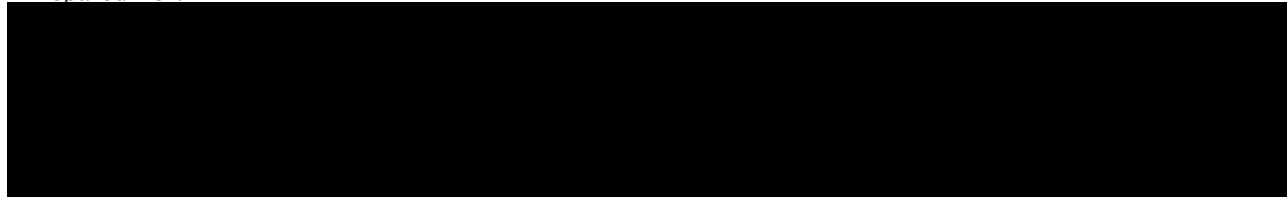




GREENBELT STRUCTURAL SERVICES
A DIVISION OF TAHI LLC

Prepared By:
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TAHI Inspection Services and Greenbelt Structural
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TDLR Mold Assessment Consultant #MAC1423
TREC Professional Inspector #9458
TDA Pest Control Applicator #0702346
TSBPE (Plumbing) #132292

Prepared For:



To Whom It May Concern:

TAHI Services and Greenbelt Structural performed a limited mold assessment at the subject property in accordance with the TDLR Administrative Rules and generally accepted professional practices. A Mold Assessment addresses only those building materials and conditions that are present, visible, and accessible at the time of the inspection. This report and associated conclusions are based on the visible conditions of the inspected areas and materials and information reported by the client. The assessor does not climb over obstacles, move furnishings or stored items, or go into any area that might present a safety hazard.

Various limitations were present which reduced the ability to visually assess the structure. The assessment process is not designed to be intrusive, destructive, or all encompassing. Rather, the assessment and report represent this inspector's professional opinion of the overall condition of the structure and/or specific items included within the scope of the investigation. This 3rd party assessment and report has been provided to the client for the purposes of due diligence and the requestor's documentation. The assessment process and report do not, in any manner, represent a guarantee or warranty of the structure's overall condition.

Below is a limited list of information gathered at the time of assessment.

I: MOLD ASSESSMENT - GENERAL INFORMATION AND SITE OBSERVATIONS

CONSTRUCTION TYPE: Single Family Residence
BUILDING TYPE: Earth Berm Home (Concrete/CMU Walls)
BUILDING TYPE: Portions of Building Standard Stick Built Design
APPX. SIZE: Less Than 3000 Sq. Ft.
SCOPE: Entire Structure
PURPOSE: Determine Sources, Locations, Extent of Mold Growth (Where Applicable)
PROTECTIVE EQUIPMENT REQUIRED: Low Level PPE (Face/Hand/Eye Pro)
SAMPLES COLLECTED: Yes (Per Texas Administrative Code, Chapter 78)
PRIMARY SAMPLING METHOD: Standard Bio Tape Lifts
MOLD REMEDIATION PROTOCOL: Not Within Scope of Work
BUILDING OCCUPANTS: Appx. 3-6 Occupants
CONTAINMENT REQUIREMENTS: N/A (Not Within Scope of Investigation)
EQUIPMENT UTILIZED: Pin Type and Non-Intrusive Moisture Meter (Wagner, Tramex, Prometer)
EQUIPMENT UTILIZED: AMB-200 Wireless Environmental Meter
EQUIPMENT UTILIZED: Flir Thermal Cameras (Limited Use)
EQUIPMENT UTILIZED: Standard RH Gauges, Thermometers, Air Quality/Condition Meters
SAMPLE COLLECTION: Air Samples (5 Min. @ 15 LPM)
SAMPLE COLLECTION: Bio-Tape Lift Samples Collected

SITE OBSERVATIONS:

The building was constructed on or around 1982. The building is an earthen (also known as earth berm) home. Appx. 50% of the structure's vertical walls are sub grade (behind/under soil berms). The roof covering the main portion of the building is of concrete construction. Soil covers the roof in this area.

Based on my limited visual assessment, we believe the structural components of the building remain stable, however, access to visually inspect the structure is limited due to the building design (earth berm home) and recent renovations (recent remodel may have masked issues).

The section of building located between the main living spaces and garage (which we will refer to as the bonus room) contains a partial sub grade wall at the back portion of the building, but appears to be of standard stick built construction. The roof structure above the bonus room is a flat design and covered with a TPO membrane.

The garage appears to be converted from a carport or similar structure. The garage is attached to the building by framing, however, the garage foundation appears to be a separate slab.

Multiple dry-stacked stone retaining walls abut the building. Additional retaining features include CMU block walls at the front/left and left side of the building.

Cross reference of previous sales photos indicates that, prior to the 02/2023 sales transaction, the building was in a substantial state of distress. Observations during our site visit indicated that a major architectural renovation had occurred, however, various areas of building damage, installation errors, leaks, and mechanical/electrical/plumbing (MEP) issues were identified.

VISUAL INSPECTION - SITE CONDITIONS:

Structural and Building

- Active leak identified at the skylight
- Active leak identified near the building entry and laundry (roof leak entering interior of building)
- Moisture entry/moisture diversion issue at the primary suite windows
- Elevated moisture readings and indication of previous leak damage at dining area ceiling near entry to bonus room
- General concern of moisture barrier condition (multiple previous and active leaks identified)
- Garage roof covering in state of distress (surpassed usable life cycle)
- Garage/living space shared wall not provided fire partition
- Uneven, stressed CMU block wall retaining left side berm
- Condition of dry stacked retaining walls abutting building
- Flashing/moisture diversion concerns at/near recently updated exterior walls

Mechanical/HVAC

- HVAC system design concerns (1 vent serves large common area, system unable to meet set points)
- HVAC installation/functionality concerns (mini-split of amateur install, non-functional)
- Kitchen range exhaust not vented (exhaust terminates into cabinets above range)

Electrical

- Installation errors and safety concerns at electrical panel (multiple disconnected ground wires, arcing/heat damage at grounds/panel wall)
- Main electrical meter partially covered by garage wall
- Electrical systems remains dated, recent renovation did not bring system to current standards
- Improper bonding at sub-panel in kitchen closet
- Exposed wiring, open/damaged junction boxes, improper installation of fan (blades hit ceiling)
- General quality of work associated with recent updates/renovation

Plumbing

- Active drain leak at primary bathroom sink (near/below pipe entry into slab)
- Slow draining tubs (possible line blockage)
- Incoming water pressure exceeds max tolerances (recorded at appx. 100PSI, no pressure regulating valve provided)
- Water heater dated, surpassed life expectancy
- Atypical install/connections at supply piping over water heater
- Supply piping reduced from 3/4" to 1/2" (reason for size reduction unknown)
- Weak water pressure at island sink
- High water pressure at additional fixtures

General

Based on the discovered issues, known recent renovations, and general limitations of the inspection, we find it reasonable to assume that additional undiscovered issues/errors are present. Due to the increased likelihood of additional issues and repair needs, we strongly advise that the prospective buyer plan and budget for an increase in unexpected costs associated with building improvement, maintenance, and repair.

During our site visit, a limited moisture intrusion assessment occurred. During our assessment 5x locations were tested. Of the five locations, active moisture penetration/leaks or water diversion issues were identified at three locations (skylight, shared wall between main building and bonus room, primary suite window area) and elevated moisture readings were recorded at a fourth area. Based on the results of our limited testing, we find it reasonable to assume additional leak issues may be present at additional, untested locations.

II: SAMPLE COLLECTION AND LAB TESTING

Microbial samples collected by TAHI/Greenbelt are submitted under chain of custody to a Texas licensed laboratory. Fungal analysis Laboratories in Texas must be licensed by the Texas Department of Licensing and Regulation. The laboratory's report is included as an attachment to this report.

Air Samples:

Air sampling for total fungi is designed to count and identify the presence of total fungal material (i.e. cultureable and non-cultureable spores) in a measured volume of air. The air samples are collected via the spore trap method. Airflow through the cassette is produced by an electrically powered air-sampling device set and calibrated to a flow rate of 15 liters per minute. The sample cassettes are then sealed and submitted to the laboratory via a chain of custody for analysis.

Bio-Tape Lift Samples:

Surface tape samples collected using a forensic tape lift kit. These samples are collected by pressing the tape media slide to the surface of a building material. The Bio-Tape slide is then sealed in its included case and submitted to the laboratory via a chain of custody for analysis.

Sample Findings:

During the inspection process, a total of 5x samples were collected. Below is a description of sample types:

- Outdoor air sample (control reading)
- Main common area (air sample)
- Bedroom suite area/hall (air sample)
- Laundry room (bio tape lift)
- Primary suite bathroom (bio tape lift)

The results of laboratory testing indicate that the indoor fungal count is statistically similar to outdoor control readings. No atypical fungal counts or types were identified through laboratory analysis.

III: PROFESSIONAL OPINIONS AND RECOMMENDATIONS

CONCLUSIONS AND PROFESSIONAL OPINIONS:

Based on reviewed lab analysis, it appears that the tested areas are free from elevated mold levels, however, known leak issues increase the likelihood of elevated mold levels at inaccessible locations and/or future mold issues if leaks are not professionally addressed.

Based on current known findings, no specific mold remediation work is recommended at this time, however, we advise further inspection occur when the general repair process takes place (reinspect when walls are opened/exposed).

Various repairs and updates will be required to address building envelope/leak issues, replace dated/damaged material and systems, and address installation/quality of work concerns related to the recent renovation.

NOTE: Currently, there are no governmental, jurisdictional or generally accepted standards/regulations for "normal" or "safe" airborne mold spore exposure levels. As such, spore counts are compared to a baseline, outdoor sample. In general, indoor spore counts should be statistically similar to the outdoor counts and proportionately similar in terms of spore types.

NOTE: See below for further information.

III: PRACTICES AND PROCEDURES

MINIMUM WORK PRACTICES AND PROCEDURES FOR MOLD ASSESSMENTS:

The following information has been produced and published in the Administrative Rules of the Texas Department of Licensing and Regulation 16 Texas Administrative Code, Chapter 78 (Effective November 1, 2017). A complete copy of this document can be viewed at: atxinspect.com/maar

78.100. Minimum Work Practices and Procedures for Mold Assessment:

- (a) Scope. These general work practices are minimum requirements and do not constitute complete or sufficient specifications for mold assessment. More detailed requirements developed by an assessment consultant for a mold assessment or for a particular mold remediation project shall take precedence over the provisions of this section.
- (b) Purpose. The purpose of a mold assessment is to determine the source(s), location(s), and extent of mold growth in a building, to determine the condition(s) that caused the mold growth, and to enable the assessment consultant to prepare a mold remediation protocol.
- (c) Personal protective equipment for assessors. If an assessment consultant or company determines that personal protective equipment (PPE) should be used during a mold assessment project, the assessment consultant or company shall ensure that all individuals who engage in assessment activities and who will be, or are anticipated to be, exposed to mold are provided with, fit tested for, and trained on the appropriate use and care of the specified PPE. The assessment consultant or company must document successful completion of the training before the individuals perform regulated activities.
- (d) Sampling and data collection. If samples for laboratory analysis are collected during the assessment:
 - (1) sampling must be performed according to nationally accepted methods;
 - (2) preservation methods shall be implemented for all samples where necessary;
 - (3) proper sample documentation, including the sampling method, the sample identification code, each location and material sampled, the date collected, the name of the person who collected the samples, and the project name or number must be recorded for each sample;
 - (4) proper chain of custody procedures must be used; and
 - (5) samples must be analyzed by a laboratory licensed under §78.62.
- (e) Mold remediation protocol. An assessment consultant shall prepare a mold remediation protocol that is specific to each remediation project and provide the protocol to the client at least one calendar day before remediation activities begin. The mold remediation protocol must specify:
 - (1) the rooms or areas where the work will be performed;
 - (2) the estimated quantities of materials to be cleaned or removed;
 - (3) the methods to be used for each type of remediation in each type of area;
 - (4) the PPE to be used by remediators. A minimum of an N-95 respirator is recommended during mold-related activities when mold growth could or would be disturbed. Using professional judgment, a consultant may specify additional or more protective PPE if he or she determines that it is warranted;
 - (5) the proposed types of containment, as that term is defined in §78.10(9) and as described in subsection (g), to be used during the project in each type of area; and
 - (6) the proposed clearance procedures and criteria, as described in subsection (i), for each type of remediation in each type of area.
- (f) Building occupants. A mold assessment consultant shall consider whether to recommend to a client that, before remediation begins, the client should inform building occupants of mold-related activities that will disturb or will have the potential to disturb areas of mold contamination.
- (g) Containment requirements. Containment must be specified in a mold remediation protocol when the mold contamination affects a total surface area of 25 contiguous square feet or more for the project.

MOLD ASSESSMENT - PURPOSE, LIMITATIONS, AND RESPONSIBILITIES:

Your lead assessor and/or project manager is available to the client for during and after services are provided. Please contact us if clarification of assessment findings are required.

Information in this report should be read in its totality.

This Mold Assessment was subject to the Texas Mold Assessment and Remediation Rules (16 Tex. Admin. Code, Chapter 78), Administrative Rules of the Texas Department of Licensing and Regulation. For a full copy of this document, please visit: atxinspect.com/maar

TAHI Services and Greenbelt Structural performed a "limited" mold assessment at the subject property in accordance with the TDLR Administrative Rules and generally accepted professional practices. A Mold Assessment addresses only those building materials and conditions that are present, visible, and accessible at the time of the inspection. This report and associated conclusions are based on the visible conditions of the inspected areas and materials and information reported by the client. The assessor does not climb over obstacles, move furnishings or stored items, or go into any area that might present a safety hazard.

TAHI makes no guarantees or warranties, express or implied, regarding the condition of the property. TAHI reserves the right to revise opinions and conclusions if necessary and warranted by the discovery of new or additional circumstances. This report is specific and "limited" in nature and shall not be relied on as a statement that no mold exists in this property. Mold is a naturally occurring substance in nature and is present in most areas to one degree or another. Areas of elevated mold growth may exist beyond visibly accessible areas and not be included in this report. The information in this report is limited to the day/time of the assessment and areas viewed by the assessor. Additional issues or proliferation of mold may take place following the assessment. In these cases, the delivered report will not apply to changes in site conditions which occur following the investigation. Professional opinion regarding the presence of uncommon mold levels, likelihood of additional issues, degree of concern, and need for mold remediation/further action will vary from one specialist to the next. A difference in professional opinion or final conclusions/recommendations is not an indication of error or omission by any one individual. Professional opinion will vary and should be expected in the event multiple specialists are assigned to the investigation.

This inspection did not include locating/testing of asbestos materials or lead-based paint.

Although some preventative maintenance issues may be noted in this report, this assessment was not a safety or code inspection or a leak detection inspection, and the assessor is not required to identify all potential issues.

Items identified in this report do not obligate any party to make repairs or take other actions; however, failure to address water intrusion or moisture issues or wet materials noted in this report, may lead to mold growth and/or further damage of the structure. This service does not include follow-up inspections or testing to verify that proper corrections have been made. The assessor has performed a limited investigation of the structure and is not required to document all issues or potential issues. Nor is the assessor responsible for undiscovered issues at areas not within the scope of the investigation and/or areas that were not discovered due to various circumstances including, but not limited to: visual limitations, inconclusive conditions at the time of assessment, unintentional omission/negligence, site specific conditions reducing scope of work, weather conditions reducing scope of work, etc. This report is provided for the specific benefit of the client named above.

MOLD SAMPLING INFORMATION AND CLIENT ACKNOWLEDGEMENT:

Currently, there are no governmental, jurisdictional or generally accepted standards/regulations for "normal" or "safe" airborne mold spore exposure levels. As such, spore counts are compared to a baseline, outdoor sample. In general, indoor spore counts should be statistically similar to the outdoor counts and proportionately similar in terms of spore types.

- If the indoor results are statistically similar to the outdoor results, we consider the airborne mold spore levels to be normal.
- When the airborne mold levels indoors are not statistically similar, the results may indicate an indoor source of mold, which is amplifying the airborne levels of one or more types of mold.
- If there are water marker mold types (*Stachybotrys*, *Chaetomium*, *Ulocladium*, and *Memnoniella*) present in an indoor air sample, this is considered to be a common indicator of a moisture and mold concern in the area tested.

- When the indoor levels of one particular type of mold are significantly higher than the outdoor levels of the same mold type, this is considered to be a common indicator of a mold concern in the area tested and may indicate or confirm the presence of a hidden source of mold growth.

CLIENT ACKNOWLEDGEMENT OF SCOPE OF WORK LIMITATIONS:

The assessor has performed a limited investigation of the structure and is not required to document all issues or potential issues. Nor is the assessor responsible for undiscovered issues at areas not within the scope of the investigation and/or areas that were not discovered due to various circumstances including, but not limited to: visual limitations, inconclusive conditions at the time of assessment, unintentional omission/negligence regarding the assessment or report provided, site specific conditions reducing scope of work, weather conditions reducing scope of work, etc.

Multiple limitations are present during the site assessment process. Non-discovered mold and air quality issues, both minor and significant, may not be documented in this report or discovered during the assessment of the structure.

The assessment process is not designed to be intrusive, destructive, or all encompassing. Rather, the assessment and report represent your inspector's professional opinion in regards to the general condition of the structure and associated systems. Professional opinions may vary from one individual to the next. The inspection process and report do not represent a guarantee or warranty of any kind.

(1) Containment is not required if only persons who are licensed or registered under this chapter occupy the building in which the remediation takes place at any time between the start-date and stop-date for the project as specified on the notification required under §78.110.

(2) The containment specified in the remediation protocol must prevent the spread of mold to areas of the building outside the containment under normal conditions of use.

(3) If walk-in containment is used, supply and return air vents must be blocked, and air pressure within the walk-in containment must be lower than the pressure in building areas adjacent to the containment.

(A) Operation of equipment to recirculate air inside of containment without maintaining negative air pressure may be conducted when the specific conditions, phases, and time periods during which it may or must occur are specified in the mold remediation protocol before commencing this use of equipment.

CLIENT INFORMATION
The Austin Home Inspector
3571 Far West Blvd.
Austin, Texas 78731

PROJECT INFORMATION
Site Investigation: 9103 Towana
9103 Towana Trl.
Austin, Texas 78736

Air Exam Chain of Custody

Test Code 1: Spore Trap -fungal limited
Analysis Method: ASTM Designation D7391-17 (Modified)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.



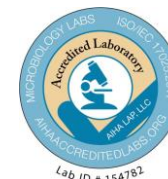
Submitted By: Andy Jordan | via: Billable Stamp (FedEx) | Submittal Date: 9/11/2023 | Sample Date: 9/7/2023 | Analysis Date: 9/12/2023 | Report Date: 9/12/2023 | Lab Job No.: 23-109588 | Technician: Connor Fiscus

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Results apply only to samples as received and tested. Results may not be reported or reproduced except in full without written approval of Moldlab. All samples were received in acceptable condition unless noted in the Tech Notes section. Field blank correction of results is not applied. An estimate of measurement uncertainty is provided upon request. Moldlab assumes no responsibility for sample collection or handling prior to receipt at the laboratory. This report does not express or imply interpretation of the results contained herein. LAB0137 by the Texas Dept. of Licensing and Regulation AIHA LAP, LLC EMLAP Accredited ID No. 154782 Report Approved by Kristina Rucker

Approved by:

Kristina Rucker, Lab Director



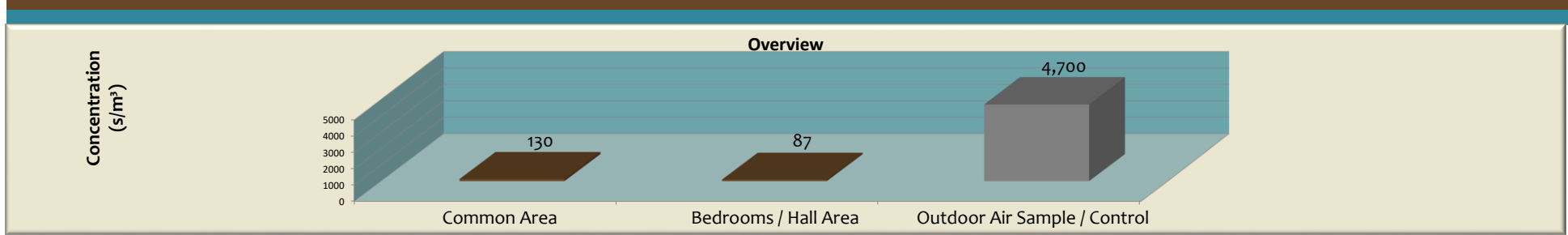
moldlab
2501 Mayes Rd #110
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P - (972) 820-9373
Toll Free (866) 416-6653
Website - www.moldlab.com

Snapshot

Test Code 1: Spore Trap -fungal limited
Analysis Method: ASTM Designation D7391-17 (Modified)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.



Location to Reference Comparison

Identification	Common Area		Bedrooms / Hall Area	
	AS1	AS2	AS1	AS2
Sample Number	75		75	
Volume (L)	75		75	
	Raw	s/m³	Raw	s/m³
Alternaria	-	-	-	-
Aspergillus/Penicillium-like	-	-	-	-
Basidiospores, non-specified	-	-	-	-
Cercospora	-	-	-	-
Cladosporium	-	-	1	44
Hyphal Fragments	2	87	1	44
Myxomycetes/Periconia/Smut/Rust	1	44	-	-
Total Fungal Structures	3	130	2	87
Non-Microbial Debris Field Rating	Moderate		Moderate	

Compares	Outdoor Air Sample / Control	
	OAS	Control
	Raw	s/m³
	2	87
	43	1,900
	10	440
	2	87
	49	2,100
	2	87
	-	-
	110	4,700
	Light	

Submitted By: Andy Jordan | Submittal Date: 9/11/2023 10:00:00 AM | Report Date: 9/12/2023 | Lab Job No.: 23-109588 | Analyst: Connor Fiscus

If a structure is not listed, or listed with a (-), it was not observed in the sample(s) submitted. Debris rating estimates the total non-fungal particle load on the sample. Ratings of None Detected, Trace (>0 to 5%), Light (>5% to 25%), Moderate (>25% to 75%), Heavy (>75% to 90%), and Occluded (>90%) are used. A rating of Light or higher may have a higher number of structures present than indicated. The higher the rating, the greater the negative bias. A rating of Occluded makes quantitative results impossible; instead, any structures detected will be marked as Detected.

Concentrations are rounded to two significant figures. The 'total' field may not add up to sum of individual types due to this rounding. The maximum raw count is 100 due to stopping rules. The calculated concentration for a 100 raw count sample will vary depending on the traverse in which the stopping rule was applied. Sample volumes are provided by the customer and impact the validity of structure concentrations. Yellow highlighted concentrations are higher than the reference.

Report

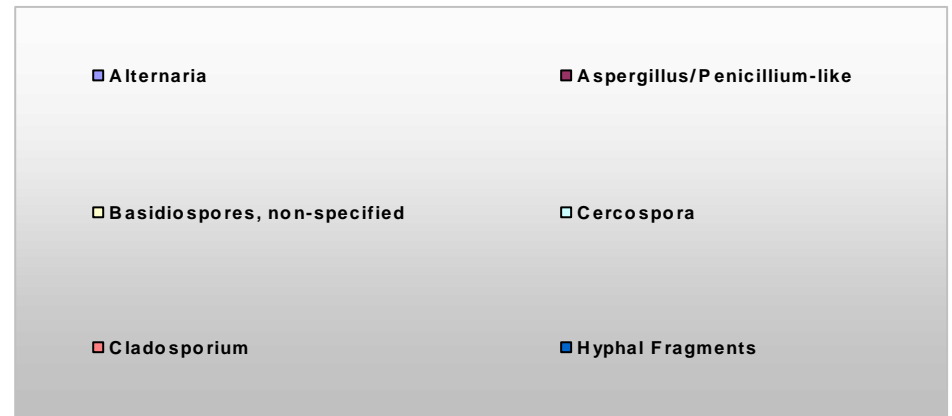
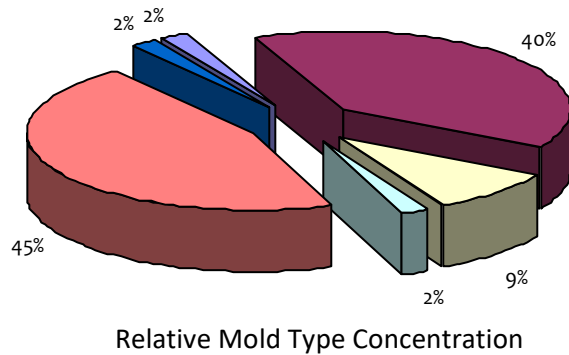
Test Code 1: Spore Trap -fungal limited
 Analysis Method: ASTM Designation D7391-17 (Modified)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

Sample No: OAS	Sample Type: Allergenco D	Analysis Date: 9/12/2023	Sample Start Time: 15:00
Location: Outdoor Air Sample / Control	Volume (L): 75	% Sample Analyzed**: 30.56%	Sample Stop Time: 15:05

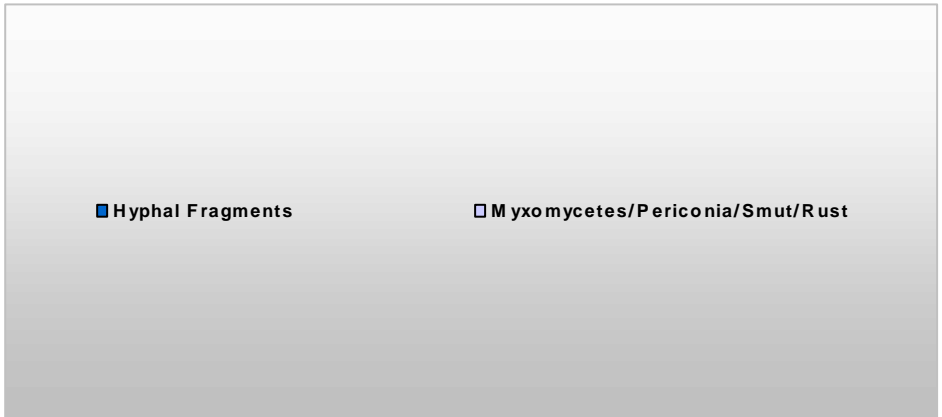
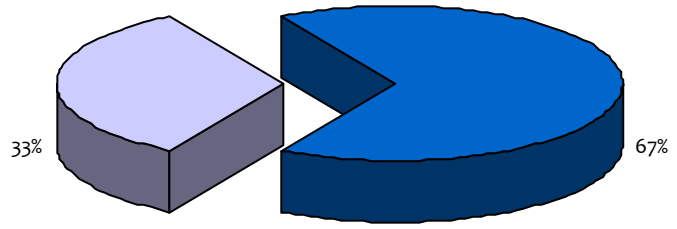
Identification	Raw Count	Concentration (s/m ³)*	Analytical Sensitivity (s/m ³)*	Identification	Raw Count	Concentration (s/m ³)*	Analytical Sensitivity (s/m ³)*
Alternaria	2	87	44	Aspergillus/Penicillium-like	43	1,900	44
Basidiospores, non-specified	10	440	44	Cercospora	2	87	44
Cladosporium	49	2,100	44				
Hyphal Fragments	2	87	44				
Total Fungal Structures/m³*:		4,700					



Tech Notes:

Sample No: AS1	Sample Type: Allergenco D	Analysis Date: 9/12/2023	Sample Start Time: 15:10
Location: Common Area	Volume (L): 75	% Sample Analyzed**: 30.56%	Sample Stop Time: 15:15

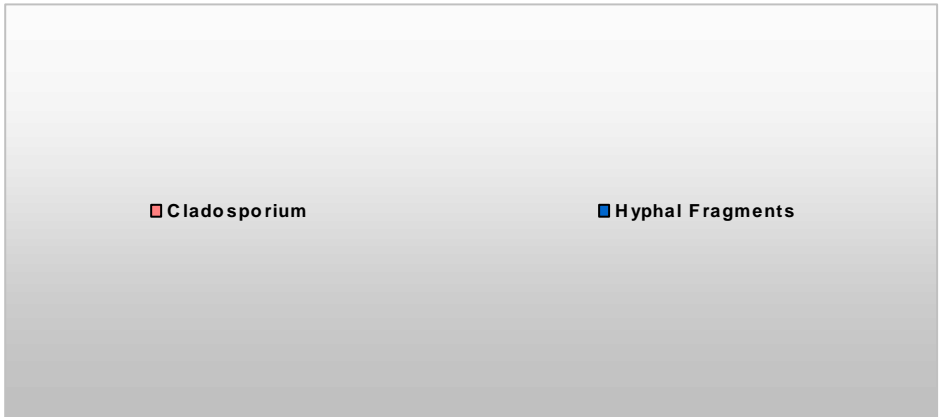
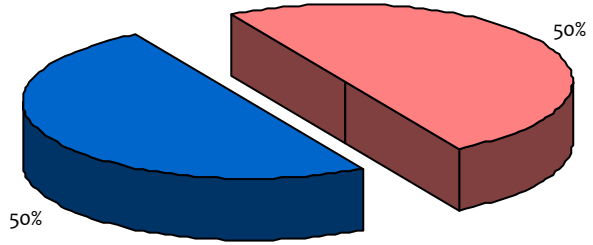
<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/m³)*</u>	<u>Analytical Sensitivity (s/m³)*</u>	<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/m³)*</u>	<u>Analytical Sensitivity (s/m³)*</u>
Myxomycetes/Periconia/Smut/Rust	1	44	44				
Hyphal Fragments	2	87	44				
Total Fungal Structures/m³*:		130					



Tech Notes:

Sample No: AS2	Sample Type: Allergenco D	Analysis Date: 9/12/2023	Sample Start Time: 15:20
Location: Bedrooms / Hall Area	Volume (L): 75	% Sample Analyzed**: 30.56%	Sample Stop Time: 15:25

<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/m³)*</u>	<u>Analytical Sensitivity (s/m³)*</u>	<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/m³)*</u>	<u>Analytical Sensitivity (s/m³)*</u>
Cladosporium	1	44	44				
Hyphal Fragments	1	44	44				
Total Fungal Structures/m³*:		87					



Tech Notes:

Submitted By: Andy Jordan | via: Billable Stamp (FedEx) | Submittal Date: 9/11/2023 10:00:00 AM | Sample Date: 9/7/2023 | Analysis Date: 9/12/2023 | Report Date: 9/12/2023 | Lab Job No.: 23-109588 | Technician: Connor Fiscus

If a structure is not listed, it was not observed in the sample(s) submitted. Debris rating estimates the total non-fungal particle load on the sample. Ratings of Non Detected, Trace (>0 to 5%), Light (>5% to 25%), Moderate (>25% to 75%), Heavy (>75% to 90%), and Occluded (>90%) are used. A rating of Light or higher may have a higher number of structures present than indicated. The higher the rating, the greater the negative bias. A rating of Occluded makes quantitative results impossible: any structures detected will be marked as Detected. Concentrations are rounded to two significant figures. The 'total' field may not add up to the sum of individual types due to this rounding. The maximum raw count is 100 due to stopping rules. The calculated concentration for a 100 raw count sample will vary depending on the traverse in which the stopping rule was applied. Sample volumes are provided by the customer and impact the validity of structure concentrations. * s/m³ is structures/m³. A structure is the analyte of interest chosen by the client. **Refers to percent of sample in which structures are enumerated. If you have any questions regarding count rules, please call the lab.

Air Exam FAQ

Test Code 1: Spore Trap -fungal limited

Analysis Method: ASTM Designation D7391-17 (Modified)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

How do I know if the results are normal?

The general guideline is that the concentration and types of spores in the inside sample should be similar to or lower than the concentration in the baseline/reference sample. Due to the high variability in results, this test is mainly used to alert one to potential problems that may have been missed by visual inspection. Accurate measurements of true airborne concentrations require multiple samples taken during different times, and it can involve complex statistical analysis. The category *Aspergillus* / *Penicillium* are small (1-3 microns), round, colorless spores that may include *Gliocladium*, *Trichoderma*, other morphologically consistent with *Aspergillus* / *Penicillium* spore types. A culture sample would be necessary to differentiate between them. Currently there are no dose response relationship statistics for allowable or safe levels of aeroallergens. However, if spores of *Aspergillus* / *Penicillium* are found at higher levels than outside, or *Stachybotrys* are found inside at even low concentrations, further investigation of the source should be conducted by a IAQ professional.

What is the Calculated Concentration ?

The Calculated Concentration is a measure of the concentration of mold spores in the air, and is listed as spores per cubic meter of air. It is useful for comparing samples and understanding how many spores are in a given section of air. This is calculated based on the air flow rate of the pump, the time the pump was run for, the proportion of the sample enumerated, and the raw count. It is calculated as $((100/\text{Proportion of Sample Analyzed})/(\text{Air Flow Rate} * \text{Pump Run Time})) * (\text{Raw Count})$. This number is then rounded to two significant figures. The calculated concentration is useful for comparing samples with different volumes, sample types, and counting methods. It is also useful for understanding how many spores there are in a given section of air. If you believe that the air flow rate and pump run time may be incorrect for some or all of your samples, please contact the lab and we can correct this for you.

What is the Raw count on the report?

The 'raw' count is how many spores the technician actually viewed on your sample while looking through the microscope. We use this number to generate the calculated concentration. Moldlab stops counting spores at 100 and reports as ">100."

Can you tell me a little more about Airborne Mold Spore samples?

This type of sample is a non-cultured air sample. Results are reported in concentrations of spores per cubic meter (spores/m³). This test is referred to as a "snapshot" of the air at the exact time of sampling. The test works by pumping a controlled volume of air through a spore trap. The spore trap has a sticky substance on its surface which captures any particles from the air, including mold spores. Results account for both live and dead spores as well as pollen, skin, insect parts etc. (if a full profile analysis is requested).

What is the debris field rating ?

The 'debris field rating' is a visual estimate made by the technician of how much non-fungal debris there is on the sample. The rating includes all non fungal particulate (fibers, debris, pollen, insects, skin, etc.). The scale includes ratings of 'None Detected', 'trace,' 'light,' 'moderate,' 'heavy,' and 'occluded'. 'None detected'= no sample was detected on the slide(possibly due to equipment failure or user error). 'Trace'= trace amounts of debris are present. 'Minor'= small amounts of debris are present. 'Moderate'= an average amount of debris present. 'Heavy'=indicates a high concentration of debris particulate. Lastly, 'occluded'= indicates the amount of particulate on the sample is so concentrated that the technician could not see through it to count and identify accurately. This is a common occurrence in wall cavities, construction areas, crawlspaces or other particularly dusty environments. The higher the debris rating, the greater the negative bias of results.

What is a "significant figure?"

Significant figures are used in science to give a better representation of the accuracy of a number. All non-zero digits in a number are significant. Additionally, any digits to the right of a decimal are significant, whether they are zero or not, and all digits in between non-zero digits are also significant. Significant figures give an understanding of what decimal place a number is accurate to. For example, if 43 is given as 43.0, it is assumed that the "true" value is somewhere between 42.95 and 43.049. If it is given as 43.00, it is assumed the "true" value is somewhere between 42.995 and 43.0049, which is much more precise. Similarly, if 431 is shown as 431, it is assumed that the analysis is accurate to between 430.5 and 431.49, while if it is given as 430, it is only assumed to be accurate to between 425 and 434.9. In this report, all calculated numbers, such as the minimum reporting limit and the calculated concentration, are rounded to two significant figures. All numbers that were not calculated are given without rounding.

What is the "minimum reporting limit?"

A minimum reporting limit is exactly what it sounds like- the minimum number that must be reported for the calculated concentration if any spores are detected. This is calculated as $(100/\text{Proportion of Sample Analyzed})/(\text{Air Flow Rate} * \text{Pump Run Time})$. This number is essentially the amount a single spore increases the calculated concentration by. All spores types that are not listed as having a raw count of 1 or greater have a calculated concentration of less than the minimum reporting limit. It cannot be said based upon a raw count of zero that the true concentration of that spore type is 0, however, because the testing procedure is not sufficiently accurate. For this reason, the minimum reporting limit gives a useful measure of the minimum detectable concentration of mold types. Bear in mind that any negative bias due to the debris field rating IS NOT accounted for in this minimum reporting limit.

Air Glossary

Test Code 1: Spore Trap -fungal limited

Analysis Method: ASTM Designation D7391-17 (Modified)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

***Diagnosis of health effects should be left to a medical professional. Moldlab is not a clinical laboratory and does not have medical professionals on staff.

Health effects in general are not well studied, and dosage, exposure, and sensitivity thresholds are not well known and can potentially vary tremendously depending on various conditions and on the particular individual. Effects can also vary from species to species within a particular mold genus.

The EPA, OSHA, NIOSH and other occupational health related associations in the U.S. have not yet established permissible exposure levels (PEL), recommended exposure limits (REL), or other limit values for aeroallergens.

Please realize that the evaluation of one's specific results in terms of potential health hazards and subsequent courses of action are beyond the scope of the laboratory analysis.

Pictures / images are for *illustration* purposes only and are NOT of the samples tested.

Terminology:

Allergen- the most common effect, and can range from hay fever and asthma, to a very particular reaction in certain organs or tissues.

Contaminant- something that is present without injuring or benefiting the host; does not cause infection.

Opportunistic pathogen- Causes infection only when the weak or injured condition of the person gives the agent opportunity to infect; rarely infect persons who are otherwise healthy.

Definition

Images

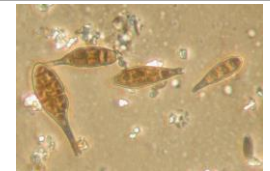
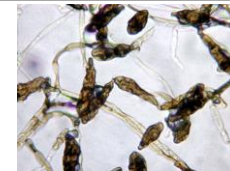
Alternaria (all-tur-nair'ee-uh)

Classification: Common Allergen / Contaminant / Opportunistic Pathogen (rarely)

Possible Health Effect: It is an important allergen and common agent of hay fever, asthma, and other allergy related symptoms, including sinusitis.

Macroscopic Morphology: The mold can appear gray / white at first than become greenish / black or brown with a lighter border over time.

Environment: Soil, Plants, Commonly found indoors on food and textiles.



Definition

Images

Aspergillus/Penicillium-like (as-per-jill-us) / (pen-uh-sill'ee-um)

Classification: Allergen / Contaminant / Opportunistic Pathogen

Possible Health Effect: Aspergillus is common on tape lift samples and air samples, but its spores are indistinguishable from Penicillium spores in most cases. There are a few exceptions but the species ID must be made from culture, and is still a difficult job. Health effects vary by species, but many are listed as allergens. Some species can produce toxins that may have significant health effects in humans. Aspergillus is listed as one of the most infectious types of mold, but infections are not common in normal healthy immune systems. However, if you are immune suppressed or compromised this should be discussed with your physician.

Macroscopic Morphology: Aspergillus can appear in a wide range of colors from white to purple, yellow to green, see images next to text.

Environment: Commonly found in the environment around the world.



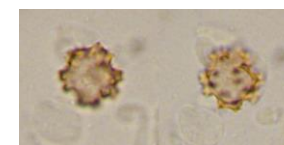
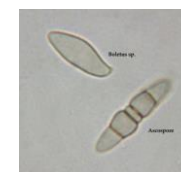
Basidiospores, non-specified (bah-sid-ee-oh'-spores)

Classification: Allergen / Contaminant. Another large general class of spores formed on a structure called a basidium, mushrooms belong to this group.

Possible Health Effect: Allergen and possible poisoning if certain species are ingested.

Macroscopic Morphology: Mushrooms, puffballs and bracket fungi.

Environment: This category of spores is found in the outdoor air make up. This is a common cause of Wood Rot. High concentrations in an indoor air sample might be indicative of water damage or too high humidity. Often abundant at night or pre-dawn hours when there is high humidity.



Cercospora group (sir-ko-spore-ra)

Classification: Contaminant / Plant Pathogen

Possible Health Effect: None found at this time

Macroscopic Morphology: reddish-brown to gray-black/wooly

Environment: Plants-cause of leaf spot on sugar beets



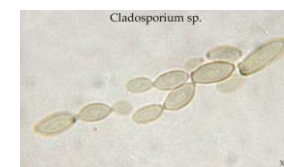
Cladosporium (clad-oh-spore-ee-um)

Classification: Common Allergen/ Contaminant

Possible Health Effect: Rarely pathogenic, it is a common agent of hay fever and asthma and other allergy related symptoms.

Macroscopic Morphology: Surface of the mold is greenish brown or can appear black in color with age and have heap or folded appearance.

Environment: Cladosporium can be found in most air samples most of the time. It is very common. Cladosporium is one of the types of mold found growing on HVAC vent covers and grills. It can grow on leaves, textiles, wood, paper, and decaying vegetation.



Definition

Images

Hyphal Fragments (hy-full)

Classification: N/A

Possible Health Effect: N/A

Macroscopic Morphology: Not a type of mold. A hyphal fragment is a small piece or portion of 'root'-like structure called hyphae/mycelia. Hyphal fragments are common in air samples. Mold type cannot be identified by the hyphae alone.

Environment: N/A



Myxomycete / Periconia / Smut (mix-oh'-my-seat) / (pare-i-cone-ee-uh) / (smut)

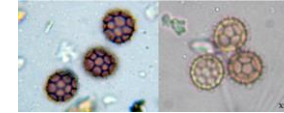
Classification: Generally a plant pathogen

Possible Health Effect: Generally plant pathogens. Some allergenic properties have been reported but generally pose no health concerns to humans.

Macroscopic Morphology: N/A

Environment: This group is associated with living and decaying plants as well as decaying wood. Sometimes can be found indoors.

**myxomycete is technically not a mold but we have included it in this group due to morphological similarities.*



Direct Exam Chain of Custody

Test Code 10: Direct Exam- Analyte Concentration Expanded (s/cm²)
Analysis Method: Internal SOP M-10



This test includes a Glossary, Cover, Report, FAQ and Glossary.



Submitted By: Andy Jordan | via: Billable Stamp (FedEx) | Submittal Date: 9/11/2023 | Sample Date: 9/7/2023 | Analysis Date: 9/12/2023 | Report Date: 9/12/2023 | Lab Job No.: 23-109589 | Technician: Kelly Reyes

Results apply only to samples as received and tested. Results may not be reported or reproduced except in full without written approval of Moldlab. All samples were received in acceptable condition unless noted in the Tech Notes section. Field blank correction of results is not applied. An estimate of measurement uncertainty is provided upon request. Moldlab assumes no responsibility for sample collection or handling prior to receipt at the laboratory. This report does not express or imply interpretation of the results contained herein. LAB0137 by the Texas Dept. of Licensing and Regulation Report Approved by Kristina Rucker

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Toll Free (866) 416-6653
Website - www.moldlab.com

Approved by: 
Kristina Rucker, Lab Director



Report

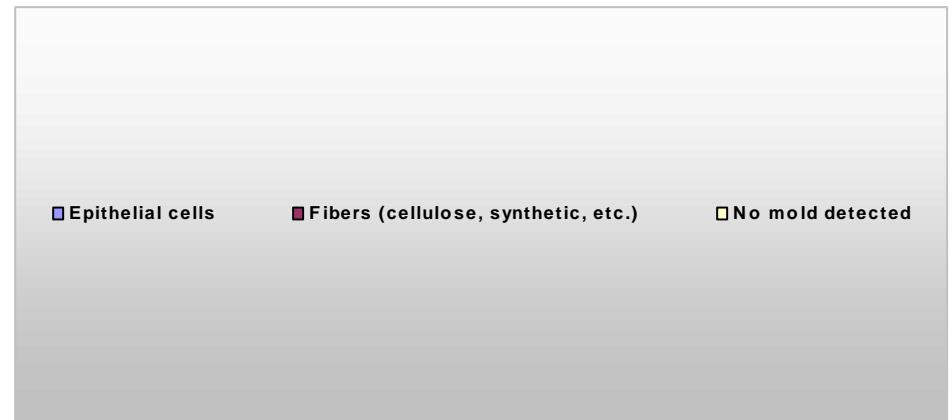
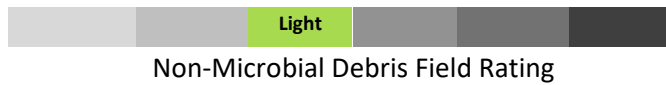
Test Code 10: Direct Exam- Analyte Concentration Expanded (s/cm²)
Analysis Method: Internal SOP M-10



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

Sample No: TL001 **Sample Type:** Tape /Bio-tape **Analysis Date:** 9/12/2023
Location: Laundry Room

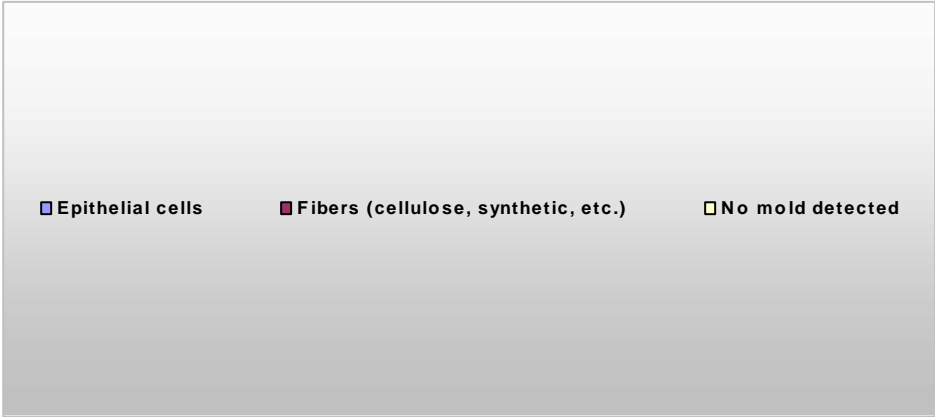
<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/cm²)*</u>	<u>Minimum Reporting Limit (s/cm²)*</u>	<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/cm²)*</u>	<u>Minimum Reporting Limit (s/cm²)*</u>
Epithelial cells	6	130	22	Fibers (cellulose, synthetic, etc.)	2	44	22
Total Non-Fungal Structures/cm		180					
No mold detected	<1	<22	22				



Tech Notes:

Sample No: TL002	Sample Type: Tape /Bio-tape	Analysis Date: 9/12/2023
Location: Primary Suite Bathroom		

<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/cm²)*</u>	<u>Minimum Reporting Limit (s/cm²)*</u>	<u>Identification</u>	<u>Raw Count</u>	<u>Concentration (s/cm²)*</u>	<u>Minimum Reporting Limit (s/cm²)*</u>
Epithelial cells	10	220	22	Fibers (cellulose, synthetic, etc.)	4	88	22
Total Non-Fungal Structures/cm		310					
No mold detected	<1	<22	22				



Tech Notes:

Submitted By: Andy Jordan | via: Billable Stamp (FedEx) | Submittal Date: 9/11/2023 10:00:00 AM | Sample Date: 9/7/2023 | Analysis Date: 9/12/2023 | Report Date: 9/12/2023 | Lab Job No.: 23-109589 | Technician:

Kelly Reyes
 If a structure is not listed, it was not observed in the samples submitted. Debris rating estimates the total non-fungal particle load on the sample. Ratings of None Detected, Trace (>0 to 5%), Light (>5% to 25%), Moderate (>25% to 75%), Heavy (>75% to 90%), and Occluded (>90%) are used. A rating of Light or higher may have a higher number of structures present than indicated. The higher the rating, the greater the negative bias. A rating of Occluded makes quantitative results impossible: any structures detected will be marked as Detected. Concentrations are rounded to two significant figures. The 'total' field may not add up to sum of individual types due to this rounding. The maximum raw count is 100 due to stopping rules. The calculated concentration for a 100 raw count sample will vary depending on the traverse in which the stopping rule was applied. * s/cm² is structures/cm². A structure is the analyte of interest chosen by the client.

LAB0137 by the Texas Dept. of Licensing and Regulation Report Approved by Kristina Rucker

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Direct Exam FAQ

Test Code 10: Direct Exam- Analyte Concentration Expanded (s/cm²)
Analysis Method: Internal SOP M-10



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

How do I know if the results are normal?

There is no clear rule for what is a 'normal' results for this type of exam. Small raw counts and/or concentrations (around 10 raw count or 250 s/cm²) can be found in typical dust samples because mold spores are a normal part of our air make up. Much higher raw counts and concentrations (50 or more raw count or 1100 s/cm²) tend to come directly from the source of the mold. For example, if you saw mold growing on a piece of fruit and sent in a sample, the lab would report a high concentration of mold. Conversely, if you had taken a sample of dust that had settled on a tabletop, you may get a report with small amounts of several types of mold listed. Keep in mind there are numerous variables involved in interpreting lab results and making conclusions based solely on testing such as surface lifts is generally considered unreliable.

What is the Calculated Concentration?

The calculated concentration is a measure of the concentration of mold spores on the tape lift, and is listed in spores per centimeter squared. This is calculated based on the raw count and microscope objective size. The calculated concentration may be useful for comparing tape lifts that were taken in an identical manner. Note that this concentration does not correspond to the concentration of spores on the surface from which the tape lift was taken. If you have further questions about the calculated concentration, please contact the lab.

What is the Raw count on the report?

The 'raw' count is how many spores the technician actually viewed on your sample while looking through the microscope. We use this number to generate the calculated concentration. Moldlab stops counting spores at 100 and reports the raw count as '>100'.

What is the 'debris field rating'?

The 'debris field rating' is a visual estimate made by the technician of how much non-fungal debris there is on the sample. The rating includes all non fungal particulate (fibers, debris, pollen, insects, skin, etc.). The scale includes ratings of 'None Detected', 'Trace', 'Minor', 'Moderate', 'Heavy', and 'Occluded'. None Detected indicates no sample was detected on the sample (possibly due to a bad sample). Trace indicates trace amounts of debris are present. Minor indicates small amounts of debris are present. Moderate indicates and average amount of debris is present. Heavy indicates a high concentration of debris articulate. Lastly, Occluded indicates the amount of particulate on the sample is so concentrated that the technician could not see through it to count and identify spores accurately. The higher the debris rating, the greater the negative bias of results.

What is a "significant figure"?

Significant figures are used in science to give a better representation of the accuracy of a number. All non-zero digits in a number are significant. Additionally, any digits to the right of a decimal are significant, whether they are zero or not, and all digits in between two non-zero digits are also significant. Significant figures give an understanding of what decimal place a number is accurate to. For example, if 43 is given as 43.0, it is assumed that the "true" value is somewhere between 42.95 and 43.049. If it is given as 43.00, it is assumed the "true" value is somewhere between 42.995 and 43.0049, which is much more precise. Similarly, if 431 is shown as 431, it is assumed that the analysis is accurate to between 430.5 and 431.49, while if it is given as 430, it is only assumed to be accurate to between 425 and 434.9. In this report, all calculated numbers such as the minimum reporting limit and the calculated concentration are rounded to two significant figures. All numbers that were not calculated are given without rounding.

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What do I do now?

If you receive a lab report back that lists high concentrations of structures(s) with potentially adverse health effects, we usually recommend that air samples be taken. Air sampling will tell you if that same mold the lab detected on your surface sample is airborne. If no one in the home is experiencing health effects and you intend to have the affected area remediated, air sampling may not be necessary.

How do I get rid of it?

Many molds are allergens and some may be toxigenic, so if you are going to disturb the mold with cleaning methods, you increase your chances of exposure to the particulate. Mold clean up and disposal methods vary greatly from company to company. A good rule of thumb is that if the contaminated area is small and the material is non porous such as metal, it can be cleaned by traditional methods, taking care to use personal protective equipment. Porous materials on the other hand, such as wood, textiles, or sheetrock are difficult to clean because of the microscopic holes in the material. The root structures of the mold called hyphae/mycelia can grow down into the holes and make it hard to clean effectively. The surface will appear clean but as soon as conditions are favorable the mold can start to grow again.

Is this the Black Mold?

Usually when a customer asks this question he/she is referring to *Stachybotrys*. Although *Stachybotrys* is black in color, so are many other types of mold. Do not make the mistake and discount the importance of other types of mold listed on your report because you do not see the word(s) *Stachybotrys* or Black mold. For more about 'black mold' visit <http://www.moldlab.com/black-mold.html>

Can we still live here?

There are no established 'safe' levels of mold, just as there are no established 'unsafe' levels of mold, and individuals have different resistances to mold.

- a). Do any of the occupants fall into the susceptible group? This group includes: children, elderly, immunocompromised, and persons with respiratory disorders. Please consult your physician if you suspect you are suffering from mold related illness.
- b). Is the indoor airborne mold concentration higher than the outdoor concentration?
- c). How wide spread is the contamination? i.e. is the mold enclosed inside a cabinet, or does it cover the entire wall? When in doubt, contact a professional in your area.

Glossary

Test Code 10: Direct Exam- Analyte Concentration Expanded (s/cm²)



This test report contains the following sections: Cover, Snapshot, Report, FAQ, Glossary, Cover, Report, FAQ and Glossary.

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Terminology:

Allergen- the most common effect, and can range from hay fever and asthma, to a very particular reaction in certain organs or tissues.

Contaminant- something that is present without injuring or benefiting the host; does not cause infection.

Opportunistic pathogen- Causes infection only when the weak or injured condition of the person gives the agent opportunity to infect; rarely infect persons who are otherwise healthy.

Definition

Images

Epithelial cells (ep-uh-thee-lee-ul)

Classification: n/a

Possible Health Effects: n/a

Macroscopic Morphology: skin

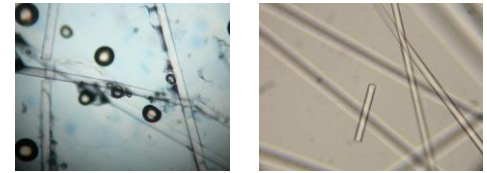
Environment: aka 'skin' cells are naturally sloughed off every day by humans. They are a normal part of our air make-up. The sample used in the photo was stained blue for enhancement.



Definition

Images

Fibers (cellulose, synthetic, fiberglass, etc.)



No mold detected

No mold types detected in this sample.



SUB-GRADE DRAINS PRESENT



SERVICE SUB-GRADE DRAINS



UNIQUE DRAINAGE NEEDS AT ROOF



DRAINAGE PATH CONCERNS



AREA OF PREVIOUS REPAIR



FRONT ROOF GUTTER PROVIDED



DRAINAGE ISSUE NEAR LEFT WALL



LOOSE DRY STACK ABUTTING WALLS



DRAINAGE CONCERN OVER WINDOW



ATYPICAL DRAINAGE POINT AT STONE/CLADDING



MULTIPLE ROOF COVERING TYPES



INDICATORS OF PREVIOUS EXCAVATION



PREVIOUS ROOF/WALL REPAIRS



PARTIAL SHINGLE REPLACEMENT



REMAINING SHINGLES IN POOR CONDITION



REMAINING SHINGLES IN POOR CONDITION



ROOF INTERSECTION CONCERNS



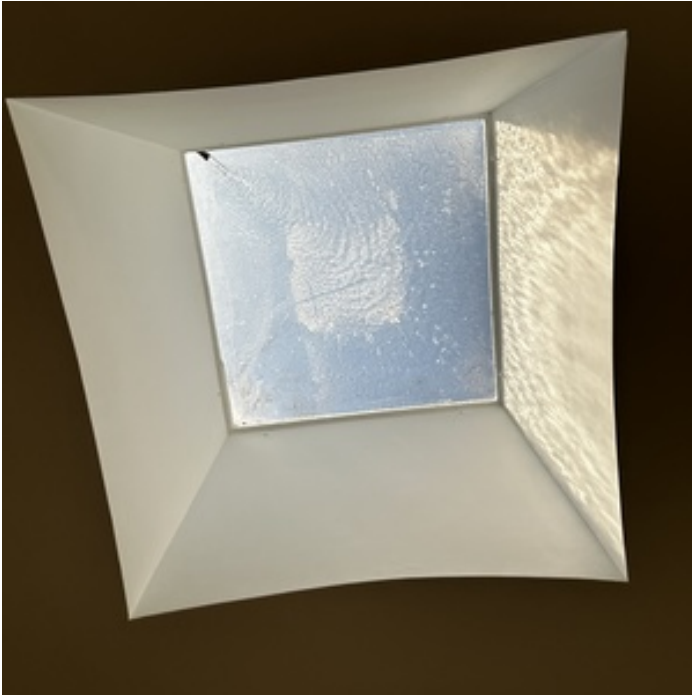
EXPOSED PLYWOOD, LOOSE TPO



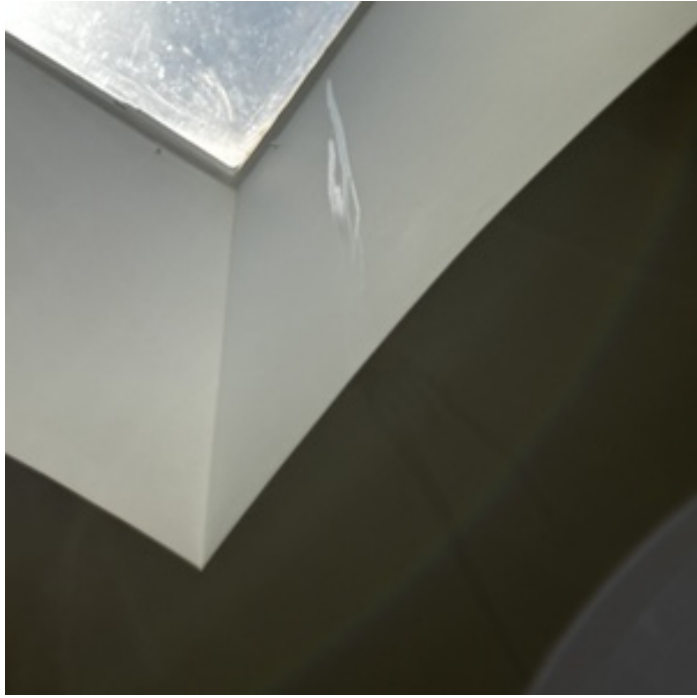
DATED SKYLIGHT



DETERIORATION OF FOAM SURROUNDING



MOISTURE TESTING CONDUCTED



LEAK AT SKYLIGHT



MOISTURE MAPPING: CONTROL READING



ELEVATED READING: NEAR DINING CEILING



MAX READING: NEAR DINING CEILING



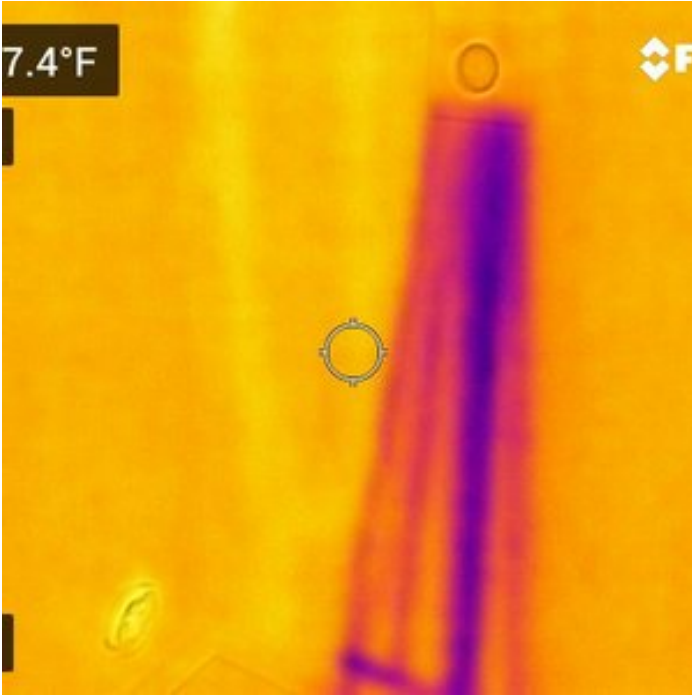
PREVIOUS DAMAGE NEAR HIGH READING



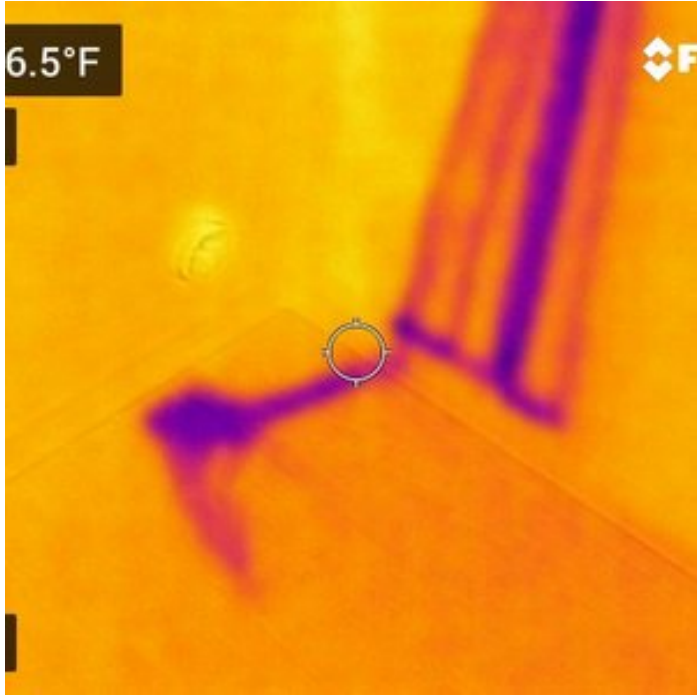
CONCERNS AT ROOF TRANSITION (TESTED)



LEAK DISCOVERED IN LAUNDRY



THERMAL: LAUNDRY AREA LEAK



THERMAL: LAUNDRY AREA LEAK



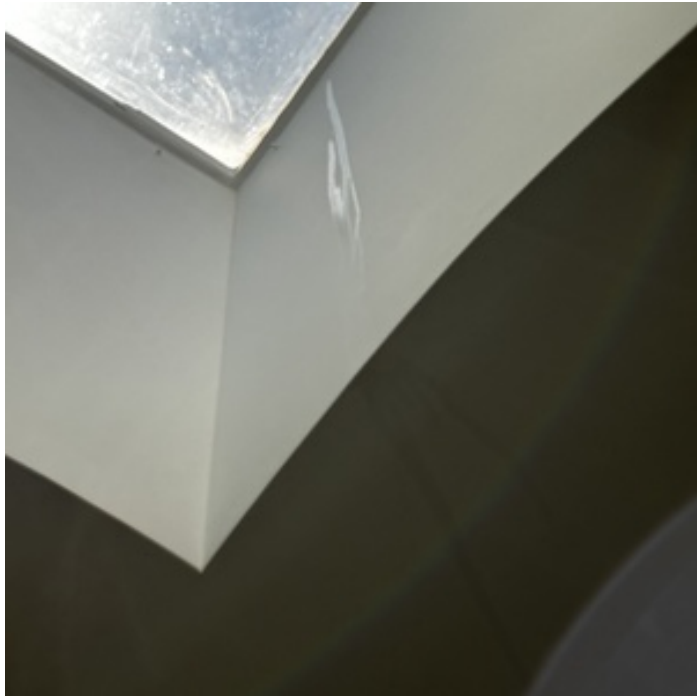
CONCRETE STRUCTURE - NO ATTIC



ENGINEERED TRUSS AT GARAGE



LEAK UNDER BATHROOM SINK



LEAK AT SKYLIGHT



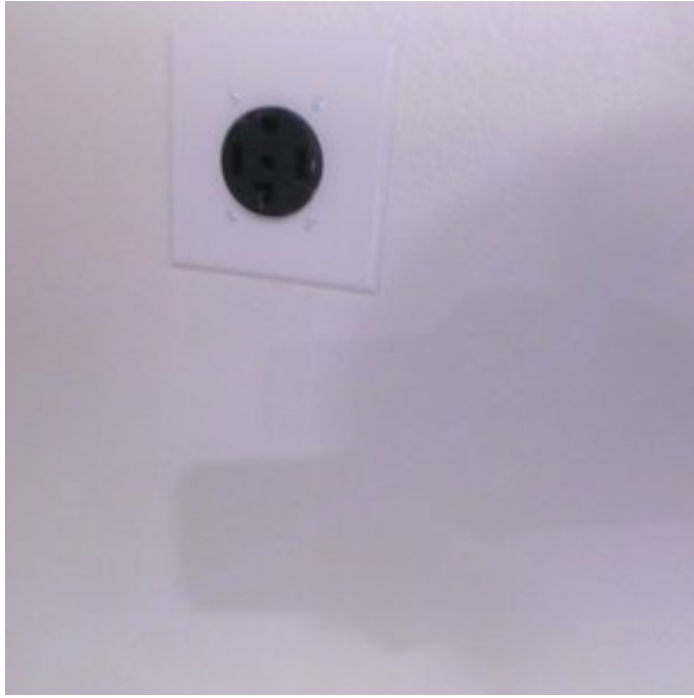
DINING: ELEVATED MOISTURE READINGS



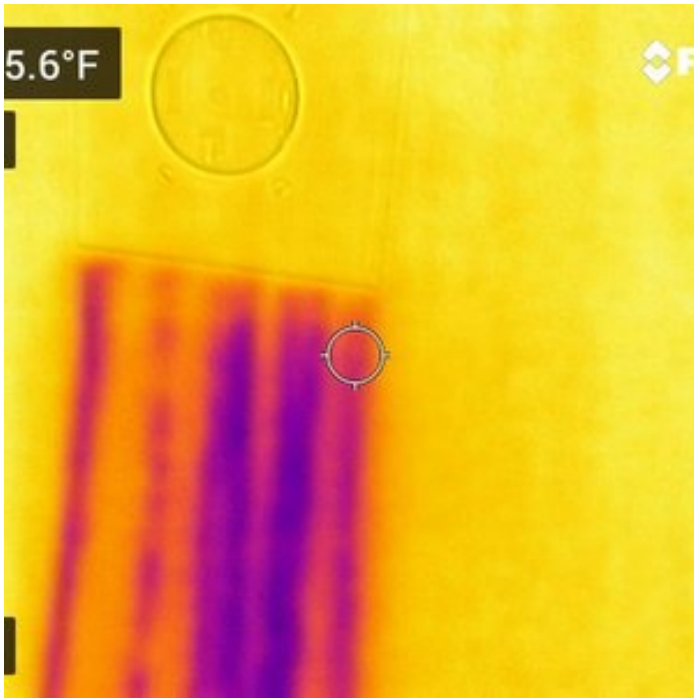
DINING: ELEVATED MOISTURE READINGS



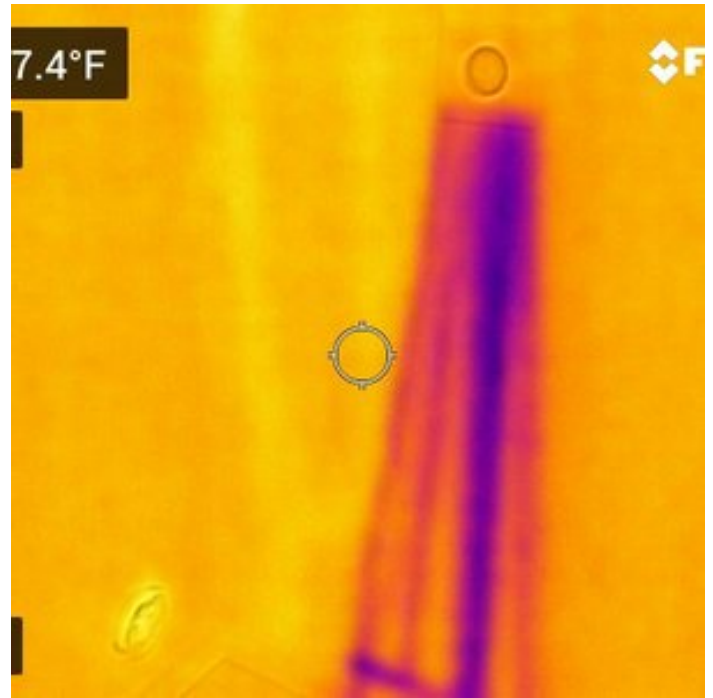
LEAK OVER LAUNDRY/NEAR MAIN ENTRY



LEAK EXITING AT DRYER OUTLET



LEAK OVER LAUNDRY/NEAR MAIN ENTRY



LEAK OVER LAUNDRY/NEAR MAIN ENTRY



VARIOUS CLADDING TYPES



GARAGE: MISSING FIREWALLS



UNEVEN CMU WALL



CRACKS AT RECENTLY INSTALLED CLADDING



LOWER WALL: 8"



UPPER WALL: 10-11"



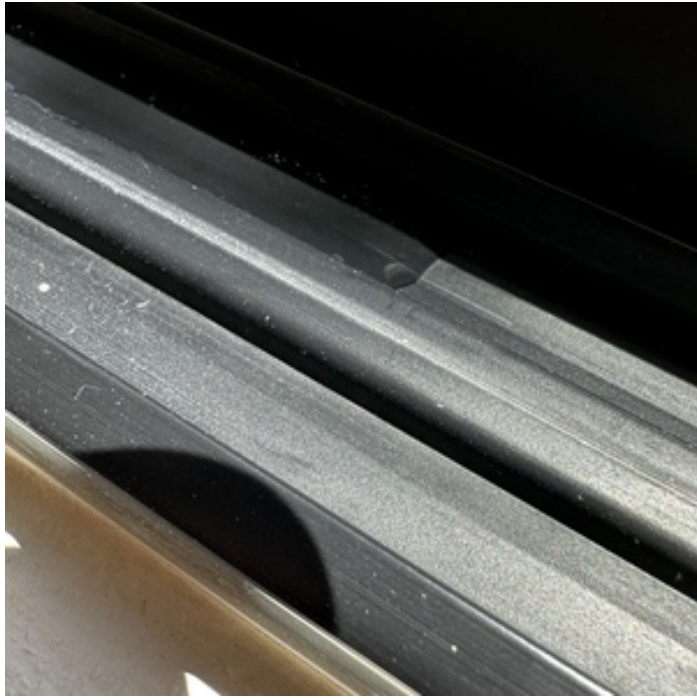
EXPOSED PLYWOOD UNDER STUCCO



LOOSE STONE ABUTS STUCCO



NO UPPER CLADDING FLASHING



WATER FILLS WINDOW SLIDE WELL



RECENT FLOORING UPDATES



AREAS OF UNEVEN FLOOR SURFACES



SEAL GAPS AT TRANSITIONS



HOLLOW SPOT IN FLOORING



TYPICAL DRIVEWAY FLAWS



CRACKS AT ENTRY PORCH/LANDING

Other



THERMAL CAMERA: NORMAL READINGS



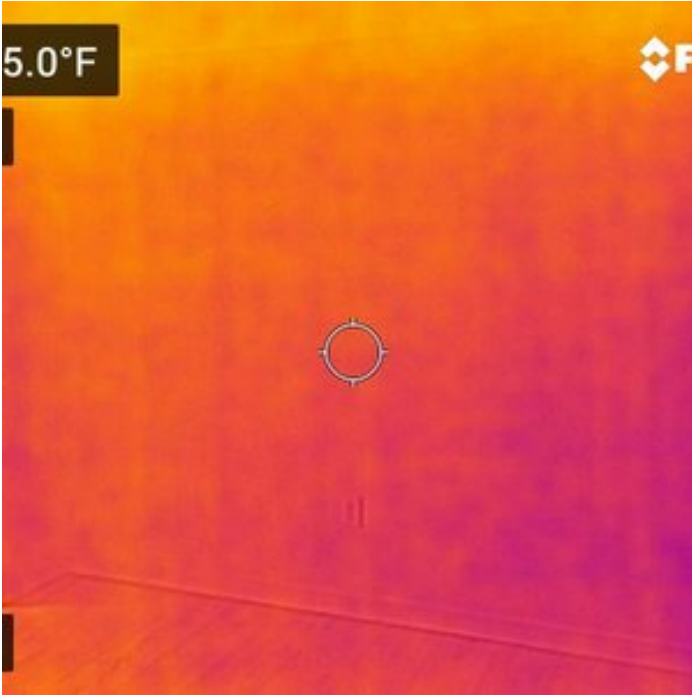
THERMAL CAMERA: NORMAL READINGS



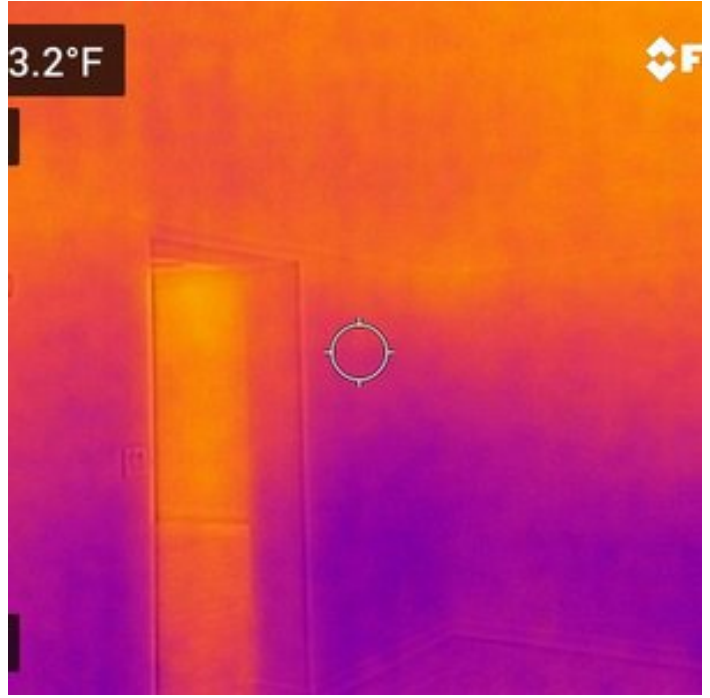
THERMAL CAMERA: NORMAL READINGS



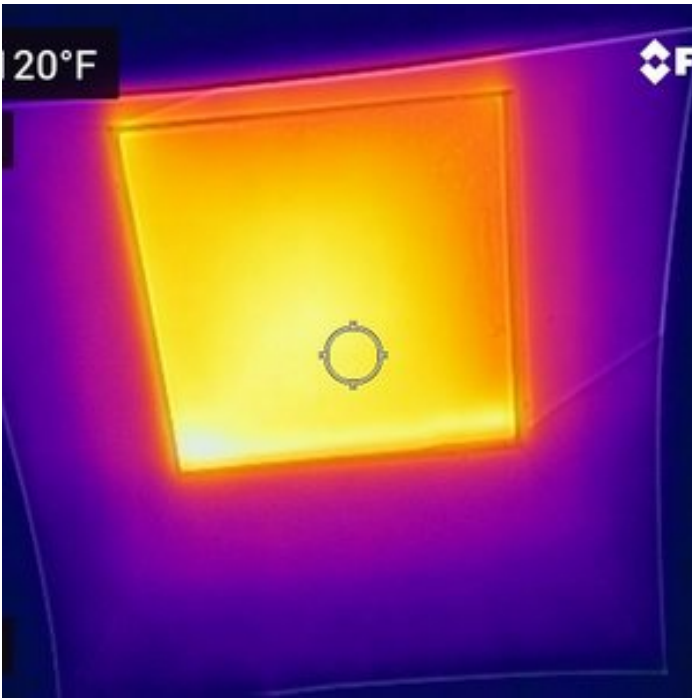
THERMAL CAMERA: NORMAL READINGS



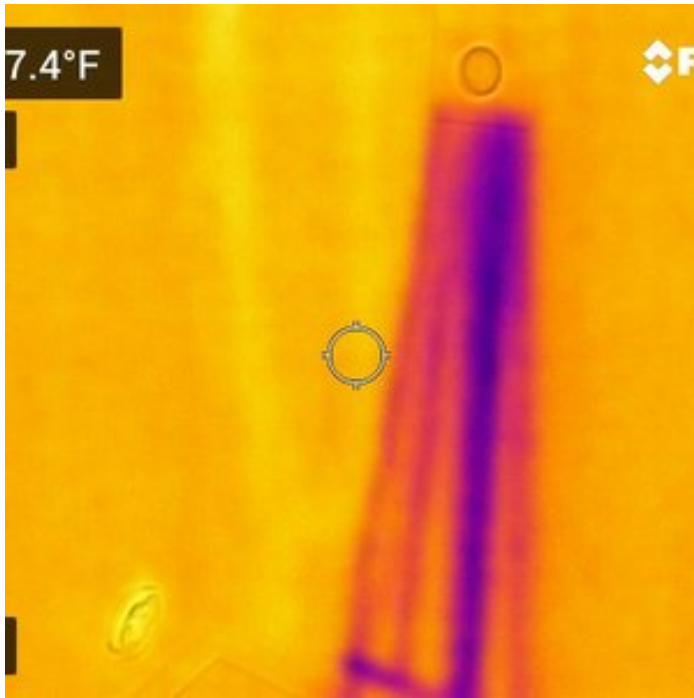
THERMAL CAMERA: NORMAL READINGS



THERMAL CAMERA: NORMAL READINGS



SKYLIGHT: INCREASE HEAT TRANSFER



ADDRESS LEAK ISSUES



TEMP DURING TESTING: 102F



PREVIOUS HVAC LEAK



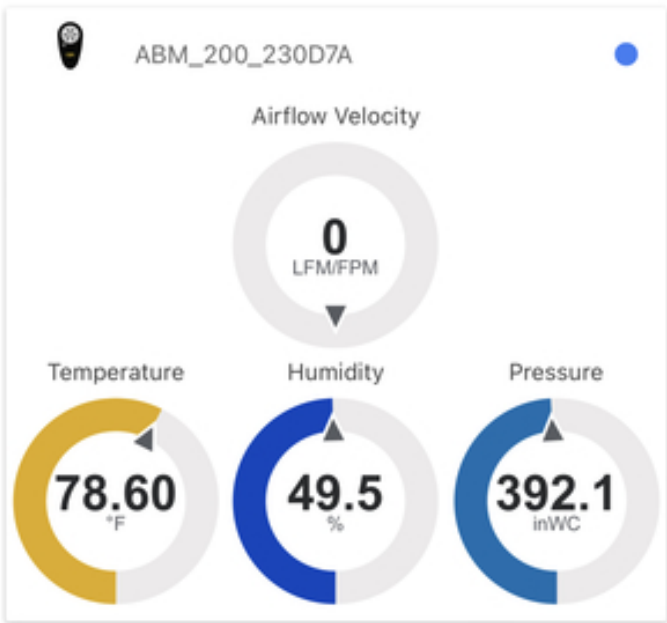
AVERAGE TEMP (BEDROOMS): 72-74F



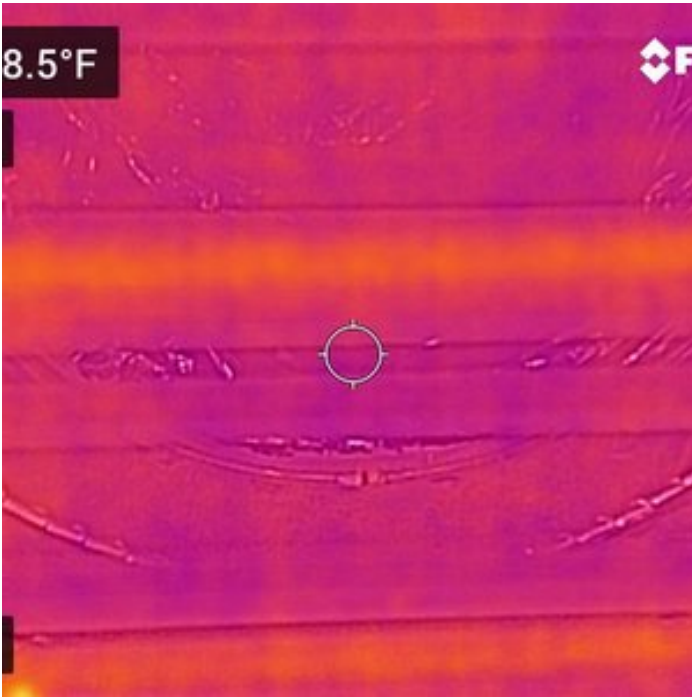
AVERAGE TEMP (BEDROOMS): 72-74F



AVERAGE TEMP (COMMON AREA): 78-79F



AVERAGE TEMP (COMMON AREA): 78-79F



SUPPLY TEMP: 59-62F (MARGINAL)



SUPPLY TEMP: 59-62F (MARGINAL)



INSTALLATION AND FUNCTIONALITY ISSUES



MINI-SPLIT FAILED TO COOL



1X VENT FOR LARGE SPACE



MYLAR FLEX DUCTING OBSERVED



WATER METER RIGHT OF BLDG.



CUT/PATCH: PREVIOUS PIPE REPAIR



ELEVATED WATER PRESSURE



KIT. SINK: WEAK PRESSURE



ATYPICAL PIPE CONFIGURATION



PROTECT PIPE, ADD ANTI-SIPHON



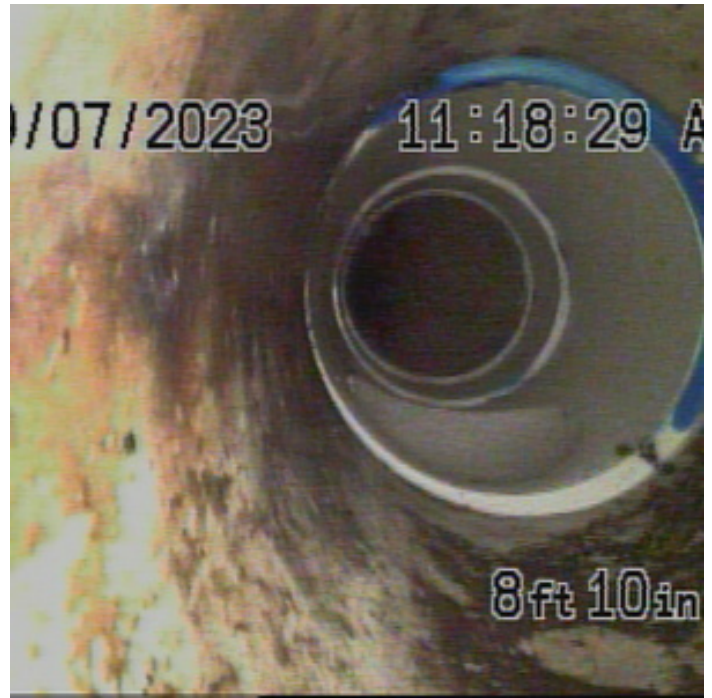
LEAK AT BEDROOM SINK



LEAK AT BEDROOM SINK



ENTRY INTO LATERAL



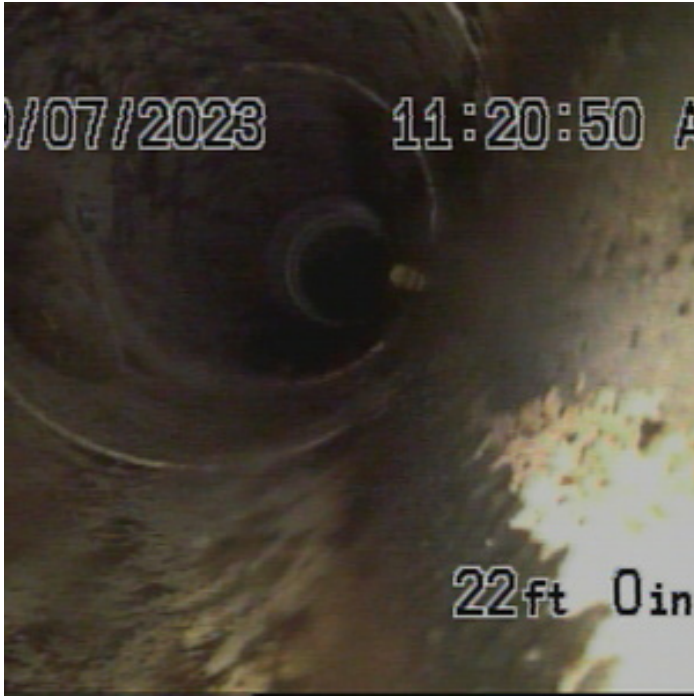
INDICATOR OF RECENT UPDATING



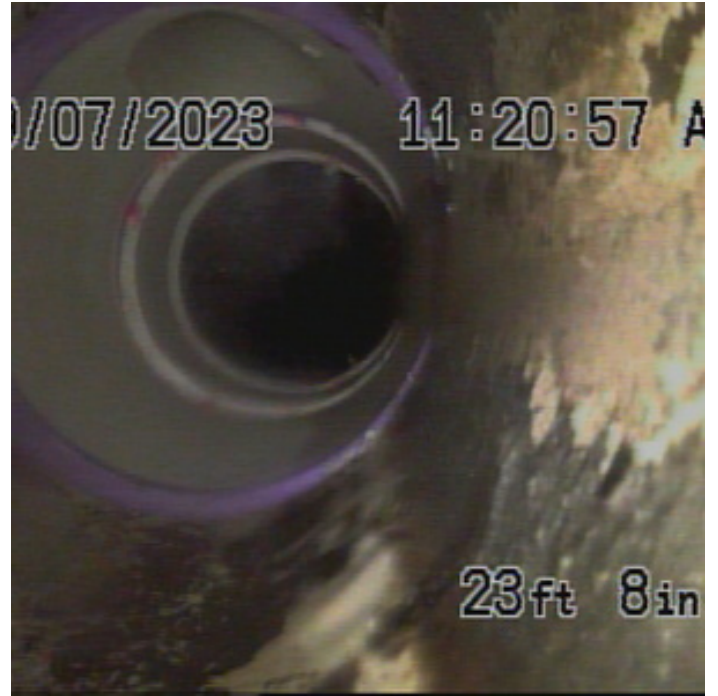
UPDATED BRANCH CONNECTION



NORMAL DRAINAGE OBSERVED



CAMERA NEARING KITCHEN AREA



ADDITIONAL UPDATES OBSERVED