

## **Offcuts**

Issue 38  
Winter 2004

### **Editors Comment**

This will be the last issue of Offcuts with me at the helm. I am leaving council to devote more time to my Architectural Design practice (see the ad on this page). I'd like to thank you all for putting up with my rantings over the years. I hope that the information I've provided has been useful. Offcuts will continue. Keep looking every 3 month for your regular dose of building information.

Last week we had a very good seminar from BRANZ / BIA on the new E2/AS1 covering the exterior envelope and detailing. It was very informative, but again, disappointing that so few of you found the time to attend. We all need to make sure that we stay on top of the issues and the BRANZ seminars are an excellent way of doing so. Check out the BRANZ website for more information on future seminars.

### **Specifications? What specifications?**

*From The BRANZ May 2004 Guideline*

Apparently there are still consent applications being submitted to territorial authorities that are substandard when it comes to providing the supporting information on which building inspectorates are required to make decisions for approval.

Some don't have any specifications to accompany drawings or details, or other supporting documents.

A specification is an explanation of how certain aspects of a construction job are to be executed, a description of how things are to be done, and to what standard or level of finish and quality.

Without the specification, the territorial authority - or anybody for that matter - will be unable to understand what the plans will produce, even if they're accompanied by comprehensive product information.

### **INSURE AGAINST THIS HOUSE OF CARDS**

*From The BRANZ April 2004 Guideline*

The other day a colleague, reflecting on the issues surrounding leaky buildings, made an interesting observation. The closer a building is designed to the minimum requirements, be they building code or other regulatory requirements – structural, thermal glazing, etc – the greater the risks, especially if building conditions during construction mean compromises are made. This could mean that the building will not perform as designed, and may not even comply with the building code.

A sobering thought, and one that would be especially relevant in situations where the building's performance causes problems sufficient enough for the occupier to complain.

A complaint can lead to site inspections that can literally mean the building is taken apart again. A great deal of technical rigour can be brought to bear – far more than was ever in evidence when the building was under construction. This rigour, applied by legal imperatives, lays bare any deficiencies. For example: a leaky window leads to a floor rotting to such an extent that someone's foot goes through it. This leads to a wider examination that shows deficiencies in cladding detailing that have allowed water to get into the wall cavity.

Opening the wall shows that insulation levels are inadequate because of substituted products. Further leaks discovered in the walls at higher levels lead to the investigation of membrane roofing detailing which has been compromised by floor levels and parapet caps penetrated by fastenings. Finally, it's discovered that height plane requirements have not been met because excavation levels were not achieved and increased joist sizes are now required at the second- and third-story level because those originally specified are undersized ... and so it goes on.

Aside from the maintenance issues, it's clear that if design and construction practices are purposely aimed at ensuring that only the minimum requirements are met, then the risk of cumulative faults developing is high, thus creating a sort of 'house of cards' approach to design.

Most design professionals and trades people have insurance for the unexpected. One of the cheapest forms of PI insurance available (and, incidentally, one that will provide cover for weathertightness-related issues) is the attitude of mind that produces a design and executes construction practices that are not pared down to minimum requirements.

This approach will accommodate a small leak, should one eventuate, allow for sufficiently robust construction so that repair does not mean extensive demolition, and - best of all - will not involve the scrutiny, cost and dissection of an investigation designed to apportion blame, and for which there is now no insurance cover available.

## **Bending Reinforcing Steel**

From the BRANZ June Guideline

Recently we have been made aware of a popular portable hand-operated reinforcing steel cutter / bender that uses the same sized mandrel for all bends made in bars up to its maximum capacity of 16mm diameter bars. The mandrel is 34mm in diameter and is too small to allow any commonly used rebar to be bent to comply with NZS 3109, which is the Acceptable Solution, and therefore the Building Code. The Standard sets the requirements for the minimum diameter of rebar bends. In addition to having differing values for plain and deformed bars, stirrups and ties have differing requirements

compared with all other bars. A 12mm deformed bar being bent as a stirrup needs to be bent around a mandrel with a minimum diameter of 4D, i.e., 48mm. The same bar used as general reinforcing must be bent using a larger 5D or 60mm mandrel, nearly twice the diameter of the mandrel provided as part of the bender.

The problem in bending bars too tightly is that they may be strained to a degree that significantly weakens them. Bars bent with this equipment are relatively easy to detect and they, or indeed concrete proven to contain such bars, will very likely be rejected by Building Inspectors or supervising professionals.

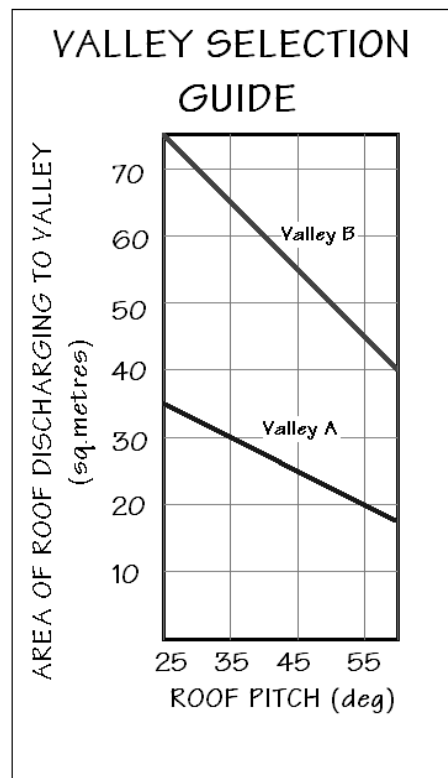
There is available, however, a bender that uses an 80mm mandrel, which has been brought to the attention of the BIA and they will be providing further comment on the bender in a future issue of BIA News.

## Valley Issues

The hailstorms earlier this year caused millions of dollars worth of damage. Much of it through leaks in flashings such as valley flashings. Valley flashings don't normally get a lot of thought at the design stage but when you consider how easy it is for hail, leaves, or the kid's cricket balls, to block them up and cause leaks, you begin to realise just how important they are. I've also noticed that valley sizes recently have shrunk and this is a cause for concern.

In the approved document to the building code, E1/AS1, valley flashings are treated as internal gutters. Figure 16 in E1/AS1 gives the cross sectional area for valleys but it takes a bit of figuring out and you need to modify the values to cater for Wanganui's rainfall intensity.

Normally a 250mm wide flashing that returns up 25mm at the sides (valley A) will provide sufficient capacity for a roof catchment of up to 30m<sup>2</sup> on a roof pitch 15-25 degrees. Any valley outside this range should be enlarged (see valley B)

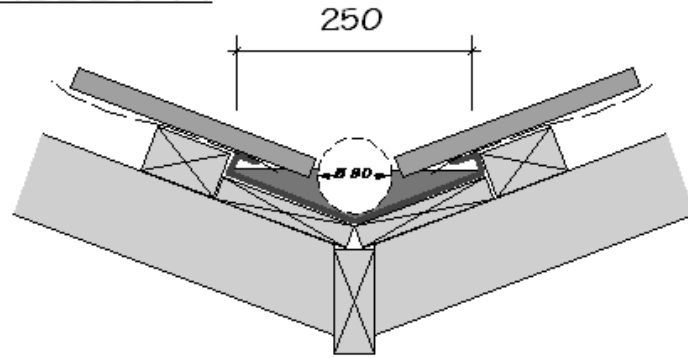


To simplify matters, in both cases you should use 150mm wide timber (either 25 or 50mm thick) as valley boards or Dwangs.

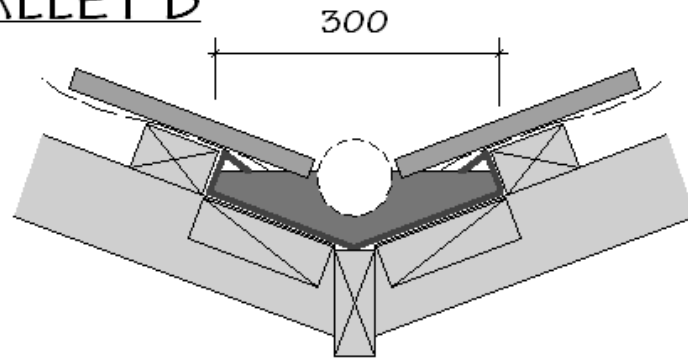
### Alternative Solutions

The NZ Building Code is performance based. This means that it

## VALLEY A



## VALLEY B



sets a minimum standard to be achieved in the construction of a building, but does not tell you how to achieve it. A range of 'Acceptable Solutions' have been produced by the BIA and certain NZ Standards (ie: NZS 3604) have also been nominated as acceptable solutions. By using these documents to design or build, compliance with the NZBC is guaranteed. But they don't cover every situation and in so an 'Alternative Solution' may be required. Alternative solutions allow the designer latitude to provide creative solutions to the NZBC.

When issuing a building consent, council needs to be *satisfied on reasonable grounds* that the proposal complies with the requirements of the building code before the consent can be issued. If the proposal is covered by Acceptable Solutions, it's a 'spot the dot' exercise- we just check that the proposal complies with the Acceptable Solution. If what is proposed does not cover by a Acceptable Solution and an Alternative Solution is proposed, being *satisfied on reasonable grounds* is a little more complicated.

An Alternative solution needs to be backed up with sufficient evidence to demonstrate how compliance is to be achieved. It is not sufficient to say "I'm an experienced Architect/Builder/Plumber etc and therefore It'll work." Believe it or not, the inspectors are also widely experienced and have learnt an awful lot more than most *through the failures of others*. Something similar to what you think is your unique solution (or even the same) may have been observed to fail by the processing inspector or one of his colleagues. So you need to make a case for it- why will your solution work?.

Your case should state clearly the specific performance requirements of the NZBC that applies to the proposal (don't forget durability (B2) which applies in all cases), and how the proposal will achieve this. The Acceptable solutions provide a benchmark for assessing an Alternative Solution- so do other similar tried and true products and/or methods. How does your proposal compare? Is

it better than or at least equal to them? Most Alternative solutions are proposed because the designer can't achieve the performance required by the NZBC. Remember, *we won't lower the standards*. So, if the proposal falls short in some respect you need to show how you are going to compensate for this shortfall so that the end result is equivalent.

***Remember- 'Alternative Solution' is not a band-aid-fix-it all label to cover inadequate design.***