

## **Asbestos Coatings and Components on Concrete Bridges, Compliance and Abatement**

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### **ABSTRACT**

The use of asbestos in buildings is common knowledge, with building industry professionals aware of the need for regulatory compliance when working around, or subcontracting out abatement services. However, it is often a surprise for bridge maintenance firms and even transportation agency personnel to learn that bridges can contain asbestos components and that they are subject to similar stringent abatement regulations and processes too.

Various asbestos containing materials (ACM) and asbestos-containing surfacing materials (ASCM) were historically applied in significant quantities to concrete bridges. During renovation (surface preparation for overcoating or total coating removal and replacement) or demolition of the structure, asbestos may be emitted into the air, creating an airborne hazard to humans and the environment.

There are specific EPA, OSHA and State regulations regarding this type of activity. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) requires an inspection for the presence of asbestos-containing materials prior to renovation and/or demolition of a facility or a facility component.

If ACM is present then specific work practices and notifications are required to be implemented under the NESHAP. Further, OSHA's asbestos regulation (29 CFR 1926.1101) contains specific requirements regarding employee training, personal protective equipment, exposure monitoring, waste packaging, medical surveillance, etc. Lastly, States may have specific requirements for managing and disposing ACM.

This Presentation covers the regulatory framework for renovations, demolitions and repainting of concrete bridges where ACM is present and an overview of traditional and novel approaches concerning the issue.

Key words: asbestos, abatement, notification, NESHAP, survey, friable, non-friable, wet-method, compliance

## INTRODUCTION

Asbestos containing textured coatings and other various asbestos containing components are not often thought of as being used on bridges. However, their use on bridges, especially concrete bridges is widespread in some regions and because of this, specific regulatory compliance is required. Knowing how to comply and how proper abatement is performed will keep the contractors and facility owners in compliance, avoid associated liabilities, provide proper employee safety and keep bridge maintenance projects on schedule.

## ASBESTOS COMPONENTS ON CONCRETE BRIDGES

An asbestos containing material by regulatory definition is any material with greater than 1% of asbestos. Asbestos containing components often identified on concrete bridges include: textured coatings (applied to rails, beams, columns, bent caps, wing walls, abutments and retaining walls), expansion joints, caulking, guard rail post pads (between metal rail post and concrete rail), drain lines and conduits and utility lines attached to bridges. These materials have been identified in bridges built as late as the early 1990's.

## ASBESTOS BACKGROUND

The use of asbestos in buildings and industrial facilities is well known. Significant chrysotile asbestos deposits were discovered in Quebec, Canada in the late 1800's and subsequent mining operations provided an inexpensive material ultimately used in a wide variety of products for building and industrial applications. Two other types of asbestos, amosite and crocidolite, were also mined elsewhere and were used to a lesser extent. All total, asbestos is believed to have been and continues to be used in over 3,600 different products.

Asbestos is extremely heat-resistant, chemical resistant, durable, doesn't conduct electricity, and has great acoustical properties. In addition, its fibrous structure with a relatively low density makes this inexpensive mineral a great binder and filler in all sorts of materials. Significant economic uses include fireproofing, piping and boiler insulation, transite asbestos cement pipe or board, acoustical materials, concrete coatings, and spray or trowel-applied surfacing materials.

For the most part, the use of asbestos in building and construction/industrial materials has been phased out, in part due to rules for certain manufactured goods and, in part, due to liability associated with the adverse health effects of exposure to asbestos. In 1989, EPA's Toxic Substances Control Act added provisions which would have permanently banned the use of asbestos in most products. However, in 1991, the Fifth Circuit Court of Appeals overturned the ban in a case brought by the asbestos industry (Corrosion Proof Fittings v. EPA). Now, most all states have rules banning its use, but up to 1% of asbestos can still be used in products and it is frequently found in imported products under trade names and chemical names as well.

Adverse health effects from inhalation of airborne asbestos fibers are extremely well documented. Ingestion is also linked to certain diseases. These include mesothelioma, lung cancer, ovarian cancer and laryngeal cancer. Asbestosis and COPD are two other common diseases associated with exposure to asbestos. A person's exposures to asbestos initially will have little adverse health effects, but the diseases, which have a latency period from 15 to 40 years can be debilitating and may be fatal.

## ASBESTOS REGULATORY FRAMEWORK

In the United States there is a significant and well-established regulatory framework concerning the identification and proper management of asbestos-containing materials (ACM). The Environmental Protection Agency (EPA) requires facility owners to properly identify asbestos-containing materials (ACM) prior to renovation or demolition of a facility or facility component. Bridges are considered facilities within the regulations. Certain classifications of ACM must be removed prior to construction activities including renovation or demolition. Both EPA and the Occupational Safety and Health Administration (OSHA) have regulations concerning the removal, notification, transportation, and disposal of ACM.

While regulations are not the primary focus of this presentation, they nonetheless are the basis for it. While asbestos is typically no longer used in building materials it may exist in a variety of older materials including textured concrete coatings. This section will provide a brief look at the most important aspects of the regulatory framework.

### EPA Regulations

*NESHAP. The National Emission Standards for Hazardous Air Pollutants, (NESHAP) 40 CFR Part 61, Subpart M – National Emission Standard for Asbestos.* This regulation not only requires facility owners to inspect for ACM, but also to provide project notification, manage regulated asbestos-containing material (RACM) so it is removed wet and without the creation of visible emissions. The materials must be packaged in leak-proof containers and then transported to a disposal facility that accepts ACM. Specific requirements govern both transport and disposal facilities.

Three definitions under NESHAP are initially of significance:

*Facility* - means any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building, structure, or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building. Any structure, installation or building that was previously subject to this subpart is not excluded, regardless of its current use or function.

*Renovation* - means altering a facility or one or more facility components in any way, including stripping or removal of RACM from a facility component.

*Demolition* - means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

Prior to renovation or demolition at a facility, a thorough inspection must be conducted to determine if RACM is present. The definition for RACM is a bit convoluted so for purposes herein it is assumed that any identified ACM will be treated as RACM. The thorough inspection should be conducted by an asbestos professional.

Both EPA and OSHA define ACM as having greater than 1% asbestos as determined through laboratory testing. Laboratories are approved for various asbestos-related testing services. As discussed above, there are a variety of asbestiform minerals. Chrysotile is the one most commonly found in certain older coatings.