

23 December 2003

Background to Timber Durability Changes

What is being changed?

The BIA is changing the **Acceptable Solution** for Clause B2 Durability of the **Building Code** (known as B2/AS1).

This clause covers how long certain elements of a building, including timber, should last and is therefore concerned with treatment levels of timber.

The Building Code and Approved Documents

The Building Code consists of 35 clauses. Each clause sets out performance standards that buildings must meet. These cover things like durability, fire safety, energy efficiency and access.

Approved Documents provide a prescriptive means of complying with the clauses of the Building Code. That is, buildings built to the method described in an Approved Document are automatically deemed to comply with the Code – they're sometimes referred to as "cook book" solutions because they prescribe a "recipe" for ensuring compliance.

The BIA publishes two types of Approved Documents - **Acceptable Solutions** and **Verification Methods**.

Acceptable Solutions set out prescriptive construction solutions to follow (e.g. what insulation is needed to comply with energy efficiency requirements or what level of treatment is required for timber to meet the durability requirements).

Verification Methods set out mathematical calculations, scientific tests or measurement methods to determine compliance (e.g. calculations of the size of beams).

Are Approved Documents mandatory?

No – they provide one means, if followed, of ensuring compliance with the Building Code.

A building can be designed and constructed in a way that differs partially or totally from an Approved Document but can still comply with the code. This is known as an **Alternative Solution** and must be considered on its merits by a territorial authority or building certifier.

The nature of the change

The changes require increased treatment level for timber in certain situations. They are based on an assessment of the risk of moisture causing damage in specific parts of a building, and the level of protection needed to manage that risk.

The changes apply to all buildings, not just residential buildings as was originally proposed.

Changes in Treatment Levels

Building Element*	Current Minimum Treatment Requirements	New** Minimum Treatment Requirements
<ul style="list-style-type: none"> ▪ Roof framing, trusses and ceiling joists ▪ Interior wall framing, including bottom plates ▪ Exterior wall framing in low risk, single storey masonry veneer buildings 	<ul style="list-style-type: none"> ▪ Untreated kiln dried radiata pine ▪ Untreated Douglas fir ▪ H1 treated, planer gauged radiata pine^ 	No practical change
<ul style="list-style-type: none"> ▪ Exterior wall framing and parapets in all but low risk, single storey masonry veneer buildings ▪ Enclosed framing within skillion roofs^^ 	<ul style="list-style-type: none"> ▪ Untreated kiln dried radiata pine ▪ Untreated Douglas fir ▪ H1 treated, planer gauged radiata pine^ 	<ul style="list-style-type: none"> ▪ H1.2
<ul style="list-style-type: none"> ▪ Subfloor framing 	<ul style="list-style-type: none"> ▪ Untreated Douglas fir ▪ H1 treated, planer gauged radiata pine 	<ul style="list-style-type: none"> ▪ H1.2
<ul style="list-style-type: none"> ▪ Enclosed framing within flat roofs ▪ Framing for enclosed decks and balconies ▪ Framing within enclosed balustrades 	Standard unclear, but in practice the following have been typically used: <ul style="list-style-type: none"> ▪ Untreated kiln dried radiata pine ▪ Untreated Douglas fir ▪ H1 treated radiata pine^ 	<ul style="list-style-type: none"> ▪ H3.1
<ul style="list-style-type: none"> ▪ Piles and other structural in ground material 	<ul style="list-style-type: none"> ▪ H5 	No change

* Summary of major elements only

** Takes effect from 1 April 2004, subject to final industry feedback

^ A range of other minor timbers are permitted

^^ A pitched roof where the ceiling lining is parallel and close to the roof cladding

Identification requirements

In order to help ensure the right timber is used in the right situation, the Acceptable Solution will introduce changes to the way treated timber will be identified. These are:

- In addition to the existing requirement that the treatment level of timber is branded on its end, there must be a unique numbering system that identifies the treatment type.
- A requirement that framing timber is coloured at the time of treatment to identify treatment levels.

How did the BIA decide on these changes?

When developing changes to the Building Code or its Approved Documents the BIA consults widely, reviews existing research and undertakes independent analysis and research: In this case this involved

- i. Preliminary discussion with industry stakeholders on options
- ii. Publication of a consultation document containing options for proposed changes to the Acceptable Solution which included a preferred option and an alternative option
- iii. Publication of an independent cost benefit analysis (prepared by NZIER) of the proposals and a regulatory impact statement
- iv. An eight week consultation period that allowed submissions on the proposal, the cost benefit analysis and the regulatory impact statement to be made. In total, 225 submissions containing several thousand pages of comments were received.
- v. Submissions were then analysed by BIA staff and a BIA facilitated working group. The working group included a cross section of representatives from the timber and building industries and a consumer representative.
- vi. NZIER considered comment on the cost benefit analysis and updated it accordingly.
- vii. The full Building Industry Authority considered recommendations from this process and made final decisions on the changes.

How does this relate to work the BIA is doing on external moisture management?

The two are closely linked.

The BIA has published proposals to change the Approved Documents (an Acceptable Solution and a Verification Method) supporting Clause E2 (Weathertightness) of the Building Code. Essentially, these address the way buildings should be constructed to keep moisture out and deals with components like cladding systems, cavities and flashings.

The durability requirements we have introduced recognise that no matter how good the building control regime is, there is always a risk that a building could leak at some stage in its life. The timber durability and treatment requirements are therefore about providing a second line of defence targeted to where this is needed in the building.

In essence, the changes to the E2 Approved Documents introduce a range of prescriptive regimes for complying with the external moisture requirements of the Building Code including:

- Providing more detail in prescribing how certain building materials (including some so-called “monolithic claddings”) should be used to help prevent buildings from leaking
- Broadening the range of claddings covered by the Approved Documents
- Providing more direction regarding the design and use of flashings
- Introducing a requirement that cavities be built behind claddings in situations that are considered to be a high risk for leakage (cavities provide an opportunity for moisture to drain or evaporate before causing damage to building materials such as timber framing).

The changes proposed in this area are complex. The BIA has made significant progress on most principal issues and is working to publish the final changes as soon as possible in 2004.

What do the changes mean in terms of the cost to homeowners?

The impact will be relatively small – the treated timber changes will add around \$500 to the cost of a typical new house affected by these changes.

Not all new houses will be affected by these changes though. Low-risk simple brick veneer clad houses do not require treated framing - they make up around one third of the market. There will be no additional cost for these houses as a result of the changes.

However, it should be stressed that the changes should be considered as part of a package with the proposed changes to the External Moisture approved documents. It is estimated the combined additional cost for an average house is \$5,000 or about 2-3 percent of the cost of an average house. Increased costs will be offset by a reduction in the risk of structural damage to housing.

How do these changes affect houses built with untreated timber?

During consultation concerns were raised that these changes could lead to a devaluation of properties built using untreated timber.

This was acknowledged in the NZIER report but they believed the impact was likely to be relatively minor and that “value changes” were already likely to have been largely factored into the property market as a result of building failures and the general publicity around the weathertightness issue over the last year or so.

Could council's refuse code compliance certificates for buildings that don't have the level of treatment required?

Changes to Acceptable Solutions are not retrospective. If a council has granted a building consent or code compliance certificate before 1 April 2004, the consent or certificate will remain valid.

We have introduced the 1 April 2004 date for two reasons. It provides industry with an opportunity to address supply chain issues. Secondly it provides a reasonable opportunity for existing construction jobs to be completed, and signed off prior to the changes taking affect.

However, from 1 April 2004, if a building consent has been granted but no code compliance certificate has been issued, councils **may** apply the new Acceptable Solution when considering whether to grant certification. Councils must have reasonable grounds that a building complies with the Building Code in order to issue a code compliance certificate.

This means builders and designers should take the changes to the Acceptable Solution into account in regards to current building projects.

We will also be giving strong advice to councils that they clearly inform customers applying for building consents of the changes to the Acceptable Solution and the implications for their building project.

If a building does not comply with the Acceptable Solution, it may still comply with the Building Code as an Alternative Solution. The building is just not automatically deemed to comply. Councils must consider these buildings on their individual merits and determine whether they will meet the performance requirements of the Building Code. Councils must have reasonable grounds that a building complies with the Building Code in order to issue a code compliance certificate.

It should also be noted that there are three months before the changes come into effect. This change has been widely anticipated since at least the publication of the Hunn report more than 12 months ago. The BIA clearly signalled a need for increased timber treatment requirements when it published proposed changes to B2/AS1 in June 2003.

How will these changes affect the Douglas fir industry?

The impact on the Douglas fir industry was widely canvassed during the consultation process and has been carefully considered by BIA staff and the Authority.

Despite arguments to the contrary we have not found the available science compelling enough at this time to accept that untreated Douglas fir has sufficient durability to be allowed in situations of a relatively high-risk nature (that is, to give it the status of automatically being deemed to comply with the Building code).

Because Douglas fir cannot easily be treated at this time, strong concern was expressed that the proposed changes would result in significant harm to the industry and to the South Island communities around which the industry is based.

Those arguments have certainly had some impact in focusing the BIA on a risk informed approach, rather than the earlier proposal requiring treated timber throughout a building. The final changes to the Acceptable Solution should involve substantially less impact on the Douglas fir industry as they allow Douglas fir (and untreated kiln-dried radiata) to be used in quite a number of framing situations which are seen as low risk. We estimate 70-80 percent of all timber framing for housing (excluding sub-floor timbers) could be either untreated kiln-dried radiata pine or Douglas fir.

The BIA will continue to keep this matter under review and will take a leadership role in promoting co-operative research in this area.. If the science changes and provides us with appropriate evidence that Douglas fir does have sufficient durability, then the BIA will review its decision.

Can Douglas fir still be used for external framing?

In some circumstances, yes.

Under the Acceptable Solution, Douglas fir could still be used in external framing for low risk masonry veneer buildings. These make up around one third of the residential construction market.

It should also be noted the Acceptable Solution is not mandatory. People may use alternatives to what is set out in any Acceptable Solution. This means that Douglas fir could be used in the external framing of any building so long as people can demonstrate to a

Council or building certifier that the building design meets the durability requirements of the Building Code.

Following the methods set out in the Acceptable Solution (that is, H1.2 for external framing in all but low-risk masonry veneer buildings) simply means the building will automatically be deemed to comply with durability requirements of the Building Code.

Why increase treatment levels in external framing, wouldn't requiring cavities behind all cladding have the same effect?

No – the changes to treated timber requirements are about a second line of defence. Framing timber can still be subject to moisture contact even behind cavities.

New Zealand's design and construction experience with cavities is still not highly developed. Accordingly it makes sense to have treated timber behind cavities, at least at this stage.

The Acceptable Solution does allow for the use of untreated timber in external walls for low risk masonry veneer buildings (which do use cavities). But there are some important differences about cavities used in masonry veneer buildings and those used behind other claddings. Masonry veneer claddings are substantially wider; ties are significantly less likely to transmit water than battens used in other cavities; and ventilation is provided at top and bottom.

How will these changes affect the export of New Zealand timber?

During the early consultation with the timber industry, concerns were raised that the removal of untreated kiln-dried radiata from B2/AS1 would have a serious detrimental effect on the export opportunities for this timber – particularly to emerging markets like China and India.

The matter was not raised in formal submissions and it is difficult to determine the likely quantitative effect. As NZIER pointed out, any impact on the export industry is likely to be driven by general knowledge and media coverage of concerns rather than by specific changes to B2/AS1. That knowledge has already been conveyed to overseas markets and factored in.

In addition, the final changes recognise the performance to date of untreated kiln-dried Radiata pine and represent a significant shift from the preferred option set out in the consultation documents.

It is also interesting to note the recent announcement that China has approved the use of untreated kiln dried radiata pine under its building code.

Should we be concerned about the introduction of additional chemicals to our homes?

Submissions to our proposals made it clear there are concerns about the use of chemical treatments. While these changes will lead to an increase in the use of treated timber, the increase will not be as great as under our original proposal. The use of treated timber is targeted at areas at risk rather than the more widespread application as previously proposed.

It should also be noted, framing timber is typically used in an enclosed setting where people cannot come into contact with it.

In addition, timber durability requirements can typically be achieved with a range of treatment types and end users have some choice over what they feel most comfortable with. The new requirements for durability identification include an identification of the chemical treatment type. This will allow users to be sure that they have received the treatment type they have ordered.