SURVEY OBJECTIVES

Our damp surveys are designed to provide a holistic diagnosis that identifies and deals with causes rather than a focus on symptoms. Symptoms will disappear over time, once damp is stopped at source. Our reports:

- identify root cause(s) of major unwanted dampness within the property,
- identify major symptoms of unwanted dampness,
- identify major structural damage caused by dampness,
- recommend actions and estimated costs to stop damp at source and mitigate its effects,
- recognise that treating damp is often a staged approach, treating obvious causes first.

Note neither condensation nor rising damp are causes. They are symptoms.

INDEPENDENCE AND METHODOLOGY

Our only income is through damp survey fees. We are independent of contractors and never profit from remedial work. We do not receive or pay any fees or other inducements. Our motivation is peace of mind and practical, durable solutions. We use an array of equipment to identify the root cause of damp within walls. Our damp surveys follow guidance from “RICS Historic England joint methodology” and support RICS’s highest standard, level 3 “Home Survey Standard” (HSS).

UNDERSTANDING DAMP

For survey purposes, damp or dampness is defined as unwanted water. Water brings life. We need it. Unfortunately, fungus and insects also thrive in water. While a damp wall can cause decoration to spoil, it is not the moisture, but the life it brings that causes the greatest concern in the home environment. 85% of residential damp problems are caused by vapour.
SURVEYOR'S DECLARATION AND CONCLUSION

I confirm that I inspected XXXX on XXXX. I conclude that there was condensation and mould caused by thermal imbalance and insufficient ventilation. All buildings can be exposed to unvented vapour and external dampness to some degree. You will mitigate the risk of damp if you follow all our recommendations. This report is intended to be read in full with links off it. Observations and opinions must not be taken in isolation. Like any building, you need to be aware of the risks of damp arising in the future and plan a programme of prevention and maintenance accordingly.

REASONING

Rising damp
Rising damp is the absorption of moisture through a brick wall in contact with groundwater. Groundwater acts and should be treated quite differently to rainwater or floodwater. It is akin to a huge underground lake, made of water saturated permeable rock. There is 50 times more water in groundwater than in all the lakes and rivers of the world. Since Victorian times groundwater has been pumped out from under London to use for drinking and industry. The current water table is about 65M below Trafalgar Square.

Absorption is a force acting in all directions on a liquid through an absorbent material, like water on a kitchen towel. The force of absorption is considered analogous to the rise of water in a capillary. The problem with this analogy is very few people have investigated the rise of water in capillaries other than when held vertically. The second force is gravity, which acts to draw water downwards. This is easy to demonstrate by placing water in the centre of a vertically held kitchen towel. Most of the water descends, with an elliptical profile.

Unlike groundwater, which is water from permanently saturated impermeable rock, water in soil is suspended by the force of absorption of the soil and plants. Therefore there is a force of absorption coming from. The force of absorption from the soil itself is stopping any significant rise of water from soil up a brick wall. Soil from water does not cause rising damp. What is often thought of as rising damp is rainwater splashing off raised ground levels, onto a wall above a damp proof course. A damp brick loses about 50% of its thermal insulation making it more susceptible to condensation. Ironically, the damp proof course “DPC”, stops water from being absorbed down into the sub-floor void, exacerbating the heat loss and risk of condensation from rain dampened brickwork.

Despite the risk of contact with groundwater being remote, this property was built with damp proof course and has been treated twice against rising damp. One of those treatments involved the replacement of 5 courses of bricks with new, less absorbent bricks and the insertion of a damp proof course. Yet the walls are damp. Why has treatment against rising damp failed 3 times? Could it be because the root cause is not rising damp?

Mould
There was mould on and around the damp internal walls in this flat. Mould only grows where relative humidity exceeds 85%RH for 6+ hours. Excess humidity results from insufficient ventilation. Unlike rainwater and condensation, groundwater and tap water
contain significant quantities of nitrates salts. Nitrates inhibit the growth of mould (which is why it is used to prolong the shelf life of food). If there is mould on a wall, then there is no groundwater on that wall, and in turn no rising damp. We tested salts from the damp walls for nitrates and found them to have low quantities of nitrates. This eliminates rising damp.

Condensation
If there is mould, then there are the same conditions for condensation to form. There was evidence of condensation on the double-glazed windows at the time of the survey. The profile of condensation is different to rising damp. Rising damp creates a horizontal line of dampness, like a flood. Whereas condensation forms on the coldest surfaces, which tend to be the corners and base of walls away from radiators.

Ground floor conversion flats have significant challenges from rainwater and excess humidity (vapour), as rain falls to the base of a wall, there is minimal warmth from the sun, of wind and occupiers are less willing to open ground floor windows. This flat has additional challenges, with an open plan kitchen, no mechanical ventilation from the bathroom or kitchen and areas of cold external walls far from radiators.

Tanking
Cellars in Victorian houses had two functions. To store coal for heating and to allow rainwater to evaporate from under a property and be ventilated safely away through sub-floor airbricks, thereby reducing the risk of dampness, rot and woodworm. Cellars were not designed for habitation. The economics in central London are such that owners have dug down to increase living space. Digging down and tanking is discouraged as it causes issues with natural drainage of rainwater.

Kenwood Damp Proofing Plc
Kenwood’s report and quotation dated 2 March 2020 does not state that there is rising damp nor that their proposed new damp proof course will stop dampness. Instead it states there is “evidence of dampness to be affecting the areas marked .... and therefore we are pleased to provide our quotation for the installation of a new damp proof course”. Kenwood reports evidence of woodworm but do not provide sufficient detail to verify this. It is difficult to tell, but Kenwood appears to be quoting for tanking the cellar, presumably to convert it into a habitable space. If the buyers choose to convert the cellar, they should have mechanical ventilation designed to remove excess humidity such as from rain, common to most cellars, without the need for expensive tanking.

Simon Hichens BSc Chemistry ASSI Institute of Specialist Surveyors & Engineers
RICS Qualified Expert Witness (Royal Institute of Chartered Surveyors)
ABBE Certificated Surveyor of Timber & Dampness in Buildings
PCA Certificated Surveyor of Dampness in Buildings (Property Care Association)
ICAEW and Property Mark Qualifications
Member of the Society for the Protection of Ancient Buildings (SPAB)
Report XXXX
**RECOMMENDED REMEDIAL ACTIONS**

<table>
<thead>
<tr>
<th>Remedial actions necessary to keep the property dry and mould free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close bathroom door, keeping window open on the safety lock - this alone will probably solve the rear bedroom damp.</td>
</tr>
<tr>
<td>Cook with tops on pots and pans to reduce production of vapour from cooking by 80%.</td>
</tr>
<tr>
<td>Keep temperature of bedroom walls above the dew point, about 10°C during the survey. Note there is a relative temperature difference between the thermostat and the cold walls of about 5°C, so you will have to keep a modest heat of around 15°C on the thermostat to achieve 10°C on the walls blocked from airflow from the radiators. Note, moving the bedroom slightly forward, removing obstructions to airflow and fans can help circulate warm air, reducing the damp and mould on walls.</td>
</tr>
<tr>
<td>As the property is semi-detached, with air bricks to the side, there are more sub-floor airbricks and therefore better sub-floor ventilation than in a typical Victorian property. However, using the cellar for drying clothes has resulted in humidity, forming on the stopcock. This is not a major concern, but consider using a dehumidifier when drying clothes.</td>
</tr>
<tr>
<td>Keep some ventilation in occupied rooms, such as opening the tops of windows.</td>
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</tbody>
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<table>
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<tr>
<th>Remedial actions – estimate of total costs</th>
</tr>
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<tbody>
<tr>
<td>£0</td>
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<table>
<thead>
<tr>
<th>Optimal actions to improve the home environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruct electrician to install quiet, light switch operated extractor fan to bathroom with 30 minute overrun.</td>
</tr>
<tr>
<td>Instruct general builder to duct out kitchen extractor fan.</td>
</tr>
<tr>
<td>Consider painting anti-mould paint onto walls vulnerable to mould (top coat only).</td>
</tr>
<tr>
<td>Use fan to dry damp wall out.</td>
</tr>
<tr>
<td>Consider installing a modern WIFI connected thermostat, with multiple heat settings, so as to ensure the wall temperature doesn't drop below the dew point.</td>
</tr>
<tr>
<td>Observe and film the way rain falls on walls, especially rear wall where there is algal growth. I suspect that the gutters may need clearing. This is not causing internal dampness, only requires the use of a ladder and would probably be a shared cost with upstairs, if there is any cost.</td>
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</tbody>
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<tr>
<th>Optimal actions – estimate of optional costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>£1,000</td>
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This is not a quote. This estimate is based on approximate time, costs and competence needed to complete repairs. Most work can be completed by a general builder. [CheckaTrade.com](http://CheckaTrade.com), [trustatrader.com](http://trustatrader.com) and [trustedtraders.which.co.uk](http://trustedtraders.which.co.uk) are good sources of general builders. Once the recommended remedial actions are completed and the walls allowed to dry, dampness will not have a material impact on the value of the property.
DETAILED FINDINGS

Background
London terraced Victorian properties were built in very similar ways to each other following standard blueprints. They were not built on areas with natural springs or groundwater, these were made into parks. Houses were not designed and built with damp problems.

It is not the properties themselves, but changes to them that causes damp problems. These including weathering, damaged gutters, blocked down-pipes, cracked drains, build-up of external ground levels, extensions, conversions into flats, wall removal, central heating (heating with wood or coal creates ventilation), double glazing, bathrooms, not to mention modern lifestyles, where people wash clothes after a few hours use and shower twice a day, compared to Victorians who took a bath about once a week (the family sharing the water).

This property has three major challenges from a damp perspective:
1, Excess humidity coming from a bathroom which is habitually left open, kitchen which is open plan and double glazing. Closing the bathroom door, keeping windows slightly open and cooking with tops on pots and pans will resolve most of the damp and mould.
2, Poor circulation of warm air from radiators, which are unheated at night.
3, Previous damp proofing treatment, probably resulting in absorbent plaster being replaced with impermeable (non-absorbent) plaster and thermal loss.

Profiling damp
Different forms of dampness have distinctive profiles.

There is damp mark and high damp meter readings up to about 800mm on the wall in the front right-hand cold corner of the front room, where air circulation is impeded by furniture.
Yet to the corner of the bay the wall is dry at skirting board level. Note how deep and how many attempts previous damp surveyors have made to encourage high damp meter readings. We tested the inside of all external walls every 1M, the base of the walls by external entrances, chimney breasts and a sample of internal walls with a Protimeter damp meter in conductance mode. Damp meters measure electrical conductance. Water is a poor electrical conductor. It is salts in water that conduct electricity. Despite criticism, damp meters are a good test of dryness. Protimeter readings below 20WME are considered dry.

The front wall has the profile of mould & condensation, not a rising damp profile, which dips down at all corners. See https://surveyor.tips/damp-profile/#Mould_and_condensation. Previous damp proofing treatment may affect the profile, so we will look further.
There was condensation forming on the double-glazed windows during the survey.

At 9:30AM the temperature of the front wall behind the desk was 12.4°C, about 5°C below the temperature of the thermostat. The internal humidity was 59.4%RH (normal), with a temperature of 16.7°C, this gives a calculated dew point (temperature that condensation starts at) of 8.7°C, or a surface humidity of 78%RH. The external temperature before the survey was 6°C, sufficient to drop the wall temperature below the dew point, thereby causing condensation. Mould grows in similar conditions but needs prolong humidity.
Mould can be seen growing up behind the shutter frames. Mould only grows where relative humidity exceeds 85%RH for 6+ hours. Excessive humidity results from insufficient ventilation. Ventilation is most effective when air is extracted at the source of humidity; bathroom, kitchen, drying clothes and occupied rooms.

It is also growing on the front wall, that reputedly has rising damp. Groundwater, the source of rising damp contains nitrates that inhibit mould (in the same way as used to increase the shelf life of food). Mould can result from vapour evaporating off a wall affected by rising damp, but cannot grow on a section of wall directly affected by rising damp.
There is discoloration on the front bay wall caused by condensation forming on the bay window, it is a similar colour to staining from water flowing through a substrate, like timber. The wall was damper at the top, than at the base, at the time of the survey.

A sample of surface salts were tested and found not to contain significant quantities of nitrates found in ground water. This eliminates rising damp as the root cause of dampness.
Many of the bricks in the cellar, below the DPC are dry, which they would not be if there was rising damp. Victorian properties rarely had foundations, so the lowest course of bricks (footings) are typically at the same height as the cellar floor. The floor would have to be full of groundwater and the cellar would have to be humid and poorly ventilated for there to be any chance of groundwater rising a height of about 2M from the base of the cellar floor.

**Woodworm**

I searched thoroughly across the whole underside of the living room floor for woodworm, but could not find any evidence.
Damp proof courses used to prevent rising damp

The walls have been protected from rising damp on 3 occasions. It was built with a DPC. It has since had the lowest five courses of bricks replaced (yellow arrows) and a bitumen damp proof membrane (blue arrow). More chemicals have been inserted into the walls (red arrows). As the proverb goes; “fool me once, shame on you; fool me twice....” three times??

The airbrick in the flank wall behind the master bedroom is probably doing a good job of keeping the sub-floor void dry. However, unnecessarily retrofitting the airbrick above the DPC will reduce the temperature of the wall, increasing the risk of condensation and mould.
Rainwater goods

There are signs of slight penetrating damp to the corner of back addition. There are no signs of internal dampness resulting from this.

It is probable that rainwater is overflowing the first floor gutters. It should be cleared.
There are signs of damp by the right-hand side of the living room wall. There are no signs of internal dampness resulting from this.

It is possible that some rainwater is overshooting the gutter during heavy rains storms.
Every household has a challenge with drying clothes. Condenser dryers only take out 40% of moisture from clothes.

Excess humidity is condensing harmlessly on the mains pipe. You could use a dehumidifier.
Summary findings

Visible effects: penetrating damp, condensation, mould. There are signs of condensation on the lower ground floor. There is penetrating damp to the rear lower ground floor bedroom, window above the staircase and below the central gutter.

Damp meter test: We tested walls with a Protimeter damp meter in conductance mode. Damp meters measure electrical conductance. Water is a poor electrical conductor. It is salts in water that conduct electricity. Despite criticism, damp meters are a good test of dryness. Protimeter readings below 20WME are considered dry. Walls were sample tested with a Protimeter in conductance mode. High damp meter readings were confined to cold walls.

Profile: The profile of damp was patchy like condensation. The colour and profile of dampness was that of penetrating damp.

Symptoms of main issue: mould and condensation.

Profile of main issue: mould condensation profile

Visible effects: mould and condensation, condensation to front and rear bedrooms and mould around window to front and rear bedrooms.

Conditions during survey

Relative humidity 59.4%RH  Temperature 16.7°C
Mould point 11.2°C  Dew point 8.7 °C  See mouldpoint.co.uk
Temperature of damp wall 12.6°C  Relative humidity of wall was 78%RH
Weather: dry
External low at night: 6°C, the conditions were ideal for mould growth during survey and condensation on the day of the survey.
About the property

The property is an a semi-detached Victorian ground floor flat with a solid wall made of two brick widths (225mm). The front door faces west.

Changes to the property’s original design

Properties are not designed and built with damp problems. Understanding changes to a property since first inhabited is the starting point for tracing damp back to its root cause.

Key changes are; conversion into flats, bathroom, open plan kitchen, central heating, double glazing with no or insufficient trickle vents and lifestyle changes including more frequent showers and clothes washing.

Ventilation assessment

Bathroom extractor (nearest damp wall). There is no functioning bathroom extractor fan. The bathroom does not have an extractor fan. The bathroom door is left open.

Kitchen ventilation
There is no functioning extractor fan in the kitchen. The kitchen does not have an externally ducted extractor fan. The kitchen is open plan to the rest of the property.

Thermal imbalance
The main source of unvented vapour appears to be caused by the bathroom and kitchen.

Ventilation improvements
Ideally install a quiet, strong light switch operated extractor fan in the bathroom, with 30-minute overrun after lights are switched off. Keep the bathroom door closed. In addition, dry clothes in a vented room or vented tumble drier (externally ducted). Install an externally ducted extractor fan to the kitchen. Keep heat balanced across the property and across the day and night so that the wall temperature doesn't drop below the dew point. Consider retrofitting trickle vents into double glazed windows.

Ventilation overall
You should consider upgrading your ventilation. In the meantime, keep a balanced heating system and wipe away mould and condensation as soon as it appears.

Penetrating damp assessment

The drains are of no special concern.

Timber assessment

There are no suspicions of significant timber decay.
Leak assessment

There are no obvious signs of a significant mains or wastewater leak.

Rising damp assessment

Elevation is: 17M above sea level. The flood risk is: no risk.
Sub-soil rocks are: Rocks with essentially no groundwater. I can see 1M+ below ground level, there are no signs of groundwater.

Therefore the risk of rising damp is a remote possibility.

Despite the low risk of rising damp, there have been multiple attempts at treating for rising damp, including chemical injections and the removal of the lower 5 courses of bricks and replacement with modern bricks and a modern damp proof course. Rising damp treatment is normally a sign of insufficient ventilation. The walls have been drilled into by about 200mm and injected with damp proofing chemicals. In theory the chemicals are absorbed into the brick pores reducing the bricks ability to absorb moisture. This can cause problems with absorption imbalance resulting in increased condensation on other walls or vapour becoming absorbed and trapped behind the slurry. There was evidence of surface condensation in areas probably not treated with replacement plaster but no evidence of trapped vapour. The solution is through ventilation and humidity control.

Other matters

despite spending about 15 minute searching under and over the living room floorboards I could not find evidence of past or current woodworm activity
Airflow was reduced by objects stopping heat from radiators warming external walls.

During the survey I explained why the damp and mould will disappear once the bathroom door is kept closed and window open, and why cooking should be with tops on pops and pans. Keeping airflow around cold corners and keeping a modest amount of night time heat will also go a long way to reducing the risk of mould and condensation.
By talking a root cause approach, rather than a focus on blocking the symptoms of damp the savings are likely to be around £18,960. There are no outstanding matters. The remedial actions will resolve the highlighted damp.
UNDERSTANDING THE ISSUES IDENTIFIED

Mould  Condensation  Heat imbalance

MONITORING AND OTHER TOOLS

Laser thermometer  Data logger  Monitor dryness
GLOSSARY OF TERMS AND ONLINE RESOURCES

Protimeter Surveymaster
Walls were sample tested with a Protimeter damp meter in conductance mode as well as radio frequency mode. There some high damp meter readings on many walls. The profile was of condensation, which is quite different to rising damp.
https://surveyor.tips/glossary/protimeter

Ventilation
https://surveyor.tips/ventilation
Building Regulations F – Means of Ventilation
https://surveyor.tips/building-regulations-f

Root causes of internal dampness
Vapour
https://surveyor.tips/vapour-is-the-most-common-cause-of-dampness
Penetrating damp
https://surveyor.tips/penetrating-damp
Leaks
https://surveyor.tips/leaks
Groundwater
https://surveyor.tips/groundwater

Symptoms of internal dampness
Condensation
https://surveyor.tips/glossary/condensation
Interstitial condensation
https://surveyor.tips/interstitial-condensation
Rising damp
https://surveyor.tips/rising-damp
Rot
https://surveyor.tips/understanding-rot
Active woodworm
https://surveyor.tips/active-woodworm
Salts
https://surveyor.tips/understanding-salts

Video Link
https://www.youtube.com/watch?v=H4Lx9Y4ZFkE&t=6s
Video to help understand damp issues.
**LIMITATIONS**

Damp Surveys Ltd reports are designed to provide you with an informed independent expert opinion as to the condition of the property together with any recommendations for further investigation or remedial work. We do not warrantee any findings in this report unless we enter into a separate warrantee agreement with you.

I saw the whole property without limitation. The survey was conducted during daylight hours. Damp will be more noticeable at night and when the weather is colder and more humid. Gutters are more likely to fail when full of leaves and during periods of prolonged rain and adverse wind. We make best endeavours but cannot guarantee being able to identify all forms of damp, rot and insect infestation affecting the property. We are happy to return and update our observations and advice at any time.

We carried out a careful and thorough inspection of as much of the property as was accessible. However, when it is not possible to make a full inspection, we make a professional judgement about the likelihood of a defect being present. In certain circumstances, this may lead to a recommendation for further action to open up an area for further investigation. We are unable to see the whole roof, all the guttering and some of the drains. We were unable to inspect woodwork or other parts of the structure which are covered, unexposed or inaccessible, and are therefore unable to report that such parts of the property are free from defect. There were no obvious signs of damp resulting from these limitations.

This report is for the sole use of XXXX for whom the survey was undertaken and can only be relied upon for 90 days from the survey date. Unless expressly stated otherwise in this report, nothing in this report confers or is intended to confer any rights on any third party pursuant to the Contracts (Rights of Third Parties) Act 1999.
W.H.O. (World Health Organisation) guidelines for indoor air quality

“Management of moisture requires proper control of temperature and ventilation to avoid excess humidity, condensation on surfaces and excess moisture in materials. Ventilation should be distributed effectively throughout spaces, and stagnant air zones should be avoided.”

A typical house contains 30 - 40 litres of water as vapour. Each day, each occupant adds about 1.5 litres.

Unvented vapour can cause condensation, mould and allergenic dust mites. The simple rule is vent out as much vapour as you add to a property every day.
UNDERSTANDING CONDENSATION AND MOULD

We intuitively know and understand condensation. But there may be surprises.

- Condensation can form on a warm summer’s night, as dew on cold grass.
- Water can evaporate off ice, even when the temperature is below 0°C.
- Mould only grows when relative humidity exceeds 85%RH.
- Mould mainly forms at night between 2AM and 5AM, when it is coldest.
- Allergies people associate with mould, typically come from dust mites.

Understanding relative humidity

Warm air holds more water vapour than cold air. The warmer it is, the more air’s capacity to hold water vapour. Conversely the colder it is, the less capacity, until air cannot hold any more vapour. We call that the dew point or 100%RH. As soon air reaches capacity, condensation will form on the coldest surfaces.

Mould and dust mites

Mould only grows when air is humid for over 6 hours. When it exceeds 85%RH. Dust mites are microscopic insects that can cause allergies. They grow in similar conditions to mould. So ventilate more to avoid allergies.

Health concerns

There are no health and safety issues from damp noted. It is in the occupier’s interests to keep a property properly ventilated and temperatures above the dew and mould points throughout the property, thereby reducing the health risk associated with dust mites, bacteria, protozoans, as well as decorative spoiling caused by mould.

https://dampsurveys.com/mould-health-concerns
TIPS TO KEEP PROPERTIES CONDENSATION AND MOULD FREE

Reduce the production of vapour at source

- Keep bathroom extractor fans running, or window open for at least 30 minutes.
- Keep bathroom doors closed at all times, and bathroom windows open safely.
- When filling the bath, run the cold water first then add the hot.
- Dry clothes outside in a dryer or vented room, never on radiators or heated rail.
- Cook with tops on pots and pans, avoiding excessive boiling.
- Keep the kitchen door closed and extractor fan on where possible.
- Keep chimney breasts or passive vents open.
- Keep trickle vents open or alternatively, open windows on safety locks.

Stop mould forming

- Maintain external wall temperatures above 12°C, with low background heating.
- Declutter leaving space for warm air to circulate around cold surfaces.
- Where possible, avoid placing wardrobes and furniture against external walls.
- Avoid overfilling wardrobes and cupboards as it restricts air circulation.
- Use dehumidifiers or small wardrobe dehumidifying bags and replace regularly.
- Wipe mould and condensation off walls and clothes as soon as it appears.

MONITOR HUMIDITY

If all else fails, we suggest monitoring temperature and relative humidity with a datalogger to see what is happening.

HELP

It takes teamwork to solve damp and mould issues in properties. It isn’t easy or obvious. We can help, but be patient, we are often exceptionally busy.