

CEMP-RT Engineer Pamphlet 1110-1-23	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	EP 1110-1-23 31 January 1999
	Engineering and Design ASBESTOS ABATEMENT AIR MONITORING STANDARD SCOPE OF WORK	
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ERRATA Sheet

No 1.

Asbestos Abatement Air Monitoring
Standard Scope of Work

EP 1110-1-23

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Page A-12, Table A-2: For both “Inside Abatement Area” and “Each Room in Abatement Area Less than 1500 ft” change “Minimum Volume” to “3850” and “Sampling Rate” to “2-16”.

Page A-13, Table A-3: For both “Inside Abatement Area” and “Outside Abatement Area”, change “Minimum Volume” to “1500” and “Sampling Rate” to “2-16”.

CEMP-RT

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Engineering and Design
ASBESTOS ABATEMENT AIR MONITORING
STANDARD SCOPE OF WORK

1. Purpose. This pamphlet provides guidance for developing project scopes of work to conduct air monitoring during asbestos abatement (in accordance with CEGS 13280), to include environmental air quality control and/or air sampling for baseline (pre-abatement) and final clearance phases.
2. Applicability. This pamphlet applies to all HQUSACE/OCE elements and all USACE commands having civil works and/or military programs responsibilities.
3. References.
 - a. Title 40 Code of Federal Regulations (CFR) Part 763, Asbestos-Containing Materials in Schools.
 - b. EPA Publication 560/5-85-024 (1985), Guidance for Controlling Asbestos-Containing Materials in Buildings.
 - c. NIOSH Publication 01 (1994), Manual of Analytical Methods.
 - d. U.S. Army Corps of Engineers Guide Specification, CEGS 13280, Asbestos Abatement(1997).
 - e. U.S. Army Corps of Engineers Pamphlet EP 1110-1-11, Asbestos Abatement Guideline Detail Sheets.
4. Distribution. Approved for public release; distribution is unlimited.
5. Scope. The standard scope provides options for the scope writer to tailor specific air monitoring requirements for asbestos abatement according to specific abatement techniques and state or local requirements. Requirements for performing area air monitoring during abatement and for final clearance are addressed.

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6. Action to be Taken. Use this pamphlet to prepare the project scope when retaining an independent industrial hygienist contractor or independent laboratory with industrial hygiene capabilities to conduct air monitoring during asbestos abatement.

FOR THE COMMANDER:



ALBERT J. ENETTI, JR.
Major General, USA
Chief of Staff

1 Appendix
APP A - Asbestos Abatement Air
Monitoring Scope of Work

APPENDIX A

ASBESTOS ABATEMENT AIR MONITORING
STANDARD SCOPE OF WORK

NOTE TO PROJECT SCOPE WRITER:

This standard scope of work is to be used in conjunction with CEGS 13280 for the design of asbestos abatement projects when a decision has been made to use an independent air monitoring contractor (other than the construction contractor) to perform environmental air monitoring. The air sampling regimen is dependent upon the abatement techniques specified in the construction contract documents and applicable laws. Consult the state, local and customer requirements and edit accordingly. Where phrases or sentences appear in brackets, a choice must be made to correspond to the particular contract objectives. Paragraphs with blank spaces denoted by an asterisk (*) require insertion of the appropriate data. The designer is advised to coordinate with construction and contracting personnel to determine the best method of contracting for independent air monitoring services. For example, the scope can be used for a separate contract or as an extension of the A-E services (construction phase services contract). The selected contracting option should minimize cost and procurement time and ensure ease of management by USACE field offices.

1.0 PROJECT DESCRIPTION AND OBJECTIVES

Air monitoring covered by this contract is required to determine airborne asbestos fiber concentrations generated during abatement within regulated work areas and compare them to established work limits. In addition, air monitoring is necessary to ensure that areas outside the asbestos-regulated work areas do not become contaminated with asbestos fibers. Finally, air monitoring is required to evaluate the final cleaning by the abatement contractor upon completion of the abatement for compliance with specified clearance requirements and/or comparison to baseline data. The work effort under this scope will include [area air monitoring inside and outside the asbestos-regulated work area for environmental quality control] [and] [air sampling [to establish a baseline and] for final clearance] for the abatement tasks listed in Annex

A. The Monitoring Contractor will provide all personnel, equipment and resources required to carry out the tasks associated with this project and will coordinate, when necessary, its activities with the Abatement Contractor. The Monitoring Contractor will coordinate all on-site activities with the Abatement Contractor, the COR and other affected parties as directed by the COR and will perform activities on a schedule compatible with the Abatement Contractor's work schedule. Personnel air monitoring during asbestos abatement projects is the responsibility of the abatement contractor and is not a task covered by this contract. Personnel performing work tasks covered by this contract will be monitored for asbestos exposure by the Monitoring Contractor in accordance with 29 CFR 1926.1101.

NOTE FOR PROJECT SCOPE WRITER: Attach copy of the Abatement Hazard Plan as Annex A. This contract is to include the approved Asbestos Abatement Plan, the Accident Prevention Plan and those Detailed Drawings related to the air monitoring requirements.

2.0 GENERAL SCOPE OF SERVICES

2.1 Review of asbestos abatement contract documents.

2.2 Prepare and submit an Air Monitoring Plan for approval by the Contracting Officer's Representative (COR).

2.3 Conduct area asbestos air [baseline sampling prior to abatement],[monitoring during asbestos abatement for environmental quality control],[and] [sampling for final clearance of asbestos abatement].

2.4 Prepare and submit a final report of laboratory results and daily air monitoring logs.

2.5 Submit monthly progress reports.

3.0 DETAILED DESCRIPTION OF SERVICES

All tasks will be conducted with the concurrence of the Contracting Officer (CO) or the COR and performed by a designated qualified industrial hygienist(IH) as defined herein. While

at the abatement site, the Monitoring Contractor will follow and comply with the Abatement Contractor's accepted Asbestos Hazard Abatement Plan and Accident Prevention Plan for site activity.

3.1 Task 1, Document Review. The Monitoring Contractor will obtain and review pertinent abatement contract documents to include, but not be limited to, the asbestos abatement specifications, the Abatement Contractor's Asbestos Hazard Abatement Plan, Accident Prevention Plan, and detailed project drawings to become familiar with the abatement procedures to be conducted.

3.2 Task 2, Air Monitoring Plan Preparation. The Monitoring Contractor will prepare and submit to the CO for review and approval an Air Monitoring Plan which describes the proposed air monitoring strategies. The plan will include a description of proposed sampling methods and equipment with schematic diagrams approximating sample locations and a description of record keeping methods. A separate section will list the qualifications and organizational structure and include documentation of qualifications for the Monitoring Contractor's personnel to include the Designated IH and the Monitoring Contractor's independent testing laboratory and analysts. Documentation will include any state licenses and certifications of required training. The plan will be signed by the Monitoring Contractor and the Designated IH.

3.2.1 Industrial Hygienist Qualifications. The qualifications and organization section in the Air Monitoring Plan will provide the name, address, telephone number, and resume of the Designated IH selected to direct air monitoring. The IH will be a person who is [board-certified in the comprehensive or specialized practice of industrial hygiene] [board-eligible (meets all education and experience requirements)] as determined and documented by the American Board of Industrial Hygiene (ABIH), and has a minimum of [2] [] years of experience in air monitoring for asbestos abatement activities and is licensed by the state as required. The IH will be completely independent from the Abatement Contractor and will not be an employee or

principal of a firm that would constitute a business relationship that would not be considered independent according to federal, state, or local regulations. A copy of the Designated IH's [current valid ABIH Certification] [current valid ABIH confirmation of eligibility in writing from the ABIH] will be included. In addition, the Monitoring Contractor will submit the name, address, telephone numbers, and resumes of additional IHs and Industrial Hygiene Technicians (IHT) who will be assisting the Designated IH in performing on-site tasks. IHs and IHTs supporting the Designated IH will have a minimum of [2] [___] full years each of practical on-site experience performing air monitoring for asbestos abatement. The formal reporting relationship between the Designated IH, support IHs and IHTs, and the Monitoring Contractor will be indicated. The resume of each support IH and IHT will be signed by the individual for whom the resume was prepared, the Designated IH and the Contractor.

3.2.2 Laboratory and Laboratory Analysis Qualifications. The qualifications and organization report will provide the name, address, and telephone number of each testing laboratory selected to perform the sample analyses and report the results. The laboratory selected will conduct [phase contrast microscopy (PCM) of airborne samples using the methods specified by NIOSH Method 7400 with optional confirmation of results by transmission electron microscopy (TEM) using methods specified by NIOSH Method 7402] [TEM Mandatory Method of airborne samples using the methods specified by 40 CFR Part 763]. Written verification of the following criteria, signed by the testing laboratory principal and the Monitoring Contractor will be included:

(1) Data indicating the laboratory is currently in the Industrial Hygiene Laboratory Accreditation Program administered by American Industrial Hygiene Association (AIHA) and judged proficient (classified as acceptable) in counting airborne asbestos samples by phase contrast microscopy (PCM) by successful participation in each of the last four rounds in the AIHA Proficiency Analytical Testing (PAT) Program.

(2) The name of each selected microscopist who will analyze airborne samples by PCM

with substantiating verification that such analyst possesses the demonstrated proficiency to conduct PCM analysis by being judged proficient in counting samples as a current participating analyst in the AIHA PAT Program, by being listed in the AIHA Asbestos Analysts Registry, and by having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent; a copy of course completion certificate is required).

(3) The laboratory is fully equipped and each analyst possesses demonstrated proficiency to confirm NIOSH Method 7400 PCM sample analysis results from the same filter by conducting NIOSH Method 7402 TEM analysis.

[(4) The laboratory is fully equipped to conduct TEM analysis of airborne samples using the mandatory method specified by 40 CFR Part 763, the laboratory is currently accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for airborne sample analysis of asbestos by TEM, and the laboratory will use analyst(s) (provide names(s)) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM.]

3.3 Task 3, Area Air Monitoring. The Monitoring Contractor will conduct area [air monitoring for environmental quality control][and][air monitoring for baseline and final clearance]. For [environmental quality control], [baseline], [and] [final clearance] samples, analysis will be by NIOSH method 7400 PCM with optional confirmation of results by NIOSH method 7402 TEM. Confirmation analysis will be conducted at the discretion of the CO. When confirmation of PCM samples is conducted, it will be from the same sample filter used for the NIOSH 7400 PCM analysis. All sampling results will be calculated at the 95% confidence level as shown in Table A-1. [For final clearance samples in schools, analysis will be by the mandatory EPA TEM method specified in 40 CFR Part 763.]

3.3.1 [Air Monitoring for Environmental Quality Control. The Monitoring Contractor's Designated IH will provide area sampling as indicated by state and local requirements and in

accordance with the Air Monitoring Plan. Representative area sampling will be conducted at least once every shift, close to the work inside the containment area, outside the containment area, outside the clean room entrance to the containment area (outside air lock for mini and modified containment areas), inside the clean room (inside the air lock for mini and modified containment areas), outside the load-out unit exit, if used, and at the exhaust discharge point of the local exhaust system. If the sampling outside the containment area shows airborne fiber levels have exceeded background or 0.01 fibers per cubic centimeter (f/cc), whichever is greater, the CO will be notified within [24 hours] []. In addition, should an environmental concentration of 0.1 f/cc expressed as an 8-hour TWA occur inside the asbestos regulated work area, the CO will be immediately notified. [In areas where the construction of a containment area is not required, sampling will be conducted at the boundary of the asbestos regulated work area in such location and at such frequency as recommended by the Monitoring Contractor.] [Where glove bag methods are used, area air sampling will be performed at locations and frequencies that will accurately characterize any evolving airborne fiber levels.]]

3.3.2 [Air Sampling for Final Clearance of Abatement. Final clearance air sampling will not begin until the CO's acceptance of final cleaning and visual inspection of the abatement area. The Monitoring Contractor will provide area sampling of airborne fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 or as otherwise required by federal or state requirements. The sampling and analytical method used will be [NIOSH Method 7400 PCM with optional confirmation of results by NIOSH Method 7402 TEM. The fiber concentration inside the abated asbestos regulated work area for each airborne sample will be less than 0.01 asbestos f/cc. If any sample result is greater than 0.01 asbestos f/cc or baseline whichever is higher, the abatement is incomplete. Upon receipt of these results, the area will be recleaned by the Abatement Contractor. Upon completion of any required recleaning, resampling will be conducted to determine if the area meets the required clearance criteria.] [the mandatory EPA TEM Method specified in 40 CFR Part 763]. The final clearance air samples

will be collected and analyzed as indicated in [Table 2 at the end of this section and NIOSH 7400 PCM] [Table 3 at the end of this section and the EPA Mandatory Method as specified in 40 CFR Part 763 TEM. The arithmetic mean concentration of the five inside samples will be less than or equal to 70 structures per square millimeter (70 s/mm^2). When the arithmetic mean is greater than 70 s/mm^2 , the three blank samples will be analyzed. If the average of the three blank samples is greater than 70 s/mm^2 resampling will be required. If less than 70 s/mm^2 , the five outside samples will be analyzed and a Z-test analysis performed. The Z-test results will be less than 1.65. If the Z-test results are greater than 1.65, the abatement is incomplete. Upon receipt of these results, the area will be recleaned by the Abatement Contractor. Upon completion of any required recleaning, resampling will be conducted to ensure that the area meets the required clearance criteria.]

3.3.3 Air Sample Results and Record Keeping. Air sample fiber counting will be completed and results provided within [24] [] hours after completion of a sampling period. The CO will be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results will be submitted to the CO within five working days of the date of collection. The written results will be signed by testing laboratory analyst, testing laboratory principal, the Monitoring Contractor's Designated IH, and the Monitoring Contractor. The air sampling results will be documented on a Monitoring Contractor's daily air monitoring log. The daily air monitoring log will contain the following information for each sample: date sample collected, date sample analyzed, sample number, sample type (E = Environmental Quality Control, C = Abatement Clearance, IRWA = Inside Regulated Work Areas, ORWA = Outside Regulated Work Areas, DU = Decontamination Unit, LOU = Load-out unit, AT = Access Tunnels), sample period (start time, stop time, elapsed time minutes), sampling pump manufacturer (model and serial number), average flow rate (liters per minute (l/min)), total air volume sampled (liters), sample results [fibers per cubic centimeter (f/cc)] [and][structures per square millimeter (s/mm^2)], and location/activity/name where sample was collected. In addition,

the daily log will identify the calibration method used to calibrate the sampling pumps, the name and location of the laboratory conducting the sample analyses, print name, signature, and date block for the IH who conducted the sampling and the review verifying the accuracy of the information.

3.4 Task 4, Final Report of Laboratory Results and Daily Air Monitoring Results. The Monitoring Contractor will submit a final report of laboratory results to the CO for acceptance at the completion of the contract. The report will contain the original of all laboratory results with all information as required by Task 3. In addition, the Monitoring Contractor will submit the daily air monitoring log in final form to the CO for acceptance at the completion of the contract.

3.5 Task 5, Monthly Progress Report. The Monitoring Contractor will prepare and submit a monthly progress report describing the work performed since the previous report, work currently underway, and work anticipated. The report will state whether current work is on schedule, and, if not, what actions are anticipated in order to get back on schedule. The report will be submitted to the CO not later than the 10th day of each calendar month and will discuss the activities of the previous month.

4.0 SUBMITTALS

4.1 Plans and Reports. All plans and reports presenting all data, analyses, and recommendations will be prepared in a standard format for Contractor reports. The plans and reports will consist of 8-1/2 by 11-inch pages with drawings or diagrams folded if necessary to this size. Reduced drawings which are clear and legible may be placed in the reports. A decimal paragraphing system will be used. The plans and report cover will be durable; and binders will hold pages firmly while allowing easy removal, addition, or deletion of pages. A title page will identify the Monitoring Contractor, the Corps of Engineers District or Division, the project location, and the date. The Monitoring Contractor identification will not dominate the title page.

This scope of work will be incorporated as the last appendix in the draft air monitoring plan only. Each page of the draft plan will be stamped "DRAFT." Submittals will include incorporation of all previous Government review comments as well as the disposition of each comment. Disposition of comments submitted with the final plan will be signed by the Designated IH and the Monitoring Contractor. The information will be incorporated into the plan and included in all subsequent air monitoring plan submittals.

4.2 Minutes of Meetings. Following each review conference, the Monitoring Contractor will prepare and submit minutes of the meeting within 10 working days to the CO.

4.3 Correspondence. The Monitoring Contractor will keep a record of each phone conversation and written correspondence where information related to the performance of this contract is made. A summary of the phone conversation and written correspondence will be submitted to the CO monthly. Points of contact for this contract are:

Installation POC (*)

U.S. Army Corps of Engineers, District, or CO (*)

4.4 Completion Dates.

Draft Air Monitoring Plans (*)

Final Air Monitoring Plans (*)

Draft Reports (*)

Final Reports (*)

Completion of Contract (*)

4.5 Addressees. Copies of plans and reports will be distributed to the following addressees in the quantities indicated. (*)

TABLE A-1
FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

$$\text{Fibers/cc (01.95 percent CL)} = X + [(X)(1.645)(CV)]$$

Where: $X = (E)(AC) / (V)(1000)$

$$E = (F/Nf) - (B/Nb) / Af$$

E = Fiber density on the filter in fibers per square millimeter

V = Air volume sampled in liters

AC = Effective collection area of the filter in square millimeters

Af = Graticule field area in square millimeters

CL = Confidence Level

CV = The precision value; 0.45 will be used unless the analytical laboratory provides the CO with the documentation (Round Robin Program participation and results) that the laboratory precision is better.

F/NF = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

TABLE A-2
NIOSH METHOD 7400
PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NONPERSONAL)

Sample Location	Minimum No. Of Samples	Filter Pore Size (microns) (Note 1)	Minimum Vol. (Liters) (Note 2)	Sampling Rate (liters/min)
Inside Abatement Area	5/1500 ft ² (Notes 3 & 4)	0.45-1.2	1500	2-10
Each Room in Abatement Area Less than 1500 ft ²	1	0.45-1.2	1500	2-10
Field Blank	2	0.45-1.2	0	0
Laboratory Blank	1	0.45-1.2	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.
2. Ensure detection limit for PCM analysis established at 0.005 fibers/cc.
3. One sample should be added for each additional 1500 ft².
4. No less than 5 samples are to be taken per abatement area, plus two field blanks.

TABLE A-3
EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sample	Minimum No. Of Samples	Filter Pore Size (microns)	Minimum Vol. (liters)	Sampling Rate (liter/min).
Inside Abatement Area	5	0.45	1199	2-10
Outside Abatement Area	5	0.45	1199	2-10
Field Blank	2	0.45	0	0
Laboratory Blank	1	0.45	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.
2. The detection limit for TEM analysis is 70 structures/square mm.