DO'S & DON'T'S GUIDE – DAMP AND TIMBER TREATMENT

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Introduction

These notes are not a comprehensive guide on the subject of remedial damp and timber treatment. They are an overview of a particularly complex problem, the unnecessary treatment of damp and timber problems in old buildings. The principal aim of the guide is to alert surveyors to the potential problems that can be encountered and how these problems can be approached.

Background

The inherent characteristics of old buildings, together with the likelihood of past problems of fungal decay and wood boring insect infestation, makes them vulnerable to unnecessary and uncontrolled damp and timber treatment. To avoid unnecessary treatment, and the irreversible loss and damage of historic fabric, a careful reasoned approach needs to be adopted when inspecting and reporting upon historic buildings, either for valuation, survey or specification purposes.

The levels of dampness and types of timber defects from which old buildings suffer are often misunderstood. The influence that the introduction of incompatible impervious materials in the repair and maintenance of old buildings has upon the actual rate of deterioration is generally under-estimated. Remedial treatments can address the symptoms of deterioration - that is the increased levels of dampness, fungal decay and wood boring insect attack - and not the actual causes of the problem. This is exacerbating the rate of deterioration suffered by our historic building stock. That is why in a significant number of cases the wrong diagnosis of the damp and/or timber problem, or the incorrect specification for the control of the problem, has led to unnecessary work and expense.

To avoid repeating these mistakes, and potentially increasing the risk of litigation, a careful, reasoned and informed decision needs to be arrived at as to whether remedial damp and/or timber treatment is actually necessary.

The principles advocated in this Guidance Note are succinctly expressed in the following quote from The Repair of Historic Buildings (C. Brereton. English Heritage - Prevention of rising dampness and associated problems):

'Before any measures are taken the problem should be analysed in order to identify the cause properly. In the first instance professional advice should be obtained, rather than that of a specialist contractor.'

General Points

The following guide aims to set out an approach that will reduce the risk of inappropriate, unnecessary and uncontrolled remedial treatment to historic buildings, particularly those of a vernacular construction.

DO make positive well-informed decisions based on a careful and knowledgeable assessment of the building.

> This will prevent works being carried out that would be unnecessary, inappropriate and impractical.

DO understand the building, its form of construction, its development, and the materials of construction, alteration and repair before making any recommendations.

It is advisable to only inspect and report upon building types of which you have a good understanding. The first step of any inspection should always be to identify the type of construction, and to ensure that you are fully conversant with the potential problems that are associated with that particular form of construction.

DO be aware that certain building types and materials of construction are not suitable for remedial treatment. It is essential to ensure that before making any recommendations there is confirmation that the remedial treatment is compatible with the building type and its fabric, and that it will be effective.

For example, some stone, timber framed and earth buildings require special consideration, because the unnecessary and/or inappropriate treatment of these types of building will increase the risk of structural failure.

DO understand the original performance of the building.

Old buildings performed as 'breathing' structures, that is moisture was absorbed by the fabric but was allowed to escape by the process of evaporation. The levels of dampness in a building were 'controlled' by allowing moisture to evaporate at a greater rate than it entered the fabric. Changing the traditional performance of old buildings can increase the levels of moisture which can become trapped within the construction, thereby increasing the risk of dampness and timber decay problems. It is these problems that are perceived as requiring 'treatment', when in a lot of cases they are the symptom of a change in the performance of the building.

DO assess whether the traditional use of the building, and/or the materials of construction and repair, have changed.

For example: large amounts of water vapour produced from modern living - from bathing and cooking; the introduction of impervious materials; such as cement renders, pointing and concrete floors; the reduction in the natural ventilation of the building - the draught proofing of windows and the blocking of fireplaces and flues. A combination of any of these will reduce the amount of evaporation that can take place, thereby increasing the levels of dampness suffered as a result of condensation and moisture becoming trapped, or displaced, within the construction. This in turn increases the risk of timber decay.

DO have an understanding of the qualities of the original materials.

Old buildings were generally built with soft porous materials that allowed the building to breathe and that allowed a degree of flexibility.

DO assess the compatibility of the materials used to alter and repair the building with the traditional performance of the building.

If materials used to repair or alter the building are not compatible with the original fabric they will be causing problems. Many modern materials are hard, inflexible and impervious. These qualities are not compatible with the performance of the materials traditionally used to construct and repair old buildings. The presence of impervious materials will drastically change an old building's performance by significantly reducing the amount of moisture that can readily evaporate. The consequences of which are an increased level of dampness, an increased risk of timber decay, and the accelerated deterioration of the fabric - for example, the breakdown of soft external masonry where hard cement pointing has been used.

DO identify whether the building is listed or not.

For example, listed building consent may be required for the removal of internal plaster. If listed building consent is not obtained it can expose the client (or his/her professional advisor) to an enforcement notice or even criminal action.

DO determine whether the building has any fabric of particular interest, and assess whether that interest will be affected by any proposed repairs or treatments.

DO make contact with the local authority conservation officer where the building is listed or in a conservation area.

> The conservation officer is a good source of appropriate and impartial advice. It is possible that financial grant aid assistance may be available for certain works.

DON'T rely solely upon the recommendations of a 'specialist' who has a vested financial interest in their own recommendations.

DON'T rely upon a guarantee to prevent further defects, or a re-occurrence of a problem.

> Any defect that arises as a result of inappropriate work and/or a lack of maintenance will not be covered by a guarantee. The best way of ensuring that the risk of dampness and timber defects is minimised is by implementing regular and appropriate repair and maintenance of the building, using materials and methods that are compatible and consistent with the original fabric and performance of the building.

DON'T automatically assume that the recommendations made in a damp and timber report are appropriate.

> Always check that the report and its recommendations are applicable to the building, its construction and the problems identified. If you have any doubts, or do not agree with the findings, there is no obligation to accept the recommendations.

DO try and determine whether any past treatments have been carried out.

> Where past treatments have been carried out their appropriateness, effectiveness, and influence upon the building needs to be assessed.

DON'T assume that just because a building has been treated that it was necessary, appropriate or effective.

> The treatment may be causing additional or new problems.

DO seek the input of an independent specialist who has an understanding and knowledge of old buildings.

> If the limitations of the inspection and/or report do not allow a thorough examination of the building, or enable positive advice to be provided, ensure that further investigations are recommended. Any referral to a specialist needs to be specific. This can be achieved by specifically recommending someone who understands old buildings, such as a surveyor with the RICS Diploma in Building Conservation, or a surveyor who is Accredited in Building Conservation.

DO be aware of the Red Book and its guidance, particularly in respect of valuing historic buildings for mortgage purposes. (See: TEGOVA - Valuing and surveying Historic Buildings - the future)

Dampness

DON'T automatically assume that rising dampness is the cause of the problem.

DO be aware that there can be more than one cause of dampness.

> For this reason do not rely on a single solution to remedy a problem unless all the other possible causes have been eliminated.

'If a positive diagnosis of rising damp is being obscured by other faults the surveyor should recommend that the client remedies them first and then allows a period of time to elapse before further checks are made.' - British Wood Preserving and Damp-proofing Association (BWPDA) Code of Practice; The Installation of Remedial Damp Proof Courses in Masonry Walls.

DO understand the limitations of the standard electric moisture meter.

- the moisture meter is intended and calibrated for use on timbers not masonry
- consequently the percentage moisture meter readings in materials other than wood are not very meaningful;
- the temperature and relative humidity at the time of the inspection will strongly influence readings, and these can be highly variable;
- the moisture meter cannot differentiate between moisture originating from capillary action, either rising or penetrating dampness, or from the presence of salts;
- the readings are limited to surface readings (unless accessory equipment is used);
- the readings can easily be misinterpreted, as they can be affected by the presence of salts and/or past remedial treatments.

Extreme care must be exercised by surveyors, particularly when interpreting moisture meter readings on non-wood materials. An over reliance upon the results of a moisture meter can lead to misdiagnosis and unnecessary work. For this reason the interpretation of the readings of a moisture meter needs to be based upon an understanding of the limitations of this equipment and what is actually being measured.

DON'T recommend treatment where the assessment has relied solely upon the results of a moisture meter. The limitations of a moisture meter dictate that it should only be used as a tool to aid diagnosis.

DO use the moisture meter to provide as much information as possible to aid diagnosis.

Where no, or low, readings of dampness are found this can be a positive indication that the fabric is 'dry'. Where high readings are found this indicates a problem that requires further in-depth investigation. For example, identifying the locations for carbide ('Speedy') tests or further investigations for timber defects.

The moisture meter is calibrated to measure the wood moisture equivalent. This can be used to confirm the dampness of masonry by measuring the moisture content of timber in contact with the wall. This provides a more accurate picture of the level of dampness compared with relying on the moisture readings of masonry.

DO identify the sources of dampness.

This can be achieved by plotting the moisture profile and distribution of a building. This will assist in identifying the potential sources of dampness and any timbers at risk of decay.

DO be aware and understand all the types of dampness that can be suffered:

- penetrating damp;
- lateral water penetration;
- trapped/displaced moisture;
- rising damp;
- salt contamination;

- condensation;
- other sources, e.g. defective plumbing, drainage and rain water goods.

DO identify and eliminate the causes of dampness.

If this is not achieved any remedial action or repair will be of little or no benefit, and the problem of dampness will continue to be suffered.

DON'T make pre-judgments or assumptions on what the causes of dampness are, or make rushed conclusions.

If there is any uncertainty always recommend monitoring and/or further investigation.

DO always try and reinstate the traditional performance of old buildings, where this is practically and economically viable.

The aim should be to reinstate the dynamic equilibrium where moisture can evaporate at a greater rate than it enters the fabric.

DO assess the viability, the practicality of the possible alternatives available before resorting to the installation of a damp proof course.

More often than not dampness can be solved by practical construction repairs, improved detailing and the reinstatement of the traditional performance of the building. The implementation of simple measures such as lowering external ground levels, repairing defective pointing and rain water goods will be sufficient in most cases to control a dampness problem.

DO understand the advantages and the limitations of the different types of remedial treatment prior to making any recommendations.

For example:

(i) where a damp proof course has been identified as being necessary (based upon a reasoned and informed decision) in a thick stone wall, the wall will probably require grouting, with a compatible non-proprietary material. It will be preferable for any damp proof course to be introduced into the structure by gravity feed/low pressure methods, as this will have a greater chance of success in this form of construction compared with pressure injection;

(ii) viscous fingering is a problem with solvent based systems, which are fast curing and are not water miscible, as the injected fluid takes the path of least resistance into the larger cracks and pores leaving areas where moisture can continue to rise through the masonry.

DO identify the type of construction of the building and whether it is suitable for the installation of a remedial damp proof course.

Certain types of construction will be extremely difficult, if not impossible, to effectively treat with an injection damp proof course. In some buildings the incorrect insertion of a chemical damp proof course may actually lead to the accelerated deterioration or the potential structural failure of a building, e.g. timber framed buildings and cob/earth structures. The BWPDA recognises that the following types of wall structure may present 'difficulties':

'walls of exceptional thickness (>600 mm); rubble filled walls; stud walls; walls of impermeable materials (e.g. flint, granite); walls bonded in irregular or very narrow mortar courses; perforated or unusually bonded brick; walls constructed of local materials (e.g. clay or chalk cob).'

BWPDA Code of Practice; The Installation of Remedial Damp Proof Courses in Masonry Walls.

DO be extremely cautious of recommending the injection of irregular masonry, such as flint and random rubble stone walls.

The injection of these types of construction can cause the physical disturbance of the wall and potential structural problems.

DO ensure that where remedial damp proof courses and any remedial plasterwork are introduced that they are kept below, and free, of timbers, particularly the structural timbers of traditional timber framed buildings.

DO make a **full** assessment of the implications that the installation of a damp proof course, and the associated measures -such as replastering, will have on the building.

The installation of an effective damp proof course can cause the concentration of moisture and salts below the level of the damp proof course. Where the masonry is soft and porous this will cause it to deteriorate at an accelerated rate. Impervious hard plasters/renders should not be used as they will only cosmetically conceal dampness and salts, whilst increasing the risk of the moisture and salts being trapped and displaced within the construction.

DO be aware that salt contamination may be suffered.

This is an extremely difficult problem to remedy. The provision of a 'sacrificial' plaster/render can assist in alleviating the problem.

DO assess the potential variations in the masonry to be treated, the type of damp proof system, and the standard of workmanship, as all these will influence the effectiveness of any treatment.

DO follow the trail, where there is dampness there is usually timber decay.

Always recommend further investigations where the limitations of an inspection prevent an inspection of an area considered to be at risk. These investigations should be non-destructive, or at least limited in nature, to avoid the unnecessary loss and damage of the historic fabric.

Timber Defects

(**See:** Is that timber treatment always necessary)

DO always ask the question: is there any need for remedial chemical treatment to control and stop timber decay?

DO always seek to solve timber problems by construction methods (such as repair and replacement) where economically viable, before considering the use of chemical treatment.

DON'T rely solely upon chemical treatment.

If the causes of the timber decay, dampness, are not eliminated continued dampness and decay will be suffered. Chemical treatment should only be used as part of an overall strategy, that is the elimination of the sources of dampness, drying, repair and the provision of support conditions e.g. ventilation.

DO be aware of the limitations of surface treatments (poor penetration of the preservative and the possible concealment of ongoing decay below the surface), and the suitability of different types of treatment for particular problems.

DON'T automatically assume that just because a timber has been treated that it was:

(a) necessary.

(b) appropriate for the timber or the decay mechanism. The timber may be resistant to treatment, or persistently damp, making some forms of treatment

ineffective. Some forms of decay are particularly difficult to treat, due to their life cycle and the nature of the timber they inhabit - such as death watch beetle (Xestobium rufovillosum). In these cases special treatments may be required.

(c) effective.

DO, wherever possible, positively identify the species and/or type of timber prior to recommending any repair or treatment.

The age, type and quality of timber used in the construction or repair of a building dictates the vulnerability to decay and the resistance to treatment of the timber.

For example, the heart wood of oak is classed as being naturally durable and also extremely resistant to treatment by chemical preservatives.

DO make a thorough visual inspection of the accessible timbers.

In many buildings a significant amount of the timbers will be concealed (such as bonding timbers, lintels and bressummers).

Reasoned assumptions have to be made as to the condition and the potential risk of these timbers suffering from decay.

DO identify the areas where dampness is or may be a problem, e.g. defective rainwater gutters/downpipes, high external ground levels, etc., and make a thorough investigation in these areas.

DO identify the areas at potential risk.

A thorough investigation of these areas should be made wherever possible, such as timbers in vulnerable locations, e.g. behind impervious materials, within voids, and below central valley and parapet gutters.

DO make a thorough visual assessment of the timbers for signs of problems, such as: staining reflecting water penetration; damage from rot/insects (cracking of the timber or flight holes and frass/bore dust).

DO understand that all fungal decay, including dry rot (Serpula lacrymans), can be positively addressed by eliminating the sources of moisture and drying the fabric out within an appropriate time scale.

Chemical treatment may not be required where this can be achieved. Where the drying out process is delayed the fabric will require careful monitoring to ensure that the timbers are not at risk of decay. In some cases targeted treatment will be required to reduce the risk of fungal decay whilst the fabric is drying out.

DO identify the type of infestation, whether it is active, and whether it is of a type that requires treatment.

This will assist in avoiding a complete waste of time and money in treating fungal attack or insect infestation that does not require treatment. It is not uncommon for insect infestations that have been dead for centuries to be treated.

DON'T refer to insect attacks as woodworm.

There is a large difference in the significance of an attack by common furniture beetle (Anobium punctatum) and an attack by death watch beetle (Xestobium rufovillosum), and yet both these insects could be classified as 'woodworm'. - refer to the Oswald v. Countrywide Surveyors Ltd case. (See: Thinking of surveying an Historic Building?)

DO identify whether the decay is active or not, as there is obviously no need to treat or repair a problem that no longer exists or has been effectively repaired or treated in the past.

It can be difficult, especially from a single inspection, to determine whether an attack is active or not, particularly with an insect attack. To avoid unnecessary repair or treatment it is strongly advocated that where there is any doubt about the activity of any attack that the situation is monitored and/or specialist non-destructive investigations are carried out. Where the structural integrity of a building is not at risk a greater emphasis should be placed upon monitoring. This will allow the precise level of activity and the extent of the attack to be determined.

DO determine the rate of deterioration.

This will assist in ascertaining whether the structural integrity of the timbers will be put at risk.

DO institute good building practice.

That is, providing support measures to prevent further wetting and promoting the drying of the building and its fabric. This can be achieved by the provision of adequate and preferably permanent ventilation, physical barriers and the isolation of vulnerable timbers.

DO ensure chemical treatment is only carried out where the treatment has been justified - that it is a type requiring treatment, that it is active and cannot be addressed by constructional methods.

DO ensure that any treatment is applied only where it is absolutely necessary.

Wholesale precautionary treatment is not only unacceptable it is illegal. Except in very limited circumstances where a fully written justification can be provided [Control of Pesticides Regulations 1986 (COPR) & Control of Substances Hazardous to Health Regulations 1988 (COSHH)].

DO ensure that where chemical treatment is found to be necessary the mandatory legislative controls and codes of practice are strictly adhered to.

DO keep a record of all treatments.

This will assist future owners, and their professional advisors, of the extent and type of treatment carried out. It will also assist in reducing the levels of unnecessary treatment by preventing the practice of re-treatment every time a property is bought and sold.

Summary

A surveyor must have an appreciation of the type and nature of defects from which the building under inspection is likely to suffer from, together with an understanding of the influence these defects will, or could, have on the building's structural integrity. This will only be achieved where the surveyor understands:

- how the building was constructed;
- the materials used to construct and repair the building;
- the consequences of the use of impervious materials on the rate of deterioration of the fabric;
- the type and nature of the defects that the building is likely to suffer from, and;
- the need to follow the 'trail'.

To reiterate some of the principal points:

DO identify and eliminate the actual causes of the problems, rather than addressing the symptoms - such as dampness and timber decay.

DON'T rely solely on the moisture meter to detect dampness, be aware of its limitations and use it as a tool to aid diagnosis.

DON'T change the traditional performance of the building without understanding the implications.

DO ensure that the client is aware of the effects of dampness and also the consequences of not dealing with the problem.

DO advocate regular repair and maintenance. Once the causes of dampness and timber decay have been eliminated, regular and appropriate maintenance is the best guarantee against damp and timber defects.

DON'T rely solely upon the recommendations of a 'specialist' with a vested financial interest in their own recommendations.

DO obtain independent specialist advice.

Where defects are suspected and the inspection is limited the recommendation for further investigation should suffice. The investigation should be undertaken by someone who is independent and conversant with historic buildings, and preferably with no vested financial interest in their own recommendations.

If the approach advocated in this guide is adopted a reasoned and informed decision will have been reached on the repair of the building in question. This will reduce the risk of a serious problem, and any litigation, arising as a result of misdiagnosis.

It is imperative that each individual case is assessed on its own merits and circumstances, remember each old building will have developed and evolved in highly individual circumstances. For this reason alone standard remedies and solutions should not be advocated for non-standard buildings.

In the vast majority of cases there is no SINGLE or INSTANT solution to the problem of damp and timber defects.

Reading List:

The reading list includes a number of sources of informed knowledge and experience in respect of damp and timber defects and their remedy. It is, however, important to appreciate that some of the publications listed below advocate practices that are accepted as not being compatible with the performance of old buildings or conservation minded. Nevertheless, they provide a good source of background information which will assist in reaching an appropriate decision on what course of action to take.

The Control of Damp in Old Buildings. Technical Pamphlet 8. The Society for the Protection of Ancient Buildings (SPAB)

Timber Treatment - a warning about the defrassing of timbers. Information Sheet 2. SPAB

The Need for Old Buildings to 'Breathe'. Information Sheet 4. SPAB

Colourless Water Repellent Surface Treatments on Historic Masonry. SPAB Statement. SPAB News, Vol. 17 No. 2 1996

Is that timber treatment really necessary? Information sheet 14. SPAB News, vol 20 No. 4 1999

Recognising wood rot and insect damage in buildings. Bravery, Berry, Carey & Cooper. BRE

Remedial Treatment of Wood Rot & Insect Attack in Buildings. Berry. BRE

Rising damp in walls: diagnosis and treatment. BRE Digest 245

Timbers: their natural durability and resistance to preservative treatment. BRE Digest 296:

Surface condensation and mould growth in traditionally -built dwellings. BRE Digest 297

Wet rots: recognition and control. BRE Digest 345

Remedial Timber Treatment in Buildings - A Guide To Good Practice and the Safe Use of Wood Preservatives. Health & Safety Executive. 1991

An Introduction To Timber Decay and its Treatment. Ridout

Building Mycology. Management of Decay and Health in Buildings. Edited by Singh

Guide to Identification of Dampness in Buildings. Coleman

Dampness in Buildings. Oliver (2nd Edition)

Code of Practice. The Installation of Remedial Damp Proof Courses in Masonry Walls. British

Wood Preserving and Damp-Proofing Association (BWPDA)

The use of moisture meters to establish the presence of rising damp. Leaflet DPI. (BWPDA)

The Repair of Historic Buildings - advice on principles and methods. Brereton. English Heritage

Oswald v. Countrywide Surveyors Ltd

Reported in Structural Survey:

Volume 12 No. 5 1993/4 'The Death Watch Beetle Case..'

Volume 12 No. 6 1993/4 '**DO** Women Like Beetles?'

Relevant Legislation:

Control of Substances Hazardous to Health Regulations 1988 & 1994 (COSHH)

Health & Safety at Work etc. Act 1974 (HSW Act)

Control of Pesticides Regulations 1986 (COPR)

Wildlife and Countryside Act 1981

Construction (Design & Management) Regulations 1994 (CDM)

Party Wall etc. Act 1996