TIMBER QUEENSLAND
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TECHNICAL DATA SHEET
ISSUED BY TIMBER QUEENSLAND

TERMITE MANAGEMENT OF NEW BUILDINGS

12

RECOMMENDED PRACTICE // MAY 2015

All buildings, building materials and building contents are subjected to a number of hazards throughout their useful life. These include corrosion of metal, spalling of concrete, fire and water damage. Another potential hazard is termite attack of some timbers and cellulose-based materials.

There are two main types of termites capable of attacking buildings: drywood termites, which do not have ground contact, and subterranean termites, which require contact with the ground or some other moisture source. Subterranean termites are distributed throughout Queensland and are responsible for most of the termite damage of economic significance.

This data sheet provides information on how to reduce the level of risk of subterranean termite attack. In addition, potential for damage by drywood termites, including the West Indian termite, can be greatly reduced by using termite treated framing such as H2/H2F treated pine framing.

BUILDING LEGISLATION

The Building Code of Australia (BCA) requires that buildings, during construction and use, must reliably resist termite actions. The BCA provides two deemed-to-satisfy options for the protection of buildings where a subterranean termite hazard is present.

(i) **Termite Resistant Materials** for all structural elements; e.g trusses, framing, bracing, structural flooring etc. In Queensland the BCA also requires, where termite resistant materials are used as a 'stand-alone' option, then in addition to structural elements, architraves, door jambs, window reveals & skirting must also be termite resistant.

(ii) **Termite Management Systems** in accordance with AS 3660.1 to protect the whole building against termite infestation. In Queensland the BCA also requires:

- Underslab chemical barriers to be reticulated not hand sprayed;
- Perimeter chemical barriers to be protected by a 300 mm wide x 50 mm thick concrete cover strip.

A combination of both options will provide the greatest level of termite management.

TERMITE RESISTANT TIMBERS

The heartwood of many timber species (refer Table 1) has natural resistance to termite attack while the sapwood and heartwood of some naturally susceptible timbers can be preservative treated in accordance with AS 1604 to achieve termite resistance. "H2/H2F" level (or higher) is required to render termite susceptible timber resistant.

Timbers that are easily preservative treated include the main structural softwood framing timbers and engineered wood products (EWPs) from slash pine, hoop pine, radiata pine and Caribbean pine. The sapwood of termite resistant hardwoods can also be treated to render it immune to termite attack. The most common preservatives used to achieve termite resistance are based on naturally occurring insecticides, i.e. the pyrethroids, bifenthrin and permethrin or neonicotinoids such as imidacloprid.

The use of highly resistant, durable timber or treated timber is recommended for timber stumps, building poles and landscaping timber in direct contact with the ground.

Relevant preservative treatment requirements are:

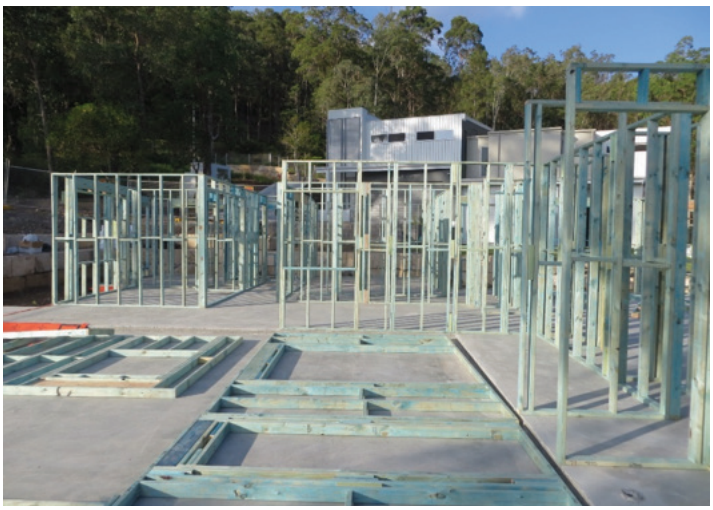
H2F – timber treated for termites for use south of the Tropic of Capricorn and fully protected from the weather. Typically in softwood framing these products have a distinctive blue colouring.

H2 - timber treated for termites for use anywhere including north of the Tropic of Capricorn and fully protected from the weather. Typically in softwood framing these products have a distinctive red colouring.

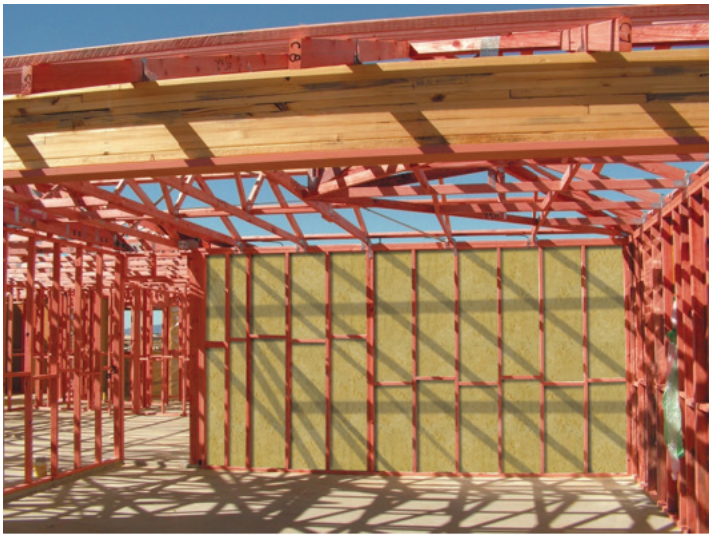
H3 – timber treated for termites and decay for use in above ground, well ventilated, weather exposed applications. Typically in softwood framing these products have a distinctive green colouring.

H5 - timber treated for termites and decay for use in ground contact such as stumps, posts and poles.

Note: Other colours such as yellow may also be used on some products to indicate termite treatment.



H2F termite treated structural softwood framing.



H2 termite treated structural softwood framing.

TABLE 1 - TERMITE RESISTANT TIMBERS (SEE NOTES)

In-Ground and Above Ground[1]	Above Ground Only
red bloodwood	blackbutt
grey box	spotted gum
forest red gum	red mahogany
ironbark (all species)	white stringybark
white mahogany	cypress
Gympie messmate	
tallowwood	
turpentine	
slash pine[2/3]	
hoop pine[2]	
radiata pine[2]	
Caribbean pine[2/3]	

Notes:

1) The sapwood of these species is to be treated to 'H5' level for in-ground use, 'H3' level for weather exposed above ground use and 'H2/H2F' level for fully protected, above ground applications.

2) The heartwood of these softwoods is to be limited 20% of the cross-sectional area in all weather exposed applications.

3) The heartwood of slash and Caribbean pine is rated termite resistant, and therefore does not need to be limited to 20% for fully protected, above ground applications.

H2F TIMBER BUILDING PRACTICE

Termite resistant timber shall be installed, used and maintained in accordance with the building practice requirements of Australian Standard AS 1684 "Residential timber-framed construction." In H2F timbers termite resistance is dependant upon the integrity of the preservative envelope. Research has shown that a trimmed end, abutting a treated surface does not adversely affect the termite resistance of the timber. Similarly minor notching, trenching and drilling of holes in accordance with the requirements of AS1684.2 Clause 6.2.1.4 is considered acceptable.

Practical building situations however can arise, during construction, which may necessitate the removal of the preservative envelope beyond the limits of AS1684. E.g.

1) Recessing of metal bracing products
2) Rebates to accommodate showers or baths
3) Stud straightening by planning of stud mid sections
4) Inadvertent damage to members

Where the exposed surface area of termite susceptible timber exceeds the cross sectional area of the member concerned, then additional termite protection is required to achieve the performance requirements of the BCA relating to termite action. Where replacement of the affected timber member is not practical or possible then the in-situ preservative treatment of termite susceptible timber should be considered.

Suitable brush-on or spray-on preservative treatments for termite susceptible timber used for protected framing are listed below,

- Protim Solignum "XJ Clear". (See Figure 1)
- Tanalized "Ecoseal" or "Enseal Clear". (See Figure 2)

Figure 1.
Protim Solignum XJ Clear.

Figure 2.
Tanalized Ecoseal & Enseal.

These site applied preservatives may also be required for use with H2 and H3 treated timber. For H4 and H5 treated timber copper napthenate oils and omulsions are recommended. Check timber and preservative manufacturer's recommendations for specific requirements.

MINIMIZING THE RISK (Prevention is better than the cure)

The risk of termite attack on buildings has increased with the change to construction methods dominated by concrete 'slab on ground' and masonry enclosed sub-floors

In addition to the use of termite resistant timbers, where building owners seek greater security, and additional protection for the building and the contents, it can be provided by the use of termite management systems using sheet, chemical, or granular materials but most require on-going maintenance and regular inspections to ensure integrity.

The use of termite resistant timber may also be appropriate where future maintenance and inspections will be difficult or unlikely to be carried out.

For traditional Queensland construction (i.e. using timber floors off the ground), termite management is easily afforded by incorporating physical protection into the design, coupled with regular inspection. Queensland's rich heritage of timber buildings is testimony to the effectiveness of these measures.

BUILDING TERMITE MANAGEMENT SYSTEMS

AS 3660.1 provides a range of options for termite management of new buildings from subterranean termites. Figures 3 and 4 summarise these for timber floors and monolithic slab on ground construction respectively.

N.B: Where the concrete slab is not monolithic in accordance with AS 2870, full under-slab chemical (reticulated in Qld) or physical management systems may be required.

Ant Caps (Termite Shields)

These are physical management systems that are inserted between the lowest floor framing timbers and the supporting stumps, brickwork, piers etc. They are usually formed from corrosive resistant sheet metal or mesh and are designed to force the termites out into the open and to allow physical inspection and simple, early detection and eradication of termite activity.

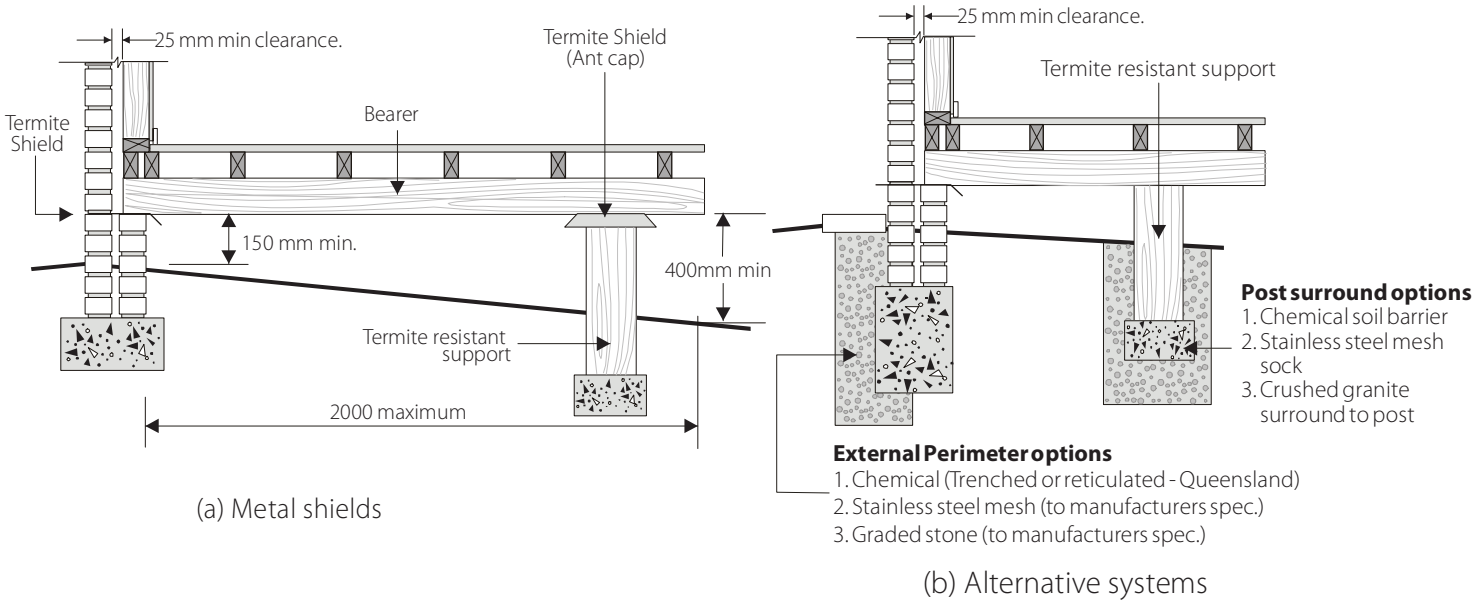


FIGURE 3 TERMITE MANAGEMENT SYSTEMS FOR SUSPENDED TIMBER FLOORS

NOTE: All systems require regular inspections (not greater than 12 month intervals).

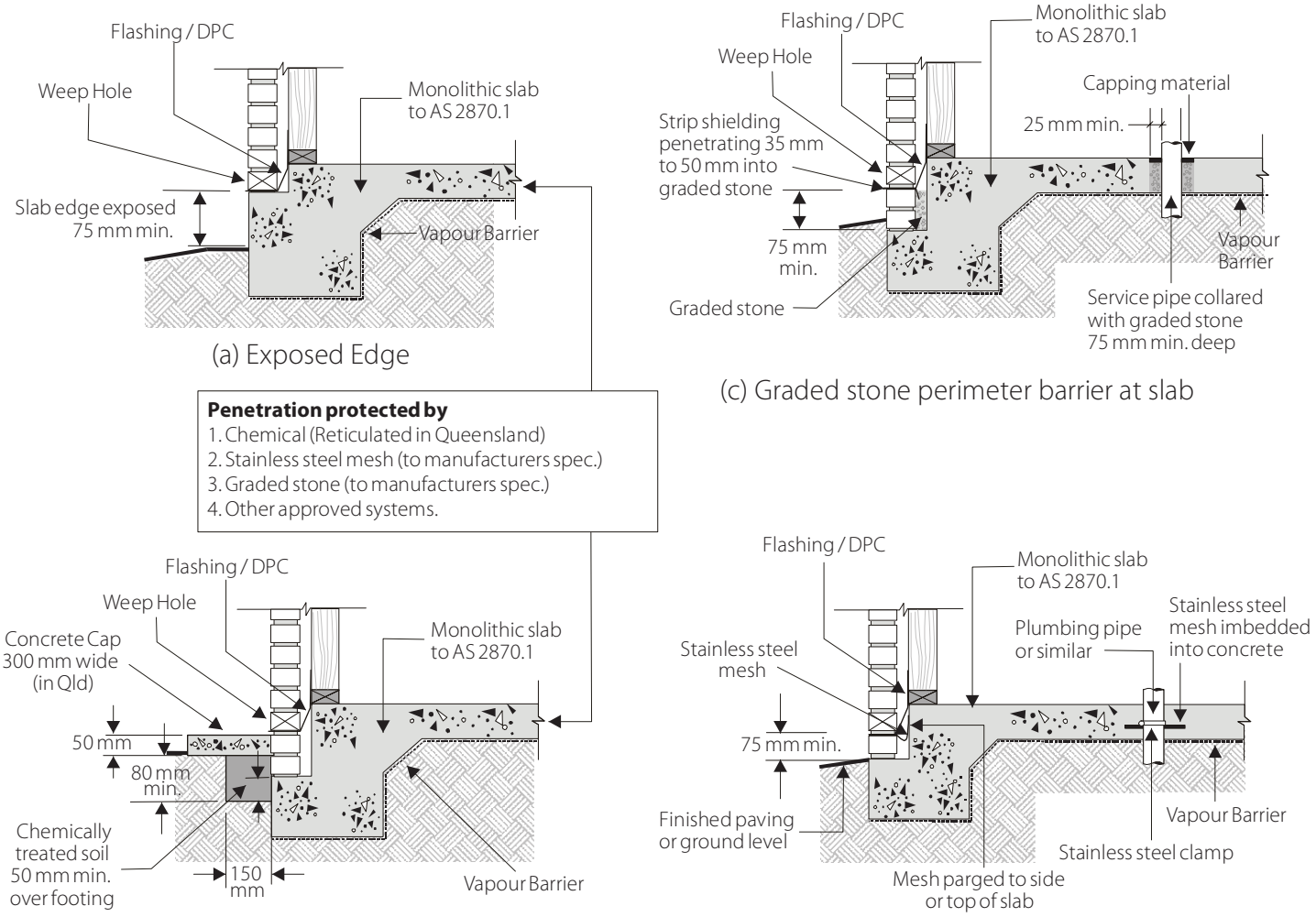


FIGURE 4 TYPICAL TERMITE MANAGEMENT SYSTEM FOR MONOLITHIC CONCRETE SLABS

NOTE: All systems require regular inspections (not greater than 12 month intervals).

Concrete Slab Systems

A good quality monolithic slab (no cracks or construction joints) designed and constructed to AS 2870 provides a physical management system. Where construction joints or service penetrations occur, other forms of physical or chemical barriers must be provided. Exposed slab edges (min. 75 mm) around the perimeter of the building provide for physical inspection, detection and eradication.

Chemical Systems

Chemical management systems provide a zone of treated soil, poisonous to termites, under footings and slabs and/or around the perimeter. Chemicals registered for termite protection include organophosphates and synthetic pyrethroids (modified). These chemicals have varied life expectancies (refer to product label & directions), depending on soil and exposure conditions, and will therefore require replenishment at regular intervals.

Reticulated Chemicals

Chemicals may require a reticulation system to permit retreatment in inaccessible areas, i.e. under slabs. This requirement is mandatory in Queensland. These proprietary systems use a piping and distribution network installed at strategic points under concrete slabs and around the perimeters of buildings. At completion of construction, chemicals are injected to reach each distribution point. Retreatment can be applied at any time.

Chemically Impregnated Membranes

Underslab and perimeter protection can be provided with a termite management system where a vapour barrier membrane is laminated to a synthetic fibrous web impregnated with synthetic pyrethroid or other termiticide.

Stainless Steel Mesh

This system consists of a fine woven marine grade stainless steel mesh used as a physical management system. The stainless steel mesh is too small for termites to pass through and too hard to chew through. The mesh can be under the entire concrete slab or as a partial system in conjunction with a concrete slab barrier, that allows for construction of a perimeter barrier only, with sleeves and clamps to seal around service penetrations. The mesh can also be formed into 'socks' for stump/post applications.

Granular Materials

These termite management systems can be used under slabs and/or around posts and footings. The system is comprised of finely graded granular materials of particle size and voids designed to prevent termite passage, i.e. voids too small to pass through and particles too large for termites to move. These systems may not be recommended for protecting buildings against Mastotermes spp. and therefore may not be suitable for use north of the Tropic of Capricorn.

MINIMIZING THE RISK (Prevention is better than the cure)

In addition to the use of Termite Management Systems, where building owners seek greater security, and additional protection for the timber building elements, it can be readily provided by the use of termite resistant timber.

Correct building design, site preparation, construction practices and maintenance will also contribute to the prevention of termite entry into buildings. The following notes are intended to supplement or emphasise points discussed in AS 3660.1.

Building Design

- Timber houses with elevated timber floors should be designed to ensure a physical management system is installed between the lowest floor timber and the ground. This also applies to stairs, pergolas and decks that attach to the building (refer Figure 3). Termite resistant or preservative treated timber stumps and posts should be used to support floors (refer Table 1 Termite Resistant Timbers). Other termite resistant materials including preservative treated timber may also be used.
- Sufficient under-floor crawl space (400 mm clearance to the underside of bearer) should be provided to enable easy inspection of physical barriers.
- Strip footings and slabs should be designed as integral components minimising construction breaks or construction joints as these provide avenues of termite entry.
- Services (pipes, plumbing, wiring etc.) should be installed where possible so that they do not penetrate through slabs or footings.
- Cavity brick or hollow masonry should be avoided below ground level. Masonry veneers should not be carried down over concrete foundations.
- Wherever possible, buildings should be designed with physical management systems to prevent termite access to the structure. Refer to Figure 5 and AS 3660.1.
- In areas where subterranean termites are prevalent, the level of risk of attack to buildings can be reduced by taking simple and inexpensive measures during construction; such as eliminating moisture traps and providing adequate ventilation in critical zones, (e.g. sub-floor areas) to enable timber to remain dry.
- Drainage (surface or sub-surface systems) should be provided to remove water and prevent ponding on the site; particularly with 'slab on ground' construction.
- Sites should be cleared of vegetation and ripped to remove roots etc. prior to commencing earthworks.
- Vegetation, tree stumps, and roots should be removed from site and not incorporated in any fill.

GENERAL CONSTRUCTION PRACTICE

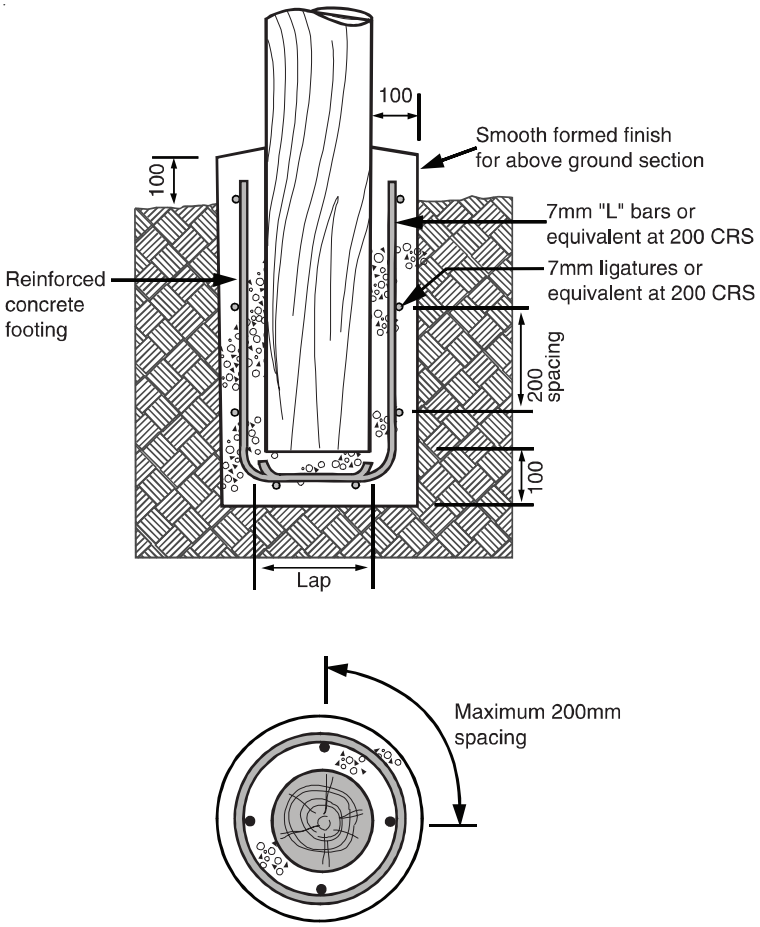
Prior to Construction

Where termites are detected on site, they should be eradicated by a licensed pest controller. Site preparation and earthworks should, where possible, eradicate termite nests or colonies.

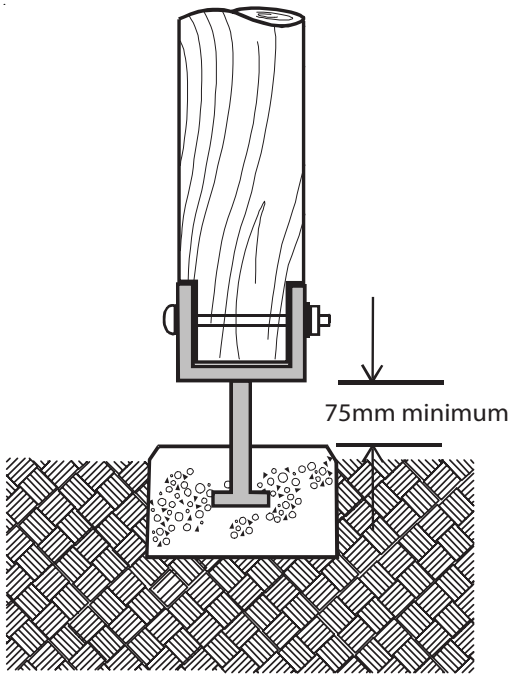
Construction close to/on boundaries

For buildings that are constructed close to or on allotment boundaries, due to restricted access, it may not be possible to maintain or properly inspect physical or chemical termite management systems. For this type of construction, the most appropriate and efficient termite management option is the use of termite resistant materials, including termite treated softwood framing and EWP's for floor, wall and roof framing.

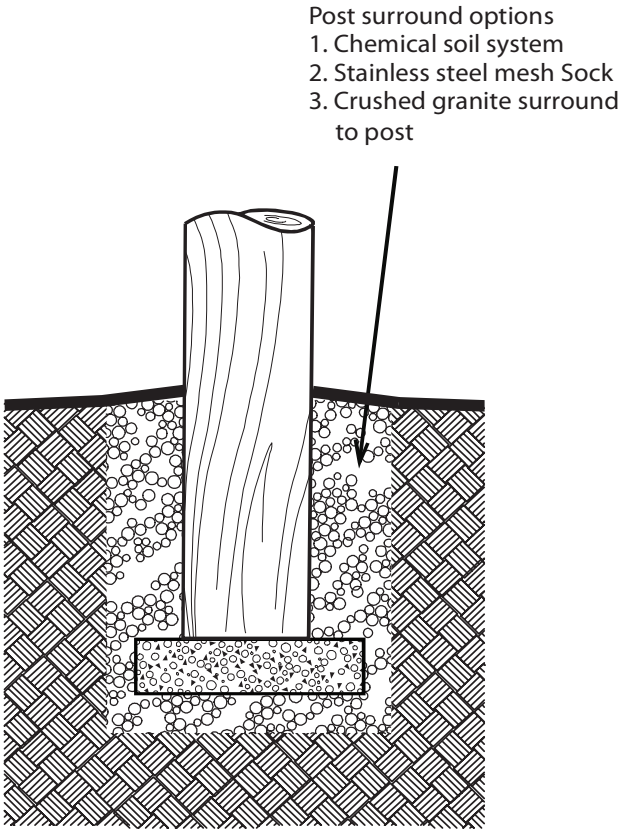
Typical built to boundary housing.



(a) Reinforced concrete footing



(b) Posts and poles on Stirrups (AS 3360.1)



(c) Posts surround options (AS 3360.1)

FIGURE 5 TERMITE MANAGEMENT SYSTEMS FOR POSTS AND POLES

Note: All systems require regular inspections (not greater than 12 month intervals).

During Construction

For termite resistant timbers apply standard timber building practice in accordance with AS1684.

For termite management systems install physical or chemical management systems in accordance with the NCC-BCA and AS 3660.1. Refer Figures 3, 4 and 5.

Notes:

(i) Chemical management systems must be installed by licensed pest control operators.

(ii) Physical management systems and reticulated chemical systems must be installed by licensed installers.

(iii) As well as underslab treatment, AS 3660.1 also requires perimeter protection of the building which must be capped in Queensland.

- Ensure physical management systems are not damaged by various tradespeople.
- Remove all formwork, form boards, profiles, pegs, etc. near or under foundations or slabs. Vegetation and timber products should not be included in any backfill.
- Use termite resistant timber for timber in contact with the ground, i.e. Durability Class 1 timber or timber treated to "H5" level.
- Once formed, the system should not be bridged or breached by construction, e.g. carports, paving, trellises, annexes, installation of underground telephone cables, landscaping or gardening. Where such projects are intended, or have occurred, action must be taken to maintain or to restore the integrity of the barrier system.
- Ensure weep holes or joints in brickwork are not covered by soil or other landscaping materials.

Post Construction and Maintenance

- Where landscaping or other site disturbances (new telephone cables, slabs, etc.) adjoining the structure breach the perimeter chemical soil barrier engage a licensed pest control operator to re-establish the barrier in accordance with AS 3660.1.
- Have a licensed pest control company carry out annual inspections in accordance with AS 4349.3 to detect any termite activity.

Annual inspection should at least include:

- inspection around perimeter weepholes in brick veneer construction.
- inspection of landscaping timbers, fencing and other timber structures.
- inspection of termite shields ensuring they are in good condition and not breached by galleries.
- underfloor inspection of stumps, floor frame and perimeter masonry.

If termites are found, take remedial action in accordance with AS 3660.2.

- Search for and eliminate sources of persistent moisture or dampness within or near buildings.
- Inspections by licensed pest controllers should be supplemented by more regular inspections by the home owner at approximately 3 - 6 monthly intervals. If any unusual activity is noted call in a pest controller to identify and treat.

For further advice on inspection and remedial action, refer to AS 4349.3.

NOTE: After the discovery of an active infestation, it is important that the termite workings are not further disturbed until the control approach has been determined.

Landscaping

- Landscaping elements should not breach or bridge physical or chemical barriers.
- Don't store wood or other organic material against buildings.
- Keep gardens and landscaping clear of weep holes and joints in masonry, physical barriers (ant caps) and damp proof courses.
- Conduct regular inspections to ensure the perimeter of the house is kept clear of organic material and kept neat and tidy.
- The perimeter area around buildings should be graded to drain away from exterior walls (refer AS 2870.1), and to divert stormwater from the building.
- Timber used in contact with the ground should be termite resistant.

SUMMARY

Buildings can be effectively managed for subterranean termite attack. The level of protection provided and the associated risk will vary depending upon construction type, preventative measures taken and the level of regular inspection and maintenance.

Where there is a significant risk due to design, potential lack of maintenance/inspections, etc, for added protection, whole building termite management should always be considered in addition to termite resistant framing.

SAFE WORKING

Working with timber produces dust particles. Protection of the eyes, nose and mouth when sanding, sawing and planing is highly recommended. Refer to tool manufacturers for safe working recommendations for particular items of equipment.

DISPOSAL OF OFFCUTS AND WASTE

As with all treated timber, do not burn offcuts or sawdust. Preservative treated offcuts and sawdust should be disposed of by approved local authority methods.

FURTHER INFORMATION:

www.qbcc.qld.gov.au

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