, the Public Accountability Committee (**PAC**) of the NSW Parliament added a further report after conducting an inquiry into "*The regulation of building standards, building quality and building disputes by government agencies in New South Wales*". The Inquiry produced an *Interim Report* in November 2019 (NSW Parliament, Legislative Council PAC 2019), followed by a Final Report in April 2020 (NSW Parliament, Legislative Council PAC 2020), drawing on over 200 submissions, six public hearings and an online survey. The Final Report (2020, p.viii-ix) identified "systemic issues plaguing the building and construction industry and the lack of regulation and oversight by the NSW Government...which has stepped away from its responsibilities to ensure homes are built to an acceptable standard and are safe for occupation." It made 22 recommendations to government, which included: hiring additional building inspectors and introducing additional mandatory inspections of new construction; the introduction of an obligation on owners to report flammable cladding; and allowing potential purchasers and tenants access to government information about flammable cladding. These recommendations were in addition to the 19 provided in the Interim Report, including amending the definition of 'defects' to provide greater clarity for homeowners, increasing the value of the bond paid by developers to cover the cost of defective work, and requiring the government to commit to fully implementing the recommendations of both the Lambert and the Shergold Weir reports.

While their specific focuses were different, the Lambert, Shergold Weir, Senate Inquiry and NSW Parliamentary Inquiry reports all pointed to systemic issues with construction practices, regulations and quality across Australia, and identified NSW among the jurisdictions most in need of regulatory reform. In 2019, Lambert claimed that NSW had the furthest to go of all Australian jurisdictions in addressing building quality:

While the core problems identified in the Shergold Weir report are fully relevant to regulation of building in NSW, there are additional issues that exacerbate the situation in NSW. I would argue that building regulation and building outcomes in NSW are poorer than in any other major Australian State and requires reforms in addition to those recommended in the Shergold Weir report (Lambert 2019, p.1).

Nonetheless, with some minor exceptions, it took five years after the release of the comprehensive Lambert report for significant regulatory change to occur in NSW, as well as two further high-profile building failures (the Opal Tower and Mascot Towers evacuations). Prior to this, the most significant change to the regulatory landscape in NSW was the 2018 introduction of the Strata Building Bond and Inspections Scheme (SBBIS).

2.2.2. Strata Building Bond and Inspections Scheme

The SBBIS commenced operation in January 2018. The scheme is aimed squarely at MUST developments, and is designed to incentivise developers and builders to build well and work collaboratively with OCs to minimise building issues in new residential high-rise buildings. Where there is defective building work, the SBBIS aims to ensure it is readily identified so it can be fixed promptly and cost-effectively. The scheme works by requiring developers to lodge a building bond (for 2% of the contract price) with NSW Fair Trading for residential and mixed-use high-rise strata buildings of four storeys and over ¹, which can be drawn upon to pay for the costs of rectifying defective building work. If the bond is not needed to address defects within two years of completion, the money is returned to the developer, thus creating an incentive to produce quality work, while also ensuring owners with defects are not left high and dry by development and building companies being wound up shortly after a development is completed.

While the SBBIS appears to tackle the defects issue head-on, in practice the scheme has been criticised for not going far enough in addressing the defects issue (NSW Parliament, Legislative Council PAC 2020). Concerns include the fact that a 2% building bond will often not cover the full costs of rectification, and that the timing of inspections does not allow for the time taken for defects to become apparent. Also, because inspections are visual rather than invasive, some types of defects (e.g. faulty waterproof membranes or fire dampers) may remain undetected, and subsequently be excluded from cover. Each of these issues is addressed in more detail in 8.2.3 of this report. Furthermore, the scheme only covers buildings completed since 2018, leaving earlier buildings with no cover. Nonetheless, the introduction of the scheme is an acknowledgement by the NSW government that defective work in MUST buildings is an issue and that consumers need protection.

2.2.3. Opal and Mascot Towers: the catalyst for major change in NSW

While the Grenfell tragedy clearly focused Australian governments' attention on the risks of poor construction quality in high-rise developments, it was not until the Opal and Mascot Tower debacles in December 2018 and June 2019 that the NSW Government began the process of significant regulatory change. The two building evacuations attracted extensive media reporting and raised public consciousness of the extent and potential impact of the MUST apartment quality crisis. Both cases involved the emergence of structural cracking that created a perceived risk of building collapse, and resulted in residents being unable to re-enter the building for extended periods (12 months for Opal Tower, while Mascot Towers remains empty more than 2 years on).

An immediate independent investigation of the Opal Tower case, commissioned by the NSW Government, identified poor quality construction materials, structural design flaws, construction not following designs, lack of adequate oversight of construction compliance with design, and poor workmanship (Hoffman et al. 2019). While technical reports on the issues with Mascot Towers have not been made public, media reports identify cracking in both the building's central support structure and its façade. Because the building is now 12 years

¹ Buildings that are three storeys or under are already covered under NSW Home Building Compensation Fund, previously called Home Warranty Insurance.

old, it is outside the statutory warranty period, and owners have been unable to take legal action against the developer because it had gone into liquidation before the structural issues emerged. Owners are pursuing a claim against parties involved in the construction of the building next door, which is argued to have contributed to Mascot Towers' cracking problems. The NSW government is providing financial assistance towards the cost of residents renting elsewhere, and has also engaged experts to provide owners with independent technical advice on the rectification works required.

2.2.4. Enter the NSW Building Commissioner

A month after the evacuation at Mascot Towers, the NSW Premier Gladys Berejiklian announced the creation of a new role—the NSW Building Commissioner—to lead a suite of building industry reforms. The Office of the Building Commissioner (**OBC**) is responsible for:

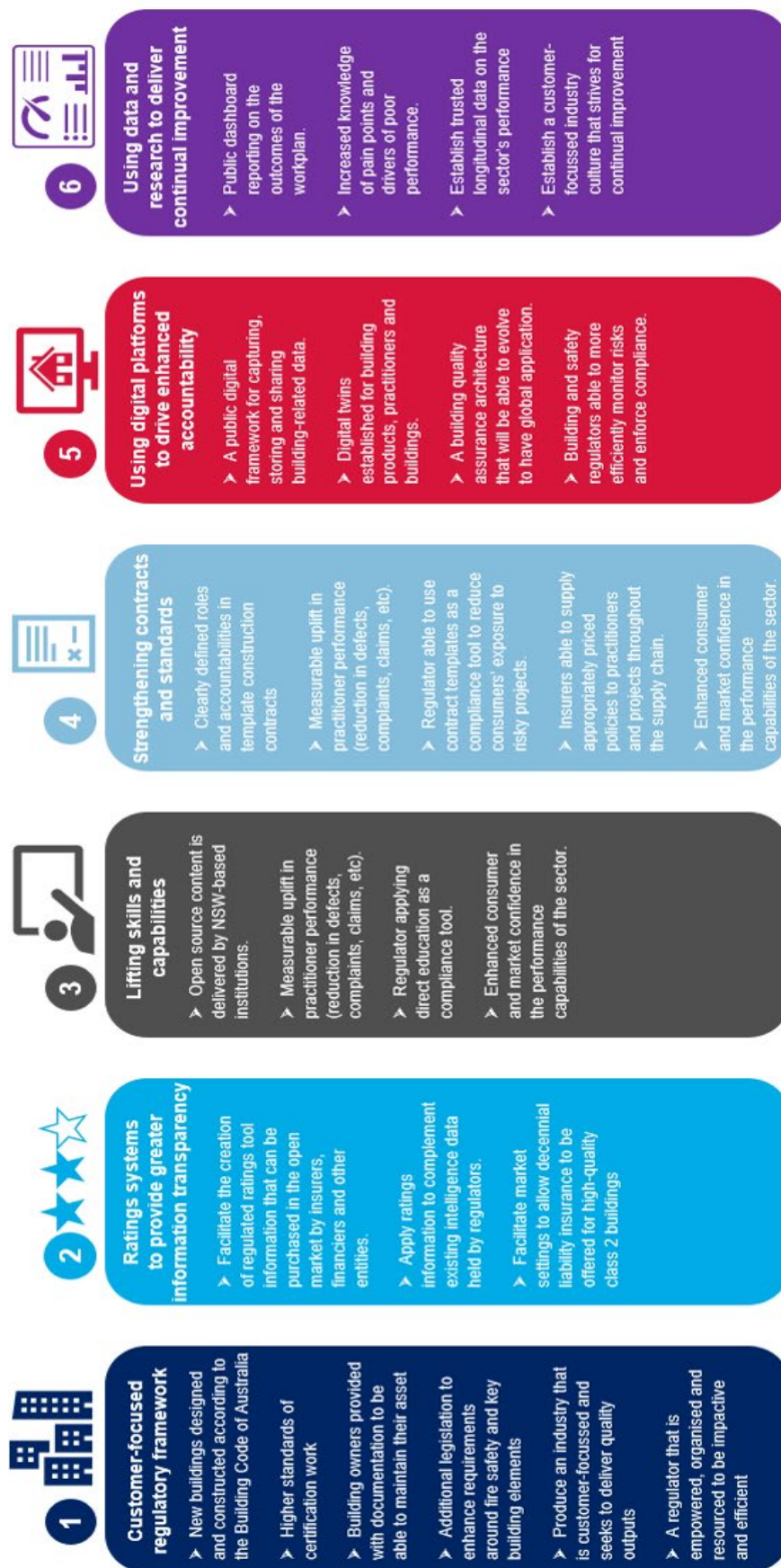
- Investigating and initiating disciplinary action for misconduct in the building industry;
- Overseeing licensing and auditing across the industry; and
- Driving legislative reforms.

David Chandler OAM was appointed to the role in August 2019, and has since developed a strategy and implementation plan called Construct NSW, which sets out a suite of regulatory reforms to be undertaken through to 2025. The aim of Construct NSW is to produce more trustworthy buildings through a more customer-focused, ethical, sustainable, innovative and digitally enabled construction industry. The Construct NSW plan comprises a six-pillar strategy as shown in Figure 3 (below).

A key element of the Construct NSW plan has been the passage of two new pieces of legislation, the *Residential Apartment Buildings (Compliance and Enforcement Powers) Act 2020* (NSW) (**RAB Act**) and the *Design and Building Practitioners Act 2020* (NSW) (**DBP Act**). These legislative reforms are discussed in more detail in Chapter 8, which explores whether the new regulations are likely to adequately address both industry and public concerns about building quality in MUST developments in the light of the findings of this research.

While it is too early to assess the impact of these reforms on building quality in NSW, the extent of the reforms suggests that the NSW Government is taking building quality issues much more seriously than it has in many years. This is important, given that in addition to the suite of policy-focused reports outlined above, there is also a growing body of academic research that points to building quality issues being a long-standing and significant issue in MUST developments, both in NSW and other Australian jurisdictions, as well as overseas. This academic evidence is reviewed in the next chapter.

Figure 3 Construct NSW six pillar strategy (2020)



3. Research context

As the previous chapter demonstrates, concerns about defects are not new, with the issue being increasingly prominent in the media and in policy debates over the past decade. At the same time, researchers have examined the causes and effects of defects from a range of perspectives. This chapter provides an overview of key findings and gaps in the research to date.

There is a large and longstanding body of research into the problem of poor quality in construction, which has revealed a wide range of causal factors related to the industry's cultural, regulatory, organisational, legal, institutional and procurement characteristics. Indeed, the Association of Researchers in Construction Management database of leading journal and conference articles and research cites over 1700 references going back over thirty years (ARCOM 2019). There has also been considerable research into the construction processes in residential developments in Australia (e.g. Ilozor et al. 2004; Wong & Vimonsatit 2012; Yeung et al 2009), but this has largely focused on how developers and contractors can improve efficiency and reduce costs. Moreover, while defects have been shown to be a chronic issue in the *house* building sector (Ilozor et al. 2004; Mills et al. 2009), the issue of *apartment* quality and defects has received less academic attention. In particular, empirical research into the prevalence of defects in the MUST sector remains scant. This lacuna may be related to the relatively recent rapid expansion in the scale of the MUST sector, both in terms of the number and size of developments. The present research is therefore one of the few academic exercises to address this information gap.

This section begins by reviewing academic research on defect prevalence in MUST developments in Australia and worldwide. Following this, we outline the distinctive features of the MUST development model that are relevant to the occurrence of building defects.

3.1. How prevalent are defects?

While much research has investigated building defects, there have been few studies that aim to systematically understand the prevalence of defects in general, and especially in MUST housing in particular. Existing studies often consider the *relative* frequency of particular types of defects based on a sample of defective buildings, drawn from rectification or dispute records, rather than prevalence across all buildings. In Australia, the most comprehensive indications of defect prevalence in the MUST sector come from Easthope et al. (2012) in NSW, and Johnston & Reid (2019) across NSW, Victoria and Queensland.

3.1.1. Easthope et al. (2012): Governing the Compact City

Previous research by two of the authors (Easthope and Randolph) has indicated a high incidence of defects in MUST developments which are exacerbated by governance, regulatory and legal difficulties for residents in recouping costs associated with rectification, compounded by ongoing quality issues in ongoing maintenance and repairs (Easthope et al. 2009; Easthope et al. 2012; Easthope et al. 2013). In particular, a formative report entitled *Governing the Compact City* (Easthope et al. 2012) still offers the most detailed empirical data on the scale and nature of defects in MUST property in NSW. The report drew on data from a statistically representative survey of over 1,000 residential strata owners across NSW and addressed a wide range of strata management issues, including the incidence of defects in their buildings. The research found that building defects constituted a major concern, with 72% of all respondents indicating that they were aware that one or more defect(s) had been present in their scheme at some stage. Many of these defects had not been fixed; in buildings with defects, 60% of respondents still had defects to rectify, with the proportion rising to 75% for buildings built since 2000. The authors stated that, should the issue of construction quality in MUST developments not be addressed, "increasing numbers of owners, residents and owners corporations will suffer short and long term problems caused by defects and the necessary costs and efforts associated with rectification" (2012, p.67).

However, it is important to note that the survey was based on self-reported questionnaires from individual strata owners, rather than a sample of data on the condition of buildings. While the sample was broadly representative of strata owners in NSW, the self-report nature of the data and the opt-in nature of the survey means the findings may not truly reflect actual defect prevalence. The report recommended that further

research be undertaken to better understand the extent and nature of the MUST defects problem in Australia. The research for this report is a direct outcome of that recommendation.

3.1.2. Johnston & Reid (2019): An Examination of Building Defects in Residential Multi-owned Properties

Another recent report, widely cited by the media as justification for claims that there is a residential building defects crisis in Australia, is Johnston and Reid's (2019) *An examination of building defects in residential multi-owned properties*. The report is based on 11 interviews with industry stakeholders and building professionals and a comprehensive analysis of 212 defect audit reports of buildings in NSW, Queensland and Victoria provided by three consulting and auditing companies. It focuses primarily on understanding the types of defects common in residential buildings as well as their impacts (rather than defect prevalence across the sector), and notes the "paucity of research" identifying defect types in MUST properties (p.9). The authors concluded that the extent of defects is significant and proliferating and causes great distress and harm (financial, physical and psychological) to building occupiers and owners. Eighty-five per cent of all buildings in the sample had at least one defect (NSW 97%, Queensland 71%, Victoria 74%), with an average number of defects per building at 14 (NSW 16, Queensland 12, Victoria 11). The most impacted construction systems were building fabric and cladding (40% of defects identified), fire protection (13%), waterproofing (11.5%), roof and rainwater disposal (8.5%) and structural (7%). Based on interviews, the authors note that fire protection defects are likely more common than reported, due to the difficulty of detection. That the reports they examined recorded a high incidence of defects is not surprising as they were reporting on defect audit reports, although it was noteworthy that individual buildings often experience multiple defects. The authors also developed a useful classification system for building defects and provide important data on the parts of buildings in which defects tend to occur.

3.1.3. Other research

Other international studies have set out to analyse the frequency of defects across a particular sector, considering varying building samples. Here, we focus on those that include some proportion of MUST dwellings. In the UK, Pan and Thomas' (2014) analysis of the maintenance/defect records of a national builder found 95.4% of dwellings (including houses and apartments) needed defect rectification within one year of occupation, with 22% of these defects 'making good/minor adjustments' and 8% needing attention within 24 hours. In Denmark all public and publicly-subsidised developments must be benchmarked, with data including defects and customer satisfaction collected by an agency, and results are used to publicly rate contractors. Schultz and colleagues (2015) use this data to analyse 329 building projects from 2007-2010. They found that cosmetic defects were five times more likely than 'less serious' typical defects, and fifty times more likely than serious/critical defects, and split projects into three quality groups: 51% with very few defects at handover, 34% with 'typical' defects and 15% with many/serious defects. For the lowest quality group, 0.49 serious defects were found for every DKK1 million (AU\$210,000) of the construction contract, and 5.96 typical defects.

An Australian study by Mills, Love and Williams (2009) draws on government insurance data for 800,000 dwellings built between 1983 and 1997 in Victoria, the majority of which were detached houses. One in eight dwellings reported defects, with water ingress (because of cost and frequency) and footings (because of severity) the most concerning. Where existing, defect rectification was 4% of the original contract price. The prevalence and cost of defects in the MUST sector is likely higher, however; Rosewall and Shoory (2017) argue the defects problem in this sector is partly a consequence of the trend to much larger apartment blocks which are more complex to design and build, with non-traditional high-rise construction methods now the norm. Recent data from the NSW OBC (apparently based on the program of audits six months prior to applying for an Occupation Certificate) reports that 44% of MUST buildings surveyed have structural concerns, 53% have waterproofing concerns, 45% have fire safety concerns, 25% have external cladding concerns, and 53% have 'essential services' concerns (Chandler 2021). These figures are likely based on a sample of 'concerning' buildings targeted for audits, so may overestimate the true prevalence of defects. An additional OBC survey of OCs suggests 36% of buildings have 'material defects' in common property, and only 17% of owners reported these defects to the NSW government (Frew 2021). This implies government data on defects is likely to fall short of the reality.

Other studies investigate defects based on samples of defect reports or complaints. In Spain, Forcada and colleagues have produced a body of work analysing the types of defects that present during the construction

phase of housing developments, at handover and later in a building's life cycle, developing a classification system for defect types, building elements affected and trade (Forcada et al. 2012; 2013; 2014; 2016). Their data sources included contractors' documentation during construction and at handover inspections, in addition to customer complaint forms regarding post-handover defects. Forcada et al. (2016) note that contractors are responsible for registering inspection results, however they may miss or skip some defects. Similarly to Johnston and Reid (2019), they focus on relative prevalence of types of defects and their causes, rather than defect prevalence across all buildings. In a comparison of defects in the construction period, at handover and post-handover, Forcada et al. (2016) found that surface appearance defects were most common at handover inspections (65% of defects), followed by tolerance errors (9%). Water problems constituted 3% of defects at this stage. Most common during the construction period was inappropriate installation (24% of defects) and surface appearance (15%). Post-handover, end-users most commonly complained of a missing item/task (37% of defects), surface appearance (19%) and inappropriate installation (16%), with windows and doors the elements most affected (25% of defects post-handover). These figures give some idea of the types of defects likely to be picked up by different parties, as well as the defects that tend to carry through to occupation – often because subcontractors have moved to another site and do not return to rectify prior to occupation. Additionally, Forcada et al. (2013b, p.760) observe that customers “tend to be technically inexperienced and are thereby more likely to have a strong emotional attachment with the quality of the product itself and the softer issues of quality, such as the aesthetics, cleanliness, presentation, and look and feel (functional quality) because they view the technical aspect (treated as quality specifications) as a given covered under the various regulations and standards”.

Chew and De Silva (2002) cite a media report that over half of buildings in Singapore had water leakages within a year of occupation, and reviewed defect investigation reports for 1500 Singaporean high-rise residential buildings to examine the problem. Water-related defects were most commonly related to pipe penetrations (43% of water-related defects), followed by cracks (24%), joints (19%) and porous slabs/walls (14%) – though porous slabs/walls were associated with the most severe leakage. Problems generally occurred between 12 and 16 years after construction, which the authors link to the life span of waterproofing materials, however a reasonable number occurred in the first five years. They conclude that high-performing wet areas “may be difficult to achieve due to the fragmentation of contractual arrangement and segregation of design and construction activities” (p.381). In Malaysia, Abdul-Rahman and colleagues' (2014) survey of affordable housing found that leaking pipes were a ‘frequent’ or ‘very frequent’ problem for 56% of the 310 respondents, while water supply failure frequently/very frequently affected 49%. Cracking in external walls was (very) frequent for 34% of respondents, and concrete wall dampness for 23%. They advise lifting the price of construction or increasing government subsidies to support better quality materials and more skilled labour.

In a recent South Korean study, Lee et al. (2020) analysed the frequency and severity of defect types in 133 residential buildings with defect disputes between 2008 and 2017. While using dispute data means only a subset of defect cases are included, this data source includes information on costs as well as frequency, location and work type. ‘Damage’ (components split/deteriorated) was the most frequent defect, at 34% of defects, followed by ‘missing task’ (14%) and ‘water problem’ (12%) – though ‘missing task’ could include waterproofing. ‘Surface appearance’ constituted 10% of defects. ‘Damage’ was also most costly on average, with a cost per instance of US\$254,245. Incorrect installation came in at an average of \$140,005, missing task at \$117,771 and water problem at \$84,082. The most severe defects, based on cost to rectify in that particular location, were incorrect waterproofing installation in garages, followed by incorrect installation of balcony doors and windows and missing waterproofing installation in garages. Of the fifteen most severe defects, six related to waterproofing or water problems. An earlier study by Park and Seo (2017) investigated defects in 177 buildings completed between 2002 and 2011 in South Korea, and found finishing work was the most common defect, at 42% of defects, followed by water supply/drainage/sanitation (14%) and electrical (12%).

Other studies on quality in construction have pointed out the difficulties of obtaining information on building defects, as well as the questionable reliability of the data available (Georgiou 2010; Yung & Yip 2010; Mills et al. 2009; Forcada et al. 2014). The research reviewed here varies in terms of sampling (representative or defect-focused), what the percentage refers to (e.g. buildings or defects), the types of buildings included (commercial, residential, public, private, houses, high-rise, affordability), how defects are defined and classified by type, whether severity is recorded and how, the expertise of the reporter (occupant or expert) and the point at which defects are included in the dataset or cut off (e.g. one year post-occupation, seven years, upon

dispute). This makes it extremely difficult to ascertain the prevalence of defects in different contexts, and to determine what might be considered a typical or expected prevalence of minor or major defects.

3.2. The broader context for MUST defects: does research suggest strata exacerbates the problem?

The limited empirical evidence regarding defects in MUST developments is frustrating, given that the literature shows that the dominant method of financing and developing MUST buildings entails many factors that can generate poor quality outcomes. The most significant of these are the use of increasingly complex designs and new materials; poor integration between architects and builders; insufficient independent project oversight; financial pressure on developers (manifest in a requirement for off-the-plan sales before development finance can be secured); unrealistic schedules; risk-shifting between designers, builders, subcontractors and suppliers; poor training and skills; lack of integration between planning authorities; limited insurance for high rise development; and developers keeping control of OCs (see Georgiou 2013; Drane 2015; Loosemore & Cheung 2015; Johnston 2016; Love et al. 2016). There are also issues with the compromised and fragmented regulatory environment, including the move to private certification for new buildings (Lambert 2015; Hills 2018; Shergold & Weir 2018). Developers are often pressured by strict loan repayment schedules in a volatile market, creating incentives to cut corners to meet deadlines, and they may be difficult to pursue legally once the building is sold (Britton & Bailey 2011). The length of time needed to plan and deliver apartment blocks (as opposed to houses – see ABS 2016) also creates additional development risk, encouraging risk-shifting behaviour by developers. Taken together, these factors cumulatively build in a range of disincentives for developers to focus on quality outcomes in the MUST sector, especially in the moderate to lower value parts of the market where development margins can be tight. Additionally, if the presence of defects is difficult to identify or not adequately recorded and available, this reduces incentives for developers to avoid defects as they may have only minimal effect on their reputation.

In practice, all the various stakeholders in the MUST development context—and there are many of them—have a range of inherently conflicting interests which can result in a lack of transparency in the recording and reporting of defects and other problems in a block of apartments. To understand why the structure of the MUST industry exacerbates these issues, it is helpful to turn briefly to economics literature, and a theory known broadly as the ‘principal-agent problem’.

3.2.1. The principal-agent problem in strata

While the above review summarises the academic literature on the incidence and nature of defects, there is also a literature that offers a broader perspective on how and why such problems emerge, and why MUST development may be particularly susceptible. Largely drawn from behavioural economics and contract theory, this literature can usefully be categorised into three broad and interrelated concepts: *principal-agent theory*, *split incentives* and *information asymmetry*.

Principal-agent theory (Eisenhardt 1989) is based on the observation that in many market transactions, an ‘agent’ (e.g. a MUST developer) is able to make decisions and/or take actions that impact another entity, called the ‘principal’ (e.g. a MUST purchaser). The principal-agent problem (also known as ‘agency dilemma’ or the ‘agency problem’) occurs when agents are motivated to act in their own best interests, which are contrary to those of their principal. This issue has shown to be a problem in apartment markets generally (see Lützkendorf & Speer 2005; Yiu et al. 2006; Yip et al. 2007; Guilding et al. 2005; Easthope & Randolph 2016).

The principal-agent problem can be intensified when an agent acts on behalf of multiple principals, as is generally the case in MUST developments (Easthope & Randolph 2016). In this situation, agents can be further empowered because the complex governance mechanisms associated with strata ownership can pose obstacles to principals engaging in coordinated collective action even after an issue with defects is discovered (Khalil et al. 2007). As a result, agents may exploit their position further by exacerbating information asymmetries with buyers (opportunistic behaviour), such as by failing to provide adequate handover documentation. At the same time, buyers can engage in free-riding or opportunistic behaviour by pursuing their own interests to the detriment of other buyers, thereby further reinforcing the advantage of the agent (Martimort 1996; Gailmard 2009; Garrone et al. 2013). For example, investor owners may be reluctant to

expose defects in a building in order to keep their outgoings to a minimum, while resident owners may not want to reveal defects that could reduce the resale value of their units. This has been called the 'multiple principal problem' and can be a serious problem in MUST developments because of poorly managed strata committees, complex laws around the operation of OCs, the increasing size of MUST developments, and the large numbers of dispersed people involved (Easthope & Randolph 2016; Zahid & Nabilah 2015).

For this research, we are particularly interested in two circumstances in which the principal-agent problem arises in MUST housing development: when the structural conditions mean the principal and agent necessarily have different interests (often referred to as *split incentives*, or conflict-of-interest); and/or when the system means the two parties have access to different amounts and/or quality of information (*information asymmetry*). These two contexts are explained in more detail below.

3.2.2. Split incentives

None of the limited number of studies that have mobilised principal-agent theory to look at MUST developments has focussed directly on the issue of building quality, although it has been highlighted as a consequence of the principal-agent problem (Easthope & Randolph 2016). Instead, they have focussed on 'split incentives' issues. 'Split incentives' refers to situations where parties in an endeavour have differing goals, which can complicate the delivery of goods or services (Easthope & Randolph 2016). There is a significant literature on split incentives in MUST buildings, but much of it relates to energy consumption issues rather than defects (e.g. Bird & Hernandez 2012; Melvin 2018).

Literature referring to principle-agent issues in the ownership and management of MUST development includes Yiu et al. (2006) who note that principal-agent problems can arise between owners and their property managers in residential developments in Hong Kong, while Yip et al. (2007) used principal-agent theory to examine the choice of different residential management models in Hong Kong and Taipei. In a rare study using principal-agent theory to study MUST developments in Australia, Guilding et al. (2005) sought to understand the idiosyncratic nature of condominium governance in major tourist areas and in particular, the conflicts that can arise between a condominium complex's unit owners and its resident manager. More recently, Easthope and Randolph (2016) used principal-agent theory to understand the impact of developer actions on the ongoing management of MUST properties. Easthope and Randolph (2016) focussed on the issue of split incentives between developer and owner stemming from the potentially conflicting requirement for developers to maximize short term profitability, and the owners' longer term need to minimise life cycle costs and disruption. As a contrasting example, Love et al. (2016) analyse the factors leading to rework in a large water infrastructure program in Victoria, where the heavily-involved client instituted a rework prevention program to minimise later costs and increase safety, aligning the incentives of client and construction team. They identify a 'lack of operations (end user) persons buy-in' (p.7) as one of several factors contributing to rework, which encapsulates the situation in strata where future owners are allowed little direct buy-in or involvement. In situations of split incentives, there are often differences between the information and expertise each party possesses, enabling the information-advantaged party to better pursue their interests.

3.2.3. Information asymmetry

The concept of information asymmetry refers to a situation where one party in a transaction has more or better information than another, and has its foundations in the seminal contributions of Akerlof (1970), Spence (1973), and Rothschild and Stiglitz (1976). Their work challenged economists' assumptions that information regarding goods and services in a market was perfect, complete and equally shared, and that as a consequence price follows quality, transaction costs between buyers and sellers are zero and contracts are complete. In contrast, their empirical observations indicated that market actors often have access to differing amounts and quality of information and that these information asymmetries alter market processes, affecting both seller and buyer behaviour. These asymmetries introduce transaction costs and power imbalances into buyer and seller relationships, enabling products of varying quality to coexist in the marketplace, independent of price.

Information asymmetries can have many negative consequences for buyers and sellers due to the market inefficiencies they introduce. Of particular relevance here is the overall market tendency towards declining quality, as consumers favour cheaper and lower quality products in the absence of price differentiating information (referred to as 'adverse selection' (Akerlof 1970)). Over time, this can lead to bad products driving

better quality products out of the market. This phenomenon is especially evident in markets where responsible agents are not rewarded for delivering quality information or cannot disclose it sufficiently. It is also more likely if principals cannot discriminate between the quality of different products because the products cannot be inspected easily. This is often the case with MUST housing, both with off-the-plan apartments, and where defective work may be concealed in the finished product (e.g. a lack of fire dampers within the wall cavity). In these ways, information asymmetries can significantly exacerbate the risk of poor quality in MUST markets.

Another negative market distortion which can arise from information asymmetries is the incentive for vendors to engage in opportunistic 'hidden' behaviours. For example, an unscrupulous MUST vendor may abuse a lack of transparency by disguising lesser quality products while keeping prices the same as competitors. This behaviour is termed 'moral hazard' in principal-agent theory and occurs because principals (buyers) do not have the information to make an appropriate judgement on quality against price. Furthermore, there can be negative spill-over effects for other consumers as adverse selection and moral hazards lead to increased risks across an entire market. For example, one consequence of poor-quality products may be increased insurance premiums and reduced coverage for consumers – a phenomenon seen in NSW, where "the current insurance market environment is already unsustainable" (NSW Parliament Legislative Council PAC 2019, p.61).

To our knowledge, the only study to explicitly focus on information asymmetries using principal-agent theory to explore building quality issues is Lützkendorf and Speer's (2005) investigation of property markets. While not focused on MUST dwellings, they argued that asymmetric information in property markets is the norm and that buyers are either not supplied sufficient information or are unable to interpret the information received due to a lack of experience. This has numerous consequences for both the buyer and developer including loss of trust in the market, conflicts between buyers and sellers, and high transaction costs as buyers invest time and resources searching for information to reduce the asymmetry. Notably, by mobilising principal-agent theory, the authors argue that developers invariably have an edge over consumers due to information asymmetries, which distorts the market by prompting consumers to favour cheaper lower-quality buildings over good quality buildings. The potential consequence is that price and quality continuously fall as high-quality buildings are gradually driven out of the market through adverse selection. Other research on quality in construction indicates that this then further increases the risk of poor-quality construction (and further information asymmetries), as developers must work with ever reducing budgets and programs (see e.g. Nepal et al. 2006).

More recently, Johnston and Leshinsky (2018) have examined the extent to which gatekeepers of information stymie due diligence investigations of buyers of existing MUST units. While they do not use the term 'information asymmetry' or consider quality, their work is informative because it highlights that information asymmetry in the MUST sector is not only an issue at the time of the original sale by the developer, but also in subsequent sales between individual owners. Focussing on the risks that a poorly managed OC can pose to potential buyers, they argue that OCs add a layer of complexity in the process of information provision which increases the risk to buyers above other types of development.

In sum, principal-agent theory and the related concepts of split incentives and information asymmetries offer a sound conceptual basis to explain why defects problems occur in MUST developments. In addition, these concepts shed light on why dealing with defects is problematic and why there is such poor visibility of the extent of the problem. On the one hand, MUST developers are not only poorly incentivized to produce high quality buildings, but also potentially have an interest in perpetuating information asymmetries when they sell the development. On the other hand, while MUST buyers may initially seek out as much information as possible, as future vendors their incentives to address these information asymmetries are also reduced. These information asymmetry challenges underpin a common theme running through previous attempts to study building defects in the MUST sector: the difficulty of obtaining reliable data, especially reliable estimates of the proportion of buildings affected. This means that we have glimpses of the potential scale of the problem but cannot be certain of the accuracy or representativeness of the data. The research for this report attempted to address this basic data 'vacuum' on MUST defects.

4. Defining ‘defects’

Before we turn to reporting how the research sought to tackle this data vacuum, however, it is important to consider one further key concept underpinning this work – the meaning of the terms ‘defect’ and ‘defective work’. How these terms are defined and interpreted plays a central role in how issues of building quality are assessed, rectified and litigated, and often determines who bears responsibility. Despite the importance of these concepts, however, determining what constitutes defective work is not straightforward. Inconsistencies exist in the definition of ‘defective work’, as “no universal term for ‘building defects’ has been applied across the literature” (Johnston & Reid 2019, p.8). Inconsistencies also exist in the assessment of defects in practice. As Forcada et al. (2012, p.437) note, what constitutes a defect in practice can depend on who you ask, as “the perception of quality and what constitutes defective work varies between client, the developer and the contractor”. Given these challenges, it is important to set out our approach to defining defects, and how this approach has informed our review of the data collected.

4.1. Defective work: what does it cover?

A commonly used starting point for defining a defect is Watt’s (2007, p.96) definition of defective work as:

a failing or shortcoming in the function, performance, statutory or user requirements of a building, and might manifest itself within the structure, fabric, services or other facilities of the affected building.

This definition is useful as it emphasises that defective work is not necessarily limited to work that breaches or fails to fulfil existing functional, performance or statutory requirements for construction work. As Watt indicates, construction that fails to meet reasonable user requirements may also be considered defective in certain circumstances. It is helpful to consider these two elements of the definition of ‘defect’ in turn.

4.1.1. Work that fails to meet functional, performance or statutory requirements

In NSW, the minimum technical requirements for buildings are set out in the National Construction Code (NCC), which incorporates the Building Code of Australia (BCA) and the Plumbing Code of Australia (PCA). As Johnston & Reid (2019, p.14) explain, “the NCC is a performance-based code setting minimum standards to ensure buildings are constructed in a safe, accessible and sustainable manner”. Work which fails to meet the requirements of the NCC (and associated Australian Standards) may therefore be considered defective.

However, it is important to recognise that many NCC requirements are performance-based, rather than prescriptive. This means that the NCC sets out requirements for the relevant building element to perform in a certain way, rather than a requirement that a particular construction technique or product be used. As such, the question of whether building work meets NCC requirements may be open to interpretation, and different construction methods may adequately fulfil the requirements of the NCC, if they perform as required.

In addition to meeting NCC requirements, there are also other statutory warranties that a builder operating in NSW must provide. These require the builder to warrant that the building has both quantitatively and qualitatively met appropriate standards of quality. Under the *Home Building Act 1989* (NSW) (HB Act), owners of buildings receive a statutory warranty that work:

- will be carried out with ‘due care and skill’ (s.18B(1)(a));
- that all materials used are ‘good and suitable for the purpose’ (s.18B(1)(b));
- that the work ‘will be done in accordance with, and will comply with, this or any other law’ (s.18B(1)(c));
- that a residential building will be ‘reasonably fit for occupation as a dwelling’ (s.18B(1)(d)); and
- that the work and materials ‘will be reasonably fit for the specified purpose or result, if the person for whom the work is done expressly makes known...the particular purpose for which the work is required or the result that the owner desires the work to achieve’ (s.18B(1)(e)).

These warranties set a baseline requirement that buildings be habitable.

In most cases, the warranties provided under the HB Act last for two years, unless the breach results in a 'major defect' in residential building work, in which case the warranty period is extended to 6 years.

A 'major defect' is defined as follows (s.18E(4)):

- (a) a defect in a major element of a building that is attributable to defective design, defective or faulty workmanship, defective materials, or a failure to comply with the structural performance requirements of the National Construction Code (or any combination of these), and that causes, or is likely to cause—*
 - (i) the inability to inhabit or use the building (or part of the building) for its intended purpose, or*
 - (ii) the destruction of the building or any part of the building, or*
 - (iii) a threat of collapse of the building or any part of the building, or*
- (b) a defect of a kind that is prescribed by the regulations as a major defect, or*
- (c) the use of a building product (within the meaning of the [Building Products \(Safety\) Act 2017](#)) in contravention of that Act.*

This definition requires both that there is defective design, work, materials or a failure to meet the requirements of the NCC, **and** that the defect results in collapse, destruction or in the building being rendered uninhabitable. This standard has been criticised for excluding many defects, leaving owners only two years to claim for defective work that nonetheless has significant impacts on the building's operation (Cooper & Brown 2014).

Interestingly, the new RAB Act contains a new term—'serious defect'—to determine when the relevant department Secretary may require rectification works to be undertaken. The definition of serious defect (s.3) varies slightly from the HB Act definition of major defect:

serious defect, in relation to a building, means—

- (a) a defect in a building element that is attributable to a failure to comply with the performance requirements of the Building Code of Australia, the relevant Australian Standards or the relevant approved plans, or*
- (b) a defect in a building product or building element that—*
 - (i) is attributable to defective design, defective or faulty workmanship or defective materials, and*
 - (ii) causes or is likely to cause—*
 - (A) the inability to inhabit or use the building (or part of the building) for its intended purpose, or*
 - (B) the destruction of the building or any part of the building, or*
 - (C) a threat of collapse of the building or any part of the building, or*
- (c) a defect of a kind that is prescribed by the regulations as a serious defect, or*
- (d) the use of a building product (within the meaning of the [Building Products \(Safety\) Act 2017](#)) in contravention of that Act.*

No additional types of defect are currently prescribed in the Regulations.

A notable feature of this definition of 'serious defect' is that a failure to comply with the BCA, Australian Standards or approved plans can be considered a serious defect in and of itself, irrespective of whether it renders the building uninhabitable or at risk of destruction/collapse. This broadens the range of defective work for which the Secretary has powers to intervene (see Chapter 8 for more detail on these powers).

While the question of whether work has met the regulated standards may be open for debate in some cases, there is little dispute that a failure to meet such standards should be considered defective work. Greater debate arises over the question of whether a definition of defective work should extend beyond minimum standards, to include work which is technically compliant but otherwise fails to meet the user's reasonable needs.

4.1.2. Work that fails to meet user requirements

Buildings are constructed objects with an intent and a purpose behind their construction. For residential buildings, the intent and purpose is for the building to be a suitable dwelling. While being habitable is the baseline for suitability, does the requirement for a building to be ‘fit for purpose’ extend an obligation beyond this? Watt (2007, p.20) argues that “...for a building to be fit for its purpose it must allow its occupants to carry out their activities economically and conveniently, and have a satisfactory environment to suit the user”. If the intent or purpose of the building is not met and the building fails to meet the end-users’ reasonable expectations as a suitable dwelling, then the building is arguably lacking and therefore defective.

In practice, however, determining what might be ‘reasonable expectations’ on the part of end users is not always straightforward. While the agreed design and construction plans included in the construction contracts offer a starting point, these may themselves contain errors or otherwise be insufficient to provide a satisfactory environment for the end user. Furthermore, in the MUST context end users usually have no access to these detailed plans to confirm whether they consider the building ‘fit for purpose’. The other reason using these plans as a basis for determining what is ‘fit for purpose’ is that the design-and-construct (D&C) model means other variations will occur throughout construction, meaning the final product often differs quite significantly from the original design. While these variations may be the cause of dissatisfaction in some buildings, they do not necessarily mean the final building is not fit-for-purpose; and in some cases they may result in an improved outcome. Thus, while non-conformance to a contract or plan may *indicate* that work is defective, this is not always the case. On the other hand, simply meeting the contracted requirements may not always mean a building is fit-for-purpose.

Given these complexities, in practice assessments of whether building work is ‘fit-for-purpose’ are likely to fall back on relying on the elements included in the legislative definitions: fit for occupation as a dwelling, or fit for other purposes that are explicitly made known by the owner/client.

4.2. Defective work: what doesn’t it cover?

While Watt’s approach of incorporating ‘user requirements’ and the concept of ‘fit for purpose’ may be considered broad by some, it is widely adopted (Johnston & Reid 2019) and reflected to an extent in the legislative framing. It is also not the broadest approach possible. Here we note two topical debates over defective work and quality: one that presents opportunities to push the definition further (potentially bringing real benefits for consumers), and another that highlights necessary limitations.

4.2.1. Non-defective work isn’t necessarily ‘quality’ work: towards ‘total quality’

If ‘defective’ is hard to define, ‘quality’ is perhaps even harder – while something is viewed as either defective or not, there are degrees of quality. We accept that work which may not be viewed as high quality by many experts may nonetheless not be defective in any meaningful way. For this reason, we have not delved deeply into debates on ‘construction quality’, focusing instead on identifying work that is defective.

One aspect of the work on construction quality is worth noting, however, as it is relevant to some of the recommendations identified in this report. As the above overview demonstrates, the focus in defining defective work has been primarily on assessing the quality of the building product itself. However, Lützkendorf and Speer (2005) and Forsythe (2007; 2015) argue that in addition to product quality, any definition of quality in construction should also encompass process and service quality – namely, the quality of the process through which the product is produced, and the degree to which delivery of the product meets customer expectations. For example, research shows that the systems builders use to hand over projects have a significant impact on the number of defects customers experience and the subsequent psychological strain they experience in rectification (see e.g. Firing et al. 2016).

The adoption of these ideas results in a shift in thinking away from merely a compliance-based approach to product quality, which tends to dominate quality debates in construction because prescriptive specifications, standards and codes are easy to implement, measure and monitor. Instead, a *process-focused* approach requires adopting an outcomes-based ‘total quality’ perspective, which sees quality in three dimensions: that of the management systems and process of producing buildings; the object of the building itself; and the professionalism by which it is delivered to customers. Notably, this is similar to the outcomes-based approach advocated by Hackitt (2018) in her review of construction quality in the UK. Under this wider definition, a

building has a satisfactory quality level when the building meets technical specifications, product standards, contractual agreements or regulatory requirements (in terms of asset performance, fitness for purpose and impact) but is also delivered through systems, processes and cultures which make that transparent to the customer and meet their expectations. At present, however, this is not a widely adopted approach to defining construction quality; as such, failure to meet these 'total quality' standards would not be widely accepted as resulting in 'defective work'.

4.2.2. Construction defects exclude issues caused by poor maintenance

This project is interested in construction defects of a building only, including issues arising from defective building work or the use of defective materials, but not issues that subsequently arise through normal wear and tear over the building lifecycle. A construction defect is a fault at design or construction stage, although it may be latent and identified much later. For an issue to be marked as a construction defect versus any other issue with the building, there needs to be some indication that the issue could have been avoided in the design and construction of the building. As Richardson (1991, p.2) distinguishes:

Defects arise due to error or omission, that is breach of contract of negligence by a designer or contractor, but deterioration is a natural process which may be unavoidable, although minimized by care in design and the selection of materials.

In practice, distinguishing between a defect and deterioration or poor maintenance can be difficult. A builder should not be held responsible for all future issues that may arise in a building, but the end-user should not be left with a defect that should reasonably have been avoided. If building maintenance after construction is poor, it can be impossible to determine whether a building issue arises because of a defect or associated issues with an initial defect, or because inadequate maintenance exacerbated the deterioration process. In addition, defects from construction may exacerbate deterioration of a building (Richardson 1991). This happens where the initial defect is not identified and/or rectified, and the initial defect then causes further deterioration that may become more serious and identifiable.

The earlier an issue is identified, the more likely the issue is to be the fault of initial design or construction. To apportion responsibility, NSW legislation sets strict timeframes within which an owner can claim against a builder for defective work or materials. These timeframes set the legislative barrier between defects that are likely to be construction defects and building issues that could be a result of maintenance issues, improper use or wear and tear. However, using these timeframes to identify a construction defect is limiting – especially when they are relatively short, as in NSW. Issues can arise from defective building work many years after construction, or initial faults can cause subsequent defects many years beyond these timeframes (NSW Parliament, Legislative Council PAC 2019). Timeframes alone do not necessarily identify the cause of the initial fault, and the determination of an issue as defect-related can require extensive investigative work.

4.3. Not all defects are created equal: challenges in assessing defect severity

Even where experts agree that work is defective, there may be disagreements as to the defect's severity. NSW legislation provides a starting point for determining the severity of a defect – primarily through the distinctions drawn between 'major' and other defects (HB Act) and 'serious' and other defects (RAB Act). As discussed above, however, there is inconsistency between these legislative definitions, and the narrow legislative approach to defining 'major' defects has been widely criticised (NSW Parliament, Legislative Council PAC 2019, p.40-41). While the RAB Act's definition of 'serious' defect is slightly broader, there are still many defects which cause significant harm and expense which would not meet this threshold. A more nuanced legislative approach to assessing the severity of a defect would be welcome, if a workable definition can be proposed.

There are a range of approaches proposed in the research literature on how to assess the severity of defective work in a more comprehensive way. These approaches vary, depending on the data source and research aims. Builders may rate defect severity according to the level of urgency to achieve a remedy (Pan & Thomas 2014) or the financial risk based on cost and frequency of occurrence – thereby pinpointing where to take most care in the construction phase (Lee et al. 2020). Industry watchdogs may class builders according to the number and/or technical and functional impacts of the defects in their developments, as in Denmark (Schultz

et al. 2015). Insurers carry information on cost to rectify and frequency (Mills et al. 2009), while defect investigators vary in their reporting, with some not including apparently minor defects or those arising after handover (Johnston & Reid 2019). Defect severity may also be considered in terms of downstream effects and context; for example, a relatively minor crack may lead to water ingress and further damage, which may be more severe in humid climates than dry (Abdul-Rahman et al. 2014). Johnston and Reid (2019) note that research on risks to physical and psychological health has been limited. These factors therefore may not be taken into account in assessing the severity of a defect.

In practice, defect assessment and rectification experts take a variety of approaches to determining the severity of a defect. The lack of industry coherence on this issue highlights the need for further industry collaboration to develop a workable, consistent and adaptable approach to determining the severity of defective work, which could then inform changes to the current legislative definitions.

4.4. Definition of defective building work informing this research

Given the complexity outlined in this chapter, the question of how best to define ‘defective work’ has been an ongoing discussion among the research team, the project partners and the project’s expert Reference Panel, as well as with expert interviewees. At the start of the project, defects were defined for working purposes as *building work that either fails or is not in compliance with regulatory requirements due to poor design, faulty materials or poor workmanship*. After much debate, this definition has been refined and broadened.

Given the significant role the law plays in determining whether defects can be redressed, it was important that the project adopted a definition of defects in this report that is structured to be inclusive of NSW legislative definitions of defective work (including both major defects and other defects). However, because of the limitations of the legislative approach, and the fact that work which meets the basic statutory requirements may still create significant hardship for an end user, we have sought to embrace a broader definition of defective work. To this end, this report endorses Watt’s (2007, p.96) widely-recognised definition of a defect as *‘a failing or shortcoming in the function, performance, statutory or user requirements’ resulting in a building that is not ‘fit for its purpose’*. However, to indicate the research focus on construction defects specifically, Watt’s definition of a building defect is combined with the definition used by Easthope et al. (2012, p.65), where defects are failings or shortcomings *‘that have existed since construction or been triggered later on by faulty original construction or design’*.

In summary, the definition of a defective building underpinning this research is:

a building that is not fit for its purpose due to a failing or shortcoming in the function, performance, statutory or user requirements of the building, where the failing or shortcoming has existed since construction or been triggered later on by faulty original construction or design.

In practice, in reviewing the data, we have looked for any indication that defects may have occurred in our building sample, and reported all indications. Where possible, however, the level of reliability of that data/assessment is also acknowledged in how the data is reported – i.e. whether it is a self-reported concern, or whether it is an expert-assessed determination. For example, this is apparent in the distinction drawn in Chapter 6 between ‘robust’ data and other data. The uncertainties and inconsistencies in how defective work is defined in both theory and practice needs to be kept in mind when interpreting the research findings.

While the uncertainty around defining defective work is frustrating from a researcher perspective, acknowledging the lack of clarity is helpful when thinking about issues of information asymmetry. The lack of a clear definition and an industry-wide approach to defining defects makes the task for owners grappling with defects significantly more complicated. It makes it harder to assess the quality of expert advice received, and opens up the possibility that consumers will get caught out by genuine misalignments between their expectations of ‘quality’ and what the developer is offering. This challenge will be considered further in Chapter 7, after the method and the data findings have been set out in the next two chapters.

5. Method

Reflecting the shortcomings in available data, this project was designed to provide new empirical evidence of the extent and causes of building defects in MUST housing, as well as identifying possible solutions. The research approach adopted is set out in detail below.

The project was undertaken in two stages: Stage 1 involved detailed quantitative data collection to investigate the prevalence of defects (Research Aim 1), and Stage 2 involved expert interviews to understand why defects occur and how they could be minimised in future (Research Aims 2 and 3).

5.1. Stage 1: Quantifying the defects problem

This stage sought to assess the scale and nature of defects in MUST buildings completed over the decade 2008–2017, the most recent period of expansion of the strata residential sector (HIA 2017).

5.1.1. Sampling

To ensure both project viability and cost-effectiveness, the team used a targeted sampling approach focusing on three locations where recent MUST activity has been significant in the Sydney metropolitan area – the Cities of Sydney, Parramatta and Canterbury-Bankstown. These three local government areas (**LGAs**) represent a mix of high, medium and lower value housing markets that have all seen significant MUST growth over the study period. Together they account for one in five MUST schemes registered across Sydney in the study period (NSW Land and Property Information (**LPI**) database held by City Futures via existing licence arrangements). A random 50% sample of all strata-titled properties registered in the three LGAs over the decade 2008–2017 was selected to form the research sample, totalling 635 schemes. The 50% sample was assessed as sufficient to deliver a representative cross-section of MUST buildings in the three LGAs, while remaining a viable task within the project resources. The data received from LPI includes strata registration numbers, addresses and number of lots for each of the 635 schemes.

The sample of buildings used in this stage of the project are described in Table 1.

Table 1 Sample details

	City of Sydney	City of Parramatta	City of Canterbury-Bankstown	Total
Total buildings	185	224	226	635

5.1.2. Data collection

Once the sample was identified, data about these schemes were sought from a range of possible sources, a labour-intensive process completed over 18 months and closely involving support from the project partners. The sources of data explored by the research team included:

- three relevant state government departments (Department of Planning, Industry and Environment, Fire & Rescue NSW, and the Department of Fair Trading, which oversees regulation of building practices and management of strata buildings);
- representatives from the planning department of the three LGAs;
- development application records for the three LGAs, via a search of council websites;
- four strata inspection firms (private companies that inspect the records of a strata scheme and produce a summary report of key issues/risks for potential purchasers);
- 15 defect rectification firms;
- insurers (including two strata insurers, a construction insurer, an insurance broker and the state-run insurer *icare*);
- a strata-focused financing company (which provides financing for rectification works in strata buildings);

- publicly available court records from the NSW Supreme Court, NSW Court of Appeal, Land and Environment Court of NSW, and the NSW Civil and Administrative Tribunal (**NCAT**);
- the public register of complaints lodged with the NSW Building Professionals Board (**BPB**) (now abolished) against private certifiers and other building professionals;
- submissions to a public inquiry by the NSW Parliament into building quality; and
- a preliminary combustible cladding register for one LGA.

The aim of this multi-source approach was to collect as many pieces of data as possible about each building in the sample, in recognition of the fact that no one source of data would provide an entirely robust or complete picture of a scheme's defects history. For example, a defects report may outline defects identified within 18 months of occupation, but additional latent defects (e.g. water leaks) may then be identified in a subsequent insurance claim. For this reason, a 'layering' approach was seen to provide the best chance of producing a comprehensive picture of a building's defects history. This approach aimed to avoid the methodological difficulties in previous research on defects, which relied either on self-reporting or on (relatively) accessible data on a subset of buildings with documented defects, rather than a randomly selected cross-section of buildings. By drawing from many different sources of information, we hoped to overcome these issues.

Notably, we did not approach OCs, strata management or building management directly for each building. The decision not to approach OCs reflected the fact that the current project explicitly sought to take a different approach to that adopted in [Governing the Compact City](#), where owners were asked to self-report defects. Furthermore, approaching individual OCs for over 600 buildings would be extremely labour intensive, and require resources beyond the scope of this project. Similarly, while we spoke to multiple strata managers in the course of developing the research, the decision not to formally approach strata and building managers for data reflected concerns over the complexity of confidentiality and conflict-of-interest issues, combined with the resource demands and ethics approvals associated with approaching these parties. It should be recognised, however, that these stakeholders may have additional information that could fill out the dataset gathered.

We also explored using the *Government Information (Public Access) Act 2009* (NSW) (**GIPA Act**) to access data from local and state governments, however this was ultimately not pursued as it raised concerns that the identity of the schemes in our sample may be made accessible to third parties.

Ultimately, we were successful in obtaining the following relevant documentation relating to sample schemes:

- strata inspection reports from three strata inspection companies, some of which included defects reports and annual fire statements (among other attachments);
- defects reports and assessment documentation from 27 defects rectification companies (sourced directly from these firms or collected as attachments to strata inspection reports);
- basic Development Assessment (**DA**) documentation from all three LGAs and full DA paperwork from two LGAs;
- council business reports (meeting minutes) for one LGA (mentioning fire orders for inadequacy of fire safety and non-compliance with legislation);
- a register of buildings with potential combustible cladding concerns for one LGA (which was made public online);
- NCAT decisions relating to two schemes;
- basic quotation data from two strata insurance companies;
- more detailed claim and background data for some properties from one of the same insurers;
- basic financing inquiry data from a strata financing company; and
- basic data on remedial works carried out by a defects rectification firm.

Of these data sources, only strata inspection reports, DAs, council business reports, NCAT decisions and the preliminary cladding register are accessible to interested buyers, through purchase or online search.

In addition, we were able to collect useful datasets that were not specific to our sample but spoke to defects issues across NSW more broadly. These included:

- *icare data*: This data relates to the Home Building Compensation Fund (**HBCF**), the NSW government's last-resort builder's insurance, which provides a '[safety net for home owners in NSW](#)'

[faced with incomplete and defective building work](#)'. This data includes policy and claims data covering all NSW multi-unit developments of three or fewer storeys developed July 2010-July 2020 (4,785 new-build policies taken out 1 July 2010-16 July 2020), comprising approximately one third of strata schemes developed in that time. This data cannot be aligned with our sample for anonymity reasons, so is used to provide a wider view of the prevalence of defects in low-rise MUST developments across NSW. The data was provided in confidence by *icare* and is not publicly available;

- *NSW case law*: These records were collected through a search of reported judgements citing defects/rectification and strata in relevant NSW courts and tribunals up to and including 10 July 2020. Of the 337 cases found, 3 cases dealt with 2 schemes in our sample (noted above). The remaining cases were reviewed and catalogued to provide a general overview of the nature of defects claims and the costs involved. While reported judgements provide some insight into the nature of complex or contentious defects disputes, these cases provide only a limited picture of the extent of the defects problem, due to the large majority of cases settling out of court (see section 6.4.2 below);
- Details of complaints lodged with the BPB about private certifiers, available online; and
- Submissions made to the NSW Parliamentary Inquiry (NSW Parliament 2020).

5.1.3. Analysis

Once received, all relevant documentation was reviewed in detail, and all references to defective work recorded in an Excel database against each strata plan number, together with additional data drawn from the LPI database. The data collected from these sources is summarised in Chapter 6. An analytical framework was developed to systematically compare and assess key data elements from this review, producing a categorisation of defect types. The categorisation was derived first from the three key categories mentioned in the literature and recurring in discussions with experts (cracks/structure, water and fire), with breakdowns of different types of defects within this, and further categories grouping the types of defects by location (e.g. doors/windows), system (e.g. mechanical/electrical) or damage (e.g. corrosion). Terms used differed across the type of document and who produced it, and this is our best compromise to produce consistency. Schemes were marked as having/not having identified each type of defect in their building, with further details noted. Where a defect type fit more than one category (e.g. fire door defects), it was classified under one category (in that case, fire related defects). Table 2 shows the final defect classification.

Table 2 Defect type categorisation

Category	Type of defect	
Crack related defects	Crack	
	Collapse	
Water related defects	Blocked weephole	
	Waterproofing defect	
	Water pond / Water flooding	
	Water leak / Water penetration / Water seepage / Water ingress	Slab
		Pipe
		Tap
		Shower booth, Basin etc.
	Moisture / Mould / Humidity / Dampness	
	Drainage defects - Inadequate fall, Insufficient drainage etc.	
Fire related defects	Cladding	
	Fire door defects / Fire damper defects / Fire separation wall defects / Fire hose defects / smoke alarm defects / Unsealed pipe or cable penetrating etc.	
Gap / Cavity related defects	Gap between walls and slabs	
	Cavity / Hole	
	Other wall, façade defects - Sealing, Mortar, Misalignment, Grouting, Louver, curtain wall etc.	
	Other slab, floor, ceiling defects - Expansion joint, Sealing, Staining, Insufficient step down, Uneven floor etc.	
Corrosion / Efflorescence related defects	Corrosion	Wall, Slab, Beam
		Material
	Exposure	
	Calcification / Bleeding of mortar / Efflorescence	
Door / Window related defects	Door defects	
	Window defects	
Electrical / Mechanical / Hydraulics related defects	Hydraulics defects	
	Electrical defects / Mechanical defects	
Miscellaneous	Delaminated joint / Delaminated render / Cracked render	
	Broken tile / Drummy tile / Corrosion tile / Missing tile / Cracked tile / Delaminated tile	
	Noise transmission	
	Odour problem	
	Painting defects	
	Material defects / Finishing defects - Raised floor, damaged UV coating etc.	
	Miscellaneous - Burst pipe, balustrade height, handrails, stair riser, cracked basin, bolt missing, unsuitable access etc.	

5.2. Stage 2: Understanding why defects occur and possible solutions

This stage sought to determine how and why building defects occur in MUST housing and how current procurement, construction and regulatory systems could be improved to minimise defects in the future. This was undertaken through a series of interviews with a wide range of practitioners and stakeholders involved in strata building, management and defect rectification. Perspectives on the severity of the problem and instances of defect costs were also gathered to complement the quantitative data obtained in Stage 1.

5.2.1. Sampling

A total of 57 interviews were conducted, with 66 relevant experts (see Table 3). Some interviews involved multiple participants from the same organisation. Experts were initially identified through recommendations by project partners, the project's expert Reference Panel and the research team's extensive network of industry connections, as well as some additional suggestions by interviewees as the interviews progressed. Particular attention was paid in selecting the participants to include experts from a broad range of relevant sectors. The majority of interviewees worked primarily in NSW, however we also included two Victoria-based academics, a Victorian lawyer, a Queensland lawyer, a Victorian expert on alternative development models and a Victorian expert in property marketing/real estate, to provide comparisons with NSW. The aim was to ensure a diverse mix of perspectives and a comprehensive picture of what causes defects and how they can be prevented.

Table 3: Overview of interviewee expertise

Sector	No. of interviews
Rectification specialists (includes contractors, water-proofers, structural and façade repairs, engineers, expert witnesses)	7
Development Industry	6
Lawyers	5
Academics	6
Subcontractors (includes plumbers, tilers, carpentry, joinery, interiors, foreman)	5
Alternative development model experts (CHPs, student housing etc.)	3
Architects/Designers	3
Builders/Construction companies	3
Government employees (state and local)	3
Engineers	2
Certifiers	2
Insurers	2
Strata media	2
Property marketing and real estate companies	2
Strata managers	2
Suppliers	2
Strata inspectors	1
Owners	1
Total	57

5.2.2. Data collection

Data was collected using semi-structured telephone and video interviews based on a list of key themes developed by the research team before interviews began, and tailored to suit each interviewee's area of expertise. The overarching themes were:

- Establishing the extent and impact of the defects problem in NSW;
- Examining systemic causes of defects;
- Comparing the extent of defects and responses in different jurisdictions and development contexts;
- Exploring whether the strata model exacerbates the defects risk; and
- Identifying solutions (both regulatory and market-based, potentially drawing on alternative models like social housing, student housing etc.).

The interviews lasted between 45 minutes and 2 hours, and involved 2-3 members of the research team. Interviews were recorded and transcribed, and the transcripts were then coded following the approach outlined by Braun & Clarke (2006). This involved organising interview excerpts into broad categories according to extent and impact, systemic causes and solutions, with specific categories beneath this on the building process, buying process, management process and rectification process. Drawing on our analytical framework, we further categorised interview excerpts according to themes under information asymmetry and split incentives, as well as capacity, oversight, protections, alternative development models and recent reforms. The focus in this report is primarily on the interview material relating to information asymmetry issues. Interview material addressing other aspects of the construction/strata landscape will be reported in subsequent publications, other than the brief overview of key interview themes set out in section 6.4 below.

5.2.3. Analysis

While qualitative data is sometimes portrayed as less objective than quantitative data, and is therefore often less valued in policy-making (Rottenburg & Merry 2015), both approaches have strengths and weaknesses. As we have seen in this research, quantitative analysis can have pitfalls in terms of data availability and reliability, as well as biases introduced due to the framework used, what data is sampled and its source. Qualitative data provides context, helps to explain gaps in quantitative data, and suggests potential causes and solutions. When experts from widely different fields are in consensus, we can be relatively confident their conclusions are correct. When their perspectives differ, these tensions highlight important complexities, as well as alternative or complementary explanations. For this reason, this report gives detailed consideration in Chapter 7 to the qualitative data collected, after setting out the quantitative data findings in Chapter 6.

6. Documenting defects: the data

As noted in Chapter 3, there is currently no comprehensive database of building defects in the MUST sector in any jurisdiction in Australia. While government agencies collect some information of relevance to building defects, this is limited and divided between government agencies at state and local level. This lack of reliable data has been a source of frustration for regulators, researchers and industry participants alike.

The database created for this research project was developed in an attempt to fill this knowledge gap. As described in the previous chapter, it has been created over 18 months by a team of six researchers, who have identified publicly-available information relating to defects for the 635 case study strata schemes, and sought to negotiate access to relevant limited-access data sources held by industry and government. Gaining access to this material has involved drawing on existing relationships across industry and government, as well as developing new relationships. Support was provided by the five project partners, as well as the project's expert Reference Panel, nominated for their expertise in relevant aspects of the construction industry. This chapter sets out what data was collected and added to the database, as well as the challenges encountered in trying to create a comprehensive picture of the extent of building defects in Sydney.

6.1. What data could we get?

As Section 5.1.2 detailed, we approached numerous organisations and also searched publicly-accessible data sources for data relevant to our sample. The dataset collected from these sources is outlined here.

6.1.1. Overview of data collected

Table 4 (below) summarises the documents and data collected for the sample. The widest coverage came from one of the insurance providers, who had provided quotes for all schemes in our sample (applicants are required to note any defect present in their requests for quotation, making this a self-report measure). We were also able to access and analyse the detailed insurance files of one of the insurance providers, a time-consuming task which required prioritising data on schemes with a defect status of 'unknown' or 'yes'. Once data on these schemes had been gathered, we prioritised Canterbury-Bankstown schemes due to the scarcity of information available for this LGA from other sources. This enabled us to source greater detail on cases with existing or suspected defects. The detailed insurance files included a range of documents, including defects reports, builders' rectification settlement documents, claims data and emails.

We also sourced strata inspection reports for almost half our schemes from three providers. These reports are available for purchase by potential apartment buyers, and are intended to aid buyers in their due diligence. Basic development application data was available for more than one third of cases, with fewer cases having detailed documentation on the DA. However, DAs were largely for initial construction, and gave little detail on defects – although a small number related to rectification.

Annual fire safety statements were often appended to strata inspection reports, but provided limited information on defects. Defects reports were found for one in ten buildings, with almost half of these in the City of Sydney. A factor here is the geographic focus of the firms which provided data; of the 15 firms contacted, only four could supply data, and three of these were based and operated in inner Sydney. A preliminary register of City of Sydney buildings with potential cladding issues (as reported by OCs) was publicly available online due to a request by the *Herald Sun* newspaper under the GIPA Act, with 42 of the buildings in our sample listed.

Twenty of our sample buildings had enquired about loans from a financing company, with some of these related to defect rectification works. A remedial firm provided data on nine cases detailing the types of defects and rectification work required, while a search of 'fire orders' in council business meeting minutes found references to three cases in the City of Sydney. The searches of case law found three cases relating to buildings in our sample (two related to the same building).

Table 4 Data collection outcomes

Data Source		Sydney	Parramatta	Canterbury-Bankstown	Total	% of schemes
Insurance Info	Provider 1	185	224	226	635	100%
	Provider 2	124	168	166	458	72%
	Detailed	28	13	56	97	15%
Strata inspection reports (357 total – some duplicates)		115 (174 total – some duplicates)	90 (113 total – some duplicates)	60 (70 total – some duplicates)	265	42%
DA data (basic)		86	118	33	237	37%
DA Documents (detailed)		78	100	0	178	28%
Annual Fire Statements (152 total – some duplicates)		82 (98 total – some duplicates)	36 (38 total – some duplicates)	16	134	21%
Defects reports (79 total – some duplicates)		41 (52 total – some duplicates)	15 (19 total – some duplicates)	8	64	10%
Cladding register (preliminary)		42	0	0	42	7%
Financing Data		8	8	4	20	3%
Remedial data		7	1	1	9	1%
Council business report (meeting minutes)		3	0	0	3	0.5%
Case Law		0	2 (3 cases total)	0	2	0.3%

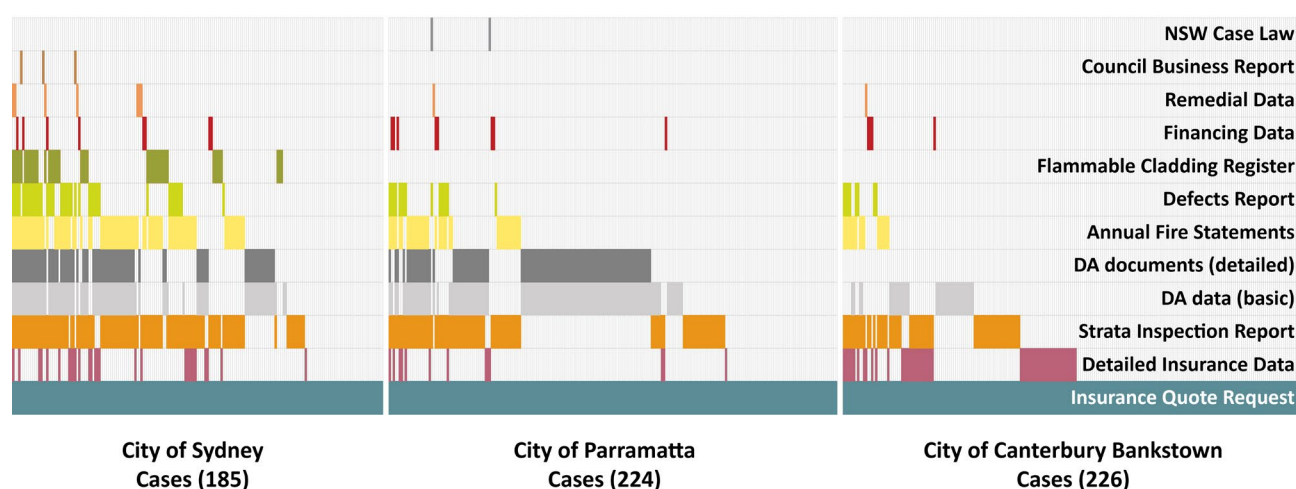
Table 5 shows the information available within each dataset, with categories most helpful in determining defect status highlighted in darker blue, and categories of some help in light blue. Note that datasets seldom have every category filled for every scheme.

Table 5 Categories of information contained within each dataset

Insurance Info 1	Insurance Info 2	Insurance Info (detailed)	Strata Inspection Reports	DA Data (basic)	DA Documents (detailed)	Annual Fire Safety Statements	Defect Reports	Cladding Register	Financing Data	Remedial Data	Council Business Report	NSW Caselaw
Address	Year Built	Insurance claims	Date of Inspection	Application No.	Architectural plans	Type of Statement	Investigation Method	Address	Enquiry Date	Year Built	Report of the Corporate, Finance, Properties, Tenders Committee	Document No.
Insured or Quoted (Yes/No)	Address	Insurance cost	Address	Description	Site plans	Building Information (Address, SP, Building Name)	Referenced Documents	Cladding assessed for fire risk (Yes/No/Underway)	Loan Enquiry Amount	Address	Report of the Environment Committee	Court (Tribunal)
Defects (Yes/No)	Has Known Defects (Yes/No)	Defects Report	Search (Inspection) Company	Decision date	Site analysis	Description of Building	Location and Description of Defects	Recommendations made in assessment report	Lots	Number of floors	Report of the Cultural, Community Committee	(Medium Neutral) Citation
Asbestos (Yes/No)	Defect Details	Annual Fire Safety Statement (AFSS)	Strata (Managing) Agent	Estimated cost	Statement of environmental effects	Owner Information	Causes of Defects	Issued fire safety order (Yes/Unknown)	Purpose Code	Number of apartments	Report of the Transport, Heritage, Planning Committee	Decision (Judgment) date
Cladding (Yes/No)	Roof Construction		Insurances Detail	Developer	Preliminary Contamination Assessment	Fire Safety Measures	Breaches		Purpose Detail	Roof Construction type		Decision
	External Wall Construction		Defects Report	Applicant	BASIX Assessment	Detail of Competent Fire Safety Practitioners	Recommended Scope of Works; Method of Repair			External Wall Construction type		Catchwords
	Floor Construction		Annual Fire Safety Statement (AFSS)	Owner	BASIX Certificate		Defect classification			Floor Construction type		Legislation cited
	Num Basements		Other Reports (WHS Report, Meeting Minutes etc.)	Application Form; Letter (Yes/No)	Response to Council		Photographs of defects			Num Commercial Lots		Category
	Num Commercial Lots				BVA Supplement					Num Residential Lots		Parties
	Num Residential Lots				Waste Management Plan					Total lots		Disputes
	Is Refurbished				Notification Letter					Has Known Defects (Y/N)		Kind of bldg defects
	Refurbishment Details				DA Notice of Determination					Defect Types		Defect cost
	Fire Protection									Defect prevalence		
	Security Protection									Defect locations		
	Number of Claims									Date of defects reported (year)		
	Claim Total (Cost)									Rectification Details		
	Loss Causes											

Figure 4 summarises the coverage of data types we were able to source for each building, with each vertical line representing one strata scheme. For the City of Sydney, we have three or more data types for the majority of schemes, however for the City of Canterbury-Bankstown only around 20% of schemes have three or more data types sourced.

Figure 4 Data types sourced for each strata scheme in sample (each vertical line = 1 scheme)



In addition, we were able to obtain a comprehensive dataset of HBCF insurance policies and claims that could not be linked to our sample due to its anonymous nature. This is used to provide a comparison in Appendix 1.

6.2. What were the key challenges in data collection?

The research design took into account the fact that no 'single source of truth' existed which documented building defects in the MUST sector in NSW (just as Georgiou (2010) noted in Victoria). As such, we anticipated that the research team would encounter obstacles in collating sufficient material about the prevalence and severity of defects in our sample of buildings. Nonetheless, the issues encountered have made clear that the challenge is greater than anticipated and have shed light on how information asymmetry, or indeed absence, is a defining feature of the MUST market. Herewith, a few observations that have led us to this conclusion.

6.2.1. Data holdings are fragmented

Currently, information on building defects is spread widely across the strata and construction industries. Bodies that hold potentially relevant information include multiple departments of local and state government, private certifiers, contractors and subcontractors, builders, developers, rectification firms, strata managers, OCs, NCAT and the courts, law firms, strata inspectors, construction and strata insurers and real estate agents. Building a comprehensive database of existing defects requires liaising with each of these parties individually and dealing with complex confidentiality issues.

6.2.1.1. The availability and accessibility of information across governments is limited

The lack of data held by government – and the challenges faced in sharing it, both between departments and with external organisations (including researchers) – is particularly notable. Identifying which government department or agency holds various records is not straightforward, and records which should be publicly available are not always easily accessible (e.g. only limited DA documentation being available via a council's online register, for example). In other circumstances, access to potentially relevant records was only available by lodging a request under the GIPA Act. Schapper et al. (2020) highlight the challenges with using freedom of information legislation like GIPA to access material for research projects.

These issues reflect a mix of limited record-keeping requirements, resourcing shortfalls, and sensitivities around the risk to existing owners if defects information becomes public. There has also been no obligation on owners or OCs to report defects to the government. While Fair Trading has a mechanism for consumers to report issues with building quality, it seems that the Department has not always been resourced adequately to allow detailed investigation of complaints (see sections 7.2.1.1 & 8.1.5) and reporting was not proactively

encouraged. This has only recently changed, with the Building Commissioner and Fair Trading now strongly encouraging all buildings experiencing problems to report them.

Even where government has relevant data, there have been obstacles to making it public. A striking example of how governments have wrestled with the implications of making defects data publicly available is the disagreement within the NSW government about sharing the register of buildings identified as having 'high risk' flammable cladding, which was developed in the aftermath of the Grenfell Tower fire tragedy. When the Parliamentary Inquiry into building quality sought access to this register, it was produced only under a claim of privilege, which meant access was only given to relevant members of parliament on a confidential basis (NSW Parliament, Legislative Council PAC 2020). As the Parliamentary Inquiry noted, there are also issues around the accuracy of the register data, as it was created by requiring OCs to report if they believed their building had flammable cladding. Given the penalties in place for failing to report, many buildings self-reported out of an abundance of caution. A review by Fire & Rescue NSW of the buildings on the register is ongoing to determine how many buildings are actually at risk (NSW Parliament, Legislative Council PAC 2020). Meanwhile, the Parliamentary Inquiry also noted that it is currently not possible for prospective purchasers to find out whether a building is listed on the register.

6.2.1.2. Industry-held data is more comprehensive, but also dispersed and confidential

After 18 months of seeking access to relevant defects data, our conclusion is that the most informative records sit with industry participants, not government. Despite professionals working in the defect rectification space standing to gain financially from the ongoing occurrence of building defects, many industry participants expressed significant concern about MUST quality issues and were willing to assist with research to address the issue. Nonetheless, gaining access to this information was not always straightforward, and its usefulness varied significantly. Insurers showed a particular willingness to help, but often did not hold detailed data about building defects and relied on self-reported data from OCs (such as a tick box on a request for quotation form, which asked 'are you aware of existing defects in your building?'). This was somewhat eye-opening for the research team, given the risk and cost associated with defects for strata insurers. Some insurers are actively seeking ways to better risk-profile buildings in relation to defects, as one interviewee explained:

We are looking at data in a different way to find out better ways to predict performance, and the best prices, and more capital will go to those buildings that have more predictable behavioural indicators. – Insurer 1

Defects rectification firms held more detailed data (including initial defects reports and subsequent scopes of work and Scott Schedules), and were also often willing to assist. This part of the industry is highly fragmented, however, with many small firms, all of whom design their own defects categorisations and data management systems. Furthermore, these firms are employed directly by OCs, and must therefore ensure the information they hold is kept confidential. Gaining access therefore required one or more meetings with senior managers to explain the research project and data management approach, followed by the signing of individual non-disclosure agreements (NDAs) with each firm. This was a time-consuming exercise, given that many firms were only able to provide information about a small number of buildings. In addition, the data provided is not consistently structured, requiring significant further work to incorporate this into the broader database (on this point see also Johnston & Reid 2019).

6.2.2. Data is often inconsistent or unreliable

As the above overview shows, there are many obstacles to collecting detailed data about building defects in NSW. Even when data is available, however, further challenges emerge. Because the available data comes from a range of sources, and is produced for diverse purposes, it is often inconsistently expressed and/or incompatible with other available data. In some cases, the robustness of the data is also questionable, as this depends on the skills and knowledge of the person assessing or reporting the defects.

6.2.2.1. Data consistency issues

Because of the fragmented nature of who produces data on building defects, the available documentation is often inconsistent in both content and format. The data collected for this project included spreadsheets, PDF documents, and material cut and pasted from websites and database interfaces. These inconsistencies slow down analysis, but can be overcome. More challenging are the inconsistencies in how defects are analysed

and reported, depending on the purpose for which the information is being produced. The way defects are described and the amount of detailed information provided often varies significantly between a strata inspection report and a defects report, for example. This makes sense given the different purpose and audience for which these documents were produced, but nonetheless makes comparisons difficult.

Perhaps more surprising was the extent of variation in style and content even within document categories. Because we were able to collect strata inspection reports and defects reports from multiple providers, we could compare the approach taken to analysing and displaying information about defects. In both contexts, there were notable variations, not just in style, but also in how key information was classified. For example, looking at the defects reports collected, we found a range of different classification systems used – some simply noted all defects in a single category, while others distinguished between major and minor defects, and others adopted a 3-level classification (e.g. high, medium and low priority). Defects were assigned to different categories for different reasons – in some cases depending on whether they were considered major or minor under the HB Act, in others depending on the perceived risk to human safety, and in others depending on the consequential damage likely to occur if left unaddressed. These variations may result in similar defects being categorised differently across reports from different providers, as Table 6 suggests. In this table, we have summarised the assessment categories used by four different defect report providers, and shown which categories some common types of defects are usually assessed as falling within.

Table 6 Summary of different classification approaches in defects reports

Kind of defects	Classification of defects								
	Defect Report 1	Defect Report 2			Defect Report 3			Defect Report 4	
	Defect	Condition Rating 1	Condition Rating 2	Condition Rating 3	High Priority	Medium Priority	Low Priority	Defects	Minor Defects
Crack	☑	☑	☑		☑	☑		☑	☑
Tile damage	☑		☑	☑		☑			☑
Blocked weephole	☑	☑			☑			☑	
Water penetration	☑	☑			☑				

Undoubtedly, some of the variation here reflects the varying severity of the defect itself – a ‘crack’ can be cosmetic or life-threatening if it affects structural integrity. Nonetheless, this table shows the complexity of attempting to extract consistent data from the existing documentation without independently reassessing the defects. This is a challenge other researchers have also encountered; see, for example, how Johnston and Reid (2019, p.18) describe their experience of reviewing defects reports sourced from multiple companies:

Although each company had a template for the reports produced, there was variation in relation to the level of detail and the terms or language used to describe the observed defects. The personnel undertaking the audits also varied in terms of background. Some companies engaged engineers, others engaged qualified builders or a combination of both to carry out the audits. It was also difficult to determine the criteria applied in reporting the defect. Some companies may focus less on minor faults or faults that have arisen post-construction.

While Table 6 highlights the challenges of extracting consistent data from defects reports, the possibility that information does *not* appear is also a concern.

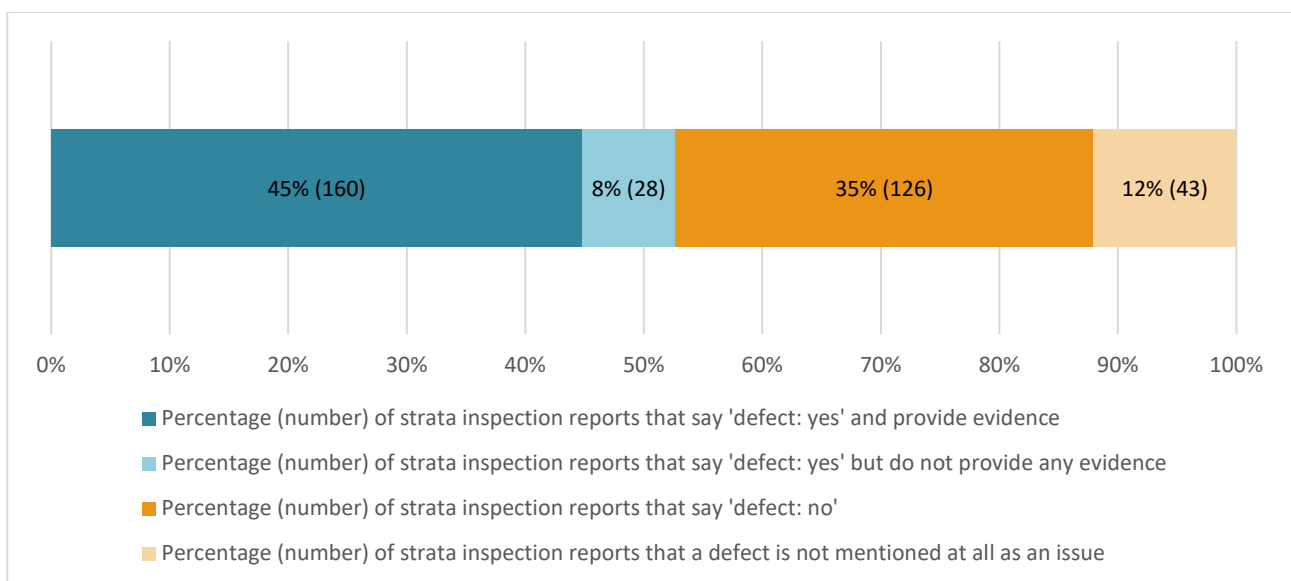
6.2.2.2. Data robustness issues

While defects reports are the most comprehensive source of data we have been able to collect, they may still present only a partial picture of the defects in a building. The robustness of defects reports depends on the skill of the consultant undertaking the assessment, and whether destructive testing is possible. Even some serious defects (including leaks, issues with fire protection systems and electrical wiring faults) will most likely not be visible during a visual inspection, meaning a defects report based only on a visual inspection is necessarily incomplete (Johnston & Reid 2019). As one interviewee explained, a poor report may be of little value, despite costing a significant amount to acquire:

Some of the reports, they're quite expensive, some of them are not thorough, they don't go into every apartment, especially if they're tenanted [...] Sometimes I think if it's a very surface-type report, then it doesn't really go into the proper depth that it needs to [...] These sorts of just general reports don't really – can't really be used if matters have to be progressed [legally], and they're quite costly in the first instance. – Strata Manager 1

Robustness is also an issue with strata inspection reports. The quality of the information they contain about defects depends on the quality of record-keeping by OCs and strata managers, and the thoroughness and skill of the strata inspectors. As with the defects reports collected for this project, we have found significant variation in the format and comprehensiveness of the strata reports reviewed. As Figure 5 shows, 12% of the strata inspection reports collected did not mention defects as a consideration at all, while another 8% mentioned the possibility of defects occurring but did not provide any supporting evidence (note that some buildings had multiple strata reports, so this does not equate to defect prevalence across our sample).

Figure 5 Mentions of defects in all strata inspection reports sourced



Where the strata inspection report contains limited or no discussion of defects, it is impossible to know whether this is because (a) there are no defects in the building, or any defect issues have been resolved; or (b) defect issues have not been adequately captured in, or extracted from, the scheme's records (this appeared to be the case for at least nine buildings, based on other data sources). As such, the failure of a strata inspection report to mention defects cannot be assumed to mean that the building is defect-free.

These issues with data quality require caveats on how the data we have collected can be interpreted, but are also themselves a notable research finding. Furthermore, it is worth noting that even with these caveats, the data collected for this project remains one of the most comprehensive datasets on building defects that exists in Australia, to our knowledge. As such, it remains both useful and important to examine what the data collected can tell us about building defects, despite its limitations. This is the focus of the next section.

6.3. What does (and doesn't) the data tell us?

The charts in this section show the prevalence of defects in our sample, which must be read taking into account the significant caveats discussed in the previous section. Following this we discuss information on the types of defects arising in the data. The true extent of defects is likely to be higher, and estimations of defect severity are difficult to make due to the availability, consistency and robustness of the data.

6.3.1. Pursuing the full picture: estimating the prevalence and severity of defects

The data collected for this project indicate defects are common, however it is difficult to arrive at a definitive assessment of actual prevalence given we cannot tell how much the numbers reflect the existence of defects and how much they reflect (lack of) reporting. This section provides several ways of looking at the data, concluding with our estimated ranges of defect prevalence.

We have evidence of at least one defect for 26% of the schemes in our sample, but due to scarce data this is likely to be a poor estimate of true defect prevalence. To better ascertain defect prevalence, we can restrict our analysis to those schemes for which we have what we consider 'more robust' data about the likely existence of defects. Having reviewed the collected records and discussed the reliability of their contents with our industry partners and expert Reference Panel, we would consider the records provide a more robust indication of the possibility of defects in the following circumstances:

- Where we have the defects report (the most detailed information we have on defects);
- Where we have detailed insurance records (e.g. claims documentation); or
- Where we have the strata inspection report.

Throughout this section, where reference is made to 'more robust' data, it means we have sourced at least one of the above documents.² The percentage of schemes for which we have more robust data is shown in Figure 6 below, alongside the schemes for which we have a defects report (the most comprehensive defect data available), plus the schemes in which a defect has been identified. The proportion of defects identified visibly follows the proportion of schemes with more robust data.

² A potential drawback of this approach is over-sampling of cases with defects, as defects reports were not obligatory before 2018, and our sample was registered 2008-2017. While well-advised schemes would have commissioned a report before 2018 regardless of whether defects were apparent, not all would have. This means that a proportion of schemes likely commissioned a report because they had defect concerns, meaning defects reports may over-represent defect prevalence. Additionally, as section 7.1.1 notes, the detailed insurance data predominantly covers schemes with reported or 'unknown' defects. However, the third category of 'more robust' data—strata inspection reports—are commissioned to aid purchase decisions rather than investigate defects, and are more likely to give an even spread of buildings with and without identified defects. Of the 358 schemes with 'more robust' data, only 6 are included solely on a defects report or detailed insurance data. We believe this does not skew results in favour of defective buildings to a significant extent.

Figure 6 The percentage and number of schemes with a defect type identified vs schemes with more robust data and schemes with defects reports (by LGA)

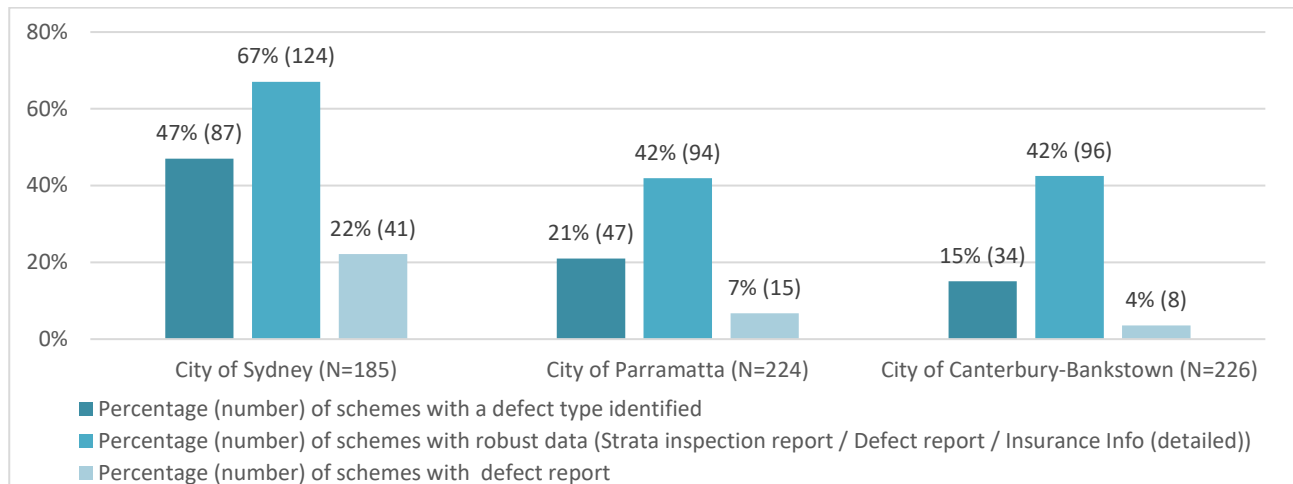
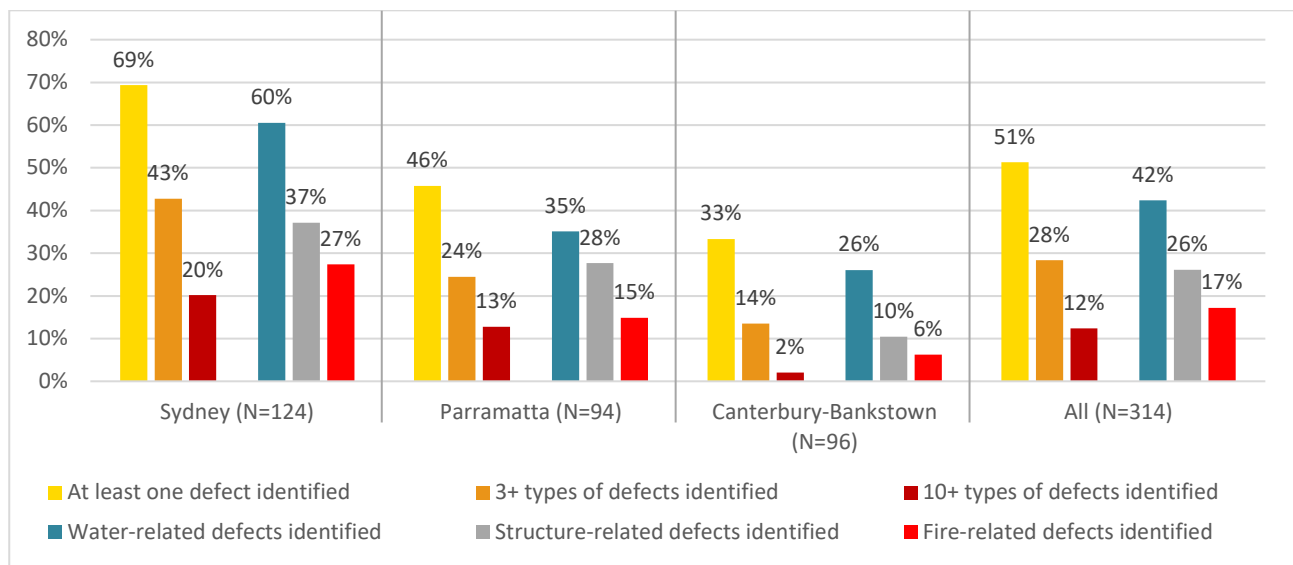


Figure 7 shows defect prevalence for all schemes with more robust data, with 51% of all schemes having evidence of at least one defect. As noted in 6.2.2, it is difficult to determine the severity of defects due to varying reporting methods. The figure gives some indication of potential defect prevalence and severity through several proxies, counting schemes: (i) with three or more different types of defects (as defined in Table 2, section 5.1.3); (ii) with ten or more different types of defects; and (iii) with defects related to any of the 'big three' defect types. These are defects relating to fire, water and structure (cracks or collapse) and are deemed important due to their health and safety implications, their (in)visibility and/or their expense to fix (see section 7.3.2 below for more on why these defects are of particular concern).

Figure 7 Defects identified in sample, schemes with more robust data (by LGA)

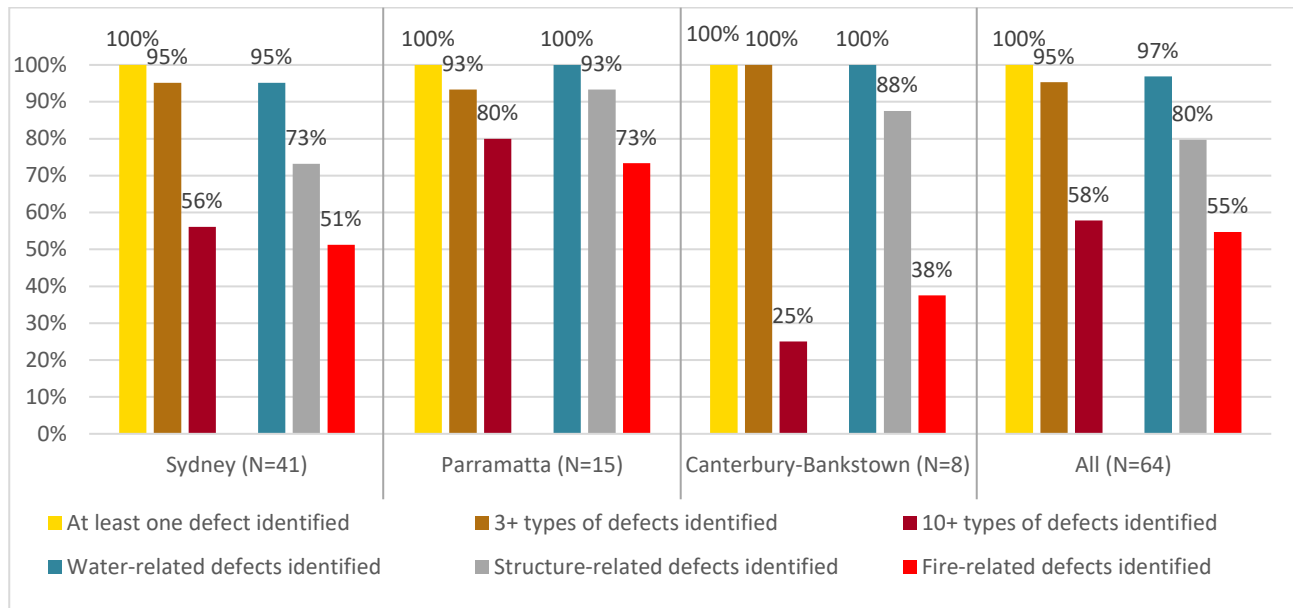


It is important to be clear about what this graph tells us. While this figure suggests defects appear to be most common in Sydney LGA, we do not claim that this is a comprehensive picture of the percentage of schemes in each LGA in which defects *actually exist*. Rather, we believe this result is influenced by the availability of data across the three LGAs – with 680 total records collected for Sydney, 601 for Parramatta, and only 394 for Canterbury-Bankstown. As Figure 6 shows, the 'more robust' data for Sydney contains many more defect reports (41) than for Canterbury-Bankstown (8) or Parramatta (15). These reports are the most comprehensive source of defects data, so an LGA with greater defect report coverage will show greater numbers of defects.

To account for this unequal distribution Figure 8 shows the same categories using *only* schemes with defects reports. As previously noted, for our cohort of buildings (2008-2017) defects reports were not mandatory, therefore many were likely undertaken only when defects became apparent. While the numbers are too low to

draw meaningful conclusions (only 8 schemes in Canterbury-Bankstown and 15 in Parramatta), we can see a much more even distribution of defects across LGAs.

Figure 8 Defects identified in sample, schemes with defect reports (by LGA)

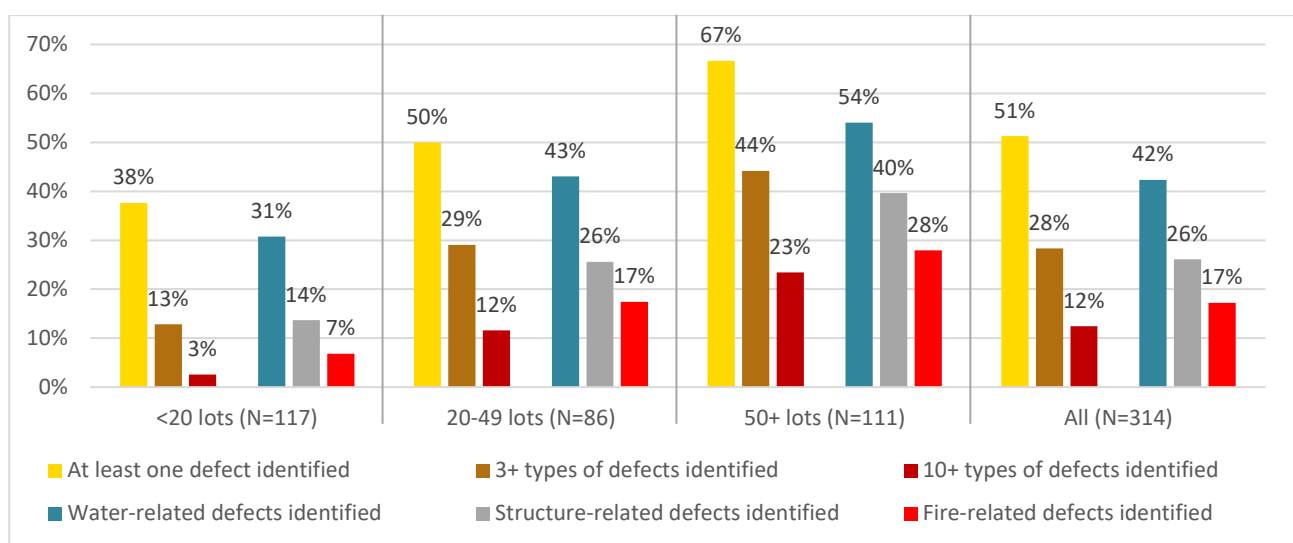


Despite the likely impact of greater data availability in City of Sydney, it is also possible that the size of schemes has an impact on defects, related to complexity (Rosewall & Shoory 2017). Half of the schemes with more robust data in the City of Sydney have 50 or more units, while only 10% of those in Canterbury-Bankstown and 41% of those in Parramatta are schemes of this size. We further break down the data in the section below, using the 'more robust' dataset and considering both actual defect prevalence and data quality/reporting.

6.3.1.1. Building size, age, level of owner occupation and socio-economic bracket

Figure 9 tests the impact of building size on reported defect prevalence. From this data, defects are more prevalent in larger schemes, with almost one quarter of 50+ lot schemes having ten or more defect types identified, while less than one in thirty smaller schemes have this many identified defect types. This data seems to support the hypothesis that greater complexity is associated with more prevalent defects, however there are additional factors to consider. For example, larger buildings often employ management staff, who may facilitate defect investigations. Furthermore, large buildings may have more defects identified because large buildings are more common in the City of Sydney, the LGA for which we have the most comprehensive data.

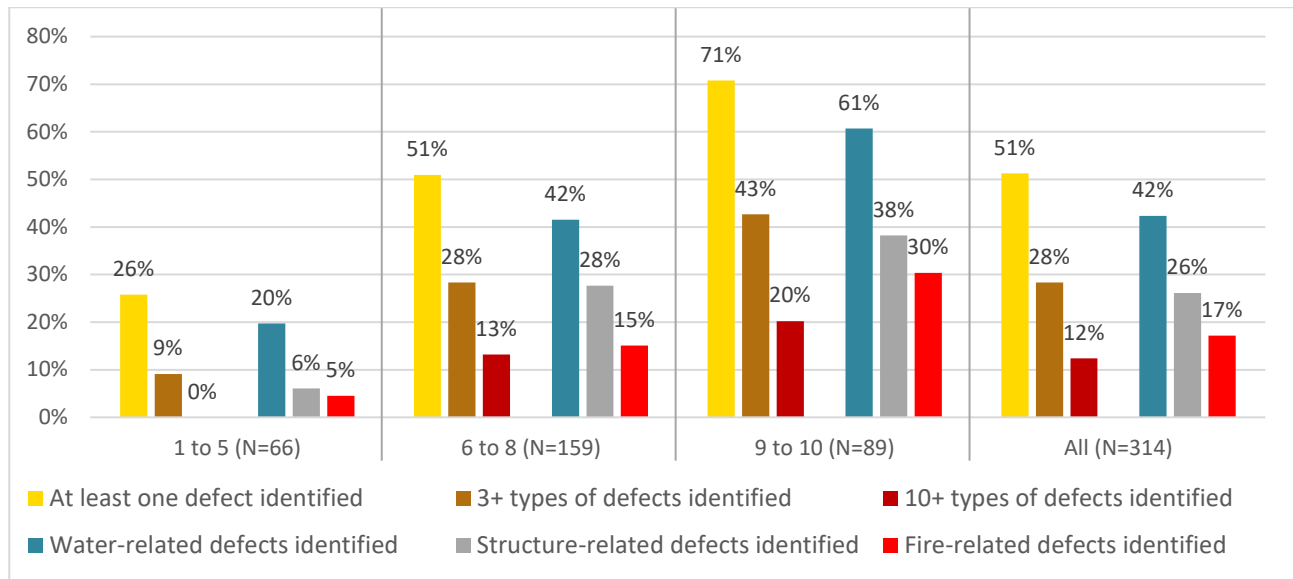
Figure 9 Defects identified in sample, schemes with more robust data (by number of lots)



Age of building, conversely, does not show any clear patterns, nor does level of owner occupation, based on our more robust dataset. However, socio-economic status does show a relationship. Figure 10 shows the

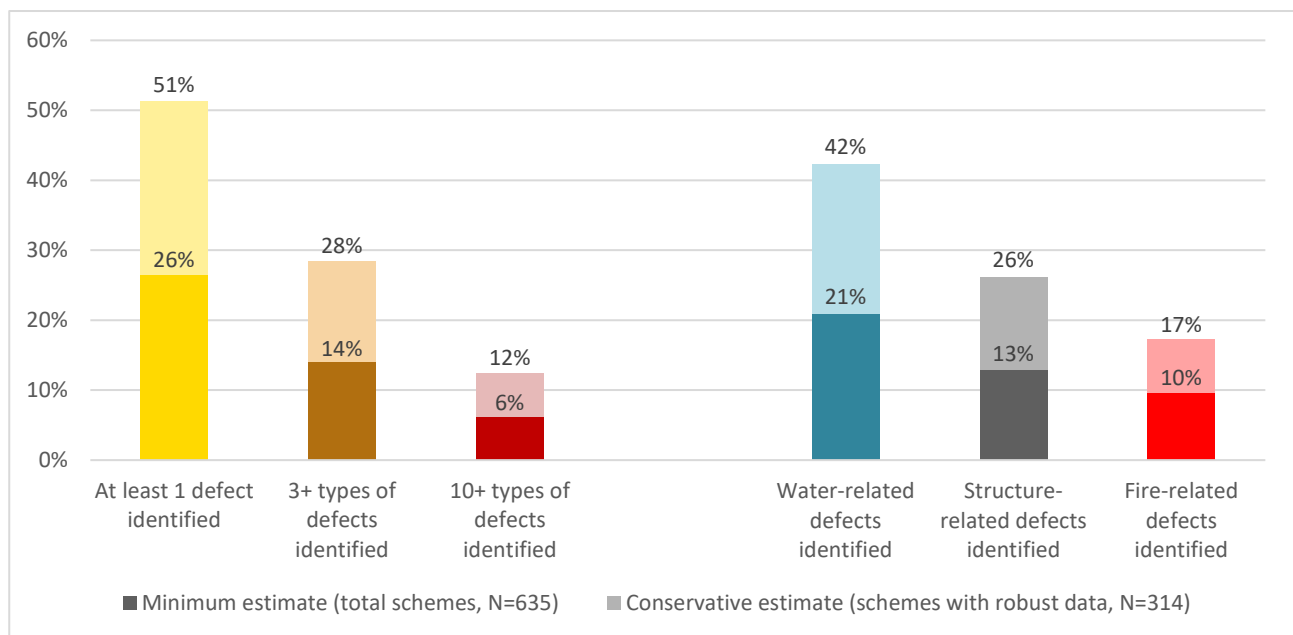
prevalence of identified defects by socio-economic status, based on the Socio-Economic Indexes for Areas (SEIFA) score of a scheme's postcode in the 2016 ABS Census. Fully 43% of schemes in high socio-economic areas have at least 3 types of defects identified, in comparison to 9% of schemes in lower socio-economic areas. These numbers may be impacted by building complexity, but may also tell a story of data availability and rigour of defect investigation. Quality investigation and reporting costs money that some schemes may not have – let alone the money to rectify and litigate if necessary (see section 6.4.2).

Figure 10 Defects identified in sample, schemes with more robust data (by SEIFA decile (in NSW) of postcode (ABS 2016))



To conclude, we present estimates of defect prevalence drawing on our sample schemes, using prevalence in the full dataset as a minimum (darker shading) and prevalence in our 'more robust' dataset as a conservative estimate (lighter shading).

Figure 11 Defect prevalence in Cities of Sydney, Parramatta and Canterbury-Bankstown MUST buildings completed 2008-2017: minimum and conservative estimates, number and types of defects



While these estimates are broad, their broadness only further underlines the lack of available data, and the imperative to collect more consistent and reliable data to better understand the extent of the problem.

6.3.2. Types of defects

The types of defects that are most prevalent reflect similar findings by Johnston and Reid (2019) and Easthope et al. (2012), especially regarding the 'big three' of water, fire safety and cracking issues. Figure 12 breaks down the types of defects identified in our sample schemes, based on the categories in Table 2 (Chapter 5).

Water penetration (wall, slab) and cracks are the most common defect types within these categories. The prevalence of water-related defects is concerning considering that Georgiou et al. (1999) and Mills et al. (2009) found water ingress defects to be amongst the most expensive to fix. In some cases, cracks may be only cosmetic, but in others they affect structural integrity.

Fire issues were less prevalent in our sample than expected based on previous research (Johnston & Reid 2019; Easthope et al. 2012), recent comments by the Building Commissioner, and our interviews:

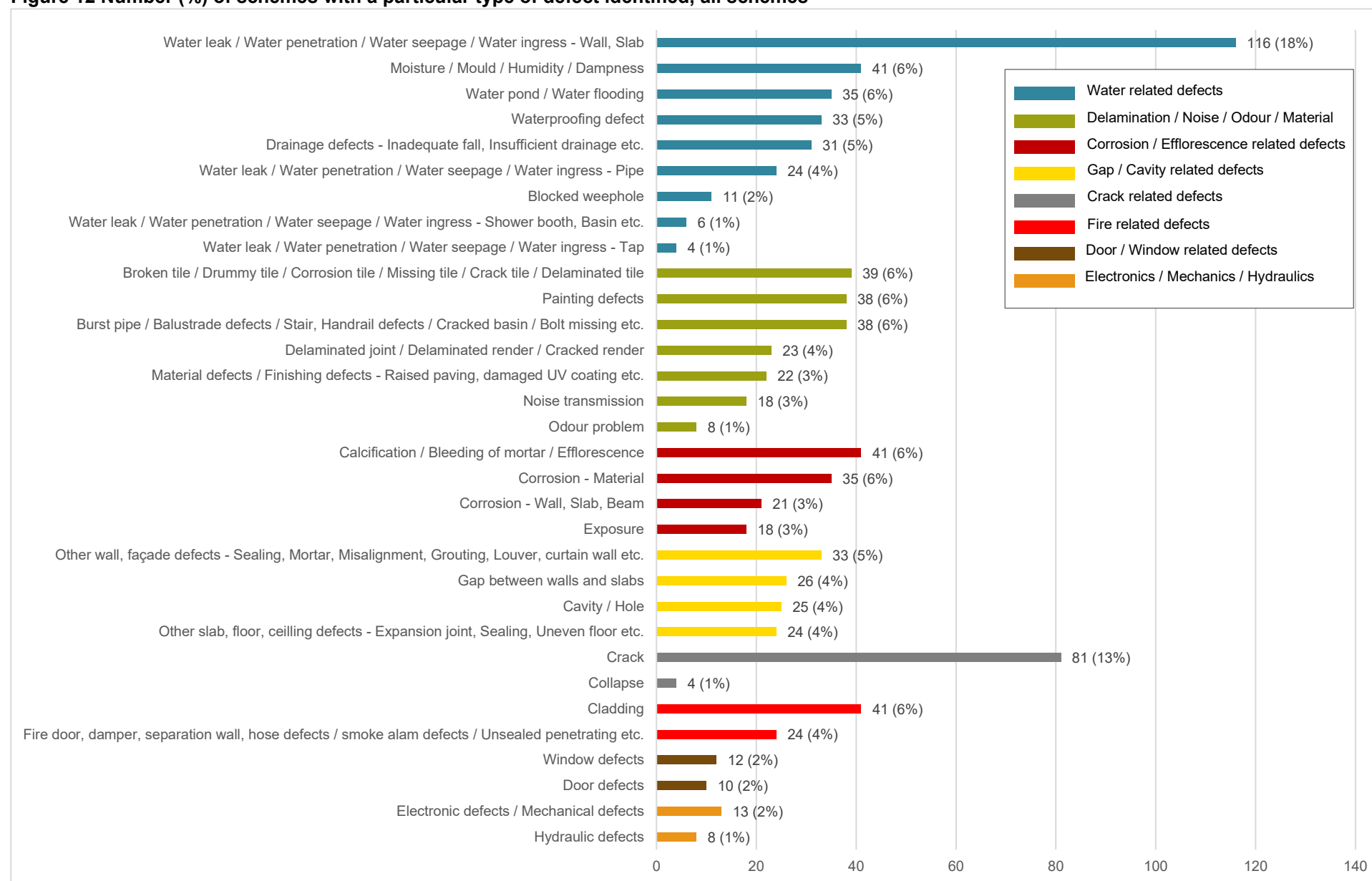
While waterproofing has been at the forefront of the serious defects reported in buildings to date, the quality of fire installations and structures are a close second based on data so far. – Chandler (2021)

I've never walked into a building without a fire safety defect. So yeah, I think it's the reporting and the access to information, that's the problem. – Government officer 1

The low figures for fire defects may be due to different categorisations in documents (e.g. as door defects), but also because fire systems tend to be hidden, meaning defects only become apparent when there is destructive investigation or work begins to rectify other defects. As Johnston and Reid (2019, p.58) explain:

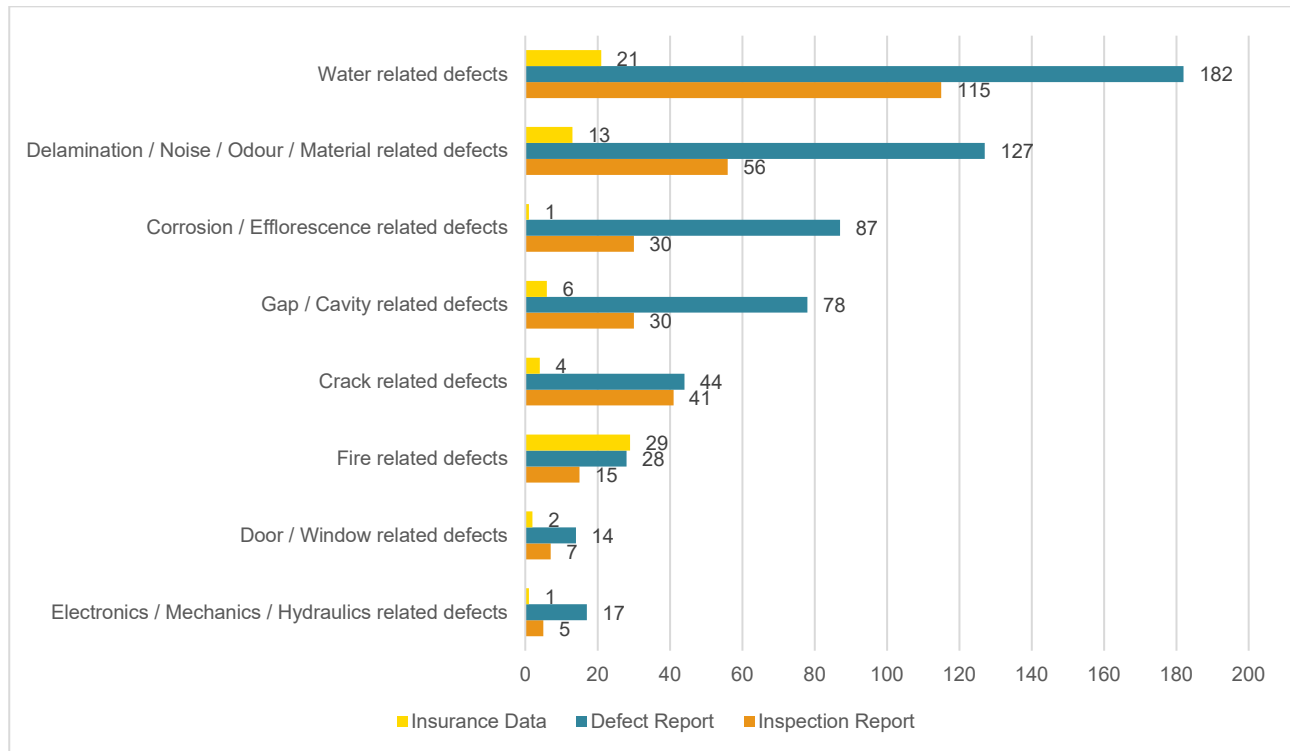
The building consultants interviewed for this project advised that latent defects, particularly fire related defects, are often uncovered by accident when rectifying other building defects. Although passive fire defects were the most prevalent defects reported under the fire protection system, the majority of those defects related to penetration seals, which are easier to detect than fire separation defects. Given the comments made by a number of interviewees, it is likely there is a higher proportion of passive fire defects than identified in this report. The concealment of fire separation may also be the reason that past studies have not accurately identified fire protection defects as a considerable problem.

Figure 12 Number (%) of schemes with a particular type of defect identified, all schemes



Our data reflects both the existence of defects and whether defects have been identified. Notably, some types of defects are more commonly picked up in one type of document than another. Figure 13 disaggregates this for detailed insurance data, defect reports and strata inspection reports. Detailed insurance data was most helpful for identifying fire related defects (drawing on owner disclosure as well as claims documentation), while defect reports were most helpful for identifying other categories of defects.

Figure 13 Number of instances a defect type is identified in particular document types



This underscores the importance of a layering technique, using as many data sources as can be obtained. As with estimating prevalence and severity, the vagaries of our data mean these findings provide only part of the picture. In this case, it is valuable to 'triangulate' quantitative data with qualitative data to test the findings, as we do in the next section.

6.4. Do the expert interviews support these findings?

This section presents expert interviewees' insights on the extent of the defects problem, providing valuable context for our data analysis, and helping to fill some of the gaps in the quantitative data. Our findings broadly support the findings of the previous inquiries and reports reviewed in section 2.2.1.

6.4.1. Severity of the defects problem in the MUST sector

Only three of 66 interviewees felt defects in the MUST sector were not a large or growing problem in New South Wales. These three interviewees suggested that the prevalence of defects was on par with international rates, and any perceived increases were due to increased apartment supply, with defect rates constant. While they agreed that it was inevitable some defects would occur and that these should be rectified, they questioned whether *serious* defects were as widespread as the media suggest:

You can't say that you've had two random incidents in Sydney and suddenly you've got a building defects catastrophe in the context of apartment living when 70% of all new buildings in Greater Sydney are apartments. It's a ludicrous overreaction that caused a public panic and great, great damage to the industry and to the economy. – Development Industry 5

Over 10 years, there's 500,000 dwellings. Let's say we know of a 1000 [2%] that are flawed in some way. It's not great. Of course it's not great. But it's not shockingly bad either. – Development Industry 6

In terms of defects, sure, they are, with the rise in buildings, they're more prevalent, over the increase in building they're more prevalent, but we're not seeing an actual increase over time, I don't think, in terms of the quantum as a proportion of total building activity. – Development Industry 2

Defects were generally accepted by expert interviewees as part of the construction process, with “minor omissions and defects” (Builder/Contractor 1) acknowledged in contracts. Reputable builders work to reduce the incidence of serious defects, and return to fix (hopefully minor) defects.

We are all going to have defects. It's the amount that we're investing today to give ourselves the best possible chance that, when you come to build the thing, it isn't going to be defective. There aren't going to be some really bad defects in there, because you're just catching the chipped tile or the door frame that's not swinging properly. – Builder/Contractor 1

You name a large builder, and I've done inspections of their work, and there is not one builder in Sydney that can put his hand on his heart and say that I've done everything perfectly all of my life. They all have problems, but the difference between the good ones and the bad ones is that the good ones will accept those problems and come back and fix them. – Rectification Specialist 3

However, many experts felt the scale and severity of the problem was not widely appreciated.

I believe that it is far worse than the government or the media either understand or would concede is the case. [The public is] seeing the tip of the iceberg, because the number of defects claims that I have dealt with and are continuing to deal with, and will deal with for another 10 to 20 years – it will probably see out my career. – Lawyer 2

How bad is it? It's really bad, let me tell you. It's very rare that I will go to a building built in the last 10 years and not find a problem. – Rectification Specialist 3

I don't really see buildings that are terrific because nobody asked me to come and see them. So I'm probably bitter and cynical as a result, but what I can see in general is that the sort of defects we see are so pervasive, particularly in waterproofing, that I don't think that - if we found a building that had properly executed liquid applied membranes internally, I would be amazed. – Academic 5

The average cost of claim in property terms, has [...] been between 10 to 12% inflation year on year for at least the last five or six years. – Insurer 1

Overall it is clear that many industry experts hold concerns about the quality of MUST buildings produced in NSW in recent decades. This adds further support to the evidence of defects found in our quantitative data.

6.4.2. Costs

Another way of approaching the issue of severity is to examine the costs involved in addressing defects. Previous work on defect costs in the Australian MUST market 2010-2019 has estimated the cost of rectification at \$5.2-\$7.2 billion (Equity Economics & Development Partners 2020). However, this estimate does not include a range of associated costs, including legal costs. It also does not cover the full range of defects, focusing on combustible cladding, other fire safety defects, water leaks and structural defects. Of these, only combustible cladding has been robustly assessed in terms of prevalence, drawing on Victorian government inspection data. As we have shown, defect prevalence is extremely difficult to estimate, undermining attempts to model costs.

While we cannot estimate the total costs of rectifying defects from either our quantitative or qualitative data, there is evidence that they are significant in many cases. A number of experts interviewed spoke about the expense involved in addressing defect issues:

My main job is really to explain to these poor people why they have to pay \$100,000 each to fix something that they bought with a certificate of occupation. It's really difficult for them to get their head around it. – Academic/Independent Advisor

It's these 400-odd bathrooms that David Chandler has picked on. Well, they're \$25,000 a bathroom. That's \$10 million to fix those bathrooms, and then there are whatever else he's picked up, fire issues, and podium level issues. So it's probably going to be a \$15 million to \$20 million claim against the builder. – Rectification Specialist 3

If the builder is not prepared to fix the defects, a large proportion of the eventual costs of rectification can be spent on legal fees, with some interviewees advising OCs against legal claims for defects under a certain cost.

Owners corps take on builders legally and they spend three million dollars in legal fees and for the three million dollars not one defect has been fixed. – Builder/Contractor 1

I wouldn't sue for under \$200,000. It's just not worth it. Get an expert in that you can trust, throw the money at the solution, don't throw the money at the litigation. – Lawyer 3

One argument advanced by defect sceptics is overreaction and misunderstanding from owners. For instance, very minor defects could be reported as major:

The whole media maelstrom ultimately – the piling in where you'd point to literally a bit of a crack on a tile in a toilet and suddenly that was a defect that was somehow commensurate with the structural element of a defect associated with the collapse of Opal Tower – Development Industry 5

We can consider the question of defect severity using our NSW case law and HBCF datasets. Figure 14 charts the figures mentioned in the NSW case law dataset, including payouts to plaintiffs and estimates to fix defects, regardless of the final judgement and not including court costs, interest or conditional payments. Note that these publicly available decisions are likely the 'tip of the iceberg' of cases, as many cases settle before reaching a decision. As two of our interviewees explained:

The vast majority of cases settle [...] Very, very few of mine have ever gone to final hearing. One, it's expensive. It is really expensive. If you've spent the money on the experts and you can get the experts to agree, then essentially you know what the tribunal, the court will be determining [...] It becomes a costs exercise, or commercial exercise. – Lawyer 3

Probably nine out of 10 cases [settle]. – Lawyer 4

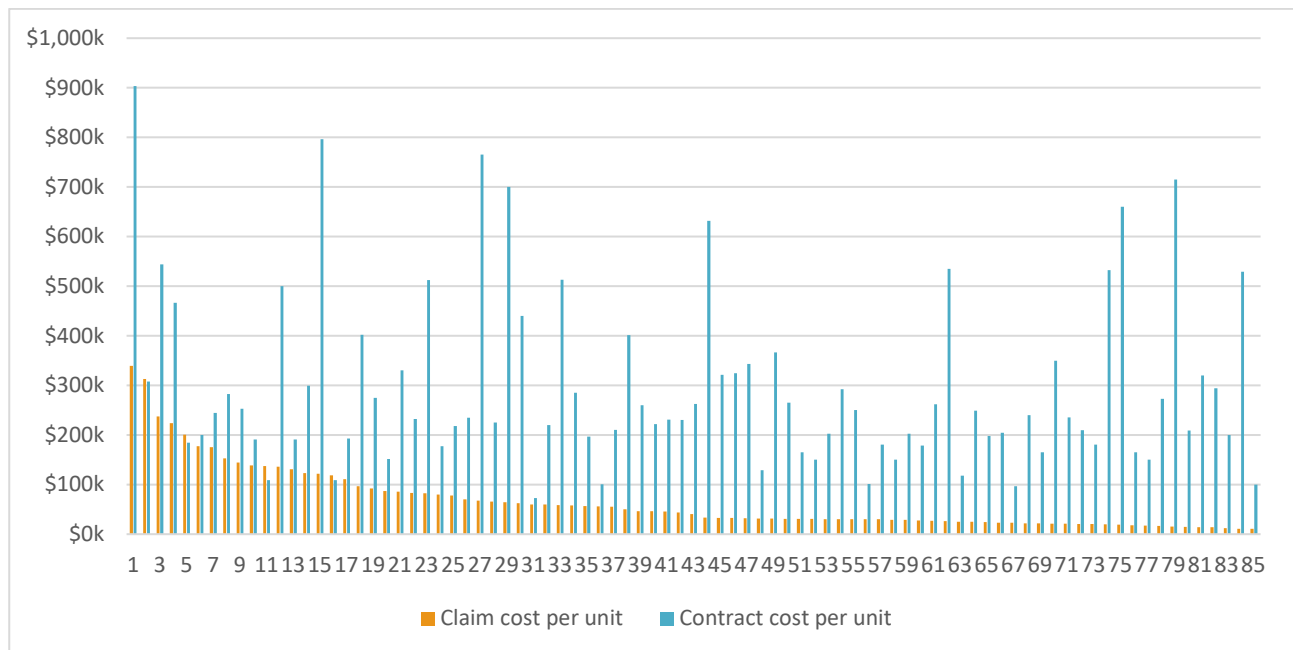
The median of these estimates and payouts is \$500,000, with the largest figure mentioned \$14.3 million.

Figure 14 Price tags to fix MUST defects in NSW 1999-2020 case law (N=63) (regardless of judgement, not including 'costs', interest to be calculated or conditional payments)



The HBCF dataset covers all multi-unit buildings of three or fewer storeys with builders insurance policies taken out between July 2010 and July 2020 in NSW. Figure 15 shows all HBCF policies with estimated claims of more than \$10,000 per unit, in comparison to their original contract cost. These are instances where the builder has disappeared or become insolvent, *and* work is incomplete or defective, and icare has estimated the cost of work to rectify at more than \$10,000 per unit – therefore professionally assessed to be relatively costly to fix. Almost one in fifty schemes (1.8%) fit this description. In four cases, rectification is estimated to cost more than the original contract value, and in 67 cases the figure is at least 10% of the contract value (1.4% of schemes covered by HBCF in this period).

Figure 15 HBCF estimated claim cost per unit, compared to original contract cost per unit, for all policies with claims >\$10,000/unit, 2010-2020 (1.8% of policies, N=85)



This suggests that large sums are being spent to litigate and rectify building defects in MUST developments in NSW by owners, contractors and insurers.

6.5. How does our data compare to previous research?

6.5.1. Prevalence and types of defects

Table 7 shows how our findings compare to other research on the prevalence of defects. As Johnston & Reid (2019) note, it is difficult to compare across research on defects due to differing definitions across jurisdictions and studies. Defect percentages may be reported for a given sample of buildings (as the present research does) or for a given sample of defects (e.g. Johnston & Reid (2019) on types of defects). These points should be borne in mind when reading the following table.

Table 7: Comparisons with previous prevalence research

Study	Context	Prevalence
Samples drawn across a sector		
Easthope et al. 2012 (Australia)	Survey of strata owners in NSW, 1,020 valid responses representing around 990 strata schemes. Self-report, with a CI +/- 3.1%.	72% of all schemes had had one or more defects at some stage, rising to 85% for schemes built since 2000. Internal water leaks most common (42%), followed by cracking (42%) and water penetration from outside (40%). 15% reported a lack of, or defective, fire safety measures.
Mills et al. 2009 (Australia)	Victorian Housing Guarantee Fund data for all dwellings constructed or renovated 1982-1997 (over 800,000). Majority detached 1-2 storey dwellings. Analysis on subset of 10,548 dwellings with claims.	1 in 8 dwellings with claims, claims total 4% of contract value on average.
Abdul-Rahman et al. 2014 (Malaysia)	Representative survey of 310 residents of affordable housing in Malaysia, covering flats, terraces and houses up to approximately 10 years of age, and including owned housing.	Defects reported as frequent/very frequent by respondents were: 56% water pipe leakages, 49% water supply failure, 34% cracking in external walls, 32% faulty door knobs, 23% concrete wall dampness.
Pan & Thomas 2014 (UK)	261 houses and 66 flats built by a national builder, representative of new-build dwellings, built post-2006. Records cover the 1 year period post-occupation, when the builder is required to return to fix defects.	95.4% of dwellings reported defects. Flats had significantly fewer defects reported (average 6.9) than houses (average 10.6). 22% of defects were 'making good' (i.e. minor cosmetic), 12% malfunctions, 9% screw/nail pops/tape blows, 9% drafts/gaps/holes, 8% leakages, 8% cracks.
Schultz et al. 2015 (Denmark)	329 public or publicly-subsidised construction projects (all types) built 2007-2010, records from Benchmark Centre for the Danish Construction Centre.	51% with very few defects at handover, 34% with 'typical' defects and 15% with many/serious defects.
Samples drawn from defect reports/complaints		
Johnston & Reid 2019 (Australia)	Defect audit reports of residential buildings in NSW (99), Queensland (47) and Victoria (66) covering the period 2003-2018 in NSW and 2008-2017 in Queensland/Victoria. 212 buildings in total.	85% of buildings had one or more defects, rising to 97% in NSW (but note sample of defect reports). 40% of defects related to building fabric/cladding, 13% to fire protection, 11% to waterproofing, 9% to rainwater disposal and 7% to structural. Regarding the causes/effects of defects, water ingress/moisture was the most common, with 29% of defects in the dataset relating to this. Safety was a consequence of 20% of defects, and building damage of 15%.
Chew & De Silva	Examination of defect investigation reports for 1500 residential high-rises 0-	Water-related defects due to pipe penetration issues (43%), cracks

2002 (Singapore)	35 years of age, focusing on water leakage problems.	(24%), joints (19%) and porous slabs/walls (14%).
Lee et al. 2020 (South Korea)	133 residential buildings with defect disputes occurring between 2008-2017.	'Damage' (components split/deteriorated) 34% of defects, 'missing task' 14%, 'water problem' 12%, incorrect installation 10%. 'Surface appearance' constituted 10% of defects. Note 'missing' or 'incorrect installation' could cover waterproofing.

Additionally, as noted in section 3.1.3, an early occupation certificate audit data from the NSW OBC suggests that issues with waterproofing (53%), structural concerns (44%), fire safety (45%) and 'essential services' (53%) were common in the buildings they have audited under the new RAB Act inspection scheme. The sample for this is likely to be skewed towards buildings with concerns, but has the advantage of in-depth investigation of the building fabric before issues are 'patched' over (Chandler 2021).

Internationally, water issues and cracks are commonly identified defects, as in our research, while fire issues are more rarely represented. As previously discussed, this is likely due to the relative difficulty of identifying fire safety defects. In terms of relative prevalence of cosmetic defects and more major defects, Lee et al. (2020) found 10% of defects were simply 'surface appearance' in their South Korean dataset of disputes, Pan and Thomas (2014) found 22% of defects were issues with 'making good' at handover and Schultz and colleagues found 34% of developments had 'typical' non-concerning defects in Denmark. Our data shows some cosmetic defects (Figure 11), however we are likely not capturing many of these minor defects due to lack of reporting. We therefore cannot be sure of the ratio between cosmetic defects and more major defects. However, our data refutes the argument that significant defects are rare and the defects 'crisis' is simply an exaggeration of cosmetic issues.

The apparent prevalence of defects varies widely across these studies, likely due to different sampling and definitions as well as the actual existence of defects. It is therefore difficult to draw firm conclusions on where New South Wales sits internationally in terms of building quality. In the absence of reliable and consistently-measured quantitative data, we can infer more from qualitative comments from our experts.

There was a comment made at [an industry conference] where someone said in the global insurance market, ranked number two as worst risk is Australian construction. If you put it in that – with all the other risks that are out there from natural disasters, typhoons, I don't know, pandemics possibly. To think that we're up there, great, punching above our weight there. – Government officer 1

6.5.2. Poor data quality and availability

Both Johnston and Reid (2019) and Easthope et al. (2012) highlighted issues with poor data quality. As in our research, the defect reports analysed by Johnston and Reid (2019) varied widely in format, detail, focus and language used, and differed in the type of personnel used to carry out the audits. Even where the existence of defects was established, it could be extremely expensive to determine how common the defect was in a building (for example, potential nickel sulphite inclusion in balcony glass requiring inspections costing over \$100,000), therefore these more detailed inspections may not be completed, resulting in incomplete records.

Our research confirms the paucity of data and fleshes out that point by proving it is extremely difficult, if not impossible, to obtain comprehensive data on defects, at least in NSW – although the evidence suggests other jurisdictions have a similar problem. The lack of information traces back to handover, with developers failing to pass on vital information to building owners and occupiers (see Hackitt 2019; Shergold & Weir 2018). However, there are further points of information loss and information asymmetry that are vital to examine to fully understand the scope and implications of this lack of data. We unpack these in the next chapter, drawing on the insights gained from the expert interviews.

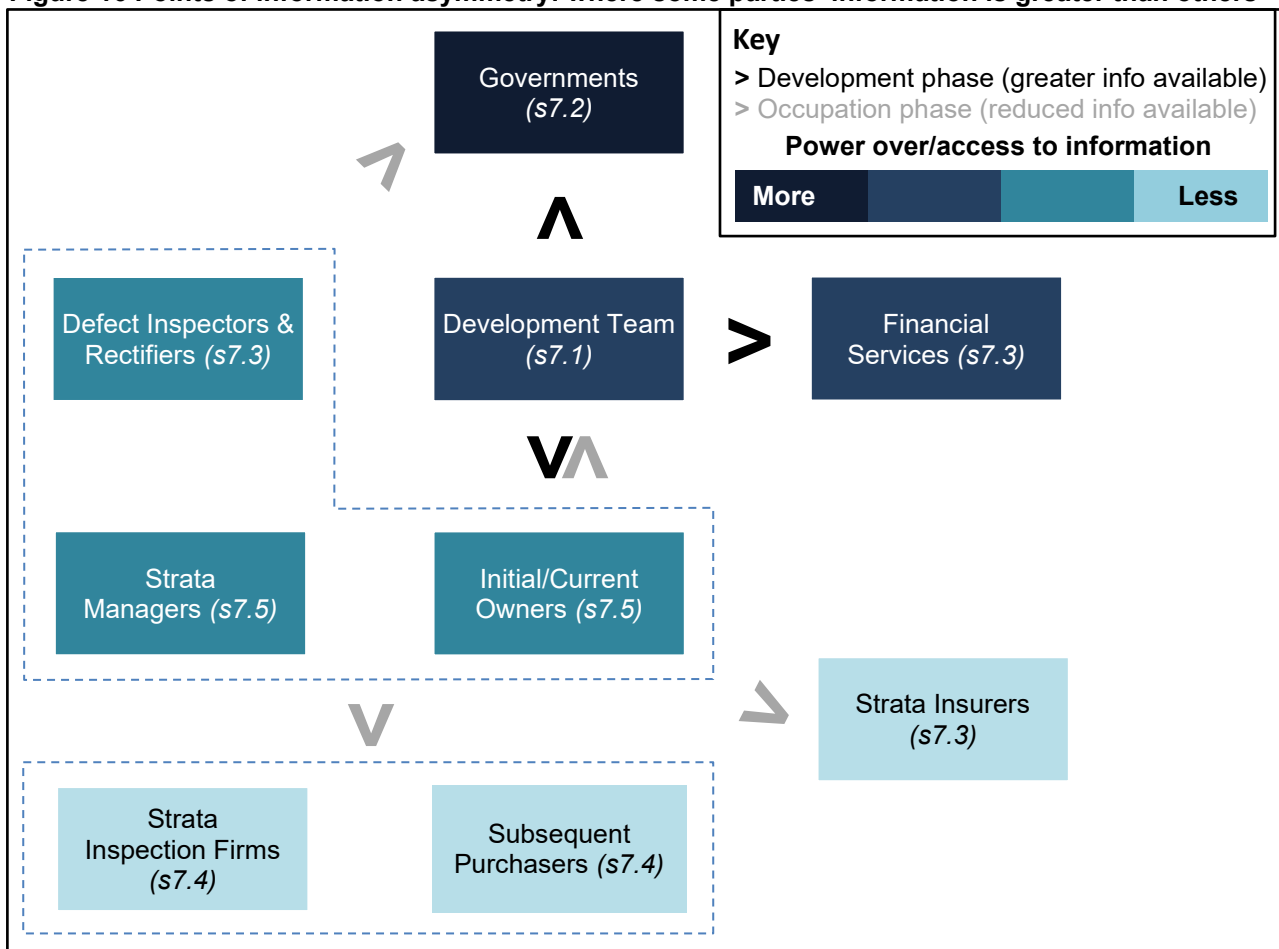
7. How do information asymmetries contribute to poor quality outcomes in the MUST sector?

The existing research outlined in Chapter 3 suggests that information asymmetries are likely to be both more common and more problematic in MUST developments than in other development contexts. In other construction contexts, such as a commercial building project, the client has oversight of the project as it proceeds and may employ its own building experts to monitor the work. This means the client is better able to exert pressure on the builder/developer to provide relevant information and to achieve good quality outcomes.

In the MUST sector, by contrast, the client effectively doesn't exist until completion, which means only the government provides oversight of the development of these buildings. Furthermore, MUST clients generally have little knowledge about building design and construction, meaning they have less capacity to assess the quality of the developer's past work and exert pressure indirectly through purchasing decisions. Because of these vulnerabilities, information transparency is even *more* important in the MUST context, as it can help to mitigate these weaknesses in the MUST model – enabling purchasers to exercise their market power more effectively, regulators to regulate more effectively, and key industry third parties (financiers and insurers) to drive better quality outcomes by pricing risk more accurately.

The data analysis in Chapter 6 points to multiple information asymmetries in the system, but the causes and effects of these information breakdowns are not always apparent from the data alone. This chapter examines these causes and effects in detail, drawing on the project interviews as well as past research and expert reports. It looks first at information breakdowns in the development team and government/regulatory contexts, before turning to examine the flow-on effects for purchasers, owners and other industry players (insurers and financiers). Figure 16 below summarises the key points of information asymmetry to be examined.

Figure 16 Points of information asymmetry: where some parties' information is greater than others'



7.1. Causes and effects of development team data blindness

The bulk of this chapter deals with information asymmetries between two parties, however we must also consider instances where information is not collected and recorded or not held. This section deals with the information held (or not held) by the development team as they progress through the design and construction phase, and the following occupation phase. It considers situations where information is not captured, when the information captured is not useful, and when the information captured is not kept.

7.1.1. Key reasons the development team don't have (or keep) the information they need

7.1.1.1. No requirement to record information

While the development team is often in possession of greater information than other parties, there are also situations in which information is lost or never recorded because it is not required (or checked) by internal or external audit mechanisms. Documentation is often the first to fall to pressures for speed and reduced costs.

I used to enter all of my data into my structural engineering [...] system. I'm not doing it anymore because it took me a lot of time and nobody asked for that information anymore.
– Engineer 1

A related difficulty is the lack of upfront design and documentation, often associated with design and construct (D&C) contracts. Some experts acknowledged that D&C contracts could work well provided the team had a high level of expertise and excellent communication and coordination. In many cases, however, “the design process lacks synchronisation and project specific detail” (Rectification Specialist 5). Furthermore, the practice of tendering with minimum documentation allows (and may even incentivise) cost cutting.

One of the biggest issues which is lacking is the level of documentation. [...] You can't actually build off the documentation. You can barely tender off the documentation, then you call it D&C and it's only 30 per cent resolved. So the builder gets it, and the builder goes, well all I've got to do is just build it as cheaply as I humanly can. Some developers are going, well if you save some money, we'll split the savings. They'll even incentivise over the top of that. So how do you manage that, where there's incentive to do less, or do the minimum. – Certifier 2

One rectification specialist was hopeful that recent legislative changes would reduce these practices, with a more developed design required before construction starts.

Probably one of the benefits of the Building Practitioners Act that's been adopted, is that it's going to put a stop to those loophole processes of a developer having development approved plans with no construction detail, not doing the work at the front of the project, having it designed and specified correctly before it even gets to a builder coming onsite to construct it. I think that's one of the big failings of our industry, is that that whole process of documentation has been left out in multi-residential construction. – Rectification Specialist 4

Ensuring that documentation is produced, carried through the life of the project and handed over to owners and their agents in a comprehensible format means it is later available should anything go wrong, as well as assisting with ongoing maintenance (see sections 7.5.1.1 and 8.2.2).

7.1.1.2. Legalistic processes and box ticking

While in some cases minimal documentation is the problem, in other circumstances the issue might better be described as ‘document overload’. Unwieldy contracts are used to shift risk onto other parties, creating a legalistic, “adversarial environment” (Builder/Contractor 3) where one must cover one's own back rather than collaborate on the best solution. When there are problems – as naturally occur as part of the construction process – there is an incentive is to hide these to avoid repercussions.

I sign a contract, 300 pages, and basically whatever I do, whatever I think, it's my problem, they know I signed that, I know it's one-sided, but I have to sign it to get the job. [...] It is just a one-sided penalty system, and everybody will blame each other, and everybody will cover the mistakes and whatever, they will try to do, cover all that up till the end. But at the end of the day, if you have a problem, you can't cover it up. But you'll have to cover it up because it's going to cost you. – Subcontractor 3

Paperwork is getting just more and more. It's just arse covering [...] I was out all this morning, I can open up [my phone], I'd say I have 30 emails. [...] there will be five of them relevant and I'll be cc'd on the other 25 for stuff that has absolutely nothing to do with me. – Subcontractor 2

While it might be framed as documenting the process, in practice excessive documentation is not in the interests of the project and its stakeholders, especially when documentation is simply a box-ticking exercise and takes time away from doing a good job on site. Industry experts interviewed often felt that greater administration demands over the past few decades created a heavy burden while contributing little to quality.

[We] used to run 280 people with about 10 or 12 supervisors. Now we're running 280 people with about 65 administrators, supervisors. [...] There's so much more paperwork and stuff you've got to do. I just wish that all that stuff translated to better quality at the end of the day. – Supplier 2

If I didn't have a computer, if I finished a job, I would need a whole bedroom to archive my papers. I'm thinking do we really need to do that? Why do I need a bedroom to archive my papers for one site? – Subcontractor 3

In these circumstances, the important information—including about defects—can easily get lost in the 'noise' of thousands of documents being circulated, often to people who don't need them. Even where documentation is well-thought out and supports the project, resourcing issues can mean the documentation is not adequately completed. Cost pressures also lead to junior staff being tasked with oversight and inspection roles, further reducing the usefulness of the exercise.

The systems are perfect. Perfect, yep, absolutely perfect. But they're impossible to actually comply with. It's impossible. It would be possible with more people, but then cost has driven the people out of the picture. So they've been taken away, and you can't do it. So then you go, okay, to a junior site engineer who's just started, you do the ITP [Inspection Test Plan]. Ooh, it's quite important, those ITPs, but no, we're going to put a junior in charge of it to make sure it's all right. [...] then he'll go to the contractor, because he doesn't know really what he's doing, or she's doing, and they'll say, 'oh, it's all right, I've ticked it', so they'll tick it, but they haven't checked it. That's what happens. It's not their fault, it's not the poor, young engineer's fault, it's the system. – Subcontractor 5

People think once the paperwork's done, everything else is fine. The reality is it's not fine. You've got a piece of paper that says everything's been installed correctly. Then you walk on a deck and tell me if what you see on the deck reflects what's written on the paper. – Supplier 2

A solution proffered by several experts was having more experienced, in-person oversight on the site, modelling behaviour and enforcing quality standards while reducing ineffectual documentation. This person would then be in charge of producing or signing off on suitably detailed documentation that actually reflects the final construction outcome.

If you said to every contractor that was building on a job [...] 'listen, we don't need you to do any pre-pour checks. We don't need you to do any QA documents other than maybe certain things that have to be done. But we're going to take away a bucket load of paperwork from you [...] we're going to put two people on this job to make sure everything's done right.' Some of them would probably shit their pants because they think 'oh Jesus,

that means everything's going to have to be done to the millimetre. Everything's going to have to be installed properly [...] It's going to take me longer to do things.' Some of them would think, 'yeah, that would be a great thing.' – Supplier 2

These reflections raise an important point – ‘information’ is not synonymous with ‘documentation’, and poor or excessive documentation can actually obscure necessary information. Reforms need to ensure that relevant, robust *information* is ultimately handed on from the development team to the owners, rather than reams of meaningless paperwork (see also Hackitt 2018, p.26).

7.1.1.3. Development team rarely have feedback mechanisms

Apart from litigation or complaints, many industry players do not have formal mechanisms to become aware of their mistakes and improve in future. This is one case where the owner has more information than the developer. While some developers do undertake a post-occupancy evaluation to create a feedback loop, this is not undertaken consistently across the sector.

If you're in the new construction space, you move on to another job before you realize if you've been doing something the wrong way. Because you're not going to fix the defect, someone else comes in and does that so you can continue to repeat that because you're not learning, there's no closed loop on that. – Rectification Specialist 2

You don't get any feedback when it's for a developer who sells it onto somebody else and then you don't know, you don't know anything at all. Even down to something simple like the light fittings that were chosen have got the best environmental outcome, the best long-life outcome, but as it turns out, perhaps the fitting doesn't work because it hangs down and people knock it off all the time or whatever. To get that sort of feedback would be really worthwhile as well, and you don't get that in apartments. – Architect/Designer 3

In some cases, feedback mechanisms are built into the process, but lessons are not incorporated into future developments due to a lack of interest or understanding of potential gains.

We finished one last year, and this developer, then they had a 'lessons learnt' [session]. You say the same old stuff, you trot it out, and it just goes in one ear, and you see they're not interested. In fact, they'd rather you weren't in the room, because, you know, this is stuff they don't want to hear, this may have an economic impact of it. It's like, 'we're not interested in that. Just go away and build your building and let us know when it's finished.' – Subcontractor 5

The strata model also means that even where a building is subject to a fire order from the local council, the development team will likely only become aware of this through litigation.

Generally, if there's an order from Council it would be served on the strata, as you know. They generally wouldn't go back to who's constructed the building initially. Like there possibly could be a civil case depending if it's within the liability period. But generally the order is served on the owners which is the strata and it's up to them to get the works fixed within a particular period of time. – Government 1

As a result, opportunities for the industry to learn and improve over time are missed, and government lacks a formal mechanism to engage directly with developers to ensure better outcomes next time around.

7.1.1.4. Culture in parts of the industry does not drive developers to do better

Stepping back, it is clear that while some of these issues stem from system failures and the increasing complexity of larger building projects, many can ultimately be attributed to a failure to invest in processes and experienced staff to ensure work is documented adequately and effectively. Developers are in a position of relative power as the drivers of projects, meaning they can put in place systems to gather more information if they wish. As David Chandler (2021) has said, developers “are the ones who sell apartments to their purchasers and they alone must be the ones to ensure they are delivered in full.” While there are financial pressures that may disincentivize developers from implementing thorough systems, a number of interviewees

also pointed to a broader reason for these failures – a perceived decline in industry culture, underpinned by either a lack of care or a desire to maximise profit.

Importantly, many interviewees noted that there are still many industry players with a strong positive culture, who care greatly about doing quality work, but suggested that this is less common than it used to be.

Some businesses care about making sure they do the right thing and look after the end customer and value their reputation. Other people are just out there to make a buck and move on. – Supplier 2

The decline in culture is tied up in the way the financial model of the development industry has changed, with a focus on short-term outcomes, pushing costs onto owners.

There is a culture for apartments which says, I've met all the regulatory requirements. It's going to be okay for 10 years, maybe, and it's going to pack up in 15. I think that's a terrible culture, because you can build buildings that set out for a 50-year life or a 100-year life, and it means you make different decisions. [...] You choose high-quality materials. You put them together more carefully, and I'd call it old-fashioned building. I'd call it what we're supposed to be doing, but it's very rarely done. – Architect/Designer 1

One expert unpacked the drivers of this poor culture, tracing the effects all the way through the project's original ideation and goals and into the construction phase:

By virtue of naivety or mercurial behaviours, they set the project up for failure across a number of points. Most of it as I said starts with ideation. If somebody is in this space to make a buck through land cutting or subdivision or value uplift, then they are wanting to make the most amount of money with the least. There is a whole phase of the project when they've secured a site but they immediately start being exposed to cost - interest cost, land cost, holding cost generally. They want to as quickly as possible traverse the point to which somebody else is paying for that. That is getting sales away and getting construction finance in place and ideally novating the design team to the builder so that becomes a cost of construction, not something that they are paying for out of their limited reserve of funds which they'd much prefer to allocate to buying another site and doing the same thing. They try to preserve their capital. The best way to do that if we're looking at the lowest rate type of developer is by getting cheap consultants. Cheap consultants either have the wrong scope of services or they're inexperienced and don't know what they're doing, or like the developer themselves they don't really care about what they're doing and they're invested in just high-volume/low-value. They're probably working in concert with the developer in some sort of ecosystem that just rolls on like a hungry beast. The problem goes on and on and on. If you've got the wrong consultants and you've got the wrong designers and you've got the wrong ideation and all the decision-making is about the greatest possible revenue and the lowest possible cost, but nothing to do with value, then you're setting the project up for a whole series of problems. – Alternative Development Model Expert 2

The result of this model is that some quality players, who do maintain a good on-site culture and wish to produce quality work, feel they can no longer compete. Some experts interviewed no longer did residential MUST work due to the risks involved, and undercutting by less scrupulous or inexperienced players. This is worrying, suggesting that the sector's current financial model and culture do not facilitate quality.

We started bidding residential work [...] at the quality that we would expect of ourselves - we were losing. So ultimately we said, 'well, we're wasting our time bidding it properly and putting the right quality materials in it and taking the time to flood test a bathroom and make sure that it didn't leak before we tiled it.' Clients [developers] didn't want that. – Builder/Contractor 1

These broader concerns around industry culture suggest that simply improving systems and training shortcomings in how the development team collects, uses and shares data about defects will not address the information asymmetry problem in a comprehensive way. This is a concern, given that the effects of poor

information collection and management during the development phase affect the building through its entire lifecycle, as the next sections demonstrate.

7.1.1.5. Information required to produce quality work is not always accessible

Finally, there are a number of barriers to information that make it harder to produce quality work. Several experts argued that Australian Standards should be much cheaper or free to access, given that they are needed to build according to the National Construction Code.

The standards are very expensive to purchase, and they're not accessible [...] What needs to happen is when you pay for your builder's licence every year, I think there should be a flat fee in addition to that that enables you to access all of the referenced Australian Standards in the NCC. I think if they did that, and they made the portal so that it was user friendly, so that you can access it on building sites, on your iPad [...] But \$350, \$400 to download a standard and then in a year – every three years, it might change, you're talking at least \$4000 to \$5000 to buy the suite of standards, or I think the fee is about \$1500 to \$2500 a year to have access to Standards Australia. How does your cottage builder [or subcontractor] afford that? – Rectification Specialist 3

You can spend \$300 on a code which shouldn't cost \$300. If \$300 is a hurdle to entry then less people read it than need to. I would really like there to be another model. – Rectification Specialist 6

Clearer reporting and public notifications for non-conforming products and quality issues would also be of value for those in the industry who want to improve build quality, as this would support better education.

In England, they've got a thing for structural steel, it's called CROSS, which ... basically, it's an anonymous reporting system. You go in there and you report any structural steel issues. Fabrications falling apart. Bridge bearers that are rusting. Whatever it happens to be. The thing that's gotten them across the line is, they've made it completely anonymous. You don't put any details about who you are. You just report the issue. Then it's up to the team that gets that to then go and find out who did what, when and how. They've had a lot of success with that [...] For them, they're using it as a means to inform their graduates and their engineering cohort about the dangers that they could face if they go the wrong way. So it's a long-term educational tool rather than being used as a regulatory compliance tool, that they then go and actually prosecute. – Supplier 1

Others called for the government to take greater responsibility for testing building products, giving members of the development team more confidence that the products they use are safe and fit for purpose.

There has to be someone governing the process. There has to be someone holding people accountable. At the moment anyone can put together a building system and go and test it. [...] We felt that [a specific ceiling system] wasn't appropriate to install on this particular project. So we put it to the attention of the principal builder and the architect. They said no. You build it as it's specified. We went and built it as it was specified and then the ceiling system collapsed. Then [...] we discovered that the company that was promoting, marketing and selling this ceiling system, hadn't engaged the engineers to do the due diligence to develop the suspension system to be able to hold this ceiling system up. All they did was put together a set of pretty pictures in a marketing sense to say 'hey yes this ceiling system will work', but it didn't. – Subcontractor 4

Increasing the accessibility of the key information needed to construct a quality building, gathering information on poor practices and materials, and providing more oversight of building products would support higher quality outcomes by increasing industry capacity and the quality of the materials they use. Without this, the systemic quality issues in the MUST sector will be difficult to fix. There are also a number of other consequences of the developer lacking or discarding information, however, which we discuss below.

7.1.2. What happens when the development team lacks or discards information

7.1.2.1. Expertise is not valued or developed

If quality assurance processes tend towards box-ticking and the role of skilled judgement is diminished, there is less scope for practitioners to use their expertise as well as a perception that expertise is not needed, thus deskilling the industry. This has an impact on the calibre of people in the industry – if good people do not feel their expertise is valued, they are less motivated to continue in their trade.

There's an element of due diligence of everything that you do, which is good, which I support and all that. But that due diligence sometimes is overused or somehow, it's inaccurately used, it takes away so much human factor and energy out of it. You end up with an environment onsite that is like – I mean you have to remember the building is built by humans, but you have a feeling the building's built by papers and by computers. So, when I feel that, wow, [...] I feel rejected completely. – Subcontractor 3

We've cheapened up the entire process of the knowledge of the craft, the skill of the trade. We've cheapened to such a point there is no pride to the work. – Rectification Specialist 4

There is also the risk that practitioners rely too heavily on forms and not enough on their own judgement, following procedures that may not be appropriate for the particular project (see also Hackitt 2018, p.26).

The builders coming out of university, for example, a lot of them focus on that, 'oh, I've just got to get these forms done'. Yeah, but guys, let's think about the form and let's talk about them. 'Oh no, we don't want to talk about them'. [Laughs] Like, we don't want to debate it, we just want to tick it. I'm like, 'I'm not trying to be difficult' [...] They just assume – I've got this form – it's right. The form could have been developed on a 30-storey building and you're building a one-storey school, but [...] they go, 'oh well, that's the form, so that's the one I've got to use'. People aren't thinking for themselves, and people aren't asking the questions along the way. – Engineer 2

7.1.2.2. Focus on value engineering

A lack of detailed documentation provided at the front end – such as through the D&C process – means that contractors have more flexibility in the products they use and their installation. This could be a positive, allowing contractors more agency and allowing for cost savings. However, if contractors lack the ability or desire to produce good outcomes, it can lead to poor quality and cost-cutting. In those circumstances, value engineering is more about shifting risks down the chain of responsibility, rather than enabling innovative outcomes.

Anything that changes past that [initial level of documentation] is really open to value engineering, which started off being a good way to do things but not costing much, but I think it's actually just become a way of saving money completely. – Architect/Designer 3

Value engineering's funny, because it's just – it's not really value engineering, you're just taking the good stuff out and putting inferior stuff in. – Subcontractor 5

Where cost is the main driver, initial documentation allows too much flexibility, and the lack of records means responsibility cannot be easily traced, the incentives to produce good quality outcomes are reduced. Value engineering can also be a greater problem where inexperienced players take a chance on a development and begin construction on the back foot.

Defects start when the financial structure of a project is not sound. When it is sound, I find that people don't mind doing a slightly better job, because they've got that feeling that they're safe. – Architect/Designer 1

7.1.2.3. **Insufficient and inaccurate record-keeping complicates rectification**

Accurate records of construction are especially helpful when rectifying a building, allowing specialists to more quickly understand issues and work to resolve them. Unfortunately, what is ultimately built can often differ significantly from what is documented.

[An as-built drawing] gives you a bit of a head start, so at least you can give that to the experts that are coming in from a remedial basis. And it lets them at least have – it's not half the jigsaw. But, you know, at least then they've got all the edges of the jigsaw and then they can start working in. Rather than just give them the jigsaw pieces and say 'Here, go to work' [with] the DA plans [which] might not be the right pieces in the box, or you might have 10 different pieces that are just thrown in there for, you know, fun. Oh! That didn't go into the building, oh right. – Lawyer 3

[Lack of information] is a massive problem and it's probably going to continue to be a very big problem. There isn't an audit trail to help find the problem down the track. The records aren't being kept. – Alternative Development Model Expert 2

The need for rectifiers to effectively start from scratch results in greater costs for owners than if rectifiers were well informed initially. The impact of this is evidenced by the audits now underway in NSW and other states to address combustible cladding risks. Governments are now requiring building owners to investigate the flammability of their cladding, which should in theory simply require a review of the building documentation to see which product was used. In practice, this information is not always available and owners must engage experts to check the building in person. This adds time, risk and costs.

Poor record-keeping also causes problems even in situations where there has not been any defective work, but a product is subsequently found to be less suitable than expected. Product recalls are hampered because if a product is found to be defective, there is no simple way to find out which buildings are affected. The Infinity Cable recall is a prime example, requiring years of effort to track down all the properties which had the cable installed (see Cormack 2017). This eye-opening example highlights the extent of problems that decades of poor record-keeping and information management can create.

7.1.2.4. **Development team is not aware of the severity and extent of the problem**

Finally, if members of the development team do not get feedback, they have no way to learn from their mistakes. Poor practices can be perpetuated, despite the best intentions. In the MUST context even small issues can have major impacts down the track, especially if an issue is replicated in every apartment.

What I see is the project team not having an appreciation for how really granular detail can cause issues at the backend. – Rectification Specialist 5

There's a whole industry out there working on - right behind, fixing up builders' problems where they tried to take shortcuts or people are just uneducated. [So] they didn't see the problems they were building in. – Rectification Specialist 1

This point is especially important to remember in the context of stakeholders disavowing the existence of a defects crisis (e.g. section 6.4.1). Some may be disingenuously ignoring evidence, but others simply may not know. Neither is an acceptable state of affairs, but the steps required to address the two issues are different.

Overall, these issues – and the underlying concerns around culture as a key driver of poor information management – point to a need for government intervention to ensure work is being adequately documented, and relevant data is passed on to regulators and consumers. Unfortunately, similar shortcomings around information collection and management also exist in the government context, as the next section will show.

7.2. **Causes and effects of government data blindness**

Among the most concerning findings of this research has been the extent to which governments in NSW lack the information necessary to regulate the construction industry and address building quality issues adequately. The need for more detailed reporting to government, and better data management by government, is a

recurring theme in all recent reports into building quality, both in NSW and nationally. For example, the 2015 Lambert Report (p.23) noted that “an integral part of the proposed reforms is to create and maintain a database that provides the evidence against which to assess the performance of building regulation and guide adjustments of the approach to ensure that a best practice approach is attained and maintained.” Unfortunately, little was done to address this need until the creation of the OBC in 2019. In many respects, this issue underpins the information asymmetry failings across both the construction industry and the strata sector, as the lack of regulatory control has allowed these failings to flourish.

7.2.1. Key reasons governments aren’t collecting the data they need to properly assess and regulate building quality

7.2.1.1. The drive to ‘cut red tape’ has undermined government expertise and data collection

The most prominent cause of government data blindness identified by interviewees is the dominant ethos that has prevailed in government since the 1990s, which has underpinned efforts to deregulate and privatise the construction industry (NSW Parliament, Legislative Council PAC 2020). This philosophy has been pointed to as a driving force behind decisions to privatise the certification process (CFMEU 2019) and streamline planning processes (Ruming & Gurran 2014). The argument in favour of this deregulation approach is that it allows more housing to be produced more quickly and more affordably. However, the flow-on effect on government’s capacity to monitor the performance of construction, planning and strata industry participants has been less widely acknowledged.

Interviewees noted that this is not a new problem, but one at least two decades in the making:

Most of it goes back to government, and points to government, really, because ultimately there has been a regime in place for years, since the early [2000s]. [...] One of the issues [...] even [with] some of the freedom of information requests that we’ve made is, there’s been a total lack of governance from their side, with respect to certifiers, with the building surveyors. In that context, what I really mean is there hasn’t been appropriate auditing, there hasn’t been appropriate guidance. – Certifier 1

It’s ‘let’s cut down, we don’t need to see documentation of this, it doesn’t need to happen, let’s just get it done fast’. It’s all been driven by ‘let’s get it done fast and let’s get it done cheaply’. – Architect/Designer 3

The early ‘90s [they] had a group of 100-plus inspectors running all over the subcontractors, and the licencing of subcontractors. They disbanded that licencing regime and auditing regime. [It] used to run with an iron fist, so contractors were afraid. They valued their licence, they understood what it actually meant to lose their licence. The problem now is, we’re not doing licence checks, and Fair Trading says, ‘yeah, [we know who runs the licence]’. I go, ‘yeah, but you’re not checking them, right?’ You have to make a licence worth something. If a guy doesn’t have a licence, (1) he needs to be audited. (2) If he doesn’t have a licence then he can’t build, he can’t tile, he can’t brick-lay, he can’t do any of that stuff, because that’s the only way to push people back into accountability. – Certifier 2

Some interviewees saw this ‘light touch’ approach to governance as a deliberate strategy to minimise the extent to which government needed to get involved in addressing shortcomings in industry practice – a ‘don’t ask, don’t tell’ approach to construction and strata industry oversight:

This government – and Labor are just the same these days – are all about cutting red tape. But that’s just used as an excuse in a lot of cases for no responsibility... The government does not take strata seriously and doesn’t want to take strata seriously because then they would have to address the problem. – Strata Media 2

If the legislation said you didn't have to do it, from a business point of view, why would you spend an hour and half to go out and do something if they said you don't have to do it? – Certifier 1

While promoted as a strategy to facilitate delivery of greater housing supply, the 'cut red tape' approach by successive state governments has contributed to an inability to assess the extent of the defects problem, as governments do not have the data and workforce required for this assessment. Now that the political imperative has shifted back towards greater industry oversight, there is significant work required to reverse this. One interviewee summarised this point neatly, painting a vivid picture of the problem:

It's Wile E. Coyote. They've shot off the cliff and suddenly realised they got nothing to hold them up. Because the compliance and regulation of the market is nowhere near what the government can provide, and the government has basically hollowed itself out. I think 20 years ago you certainly saw a lot more people, for example, in Fair Trading, who had been there in the '90s and were part of a very strong, highly resourced, highly budgeted regulatory and compliance machine. – Lawyer 2

The resources put towards creating the OBC, including a new team of building inspectors, is an important step towards addressing this 'hollowing out' of regulatory capacities. However, interviewees noted that other branches of government with responsibility for construction and planning oversight remain under-resourced, making it difficult to collect and act on the information needed to ensure better outcomes industry-wide:

It's our ongoing battle that every building we touch, every plan we look at, every intervention – that will make the building safer. Just the scrutiny, let alone our expert advice back, will make it safer. Yet our resources are limited [so] that we can't look at every building, that we can't do everything that we want [...] We don't have commercial vested interests in this, we're just [interested in] public safety. It's a good place to be if you're resourced properly because then you can have a bigger influence. But at the moment we have a perpetual struggle with things like labour expense cap, head count. – Government Officer 1

The same interviewee noted that this issue affects local government, as well as state agencies:

Councils are under resourced in what they do. Some fire safety work is discretionary, it's not mandatory for them to do that work. So if you're getting development applications you're required to assess those and get those out the door. The State Government makes that mandatory. With fire safety work, yeah, you don't have to do it. Not all of them even collect annual fire safety statements actively. – Government Officer 1

Another government officer suggested that governments may hesitate to undertake additional inspections or collect extra information because of liability concerns, which incentivize them *not* to look into issues further than required:

My observation of the concrete beams, the reinforced steel beams, where the formwork had been stripped away, I was most concerned because [...] to my mind [this] means the building isn't built to a satisfactory standard. But I was concerned about investigating it further or taking it further because that wasn't Council's role and if we had raised issues, that may have caused the building work to delay or, in my opinion, I would have asked for more than a delay in construction. But then Council could have been involved in litigation with loss of income and so on. So we're, to some extent, limited as to how much we get involved with these projects. – Government Officer 3

Again, this comes back to resourcing concerns, with uncertainty around whether local councils have the resources to respond adequately to a legal challenge from a developer. This may also help to explain why councils seem to exercise their powers to investigate buildings on a relatively limited basis. While recent legislative reforms have provided new powers to the Building Commissioner to undertake inspections and collect and publish data about breaches, some powers did already exist for government to undertake this kind of work. For example, the EP&A Act provides relevant powers to both local and state government officials (e.g.

Division 9.2, which provides broad inspection powers to both state and council investigators, and Division 9.3 which allow orders to be issued for a wide range of scenarios involving risks to public health and safety).

Despite these powers, however, some interviewees noted the retreat of government has also involved a retreat from playing a direct role in compliance and enforcement of those powers which do exist. In some cases, this has involved outsourcing of the compliance function – most notably through the decision to allow private certification, which has been heavily criticised. But interviewees noted that the lack of compliance and enforcement is broader than the private certification issue:

You have the power. You are Fair Trading, you are registering everybody, and everyone is allegedly registered and licenced. So you see, these people should be controlled, checked and accountable, because ultimately, if you know that there's an endemic problem with a specific company, well then you follow that company and you audit them, you make it a little bit harder, you make sure they pull their socks up. – Certifier 2

There's a fundamental policy flaw, which is not just limited to construction. It's more general in our society. It's an endemic problem, and that is that there's a belief somehow that if you have a policy, things will change. Policies are one thing, but the enforcement of policy is critical and if you don't enforce a policy, it's nothing. So, what we've done for many years is had policies on things, had self-certification, no enforcement and that's led us to where we are. – Academic 6

Enforcement, in addition to pulling players into line, provides a source of documentation and makes it easier for the public and other industry players to track performance. Even if compliance is outsourced to a third party, there remains an important oversight role for government.

7.2.1.2. Failure to manage the data collected effectively

Even where governments have not retreated from collecting robust information from industry through their regulatory and compliance processes, they have often not made good use of the information they do collect. One issue alluded to in the interviews was the difficulty governments encountered sharing information across internal 'silos' or divisions, which has been a recurring theme in planning literature more broadly (see e.g. Pettit et al. 2019; Oseland 2019). It seems the recent crisis may have prompted real efforts to address this at last:

I think the one thing I think that's been really good that's come out of [the cladding crisis] is how collaboratively governments worked together on it and the sharing of information with government on it. I think that's been excellent. I've – we've never worked as closely with our colleagues in Department of Customer Service, Department of Planning, Finance, Office of Local Government. – Government Officer 1

While this is a positive sign, there were other indications that there are still silos to overcome, or alternatively, information feedback loops that need to be closed:

The DA [Development Application] planners, for instance, spend weeks and months dealing with a design or an approval for a multi residential building and ... they never go back and see the finished product. Because their end of the process is the paperwork exercise on the desk. – Certifier 1

Private certification documentation was also identified by this interviewee as an area where issues remain to be addressed. Responsibility for managing the documentation received from private certifiers sits with councils, which means it is automatically more dispersed than if it were collated centrally. The centralisation of this dataset has only recently become a project for the state government:

So council has always been the keeper of the public record for certification. Because it had to be gathered somewhere [...] And it's only just now that even the Department of Planning, through their planning portals, are talking about them being the repository of all certification documentation. – Certifier 1

Meanwhile, council records themselves may be patchy and dispersed due to a combination of poor data inputs from industry and a regulated limit on how much councils can charge to manage the documentation:

So [councils] still have to provide to the ABS [Australian Bureau of Statistics], BPB [Building Professionals Board], and various other places, all of the details from the certifiers' certificates [...] because they don't collect it from private certifiers, because there's too many of them, they're too disparate. Someone goes out of business, you lose all of that information. So councils [...] charge 100 and something dollars for document management for our DAs, and yet we only can [charge] \$36 for the document management for a private certifier... [It's] much easier now that it's electronic, but you imagine the days when it was all paper and you had to scan every single sheet of a 50 page document for a multi-residential building. And that's why you'll be having problems in obtaining records, especially going back over 10 years, before we had electronic document management systems. – Certifier 1

As this interviewee notes, digitisation will help make the processes of information sharing and government record-keeping more effective and efficient. However, digitisation doesn't remove the need for reviewing the data and ensuring it is accurate and well-managed, which requires ongoing resourcing. Without this resourcing, efforts to improve policy-making and enforcement will falter if relevant information about what is happening on the ground is not effectively collected, managed or shared.

7.2.2. What happens when governments don't have adequate information

The widespread effects of government retreat from adequately investigating and enforcing building quality issues have been touched on in the previous section, particularly in allowing poor cultures to flourish, and inadequately skilled workers to practise. Beyond these broad impacts, it is helpful to tease out a few more specific flow-on effects from the government's failure to collect and manage information about the construction industry. Now that the NSW Government is exercising greater regulatory control, the lack of necessary information held creates roadblocks to undertaking this role effectively and efficiently.

7.2.2.1. Lack of clear strategy about how best to respond

Because of the 'hollowing out' of government capacity and decline in information-gathering, governments are faced with a significant hill to climb to reinstate strong regulatory oversight and effectively monitor the sector. One interviewee suggested that there is still a lack of clarity about exactly what the issues are and how best to address them, in part because government does not have clear visibility of the extent of the problem:

From a regulatory perspective, I think there's some – it's very disjointed to me. I think there are some people that see the issue and know that they need to move forward, but probably don't have a really great idea of the complexities of the issue [...] You would have heard, as I've heard, lots of people jumping up and saying, 'I've got the answer!' [...] My position is, well, those people know nothing, because – it's so complex [...] I think this is the danger that the regulators and the government more broadly have, is that they're really concentrating on specific areas and thinking that there is a fix. I hate them constantly saying 'oh, this is going to fix it', because I think 'oh, it's so not.' – Academic 1

As a corollary, there were concerns raised that governments were not well placed to target their limited resources effectively, as they did not have the information they required to identify the riskiest players:

[Some industry players] have the philosophy of, 'oh not my problem. If you were dumb enough to buy my crappy unit in the first place, that's your problem' [...] They're the people regulation compliance has to target and weed out, and currently it's not. Currently it's moving towards trying to, but there's a lot more work to be done. – Lawyer 2

Similarly, some interviewees expressed concerns that efforts to rebuild the system using new digital systems could lead to poor decisions, if the oversight of those systems is inadequate. One established industry player offered an example of how automated or overly rigid systems can produce unfortunate side-effects:

We failed a financial audit [...] The people that hire us the photocopiers weren't sending the invoices to the right individual [...] and we hadn't paid our photocopying bill for about six months and we were found to be a bad credit. So you know no one really looked at the other side and said 'by the way, they pay about 50 million a month to all these other suppliers, and that's all on time.' [...] [You need to] road test your process so it's actually doing the right things and not [...] inadvertently causing people that are trying to do the right thing some disadvantage. – Builder/Contractor 1

Rebuilding robust systems, with high quality data and appropriate checks and balances, will take significant time and investment. The OBC has made some important steps in this direction, but will need to ensure there is a long-term commitment to rebuilding institutional knowledge within government. Failure to do so will leave consumers exposed, even with the new legislative powers now in place. This is unacceptable, especially given the obstacles that prevent purchasers and owners from accessing the information they need to make informed decisions about building quality, as the final two sections in this Chapter demonstrate.

Before turning to consider the challenges faced by consumers, it is important to note that tied in with the government's retreat from strong regulatory oversight has been an expectation that industry would take on a greater role in self-regulation (Saulwick et al. 2019). While it is clear from the previous section that parts of the industry have failed to do this, the system should also provide third-party industry oversight, most notably from insurers and financiers. Once again, however, our interviews highlighted multiple ways in which these industry players have chosen or been unable to adequately assess and disincentivise risks associated with poor building quality. Once more, a lack of adequate information sits at the centre of many of these failings.

7.3. Causes and effects of financial services industry data blindness

In a well-functioning market, financiers and insurers would disincentivise developers and builders from producing poor quality buildings, as this increases the risk that the developer would not be able to repay their loans (due to the asset being devalued), and the risk that the insurer will receive claims to fix the defective work. In practice, however, these disincentives have not operated effectively, in part because financiers and insurers don't have all the information needed to make informed assessments.

7.3.1. Key reasons financiers and insurers don't have information about quality

7.3.1.1. Financiers use legal and financial mechanisms to reduce risk instead

Few developers can independently fund their developments, so must work with financiers to raise the capital. Financiers aim to protect their investment and ensure they get their returns. One strategy to achieve this is by only financing reputable developers with a record of high-quality buildings, while avoiding risky players. However, there are other ways to reduce risk that do not take quality into account, thus reducing the need to collect robust information about quality and reputation. To date, these alternative approaches seem to have been more popular with financiers, meaning they are not playing a strong role in incentivising industry transparency and quality control.

One mechanism which has attracted particular attention is the practice of developers setting up a 'single purpose vehicle' (**SPV**) – effectively a new company – to undertake each new development. This may be considered good practice, as a lawyer explained:

[It] compartmentalises the liability, you take the profits out, they've loaned all the money for it from other companies anyway, it's all mortgaged, they can collapse their deck of cards if they want to. They do that for tax reasons as well, but if a developer came to me and asked me, what should I do with this, I'd be negligent not to tell them to do it, because it's allowed. – Lawyer 2

The key benefit of SPVs for financiers is that it prevents financial failures in one part of a developer's portfolio from affecting their capacity to repay the loan on a different project. For this reason, a developer we interviewed claimed that financiers need to have an SPV in place before investing. However, this claim was contradicted by a lawyer who argued that financiers were simply going along with their clients' (developers) wishes, rather than imposing the requirement for an SPV themselves:

You know, when I was at [a major] bank? We could never have invested – and it would be against banking regulations – we could have never invested in our real estate business if we did not have a separate entity. So you actually – the only way institutional developers can develop is by setting up a standalone company. And everyone's calling this phoenixing, but it's not phoenixing, it's actually setting up structures to minimize ongoing liabilities. – Development Industry 2

I don't really accept it, because for all the years before 2003, and even later for a number of developments, it was all being done through companies that aren't a separate company for each development. [...] I've seen seminar papers, some probably as early as 2000 and 2007, 2008 – where lawyers are openly saying 'you should be using a single purpose vehicle for your developments.' They never said, 'because a bank will require it', it's always said [...] 'because you need to protect yourself from defects liability.' [...] Finance companies will probably say informally, 'oh yeah, that's what we like to see' and sort of go along with [it] [...] they're helping their clients if they foster that impression, but no one's ever explained why that's the case, that banks require that, like the particular reason for it. – Lawyer 4

The reference here to 'phoenixing' is the term used for liquidating a company to avoid liabilities, which is generally viewed as misconduct. A recent *Sydney Morning Herald* investigation found that reports of criminal misconduct in relation to insolvent construction businesses were far higher in NSW than in Victoria or Queensland, suggesting that phoenixing is especially common in our research context (Gladstone & Fellner 2019). Phoenixing can be a significant impediment to OCs making successful claims against developers to have defects fixed, as the responsible development company ceases to exist, and its related companies (the developer's ongoing operations) usually cannot be brought into the claim. Even where phoenixing doesn't occur, the growth in SPVs makes it increasingly complex to collect information about the track record of a developer and ascertain whether the developments being funded are likely to be high quality.

Beyond SPVs, another strategy for financiers seeking to reduce risk is to require a high level of presales, with more apartments already sold to purchasers. This shifts the risk onto the purchasers, rather than the financier, and again means gathering information on quality is less important.

The financiers, when they got nervous, just started to increase their presale requirements. So they were only interested in getting their money back. So therefore a building that required 50% presales went to 85, went to 95, went to 100. Or even 110%, you need to cover yourself because we know people are going to fall out. All they were doing there was covering their own ass to make sure they got their money back. – Strata Manager 2

The Building Commissioner has recently singled out lending to risky players in his public communications, stressing "the importance of financiers taking a greater interest in developer entity relationships and governance" and adding "this is simply prudent lending risk management." (Chandler 2021). At this stage, however, it is not clear whether financiers are heeding this call and collecting more information about building quality, rather than relying on SPVs and higher presale requirements to protect them. This is a little surprising given they are also exposed at the purchaser end, as one interviewee noted:

I've always been a little bit... bewildered by the lack of [concern from financiers] [...] Banks are financing people [buying] into these jointly owned buildings. And they have no idea about the exposure of... the risk to themselves. And I guess they're going to see some of that come through. – Insurer 1

Banks with mortgages over properties in buildings like Opal and Mascot Towers have seen this risk materialise, as the value of the secured assets in these schemes has dropped significantly. But whether this is enough to prompt a greater financial industry focus on quality oversight and data collection remains to be seen.

7.3.1.2. Builders are not required to have insurance for buildings over three storeys

Insurers also gather information about developers and builders to ensure they are not risking their capital. The government insurer *icare* provides last-resort builders insurance via the HCBF scheme for new-build residential

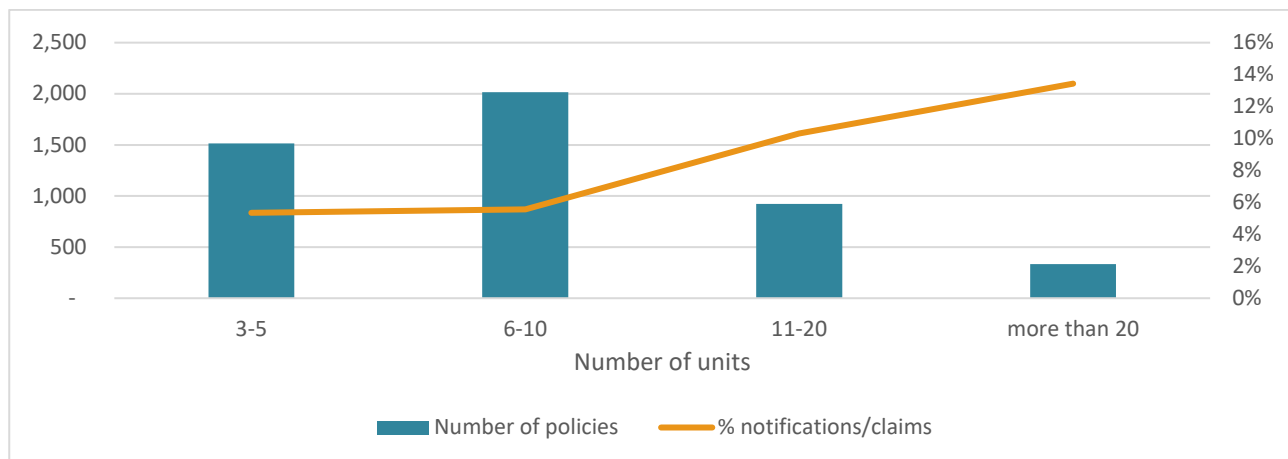
construction up to three storeys, as well as remedial works for buildings of any size. Prior to 2004, buildings of any size were also covered for initial construction. However, after the liquidation of the HIH Insurance Group in 2001, and the NSW government (via SI Corp) subsequently acting as the reinsurer for all remaining private insurers “due to multi-dwelling construction issues”, the government found itself “carrying all significant risks from volatility and essentially subsidising the private market” (*icare: Insurance and Care NSW 2020*, p.32). In 2003, the Grellman Inquiry recommended an end to compulsory coverage for high-rise developments subject to mandatory certification of construction. This was justified by reference to the protections to purchasers offered through the financier monitoring the builder’s financial security, as well as the concentration of financial risk in high rise construction occurring after the build (when property sales settle) and therefore during warranty periods (*icare: Insurance and Care NSW 2020*, p.32). The government accepted this recommendation and since 2003, a home owners warranty certificate of insurance is no longer required for the construction of new multi-storey buildings of four or more storeys in NSW, although it is still required for rectification work.

To get HBCF insurance, builders are scrutinised by *icare*, and approved to work on various classes of building based on their capability and capacity. This introduces a degree of oversight prior to development starting, with less chance of insufficiently skilled or resourced companies building.

When you're in this [remedial] space you have to be audited, so your finances are audited at least once a year. If you want to grow a bit bigger in one year, then they might put a quarterly review on your finances. They ask for a business plan. They look at an analysis of your closed jobs, recently closed jobs and to look at the profit margins on each and then also an analysis of why they did what they did. So there is a real lens put on this area of the industry. [...] They also look at your claims history as well, so it's all bundled up together. – Rectification Specialist 2

Claims and notifications ³ on HBCF insurance also provide a relatively robust data source to ascertain defect prevalence (although this is still moderated by owners advising the insurer). For example, Figure 17 shows the percentage of policies 2010-2020 with a claim or notification (of defects/non-completion) by number of units.

Figure 17 HBCF notifications/claims on policies by number of units



However, because HBCF insurance is not required for the construction of buildings of four or more storeys, builders in the high-rise market do not need to meet *icare*’s oversight requirements, and therefore do not submit any information to the insurer. As well as the issues this causes owners in larger buildings (who have no last-resort recourse if their builder collapses or disappears), this is a missed opportunity for government to gather valuable data about the types and prevalence of defects in larger schemes. Given our data suggests the rates of defects may be higher in larger schemes (possibly due to their greater complexity), this is a significant loss. Meanwhile, private insurers have not stepped into this role either, given the risks involved.

³ A claim occurs when there is defective/incomplete work *and* the builder has disappeared, is insolvent, or has had their licence revoked. A notification occurs when owners/managers lodge a Notification of Loss form regarding defective or incomplete work, and is thus a more encompassing indicator of the existence of defects (albeit involving self-reporting).

7.3.2. What happens when financial services don't have the information they need

7.3.2.1. Risky players can access finance and construct large buildings uninsured

As discussed in the previous section, financier oversight of building quality is lacking for the MUST sector, as is insurer oversight for buildings of four storeys or more. In contrast, the stricter oversight associated with HBCF insurance means that insufficiently resourced builders are locked out of the low-rise market – but not out of the market for larger buildings. Perversely, this incentivises under-equipped or disingenuous players to enter the high-rise market, despite the greater complexity and greater safety risks for residents in high rise.

You can get, for something under four storeys or less, [HBCF] insurance. But to comply with that, there are only a few builders in Sydney that can do your work, if you've got a big community of three to four storey houses. And I don't think that's necessarily a bad thing. Whereas, because there's no insurance product, all the dodgy builders, all the ones that are going to cut corners, they all go to the multi-unit apartments because there's no requirement for them to meet the criteria for them being allowed to offer [HBCF] insurance.
– Development Industry 2

Meanwhile, those builders covered by HBCF are incentivised to do quality work, as having claims made against them creates a paper trail, and this track record is used to assess future access to the market:

In fact smaller buildings now, with [HBCF insurance], I would argue are much better quality than larger buildings. Because the liability and the responsibility that is imposed on the builder, developer and subcontractor, because they know that their [HBCF insurance] can be drawn and the next time they try to get that, they're not going to be able to because their history will preclude them from getting that, [it] means that they deliver a better building. – Strata Manager 2

These comments indicate that insurer oversight can be an effective mechanism for improving quality, and that robust data collection is a key tool for insurers to assess developer track records and accurately price risk.

Even with these protections in place, however, the HBCF scheme has been unsustainable in recent years. Michael Lambert's (2019) submission to the NSW Parliamentary Inquiry notes that "in 2018 the insurance premiums paid for the [HBCF] was \$84 million while the claims paid in that year was \$204 million. That would indicate that the scheme is unsustainable on current premiums with the level of current building defects" (p.11). This is concerning given that this is the scheme covering buildings three storeys and under, and is last resort insurance, kicking in only when the builder has become insolvent or disappeared.

One explanation for this is that *icare* has used its oversight to focus more on the risk of builders going insolvent, rather than the risk of them undertaking defective work. This is noted in the recent IPART (2020, p.7) Review of the Efficiency and Effectiveness of the NSW Home Building Compensation Fund:

icare focuses on mitigating the risk of builder insolvency in order to manage the costs of the fund, rather than managing the risk that a defect will occur. This means that a strong regulatory framework and enforcement of building standards in the first instance is required to reduce the incidence and severity of defects. Ensuring that all builders are held accountable for the quality of their work would reduce the cost of claims under the scheme.

Access to more data about a developer's track record with defects would help *icare* to better assess developer risk and allow it to adjust premiums to reflect the likelihood of claims in the event of insolvency. One suggestion for improving this situation was ASIC's proposal that every director have a unique identification number.

Given these challenges and the costs associated with the amount of defective work claims being made, it is unsurprising that there is little appetite for either government or private insurers to re-enter the 4+ storey building market. As a result, in this high-rise market, the problems of high risk and low information continue to compound each other.

7.3.2.2. **Construction insurance is unviable for the private market**

Insurers' actions are a telling indication of the perceived risks associated with the MUST sector, with their decisions based on the need to cover claims across their portfolios. As one interviewee argued, private insurers will avoid the MUST sector in NSW until the risks become more manageable, leaving government as the only option for last-resort insurance:

The model is so fundamentally broken. I think the answer is the government has to step in and be the insurer of last resort, until they clean the system up over the next five to ten years and the private insurers have an appetite for it. But they don't want to do that because every time they insure stuff, like with HBCF, they end up with a \$310 million bill for the year. This is the thing, it's actually in the government's interest to clean the building industry up because they're burning money on the HBCF that they do insure, which doesn't even cover anything over three storeys high. It's insanity. – Lawyer 2

Meanwhile, insurance companies are also increasing the cost of professional indemnity insurance for experts in both the construction and rectification space, restricting the tasks they are covered for and forcing some to leave the industry. This is also making it more difficult to get professionals to sign off on remediation works.

The flammable cladding caused an increase in our premium of about 30% this renewable. Yeah and we don't do much in [cladding] – but our broker said 'yeah, and by the way, you're excluded from doing anything in it.' But they said just across the board [...] Everybody has been stung because the insurers and reinsurers aren't going to take the hit. – Rectification Specialist 6

The number of experts that I can get to go out and look at cladding and advise on cladding and even fire safety, is rapidly shrinking. Their premiums are going through the roof [...] Insurers are not going to cover it until the system works, and the system is not going to be in a functional state with an acceptable risk profile for them for a number of years. If it was, they'd be issuing insurance for certifiers and fire experts. They're not because they've gone from being quite happy to insure stuff that they didn't really understand the risk on, to assuming everything's a risk and huge premiums for not much cover. – Lawyer 2

As the second quote indicates, the lack of information has prompted insurers to shift direction, with the assumption now that anything involving unknowns is high risk. Better data would allow more nuanced assessments and better pricing of risk, enabling quality professionals to benefit through lower premiums.

7.3.2.3. **Higher premiums for private strata insurance**

This low information/high risk situation also affects strata owners seeking to insure their building after completion. Several experts referred to problems in Far North Queensland (due to widespread cyclone damage) as an example of where the NSW market could go:

Yes, there is a potential that it all becomes too expensive. We've found, certainly in Far North Queensland, and I'm sure you guys will be aware of the issues up there, but the ACCC did a report into that a couple of years ago, and some of those schemes have had a 300% increase in their insurance premiums, or what we've seen recently is just a complete lack of availability of insurance. This is obviously not your statutory insurance, it's the sort of building replacement and third-party liability insurance. – Lawyer 5

We're not making money, you know, [strata] insurers aren't making money, and the sense of humour will dry up. So either the build quality improves, or the capital goes away, and so costs will go up and availability will be limited to those better buildings. – Insurer 1

The possibility of strata insurers refusing to insure buildings creates huge risks for owners and the system more broadly, given that the SSM Act mandates that MUST buildings must hold damage policy insurance (SSM Act Part 9, Division 1). So once again, the lack of building quality – and the lack of reliable information

about building quality – threatens to undermine the whole insurance system. This will leave owners in poor buildings exposed, with pressure on government to step in once more.

Unfortunately, many MUST purchasers fail to understand these risks when they buy, as they too lack access to the information they need to assess the building quality. The next section examines the key reasons why.

7.4. Causes and effects of purchaser data blindness

As noted above, purchasers are the most vulnerable parties in the MUST development and sale process and are more vulnerable than clients in other high-rise development contexts, who tend to be institutional players. For this reason, the system should be focused on providing information transparency to support purchasers. Instead, almost everyone in the current system is incentivised to hide information from them.

It is notable that only four categories of data collected for this project are accessible to individuals: DAs and council business records (which are made publicly available by councils, at least for a period of time); reported case law (which can be searched online); and strata inspection reports (which can be purchased for a fee, usually \$150-\$400 dollars). The first three provide limited insights into building quality. DAs are produced before building completion, so do not provide any direct insights into defects (although they do provide information such as the developer's details, which may enable research on their track record). Council business records only pick up defect issues in selected cases. Reported legal cases can provide detailed information about defective work, but very few cases actually make it to final judgment.

As such, buying a strata inspection report is the main way purchasers of existing apartments can research the building's condition, as well as management issues (e.g. available financial reserves). This puts significant weight on the strata report to provide the information purchasers need to make an informed decision. Unfortunately, as the next section shows, poor strata reports are a key cause of purchaser data blindness.

7.4.1. Key reasons purchasers don't have the information they need

7.4.1.1. The strata inspection and reporting system produces mixed outcomes

The creation of strata inspection reports is enabled by section 182 of the SSM Act, which allows for the inspection by an agent of the owner of relevant records relating to the scheme and held by the OC. Commercial strata inspection companies regularly undertake these inspections when a MUST property is advertised, and prepare reports summarising key information, which are sold to prospective purchasers.

As discussed in Chapter 6, for this research we obtained 357 strata inspection reports relating to 265 buildings in our sample. Twelve percent of these reports did not mention the issue of defects as a consideration at all, while another 8% mentioned the possibility of defects occurring but did not provide any supporting evidence (see Figure 5). This is striking, as it suggests that in these cases purchasers had no real insight into whether defects have arisen in the building and are often not even alerted to defects being a matter on which they should do due diligence. Of course, in some cases the failure to mention defects in the strata report would be because there are no known issues with defects in the building. Nonetheless, this would itself be a helpful observation for potential buyers, and something worth noting explicitly in the report. Similarly, it is also helpful for the potential purchaser to understand when no adequate records relating to defects were made available during the search, a situation which appears to be relatively common.

Everyone says, 'oh, but you should be able to get the records', and it's like, well, unless it's physically there, we can't see it. We don't know. So that's the hardest thing for them to understand as clients. – Strata Inspector 1

Under s15(n) and Schedule 1 cl6(d) of the SSM Act, there is now a requirement that AGM agendas must include an item "to consider defects and rectification". This means that any defect issues should be documented in meeting minutes, and this information then be made available to strata inspectors to include in strata inspection reports. The strata inspector we interviewed noted that this had improved the quality of OC records regarding defects, at least up to a point:

Under the new legislation, all AGM agendas include the defects motion, no matter how old building is. So we're seeing it come up at every AGM now when we read through minutes.

So we'll just note in our report, look, defects motion was tabled and, you know, whatever the comment is. Sometimes there's not even a comment. They just put that little motion there about responsibility about investigating and covering off warranty timeframes. But, very often, there'll be a very loose resolution or an explanation of what transpired from that motion. – Strata Inspector 1

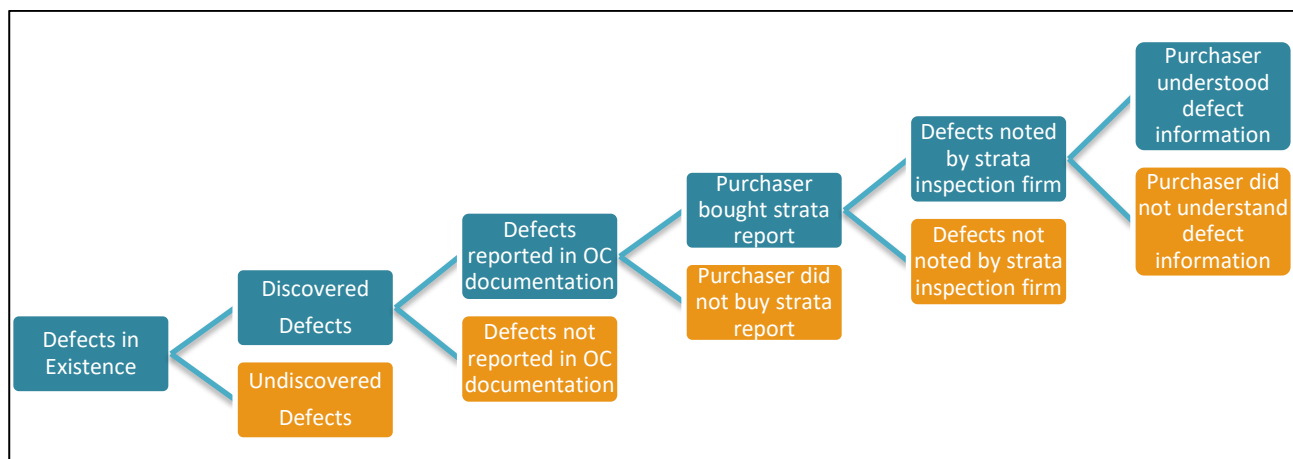
We propose that an informative strata report should always mention defects as a category of information of concern to a potential purchaser, even if only to note that there is no indication that any defects have arisen (see section 8.2.6 for more details).

A further issue is that purchasers may be unaware of the value of a comprehensive strata report. Strata inspection reports vary in price and quality, with real estate agents sometimes on-selling more basic reports to purchasers, and less experienced firms entering the marketplace. Purchasers can choose to order their own bespoke report from a reputable strata inspection firm, but often do not.

I think there's a pretty high incidence of people not really understanding the full importance of getting a - not only just a strata report, but a good one. I mean, you could get a cheap one or something that the agent prepared. You're always going to run that little bit of a risk that important things might be omitted. – Strata Inspector 1

The variation in the quality of strata reports in our sample highlights the information asymmetries at play, not just at the time of sale by the developer, but at each point of subsequent resale. To illustrate this point, Figure 15 models the range of circumstances in which a purchaser may not be adequately informed of existing defects, even if they have purchased a strata inspection report.

Figure 18 Information attrition in data accessible to purchasers through strata inspection reports



As a final point, it is important to acknowledge that strata reports are only available for purchasers of *existing* apartments – even this level of protection is unavailable for buyers of new apartments. In those circumstances, purchasers must rely solely on any information provided by the developer.

7.4.1.2. Purchasers lack knowledge about building quality risks, and expect care has been taken

Just as many purchasers do not appreciate the importance of obtaining a detailed, independent strata report, many also lack awareness of why investigating building quality issues is so important.

A lot of people, particularly first home buyers and even investors, they just don't spend too much time thinking about it. They don't give it the appropriate thought for the actual importance of the decision. But they make these assumptions that because it's new it should be good and therefore are quite surprised and shocked when they get into a situation. – Property Marketing & Real Estate 1

Purchasers are rarely construction experts and should not be expected to be. Interviewees noted that MUST developments are often extremely complex even for experts to understand, and the onus should therefore be

on the parties that best understand the development to guarantee good building quality. In practice, however, as Michael Lambert has noted, “in the residential area, [there is] a major gap in understanding and knowledge between the builder and the consumer” (2019, p.3). As our interviewees put it:

The majority of potential purchasers just want to move in and not worry about anything, and they won't - they won't go and look at the, let's say the designs of the waterproofing, they won't know whether the right thickness of the membrane has been put down correctly or whether there's a step up or a step down or whatever there needs to be. They just want to move into something that's waterproof and it's up to us as industry to make sure that the products we produce are waterproof. – Builder/Contractor 2

Do we have to expect them to do that level of research and upskilling? I mean it's like saying you have to become a mechanic to buy a car, you need to know exactly how it works and how this is happening and all of that. I mean these are substantial purchases and costs that have been outlaid. I don't think it's fair to burden lot owners with that level of responsibility. – Strata Manager 1

I think most of the people who come from overseas they think, okay, the government does this [checks quality] [...] But we do not. Our government doesn't do that. That's the problem. [It] doesn't actually check the quality. – Engineer 1

Another common theme amongst interviewees was the power of marketing strategies to convince consumers they would get something better than the reality when buying off the plan. Issues may arise at handover, with the product appearing lower quality than was implied, or they may show up over the first months of occupation.

Once the whole reality of the defects comes to fruition in their minds people are blindsided. Because all the brochures are beautiful and the apartment that you look at all looks fine until – not even six to eight months later things are falling off, water is coming in, the car park was flooding, and people couldn't park their cars in there. – Strata Manager 1

The end owners are the poor people that think they're buying a five star quality apartment in Rushcutters Bay. And you know - the glossy magazines and [...] the guy with the sports car outside is telling them this [display suite] is going to be where you're living ... And they're mum and dads and they just... 'that's what I see, I see quality so therefore you know what I'm gonna walk into is going to be quality too', but they have no control. Nil. – Builder/Contractor 1

Part of the problem here is that purchasers may assume luxury and quality go hand in hand, which is not always the case. The industry is generally geared towards marketing and producing 'luxury', which provides visible price signals that purchasers understand. Unfortunately, luxury can be surface deep, and in some cases can create more complex and problematic buildings.

Every unit you go around they have awards, luxury, quality, against it. There should be some sort of delineation for the consumer [...] to be able to actually [distinguish] between the quality and luxury. They are two different things. [...] Luxury is the money the developer invests that can be seen, but quality is the money that you can't see. – Engineer 1

Oh, we want more 'flair'. Change this cladding to this and do this and do this. You get more waterproofing issues; more fire rating issues. You just know it's going to be a problem. – Engineer 2

Purchasers also often reasonably assume that adequate consumer protections are in place, particularly for new builds. As Forcada et al. (2013b) argue regarding apartment purchasers in Spain, people expect that technical quality issues have been taken care of under various regulations and inspections. This means they may not seek out information on the developer's track record regarding defects and tend to look more closely at aesthetic concerns in their inspections and research.

When I first moved into apartments in Sydney which was 30 years ago, there was a very naïve sense that I am – this is the biggest investment in my life. I'm putting literally hundreds of thousands of dollars or at least a commitment over the next 20 years. The government wouldn't let me be ripped off. That would be such a stupid thing for the government to do. Well, [laughs] I was wrong. But I was not alone in thinking that. – Strata Media 2

Furthermore, there is a general lack of understanding about what purchasers are buying when they buy a MUST unit: their unit, plus membership in the OC which is charged with keeping the common property in good condition. When buildings do have defects, purchasers are legally responsible for making sure these are fixed.

It's the consumers bearing the brunt of it. It's one of those things that goes hand in hand with people really not understanding what they're buying, number one. So consumers... It's private property, but it's not private property in the sense that it's your and my private property. It's the owners corporation's private property and I'm a member of that legal entity and it's got a common law duty... You know you've got to fix the building. It has to fix the building so that it doesn't fall into disrepair. It's a public health and safety issue, but also too economically, if you let something fall into ruins, you're not going to get the money back on the market. – Insurer 1

Because many purchasers fail to fully understand these legal obligations before they buy, they can underestimate the importance of investigating the quality of not just their individual unit, but also the whole building. This means they may not appreciate the value of a detailed, independent strata report as the bare minimum due diligence that is required. However, even purchasers who do their research can be caught out if quality issues only become apparent after purchase. This has been the case for many buildings with combustible cladding, as one expert who has advised buildings explained:

My job is to go to meetings and say, well, actually, you do have to [rectify] because if you don't, well, first of all, someone might die, second of all, you're never going to get valid insurance because you've not made disclosure and even if you have made disclosure, all the insurers are saying, well, we don't touch anything with any percentage of combustible [cladding]. So, they're just on a hiding to nothing. Who can they believe? Who can they turn to and say, this beggars belief? It beggars belief. These are – not that it matters whether it's a \$4 million apartment or a \$400,000 apartment but in this particular case, they are \$4 million apartments, so the people are sophisticated, they're leaders of industry, they're powerful people and they just look at me and at the moment they just think I've got two heads. They're gradually coming to understand that what I'm telling them is their reality, you know? – Academic/Independent Advisor

In these circumstances, owners may expect that the government would provide more assistance than has been the case, and are understandably upset to find they have few avenues of recourse.

7.4.1.3. Market pressures discourage in-depth research

While many purchasers may not fully appreciate the importance of detailed due diligence, those that do still encounter other obstacles. Purchasers are often under pressure to make quick decisions, especially in a booming market, which certainly existed in Sydney during the period our sample of buildings were completed:

When things were going berserk between about 2013 and 2016 [...] there's this riot, where people were trying to get a unit, which is of course totally irrational, but that's what they were doing. Do you really think – well ... they were buying off-the-plan, but do you really think they were making a rational decision about the quality of the build or the quality of the developer, and all of that stuff? – Development Industry 6

In this type of market, there is little time to look into the history of the developer and its team, especially when this is complicated by the use of SPVs. In a hot market, purchasers may also settle for less comprehensive strata inspection reports due to the number of properties they are inspecting. Spending more money on a

report may not seem worth it if the chance of securing the property is slim. The costs of getting full disclosure can also add up when the purchasing process takes weeks or years, with auctions every weekend.

Because auctions were so hot, they didn't want to spend the three or four hundred dollars on a report because... they might miss out. So they'd go to the one hundred and two hundred [dollar reports]. We had clients that would [pay more]...and then we did end up giving ours at discount each time [because] they would go through us, again and again. - Strata Inspector 1

In this type of market, purchasers' budgets are also stretched to their limits by the property prices involved, even though the relative costs seem minimal.

I've got clients who are buying \$2 million homes, and they haven't done a building and pest on them because they've been looking six months and they've done three or four of them and they're like, we can't afford to pay \$600. It's like, obviously, you should be able to afford \$600. You shouldn't be buying a \$2 million property without paying \$600. - Property Marketing & Real Estate 1

Additionally, property buying is heavily swayed by emotion, especially for owner occupiers who are seeking a place to call home. Even when purchasers do spend the time to conduct due diligence on their purchases, they may not give adequate weight to warnings about quality, because of their emotional attachment to the property and their future plans for it (see also Easthope 2019).

When it comes to property people are like – someone just rang me earlier and said, 'oh but I love this property' [...] I said I wouldn't buy it if I didn't have any information, because they won't give him any information about it so I wouldn't be buying in there. He said to me, 'oh, but I really like it.' – Strata Manager 1

Hot markets add an additional layer of difficulty for buyers having to overcome these emotional responses, as options are likely to be limited. For many buyers, the only choice may well be between two apartments of questionable quality, or between an apartment of unknown quality and no purchase at all. For buyers looking to secure a home, it is not hard to see why they may fail to heed the risks unless they are very clearly disclosed and the implications thoroughly explained. The limited disclosure in many of the strata reports we have reviewed is unlikely to reach this threshold.

7.4.1.4. The development team may be difficult to link to a development

For those buyers who do overcome these financial and emotional pressures and seek to do due diligence beyond obtaining a strata report, further obstacles emerge. As discussed in section 7.3.1.1 above, the use of SPVs and the prevalence of phoenixing makes doing due diligence on developers and builders difficult.

You've got to have the visibility which David Chandler talks about on products and everything else. But the fact of the matter is, if you're setting up a special purpose vehicle for every project and you set it up and shut it down, how can anyone tell you your track record? – Lawyer 2

If names change for every development, tracking down previous work is not feasible for a layperson. In addition, cases settling out of court, with a Non-Disclosure Agreement (**NDA**) in place, means developers and builders can prevent bad news stories from spreading.

Unless it's one of the handful of buildings that ends up hitting the media, there's never going to be a judgement out there where they're getting slammed by a judge or a tribunal member saying they had all these defects. If someone Googles a company, they're not going to come up with something that tells them oh this company has a bad track record, they'll just find nothing and they'll think that's a good thing. – Lawyer 4

Together, these obstacles make it near impossible to undertake rigorous due diligence about a developer without the support of an expert or industry insider.

7.4.1.5. Existing owners sometimes reinforce purchaser data blindness

Developers and builders are not the only parties with an interest in preventing news about their defective buildings from spreading. While purchasers are initially the victims of information asymmetries, once they become owners, they can help to perpetuate the imbalance – sometimes deliberately and sometimes unwillingly. In circumstances where legal action has been taken against a builder or developer to resolve a defects dispute, it is common for a NDA to be signed, which prevents owners from discussing the issues publicly. This may be a compromise by the owners to achieve a payout, or may be a mutually-beneficial outcome, with owners seeing it as a way to protect the resale value of their properties. Irrespective of motive, the net effect is to protect the developer and builder against reputational damage (which would otherwise signal to the market that their products should not attract such high prices in future).

Even where NDAs are not used, there is some evidence of defects being concealed or ignored by owners, as they fear the impact on the value of their investment (see also Sweeney 2019; NSW Parliament, Legislative Council PAC 2020, p.108).

If there are problems in the building, the owners are already bought in there. They go, s\$\$, this is going to impact on their value. They can collude not to actually put it in the minutes, they can collude to just have little conversations in the corridors rather than actually properly have these on the agenda and minute these conversations and put them in email [...] There's a real disincentive for owners of buildings that have problems to actually openly discuss them. So, you've got this very opaque system – Real Estate/Property Marketing 1*

One way to conceal defects is to keep minimalist meeting minutes, so that issues are not clearly recorded in documentation that must be made available to a strata inspector. While the SSM Act requires defect matters to be tabled at every AGM, minutes may not be comprehensive. This can also give the impression that defects are simply cosmetic – which contributes to misunderstandings of the scale of the issue across the sector.

They're terrified of stuff going on to the committee meetings and the body corporate records about defects...They're trying to keep that off and then [...] they only want to do the cosmetic things. Yeah, so it's like no real issue is going to be dealt with here. – Owners

This highlights why strata inspection reports can be an insufficiently reliable form of disclosure, as they can only be as informative as the underlying records allow. It also points to the fact that regulatory change to reduce information asymmetries at completion is not enough; a comprehensive response must also remove the incentives to conceal information across the building's lifecycle. While the inclination to conceal material about defects is understandable, one interviewee argued that it is already in the best interests of owners to be as transparent as possible:

You're much better off having it all on the books and records, being open, being transparent and then having a report back from your engineer to say 'look, that work's done. Here was a reputable remedial builder. I've gone back in and inspected, no more defects.' – Lawyer

3

This necessitates taking a long-term view of apartment values, and being able to have confidence that values may drop in the short-term but are likely to recover over the long-term. It also means purchasers need to understand the value of a building that has successfully completed a defects rectification process – and be able to distinguish between a quality, well-managed building and one less so. Currently, market dynamics make this difficult. We discuss the consequences of lacking the right information below.

7.4.2. What happens when purchasers are uninformed

7.4.2.1. Consumer confidence drops and market mechanisms fail

As the previous section shows, MUST purchasers are currently unable to adequately inform themselves about the quality of the product they are buying. This means the market risks devolving into Akerlof's (1970) classic 'market for lemons', where consumers cease paying for quality as they lack confidence it is a worthwhile investment. This in turn makes quality construction harder to produce.

It's only in knowing that your client wants a level of quality that you can actually deliver a product at a price that you're - you know you've got a fair enough chance to say, well, the profit that I made on that project I'm going to be able to keep. – Builder/Contractor 1

Some experts pointed to evidence of a loss of consumer confidence in NSW and increased wariness on the part of purchasers, due to recent media attention on the issue of defects.

Certainly with the publicity with Opal Towers, Mascot Towers and so on, people are realising that a new building doesn't necessarily mean it's going to be a building having a long life. Unfortunately in the last several months, for example, I've had owners or prospective owners being required to settle on a purchase of an apartment in a high-rise building when they, as lay people, can see problems [...] wanting to know if council can cancel an occupation certificate issued by a private registered certifier because they've seen structural cracks in the basements, for example, or the finish of their apartment is well below what was described to them or shown to them in an exhibition unit or apartment. – Government officer 3

Many experts we spoke to said they would not buy a recently-built apartment, and many were in a position to offer purchasers the same advice.

People say, would you buy an apartment? Well, I said yes, I would buy an apartment, probably if it's [built] in between 1940 and 1955, I might, and there's no infrastructure in it. – Builder/Contractor 2

Number one big no-no is buying off-the-plan. Number two big no-no for me is really looking at most things under five years. Number three big no-no is well, if it's under 20 years old, you can't rely on it being any good. – Property Marketing & Real Estate 1

Conversely, other interviewees argued that many purchasers were still confident enough to buy, whether because of a lack of knowledge, or because they assumed any problems would not affect them. This continued confidence based on poor transparency meant that poor quality buildings continued to sell.

My magic wand would be that consumers actually had the scales peeled off their eyes and actually demanded better quality and realised the risks that they're taking. That would be my magic wand. Because then if there was no one to buy them, they couldn't get built. – Property Marketing & Real Estate 1

One interviewee was optimistic that purchasers would eventually come to recognise potentially defective buildings, enabling high quality product to keep its value while low quality product becomes more difficult to sell and less feasible to develop.

If you look at New Zealand as a whole and leaky buildings, people in that market know a leaky building when they see it and there's a two-tiered market. I think that's almost inevitably going to happen. There's going to be a two-tiered market because unless these things can be fixed and fixed properly, then I think that's the inevitable result. The valuers will know, the banks will know and ultimately, the people will know. – Academic/Independent Advisor

However, it is worth noting the New Zealand leaky buildings crisis is associated with a specific style of construction and type of cladding, making a potentially leaky building immediately recognisable to laypeople. A number of serious defects occurring in the NSW context are invisible upon visual inspection, even to experts.

Even if you're an experienced professional who's seen it all, it's very hard to pick – for them to pick it up when it's covered with plaster and paint. – Academic 4

If the market (consumers) is not regulating quality and only parts of industry are self-regulating, the responsibility falls to government to regulate and enforce quality directly, to incentivise self-regulation, and to reduce information asymmetry to allow market mechanisms to work as they should. While interviewee

responses to the Building Commissioner's recent reforms were mixed, one developer was keen for the government take a strong line to ensure consumer confidence did not dip further, given the risks:

Our biggest problem is the new [buildings] coming in and getting confidence and certainty around that. So certainly from my stakeholder perspective [...] in terms of community confidence, I think that first battle's very, very important [...] I want [the Building Commissioner] to get in there, find the problems, create the change he needs to, and I think he's doing that, and then we can come back to community and say, 'well, we've solved some of these systemic issues'. – Development Industry 1

This reinforces the conclusion that growing consumer awareness of poor quality and information transparency issues is now creating real market impacts.

7.4.2.2. Defect costs are passed onto purchasers

There is an argument that mandating 'high quality' buildings would price many purchasers out of the market, and that cheaper (lower quality) developments fulfil a need for affordable housing. One developer made this point explicitly, arguing that more affordable apartments having defects is simply how the market operates:

Ultimately you get what you pay for. If you want to pay the extra amount of money to get something from a builder who's going to get everything right the first time, then that will cost you a premium. But at the same time, so long as it's not threatening life and safety, my view is if you go with a cheaper product that gives people a house over their head and an opportunity to participate in the great metropolis of Greater Sydney at an affordable price but that means that not everything is going to be perfect from the day that you move in, then [that's] the market offering. You should have all of those elements available to you. – Development Industry 5

While this developer was talking primarily about cosmetic defects, it is still striking to hear defective work framed as a necessary part of providing affordable housing and a 'routine' part of the development model. The counter argument (see section 7.4.1.2) is that there is a difference between quality and luxury, and that buildings should meet minimum quality levels. An 'affordable' apartment with defect issues is not truly affordable, as these issues will be expensive to fix, devalue the property and may mean it cannot be sold.

All you're doing here is passing the cost on, rather than the developer making less profit by spending more money on a properly leveraged risk portfolio for the contract and making sure everyone's doing their job right. Everyone cuts corners, you do the job cheaply, the profit is bigger. The developer buys his yellow Maserati or Lamborghini, the builder keeps ticking along, and then there's a big bill to fix all the defects because it was done poorly, and who does that fall on? The unit owners. That's called a subsidy. You pass - you're just moving the cost. The profit for the developer and the operating costs and margin for the builder, are paid for indirectly by the unit owners that have to pick up the bill for the crap job that allowed the profit margin to be made. – Lawyer 2

[In buying an 'affordable' apartment] you're going to stay on that bottom rung probably forever. Then if you've got defects, of course, you're stuck even worse [...] because if those defects become known the building is devalued and then you literally are stuck because you can't just hand the keys back. – Property Marketing & Real Estate 1

We would argue that if the desire of governments to provide greater housing supply is underpinned by a desire to provide greater financial and social stability by facilitating property ownership, then passing the cost of defects on to consumers is unlikely to achieve this. This is especially the case if it is impossible for consumers – especially those at the lower end of the market – to protect themselves by doing their due diligence.

7.5. Causes and effects of owner data blindness

While many MUST purchasers go into a sale without the information they need to make informed decisions, they often do not become much more informed after the sale has been finalised. Many of our interviewees

explained that the processes for ensuring the transfer of relevant information about a building to new owners are flawed, and owners may not have the expertise to understand and act upon this information.

7.5.1. Key reasons owners don't have the information they need

7.5.1.1. Completion handover mechanisms are insufficient in practice

What happens during the period when a MUST building transitions from developer control to the control of subsequent owners is very important. During this period, new owners need to collect as much information as possible about their building, and the quality of construction in particular. Having this information, and understanding it, is essential in arranging for defects to be rectified within the limited timeframes provided under statutory warranties.

Where comprehensive records are not kept during the construction process (see section 7.1), it is of course not possible for them to be passed on to subsequent owners. However, even where records have been kept during construction, they may not be passed on to OCs. As Johnston & Reid (2019, p.60) observe, there is a general "lack of pressure on the developer to hand over all scheme (particularly construction-based) documents". This was previously raised as an issue in the Discussion Paper that preceded legislative reform to the SSM Act in 2015 (NSW Fair Trading 2012, pp.33-34, 56). Additionally, where documentation is provided, OCs often require specialist help to verify the quality and completeness of documentation (OCN 2021).

The failure to provide adequate documentation is not because there is no obligation to do so, as multiple NSW regulations require developers to hand over information on completion. This includes s.6.27 of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*, which requires that "a certifier is not to issue an occupation certificate [...] unless a building manual for the building has been prepared and provided to the owner of the building in accordance with the requirements of the regulations."

However, the EP&A Regulations do not set out any requirements in accordance with s.6.27, and it seems this provision is rarely enforced.

The NSW EP&A Act [...] states, 'thou shalt have a building manual to hand over to occupiers.' My paraphrase. Unfortunately, the regulations were never written to bring it into force. You no doubt are aware that the Act doesn't actually make it happen [...] If that had happened, then we probably [...] wouldn't have the problem we have today. It's as simple as that [...] I think that's an indictment on all the governments between then and [now]. – Academic 4

The second provision that requires handover of documentation is s.16(1) of the SSM Act, which is more explicit about the documentation to be handed over:

16 Documents and records to be provided to owners corporation at first AGM

(1) An original owner or lessor of a strata scheme is required to convene a meeting under this Division must, not later than 48 hours before its first annual general meeting, deliver to the owners corporation the following—

- (a) all plans, specifications, occupation certificates or other certificates (other than certificates of title for lots), diagrams, depreciation schedules and other documents (including policies of insurance) relating to the parcel or any building on the parcel,*
- (b) [...] all planning approvals, complying development certificates and related endorsed plans, approvals, "as built" drawings, compliance certificates [...], fire safety certificates and warranties relating to the parcel or any building, plant or equipment on the parcel,*
- (c) the certificate of title for the common property, the strata roll and any notices or other records relating to the strata scheme,*
- (d) the initial maintenance schedule,*
- (e) any interim report or final report of a building inspector prepared under Part 11 and relating to any building on the parcel,*
- (f) any other document or item relating to the parcel or any building, plant or equipment on the parcel that is prescribed by the regulations for the purposes of this section.*

However, Clause 16(2) notes that these requirements do not apply if the documentation is not in the possession of the original owner (i.e. the developer), or cannot be obtained by taking 'reasonable steps'.

In addition, Clause 6 of the SSM Regulations requires the following additional documentation to be provided:

For the purposes of section 16(1)(f) of the Act, the following documents obtained or received by the original owner or lessor and relating to the parcel concerned, or any building, plant or equipment on the parcel, are prescribed—

- (a) [...] any valuation of the building,*
- (b) maintenance and service manuals,*
- (c) all service agreements relating to the supply of gas, electricity or other utilities to the parcel,*
- (d) copies of building contracts for the parcel, including any variations to those contracts,*
- (e) the most recent BASIX certificate [...] for each building on the parcel.*

The problem of document handover seems therefore to be one of enforcement, not insufficient regulation. As Johnston & Reid (2019) suggest, this is not just a NSW issue. A Queensland-based lawyer in our research also confirmed the same challenge plays out north of the border:

The developer, even though they're required under the Body Corporate and Community Management Act to hand over contracts, plans, specifications, all of those things at the first annual general meeting, either, often they don't, or someone loses them, but routinely we're sort of saying, 'can we please have these documents', and the schemes are saying, 'we don't have them'. If the developer's no longer a lot owner in the scheme, then you've got to go and essentially bring a court proceeding for a pre-preceding disclosure, or a mandatory injunction to produce those documents. So, before you even pass go, you're spending a fair bit of money on a court process to try and even get the documents, to work out whether you've got a cause of action. – Lawyer 5

Even where owners succeed in obtaining the relevant documentation, there is limited oversight of the accuracy of these documents. One strata manager pointed to examples where documents handed over were clearly not produced in good faith:

The government has a really important role to play in terms of them either holding that information or peer checking it [...] No one is checking the veracity or the accuracy of it. So if I said to you, here's a set of as-builts you'd say, 'great'. Now I don't know if you've ever seen what they've done between design drawings and as-builts, sometimes they just change the filename. – Strata Manager 2

Again, owners in this situation may have to take the developer to court to get inaccuracies addressed, assuming they or their advisors have the technical skills to recognise the issue. This places the financial burden on owners to pressure the developer to comply with their legal obligations instead of the system enforcing compliance or, at the very least, incentivizing developers to comply in good faith.

7.5.1.2. Owners are usually not strata or building experts

During the handover period, ownership of the building transfers from a single owner with extensive knowledge of MUST developments and this building in particular (the developer), to a group of disparate owners who are new to the building and usually have little MUST expertise (the unit owners). This creates real challenges:

By its very nature the collective ownership of the problem that occurs post-registration of the plan is almost like an obfuscation of responsibility from someone who knows what they're doing, builder-developer, sophisticated entity, to a bunch of amateurs who, if they get their act together with the right advice, are well equipped to deal with it. But if they don't, they're going to fall over like bowling pins. – Strata Manager 2

The timeframe that they have to report [defects] in for new buildings is extremely challenging for new committees to get their head around. They're just getting their act

together, maybe after a year. They've got to do all the reporting. [...] The committee often can't get themselves together first to then tackle something, because they have to be quite a cohesive bunch to then take it on. Or there's got to be one really strong champion because it's a hell of a lot of work, or cost if they're going to pay someone else to do it. It's really hard to get the message across to new owners how important it is. – Strata Media 1

This is one of the major ways in which MUST developments differ from commercial developments, and why greater information transparency and clarity is even more important in the MUST context.

In the case of commercial, you've got a very powerful owner or developer calling out the builder or [not] allowing the builder to cut corners because they want to get the thing off their hands as quickly as they can ... As opposed then to devolving down into apartment buildings or strata, where ... you hand over to a whole bunch of people who are just average joes, who don't understand, and wouldn't be able to know what was going on. – Supplier 1

Strata owners can hire experts to advise them on defects, but there are difficulties here too. It can be hard for owners to know which reports are necessary and to justify the cost of expert reports to other owners, especially if this requires special levy payments. Under the current system, owners must put their trust in an advisor to recommend the appropriate course of action to obtain the information they need on defects. While OCs who get 'the right advice' will benefit from doing so, it can be difficult for owners to assess whether they are receiving good advice, and to guard against predatory practices (see section 7.5.2.2 below).

They might see the waterproofing, the fire issues are hidden and they don't understand why we say to them 'look spend \$8,000, \$10,000, \$15,000 on a report to get the fire issues looked at'. 'Well, why would we do that? It's working perfectly'. We don't know it's working perfectly. – Lawyer 3

While one solution to this challenge might be to suggest that owners need more education, this is not a straightforward task given the complexity of the buildings in question, and has not proven effective to date.

If I see another report that says we've got to educate unit owners more, I will vomit. Really, just stop it. We've been saying that for 30 years and for 30 years people have been trying to do it ... They don't want to be educated. They don't want to be and they're not going to be, so we've got to come at it another way ... My frustration with it is I think it's an easy finding for people to make, for academics to make, for government to make, for industry groups to make. 'Oh, we've had an inquiry and we need to educate people.' It's so simple to say it but it hasn't moved us anywhere. It hasn't changed anything. – Academic/Independent Advisor

Instead, what is needed is a clear process to ensure that owners are provided with the information they need, and that the appropriate checks take place to identify and act upon building defects in a timely manner. This is partly the intent of the SBBIS (although this scheme has its own challenges). Without better processes, a push to 'educate' owners is arguably just a way to justify shifting responsibility for dealing with defects to them.

We've had conversations for years about 'owners don't understand their roles' and that sort of stuff, and ... that they need to be educated and they need to do this and they need to do that, and I really find that quite an offensive position. Because I think, if you get the structure right, right from the beginning - well, first, if you build buildings correctly, then there's no issue to deal with. But even if there are some minor defects, which we always know there will be, then you need to cut out that section where there's control and those conflicted interests, so that individuals - right from the beginning, there's a better transition for them to take responsibility and accountability for that decision-making right from the beginning, and have processes set up. – Academic 1

Also, it is not unreasonable that owners don't always understand the extent of the risks, especially when governments have not been forthcoming with this information.

If you read the cladding brochures that were put out by government, they were so soft and in part just terribly misleading, by using language saying things like, 'not all cladding that's full of combustible petrol is dangerous.' Well, that's just not true but the government papers were just peppered with this stuff and it was almost about, well, don't panic and it just was wrong. It still is, it's just wrong because the truth is, if you talk to the experts [...] well, that's not what the fire chiefs are saying. The fire chiefs are saying, 'don't give me something that only burns a little bit.' That doesn't work. It either burns or it doesn't burn. So, the mismatch between the experts and the first responders ... compared with government is just shocking. It's shocking. – Academic/Independent Advisor

As the group that comes to the MUST market with the least expertise, consumers should be able to rely on governments and professionals to support them in providing the information they need to make good decisions about their homes and assets.

7.5.1.3. Professionalisation of strata managers varies, and industry pressures are high

The group of professionals that owners most often turn to for assistance with their strata scheme is their strata manager (for those schemes that employ one). It is often the strata manager who will recommend action to be taken to deal with defects and provide referrals to building experts. Where strata managers are experienced with this type of work, they can play an important role as advisors. However, the quality of strata managers varies, and not all managers have the expertise to provide appropriate advice on defects rectification.

Some of them are really good, some of them are very passionate, but some of them are pretty awful. They're way beyond what their capability should be, and they're managing the lives of maybe 100 families. It's a pretty serious responsibility to be a strata manager and making sure that the building's looked after and the occupants are looked after. – Certifier 2

The strata manager was relying on external consultants and if you're entirely relying on external consultants to do your work and you don't have the expertise to know what you're being dished up with, you don't know how to implement it. So, the lawyers were actually driving the process for and on behalf of the strata manager and no one from the lawyer to the strata manager had any building experience. They were just shooting letters back and forth – Development Industry 4

It is important to note that strata managers are typically not building experts. Instead, their skills and qualifications often lie closer to real estate and accounts management.

If you look at the difference between wholly-owned buildings where they get someone like JLL in to kind of manage the building, in the multi-owned buildings you'll have a strata manager who may not be equipped to deal with the complexity of building management obligations with these large-scale buildings, but they are essentially the same buildings that the likes of JLL are managing. – Lawyer 5

One challenge facing the strata management industry is that historically the sector has been very price-sensitive, with competition based primarily on fees rather than expertise. There are some signs that this is changing, with increasing calls to improve performance and compete on both experience and expertise.

There needs to be an acceptance that consumer-led pricing, which is, 'well I've got three quotes from a guy down here and [...] you should do it cheaper' - is going to lead to structural issues around capability and capacity. [...] There still needs to be a more structural shift in thinking to understand that the value of a strata manager is more than just an administrator, to a bona fide collaborative partner. – Strata Manager 1

Another challenge is that the rapid growth in the sector has resulted in high turnover of strata managers and fierce competition for experienced managers. This means that managers' portfolios are frequently changing, and buildings may be allocated new a manager in the midst of a defects rectification process.

Yeah, I think one of the problems that tends to occur is that there's a pretty high burnout in the strata management industry. So the churn of strata managers going from company to company or leaving the industry is a pretty high ... So that's a bit of an industry problem, that there just isn't enough skilled people staying on in the industry or staying on managing buildings for a longer period of time so there's a natural flow of care taken on in any particular building. – Strata Inspector 1

Importantly, these turnover issues can also translate into information loss issues:

I think also when strata records change hands from one manager to another, one company to another, often there's a little bit of a misfit with the information that goes missing or strata managers use different software than the other company, so when they pass the information on to the new company, they're using a different format. So all the files don't always necessarily come across in digital format. – Strata Inspector 1

Management can churn between managers from time to time and at that point in time we receive all the archive documents for a building, which could be 50, 100 boxes, and then the latest active files which are finances and the latest correspondence. [...] if we drew a line in the sand and said that the strata inspection reports were mandatory and that there was a prescriptive list of what's to be included, it would be reasonable to expect that 99 per cent of buildings would be non-compliant initially because they just don't have that documentation. – Strata Manager 2

As well as improving the advice owners could receive, further professionalisation and stabilisation of the strata management industry could help to ensure owners have better building records and data. This is important, as patchy record keeping in strata schemes is a widespread and well-recognised issue. As well as records being lost, industry pressures may mean not all records which should be created are:

The strata management industry's become far more complex because there's more things for the strata managers to do, there's more responsibilities, there's more legal obligations, there's a hell of a lot more compliances involved in managing buildings, so, therefore, the records become more complex too. And as the records become more complex, their job becomes more difficult, and I guess that always heightens the risk that not everything's going to make its way into the records because they're all so busy managing 70 or 80 buildings per strata manager on average now. – Strata Inspector 1

The volume of things [strata managers] get, they're making constant decisions about what to bother including or what to not include ... so you're getting things filtered there that probably shouldn't be filtered and you also can't really know how significant things are going to be when you get them. Even as a lawyer you don't really know if it's going to be significant a lot of the time, a year down the track, and ... it's often gone to an assistant of the strata manager who isn't as trained or doesn't know the matter as well. – Lawyer 4

Given the reliance owners often place on strata managers, it is important that the industry structure enables managers to have the skills, training and time needed to ensure schemes are well informed, and their defect issues well documented. Achieving this is likely to require an increase in management fees across the sector.

7.5.2. What happens when owners don't know enough about defects

When owners do not have the necessary information about defects, or when they are unable to understand the information they do have, this will have negative consequences for defects rectification. Insufficient information and knowledge about defects can result in missed opportunities to get building defects rectified, or unsuccessful attempts at holding the developer, builder or other parties to account. There is also the potential, where owners do seek professional advice and expertise, that their lack of knowledge will expose them to predatory practices. Finally, where insufficient information is available about the maintenance needs of the building, or where this information is not easily understood, there is also the risk that poor maintenance will further complicate claims relating to building defects.

7.5.2.1. Missed efforts to get the developer/builder to rectify

As noted in the previous section, the timeframes during which owners must take action on building defects in NSW are relatively short, making it important that action is taken as soon as possible after new owners take possession. Sometimes, when owners take timely action and organise with a developer/builder to return for repairs, the defects are adequately fixed. However, not all developers/builders will return, and in these cases, owners must decide whether to take legal action. In this situation the owners are usually at a disadvantage, as they lack experience in how this process will often play out.

If we assume that every building has defects, and even the very good developers will argue those defects if they can - which they are perfectly entitled to do, if there's a grey area ... again, which party is best to deal with it? It's not that group of owners who then are forced to go out there and get legal advice and experts and all of this. – Strata Manager 2

Even owners with experience can find this process daunting. Two owners we interviewed were in the midst of suing, and despite both being professionals with property industry experience, they were finding it tough:

Owner A: we're going recovery against the developer for items not supplied and for defects. That's two [legal] cases going ...

Owner B: We're ... in a situation that a lot of people might not be in, because I mean A's very legally minded, but we also have family members who are lawyers and are giving us advice. But for somebody to be able to do what we're doing, it's beyond most people's capabilities and to think, we're just one little guy trying to fight this big company and all the people associated with them. I mean I'm daunted now too, but I just think we have to try. You just have to try and do something. - Owners

Furthermore, having organised for the developer/builder to return does not necessarily guarantee that the repairs are adequate. Two interviewees spoke about strategies used by some builders and developers as a means of stalling any future legal action, without adequately repairing the problem at hand.

I know as soon as we get one of the [Developer name] buildings, it will have an issue. Generally water, and you know they will come out and they will do, they will be very conciliatory and say 'yes, yes, yes there's a defect'... right up until the warranty period. They'll fool some lot owners into you know, doing a little bit here, a little bit there, never telling them what they're going to do. But just turning up one day with some tools and doing stuff and the lot owners are so desperate they let them in, despite us saying 'we know this is their tactic. This is what they do. Do not let them in.' [...] After the warranty period... [they turn to] dust. – Lawyer 3

My experience has been with a lot of builders of defective buildings, is that [...] they're not getting paid for [the repair work]. They take shortcuts and their priority is to just get out of there and get rid of the defect liability as cheaply as possible. All they've got to do is something that's going to last long enough for the owners' corporation to not realise that it hasn't been fixed properly and commence proceedings within two years, for most defects. – Lawyer 4

To fully protect themselves under the current system, owners may need to commission expert oversight of the defects rectification process. Taking such action early on may save money in the long term, especially if it means the builder or developer does adequately rectify the defects at their own expense. However, this requires significant upfront costs early in the life of a building, and may be difficult to justify when owners are not necessarily aware of the extent of the defects.

We sound like we're just trying to drum up fees, but you're saying to these people, you need to get us involved earlier, you need to get a higher level of engineer report done earlier, so that you can fully understand what these defects are, and how they're caused, and how they're rectified. People are reluctant to spend that money early on, because they don't know, do they have a problem or what the size of that problem is. What we find is,

they seem to get funnelled down a process that kind of looks like, get a general investigation report done, it says there are these problems, here are some people who can come and rectify these problems for you. Then they roll into a rectification process, again without any legal advice, or someone scoping that properly, or contracts being entered into properly. Then we get involved, many, many years down the track where we're saying, there's a bunch of limitation periods that have run out. People have touched the building 12 times in the last [two] years and we don't know who did what when, and it becomes really hard to unscramble the egg. – Lawyer 5

Having access to better information about a developer's or builder's track record with rectification work, as well as better building records with which to brief experts and lawyers, could help owners to avoid some of these pitfalls and get rectification work done well and in time.

7.5.2.2. Predatory practices

This situation is further complicated by the fact that poorly informed owners are at risk of being taken advantage of by unscrupulous experts.

Unfortunately there's a lot of stuff where owners corporations are overcharged like you wouldn't believe. [A lawyer] said to me, 'there's no money in settling a matter.' [...] If you have savvy people on the committee ... then that's probably less likely to happen. But people that are already affected by defects, they just want someone to help them [...] they're more vulnerable I would say and therefore they're more susceptible to [...] managers and lawyers that really won't be [acting] in their best interest. I mean the manager wouldn't really know if the lawyer is good enough. – Strata Manager 1

To date, discussions about ratings or benchmarking tools have focused primarily on developers and builders. It may be worth considering whether including other professionals involved in rectification work – such as lawyers, consultants and engineers – might also be beneficial to owners. This could help to give owners more certainty that they are not throwing good money after bad investing in expert help to resolve their defect claims.

7.5.2.3. End-users' behaviour can lead to problems

Maintenance or use issues can lead to complications by exacerbating minor defects or creating new problems that interact with and complicate construction flaws. This may be a serious problem in some cases, especially given that owners do not always understand their responsibilities regarding maintenance (see section 7.5.1.2). If owners do not have adequate information about how a building should be maintained, however, it is unreasonable to expect that they can avoid these issues.

Sometimes through straight ignorance - owners corporations not hiring high-enough-quality building maintenance operators [...] and as a result of the lack of maintenance, you get what [are] perceived to be defects. Six years later, there's an argument between the developer and the OC as to who was responsible. – Development Industry 5

On this point, it is worth noting that some interviewees felt the 'poor maintenance' argument could be used to shift responsibility to owners where design or construction issues do exist, taking advantage of the difficulty in determining the line between defects and maintenance issues (see section 4.3).

They'll always say it's maintenance because there's debris in the gutters and whatever [...] But at the end of the day, a building shouldn't leak. If it leaks, it's likely to be a defect. – Lawyer 1

Either way, to avoid issues owners need to be well-informed regarding the need for regular, good quality maintenance. This in turn highlights the need for detailed and well-designed user and maintenance manuals to be part of the information handover from developers. At present, it seems few developers are providing this kind of user-friendly information. In addition, OCs need to put in place mechanisms for ensuring user information is passed on from owners to tenants, and to subsequent purchasers. Unfortunately, the fragmented nature of strata ownership makes it difficult to ensure that information like this is available and widely known. This is a useful reminder that in the MUST context, both the need for information and the challenge of providing

it are greater than in other development contexts – from the beginning of the construction phase, all the way through to the maintenance phase of a building's lifecycle.

7.6. Information asymmetry: putting it in context

As this chapter has shown, issues with information loss, data blindness and information asymmetries arise at all phases of the MUST development process, and shape the behaviours of all key stakeholders, from the developers and builders, to government, financiers and insurers, to strata managers and inspectors, to purchasers and owners. Stepping back to consider the qualitative data as a whole, three key themes emerge as to why the information failures have been allowed to flourish throughout the sector: *poor culture* (a lack of care and/or a desire to maximise profit); *poor capacity* (a lack of required skill or experience); and *poor control* (a lack of adequate regulatory oversight). These same three issues also underpin the apparent rise in defective work occurring in the first place.

Our interviewees captured these overarching themes eloquently and concisely:

Poor Culture: *If I waved a magic wand I'd like to change the culture of the industry. I mean that was pointed out in both Shergold Weir and Hackitt. That it requires a cultural change. We talked about - you're always, it's race to the bottom. You're always looking to cut corners, regardless of safety to save a buck. [It should be] in terms of, you know, responsibility to the [...] future owners of the building. But it's also a mindset about not cutting corners. Not shaving safety out of a building. That you're trying to do - deliver best possible product. – Government 1*

Poor Capacity: *What we see in the industry, probably the worst kind of problems are all based [on] a lack of understanding, where you've [got] a lot of people doing a lot of jobs, which they don't understand. You've got a lot of people in, supposedly in skilled jobs, that are unskilled. You've got people [who] don't understand, and you've got people using products against products that [...] aren't compatible [...] I think there's a bit of a skill shortage in the industry, and people just don't, unfortunately, know what they're doing [...] I think, a lot of the time, of all the building defects I see, it's hard to put a number to it, but say, 75% of it is not intended, the defects. It's only a good 25% which I see as intentional, just knowing they don't really care about the outcome. – Engineer 2*

Poor Control: *The thing that leapt out I think, was the fact that there was no high-level governance of the system. The building ministers didn't really have a plan. They didn't know where they were going. They met when they wanted to meet. They weren't committed to a long-term vision. So we felt that all these problems, compliance, defects, all this stuff really, I suppose, [flows from] a lack of clear guidance and clear governance at the very top of the pyramid [...] A lot of the things that you guys are looking at, at that lower end, are the results of the fact of lack of governance and proper leadership at higher level. – Supplier 1*

These issues reinforce each other in multiple ways. To begin with, a lack of control means there is little incentive to improve a poor culture:

*Governments don't like to legislate this stuff either. They don't like to put all these restrictions in place and make it more onerous and, 'I don't want to burden the industry, I don't want to burden the owners.' It's like, 'f*cking hell, you've got to burden them' - because otherwise they won't do the right thing and then you don't have this uniform language that we can use to actually determine whether that's a good building versus that's a good building. – Property Marketing & Real Estate 1*

Meanwhile, poor culture means less attention is paid to ensuring onsite capacity is adequate:

There's almost a stratification of different cultures of design and construction, and there's a whole group of people who are either inexperienced or unwilling to do things properly or unable to do things properly. They will have a group of people around them that have a

similar mindset, if I can put it that way. That's what I find, so there's a culture of short-termism or maximising profit, not worried about on-going reputation, [opting] for very inexperienced [employees] or using people because they're cheap. – Architect-Designer 1

And poor capacity means fewer workers onsite with the experience to ensure a good culture prevails:

The experienced people, that's getting rare on site, I don't know how we can keep them, but I wish I could keep them, and I think the reason they're leaving is because it's like me, they give up because there's nothing we can do [with pride]. We should [just] do whatever is necessary to get the job done and get paid and go home. – Subcontractor 3

Unravelling these interlinked drivers of poor-quality outcomes can be challenging, as another interviewee explained:

I think it's just this slow erosion of rights over time and this loss of confidence and capability that's occurred that has led to this, I don't think there's a singular point. I mean I know some people will point back to changes and significant structural changes in the home owners warranty and a few others that signalled a more material deviation from quality, and some people will refer back to the abolishment of the clerk of works, or the privatisation of certifiers. I think they're all cumulative impacts that have resulted in a loss of integrity across the whole system. So, the capability and the training and the capacity of the whole development pipeline seems [poor] because there was no one to hold them to account, so there was no need to get better, and there was no enduring consequence at the back end. So profit prevailed over quality for some time. – Strata Manager 2

Nonetheless, understanding the interplay between these broader drivers is essential, as it helps us to understand the motivations for certain behaviours. This in turn helps us to recognise the type of multilayered change required to reset the industry culture, worker capacity and regulatory control levers to ensure quality outcomes. Some of the steps required to achieve this reset are explored in the next chapter.

8. How can we tackle the information asymmetry issues?

Chapter 2 outlined the suite of regulatory reforms that have been introduced by the NSW Government in the aftermath of the Opal Tower and Mascot Towers evacuations. This Chapter explains these reforms in more detail, and considers how well they may address the issues raised in Chapters 6 and 7 of this report. It also identifies additional reforms required to comprehensively improve the information asymmetry issues currently plaguing the NSW construction industry and MUST housing market.

8.1. Current reform processes

Central to the reform processes being led by the OBC are two new pieces of legislation, both of which passed the NSW Parliament in 2020.

8.1.1. Residential Apartment Buildings (Compliance and Enforcement Powers) Act 2020 (NSW)

The *Residential Apartment Buildings (Compliance and Enforcement Powers) Act 2020 (RAB Act)* grants new powers to the Department of Customer Service to investigate building work and require rectification of defects. It applies to both buildings under construction and existing buildings for up to six years after the occupation certificate has been granted. These are the powers underpinning David Chandler's highly publicised new audit regime, under which selected new buildings are being inspected by government inspectors before completion.

The Act authorises the issuance of a building work rectification order if the Secretary of the Department of Customer Service "has a reasonable belief that building work was or is being carried out in a manner that could result in a serious defect in relation to a residential apartment building" (s.33). The Secretary can also issue stop work orders (s.29) and prohibition orders (s.9), which prevent the issue of an occupation certificate until identified quality issues are addressed. As discussed in Chapter 5, the definition of 'serious defect' in this Act is somewhat broader than previous legislative definitions, as a failure to comply with the BCA, Australian standards or approved plans can be considered a serious defect in and of itself, irrespective of whether it renders the building inhabitable or at risk of destruction/collapse.

Importantly for the purposes of information transparency, the RAB Act also requires that orders made by the Secretary be made public, at least while they remain in force. Section 62 requires that:

The Secretary is to—

(a) keep a register containing—

(i) copies of all prohibition orders, building work rectification orders and stop work orders in force, and

(ii) other information prescribed by the regulations, and

(b) cause the contents of the register to be made publicly available for inspection free of charge by the public on the Department's website.

This register is available at <https://www.fairtrading.nsw.gov.au/help-centre/online-tools/rab-act-orders-register>. While it seems that orders may be removed from the Register once they are revoked, it would not be difficult for a third party to keep track of published orders for historical use. This would provide visibility of whether particular builders or developers display a track record of orders over time. Similarly, ratings agencies could use this information for ratings tools (see section 9.1.3 below).

Beyond this Register, however, the RAB Act also places limits on how information collected through the administration of the Act can be disclosed. Section 64 provides:

(1) A person must not disclose any information obtained in connection with the administration or execution of this Act unless that disclosure is made—

(a) with the consent of the person from whom the information was obtained, or

- (b) *in connection with the administration or execution of this Act, or*
- (c) *for the purposes of any disciplinary or legal proceedings arising out of this Act or of any report of those proceedings, or*
- (d) *in accordance with a requirement imposed under the [Ombudsman Act 1974](#), or*
- (e) *with other lawful excuse.*

This may make it difficult for additional data collected by investigators under the Act to be used for research purposes by third parties. However, the Act does allow for information sharing between government agencies (s.65). It also appears possible that ratings agencies and/or research teams could be prescribed as a 'relevant agency' with which information can be shared, if identified as such in the Regulations (s.65(7)). At the time of writing, the Regulations only include local councils as a 'relevant agency' for this purpose.

8.1.2. Design and Building Practitioners Act 2020 (NSW)

The *Design and Building Practitioners Act 2020 (DBP Act)* has three main functions:

- To introduce new registration requirements for designers, engineers, specialists and builders, to give government and industry bodies greater oversight and ensure they are adequately qualified;
- To require that designers lodge building designs before construction starts, and that builders lodge 'as-built' plans upon completion. Builders must also declare that the completed building complies with the lodged designs and the BCA; and
- To introduce a statutory duty of care for practitioners, to make it easier for subsequent owners to sue if a person who carries out construction work fails to exercise reasonable care to avoid economic loss caused by defects.

The new duty of care has been in force since 10 June 2020 and applies retrospectively, capturing cases where the economic loss has become apparent in the 10 years prior to 10 June 2020. The requirements on practitioners to register, lodge plans and make declarations came into force in July 2021. If necessary, both the Secretary and authorised officers have powers under the Act to require relevant information to be provided. For example, ss.76-79 give authorised officers powers to require documentation to be handed over and to require answers be provided. Similarly, s.105 provides the Secretary with powers to require information regarding insurance policies to be provided.

In addition, the DBP Act contains provisions relating to data collection and information sharing, which mirror those in the RAB Act. These include limits on disclosure and misuse of information (s.103 – equivalent to s.64 of the RAB Act, which is set out in the previous section), and a right to information sharing between 'relevant agencies' (s.104 – equivalent to s.65 of the RAB Act). The Regulations are yet to be finalised (at the time of writing), so it is unclear whether the 'relevant agencies' will again include local councils (or any other body).

Together, these new obligations should help to address information asymmetry in relation to new buildings. The new duty of care may give rise to a greater number of court cases, reporting of which will shed light on the number of buildings experiencing problems in getting defects rectified. The new registration, lodgement and declaration requirements will provide greater government oversight of a broader range of building professionals, and will enable monitoring of their track record in making accurate declarations about new buildings being compliant with declared designs and the BCA. In addition, the new lodgement requirements will ensure that accurate 'as-built' plans of new buildings are centrally stored by government. It is understood that these plans will be made accessible to owners to investigate potential building quality issues (David Chandler (2019) has noted that "[b]oth the declared designs and as-built drawings will be available in an easy to access electronic platform", although the details are yet to be revealed). And the information collection and exchange of information powers of the Secretary and authorised officers should enable other information gaps to be filled, and relevant records to be more easily shared within (and potentially even beyond) government.

8.1.3. Industry benchmarking/rating tools

In addition to the legislative changes outlined above, the Building Commissioner has offered support for industry-led efforts to develop rating tools to assess the risk associated with different developers (NSW Government, NSW Building Commissioner n.d.b). The credit ratings agency Equifax has been developing a

ratings tool called 'iCirt' (independent construction industry rating tool), which will draw on a range of data including creditworthiness, insurance data, regulatory breaches and legal claims, to assign a rating to development companies. Once finalised, it is anticipated that this tool will be made available to the public, as well as to government and industry players. However, at this stage it is not clear how much detailed data will be available to individuals seeking to purchase a ratings report using iCirt, nor how past issues with defective work will be incorporated into the assessment of a developer's riskiness. It is also unclear how much a ratings report will cost, and therefore whether these reports will be widely accessible, or only available to well-resourced purchasers. Equifax has launched a pilot version of the ratings tool, with reports currently available to government and to companies seeking a report on themselves.

Figure 20 Summary of features in Equifax's pilot iCirt ratings reports for government and industry

Brief Report	Standard Report	Detailed Report
Business Tenure	Directors Identify Verification	Project Performance
Officeholder History	National Criminal Checks	Insurance & Claims History
Commercial Record	Local / Global Media Checks	Industry Awards & Recognition
Trading Performance	Sanctions, PEP, AML & CTF	Operating Practices & Standards
Related Entities	Disqualified Persons Checks	Tax & Statutory Obligations
Project Activity	Employment History Checks	Subcontractor Payments
License History	Qualifications Checks	Debt Covenants & Headroom
Court Judgements	Ultimate Beneficial Owners	Cashflow and Capacity
Phoenix Flag	Private Financial Statements	Consultant Engagement
Key Trading Partners	Performance References	Third Party Governance
	PLUS all Brief Report Features	PLUS all Standard Report Features

Source: www.builddrating.com

While ratings tools like iCirt may eventually become useful for consumers to inform themselves about a developer's reputation, currently the tool is largely pitched at governments seeking data on how best to target their regulatory resources. It is possible that planners may also use these tools to inform the development application review process in future. In addition, these tools may be adopted by insurers and financiers, thus making it more difficult for high risk developers to get their projects off the ground. The use of the tool by the financial services industry was seen as a positive by some construction experts, as it may help to address ongoing issues with prohibitive insurance premiums:

It would be nice if their contractor ratings tool gets up and going and gets a good take up because then that might – if they expand it, that should have a positive influence on builder's insurances. Because if you're a gold star or a platinum star or whatever the highest level is, you're a low risk so you should be able to get some sort of substantial discount on your insurance. Similar for the consultants. If they roll that out to the consultants as well [...] that should exert a downward pressure on [the premiums of] the consultants who have a positive rating. – Rectification Specialist 6

Ratings tools could also be a valuable source of consistent, reliable data for researchers – as noted in section 3.1.3 above, a Danish benchmarking tool provided data for Schultz et al.'s 2015 study of building quality.

8.1.4. Data integration and new online tools

The NSW state government has been undertaking a digital uplift program in recent years, and these changes should support better collection and use of information about building quality and defects. Of particular

significance are a new program of digital integration, greater functionality in the NSW planning portal, and the creation of a new strata portal.

8.1.4.1. Data integration within government

The Building Commissioner has been pushing a program of data integration across government, which has been variously described as collecting disparate datasets in a 'data lake' or creating a 'Single View of Business' for government departments operating in the building and planning space. Sitting under Pillar 6 (see Figure 3) of the OBC's work program, the aim is to "[join] up some 20 data silos previously deployed by subject matter inspectorates over many years" (Chandler n.d.). Recognising that "regulator data integration will help all players", it is proposed that the integrated data source will also be made available to Local Government NSW, Fire and Rescue NSW, and potentially others. While the progress being made on this project is difficult to assess from outside of government, it appears to be a significant undertaking. In concert with greater inspection powers, achieving greater information integration within government will help to address the inadequate visibility both state and local government has had of the building defects issue in recent decades.

8.1.4.2. NSW Planning portal

While the data integration project is primarily designed to address information blindness within government, there are also digital uplift projects underway that have the potential to improve consumer access to information regarding MUST buildings and quality. The Department of Planning, Industry and Environment (DPIE) has been developing its 'ePlanning' functions for some years now, and in 2020 added online lodgement of Development Applications. This means information about approved developments, as well as relevant certificates (e.g. complying development and occupation certificates), will now be centrally stored and administered by DPIE. While this documentation does not necessarily provide direct evidence of defects, it will provide a more holistic picture of developments taking place across NSW, as well as identifying applications that relate to rectification works (including cladding replacement). It should also improve oversight of complying development approval processes and provide better data for reviewing the performance of private certifiers.

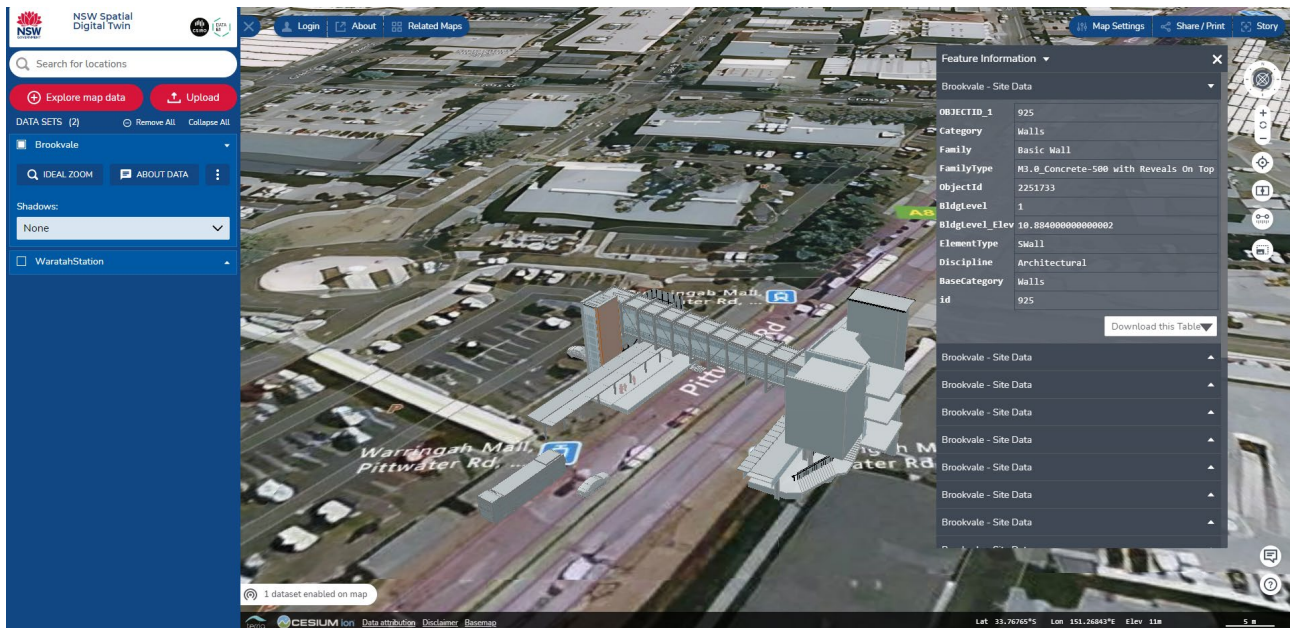
8.1.4.3. NSW Strata Portal

In July 2019, the NSW Minister for Customer Service formally proposed the establishment of a 'Strata Portal' in response to calls from strata sector stakeholders for a more effective mechanism for government to communicate with OCs. The strata portal will provide an online register of strata schemes in NSW, and is currently being piloted with strata managers and strata committee members. In the pilot version, information is requested about the strata scheme number and street address, the contact details of the strata committee secretary, strata manager and building manager, the occupancy types in the scheme (residential, commercial etc.), how many lots of each type are within the scheme, whether the scheme is part of a larger governance structure (such as within a community title scheme), the date of the last annual general meeting, whether the bylaws have been consolidated, and the scheme's energy and water performance rating (where available). Once fully operational, the portal will provide an important conduit for government to communicate with OCs and their representatives. This streamlined communication channel may enable greater education of owners about defect risks (e.g. to disseminate new information about problematic products like cladding), as well as simplifying the process of collecting information for a defects complaint lodged with Fair Trading.

In addition, work is also now underway to extend the portal's functionality to allow buildings involved in the SBBIS to complete this process digitally. Given the SBBIS currently involves 36 paper-based forms, digitisation should make it far simpler for owners to navigate, as well as making it easier for the government to extract and analyse defect data. While not currently slated, there is also the possibility that the portal could be used to capture defects data from strata schemes even after their involvement in the SBBIS has ended, such as through a brief annual survey about whether defects issues have emerged or been addressed during the previous year. This would enable an ongoing overview of defect prevalence and time for defects to manifest.

8.1.4.4. Digital twins and Building Assurance Solution

In addition to these relatively low-tech projects, the NSW Government is also developing 'digital twins' of new buildings as a mechanism for supporting better quality outcomes in future. This technology provides a 3D digital recreation of a building, including detailed data about construction systems and materials used. An early prototype of the technology is already available (see Figure 21 below).

Figure 21 Screenshot of NSW Government's Spatial Digital Twin, currently under development

In conjunction, the government has recently announced it is working with industry and consultants to produce a new 'Building Assurance Solution' system, which offers a route towards a more informed future for MUST development (NSW Government 2021). Backed by blockchain technology, this initiative could provide a basis for tracking the provenance and performance of the complex components that comprise modern MUST buildings. The system will incorporate data collected under the new regulatory regime (see section 8.1.2).

While these kinds of technological developments are seen by many in industry as a promising tools, their development is still in the early stages, and they will likely take years to roll out. This means many new buildings will be completed before this technology is available. Once up and running, the systems will also need to be maintained regularly, and updated through a building's life to remain relevant. This is likely to require significant resources and specialist skills.

Furthermore, there remains a question of whether these approaches will capture all the information residents, strata and building managers and rectification experts need to deal with defects, as one expert argued:

If you go to the digital twinning route [...] you don't get the briefing documents. You don't get the negotiations with councils about zoning. You don't get to hear about the compromises you make as a developer. You don't get to know all about the design issues that go into it. For instance, if you have a roof, you've got to have certain safety precautions like handrails and bolts that abseilers can latch into. All this sort of stuff. You don't get the logic of the alternatives that were considered and the risk management approach that made you adopt a particular design solution. Now, those sorts of things are probably more important than knowing where the reinforcing steel is. You don't get the design logic that an architect goes through when he says, 'well I've got three or four concepts. I'm evaluating these and those three don't satisfy these conditions of aesthetics, say, or technical issues or market demand issues, so I'm adopting this.' But it also doesn't record the developer who looks at it and says 'no, I don't want that. I want this one. It's cheaper.' All those sorts of nuances that go on in the design development process. – Academic 4

This suggests that developing these technological tools may be harder, more costly and ultimately less effective than enforcing adequate information handover from developers to owners. For consumers, this may be an area where a low-tech solution (a comprehensive building manual) may be just as effective as pursuing a more sophisticated, hi-tech approach.

8.1.5. Defect reporting to NSW Fair Trading

As part of the OBC's reforms, owners are now being encouraged to report building defects to NSW Fair Trading (NSW Fair Trading 2020). While responding to defects complaints is not a new function for Fair Trading, owners were previously advised only to report complaints after attempting to resolve the issue directly with the builder or developer. In addition, Fair Trading has not always been able to proactively assist owners. As one of our interviewees described the experience:

At the moment you go to Fair Trading and you say 'I've got a problem with my building, what can I do?' They'll say 'well let's get people in and we'll have a chat, and we can see if we can resolve it'. [Then] they say 'well they're not going to talk to you'...[so] do I have a good case to go to the Tribunal? Fair Trading will say, 'well there's the law, you decide. We're not going to tell you. That's not our job.' There's a big disconnect right there. – Strata Media 2

As a result of these limitations, reporting defects to Fair Trading has not been common practice (the Building Commissioner recently publicised a survey that found only 17% of buildings with major defects had been reported (Chandler 2021)). As well as the limited powers of Fair Trading, another reason for this hesitance may be concerns around confidentiality, and the risk to asset values if a scheme's defects become known. This has undermined the effectiveness of other reporting processes, as one interviewee explained:

Facilitator: One of the things that [the government] want is for people to report any issues with building quality to the regulator in the first instance – to Fair Trading.

Interviewee: Good luck with that [...] It's a tricky one. We were pushing the [Federal] government many years ago for an anonymous reporting system for non-conforming building products and, eventually [...] we got that with the building code [...] I think it's been used about three or four times. [...] The biggest issue, apparently, is confidentiality. Most people don't fill these things out there because they're worried that their name will get back to somebody. – Supplier 1

Overcoming these concerns with the Fair Trading reporting system will be essential if it is to prove a valuable tool in the government's push to improve quality and information transparency..

The tool's effectiveness will also depend on whether it is broadly and clearly communicated to the public. At present, there has been limited communication of the change, and there remains conflicting information on Fair Trading's websites, some of which state that owners should only report after trying to resolve the issues with the builder/developer (e.g. NSW Fair Trading n.d.a). Communications about the importance of reporting need to be much higher profile, and designed to ensure that they reach communities where English may not be owners' first language, or where owners are less actively engaged in the management of their strata scheme. Both the data collected for this project and the *icare* data suggest that reporting of defect issues is currently more common in more affluent parts of Sydney; it would be unfortunate if this new mechanism for capturing data about building defects failed to provide a representative picture of the issue across NSW.

8.1.6. New insurance product

Efforts to strengthen the industry oversight provided by insurers and financiers, to bolster the efforts of regulators, have also been part of the OBC's work plan over the past two years. To this end, the Building Commissioner has committed to:

“undertake research on Decennial Liability Insurance (DLI) to understand the necessary market conditions that will need to be established in NSW for insurers to offer this type of insurance product. DLI can provide consumers with a ‘first resort’ insurance policy that extends for a period of up to 10 years post-completion” (NSW Government, NSW Building Commissioner n.d.a)

Recent press reports suggest progress has been made towards introducing DLI, but details remain limited (Bleby 2021).

8.2. Further changes to address remaining information issues

The changes outlined in section 8.1 represent a significant step towards improving information transparency in the construction industry, including in MUST housing. However, important gaps in the reform agenda remain. Table 8 below sets out which of the issues identified in Chapter 6 and 7 have been addressed by the policy changes made to date, and those which require further attention to resolve.

Table 8 Summary of how new reforms address information asymmetry issues

Cause of info asymmetry	Policy to resolve issue	Will policy address issue?
Development team		
No requirement to record information	DBP Act Industry rating tool designed to incentivize better processes	DBP Act should mean as-builts are accurate so long as oversight mechanisms are effective. Ratings tools may have an effect, but are only an indirect driver to improve developer data management.
Legalistic process & box ticking	Industry rating tool designed to incentivize better processes	Ratings tools may have an effect, but are only an indirect driver to improve developer data management.
Lack of feedback mechanisms	Industry rating tool designed to incentivize better processes	Ratings tools may have an effect, but are only an indirect driver to improve developer data management.
Poor culture	RAB Act DBP Act	Inspection regime under RAB Act and new duty of care under DBP Act should increase risks of allowing poor culture to prevail.
Government		
Deregulation agenda	Creation of OBC RAB Act DPB Act	New office and laws provide much greater regulatory oversight; need to ensure these are maintained, and enforcement and data collection is ongoing.
Poor internal data management	Data 'lake' Planning and strata portals	Evidence suggests a strong commitment to improving internal data capabilities.
Financial Services		
Use of SPVs + presales to de-risk	No changes currently announced	
No mandatory builder insurance	Decennial insurance product is under development	Remains unclear how viable a private insurance market is.
Purchasers		
Strata inspection/reporting system produces mixed outcomes	No changes currently announced	
Limited understanding of strata & quality issues	No changes currently announced	
Price/time pressure discourages pre-purchase research	No changes currently announced	
Hard to link developers to projects	Industry rating tool designed to make track records visible	Not clear yet how available/viable these tools will be for consumers.
Existing owners reinforce barriers to information	No changes currently proposed	

Existing owners		
Handover requirements for new buildings are insufficient	DBP Act Digital twins	DBP Act should provide better access to plans. Not clear whether digital twin will be an effective mechanism for sharing information with owners.
Owners are not experts	Strata portal	Strata portal may be a valuable conduit if used effectively.
Strata manager professionalisation varies and industry pressures high	Strata portal	Strata portal should facilitate data collection for managers, and has the potential to provide schemes with access to a consistent record if managers change.

Table 8 demonstrates that there are further reforms needed to improve transparency for consumers. On the positive side, it is clear there has been a significant shift in government activity regarding data management and regulatory oversight. And while our expert interviewees debated how big an impact the new regulatory regime will have on the behaviour of development teams, there are some early indications that it will lead to improved culture and practices. Nonetheless, we see room for further improvements across all categories.

The remainder of this chapter sets out additional changes which our research indicates would help to address the unresolved issues highlighted in Table 8.

8.2.1. Improved data collection by government during development

Perhaps the most significant change that could be made to reduce information asymmetries is for both local and state governments to ensure that they are capturing as much information from industry as possible, and managing that information so that it is easily available to relevant regulatory entities. It is encouraging to see the shift towards greater information gathering as part of the new regulatory regime in NSW. The mandatory lodgement, data collection and transparency requirements in the RAB and DBP Acts will help to ensure more data flowing to state government (and from state government on to consumers, in some cases).

However, the operation of the new legislative regime now needs to be monitored closely to identify where information gaps remain. The reforms to date will not resolve all of government's information issues, and there was concern expressed by one interviewee that the extent of the problem had still not been fully acknowledged:

As far as data's concerned, I'm getting the sense that the governments in each of those jurisdictions think they are able to obtain the data - I'm not quite sure where they think they get that from. [...] How difficult it is to obtain data, I think, is something that we all need to be very vocal about, and to say that you're going off to do all these reforms, but we don't know anything really about the intricacies of these defects in these buildings. – Academic 1

In addition, there is room for local government to play a greater role in the renewed inspection and data gathering regime. One of our interviewees argued that in some respects, local government is better placed than the state government to collect data and provide oversight:

You've already got Local Government with people all over the state. Why you would then have another group of people who are responsible for occupation certificates who are not part of that system, I just don't know. There's plenty of powers in the Local Government Act and the [EP&A] Act too that could be pulled. There'd be a lot gained by trying to get cooperation amongst Local Government people involved in building.

You might have to fund Local Government to do this because, of course, they've been placed in a difficult financial position and so they don't have money necessarily to chase around and do these things, but it might be actually cheaper to fund them to do this rather than trying to set up a group of people are based in Sydney when you've got things happening in Tweed Heads which is a six-hour drive away. – Academic 5

Undoubtedly, industry will argue that greater reporting requirements increase their costs, which ultimately translates into greater costs to the consumer. As one of our developer interviewees argued:

Every time we put another legislative overlay on a construction industry or on any industry, it increases cost. Now, I'm not saying that's a bad thing, but I'm saying I think we need to be careful and rigorous in how we do it, to make sure that the benefits of that new legislative overlay match the cost or are greater than the cost, otherwise we're really going backwards. – Development Industry 6

For other industry players, however, there was an acknowledgement that while this greater level of oversight and reporting may cost more upfront, overall the cost is worth it – and saves costs down the track:

I don't see it as a really hard issue – I really don't. If we build properly, if the architects design properly and we build properly and we have a better type of builder, which will mean it'll cost more, that's my view, then that's the price. But at least the consumer has a better outcome, a better built environment. – Builder/Contractor 2

8.2.2. Strengthen and enforce requirement to provide Building Manual to OCs

While ensuring government has improved visibility of the construction industry is the first priority for reducing information asymmetry, ensuring consumers are better informed is a close second. A relatively straightforward way to do this for new MUST buildings is to ensure owners are given a comprehensive building manual containing all the information required to maintain the building adequately and address defects quickly.

As noted above, the new legislation introduces additional requirements regarding the lodgement of 'as-built' plans, and new technologies like digital twins may also provide a clearer picture of how buildings were actually constructed. However, these reforms are not necessarily geared towards producing the kind of information consumers ultimately need. Recognising this, an industry group involving SCA, Engineers Australia and WebFM (a construction management software provider) has developed a guideline outlining best practices for the development of building manuals (Strata Community Association, Engineers Australia & WebFM 2020). It describes a building manual as “a document that provides relevant information on the safe use, maintenance and replacement of elements of a building and its facilities [and] that demonstrates the building complies with regulations and other obligations.”

The guideline states that a comprehensive building manual should contain four key categories of information:

- **Design:** to be provided by the architect/building designer; includes information on key design elements and their capacities, including performance-based solutions, as well as how new facilities should be operated, maintained and upgraded;
- **Development:** to be provided by the developer/owner; including planning approval documentation, details of any special environmental conditions, land and strata title documents;
- **Operations and Maintenance:** to be supplied by the builder/sub-contractors; includes as-built plans, schedules of assets, operating and maintenance instructions, certificates, warranties, and details of spare parts; and
- **User needs:** information for owners, tenants and other users of the facilities; includes copies of floor plans, user guides (e.g. access and security, safe use of appliances), copies of critical legal documents like completion and compliance certificates.

Importantly, an expert involved in the development of the guideline stressed that the requirement to prepare the manual should mean that developers, builders and contractors must compile data as construction occurs – not just try to re-engineer a clear picture of the building just before the final deadline:

[Six months before occupancy] the horse has bolted. You will never recover the information because a lot of the consultants at that stage have gone. You know, gone to another job. Forgotten about why they [...] put a bolt in. You can only capture that at the moment in time that you're making those decisions. [...] You should be asking the architect to record his discussions about the design development and why he has made certain decisions. So

it's recorded for posterity. [...] [We should be] insisting upon sign-off month-by-month as you go through the project. It's useless to say six months before the end, I'm waving a flag, I want to occupy. [...] What you're doing is putting in place a quality management system that makes sure we do it right the first time. [...] Too often, it's the last six months' panic of getting all the manuals together and manuals isn't what we want. What we want is a - the storyboard of how it comes together. – Academic 4

It is notable that Michael Lambert has also offered strong support for the idea of comprehensive building manuals being a requirement. His 2019 submission (p.6) noted the need to:

Establish [a] digitally based building manual for all [...] residential (Class 2 and 3) buildings with a rise in storeys of 4 or more [...] that is accessible to the building owner, fire authorities and the building regulator that records information on the building plans, approvals, critical building systems and elements, including fire protection systems and all post occupancy work undertaken. This should become mandatory for all of the abovementioned buildings and be phased in for existing buildings.

Importantly, enforcing this approach to developing a building manual would also help to address some of the poor industry information management processes described in section 7.1.1, including both under-documentation and over-documentation. At this stage, however, the Building Commissioner has not offered support for the requirement to provide a comprehensive building manual. While some developers do already provide detailed information to buyers during their handover processes as part of their 'value proposition', there is a need for more consistency in how this information is produced and presented. At the same time, many other developers provide far less than what is needed. For this reason, government oversight of the information handover process is important, rather than simply relying on industry to meet their obligations.

8.2.3. Improvements to the Strata Building Bond and Inspection Scheme

As indicated in section 2.2.2, multiple concerns have been raised about the SBBIS. These include concerns relating to the size of the bond; the timing of inspections; the type of inspections; and the reporting requirements associated with inspections. Some interviewees called for the SBBIS to be discontinued, concerned that it is ineffective in its current form.

I'd advocate scrapping it, to be perfectly honest. I think it was a knee-jerk policy that, on paper looked like it was going to hold some level of accountability to the developer, but [...] the system was so distorted initially and manipulated, to the extent where I have seen - and I've seen a fair amount of new developments - I have not seen a building defect bond [paid out] personally. That defect bond commenced in [...] 2018 [...] So the system has already learnt how to divert around that level of culpability or liability or responsibility. – Strata Manager 2

Others saw the potential for amendments to improve its effectiveness. At present, the SBBIS remains one of the only mechanisms in place that purports to help owners to discover they have defective work, and to ensure owners are informed about the quality of their building. Given that few of the regulatory changes to date are directed towards helping existing owners navigate the defects process, it is essential that this scheme is either improved or replaced with a more effective alternative. Some suggestions for improvements are set out below.

8.2.3.1. The size of the bond

The available evidence suggests that 2% of the contract price will be insufficient to cover the costs of defects where they occur. Victorian research on defects in houses demonstrates that where defects occur, they cost on average 4% of the contract price to rectify (Mills et al. 2009). The *icare* data reviewed for this report indicates that the cost of defects rectification for buildings up to 3 storeys would be more than 10% of the contract cost for 1.4% of policies (see 6.4.2).

Two of the developers interviewed also raised concerns about 2% being sufficient to cover rectification costs:

Two per cent's a lot of money if you haven't got problems, and it's bugger-all if you really do have problems. – Development Industry 1

One developer suggested that this money would be better set aside to underpin an insurance product for the sector. This insurance product could then be linked to developer performance and accreditation.

Now, [the OC] are going to go and fix it up and take 2% out of it ... But they'll just take the money, they'll just take it against the defects. But it would be good if it could be used as an insurance product, and then use insurance as a means to accredit and pre-qualify people to do developments. Because there's no pre-qualification at the moment. – Development Industry 6

To address these concerns, there needs to be close monitoring and analysis of the operation of the SBBIS, to assess whether 2% bond is sufficient and if not, whether increasing it is the best option, or an alternative model (like the insurance product proposal) might be better.

8.2.3.2. The timing of inspections

Under the SBBIS, the first inspection must occur between 15-18 months after the building work is finished, after which a report is prepared on defects identified. The developer then has until 21 months after the building work is finished to rectify the identified defects. Then between month 21-24 the building is inspected again to determine whether any of the defects identified in the first report remain unrectified (NSW Fair Trading n.d.b). This means that only defects identified in the first inspection must be rectified, even if there are new defects present at the second inspection.

Regardless of how good the building inspector is or how hard they're trying, it's limited to covering defects that they can identify at that [first] inspection, which is generally going to be not much and even if by the time of [the second] inspection that they do for their final report, if there are new defects that are very obviously defects [...] [the] building inspector is not allowed to include them in the final report. So even at [the second inspection], if there are defects there that weren't picked up at [the first inspection] and the bond is there, it just can't be used, which just doesn't seem right. So it's set up to not pick up many defects in those respects and [...] you can't cure that for any defects that are picked up a bit later on. – Lawyer 4

This is especially problematic because many defects are not evident (to a visual inspection) until much later.

You're going to hold two per cent of the cost of construction, or whatever it might be, for what reason? We know those sort of defects really start to raise their head around year five, year six ... major defects are probably around the ... six to ten [year] band, not at two [years]. – Certifier 2

While these timing problems are a serious issue for the OCs involved, they also have broader implications. If defects are not picked up during SBBIS inspections these will not be recorded in any data that emerges from the SBBIS, and the developers/builders responsible will not have these issues linked to their track record. This creates a risk of significant under-reporting of the extent of defective work across the sector, and is a missed opportunity for consumers to get better information about the trustworthiness of a developer (either through government reporting of SBBIS outcomes or via an industry rating tool that draws on this data). Extending the inspection timeframes would mitigate this issue and produce a more accurate picture of the extent of defects.

8.2.3.3. The type of inspections

The fact that the mandated inspections are visual inspections raises further concerns, as many defect types cannot be identified through a visual inspection. This was raised by multiple interviewees.

These superficial you know 'let's have a look around' [reports], they're not worth the paper they're written on. – Strata Manager 1

The nature of these reports are not a properly diagnostic defects report, they're a cursory inspection [...] So when you start to unpack it [...] the reports are going to be relatively ineffective, they don't provide much by way of proper diagnostics, there's no need to do

any invasive testing, there's no flood testing, there's no testing that you [would] ordinarily expect – Strata Manager 2

They only do a visual inspection, not an invasive inspection. So all of the stuff, like the fire dampers, you're not going to pick up because you can't see that until you put a hole in the wall. It's going to be very interesting to see what some of the cases that come through that scheme, what they can ultimately claim for, and what they then subsequently discover has been missed through that process. – Strata Media 1

The issue is, how do you determine an Opal problem by visual inspection? – Certifier 2

This situation could be improved by mandating more rigorous inspections that go beyond visual inspections.

Maybe at handover ... they need to do random tests where they x-ray concrete to see what the [reinforcement] is or random test where they do climb up and check a fire damper, or how the membrane on the roof [was installed], [whether] the joints were lapped properly or the plumbing pipes or whatever. Now, all of that's expensive. It's a cost ... but maybe that's what we need. – Development Industry 6

Again, ensuring that inspections identify as many significant defects as possible is important not just for the OCs, but for government's capacity to understand the scope of the defects problem and regulate accordingly.

8.2.3.4. Reporting requirements

A lawyer specialising in defects rectification raised a series of concerns around reporting at multiple stages in the SBBIS process. First, in the initial inspection report, building inspectors are only required to provide a list of defects and are not required to specify the scope of the works. This is especially problematic when the builders undertaking the remedial work are not necessarily trained in this type of work.

The other big problem with it, well two other big problems, is that in the interim report all the building inspectors have to do is give a list of defects. They're not required to attempt to say what the scope of repair work should be. Then what happens then, there's an obligation of owners to provide access to the builder to rectify. So it's set up so that builders get a chance to get in there and do work on things that are seen [as] defects without having to agree to, or commit to, a scope of works that actually work. They're allowed to – the same builder that managed to stuff-up what they're trained to do, which is build buildings from scratch, is suddenly left to its devices to do the more specialist side of it, which is remedial work – Lawyer 4

Second, the inspector is not required to provide close oversight of the remedial work to check its quality.

The building inspector is not expected to nominate hold points, which is the points in the remedial work where you lose the ability to check whether the work that's already been done has been done properly. So you might put in a new waterproofing membrane, once you put something on top of it you can't flood test it or do anything else to check if it's been done properly. You might be doing something inside a wall, it needs to be checked before you put the plasterboard back up, or something like that. For a lot of defect issues the building inspector will only come along six months later and all they'll see is the fresh lick of paint over the plasterboard or whatever, but they've got no idea what's been done or whether it's been done properly. – Lawyer 4

Third, as well as not reporting on the scope of the works, inspectors are not required to report on likely costs. This means that to access the bond money, OCs will have to negotiate these costs with the builder/developer.

The way it should work is if there are still defects there at the final report, the owners corporation should have a piece of paper that says, okay this is how much money you get on the defects bond and they just lodge it and Fair Trading pay it out and it's been done independently and that's avoided a litigation process. [...] But instead after the final report

[...] if they want to get any money out of the bond, they've got to try and negotiate with the developer as to what it should cost to do those scopes of work. – Lawyer 4

Requiring building inspectors to not only identify defects but also assess the rectification work involved and the likely cost would be helpful in overcoming these shortcomings. Coupled with the ability to specify hold points in the rectification work, this could result in substantial improvements both in the quality of the repair work itself, and the experience of owners trying to negotiate this process.

In addition, inspectors providing records of the scope and cost of works would create a far richer aggregate picture of the extent of defective work for government to analyse. By adding this data to the 'data lake', governments would be able to better assess the effectiveness of the new regulatory regime over time, and to target resources more effectively. Given that it will take time for the construction industry to address culture and capacity issues, having a mechanism to collect thorough data about quality issues that do emerge will be valuable for years to come. With significant improvements, the SBBIS could play this role.

8.2.4. Better reporting of defects rectification work completed

Beyond the need for additional reporting and better enforcement of existing reporting requirements during the construction phase, there is also a need for government to collect and record information about the defects rectification process. As one rectification expert explained, commercial arrangements currently prevent information-sharing that would allow better oversight and industry education:

It would be good if we could [have] a remedial failures reporting body that people could just send in [information] - 'here's a mistake I've found. I've found it in 42 locations out of 50. It needn't have been built like that and here's the reasons why.' Because I've spoken with a few peers over the years who say 'yeah, that's a good idea but if I release that information on my clients, they might sue me because I've just devalued their building.' - Rectification Specialist 6

As noted above, in theory the SBBIS could produce this data for new buildings, but currently does not do so adequately. In addition, there will be a long 'tail' of buildings completed before the scheme began which will require rectification work in coming years. Introducing a process that allows industry to report evidence of defects to be used for regulatory and educational purposes could therefore be of great value. This could be done confidentially, to ensure building owners were not negatively impacted by their defects being publicised.

It is also worth noting that the lodgement obligations introduced under the DBP Act will help to provide better government oversight of rectification works. The definition of 'building work' under the DBP Act explicitly extends to repair works (s.4):

For the purposes of this Act, building work means work involved in, or involved in coordinating or supervising work involved in, one or more of the following—

- (a) the construction of a building of a class or type prescribed by the regulations for the purposes of this definition,*
- (b) the making of alterations or additions to a building of that class or type,*
- (c) the repair, renovation or protective treatment of a building of that class or type.*

This indicates that rectification experts need to lodge 'as-built' plans, which in time could then be linked to the original as-built plans lodged under this Act. Furthermore, the lodgement of DAs through the planning portal should make it possible to link documentation of rectification works to the original DA documentation. Together these improvements should provide greater visibility for government of the amount of rectification work being done to address construction defects. Requiring those lodging DAs and as-builts to tick a box explicitly acknowledging that the works are occurring to address construction defects may help government to consolidate and monitor this data more easily.

Another way to achieve a similar outcome would be to develop a process for details of defects issues reported during mediations and court proceedings to be extracted, collated and analysed. Again, this could be done with confidentiality protections in place to ensure that individual buildings are not unfairly affected, while still providing broader public benefits through sharing this information.

8.2.5. Greater consistency in format and criteria for defects reports

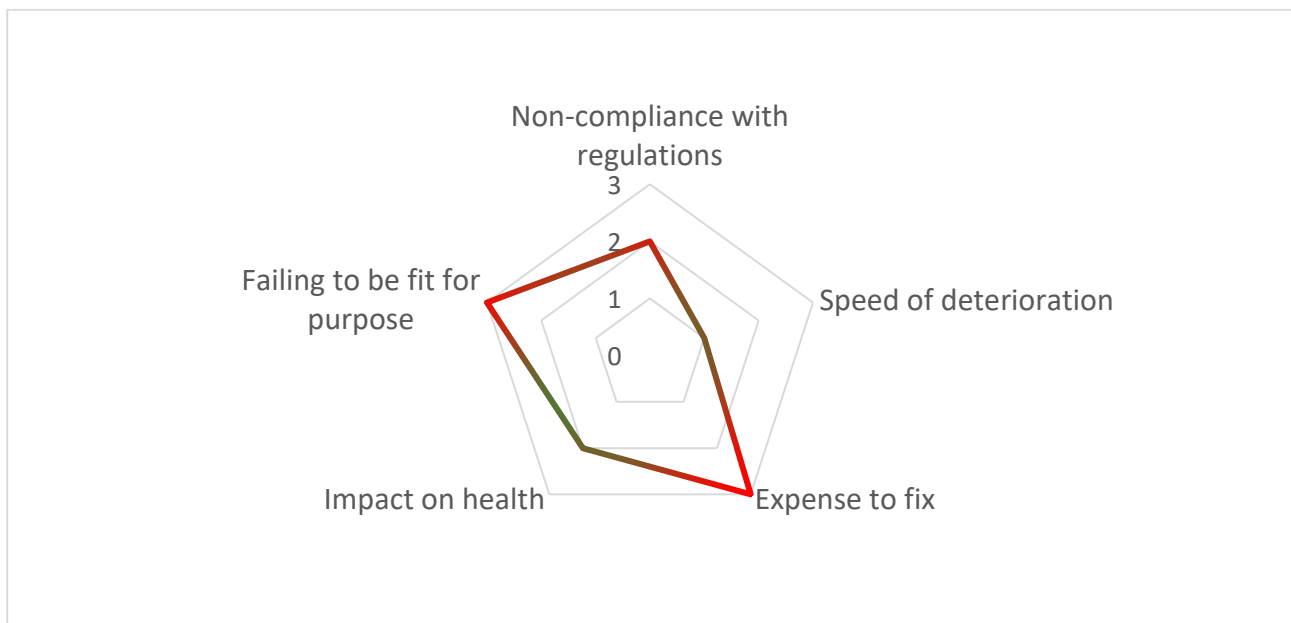
Another issue relating to industry-held data about defective work is the lack of consistency in how it is produced and stored, as section 6.2.2 outlines. There is currently no standard format for building defect reports, nor a standard approach to categorising the severity or significance of defects. This can make it difficult for owners to understand the nature of defects in their building, and create confusion if they commission a second opinion (and receive two reports with different categorisation approaches). As one rectification expert explained:

The [defect inspection companies] that have been in the strata space for quite some time, they're reasonably consistent with each other. So we've kind of been coached into that discipline of sticking to major, minor, investigate and [...] maintenance. [...] That said, there are some practitioners in the industry that you see their reports and they are terrible. Because they've, I don't know, they've got into the game because [...] they've done pre-purchase property inspections and then they've been asked to get into this more academic space [...] where you've got to spell things out and state your case because somebody's livelihood might depend on it. Yeah, some of the styles and language in some reports I've had to respond to or follow on after, you go 'wow, that's a bit unfortunate'. – Rectification Specialist 6

It also makes it difficult to produce a clear picture of the prevalence of defects sector-wide using industry data.

The difficulty in defining defective work (see Chapter 4), and the fact that identifying and assessing defects often involves the exercise of professional judgement, make it unrealistic to expect complete consistency from one defect report to another. However, it should be possible to develop some broad parameters for how defects are described and their severity assessed, and for this approach to be used consistently. For example, using consistent language and criteria across reports should overcome the inconsistencies identified in Table 6 above. In addition, a similar format for displaying how a defect fits within the agreed categories could be adopted; one possible approach might be a star diagram, along the lines of the example in Figure 22 below.

Figure 22 An example of how standardised defects data could be reported



We appreciate that some defect experts may feel their approach to categorising defects and presenting reports provides a commercial advantage over their competitors, and therefore resist efforts to standardise reports. However, we would argue that greater standardisation would increase the value of defects reports for customers, and therefore encourage more OCs to order reports, thus growing the entire industry. In addition, standardising the reporting structure does not change the fact that each expert brings different levels of skill and experience to the inspection; having a consistent reporting structure may make these differences in expertise more readily discernible from one report to the next, as they can more effectively be compared.

As a final point, we note that the SBBIS provides a standard format for defects inspections, which will produce a degree of consistency in defects reports produced under the scheme. However, it is unclear how much guidance inspectors are given about how to consistently assess or describe the severity of defects, other than a requirement that 'defective building work [that requires] urgent attention AND/OR is... a serious hazard' be noted. If the defective work is a 'serious hazard' it must be reported immediately to the client (the developer). It will be interesting to see whether this requirement is applied consistently by different inspectors. An industry-led initiative to develop standardised language and criteria for all defects reports—both commercial and SBBIS—would be a valuable exercise, improving outcomes for owners, researchers and the government.

8.2.6. Improvements to the strata inspection and reporting system

Requiring greater consistency in reporting styles and information covered in strata inspection reports would also be of great value. The importance of strata inspection reports as a key mechanism for purchasers to access information about a building and any defects issues is outlined in section 7.4.1.1 above. Currently, the strata inspection reporting industry is not well regulated. There are multiple changes which could be made to improve the likelihood of purchasers receiving reports that are accurate and sufficiently detailed:

- **Educating purchasers about the importance of strata reports:** while we do not have precise data on what percentage of purchasers obtain a strata inspection report, it is clear that not all purchasers do so. It is important that purchasers understand why a strata inspection report is essential, and the risks involved in failing to obtain one. This guidance should also extend to informing purchasers about the likely differences between vendor-provided reports (which are often shorter, less detailed) and those prepared by independent, third-party inspectors.
- **Standardising strata reporting requirements:** Section 6.2.2.2 highlighted the high levels of variation between different strata reports, including significant variation in how they dealt with defects. Regulating a set of required components for strata reports would help to ensure a basic standard is met, and purchasers have their attention directed to key issues. This would ensure that all purchasers are aware that the building's defect history is something they should investigate before purchasing. One of our interviewees explained how a standardised approach might work:

Imagine a one-page form and the one-page form said [...] is there combustible cladding on this building, yes or no? Have you had a defects report delivered in the last three years, yes or no? Does the building leak, yes or no? [...] Just ask six or seven questions, and even down to, can I have a dog, yes or no? At the moment [...] if you buy a unit [...] you still don't know whether I can have a dog because the contract says 'strata purchasers will have to make their own enquiries.' – Academic/Independent Advisor

- **Improving the skills of strata inspectors:** Given the complexity of strata records, and the range of issues that can arise (particularly in larger buildings), there is significant skill involved in producing a rigorous strata report. It is not simply a tick-box exercise. As an experienced strata inspector explained:

Part of the real skill of doing these reports, and what we've been able to develop is a system of clarity and, I guess, almost like a bit of a storytelling [exercise] [...] transposing information and putting it into a common sense format that people can understand. You can't put everything in the report [...] [but we] try and mine the history of the minutes - so people can see where a process has started and where it is at. – Strata inspector 1

The task also involves recognising when key information might be missing, and knowing how to obtain that information. At present, there are no qualifications required to become a strata inspector, which makes it difficult for purchasers to be sure they are dealing with a reputable, experienced company. As the inspector explained, "there really isn't any clear litmus test for what's a good report or not. [A company's reputation is] purely word of mouth". Introducing some basic training, qualifications, and/or registration may help to ensure greater consistency in the quality of strata reports being produced.

- **Improving the quality of records kept by OCs/strata managers:** one of the biggest challenges strata inspectors encounter is poor record-keeping by OCs and strata managers, which makes it difficult (or even impossible) to locate information that should be provided to the purchaser. As the strata inspector we interviewed noted, “there really isn’t any industry standard for recordkeeping or presenting records, because...there’s no rules [in the SSM Act] for a strata report, and there’s no rules here for recordkeeping. It just says a strata manager needs to provide all relevant documents”. Efforts to ensure records are stored and managed more consistently and comprehensively – whether through better training, improved digital management platforms, or greater regulation – would greatly assist. Another option may be to introduce an auditing system, as the strata inspector interviewee suggested:

Nobody’s auditing strata schemes...and strata managers’ offices too. That’s part of the problem... [but what if] Fair Trading came through maybe once a year and say ‘let’s have a look at all your strata records from [the past 3 years] and what procedures you followed’?
– Strata Inspector 1

- **Access to building management records:** In larger schemes, where a building manager is employed as well as a strata manager, documentation relevant to building defects may be stored in the building manager’s document management system. Often, strata managers are not given access to these systems, which means relevant material may be missed by strata inspectors. A requirement should be introduced to ensure that strata inspectors can access document management systems of building managers (where relevant), as well as strata managers.

Given the importance of strata inspection reports for consumers, as the primary (and often sole) mechanism for investigating the history of the building, greater oversight and regulation of the industry is overdue.

8.2.7. Better data access for researchers

Researchers have played an important role in highlighting the issue of poor building quality in MUST development, but have done so without access to the data required to examine the issue comprehensively. The challenges encountered in this research are evidence of this (see section 6.2), as are the concerns raised in previous projects (see section 6.5.2). Given the vested interests of industry players, and the limited ability of consumers to do their own research, it is important that independent and in-depth analysis of MUST building quality occurs. While governments can play this role, it may be argued that they too have a vested interest of sorts – there is a political benefit in demonstrating the regulatory system works well and the quality of MUST housing is high. As such, independent third-party organisations are best placed to make an objective assessment of quality issues, provided they can access the data required. In some cases, providing open access to data may also be appropriate (depending on confidentiality concerns). Examples of datasets which could be useful include the records being collected through the SBBIS; details of defects complaints lodged with Fair Trading; and records of building documentation lodged under the new DBP Act. In this regard, it is heartening to see orders imposed under the RAB Act are being publicly reported online; hopefully this is the beginning of an era of greater transparency and access to government data on defects in NSW.

9. Conclusion

This report is based on the most representative analysis of defects in the multi-unit strata title residential sector yet to be published in Australia. This data collection and curation effort indicated that defects were present in *at least half* of the buildings for which we were able to obtain relatively robust information. For many schemes, however, we were not able to locate verifiable information on whether defects had occurred. The data confirmed the main types of defects that were identified in our earlier research (Easthope et al. 2012), most notably water ingress or leakage and structural problems. The data also provide insights into the potentially significant costs associated with defect rectification. These empirical findings were backed-up by in-depth interviews with a wide range of industry stakeholders. Their testimony was both revealing and concerning. Few harboured many illusions about the scale and severity of the defects problem.

Importantly, the findings offer clear support for the policy reform process stemming from the NSW Building Commissioner, appointed as this research was getting underway in 2019. This process aims to transform the culture of the MUST development industry in NSW to one where defects are 'built out' at source. Our research complements this approach by focusing squarely on the needs of the consumer – the apartment buyer. This includes those buying a new apartment off-the-plan 'unseen', as is usually the case with new development, and those buying a second-hand apartment in an existing building.

As a result, this report has focused primarily on the central issue of information, in particular the information available to a buyer to make an informed judgement about the apartment they are buying. Information is at the heart of any properly functioning market. This is no less important for a buyer of an apartment in a 40-storey multi-unit strata building than a buyer of tomatoes in a vegetable market. A significant difference is that the buyer of tomatoes comes with prior knowledge of what a good tomato looks like and costs, as well as information about past purchases and comparable tomatoes for sale elsewhere in the market. They do not need to rely on the word of others. In the apartment market, apart from the price and some pictures in a glossy brochure, off-the-plan buyers are almost completely in the dark as to what they are buying. The situation is better for buyers of existing property. At least they can walk around and see the property for themselves. However, the information these buyers can access to reassure them of the quality of their prospective homes –strata inspection reports—are variable in both scope and quality. This in large part reflects the lack of systematised information available to strata inspectors when carrying out their inspections, including comprehensive data on the as-built design and construction of the building as well as accurate and detailed reporting of subsequent defect identification and remediation work. Of course, even these reports are not available to off-the-plan buyers, who must simply rely on the assurances and reputation of the developer that everything is going to be alright.

We conclude that the market does not function well. Information asymmetry is the root cause of this problem. The report findings clearly demonstrate why regulation and independent public oversight are so important to address this asymmetry and adequately regulate the market. In our view, the next point of focus for regulators must be to plug the remaining data cracks identified in this report, to ensure that consumers can get the information they need to make an informed decision about buying an apartment, and all apartment residents can feel safe in their homes.

Our research shows that there are information gaps – and their close cousins, split incentives – at all points in the MUST development and sale process. We termed these gaps cases of 'data blindness'. This condition affects all parties to the apartment development and sale process: builders, developers, managers, regulators, and owners. One might think that of all the participants in the MUST procurement process, the development team would have the clearest visibility of building quality issues in their project. As the various media reports, as well as our own research attest, this is often not the case. This is the area that the NSW Building Commissioner has been primarily concerned to address, with good reason. It is to be hoped that the current NSW reforms will address the information failure in the procurement chain once and for all.

But there is more to be done. It is in the liminal space between the completion of the project and the handover to the newly minted Owners' Corporation that more attention is needed to standardise the transfer of information to incoming and successive owners. Reforms need to ensure that relevant, robust and accessible information is ultimately handed over from the development team to the owners. At present, however, cost and time pressures disincentivise this behaviour. This documentation is particularly important for those tasked with

inspecting the building for future buyers, as well as those employed to address defects and other building issues into the future. Without proper records of what was actually built and where, their task becomes doubly difficult, and therefore more costly. While providing detailed documentation is already a requirement in NSW, it does not seem to have been widely enforced. There is clearly scope to ensure the digital provision of this essential piece of information, as well as improving its coverage and format.

Most of these apartment buildings are likely to last for fifty or more years. It is essential that reforms ensure that information management processes are strengthened not just during the construction process, but also in building management by OCs and their agents, to drive transparency throughout the lifecycle of the building. Proper building documentation should also record work to address defects and future maintenance and repair activity. This 'cradle to grave' building manual would accompany the building across its lifecycle.

Changes to government practices are also required. Our research has shown that regulators have not been collecting the required data to have clear oversight of the quality issues arising in the market, until they hit the front pages. Even where information was gathered, limited use was made of it, or it was not shared effectively between government silos. The promise of digital data offers a possible route towards greater transparency and sharing, but this is by no means assured if the processes and resources are not in place and maintained to make this effective. And it provides limited help to owners or buyers of existing apartment buildings.

We have concluded that these critical information deficits are a result of three key failures in the procurement process: *poor culture*, *poor capacity* and *poor control*. Reforms to address the information asymmetry problem are required in all three areas. Taken broadly, the first—**poor culture**—refers to a lack of care within the development industry to put the customer first. Some developers are aware their reputation rests on their customer experience and try to minimise defects and take steps to rectify them. But for too long, it has been too easy for developers to escape their responsibilities and to pass off poor quality buildings as 'luxury' products.

We defined **poor capacity** as a lack of skills and experience within the industry to ensure quality outcomes are at the forefront. This includes the longstanding training deficit within the building industry resulting in skills shortages, including for project oversight. This situation is compounded by new construction methods and materials that have accompanied the increasing complexity of buildings, where trades may not have the skills to deliver high quality. This is further impacted by the highly competitive situation builders and trades find themselves in when price becomes the main arbiter. It can be difficult even for the most diligent trades to maintain standards when under pressure to complete, and for some others quality work simply means more expense and less profit.

Poor control refers to the lack of an effective, overarching and integrated framework to drive quality outcomes, from the national Building Ministers and building standards regulators down. The fragmented and multi-level system of government oversight does not help, and the complexity of the system can confound regulators as much as it does builders. What came through in our interviews was the pervasive feeling of the defects problem being a complex outcome of a whole series of incremental changes and processes across multiple agencies and regulators impacting the focus on quality outcomes, to the detriment of the eventual buyer.

These issues have been a long time in the making. Deregulation, the poster child of the 1980s and 1990s across government, was heralded as an essential reform to get markets working efficiently. But the 'bonfire of red tape' that accompanied this policy shift, together with the running down of public resources to oversee what regulations were left, has had many negative outcomes. Mounting defects and poor building quality are just one of these. And expectations that all parts of the industry would police themselves effectively, to be facilitated by private certification, were sadly misplaced. While there are undoubtedly industry players seeking to do the right thing and produce quality products, their efforts have been undermined by those who have seized opportunities to game the system, with limited oversight. Furthermore, even the oversight of the insurance industry, always alive to a poor risk, was taken away when the NSW Home Building Compensation Fund was restricted to buildings of three or fewer storeys. The recently introduced Strata Building Bond Inspection Scheme purports to fill this gap, but our interviewees had little confidence that it would prove an adequate safeguard in practice. Hopefully one of the changes to be stimulated by the Building Commissioner is an effective building insurance regime for high rise apartment buildings.

It should not have taken several tragedies for the NSW government to begin reforms. This reactive approach must be banished for good. The Building Commissioner has now achieved a great deal in a short amount of

time, and it is essential that this momentum is maintained in the longer-term. Governments must be involved actively in developing a culture of awareness and shared responsibility in all those involved. Both the carrot and the stick must be in the regulatory toolkit, together with a willingness to use both where appropriate. Simply deregulating and relying on the market to police its own problems has demonstrably failed.

The other aim of the research presented here and the recommendations we propose in the following section is to push forward the cause of the consumer in the apartment market. It is critical that Australians have confidence in the way MUST housing is developed and regulated. Apartments should perform as specified and be fit for purpose to add social, economic, cultural and environmental value and improve the wellbeing of those that buy and live in them. Any ongoing systemic issues with defective work in new MUST developments will have major social and economic impacts on Australian society, threatening to seriously undermine confidence in apartments and with it, confidence in the principal building model that planners depend on to deliver the housing needed to accommodate Australia's growing urban populations. With ever increasing numbers of people living in MUST dwellings, the potential economic, physical and psychological stress and damage that could be caused to owners and residents is massive. Furthermore, a growing proportion of Australian household debt is tied up in MUST housing, so any systemic loss of confidence in the sector brought on by poor build quality and the need for expensive remediation threatens not only the financial wellbeing of owners, but also the Australian economy and financial sector as a whole.

Shared, transparent and accessible information is the key. As the Shergold Weir (2020, p.9) report noted, "sunlight is said to be the best of disinfectants" to drive cultural change, and is essential to support a well-balanced system of regulatory intervention. The authors of this report and our industry partners wholeheartedly agree with this sentiment. The aim of this research has been to shed more sunlight on a problem that too many apartment owners will continue to bear at their cost.

10. Recommendations

10.1. Next steps to fill the cracks

Currently, it is very difficult for apartment buyers to tell a good-quality apartment from a poor one, as information is lost or hidden. These next steps and their associated recommendations (circled) will help increase the information available to consumers and their agents, and stop it from falling through the cracks.

Require developers to provide comprehensive, consumer-friendly records to buyers

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To address defects, consumers need to know how their buildings work and who built them

Strata professionals and defect rectifiers need better documentation to help owners manage their buildings effectively & safely

Requiring developers to produce better information for consumers will drive better data collection and management during construction

A detailed, consumer-friendly Building Manual can fulfil these requirements effectively

Ensure ongoing resourcing for a building regulator

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For the strata market to work, consumers need someone looking out for their interests – this is government's job

Embedding cultural change in the building industry is a long-term project, not a quick fix

An effective regulatory regime ensures good performers are rewarded for their efforts

Make defect inspection and reporting processes more consumer-friendly

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Regulated inspection schemes need to prioritise long-term health and safety and ensure obligations to rectify are fulfilled

These schemes must prioritise consumer interests by imposing appropriate time frames and comprehensive inspections

Owners need a clear and consistent reporting framework to be able to understand the risks defects pose

Better systems for reporting defects and rectification work to government will strengthen oversight and allow insights into defects at a macro scale

Strengthen strata record-keeping and inspection processes

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Strata scheme records are the key to understanding a building's history, but aren't always maintained adequately

Strata inspection reports are the best way buyers can do their homework, but are not of a consistent standard

Many strata inspection reports do not provide adequate information about defects

Buyers need comprehensive, clear and consistent inspection reports to make informed decisions

The strata inspector industry needs upskilling, better access to records and better oversight

Keep improving government information collection, sharing and digitisation

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Governments need to ensure silos don't get in the way of effective and efficient regulatory oversight

Real improvements have been made in NSW in recent years – this work needs to continue

Sharing with researchers and industry ratings tools will help ensure many eyes on the sector


















Better data management will allow insights to be shared with industry to drive improvement











Insurers will be able to access more info to better price risk and provide better coverage












Consumers and their representatives can benefit from government sharing of appropriate/useful information




10.2. Recommendations to government

As a preamble, it is important to note that there are recommendations in the Lambert Report (2015), Shergold & Weir Report (2018), and the research by Johnston & Reid (2019) which outline necessary improvements to the construction industry as a whole, and which remain unaddressed. Our proposals are designed to complement these existing recommendations, and reflect our specific focus on addressing information asymmetry issues. We have indicated the level of government our recommendations are aimed at (Federal 🇦🇺, State 🇺🇸 or Local 🏛️), and related parties that may be directly impacted.

		Gov. Action	Related parties
1	Continue to strengthen cross-government information sharing , particularly to ensure that data from registration and licencing schemes is used to identify well-performing and poorly-performing professionals and entities, and to ensure incentives and penalties based on performance are enforced. <i>See sections 7.2.1.2 and 8.1.4.1.</i>	  	Development Team Certifiers
2	Provide ongoing support for efforts to document the track record of developers , whether by way of an industry ratings tool or another mechanism. Ensure that this track record is accessible and comprehensible to consumers. <i>See sections 7.3.2, 7.4.1.4 and 8.1.3.</i>	  	Development Team Consumers
3	Institute a government-run anonymous whistle-blowing scheme to report poor construction industry practices, with associated resources for investigation and use of the data for industry training (as opposed to industry-run models). <i>See sections 7.1.1.5 and 7.2.1.1.</i>	  	Development Team
4	Improve information sharing with industry on quality issues (for example, a database of non-complying materials), and clearer communication of other data relating to quality risks. <i>See sections 7.1.1.5 and 7.1.2.4.</i>	  	Development Team
5	Make Australian Standards affordable to industry professionals, to ensure there is no barrier to industry participants ensuring their work is compliant. <i>See section 7.1.1.5.</i>		Development Team
6	Strengthen and enforce requirements for developers to provide the Owners Corporation with a Building Manual , which provides all necessary information without overloading owners with unhelpful complexity. Access should also be given to local government and Fire & Rescue NSW. Support developers to ensure their reporting processes align with the steps required to produce a comprehensive, well-communicated manual. <i>See sections 7.1.2.3, 7.5.1.1, 7.5.1.2 and 8.2.2.</i>	 	Development Team Consumers
7	Continue to improve the centralisation of building quality data currently collected or produced across different governments/departments (e.g. complying development data). This data should also be made easily accessible to councils. <i>See section 8.1.4.</i>	 	

8	Allocate long-term resourcing for a government compliance and enforcement agency to continue the Building Commissioner's work. Cultural change within the construction industry is a long-term project and requires consistent, ongoing regulatory oversight. At present, it is unclear how the OBC will be resourced beyond the end of the Commissioner's term; this uncertainty may undermine confidence that the new regulatory regime will become the 'new normal' and will be adequately enforced. <i>See sections 7.1.1.4, 7.2.1.1 and 8.1.</i>		
9	Improve government oversight of certifiers , including strengthening of audit processes, compliance and training, to ensure adequate and appropriate documentation is being produced and collected during the certification process. <i>See sections 7.1.1.1 and 7.2.1.1.</i>		Certifiers
10	Ensure that declared designs and as-built drawings are made available to the Owners Corporation (and potentially possible buyers) via an easy-to-use platform (as the Building Commissioner has proposed). This should be made available as soon as possible, rather than waiting for more complex digital twin technology to be developed. <i>See sections 7.5.1.1, 8.1.4 and 8.2.2.</i>		Consumers
11	Clarify the purpose of owners reporting defects to Fair Trading , and strengthen FT's capacity to respond adequately to reports. At present it is unclear whether the aim of reporting is to collect aggregate defects data, to help track developer/builder performance, or to allow FT to support owners through rectification. Different reporting processes may be appropriate depending on this function (e.g. should reports be confidential?) Once clarified, FT should undertake a campaign to encourage owners to report, with particular efforts to ensure awareness-raising with lower socio-economic and ESL communities. <i>See section 7.2.2.1, 7.4.1.5 and 8.1.5.</i>		Consumers
12	Provide support to Owners Corporations to ensure that Building Manuals are kept up to date , and a copy is provided to all subsequent purchasers (e.g. guidance, templates from Fair Trading; training for strata managers). <i>See sections 7.5.1.2, 7.5.1.3, 7.5.2.3, 8.2.2.</i>		Consumers Strata Managers
13	Strengthen the SBBIS inspection process to ensure it picks up all significant defects. This should include adding requirements for inspections prior to completion of key building elements and for invasive inspections in appropriate circumstances, extending the inspection timeframe to allow time for defects to manifest, and allowing defects found at the second inspection to be included under the scheme. <i>See sections 8.2.3.2 and 8.2.3.3.</i>		Defect Inspectors
14	Require more detailed and consistent reporting under the SBBIS , including a requirement that a scope of works (including indicative costs and timeframes) be included in the inspector's report. This will help to ensure that information collected from this scheme provides a clearer picture of current defect trends in new construction. <i>See section 8.2.3.4.</i>		Defect Inspectors
15	Collate and analyse data provided through the SBBIS to assess the risk of defects across the strata sector, and report publicly on this aggregate data. This data could also be used to inform industry tools to track developer performance. <i>See section 8.2.3.4.</i>		
16	Collect data on all buildings undergoing rectification works, as an additional dataset to monitor quality issues over time. One option may include clearer identification of rectification works in Development Applications, which could be used to analyse defect prevalence and risks. <i>See section 8.2.4.</i>	 	

17	Explore options to expand the functionality of the new Strata Portal to provide updated information to strata owners about defect risks (e.g. new product warnings), and to collect information about owner experiences with defects and rectification (e.g. this may provide a streamlined mechanism for reporting defects to Fair Trading). See <i>sections 7.5.1.2 and 8.1.4.3</i> .		Consumers Strata Managers
18	Undertake a public education campaign about the importance and value of strata inspection reports , and how to distinguish a thorough report from a less well-researched one. See <i>sections 7.4.1.1 and 7.4.1.3</i> .		Consumers
19	Enable greater information sharing with independent researchers and ratings agencies to support industry oversight (e.g. data gathered under the SBBIS, the RAB Act and the DBP Act). See <i>section 8.2.7</i> .		Researchers
20	Review current data collection and reporting processes of available data relating to building quality, to identify gaps and opportunities for greater public accessibility . See <i>sections 7.4.1.3 and 7.4.1.4</i> .		
21	Report post-occupancy issues with buildings (e.g. fire orders, rectification orders) to original developers and builders as well as to Owners Corporations, to strengthen the feedback provided to development teams. See <i>section 7.1.1.3</i> .		Development Team
22	Connect government staff involved with development projects before and after approval and occupation, to improve oversight and sharing of institutional knowledge about complex projects and precincts. See <i>section 7.2.1.2</i> .		
23	Work with the development industry to minimise low-value documentation and avoid 'box-ticking' approaches to quality and compliance by ensuring oversight is undertaken by appropriately skilled and accountable staff, who can assess outcomes based on expertise as well as procedural documentation. Reporting processes should align with the steps required to produce a comprehensive, well-communicated Building Manual for new owners. See <i>sections 7.1.1.2, 7.1.2.1, 7.1.2.3, 7.5.1.1, 7.5.1.2 and 8.2.2</i> .		Development Team
24	Work with the defect inspection and rectification industries to develop a standardised and comprehensive approach to the structure and presentation of defect inspection reports and the definitions used to identify defective work, and adopt this across the industry. See <i>sections 6.2.2, 8.2.3.4, 8.2.4 and 8.2.5</i> .		Defect Inspectors & Rectifiers
25	Share pertinent data on development team track records with financiers and insurers to enable them to reduce risk, and incentivise them to give greater priority to this data in financing and insurance decisions. Financiers and insurers may also require the developer to produce additional documentation (including from their contractors) and use commercial ratings tools. See <i>sections 7.3.1, 7.3.2.1 and 7.3.2.3</i> .		Financiers & Insurers Development Team
26	Work with the strata inspection industry to develop minimum standards and a standardised reporting format for strata inspection reports . Regulating and enforcing a set of required components would help to ensure purchasers have their attention directed to key issues. See <i>sections 6.2.2 and 8.2.6</i> .		Strata Inspectors
27	Work with industry to improve the professionalisation of strata inspectors . Introducing additional training, qualifications, and potentially registration of strata inspectors would help to ensure greater consistency in the quality of strata inspection reports. See <i>sections 7.4.1.1 and 8.2.6</i> .		Strata Inspectors

28	Work with industry to improve the professionalisation of strata managers . Managers play a key role in educating consumers and as a conduit for information between consumers, developers, inspectors, building managers and rectifiers. Exploring opportunities for additional training and advanced qualifications will help to improve the quality and consistency of strata records, which will in turn improve the quality of strata inspection reports. <i>See section 7.5.1.3.</i>		Strata Managers
29	Work with the strata industry to improve the storage and management of OC records . For example, this may include driving changes to ensure greater interoperability between systems to minimise data loss when schemes change managers, or strata managers change firms. This would also help inspectors find records. <i>See sections 7.5.1.3 and 8.2.6.</i>		Strata Managers
30	Require strata managers to allow strata inspectors to access building management records . <i>See sections 7.4.1.1 and 8.2.6.</i>		Strata Managers Strata Inspectors

References

- Abdul-Rahman, H., Wang, C., Wood, L.C., & Khoo, Y.M. (2014). Defects in affordable housing projects in Klang Valley, Malaysia. *Journal of Performance of Constructed Facilities*, 28(2), 272-285. [doi.org/10.1061/\(ASCE\)CF.1943-5509.0000413](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000413)
- ABS. (2020). Building Activity, Australia - 8752.0 <<https://www.abs.gov.au/statistics/industry/building-and-construction/building-activity-australia/mar-2020>>
- ABS. (2017). 2071.0 - Census of Population and Housing: Reflecting Australia - Stories from the Census, 2016. <<https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0~2016~Main%20Features~Apartment%20Living~20>>.
- ABS. (2016). Census QuickStats: Greater Sydney, Greater Melbourne, Greater Brisbane. <<https://www.abs.gov.au/websitedbs/D3310114.nsf/Home/2016%20QuickStats>>.
- Akerlof, G.A. (1970). The market for 'Lemons': Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3), 488-500. doi.org/10.1016/B978-0-12-214850-7.50022-X
- Bird, S. & Hernández, D. (2012). Policy options for the split incentive: Increasing energy efficiency for low-income renters. *Energy Policy*, 48, 506-514. doi.org/10.1016/j.enpol.2012.05.053
- Bleby, M. (2021) NSW plans defects insurance for apartment buildings. *Australian Financial Review*, 25 August. <<https://www.afr.com/property/commercial/nsw-plans-defects-insurance-for-apartment-buildings-20210825-p58lnr>>
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi.org/10.1191/1478088706qp063oa
- Britton, P. & Bailey, J. (2011). New homes and consumer rights: England and Australia compared. *International Journal of Law in the Built Environment*, 3(3), 269-295. doi.org/10.1108/17561451111178461
- CFMEU (2019). *Shaky foundations: The national crisis in construction*. Report by the Construction, Forestry, Maritime, Mining And Energy Union. <<https://www.cfmmeu.org.au/sites/www.cfmmeu.org.au/files/uploads/CFMEU-Shaky-Foundations-FINAL.pdf>>.
- Chandler, D. (2019). New NSW building legislation: here's the start of a new deal. *The Fifth Estate*, 30 October. <<https://thefifthestate.com.au/columns/spinifex/new-nsw-building-legislation/>>.
- Chandler, D. (2021). OC Audits are now evidencing construction's fault lines. *LinkedIn*, 7 March. <https://www.linkedin.com/pulse/oc-audits-now-evidencing-constructions-fault-lines-david-chandler-oam?trk=portfolio_article-card_title>.
- Chandler, D. (n.d.). Creating trusted players in the NSW multi-unit residential market. Fast. <<https://www.nsw.gov.au/building-commissioner/news/creating-trusted-players-nsw-multi-unit-residential-market-fast>>.
- Chew, M.Y.L. & De Silva, N. (2002). Factors affecting water-tightness in wet area of high-rise residential buildings, *Architectural Science Review*. 45(4), 375-383. doi.org/10.1080/00038628.2002.9696953
- Chew, M.Y.L. (2004). Defect analysis in wet areas of buildings. *Construction and Building Materials*, 19, 165. doi.org/10.1016/j.conbuildmat.2004.07.005
- Cooper, B. & Brown, M. (2014). *Dealing with Defects: Final Report*. City Futures Research Centre, UNSW. <https://www.be.unsw.edu.au/sites/default/files/upload/City%20Futures%20Report%20Dealing%20With%20Defects_published_amended.pdf>.
- Cormack, L. (2017) Infinity electrical cables still present fire risk for thousands of homes, ACCC warns. *Sydney Morning Herald*, 29 May. <<https://www.smh.com.au/business/consumer-affairs/infinity-electrical-cables-still-present-fire-risk-for-thousands-of-homes-20170529-gwfdhz.html>>

- Cuneo, C., Klein, N. & Vidler, A. (2012). Woman dead after leaping from apartment to escape fire in Bankstown, Sydney. *News.com.au*, 7 September. <<https://www.news.com.au/national/children-trapped-in-burning-building/news-story/97e3e33535847f1ce094ce106723a5f1?sv=acd7fb612af59d1b118df70dc6a6ce6b>>.
- Drane, J. (2015). *Building Defects: How can they be avoided? - a builder's perspective*. Paper presented at Conference on Strata and Community Title in Australia for the 21st Century, Griffith University, Gold Coast. <https://www.researchgate.net/publication/282073797_Building_Defects_How_can_they_be_avoided-a_builder's_perspective>
- Dunstan, J. (2019). Lacrosse apartment owners awarded \$5.7 million in damages after flammable cladding blaze. *ABC News*, 28 February. <<https://www.abc.net.au/news/2019-02-28/lacrosse-apartment-owners-win-5.7-million-cladding-fire-damages/10857060>>.
- Easthope, H., Hudson, S. & Randolph, B. (2013). Urban renewal and strata scheme termination: balancing communal management and individual property rights. *Environment and Planning A*, 45(6), 1421-1435. doi.org/10.1068/a4598
- Easthope, H. & Randolph, B. (2009). Governing the compact city: The challenges of apartment living in Sydney, Australia. *Housing Studies*, 24, 243-259. doi.org/10.1080/02673030802705433
- Easthope, H., Randolph, B. & Judd, S. (2012). *Governing the Compact City: The role and effectiveness of strata management*. City Futures Research Centre, UNSW. <https://cityfutures.be.unsw.edu.au/documents/43/Governing_the_Compact_City_FINAL_REPORT.pdf>.
- Easthope, H. & Randolph, B. (2016). Principal-agent problems in multi-unit developments: The impact of developer actions on the on-going management of strata titled properties. *Environment and Planning A*, 48(9), 1829-1847. doi.org/10.1177/0308518X16650894
- Easthope, H. (2019). *The Politics and Practices of Apartment Living*. Edward Elgar Publishing.
- Easthope, H., Thompson, S. & Sisson, A. (2020). *Australasian Strata Insights 2020*. City Futures Research Centre, UNSW. <<https://cityfutures.be.unsw.edu.au/research/projects/2020-australasian-strata-insights/>>.
- Eisenhardt, K.M. (1989). Agency theory: An assessment and review. *Academy of management review*, 14(1), 57-74. doi.org/10.5465/amr.1989.4279003
- Equity Economics & Development Partners. (2020). *The cost of apartment building defects*. <https://static1.squarespace.com/static/539fdd0de4b09fc82dfddd08/t/5d594ef0750ae80001789020/1566134001664/APARTMENTDEFECTS_Equity+Economics+Modeling+of+Cost.pdf>
- Fire & Rescue NSW. (n.d.). *Residential fire sprinklers*. Website. <<https://www.fire.nsw.gov.au/page.php?id=9275>>
- Firing, M., Lædre, O. & Lohne, J. (2016). Main challenges found in the handover of a shopping centre in Norway. *Procedia - Social and Behavioral Sciences*, 226, 100–107. doi.org/10.1016/j.sbspro.2016.06.167
- Forcada, N., Macarulla, M., Fuertes, A., Casals, M., Gangolells, M. & Roca, X. (2012). Influence of building type on posthandover defects in housing. *Journal of Performance of Constructed Facilities*, 26(4), 433–440. [doi.org/10.1061/\(ASCE\)CF.1943-5509.0000225](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000225)
- Forcada, N., Macarulla, M., & Love, P.E.D. (2013a). Assessment of residential defects at post-handover. *Journal of Construction Engineering and Management*, 139(4), 372–378. [doi.org/10.1061/\(ASCE\)CO.1943-7862.0000603](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000603)
- Forcada, N., Macarulla, M., Gangolells, M., Fuertes, A., Casals, M., & Roca, X. (2013b). Post handover housing defects: Sources and origins. *Journal of Performance of Constructed Facilities*, 27(6), 756–762. [doi.org/10.1061/\(ASCE\)CF.1943-5509.0000368](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000368)
- Forcada, N., Macarulla, M., Gangolells, M., & Casals, M. (2014). Assessment of construction defects in residential buildings in Spain. *Building Research & Information*, 42(5), 629–640. doi.org/10.1080/09613218.2014.922266

- Forcada, N., Macarulla, M., Gangolells, M. & Casals, M. (2016). Handover defects: comparison of construction and post-handover housing defects. *Building Research & Information*, 44(3), 279-288. doi.org/10.1080/09613218.2015.1039284
- Ford, M. (2016). Lidcombe unit owners face \$2.6m storm damage bill after AIG insurance rejects claims. ABC News, 8 April. <<https://www.abc.net.au/news/2016-04-08/lidcombe-unit-owners-face-storm-damage-bill,-insurance-bid-fails/7312578>>.
- Forsythe, P.J. (2007). A conceptual framework for studying customer satisfaction in residential construction. *Construction Management and Economics*, 25(2), 171–182. doi.org/10.1080/01446190600771439
- Forsythe, P. J. (2015). Monitoring Customer Perceived Service Quality and Satisfaction during the Construction Process. *Construction Economics and Building*, 15(1), 19–42. doi.org/10.5130/AJCEB.v15i1.4172
- Frew, W. (2021). NSW Building Commissioner David Chandler, two years in, on the bouquets and brickbats. *The Fifth Estate*, 24 June. <<https://thefifthestate.com.au/innovation/residential-2/nsw-building-commissioner-david-chandler-two-years-in-on-the-bouquets-and-brickbats/?>>.
- Gailmard, S. (2009). Multiple principals and oversight of bureaucratic policy-making. *Journal of Theoretical Politics*, 21(2), 161–186. doi.org/10.1177/0951629808100762
- Garrone, P., Grilli, L. & Rousseau, X. (2013). Management discretion and political interference in municipal enterprises. Evidence from Italian utilities. *Local government studies*, 39(4), 514–540. doi.org/10.1080/03003930.2012.726198
- Georgiou, J., Love, P.E.D. & Smith, J. (1999). A comparison of defects in houses constructed by owners and registered builders in the Australian State of Victoria. *Structural Survey*, 17(3), 160-169. doi.org/10.1108/02630809910291343
- Georgiou, J. (2010). Verification of a building defect classification system for housing. *Structural Survey*, 28(5), 370-383. doi.org/10.1108/02630801011089164
- Gladstone, N. & Fellner, C. (2019). Small business flattened by 'dodgy' builders in phoenixing epidemic. *The Sydney Morning Herald*, 17 December. <<https://www.smh.com.au/national/nsw/small-business-flattened-by-dodgy-builders-in-phoenixing-epidemic-20191125-p53drr.html>>.
- Guilding, C., Warnken, J., Ardill, A. & Fredline, L. (2005). An agency theory perspective on the owner/manager relationship in tourism-based condominiums. *Tourism Management*, 26(3), 409–420. doi.org/10.1016/j.tourman.2003.11.021
- Hackitt, J. (2018). *Building a Safer Future, Independent Review of Building Regulations and Fire Safety: Final Report*. Report presented to UK Parliament by the Secretary of State for Housing, Communities and Local Government. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707785/Building_a_Safer_Future_-_web.pdf>
- Hills, R. (2018). *Rebuilding Confidence: An Action Plan for Building Regulatory Reform*. Building Products Innovation Council, Australia. <<https://www.bpic.asn.au/wp-content/uploads/2019/07/Rebuilding-Confidence-Action-Plan-for-Building-Regulatory-Reform-FINAL.pdf>>
- Hoffman, M., Carter, J. & Foster, S. (2019). *Opal Tower investigation: Final Report*. Independent Advice to NSW Minister for Planning and Housing. <<https://www.planning.nsw.gov.au/-/media/Files/DPE/Reports/opal-tower-investigation-final-report-2018-02-22.pdf?la=en>>
- Housing Industry Association (HIA) (2017). *A tale of many housing markets*. Media Release, 30 August. <<https://hia.com.au/-/media/HIA-Website/Files/Media-Centre/Media-Releases/2017/national/A-Tale-of-Many-Housing-Markets.ashx>>.
- icare: Insurance and Care NSW (2020). *NSW Home Building Compensation Scheme*. Submission to IPART Review of the efficiency and effectiveness of the NSW home building compensation fund, 31 May. <<https://www.ipart.nsw.gov.au/sites/default/files/documents/online-submission-icare-n.-agius-1-jun-2020-083451027.pdf>>

- Ilozor, B., Okoroh, M. & Egbu, C. (2004). Understanding residential house defects in Australia from the State of Victoria. *Building and Environment*, 39(3), 327–337. doi.org/10.1016/j.buildenv.2003.07.002
- Independent Pricing and Regulatory Tribunal (IPART) NSW. (2020) *Review of the efficiency and effectiveness of the NSW home building compensation fund*. Draft Report, 18 September. <https://www.ipart.nsw.gov.au/sites/default/files/documents/draft-report-efficiency-and-effectiveness-of-the-nsw-home-building-compensation-fund-september-2020_0.pdf>
- Johnston, N.R. & Leshinsky, R. (2018). Gatekeeping information in the multi-owned property environment: Stymieing buyers' rights to discover and decide. *Property Management*, 36(5), 506–520. doi.org/10.1108/PM-04-2017-0025
- Johnston, N. (2016). *An examination of how conflicts of interest detract from developers upholding governance responsibilities in the transition phase of multi-owned development: A grounded theory approach*. (Doctoral dissertation). Griffith University, Gold Coast. <https://research-repository.griffith.edu.au/bitstream/handle/10072/367721/Johnston_2017_01Thesis.pdf?sequence=1&isAllowed=y>
- Johnston, N. & Reid, S. (2019). *An examination of building defects in residential multi-owned properties*. Deakin University, Melbourne. <<https://www.mopresearchhub.org/archives/research/examination-building-defects-multi-owned-properties>>.
- Jones, C. & Burton, S. (2019). The high stakes of high rise. *Holding Redlich blog post*, 15 January. <<https://www.holdingredlich.com/the-high-stakes-of-high-rise>>.
- Khalil, F., Martimort, D. & Parigi, B. (2007). Monitoring a common agent: Implications for financial contracting. *Journal of Economic Theory*, 135(1), 35–67. doi.org/10.1016/j.jet.2005.08.010
- Lambert, M. (2015). *Independent Review of the Building Professionals Act 2005*. Report to NSW Government. <https://www.fairtrading.nsw.gov.au/data/assets/pdf_file/0017/604520/Independent-review-of-the-Building-Professionals-Act-2005.pdf>.
- Lambert, M. (2019). *Submission to the Building Stronger Foundations Consultation*. Submission to NSW Fair Trading, 24 July. <https://www.fairtrading.nsw.gov.au/data/assets/pdf_file/0008/544364/Michael-Lambert.pdf>.
- Lee, J., Ahn, Y. & Lee, S. (2020). Post-Handover Defect Risk Profile of Residential Buildings Using Loss Distribution Approach. *Journal of Management in Engineering*, 36(4), 04020021. [doi.org/10.1061/\(ASCE\)ME.1943-5479.0000785](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000785)
- Levy, M. (2013). Lucky escape: 10 hurt in balcony collapse at family dinner. *The Sydney Morning Herald*, 28 February. <<https://www.smh.com.au/national/nsw/lucky-escape-10-hurt-in-balcony-collapse-at-family-dinner-20130228-2f70j.html>>.
- Longhetti, C., Connellan, M. & Pearson, M. (2015). Man dies in Macquarie Park as balcony gives way. *The Daily Telegraph*, 2 April. <<https://www.dailytelegraph.com.au/news/nsw/man-dies-in-macquarie-park-as-balcony-gives-way/news-story/9b8cd4710234caf536fea8aa16cc961d>>.
- Loosemore, M. & Cheung, E. (2015). Implementing systems thinking to manage risk in public private partnership projects. *International Journal of Project Management*, 33, 1325–1334. doi.org/10.1016/j.ijproman.2015.02.005
- Love, P.E., Teo, P., Morrison, J. & Grove, M. (2016). Quality and safety in construction: Creating a no-harm environment. *Journal of Construction Engineering and Management*, 142(8), 05016006. [doi.org/10.1061/\(ASCE\)CO.1943-7862.0001133](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001133)
- Lützkendorf, T. & Speer, T.M. (2005). Alleviating asymmetric information in property markets: building performance and product quality as signals for consumers. *Building Research & Information*, 33(2), 182–195. doi.org/10.1080/0961321042000323815
- Martimort, D. (1996). Exclusive dealing, common agency, and multiprincipals incentive theory. *The RAND Journal of Economics*, 27(1), 1–31.

- Melvin, J. (2018). The split incentives energy efficiency problem: Evidence of underinvestment by landlords. *Energy Policy*, 115, 342-352. doi.org/10.1016/j.enpol.2017.11.069
- Mills, A., Love, P.E.D. & Williams, P. (2009). Defect Costs in Residential Construction. *Journal of Construction Engineering and Management*, 135(1), 12-16. [doi:10.1061/\(ASCE\)0733-9364\(2009\)135:1\(12\)](https://doi.org/10.1061/(ASCE)0733-9364(2009)135:1(12))
- Ministry of Housing, Communities & Local Government, Scully, P. & Jenrick, R. (2021). *New regulator established to ensure construction materials are safe*. UK Government Press Release, 19 January. <<https://www.gov.uk/government/news/new-regulator-established-to-ensure-construction-materials-are-safe>>.
- Nepal, M.P., Park, M. & Son, B. (2006). Effects of schedule pressure on construction performance. *Journal of Construction Engineering and Management*, 132(2), 182-188. [doi.org/10.1061/\(ASCE\)0733-9364\(2006\)132:2\(182\)](https://doi.org/10.1061/(ASCE)0733-9364(2006)132:2(182))
- NSW Fair Trading (2012). *Making NSW No. 1 Again: Shaping Future Communities—Strata and Community Title Law Reform Discussion Paper*. NSW Government. <https://www.fairtrading.nsw.gov.au/data/assets/pdf_file/0017/400058/Making_nsw_no_1_again_shaping_future_communities.pdf>.
- NSW Fair Trading (2013). *Strata Title Law Reform: Strata and Community Title Law Reform Position Paper*. NSW Government. <https://www.fairtrading.nsw.gov.au/data/assets/pdf_file/0006/393405/Position-Paper-Strata-Title-Law-Reform.pdf>.
- NSW Fair Trading (2019). *NSW Government Response to the Shergold Weir Building Confidence Report*. NSW Government. <https://www.fairtrading.nsw.gov.au/data/assets/pdf_file/0007/451375/Response-to-Shergold-Weir-Building-Confidence-Report.pdf>.
- NSW Fair Trading (2020). *Strata update: Information for strata and community schemes*. NSW Government, online newsletter. <<https://lnk.nswfairtrading.trclient.com//qpMr1E-FjhEBWKjteUj74xw>>.
- NSW Fair Trading (n.d.a). *Resolving building disputes*. NSW Government, website. <<https://www.fairtrading.nsw.gov.au/housing-and-property/building-and-renovating/resolving-building-disputes>>.
- NSW Fair Trading (n.d.b). *Strata building bond and inspections scheme*. NSW Government, website. <<https://www.fairtrading.nsw.gov.au/housing-and-property/strata-building-bond-and-inspections-scheme/strata-building-bond-and-inspections-scheme>>.
- NSW Government (2021). *New tool to determine quality and trustworthiness of NSW residential buildings*. NSW Government Press Release, 9 July. <<https://www.nsw.gov.au/media-releases/new-tool-to-determine-quality-and-trustworthiness-of-nsw-residential-buildings>>
- NSW Government, NSW Building Commissioner (n.d.a). *Data and research*. Website. <<https://www.nsw.gov.au/building-commissioner/construct-nsw/data-and-research>>.
- NSW Government, NSW Building Commissioner (n.d.b). *Ratings system*. Website. <<https://www.nsw.gov.au/building-commissioner/construct-nsw/ratings-system>>.
- NSW Parliament, Legislative Council PAC (Public Accountability Committee) (2019). *Regulation of building standards, building quality and building disputes: First report*. NSW Parliament, 13 November. <<https://www.parliament.nsw.gov.au/lcdocs/inquiries/2540/Regulation%20of%20building%20standards,%20building%20quality%20and%20building%20disputes;%20First%20report%20-%20Report%20No.%204.pdf>>.
- NSW Parliament, Legislative Council PAC (Public Accountability Committee) (2020). *Regulation of building standards, building quality and building disputes: Final report*. NSW Parliament, 30 April. <<https://www.parliament.nsw.gov.au/lcdocs/inquiries/2540/PAC%20-%20Regulation%20of%20building%20standards%20quality%20disputes%20-%20Final%20report%20-%20Report%20no%206.pdf>>.
- OCN (Owners Corporation Network) (2021). *Building confidence report discussion paper*. Submission to the Australian Building Codes Board, 19 January. <<https://ocn.org.au/wp-content/uploads/2021/02/OCN-Submission-ABCB-Building-Manual-Requirement-January-2021.pdf>>

- Oseland, S.E. (2019). Breaking silos: can cities break down institutional barriers in climate planning? *Journal of Environmental Policy & Planning*, 21(4), 345-357. doi.org/10.1080/1523908X.2019.1623657
- Pan, W. & Thomas, R. (2014). Defects and their influencing factors of posthandover new-build homes. *Journal of Performance of Constructed Facilities*, 29(4), 04014119. [doi.org/10.1061/\(ASCE\)CF.1943-5509.0000618](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000618)
- Park, J. & Seo, D. (2017). Basic Study on Term of Warranty Liability for Finish Work Defect in Apartment Building. *International Journal of Research in Chemical, Metallurgical and Civil Engineering. (IJRCMCE)*, 4(1), 7-12. doi.org/10.15242/IJRCMCE.EAP117424
- Parliament of Australia, Senate Economics References Committee (2018). *Non-conforming building products: the need for a coherent and robust regulatory regime*. Commonwealth of Australia. <https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming45th/Report>.
- Pettit C.J., Hawken S., Ticzon C., Leao, S.Z., Afrooz, A.E., Lieske, S.N., Canfield, T., Ballal, H. & Steinitz, C. (2019). Breaking down the silos through geodesign – Envisioning Sydney's urban future. *Environment and Planning B: Urban Analytics and City Science*, 46(8), 1387-1404. doi:[10.1177/2399808318812887](https://doi.org/10.1177/2399808318812887)
- Richardson, B.A. (1991). *Defects and Deterioration in Buildings*: E. & F.N. Spon.
- Rosewall, T. & Shoory, M. (2017). *Houses and Apartments in Australia, Bulletin–June Quarter 2017*. Reserve Bank of Australia. <https://www.rba.gov.au/publications/bulletin/2017/jun/1.html>
- Rothschild, M. & Stiglitz, J. (1976). Equilibrium in competitive insurance markets: An essay on the economics of imperfect information. *The Quarterly Journal of Economics*, 90(4), 629-649. doi.org/10.2307/1885326
- Rottenburg, R. & Merry, S.E. (2015). A world of indicators: The making of governmental knowledge through quantification. In R. Rottenburg, S.E. Merry, S.-J. Park, & J. Mugler (Eds.) *The world of indicators: The making of governmental knowledge through quantification* (pp. 1–33). Cambridge University Press.
- Ruming, K. & Gurran, N. (2014). Australian planning system reform. *Australian Planner*, 51(2), 102-107. doi.org/10.1080/07293682.2014.896065
- Saulwick, J., Gorrey, M. & Visentin, L. (2019). 'It hasn't worked': Premier admits Sydney's building industry is failing. *The Sydney Morning Herald*, 10 July. <<https://www.smh.com.au/national/nsw/it-hasn-t-worked-premia-admits-sydney-s-building-industry-is-failing-20190710-p52601.html>>.
- Schapper, J.H., McLeod, S., Hedgcock, D. & Babb, C. (2020). Freedom of Information for Planning Research and Practice in Australia: Examples, Implications, and Potential Remedies. *Urban Policy and Research*, 39(1), 106-119. doi.org/10.1080/08111146.2020.1853522
- Schultz, C.S., Jørgensen, K., Bonke, S. & Rasmussen, G.M.G. (2015). Building defects in Danish construction: project characteristics influencing the occurrence of defects at handover. *Architectural Engineering and Design Management*, 11(6), 423-439. doi.org/10.1080/17452007.2014.990352
- Shergold, P. & Weir, B. (2018). *Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*. Report to the Building Ministers' Forum. <https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf>.
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374. doi.org/10.2307/1882010
- Strata Community Association, Engineers Australia & WebFM. (2020). *Australian Building Manual Guideline: Building Confidence starts with the right information*. <<https://www.buildingmanuals.org/wp-content/uploads/2020/03/Building-Manual-Guideline-V1-3-Web.pdf>>.
- Sweeney, N. (2019). A bigger problem than building defects. *Australian Financial Review*, 31 July. <https://www.afr.com/property/residential/a-bigger-problem-than-building-defects-20190724-p52a6g>

- Troy, L., Randolph, B., Pinnegar, S., Crommelin, L. & Easthope, H. (2020). Vertical Sprawl in the Australian City: Sydney's High-rise Residential Development Boom, *Urban Policy and Research*, 38(1), 18-36. doi.org/10.1080/08111146.2019.1709168
- van der Merwe, C.G. (1994). 'Apartment ownership', in Yiannopoloulos, A.N. (Ed.) *International Encyclopedia of Comparative Law, Property and Trust*, Vol. 6, Mohr, Tu"bingen.
- Watt, D.S. (2007). *Building pathology: principles and practice* (2nd ed.). Blackwell Publishing.
- Wong, K. & Vimonsatit, V. (2012). A study of the factors affecting construction time in Western Australia. *Scientific Research and Essays*, 7(40), 3390-3398. doi.org/10.5897/SRE12.138
- Yeung, J.F., Chan, A.P. & Chan, D.W. (2009). Developing a performance index for relationship-based construction projects in Australia: Delphi study. *Journal of Management in Engineering*, 25(2), 59-68. [doi.org/10.1061/\(ASCE\)0742-597X\(2009\)25:2\(59\)](https://doi.org/10.1061/(ASCE)0742-597X(2009)25:2(59))
- Yung, P. & Yip, B. (2010). Construction quality in China during transition: A review of literature and empirical examination. *International Journal of Project Management*, 28(1), 79-91. doi.org/10.1016/j.ijproman.2009.03.003
- Yiu, C., Wong, S. & Yau, Y. (2006) Property management as property rights governance: Exclusion and internal conflict resolution. *Property Management*, 24(2), 87-97. doi.org/10.1108/02637470610657989
- Yip, N.M, Chang, C.O. & Hung, T.Y. (2007) Modes of condominium management: a principal-agent perspective. *Facilities*, 25(5/6), 215-226. doi.org/10.1108/02632770710742183
- Zahid, N. & Nabilah, S.N. (2015) Assessing the maintainance in strata high rise residential property. (Student dissertation). Universiti Teknoligi MARA, Malaysia. < <https://ir.uitm.edu.my/id/eprint/15605/>>