Take-Home Asbestos Exposure

PRESENTED BY:

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CSP, LAC, GC

- Decontamination of personnel and equipment at the conclusion of non-friable asbestos abatement projects has become more of an “illusion” than a reality.

  – Tom Laubenthal, EIA Conference 2010

Take-Home Asbestos Exposure 2011 Topics

- What is the illusion?
- Where were dust samples collected, and what were the results?
- What do the results imply?
- How important are decontamination chambers and abatement procedures?

The Asbestos Abatement Illusion

- Showers may not be connected to a water source and HEPA filtered vacuums may never be used.
- Owners/Supervisors/Workers go through the motions of making the abatement project appear compliant.

The Asbestos Abatement Illusion

Water filters may not work:

- The illusion consists of showers that are not connected to a water source and sometimes even the work area.

The Asbestos Abatement Illusion

- During the removal of floor tile, mastic, and other non-friable ACM, workers are typically wearing street clothes into the work area, and they are not showering nor vacuuming themselves/their clothing upon exiting the containment.

The Asbestos Abatement Illusion



Take-Home Asbestos Exposure

The Asbestos Abatement Illusion

The common responses from workers when questioned about their lack of PPE or care for decontamination are:

- “The air samples did not show elevated fibers.”
- “It’s floor tile.”
- “It’s a demolition project.”
- “I have been doing this longer than you!”

Shower/Decontamination

Regulation Review:

Decontamination Chambers - 29CFR OSHA

1926.1101 (j)(1)(i)

- The decontamination area must include an equipment room, shower area, and clean room in series.

1926.1101 (j)(1)(i)(A)

- The equipment room must have impermeable, labeled bags and containers to store and dispose of contaminated protective equipment.


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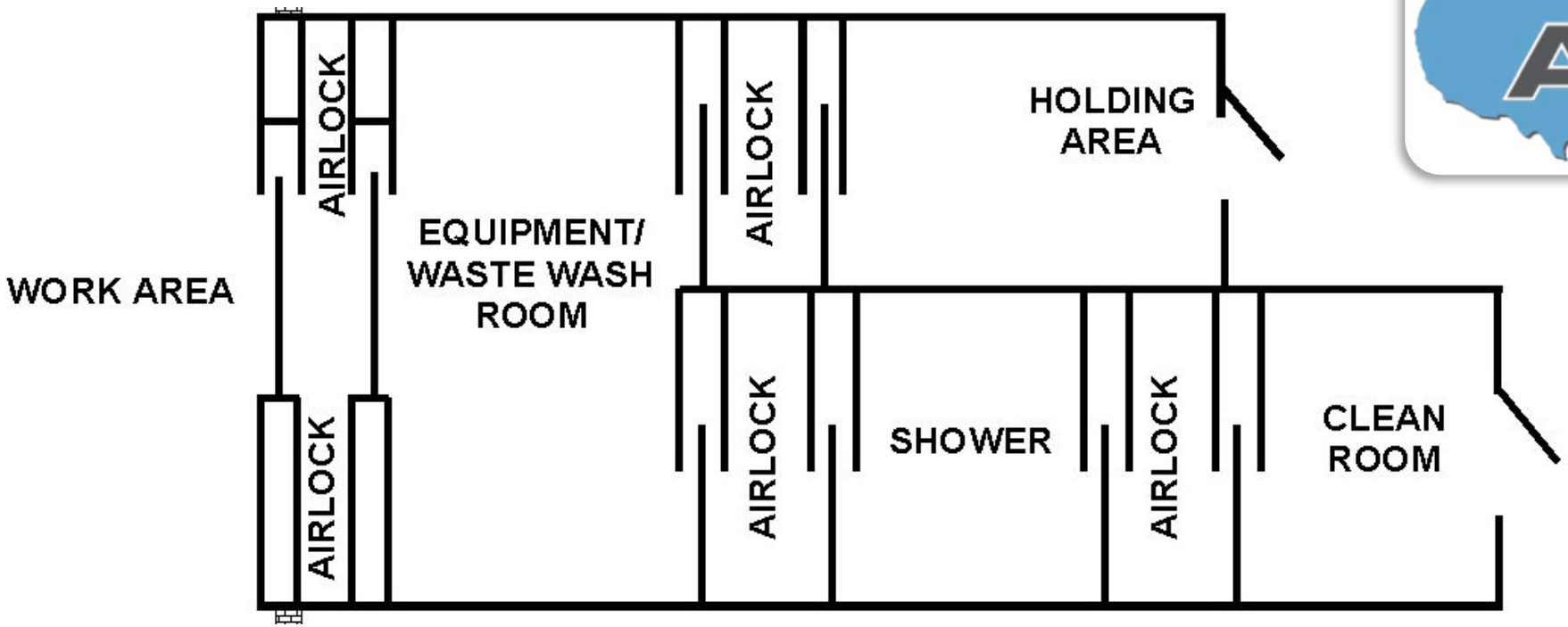
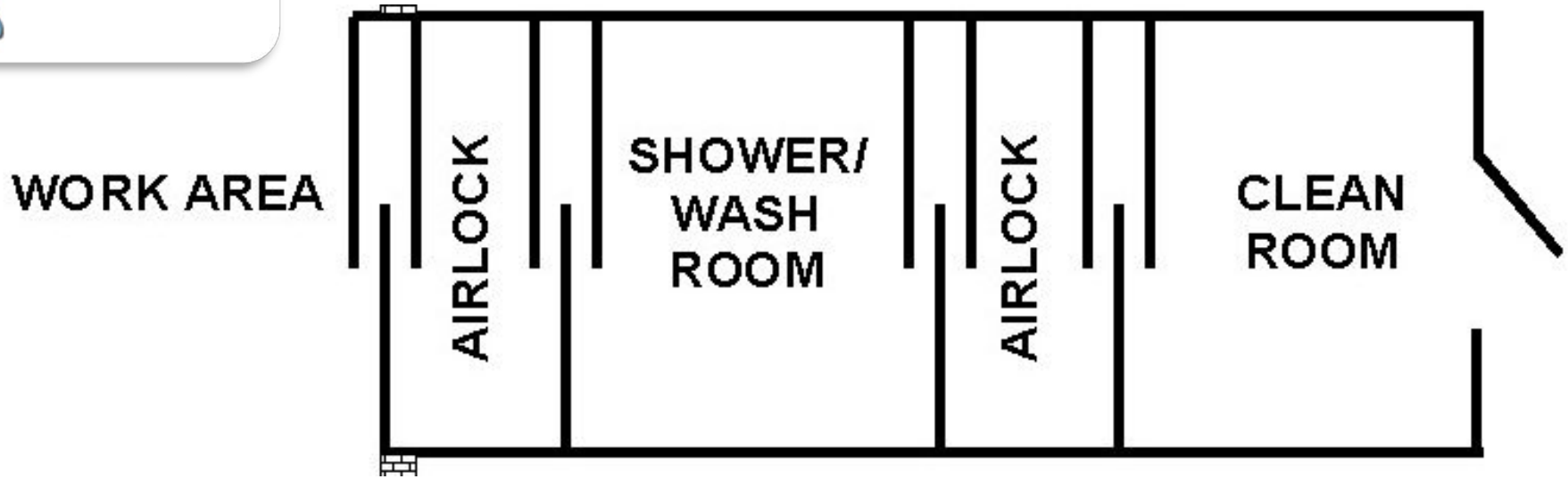


Parallel Personnel/Waste Decontamination Chamber



Regular Personnel/Waste Decontamination Chamber

OSHA/Flooring Removal/Containments

Regulation Review:

<u>Flooring Products</u>

OSHA 1926.1101 (g)(80(i)(f)

- Mechanical chipping is prohibited unless performed in a negative pressure enclosure, which meets the requirements of paragraph (g)(5)(i).

Shower/Decontamination

Regulation Review:

Decontamination Chambers

OSHA1926.1101(j)(1)(i)(B)1-2

- A shower area must be adjacent to both the equipment and clean rooms, unless work is performed outdoors, or this arrangement is not feasible.
- In either case, employers must ensure that employees remove asbestos contamination from their worksuits.
- This should be done in the equipment room using a HEPA vacuum before proceeding to a shower not adjacent to the work area, or remove their contaminated worksuits in the equipment room, don clean worksuits, and proceed to a shower not adjacent to the work area).

Shower/Decontamination

Regulation Review:

<u>Decontamination Chambers</u>

OSHA1926.1101(j)(1)(ii)(D)

- To enter the regulated area, employees must pass through the equipment room. Before entering the regulated area, employees must do the following:
  - Enter the decontamination area through the clean room.
  - Remove and deposit street clothing within a provided locker.

OSHA 1926.1101(j)(1)(ii)(C)

- Put on protective clothing and respiratory protection before leaving the clean area.

Shower/Decontamination

Regulation Review:

Decontamination Chambers

OSHA 1926.1101 (j)(1)(iii)A-E

- Before exiting the regulated area, employees must do the following:
  - Remove all gross contamination and debris.
  - Remove protective clothing in the equipment room. Deposit the clothing in labeled, impermeable bags or containers.
  - Remove respirators in the shower and then shower before entering the clean room to change into “street clothing.”

Note: When workers consume food or beverages at the Class I worksite, employers must provide lunch areas with airborne asbestos levels below the PEL and/or excursion limit.

ASTM D5755-09

- Standard test method for microvacuum sampling and indirect analysis of dust.
- multiple samples were collected from workers, their clothing, vehicles, and surface areas after clearance of the work area was conducted.

What is ASTM D5755-09

- This microvacuum sampling and indirect analysis method is used for the general testing of non-airborne dust samples for asbestos.
- It is used to assist in the evaluation of dust that may be found on surfaces in buildings such as ceiling tiles, shelving, electrical components, duct work, carpet, etc.
- This test method provides an index of the surface loading of asbestos structures in the dust per unit area analyzed as derived from a quantitative TEM analysis.

What ASTM D5755-09 is not

This test method does not describe procedures or techniques required to evaluate the safety or habitability of buildings with ACM, or compliance with federal, state, or local regulations or statutes.

Currently, no relationship has been established between asbestos-containing dust, as measured by this test method, and potential human exposure to airborne asbestos.

AMA Analytical Services, Inc.

Fort Myers, Florida 33907

Job Number: 07-062655-AM

Person Submitting: Paula Reyes

P.O. Number: Not Provided

Attention: Tim Jacobson

Summary of Results of Asbestos in Settled Dust by TEM - ASTM Method D5755-95

AMA Sample Number	Client Sample Number	Surface Area Sampled (cm^2)	Sample Aliquot (ml)	Filter Collection Area (mm^2)	Dilution Factor	Filter Area Analyzed (mm^2)	Analytical Sensitivity (s/cm^2)	# of Asbestos Structures and Asbestos Type	Asbestos Concentration (s/cm^2)	Comments
0781573	1	100	1.00	1260	100.0	0.134	9403.0	3 Chry	28200	
0781574	2	100	3.00	1260	33.3	0.1206	3482.6	100 Chry	348000	

Method of Analysis: ASTM Method D5755-03 "Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy (TEM) for Asbestos Structure Number Concentrations"

Limit of Detection: The Limit of Detection (LOD) for this method has been determined by the ASTM D6620. Therefore, if fewer than one (1) structures was observed, the asbestos concentration is reported as less than the analytical sensitivity.

Analytical Sensitivity: An analytical sensitivity of 1000 asbestos structures per square centimeter has been designed for this method. Occasionally, this analytical sensitivity cannot be achieved due to high particulate loadings or high asbestos concentrations invoking the stopping rules.

Stopping Rules: The analysis is terminated for a sample when an analytical sensitvity of 1000 s/cm^2 is achieved, Ten (10) grid openings have been analyzed, or upon completion of the grid opening in which the 100 confirmed asbestos structure was documented.

Asbestos Types: Chry = Chrysotile; Amos = Amosite; Croc = Crocidolite; Trem = Tremolite; Actn = Actinolite; Anth = Anthohyllite; NAD = No Asbestos Detected

Units of Measure: cm^2 = square centimeters; mm^2 = square millimeters; s/cm^2 = asbestos structures per square centimeter of surface area sampled.

s/ft^2 Conversion: To convert the final asbestos concentration to structures per square foot (s/ft^2), multiply the final concentration reported in s/cm^2 by 929.

Significant Figures: Final results are reported to three (3) significant figures.

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AMA Analytical Services, Inc.

CERTIFICATE OF ANALYSIS

Client:	American Management Resources Corporation	**Job Name:**	Take Home Asbestos Exposure	**Chain Of Custody:**	207885
Address:	5230 Clayton Court	**Job Location:**	Not Provided	**Date Analyzed:**	3/14/2011
	Fort Myers, Florida 33907	**Job Number:**	Not Provided	**Person Submitting:**	Morgan Beall
		P.O. Number:	Not Provided		
Attention:	Jack Snider				

Summary of Results of Asbestos in Settled Dust by TEM - ASTM Method D5755-95

AMA Sample Number	Client Sample Number	Surface Area Sampled (cm²)	Sample Aliquot (ml)	Filter Collection Area (mm²)	Dilution Factor	Filter Area Analyzed (mm²)	Analytical Sensitivity (s/cm²)	# of Asbestos Structures and Asbestos Type	Asbestos Concentration (s/cm²)	Comments
1139943	#1	100	5.00	1260	20.0	0.134	1880.6	NAD	< 1880	
1139944	#2	100	5.00	1260	20.0	0.134	1880.6	2 Chry	3760	
1139945	#3	100	5.00	1260	20.0	0.134	1880.6	2 Chry	3760	
1139946	#4	100	5.00	1260	20.0	0.134	1880.6	NAD	< 1880	
1139947	#5	100	3.00	1260	33.3	0.134	3134.3	NAD	< 3130	
1139948	#6	100	3.00	1260	33.3	0.134	3134.3	NAD	< 3130	
1139949	#7	100	1.00	1260	100.0	0.134	9403.0	2 Chry	18800	
1139950	#8	100	1.00	1260	100.0	0.134	9403.0	8 Chry	75200	
1139951	#9	100	5.00	1260	20.0	0.134	1880.6	57 Chry	107000	
1139952	#10	100	5.00	1260	20.0	0.134	1880.6	2 Chry	3760	
1139953	#11	100	1.00	1260	100.0	0.134	9403.0	81 Chry	762000	
1139954	#12	100	1.00	1260	100.0	0.0938	13432.8	115 Chry	1540000	
1139955	#13	100	3.00	1260	33.3	0.134	3134.3	NAD	< 3130	
1139956	#14	100	5.00	1260	20.0	0.134	1880.6	NAD	< 1880	

An AIHA (#100470), NVLAP (101143-0), and NY ELAP (#10920) Accredited Laboratory

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Dust Sample Analysis Interpretation

Settled Dust Sampling and Analysis:

- "Levels above 10,000 s/cm^2 are considered generally above background."
- "Levels above 100,000 s/cm^2 are considered high and in the range of a significant accidental release from an abatement site."

– JR Millette and SM Hayes 1994

Dust Sample Analysis Interpretation

Settled Dust Sampling and Analysis:

- “The U.S. Environmental Protections Agency has issued “Cleanup Benchmarks” for the assessment and cleanup of asbestos settled dust.
- “The benchmark for asbestos in accessible areas is 5,000 structures per square centimeter (s/cm2 and 50,000 s/cm2 for infrequently accessed areas).

Sample Locations

Samples were collected from the following locations:

- On the back of abatement workers upon arrival and at completion of work
- Abatement worker's baseball caps
- Back of an abatement worker's head
- Abatement contractor's box truck seat
- Abatement worker's car seat
- Floor area inside and outside of containment after floor tile was abated

Sample Identification	Sample Location	Sample Results
1	Abatement workers hat that was worn in the containment and prior to going home for the day	28200 structures/cm^2
2	From the surface (neck) of the outside supervisor's neck prior to going home for the day	348000 structures/cm^2
3	Abatement workers hat that was worn in the containment and prior to going home for the day	889 structures/cm^2
4	Abatement workers polyspun suit that was worn in the containment.	20500 structures/cm^2
5	From the surface of an abatement worker prior to going home for the day	None Detected
6	From the surface of an abatement worker prior to going home for the day	1870 structures/cm2
7	From the surface (shoulder) of an abatement worker upon arrival for work	None Detected
8	From the surface (shoulder) of an abatement worker prior to going home for the day	3760 structures/cm2
9	From the surface (head) of an abatement worker prior to going home for the day	3760 structures/cm2
10	From the surface (head) of an abatement worker prior to going home for the day	None Detected

Sample Identification	Sample Location	Sample Results
11	From the surface (shoulder) of an abatement worker upon arrival for work	None Detected
12	From the surface (shoulder) of an abatement worker prior to going home for the day	None Detected
13	Drivers seat of an abatement contractors box truck	18800 structures/cm2
14	Drivers seat of an abatement workers car	75200 structures/cm2
15	From the surface (shoulder) of an abatement worker upon arrival for work	107000 structures/cm2
16	From the surface (shoulder) of an abatement worker prior to going home for the day	3760 structures/cm2
17	Concrete floor leading up to work area entrance of a floor tile abatement project	762000 structures/cm2
18	Floor area inside the containment after floor tile was removed	1540000 structures/cm2
19	From the surface (shoulder) of an abatement worker upon arrival for work	None Detected
20	Drivers seat of an abatement contractors box truck	None Detected

Sample Locations

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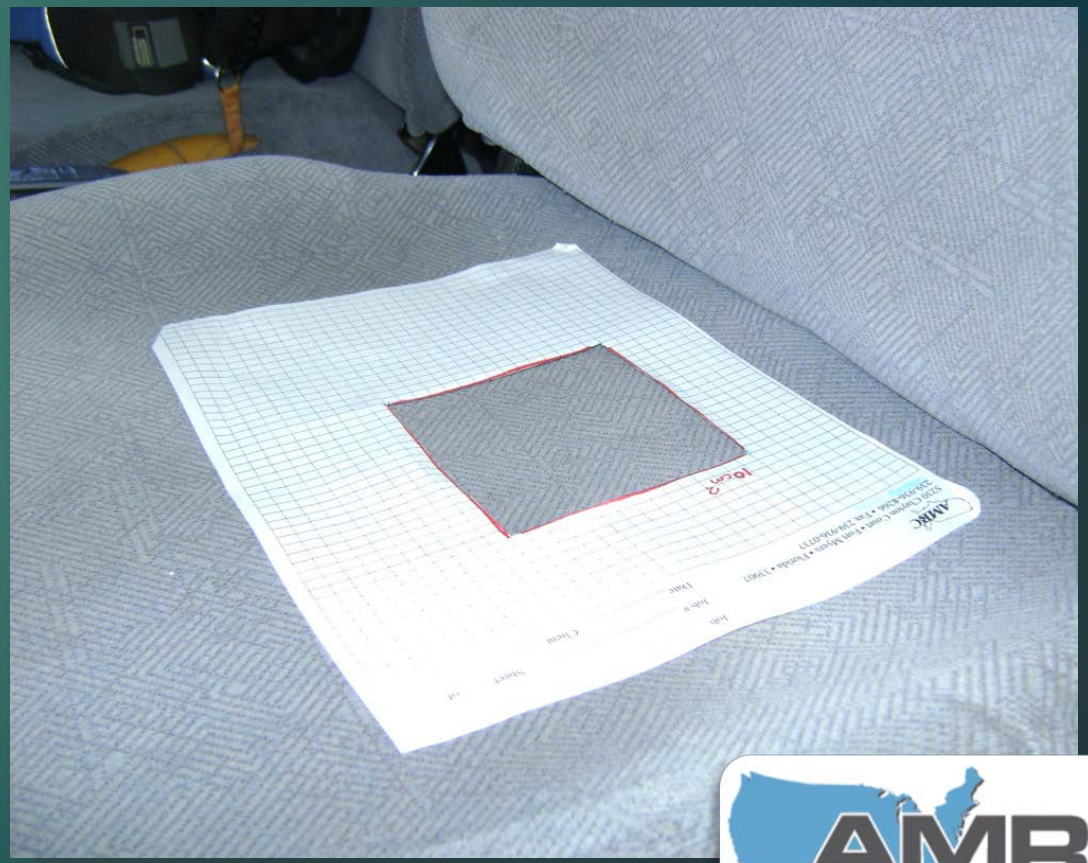
SAMPLE LOCATION 13 – 18,800 STRUCTURES/CM²



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SAMPLE LOCATION 14:

- 75,200 STRUCTURES/CM²

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Sample Locations 15 & 16:

- 107,000 structure/cm²
- 3,760 structures/cm²

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Sample Location 17:

- Concrete floor leading up to work area entrance of a floor tile abatement project
- 762,000 structures/cm²

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Sample Location 18:

- Floor area inside the containment after floor tile was removed
- 1,540,000 structures/cm²

What does this mean?

- The data suggests that abatement practices on many asbestos removal projects are missing the purpose.
- Consultants/Contractors/Building owners must be responsible for conducting removal work correctly.
- We must remember that asbestos is a silent killer!

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