

Cost effective quality: next generation building controls?

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ABSTRACT: In 2004 the New Zealand Government reviewed the New Zealand Building Act. The review was prompted by increasing concern at the lack of weather tightness evident in buildings constructed since the initial performance based Building Act was passed in 1991. Now, in 2010, some six years after the 2004 review and against a continued backdrop of non-performing leaking buildings, the Government is preparing to review the Building Act again.

This paper will provide a brief history of the controversy surrounding building under performance in New Zealand since the initial Act was passed. It will summarize the changes brought about by the 2004 Building Act. It will also discuss the reasons for the Government's desire to yet again initiate amendments, particularly in areas related to the exemption of minor works, low risk dwellings and the rationalization of building consent processes. The paper reinforces the view that changes lessening the degree of oversight by Building Consent Authorities (BCAs) to building work should proceed cautiously, and then only after the appropriate back up legislative and educational systems have had time to coalesce and prove their effectiveness.

1 INTRODUCTION

In 1996, five years after the introduction of the first nationally binding performance based New Zealand Building Code, a change was made to the NZ Standard NZ3602 to allow the use of untreated kiln-dried *pinus radiata* in timber house framing. This change, which was subsequently retracted in 2004, has had significant and long-term consequences for the NZ building industry in that it led to a period where moisture problems became the single most common reason for unsatisfactory building performance in New Zealand. (Murphy 2003)

The rapid uptake of new cladding materials in the 1980s saw a decrease in the use of the traditional weatherboard and brick construction here in NZ and increased use of both face sealed proprietary rigid sheet cladding systems and the once commonly used, but largely forgotten, traditional stucco cladding system. The upsurge in the use of these "new" cladding materials coincided with other changes in the building industry. The running down of the apprenticeship programme, a rise in the number of apartment buildings under construction and a corresponding move away from traditional fixed price contracts to other forms of construction procurement to meet the rapid growth in this particular corner of the housing sector, all combined to create a period of uncertainty that saw many operators handling new systems and materials in complex building forms without the necessary background and training.

The pre Building Act environment traditionally saw inspectorate attention during construction concentrated on the structural aspects of the building framework, typically the structural integrity of the flooring, walls (including bracing) and roof. Cladding integrity and the inspection thereof were not considered as important elements in the checking process. Cladding design and installation methods on the other hand, followed well-formulated design and build procedures using materials familiar to the industry. By and large, for these traditional brick and timber weatherboard structures, particularly where free of insulation, this approach to construction oversight was satisfactory.

The advent of more complex cladding systems, elevation profiles and larger, more complex structures within the domestic market in the 1980s and 1990s, along with the introduction of monolithic type face fixed cladding systems, cavity insulation and kiln dried chemical free timber studs meant this approach was no longer sufficient. Yet both designer and the local authority consent processor were slow to adapt to the fall off in construction quality.

Deficiencies in the external building fabric continued to become apparent as inquiry and debate over the quality of construction intensified. In 2001 a report by the writer commissioned by the Building Industry Authority (BIA) (Murphy 2000) that surveyed some 287 pre-purchase reports indicated some 60% of the dwellings inspected let in moisture through the cladding to an unacceptable degree. Whilst buildings in New Zealand had always leaked to some degree (NZ is a coastal climate and capable of extreme climate variation) what was different and new and picked up by the survey, was the significant percentage increase in cladding systems letting in moisture (compared to building defects) in the period following the introduction of the National Building Code in 1991. This can be clearly seen in Figure 1, where the graph columns indicating defects for the cladding case reviewed is to a similar proportion for all periods except the 1990s. In this last column the ratio of defects to the number of cladding cases reviewed increases significantly.

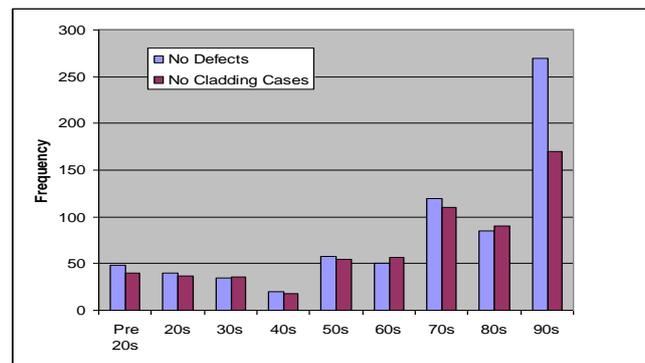


Figure 1: Defect v Cladding Cases

The societal factors briefly outlined above were not the only reason for building deficiencies. Causes identified in the report of the Overview Group in Weathertightness (Hunn 2002), a report commissioned by the Government in 2002 to investigate the causes of building failure due to moisture ingress, nominated a significant number of contributory causes including:

- Inadequacy in the Building Code and Approved Documents
- Inadequate documentation supplied for building consent.
- Insufficient checking at building consent stage.
- Inadequacy of building products, materials and components including evaluation of their suitability of fitness of purpose.
- Inadequate contract documentation
- Inadequate trade skills and supervision on site
- Lack of co-operation and sharing of responsibility on site.

1.1 Additional government initiatives.

The public reaction to the Hunn Report was such that Government felt compelled to put into place additional procedures designed to restore public confidence in the building industry. One of these was the Weathertight Homes Resolution Service Act 2002, which set up a framework for mediation and adjudication between owner, contractor and other stakeholders. This act was later replaced by the WHRS Act 2006, which came into force on 1st April 2007, creating in turn the Weathertight Homes Tribunal, a judicially independent Tribunal providing adjudication on matters of weathertightness.

Additional initiatives included the movement of the Building Industry Authority (BIA), a crown entity, from the Internal Affairs ministry to the more proactive Ministry of Economic Development. Not content with these changes, and facing strong criticism from the public and media over inadequacies in the BIA's role within the ongoing saga, the government in November 2004 established the Department of Building and Housing and absorbed the Building Industry Authority (BIA) functions into the new Department. Government intentions to tighten up controls associated with building and construction were signaled in March 2003 through this ministry, culminating in the introduction of a major piece of new legislation, the Building Bill was read in Parliament on August 29th 2003. The Building Act 2004 came into effect in November 2004. (Murphy 2004)

2 THE BUILDING ACT 2004

2.1 Summary of Changes

The Building Act 2004 was a reactive response to the criticisms inherent in the Hunn report of 2002 and saw a considerable tightening up of procedures and policies surrounding the implementation of building controls. These may be summarized as follows:

- **Changes to the Durability regime (B2/AS1) -timber treatment.**

These changes, re-instigating timber treatment requirements removed in 1996, met strong resistance from some quarters in the lead-up submission process, particularly from timber industry suppliers and millers who saw severe restrictions in the traditional use of the Douglas Fir species as a result of increased treatment requirements. There were other concerns, including environmental concerns, particularly amongst the users who were to handle the new levels of treated timber and others including the NZ Institute of Architects (NZIA 2003), who saw the move to more environmental friendly products as a step in the right direction:

There is nothing intrinsically wrong with using untreated timber, including untreated radiata pine, in any building or housing construction. ...[the only proviso would be that] if green or wet on installation, or if occasionally wetted after that, they should be allowed to dry out. (P.2)

On the other hand respected research institutions like Forest Research (Hedley 2002) strongly supported a return to a comprehensive treatment regime for *pinus radiata*:

Forest Research believes that the risk of decay or insect attack during the 50 years of required durability is too high to support the use of untreated radiata pine in structural applications (P.2)

- **Changes to Acceptable Solution E2/AS1 External Moisture.**

Revision of this Acceptable Solution within the Building Code was extensive and marked the first serious attempt to document in a prescriptive way standard domestic building practice since the Building Code was first introduced in 1991. Of particular note was the reintroduction to the building fraternity of the window flashing system, devices and systems largely lost to the industry since the introduction of the aluminum window in the 1970s and 1980s replaced the more traditional timber window profiles. Also significant was an attempt for the first time to access the degree of exposure of a particular building on a site based on the complexity of the elevation profile and its exposure to the elements, and to prescribe levels of compliance for the cladding system based on the results, a procedure that has seen the introduction of the drained cavity as an almost permanent feature of the domestic building envelope

- **Licensed Building Practitioner Scheme.**

A long term proposal to license Builders was introduced to redress the respective deficiency identified in the Hunn Report causes outlined above. The Licensed Building Practitioner's scheme, introduced in 2004 with the new Act and modified in 2010 is, for the moment, a competency based, and until March 2012, voluntary scheme that enables builders and trades people with a genuine track record "...to have their skills and knowledge formally recognized, whether they are trade-qualified or not." (Department of Building and Housing (C) 2010). Come March 2012 the consequences surrounding licensing tighten, with persons not licensed restricted from undertaking and signing off responsibility for certain types of building work, including, as can be expected, work associated with the construction of the weathertight cladding system, the primary structure, including foundations and framing, and the design of certain types of fire systems in small to medium sized residential apartments. In 2015 this competency based system moves to a qualification based one, with applicants after this date needing the appropriate trade qualification to qualify.

- **Territorial Authority Accreditation System**

A rigorous and comprehensive approval system, as outlined in the introduction, has replaced the *laissez faire* attitude of yesterday. An accreditation scheme regime for local councils (Territorial Authorities) instigated by the 2004 Building Act rewards competent Authorities and potentially removes the right to process building consents from the less able. It enables those displaying the appropriate competency skills to becoming building consent authorities (BCAs)

2.2 The Cost of Leaking Buildings

How successful this amended Act has been in terms of stopping the chronic decline in building standards is as yet hard to gauge. On-going public discontent over the continuing failure of claddings built in the later part of the 1990s, and the main reason for amending the Building Act in 2004, has kept the issue to the forefront politically and is no doubt a factor in recent attempts to again amend the Building Act. If it were to be judged, as indicated in Table 1, on estimates of the ever increasing cost to the economy of the ongoing social and physical costs of refurbishment, or assessed, as per the Covec Report (Irvine 2010) in a scale of natural disasters (figure 2), then it would be judged a distinct failure.

Table 1: Cost Estimate Comparison

Analysis Source	Year	Estimate no. homes with weather tightness issues	Estimated cost assessed in 2008 \$
PwC Report (2009)	2009	42,000	\$11.3 Billion
PwC Report	2005	12,000	\$1.1 Billion
CINZ (2009)	2000	11,270	\$890Million.

An assessment of the Amended Act's effectiveness based on money terms is of course unfair. The consensus indicates most of the damage has been done to buildings between the years 1992 leading up to the change in legislation in 2004. The Price Waterhouse Coopers research report, completed in 2009 was a recent attempt to bed down the costs to the economy of the long standing repairs likely as a result of systemic failure in the external cladding systems of residential buildings (Price Waterhouse Coopers 2009). PWC's estimate of \$11.3 billion for failure costs to 42,000 dwellings is a projected increase from earlier reports and suggests most of the damage is still yet to be reported or indeed repaired. This is because: problems are not yet manifest, owners are in denial or lack finance to attend to litigation to recover costs or make repairs, there are procedural obstructions in claims within multi-unit complexes and, of particular concern, the slower manifestation of problems in the drier areas of the country (PWC 2009:2).

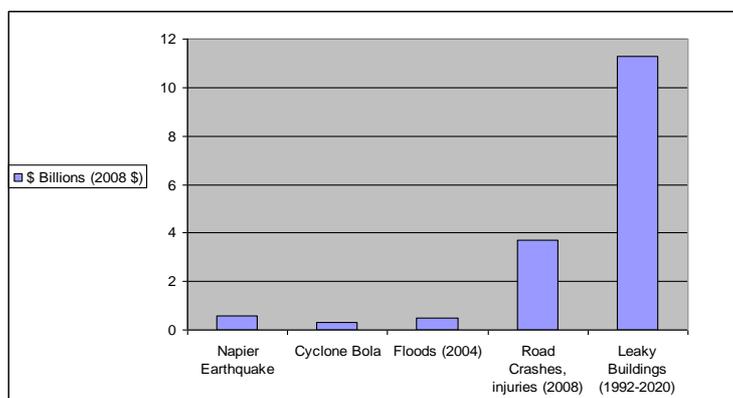


Figure 2: Cost Comparisons –Leaking Buildings (Irvine 2010)

It does however indicate some grounds for optimism (PWC 2009 3):

Failure rates since 2006 appear to be much lower than in previous years, suggesting changes in the regulatory requirements and building practices have addressed the major problems identified in the past and reduced the incidence of weathertightness issues.(p.3)

If this is so, it suggests that the many changes brought to the Building Act 2004 discussed in this paper have begun to bear results. If so, why would the current Government wish to change the Act again, six years after the last comprehensive review?

3 REVIEW OF THE BUILDING ACT 2004:

3.1 Terms of Reference

The reasons for the review appear to reflect apprehensions round the performance of the various stakeholders operating in this post 2004 environment. It also reflects Government apprehension hinted in the PWC report, that despite lower failure rates since 2006, there is plenty of more bad news to come! Whilst not wanting to take the 'foot off the accelerator' in terms of compliance for appropriately complex structures, the Government had concerns that the parts of the Act are now too cumbersome, too costly to administer and not achieving the outcomes required by the Act's key principles. To quote the Minister of Building, there was a need to "...strike a better balance between the amount of control, the level of risk, and the capability and responsibility of those involved. (DBH (A) 2010).

Consultation took the form of a DBH sponsored discussion document titled *Cost effective quality; the next generation building controls in New Zealand*, and focused on:

- Clarifying the purpose and principles of the Building Act and the requirements of the Building Code –implying much confusion still remains in the public domain about the nature of the Act and the difference between the Act and Code.
- Moving to a more balanced approach to building control –thereby acknowledging there exists an undue reliance on building consent authorities to protect consumers from defective building work, even when, as the document states, "the consequences of failure are low". (2010:6)
- Building consumer confidence –including improving contracting practices, more effective warranties involving surety as security and better access to dispute resolution. Allied to this is the Licensed Building Practitioner Scheme, where the construction of "critical" elements of a building is to be eventually limited to approved accredited building operators. (2010:1)

As can be expected, the call for submissions resulted in a range of responses from a wide cross section of the building industry. The 381 submissions received reflected a similar response rate to the controversial submissions on timber treatment some seven years earlier (Murphy 2004). The responses were collated in a Summary of Submissions document by the Department. The balance of this paper will focus on the responses to the exemption of minor work from the consent process, the "streamlining" of consents for low-risk buildings and suggestions to rationalize the building consent authority (BCA) consent processes.

3.2 Rebalancing Building Control Processes.

This section of reform was without doubt instigated to lessen the burden of oversight and control of building work from where it resides at present, viz with the building consent authorities (BCA), and to move a portion of the oversight to those considered professionally capable, e.g. architects, engineers and eventually, licensed building practitioners. The new proposals put forward for comment would have building consent authorities "targeting" buildings where "the risks and consequences of failure are greatest" (DHB (B) 2010:1), and by implication, moving less onerous consent oversight (and ratepayer liability) onto, once again, the private sector. Two proposals were put forward, exemptions for minor work and the "streamlining" of low-risk residential building work.

3.3 Exemptions for Minor Work

This proposal suggested extending Schedule 1 of the Building Act and exempting more of the lower-risk work from consenting requirements, especially when it is undertaken or overseen by licensed building practitioners. The proposal was accompanied by a five page Schedule of likely exemptions, together with defined boundaries suggesting the likely limitations to those exemptions. (Figure 3)

As could be expected, the range of responses underscored the difficulty of defining "risk" or specifically, "low-risk", in a descriptive way. A proposal that, on the surface, seemed an attractive and simple proposition grew ever more suspect when viewed from the different viewpoints of the multiple stakeholders.

A Schedule 1 list suggestion, for example, that a qualified plumber be permitted to install a wood burner without building consent brought predictable but understandable opposition from the Fire Service Commission (DBH (B) 2010:19).

...Nationally New Zealand has about 50 fires each year specifically attributed to incorrect installation of solid fuel space heaters

It also brought opposition from a Building Consent Authority submission, which suggested the smallest operation can have an inherent high-risk consequence (2010):

Although the installation of a solid fuel heater is a reasonably simple task, the consequences of failure can be life threatening, on an average 40% of inspections would fail mainly in the roof cavity area. I consider the only reason there has not been more fires is because the BCAs are inspecting. (p.19)

ID	Proposal	Limitations	Notes
A	Construction of a detached non-habitable dwelling or habitable building that does not contain cooking facilities or plumbing, if:	-single storey, and -floor area<20m2, and -floor level <1.0 m above ground level and -not closer than 1.0 m to any legal boundary or existing building, and -not required to be licensed in terms of the Hazardous Substances and New Organisms Act 1996, and -used in connection with an existing building	-All work is subject to planning rules and controls -There is an existing exemption for 10m2 sleepout -Should plumbing be exempt in these circumstances?
J	Pipe and cable penetration through walls, if:	-fire, structural and weathertightness performance of the building is not reduced	-Guidance needed to support good installation solutions/practices

Figure 3: Proposed Additions to Schedule 1of the Building Act (DBH (A) 2010)

Submitters debated the difficulties of defining the parameters that would reduce the level of risk to acceptable levels. Whilst the “definition of risk is itself risky...” (DHB (B) 2010:26) it was viewed as inherently bound in to the competency of the individual or group and the context of the activity.

Risk is as much to do with the skills of those undertaking the work as the complexity of the design (P.29)

The document did acknowledge the difficulties of assessing risk and commented on the veracity of submissions that proposed developing “effective tools” to accept the risk involved in any one application, including the adoption of “risk matrix” approach, developed in 2004 as a consequence of the review of the 1991 Building Act and operating within the E2/AS1 Building Code document.

Other issues, underscoring the difficulties facing reform in this area, included the need for effective oversight and clear communication to the public and industry of the extent of exemptions.

The importance of keeping property records was also emphasized by the Registered Master Builders Federation (2010):

BCAs act as a repository for information relating to a building that is relatively static, consistent and available.... It is already an issue, when building defects occur, trying to locate who worked on the property, what they did and when they did it. With the scope of building work that can be done without a building consent increasing – where will this information be held? (P.21)

Also mentioned was the need for on going monitoring of any exempt work categories to assess poor practices and any systemic issues. In other words, if you proceed, then proceed with caution!

3.4 Exemptions for low-risk (simple residential) buildings

In their quest to strike this better balance between regulation and risk, the DHB suggests LBP’s, architects or registered engineers would take responsibility that certain low risk buildings, designed and constructed under their control, would comply with the Building Code. The BCA’s role would in this case be limited to inspection of “critical construction points” along the route to building completion and it would be left to the LBP to oversee construction and/or construct and, either way, certify that the work is code compliant.

The response in the Summary of Submissions indicated the building industry do not share the Government's optimism in the ability of the country's professional builders to achieve these ends. Whilst the scheme met with some favour from 92 submitters, a proportion of them (54) indicated reservation and conditions were necessary to make the proposals work. An additional 84 submitters indicating their opposition on the basis that the building industry is not sufficiently well enough educated or trained to take up this challenge (DHB (B) 2010). To quote a submission from the Inspectorate Association of NZ (IANZ 2010)

It is not the complexity of a building that causes increased risk but rather the level of competence and commitment of the persons and organisations designing, planning, building, installing and checking the works.(p25)

Should such a rebalance of responsibility take effect, it was considered imperative that the degree of risk be assessed (in itself acknowledged as a difficult task), and that suitable conditions apply (also difficult to define). These issues would include clearly assigned accountability and liability, increased skill levels, the keeping of accurate records, independent 3rd party checks and balances, the alignment of incentives and monitoring to encourage "a quality culture" and minimize conflicts of interest. (DBH (B) 2010:29)

There is no evidence that licensing, without significant further training and assessment, will deliver Code compliant work (IANZ 2010:27)

BCA inspections need to continue until professionals and LBPs have proven compliance competencies... (DHB (B) 2010:28)

Our industry is not ready to be left to their (sic) own devices – unchecked they will get it wrong. (DHB (B) 2010:29)

What in fact comes through in the submitters' views is a feeling of *déjà vu* about the consequences of Government intentions, this time round. Or, put another way, having (in the case of a BCA for example) come through the rigours of accreditation brought on by the 2004 Act reforms, with the consequent (and huge) upskilling of people and processes...having survived derision by media and lawsuits by disgruntled consumers, here is the Government wanting to revert back to days when control is once again in the hands of persons not (in the opinion of many) capable of undertaking the role!

3.5 Building control systems.

The Government in its request for review suggestions implied much could be done to improve the administration of the building control system in such a way as to reduce costs, and improve the consistency and efficiency of the consent processing system (DBH (A) 2010:39). By implication then, the inference is that the present system lacks consistency, is too cumbersome and costly and represents a lack of value for money. And, could the private sector do it better?

Feedback to the suggestions was understandably mixed, but impressions suggest no appetite for radical change in a BCA system still settling in the Building Act's 2004 arduous accreditation requirements. There were distinct advantages seen in a strong BCA continuing to be in the forefront of building consent control, if only because they are a "known repository for property related information". Many saw advantages in the BCAs continuing to work towards a "...nationally consistent, objective, central consenting system that eliminates the 70 odd different systems that currently operate". (RMBF 2010:41) Others saw value in the local, smaller unit remaining viable if only because "Larger BCAs are less efficient for consent processing times and cost." (DHB (B) 2010:40).

Attitudes to a private sector role were mixed, with 68 supporting some (limited) activity and 56 against any private sector input. Apprehensions included issues around accountability, longevity, insurance cover, maintaining records and maintaining the necessary skills levels. BCAs saw themselves as undertaking a statutory public role similar to that of the public health and state education, needing to cope with all eventualities, yet unable (as per the private health and education sector) to pick and choose the "lowest risk clients" (2010:42)

4 CONCLUSION

The principle of less BCA involvement (and more but limited private sector involvement) in minor work and "low-risk" housing was seen as desirable if it meant less drain on the ratepayer from a resource and liability perspective and if resources could be better freed up for the more complex, high risk projects requiring the full weight of BCA care and attention. But - this only in the longer term, and after careful

consideration to the quality and performance of LBPs and others, and in any event not without adequate oversight and record keeping by the BCA.

The PWC report (2009) suggests building failure rates appear to be much lower since 2006. Yet the same report estimates for the reasons stated that most of the damage is still yet to be reported. For this reason alone the Building Consent Authority should remain at the core of the consenting process. This said, improvements in efficiency are needed, and would, given the right incentives, happen with time. There was no appetite for radical restructure. The Government's stated aim to "strike a better balance between the amount of control, the level of risk, and the capacity and responsibility of those involved" (DHB (A) 2010:1) was, it is sensed, viewed with a slight measure of skepticism and a weariness by many, particularly one sensed by those old enough to remember the buoyant optimism of the 1991 "performance based" Building Act, and the subsequent "lack of performance" that ultimately resulted and still haunts the building industry today.

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