South African Pest Control Association

WOOD DESTROYING ORGANISM

INSPECTOR STANDARD

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SECTION 1 – WOOD DESTROYING ORGANISM INSPECTOR STANDARD

This standard will determine and set out the minimum standard and requirements for visual inspections and the report on the activity and presence of wood destroying insects and organisms.

THE PURPOSE
The purpose of an inspection for wood destroying organisms in a building is to assess the following;

- Evidence of wood destroying organisms and insects
- Severity of damage caused by wood destroying organisms and insects.
- Remedial and protective measures required.
- Susceptibility of building to infestation by other wood destroying organisms and insects.

APPLICATION
This standard is for the use of wood destroying organism inspectors, pest control operators, prospective purchasers, financial institutions, property conveyancers, property owners and managers, building surveyors, building inspectors, architects and all other parties involved in property transfers and maintenance.

DEFINITIONS
1) **Access hole** – a hole cut in flooring or other part of the structure to allow for entry to carry out an inspection.
2) **Active** – the presence of live infestation of wood destroying organisms and insects at the time of inspection.
3) **Client** – the person for whom the inspection is carried out.
4) **Dry wood termites** – termites that do not require a water source other than the atmosphere and the moisture content of the timber in which they occur. They are mostly found in tropical areas with timber moisture content constantly above 16%, although some species occur in dry areas. They live in numerous small colonies and produce dry faecal pellets that are ejected from the infested timber.
5) **Excessive moisture conditions** – presence of moisture that is conducive to wood destroying organisms and insects activity
6) **Frass** – dust and droppings produced by woodborer activity.
7) **Fungal decay**(wet rot and dry rot) – loss of strength due to the destruction of cellulose and/or lignin by wood decaying fungi.
8) **Inactive** – the absence of live wood destroying insects at the time of the inspection and where signs of old infestations that such will be deemed to require treatment unless there is and valid guarantee still valid over the building

NOTE: *WHERE VISUAL EVIDENCE OF INACTIVE TERMITE WORKINGS AND/OR DAMAGE IS LOCATED, IT IS POSSIBLE THAT TERMITES ARE STILL ACTIVE IN THE IMMEDIATE VICINITY AND THE TERMITES MAY CONTINUE TO CAUSE FURTHER DAMAGE. IT IS NOT POSSIBLE, WITHOUT BENEFIT OF FURTHER INVESTIGATION AND INSPECTIONS*

OVER A PERIOD OF TIME, TO ASCERTAIN WHETHER ANY INFESTATION IS ACTIVE OR INACTIVE. CONTINUED, REGULAR INSPECTIONS ARE ESSENTIAL.

9) **Lignin** – organic substance that binds together adjacent cellulose fibres in the cell wall of wood.
10) **Mould** – a type of fungus that does not structurally damage wood.
11) **Property** – includes the allotment, improvements and all timber structures such as buildings, patios, decking, landscaping, retaining walls, fences and bridges.
12) **Reasonable access** – areas where safe, unobstructed access is provided and the minimum clearances are available or where these clearances are not available, areas within the WDO inspector's unobstructed line of sight and within arm's length.

Area	Access hole	Crawl space	Height
Roof interior	450x400	600x600	Accessible from a 3.6m ladder
Sub floor	500x400	Vertical clearance 450 mm	
Roof exterior			Accessible from a 3.6m ladder

NOTE: *REASONABLE ACCESS DOES NOT INCLUDE REMOVING SCREWS AND BOLTS TO ACCESS COVERS*

13) **Site** – the area within the property boundaries up to a distance of 50m from the building.
14) **Structural Damage** – significant impairment to the integrity of serviceability of any structural timber in service within a built structure.
15) **Subfloor** – the part of a building between the soil and the ground floor level.
16) **Timber pests** – subterranean and dry wood termites, borers of seasoned timber and wood decay fungi.
17) **Wood destroying organism inspector** – a person who has been found competent and passed the relevant examinations set by the South African Pest Control Association
18) **SAPCA**. – South African Pest Control Association
19) **PCITA** – Pest Control Industries Training Academy

Insurance – The wood destroying Organism inspector should have adequate insurance due to the risk involved. This should include public liability and professional indemnity as well as all risks for the death or injury to self or employees.

SECTION 2 – THE WOOD DESTROYING ORGANSIM INSPECTION

WOOD DESTROYING ORGANSIM INSPECTORS

WDO inspectors shall be informed about principles of construction including type and style of the building relevant to timber pest activity and damage. WDO inspectors shall also be informed about the ecology, behaviour and identification of timber pests and be familiar with the damage they cause and the procedures required for their eradication and prevention.

ITEMS TO BE INSPECTED

WDO inspectors shall familiarize themselves with the overall locality and its effect on the report, and inspect those parts of the property to which reasonable access is available. The inspection report shall include an assessment of each of the following areas as necessary for the completion of the inspection report:

(a) The interior of the buildings
(b) The exterior of the buildings
(c) The roof space
(d) The subfloor space
(e) The site (including trees, stumps and timbers imbedded in the soil), within 50m of the main building and within the boundary.

All accessible timber in service within the property boundaries shall be inspected such as:

(a) Structural timber – subfloor, floor walls, stairs, ceilings, roofing and eaves.
(b) Joinery and decorative timbers-doors and door frames, windows and window frames, skirting and joinery (excluding furniture).
(c) Auxiliary structures-false floors, built-in cupboards, built-in furniture.
(d) Attachments and outbuildings-garages, carports, pergolas, patios, verandas, sheds and posts.
(e) Garden timbers-landscaping timbers, fences, logs, pool surrounds, garden boxes or tubs, firewood, paving blocks and sleepers.
(f) Standing timbers-trees, stumps for signs of termite activity.

The person requesting the report shall arrange for the WDO inspector to have reasonable access to the property, together with any information that may be necessary to carry out the inspection.

All Inspection Reports shall be made in writing as oral reports cannot be relied upon.

EXCLUSIONS

The following timber items within the property are excluded from the standard WDO inspection:

(a) Furniture
(b) Furnishings
(c) Stored items
(d) Concealed timbers
(e) Inaccessible timbers (*it is important to note these on the inspection report)*

SUSCEPTIBILITY TO INFESTATION BY WOODDESTROYING ORGANISMS

The level of susceptibility of the building to infestation by wood destroying organisms should be assessed as follows:

(a) Level of accessibility for inspection
(b) Presence and effectiveness of visible physical termite barrier.
(c) Subfloor ventilation
(d) Subfloor drainage
(e) Influence of adjacent areas (such as gardens and paving, especially the levels if above floor level).
(f) Obvious areas of damp that are likely to be conducive to wood destroying organisms including:
    - Leaks through damp proof courses or flashing
    - Plumbing leaks;
    - Leaks through water proofing membranes
    - Roof and storm water disposal blockages

(g) Storage of timber and stored goods under or adjacent to the building and structures
(h) Timber in contact with the ground or masonry
(i) Timber products of inappropriate durability (e.g. pressed wood facias). Sometimes timber is used, that that has no durability and is not suitable for outdoor use, such as pressed wood.
(j) Bridging of damp-proof courses, physical barrier or slab edges.

INSPECTION FOR WOODDESTROYING ORGANISMS
Inspection of the property shall comprise of a visual examination of all accessible areas of the property for the following:

1) Evidence of the presence of wood destroying organism, identification of the common name, genus and, where relevant, the species of the timber pests, location of activity or damage, and a general description of the severity of the damage
2) Evidence of inactive wood destroying organisms
3) Evidence of treatment for wood destroying organisms

4) Conditions conducive to wood destroying organisms, e.g. wood to soil contact, excessive moisture, and debris containing cellulose, cracks in concrete slabs or foundations, poor ventilation
5) Damage caused by wood destroying organisms
6) Location of subterranean termite nests, Lyctus or Phoracantha in wood stumps found within the property boundaries up to 50m from the main building

INACCESSIBLE AREAS

Where access is not available to enable a visual inspection, appropriate recommendations should be made to gain access so that an inspection of these areas can be made. The areas where reasonable access is not possible should be recorded on the inspection report. This is where there is a wooden floor on a concrete base that is impossible to gain access to or a flat roof where accessibility will lead to leaks.

DETECTION OF WOODDESTROYING ORGANSISMS

Wood destroying organisms can be detected by careful inspection for likely signs of activity or damage. WDO inspectors should be trained to look for the various signs of wood destroying organism infestations or damage.

Indications	**Fungal decay**	**Subterranean termites**	**Borers of seasoned timbers**
Visible signs	Mycelium, fruiting body.	Mudding, visible nest swarms, termites.	Frass, borers, wings.
Visible damage	Swollen/Shrunk timber warped, timber tide marks, cubical or stringy rot.	Misshaped timbers, flight holes, collapsed timbers.	Holes, portions of timber missing.
Testing sound	Dead sound, timber dents as damage increases, timber disintegrates.	Hollow sound, timber crushes as damage increases.	Slightly dead sound increases as damage increases.
Splinter test	Timber crumbles when tested.	Timber splinters.	N/A
Moisture content (MC)	MC above 20% and often>30%.	MC usually higher than adjacent timber. MC may increase as activity increases.	N/A
Pre-conditions for infestation	Excessive humidity, poor drainage, low durability timbers.	Excessive humidity, timber in ground contact, external ground above damp proof courses.	Varies.

TOOLS FOR INSPECTIONS

(a) Probe or screwdriver for testing and sounding timber.
(b) Moisture meter for assessing moisture content in timber.
(c) Powerful torch or lead light
(d) Ladder
(e) Knife for splinter test
(f) Magnifying glass
(g) Cap and dust mask for protection
(h) Chalk to mark infested timbers

SECTION 3: THE WOOD DESTROYING ORGANSM INSPECTION REPORT

THE STANDARD WDO INSPECTION REPORT

The report should include the following:

(a) The name and address of the firm or person issuing the report.
(b) The name and SAPCA number and signature of the WDO inspector.
(c) The name and address of the client.
(d) The date of the inspection.
(e) The address of the property inspected
(f) The estimated age of the property.
(g) The description and identification of the building or timber structures inspected.
(h) Main roof
(i) Eaves
(i) Floor and skirting including mezzanine floors
(j) Subfloors
(k) Joinery
(l) Auxiliary roof and outbuildings, fences
(m) General *(any items i.e. adjoining or furniture that could lead to infestation*)
(o) Area not inspected.
(p) Presence of active wood destroying organisms, identification of pest.
(q) Evidence of inactive wood destroying organisms. (Inactive could be dead insects or evidence of dead Crypto, maybe old discarded wings)
(r) Evidence of previous treatments for wood destroying organisms.
(s) Location of pest damaged timber and a general description of the severity of damage to the affected timbers such as slight, moderate or extensive.
(t) Recommendations for eradication, control or protective measures.
(u) Areas where the inspection was restricted such as insulation or air-conditioning ducts or pipe work.
(v) Inaccessible areas such as enclosed patios, flat roofs.

(w) Areas with excessive moisture caused by factors such as poor ventilation, ineffective drainage, leaks etc. with recommendations for reducing moisture levels.
(x) Area conducive to infestation.
(y) Recommendations for frequent and further inspections.

LIMITATIONS AND CONDITIONS

Limitations: The standard inspection report should not contain any assessment or opinions relating to:

(a) Any area or item that was not, or could not be inspected by the WDO inspector;
(b) A matter which is not within the WDO inspectors expertise;
(c) A matter, the inspection or assessment of which is solely regulated by statute.

Conditions: A standard inspection report may be conditional upon or conditional in relation to:

(a) the assessment of any apparent active or inactive WDO the detection of which may be subject to prevailing weather conditions;
(b) information provided by the person, the employees or agents of the person requesting the report;
(c) the specific area of "expertise" of the inspector specified in the report;
(d) apparent concealment of possible active or inactive WDO;
(e) Any other factor limiting the preparation of the report.

NOTES: *ALL DESCRIPTIONS AND POSITIONS GIVEN IN THE REPORT MUST BE GIVEN WITH THE REFERENCE POINT BEING AS IF THE WDO INSPECTOR IS STANDING IN THE ROAD IN FRONT OF THE PROPERTY FACING THE MAIN BUILDING.*
REGULAR COMPETENT INSPECTIONS ARE STRONGLY RECOMMENDED, AT LEAST ON AN ANNUAL BASIS.
THE PURCHASER SHOULD BE ADVISED THAT HE MAY HAVE ADDITIONAL LIABILITY FOR WOOD DESTROYING ORGANISM DAMAGE IN COMMON PROPERTY AREAS, WHICH MAY REQUIRE ADDITIONAL INSPECTION (SECTIONAL TITLE BUILDINGS)
THE WDO INSPECTOR CAN ONLY BE HELD RESPONSIBLE FOR AND INSPECTION REPORT FOR A PERIOD OF THREE MONTHS AFTER THE DATE OF THE INSPECTION AS INFESTATION CAN OCCUR AT ANY TIME.

SECTION 4: INDENTIFICATION OF WOOD DESTROYING ORGANISMS

SUBTERRANEAN TERMITES

The WDO inspector knows the habits of termites in general, the manner in which they work, the places where they are likely to be found and the signs which show that they are present.

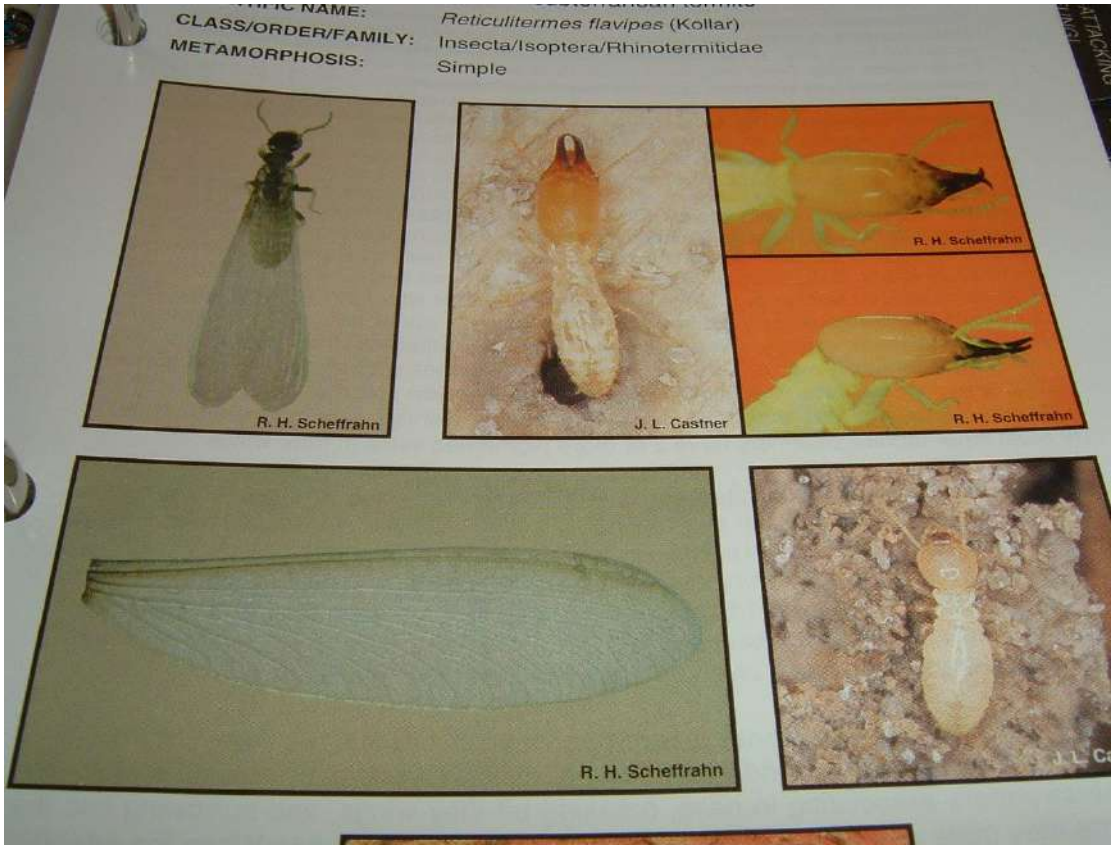
Termites have soft bodies that cannot withstand the desiccating effects of dry air. They move about in sheltered mud tubes which they build when they have to cross open spaces that are exposed to the air. Consequently, they are not easily noticed and may go undetected except by the trained eye. The presence of shelter tubes is the most positive indicator of termite infestation. A WDO inspector must be able to distinguish between old and new shelter tubes. Old shelter tubes are brittle, cracked and break away easily, whereas new ones tend to be stronger and with a certain amount of moisture.

Termites excavate galleries that follow the grain of the wood, often for several meters without any surface openings. In some cases, these galleries follow the growth rings of the timber, giving heavily attacked wood a *'leafed'* or *'layered'* appearance when cut, *in others; the whole of the interior may be eaten out*, leaving only a paper thin skin of uneaten wood or paint.

Termite damage in timber may be detected by the presence of mud 'plastering' along joints and cracks on the surface or by a depressed or corrugated surface skin which remains after the interior has been eaten. When lightly tapped, damaged wood often has a 'papery' and hollow sound.

Termites may attack upper floors or roof timbers without visible signs of attack in lower floors, the termites may have travelled from floor to floor through the wall cavities, lift wells, through casings covering electrical wiring or telephone cables. Other places to be examined are woodwork, wooden panelling and staircases.

A search should be made for nests up to 50m from the building. In most instances it is almost impossible to locate the nest since it is usually located underground. Nests may be obvious mounds or be concealed under a solid concrete slab. They may also be in the base of a stump, pole, railway sleeper or tree. No matter what the external shape, location or covering of the nest, the inner zones centred on the nursery always consists of concentric layers of cells with thin, fragile walls of organic matter and soil.



IDENTIFICATION OF TERMITES

A subterranean termite colony is made up of large numbers of workers, a lesser number of soldiers and, generally, a pair of reproductives, the king and queen. At certain times of the year the colony may also contain winged reproductives (alates) and the precursory nymphs. The following are common in South Africa.

(a) The insidious fungus grower – Odontotermes badius

Found in the O.F.S., Gauteng, Northern Province, North West, Mpumalanga, Botswana, Swaziland and Kwazulu Natal. Nest is less than a meter high, up to 1,5m in diameter with the nest cavity about half a meter below ground level. It comprises of sturdy clay shelving with a continuous mass of spongy fungus gardens, they can even appear in the open in damp conditions under suspended floors. This species eats anything containing cellulose at a rapid rate.

(b) The Natal Fungus grower – Macrotermes Natalensis

This is the second most destructive termite in S.A. occurring almost as widely as Odontotermes badius. A surface mound of up to 2m of hard clay is characteristic. The wood that is destroyed is always replaced by hard clay. The nest is nearly spherical about 1m in diameter, with clay shelves and separate fungus gardens.

(c) The funnel building fungus grower – Odontotermes Latericius

Third in the order of economic importance. The workers are smaller than the above two species. The termite makes a slight elevation over its nest with large funnels or ventilation shafts around its nest linked to the nest with very narrow passages. This species only feeds under cover of clay canopies.

(d) The Swaziland termite – Macrotermes swaziae

Mainly found in Swaziland and Mpumalanga. An important characteristic are its very large soldiers and the fact that soldiers and workers leave the nest to collect grass and twigs just like harvester termites.

BORER

Holes in timber with an accumulation of frass are evidence of the presence or history of borers. It is essential that a WDO inspector is able to distinguish softwoods from hardwoods and sapwood from heartwood. This will equip him to positively identify infestation.

ITALIAN BEETLE - HYLOTRUPES BAJULUS

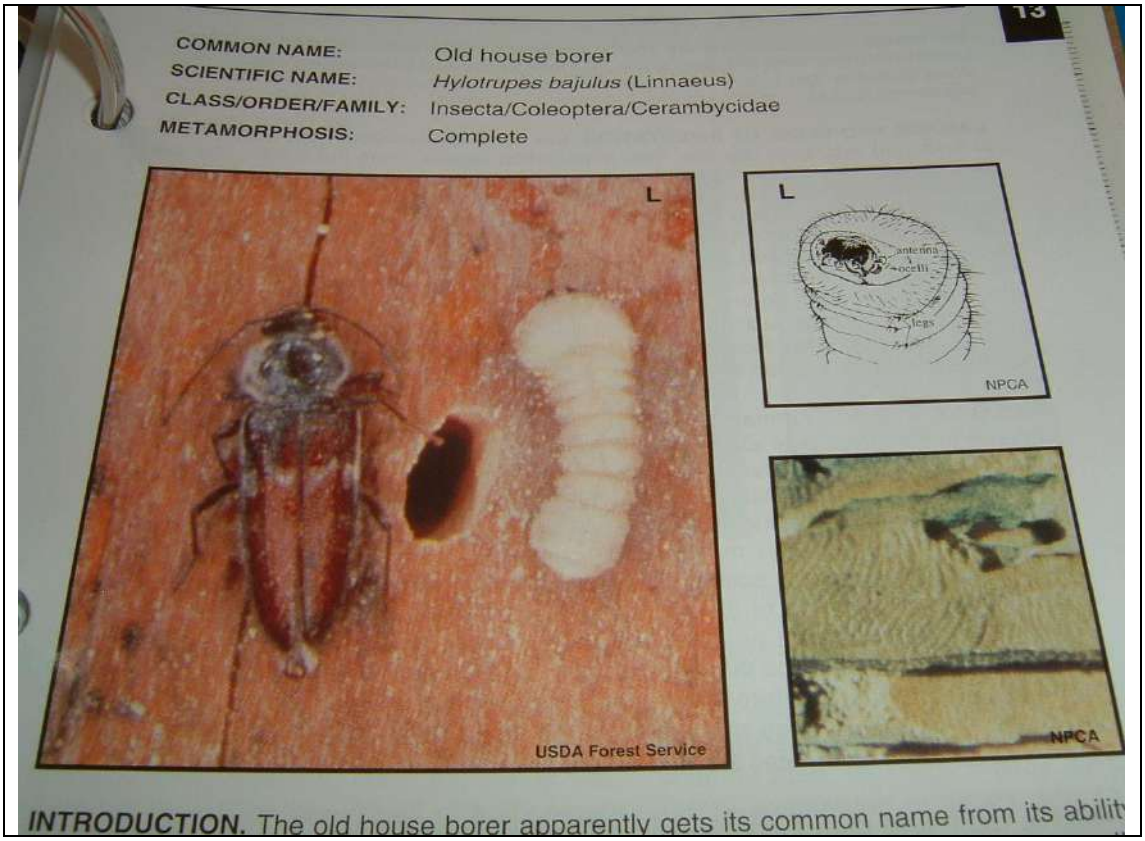
Found in the coastal regions of South Africa and the Nelspruit region. The Italian beetle lays its eggs on, and the larvae feed inside, the sapwood of coniferous timbers. The larvae bores inside the timber for a period of several years, up to four years, thus seriously weakening the timber.

The larva grows to about 30mm in length. It is dirty white or cream coloured and the thoracic segments are larger than those of the rest of the body, so that the larva appears to have swollen front end.

The adult is black, with thick grey hairs covering most of the pro-thorax. There are four spots on each wing cover. There are two smooth, shiny black raised spots on the thorax. The antennae are about half the length of the beetle, average length of the female is 17mm and the male 11mm.

The holes the beetle cuts in the timber are oval-shaped and about 5mm by 2mm in the surface of the wood.

Frass produced by the larva is composed both of wood chewing and excreta from the alimentary canal. Frass is often packed tight in the burrows and the colour often lighter coloured than the wood. The timber takes a blistering effect.



Damage by Hylo

ANOBIUM PUNCTATUM OR COMMON FURNITURE BEETLE

This beetle is distributed throughout South Africa but is very common in the coastal areas. The beetle prefers sapwood but will attack heartwood, and has been reported to attack both hard and softwoods.

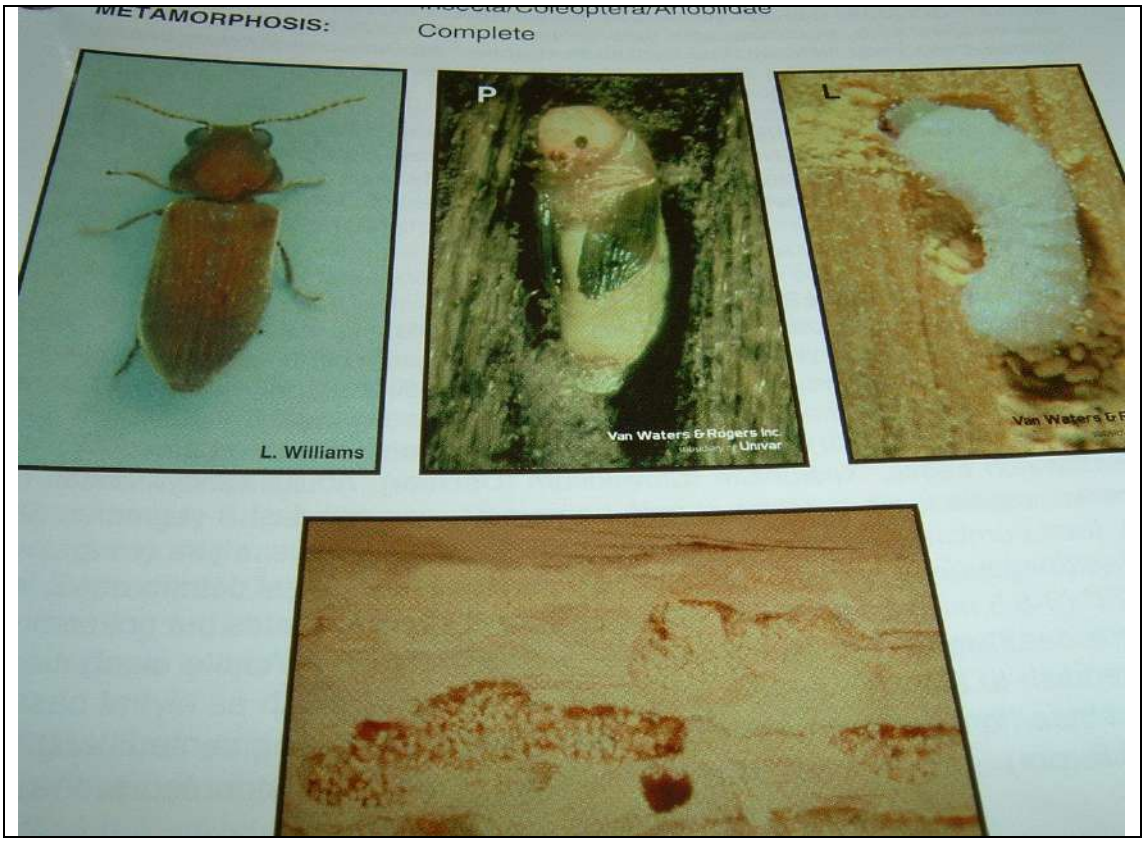
The furniture beetle prefers to attack wood that has been seasoned and in use for some years. It is believed that a slight chemical change in the timber may attract the beetles. The first signs of infestation are noted with the appearance of emergence holes in the surface of the wood and small piles of sawdust underneath. Holes are made by adult insects emerging from the wood. The galleries inside the wood, made by the larvae burrowing and feeding there, are often so numerous that they seriously affect the strength of the infested wood.

The emergence holes made by Anobium beetles are circular and about 1,5mm in diameter.

The larva is creamy white and about 5-7mm long, with three pairs of legs and a dark coloured head. The larva usually remains curled up in the shape of comma when it is removed from its tunnel in the wood.

The beetle can vary in length from 2,5mm to 5mm and is usually reddish or yellowish brown. The wings are well developed and are capable of sustained flight. A characteristics feature is the series of nine longitudinal rows of small pits on each wing cover. The head is bent downwards and viewed from above its is hidden underneath the front edge of the thorax.

The frass is produced by the larvae in the shape of microscopic barrels or spindles. The inside excavations and flight holes are filled with this powdery dust and when rubbed into the palm of the hand it has a gritty feel resembling salt.



OXYPLEURUS NODIERI OR BROWN HOUSE BORER

Found on the coastal areas between Cape Town and Port Elizabeth.

The larva is a slender creamy white grub with a thickened thorax typical of the longhorn beetles. It can grow up to 18mm long. The orange coloured head is sunk into the thorax and the dark brown, wedge shaped mandibles can be clearly seen. The pupa has the antennae, legs and wings of the adult folded down along the front as in most beetles. It is creamy white in colour until shortly before emergence when it gradually darkens in colour.

The adult beetle is of a uniform gingery brown colour and up to 14mm long. The male is usually smaller than the female. The antennae of the male reach to the end of the elytra but those of the female are shorter and only reach about two thirds of that length. Frass produced by the larva is in the form of spirally twisted shavings and threads which are quite characteristic.

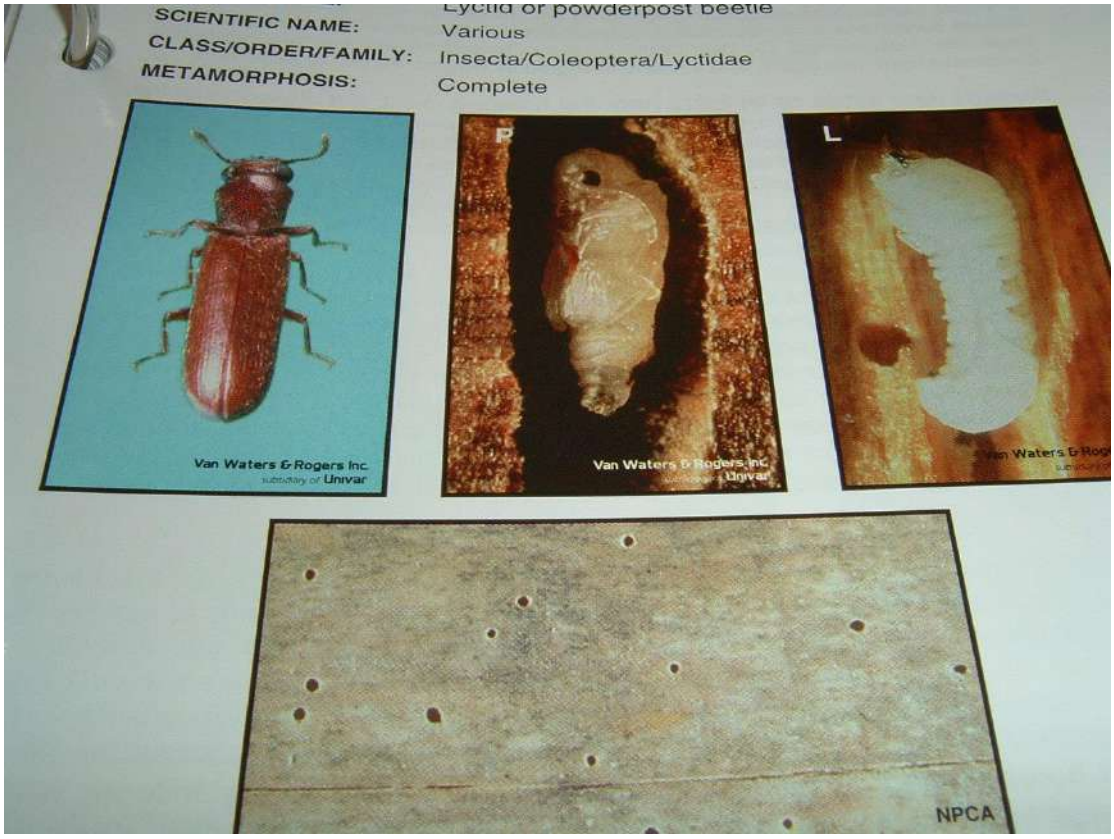
The damage is caused by the burrowing of the larvae, mainly in the sapwood of the timber and by the adults making oval holes (5mm by 2mm) in the surface of the timber.

LYCTUS BRUNNEUS OR POWDER POST BEETLE

Powder Post Beetles are the most serious of the insect pests of hardwoods, but they only attack the sapwood. Damage is caused by the larvae which tunnel through the sapwood without coming to the surface. Since the life cycle may take up to six years, an infestation may be noticed when the timber is cut and used. It is only later that the purchaser finds small heaps of fine wood dust or powder. As far as we know the Powder Post Beetle does not enter buildings to lay eggs and does not lay them in polished, painted or treated timber.

The flight holes are about 1,5mm in diameter and very similar to those of furniture beetle. The larva is about 5mm long, creamy white with a dark head and strongly arched. The thorax is enlarged and has three pairs of legs. The beetle is generally 4mm long and reddish-brown to black. The head is visible from the top. The last two antennal segments are enlarged, so that the antennae appear to be clubbed at

their ends. The frass is in the form of a very light powdery dust, usually light coloured, and resembling face powder. Newly formed flight holes are light in colour on the inside whereas older infestations show flight holes to be darker.



CRYPTOTERMES BREVIS OR WEST INDIAN DRY-WOOD TERMITE

Cryptotermes brevis can be found throughout Kwazulu Natal as far as Port Elizabeth with new outbreaks reported in Cape Town.

No timber, hardwood or softwood, sapwood or heartwood, appears to be immune to attack.

Paint on the outer surfaces of timber acts as a deterrent, but entry by colonizing reproductives can be obtained through cracks and joints, etc.

Due to re-infestation of timber already infested, damage is compounded yearly until the timber loses all structural strength. Structural timber, wooden fittings and furniture are equally readily attacked. Pieces of timber of the size of a matchbox or less could be successfully infested owing to the small size of individual colonies.

Signs of infestation:

The emergence during the swarming season, of winged reproductives fluttering around lights.

The presence of wings, below or next to timber shed by reproductives boring into wood.

Frass in the shape of poppy-seed-like dark coloured faecal pellets adjacent or below infested timber.

The buckling, warping and cracking of the outer protective shell of the timber in an advanced state of destruction.

The winged reproductive is a small insect of medium reddish brown or brown colour dorsally, and paler creamy brown ventrally. The two pairs of wings are clear and transparent. Two well-developed black compound eyes are present on the head. The nymphs are un-chitinised and white in color. Except when adult winged reproductives are present in the nest prior to swarming, each colony consists predominantly of white nymphs, with a sprinkle of white bodied, dark headed soldiers and the dark bodied royal pair.

Swarming takes place between September and December but has been known to last till mid February.

There are other wood-destroying insects infesting timber but they are not of any economical importance. Listed below are a few examples:

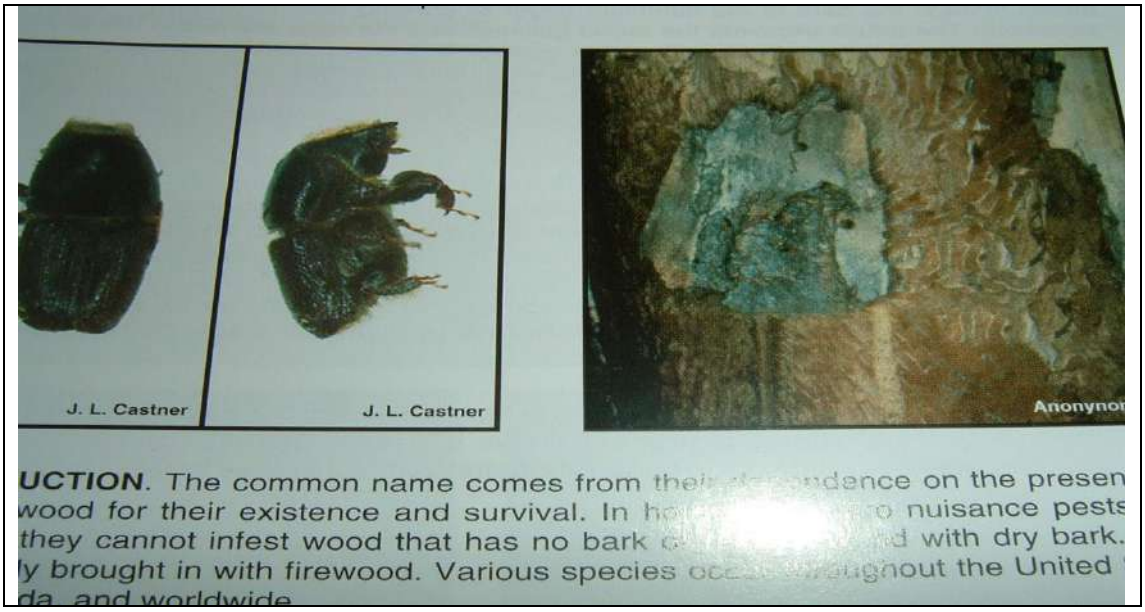
(a) Dinoderus Minutus or Bamboo Borer

This is a small insect 2,5mm to 3,5mm in length, reddish-brown to dark brown in colour with the prothorax darker than the elytra. The beetle is a common pest in bamboo or cane furniture, partitioning or baskets. It is also found in stored grain products and spices.

(b) Emobius Mollis or Bark Beetle

This beetle is dark brown in colour, with silky yellow hairs which soon wear off. It is up to 6mm in length. The exposed tunnels of larva reveal tightly packed frass the same colour as the bark or sapwood that is has fed on. The beetle is

commonly found in sofas or roof struts where a piece a piece of timber with bark on was used.



(c) Carpenter Bees

These large carpenter bees look and sound like a bumble bee, bore into seasoned dry-wood, commonly roof overhangs and fascias, making a hole and tunnel about 10-13 mm in diameter and 45cm in length. Inside the nest is hollowed out. When infestation is noted it can easily by treated by injecting the pesticide into the holes and plugging them afterwards.

SECTION 5: FUNGAL DECAY

Fungi are very important in the destruction of wood outdoors where the wood is exposed to the weather, or where it comes in contact with the soil, in indoor situations where wood is more protected, the fungi are not as important as insects, unless moisture leaks and keeps the wood permanently damp. In general, softwoods are less resistant to fungal attack than hardwoods. In order to understand the need for timber preservation, we must know something about the nature of fungi that damage wood, and of the conditions under which they flourish. Fungi do not have the green pigment called chlorophyll. Chlorophyll enables the plant to make their own sugars for food, from the carbon dioxide in the air (with the help of sunlight). So fungi has to find their own food, they do this by attacking plant and animal materials, breaking them down to form water soluble chemicals which can be absorbed by the fungi cells.

BROWN ROT

Brown rot attacks particularly the cellulose, and as the decay progresses in the wood, so the colour becomes darker because the coloured materials, such as tannins, are left when the rest has decayed away. As the framework of cellulose is destroyed, the wood cracks, shrinks, and eventually collapses. Two examples of brown rots are:

a) DRY ROT

"Dry rot" is the name given to a particular decay of timber brought about by the activity of one species of fungus: Serpula Lacrymans. The term "dry rot" refers to the dry and brittle condition of the rotten wood.

Wood decayed by this fungus shows deep transverse and longitudinal fissures and the wood breaks up into cubes, sometimes of large dimensions. The wood becomes very light in mass, owing to the extraction of the cellulose by the fungus. The wood also breaks up very easily when rubbed between the fingers.

b**) THE CELLAR FUNGUS**

This fungus is also a brown rot, but it does not break up the wood into cubes. Instead the wood develops long splints, or cracks. Wood which is attacked becomes darker in colour, and the longitudinal cracks which are formed, are dark brown or black. Cracks may also develop at right angles to these. In the final stages of attack, the wood is extremely brittle and it may be 'powdered' by rubbing with the fingers. The cellar fungus grows best under very wet conditions, and it is liable to occur wherever there is persistent leakage or condensation.

SECTION 6: DEFIBRATION

Defibration of wood is the chemical breakdown and separation of the cell walls until the cell walls are no longer present, resulting in collapse, particularly where the wood forms part of a building structure.

Wood consists mainly of cellulose, some hemicellulose and lignin. The proportions vary from one timber to another, and are very different for pines and hardwoods. Timbers affected by defibration have masses of yellow to orange coloured fibres on the surface. These symptoms are mostly found on tile battens, rafters and other roof members. Advanced defibration can cause collapse of affected timber members.

Defibration often occurs in areas close to the coast where the air is salty. Analysis of affected timber usually reveals higher sodium and moisture content than that of unaffected timber in the same situations. The main timbers affected by defibration are Oregon.

Defibration also occurs in timber in some factories where chemical gases and fumes are present. Vapours from combustion stoves discharged into roof cavities

have also caused defibration, and at a more rapid rate than that produced from exposure to salty air.

Replacement of affected timbers with more resistant species is the only recommended and effective procedure when advanced defibration occurs. Alternatively the exposure of timbers to chemical gases and salt water must be eliminated or reduced as a preventative measure.

SECTION 7: RECOMMENDATIONS

When a live active infestation of wood destroying organisms are found during an inspection by a WDO inspector the following procedures have to be followed for the eradication of such infestation.

SUBTERRANEAN TERMITES

Where active infestations of subterranean termites are found, the entire building has to be treated against termites with a registered termiticide as per the South African Bureau of Standards Code of Practice SANS 10124 of 2006.
When a subterranean termite nest or mound is found under suspended flooring or within 50m of the main building, the nest must be broken down and flooded with a termiticide. When the active subterranean nest is found underneath the building in a sub-floor the nest as well as the rest of the building has to be treated for subterranean termites as per SANS 10124 of 2006.
When damage by subterranean termites is found in a slab-on-ground section and no evidence of treatment can be determined, treatment of the building should be recommended as per SANS 10124 of 2006, unless proof of recent treatment can be produced.

WOODBORER AND DRY-WOOD TERMITES

When active infestation by woodborers or dry-wood termites are found, or evidence of active infestation is found in timbers which may not be probed (e.g. joinery) or from inaccessible areas, the recommended treatment should be selected in the following order:

1) Methyl bromide fumigation a per SANS 0204 of 1985;
Building / structure to be covered with gas proof plastic sheeting and made airtight. Methyl Bromide gas 100% to be introduced at a rate of 48 grams per cubic meter for an exposure period of 24 hours. It is recommended that a higher dose be used for Lynctus especially when it comes to gum poles as 48g/m³ has a % of failure, it does not kill the eggs. The roof is then dusted down and swept and all debris removed and a solution of a suitable wood-preservative insecticide is then applied to all accessible structural timbers.
2) Where Methyl bromide fumigation is not reasonably possible, then use the following method;

Removal and replacement of infested timber:
All infested timber has to be removed from joint to joint and be replaced with new pre-treated timber (meaning it must be the same dimensions as

the timber to be removed), and all remaining timber thicker than 45 mm has to be drilled with 8mm holes ⅔ deep into the narrow section of timber no further than 300mm apart and then injected with a suitable wood-preservative insecticide, in an organic solvent to point of saturation. Injection pressure must be monitored carefully.
Please note that inaccessible areas have to be opened up and similarly treated.
NOTE: ***A Clearance Certificate should not be issued where infested timber has only been treated by the palliative (drill & inject) method***.

Where evidence of active infestation has been found, and probing has established that the infestation for example, frass from Cryptotermes Brevis found in a roof void, but probing reveals old damage and no active infestation – recommend sweep down of the roof void and removal of evidence of active infestation i.e. frass.

WOOD ROTS
As all wood rot is caused by excessive water and moisture conditions the recommendation should be replacement of all affected timber and the removal of the water source or problem causing the rot in the first place.

WHITE ROTS
The fungi causing the white rots damage all the constituents of the wood, including the brown colouring materials as well as the cellulose. The wood becomes lighter in colour as well as in mass, and the texture becomes fibrous. The normal fruiting body which grows in open air situations are large, yellow and orange and consisting of whorls of finger-like structures. When this grows indoors on a protected situation it assumes shapes like the branched horns of a buck. When decayed, the wood cracks into cubes, and a skin-like mycelium fills the cracks.

SOFT ROT
Soft rot causes decay of timber in cooling tower of power stations. The decay takes a different form from that caused by the more usual wood-rotting fungi. For it completely decays only the surface of the timber, while the wood underneath appears to be perfectly sound. Although soft rot can cause damage of considerable economic importance, the very wet conditions necessary for growth explain why this type of fungus is not a problem in ordinary buildings.

Floors

Suspended Strip Floors
Suspended and replace the infested timber with new pre-treated timber. Machine sand the floors and flood with a solution of a registered insecticide in organic

solvent at the rate of one litre per square meter. Sub-floor supporting timbers should be drilled and injected with the same solution after removal of dust. Thereafter, spray all accessible sub-floor timbers and under surfaces of all floorboards with the same solution.

Suspended Strip Floors with no access below

Machine sand the floors, then seal the building to ceiling height and make gas tight. Fumigate with Methyl Bromide gas at a minimum maintained concentration of 48 grams per cubic meter for a period of 24 hours – then flood the surface with the insecticide solution.

Block Floors

Remove infested floor blocks and replace with new pre-treated timber. Seal the room and make it gas-tight. Fumigate with Methyl Bromide gas at a minimum maintained concentration of 48grams per cubic meter for a period of 24 hours

THE DAMAGE CAUSED BY THE MORE COMMON WOOD BORERS

TIMBER	BORER ATTACKING SEASONED TIMBER						
Bostrichids	Sirex	Cypress pine jewel beetle	Lyctids (powder post beetle)	Anobium puntatum (furniture beetle)	Ernobius mollis (pinebark anobiid)	Hylotrupes bajulus (European house borer)	Ameodontus tristis (two-tooth longicorn)
Mainly hard woods	Soft woods mainly pine	Cypress pine	Hard woods	Mainly soft wood	Soft wood with bark	Mainly soft woods	Some Pines
Sapwood Only	Mainly Sapwood	Sapwood and heartwood	Sapwood only	Mainly Sapwood	Mainly bark some sapwood	Mainly Sapwood	Sapwood and heartwood
Meandering long grain	Curved random	Crescent like	Meandering along grain	Meandering honey combed	Meandering random	Meandering random	Meandering long grain
Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Opius	Tightly packed	Tightly packed	Copious	Copious	Moderate	Copious	Moderate
Fine and Powdery	Coarse	Coarse	Fine and powdery	Granular like salt	Granular and speckled	Granular and powdery	Coarse and compacted
Round - 6mm	Round 3-6 mm	Oval 3-6mm	Round 1-2mm	Round 2mm	Usually circular 2-6mm	Oval about 6mm (long axis)	Oval about 6mm (long axis)

POROUS TIMBERS, OR SOFTWOODS, SUCH AS THE PINES, FIRS AND SPRUCES AND THE HARDWOODS, SUCH AS THE EUCALYPTS.