

ARCHICENTRE AUSTRALIA TECHNICAL INFORMATION SHEET

TERMITES AND BORERS

This technical information sheet constitutes a vital part of Archicentre Australia's recommendations to you. Failure to observe these could lead to premature deterioration of the building.

The nerve-racking part about buying a property – residential or commercial – is that, more often than not, it is the unseen problems which cause all the heartaches.

One of the worst cases seen by assessors was in a house in Bentleigh, Victoria, where the architraves, Skirtings, doors, windows and cupboards were all infested with termites. The house had been superficially renovated to cover up tens of thousands of dollars' damage. Similar properties are frequently encountered all over Australia, and particularly in Queensland.

According to Archicentre Australia's statistics, after cracking and rising damp, termites and borers scare people the most. Part of this fear comes from the unknown. They conjure up vivid pictures of teams of nasty little creatures voraciously chomping up a building into a pile of rubble. Most people don't understand termites and borers, but like everything, once the cause and remedy are explained, the problem doesn't seem so bad.

Termites are often mistakenly called 'white ants', although apart from their social habit of living in colonies, and similar size, they are a very different category (genus) of insect.

We trust that your Archicentre Australia Timber Pest inspection will assist you in realistically assessing whether you can accept the risk of termite and other destructive timber pests in the property you are considering purchasing.

SUBTERRANEAN TERMITES

Termites are everywhere. If it is any comfort, although Australia has its share of destructive termites, they are nothing compared with their cousins in tropical Africa who can reduce a house to rubble in three months. In northern Australia, they can grow up to 15mm long (*Mastotermes darwiniensis*) and will devour wood, cow dung, paper and corn for their cellulose content. They are even known to attack lead-coated cables, make holes in plastic water pipes and even attack billiard balls. There are over 300 species of termite in Australia, but only about 30 cause damage of any economic significance. Only Tasmania is free of "economically significant" termite attack to buildings.

Termites in other States may be smaller than the species in the north of Australia but can be more numerous and just as voracious. Termites tend to be prevalent in moist sandy soils, like beach-side suburbs especially where underground water is present (one in ten houses or more is likely to have had termite trouble) but clay and other soils are also quite susceptible. No area in Australia is immune.

The problem, as we shall see, is that they are sometimes extremely difficult to find. For this reason, a visual inspection that fails to find termite activity does not necessarily mean that they are not present, or that they won't invade soon after the inspection.

TERMITE BEHAVIOUR

Subterranean termites hate light and dry heat, preferring dark, warm, moist environments because their bodies are very prone to desiccation (drying out). They will never be found in the open and their activity is always well inside the timber they are attacking. In very bad infestations they may eat most of the available timber, leaving only a very thin veneer on the surface. Commonly they will completely gut a piece of wood leaving no evidence on the outside.

Main and often subsidiary nests are excavated underground or in rotted tree stumps and wood piles, wherever humidity is high. Underground galleries are dug to search for wood. The galleries preserve the moist atmosphere of the nest, shield the termites from light and protect them from predators (largely ants). Their network of galleries can stretch up to a hundred metres from the nest in search of food.

Where their galleries leave the ground (e.g. to feed on a building's floor framing), the termites construct shelter tubes with the same properties as galleries. They are usually about 20mm wide and look like piled-up mud trails, being constructed of soil and faecal material, bound together with termite saliva. These mud shelter tubes are the best way of identifying termite activity. The tubes may be seen climbing up the walls between the ground and floor-boards, or if your building has stumps, snaking over ant caps between stump and bearer. Once new food is found, the colony can virtually excavate the whole of the inside of the timber, leaving only a honeycomb of tunnel walls and a thin outer layer which preserves the controlled atmosphere. The destruction can be devastating and may be remarkably quick.

Termites are good at predicting weather changes. Even before a heavy warm-season downpour begins, swarms of the reproductive caste termites (Alates) are released from the nest and fly away to form new colonies. Fortunately, of the millions which set out, only an occasional pair succeed in finding a suitable site, and many of these are taken by predators or die by desiccation. Warm humid weather conditions are favoured for the short flights, which usually occur during the warmer months. Once established and mature, the colony population can expand rapidly, as the Queen termite can produce up to 2000 eggs a day! This represents a huge potential for ever-increasing timber destruction, if conditions are right.

Properly installed termite 'barriers' force termites to show themselves. Physical barriers include ant caps and proprietary mesh and stone products. Chemical treatments include repellent and non-repellent termiticides, the former of which may also be combined within products with 'barrier' type properties. There are also monitoring and baiting systems and reticulating systems. Some of the proprietary physical barrier products and reticulating systems can only be installed during the construction of the building.

PREVENTION IS BETTER THAN CURE

Being aware of, and appropriate management of the environmental conditions which are conducive to timber pest attack can go a long way in mitigating your property's risk of attack. If your neighbours have had termite problems, or there is a change in local conditions, for example, road or development works through an adjacent reserve, it may be wise to obtain a timber pest inspection. The cost of such an inspection compares favourably with the cost of eradication and replacement of affected timbers.

CONDITIONS CONDUCTIVE TO TERMITES

HIGH LEVELS OF MOISTURE

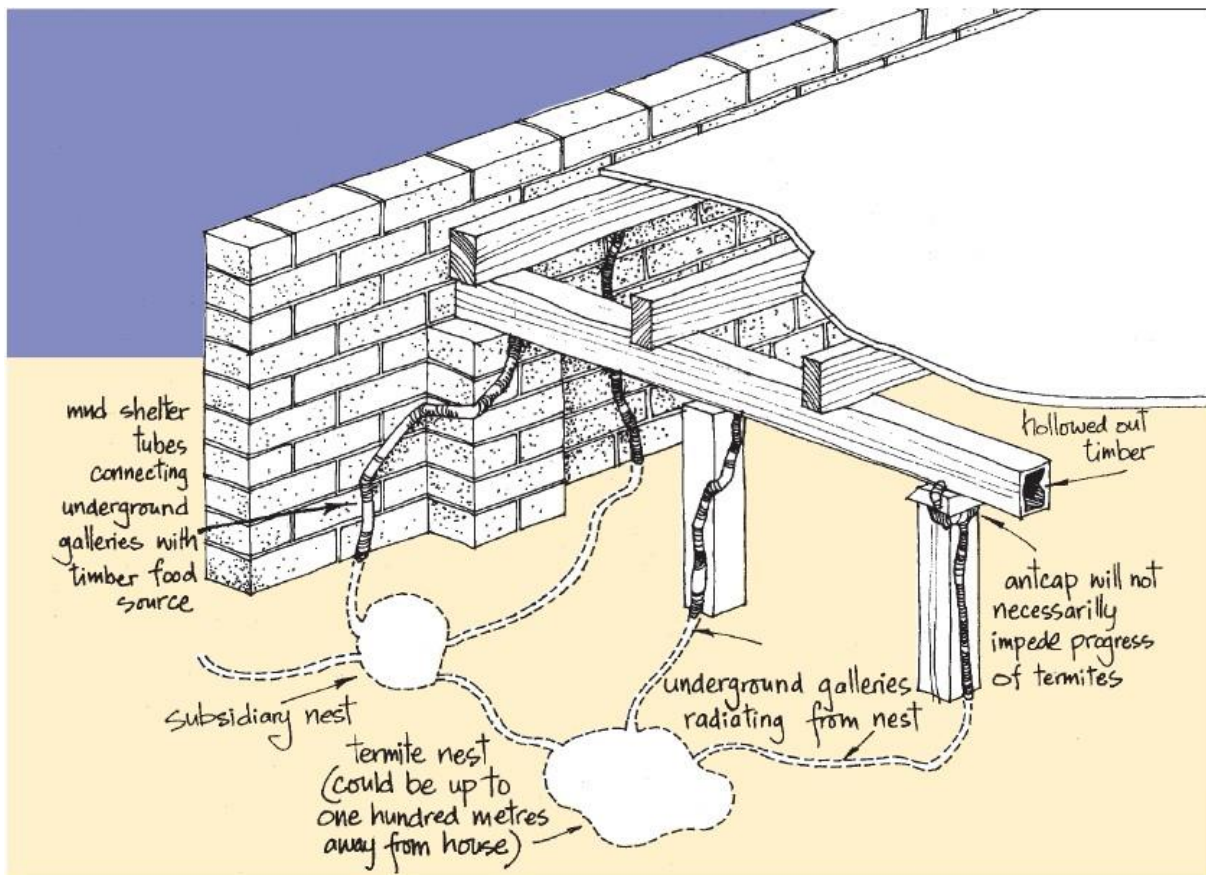
Keep sub-floor and roof spaces dry and well ventilated. Ensure the adjacent ground surfaces and the overflows from hot water units, rainwater tank, air conditioning units or the like, drain away from the building. Damp soils under or around a building may also be an indication of broken drains or pipes. Rectification of these defects should be prompt. Persistently damp soil and timbers will also encourage termite activity.

BLOCKED SUB-FLOOR VENTILATORS

Avoid the temptation to build up garden beds directly against the external walls, particularly against weatherboards, and keep well clear of sub-floor ventilation grilles or openings. Similarly, keep sub-floor ventilation grilles or openings free from obstructions. Avoid laying paths or paving where they may obstruct the free flow of air through the ventilators. Do not forget to ensure adequate sub-floor cross ventilation where new building work may cover existing sub-floor vents.

BLOCKED WEEPHOLES

Weepholes drain moisture and condensation from within wall cavities. Blocked weepholes not only increase moisture levels within these spaces but also may provide concealed access for termites. Weepholes should be kept free of garden mulch and litter.



CONCEALED SLAB EDGES

Homes built on concrete slabs are not immune to timber pest attack. While there are no sub-floor timbers, termites can gain concealed access to the wall framing and eventually the ceiling and roof framing through poorly sealed pipe penetrations, slab cracks and the brick or cladding interface.

Australian Standards recommend that the slab edge be exposed at least 75mm to permit termite detection. The slab edge should not be rendered, tiled, clad or concealed by flashing or landscaping.

TIMBER IN CONTACT WITH THE GROUND

Timber in direct contact with the ground provide the ideal progressive dinner - food on the go - whether the timber is part of a building structure, a stack of firewood or building waste left under the house. Waste timber should be removed; firewood stored away from the home; posts raised on stirrups; and stumps fitted with antcaps to aid detection.

MAINTENANCE ITEMS

To guard against termite attack, there are several precautions that should be taken:

- Remove all timber debris from under the house, since its presence encourages foraging termites. Move piles of timber or firewood (potential food source for a new colony) away from the building, and store the timber in a dry, well-ventilated location. Old decayed tree stumps should be removed to below ground level.
- Ensure building timbers are not kept in persistent damp conditions, such as under heavy creepers, near leaking taps or regularly operated sprinklers but are allowed to dry out. These timbers will require regular inspection for both timber rot and termites.
- Provide good ventilation under all suspended floors. The reduced humidity and moisture makes the subfloor area vastly less attractive to termites. Leaking water pipes or bad drainage encourages termite presence so these defects should be remedied.
- Examine new constructions; for example, verandahs and timber decking, if built on stumps, may not have ant caps. These constructions, and concrete additions to the house, may also bridge previously laid chemical treatments, permitting unobserved termite entry. The underside of a concrete slab is a popular place for termite nests. If you have concrete laid next to the timber frame of your house, damp conditions may be promoted, and subsequent termite entry would be extremely difficult to detect. You should consider this when renovating: if concrete-next-to-timber is part of the design, have an expert first put in place a preventative treatment.
- If you notice what you think is termite activity, leave them alone and arrange an inspection by an expert. Never disturb what you think may be termite activity. This prompts the termites to move elsewhere which makes future detection and eradication more difficult. It may also result in the damage being increased elsewhere.

FOOTNOTES

(QLD ONLY) WEST INDIAN DRYWOOD TERMITES

These highly destructive termites were first recorded in Maryborough in 1964. They do not need access to water or earth, so do not leave the normal termite mud tunnels, and thus are harder to find. Colonies have since been found in Maryborough, Bundaberg, Childers and Brisbane. They have been declared a "notifiable disease" and eradication treatment is performed without cost to the householder. Isolated outbreaks have occurred in Sydney and Perth as a result of untreated imported furniture. You can minimise the chance of infestation by thoroughly examining second-hand timber and furniture before introducing it to your house. West Indian termites leave very small oval shaped pellets, brown, black or reddish in colour, near the site of attack. If you suspect you have them, send samples of the pellets (or "frass") to the Queensland Department of Forestry or your state agricultural or primary industry department. The Department of Forestry urges the public to be vigilant and hopes to eradicate this pest completely.

DAMPWOOD TERMITES

Dampwood termites are not considered to have significant economic impact on timber in service, generally tending to feed only on damp or rotting timber. They are rarely found in dry timbers in buildings and do not attack buildings unless there is timber-soil contact that allows access to other timbers. The risk of infestation is reduced significantly by isolating wood from the ground and preventing dampness. Affected timbers should be replaced.

DETECTING AND ERADICATING TERMITES

The annoying part is that termites are hard to find even for experts and it is usually only after a chair leg goes through a weakened floor, or the vacuum cleaner head crushes a hollowed-out skirting board, that people notice their unwelcome visitors for the first time. Termites typically leave the thinnest of barriers between themselves and the atmosphere, sometimes the mere thickness of a coat of paint, which can be a way of identifying their presence.

They are normally first noticed in low density woods like skirtings, architraves, floorboards and Pine house framing timbers, but can extend into denser hardwood timbers if not eradicated.

Termites are the cause of the greatest economic losses of timber-in-service in Australia. Independent data compiled by State Forestry shows 1 in every 5 homes is attacked by termites at some stage in its life. More recent data would indicate that this is now as high as 1 in every 3. Australia's subterranean termite species are highly destructive timber pests causing around \$1 billion worth of damage and treatment costs each year.

Under the right conditions, it can take only a matter of months for a termite colony to severely damage almost all the timber in a home.

Termite infestations can be treated. Chemical pest management treatments should only be performed by an expert, so make sure you contact only currently licensed members in your State. There are a number of alternative treatments. Termiticide can be applied at critical locations around the property, usually in soils or on timbers. Termites absorb the toxin as they pass through the soil and carry it back to their nest where, as they clean or 'groom' each other, the toxin is eventually passed through the entire colony. A non-toxic approach is also available that uses a hormone which affects the growth cycle of the termite, preventing it from shedding its exoskeleton - a necessary process in its life cycle. The hormone, mixed together with a cellulose material and contained in strategically located baiting stations, is also passed through the colony as the termites groom each other.

It is important to understand that if termite activity or evidence of termite damage has been identified on your property or within the building, even if a treatment has been successfully applied, termite damage to timber members may have occurred, either prior to, or during, the treatment process. Some of this damage may be visible, but as much of the timber of a building is concealed and inaccessible to a visual inspection, (for example, behind wall and ceiling linings and claddings, under floor finishes, and insulation, behind joinery units, fittings, fitments or equipment) the unseen damage may be quite extensive and affect structural members.

Similarly, while a treatment might possibly have eradicated a previous infestation of termites, it is no guarantee that they won't return and attack a house again. All termite management systems have limitations. Physical barriers can be bridged or broken and chemical treatments can deteriorate over time. While many product guarantees have conditional cover, ultimately there is no guarantee that any system will provide complete protection. Consequently, we always recommend a termite management plan that includes regular inspections.

The risk of infestation and/or damage to areas inaccessible to a visual inspection, whether or not termite activity has been sighted, should be seriously considered, particularly when the property has identified conditions conducive to termite activity and inaccessible areas at risk of attack or infestation. It is prudent to undertake an intrusive inspection in these areas to determine the presence and/or extent of possible concealed activity or damage.



ABOVE: Timber devastated by a termite attack (As shown above)

BORERS OF SEASONED TIMBER

There are several types of timber borers in Australia, some serious and some not, so identification is important if you think you have a problem. Borers are actually the larval form of different families of beetles. Some of the relatively harmless ones that do not need any special eradication treatment are pinhole borers, longicorn borers and auger beetles.

Pinhole borers cannot survive in timber once it has dried out, so they normally leave before, or soon after, the timber is used for construction. You can identify them by examining their "flight holes" (the holes made when leaving the timber). These holes will rarely have borer dust (or frass) around them, since in most cases, the insect is long gone or dead. They leave relatively few holes unlike the more destructive species below.

Longicorns leave oval shaped holes 6-10mm in size as they emerge from framing timbers or wall linings. They are not a serious structural problem because, unlike the more destructive species, they cannot breed in the timber and therefore cannot proliferate. The size and shape of their flight holes makes this borer easy to identify.

Auger beetles, again fairly harmless, are harder to distinguish from the more destructive Lyctid borer. One way of telling them apart is that auger beetles leave far fewer flight holes since they also cannot proliferate in the timbers, and so are far fewer in number. However, differentiating them from Lyctids is not normally important, since if conditions are right for auger beetles, they are even better for Lyctid borers: therefore, if one species is present, you will normally find the other.

While the adult beetles lay their eggs within the timber, it is the larval (grub) stage of borer beetle development that is the most destructive, as the grubs feed on the timber as they grow. Some beetles may spend several years in the larval stage causing significant and concealed damage. It is only after the borer have finished their pupal stage, during which time their destructive activity ceases as they metamorphose from grub to winged insect within a pupal case, that their presence may be observed through the flight holes they have cut on emerging from the timber, only to mate as adults and repeat the cycle.

LYCTUS BORER (POWDER POST BEETLE)

These borers only attack the sapwood of certain susceptible species of hardwood timber. Sapwood is the living band of wood around the outside of the tree. Each State has its own regulations limiting the amount of sapwood that can be cut from felled trees for use in serviceable timbers, with some States try to eliminate its use altogether, or require susceptible sapwood to be treated.

In the southern States, Lyctid attack to the sapwood of framing timbers is common, but because the amount of sapwood in framing timbers is small, the presence of Lyctid borer is unlikely to seriously affect the timber's strength. And being out of sight, the borers will rarely be noticed. Treatment or replacement of affected structural timbers is generally unnecessary. However, because decorative timbers like skirting boards, small dimensioned battens and timber trims are thin, they could, in some cases, be cut almost exclusively from the outside of the tree and be largely made of sapwood - food for Lyctids, these timbers could be riddled with Lyctids within three to five years of the house being built. Lyctids can be recognised by their 2mm holes and large quantities of flour-like dust (or frass). Although not generally a problem structurally, they are certainly unsightly. If Lyctid attack is visible, or present in battens supporting tiles, claddings or linings, the affected timbers may require replacement. Otherwise they do not need any special treatment.

ANOBIUM BORER (FURNITURE BEETLE) & QUEENSLAND PINE BORER

Anobiid borers are more serious and attack softwoods, especially varieties of Pine (although very rarely do they attack the common *Pinus radiata*). Like Lyctids, Anobiids are widespread throughout Australia. The *Anobium Punctatum* species especially loves Baltic Pine, commonly used 50 to 150 years ago but still occasionally used for floorboards and weatherboards. The "Queensland Pine beetle", *Anobiid Calymmaderus Incises*, found in south east Queensland and northern NSW and farther north, has a similar love for Hoop and Bunya Pine.

Anobiids tend to channel along the grain of the wood, making the odd 2mm pinhole and leaving large quantities of loose gritty dust with a texture of fine table salt. They are capable of eating for years and will happily chomp away anonymously under the carpet. You will probably first notice the floor feeling spongy at one end of a large room (like the living room) because a big floor area will deflect more noticeably. Also be aware that second hand or antique furniture, or old floorboards may contain borers, so examine such articles well before introducing them into the house.

Anobiid damage must always be attended to. Building owners have sometimes stopped infestation by removing all significant borer-infested timbers and replacing them with non-susceptible timbers, then monitoring the results. Such treatment is only worthwhile if sub-floor humidity is simultaneously reduced, because borers thrive in damp conditions. Humidity can be reduced by removal of debris, increasing sub-floor ventilation (cleaning out vents and possibly adding more) and draining damp soil where necessary.

In some cases, Anobiid-infested timbers need chemical treatment. As with termite eradication, it is recommended that only currently licensed members of your State's pest control association be contracted and that they should provide a written description of proposed treatment.

BORER RECOMMENDATIONS

Replacement of all susceptible timbers is always preferred since, in the event of selling the property in the future, it is probable that an inspector will report the borers as active. A chemical treatment to control and/or protect against furniture beetle and/or Queensland pine beetle can be considered as a less effective, lower cost option.

Before considering this option, you should consult with a structural engineer to determine if the timbers are structurally sound. Following the initial treatment, a further inspection is essential in twelve months time to determine if further treatment is needed. Treatments over a number of consecutive years may be required.

TIMBER DECAY FUNGI

Timber may also be affected by fungal decay. Timber affecting fungi reproduce via the release of microscopic spores which can be carried long distances by wind, air currents, water or even on animals. Spores will germinate on damp wood - with a moisture content of approximately 30 - using the timber cellulose as a food source.

Fungal activity will be determined by the type and durability of the timber, its level of protection, ego paint or finish, and environmental conditions, although activity, once commenced, may continue within the already decaying timber even with reducing moisture levels. The environmental conditions conducive to fungal attack are similar to those conducive to timber pest infestation. Rectification of these conditions may prevent local, as well as invasive attack by both fungal and insect types of destructive timber pests.

DECAY CAUSED BY TIMBER DECAY FUNGI

Where exposed to the weather, blistering, peeling, cracked and chalky paint allows water to enter timbers and will result in timber decay over time. Timber is particularly susceptible at joints, connections or overlaps with other members, fixing bolts, nails and fixing plates where the paint or protective cover may be compromised or worn, and where water can pool on surfaces or enter the end grain. Timber should not be in direct contact with soil. External timber elements exposed to persistent shade or damp, such as under wide eaves and verandas, next to or covered by dense garden plant growth or abundant creepers and in poorly drained corners, courtyards or light wells where permanently shaded by buildings, are also at high risk of developing timber rot.

It is important to ensure that susceptible timbers are appropriately protected and well maintained and sources of damp eliminated or controlled. Early sign of timber decay may be timber discolouration, and while timely rubbing back, sealing and repainting to protect the members or elements may appear to halt the process the fungal growth can continue within the already decaying timbers even if the moisture content of the timber is reduced. Smaller sections of cosmetic damage can sometimes be treated by removing the loose and fibrous material, treating with an appropriate fungicide and filling or splicing with a new section, prior to painting. You should consult a building expert to obtain advice as to whether more significant timber repairs are also required. Badly affected members may require complete replacement.

Damp conditions may allow timber rot to develop in concealed framing timbers where early visual detection will not be possible, particularly in and around showers, baths and other wet area plumbing fixtures. Risk can be minimised by maintaining the grouting to floor and wall tiles and the sealant around shower screens and/or shower bases. Similarly, the floor tiling and grouting to external timber framed balconies should be regularly checked and maintained. Where movement has caused tile grouting to crack, it may also have damaged any underlying waterproof membrane, compromising its performance, and allowing water to penetrate to the balcony and, even, wall framing.

Archicentre Australia recommends regular timber pest inspections of all balconies and decks.