March 22, 2022

HVAC Systems Hygiene Assessment of the Sandels Building

Sandels Building
Located at
675 West Call Street
Tallahassee, FL 32304

Prepared for:

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HC3 Project #PJ220005

Contents

Definitions and terms used in this report are provided below.

Mold, Fungi, and Microbial Matter – These terms are synonymous for purposes of this report.

Mold growth – is the amplification or vegetative growth of fungal hyphae, conidia, or other reproductive structures on a porous or non-porous surface. This term is applied to locations where mold growth has occurred or is occurring due to favorable environmental conditions.

Deposited Mold Growth – is the deposition of fungal hyphae, spores, or reproductive structures that have grown on another surface at a different location and have been subsequently shed into the air stream. Where these fungal structures have deposited onto a surface, but have not re-initiated vegetative growth, should still be cleaned, but hyphal attachment and invasion of the substrate has not occurred.

Deposited mold spores – are deposited fungal spores (predominantly) with *de minimis* amounts of hyphal structures. This condition is predominantly associated with accumulated dust deposits from outdoor air.

1.0 Summary

On February 22 and 23, 2022 Industrial Hygienists from HC3 performed an assessment of the Sandels Building under the direction of Dr. David Krause, CIH. The assessment focused on the heating, ventilation, and air conditioning (HVAC) systems but also included inspection and testing of building materials and interior surfaces for the presence of mold growth.

The primary purpose of the assessment was to evaluate HVAC systems that were scheduled for cleaning, had been recently cleaned, and were undergoing cleaning and remediation for the presence of mold growth and debris. Earlier reports indicated that some HVAC systems had been expelling visible debris containing mold growth (*Cladosporium* sp.). A secondary component of the assessment was to assess areas of past moisture intrusion for mold growth. Surface samples were collected to determine if visible debris, particles, and discoloration were due to mold growth and to determine the types of mold growing in HVAC systems and on building materials.

Based upon visual inspections and the collection of eighty (80) surface samples six of the seven HVAC systems were found to have residual mold growth in the air handling units, flexible ducts, variable volume terminal units on coils and dampers, and in supply ducts. The black particulate observed coming from supply registers is from deposited mold growth that has been shed from the fan and transported downstream into the ducts and eventually expelled into the occupied spaces. Variable volume terminal units with re-heat coils were severely impacted with shed mold growth deposits and required further cleaning. The presence of mold growth in a building or its HVAC systems represents a potential for exposure but does not predict the magnitude of exposure or the risk of adverse health effects.

The primary underlying cause of mold growth in the HVAC systems was due to gaps in the bank of filters, allowing outside air to bypass HVAC filters and foul the fan with dust, organic matter, and mold spores. Filter gaps at the time of the assessment were minimal but may have been substantial in the past. The second component was excessive fan bearing grease that had spread onto the fan blades and internal surfaces immediately downstream. Mold growth on this mixture of dust and fan bearing grease was eventually shed into the air stream and would blow down the ducts and exit supply diffusers. Mold growth on the air handling unit (AHU) fans resulted in severe microbially induced corrosion (MIC) and rusting of the fans. The fans should be re-cleaned and refinished with an epoxy coating rust particles to prevent shedding of rust. Once filter bypass is eliminated, the fans are refinished, and the fan bearings replaced so they no longer shed grease, mold growth can be controlled. After repairs to the filter housing and fans are completed, re-clean all air conveyance system components with visible deposits of mold growth to prevent it from shedding into the occupied spaces.

Areas of the building with a history of moisture intrusion were assessed for mold growth. Based upon visual inspections and the collection of twelve (12) surface samples mold growth was found in areas outside of HVAC systems. Mold growth was found in the basement gym area beneath the floor mats. Vegetative growth of mold beneath the mats

resulted in *de minimis* spore production, meaning that exposure during normal conditions poses little risk of occupant exposure to spores, aside from odors and volatile byproducts. In offices along the north wall of the Sandels building on the 2nd, 3rd, and 4th floors mold growth was found behind built-in bookcases. Low density mold growth behind the bookcases poses little risk of exposure to spores when not disturbed, but odors and volatile byproducts may be apparent. Remediation of mold damaged building materials described above will need to be performed under containment and by a licensed mold remediation contractor. Building areas undergoing remediation will need to be unoccupied throughout the process.

Remediation of mold growth in the HVAC systems has been proceeding since late 2021. However, components of the air conveyance system require removal in order to effectively clean deposited mold growth that has accumulated. Refinishing of the fans to repair corrosion and repairing fan bearings to prevent future extrusion of grease is needed to control mold growth moving forward. More in-depth cleaning and restoration of HVAC systems will require some periods of limited occupancy on floors when the work is being performed.

Earlier testing and assessments performed on the Sandels Building suggested the presence of mold growth within the building and its HVAC systems. While air samples from earlier testing indicated possible amplification in less than 10% of samples, surface samples demonstrated areas of growth, primarily due to *Cladosporium species*. The findings of HC3's assessment concur with earlier findings but provide greater detail and granularity on specific areas and systems impacted with mold growth. This assessment also provides an estimate of the extent of mold growth and identifies probable moisture sources and underlying contributing factors. Some areas of mold growth included other genera of mold, but *Cladosporium* still dominated sample results. This latest assessment provides details on the location, extent and severity of mold sources currently in the building and forms the basis for remediation and cleaning efforts moving forward.

2.0 Evaluation Description

2.1 On February 22 and 23, 2022 Industrial Hygienists from HC3 performed an assessment of the Sandels Building. The assessment included inspections and testing of heating, ventilation, and air conditioning (HVAC) systems and testing of building materials and interior surfaces for indications of mold growth. The assessment was performed under the direction of David Krause, PhD, MSPH, CIH who is a licensed mold assessor by the Florida Department of Business and Professional Regulation (DBPR).

2.2 The purpose of this assessment was to evaluate HVAC systems that had been recently cleaned and were undergoing additional cleaning and remediation for the presence of mold growth and debris. HVAC systems throughout the building had been reported to be expelling visible debris containing mold growth (*Cladosporium* sp.). Assessment of interior building surfaces and furnishings for mold growth, a secondary component of the assessment, was performed in areas with a history of moisture intrusion. Samples were collected to determine if visible debris, particles, and discoloration were due to mold growth and to determine the types of mold growing in HVAC systems and on building materials, to the genus level. However, the presence of mold growth in a building or its HVAC systems can only demonstrate the potential for exposure but does not predict the magnitude of exposure or the risk of adverse health effects.

2.3 The presence of mold growth was assessed by using a combination of visual observations and surface sample analysis for fungi. Methods and interpretative criteria are provided below.

2.3.1 A total of seventy (70) Mycometer™ surface swab samples were collected during the assessment, each from a 9 cm^2 surface area. Swab samples from HVAC and building material surfaces were collected and analyzed using the MycoMeter Surface Fungi (MSF) method (2nd Generation Chemistry). The Mycometer™ surface sampling method quantifies an enzyme present in both hyphae and spores of molds (β-N-acetylhexosaminidase/NAHA) found in indoor environments where mold has deposited or grown. The enzyme activity is measured using a fluorometer to detect a fluorogenic enzyme substrate which, upon cleavage, releases a fluorescent label that is detected by Ultraviolet (UV) light. The enzyme concentration correlates to the amount of fungal biomass (i.e. spores and hyphae) present on the surface. Each swab sample is collected from a 9 cm^2 surface area to ensure consistency and comparability of results.

Mycometer surface sample results less than 20 fluorescent units (Category A) indicate a clean surface, with respect to fungal biomass (spores and hyphae). Sample results between 21 and 135 (Category B) indicate an increased level of fungal biomass, but not fungal growth. Sample results greater than 136 (Category C) indicate fungal growth.

2.3.2 A total of twenty-two (22) tape lift samples were analyzed as part of HC3 assessment activities. Adhesive tape lift samples were collected to determine the presence of mold growth and reproductive structures on surfaces and to identify the type(s) of fungi present. Adhesive tape samples were collected in general accordance with the methodology described in Chapter 12, Section 12.2.2 of "ACGIH Bioaerosol: Assessment and Control" (1999) using 3M Crystal Clear Adhesive Tape (3/4-in wide by 2-in long) and then placed onto precleaned standard 3-in long by 1-in wide microscope slides. Tape lift samples were shipped to AEMTEK, Inc., Fremont, CA for fungal direct examination (FDE). The samples were analyzed using direct bright field microscopy (400x), without stain, to semi-quantitatively assess the mold spore count to the genus level and to identify vegetative structures present. Tape lift results are reported in categories indicating the density of spore and hyphae present, as follows.

Category I – 1 to 10 spores/hyphal fragments per cm^2

Category II – 10 to 100 spores/hyphal fragments per cm^2

Category III – 100 to 1,000 spores/hyphal fragments per cm^2

Category IV - > 1,000 spores/hyphal fragments per cm^2

Laboratory results of tape lift sample analyses are provided in Appendix B and are discussed further in the Findings and Results Section. Adhesive tape lift sample results in Category IV are interpreted as indicating mold growth; however, “low density” mold growth can sometimes be present when sample results are Category III.

Photographs were taken of each sampling site and adjacent areas to document the location, degree of visible debris, staining, macroscopic fungal growth and material deterioration.

All measurements, observations, and sample results were used to determine if fungal growth or its remnants were present. Visible colonization, direct and indirect microscopic examination, the concentration of fungal enzymes, and visible signs of moisture damage or corrosion were all used as indicators of fungal growth or conditions that could have supported fungal growth. An overall interpretation of findings for each HVAC system or impacted building area is provided in the Findings Section of this Report. Sample results that typically indicate evidence of fungal growth are MSF Values of greater than 136 or Adhesive Tape Lift Microscopy Results greater than 1,000 spores and/or hyphae per cm^2 (Category IV).

2.4 A Mechanical Contractor facilitated access to interior components of HVAC systems, including air handling units, supply ducts, variable air volume and variable volume re-heat units. Access holes were cut or system components were opened by the mechanical contractor and re-sealed after observations made and samples collected.

3.0 Assessment Limitations

3.1 Assessment of this building was limited by access to a handful of components that were inaccessible. However, a sufficient number of other system components were accessible so we have high confidence in the generalizability of our findings. Some HVAC systems had been recently cleaned but remained visibly impacted with deposited debris believed to be from the air handling unit or areas of the system that were not successfully cleaned. This assessment included inspection and sampling of selected sites within each HVAC System but did not include all areas of each system. Only a limited amount of the duct work was accessed and sampled during the inspection. Samples were taken to determine if fungal amplification had occurred on visibly impacted building material surfaces or areas with a history of moisture damage. Some areas of mold growth may not have been identified or sampled. No air samples were collected to evaluate airborne concentrations of microorganisms. While high levels of airborne mold spores can sometimes indicate an active growth site of fungi within the building, the absence of findings cannot be interpreted as an absence of active growth sites. In lieu of air samples that often do not correlate to the amount of mold growth within a building, sources were sought by visual inspection, identifying water damaged materials, and analyzing surface samples. While there are regulations concerning the permissible exposure limits to certain chemicals in the workplace, none exist for microbiological contaminants including mold. Sources of chemical, microbial and particulate pollutants were sought throughout the building, but determinations made during the evaluation only apply to the locations evaluated and only for the conditions during the evaluation. Since buildings are under the influence of numerous external factors and occupant activities, the pollutants and environmental conditions within the building are constantly changing. As building occupancy changes, mechanical systems are cleaned, modified or degrade, and external weather conditions change, the building environment is expected to change.

4.0 Findings and Results

4.1 Inspection findings are reported for each HVAC system and occupied area where mold growth was identified within the Sandels Building. Fungal colonization and the type of affected material are described. The physical characteristics of the contaminated system or surface are documented with a photograph and identified by sample number and photograph number, provided in Appendix A. Results of surface samples for microbial growth are provided in Appendix B.

4.2 General Condition of HVAC Systems

Areas of significant mold growth were identified in each of the tested air handling systems serving the facility. Examples of the visible colonization within the HVAC systems are provided in photographs (see Appendix A). The consistency of findings indicates mold growth and hyphal deposits throughout the majority of each HVAC system, its supply ducts, and various materials sampled. Most of the areas and HVAC system components that had been re-cleaned by the Contractor (Service Tech) were found to have levels of residual mold deposition approximating a clean surface. However, AHU fans, VAV units, and Variable Volume Terminal Units (Re-heat Units) still had substantial amounts of mold growth, predominantly consisting of *Cladosporium* species. At the time of this assessment the Contractor was in the process of cleaning HVAC system components with oversight by Mihir Environics, Inc. The project was ongoing as of March 11, 2022.

4.3 General Conditions of Indoor Spaces

Several areas of past moisture intrusion were identified that contained areas of mold growth exceeding 10 square feet. A full assessment of moisture intrusion could not be performed at this time due to dry ambient conditions.

4.3.1 Basement Exercise Room Mats: Below the exercise mats in the basement along the South-facing wall mold growth was found. Vegetative structures of *Aspergillus/Penicillium*-like mold was found between the concrete floor and the mats, covering an area of approximately 20’ x 24’ (~480 square feet). The shaded area in the figure below represents the location of mold-impacted exercise mats. The mats act as a vapor barrier and trap moisture between the concrete and mat. Sample results indicate moderate spore production, but substantial vegetative growth. While in place there appears to be low risk of exposure to airborne spores from this area of growth, but odors and microbial volatile organic compounds (mVOCs) may be perceptible to occupants.

Figure 1: Basement

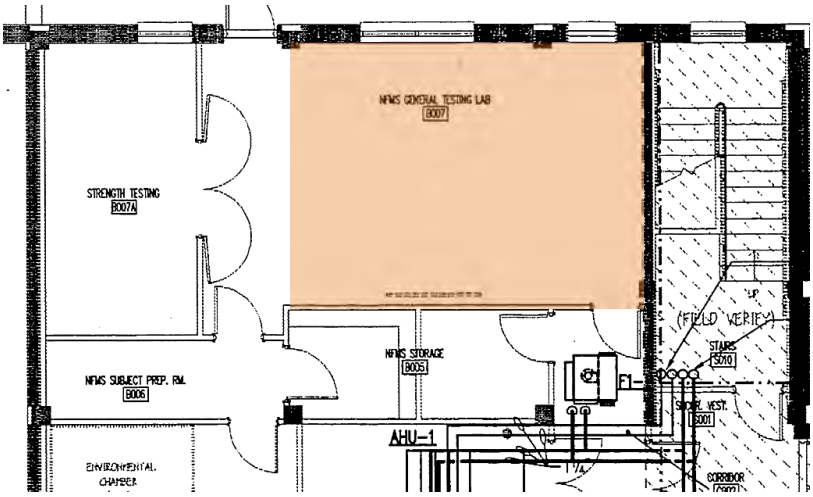

Table 1: MycoMeter and Tape Lift Sample Results

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
GM-1	M / T	Gym Floor Mat Backside Surface, Mat # 4 from left	6077	II	40	Vegetative mold growth (Asp/Pen-like) due to moisture through slab or water damage from flooding reported, Mat # 4 from left- facing emergency exit door
GM-2	M / T	Gym Floor Mat Backside Surface, Mat # 1 from left	7731	II	41	Vegetative mold growth (Asp/Pen-like) due to moisture through slab or water damage from flooding reported, Mat # 1 from left- facing emergency exit door

4.3.2 Office along the North Wall of Floors 2, 3 and 4: Bookcases built along the lower wall of offices, beneath windows, were found to be impacted by mold growth. The bookcases are constructed with medium density fiberboard (MDF) covered by a vapor-impermeable laminate that acts as a vapor barrier trapping moisture. Low density mold growth was consistently found on the backs of bookcases along the north wall of offices on the 2nd, 3rd, and 4th floors of the Sandels building. Mold growth consisted primarily of *Cladosporium* species, but some areas of *Aspergillus/Penicillium* species were also found growing. The irregular shape of bookcases, columns, and wall structures make estimating the surface area of mold growth challenging, but the estimated area of impacted materials is 60 to 100 ft^2 per office. Total amount of mold-impacted area is between 2,500 and 4,200 ft^2.

Per floor estimates are:

2nd Floor estimated 11 offices = 660 to 1,100 square feet.

3rd Floor estimated 15 offices = 900 to 1,500 square feet.

4th Floor estimated 16 offices = 960 to 1,600 square feet.

Figure 2: North Wall Offices (3rd Floor Example)

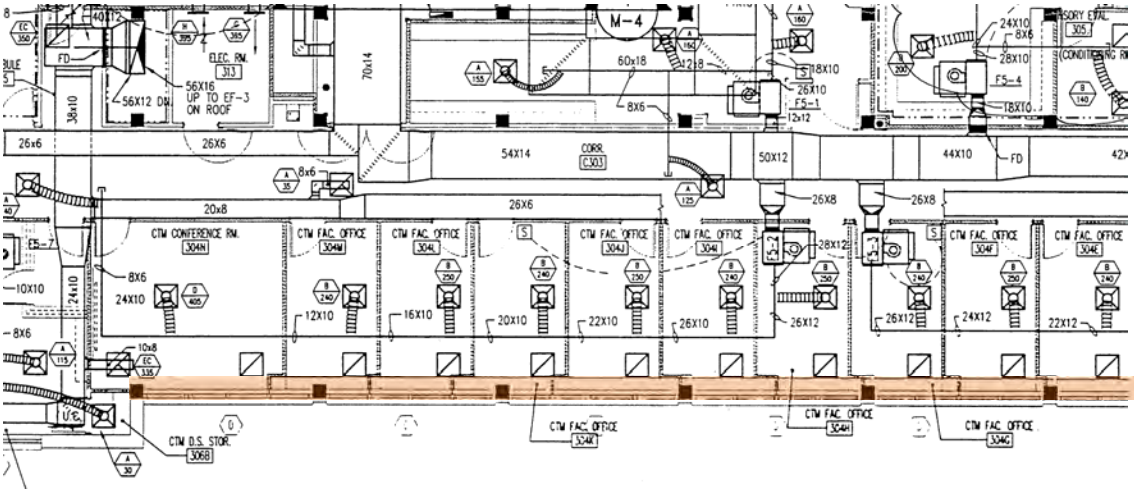

Table 2: Tape Lift Sample Results

Sample Number	Sample Type	Sample Description	Tape Lift Result	Photo Numbers	Comments
220-1	T	Rm 220 Column Built-in Bookshelf, Front	II	37	Low density mold growth of *Aspergillus/Penicillium* and *Cladosporium*
220-2	T	Rm 220 Column Built-in Bookshelf, Side	IV		Mold Growth of *Cladosporium*
220-3	T	Rm 220 Upper Built-in Bookshelf	IV		Mold Growth of *Cladosporium*
328-1	T	Rm 328 Column Built-in Bookshelf, Front	IV		Mold Growth of *Cladosporium*
328-2	T	Rm 328 Column Built-in Bookshelf, Top	IV		Mold Growth of *Cladosporium*
328-3	T	Rm 328 Built-in Bookshelf, Back Cover	IV	38	Mold Growth of *Cladosporium*
420-1	T	Rm 420 Built-in Bookshelf, Top Back	II		Low density mold growth of undetermined type (no spores or conidia observed, by hyphae present)
420-2	T	Rm 420 Built-in Bookshelf, Back Wall Base	IV		Mold Growth of *Cladosporium*
420-3	T	Rm 420 Built-in Bookshelf, shelf bottom	IV	39	Mold Growth of *Aspergillus* and *Penicillium*

4.4 Basement HVAC System #1: The AHU still supported mold growth on the fan blades and excessive bearing grease was observed on surfaces. The cooling coils had been successfully cleaned, but growth was present on electrical conduits and other interior surfaces of the AHU. The metal supply duct had been successfully cleaned but VAV interior dampers, adjoining flex duct were still supporting mold growth and deposited mold growth shed from the AHU fan. Further cleaning and remediation of the AHU and air conveyance system is needed.

Table 3: MycoMeter and Tape Lift Sample Results (HVAC #1)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
1-1	M	AHU-1 Cooling Coils, Inlet	18			(Basement floor) spotty dirt, Unit untouched by contractor
1-2	M	AHU-1 Fan Blade, Far side	5179		1	Over greased bearings with heavy debris
1-3	M	AHU-1 Isolation Vibration Material	3			
1-4	M / T	AHU-1 Power Line to Blower Motor	7903	IV	2	Mold Growth (*Aspergillus/Penicillium*) on plastic coating of electrical cable inside AHU
1-5	M	VAV F1-1 Damper	4312		3	Heavy debris, located in hallway floor near Rm B008
1-6	M	VAV F1-1 Fan Blade	48			Heavy debris, located in hallway floor near Rm B008
1-7	M / T	VAV F1-1 Side Panel Wall	39	III		Located in hallway floor near Rm B008 (Moderate Deposits of *Pen/Asp* and *Cladosporium*)
1-8	M	VAV F1-1 HP Flex Supply Duct	2086		4	Located in hallway floor near Rm B008
1-9	M	VAV F1-1 LP Isolation Vibration Material	185		5	Located in hallway floor near Rm B008
1-10	M	VAV F1-1 LP Metal Supply Duct	17			Located in hallway floor near Rm B008

4.5 First Floor HVAC System #2 & #3: Both AHUs still supported mold growth on the fan blades and excessive bearing grease was observed in AHU 3, but not in AHU 2. The fan in AHU #2 appeared to be relatively new, and bearings were not excreting excessive grease. The cooling coils had been successfully cleaned, Metal supply ducts had been successfully cleaned but VAV interior dampers and adjoining flex duct were still supporting mold growth and deposited mold growth shed from the AHU fan. Further cleaning and remediation of the AHU and air conveyance systems are needed.

Table 4: MycoMeter and Tape Lift Sample Results (HVAC #2)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
2-1	M	AHU-2 Fan Blade, Far side	7211		6	Mold Growth on fan blades only
2-2	M	AHU-2 Isolation Vibration Material	11			New replacement Fan
2-3	M	AHU-2 Cooling Coils, Outlet	7			Blower Chamber
2-4	M	AHU-2 Top Panel with Grease Deposit	1			Above fan pulleys- near blower

2-5	M	Hallway VAV F2-2 Damper, Near Rm 108	6971		7	Mold Growth
2-6	M	VAV F2-2 Side Cabinet Wall, Near Rm 108	130			
2-7	M	VAV F2-2 Fan Blade, Near Rm 108	145		8	Mold Growth
2-8	M	VAV F2-2 LP Isolation Vibration Material, Near Rm 108	28909		9	Mold Growth
2-9	M	VAV F2-2 Coils, Inlet, Near Rm 108	110			

Table 5: MycoMeter and Tape Lift Sample Results (HVAC #3)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
3-1	M	AHU-3 Fan Blade, Far side	2726		11	Heavy debris with evidence of over-greased bearings. Mold Growth
3-2	M	AHU-3 Isolation Vibration Material	11			Suspected staining but not Mold Growth
3-3	M	AHU-3 Cooling Coils, Outlet	19			Looks clean
3-4	M	AHU-3 Side Panel with Grease Deposits	5		12	No growth
3-5	M	Rm 108 VAV F3-3 Coils, Inlet	45			
3-6	M	Rm 108 VAV F3-3 Fan Blade	89			
3-7	M	Rm 108 VAV F3-3 LP Metal Supply Duct	16			
3-8	M / T	Rm 108 VAV F3-3 Internal Side	59	IV	13	Old inactive Mold Growth (*Aspergillus/Penicillium* and *Chaetomium*)
3-9	M	Rm 108 VAV F3-3 Damper	12037		14	Mold Growth
3-10	M	Rm 108 VAV F3-3 HP Flex Supply Duct	6046		15	Mold Growth

4.6 Second Floor HVAC System #4: The AHU was not supporting mold growth on the fan blades, but excessive bearing grease was observed, and the fan was severely rusted. The cooling coils could not be sampled due to limited access. Deposited mold growth was present in high pressure metal supply ducts. Substantial mold growth was present on VAV interior dampers and adjoining flex ducts. Further cleaning and remediation of the AHU and air conveyance system is needed. A limited assessment of one VAV undergoing re-cleaning indicates that cleaning activities are effective. Severe corrosion of the fan indicated that it requires resurfacing and restoration.

Table 6: MycoMeter and Tape Lift Sample Results (HVAC #4)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
4-1	M	AHU-4 Supply Chamber Outlet, Top wall	322		16	Mold Growth (2nd floor) Above blower wheel
4-2	M / T	Main Supply Trunk, Access Hatch near Mech Rm Entrance	797	III	17	Deposited mold growth shed from fan (*Cladosporium* and *Pen/Asp*)
4-3	M	Mech. Rm Flex Duct from Main Supply Trunk	10519		18	Mold Growth
4-4	M	Distal HP Metal Supply Duct, Near Rm 207	82			
4-5	M / T	Rm 225B VAV 4-11 Flex Thermo Fin, Upstream of HP	2312	IV	19	Mold Growth (*Aspergillus/Penicillium*) on internal metal surface of Thermofin flexible duct
4-6	M / T	Rm 225B VAV 4-11 Damper	10944	IV	20	Heavy debris and Mold Growth (*Cladosporium* sp.) with moderate deposits of *Aspergillus/Penicillium*
4-7	M	Rm 225B VAV 4-11 Side Panel	4862		21	Mold Growth
4-8	M / T	Rm 225B VAV 4-11 Isolation Vibration Material, LP side	21403	II	22	Mold Growth *Aspergillus/Penicillium* and *Chaetomium*
4-9	M / T	Rm 225 VAV 4-11 LP Metal Supply Duct	145	II	23	Deposited Mold Growth *Aspergillus/Penicillium* and *Alternaria*
4-10	M	VAV 4-11 Blower fan	91			Deposited Mold Spores Dirty, but have to bend filter to move it
4-11	M	VAV 4-11 Coil, Inlet	83			Deposited Mold Spores
4-12	M	Rm 242J VAV F-17 Isolation Vibration Material, Post Clean	8			POST CLEAN Sample

4.7 Third Floor HVAC System #5: The AHU was still supporting mold growth on the fan blades, excessive bearing grease was observed, and the fan was severely rusted. The cooling coils had been successfully cleaned. Deposited mold growth was present in high pressure metal supply ducts. Substantial mold growth was present on Variable Volume Terminal Units, VAV interior dampers and adjoining flex ducts. Further cleaning and remediation of the AHU and air conveyance system is needed. A limited assessment of one flex duct that had been re-cleaned indicates that cleaning was ineffective (Sample 5-6). Severe corrosion of the fan indicated that it requires resurfacing and restoration.

Table 7: MycoMeter and Tape Lift Sample Results (HVAC #5)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
5-1	M	AHU-5 Cooling Coils, Inlet	39			(3rd floor), side panel pulled back
5-2	M	AHU-5 Fan Blade	265		24	Residual Mold Growth (post cleaning), rust, grease stains
5-3	M	AHU-5 Isolation Vibration Material	136		25	Residual Mold Growth (post cleaning)
5-4	M	AHU-5 Supply Outlet Turning Vane	148		26	Residual Mold Growth (post cleaning) In Mech. Room
5-5	M / T	Reheat Unit, Inlet side of heating coils	4384	IV	27	*Acremonium* Mold Growth (Excessive debris on coils of re-heat) before cleaning
5-6	M	Rm 326 Supply Flex Duct	898		28	Residual Mold Growth (post cleaning) Unsuccessful cleaning
5-7	M	Rm 318 HP Supply Flex Duct	3			"Looks clean and new"
5-8	M	Rm 318 VAV Cooling Coil, Inlet	33		29	Dirty, but have to bend filter to move it, but not supporting mold growth
5-9	M	Rm 318 VAV Outlet LP Metal Supply Duct	75			
5-10	M	Rm 316 VAV Outlet LP Metal Supply Duct	92			Deposited mold growth Not clean, original metal
5-11	M	Rm 316 Flex Supply Duct Outlet	184		30	Residual Mold Growth
5-12	M	Rm 316 VAV Cooling Coil Inlet	47			left side
5-13	M	Rm 332 VAV F-56 Cooling Coil Inlet	37			right side
5-14	M	Rm 332C LP Metal Supply Duct	45		31	Residual mold growth deposits
5-15	M	Corner Hallway Base of HP Supply Duct, near turning vein	30		32	Near stairway

4.8 Fourth Floor HVAC System #6: The AHU was not supporting mold growth on the fan blades, excessive bearing grease was observed. The heating and cooling coils had been successfully cleaned. Deposited mold growth was present in low pressure metal supply ducts. Low level residual mold growth deposits were present on Variable Volume Terminal Units, VAV interior dampers and adjoining flex ducts. Further cleaning and remediation of the air conveyance system is needed.

Table 8: MycoMeter and Tape Lift Sample Results (HVAC #6)

Sample Number	Sample Type	Sample Description	Mycometer Value	Tape Lift Result	Photo Numbers	Comments
6-1	M	AHU-6 Heating Coils, Inlet	4			(4th floor) visibly dirty but not supporting mold growth
6-2	M	AHU-6 Cooling Coils, Inlet	8			No mold growth
6-3	M	AHU-6 HP Supply Duct Plenum	16		33	
6-4	M	AHU-6 Main Metal Supply Duct to Hallway	40		34	
6-5	M	Hallway HP Supply Flex Duct into Rm 440 VAV	0			Room Labeled Biohazard area- Level 2 bio safety (Sampled New Flex Duct)
6-6	M / T	Reheat Unit C6-6 LP Metal Supply Duct pass Rm 440 VAV	40	IV	35	Old, inactive mold growth (*Cladosporium*) associated with reheat unit C6-6
6-7	M	Reheating Unit # C6-B Side Wall, Near Rm 440	15			tag C6-B, on floor
6-8	M	Reheating Unit Side Wall, Near Rm 423	12			tag unknown, on floor
6-9	M	Reheating Unit #C4-A Inlet of Coils, Near Rm 442	11			ID #C4-A
6-10	M	Rm 442E LP Metal Supply Duct	185		36	Deposited mold growth

4.9 Rooftop Outside Air HVAC System: The rooftop outside air unit was not supporting mold growth on the fan blades or cooling coils. No excessive bearing grease was observed. The heating and cooling coils had been successfully cleaned. No further cleaning or remediation of the AHU or air conveyance system is needed.

Table 9: MycoMeter Sample Results (Outside Air HVAC)

Sample Number	Sample Type	Sample Description	Mycometer Value	Photo Numbers	Comments
RT-1	M	Rooftop AHU Cooling Coils, Inlet	0	42	No mold growth. Access from 411 Mech Rm
RT-2	M	Rooftop AHU Fan Blade	4	43	No mold growth. Access from 411 Mech Rm

4.10 Ceiling Tile Dust: Excessive amounts of deposited dust on ceiling tiles was sampled to evaluate the level of mold present. The microscopic analysis of deposited dust revealed that conditions have allowed mold growth. Observable cupping and warping of ceiling tiles indicate that moisture levels have been elevated in the past. Replacement of ceiling tiles and cleaning of dust deposits is needed to reduce this source of mold in the building.

Table 10: Tape Lift Sample Results (Deposited Dust on Ceiling Tiles)

Sample Number	Sample Type	Sample Description	Tape Lift Result	Photo Numbers	Comments
2-10	T	Dust from the top of Ceiling Tile Near VAV F2-2	IV	10	Mold growth of *Penicillium/Aspergillus* and *Cladosporium* Growth in Dust Deposits

5.0 Conclusions

5.1 Observations and measurements of surface mold conditions reflect those present on February 22 and 23, 2022. Cleaning and remediation efforts were ongoing and have continued since this assessment was performed. Many of the recommended actions provided herein may have been accomplished in the interim period. Inspections to verify and validate remediation and cleaning efforts within HVAC systems and occupied areas of the Sandels building are needed.

5.2 HVAC systems 1 through 6, serving the basement through the fourth floors, contain areas of mold growth on fans, supply ducts, VAV units, and Variable Volume Terminal Units, and require cleaning and mold remediation.

5.3 The rooftop 100% outside air unit does not require further cleaning or remediation.

5.4 The black particulate observed coming from supply registers is from deposited mold growth that has been shed from the fan and transported downstream into the ducts and eventually expelled into the occupied spaces. Variable Volume Terminal (VVT) units with re-heat coils were severely impacted with deposited mold growth and required further cleaning.

5.5 The primary underlying cause of mold growth in the HVAC systems was due to gaps in the bank of filters, allowing outside air to bypass HVAC filters and foul the fan with dust, organic matter, and mold spores. Filter gaps at the time of the assessment were minimal but may have been substantial in the past. The second component was excessive fan bearing grease that had spread onto the fan blades and internal surfaces immediately downstream. Mold growth on this mixture of dust and fan bearing grease was eventually shed into the air stream and would blow down the ducts and exit supply diffusers.

5.6 Mold growth on the air handling unit (AHU) fans resulted in severe microbially induced corrosion (MIC) and rusting of the fans. Until the fans are re-cleaned and refinished with an epoxy coating, rust particles will continue shedding. The fans should be re-cleaned and refinished with an epoxy coating rust particles to prevent shedding of rust. Once filter bypass is eliminated, the fans are refinished, and the fan bearings replaced so they no longer shed grease, mold growth can be controlled. After modifications to the filter housing and fans are completed, all air conveyance system components that require re-cleaning can be cleaned to remove residual mold growth deposits so that it does not shed into the

occupied spaces.

5.7 Deposited dust in the above ceiling return air plenum contains mold growth.

5.8 The exercise room floor mats in the basement gymnasium are harboring mold growth and should be discarded under containment and the remaining room surfaces remediated and cleaned.

5.9 The source of moisture contributing to mold growth beneath gym floor mats is likely to be vapor intrusion through the slab and/or past rainwater intrusion. The mats trapped moisture behind them and allowed mold growth between the slab and the mats. Due to dry weather conditions, definitive diagnosis of the moisture source could not be performed at the time of this assessment.

5.10 Offices along the north wall on the 2nd, 3rd and 4th floors have mold growth on the backs of bookcases and walls. These bookcases should be abated, and the underlying surfaces remediated and cleaned of mold growth.

5.11 The source of moisture contributing to mold growth behind bookcases is likely to be vapor intrusion through the brick building envelope and/or window leaks. The material and construction of the bookcases trapped moisture behind them and allowed mold growth on the wetted materials. Due to dry weather conditions and low ambient relative humidity, definitive diagnosis of the moisture source could not be performed at the time of this assessment.

5.12 Earlier testing and assessments performed on the Sandels Building suggested the presence of mold growth within the building and its HVAC systems. While air samples from earlier testing indicated possible amplification in less than 10% of samples, surface samples demonstrated areas of growth, primarily due to *Cladosporium species*.

5.13 The findings of HC3's assessment concur with earlier findings but provide greater detail and granularity on specific areas and systems impacted with mold growth. This assessment also provides an estimate of the extent of mold growth and identifies probable moisture sources and underlying contributing factors. Some areas of mold growth included other genera of mold, but *Cladosporium* still dominated sample results. This latest assessment provides details on the location, extent and severity of mold sources currently in the building and forms the basis for remediation and cleaning efforts moving forward.

5.14 The presence of mold growth in a building or its HVAC systems represents a potential for exposure but does not predict the magnitude of exposure or the risk of adverse health effects.

6.0 Recommendations for Remediation

6.1 All further remediation of mold from HVAC systems (Systems 1 through 6) and building materials should be performed under containment and with third party oversight.

6.2 Re-clean fans and restore with an epoxy product in accordance with the manufacturer's directions.

6.3 Resurfacing and restoration of AHU fans requires application of epoxy coatings that can emit significant irritating odors during the application and curing process. Building occupants should not be present in the building while this activity is underway, which may require several days.

6.4 Clean, repair, or replace the fan bearings to prevent ongoing extrusion of grease into the AHU. Alter maintenance practices to avoid over greasing of fan bearings.

6.5 Re-clean all VAVs and Variable Volume Terminal Units (Re-heat units) of all mold growth deposits or replace units that are no longer functional.

6.6 Remove and dispose of all bookcases in offices along the north wall of the Sandels building on Floors 2, 3, and 4. Clean the underlying wall, columns, and flooring to remove all mold growth and residual mold growth deposits.

6.7 Remove and dispose of all gym floor mats in the basement. Clean the underlying flooring of all mold growth and residual mold growth deposits prior to application of a sealant or reinstallation of new mats. Assess moisture intrusion rates through the basement floor slab to determine an appropriate moisture vapor barrier product to prevent mold growth in the future.

Appendix A: Photographs

Photo 1: Sample # 1-2: AHU-1 Fan blade, far side MSFV= 5179; over greased bearings with heavy debris

Photo 2: Sample # 1-4: AHU-1 Power line to blow motor, MSFV= 7903; Category IV Aspergillus/Penicillium on plastic coating of electrical cable inside AHU

Photo 3: Sample # 1-5: VAV F1-1 Damper MSFV= 4312, Heavy debris, located in hallway floor near Rm B008

Photo 4: Sample # 1-8: VAV F1-1 HP Flex supply duct MSFV= 2086, Located in hallway floor near Rm B008

Photo 5: Sample # 1-9: VAV F1-1 LP Isolation vibration material MSFV= 185, Located in hallway floor near Rm B008

Photo 6: Sample # 2-1: AHU-2 Fan blade, far side MSFV= 7211

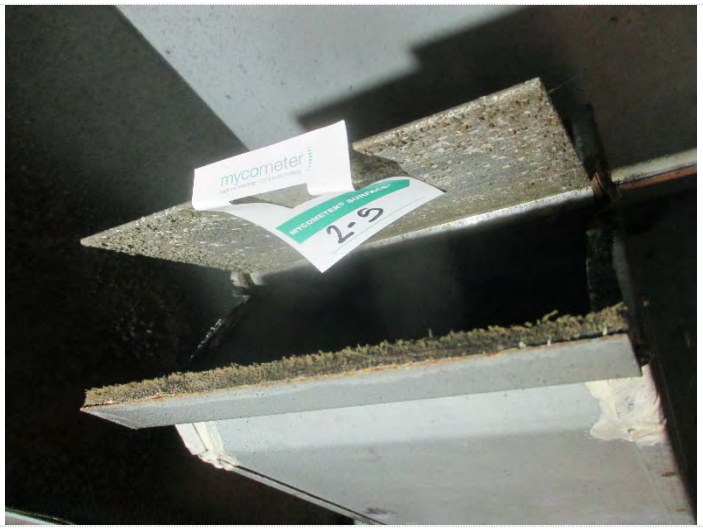

Photo 7: Sample # 2-5: VAV F2-2, Hallway damper, near Rm 108; MSFV= 6971

Photo 8: Sample # 2-7: VAV F2-2, Fan blade, near Rm 108; MSFV= 145

Photo 9: Sample # 2-8: VAV F2-2, LP Isolation vibration material, near Rm 108; MSFV= 28909

Photo 10: Sample # 2-10: Dust from the top of the ceiling tile near VAV F2-2;
Category IV Mold growth of Penicillium/Aspergillus and Cladosporium Growth in Dust Deposits

Photo 11: Sample # 3-1: AHU-3 Fan blade, far side MSFV= 2726, Heavy debris with evidence of over greased bearings

Photo 12: Sample # 3-4: AHU-3 Side panel with grease deposits, MSFV= 5

Photo 13: Sample # 3-8: VAV F3-3, Rm 108 Internal side; MSFV= 59, Old inactive Mold Growth Category IV Aspergillus/Penicillium and Chaetomium

Photo 14: Sample # 3-9: VAV F3-3: Rm 108 Damper; MSFV= 12037

Photo15: Sample # 3-10: VAV F3-3: Rm 108 Flex supply duct; MSFV= 6046

Photo 16: Sample # 4-1: AHU-4 Supply chamber outlet, top wall; MSFV= 322, (2nd floor) Above blower wheel

Photo 17: Sample # 4-2: Main supply trunk, access hatch near mechanical room entrance, MSFV= 797, Deposited mold growth shed from fan; Category III Cladosporium and Pen/Asp

Photo 18: Sample # 4-3: Mechanical room flex duct from main supply trunk, MSFV= 10519

Photo 19: Sample # 4-5: VAV 4-11, Rm 225B Flex thermo fin, upstream of HP; MSFV= 2312, Mold Growth Category IV Aspergillus/Penicillium on internal metal surface of Thermo fin flexible duct

Photo 20: Sample # 4-6: VAV 4-11, Rm 225B Damper MSFV= 10944,
Heavy debris and Mold Growth Category IV Cladosporium with moderate deposits of Aspergillus/Penicillium

Photo 21: Sample # 4-7: VAV 4-11: Rm 225B Side panel; MSFV= 4862

Photo 22: Sample # 4-8: VAV 4-11: Rm 225B Isolation vibration material, LP side; MSFV= 21403, Category II Aspergillus/Penicillium and Chaetomium

Photo 23: Sample # 4-9: VAV 4-11: Rm 225 Metal supply duct; MSFV= 145; Category II Aspergillus/Penicillium and Alternaria

Photo 24: Sample # 5-2: AHU-5 Fan blade; MSFV= 265 Rust, grease stains

Photo 25: Sample # 5-3: AHU-5 Isolation vibration material, MSFV= 136, SMG

Photo 26: Sample # 5-4: AHU-5 Supply outlet turning vein, MSFV= 148, In Mech. Room

Photo 27: Sample # 5-5: Reheat unit, inlet side of heating coils, MSFV= 4384, Category IV Acremonium Mold Growth (Excessive debris on coils of re-heat) before cleaning

Photo 28: Sample # 5-6: Rm 326 Supply flex duct MSFV= 898, "Cleaned"

Photo 29: Sample # 5-8 Rm 318 VAV Cooling unit, inlet MSFV= 33, Dirty, had to bend filter to move it

Photo 30: Sample # 5-11 Rm 316 Flex supply duct outlet MSFV= 184

Photo 31: Sample # 5-14 Rm 332C LP Metal supply duct MSFV=45

Photo 32: Sample # 5-15 Corner hallway base of HP supply duct, near turning vein; MSFV=30, Near stairway stairs

Photo 33: Sample # 6-3: AHU-6 HP supply duct plenum; MSFV= 16

Photo 34: Sample # 6-4: AHU-6 Main metal supply duct to hallway; MSFV= 40

Photo 35: Sample # 6-6: Reheat Unit C6-6 LP Metal Supply Duct pass Rm 440 VAV; MSFV= 35, Category IV Old, inactive mold growth Cladosporium

Photo 36: Sample # 6-10: Rm 442E LP Metal supply duct MSFV= 40

Photo 37: Sample # 220-1: Room 220 Column built-in bookshelf, front;
Category II Low density mold growth of Aspergillus/Penicillium and Cladosporium

Photo 38: Sample # 328-3: Room 328 Built-in Bookshelf, Back Cover
Category IV Mold Growth of Cladosporium

Photo 39: Sample # 420-3: Room 420 Built-in bookshelf, Underside (bottom); Category IV
Mold Growth of Aspergillus and Penicillium

Photo 40: Sample # GM-1: Gym floor mat backside surface, Mat #4 from left MSFV= 6077
Category II Vegetative mold growth (Asp/Pen-like) due to moisture through slab or water damage from flooding reported, Mat # 4 from left- facing emergency exit door

Photo 41: Sample # GM-2: Gym floor mat backside surface, Mat 14 from left MSFV= 7731
Category II Vegetative mold growth (Asp/Pen-like) due to moisture through slab or water damage from flooding reported, Mat # 1 from left- facing emergency exit door

Photo 42: Sample # RT-1: Rooftop AHU cooling coils inlet MSFV= 0, Access from 411 Mech Rm

Photo 43: Sample # RT-2: Rooftop AHU Fan blade MSFV= 4, Access from 411 Mech Rm

Appendix B: Sample Results

Mycometer® surface Fungi

Fungi on surfaces

Sample Number	Sample Description	Blank value (BV)	Analysis value (AV)	Mycometer-surface Fungi value MSFV= (AV-BV)
5-1	AHU-5 Cooling Coils, Inlet	21	60	39
5-2	AHU-5 Fan Blade	38	303	265
5-3	AHU-5 Isolation Vibration Material	22	158	136
5-4	AHU-5 Supply Outlet Turning Vein	19	167	148
5-5	Reheat Unit, Inlet side of heating coils	19	4403	4384
5-6	Rm 326 Supply Flex Duct	17	915	898
5-7	Rm 318 HP Supply Flex Duct	24	27	3
5-8	Rm 318 VAV Cooling Coil, Inlet	22	55	33
5-9	Rm 318 VAV Outlet LP Metal Supply Duct	20	95	75
5-10	Rm 316 VAV Outlet LP Metal Supply Duct	23	115	92
5-11	Rm 316 Flex Supply Duct Outlet	19	203	184
5-12	Rm 316 VAV Cooling Coil Inlet	22	69	47
5-13	Rm 332 VAV F-56 Cooling Coil Inlet	19	56	37
5-14	Rm 332C LP Metal Supply Duct	19	64	45
5-15	Corner Hallway Base of HP Supply Duct, near turning vein	20	50	30
4-1	AHU-4 Supply Chamber Outlet, Top wall	21	343	322
4-2	Main Supply Trunk, Access Hatch near Mech Rm Entrance	23	820	797
4-3	Mech. Rm Flex Duct from Main Supply Trunk	22	10541	10519
RT-1	Rooftop AHU Cooling Coils, Inlet	19	19	0

Analysis	***Sampling***
Room Temp: 71.8°F	**Date of Sampling:** 2/22 -2/23/2022
Reaction Time: 32.04 mins	**Sampled By:** DK and RJ
Analysed By: Shaiasia Erickson	**Instrument Standard value:** 602 **Standard Value measured:** 0.0

Mycometer® surface Fungi

Fungi on surfaces

Sample Number	Sample Description	Blank value (BV)	Analysis value (AV)	Mycometer-surface Fungi value MSFV= (AV-BV)
RT-2	Rooftop AHU Fan Blade	9	13	4
4-4	Distal HP Metal Supply Duct, Near Rm 207	11	93	82
4-5	Rm 225B VAV 4-11 Flex Thermo Fin, Upstream of HP	13	2325	2312
4-6	Rm 225B VAV 4-11 Damper	10	10954	10944
4-7	Rm 225B VAV 4-11 Side Panel	10	4872	4862
4-8	Rm 225B VAV 4-11 Isolation Vibration Material, LP side	10	21413	21403
4-9	Rm 225 VAV 4-11 LP Metal Supply Duct	10	155	145
4-10	VAV 4-11 Blower fan	11	102	91
4-11	VAV 4-11 Coil, Inlet	9	92	83
4-12	Rm 242J VAV F-17 Isolation Vibration Material, Post Clean	6	14	8
3-1	AHU-3 Fan Blade, Far side	10	2736	2726
3-2	AHU-3 Isolation Vibration Material	10	21	11
3-3	AHU-3 Cooling Coils, Outlet	10	29	19
3-4	AHU-3 Side Panel with Grease Deposits	10	15	5
3-5	Rm 108 VAV F3-3 Coils, Inlet	10	55	45
3-6	Rm 108 VAV F3-3 Fan Blade	9	98	89
3-7	Rm 108 VAV F3-3 LP Metal Supply Duct	10	26	16
3-8	Rm 108 VAV F3-3 Internal Side	10	69	59
3-9	Rm 108 VAV F3-3 Damper	10	12047	12037
3-10	Rm 108 VAV F3-3 HP Flex Supply Duct	11	6057	6046

Analysis	***Sampling***
Room Temp: 71.8°F	**Date of Sampling:** 2/22 -2/23/2022
Reaction Time: 32.04 mins	**Sampled By:** DK and RJ
Analysed By: Shaiasia Erickson	**Instrument Standard value:** 602 **Standard Value measured:** 0.0

Mycometer® surface Fungi

Fungi on surfaces

Sample Number	Sample Description	Blank value (BV)	Analysis value (AV)	Mycometer-surface Fungi value MSFV= (AV-BV)
6-1	AHU-6 Heating Coils, Inlet	25	29	4
6-2	AHU-6 Cooling Coils, Inlet	23	31	8
6-3	AHU-6 HP Supply Duct Plenum	29	45	16
6-4	AHU-6 Main Metal Supply Duct to Hallway	23	63	40
6-5	Hallway HP Supply Flex Duct into Rm 440 VAV	21	21	0
6-6	Reheat Unit C6-6 LP Metal Supply Duct pass Rm 440 VAV	24	64	40
6-7	Reheating Unit # C6-B Side Wall, Near Rm 440	23	38	15
6-8	Reheating Unit Side Wall, Near Rm 423	23	35	12
6-9	Reheating Unit #C4-A Inlet of Coils, Near Rm 442	22	33	11
6-10	Rm 442E LP Metal Supply Duct	27	212	185
2-1	AHU-2 Fan Blade, Far side	23	7234	7211
2-2	AHU-2 Isolation Vibration Material	26	37	11
2-3	AHU-2 Cooling Coils, Outlet	22	29	7
2-4	AHU-2 Top Panel with Grease Deposit	25	26	1
2-5	Hallway VAV F2-2 Damper, Near Rm 108	25	6996	6971
2-6	VAV F2-2 Side Cabinet Wall, Near Rm 108	24	154	130
2-7	VAV F2-2 Fan Blade, Near Rm 108	24	169	145
2-8	VAV F2-2 LP Isolation Vibration Material, Near Rm 108	14	28923	28909
2-9	VAV F2-2 Coils, Inlet, Near Rm 108	26	136	110

Analysis	***Sampling***
Room Temp: 75.4°F	**Date of Sampling:** 2/22 -2/23/2022
Reaction Time: 28:05 mins	**Sampled By:** DK and RJ
Analysed By: Shaiasia Erickson	**Instrument Standard value:** 602 **Standard Value measured:** 0.0

Mycometer® surface Fungi

Fungi on surfaces

Sample Number	Sample Description	Blank value (BV)	Analysis value (AV)	Mycometer-surface Fungi value MSFV= (AV-BV)
1-1	AHU-1 Cooling Coils, Inlet	34	52	18
1-2	AHU-1 Fan Blade, Far side	12	5191	5179
1-3	AHU-1 Isolation Vibration Material	8	11	3
1-4	AHU-1 Power Line to Blower Motor	11	7914	7903
1-5	VAV F1-1 Damper	12	4324	4312
1-6	VAV F1-1 Fan Blade	10	58	48
1-7	VAV F1-1 Side Panel Wall	12	51	39
1-8	VAV F1-1 HP Flex Supply Duct	11	2097	2086
1-9	VAV F1-1 LP Isolation Vibration Material	12	197	185
1-10	VAV F1-1 LP Metal Supply Duct	7	24	17
GM-1	Gym Floor Mat Backside Surface, Mat # 4 from left	11	6088	6077
GM-2	Gym Floor Mat Backside Surface, Mat # 1 from left	11	7742	7731

Analysis	***Sampling***
Room Temp: 76.6°F	**Date of Sampling:** 2/22 -2/23/2022
Reaction Time: 26:18 mins	**Sampled By:** DK and RJ
Analysed By: Shaiasia Erickson	**Instrument Standard value:** 602 **Standard Value measured:** 0.0

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Laboratory Analysis Report

AEMTEK No. 22021750

Submitted to: **HC3 Healthcare Consulting and Contracting**
2976 Wellington Circle W.,
Tallahassee, FL 32309
Attn: **David Krause**

Purpose: The purpose of this report is to present laboratory results obtained by analyzing the samples submitted to Aemtek, Inc. The report includes this cover and the data sheet(s).

Limitation: The test results presented in this report are only related to the samples supplied by the client and analyzed by Aemtek. This report shall not be reproduced, except in full, without written authorization of Aemtek. Aemtek shall have no liability to anyone with respect to any interpretations or uses of the laboratory report, decisions made or actions taken as a result of or based on the data reported. In no event shall Aemtek's liability with respect to the reported test results exceed the amount paid for the project by the client to Aemtek.

Sample Information: Sample identification, location, volume, weight, and area are from the client's Chain of custody. Unless specifically noted, the samples were received in acceptable condition.

Significant Figures: Because of the nature of the biological samples and analytical methods, the number of significant figures should generally be one of two, although the actual calculation results are reported.

Sample Custody: Samples accepted by Aemtek shall remain the property of client while in the custody of Aemtek. Aemtek shall retain preparation of samples for 7 days following the date of issuing this report. After the retention period, the samples shall be sterilized and discarded, unless otherwise requested by the client.

Confidentiality: Aemtek shall not provide analytical results or client's project information to any party other than the client, unless requested by the client, in writing, or by law.

About Aemtek: Aemtek, Inc. is an environmental microbiology laboratory providing reliable, fast, and expert laboratory services for the detection, identification, and analysis of microorganisms. We are committed to excellence in quality, service, and technology. The laboratory is accredited by the American Industrial Hygiene Association (AIHA) in the Environmental Microbiology Laboratory Accreditation Program (EMLAP Lab #167620).

Project ID: **PJ22005**

Project Location: **Sandels**

Client Sampling Date: **2/22/2022**

Sample Received on: **2/25/2022**

Analysis Started on: **2/25/2022**

Data Reported on: **3/1/2022**

Approved By:

Thomas Giang
Laboratory Manager

Laboratory Analysis Report

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E-mail: labreports@aemtek.com
www.aemtek.com

Data Sheet

AEMTEK No. 22021750

Project ID: PJ22005
Project Location: Sandels

Submitted to:
HC3 Healthcare Consulting and Contracting
Tallahassee, FL 32309

Analysis Performed: Fungal Direct Examination-BDST

Sample ID	1-4	1-7	2-10	3-8	4-2
Sample Location	1-4	1-7	2-10	3-8	4-2
Sample Type	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT
Fungal Identification	Characterization	Characterization	Characterization	Characterization	Characterization
Acremonium	-	-	-	-	-
Alternaria	-	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus	-	-	IV	-	-
Aspergillus/*Penicillium*-like	IV	III	IV	IV	II
Aureobasidium	-	-	-	-	-
Basidiospores	-	-	-	-	-
Bipolaris Dreschlera	-	-	-	-	-
Botrytis	-	-	-	-	-
Ceratocystis/*Ophiostoma*	-	-	-	-	-
Chaetomium	-	-	-	IV	I
Cladosporium	-	II	IV	-	II
Curvularia	-	-	-	I	-
Epicoccum	-	-	-	I	-
Mucor	-	-	-	-	-
Myxomycetes/*Periconia*/Rust/Smut	-	-	-	-	I
Nigrospora	-	-	-	-	-
Penicillium	IV	-	-	-	-
Petriella	-	-	-	-	-
Pithomyces	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Stemphylium	-	-	-	-	-
Ulocladium	-	-	-	-	-
Other hyaline spores	-	-	-	-	I
Other colored spores	-	-	-	-	I
Hyphal fragments	IV	III	IV	IV	I

Method ID: SOP AF102
Direct microsopy detection limit: One spore or one hyphal fragment per sample.
Data Interpretation Guideline:

Rare:	1 to 10 spores observed per sample preparation
Some:	11 to 30 spores observed per sample preparation
Common:	31-60 spores observed per sample preparation
Many:	61 to 100 spores observed per sample preparation
Abundant:	More than 100 spores observed per sample preparation
TNTC:	Too numerous to count, but no fruiting structure observed
Colony:	Abundant or numerous spores and associated fruiting structures observed
*:	Spores associated with hyphae and/or fruiting structures
None Detected:	No spore or hyphal fragment observed per sample preparation

Performed by: Cecilia Stoltz

Laboratory Analysis Report

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Data Sheet

AEMTEK No. 22021750

Project ID: PJ22005
Project Location: Sandels

Submitted to:
HC3 Healthcare Consulting and Contracting
Tallahassee, FL 32309

Analysis Performed: Fungal Direct Examination-BDST

Sample ID	4-5	4-6	4-8	4-9	5-5
Sample Location	4-5	4-6	4-8	4-9	5-5
Sample Type	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT
Fungal Identification	Characterization	Characterization	Characterization	Characterization	Characterization
Acremonium	-	-	-	-	IV
Alternaria	-	-	-	I	-
Ascospores	-	-	-	-	-
Aspergillus	IV	-	-	-	-
Aspergillus/Penicillium-like	IV	III	II	II	II
Aureobasidium	-	-	-	-	-
Basidiospores	I	-	-	-	-
Bipolaris Dreschlera	-	-	-	-	-
Botrytis	-	-	-	-	-
Ceratocystis/Ophiostoma	-	-	-	-	-
Chaetomium	-	-	I	-	-
Cladosporium	I	IV	-	-	-
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Mucor	-	-	-	-	-
Myxomycetes/*Periconia*/Rust/Smut	-	-	-	-	-
Nigrospora	-	-	-	-	-
Penicillium	-	-	-	-	-
Petriella	-	-	-	-	-
Pithomyces	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Stemphylium	-	-	-	-	-
Ulocladium	-	-	-	-	-
Other hyaline spores	-	-	-	I	-
Other colored spores	-	-	I	I	-
Hyphal fragments	IV	IV	II	I	IV

Method ID: SOP AF102
Direct microsopy detection limit: One spore or one hyphal fragment per sample.
Data Interpretation Guideline:

Rare:	1 to 10 spores observed per sample preparation
Some:	11 to 30 spores observed per sample preparation
Common:	31-60 spores observed per sample preparation
Many:	61 to 100 spores observed per sample preparation
Abundant:	More than 100 spores observed per sample preparation
TNTC:	Too numerous to count, but no fruiting structure observed
Colony:	Abundant or numerous spores and associated fruiting structures observed
*:	Spores associated with hyphae and/or fruiting structures
None Detected:	No spore or hyphal fragment observed per sample preparation

Performed by: Cecilia Stoltz

Laboratory Analysis Report

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Data Sheet

AEMTEK No. 22021750

Project ID: PJ22005
Project Location: Sandels

Submitted to:
HC3 Healthcare Consulting and Contracting
Tallahassee, FL 32309

Analysis Performed: Fungal Direct Examination-BDST

Sample ID	6-6	GM-1	GM-2	220-1	220-2
Sample Location	6-6	GM-1	GM-2	220-1	220-2
Sample Type	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT
Fungal Identification	Characterization	Characterization	Characterization	Characterization	Characterization
Acremonium	-	-	-	-	-
Alternaria	-	-	I	-	-
Ascospores	-	-	-	-	-
Aspergillus	-	-	-	-	-
Aspergillus/*Penicillium*-like	-	II	II	II	-
Aureobasidium	-	-	-	-	-
Basidiospores	-	I	-	I	I
Bipolaris Dreschlera	-	-	I	-	I
Botrytis	-	-	-	-	-
Ceratocystis/*Ophiostoma*	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	IV	I	II	II	IV
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Mucor	-	-	-	-	-
Myxomycetes/*Periconia*/Rust/Smut	-	I	-	-	-
Nigrospora	-	-	-	-	-
Penicillium	-	-	-	-	-
Petriella	-	-	-	-	-
Pithomyces	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Stemphylium	-	-	-	-	-
Ulocladium	-	-	-	-	-
Other hyaline spores	-	I	I	I	-
Other colored spores	-	I	I	II	-
Hyphal fragments	IV	II	II	II	IV

Method ID: SOP AF102
Direct microsopy detection limit: One spore or one hyphal fragment per sample.
Data Interpretation Guideline:

Rare:	1 to 10 spores observed per sample preparation
Some:	11 to 30 spores observed per sample preparation
Common:	31-60 spores observed per sample preparation
Many:	61 to 100 spores observed per sample preparation
Abundant:	More than 100 spores observed per sample preparation
TNTC:	Too numerous to count, but no fruiting structure observed
Colony:	Abundant or numerous spores and associated fruiting structures observed
*:	Spores associated with hyphae and/or fruiting structures
None Detected:	No spore or hyphal fragment observed per sample preparation

Performed by: Cecilia Stoltz

Laboratory Analysis Report

AEMTEK, Inc.
466 Kato Terrace, Fremont, CA 94539
Tel. +1 (510) 979-1979, Fax. +1 (510) 667-1980
E-mail: labreports@aemtek.com
www.aemtek.com

Data Sheet

AEMTEK No. 22021750

Project ID: PJ22005
Project Location: Sandels

Submitted to:
HC3 Healthcare Consulting and Contracting
Tallahassee, FL 32309

Analysis Performed: Fungal Direct Examination-BDST

Sample ID	220-3	328-1	328-2	328-3	420-1
Sample Location	220-3	328-1	328-2	328-3	420-1
Sample Type	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT	TAPELIFT
Fungal Identification	Characterization	Characterization	Characterization	Characterization	Characterization
Acremonium	-	-	-	-	-
Alternaria	I	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus	-	-	-	-	-
Aspergillus/*Penicillium*-like	II	-	-	-	-
Aureobasidium	-	-	-	-	-
Basidiospores	-	-	-	I	-
Bipolaris Dreschlera	-	-	-	-	-
Botrytis	-	-	-	-	-
Ceratocystis/*Ophiostoma*	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	IV	IV	IV	IV	-
Curvularia	I	-	-	I	-
Epicoccum	-	-	-	-	-
Mucor	-	-	-	-	-
Myxomycetes/*Periconia*/Rust/Smut	I	-	-	-	-
Nigrospora	I	-	-	-	-
Penicillium	-	-	-	-	-
Petriella	-	-	-	-	-
Pithomyces	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Stemphylium	-	-	-	-	-
Ulocladium	-	-	-	-	-
Other hyaline spores	I	I	I	II	-
Other colored spores	I	-	-	I	-
Hyphal fragments	IV	IV	IV	IV	II

Method ID: SOP AF102
Direct microsopy detection limit: One spore or one hyphal fragment per sample.
Data Interpretation Guideline:

Rare:	1 to 10 spores observed per sample preparation
Some:	11 to 30 spores observed per sample preparation
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Performed by: Cecilia Stoltz

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Laboratory Analysis Report

Data Sheet

AEMTEK No. 22021750

Project ID: PJ22005
Project Location: Sandels

Submitted to:
HC3 Healthcare Consulting and Contracting
Tallahassee, FL 32309

Analysis Performed: Fungal Direct Examination-BDST

Sample ID	420-2	420-3
Sample Location	420-2	420-3
Sample Type	TAPELIFT	TAPELIFT
Fungal Identification	Characterization	Characterization
Acremonium	-	-
Alternaria	-	-
Ascospores	-	-
Aspergillus	-	-
Aspergillus/Penicillium-like	I	IV
Aureobasidium	-	-
Basidiospores	I	-
Bipolaris Dreschlera	-	-
Botrytis	-	-
Ceratocystis/Ophiostoma	-	-
Chaetomium	-	I
Cladosporium	IV	-
Curvularia	-	-
Epicoccum	I	-
Mucor	-	-
Myxomycetes/*Periconia*/Rust/Smut	-	-
Nigrospora	-	-
Penicillium	-	IV
Petriella	-	-
Pithomyces	-	-
Stachybotrys	-	-
Stemphylium	-	-
Ulocladium	-	-
Other hyaline spores	-	-
Other colored spores	-	-
Hyphal fragments	IV	IV

Method ID: SOP AF102
Direct microsopy detection limit: One spore or one hyphal fragment per sample.
Data Interpretation Guideline:

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None Detected:	No spore or hyphal fragment observed per sample preparation

Performed by: Cecilia Stoltz

Sample Type Codes	
A - Air	B - Bulk
C - Culture	D - Dust
S - Swab	T - Tape
W - Water	Other:

Analysis Codes

FDE - Fungi Direct Exam: identifying fungi to genus or spore type. Rush services available.

FCG - Fungi Culturable, identified to Genus only.

FCS - Fungi Culturable, common Species identification without subculturing.

EBC - Environmental Bacteria Count and group/genus ID

SSC - Sewage Screen for total coliforms, *E. coli*, and enterococci. Please specify qualitative or quantitative.

Legionella

LG-C - *Legionella* Culturable

Legiolert - *L.pneumophila* Detection

LG-QPCR - *L.pneumophila* screen

Fungal QPCR Panels:

Health Care 46 - 46 species

Indoor Mold Panel - 22 species

Pathogenic *Aspergillus* spp.

Metagenomic Sequencing

16S - Bacteria **ITS** - Fungi *To request both write: 16S & ITS*

Turn Around Time

STD - standard/default, 7 days for culturable, 2-5 days for bacterial analysis.

Rush - not available for culturables

WH - Weekend or holiday service. Prior notice required.

FDE Only TAT Options

STD - 2 days	**3H** - 3 hours
SD - Same Day	**1D** - 1 day

AEMTEK

CHAIN OF CUSTODY

Industrial Hygiene Testing

Aemtek No.: 22021750

ıail: labreports@aemtek.com AEMTEK Environmental Lab 466 Kato Terrace, Fremont, CA 94539 Phone: 510-979-1979 Fax: 510-668-19

Contact Information		Project Information	
Company: Healthcare Consulting and Contracting (HC3)	Contact: David Krause	Project: PJ22005	
Address: 2976 Wellington Circle W., Tallahassee, FL 32309		Site: Sandels	
Phone: 850-766-1938	E-mail: DKrause@HC3FL.com		
Email for reporting: SErickson@HC3FL.com / DKrause@HC3FL.com / Rjeans@HC3FL.com		Sampled by: DK / RJ	Sampling Date: 2/22 - 2/23/2022

Sample ID	Sampling Location	Weight (g), Volume (L) or Area (sq. in.)	Analysis Requested	Sample Type	Turn Around Time	Notes / List of Target PCR Species (If applicable)
			Please use the codes on the right or specify			
GM-2			FDE	T	STD	Report in the following
220-1			FDE	T	STD	categories:
220-1			FDE	T	STD	
220-3			FDE	T	STD	I = 1-10 spores per cm^2
328-1			FDE	T	STD	II = 10-100 spores per cm^2
328-2			FDE	T	STD	III = 100-1,000 spores per cm^2
328-3			FDE	T	STD	IV = >1,000 spores per cm^2
420-1			FDE	T	STD	
420-2			FDE	T	STD	
420-3			FDE	T	STD	

Relinquished by		Submit Samples To:	Notes:	Received by AEMTEK: Date & Time
sign Shalasa Erickson	date 2/24/22	AEMTEK Sample Receiving Attn: Environmental Lab 466 Kato Terrace Fremont, CA 94539		2/25/22 11:15
print Shalasa Erickson	time 3:00pm			

Call 510-979-1979 or email lab@aemtek.com with your specific analytical needs and concerns. To ensure analytical integrity, we reserve the right to reject inappropriately prepared/shipped samples. All analytical services subject to our standard terms and conditions. **Swab, culture plates and water samples should be shipped overnight and cold.** If no turn around time indicated, standard report time applies. Samples received after 5:00 pm on business days or in the weekend will be logged in the next business day. For "same day" service, samples must be received before 10 am; for "same day", 12:00 pm; for "3 hours". Our business hours are 8:00 am - 5:00 pm, PST, Monday - Friday. Contact the lab to arrange weekend or holiday analysis. For sampling and shipping information, please visit www.aemtek.com.

Sample Type Codes	
A - Air	B - Bulk
C - Culture	D - Dust
S - Swab	T - Tape
W - Water	Other:

Analysis Codes

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SSC - Sewage Screen for total coliforms, *E. coli*, and enterococci. Please specify qualitative or quantitative.

Legionella

LG-C - *Legionella* Culturable

Legiolert - *L.pneumophila* Detection

LG-QPCR - *L.pneumophila* screen

Fungal QPCR Panels:

Health Care 46 - 46 species

Indoor Mold Panel - 22 species

Pathogenic *Aspergillus* spp.

Metagenomic Sequencing

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ITS - Fungi
To request both write: 16S & ITS

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AEMTEK

CHAIN OF CUSTODY

Industrial Hygiene Testing

Aemtek No.: 22021750

ıail: labreports@aemtek.com AEMTEK Environmental Lab 466 Kato Terrace, Fremont, CA 94539 Phone: 510-979-1979 Fax: 510-668-19

Contact Information

Company: Healthcare Consulting and Contracting (HC3) Contact: David Krause

Address: 2976 Wellington Circle W., Tallahassee, FL 32309

Phone: 850-766-1938 E-mail: DKrause@HC3FL.com

Email for reporting: SErickson@HC3FL.com / DKrause@HC3FL.com / Rjeans@HC3FL.com

Project Information

Project: PJ22005

Site: Sandels

Sampled by: DK / RJ

Sampling Date: 2/22 - 2/23/2022

Sample ID	Sampling Location	Weight (g), Volume (L) or Area (sq. in.)	Analysis Requested	Sample Type	Turn Around Time	Notes / List of Target PCR Species (If applicable)
			Please use the codes on the right or specify			
1-4			FDE	T	STD	Report in the following
1-7			FDE	T	STD	categories:
2-10			FDE	T	STD	
3-8			FDE	T	STD	I = 1-10 spores per cm^2
4-2			FDE	T	STD	II = 10-100 spores per cm^2
4-5			FDE	T	STD	III = 100-1,000 spores per cm^2
4-6			FDE	T	STD	IV = >1,000 spores per cm^2
4-8			FDE	T	STD	
4-9			FDE	T	STD	
5-5			FDE	T	STD	
6-6			FDE	T	STD	
GM-1			FDE	T	STD	

Relinquished by

sign Shalaska Erickson — date 2/24/22

print Shalaska Ericksen — time 3:00pm

Submit Samples To:

AEMTEK Sample Receiving
Attn: Environmental Lab
466 Kato Terrace
Fremont, CA 94539

Notes:

Received by AEMTEK: Date & Time

Shalaska Erickson 2/25/22 11:15

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