BUILDING & TIMBER PEST INSPECTION REPORT

In accordance with AS 4349.1 & 4349.3

11565
Report Number

81 Wesley Street, Elanora Heights NSW 2101
Inspection Address

Drake Real Estate.
Client's Name

03 April 2023
Date of Inspection

Craig Lester
Inspector

(Customised Building Company Pty Ltd T/A Inspect My Home)

☎ (02) 9336 9603
http://www.inspectmyhome.com.au

STANDARD PROPERTY INSPECTION REPORT

PLEASE READ THE TERMS AND CONDITIONS IN CLAUSE A.1 OF THIS DOCUMENT

SERVICE REQUESTED **As agreed with Client**.

STANDARD INSPECTION REPORT - Tests were carried out (see also Clause A.1).

SPECIAL CONDITIONS OR INSTRUCTIONS: **There are no special conditions or instructions.**

SUMMARY OF FINDINGS - BUILDING INSPECTION

IMPORTANT NOTE: The Client acknowledges that, unless stated otherwise, **the Client as a matter of urgency should implement any recommendation or advice given in this Report.** The Summary is not the Report. The following Report must be read in full in conjunction with this Summary. If there is a discrepancy between the information provided in this Summary and that contained within the body of the Report, the information in the body of the Report shall override this Summary.

Summary

On the day of inspection the property was found to be in an average condition for a property of its age and type, with minor defects for age detected. Recommend the implementation of an ongoing maintenance program for the property. Consideration should be given for obtaining quotations to rectify/repair any defects as identified within the report. Refer to the general maintenance tip sheet attached to this report.

Defects to the secondary and finishing elements of the property were detected on the day of inspection. See item 3. 3 -Secondary and Finishing Elements- in the Defects Assessment for further details.

In conclusion, following the inspection of the surface work in the Readily Accessible Areas of the property, the **overall condition of the building on the day of the inspection** in the context of the average condition of a similar building of approximately the same age was considered:

- **Average.**

This report is limited to the agreed service requested. For all other aspects pertaining to the property you will require consultation with relevant experts prior to settlement. These aspects may include, but are not limited to, fire and segregation, egress, disabled access, plumbing, electrical, structural design, licensing, town planning, occupational health and safety, regulatory compliance. No inspection to septic, grease traps, pump systems, tanks etc. as per Australian Standards.

Recommend client or clients solicitor make the necessary enquiries with the local council into the legality of any structure or additions on the property. Where possible, the records of the appropriate local authority should be checked to determine or confirm – whether the ground which the building rests has been filled, is liable to subside, or if it is flood prone & whether council has issued a building certificate or other notice for the dwelling.

The building report must be read in full and in conjunction with the timber pest report. It is essential that all recommendations and notes made in the building and pest inspection reports be addressed prior to the contract becoming binding.

DO NOT ACCEPT THE DWELLING without understanding the comments in the report, or without undertaking the recommendations of this report.

1.0 ACCESSIBILITY *(See also Clause A.2)*

The Consultant has endeavored to access and inspect all areas of the property on the day of inspection, however areas to which reasonable access for the full visual inspection were not available or were obstructed or restricted are outlined below:-

Visual inspection limited to some sections of the rear deck subfloor area due to low vertical clearances.

Roof because:

Physical roof access not possible due to the height of roof (not accessible from a 3.6m ladder, as per Australian Standard). No inspection due to Workplace Health and Safety restrictions. Inspection from ground level and windows only.

Roof Void because:

No access due to raked sections, therefore no inspection to this area.

Interior because:

Window furnishings, floor coverings, furniture and stored goods.

Built in sections, wall and ceiling linings.

No access to voids beneath built in cupboards and bath tubs.

Sub Floor because:

Visual inspection limited below rear deck due to low vertical clearances.

Accessibility *(See also Item 4.0 for further details)*

Due to the level of accessibility for inspection including the presence of obstructions, the overall degree of risk of undetected Timber Pest Attack and Conditions Conducive to Timber Pest Attack was considered:

- **The risk of undetected Timber Pest attack and conditions conducive to Timber Pest attack is considered to be Moderate.**

2.0 GENERAL

2.1 Brief description of the building and other structures on the property:

Type: **Detached House.**

Height: **Two storey, split level**

Building: **Brick Veneer.**

Piers: **Brick.**

Floor: **Timber, chipboard**

Roof: **Tile.**

2.2 Was the property furnished at the time of inspection? Yes

IMPORTANT: *THE PREMISES WOULD NEED TO BE VACANT AND CONTAINING NO STORED GOODS OR FURNISHINGS TO ENABLE A THOROUGH VISUAL INSPECTION AS PER AUSTRALIAN STANDARDS 4349.3*

2.3 Weather on day of inspection? Dry.

2.4 Were smoke detectors fitted on the day of inspection? Yes

NOTE: *THE CONSULTANT CANNOT COMMENT ON THE INSTALLATION/ TESTING REQUIREMENTS OF SMOKE DETECTORS AS THIS IS A SPECIALIST SAFETY CRITICAL TASK THAT IS NOT WITHIN THE SCOPE OF THIS INSPECTION AND REPORT. IT IS STRONGLY RECOMMENDED THAT THE CLIENT OBTAINS ADVICE FROM A SUITABLY QUALIFIED PERSON TO EITHER INSTALL THE ADEQUATE AMOUNT OF SMOKE DETECTORS AND/OR ENSURE EXISTING SMOKE DETECTORS ARE OF THE REQUIRED TYPE AND ARE INSTALLED AND MAINTAINED CORRECTLY.*

2.5 Was the inspection limited to assessing the interior and immediate exterior of a particular unit? No

NOTE: *NO INSPECTION TO COMMON PROPERTY AS PER AUSTRALIAN STANDARDS. MATTERS IN RELATION TO COMMON PROPERTY REQUIRE FURTHER INVESTIGATION THROUGH BODY CORPORATE. STRONGLY RECOMMEND CLIENTS SOLICITOR MAKE THE NECESSARY ENQUIRIES RELATING TO THE TYPE OF BODY CORPORATE TITLE WHICH PERTAINS TO THIS PROPERTY AS THIS WILL HAVE A BEARING ON REPAIRS/ MAINTENANCE RESPONSIBILITIES, BEFORE CONTRACT BECOMING BINDING.*

3.0 DEFECT ASSESSMENT

3.1 Structural Damage (*See also Clause A.3)*

Was evidence of any significant impairment to the integrity of the whole or part of the building structure observed, or revealed and/or confirmed under test conditions? (i.e. a matter, in view of the age and type of the building being inspected, requiring substantial repairs or urgent attention and rectification.)

- **No structural defects were detected on the day of inspection.**

3.2 Conditions Conducive to Structural Damage (*See also Clause A.3)*

Was evidence of building deficiencies or environmental factors that may contribute to the occurrence of Structural Damage observed, or revealed and/or confirmed under test conditions? (i.e. while not a structural defect currently, if not repaired or maintained, may lead to structural damage in the future.)

- **No conditions condusive to structural damage were detected on the day of inspection.**

3.3 Defects in the General Condition of the Secondary and Finishing Elements of the Construction *(See also Clause A.3)*

A Building Inspection Report is not a maintenance report. All properties require regular maintenance. Where obvious maintenance issues are noted, these have been included in the report as a courtesy comment only. The basis of this report is a structural report commenting on the overall structural stability of the dwelling.

Was evidence of any Defect in the General Condition of the Secondary Elements and Finishing Elements observed, or revealed and/or confirmed under test conditions?

- **Yes**

Corrosion to various gutter brackets. Rust treatment is recommended to help prevent further deterioration.

Cracked floor tile adjacent laundry external access door. Repairs aren't considered essential but would improve appearances.

Moisture damage to laundry external access door. Repairs recommended to help prevent further deterioration.

Some general repairs to window screens are required.

Recommend resealing bath hob at hob/ wall junction. A flexible sealant is recommended where differential movement takes place.

In conclusion, following the inspection of the surface work in the Readily Accessible Areas of the property, the **overall condition of the building on the day of the inspection** in the context of the average condition of a similar building of approximately the same age was considered:

- **Average.**

For further important information, including advice on the implementation of a preventative maintenance programme see: (Clause A.3 “Important Note”).

3.4 Undetected Structural Damage Risk Assessment

However, due to the level of accessibility for inspection including the presence of obstructions, **the overall degree of risk of undetected Structural Damage and Conditions Conducive to Structural Damage** was considered:

- **Moderate.**

RECOMMENDATION: Where the risk is considered “Moderate” or “Moderate-High” or “High”, a further inspection is strongly recommended of areas that were not readily accessible, and of inaccessible or obstructed areas once access has been provided or the obstruction removed. This may require the moving, lifting or removal of obstructions such as floor coverings, furniture, stored items foliage and insulation. In some instances, it may also require the removal of ceiling and wall linings, and the cutting of traps and access holes. For further advice consult the person who carried out this report.

Further Comments**:** **(SEE PAGE 3 – ACCESSIBILITY FOR DETAILS).**

TIMBER PEST INSPECTION REPORT

This Standard Timber Pest Inspection Report (hereinafter called "the Report") is issued subject to the Scope, Limitations, Exclusions and Definitions of Inspection and Report set out in Clause A.1 of this document.

PLEASE READ THE TERMS AND CONDITIONS IN CLAUSE A.1 OF THIS DOCUMENT

SERVICE REQUESTED **As agreed with Client** (see also Clause A.1 – Scope, Limitations & Exclusions).

STANDARD INSPECTION REPORT - Tests were carried out.

SPECIAL CONDITIONS OR INSTRUCTIONS: **There are no special conditions or instructions.**

SUMMARY OF FINDINGS - TIMBER PEST INSPECTION

IMPORTANT NOTE: The Client acknowledges that, unless stated otherwise, the Client as a matter of urgency should implement any recommendation or advice given in this Report. The Summary is not the Report. The following Report must be read in full in conjunction with this Summary. If there is a discrepancy between the information provided in this Summary and that contained within the body of the Report, the information in the body of the Report shall override this Summary.

Active (live) Termites
Were live Termites found? **No**
(See also Item 4.1 for further details)

Termite Workings and/or Damage
Was evidence of Termite activity (including workings) and/or damage found? **No**
(See also Item 4.2 for further details)

Subterranean Termite Management Proposal
In addition to this inspection report is a written proposal to treat a known infestation and/or help manage the risk of future subterranean termite access to buildings and structures recommended? **No**
(See also Item 4.3 for further details)

Previous Termite Management Program
Was evidence of a possible previous termite management program noted? **No**
(See also Item 4.4 for further details)

Frequency of Future Inspections
The next inspection to help detect any future Termite attack is recommended in **3 to 6 Months.**
(See also Item 4.5 for further details)

Chemical Delignification
Was evidence of Chemical Delignification damage found? **No**
(See also Item 6.0 for further details)

Fungal Decay
Was evidence of Fungal Decay activity and/or damage found? **No**
(See also Item 7.0 for further details)

Wood Borers
Was evidence of Wood Borer activity and/or damage found? **No**
(See also Item 8.0 for further details)

Conditions Conducive to Timber Pest Attack
Was evidence of Conditions Conducive to Timber Pest Attack found? **Yes**
(See also Item 9.0 for further details)

4.0 TERMITES *See also Clause A.3 and Clause A.8.*

IMPORTANT NOTE. As a delay may exist between the time of an attack and the appearance of tell-tale signs Associated with the attack, it is possible that termite activity and damage exists though not discernible at the time of inspection.

Due to the unpredictable nature of termite behaviour, the fact that if no active termites were located despite the best endeavours of the consultant at the time of the inspection, this should not be taken as a guarantee that no termites were present. Termites may be present but undetectable or may have temporarily vacated a location at the time of inspection.

Termites are capable of extensive activity and damage over a short period where the conditions are conducive to such activity. The client should be aware that significant damage and activity can occur in a period as short as a few weeks. The client is encouraged therefore to implement recommendations in this report as a matter of urgency to reduce the risk of such activity.

General Description of Attack
Timber hollowed beneath; some cracking at the surface of timber; earthen channels present; or pale faecal spots present.

Treatment
After discovery of an active infestation, it is imperative that the species of termite is accurately identified before costly (and sometimes unnecessary or inappropriate) methods of treatment are initiated.

Only economically important species which are known to attack timber structures should be treated.
In the case of economically important species, it is important that the termite workings are not further disturbed until the proposed method of control has been determined by a licensed pest control operator. Premature attempts to repair or replace infested timber may cause the termites to withdraw from the area temporarily, thereby hindering effective treatment. Any repair or replacement of infested timber should be carried out after the appropriate treatment has been completed.

Where evidence of active termites is detected within a building or within 30 metres of any building, it must always be assumed that the termites may also be active in areas of the property not inspected. Accordingly, where the termites are known to be of economic significance, a further (more invasive) inspection is strongly recommended of areas which were inaccessible, not readily accessible or obstructed at the time of inspection.

Termite Workings and Damage
Where evidence of damage to building timbers exists, competent advice (e.g. from a licensed or registered building contractor) should be obtained to determine the extent of any structural damage and as to the need or otherwise for rectification or repair work.

Where evidence of inactive termites is located within the building, it is possible that termites are still active in areas of the property not inspected and they may continue to cause damage. A further more invasive inspection is strongly recommended of areas which were inaccessible, not readily accessible or obstructed at the time of inspection.

Where evidence of an inactive termite infestation exists, 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.

Where evidence of termite attack exists to any trees or tree stumps a more conclusive search should be undertaken. This may require the tree or stump to be drilled to determine the existence of a termite nest. In addition, the soundness and stability of any standing trees identified as being affected by termite attack should be confirmed. Always seek further advice from the Consultant.

Previous Treatments
Where evidence of a possible termite treatment was located, the Client should obtain and keep on file all relevant documents pertaining to the extent of the treatment, any service warranties and advice in regard to the building owners' obligation to maintain the treatment and/or barrier. If evidence of a previous treatment of termite infestation is noted, and appropriate documentation is not available, the Client must assume that the termite infestation may still be active in areas of the property not inspected. Accordingly, a re-treatment may be required. Always seek further advice from the Consultant.

Frequency of Future Inspections
Australian Standard AS 3660 recognises that regular inspections will not prevent termite attack, but may help in the detection of termite activity. Early detection will allow remedial treatment to be commenced sooner and damage to be minimised.

Inspections at intervals not exceeding twelve (12) months are recommended. Where the termite risk is high or the building type susceptible to termite attack, more frequent inspections (3-6 months) should be undertaken.

The genus or species of drywood or subterranean termites listed below have the potential to cause significant structural damage. See also Clause A.1 - Limitations No 4 & No 6.

4.1 Active (live) Termites

Were live termites found? **No**

Termite species found: **None found.** They have potential to cause amounts of damage to timber including structural damage.

Was a termite nest found? **No**

4.2 Termite Workings and/or Damage

Was evidence of termite workings or damage found? **No**

Termite damage or workings were located in the following:

RECOMMENDATION; Where evidence of damage to building timbers exists or is undetermined, competent advice (e.g. from a licensed and practicing building contractor) should be obtained to determine the extent of any structural damage and as to the need or otherwise for rectification or repair work. See also Item 3.5 'Frequency of Future Inspections' recommendation

4.3 Subterranean Termite Management Proposal

A proposal in accordance with Australian Standard AS 3660.2 to treat a known infestation and/or help manage the risk of concealed subterranean termite access to buildings and structures.

Is a Subterranean Termite Management Proposal recommended? **No**

Is this Consultant engaged to provide a management proposal? **No**

NOTE: If this Consultant is not providing a management proposal, but a proposal is recommended above, then the Client should contact a licensed pest control operator in respect to obtaining a proposal without delay.

Additional Comments:

4.4 Previous Termite Management Program

Was evidence of a possible previous termite management program noted? **No**

NOTE: If Yes provide details and the location of the possible previous termite management program below (including the location of any 'Termite Treatment Notice' affixed at the entrance to a crawl space or some other place where it was protected from damage, e.g. in the case of a slab-on-ground construction, in an external electrical meter box).

NOTE: See also Clause A.3 and Clause A.8.

4.5 Frequency of Future Inspections

Australian Standard AS 3660 recognises that regular inspections will not prevent termite attack, but may help in the detection of termite activity. Early detection will allow remedial treatment to be commenced sooner and damage to be minimised.

The next inspection to help detect termite attack is recommended in: **3 to 6 Months**

The inspection frequency noted in this report is determined in the risk assessment at the time of inspection. The client should consider that any material changes, alterations and or institution of report recommendations may alter the frequency of future inspections.

5.0 UNDETECTED TIMBER PEST RISK ASSESSMENT

Due to the level of accessibility for inspection including the presence of obstructions, the overall degree of risk of **undetected** Timber Pest Attack and Conditions Conducive to Timber Pest Attack was considered:

The risk of undetected Timber Pest attack and conditions conducive to Timber Pest attack is considered to be Moderate.

RECOMMENDATION: Where the risk is considered “Moderate” or “Moderate-High” or “High” or “Very High”, a further inspection is strongly recommended of areas that were not readily accessible, and of inaccessible or obstructed areas once access has been provided or the obstruction removed. This may require the moving, lifting or removal of obstructions such as floor coverings, furniture, decking, stored items foliage and insulation. In some instances, it may also require the removal of ceiling and wall linings, and the cutting of traps and access holes. Seek further advice from your Consultant.

6.0 CHEMICAL DELIGNIFICATION *See also Clause A.4.*

Was evidence of Chemical Delignification found? **No**

7.0 FUNGAL DECAY *See also Clause A.5 and Clause A.8.*

Was evidence of Fungal Decay found? **No**

8.0 WOOD BORERS *See also Clause A.6 and Clause A.8.*

Was evidence of Wood Borers found? **No**

9.0 CONDITIONS CONDUCIVE TO TIMBER PEST ATTACK (*See also Clause A.7 and Clause A.8.)*

A 75mm ground clearance is required below subfloor vents to help prevent undetected termite entry.

Recommend clearing mulch / leaf litter from rear deck joists and decking boards to help prevent undetected termite entry and possible wood decay.

Timber debris in the subfloor area should be permanently removed to help prevent undetected termite activity.

Stored goods should be permanently removed from the subfloor area to help prevent undetected termite activity.

The Consultant sought evidence of noticeable building deficiencies or environmental factors that may contribute to the presence of timber pests.

9.1 Lack of Adequate Subfloor Ventilation

Was evidence of a lack of adequate ventilation found? **Yes**

Stormwater runoff was detected in the subfloor area due to dwelling being built on exposed bedrock. The installation of a mechanical ventilation system is recommended to help keep the subfloor area dry. Recommend seeking further advice from a ventilation specialist.

9.2 The Presence of Excessive Moisture

Prevailing weather conditions at the time of inspection: **Dry.**

Was evidence of the presence of excessive moisture found? **No**

HIGH MOISTURE RECOMMENDATION; Water leaks, especially in or into the sub-floor or against the external walls, increases the likelihood of termite attack. Leaking showers or high moisture to areas also increase the likelihood of termite attack and fungal decay. See also clause A.5

Were high moisture readings obtained using a moisture meter? **Yes**

The moisture meter detected that there is high moisture to top level bathroom shower recess walls, further investigation to the cause of this moisture is strongly recommended.

Was evidence of mould growth found? **No**

MOULD RECOMMENDATION; where evidence of mould growth was noted above, there may be environmental, biological or health issues associated with this report. Any questions concerning such issues due to the presence of mould, the release of mould spores or concerning indoor air quality should be immediately directed to an appropriately qualified inspector. See also Clause A.1 – Limitation No 7.

9.3 Bridging or Breaching of Termite Barriers and Inspection Zones

'Bridging' is the spanning of a termite barrier or inspection zone so that subterranean termites are provided with passage over or around that barrier. 'Breaching' is the making of a hole or gap in a termite barrier so that termites are provided with a passage through that barrier.

Was the finished ground or paving level above the adjacent internal floor level or damp-proof-course or obstructing any weephole or vent face on external walls? **No**

Was evidence of bridging or breaching including the condition insufficient slab edge exposure found? **Yes**

Gardens abutting dwelling are areas where termites may colonise and enter dwelling via covered subfloor vents . Recommend removal to 75mm clearance below subfloor vents

9.4 Untreated or Non-Durable Timber Used in a Hazardous Environment

This condition may include, but is not limited to, earth-wood or damp masonry-wood contact.

Was evidence of untreated or non-durable timber used in a hazardous environment found? **No**

9.5 Other Conditions Conducive to Timber Pest Attack

For example: evidence of non-existent or defective termite shields installed to isolate piers; storage of timber and stored goods under/adjacent to the building; tree stumps and vegetation in subfloor spaces; cracks in concrete slabs or foundations; defective flashings, downpipes and guttering; etc.

Was evidence of any other conditions conducive to timber pest attack found? **Yes**

Stored timbers and / or debris should be permanently removed from direct subfloor ground contact and / or from direct contact with exterior walls / timbers of the property.

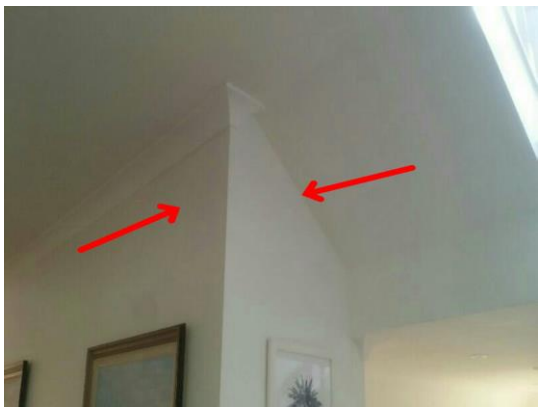
10.0 ADDITIONAL RECOMMENDATIONS

It is **strongly recommended** that a full Inspection and Report be carried out every **3 to 6 Months**. Regular inspections DO NOT stop timber pests, but are designed to limit the amount of damage that may occur by detecting problems early.

It is highly recommended that this report be read in full thoroughly.
All risk areas be rectified and treatment recommendations be strictly adhered to as a matter of urgency.

11.0 ADDITIONAL PHOTOS

Please see below for additional photos taken from this Inspection (if any).

	Stormwater runoff was detected in the subfloor area. This is a common issue to dwellings that have exposed bedrock foundations. Monitor this area in future rain events. If excessive runoff is detected then further improvements to drainage may be necessary. Installing a mechanical ventilation system is recommended to help keep subfloor area dry.
	Moisture staining / blistered paint to top level, middle bedroom wall above the built in robe. Suggests previous leaks. Recommend to monitor for any further changes/staining, if so, further investigation into the cause of the leaking may be required.
	Moisture staining to top level hallway ceiling / wall junction. Suggests previous leaks. Recommend to monitor for any further changes/staining, if so, further investigation into the cause of the leaking may be required. This area is on the same line as the blistered wall paint in the middle bedroom.
	The moisture meter detected that there is high moisture to walls behind top level bathroom shower recess, further investigation to the cause of this moisture is strongly recommended.

12.0 LIST ANY ANNEXURES TO THIS REPORT

(See Annexure 1 – CSIRO – General Maintenance Tip Sheet)
(See Annexure 2 – Asbestos & Lead in Paint Information Sheet)
(See Additional Photos)

13.0 CERTIFICATION

This document certifies that the property described in this Report has been inspected by the Building Consultant in accordance with the level of service requested by the Client and the Terms and Conditions set out in Clause A.1 as of this Report, and in strict accordance with the Australian Standards.

COMPANY NAME	**Customised Building Company Pty Ltd T/A Inspect My Home**
CONSULTANT	**Craig Lester**
POSTAL ADDRESS	**34 Plateau Road** **Bilgola Plateau** **NSW 2107**
PHONE	**(02) 9336 9603**
AUTHORISED SIGNATORY	**Craig Lester**
DATE OF ISSUE	**04 April 2023**

A.1 BUILDING INSPECTION TERMS AND CONDITIONS

SCOPE

Unless specified in writing, this Standard Property Inspection Report ("the Report") deals only with the detection, or non-detection of *Structural Damage, Conditions Conducive to Structural Damage* and any *Significant Defect* in the general condition of *Secondary Elements* and *Finishing Elements* discernible at the time of inspection. All other reports are Special-Purpose Inspection Reports.

As requested by the *Client,* the inspection assessment was based solely on the following inspection carried out by a *Building Consultant* ("the Consultant') of the *Readily Accessible Areas* of the property specified in this report:

Option 1 A visual examination of surface work (but excluding furniture and stored items), and the carrying out of *Tests* (see Limitation No 1 below).

Option 2 An inspection report, which may include Option 1 as well as the particular requirements of the Client, which are specified and attached to this document, where applicable.

NOTE. If the inspection was limited to assessing the interior of a particular unit or lot, the Client may have additional liability for defects or faults in the common property. This additional liability can only be addressed through the undertaking of a special-purpose inspection report which is adequately specified.

If the Client has any doubt about the Scope of this Report please discuss your concerns with the Consultant on receipt of the Report.

The Client acknowledges that, unless stated otherwise, the Client as a matter of urgency should implement any recommendation or advice given in this Report.

If the client fails to implement our recommendations or advice as stated within this Report, the client agrees and accepts that they will not or cannot hold us responsible, as the client had an opportunity to:

- Terminate the contract;
- Ask the Vendor to rectify or repair; or
- Renegotiate with the Vendor.

LIMITATIONS

The Client acknowledges:

1. This Report does not include the inspection and assessment of items or matters outside the scope of the requested inspection and report. Other items or matters may be the subject of a Special-Purpose Inspection Report, which is adequately specified (see Exclusions below).
2. This Report does not include the inspection and assessment of items or matters that do not fall within the Consultant's direct expertise.
3. The inspection only covered the Readily Accessible Areas of the property. The inspection did not include areas, which were inaccessible, not readily accessible or obstructed at the time of inspection. Obstructions are defined as any condition or physical limitation which inhibits or prevents inspection and may include – but are not limited to – roofing, fixed ceilings, wall linings, floor coverings, fixtures, fittings, furniture, clothes, stored articles/materials, thermal insulation, sarking, pipe/duct work, builders' debris, vegetation, pavements or earth.
4. Australian Standard *Inspection of Buildings. Part 1: Property Inspections – Residential Buildings* recognises that a standard property inspection report is not a warranty or an insurance policy against problems developing with the building in the future.
5. This Report was produced for the use of the Client. The Consultant is not liable for any reliance placed on this report by any third party.
6. This report does not include inspection to or assessment of asbestos containing materials.
7. As a matter of course, in the interests of safety, an inspection and assessment of the electrical and plumbing/gas installations should be carried out by a suitably qualified person.
8. A building report is not a maintenance report. All properties require regular maintenance. Where obvious maintenance issues are noted these will be included in the report as a courtesy comment only. A full maintenance report is available at an additional cost.

EXCLUSIONS

The Client acknowledges that this Report does not cover or deal with:

(i) any 'minor fault or defect', i.e. a matter, in view of the age, type and condition of the building being inspected, does not require substantial repairs or urgent attention and rectification;
(ii) solving or providing costs for any rectification or repair work;
(iii) the structural design or adequacy of any element of construction.
(iv) detection of wood destroying insects such as termites and wood borers;
(v) the operation of fireplaces and solid fuel heaters, including chimneys and flues;
(vi) any services including building, engineering (electronic), fire and smoke detection, air-conditioning, light switches and fittings, TV, sound and communications, intercom systems, garage door mechanisms, alarm and security systems or mechanical;
(vii) any swimming pools and associated pool equipment or spa baths and spa equipment or the like;
(viii) any appliances such as dishwashers, insinkerators, ovens, stoves and ducted vacuum systems;

(ix) a review of occupational, health or safety issues such as asbestos content, or the provision of safety glass or swimming pool fencing;
(x) a review of environmental or health or biological risks (e.g. asbestos content or presence thereof, toxic mould, allergies, soil toxicity, lead content, radon or urea formaldehyde)
(xi) whether the building complies with the provision of any building act, code regulation(s) or by-laws; and
(xii) whether the ground on which the building rests has been filled, is liable to subside, swell or shrink, is subject to landslip or tidal inundation, or if it is flood prone.
(xiii) comment on any material containing asbestos. This report makes no comment as to whether the property contains asbestos material or asbestos product. If required, a full asbestos report from a qualified person is recommended.
(xiv) Concealed plumbing; Hot water systems, Septic tanks and systems
(xv) Insulation
(xvi) Gas fittings and fixtures;
(xvii) Any air-conditioning systems including ducted or split systems.
(xviii) Solar panels or associated equipment.
(xix) The inspector can only inspect the fence from within the property. The inspector will deem the fence line to be the boundary line between the adjoining properties, unless the client and vendor advises otherwise. A surveyor should be engaged if the purchaser requires verification that the building set-backs and position is in accordance with local authority regulations.

Any of the above matters may be the subject of a special-purpose inspection report, which is adequately specified and undertaken by an appropriately qualified inspector.

DISPUTE RESOLUTION

In engaging our services, the client hereby agrees and accepts to abide by our dispute resolution process.
If the client becomes aware of any concern regarding this Report, the client must notify our office immediately. Upon receipt of the client's complaint, we will endeavour to resolve the matter with the client in a telephone conversation. An onsite visit with the client may be required in an effort to address and resolve the matter.
If we are unable to resolve the matter onsite, we will respond to the client's complaint in writing within 14 days.
If the client is not satisfied with our response, the client may choose to contact the relevant local authority.

If the client pursues a claim against the company whilst having failed to implement all of the recommendations outlined within the report the client agree to reimburse the company for any legal and associated costs incurred in defending such a claim.

DEFINITIONS

Primary Elements means those parts of the building providing the basic loadbearing capacity to the Structure, such as foundations, footings, floor framing, loadbearing walls, beams or columns. The term 'Primary Elements' also includes other structural building elements including: those that provide a level of personal protection such as handrails; floor-to-floor access such as stairways; and the structural flooring of the building such as floorboards.

Secondary Elements means those parts of the building not providing loadbearing capacity to the Structure, or those non-essential elements which, in the main, perform a completion role around openings in Primary Elements and the building in general such as non-loadbearing walls, partitions, wall linings, ceilings, chimneys, flashings, windows, glazing or doors.

Finishing Elements means the fixtures, fittings and finishes applied or affixed to Primary Elements and Secondary Elements such as baths, water closets, vanity basins, kitchen cupboards, door furniture, window hardware, render, floor and wall tiles, trim or paint. The term 'Finishing Elements' does not include furniture or soft floor coverings such as carpet and lino.

Structure means the loadbearing part of the building, comprising the Primary Elements.

Structural Damage means a significant impairment to the integrity of the whole or part of the Structure falling into one or more of the following categories:

(a) *Structural Cracking and Movement* – major (full depth) cracking forming in Primary Elements resulting from differential movement between or within the elements of construction, such as foundations, footings, floors, walls and roofs.
(b) *Deformation* – an abnormal change of shape of Primary Elements resulting from the application of load(s).
(c) *Dampness* – the presence of moisture within the building, which is causing consequential damage to Primary Elements.
(d) *Structural Timber Pest Damage* – structural failure, i.e. an obvious weak spot, deformation or even collapse of timber Primary Elements resulting from attack by one or more of the following wood destroying agents: chemical delignification; fungal decay; wood borers; and termites.

Conditions Conducive to Structural Damage means noticeable building deficiencies or environmental factors that may contribute to the occurrence of Structural Damage.

Significant Defect means a matter, in view of the age and type of the building being inspected, requires substantial repairs or urgent attention and rectification.

Client means the person or persons, for whom the Inspection Report was carried out or their Principal (i.e. the person or persons for whom the report is being obtained).

Building Consultant means a person, business or company who is qualified and experienced to undertake a Standard Property Inspection Report in accordance with Australian Standard AS 4349. "Inspection of Buildings. Part 1: Property Inspections – Residential Buildings". The consultant must also meet any Government licensing requirement, where applicable.

Readily Accessible Areas means areas which can be easily and safely inspected without injury to person or property, are up to 3.6 metres above ground or floor levels, in roof spaces where the minimum area of accessibility is not less than 600 mm high by 600 mm wide and subfloor spaces where the minimum area of accessibility is not less than 400 mm high by 600 mm wide, providing the spaces or areas permit entry. Or where these clearances are not available, areas within the consultant's unobstructed line of sight and within arm's length.

Tests means where appropriate the carrying out of tests using the following procedures and instruments:

(a) *Dampness Tests* means additional attention to the visual examination was given to those accessible areas which the consultant's experience has shown to be particularly susceptible to damp problems. Instrument testing using an electronic moisture detecting meter of those areas and other visible accessible elements of construction showing evidence of dampness was performed.

(b) *Physical Tests* means the following physical actions undertaken by the consultant: opening and shutting of doors, windows and draws; operation of taps; water testing of shower recesses; and the tapping of tiles and wall plaster.

A.2 ACCESSIBILITY

Unless specified in writing, the inspection only covered the Readily Accessible Areas of the property.

The inspection did not include areas, which were inaccessible, not readily accessible or obstructed at the time of inspection. Areas, which are not normally accessible, were not inspected and include - but not limited to - the interior of a flat roof or beneath a suspended floor filled with earth.

Building Interior:
The consultant did not move or remove any ceilings, wall coverings, floor coverings (including carpeting and wooden floorboards), furnishing, equipment, appliances, pictures or other household goods. In an occupied property, furnishings or household items may be concealing evidence of defects, which may only be revealed when the items are moved or removed.

NOTE. In the case of strata and company title properties or other Class 2 buildings or equivalent, if the inspection was limited to assessing the interior of a particular unit or lot, the Client may have additional liability for defects in the common property. This additional liability can only be addressed through the undertaking of a special-purpose inspection report, which is adequately specified.

Building Exterior, Roof Exterior and Site:
The consultant did not move or remove any obstructions such as wall cladding, awnings, trellis, earth, plants, bushes, foliage, stored materials, debris or rubbish, etc. Such items may be concealing defects, which may only be revealed when the items are moved or removed.

Roof Space:
Obstructions such as roofing, stored articles, thermal insulation, sarking and pipe/duct work may be concealing evidence of defects, which may only be revealed when the obstructions are moved or removed. Also, bodily access should be provided to the interior of all accessible roof spaces. In accordance with Australian Standard As 4349 the minimum requirement is a 400 mm by 500 mm access manhole.

Subfloor Space:
Storage of materials in subfloor areas is not recommended as it reduces ventilation and makes inspection difficult. Obstructions may be concealing evidence of defects, which may only be revealed when the obstructions are moved or removed. Bodily access should be provided to all accessible subfloor areas. In accordance with Australian Standard AS 4349 the minimum requirement is a 500 mm x 400 mm access manhole. In the case of suspended floors, if the clearance between the ground and structural components is less than 400 mm, then the ground should be excavated to provide the required clearance, subject to maintaining adequate drainage and support to footings. If the subfloor has been sprayed for subterranean termites or if the area is susceptible to mould growth, appropriate health precautions must be followed before entering the area. Also, special care should be taken not to disturb the treated soil. For further advice consult the person who carried out this report.

A.3 IMPORTANT NOTE

Special attention should be given to the Scope, Limitations and Exclusions in this document.

Unless stated otherwise in this Report, the Client as a matter of urgency should implement any recommendation or advice given in this Report.

Importantly, Australian Standard *Inspection of Buildings. Part 1: Property Inspections – Residential Buildings* recognises that a standard property report is not a warranty or an insurance policy against problems developing with the building in the future. Accordingly, a preventative maintenance program should be implemented for the property which includes systematic inspections, detection and prevention of incipient failure. **Please contact the Consultant who carried out this inspection for further advice.**

The presence of dampness is not always consistent as the prevailing and recent weather conditions at the time an inspection is carried out may affect the detection of damp problems. The absence of any dampness at the time of inspection does not necessarily mean the building will not experience some damp problems in other weather conditions. Likewise whether or not services have been used for some time prior to an inspection being carried out will affect the detection of dampness. Also, where a shower recess has been water tested for a minimum of ten (10) minutes, and no leakage was evident, this does not necessarily mean that the shower will not leak after prolonged use. Accordingly, to fully detect and assess a damp problem, may require the monitoring of the building over a period of time.

This inspection and report only deals with the detection, or non-detection of structural damage, conditions conducive to structural damage and any significant defect in the general condition of secondary elements and finishing elements discernible at the time of inspection.

Consideration should also be given to the inspection and assessment of:

- any 'minor fault or defect', i.e. a matter in view of the age, type and condition of the building being inspected, does not require substantial repairs or urgent attention and rectification.
- solving or providing costs for any rectification or repair work.
- the structural design or adequacy of any element of construction.
- the operation of fireplaces and chimneys.
- any services including building, engineering (electronic), fire and smoke detection or mechanical.
- any swimming pools and associated pool equipment or spa baths and spa equipment or the like.
- any appliances such as dishwashers, insinkerators, ovens, stoves and ducted vacuum systems.
- a review of occupational, health or safety issues such as asbestos content, or the provision of safety glass or swimming pool fencing.
- a review of environmental or health or biological risks such as toxic mould.

This additional information or advice may be the subject of a special-purpose inspection report, which is adequately specified and undertaken by an appropriately qualified inspector.

In addition, this inspection and report does not include the inspection and assessment of items or areas that do not fall within the consultant's expertise. Accordingly, consideration should be given to other specialist inspections and services such as: hydraulics; geotechnics; or building, engineering (electronic), fire and smoke detection or mechanical services.

As a matter of course, in the interests of safety, an inspection and assessment of the electrical and plumbing/gas installations should be carried out by a suitably qualified person.

Also, in all parts of mainland Australia, termites are a known problem to timber in service. Therefore, it is recommended that a timber pest inspection and report be carried out in accordance with the Report Systems Australia handbook *Timber Pest Detection Reports*.

Where possible, the records of the appropriate local authority should be checked by the Client/Clients solicitor to determine or confirm:

- whether the ground on which the building rests has been filled, is liable to subside, is subject to landslip or tidal inundation, or if it is flood prone;
- the status of the property and services (e.g. compliance of the building with the provisions of any building Act, code, regulation or by-laws); and
- whether council has issued a building certificate or other notice for the dwelling.

Where appropriate, legal advice (e.g. from a solicitor) should be sought to explain title and ownership matters and to deal with matters concerning easements, covenants, restrictions, zoning certificates and all other law-related matters.

This inspection report was produced for the use of the client. The building consultant is not liable for any reliance placed on the report by any third party.

If you have any queries with this report or require further information, please do not hesitate to contact the consultant who carried out the inspection.

GENERAL MAINTENANCE TIP SHEET

1. Check and clear roof & gutters and silicone joins. If not regularly cleaned timber rot and water damage can occur to fascia and soffits.

(1) Check silicone sealants to roof flashings – ultraviolet rays of the sun will breakdown these (if unprotected) in a few years. All minor cracks to roof tiles should be sealed and all pointing to capping tiles regularly maintained with silicone to prevent any leakage and water damage to internal ceilings.

2. Adjust and lubricate sliders (doors & windows) – silicone (non-oily).

3. Check sealants and grouts to all decks & balconies and "wet areas". Upper level patio floors which are not waterproofed may leak onto lower levels. Tiled shower cubicles are likely to LEAK if not sealed at floor levels!! Tile glues can "crystallise" in a few years if incorrectly applied. Timber rot and decay can be concealed behind showers and other wet areas.

4. Treat all exposed timbers – 50% raw linseed oil + 50% turps. Tops of open decks, floor joists and tops of open pergolas – moisture will cause timber to decay (dry & wet rot).

5. Check moisture around timber and steel stumps/supports and posts – moisture causes decay and rust and can attract termites.

6. Avoid having timbers, posts, stairs, cladding etc. in direct contact with the ground. This will help reduce the risk of termites and timber rot. Oregon timbers are highly prone to timber rot and should not be used externally for pergolas, hand rails, external floor joists and beams, etc. When freshly painted timber rot can be hard to detect through visual inspection.

7. All windows and glass to home should be brought in accordance with Australian Standards. AS2047 & AS1288.

8. Drain all surface water away from house (refer to CSIRO info sheet 10-91 attached) – 600mm wide paving around house is recommended. Water will swell ground clays and cause movement to foundations and crack brick and block walls. Recommend diverting all downpipes to curb where possible. Internal retaining walls can leak in heavy rain.

9. Any patched or repaired cracking past or present to brickwork or sheeting may require further investigation and should be monitored in the future.

10. For safety reasons, handrails and balustrading higher than 1 meter above the finished ground level (FGL) should be brought into accordance with current building codes and regulations.

11. Keep trees and gardens away from foundations of house. Keep weep holes in brickwork clear at all times. Covered weep holes can lead to rising damp and termite infestation.

12. Older homes should be checked for lead based paint and should have all lead based paint removed by a professional painter due to safety concerns.

13. Recommend installation or renewal of termite treatment and/or an annual pest inspection and report.

14. All gas fittings and storage cylinders should be checked by a licensed installer for safe operation and operation of all fixtures.

- This inspection is based on "visible and accessible" areas only on the day of inspection. It is recommended that access be gained to all areas due to possible concealment of faults. An opinion on the shrinkage and swelling of reactive soils to dry and wet conditions affecting foundations and any subsequent movement of "inaccessible areas" cannot be given. The Building Inspector will not be held responsible for deliberate concealment of defects.

- This inspection has been carried out to the local building code of the day of construction. This does not mean that the improvements meet today's local Building Codes. Any safety issues with this property raised or not in the report are the responsibility of the client/recipient of this report to rectify.

Foundation Maintenance and Footing Performance: A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10 / 91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIO NS OF SITE CLASSES	
Class	**Foundation**
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

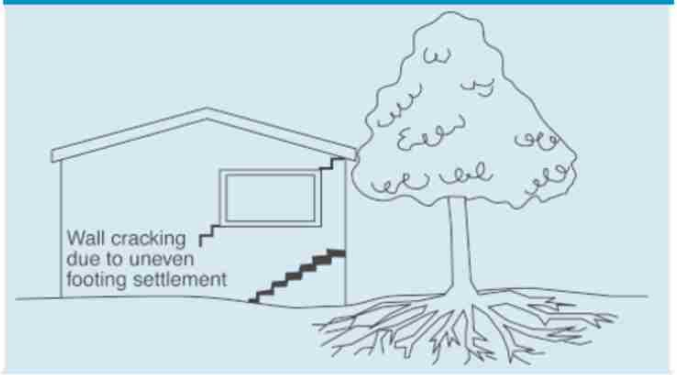
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

Trees can cause shrinkage and damage



As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied. or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention / Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATIO N OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4

LEAD IN PAINT

Painting a home?
Was the home built before 1970?
If so, the paint may contain lead.

Paints containing high concentration of lead were used extensively on the interior and exterior surfaces of houses built before 1970. Exposure to lead is a health hazard. Even small amounts of dust or chips of paint containing lead, generated during minor home repairs, can be of a health risk.

In 1965, the National Health and Medical research Council's uniform Paint Schedule recommended that the maximum lead level in domestic paint be 1 per cent. As a rule of thumb, the 1-per-cent limit was adopted by 1970. However, houses built after 1970 might still contain paint with more than 1 per cent lead. Paint containing lead is most likely to be found on window frames, doors, skirting boards, kitchen and bathroom cupboards, exterior walls, gutter, metal surfaces and fascias and may also be found on interior walls, ceilings and enamel paint. Today, domestic paints have a maximum permissible lead content 0.25 per cent.

Lead is a health hazard. Small chips of lead containing paint or lead-paint dust can create hazards. Home renovators often unknowingly create hazards. Fine-lead particles deposited in soil or household dust can become constant risk to the health of young children, other household occupants and pets. Lead enters the body as lead dust (produced by sanding or by disturbing, flaking or chalking lead based paint) or lead fumes (produced by heat and burning). Young children mostly absorb lead by eating it after touching contaminated dust or soil and than putting their fingers or toys in their mouths. A single exposure to high concentrations of lead, such as eating leaded paint flakes, can cause significantly elevated blood-levels for some weeks. Severe lead poisoning is uncommon in Australia, but even low levels of lead in the blood can adversely affect young children's intellectual development and behavior. Children and pregnant women should take special care to avoid sources of lead exposure. When renovating or doing maintenance that could disturb old paint, care must be taken to avoid exposing yourself, your family, your neighbours and your pets to lead residues. An experienced home handy man or woman can repaint a house with paint containing lead if he or she takes the recommended precautions. For more information go to **www.deh.gov.au**.

Hardware and paint stores can give advice on:

- How to test for lead paint;
- Detailed instructions for chemical stripping, wet scraping, wet sanding, heat processes;
- The right tools and equipment;
- Looking after yourself using protective clothing (coveralls, booties, hat, gloves) and a respirator (meeting the requirements of Australian Standards 1716) when the work might involve lead bearing dust of fumes;
- How to contain all waste;
- Disposing of waste; and
- How to clean up thoroughly.

The things not to do, for example don't:

- Dry sand or dry scrape or use a power sander;
- Sandblast;
- Work out on windy day;
- Use an open flame torch or high temperature heat gun;
- Eat, smoke or drink in the work area or with contaminated hands;
- Allow children or pregnant women in a house or area where lead-based paint is being disturbed.

If your renovation or maintenance job is big or complicated, or you cannot obtain the right equipment to undertake the work safely, call in professional help. Even if you are calling in a professional, it is worth researching information to ensure that the tradesperson takes all the necessary precautions.

ASBESTOS IN THE HOME

The risks associated with asbestos products have been highlighted over recent years, often in a sensational way. The purpose of this sheet is to pull these risks into perspective for the home owner and the building occupant, based on the latest information available.

The overall message is that asbestos in typical home building products is not considered significant as a health risk unless such products are disturbed by dust generating procedures.

What is Asbestos?

The term asbestos applies to fibrous forms of silicate rocks. The most common forms of asbestos are as follows:

- White asbestos (chrysotile)
- Blue asbestos (crocidolite)
- Brown asbestos (amosite)

Asbestos fibres exhibit high strength and excellent resistance to heat and chemicals, and have therefore been used in a wide range of building and other products.

Health Risks in Perspective

Worldwide medical research has established that health risks can arise from the inhalation of microscopically small asbestos fibres. This means that a health risk can arise if asbestos fibres become airborne. The risk of contracting asbestos related disease is related to the low level of exposure, similar to the health risks associated with other hazards like cigarette smoking. The more asbestos fibres you inhale and the longer you inhale them, the greater the risk.

The important concept to grasp, so that the fear of asbestosis kept in perspective, is a follows:

- Few fibres inhaled, low risk;
- Many fibres inhale over a long time, high risk.

Asbestos dust concentration in buildings containing asbestos products are usually below detection using the accepted measurement method for assessing health risks.

According to health authorities, the long term risk to the occupants of houses which contain asbestos product is extremely small relative to other risks experienced in everyday life. It has been estimated that the risk is thousands of times smaller than the risk of a fatal car accident, and tens of thousands of times smaller than that of lung cancer caused by smoking ten cigarettes a day.

The risks associated with the use of asbestos products has repeatedly been sensationalised. Many people have died from inhaling asbestos fibres over a long time. Awareness of the problem, and the subsequent introduction better work procedures, protective clothing and breathing equipment has dramatically reduced the health risks to this group of people.

Asbestos in Building Products

Asbestos is now rarely used in building products, however, the past it was extensively used in many products as shown in these examples:

- Asbestos cement sheets (flat and profiled);
- Roofing shingles and line pipes;
- Plaster patching compounds and textured paints;
- Vinyl floor tiles and backing of some linoleum floor covering;
- Asbestos insulation used for hot water pipe insulation and in domestic heaters and stoves.

The first of these is the most common but the asbestos in these products is usually firmly embedded in cement. The asbestos in plaster compounds, paint and floor coverings is also firmly embedded. Thus asbestos can only present a health risk with these products if they are mechanically disrupted by drilling, sawing, sanding or other abrasive procedures. The asbestos in insulation products is likely to be poorly bound and will require some precautions if disturbed (see below precautions with asbestos products)

In the later 1970's Australian asbestos manufacturers started using cellulose fibres as a partial asbestos fibres substitute. Cellulose fibres, unlike asbestos, have no known health risk. By 1983, asbestos had been phased out from most fibre cement building products. Confusion between cellulose cement and asbestos cement products exist within the community because both look and feel similar. However, the age of your home should give a reasonable indication as to which product is present.

External asbestos cement roof and wall cladding can become weathered after many years, exposing asbestos fibres on sheet surfaces. However, provided the surfaces are left undisturbed, the health risk from such a source is extremely small.

When deciding what to do with an asbestos cement sheet roof, the following points should be considered:

- Asbestos cement (AC) roofs need not be replaced unless they have deteriorated to an extent where structural integrity or physical safety is a concern;
- General studies of asbestos levels in the environment of AC clad buildings indicate that there is no need to coat such claddings on the basis of risks to health;
- A range of AC coatings have now appeared on the market place. There are concerns as to the durability of such coatings since they may not exhibit good adhesion to weathered AC surfaces and may peel within a short period. Organic growth on the surfaces further complicate their performances. In the absence of long term testing it is recommended that coatings be able to exhibit a minimum level of adhesion (e.g. 1.0MPA – when tested – ASTM D4541 Standard Test method for Pull Off Strength of Coatings Using Portable Adhesion Testers) and that coating companies provide at least a 10 year warranty on durability.

Precautions with Asbestos Products

In most cases, the presence of asbestos products in your home is no cause for alarm, and such products should be left in place. Where removal becomes necessary, some asbestos products can release asbestos dust unless specific precautions are taken. In some States it is illegal for you to remove asbestos products yourself. Removal of products which are highly dust producing (insulation products for example) will require a specialist contractor. Removal of old asbestos cement sheets (as in demolition) requires precautions to protect workers from inhaling asbestos fibres. However, many of the products where the asbestos is firmly embedded generate little dust provided you:

- Use hand tools and not power tools'
- Do not abrade or break up the product;
- Thoroughly wet the product prior to working with it;
- Work outdoors rather than indoors

  and
- Wet any residue prior to sweeping.

Further details in suppressing asbestos dust and appropriate work procedures can be found in the National Occupational Health & Safety Commission (NOHSC). Asbestos Code of Practice and Guidance Notes, available from the Government Bookshop in your State.

PLEASE NOTE THIS IS PURELY AN INFORMATION LEAFLET ONLY.

A.1 TIMBER PEST INSPECTION TERMS AND CONDITIONS

SCOPE

Unless specified in writing, this Standard Timber Pest Detection Report ("the Report") deals only with the detection, or non-detection of *Timber Pest Attack* and *Conditions Conducive to Timber Pest Attack* discernible at the time of inspection.

As requested by the *Client,* the assessment was based solely on the following site inspection carried out by a *Timber Pest Detection Consultant* ('the Consultant') of the *Readily Accessible Areas* of the *Building and Site*:

Option 1 A visual examination of timber and other visible accessible and unobstructed materials/areas (but excluding furniture and stored items) susceptible to attack by *Timber Pests,* and the carrying out of *Tests* (see Limitation No 1 below).

Option 2 An inspection report which may include Option 1 as well as the particular requirements of the Client which are specified and attached to this document, where applicable.

Option 3 In addition to Option 1, a Subterranean Termite Management Proposal in accordance with Australian Standard AS 3660.2 to treat a known infestation and/or manage the risk of future subterranean termite access to buildings and structures.

If the Client has any doubt about the Scope of this Report please discuss your concerns with the Consultant on receipt of the Report.

The Client acknowledges that, unless stated otherwise, the Client as a matter of urgency should implement any recommendation or advice given in this Report.

LIMITATIONS

The Client acknowledges:

9. This Report does not include the inspection and assessment of matters outside the scope of the requested inspection and report.
10. The inspection only covered the Readily Accessible Areas of the Building and Site. The inspection did not include areas which were inaccessible, not readily accessible or obstructed at the time of inspection. Obstructions are defined as any condition or physical limitation which inhibits or prevents inspection and may include – but are not limited to – roofing, fixed ceilings, wall linings, floor coverings, fixtures, fittings, furniture, clothes, stored articles/materials, thermal insulation, sarking, pipe/duct work, builders debris, vegetation, pavements or earth.
11. The detection of drywood termites may be extremely difficult due to the small size of the colonies. No warranty of absence of these termites is given.
12. European House Borer *(Hylotrupes bajulus)* attack is seldom detected as the galleries of boring larvae rarely break through the affected timber surface. No warranty of absence of these borers is given. Regular inspections including the carrying out of appropriate tests are required to help monitor susceptible timbers.
13. This is not a structural damage report. Neither is this a warranty as to the absence of Timber Pest Attack.
14. If the inspection was limited to any particular type(s) of timber pest (e.g. subterranean termites), then this would be the subject of a Special-Purpose Inspection Report, which is adequately specified.
15. This Report does not cover or deal with environmental risk assessment or biological risks not associated with Timber Pests (e.g. toxic mould) or occupational, health or safety issues. Such advice may be the subject of a Special-Purpose Inspection Report which is adequately specified and must be undertaken by an appropriately qualified inspector. The choice of such inspector is a matter for the Client.
16. This Report has been produced for the use of the Client. The Consultant or their firm or company are not liable for any reliance placed on this report by any third party.

EXCLUSIONS

The Client acknowledges:

(xx) This Report does not deal with any timber pest preventative or treatment measures, or provide costs for the control, rectification or prevention of attack by timber pests. However, this additional information or advice may be the subject of a timber pest management proposal which is adequately specified.

DISPUTE RESOLUTION

In engaging our services, the client hereby agrees and accepts to abide by our dispute resolution process.
If the client becomes aware of any concern regarding this Report, the client must notify our office immediately. Upon receipt of the client's complaint, we will endeavour to resolve the matter with the client in a telephone conversation. An onsite visit with the client may be required in an effort to address and resolve the matter.
If we are unable to resolve the matter onsite, we will respond to the client's complaint in writing within 14 days.
If the client is not satisfied with our response, the client may choose to contact the relevant local authority.

DEFINITIONS

Timber Pest Attack means Timber Pest Activity and/or Timber Pest Damage.

Timber Pest Activity means tell-tale signs associated with 'active' (live) and/or 'inactive' (absence of live) Timber Pests at the time of inspection.

Timber Pest Damage means noticeable impairments to the integrity of timber and other susceptible materials resulting from attack by Timber Pests.

Major Safety Hazard means any item that may constitute an immediate or imminent risk to life, health or property resulting directly from Timber Pest Attack. Occupational, health and safety or any other consequence of these hazards has not been assessed.

Conditions Conducive to Timber Pest Attack means noticeable building deficiencies or environmental factors that may contribute to the presence of Timber Pests.

Readily Accessible Areas means areas which can be easily and safely inspected without injury to person or property, are up to 3.6 metres above ground or floor levels, in roof spaces where the minimum area of accessibility is not less than 600 mm high by 600 mm wide and subfloor spaces where the minimum area of accessibility is not less than 400 mm high by 600 mm wide, providing the spaces or areas permit entry. The term 'readily accessible' also includes:

(e) accessible subfloor areas on a sloping site where the minimum clearance is not less than 150 mm high, provided that the areas is not more than 2 metres from a point with conforming clearance (i.e. 400 mm high by 600 mm wide); and

(f) areas at the eaves of accessible roof spaces, that are within the consultant's unobstructed line of sight and within arm's length from a point with conforming clearance (i.e. 600 mm high by 600 mm wide).

Client means the person or persons for whom the Timber Pest Detection Report was carried out or their Principal (i.e. the person or persons for whom the report was being obtained).

Timber Pest Detection Consultant means a person who meets the minimum skills requirement set out in the current Australian Standard AS 4349.3 Inspections of Buildings. Part 3: Timber Pest Inspection Reports or state/territory legislation requirements beyond this Standard, where possible.

Building and Site means the main building (or main buildings in the case of a building complex) and all timber structures (such as outbuildings, landscaping, retaining walls, fences, bridges, trees and stumps with a diameter greater than 100mm and timber embedded in soil) and the land within the property boundaries up to a distance of 30 metres from the main building(s).

Timber Pests means one or more of the following wood destroying agents which attack timber in service and affect its structural properties:

(c) *Chemical Delignification* - the breakdown of timber through chemical action.

(b) *Fungal Decay* - the microbiological degradation of timber caused by soft rot fungi and decay fungi, but does not include mould, which is a type of fungus that does not structurally damage wood.

- *Wood Borers* - wood destroying insects belonging to the order 'Coleoptera' which commonly attack seasoned timber.
- *Termites* - wood destroying insects belonging to the order 'Isoptera' which commonly attack seasoned timber.

Tests means additional attention to the visual examination was given to those accessible areas which the consultant's experience has shown to be particularly susceptible to attack by Timber Pests. Instrument testing of those areas and other visible accessible timbers/materials/areas showing evidence of attack was performed.

Instrument Testing means where appropriate the carrying out of Tests using the following techniques and instruments:

(2) *electronic moisture detecting meter* - an instrument used for assessing the moisture content of building elements;

(3) *stethoscope* - an instrument used to hear sounds made by termites within building elements;

(d) *probing* - a technique where timber and other materials/areas are penetrated with a sharp instrument (e.g. bradawl or pocket knife), but does not include probing of decorative timbers or finishes, or the drilling of timber and trees; and

(d) *sounding* - a technique where timber is tapped with a solid object.

A.2 ACCESSIBILITY

Unless specified in writing, the inspection only covered the Readily Accessible Areas of the Building and Site.

The inspection did not include areas which were inaccessible, not readily accessible or obstructed at the time of inspection. Areas which are not normally accessible were not inspected and include - but not limited to – inside walls, the interior of a flat roof or beneath a suspended floor filled with earth.

Building Interior:

The Consultant did not move or remove any ceilings, wall coverings, flooring, floor coverings (including carpeting), furnishing, equipment, appliances, pictures or other household goods. In an occupied property, furnishings or household items may be concealing evidence of timber pest attack which may only be revealed when the items are moved or removed.
NOTE. In the case of strata and company title properties or other Class 2 buildings or equivalent, if the inspection was limited to assessing the interior of a particular unit or lot, the Client may have additional liability for timber pest activity and damage in the common property. This additional liability can only be addressed through the undertaking of a special-purpose inspection report which is adequately specified.

Building Exterior, Roof Exterior and Site:
The Consultant did not move or remove any obstructions such as wall cladding, awnings, trellis, earth, plants, bushes, foliage, stored materials, debris or rubbish. Due to the 'secretive' nature of timber pests, it is possible that hidden damage may exist in concealed areas, e.g. wall framing. Damage may only be found when the obstruction is removed. In the case of buildings constructed on concrete slabs, if the edge of the slab or any weephole or vent at the base of external walls is concealed by pavements, gardens, lawns or landscaping then it is possible for termites to gain undetected entry into the building. The building of gardens or planting of shrubs close to the perimeter of the building can promote and conceal termite entry points. The storage of cellulose materials such as building materials and firewood in close proximity to the ground or building may encourage termite activity.

Roof Space:
Obstructions such as roofing, stored articles, thermal insulation, sarking and pipe/duct work may be concealing evidence of timber pest attack which may only be revealed when the obstructions are moved or removed. Also, bodily access should be provided to the interior of all accessible roof spaces. In accordance with Australian Standard As 4349 the minimum requirement is a 400 mm by 500 mm access manhole.

Subfloor Space:
Subfloor areas should be kept free from all vegetation (including tree stumps) and other cellulose material which may encourage timber pest activity. Also, storage of materials in subfloor areas is not recommended as it reduces ventilation and makes inspection difficult. Obstructions may be concealing evidence of timber pest attack which may only be revealed when the obstructions are moved or removed. Bodily access should be provided to all accessible subfloor areas with the minimum requirement being a 500mm x 400mm access manhole. In the case of suspended floors, if the clearance between the ground and structural components is less than 400 mm, then the ground should be excavated to provide the required clearance, subject to maintaining adequate drainage and support to footings. If the subfloor has been sprayed for subterranean termites or if the area is susceptible to mould growth, appropriate health precautions must be followed before entering the area. Also, special care should be taken not to disturb the treated soil. Always seek further advice from the Consultant.

A.3 TERMITES

General Description of Attack
Timber hollowed beneath; some cracking at the surface of timber; earthen channels present; or pale faecal spots present.

IMPORTANT NOTE. As a delay may exist between the time of an attack and the appearance of telltale signs associated with the attack, it is possible that termite activity and damage exists though not discernible at the time of inspection.

Treatment
After discovery of an active infestation, it is imperative that the species of termite is accurately identified before costly (and sometimes unnecessary or inappropriate) methods of treatment are initiated. Only economically important species which are known to attack timber structures should be treated.

In the case of economically important species, it is important that the termite workings are not further disturbed until the proposed method of control has been determined by a licensed pest control operator. Premature attempts to repair or replace infested timber may cause the termites to withdraw from the area temporarily, thereby hindering effective treatment. Any repair or replacement of infested timber should be carried out after the appropriate treatment has been completed.

Where evidence of active termites is detected within a building or within 20 metres of any building, it must always be assumed that the termites may also be active in areas of the property not inspected. Accordingly, where the termites are known to be of economic significance, a further (more invasive) inspection is strongly recommended of areas which were inaccessible, not readily accessible or obstructed at the time of inspection.

Termite Workings and Damage
Where evidence of damage to building timbers exists, competent advice (e.g. from a licensed or registered building contractor) should be obtained to determine the extent of any structural damage and as to the need or otherwise for rectification or repair work.

Where evidence of inactive termites is located within the building, it is possible that termites are still active in areas of the property not inspected and they may continue to cause damage. A further more invasive inspection is strongly recommended of areas which were inaccessible, not readily accessible or obstructed at the time of inspection.

Where evidence of an inactive termite infestation exists, 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.

Where evidence of termite attack exists to any trees or tree stumps a more conclusive search should be undertaken. This may require the tree or stump to be drilled to determine the existence of a termite nest. In addition, the soundness and stability of any standing trees identified as being affected by termite attack should be confirmed. Always seek further advice from the Consultant.

Previous Treatments
Where evidence of a possible termite treatment was located, the Client should obtain and keep on file all relevant documents pertaining to the extent of the treatment, any service warranties and advice in regard to the building owners obligation to maintain

the treatment and/or barrier. If evidence of a previous treatment of termite infestation is noted, and appropriate documentation is not available, the Client must assume that the termite infestation may still be active in areas of the property not inspected. Accordingly, a re-treatment may be required. Always seek further advice from the Consultant.

Frequency of Future Inspections
Australian Standard AS 3660 recognises that regular inspections will not prevent termite attack, but may help in the detection of termite activity. Early detection will allow remedial treatment to be commenced sooner and damage to be minimised.

Inspections at intervals not exceeding twelve (12) months are recommended. Where the termite risk is high or the building type susceptible to termite attack, more frequent inspections (3-6 months) should be undertaken.

A.4 CHEMICAL DELIGNIFICATION

General Description of Attack
Surface of timber appears very hairy; and wood and 'hairs' separate.

Economic Significance
Chemical Delignification of wood in service is only rarely encountered and then only in certain areas. Small dimensional timber members such as roof tiling battens may collapse when the wood becomes defribrated. However, in large dimensional timber members such as rafters, bearers and joists, delignification takes many years to affect the strength of timber to the point of collapse.

Where evidence of Chemical Delignification exists, competent advice (e.g. from a licensed or registered building contractor) should be sought to determine the extent of any structural damage, and as to the need or otherwise for rectification or repair work.

A.5 FUNGAL DECAY

General Description of Attack
Decaying wood contains sufficient moisture to retain its original shape and may have sufficient strength to withstand normal loads. In contrast *decayed* wood is reduced both in moisture content and size as indicated by cracking either along or across the grain or fibres coming apart in a stringy manner. *Decayed* wood will have undergone considerable strength reduction.

Economic Significance
Fungal decay can cause at one extreme, structural failure of the affected timber, and at the other purely superficial surface damage. The most critical determination is that of which timber is affected and *decaying*, because decay will most likely spread (unless sources of moisture are quickly removed). Affected and *decayed* timber may warrant timber replacement, but the rot should not spread unless a new moisture source becomes available in that area.

Where evidence of *decayed* timber exists, competent advice (e.g. from a licensed or registered building contractor) should be sought to determine the extent of any structural damage, and as to the need or otherwise for rectification or repair work. It is important to correct any condition conducive to attack prior to replacing *decayed* wood.

Where evidence of *decaying* timber exists, competent advice (e.g. from a licensed or registered building contractor) should be sought to remove the condition(s) conducive to attack, and to determine the extent of any structural damage, and as to the need or otherwise for rectification or repair work.

Where the full extent of damage or the overall condition of the timber is *undetermined* a further inspection is strongly recommended by a competent person (e.g. from a licensed or registered building contractor). This may require monitoring of the timber over a period of time and include the assessment of conditions conducive to attack in different weather conditions (e.g. to determine the adequacy of existing drainage).

Management Program
Remove any conditions conducive to attack (e.g. lack of ventilation or the presence of excessive moisture). Regular inspections are recommended at intervals not exceeding 12 months. Always seek further advice from the Consultant.

A.6 WOOD BORERS

General Description of Attack
As the attack proceeds, borer larvae eat through the wood leaving a dust called "frass'. Ejection of the frass occurs through the adult beetles' flight (exit) holes, and it is usually present beneath any timber that has been attacked. The presence of frass however, does not indicate whether the attack is active or not. Borer larvae cannot be sighted unless the susceptible timber is broken open.

IMPORTANT NOTE: *As a delay may exist between the time of an attack and the appearance of telltale signs associated with the attack, it is possible that borer activity and damage exists though not discernible at the time of inspection.*

Economic Significance
Evidence of borer activity is rarely cause for alarm, but rather for careful consideration of three main points, namely the identification of the particular borer responsible, whether the infestation is still active, and the extent of the damage. Full consideration should be given to each of these items before any action is taken.

The following wood borers cause damage most frequently encountered by building owners.

The Lyctid Borer
The most common lyctid borer in Australia is *Lyctus brunneus* (powder post beetle). Attack usually takes place during the first six to twelve months of the service life of timber. However, the powder post beetle is not considered a significant pest of timber and treatment of infestation is not usually required. As only the sapwood of certain hardwoods is destroyed, larger-dimensional timbers (such as rafters, bearers and joists) in a building are seldom weakened significantly to cause collapse. In small-dimensional timbers (such as tiling and ceiling battens) the sapwood may be extensive, and its destruction may cause collapse. This may require the support or replacement of the affected battens. Competent advice (e.g. from a licenses or registered building contractor) should be sought to determine the extent of any structural damage, and as to the need or otherwise for rectification or repair work.

The Anobiid Borer
There are many different species of Anobiid borer, the most frequently encountered being *Anobium punctatum* (furniture beetle) and *Calymmaderus incisus* (Queensland pine beetle). Attack mainly occurs to softwoods especially pine timbers such as floorboards that have been in service for at least ten years. Should any structural timbers be attacked by Anobiid borers it is often difficult to determine what extent the borer damage has weakened such timbers and replacement is often the only way of ensuring safety from collapse.

In the case of ***Anobiid borers***, once an attack is initiated it is unlikely to cease or die out of its own accord without some sort of eradication treatment. Therefore, unless proof of treatment is provided, evidence of an attack must always be considered active. Although a chemical treatment is an option, replacement of infested timbers with non-susceptible, or treated timber, is the most effective method of treatment. Before any option is considered, competent advice (e.g. from a licensed building contractor) should be sought to determine the extent of any structural damage, and as to the need or otherwise for rectification or repair work.

Other Borers
A further (more invasive) investigation is strongly recommended to determine whether infestation is still active and to positively identify the borer species responsible for the attack. Always seek further advice from the Consultant.

Management Program
Wherever practical, remove any conditions conducive to attack (e.g. Anobium borer thrive in badly ventilated subfloor areas). Regular inspections are recommended at intervals not exceeding 12 months. Always seek further advice from the Consultant.

A.7 CONDITIONS CONDUCIVE TO TIMBER PEST ATTACK

Lack of Adequate Subfloor Ventilation
Inadequate ventilation provides a condition suitable for timber pest infestation. For example, subterranean termites thrive in damp humid conditions typical of those provided in a poorly ventilated subfloor space. Where evidence of a lack of adequate ventilation has been identified in the report, the Client should seek competent advice (e.g. from a licensed or registered building contractor) in regard to upgrading ventilation.

The Presence of Excessive Moisture
Ground levels around the building should be maintained in such a way to minimise water entering under the building. Also the ground surface in subfloor areas should be kept graded to ensure that moisture does not pond or accumulate in any area. Where necessary, sub-surface drains should be installed and maintained to assist with drainage around and under the building. Likewise, the presence of excessive moisture can often be directly related to ventilation limitations and the resultant high humidity.

Also, plumbing oversights and defects such as a leaking drain or tap will provide a microclimate conducive to timber pest attack.

Where necessary, the Client should seek competent advice (e.g. from a licensed or registered plumbing contractor) to determine the adequacy of existing drainage and remove any conditions conducive to the presence of excessive moisture.

The building may need to be monitored over a period of time to detect or confirm a damp problem. The presence of dampness (including moisture) is not always consistent as the prevailing and recent weather conditions at the time an inspection is carried out may affect the detection of damp problems. Importantly, precipitation at or near the time of inspection does not necessarily guarantee that a damp problem will automatically be evident due to such circumstances as prevailing wind conditions or intensity of rainfall. The absence of any dampness at the time of inspection does not necessarily mean the building will not experience some

damp problems in other weather conditions. Likewise whether or not services have been used for some time prior to an inspection being carried out will affect the detection of dampness.

Bridging or Breaching of Termite Barriers and Inspection Zones
Physical and/or chemical barrier systems are installed to impede concealed subterranean termite entry into buildings. However, termites may easily enter the building if the barrier is bridged or breached.

With a concrete slab building it is essential that the edge of the slab be permanently exposed. An inspection zone of at least 75 mm should be maintained so that termites are forced into the open where they can be detected more readily during regular inspections. In the case of physical sheet material barriers, a minimum inspection zone of 75 mm should be maintained from the sheet material to the finished ground. Importantly, the edge of the slab or sheet material should not be rendered, tiled, clad or concealed by flashings, adjoining structures, paving, soil, turf or landscaping.

Where perimeter termite barriers have been installed, the building owner should ensure that the integrity of the barrier remains intact and that the inspection of possible termite entry points is not impaired. This is especially important where an exposed slab edge is used as an inspection zone around the building (if the edge of the slab or any weepholes at the base of external walls are concealed by pavements, gardens, lawns or landscaping then it is possible for termites to gain undetected entry).

Also, bridging often occurs when items such as attachments to buildings allow termites to gain access to the building over or around a termite barrier. Where attachments to buildings such as steps are not provided with a termite barrier or cannot be easily inspected, they should be separated by a clear gap of at least 25 mm from the main structure. Where it is not possible to separate attachments from the main building, regular inspections of these areas should be undertaken.
In addition, termite barriers are often breached by the installation of services. Any disturbance of the barrier should be promptly repaired.

Where evidence of bridging or breaching exists, to minimise risk of infestation seek further advice from the Consultant.

Untreated or Non-Durable Timber Used in a Hazardous Environment
To reduce the risk of timber pest attack, it is essential that timber used in a hazardous environment (e.g. in direct contact with the ground or damp masonry) is of sufficient durability and/or is adequately preservative treated. Where evidence of this condition exists, the Client should seek competent advice (e.g. from a licensed or registered building contractor) in regard to the need or otherwise for rectification or repair work.

Other Conditions Conducive to Timber Pest Attack
If the cause or solution to a problem is not obvious, the Client should seek competent advice (e.g. from a licensed or registered building contractor) in regard to removing any conducive condition.

A.8 RISK MANAGEMENT OPTIONS

To help protect against financial loss, it is essential that the building owner immediately control or rectify any evidence of destructive timber pest activity or damage identified in this inspection report. The Client should further investigate any high risk area where access was not gained. It is strongly advised that appropriate steps be taken to remove, rectify or monitor any evidence of conditions conducive to timber pest attack.

To help minimise the risk of any future loss, the Client should consider whether the following options to further protect their investment against timber pest infestation are appropriate for their circumstances:

Undertake thorough regular inspections at intervals not exceeding twelve months or more frequent inspections where the risk of timber pest attack is high or the building type is susceptible to attack. To further reduce the risk of subterranean termite attack implement a management program in accordance with Australian Standard AS 3660. This may include the installation of a monitoring and/or baiting system, or chemical and/or physical barrier. However, AS 3660 stresses that subterranean termites can bridge or breach barrier systems and inspection zones and that thorough regular inspections of the building are necessary.

If the Client has any queries or concerns regarding this Report, or the Client requires further information on a risk management program, please do not hesitate to contact the person who carried out this Report.