Asbestos and Roof Consulting Watching Your Step

By Chuck Marvin, RRC

The roofing industry now has sanity regarding asbestos regulations at the federal level. This improved situation is due in large part and perhaps completely to the National Roofing Contractors Association's (NRCA's) legal action taken against the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). This became a real life David versus Goliath battle and after several years, Goliath was defeated.

The days of consultants telling clients that constant change and conflicting authorities are reasons for a degree of understandable confusion are over. We now have laws that, for the most part, dovetail and eliminate the excuses often used in the past. What is regulated, worker qualifications, and procedures are now understandable with some effort.

Tables have been included herein explaining these changes. These illustrations are based on the substantial efforts of Carl Good of the NRCA, one of the leaders in David's army. As the NRCA is contractor oriented, it has amassed and assimilated the data needed for the contractor to handle regulated asbestos. I encourage membership in this organization as a way to stay informed on many issues not normally addressed by RCI, yet very important for us to have a working knowledge of.

Proper posting of the jobsite and disposal of regulated asbestos are just two of many requirements on a project with regulated asbestos.

Liability

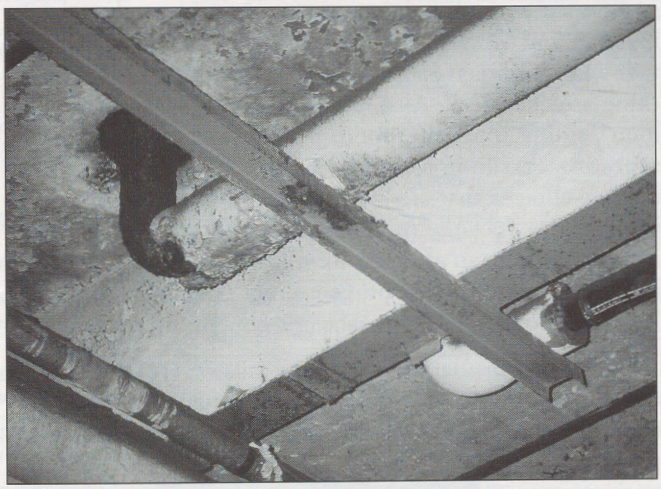
Consultants, as owners' representatives, have an obligation to inform their clients of laws and regulations when they impact a roofing project. Regulated asbestos will remain the property of the building owner/client even after it is disposed of. The owner/client, therefore, shares in significant liability should his/her property cause harm to workers or the environment through improper handling or disposal. Specifications often include wording to the effect that EPA, OSHA, DOT, and other regulations be complied with for this reason.

If consultants monitor the actual roof project, it is critical to check and ensure the handling of regulated asbestos is being conducted properly and with accredited personnel. As the owner's representative, we must know exactly what the contractor is to do and make sure he does it. The NRCA's summary tables enclosed will assist as a guideline when checking a project for compliance.

All of the regulations and laws dealing with the handling and disposal of regulated asbestos are useless if the asbestos is not accurately identified. The identification process is the key to every other aspect being properly performed. Since Nov. 20, 1991, a federal law titled the National Emission Standard for Hazardous Air Pollutants, better known as NESHAP, has been in effect with strong revisions. According to the Federal Register, 40 CFR, Part 61, Subpart M, the following must be done:

> *"Prior to the commencement of a demolition or renovation, thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II non-friable ACM."*

One key word is "affected." Affected is not defined in the regulation, so we may use the common practice of using dictionary definitions to help clarify such text. One definition from Webster is, "to produce a material influence upon or alteration in...." Any reroofing project affects not just the roofing membrane and flashing but the deck's underside, fireproofing, underside drain pipes, suspended pipes and suspended ceilings attached



These photos show a few examples of what can fall as a result of vibration caused by work being conducted on the roof or just from leaks. Ceiling tile and pipe wrap often contain asbestos.

to the deck or trusses and much more. On the roof, Transite siding is common. In the case of Transite, pipe wrap, or "mud" packing on drain wrap, the opportunity to deal with highly friable chrysotile and amosite does exist. Often these items exist in a plenum used for return air, making any asbestos fiber release potentially more litigious.

The most recent OSHA and EPA publications contain modifications to words making the owner either entirely or jointly responsible for safety and hazardous material procedures conducted by outside contractors. As owner's representatives, it is no longer acceptable to only specify that the contractor comply with EPA and OSHA. Consultants monitoring jobs in progress must make recommendations and report violations when observed in these areas to their owner/client. Fines resulting from NESHAP violations are enforced under the Clean Air Act and can include penalties of up to $25,000 per day, per violation.

Roofing contractors have made headlines for improperly disposing of asbestos. One contractor in Charlotte, NC was levied an initial dump fine of $10,000. A major manufacturer has paid hundreds of thousands of dollars in one case where they played a large role in the development of the specifications. It can be safely assumed their role of playing consultant contributed to their sharing in the cost of the problem. The following two cases are much more common and illustrate why the NESHAP law exists.

CASE I

Vic Goodman of Radco Construction, Charlotte, NC, conveys the following:

General

A school located northwest of Chicago was scheduled to be reroofed by a reputable Midwest roofing contractor. The roof membrane and flashing were tested and properly addressed. The work involved one wing of the school. The existing roof system was to be removed down to the metal deck, and new insulation and roofing were to be installed. Once started, the project progressed nicely until almost complete.

Problem

A NESHAP inspection was not conducted. Asbestos fireproofing located on the deck's underside was dislodged and fell on top of the ceiling tile below. No ceiling tile fell in; however, an 8′ diameter water puddle was observed on the floor where a 2′ x 2′ curb cap had been blown off in an intense rain storm.

Result

Owner claimed that the top surface of all ceiling tile located in a three classroom area was contaminated as a result of the reroofing project and that the contractor was liable. An abatement contractor already on site for other work removed the tile at a cost of $110,000. Approximately one cup of fireproofing had fallen. Additional cost from schedule disruption was reported to be substantial. The roofing contractor's insurance company accepted and paid the claim.

CASE II

Jeff Iannella of McMullen Construction, Safety Harbor, FL, reports another common situation:

Powered carts hauling luggers and moving hundreds of pounds of material will always affect the deck and anything attached to the deck's underside.

General

A tower was scheduled to be reroofed for a government agency. The roof membrane and flashing were tested and properly addressed. The job was started.

Problem

A NESHAP survey was not conducted. The drain wrap contained asbestos. As pipes were vibrated during removal, some of the mud wrap became dislodged.

Result

Approximately three months elapsed before the situation was resolved. The use of the tower became complicated due to the contamination. The contractor lost a "substantial amount of money" as a result of all the costs involved in settling this new issue and the related delays.

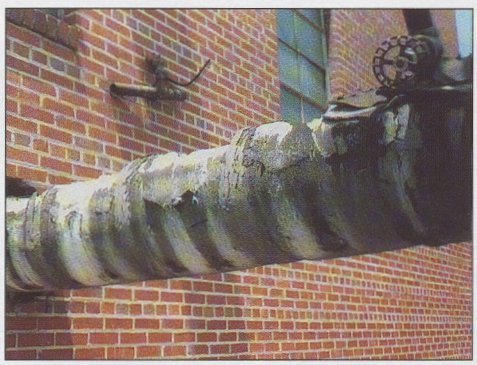
The two cases above are typical. Components such as those cited in these cases (or any other equipment directly attached or supported to the deck) that are affected by way of substantial vibration caused by reroofing traffic are thus covered by NESHAP. If a nightly tie-in is faulty or the contractor is caught in a sudden thunderstorm, water may enter the building and potentially cause damage to everything down to the floor. Is a component not affected by vibration but potentially wetted in this manner covered by NESHAP even though leaks may not happen?

The key to all of this is to properly inspect all potentially affected items associated with a reroofing project as a first step. This information can then be specifically addressed in the specification and used to develop accurate budgets and allow contractors to bid fairly.

What to Look for and Test

Before any specifications are written, budgets provided, and certainly ahead of any work being performed, a thorough inspection should be conducted to determine what will be affected. If reroofing is involved, this evaluation must extend to any components subjected to the banging and vibrations that will result. Usually, this involves looking at the underside of the deck and anything attached to it. Also, penthouses, rooftop equipment, siding, and other rooftop items often have asbestos-containing material (ACM). If it's affected there are two choices that are available: first, an item in question may be declared to be positive and treated accordingly; secondly, an affected item in question must be tested and conclusively proven to not contain asbestos if it is to be handled as non-asbestos-containing material.

Fiberglass insulation is an item that OSHA & EPA have exempted from testing in some situations. This exemption requires an accredited asbestos inspector to perform the evaluation to see if the material qualifies. Many components are often not properly identified with roofing projects due to a lack of understanding or a sometimes false confidence in knowing the material. Consultants who assume to know a material's composition are taking on great risk and may be in violation of the law. If a consultant allows a project to be conducted without a thorough NESHAP inspection, the potential liability is there should asbestos material turn up on the job.



Workers must bend over to get under this pipe, which contains loose and highly friable asbestos. Several times workers banged into this pipe with hard hats, creating a dust cloud of asbestos.

Summary of key provisions of the OSHA and EPA asbestos standards

Exempt operations	No categorical exemptions apply in either standard. The following are exempt from EPA's NESHAP but not the OSHA standard: (i) residential structures with four dwelling units or less; (ii) removal of nonfriable ACRM using proper work practices (see NOTE) other than power roof cutters; (iii) removal of less than 5,580 sq. ft. (518 m^2) of nonfriable BUR using a power roof cutter; and (iv) removal of less than 160 sq. ft. (15 m^2) of material that is friable or contaminated with ACRM-related dust or debris.	
Regulatory requirement	**Nonfriable (intact) incidental ACRM**	**Removal or repair of primary ACRM (OSHA Class II operations)**
Competent person supervision	No, but must be inspected prior to and during job, as needed.	**Yes**, primary functions include initial inspection of the ACRM's condition, set up of the regulated area and making an exposure assessment; inspections of the ACRM operations are required as needed to ensure compliance and at reasonable employee request; supervisor needn't be on site for all ACRM work, *except* for operations subject to EPA's NESHAP.
Initial exposure assessment	No	**Yes**, a competent person may make a negative exposure assessment (NEA) based on NRCA's data compilation provided material is nonfriable (intact), worker training requirements are met and required roof removal methods are used; otherwise, an NEA can be made only on the basis of: (i) "historical" or "objective" data prior to the start of the job or (ii) on-the-job exposure monitoring.
Exposure monitoring	No	**No**, if an NEA is made before the start of the job; otherwise, representative daily monitoring is required until compliance with the new OSHA permissible exposure limits (0.1 f/cc, eight-hour TWA; 1.0 f/cc, 30-minute excursion) is demonstrated.
Regulated areas	No	**Yes**, the demarcation requirement can be met by posting warning signs at points of access to the roof; neither demarcation nor warning signs are required where an NEA is made and no untrained workers have access.
Wet methods	No	**No**, if material is nonfriable and proper roof removal methods (see Note) are used, *except* that the cutting blade of power roof cutters must be misted continuously inside of the shroud; **yes**, for all ACRM and related dust and debris, but only *if* the material is friable.
HEPA dust collector and/or vacuums	No	**No**, if the material is nonfriable and proper roof removal methods (see Note) are used, *except* for dust and debris created by power roof cutters on aggregate-surfaced roof systems (gentle sweeping and/or wet-wiping is permitted for collection of power roof cutter dust and debris on intact, smooth-surfaced roof systems); **yes**, for all ACRM-related dust and debris, but only *if* the material is friable.
Bagging/wrapping/ labeling of removed ACRM	No	**No**, if material is nonfriable and proper roof removal methods (see Note) are used, *except* for the dust and debris created by a power roof cutter; **yes**, for all ACRM and related dust and debris, but only *if* the material is friable.
Prescribed lowering methods	Yes, all removed ACRM (see adjacent block)	**Yes**, all removed ACRM, including related dust and debris, must be lowered by prescribed methods—i.e., by hand, crane, hoist or dust-tight chute. In no case can ACRM be tossed or thrown off of the roof to a lower level.
Roof level air intakes isolated or shut down	No	**Yes**, intakes may be isolated by covering them with plastic or other material.
Respirators & protective clothing	No	**No**, if an NEA is produced before the start of the job; otherwise, required unless or until an NEA is made based on exposure monitoring.
Equipment area	No	**No**, if an NEA is produced before the start of the job; otherwise, required unless or until an NEA is made based on exposure monitoring.
Smoking ban	No	**Yes**
Notifications	Potentially may be required for some *installation* work.	**No** to OSHA. **Otherwise**, required as follows: (i) to EPA prior to the start of the job (*unless* exempt from NESHAP), and (ii) to employees, building owners and other employers on site, when and as applicable.
Worker training	Yes, baseline training; no min. length; refresher not required.	**Yes**, baseline worker training under paragraph (k)(9)(viii) of the OSHA standard plus "hands-on" training on proper removal methods; 8-hr. minimum for initial training; annual refresher courses required (duration unspecified but 2-hr., hands-on refresher training recommended by OSHA).
Supervisor (competent person) training	No, but competent person must be "knowledgeable."	**Yes**, AHERA 5-day supervisor training course or equivalent, but shorter EPA- or state-approved roofing-specific courses acceptable; annual refresher training required (duration unspecified, but AHERA criteria require 8-hr. refresher training).
Medical surveillance	No	**Yes**, for each worker who: (i) works on Class II ACRM removal or repair jobs for 30 or more days per year, *excluding* days involving one hour or less of such work if proper roof removal methods (see Note) are used, or (ii) is required to wear a negative-pressure respirator.
Disposal of ACRM as regulated asbestos waste	No	**No**, if material is nonfriable and proper roof removal methods (see Note) are used, *except* for dust and debris created by a power roof cutter; **yes**, for all ACRM and related dust and debris if material is friable, *unless* exempt from EPA's NESHAP.
Record keeping	No	**Yes**, for any exposure monitoring, objective data, training, medical surveillance or regulated waste disposal records and jobs where wetting is not used because of freezing temperatures (*unless* exempt from EPA's NESHAP).

Note: Proper roof removal methods include: (i) required methods as summarized in this table, *and* (ii) the use of methods that have been found not to render ACRM friable. Proper manual methods include the use of spud, spade, flat-blade or slicing tools (such as axes, mattocks, pry bars, crowbars, spud bars, shovels, flat-blade knives and utility knives) to slice, strip-off, shear-under or pry-up the roofing material. Sanding, grinding, abrading and cutting with serrated-edge hand tools, such as handsaws, are prohibited. Proper removal methods also include careful handling and stacking of removed materials without throwing or intentionally breaking or crushing the materials. Proper mechanical methods include power removers, "power slicers" and "power plows." Power slicers and power plows, though not presently available commercially, can be fabricated to slice through asbestos-containing BUR felts. When used, EPA's NESHAP is not applicable, as long as the ACRM is nonfriable.

This chart is not intended to replace a full understanding of the detailed regulations.

Chart provided by Carl Good

The owner/client is also put at risk. If unknown asbestos pipe wrap, ceiling tile, fireproofing, or anything else containing asbestos is discovered as a result of a roofing project, it would clearly meet the "affected" requirement. The only question now would be to learn the extent of any added cost for handling, worker's exposure, penalties for NESHAP violation, and more. The consultant could have liability as the owner's representative. The owner of the asbestos material certainly has liability. If materials can be affected by reroofing, they are to be handled as asbestos material unless they are tested and found not to be ACM.

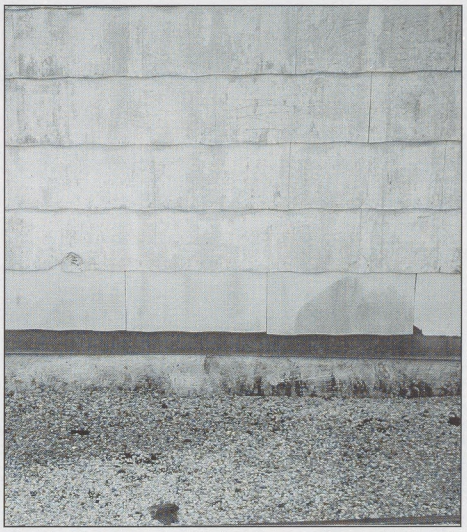
Who Should Perform the NESHAP Inspection

For states that fall directly under federal regulations, NESHAP requires the "owner or operator" of the demolition or renovation to have the affected part of the building "thoroughly inspected." It is important to note the definition in the regulations for "operator" which include anyone who "owns, leases, operates, supervises, or controls..." the facility or impending demolition or renovation. It is important to know that consultants fit the definition of "operator," providing much more responsibility than many realize. The regulations make

Top left: Some asbestos roofs have gravel surfacing. If asbestos can be visually identified, testing may not be required. Don't declare it non-asbestos without testing. Top right: This roof is a less common coal tar roof. The membrane tested negative; however, the edge stripping tested positive. Bottom left: A common condition is for the base flashing to contain greater than 1% asbestos content and the membrane to test negative. Bottom right: A built-up roof with a single ply re-cover. The membrane testing positive for asbestos will surprise few; however, the fleece backing on the single-ply also tested positive and is highly friable.

the owner, contractor, consultant and just about anyone with a substantial role to play, responsible for making sure the inspection takes place.

This inspection is to be in the form of a written report meeting many detailed requirements such as the number of samples taken with documented locations. If the threshold amount triggering EPA roofing regulations is surpassed, it is required to be submitted with the EPA notification documents. NESHAP does not technically require an accredited asbestos inspector or management planner to

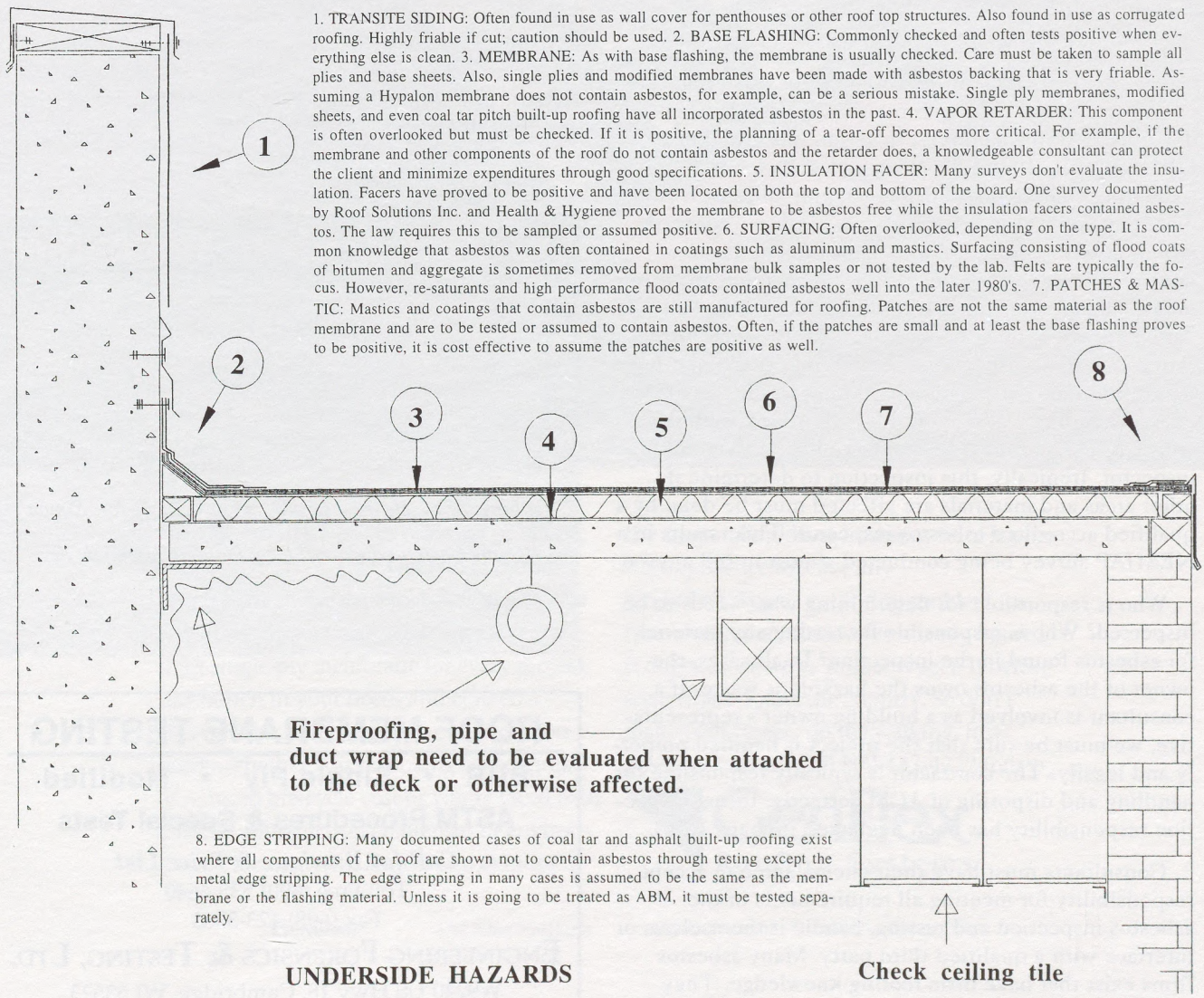


This penthouse siding is highly friable. Roofing work often encounters such conditions. These areas must be identified and addressed in the specifications.

HOT SPOTS

Drawn by: Chuck Marvin

1. TRANSITE SIDING: Often found in use as wall cover for penthouses or other roof top structures. Also found in use as corrugated roofing. Highly friable if cut; caution should be used. 2. BASE FLASHING: Commonly checked and often tests positive when everything else is clean. 3. MEMBRANE: As with base flashing, the membrane is usually checked. Care must be taken to sample all plies and base sheets. Also, single plies and modified membranes have been made with asbestos backing that is very friable. Assuming a Hypalon membrane does not contain asbestos, for example, can be a serious mistake. Single ply membranes, modified sheets, and even coal tar pitch built-up roofing have all incorporated asbestos in the past. 4. VAPOR RETARDER: This component is often overlooked but must be checked. If it is positive, the planning of a tear-off becomes more critical. For example, if the membrane and other components of the roof do not contain asbestos and the retarder does, a knowledgeable consultant can protect the client and minimize expenditures through good specifications. 5. INSULATION FACER: Many surveys don't evaluate the insulation. Facers have proved to be positive and have been located on both the top and bottom of the board. One survey documented by Roof Solutions Inc. and Health & Hygiene proved the membrane to be asbestos free while the insulation facers contained asbestos. The law requires this to be sampled or assumed positive. 6. SURFACING: Often overlooked, depending on the type. It is common knowledge that asbestos was often contained in coatings such as aluminum and mastics. Surfacing consisting of flood coats of bitumen and aggregate is sometimes removed from membrane bulk samples or not tested by the lab. Felts are typically the focus. However, re-saturants and high performance flood coats contained asbestos well into the later 1980's. 7. PATCHES & MASTIC: Mastics and coatings that contain asbestos are still manufactured for roofing. Patches are not the same material as the roof membrane and are to be tested or assumed to contain asbestos. Often, if the patches are small and at least the base flashing proves to be positive, it is cost effective to assume the patches are positive as well.



8. EDGE STRIPPING: Many documented cases of coal tar and asphalt built-up roofing exist where all components of the roof are shown not to contain asbestos through testing except the metal edge stripping. The edge stripping in many cases is assumed to be the same as the membrane or the flashing material. Unless it is going to be treated as ABM, it must be tested separately.

UNDERSIDE HAZARDS

conduct this inspection. However, it would be prudent for his/her own protection for the owner to employ an inspector with these minimal qualifications and who is very familiar with reroofing. If a serious dispute arises involving ACM after the job starts, it is safe to assume the owner will have to demonstrate the qualifications of the inspector selected.

States (such as North and South Carolina) having state counterparts to OSHA & EPA have clarified this requirement. They mandate the NESHAP inspection be conducted by a state accredited asbestos inspector. Confusion was reintroduced when the NC Dept. of Environment, Health, and Natural Resources (DEHNR) waived a NESHAP inspection for reroofing projects if the project would "only affect bituminous or membrane roofing material." In lieu of the NESHAP inspection, an accredited roofing supervisor may take the roofing samples for asbestos testing. With this exception to the NESHAP, an accredited inspector or roofing supervisor can take the samples if the work affects roofing materials only. In states with OSHA & EPA counterparts, specific requirements for that state should be determined and complied with.

Even in the case of North Carolina, which appears to have a relatively lenient requirement for reroofing, care must be used not to inappropriately apply the exception of a NESHAP inspection. A question was asked of a DEHNR official during a meeting last October attended by roofing contractors, consultants, and building owners. The question was in regards to what impact roof work vibration to the deck and underside attached components would have with the reduced inspection requirement. The answer was that nothing changed and all "affected" areas must be inspected. It was then further stated that if an inspection revealed that material other than bituminous or membrane roofing was in the affected area needing testing, a full NESHAP inspection was still required and must be conducted by an accredited inspector. Ironically, this inspection to determine if other areas and materials are affected must be done by a qualified accredited asbestos inspector! This results in a NESHAP survey being conducted almost in full anyway.

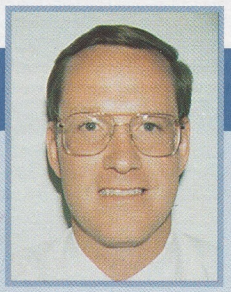
Who is responsible for determining what needs to be inspected? Who is responsible for testing any material for asbestos found in the inspection? In all cases, the owner of the asbestos owns the hazardous waste. If a consultant is involved as a building owner's representative, we must be sure that the project is handled properly and legally. The contractor is typically responsible for handling and disposing of ACM correctly. Initial inspection responsibility has been neglected in many cases.

Consultants must have their clients agree to accept responsibility for meeting all requirements of the asbestos inspection and testing, handle it themselves, or interface with a qualified third party. Many asbestos firms exist that have little roofing knowledge. They know to test the flashing and the membrane. Unfortunately, they will often not know to test for re-covers, fleece-backed membranes, gravel stop edge stripping, insulation facers and much more.

Recommendations and Cost

Use of an accredited asbestos inspector who is (or is in association with) a Registered Roof Consultant to conduct a NESHAP survey on a reroofing project will provide the most protection for the owner. This inspection, when conducted correctly, will lower the consultant's and client's liability. The contractor's liability and ability to bid and perform the work properly are also improved. These inspections usually cost only a few hundred dollars more than a visual roof survey to cover testing of samples. Most NESHAP asbestos inspections cost less than 1% of any project over one or two hundred squares—a small price to ensure that handling and disposal requirements are implemented. If ACM is not thoroughly inspected for and identified, it can't be properly handled and disposed. Workers may also needlessly be put at risk.

Credits:
Assistance on this article was provided by Joy Finch of AAA Environmental, Spartanburg, SC; Carl Good, NRCA; Jeff Dellinger and Ron Howell, NC DEHNR; and Jeff Miller.



About The Author

Chuck Marvin *is an accredited asbestos inspector and Registered Roof Consultant. He is the president of Roof Solutions Inc., a Charlotte, NC-based consulting firm. He has served as an officer for Simon Roofing Corp. and worked for a building materials division of B.F. Goodrich.*