



CONSULTING & TESTING SERVICES, INC.

ASBESTOS AIR QUALITY MONITORING

AT

**NYU DOWNTOWN HOSPITAL
VARIOUS FLOORS
NEW YORK, NY**

September 2001
Project NY-390-01 (WTC)

Prepared for:

**NYU DOWNTOWN HOSPITAL
170 William Street
New York, NY 10038
Attn.: Mr. Michael Rawlings**

EXECUTIVE REPORT

At the request of Mr. Michael Rawlings, Director of Engineering for **NYU Downtown Hospital (NYUDH)**, **Consulting & Testing Services, Inc. (CTSI)** was retained to perform environmental testing at 170 William Street. The purpose of this testing was to evaluate the building's air quality and dust composition subsequent to the World Trade Center tragedy of September 11, 2001.

Upon arrival to the site, September 13, 2001, **CTSI** met with **NYUDH** representatives to discuss the air quality concerns. The following is a summary of the site conditions, recommendations and environmental testing performed.

I. Site Conditions Noted Upon Inspection:

- Dust and debris present outside of the facility
- Facility electric power on temporary generators
- Main telephone lines down
- Access to the facility was restricted by law enforcement
- Dust deposits found in the vicinity of the Ground Floor-entrance to corridor and 1st Floor-Main Lobby

II. Based on the afore noted conditions, CTSI recommended the following engineering controls be implemented:

- Provide for constant damp mopping of the front lobby and stairs at all times. A wet mat should be outside the revolving doors with a long dry mat positioned on the inside. All mats should be cleaned several times a day and, when deemed necessary, replaced.

- Replacement of conventional vacuum cleaners with HEPA filtered units to prevent re-entrainment of accumulated dust. HEPA filtered vacuums were supplied the facility by CTSI.
- Increase cleaning intervals and add HEPA vacuuming of all horizontal and vertical surfaces.
- Elimination of dry cleaning methods, such as sweeping, dusting with feather dusters, etc., and replace with wet methods, such as damp mopping, wet wiping, etc. All vacuuming on site to be preformed with a HEPA filtered vacuum only.
- Replacement of HVAC filters with new ones. New filters to be inspected on a daily basis and if necessary replaced.
- Addition of exterior pre-filters. (These need to be changed regularly)
- Positive pressurization of entry areas if feasible.
- Inspection of existing HEPA filtered HVAC units to ensure overloading of pre-filters has not occurred, and if so, filter changing as needed.
- HEPA vacuuming of the fresh intake chambers including outside louvers and coils.
- A seminar for staff to explain the current health situation, and proper dust control methods.

III. As the result of the above stated conditions and recommendations, CTSI performed the following environmental testing:

- **Asbestos** - Representative samples of air and dust were collected and analyzed on September 13th for the potential presence of asbestos. Dust deposits found in the vicinity of the Ground Floor-entrance to corridor and 1st Floor-Main Lobby had been cleaned, and samples were subsequently collected as a part of the building's air quality/dust control evaluation.

All air and dust samples indicated that the potential asbestos contamination had been successfully addressed. Please refer to laboratory certificates of analysis in section IV.

- **Indoor Air Quality** testing was performed facility wide on September 18th. Representative areas were tested for airborne dust particulates, carbon dioxide, carbon monoxide, relative humidity, temperature and dew point. All areas tested generated results, which were within established applicable OSHA, ASHRAE and EPA standards. Please refer to section V for detailed results.

CTSI visited the facility on a daily basis from September 13, 2001 through September 18, 2001 to perform daily site assessments/inspections of the property. CTSI also followed up on the implementation of the engineering controls outlined herein. It is our conclusion, based upon the test results and various site inspections that the facility meets all applicable regulatory standards.

Regulatory Framework

For your convenience, a list of some of the cited regulatory standards (Such as PEL) follows below.

General – A PEL is the maximum concentration that the Occupational Safety and Health Administration (OSHA) established as acceptable for an eight (8) hour per day, five (5) day per week exposure. This is the standard that the hospital is responsible for compliance with. Hospital staff must not be exposed to concentrations in excess of the PEL.

The US Environmental Protection Agency (USEPA) has standards related to emissions to the environment, and the outdoor (Ambient) air. The entity emitting the contaminants can be held responsible for elevations above these limits, referred to as the National Ambient Air Quality Standards (NAAQS). The hospital is not emitting the involved emissions, and is therefore not responsible for them.

These standards are more relevant to the quality of the fresh air drawn in by the building's HVAC system, and the potential impact upon components of the drawn in contaminants that can subsequently accumulate in the building.

The accumulations can be of particulates, which do not break down over time, such as asbestos or silicates for example.

Non-particulates, such as carbon monoxide, a gas, will not accumulate, as they break down and dissipate in a short time.

Carbon dioxide, produced by the occupant's exhalation, can accumulate if insufficient fresh air is drawn in. Closing of outside air intakes to keep out exterior contaminants can cause interior emissions to build up.

Some parameters, such as microbials, have no regulatory limits. These are typically compared to the outside air for indoor air clearance criteria. The indoor air's concentration should be statistically no higher than the outdoor air's concentration. The current scenario requires some adjustment in interpretation, as the outdoor air can be considered to be somewhat compromised by recent terrorist activities.

Specific contaminants have individual PELs. Some of the parameters measured at the hospital are asbestos, carbon dioxide, and dust.

Asbestos – Airborne asbestos has a PEL of 0.1 fibers per cubic centimeter of air (0.1 f/cc). A separate clearance criteria of 0.01 f/cc is used subsequent to an asbestos abatement project, as a margin of safety. PEL is typically measured as a fiber count, which counts all fibers, not just the asbestos in the total. When total counts are elevated, confirmatory additional analysis can be performed to determine if any of the fibers were actually asbestos, and the true asbestos f/cc can then be determined.

The USEPA considers asbestos levels below 0.005 f/cc to be acceptable for occupancy of schools, and general outdoor air. They also use a clearance level of 70 asbestos structures per square millimeter (70 as/mm²) of air sampling filter if the air sample was at least 1,199 liters in volume.

Bulk materials are considered to be non-asbestos by the USEPA when less than 1% asbestos in volume. As with the above air sampling, further confirmatory analysis can be performed when warranted.

Dust – The PEL for airborne dust is 15 milligrams per cubic meter of air (15 mg/m³).

Carbon dioxide – The PEL for carbon dioxide (CO₂) is 5,000 parts per million (5,000 ppm). The outside air in your area typically has a concentration of 340 to 470 ppm. Indoor air levels above 1,000 ppm are typically considered to be indicative of a need for more fresh air intake.