

**Inspection & Eradication
of
Fungi**

David E. Collier, CR

January 1996

RESTORER'S STATEMENT

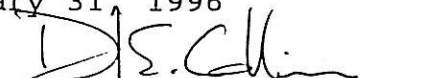
This report has been created as a result of an insurance claim and is based on direct inspections and actual remediation procedures undertaken at the building in question. No attempt has been made to validate the building ownership, the date of loss, the statements and/or the identities of the witnesses. However, this report is based on many incidents observed by the inspector who holds these findings to be true and accurate to the best of his knowledge.

The inspector has been in the construction industry for fourteen years, devoting the last seven years entirely to property damage appraisal, investigation and the remediation procedures involved. The inspector has had numerous certifications in many of the fields surrounding this report having been certified by the International Institute of Cleaning and Restoration Certification and by the Association of Specialists in Cleaning and Restoration. The inspector also remains in compliance with the individual Code of Ethics of these organizations.

First Atlantic Restoration, Inc. is an independent property restoration firm. There are no outside influences involved to possibly change the results of this report, nor are there any affiliations or ties to the building owners, building contractors or the insurance company that could affect the outcome of this report.

Date: January 31, 1996

Inspector:



David E. Collier

First Atlantic Restoration, Inc.

INTRODUCTION

On December 1, 1995, First Atlantic Restoration, Inc. was retained by National Fire and Casualty Insurance Company to inspect the reported microbial contamination of the fireproofing material in the drop ceiling at the Suffolk Juvenile Detention Home at 5800 Montgomery Road, Suffolk, VA 23717. The purpose of the inspection was to observe any possible fungal growth, offer any remediation procedures and at the approval of the insured, Namath Enterprises, Inc., initiate these procedures.

Following a conversation with Mr. Russell Kirkland, a property adjuster with National Fire and Casualty Insurance Company, 3213 Atlantic Avenue, Norfolk, VA 23502, the file was assigned to Mr. David E. Collier, a construction specialist and damage appraiser with over fourteen years of experience in this area.

BACKGROUND

As ascertained by Mr. Kirkland, on July 31, 1995, while the Suffolk Juvenile Detention Home was under construction, an intense summer storm caused an introduction of a significant amount of water to the building. At the time, the roof was under construction and only partially covered the building. It was approximated by Mr. Wayne Fontes, the job supervisor at the time of this loss, that only 40% of the roof was covered. The walls were constructed of concrete masonry units (CMU) and had been recently constructed. These walls were not sealed in any way at the time. Emergency water extraction was performed by the building contractor's personnel using available wet-dry vacuums and squeegees, as the floors were unfinished concrete. After the water removal the construction proceeded as planned. As the building reached its final stages of construction, darkening areas were noted on the fireproofing that had been directly sprayed on the bottom side of the metal roof panels and also on the metal joists supporting the roof. At this time Mr. Fontes supervised the direct spray application of a 50/50 mixture of bleach and water to each of the darkening areas. This seemed to stop the areas from spreading as they had been daily. As the City of Suffolk, VA was notified of these developments, they requested that an industrial hygienist be obtained to procure documentation on the levels of bacteria present within the building, both in the materials and in the air. As a result of that request, Mr. Charles Shelton, B.S., M.P.H., C.I.H., of Health One Laboratories, Inc. visited the site and took bulk samples of

the materials and also air samples. In Mr. Shelton's letter of November 15, 1995, outlining his findings, he states that "Elevated counts of fungi were found in both the bulk samples and the air samples." It was at this point that First Atlantic Restoration, Inc. was contacted to assist Mr. Shelton in the procedures to be involved in the microbial remediation.

INVESTIGATION

The investigation of this assignment has included interviews with Mr. Charles Shelton of Health One Laboratories, Mr. Wayne Fontes of Namath Enterprises, Inc, Mr. Cliff Zlotnik of Unsmoke Systems and numerous direct inspections of the property before, during and after remediation procedures. Moisture testing of the fireproofing was performed by a direct reading moisture meter and probe produced by Dri-Eaz Products, Inc. Photo documentation was by 35mm color photography.

INSPECTION

An inspection of the site was performed by Mr. Collier on December 1, 1995. The weather was clear, the temperature was 51 degrees F and the relative humidity outdoors was 52%. Mr. Fontes of Namath Enterprises assisted in the inspection as all of the doors in the Detention Home remain locked. The building was unoccupied at the time of inspection. The Suffolk Juvenile Detention Home is a one-story brick veneer building consisting of approximately 42,000 square feet of heated space. The drop ceiling height is approximately 12' with a 4' space between the drop ceiling and the bottom of roof decking. The building consists of three individual wings that contain a central "pod" surrounded by individual cells with steel doors. Each of these pods' ceiling raises above the main roof in a large skylight, which eliminates any drop ceiling. Along these wings leading to the pods are classrooms surrounding a center hallway. The main entrance foyer also has no drop ceiling, but rises to full ceiling height with exposed roof decking. The front "control room" is surrounded by bullet proof glass walls that view directly down each of the three hallway wings. There is also a central gymnasium that consists of CMU walls rising 26' with exposed metal joists and decking. Mr. Fontes identified the eleven problem areas

where the fungal growth had been observed. These areas were:

1. A 111 Gym Storeroom
2. A 112 Gym Storeroom
3. B 116 Classroom
4. B 119 Unit Coordinator
5. B 122 Unit Coordinator
6. B 125 Classroom
7. C 112 Classroom
8. C 115 Classroom
9. C 118 Classroom
10. D 101 Telecommunications
11. D 102 Conference Room

In each of these areas the drop ceiling tiles were lifted and set aside while an inspection of the fireproofing sprayed onto the metal joists and roof decking revealed darker areas that resembled fungal growth. These were areas identified by Mr. Fontes as ones having received the direct spray of the 50/50 concentration of bleach and water.

The drywall walls in each of these rooms were then tested to ensure that no latent moisture remained. All of these readings were in the 11% - 13% range, which is entirely acceptable for this area. However, moisture readings in the open ``pod`` areas and in the gymnasium areas where the walls consist of painted CMUs ranged from 11% - 27.8%, which is above the acceptable moisture level for this material. These areas of elevated moisture content were focused around three metal doorways in the A Pod, one doorway in the B Pod and one doorway in the C Pod. The moisture around these doorways was primarily near the bottom of side jambs and extended away from the jamb 10-12 inches.

No other areas of visible bacteria growth or latent moisture were found.

DISCUSSION

The evidence of fungal growth on the fireproofing indicates that latent moisture has remained in the building. The July 31, 1995 rainstorm that introduced the water to the unfinished building appears to be the source. Judging from Mr. Fontes' statement that ``there was 1' - 2' of water in every room of the building,`` it also appears that the

initial remediation efforts were not sufficient to remove all of the water from the building. As all of the efforts were centered around removing only the visible standing water and nothing was done to address the 'wicking' of the water into the CMU walls, these walls simply retained the absorbed water. With the average relative humidity in this area in the late summer commonly ranging from 80-95%, very little evaporation would have occurred.

The building was then closed up, the drywall hung and the HVAC system was installed and initiated. Within this closed environment the moisture apparently evaporated into the air raising the humidity of the building. As the fireproofing is a hygroscopic material (a material that will readily take up and absorb water from the air mass and will seek a moisture equilibrium with the environment), it quickly absorbed the moisture from the air until it reached an equal moisture content. As the areas of the fireproofing remained without lighting at all times, the moisture content was elevated and the building was heated, a perfect environment for fungal growth was created. However, as the HVAC system actually helped remove moisture from the air, the fungal growth was limited. The fireproofing eventually dried to an acceptable moisture level as ascertained by moisture probe readings taken in each of the affected areas at the time of the initial inspection. The probe was buried in the contaminated fireproofing and gave moisture level readings between 8.5% and 11%. However, the accuracy of this test may have been affected by the proximity of the metal joists and decking to the metal probe.

The darkened areas were proven to be fungal growth, and the air also was proven to have been contaminated as outlined in Mr. Shelton's report of November 15, 1995, primarily by the bacteria *Stachybotrys chartarum* and *penicillium*. As most materials and air contain these fungi, it is to be noted that the bulk samples and air samples simply contained elevated levels of these fungi.

REMEDICATION PROCEDURES

As the two primary concerns of the City of Suffolk were the indoor air quality and the elimination of the fungal growth on the fireproofing, Mr. Collier and Mr. Shelton held several meetings at the site to determine the necessary procedures. The fireproofing's constitution was determined to be water based and, therefore, could not withstand heavy

saturation of a water-based chemical. It was decided the method of application would be either thermal fogging or airless spraying. As spores were obviously (as recorded by Mr. Shelton's previous air samples) continuing to go airborne, it was deemed necessary to apply an encapsulant in addition to the initial treatment. In a telephone call with Mr. Cliff Zlotnik, President of Unsmoke Systems, Inc., a manufacturer of chemicals, he recommended Unsoot #2 with Micropel as an encapsulant. Mr. Zlotnik also added that Unsoot #2 was potentially volatile and that thermal fogging would not be possible without danger to the environment and the applicators. The airless sprayer's application was determined to be the most advantageous due to this.

With the method of application determined it was decided that a 2-step process would be followed. The initial step would include the application by airless sprayer of undiluted bleach to the fireproofing material. Due to the possibility of not all fungal growth sites having been observed, the decision was made to apply this to all of the fireproofing in the building. As the chemical would wet the fireproofing and could possibly cause its breakdown, it was felt that a quick drying time was imperative. To facilitate the drying 5-6 ceiling tiles in each room were removed while an air mover was placed to blow directly up onto the fireproofing.

Another concern was the indoor air quality of the building during this direct spray application. As the inhalation of the undiluted bleach would be harmful to one's lungs, an after-hours schedule was created to empty the building of its occupants during this time. Also, full respirators were recommended to the applicators.

All of these steps were followed on December 14-15, 1995, and the fireproofing was determined to be completely dry on December 18, 1995. As our remaining concern was the immediate improvement of the indoor air quality, the second step was then initiated. The second step consisted of the application by airless sprayer of Unsoot #2 with Micropel, which is actually an encapsulating fungicide or a chemical that will encapsulate and kill any fungi it encounters. The steps surrounding the application of this chemical actually mirrored those of the first application of the undiluted bleach. The air quality concerns were the same, so the procedures were followed in an occupant-free building with the applicators using full respirators. The drying speed of

the fireproofing also remained a concern, so the displacement of the ceiling tiles and the placement of the air movers was followed again.

As the existing air was deemed contaminated, HEPA air filters were recommended by Mr. Shelton and installed in the HVAC system by the building contractor. This effort was intended to cleanse the existing air of the elevated levels of microorganisms.

CONCLUSION

At the conclusion of the remediation procedures recommended by Mr. Shelton and initiated by First Atlantic Restoration, Inc., bulk samples of the fireproofing and samples of the air were again taken on January 10, 1996 and sent to a lab for testing. The results of these tests determined that the fungal growth on the fireproofing had been eliminated and that the levels of airborne fungal spores had returned to an acceptable level.



02/11/96

Client: Suffolk Juvenile Detention Ctr
Address: 5800 Montgomery Road
Suffolk, VA 23717

Contact: Namath Enterprises, Inc.
Address: Wayne Fontes, Job Supervisor

Bus. Ph: (804) 488-1600

Estimator: David E. Collier

Fax: (804) 853-3350

Reference: Russell Kirkland
Property Claims Manager
Company: National Fire & Casualty Ins.
Address: 3213 Atlantic Avenue
Norfolk, VA 23502

Bus. Ph: (804) 588-1900

Estimate: SUFFOLK

Room: Drop Ceiling Area

DESCRIPTION	UNITS	REMOVE	REPLACE	TOTAL
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Due to the fact that the area above the drop ceiling consists of approximately 36,000 square feet, and that there are many items other than the metal decking and the metal joists that have been sprayed with the fireproofing, there is no feasible way to procure a square foot price for the treatment given. This quote is written on a time and material basis, with the actual prices reflected here. This is not an estimate.

Scaffold rental - per section (per day)	16 EA @			
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Airless sprayer rental for application of chemicals - per sprayer (per day)	16 EA @			
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After hours applicator labor - per man hour - (8 men X 38 hours apiece)	304 HR @			
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Material cost - undiluted bleach - per gallon	110 EA @			
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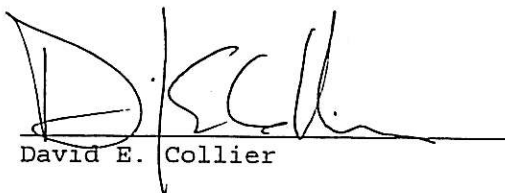
Material cost - Unsoot #2 with Micropel - per gallon (each gallon dilutes to create 5 gallons)	22 EA @			
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Room Total: Drop Ceiling Area

Line Item Subtotal:

Summary

Total Line Items		
Overhead	@	10% x
Profit	@	10% x
Material Tax	@	4.5% x
Grand Total		


David E. Collier

PHOTOGRAPH CAPTIONS

**SUFFOLK JUVENILE DETENTION CENTER
5800 Montgomery Road
Suffolk, VA 23717**

RE: Microbial Mitigation

Photos # 1&2 - Suffolk Juvenile Detention Center

Photo # 3 - Room A119 - example of an unaffected area

Photo # 4 - Room A111 - note dark splotching of fungi

Photo # 5 - Room B116 - even growth of fungi on roof decking

Photo # 6 - Room B119 - fungal growth

Photo # 7 - Room B125 - fungal growth

Photo # 8 - Room C112 - fungal growth

Photo # 9 - Room C115 - fungal growth

Photo # 10 - Room D102 - fungal growth