
130 Liberty Street
New York, New York

Supplemental Investigation
Summary Report

Visual Mold Inspection Summary

Prepared for:

Lower Manhattan Development Corporation

One Liberty Plaza, 20th Floor, New York, NY 10006



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1.0 INTRODUCTION

TRC Environmental Corporation (TRC) was contracted and authorized by the Lower Manhattan Development Corporation (LMDC) to conduct a *Supplemental Investigation* (SI) of previously inaccessible spaces in the building located at 130 Liberty Street (the Building). The intent of the SI is to address the additional sampling recommendations presented in The Louis Berger Group, Inc. (Berger) *Initial Building Characterization Report* dated September 14, 2004. This Summary Report presents a summary of the visual mold and mold precursors inspection conducted within the accessible and previously inaccessible spaces within the Building.

1.1 Background

The Building is located across the street and south of the WTC site and is a former office building comprised of 40 stories and approximately 1.5 million square feet. The massive debris generated from the collapse of the South Tower of the WTC broke approximately 1,500 windows, curtain wall, and structural components creating a gash (Gash Area) in the Building's exterior exposing portions of the interior north side of the Building between the 7th and 24th floors. The debris demolished the plaza in front of the Building, exposing the basement and subbasement (Basement A and Basement B) areas and ruptured a diesel fuel tank in the basement, the contents of which burned. The Gash Area and broken windows exposed the interior of the Building to the elements.

As a result of the collapse of the World Trade Center (WTC) on September 11, 2001, a combination of soot, dust, dirt, debris, and contaminants settled in and on the Building. See the *Initial Building Characterization Report* for additional background information.

1.2 Scope of Work

In the *Initial Building Characterization Report*, Berger identified areas with mold growth. These areas included mold-impacted building materials on exposed surfaces only in seven locations distributed over five different floors (11th, 7th, 3rd, Basement A and Basement B). The extent of mold at each location ranged from six to 24 square feet (SF), and in total, 105 SF of mold-impacted building materials were identified. No evidence of significant water-damaged materials was noted in the Building, although active water infiltration was noted in Basement B. In addition, the *Initial Building Characterization Report* identified areas that were inaccessible during their investigation including the following locations:

- Curtain Wall Cavity
- Cell Systems within Floors
- Interstitial Spaces within Interior Walls and Column Cavities
- Inside Vertical Shafts
- Exterior Building Surfaces

TRC also reviewed the fall 2003 *Report on Microorganisms at 130 Liberty Street*, prepared for Deutsche Bank by Mr. Brian G. Shelton, MPH. This report included a narrative description of the microbiological conditions in the Building, as well as photographs of areas of the Building with identified mold contamination, including several formerly inaccessible areas.

The TRC survey was conducted on January 4, 5, 6, 7 and 14, 2005. It included a visual assessment of the accessible and previously inaccessible interior areas of the Building to identify the locations and determine the quantities of visible mold, areas of visible moisture and water-damaged materials. All floors, including the basement areas, were accessed by TRC. This assessment addresses observations of moisture infiltration and mold contaminated areas, including those areas previously documented in the *Report on Microorganisms at 130 Liberty Street*.

1.3 Purpose and Objectives

The SI of previously inaccessible areas is intended to assist in determining what measures and protocols may be required in support of the 130 Liberty Street cleaning and deconstruction plan. In particular, the results of the SI are intended to provide reference information allowing for informed decisions to be made regarding appropriate cleaning and deconstruction methods. These decisions include the development and implementation of engineering controls to contain the work zone (i.e., to ensure no exposure to the surrounding community during the cleaning and deconstruction) and appropriate methods for the disposal or recycling of materials generated by the cleaning and deconstruction activities. Using the available characterization results, LMDC, its consultants, and the selected deconstruction contractor can develop and implement appropriate deconstruction protocols and safety precautions for the cleaning and deconstruction process to ensure the health and safety of workers and the surrounding community.

1.4 Survey Team

The survey for visible mold and water-damaged materials was performed by Mr. Keith Darocha and Mr. Donald Hoeschele. Messrs. Darocha and Hoeschele are appropriately experienced and qualified industrial hygienists who performed this investigation under the guidance and supervision of Mr. Edward Gerdts, who is certified as an Industrial Hygienist (CIH) by the American Board of Industrial Hygiene.

2.0 METHODOLOGY

TRC conducted a visual inspection within the Building to determine the presence of mold or mold precursors (e.g., water-damaged building materials, or water infiltration) in accordance with the EPA Office of Air and Radiation, Indoor Environments Division published *Mold Remediation in Schools and Commercial Buildings*, and the NYCDOH published *Guidelines on*

Assessment and Remediation of Fungi in Indoor Environments. The presence of mold, water-damaged building materials, and/or water infiltration, as well as the approximate extent of the impact was noted on floor plans and in tabular form.

3.0 RESULTS

Mold

Based on the visual assessment, the following locations were confirmed for visible mold (see Table 1 for specific locations and affected areas):

- Floors: cellar “B”, Cellar “A” (northerly exterior vault), 1, 4, 9, 11, 27, 28, 32, 40 and 41

Water Damage

Based on the visual assessment, the following locations were confirmed for visible water damage (see Table 2 for specific locations and affected areas):

- Floors: cellar “B” & “A”, 1, 5, 20, 22, 23, 24, 25, 26, 27, 32, 35, 36, 37, 38, 39, 40 and 41

TRC conducted this assessment during January 2005 when temperatures were generally below freezing (32 degrees Fahrenheit) and ranged from approximately 26 to 39 degrees Fahrenheit. Upon review of the Academic Press publication *The Fungi*, cold temperatures slow fungal growth by slowing the chemical reactions in the cells as well as decreasing the availability of moisture in the substrate. It should be noted that most molds do not actively grow when temperatures are below freezing. Although, under moist conditions some mold species begin growth at temperatures above freezing, most molds begin to flourish at temperatures between 59 and 86 degrees Fahrenheit. In addition, information obtained from the EPA publication *Mold Remediation in Schools and Commercial Buildings*, the key to mold control is moisture control. During warmer months, higher humidity and temperature levels can result in a greater amount of available moisture, thereby fostering mold growth. With a continuous source of moisture, molds will continue to grow unabated.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the supplemental investigation for visible mold and water damage materials revealed additional mold and water damaged building materials that should be properly addressed in connection with the deconstruction of the Building. In addition, further mold/moisture inspections should be conducted prior to and during deconstruction activities. These inspections should be conducted, with more frequent inspections during warmer months, as the changing conditions of the Building temperatures and humidity levels can result in more optimal conditions for mold growth. Furthermore, sources of water infiltration should be

promptly repaired and water impacted materials dried and removed prior to the onset of mold growth, which can occur within 48 to 72 hours under optimal conditions.

5.0 REFERENCES

Initial Building Characterization Study Report, 130 Liberty Street, New York, New York. The Louis Berger Group, Inc., September 14, 2004.

Sampling, Analysis, and Quality Assurance Project Plan, Supplement Investigation of 130 Liberty Street, New York, New York. TRC Environmental Corp., November 15, 2004.

Report on Microorganisms at 130 Liberty Street. Shelton, Brian, G., Fall 2003.

Mold Remediation in Schools and Commercial Buildings. Environmental Protection Agency Office of Air and Radiation, Indoor Environments Division. March 2001

Guidelines on Assessment and Remediation of Fungi in Indoor Environments. New York City Department of Health, January 2002

Guidelines for the Assessment of Bioaerosols in the Indoor Environment. American Conference of Governmental Industrial Hygienists (ACGIH), 1999

The Fungi (2nd Edition). Carlisle, M., Watkinson, S., & Gooday, G., Academic Press, 2001.

TABLE 1
VISIBLE MOLD LOCATIONS

**TABLE 1
Visible Mold Locations**

Floor	Mold Contaminated-Material Description	Floor Location	Damage Area Approximate Total Quantities (in square feet (SF))
Cellar "B"	Books/papers on two steel shelving units. Mold on adjacent concrete flooring and walls. Mold on walls of elevator shaft pits (3)	Southeast and elevator shafts	10 SF total on floors and walls. 2 shelving units of books/papers
Cellar "A"	Decontamination unit walls, floors and ceilings. Vault concrete walls and floor	Northerly exterior vault	500 SF
1	Sheetrock walls	Southeast	20 SF
4	Exterior and interior of ovens in the kitchen area and in washroom sink	South (ovens) and east (sink)	50 SF
9	Sheetrock walls	South-central reception room	20 SF
11	Sheetrock walls	Southwest and northwest (4 areas)	80 SF
27	Flooring, carpeting, sheetrock walls, and 2' x 2' drop ceiling tiles	Northeast	2300 SF
28	Ceramic floor tile and associated grout-lines	Central men's restroom	600 SF
32	Flooring, carpeting, sheetrock walls, and 2' x 2' drop ceiling tiles	Office, conference, reception and open areas in the Southeast-west and Northwest	2000 SF
40	Mechanical equipment, vertical piping at ceiling, concrete walls, floors and concrete and steel column painted sections	North and northeast	60 SF
40	Mechanical shaft insulation/fireproofing and air handler interior insulation	Central mechanical shaft, air handler units	500 SF
41	Spray-on fireproofing, concrete floor, and vertical piping at ceiling	Central mechanical equipment room	20 SF

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TABLE 2

VISIBLE WATER DAMAGE/WATER INFILTRATION LOCATIONS

TABLE 2
Visible Water Damage/Water Infiltration Locations

Floor	Water Damage/Infiltration Description	Floor Location
Cellar "B"	Cellar "B" is an exposed area with visible water infiltration. Standing water visible in elevator-shaft pits (3)	Exposed area along Northerly side of floor. Elevator-shaft pits.
Cellar "A"	Cellar "A" is an exposed area with visible water infiltration	Exposed area along Northerly side of floor
Floors 1-39	Moisture on interior curtain wall aluminum siding	Exposed curtain wall areas throughout Floors 1-39
1	Floor 1 is an exposed area with visible water infiltration	Exposed area along Northerly side of floor
5	Entire floor area flooded with several inches of standing water	Entire floor area
20	Pipe leak impact to ceiling tile and carpet (approximately 2,500 square feet of damage)	Southerly open area
22	Pipe leak impact on sheetrock wall (approximately 120 square feet of damage)	Easterly open area
23	Pipe leak impact to ceiling tile, waste bags and carpet (approximately 5,625 square feet of damage)	Southerly open areas and offices
24	Pipe leak impact to ceiling tile, waste bags and carpet (approximately 4,375 square feet of damage)	Southerly open areas and offices
25	Pipe leak impact to ceiling tile and carpet (approximately 8,750 square feet of damage)	Southerly open areas and offices
26	Water damaged sheetrock (approximately 10 square feet of damage)	Southeasterly corner office
27	Pipe leak impact to ceiling tile, radiator covers and carpet (approximately 2,285 square feet of damage)	Northeasterly open areas and offices
32	Pipe leak impact to ceiling tile, carpet and sheetrock walls (approximately 700 square feet)	Northeast and southwest open areas and offices. Southeast office. Central service hall.
35	Pipe leak impact to ceiling tile, carpet and sheetrock walls (approximately 625 square feet)	Central service areas and conference room
36	Fire hose valve leak impact to carpet and sheetrock wall	Central hallway area
37	Pipe leak impact to ceiling tile and carpet (approximately 1,900 square feet)	Central offices and easterly trading floor areas
38	Water damaged carpet and floor tile. Moist areas beneath raised floor	Southerly central corridor and central-west open floor area
39	Pipe leak impact to ceiling tile and carpet (approximately 220 square feet)	Central corridor area
40	Standing water (approximately 1 foot deep) in central area. Six visible pipe leaks. Impact to concrete floors and mechanical equipment	Throughout central, northerly and westerly areas.
41	Two areas of visible pipe leaks (approximately 20 square feet). Impact to spray-on fireproofing and concrete walls/floors	Central mechanical equipment rooms

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APPENDIX A
PHOTOGRAPHS

130 Liberty Street – Visible Mold/Water
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Figure 1: Floor 41 mold on flooring near pipe leak.



Figure 2 : Floor 40 water damage and mold.



Figure 3: Floor 39 water damage



Figure 4: Floor 39 water damage.



Figure 5: Floor 27 carpet water damage



Figure 6: Floor 32 sheetrock mold

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Figure 7: Floor 27 carpet water damage and visible mold



Figure 8: Floor 32 water damage



Figure 9: Floor 28 mold on flooring



Figure 10: Floor 23 water damage



Figure 11: Floor 22 water damage



Figure 12: Floor 11 visible mold on sheetrock

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Figure 13: 5th Floor water damage



Figure 14: 4th Floor mold in sink



Figure 15: Floor 1 water damage



Figure 16: Floor 1 mold on sheetrock



Figure 17: Floor 1 water damage



Figure 18: Floor 3 open area