Transmission Electron Microscopy guidance for Project Monitors

When is TEM analysis required?
TEM analysis of clearance air monitoring samples is required at the conclusion of response actions in facilities subject to the Asbestos Hazard Emergency Response Act (AHERA), where quantities of asbestos-containing materials (ACM) exceed 160 square feet or 260 linear feet.

TEM may also be used in commercial and residential settings when the amount of ACM removed is greater than 160 square feet or 260 linear feet. A certified Asbestos Project Monitor must collect samples in accordance with 454 CMR 28.10(11) and Appendix A of Subpart E of 40 CFR 763. These requirements include, but are not limited to:

- **Minimum sample volume**: 1,999 liters of air
- **Flow rate**: Less than 10 liters per minute for 25mm cassettes
- **Calibration:** Rotometer or other appropriate flow measuring device, the calibration of which is traceable to a primary standard, to measure the air flow in the sampling train immediately prior to and immediately following the collection of the clearance air monitoring samples
- **Aggressive sampling:** Must be used during collection of samples and must be performed inside a negative pressure enclosure.

Is a visual inspection required?
The Project Monitor must conduct a visual inspection of the work area before any clearance air sampling can be performed. The Project Monitor must ensure that the “no visible debris” criteria has been met. No air sampling will be performed until all visible debris has been cleared from the work area.

Sample collection
A set of thirteen (13) air samples must be collected and submitted to a Massachusetts certified laboratory for analysis by TEM. The Project Monitor shall collect TEM clearance air samples as follows:

- five (5) samples inside the work area,
- five (5) samples outside the work area, positioned at locations representative of the air entering the work area
- two (2) field blanks, taken by removing the cap for not more than 30 seconds and replacing it at the time of sampling before sampling is initiated, located (a) near the entrance to each abatement area and (b) at one of the ambient sites. Do not leave the field blanks open during sampling.
- One (1) sealed blank is to be submitted with each sample set, and is not to be opened in the field

Chain-of-Custody

To demonstrate compliance with 454 CMR 28.10(11) and Appendix A of Subpart E of 40 CFR 763, Project Monitors are expected to provide documentation on a chain of custody that identifies: pump start and stop times, volume of air collected, a unique identifier for each sample collected, the location of each sample collected both inside and outside the work area, two field blanks, one lab blank, the date of sample collection, the address where samples are collected, the name, signature and certification number of the project monitor collecting samples, and the name of the laboratory to which samples are relinquished.

When is the response action considered complete?

The response action shall be considered complete when:

- The average concentration of asbestos in the five air samples collected within the work area is below 70 structures per square millimeter.
- The average concentration of asbestos in the five air samples collected within the work area is not statistically different, as determined through application of the Z-test calculation, from the average asbestos concentration of five air samples collected at the same time outside the work area, and the average concentration of the three field blanks is below 70 structures per square millimeter.
- If the first five samples within the work area meet the clearance criteria, analysis of the five samples outside the work area is not necessary.

Air Sample Report

The Project Monitor shall submit to the LEA a report issued by the laboratory that analyzed the samples, along with the chain of custody. The report must indicate: the name and address of the laboratory analyzing the samples, the date of analysis, the results of analysis, the method of analysis, the name and signature of the analyst, and the Massachusetts laboratory certification number as a Class D laboratory.

Who is responsible for hiring the Project Monitor?

The LEA is responsible for contracting with the Asbestos Consulting Services and the Asbestos Project Monitor. At schools and sites subject to AHERA regulations, a Project Monitor who conducts a post-abatement visual inspection and clearance air testing cannot be a subcontractor of the Asbestos Contractor or an employee of the Asbestos Contractor. At any site, the Asbestos Contractor cannot perform duties for which a Project Monitor certification is required.