

## Toxic Mold Environments: Is Your Building "All Wet"?

By William J. Pyznar, PE

Potential health concerns are an important reason to prevent mold growth and to remediate/clean up any existing indoor mold growth. Because this is a common, and potentially serious hazard, I would like to use this article to discuss in some depth how and where mold can occur, and some considerations for remediation.

### Moisture: The Mold "Enabler"

Molds can be found almost anywhere and can grow on virtually any organic substance with the presence of moisture and oxygen. It is nearly

impossible to eliminate all mold and mold spores in the indoor environment because mold spores are nearly everywhere. However, mold growth can be controlled indoors by controlling moisture. Moisture control should focus on the elimination of water infiltration from the exterior and condensation accumulation on the interior of a structure or surface.

### Health Risks

The press has successfully communicated the health concerns of *Stachybotrys Chartarum* (SC) contamination. However many fungi (e.g., species of *Aspergillus*, *Penicillium*, *Fusarium*, *Trichoderma*, and *Memnoniella*) in addition to SC, can produce potent mycotoxins (poisons as a defense mechanism) that have been identified as toxic agents.

Health risks are posed not only to the inhabitants of an affected building, but to contractors performing renovations, remediation or cleaning. Two of the most common conditions caused by mold are Organic Dust Toxic Syndrome (OTDS) and Hypersensitivity Pneumonitis (HP). OTDS may occur after one heavy exposure to dust contaminated with fungi. OTDS produces flu-like symptoms. HP may occur after repeated exposures to an allergen and can result in permanent lung damage. Many people respond to fungi through allergic reactions including fatigue, runny nose, eye irritation, cough, congestion and aggravation of asthma. Contact with fungi can also cause dermatitis. Some studies



(although inconclusive) have suggested an Association between SC and pulmonary hemorrhage/hemosiderosis (an uncommon condition that results in bleeding of the lungs) in infants, typically those less than 6 months old.<sup>1</sup>

Inhalation of fungal spores, fragments of spores or mycotoxins produced by a wide variety of fungi can cause or increase the intensity/frequency of allergic reactions, toxic effects or infections. According to the New York City Department of Health, there are a limited number of documented cases of health problems from indoor exposure to fungi. A human must be directly exposed to the toxic fungi or by-product by means of inhalation, dermal contact or ingestion to be affected. A standard regarding an 'acceptable' level of exposure has not yet been established because humans react differently based upon factors such as a person's genetic predisposition, age, physical condition and exposures. Despite these potential risks, little progress has been made in definitively linking the specific health effects caused by mold exposure. At the

*continued on next page*



## The Falcon Group

FALCON ENGINEERING, LLC  
FALCON ARCHITECTURAL SERVICES, LLC

### HIGHER STANDARDS

CONNECTICUT • DELAWARE • NEW JERSEY  
NEW YORK • PENNSYLVANIA • SOUTH CAROLINA

#### HEADQUARTERS

62 Grove Street, Somerville, NJ 08876  
Phone: (908) 595-0050 Fax: (908) 595-0012  
www.falconengineering.com  
Email: info@falconengineering.com

#### NEW YORK

1560 Broadway, 10th Floor, NY, NY 10036  
Phone: (646) 292-3515 Fax: (646) 292-3517

#### PHILADELPHIA

3 Neshaminy Interplex, Suite 301  
Traverse, PA 19053  
Phone: (215) 245-2245 Fax: (215) 245-2246

The information presented here is for general knowledge purposes. It is not intended to be offered as specific advice for engineering projects or situations, and should not be treated as such. For specific advice or for more detailed information, please contact The Falcon Group.



### ALSO INSIDE:

**Clubhouse Upgrades:**

**Time for a Facelift? . . . . . Page 3**  
**What's New? . . . . . Page 4**

## Toxic Mold continued...

same time, thousands of new cases of mold-related claims are being filed with insurers, as well as, with the courts. A number of lawsuits involving commercial properties or multiple dwellings have led to very substantial awards/settlements even absent these specific causal relationships. Therefore, it is prudent for property owners and managers to do their utmost to ensure that mold formation is monitored so that its causes are eliminated, and its presence remediated in a timely and effective manner.

### Identification and Remediation

Concerns should arise when the presence of mold, water damage, or a musty odor is noticed. Upon discovery, **the issue should be addressed immediately.** The first step is to eliminate the water source. The second step is removal of the mold.

A visual inspection is the first step in identifying a possible contamination problem, and is often sufficient to warrant remedial action. The means of remediation is determined by the extent of water damage and mold growth. The use of specialty equipment to view spaces in ductwork or behind walls, or a moisture meter, to detect moisture in building materials, may be helpful in identifying hidden sources of fungal growth and the extent of water damage.

Surface or air samples may need to be collected to identify specific fungal contaminants if occupants are experiencing symptoms, or if a visual inspection is equivocal (e.g., discoloration, and staining). An individual trained in appropriate sampling methodology should perform these tasks.

In all situations, the underlying cause of water accumulation must be rectified to prevent recurrence of fungal growth. Clean-up, drying, and/or removal of water damaged materials will prevent or limit mold growth. If the source of water is elevated humidity, relative humidity should be maintained at levels below 60% to inhibit mold growth.<sup>2</sup> The proper placement of a vapor barrier during construction or renovation is as important as the proper installation and placement of exterior weatherproofing. Emphasis should be on ensuring proper repairs of the building infrastructure, so that water damage and moisture accumulation does not recur.

The size of the area and types of materials impacted by fungal contamination primarily determines the type of remediation. Non-porous (e.g., metals, glass, and hard plastics) and semi-porous (e.g., wood, and concrete) materials that are structurally sound and are visibly moldy can be cleaned and reused. Porous materials such as ceiling tiles and insulation, and wallboards with more than a small area of contamination should be removed and discarded. Porous materials (e.g., wallboard, and fabrics) that can be cleaned, can be reused, but should be discarded if possible. All materials to be reused should be dry and

visibly free from mold before the remediation can be considered complete.

When cleaning surfaces contaminated with fungi, respiratory protection (e.g., N95 disposable respirator), in accordance with the OSHA respiratory protection standard (29 CFR 1910.134), is recommended. Gloves and eye protection should also be worn.

In areas of extensive contamination (greater than 100 contiguous square feet) a professional with experience performing microbial investigations should be consulted prior to remediation activities to provide oversight for the project. These are extreme cases fraught with significant potential hazards and specialized expertise is required to properly assess and remediate the contamination.

### Summary

At best, water infiltration is more than a cosmetic inconvenience. At worst, it can be the "invisible cause" of potentially serious health and structural issues. The presence of mold within an occupied, enclosed space provides reason for concern. Whether the mold is actively growing or dormant, it may pose a risk, even though the exact nature and extent of that risk remains somewhat "murky." Although this is a matter under debate and investigation, no one denies that mold presents a true risk, and is worthy of timely attention. The primary considerations in mold remediation are removing the moisture source, properly protecting the affected environment, and removal of the mold and damaged materials.

### Notes and References

1. New York City Department of Health, Bureau of Environmental & Occupational Disease Epidemiology.
2. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. *Thermal Environmental Conditions for Human Occupancy—ASHRAE Standard (ANSI/ASHRAE 55-1992)*. Atlanta, Georgia, 1992

## Inspired Architecture...From Conception to Creation

The Falcon Group provides well-conceived designs. Strategically sculpted for function but aesthetically shaped for beauty, we specialize in blending new construction with existing. From concept to design we are appreciated by our clients for meticulous attention to detail and our personal communication with them through the process.



### THE FALCON GROUP

Falcon Engineering & Falcon Architecture  
62 Grove Street • Somerville, NJ 08876

Phone: 908-595-0050 • Fax: 908-595-0012 • [www.thefalcongroup.us](http://www.thefalcongroup.us)



# Clubhouse Upgrades: Time for a Facelift?

By Robert A. Zappulla, AIA, Principal Architect

A community's clubhouse is usually its gathering place, typically located near the recreation, pool or play areas, and can be the hub for daily life for much of the community. It generally will provide a visitor or potential buyer with curb appeal, as well as, a glimpse of the community's aesthetics. As such, the clubhouse may be one of the most visible buildings in the community; and invariably, the one building that new homeowners ask about. As varied as the aesthetics are from one community to the next, so is the range of uses and needs for a clubhouse. This article discusses some of the issues, and a process, related to updating a clubhouse.

## Is Your Clubhouse What it Used to Be?

The clubhouse typically requires flexibility in design since it is used for such a wide variety of activities and programs, from arts and crafts to fitness or aerobics classes, to providing a facility for private parties. Community usage of the clubhouse can vary by season, so consideration must be given to the needs for proper heating, ventilation and air conditioning. Unfortunately some clubhouses were not well designed to reflect this diversity of needs, and cannot be utilized as fully as the community might like. In some cases, the clubhouse is actually too small based on current needs or programming, or its design no longer matches the space requirements for its current usage, indicating a potential need for expansion or re-configuration of the space. For example, in cases where the community has steadily added programs and activities to its clubhouse schedule, it's possible the clubhouse has taken on the additional, but unintended use as a storage facility. Depending on the amount of storage space available, a "makeshift" use such as this could make the clubhouse look cluttered and even damage some of its fixtures, flooring, walls or finishes. In some instances, adequacy of space is not the issue; the facilities are simply "showing their age" or have fallen into disrepair. We have also seen communities which were built without a clubhouse, and have recognized the value it has to its membership. Many communities overlook the potential of the clubhouse during the transition process and realize after it's too late that the clubhouse does not provide for the community's needs.

## The Process of Updating/Redesigning the Clubhouse

The redesign process should be initiated by the Board. They may find it helpful to meet with an architect to discuss their issues, budget, potential scope of work and the current/anticipated use of the clubhouse. The architect has the required expertise in

listening to client needs and evaluating current facilities to help the Board translate its needs into concepts, and if appropriate at a later stage in the process, prepare actual plans and specifications for construction. Whether the clubhouse is deteriorating or needs an addition, the architect is the best source for professional advice. The potential solutions cover a wide range of choices from paint, finishes and flooring to fully-developed additions and re-programming of building elements, such as size, layout, etc. to reflect client requirements. Each community's needs and clubhouse design is unique. The architect has the education and experience necessary to formulate a plan that best suits a particular community.

For Associations interested in remodeling a clubhouse, we recommend that an architect be consulted at the beginning of the process to help guide the Board. This can minimize wasted time and resources from inaccurate assessment or faulty assumptions about possible alternatives and strategies which can be pursued to produce the desired finished product. Generally, the process involves:

1. The Board and architect meet to discuss ideas, possible scope of work and budget
2. The architect performs a zoning and building analysis to identify any possible constraints that may affect the project. The architect may need to measure the building if scale drawings are not available, to conduct this analysis
3. The architect provides the Board with a brief description of any constraints and may discuss possible alternatives and options with them after reviewing the applicable building codes and zoning ordinances
4. The Board and architect agree upon the scope of work, and the design process begins. The architect may require more precise measurements and additional documentation to conduct this phase of the project
5. A preliminary design is submitted for review/approval. The time frame required for this can vary based upon the actual scope of work and constraints. Typically the preliminary design can be developed in just a few weeks. For the Board's review, it should include schematic floor plans and elevations (as required) with notation of existing and new building elements and materials. These drawings should be concise and succinct, without construction details, since a design should be approved before proceeding to the next phase of the process
6. The architect may be asked to meet with the Board to review the preliminary design and discuss

*continued on next page*

## UPGRADES *continued...*

- alternatives or changes that may be desired or required
7. The Board provides its comments to the architect based on its initial review. The design may require revision by the architect based upon the initial review and comments by the Board
  8. The architect develops construction drawings when the preliminary design is approved. These drawings detail what will be built and the methods to be used. These drawings are technical in nature and are ultimately to be utilized for bid solicitation and to obtain building permits
  9. The bidding process begins. Based upon the scope of work, the Association may require that the project be bid with multiple contractors. The architect usually issues drawings on the Association's behalf and specifies the bidding requirements. The bid period can range from two to four weeks depending on the scope of work, and time of year
  10. The returned bids are reviewed by the architect for completeness, and then a comparative analysis is conducted. Although the typical inclination is to award the contract to the lowest bidder based upon the fee to be charged, I strongly recommend that this approach not be used. The larger the scope of work and the greater the disparity between low and high bids, the greater the likelihood that the lowest bidder may not have correctly anticipated required work or materials. If the lowest bidder appears to have included all of the materials and scope of work as the other bidders, the Board should meet with several of the contractors to determine that the scope of work is completely understood, and that each contractor is capable of delivering the project to the standards specified. This will help to alleviate the potential for misunderstandings and provide additional comfort to the Board that the lowest bidder in fact can fully deliver the quality of expected work and materials, without "cutting corners at the Association's expense"
  11. The Board awards the project to a contractor. The contractor is then responsible for obtaining the necessary permits and preparing applications on behalf of the Association.

Construction inevitably involves a variety of costs. Some of the obvious costs are the actual costs for labor and materials. These can range between a few thousand dollars for cosmetic work to \$75 per square foot for full remodeling of interior spaces including new finishes trims, and detailing. For new additions, costs can be approximately \$150 or more, per square foot. Less obvious are the costs for professional fees. Architectural fees can range from an hourly arrangement of a few thousand dollars for minor alterations to 5-10% of construction costs. This will be based upon the complexity of the design and technical nature of

the work. There are also costs of which most people are not aware. Some of these are construction-related, such as change orders. Change orders occur when there is a change of scope from the originally specified work, which causes the contractor to provide additional materials or labor. Change orders can originate from the Board's requirement for additional detailing, increase of construction scope or material upgrades, which were not originally priced by the contractor during the bidding phase.

Sometimes, change orders are caused by unforeseen structural deficiencies or otherwise hidden factors. These can include a need for relocating utilities or other building systems that were uncovered during demolition. Another possibility could involve repairing damaged building materials due to water or other unforeseen or unidentifiable types of damage. Some change orders may require additional work by the professional of record in addition to actual labor or material costs. Such work is usually not that expensive, however, it is directly proportional to the amount of work necessary to conclude the revisions to the project plans. Normally, this type of additional work for unforeseen deficiencies or increase in area volume or quality is billed on an hourly basis, or a specified fee, which can range from .5-1% of the final construction costs. I urge any Association embarking on construction projects to allocate contingency funds for construction and professional fees to cover the costs of these potentially unforeseen circumstances.

Please feel free to contact me, or your Falcon representative, with any additional questions.

## What's New?



**The Falcon Group** recently received the prestigious recognition *Professional Member of the Year* by the New Jersey Chapter of the *Community Associations Institute of NJ*. Accepting the award are William Pyznar, PE, (2nd from left) and Andrew Amorosi, PE, RS, (2nd from right) Principals of The Falcon Group. Looking on are Robert Zappulla, AIA, of The Falcon Group, CAI-NJ Executive Director Curtis Macysyn, James Ritter and David Chesky of The Falcon Group.

### WELCOME TO:

**William Petroski, PE, Hans Hochradel and Roberto Pimentel.** We are very happy to have them join our team.