



METRO BOSTON PROPERTY INSPECTIONS

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Initial Mold Assessment

Prepared for:



Subject Property Location:



MBPI Project #



Inspector:

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Testing Date:

December 1, 2017



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1.0 Executive Summary

Scope

A non-invasive visual inspection with sampling and mold laboratory analyses of air and surface samples was conducted at [REDACTED] MA 02301. The inspection and testing were conducted at the request of Mrs. Alice Juliano. The goals of the inspection and testing were to determine the presence of visible mold growth and/or conditions associated with mold growth, to describe mold levels and types within the subject property, and to provide guidance for remediation. This inspection was initiated by the client in response to suspect mold and health concerns raised by the occupants of the office space

Findings

Visible mold like staining and conditions associated with mold were observed during the visual inspection. Data collected through air and surfaces samples confirmed the visual observations. The dominant genera of mold in the samples are common allergens and have been known to produce mycotoxins. The affected areas of subject property are considered to be in condition 2 (settled spores) and condition 3 (actual growth) as defined by IICRC/ANSI *S520 Standard and Reference Guide for Professional Mold Remediation*.

This report or information contained herein should not be interpreted to imply any conclusions, opinions, or assessment related in any manner as to whether any health risks or conditions to individuals exposed to the building conditions were or were not present at the time of our inspection/testing or may not develop or increase at some time in the future. It is not a human health assessment of any kind. This inspection indicates the level of fungal spores in the areas tested at the time of the testing. The client should consult their health care professional to determine their individual risk to the conditions noted within the report.



2.0 Scope

Scope

A visual inspection within the readily accessible areas of the subject property was conducted. Moisture meter readings were obtained using a Protimeter Mini BLD2000 pin-type moisture meter and relative humidity readings were obtained using an Extech RH300 digital psychrometer. Interviews were conducted with the occupant to obtain information on history and location of suspect areas of concern.

Air samples were extracted utilizing Micro5 slide cassette impactors. Surface samples were extracted utilizing wetted swabs. All samples were extracted in accordance with industry accepted methodology. The samples were sent to Pro-Lab, 1675 North Commerce Way, Weston FL 33326 under chain of custody, where they underwent direct microscopic examination by technicians trained in the identification of fungal propagals.

Sample Plan

A limited number of indoor air and surface samples were extracted within the subject property. The purpose of the sampling is to provide supporting data for the sensory observations of the inspection. The table below describes the locations of samples:

Table 1: Sampling locations and type

Location	Type
Lobby/Reception area	Air
Wall between front and rear bullpens	Air
Private office	Air
Back hall	Air
Water utility room	Air
Rear/heat utility room	Air
Under lobby desk	Surface
Wood wall in water utility room	Surface
Wall behind toilet	Surface
Sheetrock in rear storage	Surface
Wall in the electrical room	Surface



3.0 Laboratory Analysis

Air samples

The laboratory analyses by Pro Lab for the indoor air samples extracted from the interior of the subject property indicate total and individual spore counts considered elevated. The mold types identified in the air samples are common allergens and some may produce mycotoxins. As *Stachybotrys* is rarely airborne even the presence of a single spore is indicative of a potential problem. The dominant genera of airborne mold spore found in the subject property is *Aspergillus/Penicillium*.

Table 2: Airborne Mold Spore Testing Results

Location	Sample ID	Raw Spore Count	Total Mold Spores (cts/m3)	Predominant Genera (cts/m3)
Lobby/Reception	5406-1	54	2180	<i>Aspergillus/Penicillium</i> (1900)
Wall between bullpens	5406-2	43	1740	<i>Aspergillus/Penicillium</i> (1500)
Private office	5406-3	26	1040	<i>Aspergillus/Penicillium</i> (920)
Hall to bathroom	5406-4	46	1840	<i>Aspergillus/Penicillium</i> (1600)
Water utility room	5406-5	26	1040	<i>Aspergillus/Penicillium</i> (520)
Rear/HVAC utility room	5406	40	1600	<i>Aspergillus/Penicillium</i> (960)

Surface Samples

The surface samples of the subject property indicated the presence of mold spores on the surfaces tested.

Table 3: Surface Sampling Results

Location	Sample ID	Conclusion	Identified Genera	Mycelial Estimate
Underside of lobby desk	5406-1(T)	Unusual	Basidiospores	Present
Wall in water storage room	5406-2(T)	Unusual	<i>Aspergillus/Penicillium</i>	Present
Wall behind toilet	5406-3(T)	Normal	None	None
Sheetrock in rear storage	5406-4(T)	Unusual	<i>Cladosporium</i>	Present
Electric room wall	5406-5(T)	Unusual	<i>Chaetomium</i>	Present



Description of dominant mold types observed

Aspergillus Penicillium

Habitat: The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates.

Health Effects: This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.

Ascospores

Habitat: A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report.

Health Effects: Health effects are poorly studied, but many are likely to be allergenic.

Basidiospores

Habitat: A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings.

Health Effects: Common allergens and are also associated with hypersensitivity pneumonitis.

Cladosporium

Habitat: One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts.

Health Effects: A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

Chaetomium

Habitat: Ascomycete fungus, commonly isolated from soil and decaying plant materials. It is cellulolytic and grows well indoors on damp sheetrock and other paper substrates. It is often found growing with *Stachybotrys*.

Health Effects: It is reported to be allergenic and may produce toxins



Myxomycetes

Habitat: Found on decaying plant material and as a plant pathogen.

Health Effects: Some allergenic properties reported, but generally pose no health concerns to humans.

Stachybotrys

Habitat: Commonly found in soil and on decaying plant material. It is cellulolytic, and can be found indoors on wet materials containing cellulose, such as wallboard, ceiling tile, and other paper-based materials. It is found outdoors on decaying plant material although it is rarely detected on outdoor air samples.

Health Effects: Allergenic properties are poorly studied and no cases of infection have been reported in humans. They do however produce potent tricothecene mycotoxins. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. The mycotoxin is also reported to be a liver and kidney carcinogen.

Pithomyces

Habitat: Common fungus isolated from soil, decaying plant material. Rarely found indoors.

Health Effects: Allergenic properties are poorly studied. No cases of infection in humans.



4.0 Observations

Climatic conditions

Weather:	Partly sunny
Soil conditions:	Dry
Outdoor temperature:	50-60° F
Office temperature:	65-70° F
Outdoor Relative humidity:	65-70%
Interior relative humidity:	43-47%
Basement relative humidity	75-80%


Observations:

Client/occupant interview

- The client is the owner but not the occupant of the property
- The client has owned the property for much of its recent history
- According to public records the subject property was originally built in 1930
- While information from the client indicated the property address is [REDACTED]
- The subject building is a mixed-use commercial/residential building
- The subject unit is a basement office
- The occupants became concerned with the air quality in the fall of 2017
- The occupants contracted Advanced Mold Detection Services of Brockton in mid-November to perform indoor air sampling for mold
- The sampling was limited in scope
- The Client contracted with Metro Boston Property Inspections to perform a full initial residential mold assessment
- This assessment was performed on December 1 2017

Building Information

- The property is wood frame with an asphalt shingle roof
- The foundation is stone and mortar
- The chimney is masonry with metal flashing
- The subject property has gutters and down spouts
- Driveway paving is bituminous asphalt

- 
- The walks are concrete and asphalt

The following conditions were observed

- Exterior
 - Negative drainage at the foundation on all 4 sides
 - Site grading directs water at the dwelling
 - The basement windows are at grade with no window wells
 - The entry to the subject unit is below grade and has poor drainage
 - Several downspouts are discharging water at the foundation
 - The flashing at the chimney is improperly sealed
- Interior
 - The sheetrock is in contact with the basement floor throughout the accessible areas of the subject unit
 - Visible mold-like growth was noted at:
 - Front lobby desk
 - Wall in the electric utility room, this wall abuts the rear bull pen
 - Walls in the water utility room
 - Walls in the rear HVAC utility and storage area
 - Foundation side of bathroom wall
 - Debris and other items stored in the rear storage area
 - Conditions associated with mold growth:
 - Water staining at the foundation walls and floor
 - Water staining at sheetrock walls in the HVAC utility/storage area
 - Odors in the crawl space off the HVAC utility storage area
 - Stained carpeting throughout the office areas
 - Indications of past moisture penetration at the office entry
 - Water penetration at the chimney indicates possible flashing failure
 - Indications of periods of elevated relative humidity noted
 - Multiple dehumidifiers were present however they were not operating at the time of the inspection



5.0 Conclusions

Poor site drainage and negative drainage at the foundation are directing water at the foundation. Staining at the interior of the foundation indicates moisture is passing through or under the foundation. Moisture meter readings indicate damp walls in the basement, especially at the bathroom and electric room. The relative humidity is also elevated in the dwelling. Condensation on the windows is also an indicator of elevated relative humidity in the dwelling

Visible mold like staining and conditions associated with mold like growth were observed during the visual inspection. Data collected through air and surfaces samples confirmed the visual observations. The dominant genera of mold in the samples are common allergens and have been known to produce mycotoxins. The affected areas of subject property are considered to be in condition 2 (settled spores) and condition 3 (actual growth) as defined by IICRC/ANSI *S520 Standard and Reference Guide for Professional Mold Remediation*.

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6.0 References

1. “Bioaerosols: Assessment and Control”, Janet Maker, ED., American Conference of Governmental Industrial Hygienists, Cincinnati, OH (1999)
2. EPA, “The Inside Story: A Guide to Indoor Air Quality” United States Environmental Protection Agency and the U.S. Consumer Product Safety Commission, Washington, DC (1995).
3. The IICRC publication S520 *Standard and Reference Guide for Professional Mold Remediation*
4. Standards of Practice for the Assessment of Indoor Environmental Quality, Volume 1: Mold Sampling; Assessment of Mold Contamination, IESO. 2003
5. “Fungal Contamination: A Manual for Investigation, Remediation, and Control” Hollace S. Bailey, 2005
6. “A Brief Guide to mold, Moisture, and Your Home” EPA, 402-K-02-003
7. EPA’s “Mold Remediation in Schools and Commercial Buildings” EPA 402-K-01-001, March 2001
8. Massachusetts Division of Occupational Safety and Occupational Hygiene. Indoor Air Quality Program. Form 396 “Allergies, Asthma, and Building Housekeeping” 8/20/98.
9. Center for Disease Control and Prevention “Molds in the Environment” 2005
10. “Builders Guide to Cold Climates” Joseph Lstiburek, Ph.D., P. Eng. Building Science Corp. 2004.
11. EMLab P&K IAQ Reference Guide




7.0 Work Plan


I General

- 1) The scope of work involves the remediation of mold in the affected areas of the subject property at [REDACTED].
- 2) The remediation work should be conducted by a healthy person experienced in mold remediation adhering to good work practices for removing mold and mold damaged/contaminated materials.
- 3) The contractor is responsible for performing the work in strict accordance with industry accepted standards of practice such as The IICRC publication *S520 Standard and Reference Guide for Professional Mold Remediation* as well as EPA, the Massachusetts Department of Environmental Protection and other local governing authorities to minimize the potential of airborne mold spores or other hazards associated with this project.
- 4) The contractor shall ensure that appropriate personal protective equipment (PPE) is used by workers performing the specified scope of work. The use of PPE shall comply with governing state and federal regulations and shall include, at a minimum, respirators (suitable for anticipated hazard), rubber gloves, disposable suits, eye protection (safety glasses with side shields or full face shields) and rubber overshoes/boots. Workers shall be required to decontaminate any gloves, boots respirators and other work equipment removed from the work area. Further, workers will have a decontamination station available where they shall be required to wash all exposed skin areas (face, neck, hands etc.) upon leaving the work area.
- 5) The contractor shall use clean equipment and new equipment filters including but not limited to HEPA air filtration/exhaust units and HEPA vacuums.

II Description of Work

- 1) The scope of work is as follows:
 - a. The contractor shall furnish all labor, materials, facilities, equipment, services, and insurance necessary to perform the work as well as all and any permits required to perform the work.
 - b. The goal of the work scope should be to implement recommendations for the affected areas described in this report and any other areas which may be discovered through additional inspections, testing or during remediation and repair. The overall goal is to return the affected areas of the subject property to Condition 1: (Normal Fungal Ecology) as defined by IICRC/ANSI *S520 Standard and Reference Guide for Professional Mold Remediation*.

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- c. Proper isolation with critical barriers and negative air pressure of the affected areas and pathways used for disposal should be conducted during remediation, cleaning and removal of contaminated materials. This isolation should not be removed until the project has been determined to have been returned to Condition 1 status through proper post remediation verification.
 - d. All non-essential items stored in the basement office and utility/storage areas should be disposed. The client and the contractor should consult on the personal possessions and stored items within the subject property to determine which items are essential and need to be saved and which require disposal.
 - e. Remove and dispose the following building materials
 - i. The carpeting in the basement office and storage areas.
 - ii. The affected sheetrock, paneling and wood wall surfaces in the basement office, halls, bathroom and utility/storage areas extending to at least 12 inches beyond any staining. It is likely mold growth is present around the perimeter walls of the basement office areas.
 - iii. Any insulation and any insulation that may become exposed during the remediation process
 - iv. Non-structural wood framing should be removed where possible
 - v. It is not uncommon and it is generally accepted that as remediation and further inspections progress, additional areas of mold contamination may be exposed that expand the full scope of work for remediation and repairs.
 - f. Abrasively remove all visible growth and or staining from the exposed framing components, wall sheathing, and sub floor both in the basement areas.
 - g. Clean and disinfect all HVAC ducts as well as the interior of any air handlers
 - h. HEPA vacuum and damp wipe all exposed/unprotected surfaces in the throughout the subject property especially in the pathways used for disposal
 - i. After the visible growth has been removed seal all porous, semi porous and non-porous surfaces with an industry accepted anti-microbial sealant to inhibit future growth.
 - j. Complete any final cleanup and or repairs required by the project.
 - k. Once remediation has been completed but prior to post remediation verification the contractor should run reciprocating fans, air scrubbers and negative pressure for 48 hours. During this time the contractor should periodically disturb the



settled dust. This can be accomplished using fans, leaf blowers or other similar device. These devices should be cleaned and sanitized prior to use.

- l. After the 48 hours have elapsed the property should be allowed to return equilibrium for 24 hours prior to post-remediation verification
 - m. Prior to demobilizing from the site the project should undergo post-remediation verification by an independent indoor environmental professional
- 2) To achieve reasonable air flow inside the work area a minimum of one half (0.5) air changes per hour must be maintained using HEPA filtered exhaust units. Pressure differential shall be monitored.
 - 3) The work shall be performed in a manner that generates the least amount of dust or airborne debris; however water or liquids shall not be used to reduce airborne dust/particulate.
 - 4) All waste generated during the work shall be promptly bagged or wrapped in plastic sheeting and removed from the site for disposal as conventional waste. If waste is not live loaded or immediately removed from the property the disposal truck or dumpster shall be located at least 50 feet from the house, where possible.
 - 5) It is not uncommon and it is generally accepted that as remediation and further inspections progress, additional areas of mold contamination may be exposed that expand the full scope of work for remediation and repairs.
 - 6) Cleaners/Sanitizers: The contractor shall use only industry accepted cleaners and sanitizers.

III Moisture Control

1. Install window wells at all basement windows
2. Create positive drainage at the foundation so water drains away from the foundation
3. Install a proper sump pump and basemen drying system including a properly sized dehumidification system to control moisture levels in the basement
4. Keep gutters free and clear of debris and add extensions at the down spouts to direct water at least 6 feet from the foundation
5. Clean and install proper drainage at the entry to the unit



Appendices

Background on Mold

Limitations

Pictorial Documentation



Appendix A: Background on Mold

Health Effects

The presence or level of certain molds and mold spores inside a building can result in adverse health effects to prone individuals ranging from mild to severe. Health effects may include, but are not limited to; asthma, allergy symptoms, watery eyes, sneezing, wheezing, difficulty breathing, blurry vision, sinus congestion, sore throat, cough, aches and pains, skin irritation, headaches, infections, memory loss, and fever. As humans vary greatly in their chemical make-up, so does the individual's reaction to mold exposure. For some people a small number of spores from certain molds can cause ill effects, in others it may take many more before effects are noticed.

Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material, the amount of exposure, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g. allergic reactions do not always occur in all individuals), age, state of health, and concurrent exposures. For these reasons, and because measurements of exposure are not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to determine "safe" or "unsafe" levels of exposure for people in general. EPA, CDC, or the Massachusetts Department of Public Health to date, have not established any PEL (permissible exposure limit) for mold.

Sample Interpretation

Sampling and interpretation of results are based on industry standards such as: IESO, EPA, OSHA, NIOSH, and ACIH and the laboratory producing the mold analyses. Typical mold amplification is assumed if the indoor level of airborne mold spores is higher than the outdoor levels, or complaint areas are higher than non-complaint areas.

As a general rule and guideline, that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time including both total mold spore counts and individual types of mold spore comparison of inside versus outside. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment. Spore counts are not used as the sole determining factor of mold contamination within the building. Other factors such as the results of moisture meter readings, relative humidity readings, building conditions, and history of water intrusion or condensation, and the findings of the visual inspection must be considered.


The IICRC publication *S520 Standard and Reference Guide for Professional Mold Remediation* defines the following mold conditions:

Condition 1: (Normal Fungal Ecology) An indoor environment that may have settled spores, fungal fragments or traces of actual growth whose identity; location and quantity are reflective of a normal fungal ecology for a similar indoor environment.



Condition 2: (Settled Spores) An indoor environment which is primarily contaminated with settled spores that were dispersed directly or indirectly from a condition 3 area and which may have traces of actual growth.

Condition 3: (Actual Growth) An indoor environment with the presence of actual mold growth and associated spores. Actual Growth includes growth that is active, dormant, visible or hidden.



Appendix B: Limitations

This is a visual assessment of the subject property and limited samples were collected at the time of the assessment to provide supporting data for the sensory observations. This assessment is limited to determining one of the following four outcomes.

- 1) Neither mold nor associated conditions were readily observable;
- 2) Mold was not readily observable but associated conditions were;
- 3) Mold was readily observed but no associated conditions were; or
- 4) Both mold and associated conditions were readily observable.

This report or information contained herein should not be interpreted to imply any conclusions, opinions, or assessment related in any manner as to whether any health risks or conditions to individuals exposed to the building conditions were or were not present at the time of our inspection/testing or may not develop or increase at some time in the future. It is not a human health assessment of any kind. This inspection indicates the level of fungal spores in the areas tested at the time of the testing. This report and assessment does not address other indoor air quality concerns such as volatile organic compounds, carbon dioxide, carbon monoxide, heating-ventilation-air-conditioning (HVAC), bacteria, viruses, temperature, allergens, formaldehyde, lead, asbestos, and other contaminants associated with human health risk exposure. This inspection and testing makes representation as to the conditions of the accessible areas of the building only.

The inspection was initiated to determine the presence of mold growth and/or conditions associated with mold growth in the air in the affected areas of the subject property. This report represents the results from a limited, noninvasive visual inspection and associated sampling conducted within the subject property only as described in this report and only of the accessible areas of the subject property. Please be advised that these tests and results are an indicator of conditions at the time the sampling occurred. This sampling is considered a snapshot in time of the fungal presence. As environmental conditions can change over time, this is an indicator of the type and level of mold in the area tested at the time the samples were taken and shall not be construed as representing or predicting conditions that may exist at a later time or have existed at a previous time. The results, findings, conclusions, and recommendations in this report are not a guarantee or warranty of any kind that mold growth will not develop, increase, or return at any future time within the building.

The opinions and conclusions presented in this report are based on the site conditions observed and information reviewed at the time of this assessment. Information pertaining to site conditions or changes may exist that Metro Boston Property Inspections, Inc. is not aware of or which we have not had the opportunity to evaluate within the time available for this assessment.

There is a possibility that even with the proper application of these methodologies there may exist on the subject property conditions that could not be identified within the scope of the assessment or which were not reasonably identifiable from the available information. The methodologies of this assessment are not intended to produce all-inclusive or comprehensive results, but rather to provide the client with information relating to the subject property.



This report, both verbal and written, is for the benefit of the client. This report has no other purpose and may not be relied upon by any other person or entity without the written consent of Metro Boston Property Inspections, Inc. The client may release this report to third parties; however, such third party in using this report agrees that it shall have no legal recourse against Metro Boston Property Inspections, Inc.

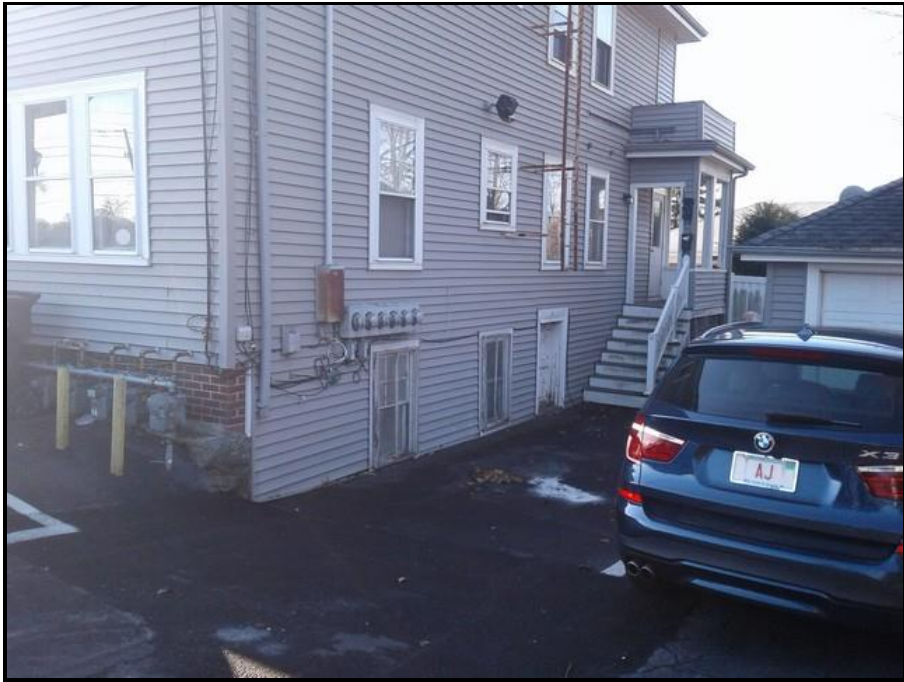
Appendix C: Pictorial Documentation



Entry



Negative drainage



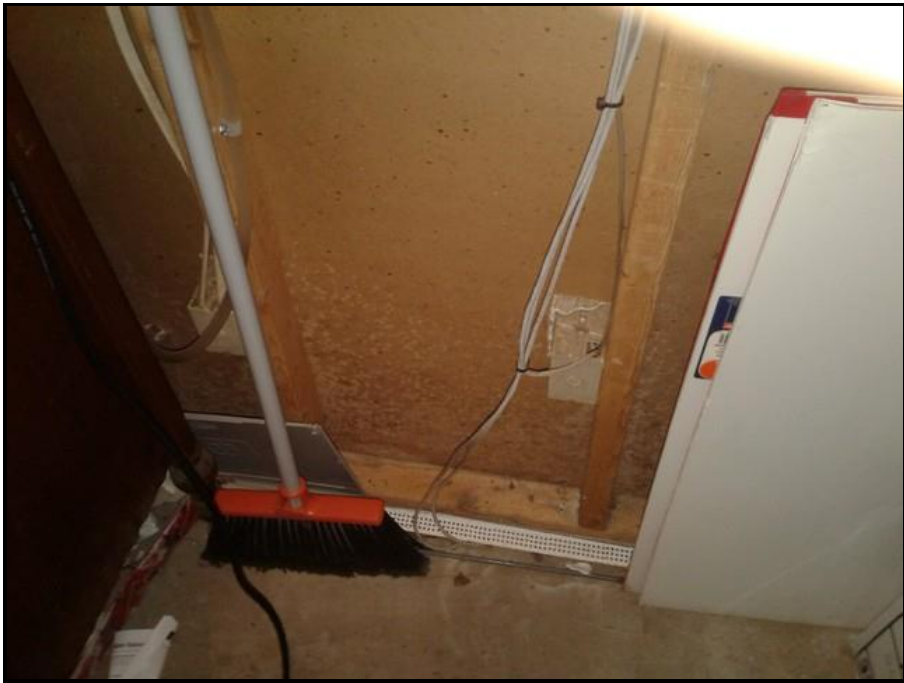
Negative drainage



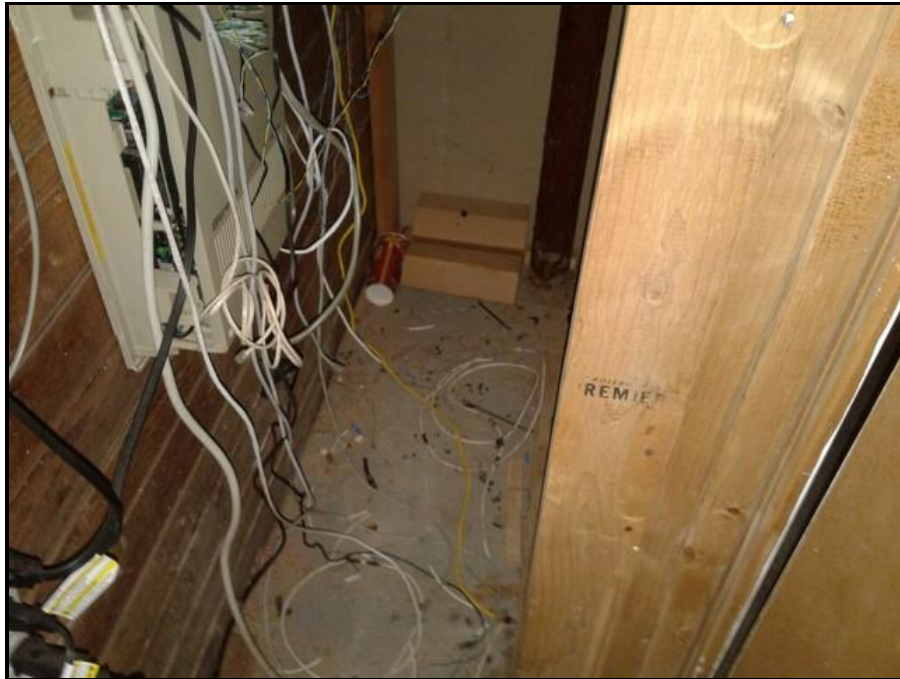
No extension at down spout



Negative drainage



Suspect area on wall in electric utility room



Suspect mold on wood wall



Suspect mold on wood wall



Suspect mold on sheetrock wall



Water staining at storage area floor



Suspect mold in bathroom



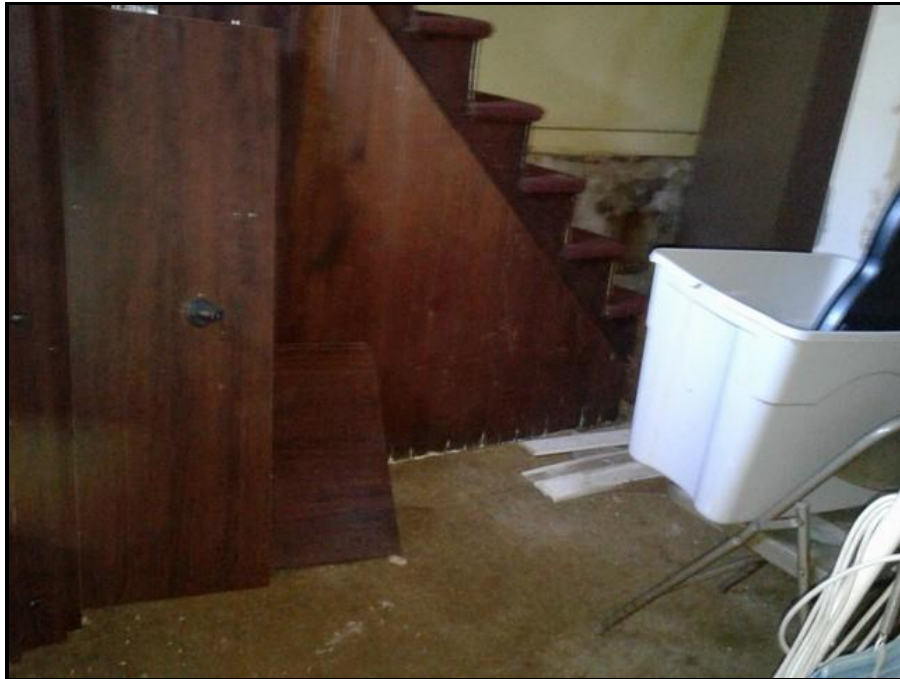
Water damage to wall



Suspect mold at front desk



Suspect mold at rear storage area wall



Suspect mold at basement steps



Suspect mold on stored items and debris



Suspect mold on stored items and debris



Water penetration at floor



Water penetration at floor



Water penetration at rear foundation