Government of **Western Australia**
Department of **Housing and Works**

DHW Technical Guideline

TG013 Termite Management

1. Purpose

This guide sets out Department of Housing and Works (DHW) requirements for termite treatment for non-residential government building projects particularly those buildings with a high timber component (e.g. framing, including sports floors). This guide is required to be circulated as appropriate to consultants.

2. Background

Termite infestations have been identified in newly completed buildings, including those with large timber sports floors. Termite infestations in buildings have consistently led to costly additional remedial works, including treatment, investigation to confirm eradication and remediation of the damaged building fabric.

All government building projects—whether in metropolitan or regional areas—must comply with Australian Standards for termite barriers and treatment systems. This is especially important for buildings that include timber components or are in areas with high termite activity.

The type of termite treatment used plays a critical role in managing risk. Perimeter-only systems are generally unsuitable for public and commercial buildings, as cracks in concrete slabs can allow termites to enter undetected.

When procuring and delivering building projects with a significant timber content, such as large expanses of timber sports floor, the approach to termite treatment should act to:

- Reduce the risk of termite activity before construction begins,
- Ensure the construction approach limits termite access during and after construction, and
- Include appropriate termite barriers, such as chemical sprays and/or physical sheet systems, tailored to the building type.

3. Potential causes for Infestations of Termites

Termite infestation of buildings can occur for a variety of reasons. Causes that have been identified in government projects include:

- Termite barrier or treatment product failure

- Incorrect installation of termite barrier or treatment system
- Positioning of termite barrier not aligning with final location of control joints – particularly if saw cut cannot always accurately locate.
- Subsidence of the soil below the slab resulting in the barrier not being in contact with the concrete slab enabling termite to travel along the underside of the slab.
- Subsidence of the soil due to excessive use of water including for cleaning and fire fighting purposes
- Impact of cleaning chemicals on the efficacy of chemical and physical barriers
- Removal, repositioning, or damage of any physical barrier after installation by pest contractor and prior to or during concrete slabs being poured.

4. Termiticides

Chemical composition of termiticides used in physical termite barriers and reticulated systems shall include deltamethrin or similar from the pyrethroid family which are synthetic versions of pyrethrins which are natural insecticides.

Hand spraying under slabs only, without use in conjunction with a reticulated system is not supported. It is noted that termiticides only provide an effective barrier for 2 – 6 years depending on climate, soil conditions and soil disturbance.

Timber intended for use in buildings, fences and other outdoor structures is often termite-proofed with chemicals by dipping or vacuum impregnation. The Australian Pesticides and Veterinary Medicines Authority (APVMA) has restricted the use of copper chrome arsenate (CCA) timber treatments, and *cancelled the use of CCA in situations in which people might come into frequent contact with the treated timber (such as timber used in garden furniture, picnic tables, exterior seating, children's play equipment, patio and domestic decking, and handrails).*[1]

5. Design / Documentation Stages

During the design and documentation stages of any project, it is necessary to ensure that the proposed termite treatment system complies with

- AS 3660.1 Termite management Part 1: New Building Works,
- AS 3660.2 Termite management Part 2: In and around existing buildings and structures and
- AS 3660.3 Termite management Part 3: Assessment criteria for termite management systems.

[1] Arsenic timber treatments chemical review | Australian Pesticides and Veterinary Medicines Authority

Termite system selection

It is recommended to use termite resistant primary structures like concrete slabs, termite resistant timber and steel frames. Ensure that the adopted termite management system is appropriate to the region, local conditions, specific site conditions, proposed use, proposed construction system and finishes, extent, intended operation and management of the proposed facility.

While concrete can itself be considered a termite barrier, large areas of concrete have expansion and control joints installed, joins at separate concrete pours and have the potential to develop uncontrolled cracks which may permit ingress by termites. A superior termite barrier system using a complete sheet system under the slab is more appropriate to the typical concrete slab type construction. This approach increases initial costs however in consideration of issues such as structural reconfiguration, movement (e.g. uncontrolled concrete cracking), existing active termite colonies or water introduced through fire fighting or other events that can add to any initial risk of failure, this type of system is likely to be a good investment over the life of the building.

Where a large timber floor is being provided, for example for a sports hall, a physical external termite barrier, in addition to the termite barrier below the slab, should be provided to the extent of the ground floor perimeter to provide protection against entry to the underside of slab. The barrier is intended to prevent termite's subterranean travel into the building structure or alternatively clearly show any 'mud' tunnels across the surface to the building fabric.

Treatment system selection that should be considered are as follows:

- Installation of a physical barrier under all concrete slab areas with particular attention to the cavities, perimeter trenches, slab joints, expansion or control joints, penetrations and perimeter tranches and cavities. Recommended best practice to double the thickness (250 mm wide) of the sheeting at control joints and penetrations.
- Warranty, depending on the product up to 50 years protection provided.
- System type and ongoing costs should be considered. For example, installation of a reticulated system under the slab and around the immediate perimeter of the structure allows for future reapplication of termiticides, maintain a protective zone against termite ingress. This proactive approach reduces the need for costly and remedial treatments over the building lifecycle.
- Some products also provide the moisture barrier for the slab for example *Trithor, Homeguard, Kordon* or a similar product equivalent in function, quality, etc to the approval of the Superintendent's Representative

On-going maintenance and inspection regimes should be clearly identified and costed with the building's routine maintenance scheduled on an annual basis.

6. Specification

For specification of the termite system refer to NatSpec Section 0184 – Termite Management. Non-chemical management systems are not considered acceptable approaches to termite management.

Chemical termite management systems including masonry incorporating a termicide in the bedding mortar may only be considered as part of an overall strategy which should include a reticulated system and physical termite barrier.

Ensure the specification of the termite management system adequately addresses the following:

- Type of system i.e. physical barrier, concrete slab barrier control, cap and strip shield or termite control/ moisture barrier system
- Extent of a particular system
- Installation inspection requirements
- System testing requirements
- Warranty period i.e. minimum 10-year warranty; and
- On-going maintenance requirements.

The specification should clearly identify that all termite barriers need to be provided at all wall cavities, perimeter trenches, slab joints and penetrations.

The specified termite system should address any penetrations for building services including ICT, specialised elements such as goal posts as well as structural joints provided below and immediately adjacent to the sport floor.

The specification should require contracted pest control manager to undertake post construction periodic termite inspection to detect termite activity or termite conducive conditions in accordance with AS 3660.2 Termite Management - In and around existing buildings and structures.

7. Construction Period

Prior to commencement of construction on site reducing the risk of termite infestation to any future building should be a key consideration. It is recommended that for Greenfield and Brownfield sites, a pest consultant should be engaged to undertake a site investigation including an examination of all tree trunks and other relevant vegetation for evidence of colonies of termites.

Where trees are to be partially or wholly cleared from the site, a termite colony can remain, relocate, and easily be built over. If a termite colony is discovered, it should not be disturbed because termites will relocate and can travel as far as 50 metres from their original location. If the colony does relocate then the consultant or contractor will be required to find the colony again to eradicate the colony at the source.

The colony should be baited in a controlled way to eliminate the Queen and the rest of the colony before the site is disturbed until there is no signs of live termites. This treatment may take approximately three months and should be combined with heat imaging to confirm the site is termite free.

The installation of a termite barrier should include removal of the existing soil against the building structure, typically to level with bottom of slab thickening or footing and nominally 500mm width to approval of termite treatment contractor.

The excavated soil should be treated with an approved termicide treatment and then returned to the excavated area together with an approved reticulated termite system. The treated soil should be protected by removable, impermeable, low maintenance cover to the approval of the Superintendent's Representative.

An additional external barrier would also be recommended for existing buildings where termites have been discovered and treated to prevent reinfestation.

All pest control contractors need to have Pest industry licensing and registration (health.wa.gov.au), and treatments applied in accordance with current Australian Standards and State regulations.

The termite contractor is required to provide termite certification that includes the same reference and a plan identifying the location and type of installed termite barriers.

At the end of the defects liability period the termite control systems should be inspected and a report on their efficacy and status provided to the Superintendents Representative and the DHW Project Manager.

8. Facilities Management

A routine maintenance schedule is required to include annual site and building inspection for any termite activity and treatment of infestation, by an industry approved professional. Inspection for termite activity should align with AS3660.2 and AS 4349.3 Inspection of buildings Part:3 Timber pest inspections.

The following areas should be examined:

- Around the external perimeter of the building, as well as weepholes in masonry constructed buildings
- Landscaping timbers, fencing, retaining walls and other timber structures
- Sub-floor structures, particularly below kitchens, toilets, and bathrooms
- Accessible roof voids
- Interior of building
- Existing termite shields to ensure they are intact.

It is recommended that the facility or building manager undertake monthly visual inspections of the building to minimise termite food sources, including old tree stumps

or logs, and ensuring subfloor ventilation is not impaired e.g. weepholes blocked by mulch or soil.

Where termites have been previously discovered or treated prior to or post construction strategically placed bait stations can be used to attract and destroy termites, or for monitoring purposes. It is recommended for sites with known termite activity or facilities with large areas of timber e.g. flooring in sporting and entertainment facilities that heat imaging equipment which detects termite body temperature should be used to confirm eradication of the termites. It is recommended this type of equipment should be available to buildings, where appropriate, to provide on-going termite detection. It is noted that this equipment is easy to use and would provide value for money.

9. References

1. AS 3660.2 Termite Management – In and Around Existing Buildings and Structures
2. NatSpec Section 0184 – Termite Management.
3. Arsenic timber treatments chemical review | Australian Pesticides and Veterinary Medicines Authority

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