FLOOD|DOCTOR

WATER DAMAGE RESTORATION SPECIALIST

# REMEDIATION & REINSTATEMENT PROPOSAL

**Prepared for:**

FLOOD|DOCTOR
WATER DAMAGE RESTORATION SPECIALIST

Private & Confidential

# Client details

| Surveyed property | | Customer details | | Flood Doctor | |
|---|---|---|---|---|---|
| [redacted] | | [redacted] | | *(office annotations)* | |
| [redacted] | | [redacted] | | Your ref. | N/A |
| | | | | Our ref. | P-2020/014 |
| | | | | Assessor | Pawel Szczepaniak |
| | | | | Survey date | 4th January 2020 |
| | | | | Time | 11:05 |
| Postcode | [redacted] | Postcode | [redacted] | Estimate Date | 9th January 2020 |

The content of this document contains the collected data and considered opinions as interpreted by the technical author. Any thermal images and moisture readings obtained during the inspection and investigation are relevant to the areas inspected and surveyed and date and time of testing only, stated above and throughout this report.
Whilst reasonable skill and care has been exercised in the undertaking of this inspection and moisture survey, it must be emphasised that some areas are concealed or inaccessible, and no warranty is given or implied.
This survey is not a dilapidation or defect survey. However, where any conditions exist as observed during the inspection and moisture survey, they will be mentioned within the report for consideration by the client.
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# Instructions & Scope

Further to receipt of instructions from [redacted], we have visited the risk address on 4th January 2020.

The purpose of this visit was to evaluate the damage in the property following EOW incident from apartment 9, which is located directly above and to prepare drying & reinstatement proposal.

# Property Details

The property is a two-bedroom flat located on the 1st floor of this purpose-built block of flats.

Based on the age of the building and visual inspection which we have carried out whilst on site, we assume that the following construction methods have been used:

**Ceiling:** 12.5 mm plasterboard fixed to aluminium stud frame above finished with paint.

**Internal Walls:** 89x38mm CLS treated timber studs, 12.5mm fibreboard. I have also noted that some of the walls (mainly around the bathroom and en suite) have additional 9mm OSB3 board behind the plasterboard. Acoustic insulation is present within the wall cavities. The walls are finished with Dulux paint.

**Floor:** Floating marine chipboard (20mm) floor with DPM below sitting on a concrete slab with timber battening in between. Carpet has been installed in the office and bedroom, tiles have been used as a floor finish in the bathroom, and en-suite, engineered flooring has been installed in the Hallway and open plan Kitchen & Lounge.

# Summary

As a result of the EOW incident caused by a faulty hot water supply pipe to the bathroom tap located in Flat 9, hallway, hallway cupboard, bathroom, En-Suite, part of the bedroom and part of an office in flat 7 have suffered from varying degrees of water damage.

It is our understanding that initially, the contractor appointed by building management company suspected that the source of the leak is located in flat 4 and later a leaking roof, the delay in identifying the source led to further water ingress and more damage.

Part of the property has also suffered from secondary damage in the form of microbial growth and possible timber decay although this needs to be clarified pending further investigative works.

At the time of our visit, we have noted the presence of microbial growth in the cavity of the wall dividing en-suite/bathroom, hallway and part of the office.

We have also noted that the engineered flooring in the hallway has started to lift, MDF skirting boards in this area have swollen and became mouldy.

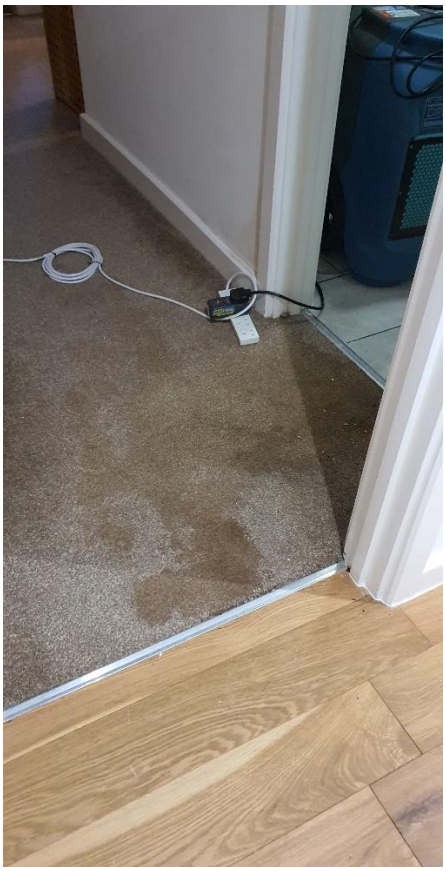
Some of the walls bear signs of water damage to the lower levels only which indicates that the water has spread horizontally under the flooring and started being absorbed by dry building materials which haven't been initially affected.

Hallway – Water damage to the skirting board and lower wall.

Microbial growth present on the surface of the skirting board.

Microbial growth present on the surface of the plasterboard.

En Suite – Water damage to the lower wall.

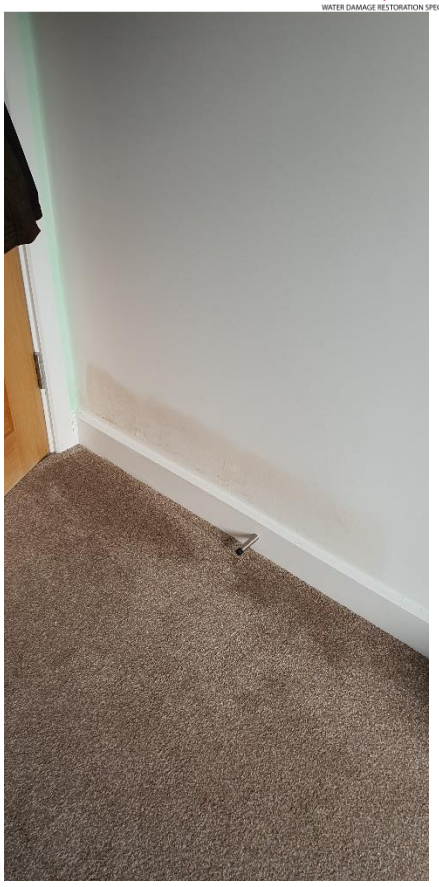


Bedroom – Stained carpet

Bedroom – Visibly wet chipboard floor.

Bathroom – Damage to the lower wall.

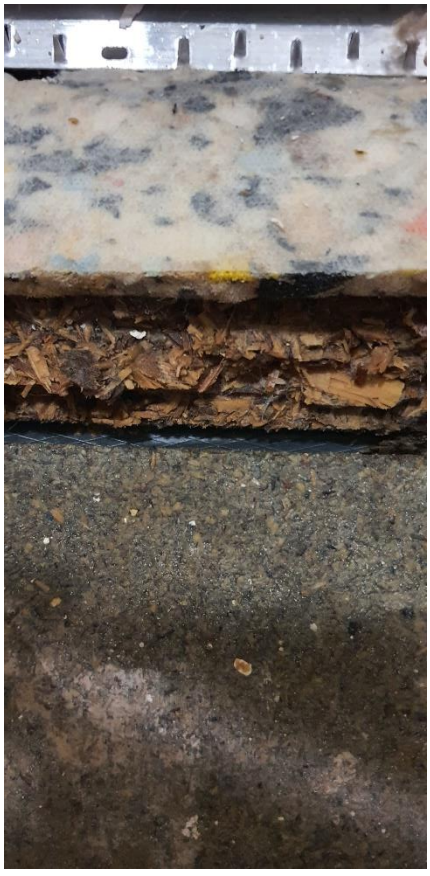
Bathroom – Boxing behind the toilet visibly wet floor and joinery.



Office – Damage to the lower wall.

Office – Damage to the floor.


Hallway Cupboard – Very high moisture levels recorded.



En Suite – Saturated chipboard floor.

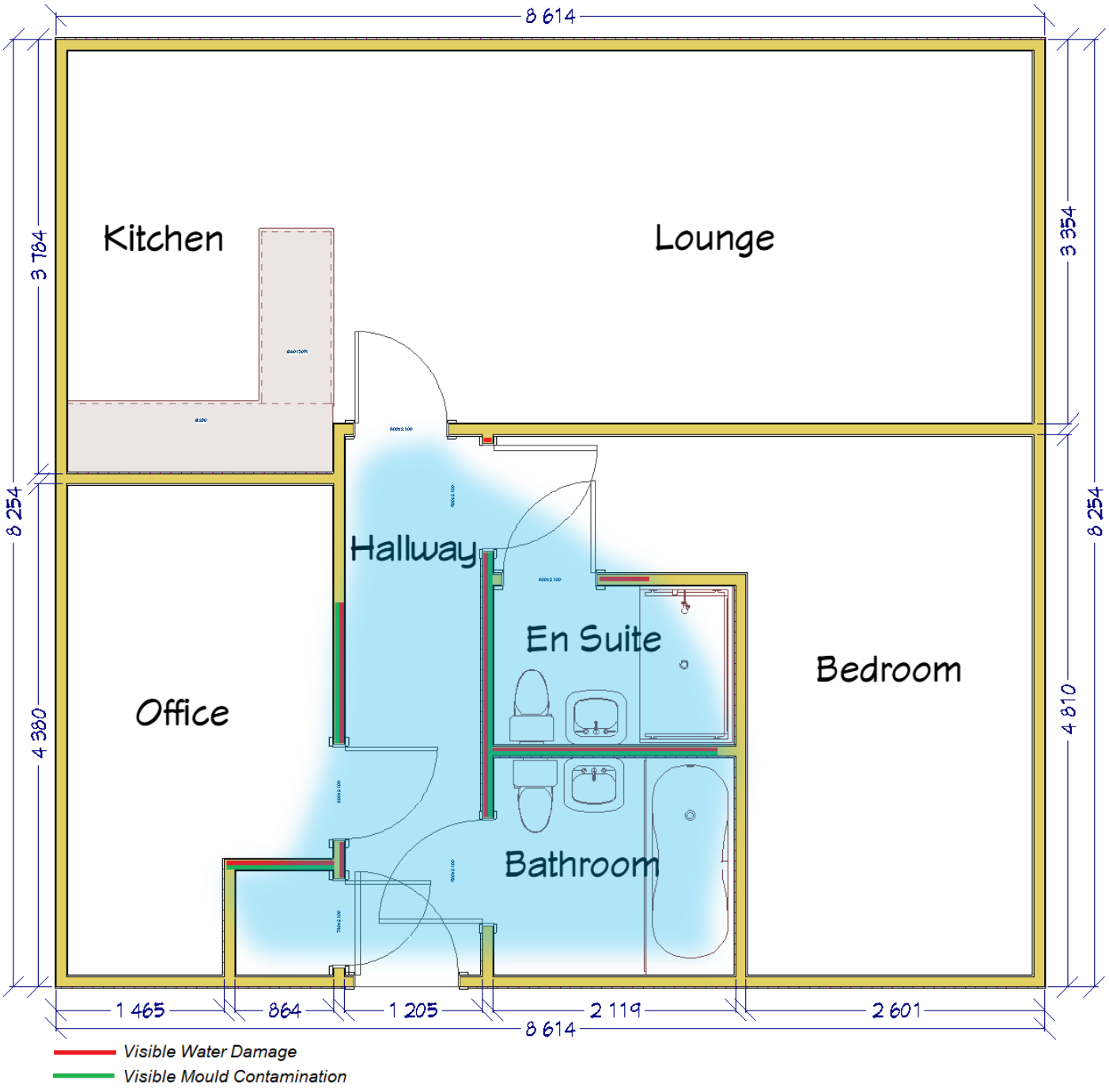
Mould is an opportunist and once established in a property will quickly colonize areas with appropriate conditions.

Most properties through their normal occupational cycle will have periods of high occupational moisture however it is the prolonged periods which will allow mould to develop.

Once the mould is present in a structure the period of time it will take to colonize new areas is reduced due to the increased level of spores being produced in an enclosed environment.

We have carried out a non-invasive moisture survey to confirm the spread of the moisture. We have marked the approximate spread on the floor plan below.

At the time of our visit the atmospheric conditions in the property recorded at 59.2% Relative Humidity, 22.0°C Temperature, 13.7°C Dewpoint and 9.75g/kg Specific Humidity.



| Room | Location / Material | Reading | Notes |
|---|---|---|---|
| Bathroom | Walls / Plasterboard | 100% WME | Highest reading which |
| | Floor / Tiles | 999 REL | have been recorded |
| En Suite | Ceiling / Plasterboard | 100% WME | In the affected areas. |
| | Walls / Plasterboard | 100% WME | |
| | Floor / Tiles | 999 REL | |
| Hallway | Ceiling / Plasterboard | 100% WME | |
| | Walls / Plasterboard | 100% WME | |
| | Floor / Timber | 100% WMC | |
| Hallway Cupboard | Walls / Plasterboard | 100% WME | |
| | Floor / Timber | 100% WMC | |
| Bedroom | Walls / Plasterboard | 100% WME | |
| | Floor / Chipboard | 100% WMC | |
| Office | Walls / Plasterboard | 100% WME | |
| | Floor / Chipboard | 100% WMC | |

# Conclusions & Recommendations

Based on the results of our inspection as well as the information provided by the client we conclude the following:

During our visit we have identified two main hazards for the occupants of this property:

**1. Visible mould contamination is present in multiple locations.**

Summary of hazardous fungal components

| | |
|---|---|
| Fungal spores | A general term referring to survival propagules produced by fungi under specific environmental conditions, typically ranging in size from 0.5 to 7 pm.<br>• Respiratory tract deposition hazard<br>• Skin, eye, membrane and respiratory irritant<br>• Surface allergens and enzymes contained on the spore coating<br>• Structural toxins contained within the spore cell wall<br>• Internal allergens, enzymes and toxins produced after germination |
| Fungal enzymes | Fungal enzymes have been associated with adverse health effects including sensory and skin irritation, allergenic and asthmatic responses. |
| Cellular debris (1-3 beta-glucans) | Beta-glucans are components of fungal cell walls recognised as having a relative ability to promote a negative response - for example to induce leukocyte activation and to produce inflammatory mediators. |

| | |
|---|---|
| Secondary metabolites | Filamentous fungi produce a wide range of secondary metabolites after the fungus has completed its initial growth phase and is beginning a stage of development represented by the formation of spores.<br>Secondary metabolites associated with sporulation:<br>1. Metabolites that activate sporulation<br>2. Pigments required for sporulation structures<br>3. Toxic metabolites secreted by growing colonies at the approximate time of sporulation — including mycotoxins |

| | |
|---|---|
| Fungal Volatile Organic Compounds | Volatile organic compounds (VOCs) are carbon-compounds that easily evaporate at room temperature.<br>All fungi produce and emit blends of VOCs as a result of metabolism<br>Qualitative and quantitative composition varies with the species and environmental conditions<br>Include mixtures of alcohols, aldehydes, acids, ethers, esters, ketones, terpenes, thiols and their derivatives<br>Responsible for characteristic 'mouldy or musty odours'<br>Known or suspected irritating and toxic effects |
| Mycotoxins | Fungal - mycotoxins are the result of secondary metabolism.<br>Toxins are substance that, on ingestion, inhalation, absorption, injection, or development within the body, in relatively small amounts, may cause structural or functional disturbance.<br>The most deleterious of natural products, in terms of negative health effects. |

**2. The possible presence of black water under the floor and/or plastic membrane due to the age of the incident.**

Although the source of the leak originated from a clean water source, a significant amount of time has elapsed since the incident has been first reported which meant that the water has been stagnant within the sub-floor void for a prolonged period which allowed for the reproduction of bacteria. Additionally, the water has been passing through various building materials and mixing with various contaminants (biological & chemical) along the way.

This type of water poses a serious health threat to anyone who comes into contact with it, and it should only be handled by a professional.

It is highly likely that the water has pooled within the sub-floor void, in the right conditions some bacterial populations can double in number every 20 minutes as such this incident should now be classed as a black water incident, and full decontamination should be carried out of the affected areas.

Based on the nature of the incident, the identified risks involve exposure to chemical and biological substances via inhalation of contaminated air or via 'hand-to-mouth/ contact from contaminated surfaces.

## Project Objectives

To return the affected indoor environment and building construction/materials to pre-incident conditions and to 'normalise' those associated risks (where reasonably practicable).

In order to achieve our goal, we are recommending the following actions to be taken:

**General:**

- Policyholder to be moved into AA while works are taking place due to the fact that en-suite and bathroom will require stripping out
- Contents to be moved into AA or storage to prevent damage/cross-contamination while works are taking place. Alternatively, lounge can be used as a temporary storage area
- Containment of the affected areas whilst enabling and decontamination works are taking place to prevent cross-contamination
- Protecting not affected areas to prevent cross-contamination
- In the event where lounge will be used as temporary storage contents to be protected using polythene sheeting
- Installation of air scrubbers to process/clean the air in the property while works are taking place

## Enabling Works & Remediation Proposal

**Hallway:**

- Mould contaminated plasterboard to be removed from the affected walls (see attached floorplan with locations). Full height on the wall dividing hallway and bathrooms and up to 500mm high on the wall dividing hallway and office.
- Skirting boards to be removed
- Engineered flooring to be uplifted and disposed of
- Chipboard floor to be inspected and removed if necessary
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**Bathroom:**

- Sanitary units to be removed and stored on-site for re-use
- Tiles to be stripped from the affected walls and floor
- Chipboard floor to be removed if necessary
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**En-Suite:**

- Sanitary units to be removed and stored on-site for re-use
- Tiles to be stripped from the affected walls and floor
- Chipboard floor to be removed if necessary
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**Office:**

- Carpet and underlay to be removed and disposed of
- Skirting boards to be removed from the affected walls

- Mould contaminated plasterboard to be removed from the affected walls (see attached floorplan with locations) up to 500mm
- A section of chipboard in the entrance to the office to be removed to expose sub-floor void
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**Bedroom:**

- Carpet and underlay to be removed and disposed of
- Skirting boards to be removed from the affected walls
- Mould contaminated plasterboard to be removed from the affected walls (see attached floorplan with locations) up to 500mm
- A section of chipboard in the entrance to the office to be removed to expose sub-floor void
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**Utility Cupboard:**

- Mould contaminated plasterboard to be removed from the affected walls.
- Skirting boards to be removed
- Engineered flooring to be uplifted and disposed of
- Chipboard floor to be inspected and removed if necessary
- Sub-floor void to be inspected and sanitised using a broad-spectrum biocide
- All exposed building materials to be cleaned and sanitised using anti-microbial or broad-spectrum biocide depending on the level of contamination

**Kitchen:**

- Fitted kitchen units to be removed as it has been built on top of the wooden flooring
- Skirting boards to be removed
- Engineered flooring to be uplifted and disposed of

**Lounge:**

- Skirting boards to be removed
- Engineered flooring to be uplifted and disposed of

Please be advised that our operatives will take great care whilst removing fitted/sanitary units which will be stored on-site for re-use however Flood Doctor Ltd must not be held responsible for any damage which may occur during removal.

**ATP swab testing to be used to validate the cleaning/sanitation process. Decontamination certificate will be issued upon successful completion of the decontamination process.**

## Drying Proposal

To remove excess moisture from the affected part of the property, we are proposing the installation of a target drying system using the following equipment:

X2 Dri-Eaz 1200 Condensing Dehumidifiers
X2 A4 ESX Adsorption Dehumidifiers
X5 Sahara E Turbo Air movers

We estimate that the drying programme using this method will take approximately 10 days.

## Reinstatements – Proposed Scope of Works

**Hallway:**

- Install new plasterboards where necessary
- Plaster finish all disturbed areas
- Install new engineered flooring install (allow £50 per sqm)
- Install new skirting boards
- Prepare ceiling, walls and woodwork for decoration
- Decorate hallway (Dulux paint)

**Bathroom:**

- Supply and install new tiles(allow £35 per sqm)
- Install sanitary ware
- install sealant where necessary
- Decorate bathroom

**En-suite:**

- Supply and install new tiles(allow £35 per sqm)
- Install sanitary ware
- install sealant where necessary
- Decorate En-Suite

**Lounge:**

- Supply and install new engineered flooring (allow £50 per sqm)
- Supply and fit new skirting boards
- Decorate ceiling, walls and woodwork

**Kitchen:**

- Supply and install new flooring (allow £50 per sqm)
- Supply and fit new skirting boards
- Install kitchen units
- Install appliances
- Decorate kitchen walls and woodwork

**Office:**

- Install plasterboard where necessary
- Plaster finish all disturbed areas
- Supply new Skirting boards
- Prepare walls, ceiling and woodwork for decoration
- Supply and fit new carpet and underlay (allow £30/m²)
- Decorate ceiling, walls and woodwork

**Bedroom:**

- Install plasterboard where necessary
- Plaster finish all disturbed areas
- Supply new Skirting boards
- Prepare walls, ceiling and woodwork for decoration
- Supply and fit new carpet and underlay (allow £30/m²)
- Decorate ceiling, walls and woodwork

**Hallway Cupboard:**

- Install plasterboards where necessary
- Plaster finish all disturbed areas
- Install flooring
- Install skirting boards
- Prepare for decoration and decorate cupboard

# Schedule of Costs

## Enabling Works & Remediation Programme

| | |
|---|---|
| Labour | [redacted] |
| Waste Disposal | [redacted] |
| Materials | [redacted] |
| H&S – PPE | [redacted] |
| Travel | [redacted] |
| NET TOTAL | [redacted] |
| VAT | [redacted] |
| TOTAL | [redacted] |

## Drying Programme

| | |
|---|---|
| Labour | [redacted] |
| Drying Equipment | [redacted] |
| Materials | [redacted] |
| Moisture Survey (Weekly basis) x1 | [redacted] |
| Travel | [redacted] |
| NET TOTAL | [redacted] |
| VAT | [redacted] |
| TOTAL | [redacted] |

Should the estimated drying time be exceeded the weekly charge for the equipment (after the initial period) will be £853.30 +VAT.

Should it be necessary for us to store equipment for a period longer than the completion of any decontamination works, then it may be necessary to make a charge.

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## Reinstatement Works – Breakdown of costs

| Reinstatement works | Materials | Labour |
|---|---|---|
| Preliminaries:<br>Parking and travel expenses<br>Plant and tool hire<br>Site setup<br>Protection<br>Insurance<br>H&S and PPE | [redacted] | [redacted] |
| Hallway:<br>-Install new plasterboards where necessary<br>-Plaster finish all disturbed areas<br>-Install new engineered flooring install (allow £50 per sqm)<br>-Install new skirting boards<br>-Prepare ceiling, walls and woodwork for decoration<br>-Decorate hallway (Dulux paint) | [redacted] | [redacted] |
| Bathroom:<br>-Supply and install new tiles(allow £35 per sqm)<br>-Install sanitary ware<br>-install sealant where necessary<br>-Decorate bathroom | [redacted] | [redacted] |
| En-suite:<br>-Supply and install new tiles(allow £35 per sqm)<br>-Install sanitary ware<br>-install sealant where necessary<br>-Decorate en-suite | [redacted] | [redacted] |
| Lounge<br>-Supply and install new engineered flooring<br>-Supply and fit new skirting boards<br>-Decorate walls and woodwork | [redacted] | [redacted] |

| | | |
|---|---|---|
| Kitchen:<br>-Supply and install new engineered flooring<br>-Supply and fit new skirting boards<br>-Install kitchen units<br>-Install appliances<br>-Decorate kitchen walls and woodwork | [redacted] | [redacted] |
| Office:<br>-Install plasterboard where necessary<br>-Plaster finish all disturbed areas<br>-Supply new Skirting boards<br>-Supply and fit new carpet and underlay (allow £30/m²)<br>-Prepare walls, ceiling and woodwork for decoration<br>-Decorate ceiling, walls and woodwork | [redacted] | [redacted] |
| Bedroom:<br>-Install plasterboard where necessary<br>-Plaster finish all disturbed areas<br>-Supply new Skirting boards<br>-Prepare walls, ceiling and woodwork for decoration<br>-Supply and fit new carpet and underlay (allow £30/m²)<br>Decorate ceiling, walls and woodwork | [redacted] | [redacted] |
| Cupboard:<br>-Install plasterboards where necessary<br>-Plaster finish all disturbed areas<br>-Install flooring<br>-install skirting boards<br>-Prepare for decoration and decorate cupboard | [redacted] | [redacted] |
| Net Total: | [redacted] | |
| VAT | [redacted] | |
| Total: | [redacted] | |

## Contingency

Our team will take extra care when installing Granite work surfaces and splashbacks as well as kitchen units; however, we cannot guarantee that they are not going to get damaged in the process.

Due to the time which has elapsed since incident occurred the timber elements of the construction might have suffered from irreversible damage and will require replacing. We will inspect these elements during enabling works and advise if this will be required.

Photographs of the damage will be taken in the various stages of the work and will be made available upon request.

| | |
|---|---|
| Kitchen units supply only | [redacted] |
| Granite worktop and splashback | [redacted] |
| Chipboard Floor | [redacted] |
| Replace stud walls en-suite/hallway and en-suite-bathroom | [redacted] |
| NET TOTAL | [redacted] |
| VAT | [redacted] |
| TOTAL | [redacted] |

**Please advise if you would like us to provide you with the quotation for the removal & storage of the contents?**

Our costs are inclusive of project management, labour, equipment, materials, subsistence and waste disposal. The cost of replacement parts, repairs or recommissioning by external service companies would be in addition to our costs.

**Upon acceptance of this quotation 50% deposit will be required before commencing works. Remaining 50% shall be paid within 3 weeks from completion of the works.**

All materials needed to complete the above works as stated to be supplied by Flood Doctor Ltd. All submission and inspection fees will be payable by the client to local authorities.

All works involving gas will be done by a GAS Safe registered engineer and be certificated. All electrical works will be done by an N.I.C.E.I.C. approved electrical contractor and be certificated.

All works will be undertaken by Flood Doctor Ltd. and finished in compliance with current building regulations and proper completion certificates will be supplied upon completion.

## Significant changes

In the event of any significant changes to the remediation, restorative drying or sampling programmes – involving additional costs, Flood Doctor shall prepare a variation and rationale to be presented to the insurers for discussion and authorisation before any such changes are implemented.

Flood Doctor shall be in full control of the proposed works within this document and shall make any alterations to the remediation programme and restorative drying system (for example the repositioning of equipment) where necessary to aid the remediation and restoration drying processes.

# Survey Equipment:

Non-destructive moisture readings using:

**Protimeter MMS 2** on search mode using radiofrequency survey method with readings given numerically from 0 to 999 REL. Survey depth is approximately 5 to 15 mm depending on material characteristics. **Please note** the readings are subjective and open for interpretation; therefore they **should not** be used indicate actual moisture content.

**Tramex MEP** using electrical impedance survey method on none wood materials the readings are given numerically from 0 to 99. **Please note** the readings are subjective and open for interpretation; therefore they **should not** be used indicate actual moisture content. Readings taken from wood are given as a %mc the unit

can be calibrated to wood species the readings indicated can be taken as an indication of wood moisture content. Survey depth up to 30 mm depending on material characteristics

**Invasive moisture readings** have been taken using a Protimeter MMS 2 reading direct % moisture in wood and % wood moisture equivalent (%WME) in other materials.

**Air moisture readings** have been obtained using a Tramex MEP or a Protimeter MMS 2 measuring temperature in °C, % relative humidity and specific moisture content in g/Kg
**Note:** all readings taken with electronic metering are a guide and should be viewed with all the available information to gauge the true condition. However for the purposes of this report, the following readings can be taken as an indication that the material checked could be said to be dry back to a satisfactory level.

| | |
|---|---|
| Non-destructive Protimeter MMS2 | 200 REL(PS) or below in masonry **guide only** |
| Non-destructive Tramex MEP Masonry scale | 40 REL(TM) or below in masonry **guide only** |
| Invasive moisture readings | Plaster and Masonry WME 16% or below **guide only** |
| Invasive wood readings | Below 15% |
| Normal indoor wood moisture content | 10% – 12% |
| Air moisture readings in concrete | Below 11 g/Kg Dry Air (75 %ERH at 20 °C) |

**Reference for Readings Table:**

| | | |
|---|---|---|
| Non-destructive Protimeter MMS2 | | REL (PS) |
| Non-destructive Tramex MEP | | REL (TM) |
| Invasive moisture readings: | Concrete: | % WME |
| | Wood: | % mc |
| Air moisture readings in concrete: | | g/kg (DA) |

**Thermal Imager:**

| | |
|---|---|
| FLIR C6 Thermal Imaging Camera | IR Sensor 80 x 60, Spectral Range 7.5–14 µm |

**Moisture reading guide:**

| | |
|---|---|
| | High Moisture Levels |
| | Moderate Moisture Levels |
| | Low Moisture Levels |

We await further instructions should our services be required.

For & on behalf of Flood Doctor.Ltd

Pawel Szczepaniak Dew. BDMA Senior Tech.

Technical Manager