President's Message

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These are the proposed subjects for Level II and Level III:

Level II

Wind; Drainage; Fire; Thermal; Steep Roofing; Low Slope Roofing; Product Testing; Chemistry; Core Cuts; Asbestos

Level III

Wind; Drainage; Thermal; Specific Roof Systems; Insulation; Decks; Flashings; Waterproofing; Walls and Windows; CSI Specifications; Quality Control/Quality Assurance; Warranties; Chemistry; Ethics; Product Info & Testing; Practical Considerations.

Hats off to the following people who have agreed to author text; they are embarked on a great pioneering endeavor:

Phil Dregger; Tom Kelly; D. B. Young; Don Bush, Sr.; Joe Hale; Phil Dawson; Bill Edwards; Chris English; Jim Sheahan; Al Macaggli; Matias Fernandez.

Thanks also to Thurman Freeman, Walt Rossiter, Marty Obando and Bruce Wittenbaum who have volunteered to assist with document review.

But these members cannot do it all; please call Headquarters and offer to write on any of these subjects. The more input, the better the result.

It's been said before, but RCI is you. All the people listed above must think it worthwhile to contribute their efforts to RCI's programs. Won't you join them? If you want to contribute time and effort (as much or as little as you can afford), call Headquarters.

Asbestos

by Joseph F. Hale, FRCI
HDH Associates, Salem, VA
Phil H. Dawson, PE CRC
HDH Associates, Salem, VA
Lynn Eichhorn
HDH Associates, Salem, VA

ROOFING CONSTRUCTION MAY IMPACT EXISTING INTERIOR BUILDING ASBESTOS

(originally presented at the 1991 International Symposium on Roofing Technology)

As asbestos continues to be an important issue in all aspects of the construction industry, it becomes necessary to explore the impact of reroofing on the possible release of asbestos to the interior of the building. Field observations reveal that roofing activities may have an effect on the existing interior asbestos containing materials (ACM) which can be released. Fibers can be jarred loose from common elements such as spray-on fireproofing, thermal pipe insulation, mudded joints and in some cases duct work that is suspended from the roof framing system. This paper suggests certain steps that can be taken to make all the involved parties more aware of these existing conditions.

Keywords

Asbestos containing materials, built-up roof, Phase Contrast Microscopy (PCM), roofing, spray-on fireproofing.

Introduction

There is a potential liability and hazard that the consultant, owner and roofing contractor need to recognize. Procedures such as engineering controls may suppress the potential release of asbestos or asbestos fibers in the interior of the building, or into the mechanical systems. An example of how a release of asbestos fibers can occur is when spray-on fireproofing in an equipment room or penthouse exists. The roofing activities create a delamination or damage to the fireproofing causing it to become loose or fall into the building air intake. This material could be picked up by the mechanical system and scattered throughout the interior of the building, creating a potential health problem to the occupants of that building. Cost for a clean up of this type can run into the hundreds of thousands of dollars, depending on the nature of the mechanical layout in the building.

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Roofing And Interior Building Asbestos

A recent incident at a large municipal hospital is an excellent example of how projects can be handled. A built-up roof (BUR) was being removed over a roof deck of gypsum. The poor condition of the existing roof mandated that complete removal was required. The building owner, roof consultant and roofing contractor knew that under the gypsum deck there was asbestos containing spray-on fireproofing. Identification and sampling for asbestos had been made prior to the design of the reroofing project. There were also several applications of asbestos found on the thermal pipe insulation in the primary mechanical room.

Ambient air samples were taken in the mechanical room to determine the fiber count prior to any reroofing activity. Phase Contract Microscopy (PCM) had been used to establish a base line fiber count in these areas.[1] This establishes reference points for the monitoring of the project. It is important to know existing conditions are safe and within current guidelines for acceptable airborne fiber levels.[2]

Construction began with removal of the existing roof, as specified in the design documents. This exposed the corroded metal pans that supported the gypsum deck. The pans had developed holes as large as 2 ft. x 2 ft. These holes were not visible from underneath during the roof survey. During the roof removal, portions of the gypsum deck fell into the mechanical room, bringing with it the spray-on fireproofing. Action by the roofing contractor and the hospital staff was to immediately close off the area.

The day of the incident, on notification to the roof consultant, with his advice and direction, the abatement contractor was summoned to the site to expeditiously secure the area, once the site was evacuated of people. The first step was to smoke test the interior of the mechanical room to establish positive air level and to confirm that no contaminated air was being pulled into the mechanical system. When this was established, the abatement contractor proceeded with an emergency cleanup. The cleanup consisted of placing micro-trap filters in the mechanical room, while cleaning up the hanging loosened material and debris from around the holes. At the same time, the roofing contractor placed a flexible sheet membrane over the entire roof above. This accomplished two things; it sealed the room so that fiber-release into the environment could not occur, and it rendered the area in question temporarily watertight while the corrective activities were implemented. This entire cleanup process was monitored by analyzing air samples from inside the work area, inside the mechanical room and directly adjacent to the closed off area. Additional samples were taken outside of the enclosed space to verify that no contaminants were leaking from the mechanical room or were being carried out by any personnel.

The hospital's maintenance people were prohibited from entering the affected area as they were not trained asbestos personnel. Additionally, these people could potentially create liability problems for the building owner. This precaution prevents the carrying out of fibers on clothes and shoes which could unnecessarily introduce people in other areas to the fibers.

Had these preventive steps not been implemented and the preplanned activities not been set into place, this incident might have forced a shutdown of the primary mechanical systems for the hospital. This would have caused the obvious following difficulties: care could not be provided to patients, lost revenue during the shutdown period, and the hospital's reputation would be damaged. Other aspects to consider would have been the ramifications that could have transpired from an economical point of view. The consequence of the hospital shutdown was estimated to potentially cost up to $800,000.[3]

If these precautionary planning steps **had** not been in place during the design and the construction monitoring phases, this incident could have caused serious problems for both the roof consultant and roofing contractor, and ended in a legal dispute on financial responsibilities.

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There is no simple formula for calculating the potential damage if this incident had rendered the mechanical systems inoperable. The entire hospital would have been evacuated. Since proper management had been thought out and pre-existing data had been gathered, the cost of this incident was approximately $40,000 with the work shared by the roofing contractor and asbestos contractor.

Various results can occur where spray-on asbestos has been applied to the structural members on the underside of the deck, and the deck is penetrated by fasteners. Many times it is likely to find an over spray on the exposed metal decking. One of those conditions was shown in an informal study. Ten samples were taken in which screws fastened a new recovery board through an existing asbestos containing built-up roof to the deck. There was no evidence that asbestos fibers were carried through the metal deck into the interior space.[4]

In areas where fireproofing has been applied and the over spray on the deck is evident, some spalling or dislodging of spray-on fireproofing can occur when the fasteners penetrate through the deck. In many situations, this could be considered a controllable situation. The movement of the air in the area would be determined by an extensive study of the air flow, the condition of the fireproofing and the space below. Where acoustical spray-on or spray-on asbestos containing materials have been used on concrete or concrete panels, it may be handled by ensuring that the fasteners have not penetrated the thickness of the slab. The preplanning for the use of fasteners and the condition of the underside of the deck need to be in place in order to decrease the possibility of asbestos fiber release.

Other than the underside of the roof deck, there are several other potentials for asbestos fiber release. These include piping joints, structural members and duct work which has asbestos containing materials attached to them. Vibrations caused by the roofing activities may affect these interior building elements. The impact of roofing equipment used in the process of reroofing can cause vibrations in the building structure. Cutting equipment, power driven removal equipment of dropable removal buckets are examples. The impact of the debris-removal bucket as it sets down repeatedly could cause structural vibration that might release asbestos fibers into the building.

Piping is often hung from the roofing framing system or the piping may be in physical contact with the under side of the deck. It is not uncommon to see drain leaders for interior roof drains that are muddied to the bottom of the drain bowl. It is not unusual to see evidence of the muddied areas that have deteriorated over the years from leaks that have appeared. The finesse and care by the removal crews in removing compression rings from the drain bowls is an activity to be monitored carefully. This removal process can cause dislodging of insulation mud from the elbows and in some cases severely deteriorated thermal pipe insulation. Further negative impacts will occur if these conditions were in an active air plenum, the fibers may be pulled through the mechanical system into the rest of the building interior.

Other equipment, such as duct work suspended from the deck system or structural system, can present similar problems. The roofing activities can break seals on the duct work and create a situation that may not have been obvious when the pre-job inspection was performed. Common knowledge provides that the heaviest live loading of the roof system sometimes occurs at the time of initial placement of the roof. The bar joists will have memory retention, and when the roof system loading is removed the bar joist will attempt to return to their original posture. This type of activity can certainly realize a disruption or dislodging of any fireproofing or asbestos material that may be on the bar joist or even on the over spray on adjacent deck areas.[5]

The type of deck will also affect the amount of disturbance. A fibrous concrete or metal deck often does not fit tightly up against the wall. Openings can be anywhere from one to eight inches. In the roofing activity of tear off of the existing roof when the cant is removed an open space can be created in the building. If the building envelope is broken, and depending on the air flow in the particular area, a circumstance can develop where air will rush out into the environment, or if power fans create a negative pressure situation in this area below the deck, it can actually pull dust and debris into the building.[6]

New Certified Roof Consultants (CRC)

Michael E. Clark PE CRC
1045 Clifton Dr
Macon GA 31204
912-923-7807

W. Nelson Hall CRC
N H & A Inc
211- North Main Street
Monroe NC 28112
708-282-0826

Edward J. Madden CRC
Gale Associates
106 E Preston Street
Baltimore MD 21202
410-625-1714

William L. Marcum CRC
Martech Associates
141 W Main Street
Millheim PA 16854
814-349-8270

Gerald M. Sullivan CRC
Gerald M. Sullivan Inc
P.O. Box 57
Springfield TN 37172
615-256-8916

Richard L. Wagner CRC
ATEC Associates
8918 Hermann Drive
Columbia MD 21045
410-381-0210

John R. Wooten PE CRC
H B Fishman & Co
357 Sugar Hill Rd
Tolland CT 06084
203-282-9036

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Conclusion

All of these considerations should be taken into account by the roof consultant in the pre-engineering studies and in the pre-design stages of every reroofing project. The roof consultant should discuss these conditions with the roofing contractor as well as the building owner.

Reroofing may affect the interior of a building. These activities have the potential of releasing asbestos fibers. Once identified, there are effective ways that the roof consultant, building owner and roofing contractor can work together to minimize any potential damage and liability.

1. 1,200 liters total of air were taken pulling 10 liters of air per minute. The readings were taken by A-1 Labs of Richmond, Virginia, using NIOSH 7400 method.
2. Acceptable level was based on the current OSHA Permissible Exposure Limit (PEL) levels.
3. Existing asbestos survey and management plans were consulted to determine the cost estimate on the removal of the spray on asbestos. No previous attempt was made to establish a cost of relocating 200 patients out of the hospital or the lost revenue because of the potential of widespread contamination of the mechanical system.
4. Ten taped samples were taken from the exposed thread of the fasteners from the underside of the deck. The samples were read by a certified laboratory, using Polarized Light Microscopy (PLM), which is the recognized method of establishing asbestos fibers and identifying the mineral origin of the fibers. The three most common types of asbestos in building materials are: chrysotile, amosite and crocidolite. There were not any asbestos fibers detected in the samples.
5. Manual of Steel Construction, Sixth Edition, Fourth revised printing, American Institute of Steel Construction, Inc., page 5-237, Standard Load Tables.
6. Any type of asbestos fibers when released into the atmosphere is covered by NESHAP (National Emission Standards for Hazardous Air Pollutants) and require reporting of any incident to the regional EPA (Environmental Protection Agency) office.

Minutes

EXECUTIVE SUMMARIES OF MINUTES OF RCI OFFICIAL MEETINGS

Summary of Executive Committee and/or Board Minutes
May/June

1. Chris English, Robert Boessen, and George Kanz represented RCI at the first RCI/ARMA Liaison Meeting in Kansas City, MO. The two groups plan to meet on an annual basis.
2. RCI has joined ASTM as an organizational member. The Immediate Past President (Donald E. Bush, Sr.) will be RCI's official representative.
3. Richard Horowitz, Joe Hale, and Bill Stevenson will represent RCI and staff the RCI Exhibit at the Association of Physical Plant Administrators (APPA) convention and tradeshow in Indianapolis, Indiana, July 26-29.
4. The Board authorized Headquarters to lease a Xerox 5065 copier and to purchase a new computer, printer, network cards and software in order to implement "Information Central."
5. American Iron & Steel Institute (AISI), Single Ply Roofing Institute (SPRI), and Western States Roofing Contractors Association (WSRCA) have expressed interest in revitalizing liaisons with RCI.
6. The Registered Roof Observer (RRO) Exam was offered for the first time in conjunction with the Region VI meeting in Reno in June. For more information about the RRO program, contact Jim Magowan.
7. The next Board meeting will be held at the Summer Workshop meeting, August 8-9, 1992, Orlando, Florida. The Summer Workshop meeting is traditionally held at the site of the next RCI convention.