

straight up

THE MAGAZINE OF THE BUILDING OFFICIALS' INSTITUTE OF NEW ZEALAND

SEPTEMBER 2009



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Rob Armstrong's background in the construction industry includes a number of years as a builder and nearly a decade in both metal and membrane roofing.

Rob is available to do his presentation at a time convenient to BOINZ members - during or after normal work hours.

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Pilot underway: new qualifications and a new assessment process

May and June are going to be interesting months for some enterprising building control officers. They will be the pilot groups of candidates being assessed for the new National Diplomas in Building Control Surveying – one group each for the North and South Island.

The new Diplomas are designed for the surveyors of small buildings, and of medium and large buildings. Much of what is required for these qualifications overlaps and is intended to reflect the strengths of a typical experienced New Zealand Building Control Officer. The Diplomas cover knowledge of building control legislation, Building Act processes, the processes of consenting and inspecting buildings, professional ethics, liability, and workplace responsibility. By 2013 all building control officers will need to have gained a Diploma.

Not only are these candidates being assessed for new qualifications, but the Assessment of Prior Learning (APL) process itself takes a highly innovative, personalised approach. This approach, developed at the Centre for Assessment of Prior Learning (CAPL) at Otago Polytechnic is gaining great interest nationally and internationally. It focuses on each candidate's own experiential learning, using highly skilled facilitators, and consequently has very high success rates.

This APL process involves candidates working closely with a facilitator, both in group workshops and one-on-one, either face to face or at a distance. The candidate brings their wealth of experience: the facilitator brings a comprehensive understanding of the qualification.

Candidates do not just assemble a portfolio, but also develop a more personally considered demonstration of competence through a 'critical reflection upon experience'. They are supported to take stock of all they have learned through their job, and



then to present this for an assessment in a way that meets the requirements of the qualification. The assessment takes three hours, and is conducted by industry professionals with specialised assessment training.

The pilot assessments are specifically for those who have extensive experience and knowledge in the industry. These candidates are therefore expected to be able to show that they already meet the requirements of the qualification.

When the pilot groups have finished, there will be a comprehensive review of how this process has worked for candidates and the needs of the industry as a whole. Currently, it seems that there will be three groups of people:

- Highly experienced building control officers who will be able to gain the whole (or nearly the whole) of the qualification through APL
- Building control officers who require some new taught learning. They will be assessed via this APL process, which will show what areas they still need to learn about. They will then carry out the needed new learning while at work and in focussed short courses
- Those new to the field, who will need a managed learning process that brings together learning while at work and focussed short courses.

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Time limits for enforcing the Building Act

Brian Cashin* consultant on Building Act matters

INTRODUCTION

Building control was the last thing on Andrew Marvell's mind when he was trying to get a coy girl into bed some 400 years ago, but his message of "lets do it now before it's too late" applies as much to building officials as it did to her.

Time is a problem for building officials not only because of the usual "too much work and too few hours" situation, and not only because a Waihine-size storm or a Napier-size earthquake can occur at any time without warning, but also because specific time limits apply to the Building Act 2004 (BA04").

One of the most important is the s 378 time limit for commencing a prosecution ("laying an information"). It is easily overlooked because no-one likes to bring an expensive, time-consuming prosecution. The only thing worse is to have left it too late to prosecute.

Under BA04, building officials have no power whatsoever to force anyone to do what BA04 requires or to punish them when they do not. Only the Courts have those powers. So when someone contravenes BA04 by continuing to do building work without a building consent, taking no notice of a notice, ignoring a compliance schedule, and so on, there is nothing a building official can do except to go to Court by laying an information or by asking for an order or injunction (this article does not discuss time limits for injunctions).

THE NIGHTMARE

Join my nightmare. I dream I'm a building official. One day last year, 9 September 2008 to be precise, I come across unconsented, but very well-finished, internal alterations to a large 1970s house. The result is open-plan living with views over the valley below and out to sea. The owner – I eventually come to think of him as Mr Ratbag,

This is one of a series of articles on legal topics related to the Building Act 2004. Readers' queries are welcome (it saves me from having to think of something to write about). However, these articles discuss the law only in general and simplified terms; they are not to be taken as legal advice, and will not necessarily apply to any particular case.

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but on first meeting he seems nice enough -- tells me he made an honest mistake. He had been careful to alter only non-loadbearing internal walls, and never thought that would need a building consent.

I consider laying an information under s 40 or issuing a notice to fix ("NTF") under s 164, but I prefer to maintain good client relations by relying on education and persuasion. So I tell Mr Ratbag that if he applies for a certificate of acceptance ("COA"), which is what a NTF would have required in any case, then I see no need to take any other action.

His application for a COA duly arrives, together with a rough floor plan and some "before and after" photographs. I respond under s 98(2) by requiring him to provide complete design

But at my back I always hear time's winged chariot hurrying near;

Andrew Marvell: To his Coy Mistress



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Collapse of the Parapets

What we learn from earthquakes... the Gisborne story

Since the four earthquakes felt in the Gisborne district between 1932 and 2007 a number of changes in legislation have been made. Changes to how buildings are assessed, either as earthquake “prone” or affected by an earthquake and therefore at “risk” have also resulted.

Prior to the Building Acts 1991 and 1994, councils were initially required to assess buildings under S. 624 of the Local Government Act 1974 which stipulated that a building was an “earthquake risk” if its ultimate load was exceeded in a moderate earthquake and therefore likely to cause danger to occupants and passers-by.

The Local Government Act also had a two-tiered approach to strengthening. There was a short-term strengthening requirement for the most at-risk components of a building and then a further full strengthening requirement with a longer timeframe.

The “interim securing” option was lost with the implementation of the Building Act 1991. This Act also changed the assessment criteria by which buildings were judged from “suffer damage” to “catastrophic collapse”. It stated that a building should be classified as “earthquake prone” if it was likely to suffer “catastrophic collapse” causing injury or death in a moderate earthquake. These changes resulted in considerably less prescriptive “assessment” than the LGA 1974 provided. For example, many buildings evaluated as an earthquake “risk” under the LGA were not earthquake “prone” under the BA 1991. These subtle differences in emphasis and terminology also feature in the 2004 Act.

The Building Act 2004 changes saw a requirement introduced that all buildings be assessed, not just unreinforced masonry. Instead of stipulating what type of building was at risk the level of earthquake that a building should withstand was encompassed in regulation. It also requires all councils to prepare an Earthquake Prone Building Policy (EPBP). The guidance material prepared by DBH for developing this policy was based around the Quaketown Model Policy. Gisborne District Council adopted its EPBP policy in September 2006.

When the Gisborne district experienced a moderate earthquake of magnitude 6.8 on 20 December 2007, very few buildings that had been strengthened (to the required 2/3 NZS 1900 or 2/3 NZS 4203) suffered any damage. However, the earthquake

details, plans, specifications and an engineer’s producer statement. There are further phone calls and correspondence, the Christmas holidays intervene, I take a fortnight off with the flue, he goes overseas for a couple of weeks, but I keep on chasing him. Finally, on 15 January 2009, Mr Ratbag tells me that he has better things to do than hire an expensive expert in connection with a minor alteration so forget about the COA.

My patience is exhausted, and I go through our internal procedures for authorising a prosecution. Finally, on 10 March 2009, I get the authorisation, only to be told by the Council’s lawyers that the 6 month time limit specified in s 377 has expired and it is too late to prosecute.

Next day, we get a letter from some other lawyers saying that on 16 January 2009 their clients had bought the house from Mr Ratbag in reliance on a clean land information memorandum (“LIM”). They had since obtained an engineer’s report revealing that the house was dangerous in terms of s 121 because most of its bracing units had been removed. Mr Ratbag now lived in Australia and is not available to be sued. However, the new owners holds the Council liable because one of its officers had been aware of the unlawful alterations but failed to take any action. Damages are estimated as more than million dollars.

Where did I go wrong?

PRIORITIES

My first priority should have been public health and safety. It was just lucky that a 50 year storm had not occurred while I was negotiating with Mr Ratbag. My second priority should have been to preserve the integrity of the building control system.

As for client relations, my real client was always the general public. That included Mr Ratbag, but it also included visitors, neighbours, future owners, and anyone else who might be affected. I should have taken immediate steps to ensure that the house was safe.

ENSURING THE HOUSE WAS SAFE

I should have immediately made a proper inspection under s 222 (costs can be recovered under s 219). Comparison with the original building permit documentation would have revealed that the house was dangerous because most of its bracing units had been removed.

LAYING AN INFORMATION

I should never have let negotiations drift on. I should have had a system of reminders to ensure that decisions with time limits were not left too late. That might seem like more bureaucratic form-filling, and a waste of time in almost all cases, but in this case it would have been worth \$1M (and my job).

INFRINGEMENT NOTICE

I should not have overlooked the infringement notice procedure under ss 370-374, which had come into effect a couple of months earlier under the Building (Infringement Offences, Fees, and Forms) Regulations 2007.

Infringement notices offer a simple procedure for dealing with people like Mr Ratbag, who unintentionally breach the Building Act. (I don’t know whether he actually was a ratbag. He probably did not realise that he had made the house dangerous. Signing the contract of sale saying that he had not done any building work without consent, could have been an innocent mistake.)

The time limits that apply to infringement notices are set out in the forms themselves, Schs 2 and 3 of the Regulations. In particular, a reminder notice must be issued if the original notice is ignored for more than 28 days.

Mr Ratbag could have disputed an infringement notice and insisted on a Court hearing, in effect a prosecution. In this case, I doubt if he would have done so (except to buy time) because he did not have any of the defences specified in ss 386 and 388 (and on the notices).

NOTICES

I should have immediately issued a NTF (in this case, I would have had to add a s 124 dangerous building notice after my inspection). Those notices would have been shown on the LIM and sounded an alarm for prospective purchasers.

People complain that NTFs are heavy-handed, and the usual covering letter threatening a \$200,000 fine certainly comes on too strong. Nevertheless, a NTF does no-one any harm and has the advantage not only of protecting prospective purchasers but also of extending the time limit for prosecution. That is because, if I had issued a NTF Mr Ratbag would have committed a new offence on each day that he failed to comply, and the 6 month time limit would have started again every day.

DANGEROUS BUILDING NOTICE

There is no need to discuss the procedures in respect of dangerous and insanitary buildings under ss 124-130, suffice it to say that a dangerous building notice extends the time limit in the same way as a NTF.

LESSONS LEARNED

It is tempting to say that the lesson I learned was “No more Mr Nice-guy”. In reality, I was not being Mr Nice-guy, I was being lazy. The Act gave me all the tools I needed, and I should have used them rather than relying on Mr Ratbag to do my job for me.

caused significant damage to many buildings in the CBD. Much of this damage was caused by the failure of transverse parapets (north-south axis) which had been unaffected by previous earthquakes in 1932, 1966 and 1993. This is because the force waves from the 2007 earthquake were in an east-west direction causing a considerably different effect on the buildings from the previous 3 earthquakes.

The benefits of having a policy which stipulates both short and long-term strengthening assessments became self-evident following the Collapse of the Parapets in Gisborne. Over 90% of the building damage in the Gisborne CBD following the 2007 earthquake has been attributed to over-topped parapets. This was notable in instances where parapets fell on to neighbouring lower buildings, namely Whitcoulls and Hallensteins. A number of other buildings escaped more serious damage when the parapet fell onto the building's own roof rather than onto its neighbour. Damage from this has also caused ongoing weathertightness issues for many buildings especially ones in between an assessment of the damage and agreements with the various parties on a way forward. In the light of this, as explained below, it has become a requirement to revisit strengthening of buildings after an earthquake event, as was the case under the Local Government Act.

Gisborne District Council based their EPBP on the Quaketown model. However, the guidance model did not include an interim securing option so as a result of the collapse of the parapets GDC amended its policy to include an additional category of building that will require interim strengthening to secure at-risk parapets. This interim strengthening does not change the overall strengthening requirements or timeframes for the whole building. All buildings built prior to 1976 with parapets have to strengthen their parapets or prove to the GDC that the parapets are not earthquake prone as defined by the Act.

The Quaketown (DBH) guidance document was also silent on post-event evaluation of buildings. Many buildings that were not earthquake prone prior to the 20 December event became so post-event. Being "prone" to damage in an earthquake is very different from becoming a "risk" afterwards. As the 2007 Gisborne earthquake has shown, the risks to a building can differ depending on which direction the force waves take. So when an earthquake strikes, what is the requirement for assessing buildings still standing afterwards? How safe are they? What is the risk? Have they become earthquake prone? The extent of damage a building has suffered in an earthquake should be promptly assessed to gauge its overall health.

Consequently, the GDC EPBP has been clarified by adding a requirement that regardless of

the earthquake prone status of the building it can be reassessed after an event and a shorter timeframe given for complete strengthening if so indicated. Given the fact that some buildings will not require full strengthening until 2036, and that magnitude 7M earthquakes are occurring every 15-20 years, the Gisborne District Council felt it was important to add this provision so that if another earthquake of similar or greater magnitude occurs the same sort of damage is not experienced by the CBD.

Some important decisions have also been made in respect of rural churches and ground classifications in the Gisborne district.

The assessment criteria promulgated by the New Zealand Society of Earthquake Engineers uses a matrix of building conditions and occupancy as a criteria for stipulating a strengthening timeframe. Many of the rural churches have a very limited occupancy rate and also little monetary resources. Each church is unique in its occupancy rates.

Many are also listed buildings in either the Gisborne District Plan and/or the Historic Places Trust Register. A special clause has been proposed to be inserted in the heritage buildings section of the GDC's EPBP specific to these churches.

The policy states: Rural churches (including those in townships) with a low occupancy

Continued on page 14

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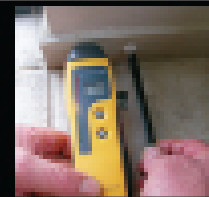
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The importance of “evidence” in building related dispute resolution processes



The stakes are pretty high if your employer is faced with defending a claim in a dispute.

This article firstly introduces the various proceedings that exist to deal with disputes and then discusses evidence. As a building inspector you may be required to help by preparing and presenting evidence. What do you need to know?

New Zealand has quite sophisticated processes for resolution and determination of civil and criminal disputes. The forums for resolution of civil disputes include the traditional court procedure, judicial settlement conferences, arbitration and mediation.

The District Court has jurisdiction to decide claims in value up to \$200,000 while the High Court deals with claims in excess of \$200,000. In Court proceedings a statement of claim must be filed setting out the factual basis for the claim and the defendant has 30 days after being notified of the claim to file a statement of defence if it disputes liability to the plaintiff.

If a defence is filed the matter proceeds through the various stages of the Court process. This includes the process of discovery and inspection whereby the parties exchange copies of all relevant documents. Once a hearing date is allocated, the parties exchange briefs of evidence of relevant witnesses and legal submissions. The matter then proceeds to a hearing before a judge who hears from witnesses and from the lawyers with respect to the legal issues and makes a decision. The Court process is relatively inflexible in that the judge is required to apply legal principles to the facts of a case in reaching a decision.

There is an increasing expectation by the Court that parties involved with Court proceedings attend a judicial settlement conference or other form of dispute resolution prior to attending a hearing or trial before a judge.

In a judicial settlement conference and in mediation, resolution can only be achieved by agreement between the parties. This involves the parties and their lawyers presenting a case in front of a judge or mediator. In both settings the judge's and mediator's role is to facilitate discussion and endeavour to resolve the dispute by mutual agreement. Neither have the power to impose a decision on the parties.

Parties may agree to refer disputes to arbitration. Arbitration is similar to the court process, the arbitrator makes a decision about a dispute after hearing evidence from the parties and legal submissions. The arbitrator's decision is called an “award”. An award is final and binding on the parties (Arbitration Act 1996) and is enforceable through the court process.

Mediation and adjudication pursuant to the Weathertight Homes Resolution Act 2006 are available for qualifying “leaky building” claims. Adjudication is similar to the Court process and involves a written claim being filed by the claimant. All respondents then reply to the claim which is heard by a Tribunal which hears from the parties, witnesses and legal representatives. At the conclusion of the hearing a decision is issued by the Tribunal.

Prosecutions involving territorial authorities are heard in the District Court. Those relating to the Building Act do not allow the party against whom relief is sought (the defendant) to elect whether to be tried in front of a judge alone or before a judge and jury, but prosecutions under the Resource Management Act do.

Irrespective of where the case is heard, “evidence” is central in enabling the Court or other decision-maker to come to a decision in disputed matters.

So, if you do find yourself involved in dispute proceedings, consider the following points regarding evidence.

Firstly, you need to know how the New Zealand justice system deals with evidence. New Zealand courts follow an adversarial system in which the parties to a dispute are expected to provide the evidential material to the Court. Judges generally make no independent enquiry into the facts. Judges are able to question witnesses, so long as they do so in a non-adversarial and unbiased manner.

Evidence is something that tends to prove a fact or which will satisfy an enquirer of the fact's existence. Admissible evidence in general can be divided into testimonial, circumstantial and real evidence.

Testimonial evidence is evidence given by a person as proof of the truth of what is asserted by that person. Circumstantial evidence usually consists of a number of items which point to the same conclusion. These items may be a combination of testimonial evidence and real evidence. Real evidence refers to objects put before the Court as the facts in issue themselves or as a means of proving the facts in issue. These could include a weapon, tape or video recordings, documents, etc.

In general, witnesses who are not expert are prohibited from giving opinions, that is, conclusions drawn from the facts. Witnesses are normally required to confine their testimony to the facts that witnesses observed, it being left to the Court to draw appropriate inferences from those facts. Expert evidence is an important exception to this general rule. The opinions of expert witnesses

are admissible to assist the Court with independent information of matters which are likely to be outside the experience and knowledge of the judge.

So what is your role if you find yourself in front of a judge, mediator or adjudicator? How should you frame your documentation and prepare and present yourself appropriately if called upon to give evidence?

There are two aspects to presenting evidence – your evidence in chief and evidence under cross-examination. There are some slight differences between the civil and criminal jurisdictions in this regard. In the criminal jurisdiction your evidence at the hearing will be given orally and you will be required to answer questions asked of you by your legal representative. In the civil jurisdiction evidence is by way of signed, written brief of evidence. The written briefs are exchanged between the parties prior to the hearing. At the hearing you are entitled to read out your brief and may then answer any supplementary questions.

Here are some guidelines to think about how you will present your brief once it has been prepared.

Express yourself simply, don't use jargon and long explanations. While your investigations may be quite complex, by the time you give evidence you should be able to describe the investigations in simple words; everyday conversations are made up of sentences about 8 to 12 words long. Your objective is to inform and hold the attention of the decision maker. Keep technical reports, complex calculations, methodologies and lengthy results in appendices to your brief of evidence so that you can refer to them if the decision maker and the parties' cross-examiner question you on their contents. Make sure you have weeded out any contradictions or inconsistencies. If you use visual aids they should be an integral part of your evidence, you should rehearse them, check the equipment you will be using and that everyone will be able to see it and be prepared to carry on if the equipment fails.

Above all believe in what you are saying.

Avoid hearsay evidence. If someone else has prepared your brief you must check it so that it is within your knowledge of the facts upon which your report or evidence is based. It is you who will be cross-examined and it is your reputation that will be under scrutiny. Confine yourself to expressing opinions based on your own knowledge of the facts and research. Relying on what someone else told you is hearsay evidence and is technically inadmissible.

Present your brief with confidence,

concentrate on the facts, have clearly prepared notes, and remember that every successful speaking occasion will strengthen your confidence. Some nervous tension is both natural and good for you, remember to breathe deeply, relax your hands and arms, shrug your shoulders to relax neck and shoulder muscles and relax your facial muscles and while talking look at and talk to the decision maker.

Next, you will have to face cross-examination.

Cross-examination will usually focus on perceived inconsistencies or inadequacies in the facts which comprise your evidence. A good cross-examiner may also try to expose bias, lack of independence, reliance on others or seek to show that you are not qualified to give the opinions you have given.

Here are some things to remember under cross-examination.

- Do not try to answer a poorly phrased question, ask for clarification, re-phrasing of the question or ask for it to be broken into parts.
- Do not point score.
- Answer questions in the positive, don't say "Possibly I took that into account" or "I think that might be the case".
- Short answers are best, a brief explanation is enough. If you are asked for a yes or no response you need only to turn to the decision maker and say that such an answer would mislead. Such a response will invariably illicit permission from the decision maker for you to give a fuller and more adequate answer, allowing you to explain the shades of grey, the qualifications you would wish to put on a bald assertion of yes or no. Be careful when asked a hypothetical question, if you have used one in your report it may come back to haunt you in cross-examination.
- Admit mistakes. If a line of questioning leads to a conclusion which is different from your own, acknowledge the point. You may be able to demonstrate that it has no impact on your final analysis. Do not back down merely to avoid confrontation. Stand by your opinion no matter if others are ranged against you.
- Avoid showing anger, defensiveness or arrogance as this gives the impression of being unwilling to concede the validity of other opinions. It is the decision maker who chooses between differing opinions and who decides which is the most credible.
- Always face the cross-examiner and maintain an air of confidence by not fidgeting.
- Don't be put off by lawyer's antics. Rustling of papers, wiping of glasses and other agitated behaviour is best ignored as it is likely to mean the lawyer is not getting the desired answers.
- If documents are referred to you in cross-examination you should ask to see them before you answer. You need to base your answer on your knowledge of the facts contained in that document. There might be a passage in the document that puts the unfavourable comment being put to you in context. You will want to point this out as part of your answer.
- Finally, avoid talking to others during breaks, particularly while giving evidence. You must not discuss your cross-examination or take advice from other parties or witnesses.

You are now ready for the day you find yourself in Court, and to help yourself should that happen, think about risk management, what a dispute resolution process entails and what you can do to keep your documentation and financial affairs in order in preparation for the day you may have to defend a claim, provide a brief of evidence or face cross examination.

Thanks to Prajna Moodley, Brookfields Lawyers, for providing information for this article.

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Plumbing E-book from Unitec now available

Unitec, as all tertiary providers in New Zealand, faces a number of challenges when running courses and programmes which integrate standards. These problems are often unique to New Zealand due to the fact that most standards are performance based, with only the outcome being mandatory, with many options given on how to achieve that outcome.

This is further complicated by the fact that in at least one area (gasfitting) there is a self certification regime, and many standards have no specified verification methods.

Due to the complexity of the Building Act and the added complexity of the various and many standards surrounding these industries, it is not only practitioners who have struggled to cope with the correct interpretation and application of standards and codes (with most not understanding the difference) but also Territorial Authorities.

The leaky Building fiasco is the most extreme example of a failure to understand how performance based standards are supposed to work, a basic systemic failure caused by a political decision to deregulate without counterbalancing that decision with the required investment in education and training needed to implement it.

Although there has been much progress since then, training providers find there is often still a basic lack of understanding within many Territorial Authorities of the practical application of the codes and standards. In almost every part of the country it is possible to visit new or recently completed constructions which have had work passed which does not comply with any known method or standard. It is possible that in some cases these have been correctly designed using first principles, and verified using correct processes, but in most they have not. They have been installed by practitioners who do not fully understand, and certified

by Inspectors who in many cases have even less understanding than the installers.

Certainly every day at Unitech we are informed by apprentices when we take theory lessons or give practical demonstrations, that "that is not how we do it at work", and are then told of methods or practices which are non compliant or in some cases dangerous. These practices are almost always certified.

Some years ago, we decided to look closely at how we taught the principles and assessed the underpinning theory and legislative knowledge inherent in these industries. We decided to integrate the required knowledge within each of the areas we taught, and went about producing entirely new material in the form of a series of books, or modules, which right from the beginning incorporated reference to legislation, codes and standards, explaining in simple terms why these rules existed, where to find them and how to interpret and apply them.

About 2 years ago, the decision was made to take this to the next level, by developing an e-book, an electronic version of our teaching material, available through the web. This was not done simply to be all modern and show we were technologically savvy. We believed that if done properly, it was a better educational tool. Shovel-ware, or simply copying the modules as PDF and shovelling it on the web, would never be an improvement. We believed there were 3 main areas where an e-book had major advantages.

1. Material could be constantly updated, and students not stuck with outdated text whenever standards, legislation or materials changed.
2. We could use the technology to utilise hyperlinks to enable instant reference to other web sites, manufacturers information, standards and to view videos etc showing far more detail than is possible in any printed format.
3. We could incorporate animation, which would enable us to clearly show not just how valves and other devices worked, but also explain esoteric and sometimes complex ideas and principles. Animation, done properly, is better than photos for doing this.

This completed resource is now available on the web. It went live to our apprentices from August last year, and we are introducing all apprentices and other trainees to it as they attend their block courses. So far we have about 300 apprentices subscribed. By June we anticipate about 500.

We have also allowed for the subscription of practitioners, who can do so from the front page of the site. There is a one week free trial available for people who would like to have a better look.

What we would like to achieve is the book being used as a resource for all industry players, including territorial Authorities. With explanations of why plumbing rules are written, references to the actual standards and codes, and diagrams, photos and animations explaining how the rules are applied, it is a valuable tool we would like to see utilised by BOINZ members. The e-book incorporates a number of useful features, including a "mouse over" glossary, so when the cursor is passed over certain technical terms or words, a definition pops up. There is also a very good internal search engine. By typing in a word or subject, the 3,500 pages of the books are searched and a list of related topics is shown, and the searcher then clicks on the appropriate reference to be taken directly to the subject.

With hundreds of full colour diagrams and photos, and currently 70 animations (about half of them interactive), it is possible to gain a very good understanding of the technical aspects of the industry including explanations of the codes and standards appropriate to each situation or system.

Any person wishing to have a preview of the book, can obtain a free trial period of one week by going to the website and following the instructions.

A one year subscription is \$100 (inc GST) and can be paid by secure credit card payment through the site, which is found at <http://plumbingonline.unitec.ac.nz>. If you have any questions, or would like a demonstration of the site, please contact Garry Cruickshank at Unitech.

Phone 09-815 4321 ext 8812, or email gcruickshank@unitec.ac.nz.

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Customer service – go ahead - make my day!

There's a saying if you can't beat them join them. Ok that may be hard to do when you're facing a customer and telling them that they have to pay the latest increase in consent fees. But what could be worse? Writing to them and telling them that they will be facing increased charges, or worse still having them read or hear about it in the press first?

We all hate opening our mail only to find it's another imposition on our taxes. So why be the bringer of such bad tidings if there is another way. That way is to educate each new customer with a subliminal appreciation of what your job is all about. It might even help when you find yourself having to knock back the umpteenth drawing or product that just does not meet the Code.

Pictures speak a thousand words. Put up pictures of the vast array of products that you have to rule on every day, and others of your colleagues knee deep in mud in a drainlayers trench, poring over plans in the office and onsite, and talking, talking, talking. Only dramatic pictures will do, and preferably candid ones. Remember that the pick and shovel once did what machines do now. It wouldn't hurt to have a few reminders of local engineering feats, past and present with some mention of the local people involved, adorning the walls of your reception area. How far back do your records go? Be proud of what you and your colleagues past and present have helped to achieve over the years and above all don't back down or fail to act if you have any concerns; think of the pick and shovel workers, that was real and it was back-breaking tough.

Remember that when people are faced with something they don't want they usually want to have a say and loudly, but with that they need to realise that when this occurs in the construction business inspection is part of ensuring that not only they but also the rest of "the community" is well served by having compliant buildings. Every home builder is a

potential seller, and buyer, so the importance of getting it right at the construction stage affects everyone sooner or later. With messages like that visitors to your office will be in no doubt that your business is focused on customer service.

Recognise the different types and needs of the customers you deal with and those you haven't and should know how to. Builders, plumbers, and other tradespeople all have their own jargon – would you benefit from training in the sorts of curly questions and situations you might encounter when dealing with them? Then there are home owners.

Have a video presentation of off and on the job inspection work containing advice for customers about the consenting process so they know what to ask before they get to the counter. If they don't know what to ask they are more likely to behave defensively because of that ignorance while you're trying to explain from scratch and defend policy throughout every syllable of the conversation or step of the way whether on or off site!

Make the most of your office space. Customers are taxpayers and believe it or not they think they own the space you're working in (as of course we do, collectively). Create information desks rather than a counter. Have you noticed that's what banks do?

Seriously though, policies must be planned with complete transparency and open to view. Don't leave them buried in a pile of consent papers, have them posted up around the office, at the counter for all to see.

Chances are by the time the customer gets to the frontline they will be in a good frame of mind to sit down and work through what actually needs to be done to ensure they get the home they want and can sell one day, and you'll have an even better day.

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Mortar – Even Good Tradesmen Can Come Unstuck!



Author of John Oliver's
BRICK BOOK

I was recently called to inspect a large two storey brick veneer dwelling under construction in the South Island. The scaffold was still in place and the veneer was about to be plastered. The owner was concerned about the quality of the mortar that had been used, contacted the council who carried out an inspection and approved the mortar.

The owner was still not happy and a senior inspector revisited the dwelling and placed a 'Notice to Fix' on the veneer and requested a professional opinion.

I visited the site, and within 15 minutes had made the decision that the veneer had to be removed and re-laid. The mortar virtually had no strength and could be easily powdered through the width of the joint. Based on my experience and knowledge, I would estimate that the strength of the mortar at less than 3MPa. If this significant failing had not been detected at this stage of the build, the possible future consequences could have been dramatic, expensive and potentially dangerous.



This South Island dwelling is ready to be plastered. Although the quality of the bricklaying is very generally good the structural integrity of the veneer is seriously threatened by the mortar strength.



15,000 bricks were removed from this new Auckland home, not principally because the mortar was considered not up to strength, but it was of concern. 4500 bricks were removed from this dwelling and palletised in one day, testament to the low strength of the mortar used, adding justification to its removal.

What made this decision that much harder was that the overall quality of the bricklaying was excellent, especially for a veneer that was to be rendered.

This veneer had been laid in very hot weather with a warm drying wind. It is highly likely that the moisture had rapidly evaporated from the fresh mortar, which was not given the time and conditions to cure properly and for hydration to occur; applicable to any mortar. Although other factors may be responsible, determining what those factors are is virtually impossible once the mortar has dried. It is also important to understand that once the mortar has dried no amount of water or chemical additive will strengthen the mortar.

Although this is certainly not the first situation of poor mortar quality I have encountered, I would view it as a wake up call to the brick and building industry. How many other brick veneer dwellings have been erected in New Zealand where the mortar quality must be of concern?

MORTAR QUALITY

The structural integrity of the brick veneer is totally dependent on the strength of the mortar that glues all the bricks together. Brick ties, size of mortar joints, cavity width and any other aspect, is secondary to good quality mortar. It is my view that this important area of bricklaying has not been given the attention it deserves.

Recent testing by BRANZ of two storey brick veneers, clearly demonstrated the important part mortar plays in the performance of the veneer. The dowelling effect that is achieved when the mortar sets inside the holes of bricks was significant when the veneer was subjected to external forces.

The strength and quality of the mortar is in my opinion, even important for masonry units that do not have holes in them or masonry veneers that are to be plastered. If a crack occurs in a plastered veneer it is certainly obvious, which may not be the case in a face veneer.

MORTAR REQUIREMENTS

In regards to mortars, NZS4210 calls for a compressive 28 day mortar strength of 12.5MPa. In veneer situations it places the onus on the masonry suppliers to nominate the strength they would like. To the best of my knowledge, they all call for 12.5MPa, which I totally endorse. It has to be said, there is not a lot of technical expertise in the brick industry, there is nothing stopping a brick manufacturer from requiring a compressive mortar strength of say 3MPa, which would be disastrous. This matter needs addressing and a minimum value for veneers to be stated in the standard.

THE BIG PROBLEM

Once the mortar has been laid and it has dried, there is no way of testing its strength to



The lack of adhesion of the mortar to the 4500 bricks concerned is evident in this jumbo-bin. Failure of this veneer even in a mild earthquake would be inevitable and certainly dangerous.

determine compliance with the standard. Mortar samples must be taken at the time of mixing in a manner to comply with the standard, and stored for 28 days in a water-bath at 21°C prior to testing. Therefore, it is totally impractical when applied to bricklaying on site – no one can or would test their mortar strength prior to laying.

How do you determine the quality of the mortar in a laid up veneer? As previously stated, there is no test and therefore it comes down to common sense, observation, and experience in testing and assessing mortar quality. If the mortar is powdery, there is certainly a question mark in regards to its quality and strength. Someone must make the often difficult call, on whether the veneer has been constructed with a mortar, which has the quality and strength to ensure its structural integrity for at least 15 years, especially during a seismic event, which is of paramount importance.

THE SOLUTION

I have recently been engaged in a mortar testing programme. Mortar samples were collected on site in accordance with the standard, taken to the testing laboratory, and after 28 days, tested for compressive strength. In most cases, these samples were taken from what I would consider competent bricklayers who had mixed the mortar, normally by volume, 4 to 1.

The results were surprising, if not alarming. They ranged from 4.0 MPa – 9.0 MPa with an average of 6.7 MPa over all samples mixed at 4:1, or nearly half the 12.5 MPa minimum called for by most masonry suppliers.

There needs to be considerably more work done in the testing of mortar in the field, the use of additives, volume of water and methods to ensure correct curing. However, it is clear that if one starts with a formula that at least has the potential to achieve the desired strength, that important part of the equation is covered. To this end, a sand/cement ratio of 3:1 should be adopted, or preferably, a 'Bagged Trade Mortar' used.

Factory manufactured mortars are produced under controlled conditions and are regularly batch tested for strength and quality. Therefore, provided the correct amount of water is used and the mortar is cured correctly, the strength of that mortar and veneer is virtually guaranteed. Certainly, the initial outlay for bagged mortar is greater than site mix, but the benefits it offers are considerable. When you consider that a brick veneer is costing between \$10,000 and up to \$60,000, for a plastered two storey veneer; the small additional amount spent to obtain good quality mortar by specifying and using trade mortars, is in my book, money well spent.



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Are you a supporter of aluminium windows?

Article prepared by Mike Anticich, Director of Flashman Flashing Systems Ltd, Christchurch

To the best of my knowledge, every weathertightness claim I have been involved with has included issues with the window and door openings. At least 50% of leaks in leaky homes occur at the window and door openings. They are still occurring.

It is essential therefore that great attention is paid to the detailing and installation of windows and doors. In my opinion this is often not happening and litigation as a result of the consequential leaks is a natural and expensive result.

Cavity construction, pressure equalisation of the trim cavity and even the most excellent flashing system will not allow for the inevitable leaks at the window or door junction that I want to focus on here.

This article is intended to bring to the attention of building control officers yet another issue that is affecting window and door installations and has created a new cause and reason for window and door leaks in aluminium joinery installations.

The new leakage point has been brought about by the extensive use of double glazing to comply with H1 requirements and the need to cantilever windows and doors out beyond the framing line as much as 50mm. This occurs with both direct and cavity construction.

What is needed is full window support along the length of the window and door.

This requirement in the main is not being insisted upon by Building Consent Officers nor is it being widely enforced on site.

This is not entirely and oversight of the BCA's as E2/AS1 is not clear on the essential requirement to provide critical support in any of the window drawings

If you look at figures 75, 81 - 86, 90, 95, 99, 115, 116, 127 and 128 of E2/AS1 which all relate to window installation, there is not one drawing that shows a support bar, let alone states that it is an essential part of the window installation.

There is however in note 3 attached to all these drawings this statement;

"Make allowance between packer and sills for support brackets for large windows. Such brackets require specific design, and shall be supplied by the window manufacturer."

This lack of clarity regarding the importance of supplying the window support has raised a potential gold mine for lawyers with

On my independent inspection of window and door installation, I discovered that often the support bar or brackets did not support anything at all!

future new litigation claims for early failure of window and doors which do not have the required support as stated in Note 3 mentioned above.

The window manufacturers themselves are in a state of confusion as to what is needed. A BCA cannot afford to be confused on such issues as they are the prime respondent in any leaky home claim.

In my discussions with the WANZ technical committee on the issue of support to windows their answer was clear and adamant. **"All windows require full support1"**.

This is not happening. Where support is being provided it is inadequate or contrary to WANZ's own recommendations to their members.

The WANZ website is very clear on the matter however as stated in this excerpt taken from their site on July 10 2009

Cill support has often been a crucial part of window installation, but has often been overlooked. The detrimental effects of not having cill support bars are not immediate but usually manifest themselves over a period of time, and hence we see indifference in using them. Most joinery is fixed to the building framing, through the jamb liners thereby creating a cantilevered action. This action stresses the corners, mullion joints, frame/liner connection and eventually compromises their integrity, and in turn the integrity of the whole window system. With double glazing becoming more common place, the weight is practically doubled and the problem is further compounded. The combination now of both double glazing and cavities becoming the norm, the stresses on joinery has been increased.

*With this in mind, all windows and doors irrespective of their size and construction/cladding type **must have cill support***

*.....These WANZ Support bars are available through your local window supplier and **must be used the full length of the window/door.***

Can't fit window support with direct fix construction

Let me ask this question at this point. How is it possible to fit and support bar to a direct fixed installation where there is a sill tray! Answer, it is not possible. That point alone should put

and end to the entire practice of direct fix! The cheapest insurance available is the price of cavity construction at a cost of approximately \$1,000 to batten out an average sized house.

On my independent inspection of window and door installation, I discovered that often the support bar or brackets did not support anything at all! A bit like the many huge beams I have seen in roof spaces where load bearing walls have been removed and a beam installed on top of the ceiling joists but not landing on any load bearing walls. In other words the support bars have added expense for no purpose whatever.

In many of the remediated leaky homes where existing window and door joinery remains, (a practice I do not recommend) the new essential support blocks were never fitted by the window manufacturer because no one had thought of window support. It is clearly impossible to provide support via a WANZ bar by or some other means, if there is nothing to support!

BCA's face litigation if windows and doors leak due to sagging and the opening up of mitres and mullion connections which cause leaks well inside the framing line. (A cavity won't help)

All aluminium windows and doors need to be properly supported as stated (unclearly) in E2/AS1 and emphatically by WANZ.

If BCA's do not enforce this requirement at Building Consent stage, during site inspections and take this into account when issuing the CCC then they will be liable for the resultant damage and drawn into another tax and rate payer funded leaky home settlement.

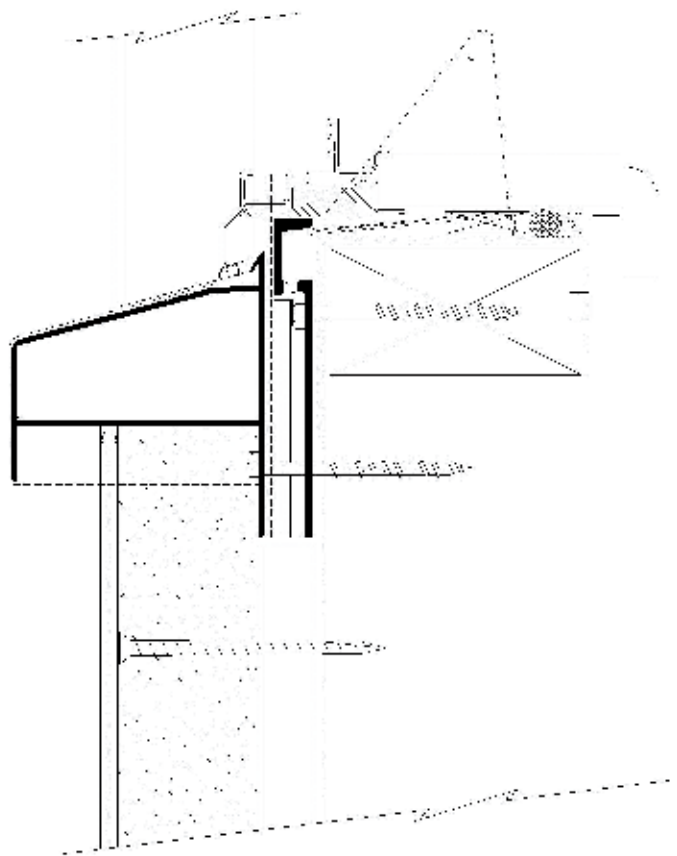
For the answer to this issue see page 13 (opposite)

Editor's Note: A number of diagrams were supplied by Mike to accompany this article but reproduction and inclusion into this article was not possible due to their size and image resolution. If you wish to receive a copy of these diagrams please contact the Institute's office for a full copy of the article received for publication.

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Say No to Leaky Homes

Technology has stepped up to the plate: so the gamble may be over for the modern weathertightness assessor?

Why is it taking us so long to understand the leaky building problem? Is it because we can't agree on how buildings should be assessed or which tools to use? If we did know how to assess buildings correctly we would have been alerted to this problem long before it got this out of hand. Little wonder many of our inspection tools are under fire.

The most commonly used assessment tool is visual inspection. The saying 'it's in the eye of the beholder' could never be more relevant. Firstly what are we looking for? Moisture Contents. Exactly how do we see a Moisture Content. Do our eyes begin flashing red and our ears beep incessantly? We look for wet carpets, soggy gib, cracking skirtings, cracked claddings, peeling paints. All perfectly lit effects when buildings have been leaking for periods. Remember the old days back in the 80s when mdf skirtings swelled and warned us of leaks? Gone. They mixed in waxes and setting agents to stop the swelling – mdf had too many complaints and too many replacements. A warning sign removed. Instead we threw away the treatment and waxed our boards. Trouble is swelling skirtings are effects long after the home has started leaking. So what about visuals before the CCC is issued – before the carpets are laid?

For some obscure reason we expect the CCC visual inspection guys to see the leaks and predict whether the building will leak in the future – and to what extent – even on a summer's day. Tried to find a leaky bike tire without blowing it up lately. What would be your odds? 50/50 maybe? 99/1 probably. Even the most thoroughly visually inspected homes are leaking.

So we need tools. Tools that help. The best tool is rainwater. So we wait until it rains. How much rain is needed? Do we need it to rain on all 4 elevations? How long after rain should we wait to measure? Can we hold up all the CCC until our inspectors speed around on the rainy days? Does the Building Act provisions over rule this practicality – ie we need to know the building is weathertight before the CCC gets handed out but is it true the builder only has to comply with the consent to get the CCC? Does red tape play a role in leaks? What's everyone else doing?

Maybe there is a solution. What if we included tools in the walls that warned home owners of leaks long before rot visited? Tools that became the home owner's responsibility (ye ha). Tools that act as locator beacons sending signals of damp patches so small even mdf wouldn't fear. Like oil lights and temperature gauges in cars. Henry Ford introduced gauges years ago as warnings, so engines wouldn't seize and cause inconvenience. His motto was 'its better to know, switch the motor off, wait a bit, let it cool down and then continue on with your journey with all your \$ still in your pocket' – it must have saved his company zillions in warranty claims. Rather be stranded on the desert road at night miles from a garage or look at the oil pressure – up to the motorist not Henry F? Moisture warning lights would work the same way. Owners would see the light (in more ways than one) and seal the window.

Project M is a research initiative to monitor 1000 homes with moisture monitoring systems as a trial to see if we can reduce the risks we all face. NOT ONE HOME HAS BEEN



FOUND TO BE FAULT FREE. They all leak – and they will keep leaking throughout their lifetime. So how best to manage risk. We all agree buildings have risk. A home's risk may be based on the risk matrix complexity or the builder's trade skills or the owner's diligence with maintenance or the materials durability or the environmental exposure. Will we get 5 out of 5 every time? What makes this so much worse is we have never actually measured buildings because we never had to. So the question for all of us is can we change 0/5 into 5/5 in a litigious world we have now created without the feedback of monitoring homes? Until we know what risk we are facing how can you say you are managing it? Do you accept with no factual proof that deemed to comply means no risk to you. Is every home in every location by every tradesperson that sure of success?

By Ian Holyoake founder of Project M the research program monitoring 1000 homes. Information can be found on this project on www.bnet.org.nz

Continued from page 5

strengthening level required on a case-by-case basis. Any building found to be dangerous as defined by the Act will be required to be immediately strengthened and/or repaired to remove the danger.

Final strengthening requirements will be subject to agreements between the building owner and/or their agents and Council. In cases where an agreement cannot be reached an appeal may be made against the strengthening requirements. This appeal will be heard by the Council's Hearing Committee. An appeal against the Committee's decision may be made by way of

a Determination under the Building Act 2004 to the Department of Building and Housing. Determinations are binding on all parties.

New Zealand Standard 1170 (the structural loading standard) provides for five site soil classifications. The loading standards change dependent on these soil types. The policy has been amended to include a definition of the soil type as a guide for design professionals.

The policy states: For the purposes of this policy the Gisborne District Council accepts the Geological and Nuclear Science assessment that the Poverty Bay flats are "Class D - Deep or Soft Soil Sites" unless

proved to be another classification by a detailed geotechnical investigation. This investigation may be satisfied either wholly or in part by a desktop analysis of data held by the GDC for sites within an acceptable radius of the subject site. An acceptable radius is defined as up to 300 m provided that at least three prior reports within this area are analysed and considered. The location of these reports is critical and this analysis should be discussed with the GDC before commencing the desktop evaluation.

Thanks to Ian Petty, Gisborne District Council for providing information for this article.

Employment Boom or Economic Bust?

Just under 2 years ago, September 2007 and up until December 2008, the construction industry was booming here and overseas. In the US inspections departments could not keep up fast enough to suit builders, with typically 40 permits being issued a month, a familiar occurrence in New Zealand also, and some even extended their hours in the US. This compares with 9 permits issued in January and 14 in February by one US county this year.

Our local authorities found it hard to fill vacancies and building inspection was on the Department of Labour's list of skills shortage occupations.

But that was then. It feels as though it all changed overnight.

Now, building inspections are down due to the slump in Western economies and a slow down in new construction on a global scale.

Some US counties have opted to cut building inspectors to trim budgets. Others are doing anything they can to keep the inspections staff because they are confident that building will pick up. Inspectors are being deployed to other departments to help out until building picks up. This has upset some who believe that "people need to be laid off instead of finding busy work to do and that someone else in another department whose services are actually needed could stay in their jobs if these salaries were not being paid. When the time comes to need this many inspectors they or someone else could fill those jobs" (SalisburyPost, 21 March 2009). Does that sound desperate? Are they ever, with the recession affecting finance and construction markets worldwide.

How is the downturn in construction affecting building inspection jobs in New Zealand? How are inspection departments whose staff were once overburdened when demands for consents were high, coping with change? Now could be an opportune time to look at training budgets, staff training, and study needs with a view to giving staff support to upskill in areas like building controls and in all facets of the scope of work they encounter on the job (building, electrical, plumbing, fire/site safety, product identification, etc., and especially in areas where authorities have experienced a lack of expertise in the past and found it difficult to recruit in technical help when it is most needed.

The Department of Labour statistics for the December 2008 quarter show that construction activity continued to fall (down 4.4%) from the previous quarter. This was driven by a fall in residential construction with non-residential construction recording an increase over the quarter. "The value of consents issued for the construction of non-residential buildings is still rising – ahead 12.3% in the three months to February from a year earlier. But the view of many in the sector is that many of these consents are being processed just for the sake of completing a long running process and many may not be acted on for quite some time." Tony Alexander, BNZ Weekly Overview, 23 April 2009.

While the Overview suggests "export-led recovery" is our main hope, it also states that the domestic situation could be improved by "low financing costs, accelerating population growth and growing awareness of the existing and worsening housing shortage". "In the three months to March", says Tony Alexander, "we can see that the number of people shifting to NZ was ahead 5.7% from a year ago while the number leaving was down 9.7%". The Overview forecasts a "net migration gain at the end of this year somewhere between 15,000 and 30,000 people".

That suggests more activity in the housing market, albeit perhaps a larger rental market but still a need for additional housing to provide for that. We will have to wait and see if it kickstarts enough activity in building consents for renovations and construction of new homes to make a difference. If it does, will BCAs still have any inspection staff left by then or will the Department of Labour put building inspection back on its skills shortage list?"

What seems more certain than anything else is the cyclic and monotonous regularity of the boom and bust economic policy we have grown used to, irrespective of whose economic theory it is, Keynes or Greenspan, Cullen or English.

AP Roover, SU Inspection

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shape moulder of expanded polystyrene

OUT AND ABOUT

As you can see there's a lot that's done in the trades that an inspector can not be expected to see if the work being done is a repair and not part of a consenting process, such as replacement of this pipe, only accessible from scaffolding. The plumber applied a transparent sealant which is not paintable. However, the painter, seemingly unaware of this, painted the seal and within a couple of days the paint peeled off leaving an unsightly mess. The interior finish and use of the sealer and paint did not satisfy the homeowner's expectations as regards durability, aesthetics or waterproofing. So the homeowner, left with a fait accompli decided to apply a silicone sealant that was paintable and to paint over that. The sealant, shown as grey in this picture, covers the same area as the transparent sealant used by the plumber. Surely there is a better way of weatherproofing pipes through weatherboards, that sealants used in plumbing should not cover such a big area and the finish to interior lining be more aesthetically pleasing? The homeowner, having nagging doubts about the quality of the work called back the plumber to explain. The manager of the firm explained that because the pipe was so close to the side of the house (as was the pipe that was replaced) the plumbers had no alternative but to use sealant. He said



Does anyone see the use of sealants generally as a concern, not just from an aesthetic viewpoint? How widespread is the use of sealants in new building today? Builder's bog and putty, traditional standby treatments, now share a place on trade merchant's shelves full of sealants to cover every imaginable gap. It's to be hoped that sealants are not being used by trade qualified plumbers and builders at the expense of accurate detailing.

that the only alternative would have been to have a metal sheet made to seal the gap as there were no parts available on the market to seal this type of opening through weatherboards. But why was the new pipe installed so close to the weatherboards?

EVENT CALENDAR - 2009

SEPTEMBER

9 September	Compliance Schedule Writing – Christchurch
10 September	Building Warrant of Fitness Auditing – Christchurch
15-17 September	Getting Started in Fire Documents - Whangarei
21-22 September	Getting Started in Building Controls (Plan Processing) – Dunedin
22-24 September	Getting Started in Fire Documents - Wellington
23-24 September	Certificate in Building Controls Administration – Christchurch
29-30 September	Complex Fire Designs – Wellington

OCTOBER

1-2 October	Getting Started in Building Controls (Site Inspection) – Auckland
5 October	NZS3604 – Wellington
6 October	Assessing Alternative Solutions – Wellington
6-8 October	Getting Started in Fire Documents – Auckland
13 October	Building Consent Vetting - Dunedin

14-16 October	Getting Started in Fire Documents - Tauranga
19-21 October	Getting Started in Building Controls – Rotorua
22-23 October	Getting Started in Building Controls (Plan Processing) – Rotorua
27-29 October	Getting Started in Fire Documents – New Plymouth
29 October	NZS3604 – Dunedin
30 October	Assessing Alternative Solutions – Dunedin

NOVEMBER

3-5 November	Getting Started in Fire Documents – Hawke's Bay
4-5 November	Certificate in Building Controls Administration – Rotorua
4-6 November	Getting Started in Plumbing Inspection – Complex Water Supply & Sanitary Drainage (Category 3 buildings and above) – Auckland
9-10 November	Getting Started in Building Controls (Site Inspection) – Rotorua
10-11 November	Complex Fire Designs - Hamilton

For programme flyers and further information please contact the Institute's office on 04 473 6002 or visit the website - www.boinz.org.nz

UPCOMING BARRIER FREE SEMINARS

2-day Seminar Dates - Modules 1-4

Auckland	15-16 September 2009
Wellington	14-15 October 2009
Christchurch	17-18 November 2009

Module 5 - Becoming a Barrier Free Advisor

Location TBC: 26 November 2009

Assessments of Modules

An opportunity is available to complete assessments for Modules in your own time after the seminar. Assessment can be used as a measure to check whether participants have achieved the desired learning outcomes. It provides a quality assurance and enhances learning. The cost of completing Assessments of Modules 1-4 is \$200 + GST.

To become a Barrier Free Advisor it is mandatory to successfully complete all assessments.

CPD Points

Our 2-day Barrier Free Seminar is recognised by some professional organisations for Continuous Professional Development Points. Please contact your own organisation if you have any questions relating to CPD.

Register Online

Places fill in quickly, so make sure you and your staff don't miss out on accessibility training - register now at <http://www.barrierfreenz.org.nz/index.php/training-and-education/registration>

Requests for further information should be directed to
The Administrator
Barrier Free NZ Trust
PO Box 25064, Panama Street, Wellington
Tel: 04-915-5848;
Email: seminar@barrierfreenz.org.nz
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BPB Plasterboard

Bracing Ratings

Bracing ratings for BPB Braceboard have been obtained from product tested in accordance with NZS 3604 : 1999 P21 bracing test procedures. The bracing values stated in the table below apply to both timber and concrete floor constructions.

BPB Standard Board		BPB Bracing System Reference					
BPB System Requirements		BPB1 S			BPB2 S		
BPB Lining Requirement		10mm BPB Standard Plasterboard one face fixed vertical or horizontal			10mm BPB Standard Plasterboard both sides fixed vertical or horizontal		
Minimum Length (mm)		1200mm	1800mm	2400mm	1200mm	1800mm	2400mm
Hold Down Anchors		No	No	No	No	No	No
Diagonal Brace		Yes	Yes	Yes	No	No	No
Bracing Units Per Meter	Wind	55	65	75	70	80	90
	Earthquake	50	55	65	60	70	75

To comply with the above ratings, wall-bracing elements must be constructed in accordance with the BPB Bracing Manual. The above schedule covers BPB Standard, Firestop and MR/Aquastop Plasterboards of 10mm and 13mm thicknesses.

Bracing ratings for BPB Braceboard have been obtained from product tested in accordance with NZS 3604 : 1999 P21 bracing test procedures. The bracing values stated in the table below apply to both timber and concrete floor constructions.

BPB Braceboard		BPB Bracing System Reference						
BPB System Requirements		BPB1 B		BPB1 B*	BPB1B P		BPB1B S	
BPB Lining Requirement		BPB Braceboard Plasterboard one face fixed vertical or horizontal			BPB Braceboard Plasterboard one side fixed vertical or horizontal. 7mm DD Plywood on the other		BPB Braceboard Plasterboard one side fixed vertical or horizontal. BPB Standard on the other	
Minimum Length (mm)		400mm	600mm	1800mm	600mm	900mm	600mm	1200mm
Hold Down Anchors		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagonal Brace		No	No	Yes	No	No	No	No
Bracing Units Per Meter	Wind	90	125	150	150	150	145	150
	Earthquake	100	115	120	150	150	145	140

To comply with the above ratings, wall-bracing elements must be constructed in accordance with the BPB Bracing Manual. The above schedule covers 10mm BPB Braceboard and 13mm BPB DuraLine.

To comply with the above ratings, wall-bracing elements must be constructed in accordance with the following specification:

- Timber frame minimum 70 x 35mm with studs at 600mm centres.
- Sheets lined vertically or horizontally. Vertical joints taped and stopped in accordance with AS/NZS 2588.1.
- Sheets fixed with 32mm x 7g Braceboard screws at 150mm centres to perimeter of the bracing element. Fixings to intermediate studs are at 300mm centres but may be omitted if sheets are glued.
- Bracing ratings in table are based on wall height of 2.4m. Ratings may be adjusted for wall heights other than 2.4m as follows:

$$\frac{\text{Actual wall height (max 4.8m)}}{2.4\text{m}} \times \text{value from above table} = \text{Adjusted Rating}$$



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