the Australia and New Zealand School of Government

CASE PROGRAM 2012-134.1

A new future for New Zealand's building industry

As a new Building Bill moved through its final stages in the New Zealand Parliament towards the end of 1991, the mood was buoyant. The Bill's gestation had been long and its parentage broad: the National Government had initiated building control reform in 1982, while a Labour Government had tabled the Bill in 1990 shortly before losing office. Now, with a National government again in power, the Bill commanded wide bi-partisan support. Members on both sides of the House saw it as a panacea for a highly prescriptive building control regime controlled by a multitude of statutes, codes, regulations and bylaws.

The Bill was "a major revolution in the way in which building controls are governed in this country," said a National MP. It would "put New Zealand's building laws out in front of those of the rest of the world."[1] Former Labour Finance Minister David Caygill declared that "New Zealand will be breaking ground in adopting a code that is performance orientated."[2] Some MPs said the Bill would usher in an era of cheaper home building. Others praised it for introducing competition into the building certification process, for encouraging innovative building design and techniques, and for its health and safety protections. The Internal Affairs Minister Graeme Lee, responsible for the Bill's passage through Parliament, said it would have "a dramatic impact and ... represent a new future course for the building industry."[3]

Maurice Williamson's dilemma

In 2011, some twenty years later, Maurice Williamson, Minister of Building and Construction in another National Government, was announcing a $1 billion relief package for

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This case was written by Margot Schwass for Professor Malcolm Sparrow, Kennedy School of Government, Harvard University. It has been prepared as a basis for class discussion of regulatory issues rather than to illustrate either effective or ineffective handling of a managerial situation. The assistance of Adrian Bennett, Peter Mumford and Mark Scully with the preparation of this material is appreciated, but responsibility for the content rests with ANZSOG.

[1] Nick Smith, New Zealand Parliamentary Debates ("Debates"), 20 November, 1991
[2] David Caygill, Debates, 31 October, 1991
[3] Graeme Lee, 31 October, 1991

the owners of the estimated 42,000 homes built after the passing of the *Building Act 1991*, that had leaked, rotted or were no longer weathertight. The estimated cost of repairs exceeded $11 billion. For many affected homeowners – who blamed their plight on a doctrinaire shift to light-handed government regulation in the early 1990s[4] – the costs were considerably more than financial *(Exhibit 1).* One, describing a 10-year legal battle and a concurrent fight with cancer (which doctors attributed to the toxic mould growing in her hillside house), said it was "beyond belief what it does with your life.... I hate my home, with a passion."[5]

The leaky building saga,[6] Maurice Williamson said, was "one of the most ghastly blights on the landscape of this nation."[7] His Government was being urged to do more to alleviate the distress of affected homeowners, even though a Court of Appeal ruling had exempted the Crown from legal liability. But the Minister was already hearing of rising frustration in the building industry as a series of regulatory reforms instituted from 2004 onwards – as a direct result of the leaky homes scandal – had once again tightened controls on the industry. In 2007, the Master Builders Federation claimed that it took longer to get consent to build a house than to actually build it. [8] Maurice Williamson himself had acknowledged that the sector, crucial to national productivity and employment, was once again "drowning in red tape and dying from over-regulation and bureaucracy."[9]

New Zealand still urgently needed an effective and acceptable regulatory framework for an industry that generated $3 in economic activity for every $1 invested.[10] As the Minister sought to define a suitable approach, what could he learn from the leaky building saga? Had building industry regulation just come full circle, and was it inevitably bound to continue its series of damaging lurches from stringency to laxity and back again? Or was there a more sustainable and stable approach: one that would simultaneously protect the public and satisfy the industry over the longer term?

The pre-1991 control regime: prescription and frustration

The purpose of building and planning controls is to guide societies as they develop the built environment and meet their accommodation needs. Building controls also provide protection: one leading authority has said their role is to "control what is built in order to protect the welfare of [society's] citizens – particularly their health and safety."[11]

A concern for health and safety was indeed the prime driver for the development of New Zealand's building control system, which began after 256 people died in the disastrous 1931 Hawke's Bay earthquake and fire. A model set of building controls was introduced in 1935 and adopted in various forms by most local authorities, although the control regime was far from uniform nationwide. A 1971 inquiry found the country's building controls were satisfactory: it was unlikely "that a dwelling which is structurally weak or lacking in the basic

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[4] 'A Rotten Shame', TVNZ documentary, first shown 6 July 2011
[5] 'Pair battle mould and mental anguish', Dominion Post, 9 December 2009
[6] Note: a wide range of buildings – including hospitals, school and other public buildings – were affected by the problems described in this case study. However, most leaky buildings are residential, and that is the focus here.
[7] Debates, 12 July 2011 [Volume 674, Page 19952]
[8] Nick Smith, Debates, 24 July 2007 [Volume 640, Page 10591]
[9] Debates, 8 September 2009 [Volume 657, Page 6021]
[10] PriceWaterhouseCoopers, *Valuing the role of the construction industry in the NZ Economy*, Oct 2011 pp2-3

[11] Professor Helen Tippett, *Building controls in New Zealand: legislative sources and control agencies*, Victoria University of Wellington: Wellington, November 1982, p1 ("Tippett")

environmental qualities needed for physical health can any longer be built in New Zealand."[12]

But the system that was delivering this commendable outcome had grown into a vast, unwieldy monster. By the early 1980s, there were 67 acts of Parliament and 64 sets of regulations applying to building and property development. Another 50 acts were "of general relevance to those operating in the building and property development fields."[13] A plethora of other control instruments, some mandatory and some discretionary, had also evolved. The 19 central government departments that administered the statutes also produced codes of practice, statutory rules and technical guides. Local authorities (at the time numbering more than 200)[14] each had their own bylaws and planning schemes. Decisions of the courts which had become common law were another element in the control system. In addition, there were the standards drawn up the New Zealand Standards Association, and numerous references, guides and procedures produced by other organisations. No single national agency was responsible for coordinating this labyrinthine system, interpreting and updating controls, or arbitrating in disputes. The system had never even been comprehensively documented. [15]

A burden on the building industry

In the 1970s, the building industry began to speak out about the cost and frustrations of complying with the highly prescriptive building control system. Many controls focused less on desired outcomes than on the technical means of achieving them. In 1979, the president of the New Zealand Master Builders' Federation condemned the "ever-increasing burden of new standards and regulations" imposed on his members:

> "Structural codes have been upgraded, fire codes made more demanding, drainage standards increased and town planning ordinances made more complex and expensive. All these changes have originated from organisations who are funded by local Government or Government and as a consequence, never have to face the cost implications of their decisions. Their livelihood is never at stake as a result of their actions..."[16]

The industry also claimed that the control system was thwarting innovation that could lower costs or give consumers greater choice – designers or builders who sought to do things differently "usually gave up after being frustrated with an unreceptive bureaucracy."[17]

Others also voiced concerns. Victoria University of Wellington Professor of Architecture Helen Tippett said that while the need for a building control system was beyond question, "the proliferation of building and planning controls has become a major factor in escalating building costs – without providing commensurate benefits to building owners, users, the building industry, or the public."[18] Building costs in New Zealand were reportedly roughly one third higher than in Australia or North America.[19]

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[12] Commission of Inquiry into Housing in New Zealand, *Housing in New Zealand*, Government Printer: Wellington, 1971, p126
[13] Tippett, p25
[14] See http://www.lgnz.co.nz/about-us/LGNZtimelineAugust2010.pdf, accessed 27 September 2011
[15] Tippett, pp7-16
[16] Don Paterson, *Construction*, No. 274, April 1979, pp8-9
[17] Bob Mitchell, president of the Master Builders' Federation, *Construction*, No 306, March 1982, p7
[18] Tippett, Building Controls in New Zealand, p1
[19] *Consumer*, No 276, October 1989, p3

In 1980, an industry lobby group formally presented its concerns to the National Government, and in 1982 the government appointed a review team to examine the building control system.

The 1983 Review of Planning and Building Controls

The review found the direct cost of complying with building controls (in terms of time spent by both the controllers and the controlled) was approximately $100 million a year. With annual investment in building standing at around $2 billion, excluding civil construction projects, this meant at least 5 percent was being spent on compliance.[20]

Other findings included differences in district schemes across the country, bylaws inconsistently administered between and within councils, and untrained building inspectors making unreasonable or overly-cautious decisions. There were complaints that the Standards Association took too long to respond to technological and other changes, and imposed unnecessary costs on the industry by constantly tightening standards. Rigid statutory requirements in areas such as electrical wiring and plumbing prevented innovative low-cost solutions. Inadequate training and a consequent lack of competence "in both the controllers and controlled" was another barrier to innovation.[21] In short, the building industry was

> "spending more and more time in dealing with the system, to obtain more and more approvals to go ahead with planned developments, to the point where the benefits to be obtained by the controls are less than the cost of the controls themselves, and, in fact, tend to deprive the community of benefits and advantages which might be obtained if the controls were less severe, less complicated, less specific and more liberal."[22]

The answer, the reviewers said, was to consolidate all controls into a single building industry act, with a national building code stipulating "basic performance standards" and recognising "codes of practice, compliance with which would be deemed to meet the standards."[23]

The shift from a prescriptive to a performance-based system was a key message. Such an approach had been adopted in 1963 by the Nordic Committee on Building Regulations, "the first international control body to recommend that the definition of regulatory controls in the legislation be limited to statements of the overall intention and broad functional performance required for built facilities". Less prescriptive legislation was supported by an array of non-statutory means-of-compliance documents. Professor Tippett said that many countries opted for the Nordic approach because it "reduces the need to change or introduce new legislation and allows more rapid response to changing public demands and technological innovation."[24]

The 1983 review did not detail how a performance-based building control regime would work in practice, but suggested a middle course between two options. Option 1 involved strengthening the role of local authorities in administering the building control system. Option 2 recognised that "responsibility for complying with control rests wholly on owners, designers and builders and not on the local authority," and implied self-certification by

[20] Review of Planning and Building Controls, Wellington, 31 May 1983, Foreword and p2 ("Review")
[21] Ibid, p79
[22] Ibid, p38
[23] Ibid p41-42
[24] Tippett, p27-28

designers. [25] The reviewers considered "self certification and 'approved certification' could well go a long way towards a more liberalised system still complying with set standards."[26]

However, the review recognised potential pitfalls in the performance-based approach. Putting responsibility for compliance in the hands of owners, designers and builders implied a greater need for disciplinary control.[27] The authors noted that self-regulation by architects and engineers had been rejected in other countries because of the likelihood of mistakes with serious consequences.[28] Other risks in Option 2 were costly registration schemes, less organised inspection work, and greater inconsistency in methods and materials. Overall:

> "While it may be possible to relax controls under the second option and allow market forces to play a more dominant part this requires further study – it is difficult to either control or enforce anything unless standards are set which can be used both technically and legally. Further, insurers, valuers and, in fact, the community are reliant on the setting and stability of standards..."[29]

A new era

The 1983 review was favourably received by a government now intent on reducing building controls and costs.[30] The Lange Labour Government elected in 1984 continued the momentum, appointing a Building Industry Commission to develop the recommended performance-based national building code and appropriate legislation, with extensive industry input.

While hardly new, performance-based regulation was then enjoying international popularity. Proponents saw it as a tool to reduce regulatory costs, increase efficiency and encourage innovation. It was particularly applied to health and safety, where it was argued "that enforcing detailed rules results in a culture where compliance with the rules becomes the primary objective, rather than an overall goal such as safety."[31]

Performance-based regulation was eagerly embraced by the free-market economic reformers of the Labour Government and their immediate successors, elected in 1990, the Bolger National Government. As the *Building Act* was being drawn up, other performance-based legislation in the pipeline included the *Resource Management Act (1991)*, the *Health and Safety in Employment Act (1992)*, the *Electricity Act (1992)*, and the *Hazardous Substances and New Organisms Act (1996).*

The Building Act 1991

After nearly a decade in development, the *Building Act* was passed in 1991, consolidating into a single law the disparate building-related regulatory controls of the past. The philosophy of the new regime was described by the Secretary of Internal Affairs in the explanatory *Constructive Guide to the Building Act*:

[25] Ibid, p41
[26] Ibid, p80
[27] Ibid, p42
[28] Ibid, p75
[29] Ibid, p42
[30] *Construction*, No 306, March 1982
[31] Peter Mumford, *Enhancing Performance-based Regulation*, Institute of Policy Studies, Wellington: 2011, p9

> "The new building control system is designed to allow market forces to be combined with regulatory controls to ensure that the statutory purposes and principles of building control can be achieved, with minimal compliance costs."[32]

The Act itself stated its broad objectives in section 6. Its purpose was "to provide for necessary controls relating to building work and the use of buildings, and to ensure they are safe and sanitary and have means of escape from fire," and there was to be particular regard to controls that addressed these areas. At the same time, "due regard shall be had to the national costs and benefits of any control."

The Act introduced many new measures. There was the performance-based Building Code itself, based on the Nordic model. An independent statutory body, the Building Industry Authority (BIA), was created to manage the building control regime: it was to ensure nationally consistent interpretation of the Building Code, and be a single source for referrals and review. Consistent with the government's policy of devolving powers to local government, territorial authorities now administered and enforced building controls in their areas. Building consent reviews and onsite inspections could be carried out not only by the authorities, but also by a new category of professionals – private building certifiers. Competition was now part of the building control system.

The Building Code was the linchpin of the new regime. It regulated "only those matters essential for ensuring that buildings perform in a way which safeguards people from injury and illness; safeguards people, particularly those with disabilities, from loss of amenity;[33] protects other property from damage; and facilitates efficient use of energy."[34] One such matter was moisture, where the performance statement required that "roofs and exterior walls shall prevent the penetration of water that could cause undue dampness, or damage to building elements."[35] But building owners were free to use whatever materials or methods they wished to achieve this outcome, providing they complied with the Code.

Owners could demonstrate Code compliance in several ways. They could comply with "approved documents" authorised by the Building Industry Authority. These "acceptable solutions and verifications" were effectively a suite of technical standards based on the old prescriptive standards. Alternatively, owners could develop or adopt "alternative solutions". These were one-off or innovative building materials, designs or methods that were not set out in the approved documents, but which nonetheless met the requirements of the Building Code. Compliance was decided either by the building consent approvals issued by territorial authorities or building certifiers, or (if there was any dispute) by BIA determination.

To help with this process, designers and contractors could provide "producer statements" confirming that a proposed alternative solution complied with the Code. The BIA could also accredit products and processes that had first been appraised by the Building Research Association of New Zealand (BRANZ) or other qualified organisation. Once the product or process had BIA accreditation, it was deemed to be Code compliant. If there was any doubt about compliance, the BIA would make a formal ruling.

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[32] Department of Internal Affairs, *A Constructive Guide to the New Zealand Building Act*, CCH, Auckland: 1992, pvii

[33] Amenity is defined in the Act as "an attribute of a building which contributes to the health, physical independence, and well being of a building's users but which is not associated with disease or a specific illness".

[34] Preface to the New Zealand Building Code Handbook, s 1.1.4 and 1.1.5, quoted in Report of the Overview Group on the Weathertightness of Buildings: Addendum to Section 3, 31 October 2002, p6

[35] Quoted in Background note: Leaky buildings, Parliamentary Library, 6 November 2002, p5

Trends in building and housing

The move to a less prescriptive building control system was not the only radical change in the building sector in the early 1990s.

Traditionally, New Zealand's housing stock was fairly homogenous – detached weatherboard or brick-clad homes on relatively large sections. But influenced by overseas examples and new lifestyle aspirations, many New Zealanders now sought something different. An increasingly popular option, despite the obvious differences in climate, was the Mediterranean-style home. These "low maintenance" homes particularly appealed to people in or near retirement. They were characterised by monolithic (seamless) plaster finishes; flat roofs without eaves; parapets and balconies; and often complex building forms. New building materials and technologies were developed to meet this fashion, such as monolithic panel cladding systems. During the 1970s and 80s, fewer than 10 percent of new homes used Mediterranean-style monolithic claddings. Between 1990 and 2002, they featured in about 40 percent of homes, including 80 percent of apartments.[36] There was also a massive increase in demand for condominium-style living. Property developers were quick to respond, and multi-unit dwellings sprung up on confined inner city sites and in new suburbs.

The building industry was changing too. Traditionally, a new home was drawn up by an architect, draftsperson or builder; the architect or builder ensured compliance with consent processes and supervised the work. The builder employed skilled carpenters and labourers, many highly trained and qualified, who carried out all but the most specialised tasks (such as plumbing and electrical work). The builder also employed and supervised any sub-contractors, who were usually well known to the principal contractor. "An intimate professional relationship prevailed between owner, designer and builder. There was a tacit sharing of responsibility between all three."[37]

By the early 1990s, though, the construction of new dwellings was increasingly driven by property developers. An architect or draftsperson might be employed only to prepare the initial drawings needed to gain building consent. A project manager would usually be engaged, often fulfilling the traditional role of the building contractor. Then there would be an array of "labour-only" sub-contractors – cladders, flashers, tilers – "who are often not well known to the main contractor and even less to the project manager and developer."[38]

If the way houses were built was changing, so too were the skills of those building them. The state-funded apprenticeship training board had been disestablished, competency-based unit standards replaced the time-based apprenticeship system, and the number of apprentices plummeted. There was nothing stopping untrained and inexperienced people from building houses: New Zealand remained one of the few countries where builders (unlike electricians or plumbers) did not require any kind of registration or licensing. There were also questions about the competence of building certifiers and inspectors. Although most had practical trades backgrounds, there was no qualification or training specific to their important roles under the new *Building Act 1991*.

[36] 'Where the rot really set in', *New Zealand Herald*, 10 October 2002
[37] Report of the Overview Group on the Weathertightness of Buildings, 31 August 2002, p8 ("Hunn Report")
[38] Hunn Report, p9

The balloon goes up

In 1994, Greg O'Sullivan, director of Auckland building surveyors Prendos, warned in the *New Zealand Herald* of a "potential time bomb" involving leaks and rot in new stucco houses[39] A few years later, Prendos directors began "bombarding" the BIA and BRANZ with warnings about the problems, culminating in 1999 with predictions of a possible "Cave Creek"[40] disaster involving rotting decks and balconies unless the BIA took coordinated action. A major concern was the use of new, largely untried cladding systems attached directly to wooden framing, and the decision to allow untreated kiln-dried timber – which rotted far more quickly than treated timber when it became wet – to be used for framing. If cladding was poorly detailed or installed, water could readily seep in, soak the timber and promote fungal decay. Prendos suggested that builders allow a gap between cladding and framing to allow water to drain away. They also called for a return to treated timber.

But the BIA did not take either step, nor move to tighten the rules on installing claddings; in fact, it did not even answer some of Prendos' letters. The BIA said the building cavity proposal created "an unjustifiable increase in cost to the industry" and was "an option the consumer can make by choice." Reintroducing treated timber would be "a backward step."[41]

Others in the industry also expressed alarm. In 1999, Dr John Kininmonth, chair of the standards review committee that had permitted the use of untreated timber in 1995, called for a rethink. Previously, all radiata pine framing used on dwellings was chemically treated with boron to protect it from insects; this treatment also made it more resistant to rot. But his committee had been persuaded by arguments that treated timber caused delays onsite as it had to dry out before use, and continued to move as it dried. Timber manufacturer Carter Holt Harvey had also lobbied for untreated timber to be allowed as part of its move to become "chemical-free". According to the *New Zealand Herald*, there was another compelling argument for untreated timber: it was far cheaper. "Industry sources say rival suppliers had their doubts, but could not afford to hold out against Carter Holt's cheaper product."[42]

However, when Dr Kininmonth's committee approved the use of untreated timber (the decision was not unanimous), they expected it to be introduced gradually and carefully. He told the *New Zealand Herald* he was "amazed – and later horrified – to see it take over so fast and be used incorrectly in places such as balconies, which were exposed to the weather."[43]

What was happening in New Zealand was not unprecedented. Since the mid-1980s, similar problems had affected houses and apartments using monolithic cladding in several parts of North America. An estimated 52,000 homes were affected in Vancouver, with total repair costs of up to C$3 billion. British Colombia's response was not only a commission of inquiry, but a moratorium on the use of a particular cladding type and eventually a new good practice guide. A provincial Homeowners Protection Act was introduced in 1998. [44]

Back in New Zealand, the media featured increasingly alarming stories of homeowners struggling with new homes that were leaky, rotting and unsafe (*Exhibit 2).* Greg O'Sullivan

[39]See 'Where the rot really set in', *New Zealand Herald*, 10 October 2002. ("Rot") Stucco is a solid plaster finish.
[40] Referring to the disastrous collapse in 1994 of a viewing platform built above a chasm. Fourteen young people died. Full details are in the ANZSOG case study: Cave Creek: a national tragedy (2004-02.1)
[41] Rot
[42] Ibid
[43] ibid
[44] Background note: Leaky buildings, Parliamentary Library, 6 November 2002, p21

said some were "in deep despair, on drugs to overcome depression. I've seen marriages strained and people almost in hiding and shame because they have a rotten home."[45] As insurance companies did not generally insure against conditions that caused progressive deterioration, such as rot, homeowners' only chance of redress was litigation. However, there was nothing to stop unscrupulous developers or builders from liquidating their companies "to avoid claims and actions from dissatisfied purchasers. Evidence of such practice abounds."[46]

Finally, eight years after the alarm was first raised, with the Clark Labour-led government elected in 1999 in power, the Building Industry Authority announced a three-person Overview Group to investigate "widespread claims that new buildings are failing to stay weathertight."[47] Industry sources estimated at least one in 10 new homes – 2,000 of the 20,000 built each year – were affected, with repairs topping $1 billion.[48]

The report of the BIA Overview Group on Weathertightness 2002

The Overview Group's report (known as the "Hunn Report") made 20 recommendations, some urgent. The first – that the BIA issue a national safety warning about the risk of rotting balconies – was acted on immediately.

The report identified no single cause for leaky buildings, but said a "confluence of factors" had made systemic problems manifest.[49] Many related to new products and methods which the Building Code allowed but gave no guidance about their use. As a result, monolithic cladding systems had been used outside their specifications or installed incorrectly, allowing water to seep in. Untreated framing timber had rotted when moisture penetrated the building envelope. Insufficient or non-existent metal flashings had allowed water to enter at junctions and openings. Sealants had been misapplied or were inadequate.

At the same time, the knowledge, skills and judgment of professionals and tradespeople had not kept pace with the new technologies and products. Skill levels on site were perceived to be declining. The "traditional 'belt and braces' approach to construction practice", which demanded a second line of defence to keep water out, had been lost.[50]

Aspects of the building control system were also responsible. The Approved Documents dealing with timber durability and external moisture "were exceedingly light on detail and lack any objective or quantitative guidance."[51] The formal BIA product accreditation system allowed for in the Act did not work; in fact, there had been only 15 accreditations in more than a decade. Product manufacturers instead sought BRANZ appraisal certificates that were granted through a less rigorous process relying heavily on suppliers' trade and marketing literature, and seldom set out a product's scope and limitations. Although BRANZ had undertaken 26 appraisals of cladding systems, the Overview Group was not aware of any "specific testing ... relating to weather penetration of the building envelope."[52]

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[45] 'Committee hears how rot set in', *New Zealand Herald*, 8 November 2002
[46] Hunn Report, Addendum to Section 3, p10
[47] Media release, BIA, 25 March 2002. Available at www.dbh.govt.nz/whrs-media-20020325 , accessed 20 September 2011
[48] 'Toxic rot crisis in new homes', *New Zealand Herald*, 13 April 2002

[49] Hunn Report, p16
[50] Hunn Report, p10
[51] Ibid, Addendum to Section 3, p12
[52] Ibid, p28

The Overview Group criticised consent authorities for accepting a "minimal level of detailing, particularly with regard to weathertightness" in the drawings and specifications that accompanied building consent applications.[53] Inspections were often cursory or insufficient.

The reviewers also took issue with the Department of Internal Affairs' assertion that the Building Act's philosophy was to "minimise compliance costs". Did this refer specifically to the administrative cost of compliance, or to the overall cost of ensuring that design and construction complied with the Code? There was anecdotal evidence that the BIA had told building officials to "avoid putting inflationary pressure on building costs." Such cost-cutting attempts, which focused solely on the initial capital cost of constructing buildings, overlooked whole-of-life costs, said the reviewers. "This could compromise the long-term value of dwellings and result in a lower value housing asset base in New Zealand."[54]

In an addendum to their main report, released two months later, the Overview Group also tackled the role of the regulations and the regulator. This was welcomed by many in the industry who felt builders had been singled out for blame. Now the Overview Group pointed the finger at the BIA too, saying it was not meeting the needs of the industry or the public. It interpreted its responsibilities too narrowly, was hard to access, slow to respond, defensive, and too vague in its advice and rulings. The publicly-funded research organisation BRANZ (which also conducted research for industry clients on a commercial basis) came under fire too. Weathertightness research had been slow to gain momentum because of insufficient funding and "a reluctance to believe that our building products could be seriously inadequate". The group called for a research programme to be established that was independent of commercial interests, and it identified eight areas for immediate attention.

As for the Building Act, the group said it was "very much a product of its time and the laisser-faire philosophy"[55] but nonetheless fundamentally sound. There was general industry support for the performance-based approach and no desire to return to more prescriptive controls. However, they said certain deficiencies in the Act, many quite subtle, had probably contributed to the current problems.

First, neither the Act, the Building Code, nor the Approved Documents gave sufficient emphasis to weathertightness and durability requirements. The reviewers stressed that "housing is not just another commodity. It has a special call on the Government's attention and the regulatory framework must reflect this – it cannot be left to market forces alone."[56]

Second, the regime was light-handed and overly reliant on "voluntary arrangements, such as market forces, self regulation or self-interest."[57] Such arrangements could probably be relied on if all parties acted professionally, exercised their duty of care appropriately, and correctly interpreted the building controls. But this was an unrealistic ideal, said the Overview Group, meaning a higher level of regulatory control was justified.

Finally, the Overview Group said some of the original principles underpinning the Act should now be revisited – the notions that "every control provision should represent a balanced position between acceptable cost and acceptable risk," that "the control system simply creates

[53] Ibid, p21
[54] Ibid, p19
[55] Weathertight, Addendum to Section 3, p4
[56] Ibid, p9
[57] Weathertight: Addendum to Section 3, p10. Here, the reviewers are quoting the Building Industry Commission, 1990.

the basic framework of safeguards within which people can make their own choices," and that "the control authority, the owner and the producer all share the responsibility for efficient operation of the system." Given the present crisis, were these principles still valid?

The state steps in

Even though the exact extent of the leaky home problem was still unknown, the Overview Group called for it to be dealt with urgently, systematically and comprehensively. The immediate Government response included establishing a select committee inquiry that reached conclusions similar to the Hunn Report. Responsibility for the policy and regulatory functions of the building control regime transferred from the Department of Internal Affairs to the Ministry of Economic Development. The review of the Building Act 1991, begun in 1999, was expanded. The Government agreed that the Act's fundamental objectives had resulted "in a relatively heavy weighting on the minimisation of front-end costs."[58]

Since then, successive governments have sought, first, to resolve and remedy the problems of the past. Looking ahead, they have also initiated extensive regulatory and structural reforms.

Resolution for homeowners?

The Labour-led coalition government established the Weathertight Homes Resolution Service (WHRS) at the end of 2002 to provide mediation and adjudication services. It was to be an inexpensive, efficient "first port of call" for homeowners. If owners could not reach a settlement through mediation, they could pursue litigation – although it was hoped the WHRS "would keep as many people out of court as possible." [59]

But within two years, the government was admitting shortcomings in the WHRS. People were spending more on lawyers than on getting their homes fixed.[60] The service's processes were too slow; hard-up homeowners found themselves pitted against high-powered lawyers representing developers, builders, designers and sometimes the BIA; respondents sometimes avoided mediation altogether by liquidating their companies. There were repeated efforts to streamline the WHRS process, including the establishment of a separate tribunal.

Meanwhile, with many homeowners choosing to pursue court action anyway, the potential burden on the Crown (on behalf of the BIA) mounted. But in 2005, when claims against the Crown had grown to almost $40 million,[61] the Court of Appeal ruled that it could not be held liable for leaky homes. Critics said this did not absolve it: "The problem is simply too large for the state to ignore," said a major newspaper. "That is also to ignore the role of politicians in passing into law the *Building Act 1991*, which radically changed the industry and allowed for the new materials and new designs that are at the heart of the leaky buildings problem."[62]

The true magnitude of the problem was finally quantified following a further change of government. At the end of 2009, PricewaterhouseCoopers found that 42,000 dwellings built since 1992 – possibly as many as 89,000 – were likely to be leaky homes. The repair bill was estimated at $11.3 billion.[63] Maurice Williamson, appointed as Building and Construction Minister in the National-led government elected as the Global Financial Crisis hit in late

[58] Minister of Internal Affairs, Submission to the Inquiry into the Weathertightness of Buildings in New Zealand, 31 December 2002, p7
[59] George Hawkins, 'Mediation service to be established for leaky homes,' media release, 2 October 2002
[60] Lianne Dalziell, 11 December 2003 [Volume 614, Page 10654]
[61] '$40m leaky building claims', *Dominion Post,* 27 October 2005
[62] Editorial: End leaky homes pass-the-parcel,' *Dominion Post,* 1 July 2009
[63] 'Weathertightness – estimating the cost', Department of Building and Housing: Wellington, 2009.

2008, admitted this would be a huge drain on the Government's coffers. "A Government who's running very large surpluses would still struggle to find the money to help with this. But a Government who's running deficits – and has a forecast track of deficits for many years out – has to just sit there with its head in its hands, saying; 'Well, I just don't how to do this'."[64] Worse was to come when Christchurch was hit by two devastating earthquakes in September 2010 and February 2011. Now there were three national disasters, each demanding a multi-billion dollar response.

In July 2011, the government announced its $1 billion financial assistance package for the owners of leaky homes, complementing the existing WHRS. The Government and local authorities would each contribute 25 percent towards the cost of repairing leaky homes built in the last 10 years: homeowners would pay the rest. By October 2011, the government had already paid out $18 million and councils a further $5 million.

Structural and regulatory reform

Moves to reform the *Building Act 1991* proceeded in parallel, beginning with a new act passed by the Labour Government in 2004. "Designing and building it right first time" would be the catch-cry of the new regime, said the minister responsible.[65] The new act provided for greater consumer protection, more robust building controls, a strengthened product accreditation system, improved compliance and enforcement measures, and more competent building practitioners. A licensing regime for builders would be established.

The *Building Act 2004* also spelled the death-knell of the Building Industry Authority, whose alleged failure to forestall or respond to the leaky homes crisis had provoked a storm of criticism. It was now absorbed into the new Department of Building and Housing, and its role made more accountable and proactive.

Critics saw the 2004 Act as a desperate U-turn away from performance-based regulation by a government scrambling to restore public confidence. Some said that the pendulum had now swung too far towards prescription, thus increasing building costs, stifling innovation and allowing unwarranted ministerial control in the work of the regulator. The new Act was also called "a monument to the failure of the laissez-faire free-market philosophies of the 1980s and 1990s, ... the naive ideologies of the 1980s Labour Government, known as Rogernomics, and of the 1990s National Government, known as Ruthanasia... to the naive idea that if one leaves things to market forces, everything will turn out all right."[66]

It was generally acknowledged that building quality improved after 2004, with revised regulations helping to stem the spread of leaky buildings.[67] But after five years, the National Government, looking to minimise the cost of compliance without compromising the quality of construction, announced a review of the 2004 Act.

The review revealed some familiar concerns – the building control system was slow, costly and heavily reliant on building consent authorities who were now excessively risk averse. There were problems in ensuring responsibility sat in the right place. Local authority decision-making was inconsistent across the country. Building consent authorities were reluctant to approve novel designs, processes or products. Consumer protections were

[64] Leaky building bill is Govt's Budget monster, *New Zealand Herald*, 27 February 2010
[65] Lianne Dalziel, A Bill to revamp the Building Act 1991 is tabled, media release, 28 August 2003
[66] Murray Smith, Debates, 4 September 2003 [Volume 611, Page 8425]
[67] 'Cost-effective quality', Department of Building and Housing, Wellington 2010, p6 ('Cost-effective quality')

weak.[68] A change in culture and behaviour across the entire building control system was needed.[69]

To address these shortcomings, the Government embarked on a reform programme called the Better Building Blueprint. The Licensed Builders' Practitioners Scheme became established. A Multiproof service was launched, enabling standardised building designs to be declared code-compliant only once. Two amendment bills were introduced, one providing for risk-based consenting (meaning the checks and inspections required during building reflected the complexity of the work) and the other proposing tighter consumer protection measures.

There were calls for greater public protections in other areas too. A series of events, including the collapse of 60 finance companies, the deaths of 29 miners in a West Coast mine explosion, and the deaths of 185 people, mainly in collapsed buildings, during the 22 February 2011 Christchurch earthquake, suggested that more than 20 years of "hands-off" regulation had left New Zealanders vulnerable.

However, the Government's intention was clear: there was to be no retreat from performance-based building controls. Over-reaction to the leaky building crisis had seen controls become "cumbersome and costly" once more, said Maurice Williamson. "We've lurched to the other extreme in a few short years... Low risk buildings such as a simple home are treated very much the same as more complex projects. Councils are overly cautious because they bear too much of the blame if things go wrong. It's a risk-averse, one-size-fits-all approach."

He did not advocate a return to the "light handed" days of the past. The key was to develop a balanced system, whereby competent designers and builders could do their job without unnecessary red tape, the requirements of consent authorities reflected risks, and consumers could have confidence. By cutting costs ("not cutting corners"), the minister said the time and cost of building new homes could be significantly reduced, benefiting the economy by around $112 million a year.[70]

[68] Cost-effective quality, pp5–7
[69] http://www.dbh.govt.nz/buildingactreview
[70] Announcement on Building Act Review and Licensed Building Practitioner scheme, 27 August 2009

Appendix 1: The leaky building crisis – timeline of events to 2011

1935	NZ's first comprehensive building controls introduced following the disastrous 1931 Hawkes Bay earthquake and fire.
1980	The Building Regulations Impact Group is formed, a private sector group seeking the rationalisation and cost-justification of building controls. They make submissions to the Prime Minister in 1980 and 1981.
1983	The Government appoints two experienced public servants, Peter Scoular (then City Engineer, Christchurch) and Jack Searle (former secretary of Internal Affairs) to review whether the building industry is over-regulated. The reviewers release a discussion document proposing a national building code.
1984	The reviewers release a second discussion document, outlining the design of a new performance-oriented building control regime.
1986	The Government appoints a Building Industry Commission (BIC) to continue the work begun by the review team.
1990	The BIC releases its report, 'Reform of Building Controls': it becomes the foundation of the new regulatory regime.
1991	The Building Act 1991 is enacted. It brings into force a national performance-based Building Code, and establishes the Building Industry Authority (BIA) as an independent statutory body to oversee the building control regime.
1993	1 January: The Building Code, as contained in the Building Regulations 1992, comes into force.
1994	A director of Auckland building surveyors Prendos warns in the *New Zealand Herald* that serious leaks and rots are being found in new stucco houses.
1995	A standards review committee approves the use of untreated timber in framing. The BIA recognised timber treatment standard NZS3602 as an "Acceptable Solution" deemed to comply with the Building Code, in 1998.
1999	Prendos warns the BIA of a possible 'Cave Creek' disaster involving rotting decks and balconies; it calls for a coordinated response and new rules.
February 2002	The BIA appoints an independent Weathertightness Overview Group to investigate "widespread claims that new buildings are failing to stay watertight." Chaired by former State Services Commissioner Don Hunn, it also includes architect David Kernohan and engineer Ian Bond.
August 2002	The BIA releases the report of the Weathertightness Overview Group (the Hunn Report). It makes twenty recommendations, including that a national safety warning about rotting balconies be issued.
October 2002	The *New Zealand Herald* publishes articles revealing that monolithic-clad homes built in the previous decade have serious problems with rot.

	Consumer magazine estimates that 75,000 to 90,000 of the 220,000 houses built over the preceding decade are at risk of weathertightness problems. The Government: • announces a Select Committee Inquiry to further investigate issues raised by the Weathertightness Overview Group; • forms a Ministerial Committee to coordinate the response to the Group's report; • transfers responsibility for the building control regulatory regime from the Department of Internal Affairs to the Ministry of Economic Development • expands the scope of the review of the Building Act 1991 • establishes the Weathertight Homes Resolution Service (WHRS) to assess, mediate and adjudicate on claims made by the owners of leaky homes. The Weathertight Homes Resolution Service Act is passed shortly afterwards.
March 2003	'Weathertightness of Buildings in New Zealand', the parliamentary select committee's report into the leaky home problem, is released
December 2003	The Government admits to concerns about the performance of the Weathertight Homes Resolution Service, including that its processes are too slow (Lianne Dalziel, Debates, 11 December). According to the *New Zealand Herald* (Sep 1 2004), of the 2273 claims lodged since late 2002, only 152 have been resolved.
April 2004	Acceptable Solution B2/AS1 is revised to require the use of treated timber where there is any risk of water getting into the timber frame. New housing built after this date has to incorporate treated timber, dramatically reducing the effects of water that might get through the cladding.
November 2004	The BIA becomes part of the new Department of Building and Housing
April 2005	*Building Act 2004* becomes fully effective
July 2005	A new Acceptable Solution for weathertightness design (E2/AS1) provides technical advice for reducing the risk of weathertightness problems. It requires cavities between claddings and wall framing in all but low-risk situations.
December 2005	The Court of Appeal strikes out a $20 million claim made against the Building Industry Authority by owners of the Auckland apartment complex Sacramento, severely affected by leaky building problems. The owners sued the BIA (and others, including BRANZ), saying it owed them a duty of care over the cladding system used when the complex was built, and also for negligence in its supervision of the building certifiers and in allowing them to have inadequate insurance cover. The Crown, as successor to the BIA's liabilities, had appealed an earlier High Court decision.
April 2007	The Weathertight Homes Tribunal, a judicially independent tribunal providing adjudication for weathertightness claims is established under the Weathertight Homes Resolution Services Act 2006. The act also introduces other measures aimed at improve the effectiveness and efficiency of the WHRS and deliver better outcomes for owners of leaky homes.
November 2007	The Licensed Builder Practitioner Scheme is introduced. It sets out a regulated process whereby building practitioners can become LBPs by demonstrating their ability to meet industry-consulted competencies. It covers designers, carpenters,

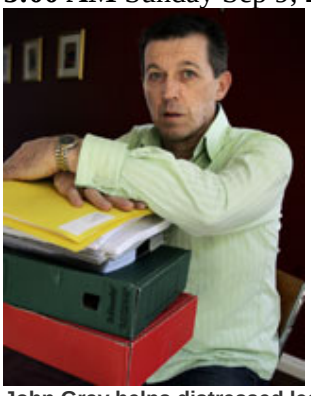
	external plasterers, brick/blocklayers, foundation specialists, roofers and on-site supervisors or managers (registered architects, plumbers and chartered professional engineers are also deemed to be licensed). From 1 March 2012, certain critical building and design work relating to the structure or moisture penetration of homes can only be carried out by LBPs.
December 2009	PricewaterhouseCooper's government-commissioned report, 'Weathertightness – estimating the cost', is released. It estimates the number of leaky homes is between 22,000 and 89,000. The "consensus forecast" is 42,000, at an estimated repair cost of $11.3 billion. This dramatically increases PWC's 2005 estimate of 12,000 affected homes, costing $1 billion. The *New Zealand Herald* alleges the cost could double once other affected buildings (eg schools, hospitals, retirement homes) are taken into account (27 February 2010). Public health specialist Dr Philippa Howden-Chapman conservatively estimates the mental and physical health cost of the leaky homes crisis at $26 million.
February 2010	The Department of Building and Housing launches the MultiProof service. A MultiProof approval confirms that a specific set of building plans and specifications complies with the New Zealand Building Code. This means 'volume builders' no longer need to get the same building designs assessed repeatedly by individual building consent authorities for Building Code compliance.
July 2010	*Building Amendment Act 2010* comes into force. It includes changes to the determinations provisions in the *Building Act 2004* (such as extending the range of local authority decisions which can be the subject of a determination), and some technical adjustments to other sections of the 2004 Act.
November 2010	Building Amendment Bill No 3 introduced to Parliament. It clarifies accountabilities and provides for risk-based consenting.
December 2010	Schedule 1 of the *Building Act 2004* broadened to allow for a wider range of building work to be completed without a building consent.
July 2011	The Government announces a $1 billion relief package for owners of leaky homes. Central Government will make a 25 percent contribution towards repair costs, and the local authority may contribute a further 25 percent. Claimants need to demonstrate they can pay the remaining share through a bank loan, partially underwritten by the government in a loss-sharing agreement reached with the major banks. The funding can be accessed only if homeowners lodge their claims within ten years of their home being completed.
September 2011	Building Amendment Bill No 4 introduced to Parliament. It proposes consumer protection measures to help people building or renovating homes to hold their building contractor to account, and to get faults fixed quickly and more efficiently.

Exhibit 1A

nzherald.co.nz

Leaky homeowners on suicide watch

By Jane Phare
5:00 AM Sunday Sep 9, 2007



John Gray helps distressed leaky home owners. Photo / Doug Sherring

At least one owner of a leaky home has taken his own life and 10 others are on suicide watch, while hundreds of others are facing bankruptcy and wrecked lives as aggressive body corporates hound them for thousands of dollars to fix leaky buildings.

Stacked atop their broken housing dreams comes ill health, depression, anxiety and sleeplessness as they watch debts they cannot possibly pay balloon with penalty interest. Leaky home advocate and Air New Zealand pilot John Gray puts in hundreds of hours a month helping desperate apartment and multi-unit complex owners who can't afford their share of bills run up by body corporates. Legal help is equally unaffordable.

Gray predicts the leaky building human toll will be enormous. He knows at least 10 people on "suicide watch" and many more who are seriously depressed. The *Herald on Sunday* understands that earlier this year, a North Shore man, unable to pay his share of repairs to a multi-storey apartment, committed suicide. Gray, who chairs the Leaky Homes Action Group, is almost overwhelmed by the number of distraught people worried about threats from body corporates over unpaid repair bills.

He has lashed out at some "self-serving" body corporates, investor owners who can afford to pay for repairs showing scant regard for owners struggling to pay mortgages, let alone the thousands extra for leaky building repairs. He says they have overstepped their jurisdiction and asks whether they have the right to demand remedial work be carried out not only on common property but on private property.

Last week, Parnell apartment owner Wayne Young was staring down bankruptcy after members of his apartment block's body corporate applied for summary judgment against him. Young, who can't afford a lawyer, is being helped by Gray. Young filed an affidavit disputing legal aspects of the case and was granted a High Court adjournment until October 3.

Gray argues body corporates are morally obliged to find solutions to help apartment owners. He suggests they should consider taking out loans to give poorer apartment owners more time to pay instead of being heavy handed. Instead, body corporates are railroading through decisions to fix entire buildings immediately and threatening some apartment owners with legal action when they can't pay their share. Budget blowouts mean that even if the body corporate is awarded a settlement, the final cost of repairs often escalate to two or three times the original estimate, he says.

In the case of an Ellerslie six-storey complex, the repair budget blowout was $5.5 million higher than the amount settled for. The repair costs were 200 per cent higher than the original estimate. "Now, of course, those owners can't bridge the gap. They can't go back for more money because the settlement has been done."

Gray expects several owners will face bankruptcy in that complex alone. He is currently dealing with 35 apartment owners on the verge of bankruptcy and expects more. "There will be a domino effect. You get one owner falling over, then the financial burden has to be carried by all the other owners. Once the work is started the body corporate is bound by the Construction Contracts Act to honour the contracts and make all payments. In the worst-case scenario all the owners could be bankrupted."

Gray said the human cost was mounting. "People have had mental breakdowns over this. They've been hospitalised and put into special care under the Mental Health Act. There are so many that are the walking dead in so far as how they have been affected. "These poor sods are struggling to save their houses and their sanity. One woman has been in and out of hospital." Now she had given up and was waiting on bankruptcy.

Owners of a 20-storey leaky apartment building in Auckland City have just got the news it will cost $8 million to fix. Two Mt Eden complexes were so badly rotted they had to be propped up to stop them falling down. They were almost "beyond economic repair", Gray said and "serious legal money" would be needed to find a way around that problem.

Leaky Home Saga

* "Leaky Building Syndrome" came to light in 2002 after new buildings began leaking and rotting.

* Causes include badly installed monolithic cladding; poor construction that didn't allow for drainage or drying; inadequate rules; lack of expertise with materials; untreated timber.

* 15,000 leaky homes nationwide, half in Auckland City.

* Leaky Homes Action Group claims at least 7500 homes in Auckland City will cost an average of $200,000 to repair.

* Although courts are finding councils owe a small portion of settlements, many builders and developers have collapsed or gone into liquidation, leaving councils to bear the brunt

* Waitakere City Council was forced to pay $250,900 to Hobsonville home owner Colleen Dicks.

* Last month, a law gave owners the right to sue for general damages.

By Jane Phare

Exhibit 1B

nzherald.co.nz

Couple demolish their rotting home

By Anne Gibson
4:00 AM Thursday Jan 29, 2009

Nicky and Chris Wordsworth in front of the new house they are having built on their Torbay section. Photo / Paul Estcourt

Thousands of rotting homes are expected to be demolished in the next two years and one North Shore couple have just taken this rare and drastic step. Chris and Nicky Wordsworth have demolished their decaying $310,000 house but an expert predicts many more places will quickly follow. The Wordsworths say they are unable to seek a single cent in compensation and have cut their losses. It only took two days in November for the disillusioned British migrants to be rid of their leaky and severely defective house in Torbay's Ashley Ave, a property QV lists as being worth $550,000: a $310,000 house now totalled standing on a $240,000 section. Few of an estimated 80,000 leaking houses nationally have been destroyed as owners attempt repairs but even those are failing in many cases. John Gray, president of the Homeowners and Buyers Association, said he knew of only six houses worth about $4 million in Auckland, Hawkes Bay, Wellington and Christchurch which had been razed but he expects thousands more in the next two years.

"It's going to become more common because houses which are now inside the 10-year time limit will be found to be insidiously rotting. There won't be a choice. The scope and cost of work will put owners in a position where it will be more cost-effective to demolish," said Mr Gray, whose organisation is helping 2000-plus leaky-home victims. Thousands of houses now need such extensive repairs that owners would be forced to rebuild rather than fix, he said. As the Wordsworths watched their house being annihilated, they felt vindicated because they saw how extensive the rot was. Once cladding was ripped off, internal wood framing around windows and doors was black, Mrs Wordsworth said. They were so disillusioned with the house they bought in 2006 after they left York that they have contracted G.J. Gardner to build them a new place which they hope to move into during April.

Pre-demolition, they had wasted $40,000 attempting repairs to a crumbling deck on the family house which had funnelled torrents of water directly into a daughter's bedroom during one drastic downpour. Mrs Wordsworth was in England when she learned that so much water had poured through a light fitting that a bucket could not keep apace so a pipe was fitted to divert the downpour outside. The house was only built this decade and was fully compliant with a code compliance certificate issued by a private certifier.

"We have been to see solicitors and everywhere we turn we come to a full stop. Everyone who was involved in our house appears to have flitted the country or gone into liquidation. "Eventually, after all the stress, we decided to just go ahead and fix the house. Once we researched it, we found that it wasn't much difference to knock it down and rebuild. To pay for some of it we have cashed in our pension and the rest will be additional to the mortgage we already have," she said.

The couple had a full builder's inspection report before buying the house as well as read-outs from moisture metres which showed no issues. The Weathertight Homes Resolution Service offered little hope and a barrister advised the couple it would cost about $150,000 in court costs to take a case. "Both my husband and I feel really let down by the systems in New Zealand and feel angry that no one is taking responsibility. The house was only five years old when we bought it and we had only been living in it for five months when it started to leak.

"Although we don't regret moving here, we both feel this has changed our whole lives and feel very much alone as everyone has washed their hands of the problem. Deep down I hope there is light at the end of the tunnel in relation to this mess and the more people we talk to, the better chance we have of getting ourselves heard," she said. Mrs Wordsworth was just one of many leaky-home victims who this week contacted the Herald. But Mr Gray said the couple could have got money had they contacted his organisation which would have charged only about $20,000 and used the Ministry of Justice's Weathertight Homes Tribunal to get compensation. North Shore Council could well be liable, Mr Gray said, even though a private certifier was used. "Now they've demolished, it's too late."

GROWING ISSUE

Weathertight Homes Resolution Service:
* Had 5646 claims by January 4, 2009
* These were lodged on 6399 properties
* Assessments completed on 6056 places
* Eligibility of 185 claims being assessed
* Resolution being pursued on 1572 claims
* Auckland City has 966 active claims
* North Shore has 230 claims, Waitakere 353

APARTMENTS 'NO LONGER LEAKY'

Apartment owners whose places are at the heart of a leaky building court ruling are unhappy that the case has put new focus on their properties. Matthew Darby and Daryll Hutchison own apartments at 3 Laxon Terrace, a Newmarket property developed by Greg Nielsen who the High Court at Auckland has ruled must pay $1.1 million in compensation for repairs. But the owners said all the places were fixed and it was damaging to find them in the public spotlight. "The buildings have now been completely repaired and they are no longer leaky homes. The repair and re-cladding was completed approximately two years ago," Mr Darby said. "The apartments were not poorly built and it was only the weather-proofing finish which was the problem," he said.

Justice Paul Heath took a different view, describing the complex in his judgment as "poorly built. Defective building work resulted in severe water ingress. The timber framing rotted", he wrote. Auckland City Council and Laxon Terrace's body corporate sued Nielsen, who denied liability.

By Anne Gibson

Exhibit 2

Common locations for leaks on post 1993 houses and apartments

1. Base clearance
2. Vertical control joints/cracks
3. Horizontal control joints
4. Horizontal joints – corners
5. Cladding base
6. Intercladding junctions
7. Sheet joints
8. Material quality
9. Cladding top
10. Decorative bands
11. Corners
12. Window jambs
13. Window sills
14. Window sill/jamb junctions
15. Window head/jamb junctions
16. Window heads
17. Raked/curved window heads
18. Garage door heads
19. Garage door jambs
20. Garage door jamb bottom
21. Parapet/roof junctions
22. Parapet tops
23. Parapet top corners
24. Rainwater outlets
25. Downpipe spreaders
26. Roof edge gutter
27. Wall/roof junctions
28. Apron flashing bottom
29. Roof to wall clearances
30. Other roof flashings/skylights
31. Inter-roof claddings
32. Inter-roof/wall junctions
33. Deck/wall junctions
34. Deck perimeter/wall junctions
35. Deck perimeter
36. Open balustrade/wall junction
37. Clad balustrade/wall junction
38. Clad balustrade top
39. Handrail fixings
40. Deck drainage/overflows
41. Balustrade/deck junction
42. Timber deck/wall junction
43. Pipe penetrations
44. Pergola fixings
45. Meter boxes/grilles

Note: Additional and/or different areas of risk apply to other design forms or materials such as solid masonry or masonry veneers, solid timber walls, timber subfloors and so on.

Defective chimney/ roof intersection and poor flashing detail on a raked window head

Cladding removed showing moisture damage

Defective window sill detailing:

Leaking deck – note no signs of the leaking or damage were visible

Leaking deck leading to extensive decay of framing timber

Source: Department of Building and Housing