

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13281 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The General Provisions of the contract, including the General Provisions for Construction Projects (2106), Special Provisions, and General Requirements of the Specifications, apply to the work in this Section.

1.02 SUMMARY

- A. This Section specifies Contractor requirements when disturbing asbestos-containing materials (ACM) associated with the Hawaii Department of Transportation Airports Division, Daniel K. Inouye International Airport, 2nd, and 3rd Level Roadway Rehabilitation. Refer to the survey data and verify the locations and quantities of ACM that will be disturbed as part of the planned roadway rehabilitation and related activities. Ensure that employees and subcontractors involved in disturbing or removing ACM have access to the survey report and the specifications, and all project personnel understand and are able to recognize and control asbestos hazards.
- B. Asbestos-containing material was identified as follows:
 - 1. Beige textured paint/skim coat on concrete ceiling, columns, and eaves on Level 1 (ground level).
 - 2. Black waterproofing underneath concrete roadway on Level 2.
 - 3. Black coating inside concrete planters on Level 2 and Level 3.
 - 4. Light gray caulking between concrete wall and floor on Level 3.

1.03 REFERENCES

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referred to in the text by the basic designation only. Federal requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:
 - 1. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), including but not limited to:

- a. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules - Title 29, Part 1910, Section 1001 and Title 29, Part 1926, Section 1101 of the Code of Federal Regulations (29 CFR 1910.1001 and 29 CFR 1926.1101)
 - b. Respiratory Protection; 29 CFR 1910. 134
 - c. Access to Employee Exposure and Medical Records; 29 CFR 1910.2
 - d. Hazard Communication; 29 CFR 1910.1200
 - e. Specifications for Accident Prevention Signs and Tags; 29 CFR 1910.145
- B. U.S. Department of Transportation (DOT), including but not limited to: Hazardous Substances; 49 CFR 171 & 172.
- C. U. S. Environmental Protection Agency (EPA), including but not limited to:
 - 1. Asbestos Abatement Projects; Worker Protection Rule 40 CFR 763, Sub-part G
 - 2. Asbestos Hazard Emergency Response Act (AHERA) Regulation Asbestos Containing Materials in Schools Final Rule & Notice; 40 CFR 763, Sub-part E
 - 3. Training Requirements of AHERA Regulation Asbestos Containing Materials in Schools Final Rule & Notice; 40 CFR Part 763, Sub-part E, Appendix C
 - 4. National Emission Standard for Hazardous Air Pollutants (NESHAP) National Emission Standard for Asbestos; 40 CFR 61, Sub-part A and Sub-part M (Revised Sub-part B)
- D. State of Hawaii: Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include, but not limited to:
 - 1. HAR – Asbestos Requirements – Title 11, Chapter 501
 - 2. HAR – Fees For Asbestos Removal And Certification – Title 11, Chapter 503
 - 3. HAR – Asbestos Abatement Certification Program – Title 11, Chapter 504
- E. Local Requirements: Comply with applicable local requirements which govern asbestos abatement work and hauling and disposal of asbestos waste.

1.04 STANDARDS

- A. Standards which apply to asbestos abatement work or hauling and disposal of asbestos waste include, but not limited to, the following:
 - 1. American National Standards Institute (ANSI), Broadway, New York, New York 10018
 - a. Fundamentals Governing the Design and Operation of Local Exhaust Systems Publication Z9.2-2012
 - b. Practices for Respiratory Protection Publication Z88.2-2015
 - 2. ASTM International, Race Street, Philadelphia, PA 19103
 - a. Standard Practice for Visual Inspection of Asbestos Abatement Projects E1368-2014

1.05 DEFINITIONS

- A. Amended Water: Water containing a wetting agent or surfactant.
- B. Area Monitoring: Sampling of asbestos fiber concentrations within the asbestos control area and outside the asbestos control area, which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone of personnel potentially exposed to asbestos.
- C. Asbestos: A group of naturally occurring minerals that separate into fibers. There are six asbestos minerals used commercially: chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- D. Asbestos Control Area: An area where asbestos removal operations are performed which is isolated by physical boundaries to prevent unauthorized entry of personnel and to prevent the spread of asbestos dust, fibers, or debris.
- E. Asbestos Fibers: Asbestos fibers having a length to diameter ratio of at least 3:1 and longer than 5 micrometers.
- F. Asbestos Permissible Exposure Limit: The limit is 0.1 fiber (longer than 5 micrometers) per cubic centimeter of air as an 8-hour time weighted average as determined by Appendix A of 29 CFR 1926.1101.
- G. Friable Asbestos Material: Material that contains more than one percent asbestos by weight which can be crumbled, pulverized, or reduced to powder by hand

pressure when dry. Friable asbestos material is considered hazardous during removal and disposal procedures.

- H. HEPA Filter Equipment: High Efficiency Particulate Air (HEPA) filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining asbestos fibers. Filters shall be 99.97 percent efficiency for retaining fibers of 0.3 micrometers or larger.
- I. Industrial Hygienist (IH): A third party industrial hygienist, retained by the Contractor, to oversee the asbestos compliance. The onsite work may be performed by an industrial hygiene technician (IHT). The IHT shall have a valid Project Monitor certification from the Hawaii Department of Health and shall be under the supervision of the industrial hygienist.
- J. Local Exhaust System: A system in which static pressure in an enclosed control area is lower than that of the environment outside the control area, as specified herein.
- K. Nonfriable Asbestos Material: Material that contain asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and may not release fibers in excess of the asbestos permissible exposure limit during any appropriate use, handling, storing, transporting, or processing. Nonfriable asbestos material may become hazardous during removal and disposal procedures.
- L. Personal Monitoring: Sampling of asbestos fiber concentrations within the breathing zone of an employee to determine the 8-hour time weighted average in accordance with Appendix A of 29 CFR 1926.1101. The samples shall be representative of the employee's work tasks. The breathing zone shall be considered an area within 12 inches of the nose or mouth of an employee.
- M. Removal Encapsulant: A manufactured asbestos penetrating encapsulant designed specifically for asbestos removal.
- N. Surfactant (Wetting Agent): A chemical wetting agent added to water to improve penetration. The surfactant shall be 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in a proportion of one fluid ounce to 5 gallons of water or as specified by the manufacturer. An equivalent surfactant shall be understood to mean material with a surface tension of 29 dynes/cm, as tested in accordance with ASTM D 1331.
- O. Time Weighted Average (TWA): TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of 29 CFR 1926.1101.

1.06 DESCRIPTION OF WORK

- A. Asbestos work generally includes asbestos-containing materials (ACM) that will be disturbed as part of the roadway rehabilitation project and identified in the survey report. Removal of ACM is typically conducted prior to removal or demolition of non-ACM; however, due to the location of some ACM, such as waterproofing material underneath the concrete roadway, the repairs will likely disturb ACM with non-ACM. Asbestos material removal is governed by 40 CFR 61, Subpart M, National Emissions Standards for Hazardous Air Pollutants (NESHAP).
- B. In addition to the asbestos fiber hazards, any concrete disturbance work pose silica hazards to site workers, facility personnel, the public, and the environment. All appropriate engineering controls must be implemented to control the hazards and prevent the exposures to asbestos fibers and silica.

1.07 SUBMITTALS

- A. Submittals shall be approved by the DOT-A prior to commencing work involving asbestos materials.
 - 1. Asbestos Hazard Prevention Plan: Submit a detailed job-specific plan of the work procedures that will minimize airborne dust, which shall be employed in the disturbance and demolition of materials touching or containing asbestos.
 - 2. The plan shall include:
 - a. A clear scope of work for the Abatement Contractor, if applicable
 - b. Interface of trades involved in the construction
 - c. Sequencing of asbestos-related work
 - d. Disposal plan for hazardous and non-hazardous waste
 - e. Type of wetting agent or removal encapsulant to be used
 - f. Product specifications and Safety Data Sheets (SDS)
 - g. Written Respiratory Protection Program
 - h. Written Hazard Communication Program (HAZCOM)
 - i. Current, valid training records for personnel who will conduct asbestos disturbance activities.

- j. Respirator fit test records
 - k. Respirators and other personal protective equipment
 - l. A detailed description of the methods to be employed in order to control pollution
 - m. Emergency Procedures plan
 - n. A sketch showing the location, size, and details of asbestos control areas, including clean and dirty areas, buffer zones, shower, storage areas, change rooms, 3-stage decontamination chamber, and removal methods.
- 3. The asbestos plan shall be approved by the DOT-A prior to the start of work, disturbing asbestos. Prior to beginning work, meet with the DOT-A to discuss in detail the asbestos plan, including notifications, work procedures, and safety precautions.
 - 4. Landfill: Submit written evidence that the landfill is approved for asbestos disposal by the State and local regulatory agencies. Within 5 working days after delivery, submit Hazardous Waste Manifest Form, prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill.
 - 5. Respiratory Protection Program: ANSI Z88.2 and 29 CFR 1910.134. Submit a list of workers who are respirator-qualified. Information shall also include date and type of fit testing and manufacturer and size of respirator.
 - 6. Permits, Licenses, and Certificates: Submit a copy of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work including:
 - a. Notices: Submit notices required by Federal, State, and local regulations with proof of timely transmittal to agency requiring the notice.
 - b. Permits: Submit a copy of current valid permits required by State and local regulations.
 - c. Licenses: Submit a copy of all State and local licenses necessary to carry out the work of this contract.

1.08 NOTICES

Send written notification as applicable and required by State and local regulations prior to beginning any work on ACM to the following:

Indoor and Radiological Health Branch
State of Hawaii Asbestos Program
99-945 Halawa Valley Street
Aiea, HI 96701
Tel: (808) 586-5800

Include the following information in the notification:

- A. Indication of whether notification is original or a revised notification.
- B. Name and address of facility and operator and asbestos removal or operator.
- C. Description of the facility being demolished or renovated, including the size, age, and present and prior use of the facility.
- D. Type of operation: abatement or renovation
- E. Estimate of the approximate amount of asbestos material to be removed from surface areas within the facility. For facilities in which the amount of asbestos material is less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) on other facility components, explain techniques of estimation.
- F. Procedure and analytical methods used to detect the presence of asbestos.
- G. Location of the facility being demolished or renovated (street address, room numbers, etc.)
- H. Scheduled starting and completion dates of abatement or renovation and any preparatory work that would disturb asbestos.
- I. Nature of planned abatement or renovation and method(s) to be used.
- J. Description of work practices and engineering controls.
- K. Procedures to be used to comply with the requirements of USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61 Subpart M).

- L. Name, telephone and address of waste transporter.
- M. Name and location of the waste disposal site where the friable asbestos waste material will be deposited.
- N. Certification that at least one person trained as required by NESHAP will supervise the operation.
- O. For facilities being demolished under an order of a State or local governmental agency, issued because the facility is structurally unsound and in danger of imminent collapse, the name, title, and authority of the State or local governmental Director who has ordered the abatement, date the order was issued, and date on which abatement was to begin. Attach a copy of the order.
- P. Other requirements per NESHAP.

1.09 PERMITS AND LICENSES

- A. Obtain and maintain current permits and licenses as required by applicable state or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract.

1.10 POSTING AND FILING OF REGULATIONS

- A. Post notices required by applicable Federal, State and local regulations. Maintain at least one (1) copy of applicable Federal, State, and local regulations and standards and approved work plan.

PART 2 - PRODUCTS

2.01 WETTING MATERIALS

- A. For wetting prior to disturbance of ACM, or when handling asbestos-contaminated waste, use either amended water or a removal encapsulant.
- B. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM, or asbestos fibers, in waste and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.
- C. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to

or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50% polyoxyethylene ester and 50% polyoxyethylene ether in five gallons of water.

2.02 POLYETHYLENE SHEET

- A. Provide a single polyethylene film in the largest sheet size possible to minimize seams, 6 mils thick, clear or frosted

2.03 DUCT TAPE

- A. Provide duct tape in 2" or a 3" width as appropriate, with an adhesive, which is formulated to stick aggressively to sheet polyethylene.

2.04 SPRAY ADHESIVE

- A. Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

2.05 DISPOSAL BAGS

- A. Provide 6 mil thick leak-tight polyethylene bags labeled as required.

2.06 SIGNS

- A. Post an approximately 20 inch by 14 inch manufactured caution sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101. The ACM waste bags shall have the same caution label.

LEGEND

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING IN THIS AREA

- B. Provide spacing between respective lines at least equal to the height of the respective upper line.
- C. Post an approximately 10 inch by 14 inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

LEGEND

NOTATION

NO FOOD, BEVERAGES OR TOBACCO PERMITTED 3/4" Block

ALL PERSONS SHALL DON PROTECTIVE CLOTHING (COVERINGS) BEFORE ENTERING THE WORK AREA 3/4" Block

ALL PERSONS SHALL SHOWER IMMEDIATELY AFTER LEAVING WORK AREA AND BEFORE ENTERING THE CHANGING AREA 3/4" Block

PART 3 - EXECUTION

3.01 EQUIPMENT

- A. HEPA Vacuuming Equipment: Vacuuming equipment utilizing High Efficiency Particulate Air (HEPA) UL 586 filter system capable of collecting and retaining asbestos fibers.

3.02 AIR PURIFYING RESPIRATORS

- A. Respirator Bodies: Provide half face, full face, or powered air purifying respirator (PAPR) type respirators.
- B. Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2. In addition, a chemical cartridge section may be added, if required for solvents, etc. In this case, combination cartridges may be considered, labeled with the appropriate color code and NIOSH Certification.
- C. Non-permitted respirators: Do not use single use, disposable or quarter face respirators.
- D. Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental.
- E. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until the area has been cleared for re-occupancy.
- F. Regardless of Airborne Fibers: Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency particulate air filters.

3.03 FIT TESTING

- A. Initial Fitting: Provide initial fitting of respiratory protection during a respiratory protection course of training. Fit types of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing have been provided.
- B. On an Annual Basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube. The fit test frequency shall be according to the OSHA requirement.
- C. Upon Each Wearing: Require that each time an air-purifying respirator is put on it be checked for seal with a positive and negative pressure fit check in accordance with the manufacturer's instructions or ANSI Z88.2 (2015).

3.04 TYPES OF RESPIRATORY PROTECTION NEEDED

- A. Provide Respiratory Protection as indicated in paragraph below. Higher levels of protection may be provided as desired by Contractor. Where paragraph below does not apply, determine the proper level of protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below 0.01 f/cc is the minimum level of protection allowed.

PROTECTION FACTORS

RESPIRATOR TYPE	PROTECTION FACTOR
Air purifying: Negative pressure respirator High efficiency filter Half or full facepiece	10
Powered Air Purifying Respirator (PAPR): Negative pressure respirator High efficiency filter Full facepiece	50
Type C supplied air: Positive pressure respirator Pressure demand Full facepiece	1,000
Type C supplied air: Positive pressure respirator, pressure demand Full facepiece equipped with an auxiliary positive pressure Self-Contained Breathing Apparatus (SCBA)	over 1,000

- B. Use the following as a minimum unless air monitoring results indicate greater protection is necessary. Refer to Protection Factors table for choice of respirators.
1. Containment or barrier installation which does not disturb ACM: Dual Cartridge, Half-face Air Purifying Respirators, at Competent Person's discretion.
 2. Removing or cleaning items or barrier installation when such operation may disturb ACM: Dual Cartridge, Half-face Air Purifying Respirators.
 3. ACM removal: Dual Cartridge, Half-face Air Purifying Respirators.
 4. Gross cleaning of removal area(s): Dual Cartridge, Half-face Air Purifying Respirators.
 5. Final wet-cleaning of area until final air tests show exposure in work areas to be below 0.01 f/cc: Dual Cartridge, Half-face Air Purifying Respirators.
 6. Loading and unloading drums on truck (outside work area): Dual Cartridge, Half-face Air Purifying Respirators.
- C. Fibers: For purposes of this section fibers are defined as all fibers regardless of composition as counted in the OSHA Reference Method, NIOSH Method 7400 procedure, or asbestos fibers of any size as counted using either a scanning or transmission electron microscope.

3.05 PROTECTIVE CLOTHING

- A. Furnish personnel exposed to airborne concentrations of asbestos fibers greater than or equal to the permissible exposure limit with protective whole body clothing, head covering, gloves, and foot coverings. Furnish disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Use tape to secure sleeves at the wrists and to secure foot coverings at the ankles.

3.06 PERSONNEL DECONTAMINATION UNIT

- A. Provide a decontamination area adjacent to the work area, as applicable. Decontamination area will consist of a polyethylene sheet placed adjacent to the work area large enough for employees to remove disposable coveralls and shower prior to exiting the work area. Waste generated during decontamination will be disposed of as asbestos containing debris. At the conclusion of work the plastic sheet will be disposed of as asbestos containing waste. Position a HEPA vacuum at the decontamination unit which workers will use to clean off protective clothing prior to removal.

3.07 CLEANING OF DECONTAMINATION UNITS

- A. Clean debris and residue from the Decontamination Area on a daily basis. Damp wipe or hose down all surfaces after each shift change.

3.08 WORK PROCEDURE

- A. Conduct asbestos-related work in accordance with 29 CFR 1926.1101 and as specified herein.
- B. Use wet removal procedures. Personnel shall wear and use protective clothing and equipment as specified in the approved Work Plan.
- C. Eating, smoking, or drinking shall not be permitted in the asbestos control area or change room.
- D. Personnel of other trades not engaged in the removal and demolition of asbestos shall not be exposed at any time to airborne concentrations of asbestos greater than or equal to 0.01 fibers (longer than 5 micrometers) per cubic centimeter of air, unless the personnel protection provisions of this Section are complied with by the trade personnel.
- E. Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the asbestos control areas. Seal intake and exhaust vents in the asbestos control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through asbestos control area.
- F. Disconnect electrical service when wet removal is performed and provide temporary electrical service protected by a ground fault circuit interrupter (GFCI).

3.09 ASBESTOS CONTROL AREA REQUIREMENTS

- A. Provide a marked perimeter around the work area during asbestos removal operations. No one will be permitted in the asbestos control area unless the person is provided with appropriate training and protective equipment (respirators and protective coveralls). During the asbestos removal operation, should the asbestos abatement employees need to exit the controlled area, they shall remove their coveralls, place them in an approved impermeable disposal bag, and then exit the area.
- B. Contractor shall conduct personal air monitoring samples on 25% of the work crew or a minimum of two employees whichever is greater during each work shift.
- C. Industrial Hygienist (IH) retained by the contractor will conduct boundary samples upwind and downwind of the asbestos control area during each work shift. If the concentration of airborne asbestos fibers at the boundaries is greater

than or equal to 0.01 fiber per cubic centimeter of air, or background quantity whichever is greater, the Contractor shall stop work, and correct the condition(s) causing the increase. If adjacent areas are contaminated, the contaminated areas shall be cleaned and visually inspected by the IH and Contractor's Competent Person. IH shall certify that the area has been cleaned of all asbestos contamination.

3.10 ASBESTOS HANDLING PROCEDURES

- A. General Procedure: If removing asbestos from components or removing components with asbestos adhered to it, wet asbestos material with a fine spray of amended water. Remove material and immediately place in approved impermeable bags that have been wetted. Collect asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing and place in sealed impermeable bags constructed of 6-mil plastic sheet.
- B. Provide asbestos caution labels on sealed impermeable bags and asbestos waste containers. When applicable, use a lined chute, hoist, lift or other State-approved method to move double-bagged asbestos containing waste material from roof, or upper floors, to asbestos waste transport container. If chute is used, it must be affixed with a negative pressure unit to minimize airborne fiber concentrations.

3.11 AIR MONITORING

- A. Work Area Airborne Fiber Levels: IH retained by the contractor will monitor airborne fiber levels in the Work Area, as applicable. The purpose of this air monitoring will be to detect potential airborne asbestos concentrations inside and outside of the control area.
- B. Outside the Work area (Barrier) Fiber Levels: IH will assess airborne fiber levels outside the work area to determine if leakage is occurring into non-work areas.
- C. IH will conduct air monitoring throughout the project, when ACM is disturbed.
- D. Contractor is responsible for his/her worker protection and personal air monitoring and legally-required documentations.

3.12 STOP ACTION LEVELS

- A. Inside Work Area: Maintain airborne levels in the work area of less than the Stop Action Level given below for the type of respiratory protection in use. If the fiber counts levels rise above this figure for any sample taken, revise work procedures to lower fiber counts. If fiber count levels for any work shift or 8 hour period exceeds the Stop Action Level, stop work except corrective action and leave air circulation system in operation. After correcting cause(s) of high airborne fiber

levels, do not recommence work for 24 hours unless otherwise authorized by the IH.

ASBESTOS

STOP ACTION LEVEL (f/cc)	RESPIRATOR REQUIRED	PROTECTION FACTOR
1	Half face APR	10
5	Full face APR	50
10	PAPR or Type C, Continuous flow	100
100	Type C, Pressure demand	1,000

- B. Outside Work Area: If any air sample taken outside of the Work Area exceeds the baseline established prior to start of work, immediately and automatically stop work except corrective action. Contractor shall determine the source of the high reading and take appropriate corrective actions.
- C. If the high reading was the result of a failure of Work Area isolation measures, initiate the following actions:
 - 1. Decontaminate the affected area(s).
 - 2. Require that respiratory protection be worn in affected the area until the area is cleared for other trade or reoccupancy.
- D. If the high reading was the result of other causes, initiate corrective action as determined by the Competent Person and the IH.
- E. Fibers Counted: Transmission Electron Microscopy (TEM) analysis will be used to resolve any disputes regarding fiber types, such as when the site work is stopped due to excessive airborne fiber counts. Cost of TEM analysis shall solely be borne by the Contractor. Phase Contrast Microscopy (PCM) analysis will used for daily monitoring.

3.13 ANALYTICAL METHODS

The following methods will be used in analyzing filters used to collect air samples. The filters used shall be in accordance with the referenced methods.

- A. Samples collected for PCM analysis shall be analyzed by NIOSH 7400 method.
- B. Samples collected for TEM analysis shall be analyzed by NIOSH 7402.

3.14 SAMPLE VOLUMES

- A. General: Number and volume of air samples taken by the IH will be in general accordance with the following schedule (see Paragraphs 3.15 and 3.16, below). Sample volumes given may vary depending upon the analytical method used and Contractor method of removal.

3.15 BASELINE

- A. Before Start of Work: IH will secure the following air samples to establish a baseline before start of asbestos removal work:

LOCATION SAMPLED	NUMBER OF SAMPLES MINIMUM	MINIMUM VOLUME (LITERS)	RATE (LPM)
Each Work Area	2 for up to 5,000 sq.ft.; one additional per each additional 5,000 sq.ft.	1,199	1-12
Outside the Work Area	1	1,199	1-12

3.16 DAILY

- A. From start of work and as applicable, IH will take the following samples during repairs, removal, or disturbance of ACM

SAMPLE TYPE SAMPLE LOCATION	MINIMUM NUMBER OF SAMPLES	MINIMUM SAMPLE VOLUME (LITERS)	SAMPLE FLOW RATE (LPM)
Work Area – Each Work Area	2 per shift	480	1-5
Barrier – Area outside of containment unit (determined by the IH)	2 per shift, unless sample area is dusty; then increase number as necessary	2,000	1-12
Barrier – Clean Room of Decon Unit	2 per shift, unless sample area is dusty; then increase number as necessary	2,000	1-12

- B. Additional samples may be taken at the IH's and DOT-A's discretion. If airborne fiber counts exceed allowed limits, additional samples shall be taken as necessary to monitor fiber levels. Personal monitoring performed by the IH shall not

remove the Contractor's responsibility to monitor his/her workers' health & safety and required documentations.

3.17 AIR SAMPLING MEDIA

- A. Sample Cassettes: Samples will be collected on 25 mm. cassettes with 50 mm. extension cowl as follows:

PCM: 0.8 micrometer mixed cellulose ester (MCE)

TEM: 0.45 micrometer MCE

3.18 LABORATORY TESTING

- A. Services of a testing laboratory will be employed by the IH to obtain area air samples as indicated. IH will obtain samples daily. Asbestos air sample results shall be obtained within 24 hours of receipt from the laboratory. Contractor and the DOT-A will have access to air monitoring tests and results at all times.
- B. Contractor is responsible for laboratory analysis for the personal air monitoring. Results shall be made available within 24 hours of receipt from the laboratory.

3.19 CLEANUP AND DISPOSAL

- A. Cleanup: Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Restrict the spread of dust and debris; keep waste from being distributed over the general area. Do not dry sweep or blow down the space with compressed air. When asbestos removal, disposal, and cleanup are complete, The IH will certify, in writing, that the concentration of airborne asbestos in the control area and barrier samples are less than 0.01 fiber (longer than 5 micrometers) per cubic centimeter of air and that there are no visible accumulations of dust, PPE were adequate, work procedures, asbestos removal, boundary samples disposal procedures, containment and clearances samples were in accordance with 29 CFR 1926.1101 and contract specifications.
- B. Competent Person and the IH will visually inspect the affected surfaces for residual asbestos material and accumulated dust before and after the removal of the asbestos control area; Contractor shall reclean areas showing dust or residual asbestos materials. If recleaning is required, monitor the asbestos airborne concentration during and after recleaning.
- C. Disposal of Asbestos: Dispose of waste asbestos material at a State and EPA approved landfill. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M of NESHAP, and State and local standards. Sealed impermeable bags may be dumped from drums into the burial site unless bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled.

Workers unloading sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

- D. Double Tape Wrapped: Asbestos materials shall be wrapped in 6-mil minimum thickness polyethylene sheets and taped with minimum 2-inch wide silver cloth duct tape. Asbestos materials shall be rewrapped with a second polyethylene sheet and taped before disposal to the dumpsite. Each bundle of wrapping shall not exceed 50 pounds in weight. Damaged polyethylene sheeting will not be accepted for disposal at the landfill.
- E. Waste Shipment Records: Prior to delivery of ACM waste materials, the Contractor shall complete the EPA's Waste Shipment Records requirements on manifesting ACM waste removal, transportation, and final disposal. Payment for this Section will not be made until a completed manifest from the disposal facility is returned, and a copy furnished to the Director. Copy and instructions for Waste Shipment Record are attached at the end of this Section.

3.20 FORMS

- A. Entry Log
- B. Employee Release Form
- C. Certificate of Workers Acknowledgement
- D. Asbestos Disposal Form
- E. Asbestos Notification of Demolition and Renovation

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work involving removal and disposal of asbestos and demolition debris shall not be measured or paid for separately, but shall be considered incidental to the lump sum price bid for the item of which it is a part in the Bid Schedule.

ENTRY LOG
(Sample)

DATE:

PROJECT No:

PROJECT SITE:

ALL PERSONNEL MUST SIGN-IN AND SIGN-OUT EVERY TIME THEY ENTER/EXIT THE WORK AREA. PLEASE PRINT CLEARLY. ATTACH EMPLOYEE RELEASE FORM FOR ALL VISITORS.

Name	Employer Name, address*, phone*	Time in	Time out	Purpose of visit	Type of PPE issued**

*Not required of Contractor's employees.

**Type of PPE (Personal Protective Equipment) issued to include list of protective clothing worn and type of respirator used (Type "C," half-face dual cartridge, etc.)

Note:

EMPLOYEE RELEASE FORM
(Sample)

Employee Name:

Employee Address:

Employee Telephone No.:

Name of Training center, Certificate Number and expiration Date:

Classification of work:

Have you had in the past or present, any respiratory problems?

Yes No

Have you worked in the past with asbestos or fiberglass type materials?

Yes No

The project you will be working on involves the use of asbestos and the removal of the asbestos from the building. Asbestos is considered a health hazard.

The company is supplying all necessary safety clothing and working conditions required and necessary for your protection from asbestos hazard.

You shall be instructed at the commencement of the job on the required use of safety equipment, clothing, working conditions, and procedures. These must be rigidly adhered to. Smoking is not permitted in the work area. Disregarding of safety instructions shall result in instant dismissal.

I acknowledge that safety instructions have been given to me by the company at my work commencement and I am thoroughly conversant with them and I have answered the above questions truthfully.

Signed (Employee)

Date

Print name

CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT

PROJECT NAME: _____ DATE: _____

PROJECT ADDRESS: _____

CONTRACTOR: _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employee contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must be trained in the dangers inherent in handling asbestos and breathing asbestos dust and proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of protective equipment
- Pressure Differential Systems
- Working practices include hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest X-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your right to training and protection relative to your employer, the Contractor.

Signature _____	ID No. _____
Print Name _____	Witness _____

ASBESTOS DISPOSAL FORM (Sample)

GENERATOR	1. WORK SITE NAME & MAILING ADDRESS	OWNER'S NAME	OWNER'S TELEPHONE NO.
	2. OPERATOR'S NAME & ADDRESS		OPERATOR'S TELEPHONE NO.
	3. WASTE DISPOSAL SITE (WDS) NAME, MAILING ADDRESS, AND PHYSICAL SITE LOCATION		WDS TELEPHONE NO.
	4. NAME AND ADDRESS OF RESPONSIBLE AGENCY		
	5. DESCRIPTION OF MATERIALS	6. CONTAINERS NO. TYPE	7. TOTAL QUANTITY M ³ (YD ³)
	8. SPECIAL HANDLING INSTRUCTIONS AND ADDITIONAL INFORMATION		
	9. OPERATOR CERTIFICATION: I HEREBY...		
TRANSPORTER	PRINTED/TYPED NAME & TITLE	SIGNATURE	DATE (MO/DY/YR)
	10. TRANSPORTER 1 (ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS)		
	PRINTED/TYPED NAME & TITLE	SIGNATURE	DATE (MO/DY/YR)
	11. TRANSPORTER 2 (ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS)		
	PRINTED/TYPED NAME & TITLE	SIGNATURE	DATE (MO/DY/YR)
DISPOSAL SITE	12. DISCREPANCY INDICATION SPACE		
	13. WASTE DISPOSAL SITE OWNER OR OPERATOR: CERTIFICATION OF RECEIPT OF ASBESTOS MATERIALS COVERED BY THIS MANIFEST EXCEPT AS NOTED IN ITEMS 1, 2, AND 3.		
	PRINTED/TYPED NAME & TITLE	SIGNATURE	DATE (MO/DY/YR)

ASBESTOS NOTIFICATION OF DEMOLITION & RENOVATION

(Ref. HAR Chapter 11-501)

SEND TO: STATE DEPARTMENT OF HEALTH
 INDOOR AND RADIOLOGICAL HEALTH BRANCH
 STATE OF HAWAII ASBESTOS PROGRAM
 99-945 HALAWA VALLEY STREET
 AIEA, HAWAII 96701
 Phone (808) 586-5800 Fax 586-5811

I. Type of notification: O=original R=revised C=cancelled			
II. Type of operation: D=demolition R=renovation OD=Ordered Demolition ER=Emergency Renovation			
III. Facility information			
Owner name:			
Address:			
City:	State:	Zip code:	
Contact person:		Telephone#:	
Removal contractor:		License#:	
Address:			
City:	State:	Zip code:	
Contact person:		Telephone#:	
Other Operator			
Address:			
City:	State:	Zip code:	
Contact person:		Telephone#:	
IV. Is asbestos present (Y/N):			
Inspector's name:		Certification#:	State of certification:
V. Facility description (Include building number, floor and room number)			
Building name:			
Address:			
City:	State:	Zip code:	
Site location:			
Building size:	Floors:	Age:	
VI. Procedure used to detect the presence of asbestos			
Laboratory name:		Analytical method	
VII. Specify the nature of the asbestos material (TSI, surfacing, VAT, miscellaneous):			
Amount of asbestos, including: 1. RACM to be removed 2. CATI left in place, and 3. CATII left in place	RACM to be Removed	Nonfriable ACM <u>not</u> to be removed	
		Category I	Category II
Pipes (linear ft.)			

Surfacing (square ft.)			
Facility components (Cu. ft.)			
VIII. Scheduled asbestos abatement dates			
Start (mm/dd/yy):		Finish (mm/dd/yy)	
Circle workdays and time:	Weekdays:	daytime:	nighttime:
	Weekends:	daytime:	nighttime:
IX. Scheduled renovation/demolition dates			
Start (mm/dd/yy):		Finish (mm/dd/yy)	
Circle workdays and time:	Weekdays:	daytime:	nighttime:
	Weekends:	daytime:	nighttime:
X. Description of the planned renovation/demolition work and methods to be used:			
XI. Description of the work practices and engineering controls to be used to prevent emissions of asbestos from the work-site:			
Project designer name:		Certification#:	State:
XII. Waste transporter #1			
Name :			
Address :			
City:	State:	Zip code:	
Contact person:	Telephone#:		
Waste transporter #2			
Name :			
Address :			
City:	State:	Zip code:	
Contact person:	Telephone#:		
XIII. Waste disposal site:			
Facility Name:		Telephone#:	
Address :			
City:	State:	Zipcode:	
XIV. For demolition ordered by a government agency, please identify:			
Name:		Title:	
Authority (Agency):			
Date of order (mm/dd/yy):		Date ordered to begin (mm/dd/yy):	
XV. For emergency renovation:			
Date and time of emergency			
Date (mm/dd/yy):		Time:	(a.m./p.m.)
Description of sudden, unexpected events and the damage caused:			
Explanation of how the event caused an unsafe condition or would cause damage or			

an unreasonable financial burden:			
Person contacted for the approval at the Noise, Radiation & Indoor Air Quality Branch:			
Name:		Date (mm/dd/yy):	Time: (a.m./p.m.)
XVI. Description of procedures to be followed in the event that unexpected asbestos is found or previously nonfriable asbestos material becomes crumbled, pulverized or reduced to powder.			

XVII. I certify that an individual trained in the provisions of Hawaii administrative rules chapter 11-501, and certified as a contractor/supervisor, will be on-site during the entire renovation and/or demolition and evidence that the required training has been accomplished for this and all workers will be available at the work-site.	
_____ Signature of owner/operator (mm/dd/yy):	_____ Date
XVIII. I certify that the information on this notification is correct.	
_____ Signature of owner/operator (mm/dd/yy):	_____ Date

XIX. Additional Comments:

END OF SECTION