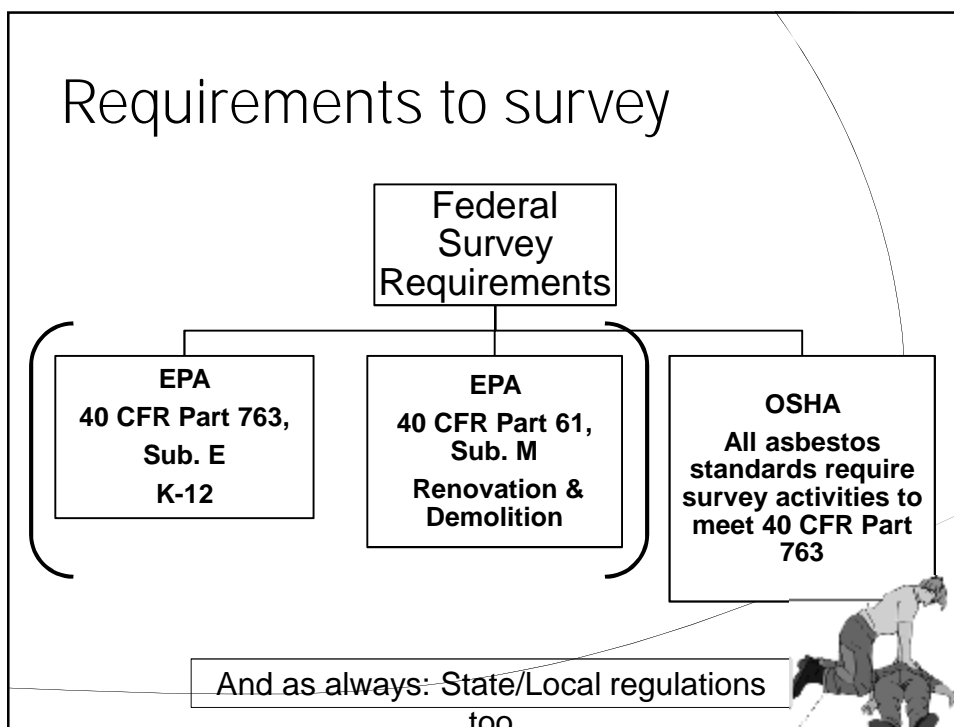


STANDARD PRACTICE FOR
COMPREHENSIVE BUILDING
ASBESTOS SURVEYS
ASTM 2356 - 14

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The Environmental Institute
Marietta GA
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What we'll cover...

- ž Survey requirements; the regulations
- ž Survey issues: the model classes, the lore and the gaps
- ž ASTM E2356
 - The format of an ASTM document and E2356 overview
 - The 3 varieties of surveys
 - Emphasis on Pre-construction Survey
- ž The realities of recommending or requiring stakeholders to utilize E2356



EPA Survey requirements in brief

- ž EPA “ACM in Schools” 40 CFR Part 763, Sub E
 - Well defined requirements including certification of Inspectors (MAP, App. C)
 - Specific sampling protocols, by material type
 - Assessment of friable materials
 - Requirements for Management Plan
 - O&M as part of MP
 - Includes recommendations for response actions
 - Others...
 - For many accredited Inspectors this is the only way in which surveys are performed...
 - A best practice in many ways; **if not NESHAP**
 - Whether required or not...“...it’s what I learned in Inspector school...”

EPA Survey requirements in brief

- ž 40 CFR Part 61, Subpart M—National Emission Standard for Asbestos
 - Asbestos-related requirements for renovation, demolition and waste management/handling
 - § **61.145** Standard for demolition and renovation.
 - (a) Applicability. To determine which requirements of paragraphs (a), (b), and (c) of this section apply to the owner or operator of a demolition or renovation activity and prior to the commencement of the 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 nonfriable ACM.....

EPA Survey requirements in brief

- ž The asbestos NESHAP is THE driving reg in today's marketplace, not AHERA compliance work.
- ž There is considerable variability in what many perform as "surveys" to comply with NESHAP
 - From ESAs to "AHERA in sheep's clothing" to sheer incompetence
- ž I have seen traction to move to an ASTM-based standard: E-2356
 - "Documented methodology"



Designation: E2356 - 14

Standard Practice for
Comprehensive Building Asbestos Surveys¹

ASTM Standards

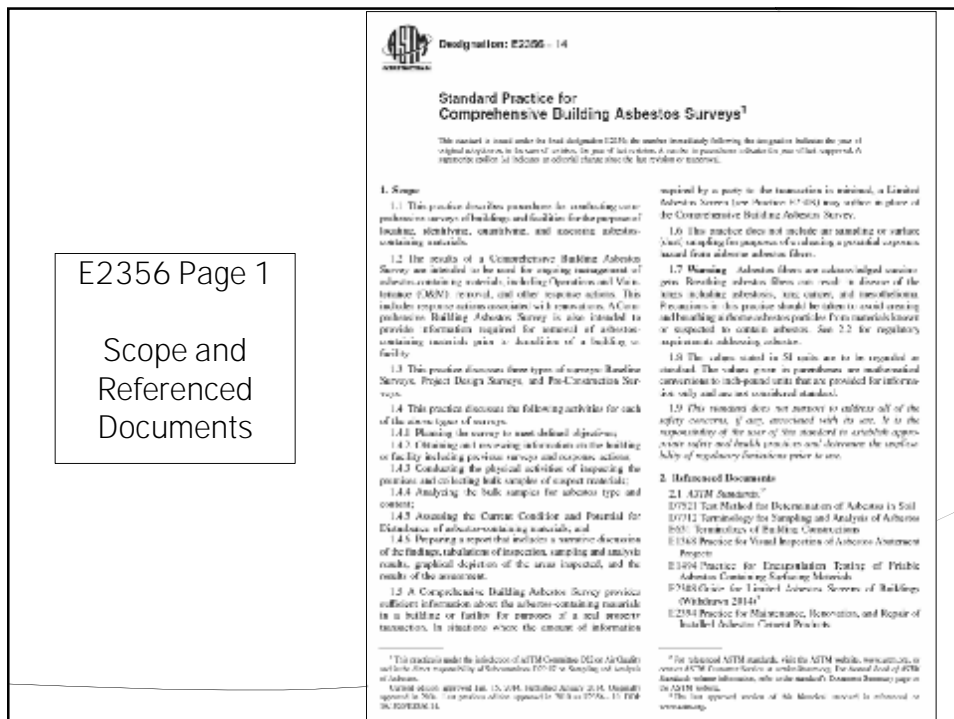
- ž Methods most often proposed by industry to fill a need for a “standard practice”
- ž Practice proposed, and written following required formatting
- ž Reviewed by sub-committee...over and over....
- ž Sent to parent committee for vote; must be 100% consensus...vote after vote...
- ž Once finalized, assigned final numbering and published as standard practice
- ž Must be reviewed every few years (2356-14)
 - Often revised during reviews or as needed

Standard Practice Format

- ž Title
- ž Scope
- ž Referenced Documents
 - ASTM standards, regulations (federal and State/Local [if germane]), agency methods (NIOSH, EPA, States)
- ž Significance and Use
- ž Qualification and Responsibilities
- ž Body of practice requirements
- ž Appendixes (mandatory and non-mandatory)

ASTM Copyright Issues

- ✘ ASTM standards are COPYRIGHTED!!
 - You must purchase them
 - It lives on your computer and you can produce one copy for your own use
 - “single use” versus “general license”
- ✘ This means a person or entity cannot:
 - Electronically transfer to anyone for any reason
 - Perhaps in-house (only) under ‘general license’
 - Make hard copies for distribution
- ✘ In other words; if you plan to add E2356 to regulations or as a recommendation...you cannot give copies away!
 - Use cover page only!!



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3.1.1.2 asbestos survey, *n*—analysis that is specific, controlled, or otherwise applied to market and exterior elevated and unretained surfaces. Nonwoven material includes several of plastic as ceiling, floor, or structural materials, and other materials that are not structural, decorative, insulating, and other purposes.

3.1.1.3 asbestos survey checklist, *n*—material which is applied to interior and exterior elevated components to ensure that work is done. The checklist includes information on paper, string, holes, flooding, leaks, doors, and other structural components.

3.2.2.1 and 3.2.2.2, *n*—material which is used to line a wall, floor, ceiling, or other surface and that may have a dust level greater than that of the substrate.

3.2.2.3 high efficiency particulate air (HEPA) filter, *n*—a filter that traps on a liquid or solid medium particulate matter that is 0.3 micrometers or a micron diameter, capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

3.2.4 dust and debris, *n*—solid particles, fragments, or chunks of material, large enough to have settled to the work area by virtue of their weight, but that proceed to have originated from the material studied by the exposure action, or from a fiber release process.

3.2.5 fiber release process, *n*—an analytical or statistical determination of asbestos-containing materials which results in the generation of dust and debris.

3.2.6 freely emitted, *n*—material easily emitted or released to ambient atmosphere.

3.2.7 asbestos action, *n*—a measure of assessment taken to control, encapsulation, or enclosure or operation and maintenance (such as repair, clean-up, or preventive measures) of asbestos-containing material in any form, by any positive asbestos.

3.2.8 clean asbestos process, *n*—the activities before, during, and at the conclusion of a response action that are associated with forcing the presence of fibers, debris, dust, and debris, or unretained material and verifying the absence thereof at the completion of a response action.

3.3 definition of 'work' (scope or task) standard

3.3.1 asbestos, *n*—the asbestiform varieties of amphibole (crocidolite, crocidolite, anthophyllite, actinolite, tremolite, actinolite, and anthophyllite).

3.3.2 accessible location, *n*—a functional space or part thereof that can be inspected without requiring asbestos testing or posing an unacceptable health or safety risk to the inspector and where entry is not prohibited by security or other restricted restrictions.

3.3.3 building asbestos survey, *n*—an activity to determine the presence, location, condition, and quality of asbestos-containing materials in a building or facility, or on the property containing the building or facility.

3.3.4 end sample, *n*—a sample of suspect asbestos-containing material (ACM) or asbestos (A) intended to demonstrate the presence of the components of the sample.

3.3.5 enclosed space, *n*—a location requiring dedicated testing for purposes of sampling or control, whether for inspection and, if necessary, sampling of suspect material. Enclosed spaces include, but are not limited to, crates made of steel, walls and floors, above and below, utility rooms, ducts, ducts and cable trays, and the interior of HVAC equipment.

3.3.6 destructive testing, *n*—inspective procedure that necessitates the destruction of or not confidence to building materials, or requires penetration of a surface with a tool, causing stress of some kind to gain access to a concealed space. Lifting a ceiling tile or opening a hatch is not destructive testing.

3.3.7 enclosed area, *n*—a functional space or part thereof where entry is prohibited by security or other restricted restrictions.

3.3.8 functional space, *n*—an area within a building or workplace in a manufacturing plant and a conference room in an office building. A functional space can be vertical in nature, such as a pipe chase, and span several floors.

3.3.9 impervious area, *n*—existing material, normal system insulation material, or miscellaneous material that is suitable to cover and isolate and prevent or reduce dust emissions.

3.3.10 asbestos, *n*—an asbestiform mineral that is sampled and analyzed to perform one or more of the following analyses, using approved methods: (1) identify and quantify asbestos in bulk samples by Polarized Light Microscopy; (2) identify and quantify asbestos in bulk samples by Transmission Electron Microscopy; and (3) identify and quantify asbestos fibers with Phase Contrast Microscopy.

3.3.11 index of observation, *n*—an area where asbestos-related activities will be conducted before, during, and at the conclusion of the project. This index includes both the location of activities and an associated restriction on circulation paths.

3.3.12 non-freely emitted, *n*—material that is not freely emitted and that consists of fibers and other particulate matter contained in a solid matrix of asbestos, such as other asbestos-containing materials.

3.3.13 operation and maintenance (O&M) program, *n*—a preventive management program to provide periodic visual inspection of asbestos-containing materials, maintain them in good condition, mitigate fiber release from existing asbestos-containing materials, and clean or asbestos-containing dust and debris that has been removed, in order to minimize worker or occupant exposure to asbestos fibers.

3.3.14 polarized light microscopy (PLM), *n*—a method of analytical microscopy that uses an optical microscope to determine the optical properties of asbestos minerals and to the use of bulk sample analysis for asbestos, to provide positive identification of suspect fibers as asbestos and to quantify the presence of asbestos in the sample.

3.3.15 asbestos, *n*—the fiber that is applied to an existing plant, facility, or other system to improve appearance or other aspects.

3.3.16 support material, *n*—material that is sampled or is prepared to receive asbestos on the basis of its location, purpose, appearance, and other factors considered by the inspector.

3.4.1 Index Defined in Practice (ID712)

3.4.1.1 asbestos, *n*—a collective term that describes a group of naturally occurring, fibrous, highly durable, chemically stable minerals which are easily separated into long, thin, flexible fibers when crushed or processed.

3.4.2 asbestos

3.4.2.1 ACM—Asbestos-containing material(s)

3.4.2.2 AHERA—Asbestos Hazard Emergency Response Act

3.4.2.3 EPA—U.S. Environmental Protection Agency

3.4.2.4 EMEA—High Efficiency Particulate Air

3.4.2.5 HAZ—No Asbestos Detected

3.4.2.6 NESHAP—National Emission Standards for Hazardous Air Pollutants (specifically the asbestos emission standard for asbestos (40 CFR Part 61), Appendix M)

3.4.2.7 NCR—Non-Asbestos Report

3.4.2.8 OSHA—U.S. Department of Labor, Occupational Safety and Health Administration

3.4.2.9 PPE—Personal Protective Equipment

3.4.2.10 PLM—Polarized Light Microscopy

3.4.2.11 PPE—Transmission Electron Microscopy

3.4.2.12 RFL—Verminicide Airtic Infiltration

1. Definitions and Use

1.1 Management of asbestos-containing materials in buildings and facilities requires knowledge of the location, type, quantity, and condition of the materials. This information and accurate data are the critical information needed to make decisions on the control measures used to reduce possible exposure to asbestos-containing fibers. This is true whether the asbestos-containing materials remain undisturbed and completely intact, are subjected to some form of maintenance or work to remove them, or are removed to the greatest extent feasible before demolishing the building or facility.

1.2 This practice describes three types of surveys that support different objectives. These are the Baseline Survey, the Pre-Construction Survey, and the Post-Construction Survey.

1.2.1 The Baseline Survey is a building-wide, or facility-wide, inspection that provides a general sense of the overall location, type, quantity, and condition of asbestos-containing materials present. It is thought to be the most accurate functional space or response area bulk sample takes of suspect materials observed. The baseline survey provides information for long-term management of asbestos-containing materials and prioritization of response actions. The presence of asbestos in suspect materials may be detected or prevented in some cases without this sample being taken or analyzed. However, the baseline survey is not sufficient in the analysis area

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Referenced Documents & Terminology

Note: 2.2 "Other Documents"

Note: Cross references in terms

Note: 3.3 "...terms specific to..."

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Terms and Significance and Use

Note 3.4

Note 4: 'Significance & Use' Important; similar to the 'applicability' of a regulation

4. Significance and Use

- ž 4.2 This practice describes three types of surveys that support different objectives. These are:
 - ž Baseline Survey,
 - ž Project Design Survey, and
 - ž Pre-Construction Survey.

4.2.1 The Baseline Survey

- ž ...a building-wide or facility wide inspection that provides a general sense of the overall location, type, quantity, and condition of asbestos-containing materials present.
 - Based on accessible materials; non-destructive
 - For the management of ACM and prioritization of response actions
 - Presumptions/assumptions by Inspector OK
 - To aid in signage requirements by OSHA

4.2.1 The Baseline Survey

- ž From Note #1 & 2:
- ž This survey would be in compliance with AHERA (K-12)
- ž "...the baseline survey described in this practice requires inspection, bulk sampling, quantification, and assessment of suspect materials that are excluded by virtue of their type and location from the AHERA regulations for schools."
 - In other words it's not just ACBM (interior) and all identified materials are assessed (not just friable mat'ls)
 - The assessment protocol for this standard is not the same as AHERA
- ž No destructive sampling; not ALL ACMs are found
 - Risk for disturbing unfound ACMs
- ž "Collecting a single bulk sample, or a small number of samples, to determine if the material contains asbestos does not constitute a survey within the meaning of this practice."

4.2.2 Project Design Survey

- ž More focused than Baseline Survey
- ž Used to provide information to the Project Designer for preparing abatement plans and specifications.
- ž The locations inspected are limited to the areas that will be affected by the abatement project.
- ž Destructive sampling: attempt to find all ACMs within the boundaries of where work will occur
- ž No assume/presume...verify with sampling
- ž Info collected during survey to aid project design in planning abatement

4.2.3 Pre-Construction Survey

ž ...is performed in anticipation of renovation or demolition where a Baseline Survey has not been conducted and there is no information, or insufficient information, as to the existence of asbestos containing materials within the planned limits of construction.

→ ž The Pre-Construction Survey satisfies the **EPA NESHAP** requirements for renovation or demolition to “thoroughly inspect the affected facility”...

4.2.3 Pre-Construction Survey

ž ...requires destructive testing if concealed spaces are to be breached during construction.


– Means: as possible find all ACM prior to disturbance

ž If asbestos-containing materials are found, a Project Design Survey is conducted to provide information for preparing the plans and specifications.

– Means: additional info collected to facilitate development of plans/specs by Project Designer

Section 4.4

Significance and Use, further...

- Practice requires *dimensional accountability*
 - "...It is important to inspect as many functional spaces as possible and to document the reasons why certain functional spaces were not inspected and locations where no suspect materials were observed and, consequently, no samples were taken."
 - ž Reasons might include access limitations, the absence of materials to sample, the existence of information from previous surveys, or the **availability of reliable documentation such as Material Safety Data Sheets.** 
 - Many have found MSDS to not list asbestos in some cases
 - This is an important point; based on this issue could a stakeholder claim a NESHAP exemption because of MSDS?????

Section 4.5 & 4.6

Significance and Use, further...

- ž A Comprehensive Building Asbestos Survey is not limited to the class of materials commonly referred to as asbestos-containing building materials (ACBM) [as with AHERA]...
 - ...these may be installed in, attached to, or adjacent to the building or facility but are not as clearly a part of the building or facility...
 - Locations outside the building, in particular equipment in industrial facilities and power plants, and crawl spaces underneath the building are within the scope...
- ž 4.6 clarifies that owner has responsibility regardless of delegation

<p>Section 5 Qualification & Responsibilities</p> <p>This section reflects EPA MAP requirements and gives nod to State/Local requirements for certification (licensing)</p> <p>This section also requires that laboratories used are part of applicable accreditation programs</p> <p>Note 5.6.3 “Air samples are not collected or analyzed as part of a Comprehensive Survey.”</p> <ul style="list-style-type: none"> - This is independent of OSHA requirements - Air samples not used as an assessment tool 	<p style="text-align: center;">E2356 - 14</p> <p>4.3 A Comprehensive Building Asbestos Survey is an initial in situ survey of materials contained in or on asbestos-containing building materials (ACBM), defined in the AHERA regulations as "... found in or on interior structural members or other parts of a building." Results on ACBM's obtained in such way include ceiling corners, laboratory hoods, gutters, chubbboards, and other areas. These may be installed in, attached to, or adjacent to the building or facility but are not an integral part of the building or facility, as floor joists or floor tile. Nevertheless, such items still fall within the scope of an asbestos management program and therefore are included in this practice. Locations outside the building, or particular equipment in external facilities and power plants, and other areas adjacent to the building are within the scope of a Comprehensive Building Asbestos Survey.</p> <p>4.4 This practice is intended to be used by individuals who are conducting a Comprehensive Building Asbestos Survey for the owner or manager of a building or facility under a contractual arrangement for services as well as by employees of the owner or manager. If the individual is conducting the survey under a contractual arrangement (which may be with the firm employing the individual, the owner or manager of the building, or will responsible for certain activities as described in this practice.</p> <p>5. Qualifications and Responsibilities</p> <p>5.1 This section describes the qualifications and responsibilities of the individuals who participate in the Comprehensive Building Asbestos Survey. The requirements for accreditation as an inspector in accordance with the Model Accreditation Plan apply to the activities covered by this practice. Additional accreditation may be required, and qualifications may be assessed by one licensing requirements on the part of the owner or manager of the building or facility that is beyond the scope of this practice. Field experience in performing asbestos building surveys as described in this practice is of minimum experience.</p> <p>5.2 Not all of the qualifications discussed herein will be required for every Comprehensive Building Asbestos Survey conducted and a survey cannot use individuals (unless they are accredited inspectors) will have more than one, and possibly all, of the required credentials.</p> <p>5.3 Qualifications and responsibilities of individuals conducting the survey.</p> <p>5.3.1 Asbestos Inspector—For both types of surveys, accreditation as an inspector is required for the individual who makes the field samples and otherwise performs the physical activities covering the survey. This includes review of relevant building documentation and preparation of the survey report.</p> <p>5.3.2 Management Planter—For a baseline survey, accreditation as a management planter is only required for hazard assessment and characterization of response action if the survey is performed in a school, but is a desirable credential for all building and facilities.</p> <p>5.3.3 Project Designer—For a project design survey, accreditation as a project designer is desirable because this survey will provide information for the plan and specifications for remediation or abatement project.</p> <p>5.4 Contracting/Operations—For a project design survey, accreditation as a contractor/supervisor must be required because of the knowledge of abatement practices such as enclosure enclosures.</p> <p>5.5 In addition to the above credentials, the following credentials are evidence of the ability to perform one or more of the aspects of a Comprehensive Building Asbestos Survey.</p> <p>5.5.1 Credentials that indicate knowledge of building design include experience in building design, construction or operation and academic degrees, licenses, or registration in an asbestos management program. A degree in construction or technical education, occupational safety or a related field indicates knowledge of the materials properties of asbestos and other substances as well as the means of controlling the hazard.</p> <p>5.5.2 Credentials that indicate knowledge of building construction and operations include field experience in building construction, renovation, demolition, or maintenance, or a combination thereof, or formal or on-the-job training in construction technology or management.</p> <p>5.5.3 Qualifications and Responsibilities of Owner or Manager of Building or Facility—to be able to provide the necessary information, access, and other support to the inspectors, the staff of the building or facility, owner or manager should have taken at least a two-hour Asbestos Awareness course.</p> <p>5.6 Laboratories analyzing the samples shall possess one or more of the following qualifications in addition to or as part of an applicable state licensing requirements.</p> <p>5.6.1 For bulk sample analysis using Polished Light Microscopy.</p> <p>5.6.1.1 Accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology (NIST).</p> <p>5.6.1.2 Participation in the American Industrial Hygiene Association (AIHA) Six-Acres Airway Analytical Testing Program.</p> <p>5.6.1.3 Certification under the State of New York Environmental Laboratory Approval Program (ELAP), and</p> <p>5.6.1.4 Participation in a proficiency testing and certification program similar to 5.6.1.1 - 5.6.1.3.</p> <p>5.6.2 For in situ sample analysis of SM by using Transmission Electron Microscopy, the laboratory shall be certified under the State of New York Environmental Laboratory Approval Program (ELAP) or have other evidence of capability and experience with the ELAP method or its equivalent acceptable to the consultant.</p> <p>5.6.3 All samples are not collected or analyzed as part of a Comprehensive Survey.</p> <p>6. Baseline Surveys</p> <p>6.1 Planning the Survey—it is essential that the planning stage of an asbestos survey be complete in addressing the following issues and be defensible. A well-organized survey will</p>
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Section 6. Baseline Survey

- ✂ **This section is vast...and detailed**
- ✂ It describes MANY aspects of a Comprehensive Survey from planning to the physical aspects of sampling to reporting
- ✂ There are numerous portions of this section that apply to the Project Design (Sec 7) & Pre-Construction surveys (Sec 8), look for the term:
 - “Under this practice...”
 - This would mean that the information referenced applied to other survey activities
 - In other words...any user of this standard will need to read section 6 to determine applicability in Sec's 7 & 8
- ✂ We do not have the time to completely dissect Section 6...but let's look at some important aspects....

Section 6. Baseline Survey

- ž The Baseline Survey is sometimes called “*AHERA on steroids*”
- ž If you know AHERA requirements, it’s a start...but then you have to move out of that box.
 - In other words, performing a E-2356 meets AHERA, but doing an “AHERA” survey does not meet E-2356
- ž A few items of interest with the Baseline survey...

Section 6. Baseline Survey

- ž Baseline is for O&M and long term prioritization of response actions
 - If survey is for pending demo/renovation; Project Design Survey
- ž Scope of survey should be in contract
 - Should be comprehensive, but if limitations, these need to be enumerated in contract and reporting
 - What will be assumed/presumed, if any
- ž Homogeneous areas should not extend beyond a single building
- ž Exterior components are sampled or assumed
 - 6.1.3.2 ACM should be identified in the Baseline Survey regardless of whether it is used as a construction material or not, and whether located inside, outside or underneath the building, as long as the area inspected is within the scope of survey. This should specifically include stored materials such as gaskets, packing, or insulation not yet installed in or on the facility.

Section 6. Baseline Survey

- ž “Bulk sampling shall be done to prove that the material in question is not ACM. Otherwise the suspect material shall be presumed to be ACM, and documented and managed accordingly.”
- ž Sampling
- ž 6.1.4.1 **Under this practice, a minimum of three bulk samples** representative of each different homogeneous area of suspect material to be sampled shall be collected and analyzed to prove that the material sampled is not ACM.

Section 6. Baseline Survey

- ž **Destructive sampling not performed**
 - Can assume homogenous areas extend into inaccessible spaces; assumption must be reported
 - Destructive sampling **IS** performed for Pre-construction & Project Design surveys
- ž 6.2 Estimating the Cost of the Survey—**Estimated Cost of Survey**
 - This section is extensive and is cross referenced
 - All aspects of costs; travel, site work, reporting and even copy-making
 - Teams of two preferred; roles clearly defined
 - A good read for rookies!!

Section 6. Baseline Survey

ž 6.4 Conducting Field Work

- The details of the physical activities of the survey
- All functional spaces and homogeneous areas identified during survey
 - Homogeneous; color, texture, date of application and general appearance
 - Classify suspect ACMs as Surfacing, TSI, or Misc.
- EPA and OSHA regulations permit only an accredited inspector to determine that thermal system insulation is fiberglass, foam glass, rubber, or other non-ACM without bulk sampling. The inspector must use his judgment in excluding apparently obvious non-asbestos materials such as glass, steel, concrete, porcelain, and wood from sampling. The complete identification and location of all suspect materials in a building is basic and essential...if in doubt as to possible asbestos content, the inspector should sample the material.

Section 6. Baseline Survey

ž 6.4.4 Quantifying Suspect ACM

- Practice has details on how to quantify by type of material

ž 6.4.5.1 Sample Locations

- The use of random sampling is expected; explained in detail...more specific than AHERA

ž 6.4.6.1 Number of samples to be collected

- This practice encourages the collection of samples beyond the minimum numbers required below to ensure that homogeneous areas are defined as accurately as practical.
- **Bottom line:** same as AHERA: EXCEPT...no less than 3 for any homogeneous material
 - As in the nebulous “samples” for AHERA Misc. category

Section 6. Baseline Survey

ž Sample collection issues

- **Appendix X1** is a vast explanation of sampling all types of building materials...it is referenced extensively for all surveys and is non-mandatory.
- There are numerous helpful sampling, assessment and other forms in **Appendix X3**...helpful and non-mandatory
- Much discussion about collection of field data, processing of samples and COC

Section 6. Baseline Survey

ž 6.5 Bulk Sample Analysis

ž 6.5.1 Analytical Methods

- This section is mandatory for Project Design and Pre-Construction Survey
- PLM followed by quantitative (gravimetric reduction) TEM as needed
- Vermiculite: the “Cincinnati Method”
 - EPA 600R-04/004

Section 6. Baseline Survey

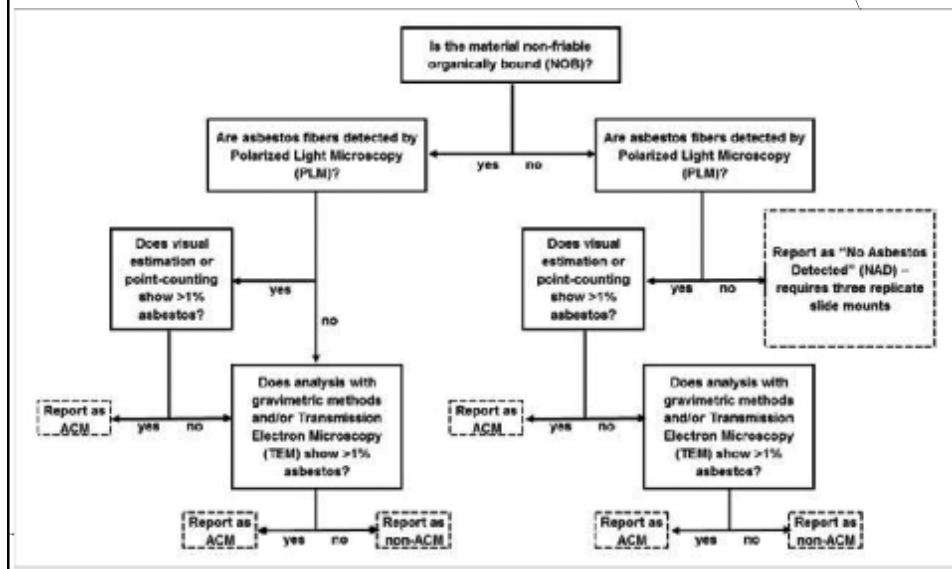
ž 6.5.2 Protocol for Confirmation of Results

- Now here's where it gets interesting!
- A full blown treatment of the NOB issue
- Point count requirements described
- Not required in Pre-construction Surveys (should it be?)

ž A thought...

- If one were to include this standard practice as a matter of State/Local regs...making this section mandatory also for a Pre-construction Survey would be a way to get these issues addressed...especially the NOB concept

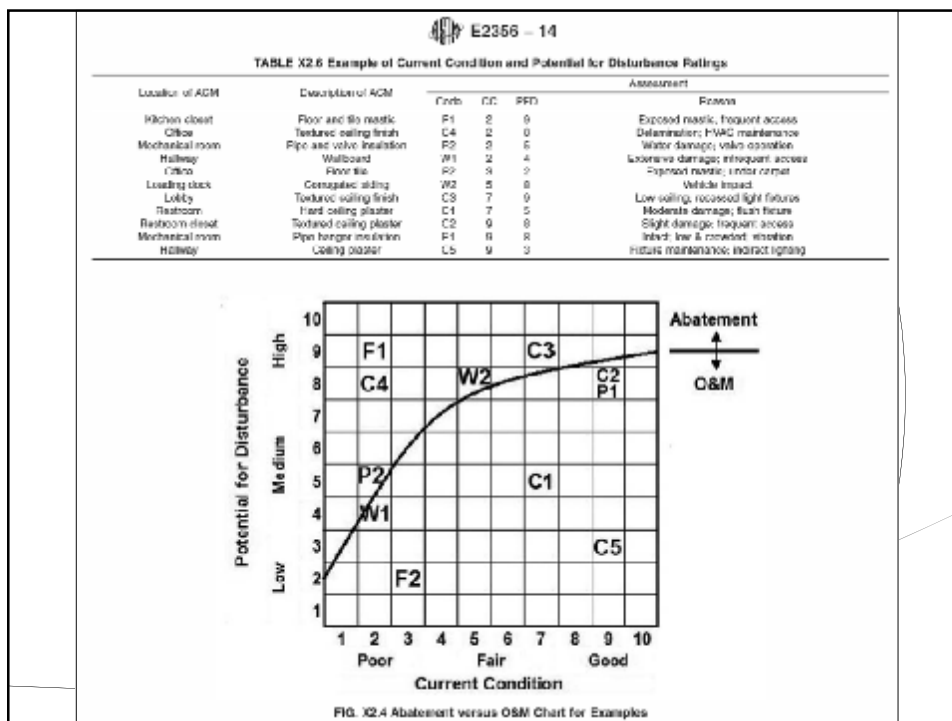
Section 6. Baseline Survey



Section 6. Baseline Survey

z Assessment is mandatory for Baseline Survey

- All homogeneous materials; interior, exterior
- Assessment has terminology similarities to AHERA but process is quantitative
- Assessment protocol is **Appendix X2**



Section 6. Baseline Survey

ž 6.5.3 Reporting of Results

- This section has important discussions on “NAD” “trace” and layered samples

ž **Bottom line:**

- Without a reasonable knowledge of the contents of the Baseline Survey and Appendixes 1-3 understanding expectations and cross referencing in the Project Design and Pre-construction Surveys will be difficult and could lead to incompliant work.
- Section

LET'S SALLY FORTH AND LOOK AT
THE PAGES OF SECTION 8
PRE-CONSTRUCTION SURVEY
(THE ONE THAT'S SET UP TO BE
NESHAP COMPLIANT)

<p>Section 8 Pre- Construction Survey</p>	<p style="text-align: center;">E2356 - 14</p> <p>examples of activities that should be identified during the Project Design Survey so they can be addressed in the project design.</p> <p>8.1.13 <i>Additional General Information</i>—If subdevelopment projects such as building or work in area building, existing form or other structure located outdoors are to be removed, the Project Designer should determine if the surface has weakened to the extent that movement is expected, or if there is dust and debris from other causes. For roofing, determine if the panels are installed as asbestos designed to the extent that they may not support a worker's weight and present a hazard of falling through. For siding installed over ground level, dust and debris may have contaminated the dirt near the building. Note the presence of paint or encapsulation, which will create asbestos fibers released into the air during the process of sanding. Determine the location of nearby ventilation intakes, windows or doors to establish whether they need to be covered or if the removal should be done within a negative pressure enclosure. See Practice E2294 for use of asbestos control products, appropriate procedures and work practices.</p> <p>8.1.14 <i>Consultant's Field Office</i>—A space must be located near the abatement area, but separate from the contractor's mobilization area, where the owner's representative can establish a temporary field office. Space must be provided to store and calibrate sampling pumps, and store personal protective equipment, fuel tanks and other items used by the project manager. The space must be sufficiently clean and unobstructed to ensure that persons other than persons on-site (such as Contract Management) cannot enter. Provisions must be made to secure this space when unoccupied.</p> <p>8.1.15 <i>ACM Accessible for Abatement</i>—ACM may have been found in locations where it is not possible to remove it during construction, such as equipment located in basements where full access to the material is not possible to reach into the cavity. This ACM presents a potential source of fiber release during demolition and during subsequent reconstruction and occupancy. The Project Designer must identify such locations so that he can include measures in the plan and specifications such as encapsulation or enclosure of the ACM to prevent fiber release.</p> <p>8.1.16 <i>Knowledge Following an Abatement</i>—A permit allows restriction of the asbestos materials to remove the ACM removed. Properly, the same contractor and contractor who handles the abatement project will also do the reconstruction work. Even though information for the applications work may be collected at the same time that the Project Design Survey is being conducted, this work is not considered part of the abatement project. For the reconstruction of floorcovering, plaster, pipe and heater enclosures, floor covering and other removal, ACM is not within the scope of this practice.</p> <p>8.1.17 <i>Documentation of the Project Design Survey</i> includes the sample data shown for bulk samples taken, a record of inspection of all functional spaces, including those subject to targeted water tests, roof plots or airways showing sample locations, functional spaces and non-functional areas, and photographs of representative or significant exposures and sampling locations. The Project Design Survey report shall also include information relevant to the new sampling control</p>	<p>measures in 7.3.0 is applicable as well as other issues noted by the Project Designer that will have to be discussed in plan and specifications. The Project Design Survey report is a resource for preparing the plan and specifications and will be substituted for it. The report must not be used as a document with which to initiate bid for abatement.</p> <p>8.1.18 <i>Asbestos Bulk Samples by PM, OI, EM, or IOM</i>, as noted, must be done in accordance with a recognized method such as those described in ISM 60084/0315 (see 5.5.1).</p> <p>8. Pre-Construction Surveys</p> <p>8.1 <i>Identification and Location of Areas Suspected to Contain Asbestos</i>—The Project Designer or other knowledgeable of the presence of asbestos in ACM. For various reasons, it may not be feasible to conduct a Baseline Survey of the entire building or facility within the time constraints of an impending construction project. However, the NESHAP regulations require the owner to "thoroughly inspect the affected facility" prior to activities that might disturb asbestos-containing materials. A Project Design Survey would be preferable because, at the time, the presence of ACM and the need for an abatement project has not been established. The Pre-Construction Survey focuses on areas of concern of asbestos that are not yet known, it is a means of asbestos identification, if not work process or abatement methods. If ACM is found, a Project Design Survey is performed and abatement takes place before construction commences.</p> <p>8.2 <i>Planning the Survey</i></p> <p>8.2.1 The plan and specifications prepared by the architect or engineer for renovation or demolition should be consulted to determine the scope of the Pre-Construction Survey. The survey must include all areas within the "limits of construction" as well as adjacent areas where ACM may be disturbed by construction activities. The survey must define those "limits of abatement" because it may be necessary, for example, to dust ACM on floors above and below the floor in which renovation is taking place, including on attic or crawl space.</p> <p>8.2.2 Before work commences, the survey—a contractor or architect—must select the method of abatement to be used. Whoever conducts the survey must be qualified as an asbestos inspector and the necessary must be qualified to perform the type of bulk sample analysis required.</p> <p>8.2.3 Establish the scope of the survey to include the buildings and facilities or portions thereof impacted by the renovation or demolition requirements. Document the areas where work will be performed and the materials within those areas that will be disturbed by the work.</p> <p>8.2.4 Determine the required number of bulk samples by type and location of suspect ACM that may be present in the affected area. It may not be necessary to sample some materials if the substructure conditions will not disturb them. However, it may be beneficial, from a cost standpoint, to include those materials in the survey.</p>
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<p>Section 8 Pre- Construction Survey</p>	<p style="text-align: center;">E2356 - 14</p> <p>8.2.5 <i>Estimate the content and format of the report</i>—Reports, tables, drawings and attachments such as the laboratory report to document the survey methodology and results, photographs or video that document the site and review process for the report before it is submitted.</p> <p>8.2.6 <i>Establish a schedule with the building owner for a convenient site visit</i>—If necessary, and the dates or when the field work will be started and completed. Arrange to meet with the architect or engineer who is designing the renovation. If applicable, get a copy of the renovation plans as soon as they are available. Determine the available times of access for the survey to be included in the plan, and the site after the permit will be issued at the time of the survey. Freedom of light and power will be available in the building during the survey.</p> <p>8.2.7 <i>The contractor cost of survey</i>—The contractor shall develop the field work, field report and management oversight. Laboratory charges will depend on the number of samples and size of analysis requested and the turn-around time if expedited results are needed. Other expenses include travel and subsistence for the abatement survey, cost of equipment such as materials and photographic documentation. For a detailed discussion of survey costs, see 6.2.</p> <p>8.3 <i>Qualification for Field Work</i>—Information regarding the previous location and quantity of ACM will be collected during one or more visits to the building or facility.</p> <p>8.3.1 <i>Identifying equipment and capture it as an important procedure to conducting field work efficiently</i>—Sampling equipment, in its normal condition, lights, tools, ladders, and other items should be inventoried for your access. See Appendix X3 for a list of equipment and supplies.</p> <p>8.3.2 <i>Conducting the field work</i>—The field work may include destructive sampling if access to concealed spaces is needed. These spaces may contain suspect ACM or it may be necessary to confirm that none are present therein. If destructive testing must be done in occupied spaces, it may be necessary to temporarily perturb the opening in the wall or ceiling. Perturbing by filling surfaces may create dust that is harmful to equipment or objectionable to occupants, and measures to control the dust must be taken during the survey. It may be necessary to perform a preliminary survey of a building system or component prior to and/or during asbestos sampling to determine if the surface being touched contains asbestos. For example, an inspector may need to collect bulk samples of plaster prior to cutting a hole in a ceiling to permit the spread of asbestos fibers, dust and debris in the space during the destructive testing.</p> <p>8.3.3 <i>Locate and inspect the functional spaces that will be impacted by the construction project</i>—Any structural area or functional space that cannot be inspected due to restricted accessibility or other reasons must be documented. Identify suspect ACM in accordance with the type of material (surface or material). Record system results as an abatement area (see 6.2) or as a suspected ACM if present in functional space, or if the only materials present are those which an accredited inspector can document without sampling, do not contain asbestos, document this information.</p>	<p>8.3.4 <i>Identify the homogeneous areas within each functional space</i>, and those that overlap adjacent functional spaces, by variations in the type of material, its appearance, color, texture and probable date of installation. The units, storage areas, determine the number of samples to be taken from random and non-random locations, consistent with 6.4.4.1 – 6.4.4.4 and the following provisions:</p> <p>8.3.4.1 Where feasible, the owner must determine suspect locations for any suspect material within a homogeneous area shall be a random sampling method described in the NESHAP plan.</p> <p>8.3.4.2 <i>Method</i>—METHOD COMPREHENSIVE SURVEY OF DISTURBED COMPONENTS—non-random sample locations for materials that may have been disturbed at the site. Such materials, which may vary in asbestos content throughout, a homogeneous area, include floorcovering, ceiling and wall surface, acoustical plaster, hard plaster and pipe filling insulation.</p> <p>8.3.4.3 <i>For surfaces such as floors, walls, and ceilings may be divided into a grid</i>, the cells of the grid numbered, and random numbers used to select cells in which to take the samples (see Practice 7). For large cylindrical objects such as tanks and vessels, an equivalent "flat" surface is an area outlined by the height or length of the object and its circumference. For homogeneous areas that are one-dimensional (linear), such as pipe insulation and impregnated boards and columns, use a random number table to select sampling locations along the length of the area.</p> <p>8.3.4.4 <i>Random sample locations are less important for homogeneous areas where the asbestos content is expected to be relatively uniform due to product specifications</i>, such materials include floor tile and ceramic, ceiling tiles, straight runs of pipe insulation, and asbestos cement products. Direct visual spotting should be sampled randomly due to the inherent absorption of asbestos by the building.</p> <p>8.3.5 <i>Material quantities may be determined at the same time that bulk samples are collected</i>, in which case the suspect ACM can be quantified. If quantities are determined on a subsequent visit after the samples results are known, only confirmed ACM need to be quantified.</p> <p>8.3.5.1 The type of material and description determine the units of measure. Square feet (square meters) is used for surface material, however, bulk test locations and their contents for which area is the most logical unit. This might include impregnating on structural members where calculation of surface area is overly complex. The thickness of these materials should be measured in order to estimate disposal quantities. Linear feet (meters) is the measure used for straight runs of pipe insulation, for window caulking, asbestos-cement pipe and duct, and other materials where length is more descriptive of the position. For pipe fittings, list each the number of individual valves, tees, elbows, etc., or indicate that they are included in the linear feet (meters) of pipe insulation, being sure to note fittings separately if the straight runs of insulation are not asbestos-containing material.</p> <p>8.3.5.2 <i>Quantities are reported in ISMA and NESHAP notification packages</i>, and the notification fees, issued against the building owner, may depend on the quantity of ACM reported on the NESHAP notification. In addition, OSHA</p>
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<p>specifies that the percent of asbestos present in the material be provided (and, by implication, the spot). Where the sample results show varying percentages of asbestos, indicate the range of percentages.</p> <p>8.5.8 Collect the bulk samples using methods and equipment discussed in Appendix X1, being careful to maintain the integrity of layered samples where necessary. In addition to sampling asbestos materials, perform necessary observations to inspect concealed spaces and sample suspect materials (e.g., Acoustics in concealed spaces, but might be impacted by the construction project should not be provided by absence of a functional space such as school of professions a study. Since the material is going to be removed, doing treatment or restoration, aesthetic considerations and manage a building materials in all use concerns during a Pre-Construction Survey.</p> <p>8.5.8.1 Creel space must be carefully inspected if abatement of asbestos ACM, dust and debris or comminuted soil may be required. Pipes, ducts and fireproofed surfaces must be sampled and quantified as in an occupied part of the building. If dust and debris are present on the surface of the dirt, or dirt is withdrawn dirt or is impacted into the hard-past, the inspector must determine over what area of the creel space, and to what depth, are a certain number of samples. These samples may have been taken with dirt containing the remains of asbestos that had been uncovered during a previous renovation. If asbestos is present, make sure faces washed into soil dirt, along with asbestos dust and debris. Samples of dust and debris should be separated from the dirt in which they are mixed so they can be analyzed for their own asbestos content, not as a composite of a soil mixture. If analysis of soil samples for asbestos content is required for the Pre-Construction Survey, see Test Method E2021. Respirators and protective clothing should be worn when sampling a suspected contaminated creel space, due to the high level levels the risk level from asbestos spillover materials and it may be necessary to not be a confined space as a confined space (see Section 9).</p> <p>8.5.8.2 If several floors of a multi-story building are to be inspected, care must be taken not to accidentally identify quantities and characteristics of ACM that are not from the floor to another floor. While care is required, it is to be expected each floor is a mix of functional spaces and may have different mechanical, structural and architectural segments from those above and below it. Stairwells, riser and exit chases, elevators and utility shafts, and air shafts are separate and distinct functional spaces from the floors they traverse.</p> <p>8.5.8.3 Processing of collective samples before sending them to the laboratory may require the samples to be stored, sealed and split, selection of random samples or sample concentration prior to shipment. Handling samples in this manner creates opening the containers, which must be done in a HEPA filtered ventilation box, for health records. A properly-executed chain of custody must accompany the shipment of samples to the laboratory, along with instructions as to the type of analysis requested and reported (see record of analysis in 8.5.11). The reports should retain a view of the chain of custody and the original chain of custody should</p>	<p>remain with the sample. Analysis of the bulk sample by DLM or TEM, or both, must be done in accordance with 6.5.1.</p> <p>8.4 Documentation of the Pre-Construction Survey includes the sample data sheets for both analyses taken, a record of inspection of all functional spaces, including those where no samples were taken, floor plans or drawings showing sample locations, functional spaces and homogeneous areas, and photographs. If representative or spot-sampled inspection and sampling locations, if any ACM was found, the Pre-Construction Survey report shall state "No asbestos was found in samples taken during this survey." If ACM is found, the Pre-Construction Survey report shall identify by location, type (surfacing material, thermal system insulation or miscellaneous material), description (type, location, floor, etc.), photo, etc.), quantity and type, and percent of asbestos.</p> <p>8.4.1 The Pre-Construction Survey report is a minimum for inclusion in Project Design Survey if ACM is found and an abatement project is planned. It is not a substitute for a Project Design Survey report and must be included in a document with which to submit bids for abatement.</p> <p>8.4.2 The results of the Pre-Construction Survey may affect the price for the removal or its abatement, even to the extent of cancelling the project. If the construction plan is allowed to include areas not covered by the Pre-Construction Survey, it will be necessary to return to the site for additional inspection and sampling, and to amend the Pre-Construction Survey report accordingly.</p> <p>9. Safety and Health Considerations</p> <p>9.1 While conducting the field work portion of the survey, the inspector shall comply with applicable safety and health regulations, as well as the policies of any building or facility owner or manager. Submittal and approval of a written safety plan may be required.</p> <p>9.1.1 Respiratory Protection</p> <p>9.1.1.1 This practice requires that a suitable, negative-pressure respirator be worn, as a minimum, while collecting bulk samples of suspect materials.</p> <p>9.1.1.2 Bulk sampling is conducted. One filter pack or OSHA under 29 CFR 1910.134 and respiratory protection is required when a Pre-Construction Survey is to be done. Respiratory protection shall be provided in accordance with 29 CFR 1910.134 (f) and 29 CFR 1910.134 (j), which require a written respiratory protection program.</p> <p>9.1.2 Respiratory protection shall also be worn whenever a space must be entered for asbestos inspection or exposure to asbestos asbestos fibers from common other than bulk sampling is indicated by the presence of dust and debris or damaged suspect materials.</p> <p>9.2 Disposable protective clothing shall be worn when entering any location where the potential for contamination by asbestos fibers from sources other than bulk sampling is indicated by the presence of dust and debris or damaged suspect materials. This clothing shall consist of coveralls, hood and foot coverage of impermeable or non-absorbent fabric, and continuous or separate. The choice of fabric should consider the potential for lead when in the functional space being inspected. The clothing shall be decontaminated by wet</p>

Section 8 Pre-Construction Survey

- z Plan scope of survey
 - "all spaces within limits of construction"
 - These demarcations can affect "limits of abatement"
- z Establish scope, report format, schedule of work, costs,
- z Conduct field work
 - Destructive sampling required
 - Identify functional spaces that will be impacted by construction activities
 - Identify all homogenous areas
 - Where feasible use random sampling
 - o Procedure is same here as Baseline

Section 8 Pre-Construction Survey

- ž Determine quantities
 - Same as baseline
- ž Collect bulk samples
 - Same as baseline
 - Crawl spaces are addressed as a matter of disturbance during construction activities
 - Contamination in and on soil
 - References ASTM D7521
 - Process samples and have them analyzed per 6.5.1
 - PLM for most, TEM when needed and “Cinci” for vermiculite

8.4 Documentation of the Pre-Construction Survey

- ž If no ACM was found, the Pre-Construction Survey report shall state “No asbestos was found in samples taken during this survey.”
- ž If ACM is found, the Pre-Construction Survey report shall identify its:
 - location, type (surfacing material, thermal system insulation or miscellaneous material), description (pipe insulation, floor tile, plaster, etc.), quantity and type, and percent of asbestos.

8.4 Documentation of the Pre-Construction Survey

- ž 8.4.1 The Pre-Construction Survey report is a resource for initiating the Project Design Survey if ACM is found and an abatement project is planned. It is not a substitute for a Project Design Survey report and must not be used as a document with which to solicit bids for abatement.
 - This is a matter of this standard practice, in that there are other sampling and reporting considerations the authors feel are necessary to create a report on which to base bids

So...that's a pile of stuff

- ž Much to think about...only after reading this behemoth 2 or 3 times
- ž This regulatory inclusion or as a recommended method could help level the performance of NESHAP surveys performed today
- ž The stakeholders will need to be trained in its use...and regulators will have to understand the extent of what they may have required!

