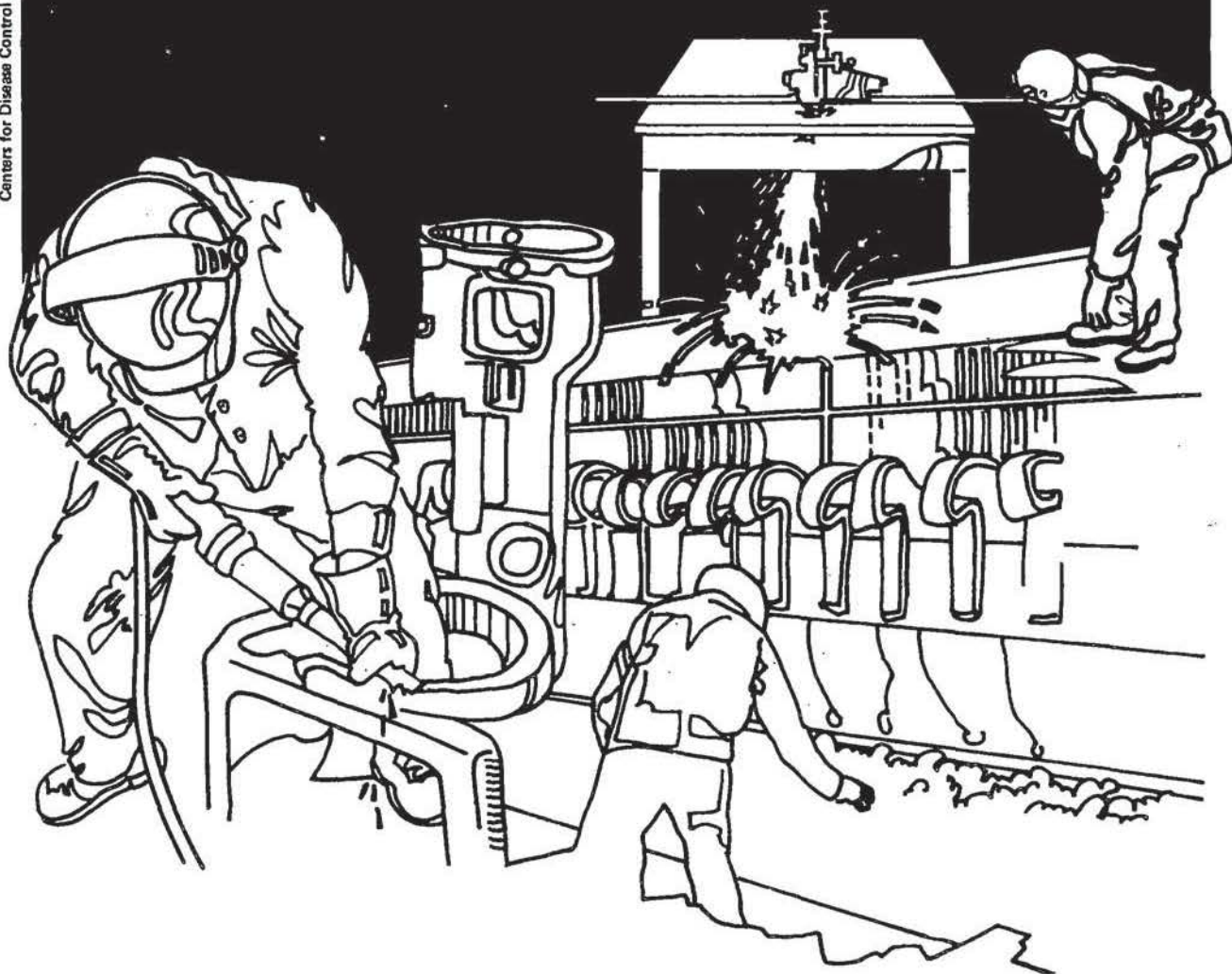


# NIOSH



## Health Hazard Evaluation Report

HETA 83-358-1362  
GEORGE H. FALLON  
FEDERAL OFFICE BUILDING  
BALTIMORE, MARYLAND

## PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 83-358-1362  
SEPTEMBER 1983  
GEORGE H. FALLON  
FEDERAL OFFICE BUILDING  
BALTIMORE, MARYLAND

NIOSH INVESTIGATOR:  
Kenneth Kronoveter

## I. SUMMARY

In July 1983, the National Institute for Occupational Safety and Health (NIOSH) received a request to evaluate potential asbestos exposures at the George H. Fallon Building, Baltimore, Maryland. Fireproofing materials containing asbestos had been used extensively throughout the building.

On July 20, 1983, NIOSH conducted an environmental survey at the building. Eight area air samples all showed total airborne fiber concentrations of less than 0.01 f/cc (laboratory limit of quantitation) as compared to the OSHA standard for asbestos of 2.0 f/cc for an 8-hour average daily exposure. NIOSH recommends that exposure to asbestos be reduced to the lowest feasible limit. Eight settled dust samples did not show any asbestos fibers when examined by polarized light microscopy and dispersion staining techniques. Four of the eight air samples and four of the eight settled dust samples were examined by transmission electron microscopy --- no asbestos fibers were observed on any of the eight samples. Two bulk samples of the fireproofing material contained an estimated 5 to 20% chrysotile asbestos.

Based on the above environmental results, it is concluded that office workers in the Fallon Building were not exposed to asbestos fibers nor were office areas contaminated by asbestos fibers at the time of the survey. It is recommended that the building be routinely monitored for a potentially emerging asbestos exposure problem. Further details and recommendations are in this report.

KEYWORDS: SIC 9199 (General Government), asbestos, fireproofing materials.

## II. INTRODUCTION/BACKGROUND

In July 1983, NIOSH received a request for technical assistance from Senator Paul S. Sarbanes. NIOSH was requested to evaluate a possible asbestos hazard in Senator Sarbanes' Maryland State Office, Suite 1518, George H. Fallon Federal Office Building, Baltimore, Maryland. Specifically, NIOSH was requested to determine the extent to which asbestos had been used in the office areas, any potential hazards that might be present, and any abatement measures that might be necessary. On July 20, 1983, NIOSH conducted a survey at the Fallon Building. During this survey: 1) Discussions were held with building management; 2) Environmental sampling was conducted to determine air concentrations of fibers (including asbestos fibers); 3) Settled dust samples were collected for asbestos analyses; and 4) Bulk samples of fireproofing material were collected for determination of asbestos content.

The Fallon Building was constructed during 1964 to 1967 with occupancy completed by September of 1967. It is a 17 story building with a basement and a sub-basement. The building houses about 2200 people and has about 535,000 square feet of floor space including the mechanical areas. Steam is purchased from the City of Baltimore and used for heating and air conditioning purposes. Most of the mechanical equipment (steam absorbers, air handling units, etc.) is located on the 3rd and 17th floors of the building. The conditioned air is ducted to the work areas and delivered through alternating lighting fixtures in the suspended ceilings. Return air moves through alternate ceiling lighting fixtures in the suspended ceiling using the space between the ceiling and the suspended ceiling as a plenum. Perimeter units handle about 20% of the heating or cooling load. Total air delivered to the work areas is over 400,000 cfm. In the winter the system runs 100% makeup air and in the summer, 40 to 50% makeup air. The ventilation air is filtered through roll-up spun fibrous glass filters before being conditioned. On October 18, 1982, the building went on a total contract for maintenance, operation of the mechanical equipment, etc.

Throughout most of the building, asbestos bearing fireproofing had been sprayed across the entire ceilings (bottom sides of floors and structural members) above the suspended ceilings. The fireproofing appeared to be uniformly applied and according to building management varied from about 3/4 to 1-1/2 inches in depth. In the mechanical rooms of the 3rd and 17th floors there wasn't a suspended ceiling below the fireproofing to act as a shield between the fireproofing material and room occupants. Also, on the 17th floor the fireproofing had been sprayed on the walls and had not been either encapsulated or shielded. On the ceiling of the 17th floor the fire-proofing had been sprayed only on the structural steel beams and not across the entire ceiling. The fireproofing was examined in three or four locations and although it is friable, there did not seem to be any delamination/deterioration of the material. As the years pass, however, it would be expected that deterioration would occur. To what extent this would

create asbestos exposures is not known. Because of vibrations caused by the mechanical equipment, deterioration of the fireproofing would probably first occur in the vicinity of the 3rd and 17th floors.

Since 1973, this building has been surveyed on six occasions (other than this survey) for asbestos. The results of these six surveys are summarized on Table 1. Of the 25 area (fixed location) air samples for fibers, 22 indicated air concentrations below 0.01 f/cc. The other 3 area samples ranged from 0.01 to 0.03 f/cc. The five personal samples on maintenance workers showed air fiber concentrations ranging from 0.008 to 0.085 f/cc. The OSHA legal standard for asbestos is 2.0 f/cc (8-hour average daily exposures). Since the analysis method considers all fibers (asbestos and nonasbestos), and since the laboratory lower limit of reliable quantitation is 0.1 f/cc, it is difficult to attach significance to these survey results. It is concluded that the air sample results of these previous six surveys did not indicate health risks at the time of the surveys. In further support of this conclusion: 1) For the survey of October 10, 1973, less than 5% of the fibers on the filters were asbestos; and 2) For the survey of August 12, 1981, the analysis of the settled dust sample by polarized light microscopy and dispersion staining techniques did not show any asbestos fibers to be present.

### III. ENVIRONMENTAL METHODS AND RESULTS

Eight general area (fixed location) air samples were collected for airborne fiber analyses (Table 2). These samples were collected on 37 millimeter (mm) diameter membrane filters of 0.8 micrometer pore size mounted in three piece plastic cassettes. Personal air sample pumps provided air flows of 2.5 liters per minute through open-face filters. The samples were analyzed by phase contrast microscopy using the proposed revised NIOSH Method P&CAM 239, which is not specific for asbestos fibers. Additionally, four of the eight air samples were examined by transmission electron microscopy for small asbestos fibers which would not be visible by the phase contrast microscopy technique.

The air fiber concentrations for the eight air samples were all less than the laboratory limit of detection (0.01 f/cc) as compared to the OSHA legal standard of 2.0 f/cc for an 8-hour average daily exposure. NIOSH recommends that exposure to asbestos be reduced to the lowest feasible limit. By the transmission electron microscopy analysis, no asbestos fibers were observed on any of the four samples analyzed. Since the air fiber concentrations were so very low and since no asbestos fibers were observed by the transmission electron microscopy analysis, these results may be summarized by saying that there was no indication of health risks at the time of the survey.

Eight settled dust samples were collected for asbestos fiber analyses (Table 3). These samples were collected by "sucking up" settled dust on 37 mm diameter membrane filters using a personal air sampling

pump. All of these samples were analyzed by polarized light microscopy and four were analyzed by transmission electron microscopy. As shown on Table 3, the polarized light microscopy analysis showed the presence of cotton lintels, paper fibers, cellulose, synthetic fibers, plant hairs and trichomes, soot, fibrous glass, mineral wool, calcite, gypsum, mineral dust, and starch grain, but no asbestos fibers. By the transmission electron microscopy analysis, no asbestos fibers were detected on any of the filters. These results show that at the time of the survey, the areas sampled were not contaminated by asbestos.

Two bulk samples of insulation were collected for asbestos analyses (Table 4) by manually transferring material to 20 ml glass vials. These samples were analyzed for the presence of specific types of asbestos by transmission electron microscopy. As shown on Table 4, these samples from structural members in Suite 1518 and the 17th floor mechanical room contained an estimated 5 to 20% chrysotile asbestos. These results confirm the presence of chrysotile asbestos in the fireproofing materials used in the Fallon Building.

#### IV. FINDINGS AND RECOMMENDATIONS

In summary, the major findings of this investigation are:

1. The previous six surveys at the Fallon Building did not indicate a health risk to office employees within the building at the time of the surveys.
2. The asbestos containing fireproofing material had been used throughout the building, having been sprayed on the bottom sides of the floors. On the 17th floor and portions of the 3rd floor, the asbestos containing fireproofing material was not shielded either by a suspended ceiling or wall paneling.
3. The air samples and settled dust samples collected in this investigation did not indicate the presence of asbestos fibers, even when examined by transmission electron microscopy.
4. The fireproofing material was determined to be mostly gypsum and mineral wool but contained about 5 to 20% chrysotile asbestos.

Since no asbestos fibers were detected in the air samples or settled dust samples by transmission electron microscopy, it would be difficult to reach a conclusion other than there was no indication of health risks to the office workers at the time of the survey. Based upon this, and the other findings of this survey, it is concluded that a building wide asbestos removal or encapsulation program is not necessary at this time. However, it is noted that some asbestos abatement experts believe that removal of asbestos containing material is the only final and satisfactory solution to the problem of potential asbestos exposures in such buildings as the

Fallon Building. Further, as time passes, it would be expected that some deterioration would occur in the integrity of the fireproofing material. Such deterioration could possibly result in hazardous asbestos exposures to the office workers. Based upon these findings and considerations it is appropriate that the following recommendations be tendered:

1. During any renovation or maintenance activity in the Fallon Building which disturbs the asbestos containing fireproofing material, the common and accepted control measures (of which GSA is aware) should be followed. These control measures include contaminant barriers, worker protection, use of wetting agents, proper cleanup, proper waste disposal, and air monitoring. Proper control programs have been presented in a number of NIOSH, OSHA, and EPA publications.
2. All of the exposed asbestos containing fireproofing materials on the 3rd and 17th floors should be suitably enclosed, encapsulated, or removed.
3. Although the building is under a total maintenance contract and the GSA custodial staff "doesn't turn a screwdriver", GSA should adhere to OSHA's requirements for a minimal acceptable respirator program, since occasionally it is necessary for GSA staff to utilize respirators.
4. The Fallon Building should be periodically monitored for the conditions under which asbestos exposures might exist. This monitoring program should include ample environmental sampling to detect the presence of airborne asbestos fibers or asbestos contamination in the work areas.
5. Should it become evident, as a result of the asbestos monitoring program, that asbestos fibers are reaching the normal work areas of the building then it will become necessary to promptly remove, isolate, or encapsulate the asbestos containing fireproofing material.

V. AUTHORSHIP AND ACKNOWLEDGEMENTS

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Originating Office:	Hazard Evaluations and Technical Assistance Branch Division of Surveillance, Hazard Evaluations, and Field Studies Cincinnati, Ohio
Report Typed By:	Cheri Nordman

VI. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal, Springfield, Virginia 22161. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address. Copies of this report have been sent to:

1. Building Manager, George H. Fallon Federal Office Building
2. Chief, Accident and Fire Prevention Branch, GSA, Region 3
3. Senator Paul S. Sarbanes
4. NIOSH, Region III
5. OSHA, Region III



Table 1

Summary of Previous Surveys' Environmental Results  
George H. Fallon Federal Office Building

Report Date	Surveyor	Survey Summary
10/01/73	National Institute for Occupational Safety and Health	Three area air samples for fibers ranged from 0.002 f/cc* to 0.008 f/cc. Less than 5% of the fibers on the filters were asbestos.
12/12/80	GSA Contractor	Four area air samples for fibers ranged from less than 0.001 f/cc to 0.001 f/cc. One bulk sample analysis showed 40-50% chrysotile.
08/10/81	GSA Contractor	Five personal air samples for fibers ranged from 0.008 f/cc to 0.08 f/cc. Bulk sample of air duct insulation showed no asbestos.
08/12/81	GSA Contractor	Five area air samples showed fiber concentrations ranging from 0.005 to 0.03 f/cc. One settled dust sample showed no asbestos.
10/15/82	GSA Contractor	Six area air samples ranged from 0.001 to 0.006 f/cc.
04/11/83	GSA Contractor	Seven area air samples ranged from less than 0.01 f/cc to less than 0.06 f/cc. Bulk sample of basement tank jacket showed no asbestos.

## \*Notes:

1. f/cc means fibers greater than 5 micrometers in length per cubic centimeter of air.
2. NIOSH recommends exposure to asbestos to be reduced to the lowest feasible limit.
3. OSHA legal standard for asbestos is 2.0 f/cc for an 8-hour average daily exposure.

TABLE 2

Air Sample Results for Total Fibers and Asbestos  
George H. Fallon Federal Office Building  
July 20, 1983

Sample Time	Sample Location	Air Concentrations of Total Fibers (f/cc)*	Transmission Electron Microscope Analysis for Asbestos
0933-1533	1st Floor, Information Booth	less than 0.01	Not analyzed
0936-1535	1st Floor, Room 131, Taxpayer Assistance, Information Desk Counter	less than 0.01	No asbestos observed
1010-1617	3rd Floor, Room 311, Mechanical Space, by #4 dual duct	less than 0.01	No asbestos observed
0852-1459	15th Floor, Suite 1518, Receptionist's Desk	less than 0.01	Not analyzed
0857-1500	15th Floor, Suite 1518, on file cabinet in hallway	less than 0.01	No asbestos observed
0859-1506	15th Floor, Suite 1518, Staff Assistant's Desk	less than 0.01	No asbestos observed
0912-1512	15th Floor, Suite 1518, above suspended ceiling by Receptionist's Desk	less than 0.01	Not analyzed
0948-1549	17th Floor, Mech. Equip. Room, just outside Control Room	less than 0.01	Not analyzed

NIOSH recommended standard for asbestos fibers

LFL

OSHA legal standard for asbestos fibers

2.0

\*Fibers greater than 5 micrometers in length per cubic centimeter of air (f/cc)

LFL - Lowest feasible limit

TABLE 3

Settled Dust Sample Analyses for Asbestos  
George H. Fallon Federal Office Building  
July 20, 1983

Sample Location	Polarized Light Microscopy Analysis	Transmission Electron Microscope Analysis
1st Floor, Information Booth, Top of Metal Hat Rack	Cotton lintels, paper fibers	Not analyzed
1st Floor, Room 131, Taxpayer Assistance, Information Desk, Metal Top of 5' high room divider	Cotton, cellulose, and synthetic fibers	No asbestos detected
3rd Floor, Room 311, Top of File Cabinet	Plant trichomes, soot, fibrous glass	Not analyzed
15th Floor, Suite 1518, Reception Area, Top of Suspended Ceiling	Mineral wool, plant trichomes, cellulose fibers, mineral dust, cotton fibers	No asbestos detected
15th Floor, Suite 1518, Hallway, Top of File Cabinet	Plant trichomes, paper and cotton fibers, mineral dust, calcite, gypsum	No asbestos detected
15th Floor, Suite 1518, Staff Office, Top of peripheral air supply unit and pictures	Plant trichomes, paper, cotton, and synthetic fiber; hairs, and mineral dust	Not analyzed
15th Floor, Suite 1518, Staff Office, Top of Bookcase	Plant trichomes, cotton, paper and synthetic fibers	Not analyzed
17th Floor, Mech. Equip. Room, Window sill on outside of control room	Cotton and cellulose fibers, plant hairs and trichomes, mineral dust, starch grains	No asbestos detected

TABLE 4

Bulk Sample Analyses for Asbestos  
George H. Fallon Federal Office Building  
July 20, 1983

Sample Site	Asbestos Content
Suite 1518, Reception Area, Structural member above suspended ceiling	5-20% chrysotile
17th Floor, Mechanical Room, Structural Member, South Wall	5-20% chrysotile

Note: The bulk samples were mostly gypsum (calcium sulfate plaster) and mineral wool.

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