

**MANAGING ASBESTOS ABATEMENT
FOR RENOVATION CONTRACTS**

A Field Procedure Manual For OICC/ROICC

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INTRODUCTION

As a government representative, the Officer In Charge of Construction/Resident Officer In Charge of Construction (OICC/ROICC) may supervise renovation projects that include the handling of asbestos materials.

The Naval Facilities Engineering Service Center (NFESC) revised this field procedures manual to help personnel in the OICC/ROICC offices administer asbestos removal contracts for building renovation. The manual's intent is to ensure that the contractor will: (1) protect the workers health and safety; (2) prevent the release of asbestos fibers into the environment; and (3) comply with all applicable standards and regulations throughout the duration of the contract.

This manual is one of many asbestos services provided by NFESC. It replaces Naval Energy and Environmental Support Activity (NEESA) document 70.2-009.2 and is one of a series of manuals designed to provide operating procedures, for the OICC/ROICC, for all phases of asbestos abatement contracts. The series includes guidance on demolition, renovation and special projects.

The manual combines information from the following Federal and Navy standards: Occupational Safety and Health Administration (OSHA) 29 CFR 1915.1001 and 1926.1101, Environmental Protection Agency (EPA) 40 CFR 61 and 763, Naval Facilities Guide Specifications (NFGS) Section 02081, OPNAVINST 5100.23 and various EPA guidance documents.

The manual parallels each stage of a renovation project, following the logical sequence of an asbestos project. It is designed to be concise and easy to use, relying on removable checklists that emphasize important criteria. These checklists can be taken to the building site to verify that all critical portions of the contract are completed. We want to stress that the checklists provide basic information regarding required and/or recommended procedures for managing asbestos removal contracts. Detailed discussions of each checklist are included. Appendices provide additional relevant information which will aid in administering the contract.

The manual is not intended to replace the contract specifications, but to augment them by providing detailed checklists for the OICC/ROICC to use at various stages of the contract. The contract specifications are the legal binding documents that provide contract detail and serve as the final reference in areas of conflict or dispute. Completion of the checklists do not ensure the complete satisfaction of the contract specifications.

We hope that the information contained within this document will serve the OICC/ROICC offices and staff personnel well and assist them in executing asbestos renovation contracts. We have an obligation to protect the safety and health of our workers as well as the environment.

ASBESTOS REGULATIONS

The Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) are responsible for promulgating federal asbestos regulations.

EPA's regulations are as follows:

40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP). NESHAP is primarily concerned with the application, renovation, demolition and disposal of asbestos containing material (ACM). The regulation defines ACM as being greater than 1% of the sample area as measured by polarized light microscopy. NESHAP requires notification and an asbestos survey prior to commencement of demolition/renovation projects. Destructive testing is required for all demolition projects.

40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA). AHERA applies to all schools, kindergarten through 12th grade. On November 28, 1992, the Asbestos in Schools Hazard Reauthorization Act (ASHARA) extended AHERA training requirements for inspectors, project designers, abatement workers, and contractor/supervisors for all personnel working in public and commercial buildings.

The following regulations address specific OSHA requirements concerning worker protection and procedures used to control ACM:

29 CFR 1915.1001 - Shipyard. This regulation covers employees at shipyards engaged in demolition, as well as in removal. Also covered are ACM spill or emergency clean-up actions, and maintenance work.

29 CFR 1926.1101 - Construction Industry. This regulation covers employees engaged in demolition, as well as in removal. Also covered are ACM spill or emergency clean-up actions, and maintenance work.

29 CFR 1910.134 - Respiratory Protection. This standard establishes a respiratory protection program and sets minimum requirements for implementing an acceptable program and guidance for respiratory selection.

Finally, the Navy's asbestos program is defined by the following:

OPNAVINST 5100.23, Chapter 17 - Asbestos. This instruction provides specific guidance for Navy personnel concerning the control/elimination of asbestos exposure during the use, removal, and disposal of ACM. The provisions of this instruction apply to both industrial and construction activities and equal or exceed the OSHA's "General Industry Standard" and "Construction Industry Standard."

NOTE: The current version of this document is OPNAVINST 5100.23D. It is important to determine the latest version of each requirement prior to awarding any abatement contract.

CONSTRUCTIBILITY REVIEW

Well designed, detailed contract specifications provide the overall guidance for each asbestos abatement project. The contract should be based on NAVFAC Guide Specification NFGS 13281, *Engineering Control of Asbestos Containing Materials*. The contract specification should include, but is not limited to the following:

CONTRACT REVIEW CHECKLIST	
CHECK <input type="checkbox"/>	CHECKLIST ITEM DESCRIPTION
	1. Does the contract clearly identify the form, condition, quantity and location of asbestos materials to be removed in the description of work?
	2. Is the contractor responsible for notifying EPA, state and local regulatory agencies, as required, and the Contracting Officer in writing 10 working days prior to commencement of work?
	3. Is the contractor responsible for furnishing all labor, materials, services, insurance, and equipment necessary for the total removal and disposal of all asbestos in the designated area?
	4. Is the contractor responsible for supplying personal protective equipment to government inspectors for entry into the asbestos regulated areas?
	5. Does the contract specification clearly state which operations require a fully enclosed regulated area?
	6. Does the contract require the Navy to retain the services of a Navy Consultant to direct all air monitoring?
	7. Does the contract require the Navy Consultant or the Private Qualified Person to meet accreditation and state licensing requirements?
	8. Does the contract stipulate the contractor's responsibility when unexpected asbestos is encountered during alteration projects?
	9. Does the contract require the following submittals: <ul style="list-style-type: none"> a. Asbestos hazard abatement plan b. Safety plan c. Name of certified testing laboratory d. Name, address, telephone number, and certification number including date of the Private Qualified Person e. Name and location of certified waste disposal site f. Certification of worker training
	10. Does the contract establish an environmental clearance limit (or clean-to-standard) of 0.01 f/cc?

Detailed Discussion.

Checklist Item #1. Because of the need for extreme environmental and personnel exposure control, both the contractor and OICC/ROICC administrator should have a firm grasp of the amounts, the condition and the locations of all asbestos materials and understand the degree of removal difficulty. The accessibility of the asbestos materials should be described in detail. Accessibility impediments may include: drop ceilings, obstruction by other objects, or scuttle ports through which personnel must enter. Failure to properly evaluate the scope of the project could inadvertently produce a disastrous situation.

Checklist Item #2. All demolition projects require EPA notification. Often a State or local air pollution/environmental agency is the designee for the notification.

Checklist Item #3. No discussion.

Checklist Item #4. Prior to entry into any asbestos regulated area all personnel must wear the proper personal protective equipment, including respirators.

NOTE: Government inspectors must have respirator training, medical screening, and fit testing prior to using any respiratory equipment. The contractor is responsible for informing the inspector of the proper respirator and cartridges to be used.

Checklist Item #5. Typically a contractor will attempt to remove asbestos without an enclosed regulated area. A roped off area or glovebag removal is frequently proposed to cut costs. The need for a full enclosure can be determined during project design and should be made a contract requirement when appropriate.

Checklist Item #6. In some States, the Navy is required by law to retain a third party, or Navy Consultant (NC), to complete all air monitoring. The NC is a qualified person who is employed directly by the government to monitor, sample, inspect the work, or in some other way advise the contracting officer. The NC is normally a private consultant, but can be an employee of the Government.

Checklist Item #7. The Private Qualified Person (PQP) or the NC must be a Registered Architect, Professional Engineer, Certified industrial Hygienist, Consultant or other qualified person who has successfully completed training and is therefore accredited under 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer. The PQP or NC must have successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent, and be qualified to perform visual inspections as indicated in American Society of Testing Materials, ASTM E 1368, *Standard for Visual Inspection of Asbestos Abatement Projects*. Additionally, the PQP or NC shall be licensed by the state, when required.

Checklist Item #8. Failure to plan for dealing with unexpected asbestos results in inadvertent exposures, project delays, as well as high cost overruns.

Checklist Item #9. The submittals required in the checklist are a minimum. The submittals required by the contract should not be limited by the checklist items herein.

Checklist Item #10. For buildings, final clearance air samples should not be in excess of 0.01 fibers per cubic centimeter (f/cc). For ships, final clearance air samples should not be in excess of 0.01 f/cc or background, whichever is greater.

PRE-ABATEMENT

The removal of asbestos containing materials is a hazardous, complicated, and costly process that should not be considered normal contract work. Only asbestos contractors/workers certified by an EPA accredited training course are be allowed to perform abatement actions.

It is mandatory that asbestos abatement actions comply with both EPA and OSHA regulations. The government's liability will be compromised if the contractor fails to perform work in accordance with the requirements of the regulations. Also, if the regulations are not followed, personnel can be exposed to and the environment can be contaminated with excessive asbestos fibers. Thus, the contractor and the employees must be knowledgeable in all health, safety, and environmental regulations.

PRE-ABATEMENT CHECKLIST		
CHECK <input type="checkbox"/>	CHECKLIST ITEM DESCRIPTION	REQUIREMENTS
	1. Has the contractor obtained state or special licenses and permits, where necessary?	
	2. Has the contractor notified the EPA, or the appropriate state or local regulatory agency, 10 days prior to the commencement of work?	40 CFR 61.145 (b)
	3. Has the contractor provided proof that all asbestos workers and supervisors are trained in the proper removal procedures of asbestos?	29 CFR 1915.1001 (k)(9), (o)(3)(i) 29 CFR 1926.1101 (k)(9), (o)(3)(i) 40 CFR 763.121 (k)(3) OPNAVINST 5100.23 ch. 17
	4. Has the contractor provided the name and certification number of the "competent" or "qualified" person?	29 CFR 1915.1001 (o)(4) 29 CFR 1926.1101 (o)(4) OPNAVINST 5100.23 ch. 17
	5. Has the contractor provided proof that the supervisor, remaining on-site during all abatement operations, is trained in the requirements of NESHAP?	40 CFR 61.145 (c)(8) OPNAVINST 5100.23 ch. 17
	6. Has the contractor provided proof that all of the employees have received medical examinations and that medical records are kept?	29 CFR 1915.1001 (m), (n)(3)(i) 29 CFR 1926.1101 (m), (n)(3)(i) 40 CFR 763.121 (n)(3)(i) OPNAVINST 5100.23 ch. 17
	7. Has the contractor provided proof that all of the employees are respirator trained and fit tested?	29 CFR 1910.134 (e)(5)(i) 29 CFR 1915.1001 (h)(4) 29 CFR 1926.1101 (h)(4) OPNAVINST 5100.23 ch. 17
	8. Has the contractor provided proof that all vacuum and ventilation equipment has the manufacturer's certification that it is capable of handling airborne asbestos fibers in conformance with ANSI Standard Z9.2?	40 CFR 61.152 OPNAVINST 5100.23 ch. 17

PRE-ABATEMENT CHECKLIST		
CHECK <input checked="" type="checkbox"/>	CHECKLIST ITEM DESCRIPTION	REQUIREMENTS
	9. Has the contractor provided a detailed asbestos hazard abatement plan that complies with EPA/OSHA Safety and Health requirements? (see Asbestos Hazard Abatement Checklist for details)	40 CFR 61.145 (b)(4)(x)-(xi)
	10. Has the contractor provided the name, address, and phone number of the Private Qualified Person responsible for the exposure monitoring program and air sampling?	
	11. Has the contractor provided the name, address, and phone number of the testing laboratory for all asbestos sampling analysis?	
	12. Has the laboratory shown proof of participation in a proficiency analytical testing (PAT) program?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	13. Has the contractor provided a Quality Assurance plan to ensure that laboratory analysis is accurate?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	14. Has the contractor provided the name and location of the certified waste disposal site?	40 CFR 61.145 (b)(4)(xii) OPNAVINST 5100.23 ch. 17

Detailed Discussion.

Checklist Item #1. Many state and local governments require special licensing for a contractor to engage in asbestos removal work. The contractor must provide copies of such certification to the Contracting Officer.

The air pollution control districts of many counties require the contractor to obtain a permit to remove asbestos. The Contracting Officer must become familiar with the local and state regulations governing asbestos work and its disposal to ensure that the contractor is complying with all regulations and also to assure that regulations are properly referenced in the contract.

Checklist Item #2. Renovation projects which disturb asbestos and all demolition projects require EPA notification. Often a State or local regulatory agency is the designee for the notification.

Checklist Items #3, #4 and #5. Asbestos abatement workers and supervisors must be trained by an EPA accredited training program. Also, a supervisor trained in the requirements of NESHAP must remain on-site during all abatement actions. Additionally, a “qualified” or “competent” person, as defined in 29 CFR 1915.1001 or 1926.1101, shall supervise all asbestos work performed in a regulated area. All training must be completed prior to beginning any abatement action. The minimum hours of training required are summarized in Table 1.

TABLE 1. ASBESTOS TRAINING UNDER 40 CFR 61 AND 40 CFR 763	
TYPE OF PERSONNEL	TRAINING REQUIRED
Abatement Workers	- 4 day course with hands on training and exam - Annual 8 hour refresher
Abatement Supervisor (Competent Person)	- 5 day course with hands on training and exam - Annual 8 hour refresher
NESHAP On-site Supervisor	- 16 hour NESHAP specific course or AHERA Contractor/Supervisor Course - Bi-annual 8 hour refresher

The contractor must submit training certificates to the Contracting Officer, signed by a certified instructor, stating that the employee has received training in the proper handling of materials that contain asbestos. Recertification is required on an annual basis. Bilingual certificate forms and training shall be required where appropriate. Most specifications will also require the contractor to provide a written statement, signed by each employee, stating that the employee has received training in the proper asbestos techniques.

Checklist Item #6. All employees must have a physical examination prior to beginning abatement actions. Most specifications will require the contractor to provide a written statement, signed by each employee, showing that the employee has had a recent physical examination. The employer is required by law to provide specific medical exams, i.e., pulmonary function, x-ray, etc., for preplacement, annual, and termination physicals for all employees working with asbestos.

Checklist Item #7. Respirators are required during most abatement operations. Training in the proper use, limitations, and fitting of the respirators is mandatory to ensure that asbestos fibers are not inhaled by workers. Proof that employees have been respirator trained, in accordance with 29 CFR 1910.134, must be submitted by the contractor.

Checklist Item #8. The contractor must provide a manufacturer's certification (or other proof) that the vacuums, ventilation equipment, and other equipment required to handle or contain airborne asbestos fibers conform to American National Standard Institute (ANSI) Standard Z9.2, *Fundamentals Governing Design and Operation of Local Exhaust Systems*.

NOTE: DO NOT allow the contractor to use ordinary industrial vacuum cleaners to pick up asbestos dusts. Such action will result in dispersion of massive concentrations of asbestos fibers into the air. Vacuums must be equipped with high efficiency particulate air (HEPA) filters and other controls specifically designed to retain 99.97% of all particulates 0.3 microns or larger in size.

Checklist Item #9. No Discussion.

Checklist Item #10. The contractor must provide the name, address, telephone number, certification number, and certification date of the PQP responsible for air monitoring during the project. The contractor shall retain the PQP's services through at least the final compliance monitoring phase of the contract.

Checklist Item #11. The contractor must submit the name, address, and telephone number of the testing laboratory that will perform monitoring, testing, and reporting of the airborne asbestos samples.

Checklist Item #12. The laboratory must show participation in the "Proficiency Analytical Testing (PAT) Program for Laboratory Quality Control" established by the National Institute for Occupational Safety and Health (NIOSH) and administered by the American Industrial Hygiene Association (AIHA), for Phase Contrast Microscopy (PCM) analysis of air samples. Laboratories doing Transmission Electron Microscopy (TEM) air or Polarized Light Microscopy (PLM) bulk sample analysis must be accredited by the National Institute of Standards and Technology (NIST).

Checklist Item #13. The contractor should also submit a Quality Assurance plan to ensure the laboratory analysis is accurate. This can be accomplished by splitting samples and sending them to the same laboratory or to a second laboratory. If another laboratory is used in the plan, this laboratory must meet all previous requirements.

Checklist Item #14. The contractor must provide written evidence that the proposed landfill is an EPA certified asbestos disposal site.

ASBESTOS HAZARD ABATEMENT PLAN

The contractor must provide the Contracting Officer with a detailed plan of work to be used in the removal of ACM. The plan must be reviewed prior to beginning any asbestos work. The contractor and the PQP shall meet with the Contracting Officer to thoroughly discuss the asbestos hazard abatement plan, including work procedures and safety precautions.

NOTE: The OICC/ROICC should request that the plan be reviewed by the Asbestos Program Manager, the cognizant BUMED Industrial Hygienist and/or engineering field division (EFD).

The plan shall include, but is not limited to the following:

ASBESTOS HAZARD ABATEMENT PLAN CHECKLIST

CHECK ✓	CHECKLIST ITEM DESCRIPTION
	1. Is the plan prepared, signed, and sealed by the Private Qualified Person, including certification number and certification date.
	2. Does the plan include a drawing showing the location, size, and details of asbestos regulated areas, including the following: <ul style="list-style-type: none"> - location of the clean and dirty areas - buffer zones - showers - storage areas - change rooms - local exhaust equipment
	3. Does the plan include a work area and breathing zone air monitoring plan?
	4. Does the plan include the precise personal protective equipment to be used?
	5. Does the plan include step-by-step details for the sequencing of asbestos-related work?
	6. Does the plan include a disposal plan?
	7. Does the plan specify the type of wetting agent to be used?
	8. Does the plan include both Fire and Medical Emergency response plans?
	9. Does the plan include a detailed description of the environmental pollution control method?

AREA PREPARATION

This section addresses asbestos abatement for a renovation which can occur in one part or the entire building. Abatement methods for different homogeneous areas have been determined in an earlier stage of the project.

AREA PREPARATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCES
	1. Is the workplace isolation required for the project?	29 CFR 1915.1001 (e) 29 CFR 1926.1101 (e) 40 CFR 61.147
	2. Have all building occupants been informed of the abatement and potential exposure hazards?	29 CFR 1915.1001 (k) 29 CFR 1926.1101 (k)
	3. If work site has multiple employers, has the abatement contractor notified the other employers?	29 CFR 1915.1001 (d) 29 CFR 1926.1101 (d)
	4. Have the mechanical systems and utilities in the containment area been disconnected from the rest of the building, if possible?	29 CFR 1915.1001 (g)(5)(i)(B) 29 CFR 1926.1101 (g)(5)(i)(B)
	5. Has the building HVAC system been deactivated or isolated to preclude building contamination with asbestos?	29 CFR 1915.1001 (g)(4)(iii) 29 CFR 1926.1101 (g)(4)(iii)
	6. Is there at least one on-site representative with NESHAP training? Is proof of training posted at abatement site?	40 CFR 61.145 (c)(8)
	7. Is there a “competent” or “qualified” person supervising the regulated work area? Is proof of training posted?	29 CFR 1915.1001 (o)(3)(i), (g)(4)(i) 29 CFR 1926.1101 (o)(3)(i), (g)(4)(i) 40 CFR 61.145 (c) 8 OPNAVINST 5100.23 ch. 17
	8. Have adequate warning signs been placed on all approaches to asbestos regulated areas?	29 CFR 1915.1001 (k)(7) 29 CFR 1926.1101 (k)(7) 40 CFR 763 (k)(1)
	9. Have all removable objects (furniture, equipment, rugs) been decontaminated then transferred to a designated clean area?	29 CFR 1915.1001 App F 29 CFR 1926.1101 App F
	10. Are all non-work surfaces vacuumed? Are the vacuums equipped with HEPA filters?	29 CFR 1915.1001 (g)(1)(i) 29 CFR 1926.1101 (g)(1)(i)
	11. Are all openings to the project area sealed off with only one entry/exit through the decontamination area?	29 CFR 1915.1001 (g)(4) 29 CFR 1926.1101 (g)(4)

AREA PREPARATION CHECKLIST

CHECK <input checked="" type="checkbox"/>	CHECKLIST ITEM DESCRIPTION	REFERENCES
	12. Does the project require negative pressure and construction of a plastic sheet temporary barrier system?	29 CFR 1915.1001 (g)(5) 29 CFR 1926.1101 (g)(5) 40 CFR 763.121(e)(6)(i)
	13. Does the local exhaust system meet ACGIH and ANSI Z9.2 standards?	40 CFR 763.121 (c)(1)(ii) OPNAVINST 5100.23 ch. 17
	14. Do filters on vacuums and exhaust equipment meet UL586 standards for HEPA filters and are the filters labeled?	
	15. Does the local exhaust system have sufficient capacity to maintain a minimum pressure differential of negative 0.02 inches of water gauge and provide 4 air change per hour?	29 CFR 1915.1001 (g)(5)(i)(A), App F 29 CFR 1926.1101 (g)(5)(i)(A), App F OPNAVINST 5100.23 ch. 17
	16. Is the local exhaust system capable of operating 24 hours per day?	29 CFR 1915.1001 (g)(5)(i)(A), App F 29 CFR 1926.1101 (g)(5)(i)(A), App F
	16a. Has HEPA filtered local exhaust ventilation been provided for portable hand and power tools?	OPNAVINST 5100.23 Ch 17
	17. Is the worker decontamination facility properly designed with a shower facility located between the clean and dirty change rooms? Is the shower facility provided with towels, soap, and hot and cold water.	29 CFR 1915.1001 (j) 29 CFR 1926.1101 (j) 40 CFR 763.121 (j)(1) OPNAVINST 5100.23 ch. 17
	18. Have procedures been established to assure protective clothing and equipment are complete and in good condition prior to entering the regulated area?	29 CFR 1915.1001 (i)(4) 29 CFR 1926.1101 (i)(4) 40 CFR 763.121 (i)(4)
	19. Is contaminated water from the decontamination process filtered or disposed of as an asbestos waste?	
	20. Have adequate procedures governing waste and equipment removal been established?	40 CFR 61.150 OPNAVINST 5100.23 ch. 17
	21. Are selected respirators approved by MSHA and NIOSH for use with asbestos?	29 CFR 1915.1001 (h)(2)(ii) 29 CFR 1926.1101 (h)(2)(ii) OPNAVINST 5100.23 ch. 17
	22. Is the air source for air supply respirators from either a bank of compressed air cylinders or from an air compressor?	29 CFR 1910.134(d)(2) OPNAVINST 5100.23 ch. 17
	23. Are the air sources labeled as being filled with Grade D or better breathing air?	29 CFR 1910.134(d)(10) OPNAVINST 5100.23 ch. 17

AREA PREPARATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCES
	24. Are all components for the air supply respirator made by the same manufacturer and are intended to work together?	29 CFR 1910.134(f)(4)
	25. Is protective equipment required, such as disposable coveralls, gloves, shoe covers, eye protection, and hard hats?	29 CFR 1910.133, .135, .136 29 CFR 1915.1001 (i)(1) 29 CFR 1926.1101 (i)(1) 40 CFR 736.121 (i) OPNAVINST 5100.23 ch. 17
	26. Is cooling in-line air supply necessary?	

Detailed Discussion

Checklist Item #1. If there is a high probability of inadvertent contamination of either people or the environment, then isolation is necessary. Most removal projects cannot be done without isolation of the project area. If the facility cannot be easily isolated and it is normally occupied, then evacuation may be necessary prior to the start of the removal.

Checklist Item #2. All building occupants must be fully aware of the abatement action. An industrial hygienist or an environmental officer should conduct a seminar to properly inform personnel.

Checklist Item #3. On multi-employer work sites, an employer performing work requiring the establishment of a regulated area is to notify other employers on the site of the nature of the asbestos work, requirements pertaining to regulated areas and the measures taken to ensure that the other employer's employees are not exposed to asbestos.

Checklist Item #4. The contractor must shut down all electrical power in the regulated area, unless equipped with ground-fault interrupters, when wet removal is in progress. The contractor shall provide temporary power in the area to run negative pressure units, HEPA filtered vacuums, lighting, or any other items requiring electrical power.

When it is necessary to continue operation in a facility while a portion of it is going under asbestos abatement, special consideration must be given for shutdown of mechanical/utility systems and fire protection systems.

Checklist Item #5. The building's heating, ventilation and air conditioning (HVAC) system cannot feasibly be used as a control measure. The HVAC system must be sealed off from the containment area with a double layer of 6 mil plastic or equivalent. Be aware that the rest of the facility may still require environmentally controlled air.

Checklist Item #6. No regulated asbestos containing material shall be stripped, removed, or disturbed unless at least one on-site representative, such as a foreman or management-level person trained in the provisions of NESHAP is present at all times. Evidence that the required training has been completed shall be posted and made available for inspection.

Checklist Item #7. On all work sites where employees are engaged in class I or II asbestos work, such as a foreman or management-level person trained in the provisions of NESHAP, is present at all times. Evidence that the required training has been completed shall be posted and made available for inspection.

Checklist Item #8. Place warning signs at all approaches to asbestos regulated areas. Locate the signs at such a distance that people can see and read them from all directions of approach.

Checklist Item #9. Transfer all removable objects present in the work areas (furniture, equipment, area rugs) to a designated decontamination area within the isolation area, where they will be thoroughly damp-cleaned, or vacuumed with HEPA filtered equipment. Then, transfer them to clean areas for storage until the area from which they came is declared clean.

Checklist Item #10. Vacuums must be equipped with HEPA filters and other controls conforming to ANSI Standard Z9.2.

Checklist Item #11. For Class I and II work, completely seal off all openings (heating and ventilation system, doorways, corridors, windows, skylights) to the regulated area. Place impermeable drop cloths on surfaces beneath all removal activities. The only access route should be through the shower/change room. Some contractors set up a separate decontamination area for equipment and removed materials. If deteriorated asbestos surfaces are present, personnel must wear protective clothing and respirators during masking and sealing operations.

HVAC systems shall be shut down and locked off. If the HVAC system must remain operational to supply other areas, then special isolation techniques must be used to ensure that asbestos does not migrate to other areas of the building. Such techniques include caulking of duct joints and pressurizing ducts which are in the regulated area. Ventilation systems used to confine asbestos fibers cannot be directly exhausted to the adjacent workplace or atmosphere without HEPA filtration.

Checklist Item #12. When negative pressure is required, construct an airlock/curtained doorway in accordance with 40 CFR 61. The doorway is also used for an entry/exit way.

Checklist Item #13. Design, construct, install, and maintain a local exhaust ventilation system in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation, A Manual of Recommended Practice*, and ANSI Z9.2. Systems not complying to the above standards are not approved.

Checklist Item #14. Each filter should be individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 µm diethylphthalate

(DOP) aerosol. Testing should be in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Each filter should bear a Underwriters Laboratory (UL) 586 label to indicate ability to perform under specific conditions. Each filter should be marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow. Prefilters and intermediate filter are recommended to prolong the operating life of the expensive HEPA filter.

Checklist Item #15. Size the exhaust systems to maintain a minimum pressure differential of -0.02 inches of water gauge and have magnehelic type manometers, with record keeping ability, to assure performance monitoring. Note that this is the pressure inside the containment relative to the outside atmosphere, not the pressure across the HEPA filter. These records shall be submitted to the OICC/ROICC Representative at least daily. The records serve as partial validation of containment and exhaust system integrity.

Checklist Item #16. Once the project begins, the local exhaust system must run continuously during project duration. Consider system capability and preventive maintenance routine to ensure the system remains effective.

Checklist Item #16a. Local exhaust ventilation is required for all hand and power tools which may produce or release asbestos fibers in excess of the PEL.

Checklist Item #17. All personnel, equipment, and removed materials shall enter and exit through the clean room, the cleaning area, and the decontamination room. Use overlapping curtains as access doors through the cleaning corridor. Provide showers which comply with 29 CFR 1910.141(d)(3), unless the employer can demonstrate that they are not feasible. Provide shower facilities with towels, soap, and hot and cold water feeding a common discharge line.

Checklist Item #18. The “competent” or “qualified” person is responsible for assuring that worker protective clothing are complete and in good condition, prior to entering the regulated area.

Checklist Item #19. Dispose of all contaminated waste water from showers, decontamination processes, cleanup process, etc. in impermeable drums as asbestos waste or filter the waste water prior to storm sewer discharge. Efficient filtration systems can capture asbestos fibers down to five microns, or even one micron, in length. If there is any uncertainty regarding water regulations in a particular area, contact the state department of environmental management.

Checklist Item #20. Develop explicit procedures governing removal of equipment and waste from the regulated area. Dispose of all waste products properly according to procedures discussed in the Post-Abatement Section. Decontaminate all equipment by wet cleaning and HEPA vacuuming before removing from the regulated area.

Checklist Item #21. Use only respirators jointly approved for protection against exposure to asbestos by the Mine Safety and health Administrations (MSHA) and NIOSH under provision of 30 CFR Part 11.

Checklist Items #22-24. Workers must wear a supplied air respirator until a negative exposure assessment has been accomplished to determine the appropriate respirator protection requirement. This type of respirator will protect the worker at all levels of asbestos exposure. Breathing air may be supplied to respirators from cylinders or air compressors and shall meet the requirements of the specification for Grade D breathing air. Also, MSHA and NIOSH approval is only valid as long as all respirator components are made by the same manufacturer and are described as being needed to provide protection against asbestos. The length of the airline hose shall not exceed 300 feet.

Checklist Item #25. Use the following protective clothing:

1. Disposable coveralls, full-body with hood (head covering), fire retardant, One-Piece, constructed of Tyvek 1422 material or material comparable in weight and strength.
2. Gloves, two pairs, one of which must provide an impermeable barrier to asbestos fibers. The outer pair of gloves are the gauntlet type that protects the area above the wrist and, if taped to the Tyvek coveralls, provide sufficient elbow room to preclude tearing of the coveralls. The inner pair is a cotton type or similar material that removes moisture from the surface of the skin.
3. Heavy polyethylene shoe covers with slip-resistant soles, or lightweight rubber boots.
4. Goggles or full-length face shields.

Checklist Item #26. Environmental control of in-line air supply may be necessary to prevent heat stress problems.

ABATEMENT METHODS

REMOVAL METHODS

The abatement method used is determined by the location and condition of the ACM. Abatement methods include: removal, encapsulation with sealant, or enclosure within an airtight structure. This chapter provides only procedures for removal of ACM before building renovation.

ASBESTOS REMOVAL CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has the material been treated with a solution of water and a wetting agent to reduce fiber release?	29 CFR 1915.1001 (g)(1)(i), App. F 29 CFR 1926.1101 (g)(1)(i), App. F 40 CFR 61.145 (c)(2)(i) OPNAVINST 5100.23 ch. 17
	2. Has the contractor obtained written approval from the EPA, state, or local agency before a dry removal project begins?	40 CFR 61.145 (c)(3)(i)(A)
	3. Is the removal complete to the substrate?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	4. Has material been packed wet?	40 CFR 61.150(a)(1)(iii) OPNAVINST 5100.23 ch. 17
	5. Has the material been placed in fiber or metal drums lined with 6-mil plastic bags, or in 6-mil or stronger plastic bags?	OPNAVINST 5100.23 ch. 17
	6. Are the drums/bags properly labeled with OSHA approved labels?	29 CFR 1915.1001 (k)(8) 29 CFR 1926.1101 (k)(8) 40 CFR 61.150(a)(1)(iv) OPNAVINST 5100.23 ch. 17
	7. Have the drums/bags been decontaminated prior to removing from regulated area?	40 CFR 61.150(a) OPNAVINST 5100.23 ch. 17
	8. Has the "lock down" encapsulant been used in areas where all asbestos has been removed?	
	9. Is daily air monitoring used?	29 CFR 1915.1001 (f)(3)(i) 29 CFR 1926.1101 (f)(3)(i) OPNAVINST 5100.23 ch. 17

Detailed Discussion

Checklist Items #1. Initiate removal of all types of asbestos only after the material is treated with a solution of water and a wetting agent to reduce fiber release. Some types of amosite-containing materials will not absorb either water or water amended with the wetting agent suggested by EPA

(50% polyoxyethylene ester and 50% polyoxyethylene ether). Test wetting agents on the material for absorption prior to OICC/ROICC approval.

Checklist Items #2. There are special conditions which may require dry removal, including areas where electrical supply lines cannot be de-energized, and where the material does not absorb the wetting agent. The contractor must obtain written approval from EPA, state, or local agency prior to starting a dry removal process. During the dry removal process, the workers must be protected with appropriate respiratory protection.

Checklist Item #3. Complete removal is to the substrate (e.g., steel, concrete) or to surfaces which are free of asbestos-containing mixtures (in general, for spray-applied asbestos, only finish coats contain asbestos). All finish coats must be stripped down to the hard "brown" or "scratch" coat.

Checklist Item #4-7. Pack bulk asbestos in leak-tight plastic or metal drums lined with sealable 6-mil thick plastic bags while wet. Seal drums with a lid and retaining ring. If the bulk asbestos will not fit into drums, put materials in 6-mil or thicker plastic bags and load onto skids for transport to an EPA-approved disposal site. Mark drums and skids with approved OSHA labels that contain the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

The disposed materials shall also be marked with the contractor's name, waste generator, and location of removal. Clean them at a decontamination area before transport. The labels should be readily visible and legible and printed with waterproof ink. Detailed asbestos disposal methods are described in following chapter.

Checklist Item #8. Apply a sealant or "lock down" encapsulant to the surface from which asbestos material has been removed, since complete removal of asbestos is difficult to ensure. All corners, crevices and internal angles between surfaces, especially where pipes enter walls and conduits attach directly to structural members, shall be saturated with a sealant or "lock down" encapsulant. Generally, use airless spraying techniques, at as low a nozzle pressure as possible. In spraying a sealant or "lock down" encapsulant, continuity and thickness are key factors. Continuity of coatings can be visually checked if the coating is pigmented with a different color than the cleaned, coated surface. Avoid transparent sealers. Surface thickness can be assured by inspecting rates of application and by insuring that sealants are not diluted by the contractor.

Checklist Item #9. Daily air monitoring is necessary to determine worker exposure and environmental contamination levels. Strict adherence to the respiratory protection program and decontamination procedures are also mandatory. Any serious violation or infraction of procedures in these areas are grounds to halt the work until discrepancies are corrected.

ENVIRONMENTAL MONITORING

Throughout the removal or abatement process, environmental monitoring for airborne asbestos fibers, both inside and outside the regulated area, must be accomplished by the PQP or NC. **The government retains the right to concurrently conduct air monitoring during all phases of the contract.** The exact sampling regimen must be detailed in the abatement plan. Consider the following in developing this sampling scheme.

NOTE: Currently, environmental air quality standards do not establish quantitative exposure levels for asbestos fibers or the methodology for sampling and analysis. However, trends have developed in the asbestos abatement industry that are becoming recognized practices. The EPA publication: *Guide for Controlling Asbestos Containing Materials in Buildings* (EPA 560/5-85-024) provides additional direction on this controversial subject.

ENVIRONMENTAL MONITORING CHECKLIST		
CHECK √	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has a final clearance level of 0.01 f/cc been set?	OPNAVINST 5100.23 ch. 17
	2. Is phase contrast microscopy (PCM) used to analyze air samples?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	3. Have background or reference ambient asbestos fiber levels been determined?	29 CFR 1915.1001 (f)(2) 29 CFR 1926.1101 (f)(2) OPNAVINST 5100.23 ch. 17
	4. Have personal samples been taken to establish airborne asbestos TWA's during the performance of each new task?	29 CFR 1915.1001 (f) (4)(ii) 29 CFR 1926.1101 (f)(4)(ii) OPNAVINST 5100.23 ch. 17
	5. Is daily area monitoring provided both inside and outside the regulated area?	29 CFR 1915.1001 (f)(3), (g)(4)(ii)(B) 29 CFR 1926.1101 (f)(3), (g)(4)(ii)(B)
	6. Does post-cleanup monitoring meet contract specifications?	OPNAVINST 5100.23 ch. 17
	7. Is air sample analysis conducted in accordance with NIOSH standards?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	8. Are monitoring results reported as soon as possible after receipt of results?	29 CFR 1915.1001 (f)(5)(i) 29 CFR 1926.1101 (f)(5)(i)

Detailed Discussion

Checklist Item #1. OPNAVINST 5100.23 defines the 0.01 f/cc clearance level for the purposes of quality control and general access. For ships, the background level, if greater, may be used instead of 0.01 f/cc.

Checklist Item #2. Unless otherwise specified, use NIOSH Method 7400, *NIOSH Analytical Method*, for sampling and analysis.

PCM is commonly used for personal air sample analysis and as a screening tool for area air monitoring. However, it cannot distinguish between asbestos fibers and other kinds of fibers which may be present in the air. For more accurate information on actual levels of airborne asbestos fibers, TEM can be used. TEM analysis is approximately ten times more expensive than PCM analysis.

Checklist Item #3. Background or ambient fiber levels help determine the extent of the problem. They also establish the baseline from which to measure contractor performance. If levels are greater than 0.01 f/cc then the area must be designated as a regulated area whereby: (1) medical surveillance of exposed naval personnel may be required (if concentrations exceed 0.1 f/cc.), (2) a respiratory protection program may be required, and (3) a formal abatement program may be necessary. Consult with the cognizant Bureau of Medicine and Surgery Industrial Hygienist (BUMED IH) for sample interpretations.

Area monitoring must be done 1 day prior to masking and sealing operations, when feasible, for each asbestos removal site to determine the background levels of airborne asbestos. This establishes, to some degree, the anticipated degree of hazard potential.

Checklist Item #4. Provide personal (worker) monitoring to establish levels of asbestos exposure. Accomplish the sampling during the first shift of each new task, i.e., sealing, masking, removal, and final cleanup. This is of prime importance since the results will determine the types of respirators used by workers. It also indicates the integrity of the enclosure barriers.

Checklist Item #5. Providing the same type of work is performed, area monitoring must be performed by PQP or NC at least once every work shift. The PQP or NC must also sample at least once every work shift outside the entrance of the regulated area and at the exhaust port of all negative pressure units. If monitoring outside the regulated area shows airborne levels have exceeded 0.01 f/cc, the contractor must stop all work and correct the condition(s) causing the increase in concentrations. The PQP or NC must notify the OICC/ROICC immediately of all sample discrepancies. All sample documents must be certified to be within acceptable limits by the PQP or NC and appropriately stamped to indicate acceptance.

Checklist Item #6. If the contract requires aggressive sampling, the results of the area monitoring, after final cleanup, must be less than 0.01 f/cc (longer than 5 micrometers) or not be greater than the outdoor reference level (defined during the initial assessment). If any of the final samples indicate a higher value, the contractor shall take appropriate action to reclean the area and shall repeat the monitoring. This is a key element for the contract because it is one of two final quality determinants to measure the success of the removal, encapsulation, or enclosure project and cleanup process. Visual inspection is the other determinant.

Checklist Item #7. No discussion.

Checklist Item #8. A timely sample turnaround is required to effectively monitor the situation. In overseas and remote locations, additional planning may be necessary to process samples quickly to prevent delays in the project.

ASBESTOS ENCAPSULATION

Encapsulation refers to the spraying of ACM with a sealant to bind together the asbestos fibers and other material components and to provide resistance to damage from impact. Encapsulation should be used only on granular, cementitious material which still retains bonding integrity. Encapsulation of ACM must be combined with an O&M program to protect area users and the environment from asbestos fiber exposure.

NOTE: Prior to preparing specifications for an encapsulation project, the feasibility of encapsulation must be thoroughly reviewed. Although encapsulation controls the release of asbestos fibers from ACM, it does not provide a permanent solution since the asbestos remains in the building.

ENCAPSULATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have federal, state, or local agencies been notified?	40 CFR 61.145 (b)
	2. Has the encapsulant been field tested?	
	3. Are negative pressure and isolation required for this encapsulation?	29 CFR 1915.1001 (e) 29 CFR 1926.1101 (e)
	4. Are measures taken for worker protection?	29 CFR 1915.1001 (g) 29 CFR 1926.1101 (g)
	5. Are low volume airless spraying techniques used to apply the sealant?	
	6. Are all waste masking and all disposable clothing handled as asbestos waste material?	40 CFR 61.150 40 CFR 61.141
	7. Has air clearance monitoring been accomplished?	29 CFR 1915.1001 App. A & F 29 CFR 1926.1101 App. A & F
	8. Has the encapsulated area been placed on the activity Asbestos O&M program?	

Detailed Discussion

Checklist Item #1. 10 working days prior to start of work, notify EPA or approved state or local agencies if the asbestos area disturbed in this project, or a combination of projects during a year, meets or exceeds 80 linear meters (260 linear feet) or 15 square meters (160 square feet).

Checklist Item #2. Field testing encapsulants is essential. Encapsulant binds with or otherwise reacts with the substrate unpredictably. Test the encapsulants effectiveness on the particular ACM on-site before designing the job. Keep a written record of testing procedures and test results. This information is needed to avoid unintentional release of fibers during later renovation or demolition.

EPA evaluated over 100 sealants, using five criteria: impact resistance, flame speed, smoke generation, toxic gas release during combustion, and adhesive/cohesive strength. ASTM also developed laboratory testing criteria for sealants. Additional information on the EPA sealant study can be obtained from EPA's office of Toxic Substances, TSCA Assistance Office.

Checklist Item #3. Negative pressure work areas and isolation barrier systems may be required if pre-design airborne monitoring during field testing indicates high fiber release. The airborne asbestos fiber will indicate the type of respiratory protection required. The cognizant PQP or NC or safety authority should be contacted for respirator selection.

Checklist Item #4. Highest levels of asbestos fiber concentrations occur during the disturbance of asbestos material anchoring systems and suspension wires, removing and rerouting utilities from enclosed areas, and asbestos removal. The PQP or the NC is responsible for ensuring proper respiratory protection is designated and breathing zone sampling done to verify protection. See the discussion for Area Preparation Checklist #21-26.

Checklist Item #5. Sealants used in the encapsulation process are applied with airless spraying techniques, at as low a nozzle pressure as possible to reduce contact disturbance. A recommended pressure ranges from 400 to 1500 psi. Use of brushes or rollers may disturb asbestos and release it into the air. Refer to EPA 560/5-85-024, *Guide for Controlling Asbestos Containing Materials in Buildings*, for further information.

In spraying a coating or sealant, continuity and thickness are key factors. A tack coat and at least two other full coats are required. As many as four coats may be required to achieve proper covering in certain situations. A 90 degree direction change is also required on the third coat. As recommended in EPA 560/5-85-024, asbestos material that is predominately fibrous and without a previous coating will probably take one gallon of sealant per 20-50 sq. ft. of material.

Checklist Item #6. All masking and disposable clothing shall be handled in the same manner as asbestos waste material. Disposal techniques are covered in following chapter.

Checklist Item #7. Environmental air monitoring methods are provided in the Environmental Monitoring Checklist.

Checklist Item #8. An O&M program protects building users from exposure to asbestos fibers. The program can be defined as a formulated plan of training, cleaning, work practices, and surveillance to maintain ACM in good condition. Procedures for developing an asbestos O&M program are detailed in EPA 20T-2003, *Managing Asbestos in Place - A Building Owners Guide to Operations and Maintenance Programs for Asbestos-Containing Materials*.

ASBESTOS ENCLOSURE

An enclosure involves the construction of air-tight walls and ceilings around the ACM. An enclosure should be used when ACM is located in a small area (e.g., a column) or where disturbance or entry into enclosed area is unlikely. Similar to the encapsulation process, enclosure is a temporary abatement method which must be combined with an O&M program to protect area users and the environment from asbestos fiber exposure.

ENCLOSURE CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have federal, state, or local agencies been notified?	40 CFR 61.145 (b)
	2. Are measures taken for worker protection?	29 CFR 1915.1001 (g) 29 CFR 1926.1101 (g)
	3. Will asbestos be disturbed during enclosure?	
	4. Has all asbestos been removed from areas where drilling and nailing of concrete or steel is planned?	
	5. Are all cut ACM surfaces coated with the "lock down" encapsulant before the enclosure construction begins?	
	6. Are all waste debris and all contaminated material handled as asbestos waste material?	40 CFR 61.141
	7. Has clearance monitoring been accomplished?	29 CFR 1915.1001 App. A & F 29 CFR 1926.1101 App. A & F
	8. Do building records reflect presence of ACM behind the new enclosure?	
	9. Has the encapsulated area been placed on the activity Asbestos O&M program?	

Detailed Discussion

Checklist Item #1. Ten working days prior to start of work, notify EPA or approved state agencies if the asbestos area disturbed in this project or a combination of projects during a year reaches a critical point described in the regulations as 80 linear meters (260 lf) or 15 square meters (160 sf).

Checklist Item #2. Highest levels of asbestos fiber concentrations occur during the disturbance of asbestos material anchoring systems and suspension wires, removing and rerouting utilities from enclosed areas, and asbestos removal. The PQP or the NC is responsible for ensuring proper respiratory protection is designated and breathing zone sampling done to verify protection. See the discussion for Area Preparation Checklist #21-26.

Checklist Item #3. When enclosure involves localized disturbance of the asbestos material, it is imperative that the asbestos material be wetted with amended water, as prescribed for wet removal.

Checklist Item #4. The asbestos material shall be removed down to the substrate layer before such operations as drilling and nailing into concrete or steel are performed. No raw edges should be left hanging from the material: edges should be leveled whenever possible.

Checklist Item #5. Once the exposed edges of ACM are dry, the "lock down" encapsulant should be applied to reduce fiber release. See Checklist Item #8 discussion of Asbestos Removal Checklist for detail.

Checklist Item #6. All unnecessary staging, scaffolding, platforms, asbestos-waste-filled drums and equipment should be decontaminated, labeled, and removed from the work area before gross cleanup is begun. All masking and disposable clothing shall be handled in the same manner as asbestos waste material. Disposal techniques are covered in the Asbestos Disposal Checklist.

Checklist Item #7. Environmental air monitoring methods are provided in the Environmental Monitoring Checklist.

Checklist Item #8. Update building records to reflect the method of asbestos abatement. With the asbestos enclosed and hidden from view, records become essential for tracking.

Checklist Item #9. An O&M program protects building users from exposure to asbestos fibers. The program can be defined as a formulated plan of training, cleaning, work practices, and surveillance to maintain ACM in good condition. Procedures for developing an asbestos O&M program are detailed in EPA 20T-2003.

POST-ABATEMENT

Proper sequencing of cleanup operations prevents recleaning and repeated air monitoring of the work area. Work area evaluation consists of initial cleaning, visual inspection, final inspection, final compliance air monitoring and tear-down of enclosure. Use visual inspection to determine if the work has been performed properly and to check for debris and other obvious signs of poor cleaning. Final air monitoring confirms that the work site has been adequately cleaned. Only then is the contractor released.

AREA CLEANUP CHECKLIST		
CHECK <input type="checkbox"/>	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has the contractor removed all asbestos materials from the building substrate?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	2. Has the contractor wet-cleaned all surfaces and equipment within the work area?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	3. Has the Private Qualified Person or Navy Consultant performed the initial compliance testing?	
	4. If an enclosure was used, has the contractor removed only the top layer of polyethylene from the floors and walls?	
	5. If an enclosure was used, have leaks and all surfaces in the work area been cleaned with water and/or HEPA vacuums?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17
	6. Has the area been <u>visually</u> inspected to ensure that it is free of visible friable asbestos material and debris?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17
	7. Does the final inspection reveal a "dust free" work site?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17

Detailed Discussion.

Checklist Item #1. This inspection determines the completeness of the removal. The inspector must visually check to see if any ACM is clinging to the substrate. If so, stop the inspection, since the removal is incomplete.

The inspection takes place before the containment barriers have been taken down, but after the plastic sheets have been damp cleaned and vacuumed with a HEPA vacuum. Inspectors must wear proper personal protective equipment (PPE), including respirators since airborne levels of asbestos have not been determined. Government personnel cannot enter the area or wear respiratory protection unless they have been properly trained, medically certified, fit-tested and are placed on a medical surveillance program. Check with your Safety Manager before entering

any area where the concentration of airborne asbestos fibers is unknown. Check the substrate surfaces to assure no ACM remains. Give special attention to pipes, beams and irregular surfaces that have corners and hard to reach areas. Check surfaces behind obstructions.

Checklist Item #2. Check that the contractor has removed gross contamination from negative air filtration units, scaffolding, ladders, extension cords, hoses, and other equipment inside the work area. Accomplish cleaning by a combination of HEPA vacuuming and wet wiping.

Checklist Item #3. The PQP or NC may choose to conduct area monitoring for asbestos fibers after cleanup but before removal of the asbestos area enclosure, if one was used. This may be referred to as "Initial Compliance Testing". These monitoring results provide an indication of what the final asbestos fiber concentration may be once the containment is removed.

Checklist Item #4. During most renovation projects an enclosure will be used. Workers must remove the first layer of plastic sheets from walls and floors only. The windows, doors, and building HVAC vents remain sealed. The negative pressure air filtering system must remain in service until air sampling is complete. If it is difficult to separate the two layers of plastic, leave them together and proceed with the cleaning. The enclosure remains intact until the space has passed final air monitoring requirements as defined in the contract.

Checklist Item #5. If an enclosure was used during the renovation project, remove any visible contamination that has leaked through to the second layer of plastic with water and/or HEPA filtered vacuums. Contractors must require workers to clean all surfaces in the work area and in any other contaminated areas with water and/or HEPA filtered vacuums. Begin wipe-down at the point furthest from the negative pressure units and clean inward toward the air cleaning unit and away from the cleaned surfaces. Remove the HEPA filters and vacuum systems last.

Checklist Item #6. This visual inspection determines cleanliness of the work area. The bottom layer of plastic and the enclosure are still in place. Examine all surfaces for dust and debris, especially overhead areas like tips of suspended light fixtures. If the inspector finds visible accumulations of asbestos debris in the work area, the contractor must repeat the wet-cleaning until the work area is in compliance. When a final inspection determines that the area is free of visible accumulations of asbestos debris, remove the bottom layer of plastic.

Checklist Item #7. This inspection is a good indicator of the potential for residual asbestos contamination. Attempt to collect dust from surfaces by wiping with a damp cloth and then examining it for dust. Or darken the room and shine a flashlight so that the beam just glances any smooth horizontal surface. Run your finger across the illuminated area. If a line is left on the surface, or if airborne particles shine in the light, dust is still present. This is a convenient way to establish compliance with the "dust-free" requirement of the contract. If dust is found by either of these two tests, reclean the entire work area and repeat the tests. A final check will be made to ensure that no dust or debris remains on surfaces as a result of dismantling operations and that all enclosure materials, plastic sheeting, and tools have been removed. It is also important to check for incomplete work, damage to surfaces, as well as incomplete cleanup of any surrounding areas. ASTM E 1368 has additional information.

FINAL ACCEPTANCE AIR MONITORING

Perform air monitoring to indicate if the airborne fiber concentration meets the predetermined criteria set for clearance of the work site and subsequent return of furnishings and personnel. Conduct air monitoring only after the site has passed visual inspection. If the first set of air samples indicate airborne fiber concentrations in the area are above the clearance level specified in the contract (0.01 f/cc), reclean the area followed again by clearance sampling. Repeat this cycle until results of airborne fiber concentrations indicate the clearance criteria has been attained.

FINAL ACCEPTANCE AIR MONITORING CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Does the contract require using aggressive sampling techniques to collect post-abatement air samples?	
	2. Does area monitoring reveal acceptable clearance concentrations (< 0.01 f/cc) or ambient background levels?	OPNAVINST 5100.23 ch. 17
	3. Do air sampling procedures comply with NIOSH standards and/or contract requirements?	OPNAVINST 5100.23 ch. 17 29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A
	4. Has the contractor satisfied the requirements of checklist item #2 and visual inspection of work site to merit release?	

Detailed Discussion.

Checklist Item #1. If specified in the contract, use aggressive sampling for the post-abatement air test. Artificially circulate air using forced air equipment such as leaf blowers to dislodge free fibers, then slow-speed fans to keep the fibers suspended during sampling. This way fibers remain airborne during the sampling process. Although the site has been cleaned and passed a visual test, persons conducting this air monitoring should wear respirators since the levels of airborne asbestos still may be elevated. Refer to EPA document 560/5-85-024, *Guidance for Controlling Asbestos-Containing Materials in Buildings*, for additional information.

Checklist Item #2. Clearance sampling criteria should be clearly defined in the contract. Clearance concentrations should be less than 0.01 f/cc or ambient background levels, aboard ships, after cleanup.

Checklist Item #3. The OICC/ROICC should be thoroughly convinced with the results and satisfied that the contractor has met his obligations. Air sampling by Phase Contrast Microscopy (PCM) should follow NIOSH method 7400 as recommended by EPA document 600/4-85-049,

Measuring Airborne Asbestos Following an Abatement Action. The BUMED IH (located in the hospital or medical clinic) or environmental engineer should assist the OICC/ROICC with any data interpretation that may be necessary.

Checklist Item #4. An asbestos abatement project is successful when the source of fiber release has been removed and the airborne levels generated during the removal have been reduced to acceptable levels. Success of the project is confirmed with final acceptance air monitoring preceded by a visual inspection. Visual inspection is used to determine if the work has been performed properly and to check for debris and other obvious signs of poor cleaning. Air testing confirms that the work site has been adequately cleaned and the airborne asbestos fiber concentration is below 0.01 f/cc. The contractor should be released only after passing both inspections. When the contractor has satisfied both of these requirements, furnishings and personnel may re-enter the work area.

ASBESTOS WASTE DISPOSAL

As of November 1990, the NESHAP regulation defines requirements for notification, work practices and disposal of asbestos containing waste from demolition and/or renovation projects. The purpose of the standard is to protect the public health by minimizing the release of asbestos fibers when facilities which contain ACM are demolished or renovated. The waste generator is responsible for the asbestos containing waste from removal off the building component until it is properly landfilled. Once it is removed, transported off the facility, and landfilled does not mean the generator is no longer responsible.

ASBESTOS DISPOSAL CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has asbestos waste been collected wet?	29 CFR 1910.1001 (f)(1)(vi) 29 CFR 1915.1001 (g)(1)(ii) 29 CFR 1926.1101. (g)(1)(ii) 40 CFR 61.150 (a)(1) OPNAVINST 5100.23 ch. 17
	2. Have all asbestos waste and scrap material including protective equipment been properly labeled and enclosed in impermeable bags or contained in appropriate drums?	29 CFR 1910.1001 (j)(4)(ii) 29 CFR 1915.1001 (l)(2) 29 CFR 1926.1101 (l)(2) 40 CFR 61.150 (a)(1)(iii)
	3. Have OSHA warning labels been affixed to waste containers?	29 CFR 1910.1001 (j)(4) 29 CFR 1915.1001 (k)(8) 29 CFR 1926.1101 (k)(8) 40 CFR 61.150 (a)(1)(iv) OPNAVINST 5100.23 ch. 17

ASBESTOS DISPOSAL CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	4. Have the asbestos-containing waste containers been labeled with the generator name and location at which the waste was generated?	40 CFR 61.150 (a)(1)(v)
	5. Has an interim storage area been assigned to the contractor for waste-containing drums?	
	6. Has a manifest/Waste Shipment Record been completed by the waste generator?	40 CFR 61.154 (d)(1)(i)-(viii)
	7. Have the transport vehicles been properly posted with danger signs during loading and unloading?	40 CFR 61.150 (b)(3)(c)
	8. Have sufficient precautions been taken to minimize loss or damage potential during transport?	40 CFR 61.150 (a)
	9. Are all workers who are loading the sealed waste drums wearing appropriate respiratory protection?	29 CFR 1910.1001 (g) 40 CFR 61.150 (a)

Detailed Discussion.

Checklist Item #1. Asbestos waste should be kept wet at all times. Use a fine amended water spray to wet the asbestos waste and minimize any potential fiber release.

Checklist Item #2. Collect items such as sprayed ceiling, pipe insulation, disposable clothing, safety equipment, masking sheets, vacuum cleaner contents, and filters in fiber drums, lined with two layers of polyethylene bags, and sealable with lids and retaining rings.

Checklist Item #3. Ensure warning labels have been affixed to the waste containers. Labels shall be conspicuous and legible.

Checklist Item #4. The asbestos-containing waste material must be labeled with the name of the waste generator and the location at which the waste was generated.

Checklist Item #5. An interim storage area should be provided for storing waste containing drums. All drums must be washed down or HEPA vacuumed prior to leaving the regulated area through the decontamination area.

Checklist Item #6. The Waste Generator refers to the owner or operator of a source covered by the NESHAP rule whose activities (renovation or demolition) produce asbestos-containing waste materials, however, the contractor performing the demolition should complete the original Waste Shipment Record (WSR). The WSR must include information such as name, address and telephone number of the waste generator, quantity removed, name of the disposal site, etc. The

WSR should be turned over to the transporter with the waste shipment, but the generator should retain a copy of the WSR signed by the transporter acknowledging receipt of the waste shipment indefinitely for their records. Since the ROICC or his representative represents the building owner and therefore shares responsibility for insuring the waste reaches the landfill, we recommend a copy of the WSR be obtained from the contractor.

Local and state governments may require manifesting hazardous waste. Some states may require a hazardous waste manifest in addition to the WSR required by the Federal government.

Checklist Item #7. Ensure the transport vehicles are properly posted with danger signs during loading and unloading to warn people in the area of the hazards.

Checklist Item #8. Haul asbestos waste drums away as soon as there is sufficient quantity for a truck load. Transportation includes receipt of the containerized waste at the generation site until it has been unloaded at the disposal site.

The NESHAP regulation states that there must be no visible emissions to the outside air during waste transport. Therefore, it's recommend that vehicles used for transport of containerized asbestos waste have an enclosed carrying compartment or utilize a canvas covering sufficient to contain the transported waste, prevent damage to containers and prevent fiber release.

Checklist Item #9. Workers loading sealed drums at the work site or disposal site shall wear respirators and appropriate PPE.

POST-ABATEMENT ACTIONS

After any removal procedure has been completed, it is important to document the abatement. The Asbestos Program Manager (located in Safety Office, Environmental, or Public Works Facilities) should be informed where the abatement occurred and the amount of asbestos removed, enclosed or encapsulated.

POST-ABATEMENT CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have copies of all appropriate environmental monitoring documents been supplied to the OICC/ROICC or the Navy Consultant?	29 CFR 1910.1001 (m)(1)(i) 29 CFR 1915.1001 (n)(2)(i), (iii), & (n)(3)(i) 29 CFR 1926.1101 (n)(2)(i), (iii), & (n)(3)(i) OPNAVINST 5100.23 ch. 17
	2. Has the Asbestos Program Manager been informed of the removal?	

POST-ABATEMENT CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	3. Have "asbestos-free" markings been applied to new building materials?	
	4. Have the building drawings been updated to indicate replacement with asbestos-free materials?	
	5. Has the contractor provided written proof of the total amount of asbestos received and buried by the landfill?	40 CFR 61.150(d)(3)
	6. Has the original Waste Shipment Record been forwarded to Environmental Division or Department?	

Detailed Discussion.

Checklist Item #1. The importance of accurate recordkeeping cannot be overemphasized. Refer to the Environmental Monitoring Checklist in the Abatement Methods Section for detailed guidance.

Checklist Item #2. Contact the activity Asbestos Program Manager (APM) so their records will reflect the location and extent of the abatement.

Checklist Item #3 & #4. Ensure that all new building materials have been marked "asbestos-free" and that the building drawings reveal the same information.

Checklist Item #5. All asbestos containing waste must be accounted for accurately. A WSR must be filled out with the appropriate information and a copy of the WSR, after being signed by the landfill disposal operator, should be returned to the generator. If the signed WSR is not received by the generator within 35 days after the waste has been turned over to the first transporter, you must take steps to locate the waste shipment. If a signed WSR is still not received within 45 days, the generator must file a exception report to the responsible NESHAP enforcing agency.

Checklist Item #6. If the OICC/ROICC office receives the original WSR, make copies and send the original to the Environmental Department point of contact. The government has responsibility for the waste from "cradle to grave" and must verify its proper disposition.

GLOSSARY

Abatement	Control of asbestos beyond an operations and maintenance program that includes removal, enclosure, and encapsulation techniques.
ACM (ACBM)	Asbestos-Containing Material (Asbestos-containing Building Material). Any material containing more than one percent asbestos.
Adequately Wet	Sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.
AHERA	Asbestos Hazard Emergency Response Act.
Air Monitoring	The process of measuring the fiber content of a specific volume of air.
Amended Water	Water to which a surfactant has been added for use in wetting ACM to control asbestos fibers.
APM	Asbestos Program Manager
Asbestos	Chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos and any of these minerals that has been chemically treated and/or altered.
Asbestos-Containing Waste Material:	Any waste that contains commercial asbestos and is generated by a source regulated under NESHAP. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing waste and materials contaminated with asbestos including disposable equipment and clothing.
Asbestos Hazard Emergency Response Act (AHERA):	An EPA regulation published 1987. AHERA requires all schools (K-12) to inspect and identify ACM their buildings, and develop and implement an asbestos management plan. The 1990 reauthorization extended training requirements to include personnel in public and commercial buildings.
Asbestos Program Manager (APM)	An activity representative who supervises all aspects of the asbestos management control program.
Breathing Zone	A hemisphere forward of the shoulders with a radius of approximately 6” to 9” (150-230 mm).

Class I Asbestos Work	Activities involving the removal of thermal system insulation or surfacing ACM/PACM.
Class II Asbestos Work	Activities involving removal of ACM which is neither TSI or surfacing ACM. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
Class III Asbestos Work	Repair and maintenance operations, where any ACM may be disturbed.
Class IV Asbestos Work	Maintenance and custodial activities during which employees contact ACM and PACM and activities to cleanup waste and debris containing ACM and PACM.
Competent Person	One who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. Additionally, a person who is specifically trained in a training course which meets the criteria of EPA's Model Accreditation Plan for project designer or supervisor, or its equivalent.
Critical Barrier	One or more layers of polyethylene taped in place over openings into a work area. Openings to be covered include doors, windows, diffusers, and any other opening that could allow outside air into a work area.
Decontamination	Cleaning of contaminated areas, equipment, and personnel. Decontamination chambers are used in asbestos abatement projects.
Disposal Bag	Properly labeled 6 mil (0.15 mm) thick (or thicker) leak-tight plastic bags used for transporting asbestos waste from work and to disposal site.
Drop Cloth	A layer of polyethylene on the floor of a work area to protect the floor below from contamination and to facilitate the clean-up of dust or debris generated during the work.
Encapsulation	The treatment of ACM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).
Enclosure	The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
EPA	U.S. Environmental Protection Agency
Excursion Limit (EL)	The OSHA term used to define a maximum airborne concentration of

asbestos in fibers per cubic centimeter as averaged over a sampling period of thirty minutes.

Friable	Any material which, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. This may also include previously non-friable material which becomes broken or damaged by mechanical force.
Glovebag	A polyethylene or polyvinyl chloride bag-like enclosure affixed around an asbestos-containing source (most often, TSI) so that the material may be removed while minimizing release of airborne fibers to the surrounding atmosphere.
HEPA Filter	High-Efficiency Particulate Air Filter. Filters rated to trap at least 99.97% of all particles 0.3 microns (0.3 μm) in diameter or larger.
Industrial Hygienist	A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupation health hazards.
Medical Surveillance	A periodic comprehensive review of a worker's health status. The required elements of an acceptable medical surveillance program are listed in the OSHA standards for asbestos.
Navy Consultant (NC)	A Qualified Person (QP) employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government
Negative Pressure System	A local exhaust system intended to prevent the escape of contaminated air to the surrounding environment. It utilizes HEPA filtration capable of maintaining a pressure differential with a lower pressure inside the Work Area than in any adjacent area. This system recirculates clean air and/or generates a constant flow of air from adjacent areas into the work area.
Negative Pressure Respirator	A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

NESHAP	National Emission Standard for Hazardous Air Pollutants - EPA Rules under the Clean Air Act.
NIOSH	National Institute for Occupational Safety and Health.
Non-Friable	Any material which, when dry, can not be broken, crumbled, pulverized, or reduced to powder by hand pressure.
OSHA	Occupational Health & Safety Administration.
PACM	Presumed Asbestos-Containing Material. Materials assumed to contain asbestos but not laboratory tested.
PEL	Permissible Exposure Limit. Airborne fiber concentration limit of 0.1 fiber per cubic centimeter of air as an eight hour time weighted average.
Personal Air Samples	An air sample taken with a sampling pump directly attached to the worker with the collecting filter and cassette placed in the worker's breathing zone. These samples are required by the OSHA asbestos standards and the EPA Worker Protection Rule.
Phase Contrast Microscopy (PCM)	A method of analysis using a light microscope, used to find the concentration of airborne fibers. Does not distinguish among asbestos and other fibers. Used by OSHA to find personal exposures, and by EPA to find area levels for AHERA project clearance.
Polarized Light Microscopy (PLM)	A method of analysis using a light microscope to find the chemical or mineral types of samples, including the concentration of asbestos in bulk materials. Used by EPA for AHERA and NESHAP, and by OSHA to see if asbestos is involved in a project.
PPE	Personal Protective Equipment.
Private Qualified Person (PQP)	A Qualified Person (QP) hired by the Contractor to monitor, sample, inspect the work and perform other tasks as required by the contract.
Qualified Person (QP)	A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under the Model Accreditation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the NIOSH 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E 1368.

Regulated Area	An area where Class I, II, and III asbestos work is done, and any adjoining area where debris and waste from such work accumulate.
Removal	The taking out or stripping of substantially all ACM from a damaged area, a functional space, or a homogeneous area.
Surfactant	A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
Temporary Barriers	One or more layers of 6 mil polyethylene installed to isolate a work area from other portions of a facility.
Transmission Electron Microscopy (TEM)	Use of an electron microscope to find and analyze the concentration of airborne or bulk asbestos fibers and structures. Distinguishes among asbestos and other materials. Used to determine clearance levels.
WSR	Waste Shipment Record.

Appendix B

SUMMARY OF CHECKLISTS

The following is an accumulation of all the checklists discussed in this manual. These can be photo copied and used as working checklists during any renovation project.

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

CONTRACT REVIEW CHECKLIST	
CHECK ✓	CHECKLIST ITEM DESCRIPTION
	1. Does the contract clearly identify the form, condition, quantity and location of asbestos materials to be removed in the description of work?
	2. Is the contractor responsible for notifying EPA, state and local regulatory agencies, as required, and the Contracting Officer in writing 10 working days prior to commencement of work?
	3. Is the contractor responsible for furnishing all labor, materials, services, insurance, and equipment necessary for the total removal and disposal of all asbestos in the designated area?
	4. Is the contractor responsible for supplying personal protective equipment to government inspectors for entry into the asbestos regulated areas?
	5. Does the contract specification clearly state which operations require a fully enclosed regulated area?
	6. Does the contract require the Navy to retain the services of a Navy Consultant to direct all air monitoring?
	7. Does the contract require the Navy Consultant or the Private Qualified Person to meet accreditation and state licensing requirements?
	8. Does the contract stipulate the contractor's responsibility when unexpected asbestos is encountered during alteration projects?
	9. Does the contract require the following submittals: a. Asbestos hazard abatement plan b. Safety plan c. Name of certified testing laboratory d. Name, address, telephone number, and certification number including date of the Private Qualified Person e. Name and location of certified waste disposal site f. Certification of worker training
	10. Does the contract establish an environmental clearance limit (or clean-to-standard) of 0.01 f/cc?

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

PRE-ABATEMENT CHECKLIST		
CHECK √	CHECKLIST ITEM DESCRIPTION	REQUIREMENTS
	1. Has the contractor obtained state or special licenses and permits, where necessary?	
	2. Has the contractor notified the EPA, or the appropriate state or local regulatory agency, 10 days prior to the commencement of work?	40 CFR 61.145 (b)
	3. Has the contractor provided proof that all asbestos workers and supervisors are trained in the proper removal procedures of asbestos?	29 CFR 1915.1001 (k)(9), (o)(3)(i) 29 CFR 1926.1101 (k)(9), (o)(3)(i) 40 CFR 763.121 (k)(3) OPNAVINST 5100.23 ch. 17
	4. Has the contractor provided the name and certification number of the “competent” or “qualified” person?	29 CFR 1915.1001 (o)(4) 29 CFR 1926.1101 (o)(4) OPNAVINST 5100.23 ch. 17
	5. Has the contractor provided proof that the supervisor, remaining on-site during all abatement operations, is trained in the requirements of NESHAP?	40 CFR 61.145 (c)(8) OPNAVINST 5100.23 ch. 17
	6. Has the contractor provided proof that all of the employees have received medical examinations and that medical records are kept?	29 CFR 1915.1001 (m), (n)(3)(i) 29 CFR 1926.1101 (m), (n)(3)(i) 40 CFR 763.121 (n)(3)(i) OPNAVINST 5100.23 ch. 17
	7. Has the contractor provided proof that all of the employees are respirator trained and fit tested?	29 CFR 1910.134 (e)(5)(i) 29 CFR 1915.1001 (h)(4) 29 CFR 1926.1101 (h)(4) OPNAVINST 5100.23 ch. 17
	8. Has the contractor provided proof that all vacuum and ventilation equipment has the manufacturer's certification that it is capable of handling airborne asbestos fibers in conformance with ANSI Standard Z9.2?	40 CFR 61.152 OPNAVINST 5100.23 ch. 17
	9. Has the contractor provided a detailed asbestos hazard abatement plan that complies with EPA/OSHA Safety and Health requirements? (see Asbestos Hazard Abatement Checklist for details)	40 CFR 61.145 (b)(4)(x)-(xi)
	10. Has the contractor provided the name, address, and phone number of the Private Qualified Person responsible for the exposure monitoring program and air sampling?	
	11. Has the contractor provided the name, address, and phone number of the testing laboratory for all asbestos sampling analysis?	

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

PRE-ABATEMENT CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REQUIREMENTS
	12.Has the laboratory shown proof of participation in a proficiency analytical testing (PAT) program?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	13.Has the contractor provided a Quality Assurance plan to ensure that laboratory analysis is accurate?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	14.Has the contractor provided the name and location of the certified waste disposal site?	40 CFR 61.145 (b)(4)(xii) OPNAVINST 5100.23 ch. 17

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ASBESTOS HAZARD ABATEMENT PLAN CHECKLIST	
CHECK ✓	CHECKLIST ITEM DESCRIPTION
	1. Is the plan prepared, signed, and sealed by the Private Qualified Person, including certification number and certification date.
	2. Does the plan include a drawing showing the location, size, and details of asbestos regulated areas, including the following: <ul style="list-style-type: none">- location of the clean and dirty areas- buffer zones- showers- storage areas- change rooms- local exhaust equipment
	3. Does the plan include a work area and breathing zone air monitoring plan?
	4. Does the plan include the precise personal protective equipment to be used?
	5. Does the plan include step-by-step details for the sequencing of asbestos-related work?
	6. Does the plan include a disposal plan?
	7. Does the plan specify the type of wetting agent to be used?
	8. Does the plan include both Fire and Medical Emergency response plans?
	9. Does the plan include a detailed description of the environmental pollution control method?

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

AREA PREPARATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCES
	1. Is the workplace isolation required for the project?	29 CFR 1915.1001 (e) 29 CFR 1926.1101 (e) 40 CFR 61.147
	2. Have all building occupants been informed of the abatement and potential exposure hazards?	29 CFR 1915.1001 (k) 29 CFR 1926.1101 (k)
	3. If work site has multiple employers, has the abatement contractor notified the other employers?	29 CFR 1915.1001 (d) 29 CFR 1926.1101 (d)
	4. Have the mechanical systems and utilities in the containment area been disconnected from the rest of the building, if possible?	29 CFR 1915.1001 (g)(5)(i)(B) 29 CFR 1926.1101 (g)(5)(i)(B)
	5. Has the building HVAC system been deactivated or isolated to preclude building contamination with asbestos?	29 CFR 1915.1001 (g)(4)(iii) 29 CFR 1926.1101 (g)(4)(iii)
	6. Is there at least one on-site representative with NESHAP training? Is proof of training posted at abatement site?	40 CFR 61.145 (c)(8)
	7. Is there a “competent” or “qualified” person supervising the regulated work area? Is proof of training posted?	29 CFR 1915.1001 (o)(3)(i), (g)(4)(i) 29 CFR 1926.1101 (o)(3)(i), (g)(4)(i) 40 CFR 61.145 (c) 8 OPNAVINST 5100.23 ch. 17
	8. Have adequate warning signs been placed on all approaches to asbestos regulated areas?	29 CFR 1915.1001 (k)(7) 29 CFR 1926.1101 (k)(7) 40 CFR 763 (k)(1)
	9. Have all removable objects (furniture, equipment, rugs) been decontaminated then transferred to a designated clean area?	29 CFR 1915.1001 App F 29 CFR 1926.1101 App F
	10. Are all non-work surfaces vacuumed? Are the vacuums equipped with HEPA filters?	29 CFR 1915.1001 (g)(1)(i) 29 CFR 1926.1101 (g)(1)(i)
	11. Are all openings to the project area sealed off with only one entry/exit through the decontamination area?	29 CFR 1915.1001 (g)(4) 29 CFR 1926.1101 (g)(4)
	12. Does the project require negative pressure and construction of a plastic sheet temporary barrier system?	29 CFR 1915.1001 (g)(5) 29 CFR 1926.1101 (g)(5) 40 CFR 763.121(e)(6)(i)
	13. Does the local exhaust system meet ACGIH and ANSI Z9.2 standards?	40 CFR 763.121 (e)(1)(ii) OPNAVINST 5100.23 ch. 17

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

AREA PREPARATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCES
	14. Do filters on vacuums and exhaust equipment meet UL586 standards for HEPA filters and are the filters labeled?	
	15. Does the local exhaust system have sufficient capacity to maintain a minimum pressure differential of negative 0.02 inches of water gauge and provide 4 air change per hour?	29 CFR 1915.1001 (g)(5)(i)(A), App F 29 CFR 1926.1101 (g)(5)(i)(A), App F OPNAVINST 5100.23 ch. 17
	16. Is the local exhaust system capable of operating 24 hours per day?	29 CFR 1915.1001 (g)(5)(i)(A), App F 29 CFR 1926.1101 (g)(5)(i)(A), App F
	16a. Has HEPA filtered local exhaust ventilation been provided for portable hand and power tools?	OPNAVINST 5100.23 Ch 17
	17. Is the worker decontamination facility properly designed with a shower facility located between the clean and dirty change rooms? Is the shower facility provided with towels, soap, and hot and cold water.	29 CFR 1915.1001 (j) 29 CFR 1926.1101 (j) 40 CFR 763.121 (j)(1) OPNAVINST 5100.23 ch. 17
	18. Have procedures been established to assure protective clothing and equipment are complete and in good condition prior to entering the regulated area?	29 CFR 1915.1001 (i)(4) 29 CFR 1926.1101 (i)(4) 40 CFR 763.121 (i)(4)
	19. Is contaminated water from the decontamination process filtered or disposed of as an asbestos waste?	
	20. Have adequate procedures governing waste and equipment removal been established?	40 CFR 61.150 OPNAVINST 5100.23 ch. 17
	21. Are selected respirators approved by MSHA and NIOSH for use with asbestos?	29 CFR 1915.1001 (h)(2)(ii) 29 CFR 1926.1101 (h)(2)(ii) OPNAVINST 5100.23 ch. 17
	22. Is the air source for air supply respirators from either a bank of compressed air cylinders or from an air compressor?	29 CFR 1910.134(d)(2) OPNAVINST 5100.23 ch. 17
	23. Are the air sources labeled as being filled with Grade D or better breathing air?	29 CFR 1910.134(d)(10) OPNAVINST 5100.23 ch. 17
	24. Are all components for the air supply respirator made by the same manufacturer and are intended to work together?	29 CFR 1910.134(f)(4)

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

AREA PREPARATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCES
	25. Is protective equipment required, such as disposable coveralls, gloves, shoe covers, eye protection, and hard hats?	29 CFR 1910.133, .135, .136 29 CFR 1915.1001 (i)(1) 29 CFR 1926.1101 (i)(1) 40 CFR 736.121 (i) OPNAVINST 5100.23 ch. 17
	26. Is cooling in-line air supply necessary?	

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ASBESTOS REMOVAL CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has the material been treated with a solution of water and a wetting agent to reduce fiber release?	29 CFR 1915.1001 (g)(1)(i), App. F 29 CFR 1926.1101 (g)(1)(i), App. F 40 CFR 61.145 (c)(2)(i) OPNAVINST 5100.23 ch. 17
	2. Has the contractor obtained written approval from the EPA, state, or local agency before a dry removal project begins?	40 CFR 61.145 (c)(3)(i)(A)
	3. Is the removal complete to the substrate?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	4. Has material been packed wet?	40 CFR 61.150(a)(1)(iii) OPNAVINST 5100.23 ch. 17
	5. Has the material been placed in fiber or metal drums lined with 6-mil plastic bags, or in 6-mil or stronger plastic bags?	OPNAVINST 5100.23 ch. 17
	6. Are the drums/bags properly labeled with OSHA approved labels?	29 CFR 1915.1001 (k)(8) 29 CFR 1926.1101 (k)(8) 40 CFR 61.150(a)(1)(iv) OPNAVINST 5100.23 ch. 17
	7. Have the drums/bags been decontaminated prior to removing from regulated area?	40 CFR 61.150(a) OPNAVINST 5100.23 ch. 17
	8. Has the "lock down" encapsulant been used in areas where all asbestos has been removed?	
	9. Is daily air monitoring used?	29 CFR 1915.1001 (f)(3)(i) 29 CFR 1926.1101 (f)(3)(i) OPNAVINST 5100.23 ch. 17

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ENVIRONMENTAL MONITORING CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has a final clearance level of 0.01 f/cc been set?	OPNAVINST 5100.23 ch. 17
	2. Is phase contrast microscopy (PCM) used to analyze air samples?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	3. Have background or reference ambient asbestos fiber levels been determined?	29 CFR 1915.1001 (f)(2) 29 CFR 1926.1101 (f)(2) OPNAVINST 5100.23 ch. 17
	4. Have personal samples been taken to establish airborne asbestos TWA's during the performance of each new task?	29 CFR 1915.1001 (f) (4)(ii) 29 CFR 1926.1101 (f)(4)(ii) OPNAVINST 5100.23 ch. 17
	5. Is daily area monitoring provided both inside and outside the regulated area?	29 CFR 1915.1001 (f)(3), (g)(4)(ii)(B) 29 CFR 1926.1101 (f)(3), (g)(4)(ii)(B)
	6. Does post-cleanup monitoring meet contract specifications?	OPNAVINST 5100.23 ch. 17
	7. Is air sample analysis conducted in accordance with NIOSH standards?	29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A OPNAVINST 5100.23 ch. 17
	8. Are monitoring results reported as soon as possible after receipt of results?	29 CFR 1915.1001 (f)(5)(i) 29 CFR 1926.1101 (f)(5)(i)

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ENCAPSULATION CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have federal, state, or local agencies been notified?	40 CFR 61.145 (b)
	2. Has the encapsulant been field tested?	
	3. Are negative pressure and isolation required for this encapsulation?	29 CFR 1915.1001 (e) 29 CFR 1926.1101 (e)
	4. Are measures taken for worker protection?	29 CFR 1915.1001 (g) 29 CFR 1926.1101 (g)
	5. Are low volume airless spraying techniques used to apply the sealant?	
	6. Are all waste masking and all disposable clothing handled as asbestos waste material?	40 CFR 61.150 40 CFR 61.141
	7. Has air clearance monitoring been accomplished?	29 CFR 1915.1001 App. A & F 29 CFR 1926.1101 App. A & F
	8. Has the encapsulated area been placed on the activity Asbestos O&M program?	

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ENCLOSURE CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have federal, state, or local agencies been notified?	40 CFR 61.145 (b)
	2. Are measures taken for worker protection?	29 CFR 1915.1001 (g) 29 CFR 1926.1101 (g)
	3. Will asbestos be disturbed during enclosure?	
	4. Has all asbestos been removed from areas where drilling and nailing of concrete or steel is planned?	
	5. Are all cut ACM surfaces coated with the "lock down" encapsulant before the enclosure construction begins?	
	6. Are all waste debris and all contaminated material handled as asbestos waste material?	40 CFR 61.141
	7. Has clearance monitoring been accomplished?	29 CFR 1915.1001 App. A & F 29 CFR 1926.1101 App. A & F
	8. Do building records reflect presence of ACM behind the new enclosure?	
	9. Has the encapsulated area been placed on the activity Asbestos O&M program?	

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

AREA CLEANUP CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has the contractor removed all asbestos materials from the building substrate?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	2. Has the contractor wet-cleaned all surfaces and equipment within the work area?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F
	3. Has the Private Qualified Person or Navy Consultant performed the initial compliance testing?	
	4. If an enclosure was used, has the contractor removed only the top layer of polyethylene from the floors and walls?	
	5. If an enclosure was used, have leaks and all surfaces in the work area been cleaned with water and/or HEPA vacuums?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17
	6. Has the area been <u>visually</u> inspected to ensure that it is free of visible friable asbestos material and debris?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17
	7. Does the final inspection reveal a "dust free" work site?	29 CFR 1915.1001 App. F 29 CFR 1926.1101 App. F OPNAVINST 5100.23 ch. 17

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

FINAL ACCEPTANCE AIR MONITORING CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Does the contract require using aggressive sampling techniques to collect post-abatement air samples?	
	2. Does area monitoring reveal acceptable clearance concentrations (< 0.01 f/cc) or ambient background levels?	OPNAVINST 5100.23 ch. 17
	3. Do air sampling procedures comply with NIOSH standards and/or contract requirements?	OPNAVINST 5100.23 ch. 17 29 CFR 1915.1001 App. A 29 CFR 1926.1101 App. A
	4. Has the contractor satisfied the requirements of checklist item #2 and visual inspection of work site to merit release?	

Project Title: _____

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

ASBESTOS DISPOSAL CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Has asbestos waste been collected wet?	29 CFR 1910.1001 (f)(1)(vi) 29 CFR 1915.1001 (g)(1)(ii) 29 CFR 1926.1101. (g)(1)(ii) 40 CFR 61.150 (a)(1) OPNAVINST 5100.23 ch. 17
	2. Have all asbestos waste and scrap material including protective equipment been properly labeled and enclosed in impermeable bags or contained in appropriate drums?	29 CFR 1910.1001 (j)(4)(ii) 29 CFR 1915.1001 (l)(2) 29 CFR 1926.1101 (l)(2) 40 CFR 61.150 (a)(1)(iii)
	3. Have OSHA warning labels been affixed to waste containers?	29 CFR 1910.1001 (j)(4) 29 CFR 1915.1001 (k)(8) 29 CFR 1926.1101 (k)(8) 40 CFR 61.150 (a)(1)(iv) OPNAVINST 5100.23 ch. 17
	4. Have the asbestos-containing waste containers been labeled with the generator name and location at which the waste was generated?	40 CFR 61.150 (a)(1)(v)
	5. Has an interim storage area been assigned to the contractor for waste-containing drums?	
	6. Has a manifest/Waste Shipment Record been completed by the waste generator?	40 CFR 61.154 (d)(1)(i)-(viii)
	7. Have the transport vehicles been properly posted with danger signs during loading and unloading?	40 CFR 61.150 (b)(3)(c)
	8. Have sufficient precautions been taken to minimize loss or damage potential during transport?	40 CFR 61.150 (a)
	9. Are all workers who are loading the sealed waste drums wearing appropriate respiratory protection?	29 CFR 1910.1001 (g) 40 CFR 61.150 (a)

Contract Number: _____ Building/Room: _____

ROICC Name: _____ Date: _____

POST-ABATEMENT CHECKLIST		
CHECK ✓	CHECKLIST ITEM DESCRIPTION	REFERENCE
	1. Have copies of all appropriate environmental monitoring documents been supplied to the OICC/ROICC or the Navy Consultant?	29 CFR 1910.1001 (m)(1)(i) 29 CFR 1915.1001 (n)(2)(i), (iii), & (n)(3)(i) 29 CFR 1926.1101 (n)(2)(i), (iii), &(n)(3)(i) OPNAVINST 5100.23 ch. 17
	2. Has the Asbestos Program Manager been informed of the removal?	
	3. Have "asbestos-free" markings been applied to new building materials?	
	4. Have the building drawings been updated to indicate replacement with asbestos-free materials?	
	5. Has the contractor provided written proof of the total amount of asbestos received and buried by the landfill?	40 CFR 61.150(d)(3)
	6. Has the original Waste Shipment Record been forwarded to Environmental Division or Department?	