



Department of Occupational Safety and Health
Ministry of Human Resources Malaysia

**GUIDELINES
ON CONTROL OF**

MOLDS

**CONTAMINATION
AND REMEDIATION**

2019

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PREFACE

These Guidelines are cited as the Guidelines on Control of Molds Contamination and remediation. The Guidelines provide information and recommendations on how to control of molds contamination and remediation in building and in line with the Industry Code of Practice on Indoor Air Quality, 2010 (ICOP IAQ 2010).

Occupiers are also required to read these Guidelines in conjunction with the ICOP IAQ 2010 so that it would help them in fulfilling the relevant requirements in a comprehensive and integrated approach.

Occupiers must understand the rationale for and the importance of controlling molds and appropriate method for molds remediation in their building, as this would minimize if not eliminate the associated occupational illnesses or diseases due to molds contamination.

These Guidelines will be continuously reviewed and improved in order to guide indoor air quality management in the building, to promote healthy indoor working environment.

I would like to thanks and acknowledge those who have assisted in the development of these Guidelines.

Director General
Department of Occupational Safety and Health
Ministry of Human Resources
Malaysia
2019

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TERMS AND DEFINITIONS

Allergen	A substance, such as mold, that can cause an allergic reaction.
Biological molds sampling	An analytical activity to determine whether the molds present in a particular environment are affecting or causing adverse health effects.
Domestic building	Building constructed, used or intended to be used for habitation but excluding the use of it for a hotel, guest-house, boarding-house, hostel, dormitory or similar accommodation and the expression “domestic purposes” is interpreted accordingly.
Germinate	To sprout or grow.
Mold	A group of organisms that belong to the fungi kingdom. In this context, the terms fungi and mold are used interchangeably.
Trained mold remediation worker	A person involves in molds remediation at the workplace and successfully attended molds remediation training.

Trained mold remediation supervisor	A person appointed by the occupier to coordinate and supervise molds remediation at the workplace and successfully attended molds remediation training.
Mycotoxin	A toxin produced by a mold.
Occupant	Any person in a place of work, and include an employee, client, patient, resident, patron, student, visitor or guest.
Occupier	A person who has the management or control of the place of work including building owner and building management.
Volatile Organic Compounds (VOCs)	Organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure.

CHAPTER 1

INTRODUCTION

1.1 Purpose

The Guidelines provide information and recommendations on how to control of molds contamination and remediation in building and in line with ICOP IAQ 2010.

General duties as prescribed under the Occupational Safety and Health Act 1994 [Act 514] for the employer and an occupier to provide a safe workplace to their employees or other person than his employees (occupant).

Hence, the objective of this document is to provide a brief guidance to be applied by the occupier of the building to prevent or minimise mold contamination.

1.2 Application and Scope

These Guidelines apply to all buildings or any part of the building where contamination of mold exist and there are persons at work, except domestic building.



Mold Contamination in a Basement

CHAPTER 2

WHAT IS MOLD?

2.1 Background

The number of reported cases of mold growth found in the office buildings, schools, automobiles and other locations where organic matter and water are left unattended has been increasing due to the lack of awareness among the public. The reality is that, if this problem is left unaddressed, it will affect the overall building operation and functionality. Mold growth in building greatly affects the indoor air quality. Besides odor problems, mold sometimes causes irreparable damage to the furniture, wall finishes, expensive equipment and worse still it is hazardous to health.

Malaysia which is located in the tropical region, does have a hot weather and high humidity. This environment introduces moisture and humid air which encourage the growth of mold whether inside or outside the buildings.

The key to limiting mold exposure is to prevent the germination and growth of mold. Individuals, property owners, building management, building maintenance personnel, architects, hospital administrator and building contractors need to know effective means of avoiding mold growth which might arise from building design, material selection, construction and maintenance practices. Likewise, effective means of locating and cleaning existing mold growths are essential to reduce the health effects of mold contamination.

2.2 Mold Organism

Molds are the most typical form of fungus found on earth. Other fungi include yeasts and mushrooms. Molds are essential decomposer of organic substances necessary for sustaining plant and animal life. Molds are made up of masses of filament-like cells called hyphae. Under appropriate conditions, hyphae would grow into long intertwining strings that form the main body of the fungus, or the mycelium.

This mycelium is visible to human eye. Molds reproduce via spores. However, molds can also spread if a fragment of broken hyphae is transplanted to an area with adequate moisture and organic matter for food.

There are several types of mold that exist in indoor environment such as:

- i. Cladosporium
- ii. Penicillium
- iii. Alternaria
- iv. Aspergillus

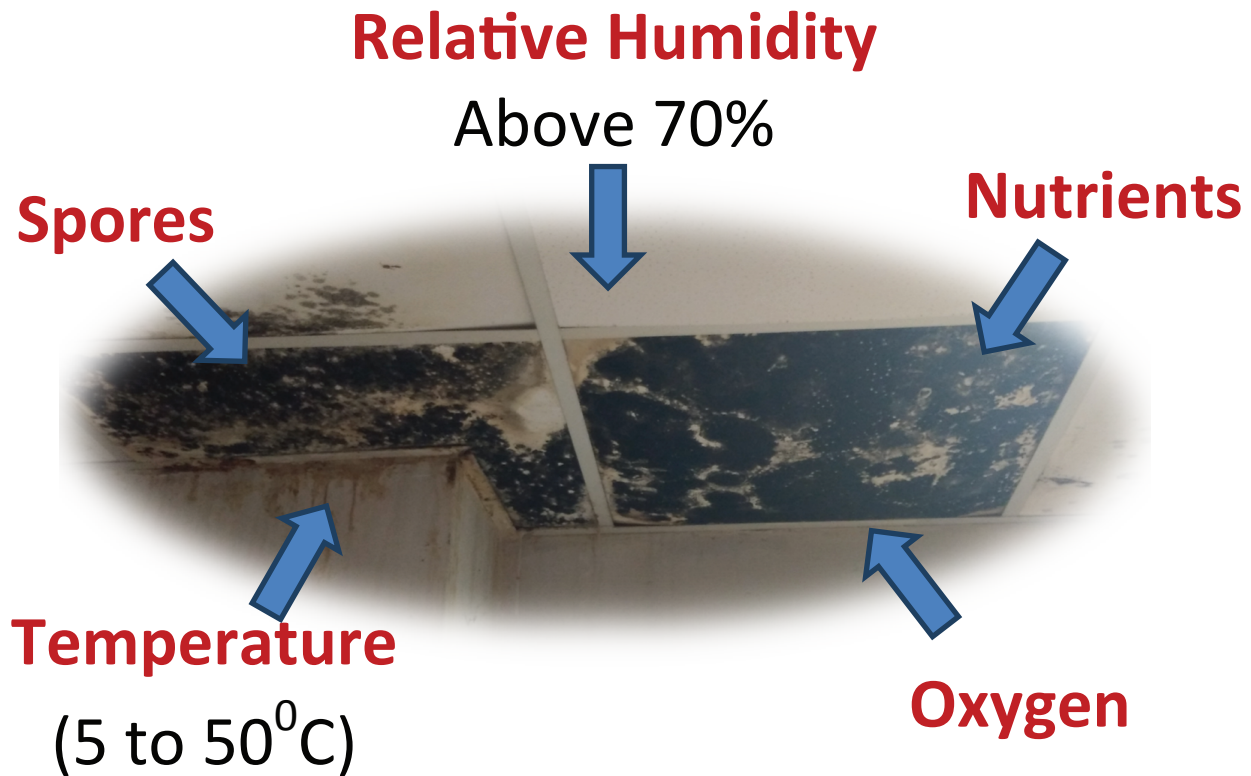
2.3 Cause of Mold Growth

Molds are incredibly resilient and adaptable. Molds gain the nutrients they need through the decomposition of organic matter. Most molds found in indoor air are saprotrophic, meaning they gather their food from dead moist organic matter such as wood, paper, paint, fabric, plant soil, dust, and cooked or raw foods. Molds can also grow on surface of damp inorganic matter such as glass and bare concrete covered by an invisible biofilm.

In general, there are few factors as shown in Figure 1 that contribute to mold growth in built environment:

- i. Mold spores – which are readily available in the air;
- ii. Nutrient – such as dirt, dust cellulose and starch;
- iii. Temperature range between 5°C to 50°C;
- iv. Relative humidity consistently above 70%; and
- v. Oxygen.


Figure 1: Mold Factors Diagram (JKR, 2009)



Air with high moisture content constitutes one of the key elements for mold growth. Therefore, to prevent mold growth, all possible factors that can introduce excess moisture into a building should be identified and eliminated. Low surface temperature (below dew point temperature) of the air adjacent to the wall and/or floor slab would cause condensation on the surface and if left unattended, will become ideal breeding grounds for mold to grow.

All molds need food source, undisturbed water and time to germinate and grow. Some molds can germinate in as little as four to twelve hours. Left undisturbed, mold can grow and spread in 24 to 72 hours.

Mold problems generally occur after prolonged or repeated water damage to a variety of organic materials. Mold spores can be brought indoor from outside. Outdoor factors that seem to affect indoor mold spore concentrations include marked shade, increased levels of available organic debris and natural or basically uncared for property.



Floods, condensation, leaking pipes, leaking windows and leaking roofs are all potential sources of moisture that can lead to mold infestation. Increased ambient humidity as a result of inadequate ventilation or improper drying of flooded areas can also lead to mold growth.

2.4 Mold Reproductive Properties

Molds reproduce by spores. Spores are like seeds; they germinate to produce a new mold colony when they land in a suitable place. Unlike seeds, they are very simple in structure and never contain an embryo or any sort of preformed offspring. Spores are produced in a variety of ways and exist in various shapes and sizes. In spite of this diversity, spores are quite constant in shape, size, color and form for any given mold, and are thus very useful for mold identification. Mold spores can survive for many years in dry or hot environments, requiring only moisture and available organic matter to allow them to germinate.

CHAPTER 3

MOLD HEALTH EFFECTS

3.1 Potential Health Effects of Mold

Mold can cause a range of health responses in humans. The severity of the impact depends upon the type and amount of mold present as well as the susceptibility and sensitivity of the individual experiencing mold exposure. Humans are exposed to molds via ingestion, inhalation, and skin contact with mold or mold infested material.

Molds produce acute health effects through toxin-induced inflammation, allergy or infection.

3.1.1 Toxin-induced Inflammation

Molds produce a large number of volatile organic compounds (VOCs). These chemical responsible for the musty odors produced by growing molds. Exposure to high levels of VOCs, can irritate the mucous membranes and affect the central nervous system (CNS), producing symptoms such as headaches, attention deficit, inability to concentrate and dizziness.

Some molds are capable of producing mycotoxins, natural organic compounds that are capable of initiating a toxic response in vertebrates. Repeated or high exposures to airborne mycotoxins can cause mucous membrane irritation characterized by eye, nose and throat irritation. When small diameter spores (2-4 μm) are inhaled, they may reach the lung alveoli and induce an inflammatory reaction, creating toxic pneumonitis. Severe toxic pneumonitis can cause fever, flu-like symptoms and fatigue (organic toxic dust syndrome).

Hypersensitivity pneumonitis, a particular form of granulomatous lung disease, is a syndrome caused by inhalation of large concentrations of dust containing organic material including fungal spores. Other symptoms attributed to mycotoxin or fungal-origin VOCs include headache, dizziness, dermatitis, diarrhea and impaired or altered immune function.

3.1.2 Allergy

Due to the presence of allergens on spores, all molds have potential to cause an allergic reaction in susceptible humans. Allergic reactions are believed to be the most common exposure reaction to molds. These reactions can range from mild, transitory responses, like runny eyes, runny nose, throat irritation, coughing, and sneezing: to severe, chronic illnesses such as sinusitis and asthma.

3.1.3 Infection

Opportunistic fungal pathogens such as *Aspergillus* are common in indoor air. A normal, healthy individual can probably resist infection by these organisms regardless of dose, although high exposures may cause hypersensitivity pneumonitis. However, any mold that can grow at body temperature can become a pathogen in an immuno-compromised host. Individuals undergoing chemotherapy, organ or bone marrow transplantation or those with HIV/AIDS are especially susceptible to invasive infection by *Aspergillus* species.

Some examples of indoor molds, their products and potential health effects are given in Table 1.

Table 1: Common Molds Found in Buildings

Fungal Species	Surface of Growth	Possible Metabolites	Potential Health Effects
Alternaria Alternata	Moist window-sills, walls	Allergens	Asthma, allergy
Aspergillus Versicolor	Damp wood, wallpaper glue	Mycotoxins, VOCs	Unknown
Aspergillus Fumigatus	House dust, potting soil	Allergens	Asthma, rhinitis, hypersensitivity pneumonitis
		Many mycotoxins	Toxic pneumonitis infection
Cladosporium Herbarum	Moist window-sills, wood	Allergens	Asthma, allergy
Penicillium Chrysogenum	Damp wallpaper, behind paint	Mycotoxins	Unknown
		VOCs	Unknown
Penicillium Expansum	Damp wallpaper	Mycotoxins	Toxic to kidney
Stachybotrys	Heavily wetted surface	Mycotoxins	Dermatitis, mucosal

CHAPTER 4

WORKPLACE EXPOSURE MONITORING AND MEASUREMENT

If there is an obvious solution to the complaints pertaining mold contamination, the occupier should take immediate actions recommended in these Guidelines to rectify the problem.

On the other hand, if the problem cannot be identified or resolved, an assessment specifically to identify the causes of mold growth should be conducted by an indoor air quality assessor.

4.1 Visual and Walkthrough Inspection

A visual and walkthrough inspection is the most important initial step in identifying a possible mold problem and in determining remedial strategies. The extent of any water damage and mold growth should be visually assessed and the affected building materials identified. A visual inspection should also include observations of hidden areas where damages may be present, such as crawl spaces, attics, and behind wallboard. Carpet backing and padding, wallpaper, moldings (e.g. baseboards), insulation and other materials that are suspected of hiding mold growth should also be assessed.

Ceiling tiles, paper-covered gypsum wallboard, structural wood, and other cellulose containing surfaces should be given careful attention during a visual inspection. Ventilation systems should be visually checked for damp conditions or mold growth on system components such as filters, insulation, coils and fins, as well as for overall cleanliness.

Equipment such as a moisture meter or infrared camera (to detect moisture in building materials) or a borescope (to view spaces in ductwork or behind walls) may be helpful in identifying hidden sources of mold growth, the extent of water damage, and in determining if the water source is active.

Using personal protective equipment such as gloves and respiratory protection (e.g. N95 disposable respirator) should be considered when conducting inspection. Efforts should also be made to minimize the generation and migration of any dust and mold.

When there is a visual evidence of mold growth, the occupier should proceed with the mold remediation work and it is not necessary to perform the biological molds sampling. However, if further investigation is needed, the occupier may appoint indoor air quality assessor to conduct biological molds sampling.

4.2 Biological Air Sampling

The IAQ Assessor shall meet the minimum required numbers of biological air sampling points given in Table 2.

Table 2: Recommended Minimum Number of Sampling Points.

Total floor area (served by MVAC system) (m ²)	Minimum number of sampling points
<3,000	1 per 500m ²
3,000 — < 5,000	8
5,000 — < 10,000	12
10,000 — < 15,000	15
15,000 — < 20,000	18
20,000 — < 30,000	21
≥30,000	1 per 1,200m ²

However, depending on the type and nature of the buildings, additional samples should be taken if it is considered necessary.

As outdoor air measurement data may provide some hints on whether outdoor pollutants contribute to molds problem. At least one outdoor sample should be taken. Where accessible, samplers should be located approximately 1 meter off the edge of the fresh air intake and enclosed in an appropriate shelter to shield from direct sunlight and moisture. Other representative locations should be considered if the fresh air intake is not accessible.

During field data collection, monitors should be positioned at the selected sampling location using the following general guidelines;

- i. Representing the primary workstation layout and work activities;
- ii. The position should be of minimal disturbance of work activities within the study area;
- iii. At least 0.5 m from corners or windows, walls, partitions, and other vertical surfaces (e.g. File cabinets);
- iv. Not directly in front of air supply diffusers, induction units, floor fans, or heaters, or the exhaled breath of the operator, etc;
- v. Not under direct sunlight that will impact instrumentation;
- vi. Preferably not in hallways or passageways;
- vii. At least 1 m from localized sources such as photocopiers, printers, etc;
- viii. Not within 3 m of an elevator if sampled at a corridor or lobby;
- ix. Not within 2 m of doors;

- x. Not obstructive to, or interfering with, occupant egresses from the study area under normal or emergency situations;
- xi Not at the junction connected to stations of the public transport facilities; and
- xii. Placing inlets of samplers at a height between 75 and 120 cm, preferably 110 cm from the floor.

Reference should be made to the “Field Guide for the Determination of Biological Contaminants in Environmental Samples” published by the American Industrial Hygiene Association (AIHA) in 1996 or as amended by the latest version.

To ensure sample integrity for sampling activities, appropriate precautions against damage, deterioration and contamination of samples during transportation, storage and handling should be taken.

For biological samples, they should be delivered to the microbiology laboratory within 24 and 48 hours respectively for analysis.

CHAPTER 5

TRAINING, RESPONSIBILITY AND REPORT

5.1 Training Program

Proper training of workers is critical in successfully and safely remediating mold growth. Training topics that should be addressed include;

- i. Causes of moisture intrusion and mold growth;
- ii. Health concerns related to mold exposure;
- iii. The use of appropriate personal protective equipment; and
- iv. Mold remediation work practices, procedures and methods.

Training programs must be reviewed at least once in two (2) years to take into account any significant changes in the type of work or work methods used.

5.2 The responsibilities of trained mold remediation supervisor or worker

The responsibilities of trained mold remediation supervisor or worker are the following;

- i. Develop remediation procedures and methods;
- ii. Present his findings, recommendations of the remediation procedures and methods to the occupier;
- iii. Coordinate and supervise remediation work;
- iv. Without any delay inform the respective occupier of the immediate danger discovered during the remediation process;

- v. Prepare remediation work report;
- vi. Furnish a report of remediation work to the occupier of a place of work after completion of the work; and
- vii. Make recommendation to the occupier to prevent or minimize the recurrence of the problems.

5.3 Remediation Work Report

The remediation work report may include the following but not limited to;

- i. Identification of potential sources of mold contamination problems;
- ii. Description of remediation procedure and methods;
- iii. The measurement results for biological molds sampling and specific physical parameters (if applicable);
- iv. The condition of the ventilation system, including the number of air changes per hour and the rate of fresh air changes (if applicable);
- v. Health complaints as well as signs and symptoms perceived to be related to mold contamination problems;
- vi. Conclusion of the remediation work report; and
- vii. Recommendations to prevent or minimize the recurrence of the problems.

An example of a mold remediation report is given in Appendix 1.

CHAPTER 6

MOLD REMEDIATION PROCEDURE

6.1 Health and Safety Consideration

Persons with respiratory problems, a compromised immune system, or susceptible health condition, should not participate in cleanup operations.

Trained mold remediation workers and supervisor should be properly attired. They should not be allowed to touch the mold with bare skin. Eyes and respiratory protection should be worn to protect workers from aerosol exposure. All efforts should be made to contain the infestation to avoid spreading mold to other areas. Adequate ventilation for the trained mold remediation workers and supervisor need to be maintained during the process.

Prior to any remediation work, consideration must be given to the potential presence of other occupational safety and health hazards. For this purpose, Hazard Identification Risk Assessment and Risk Control (HIRARC) should be conducted by referring to Guidelines for Hazard Identification, Risk Assessment and Risk Control, 2008 or as amended.

6.2 Communication with Buildings Occupant

Communication with occupants of affected spaces is important regardless of the size of the project. Building owner, management, or occupier should notify occupants in the building before large-scale remediation is performed. Notification should include a description of the remedial measures to be taken and a schedule for completion. Group meeting, held before and after remediation, with full disclosure of plan and results, can be an effective communicating mechanism. Building occupants should be provided with a copy of all inspection reports upon request.

6.3 General Remediation Procedure

The goal of remediation is to remove or clean mold damaged materials using work practices that protect occupants by controlling the dispersion of mold from the work area and protect remediation workers from exposures to mold.

The most effective way to eliminate mold growth is to remove it from materials that can be cleaned and to discard materials that cannot be cleaned such as porous materials (e.g. carpet, gypsum wall, dry wall and insulation) or are physically damaged beyond use.

Removing mold problems requires a series of actions. The order of these actions is sometimes important, but might vary on a case-by-case basis. Typically, the following actions are taken regardless of whether a problem is small and simple or large and complex:

- i. Take emergency action to stop water intrusion, if needed;
- ii. Determine the extent of water damage and mold contamination; and
- iii. Plan and implement remediation activities;
 - a) If needed, establish containment and protection for workers and occupants;
 - b) Eliminate or limit water or moisture sources;
 - c) Decontaminate or remove damaged materials, as appropriate;
 - d) Dry any wet materials, if possible;
 - e) Evaluate whether space has been successfully remediated; and
 - f) Reassemble the space to prevent or limit possibility of recurrence by controlling sources of moisture.

Refer to Appendix 2 for example of Checklist for Mold Remediation.

6.4 Removing and Cleaning Up Mold in a Building

The specific recommendation of removing and cleanup mold in the building is depending on the total size of infected area. Three different approaches of remediation steps depending on infected area size are described below:

- A. Small isolated areas (total size of infected area less than 0.9 m² (10 ft²))
 - i. Remediation can be conducted by trained mold remediation workers;
 - ii. Respiratory protection (e.g. N95 disposable respirator), gloves and eye protection should be worn;
 - iii. The work area should be unoccupied;
 - iv. If work may impact difficult-to-clean surfaces or items (e.g. carpeting, electronic equipment), the floor of the work area, egress pathways, and other identified materials belongings should be removed or covered with plastic sheeting and sealed with tape before remediation;
 - v. Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of vacuum equipment with a High Efficiency Particulate Air (HEPA) filter at the point of dust generation. Work practices that create excessive dust should be avoided;
 - vi. Moldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in a sealed plastic bag. Plastic sheeting should be discarded after use; and
 - vii. The affected work area and areas used by workers for egress should be HEPA vacuumed.

B) Medium-sized isolated areas (total size of infected area 0.9-9 m² (10-100 ft²))

- i. Remediation can be conducted by trained mold remediation workers;
- ii. Respiratory protection (e.g. N95 disposable respirator), gloves and eye protection should be worn;
- iii. The work area should be unoccupied;
- iv. Cover the floor, egress pathways, and items left in the work area with plastic sheeting and seal with tape before remediation;
- v. Seal ventilation ducts/grills and other openings in the work area with plastic sheeting. The Mechanical Ventilation Air Conditioning (MVAC) system servicing this area need to be shut down to properly seal vents;
- vi. Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of vacuum equipment with a High Efficiency Particulate Air (HEPA) filter at the point of dust generation. Work practices that create excessive dust should be avoided;
- vii. Moldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in a sealed plastic bag. Plastic sheeting should be discarded after use;
- viii. The affected work area and areas used by workers for egress should be HEPA vacuumed; and

- ix. All areas should be left dry and visibly free from mold, dust, and debris. Check other quality assurance indicators including humidity and temperature have also been met.
- C) Large areas (total size of infected area greater than 9 m² (100 ft²) in a contiguous area).
- i. Trained mold remediation workers should conduct the remediation with the presence of a trained mold remediation supervisor to provide oversight during remediation to ensure quality work and compliance with the work plan is required;
 - ii. Workers involved in the handling of mold-damaged materials should be equipped with:
 - A minimum of half-face elastomeric respirators with P-100 filters.
 - Full body coveralls with head and foot coverings.
 - Gloves and eye protection.
 - iii. Containment of the affected area:
 - The MVAC system servicing this area should be shut down during remediation.
 - Isolation of the work area using plastic sheeting sealed with duct tape. Furnishings should be removed from the area. Ventilation ducts / grills, any other openings, and remaining fixtures / furnishings should be covered with plastic sheeting sealed with duct tape.
 - Consider using an exhaust fan equipped with a HEPA filter to generate negative pressurization.
 - Consider using airlocks and a clean changing room.
 - Egress pathways should also be covered if a clean changing room is not used.

- iv The work area should be unoccupied.
- v. Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of vacuum equipment with a High Efficiency Particulate Air (HEPA) filter at the point of dust generation. Work practices that create excessive dust should be avoided.
- vi. Moldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in a sealed plastic bag. Plastic sheeting should be discarded after use.
- vii. Before leaving isolated areas, workers should remove disposable clothing to prevent the tracking of mold-containing dusts outside of the work area.
- viii. The work area and egress pathways (and clean changing room if present) should be HEPA-vacuumed and cleaned with a damp cloth or mop with a soap or detergent solution and be visibly clean prior to the removal of isolation barriers. Plastic sheeting should be discarded after use.
- ix. All areas should be left dry and visibly free from mold, dust, and debris. Check other quality assurance indicators including humidity and temperature have also been met.

6.5 Remediation of MVAC Systems

Properly trained and equipped mold remediation workers with training and experience in MVAC systems, should conduct the remediation. The presence of a trained building or occupational safety and health personnel with experience and knowledge of MVAC systems, to provide oversight during remediation can be helpful to ensure quality work and compliance with the work plan. The following procedures are recommended:

- a) Workers involved with the handling of mold-damaged materials equipped with;
 - i. A minimum of half face elastomeric respirators with P-100 filters;
 - ii. Full body coveralls with head and foot coverings; and
 - iii. Gloves and eye protection.
- b) MVAC system should be shut down prior to any remedial activities.
- c) Containment of the affected area;
 - i. Isolation of work area from the other areas of the MVAC system using plastic sheeting sealed with duct tape;
 - ii. The use of an exhaust fan equipped with a HEPA filter to generate negative pressurization should be considered;
 - iii. Consider using airlocks and a clean changing room; and
 - iv. Egress pathways should also be covered if a clean changing room is not used.
- d) Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of vacuum equipment with a High-Efficiency Particulate Air (HEPA) filter at the point of dust generation. Work practices that create excessive dust should be avoided.

- e) Moldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in a sealed plastic bag. Plastic sheeting should be discarded after use.

Before leaving isolated areas, workers should remove disposable clothing to prevent the tracking of mold-containing dusts outside of the work area.

- f) The work area and egress pathways (and clean changing room if present) should be HEPA-vacuumed and cleaned with a damp cloth or mop with a soap or detergent solution and be visibly clean prior to the removal of isolation barriers. Plastic sheeting should be discarded after use.

- g) All areas should be left dry and visibly free from mold, dust, and debris. Check other quality assurance indicators including humidity and temperature have also been met.

CHAPTER 7

RECORD KEEPING

It should be the duty of occupier to keep relevant records, which include -

- i. Complaint records;
- ii. Investigation reports;
- iii. Assessment reports including the results of biological molds sampling (if applicable) and specific physical parameters measurement;
- iv. Remediation work report; and
- v. Training records.

7.1 Keeping of Records

All records that are generated under these guidelines must be kept for a period of not less than five years.

Whenever the occupier ceases to carry on business and no person succeeds him, or at the expiration of the retention period for the records required to be maintained, the occupier must give the Director General at least three months notice in writing that he intends to dispose of such records, and he must transmit those records to the Director General, if requested to do so within that period.

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APPENDIX

APPENDIX 1

MOLD REMEDIATION REPORT Prepared by: <i>Name of Company</i> For: <i>Name of Client</i> Date: <i>1 January 2019</i>		
Introduction	<i>Brief explanation on the situation and the mold problems</i>	
Objectives	<i>Provide the objectives of the mold remediation activity</i>	
Methods and Scope of work	Small / Medium/ Large Isolated Areas	
	<ul style="list-style-type: none"> <i>i. Safe working procedures;</i> <i>ii. PPE used;</i> <i>iii. Cleaning procedures;</i> <i>iv. Cleaning agents used;</i> <i>v. Type of vacuum used;</i> <i>vi. Others</i> 	
Preliminary finding	Interviews	
	<i>Information gathered from the owner/ occupier of the building</i>	
	Visual Inspection	
	<i>Picture 1</i>	<i>Location 1 Description 1</i>
	<i>Picture 2</i>	<i>Location 2 Description 2</i>
	<i>Picture 3</i>	<i>Location 3 Description 3</i>
Discussion	<i>Explanation on the cause of the mold problem</i>	
Recommendation	<i>Actions to prevent re-occurring of the problem</i>	
Conclusion	<i>Conclusions of the mold remediation activity</i>	

APPENDIX 2

Checklist for Mold Remediation

A. Investigate and evaluate moisture and mold problems

- Assess size of moldy area (square meters)
- Consider the possibility of hidden mold
- Clean up small mold problems and fix moisture problems before they become large problems
- Appoint trained mold remediation supervisor for large areas of mold problem
- Investigate areas associated with occupant complaints
- Identify source(s) or cause of water or moisture problem(s)
- Note type of water-damaged materials (wallboard, carpet, etc.)
- Check inside air ducts and air handling unit
- Throughout process, consult registered IAQ Assessor if necessary or desired

B. Communicate with building occupants at all stages of process, as appropriate

- Designate contact person for questions and comments about the remediation work

C. Plan Remediation

- Plan to dry wet, non-moldy materials within 48 hours to prevent mold growth
- Select cleanup methods for moldy items
- Select Personal Protection Equipment- protect remediators
- Select containment equipment-protect building, occupants
- Select remediation personnel who have the experience and training needed to implement their remediation plan.

D. Questions to Consider Before Remediating

- Are there existing moisture problems in the building?
- Have building materials been wet more than 48 hours?
- Are there hidden sources of water or is the humidity too high (high enough to cause condensation)?
- Are building occupants reporting musty or moldy odors?
- Are building occupants reporting health problems?
- Are building materials or furnishings visibly damaged?
- Has maintenance been delayed or the maintenance plan been altered?
- Has the building been recently remodeled or has building use changed?

E. Remediate moisture and mold problems

- Use Personal Protective Equipment (PPE)
- Fix moisture problem, implement repair plan or maintenance plan
- Dry wet, non-moldy materials within 48 hours to prevent mold growth
- Clean and dry mold materials
- Discard moldy porous items that can't be cleaned

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