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Incidence of Major Structural Damage from Termites in Australian Houses

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Researcher:
P. Forsythe
Timber Development Association (NSW)
PO Box 50, Surrey Hills, NSW 2010

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Forest and Wood Products Research and Development Corporation
PO Box 69, World Trade Centre, Victoria 8005
Phone: 03 9614 7544 Fax: 03 9614 6822 Email: info@fwprdc.org.au
Web: www.fwprdc.org.au

Incidence of Major Structural Damage from Termites in Australian Houses

Prepared for the

Forest & Wood Products
Research & Development Corporation

by

P. Forsythe

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1 Introduction

The building industry and building owners have an interest in reducing the risk of termite attack on houses. In pursuing this interest, it was found that the Australian Bureau of Statistics (ABS) were in a position to shed light on the problem by way of data gathered on the incidence of major structural damage from termites in its "Australian Housing Survey" conducted in 1999. For instance their survey asked questions about common causes of major structural problems based on householders' perceptions. Apart from termite damage the menu of responses offered to participants included cracks in the structure, foundation movement, rising damp, plumbing and electrical problems and roof defects. Given the nature of some of these problems it would seem that the ABS question to householders could be better interpreted as major problems with the structure rather than major structural problems. This is because all options impact on the structure but only some cause major structural problems. This point is made purely to help readers clarify the interpretation and context of findings herein.

The sample from the survey was large enough to make generalizations relating to the entire population of households in Australia. Data from the survey has been used in this report as a basis for exploring the incidence of major structural damage from termite attack on houses. Comparisons are also made with other causes of major structural damage.

2 Method

ABS were asked to interrogate the data from their Australian Housing Survey as follows:

- Reduce the sample of responses to only include those houses constructed since termite construction standards were introduced in 1967 (35 years ago). By doing this, the revised sample was more likely to reflect houses that had at least some identifiable termite management system.
- Reduce the sample to deal purely with homeowners (thus excluding renters). This was because homeowners were seen as being key decision makers relating termite management while renters were not.

Based on the previous criteria, the original ABS sample was reduced to a sample of 8,772 households. ABS advised that this data set was sufficient to generalise the findings to the population of 4.478 million households across Australia (which is the estimated number of households fitting the above sampling criteria).

From the reduced data set, ABS analysed the proportion of households perceived to be suffering major structural damage from termites or wood rot, and to compare this with other causes (Note: the ABS survey question only asked a general question relating to

both termite damage and wood rot, therefore termite damage could not be analysed on its own).

ABS were also asked to break the data down into four risk zones across Australia based on a termite hazard map developed by Leicester *et al.* (2003) shown in Figure 1. With regard to this, ABS could only deal with the zones using households from capital cities in each zone. These cities represent the major population centre in each zone but to some extent this approach disadvantaged zones with the smaller capital cities and low densities of population.

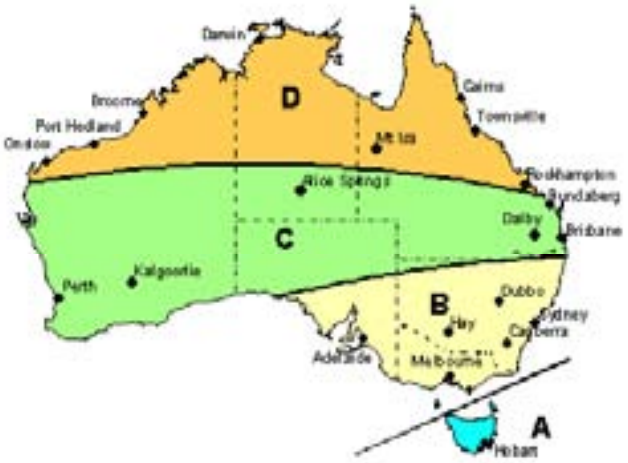

Figure 1:
Termite Hazard Map (Source: Leicester *et al*. 2003)

3 Findings

After processing the survey data according to the sampling criteria, the general findings were:

- In Zone A (designated as having negligible risk and including Hobart) the risk of major structural damage from "termite damage/wood rot" was calculated to be 0%. Having said this, it noteworthy that the calculated figure is subject to a standard error greater than 50% due to the small sample in this zone. As a result, statistical confidence in this figure is low, albeit it is logically realistic given that houses in Zone A are known to have negligible risk of termite attack.
- In Zone B (designated as having medium risk and including Sydney, Melbourne and Adelaide) the risk of major structural damage from "termite damage/wood rot" was 1.42% and the standard error was categorized by ABS as 25% (or less), thus allowing greater confidence in the accuracy of the finding.

- In Zone C (designated as having high risk and including Perth and Brisbane) the risk of major structural damage from "termite damage/wood rot" was 1.74% and the standard error was again categorized by ABS as 25% (or less), thus allowing the same level of confidence as the previous item.
- In Zone D (designated as having extreme risk and including Darwin) the risk of major structural damage from "termite damage/wood rot" was 0%. Again it is noteworthy that the calculated figure is subject to a standard error greater than 50% due to the small sample in this zone. As a result, confidence in this figure in statistical terms is low and this is further supported in logical terms because houses in Zone D are known to have an extreme risk of termite attack.

From the above it is concluded that there is little variance in risk between Zones B and C while figures from the other two zones are less reliable due to high standard errors. It is also relevant to note that Zones B and C account for the greatest proportion of households in Australia – Zones A and D are small in comparison. On this basis it seems there is little to gain by separating Australia into zones and more to gain by treating the risk of termite attack according to the way the data set was collected i.e. according to the population of households. On this basis it was pertinent to recalculate the average based on Australia wide statistics rather than individual zones (knowing that most households are located In Zones B and C). On this basis 1.3% of households in Australia (meeting the sampling criteria) had major structural problems from termite damage/wood rot during owners occupancy of the house.[1] If it is assumed that owners will remember all major structural problems that occur over the time they have owned the building, then it can be said that the 1.3% relates to a 9.1 year average (as taken from ABS survey data for dwellings owned and occupied since 1967, that also contain major structural problems).

In order to obtain greater utility from this figure there was a need to divide it into separate categories for "termite damage" and "wood rot". To do this, a data set from Tyrrell's Property Inspections (1992) published in their Building Failure Report was used. The data set for their report was based on findings from 10,000 property inspections in the greater Sydney area. When comparing the incidence of wood rot and termite damage it was apparent that the relative difference converted to a ratio of 4 to 1. Four cases of wood rot for every one case of termite damage.

This ratio has been used to breakdown the previous figure for major damage to house structures from "termite damage/wood rot" (1.3%) into its constituent parts. On this basis major structural damage from "termites" is 0.3%, and "wood rot" is 1.0% of households in Australia (rounded to the nearest one decimal place) and as previously stated, this relates to a 9.1 year period (based on the average period of ownership). Put another way, 1 in every 333 households across Australia are estimated to suffer major structural damage from termite attack and this likelihood of attack will occur over a 9.1 year period. This includes all types of households (since 1967) and is based on the perceptions of homeowners. From this, it is concluded the odds are quite low.

[1] This assumes that owners have full memory of major structural problems during their occupancy of the house

In order to place the above figure into an overall context, the 0.3% figure was compared with other categories of major problems identified in the ABS survey. For instance there were many causes of major structural problems and in total, 13.4% of households from the ABS survey thought they had such problems from one cause or another. Findings are shown in the table below.

Order of priority	Causes of major problems to the structure	Percentage of households in Australia	How many time more common than termite damage
1.	Major cracks in walls/floors	2.5	8.3
2.	Sinking/moving foundations	1.8	6.0
3.	Rising damp	1.4	4.7
4.	Walls/windows out of plumb	1.4	4.7
5.	Major plumbing problems	1.4	4.7
6.	Rot	1.0	3.3
7.	Not known	1.0	3.3
8.	Major roof defects	0.9	3.0
9.	Other	0.8	2.7
10.	Sagging floors	0.6	2.0
11.	Major electrical problems	0.3	1.0
12.	Termites	0.3	N/A
	Total	13.4	

4 Conclusions

From the previous discussion it can be seen that major termite damage is less common than other major structural problems identified in the ABS survey. For instance cracks in walls and floors are eight times more likely to occur than termite damage. All other designated categories in the ABS survey are also at least twice as likely to occur except "major electrical problems". In statistical terms, one in every 333 households across Australia are estimated to suffer major structural damage from termite attack per 9.1 years of ownership. This includes all types of households (since 1967) and is based on the perceptions of homeowners. Based on ABS data, termites are therefore considered a relatively minor cause of major structural problems in housing.

5 References

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