

NIELSEN CONSTRUCTION

STATE OF CALIFORNIA

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

APPLICATION FOR ASBESTOS-RELATED WORK

March 2013

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PART 5

STATEMENT OF SAFETY AND HEALTH POLICIES, PROCEDURES AND PROGRAMS

Part 5.1

Operating Policies and Procedures Including Waste Handling Methods

NIELSEN CONSTRUCTION OPERATING POLICIES AND PROCEDURES

5.1.1

5.1.1.1 Nielsen Construction engages in the following activities as their livelihood. Including but not limited to the following:

- (1) Demolition or salvage of structures where asbestos, tremolite, anthophyllite, or actinolite is present; Type I
- (2) Removal or encapsulation of materials containing asbestos, tremolite, anthophyllite, or actinolite; Type I
- (3) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos, tremolite, anthophyllite, or actinolite; Type I & II
- (4) Installation of products containing asbestos, tremolite, anthophyllite, or actinolite;
- (5) Asbestos, tremolite, anthophyllite, and actinolite spill/emergency cleanup; and
- (6) Transportation, disposal, storage, or containment of asbestos, tremolite, anthophyllite, or actinolite or products containing asbestos, tremolite, anthophyllite, or actinolite on the site or location at which construction activities are performed.

5.1.1.1.1 Work that does not meet the Class Standards, because it only involves work with materials containing less than one percent asbestos, or with materials containing more than one percent but do not meet any of the class I thru IV operational definitions. Work methods shall not be utilized that could create dust that could exceed the PEL. All work shall be accomplished with methods that maintain no visible dust levels. All waste shall be disposed of as containing less than one percent asbestos material. Personal protection will include ½ face respirators with P100 filters, protective clothing and foot and hand protection. Work done shall meet the requirements of the following sections [5.3.4.1.1](#), [5.7.1.3](#), [5.3.19](#), [5.3.6](#) and [5.3.7.4](#)

5.1.1.1.2 Material identified as Naturally Occurring Asbestos (NOA) shall be treated as a Class II material, all procedures required under the Class II section shall apply to work involving the disturbance, excavation, or movement of NOA.

The California Labor code further defines asbestos related work as any work involving more than 100 square feet of material with greater than 0.1 percent asbestos. Nielsen Construction conducts or intends to work in the above defined areas.

5.1.1.2 In accordance with Title 8, 341.9 and 1529(r) Nielsen Construction shall notify the nearest District Office of The Division of Occupational Safety & Health (DOSH) 24 hours prior to beginning

work, except where the circumstances require immediate abatement action in which case, Nielsen Construction shall immediately notify the nearest district office by telephone or otherwise orally at the start of work, to be confirmed in writing no later than 24 hours later. An emergency such as a fire, natural disaster or other accidental or unintentional release that has caused an immediate grave threat to human health would constitute immediate action.

- 5.1.1.3 The competent person shall notify the agency, using the agencies form. The notice shall be transmitted via fax and US mail. Any change in the information provided the division by the written notice shall be reported to the Division at or before the time of the change. If notification of any change is made by telephone, or otherwise orally, such notification shall be confirmed immediately in writing but in any event no later than 24 hours after the change.
- 5.1.1.4 The written notice shall contain the following:
 - 5.1.1.4.1 The address of the job.
 - 5.1.1.4.2 The precise physical location of the job at the given address.
 - 5.1.1.4.3 The projected starting and completion date.
 - 5.1.1.4.4 The name of the certified supervisor who has sufficient experience and authority and who will be responsible for the asbestos-related work activity.
 - 5.1.1.4.5 The name of the qualified person who will be responsible for conducting air sampling, the calibration of air sampling equipment, evaluation of sampling results, and respiratory fit testing as well as the evaluation of those tests.
 - 5.1.1.4.6 A description of the type of work to be performed, work practices that will be utilized, and an evaluation of the potential for exposure.
 - 5.1.1.4.7 When the work is completed the Competent Person Shall notify the Building Owner and the General Contractor (if present) in writing of the results of the mitigation effort. The written notification shall include any ACM or PACM known to still be present at the site as well as a restatement of the material removed.

5.2 Pre-Job Scope

The individual who initially views the site, views the survey provided by the project owner may not be the Competent person who will implement the project. Nielsen Construction specifically does not conduct bulk sampling to assess the presence of asbestos unless it falls under the limited scope of section [5.3.1.2](#), we advise the project owner to retain a Certified Asbestos Consultant (CAC) to assess the site prior to bid. In some instances we may retain a CAC or Certified Site Surveillance Technician (CSST) working under the direction of a CAC to support our Safety & Health Program. The CAC may review a project to ensure that the owner's CAC report did not provide a false negative or did not or could not identify hidden ACM. In the event that the project owner does not hire a CAC to inspect the building Nielsen Construction considers any TSI to be PACM if the building was constructed prior to 1981. Nielsen Construction seeks to ensure that clear communication exists between our estimators and sales departments and the production department. We accomplish this by the use of our project file system. The file is prepared by our administrative staff and is provided to the production competent person at the time of the job assignment. The file contains the scope of the project, the methods to be used to complete the project. The file includes any survey or identification provided by the project owner. The file includes the notices that have been filed with the proper agencies. The competent person adds the documents for the workers, and air monitoring and clearance results. The file includes the equipment selected by the competent person when he selects the required

containment material and equipment. Additionally the file will contain the daily checklists, manifests, and other written communication created during the project.

5.3 Initial Assessment

- 5.3.1.1 Prior to the start of any job the competent person shall review the job site. At that job site check the asbestos material shall be evaluated and the type of work reviewed. Nielsen Construction does not conduct asbestos survey work except in situations specifically permitted under section [5.3.1.2](#). In the event that a survey is required we require the project owner provide a survey completed by a current Project Designer. An assessment will be made either by our competent person or by a licensed California Asbestos Consultant, that assessment shall determine the amount and class of work that will be required. A negative exposure assessment (NEA) may be developed if all the requirements are met. Our Competent person conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace. The assessment must be completed in time to comply with requirements which are triggered by exposure data or the lack of a "negative exposure assessment," and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly. Basis of Initial Exposure Assessment: Unless a negative exposure assessment has been made pursuant to subsection (f)(2)(C) of 8CAC1529, the initial exposure assessment shall, if feasible, be based on monitoring conducted pursuant to subsection (f)(1)(C) of CFR 1926.1101. The assessment shall review relevant controls, conditions and factors that influence the degree of exposure. The assessment shall consider, but not be limited to, quality of supervision and employee training, techniques used for wetting the ACM, placing and repositioning the ventilation equipment, and impacts due to weather conditions. The assessment shall be based on Nielsen Construction's performance doing similar jobs. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of Nielsen Construction which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until Nielsen Construction conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment pursuant to subsection (f)(2)(C) of CFR 1926.1101, Nielsen Construction shall presume that employees are exposed in excess of the TWA and excursion limit.
- 5.3.1.2 Samples collected at a residential project . The State Law requires that a building owner or operator contract with an asbestos consultant or site surveillance technician for performance of the activities described in Sections 7181 and 7182. Section 7181 and 7182 cover any person who contracts to provide professional health and safety services relating to asbestos-containing material, as defined in subdivision (b) of Section 6501.8 of the Labor Code, including building inspections, abatement project design, contract administration, supervision of site surveillance technicians as defined in Section 7182, sample collections, preparation of asbestos management plans, and clearance air monitoring. A "site surveillance technician" means any person who acts as an independent onsite representative of an asbestos consultant who monitors the asbestos abatement activities of others, provides asbestos air monitoring services for area and personnel samples, and performs building surveys and contract administration at the direction of an asbestos consultant. That asbestos consultant or site surveillance technician shall not have any financial or proprietary interest in Nielsen Construction when we are hired for the same project. However, Nielsen Construction may hire a consultant by for the purpose of providing health and safety services for the personnel of Nielsen Construction. Nielsen Construction shall take no more than 12 bulk samples of suspected asbestos-containing material that is required to be removed, repaired, or disturbed as part of a construction project in a residential dwelling solely for any of the following purposes: (1) bid preparation for asbestos abatement; (2)evaluating exposure to its own employees during construction or asbestos abatement; or (3) determining for its own purposes or for the purpose of communicating whether or not a contract for asbestos abatement has been satisfactorily completed. Persons taking samples for the purposes described in this section shall be certified building inspectors under the Asbestos Hazard Emergency

Response Act, as specified in Section 763 of Title 40 of the Code of Federal Regulations, appendix (c) to subpart (e). Nielsen Construction trains all personnel involved in the collection of materials under this section and maintains the records of that certification and training. All training is provided in compliance with section [5.3.4.1.1](#). Nielsen Construction specifically does not provide professional health and safety services or perform any asbestos risk assessment. Nielsen Construction may seek compensation for bid preparation, including the cost of laboratory analysis of asbestos-containing material. It is the intent of Nielsen Construction to make certain that the asbestos-related work performed by a consultant, including, but not limited to, clearance air monitoring, project design, and contract administration, is performed in a manner which provides for independent professional judgment undertaken without consideration of the financial or beneficial interest of Nielsen Construction.

- 5.3.1.3 Negative Exposure Assessment: For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, Nielsen Construction may demonstrate that employee exposures will be below the PELs by data which conform to the following criteria;
- 5.3.1.3.1 Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such products or material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or
 - 5.3.1.3.2 Where Nielsen Construction has monitored prior asbestos jobs for the PEL and the excursion limit within 12 months of the current or projected job, the monitoring and analysis were performed in compliance with the asbestos standard in effect; and the data were obtained during work operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in Nielsen Construction's current operations, the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job, and these data show that under the conditions prevailing and which will prevail in the current workplace there is a high degree of certainty that employee exposures will not exceed the TWA and excursion limit; or
 - 5.3.1.3.3 The results of initial exposure monitoring of the current job made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

5.3.2 Air Monitoring Program

- 5.3.2.1 Employee safety and health are assured by our Air Monitoring Program. All Regulated Areas are determined by Class of Work and Potential Fiber levels in air. All Class I, II and & III work areas shall have a regulated area. Plans for Projects that have an estimated cost of more than 250,000.00 are approved by a CAC. Our safety procedures are reviewed on a regular basis and may be modified to provide better management and more effective safety conditions for our employees. It is our policy that fiber levels are maintained well below the Permissible Exposure Limit (PEL) as a primary protection factor for our personnel. All projects provide the highest level of personal protection feasible as well as the most effective fiber control. Nielsen Construction ensures that no employee is exposed to an airborne concentration of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals in excess of 0.1 fibers per cubic centimeter of air as an eight (8)-hour Time-Weighted Average (TWA). We recognize the excursion limit of 1 fiber per cubic centimeter for a thirty minute period, and insure that exposure level is never exceeded. We monitor constantly, closely following best available practices, using the OSHA ORM 1 as our methods. Air Monitoring results are posted at the job site or where workers congregate within five days of obtaining the results. The employees are afforded the right to observe any

and all air monitoring activities. (See Air Monitoring Section) Nielsen Construction does not conduct clearance monitoring. We advise owners to retain a licensed CAC to conduct clearance monitoring. We do not hire or retain asbestos consultants on behalf of the building or project owner.

5.3.3 Regulated Areas Policy

5.3.3.1 All Class I, II and & III work areas shall have a regulated area. Nielsen Construction establishes a regulated area in work areas where airborne concentrations of asbestos, tremolite, anthophyllite, actinolite, or can reasonably be expected to exceed the permissible exposure limit. All work conducted in a regulated area shall have a Competent person directly supervising and present when any work is being done.

5.3.3.2 Regulated areas are demarcated in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals in excess of the permissible exposure limit.

5.3.4 Communication of Hazards

5.3.4.1 Training

Training shall be obtained in a comprehensive course for supervisors and workers, it shall be a course conducted by a California state approved training provider (DOSH ACTAU). DOSH ACTAU Approved AHERA/ASHARA worker training is provided to all workers. All Training shall be provided prior to starting work and annually thereafter. Supervisors are provided DOSH ACTAU approved AHERA/ASHARA Competent Person/Supervisor training.

5.3.4.1.1 Certificates provided by workers or supervisors are reviewed to ensure that course work completed has been approved by the California DOSH ACTAU. Nielsen Construction requires that the certificates provided by workers or supervisors shall be verified and documented with a written statement from the DOSH ACTAU approved training provider that the certificates of training are valid and true copies or originals of that of the DOSH ACTAU approved training provider. See Section [5.9.1.1](#) for medical records documentation.

5.3.4.2 Signs.

5.3.4.2.1 Warning signs that demarcate the regulated areas are provided and displayed at each location where Class I, II, and III work is conducted. Signs shall be posted at such a distance from such a location that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.

5.3.4.2.2 The warning signs bear the following information:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

5.3.4.2.3 Where the use of respirators and protective clothing is required in the regulated area, the warning signs shall provide the following:

RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

5.3.4.2.4 Nielsen Construction shall ensure that employees working in and contiguous regulated areas comprehend the warning signs, including the use of foreign languages, pictographs, and graphics.

5.3.4.3 Labels.

5.3.4.3.1 Labels shall be affixed to all products containing asbestos and to all containers containing such products, including waste containers. Where feasible, installed asbestos products shall contain a visible label.

5.3.4.3.2 Labels are printed in large, bold letters on a contrasting background.

5.3.4.3.3 Labels are used in accordance with the requirements of Calif. Title 8 5194 (f) of the General Industry Safety Orders, and shall contain the following information.

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

5.3.4.3.4 Labels shall contain a warning statement against breathing airborne asbestos fibers.

5.3.4.4 The provisions for labels required by Calif. Title 8 1529 subsections (k)(8)(A) through (k)(8)(C) do not apply where:

5.3.4.4.1.1 Asbestos fibers have been modified by a bonding agent, coating, binder, or by other material, provided that the manufacturer can demonstrate that, during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the permissible exposure limit and/or excursion limit will be released, or

5.3.4.4.1.2 Asbestos is present in a waste product in concentrations less than 1.0 percent.

5.3.4.5 When a building owner or Nielsen Construction identifies previously installed PACM and/or ACM, labels or signs shall be affixed or posted so that employees will be notified of what materials contain PACM and/or ACM. Nielsen Construction shall attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance of the mechanical room/areas. Signs required by Calif. Title 8 1529 (k)(6) may be posted in lieu of labels so long as they contain information required for labeling. Nielsen Construction shall ensure, to the extent feasible, that employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

5.3.5 Access to regulated areas is limited to authorized persons.

5.3.5.1 All persons entering regulated areas are supplied with a respirator, selected in accordance with proper fit

testing regulations.

5.3.5.2 Prohibited activities. Nielsen Construction specifically prohibits eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in regulated areas.

5.3.6 **Requirements for Asbestos Removal, Demolition and Renovation Operations**

Wherever feasible, Nielsen Construction establishes negative-pressure enclosures before commencing removal, demolition, and renovation operations. Roofing and siding removal is usually considered not feasible, further special equipment may provide a negative pressure environment inside the equipment, in that case an external NPE would not be required..

5.3.7 **Competent Person Duties**

5.3.7.1 Competent (All Supervision) people who perform or supervise the following duties:

5.3.7.1.1 On all construction work sites Nielsen Construction shall designate a Competent Person, having the qualifications and authority for ensuring worker safety and health. The Competent Person must be present at all times whenever a regulated area is established to supervise the setup and removal operations and shall perform or supervise the following duties:

5.3.7.1.1.1 Maintain records for all persons who enter the controlled area, all training, fit test and salient information shall be collected and maintained for the records to be maintained at Nielsen Construction's facilities. Maintain the copies of fit test, training and medical evaluation at the job site for all entrants for the entire job duration.

5.3.7.1.1.2 Restrict access to the controlled area to permit only appropriately trained individuals with the physical ability to wear the appropriate PPE. All documentation of training, Physical Ability to wear PPE, and fit test shall be collected and maintained prior to entry.

5.3.7.1.1.3 On multi-employer work sites, when Nielsen Construction is performing work requiring the establishment of a regulated area, Nielsen Construction shall inform other employers on the site of the nature of the work with asbestos and/or PACM, of the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other employers are not exposed to asbestos.

5.3.7.1.1.4 Nielsen Construction shall provide a copy of the registration before the commencement of any asbestos-related work to the prime contractor and other employers at the site. A copy of the registration shall be posted at the job site beside the Cal/OSHA poster.

5.3.7.1.1.5 Nielsen Construction shall conduct a safety conference prior to the commencement of any asbestos related work subject to the registration and notification requirements of this article. The safety conference shall include representatives of the owner or contracting agency, the contractor, Nielsen Construction, employees, and employee representatives. The safety conference shall include a discussion of Nielsen Construction's safety program and such means, methods, devices, processes, practices, conditions, or operation, as Nielsen Construction intends to utilize in providing a safe and healthful place of employment. The requirement of this section shall apply to all asbestos-handling jobs regardless of the amount of asbestos to be handled.

5.3.7.1.1.6 For Class II and III work outside the duties may not include all of the following. As appropriate for the class of work we will do the following: See the specific headings for each type of work

below.

- 5.3.7.1.1.6.1.1 Conduct Regular Inspections to determine if the material is still intact, and that the work practices are not causing the material to become Class I material.
- 5.3.7.1.1.6.2 Set up the regulated area, enclosure or other containment;
- 5.3.7.1.1.6.3 Ensure (by on-site inspection) the integrity of the enclosure, an industrial hygienist or qualified technician inspects the enclosure;
- 5.3.7.1.1.6.4 Control entry to and exit from the enclosure and/or area;
- 5.3.7.1.1.6.5 Supervise all employee exposure monitoring required by Calif. Title 8 1529;
- 5.3.7.1.1.6.6 Ensure that employees working within the enclosure and/or using glove bags wear protective clothing and respirators;
- 5.3.7.1.1.6.7 Ensure through on-site supervision, that employees are trained to set up, use, and remove engineering controls, work practices, and personal protective equipment;
- 5.3.7.1.1.6.8 Ensure that employees use the hygiene facilities and observe the decontamination procedures; and
- 5.3.7.1.1.6.9 Ensure that engineering controls are functioning properly,
- 5.3.7.1.1.6.10 The Competent Person shall make frequent and regular inspections of the job sites, materials, and equipment and shall inspect protective clothing at least once per work shift for rips or tears. For Class I jobs, on-site inspections shall be made at least once during each work shift, and any time an employee requests an inspection. For Class II, III and IV jobs, on-site inspection shall be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time an employee requests an inspection.
- 5.3.7.1.1.6.11 To evaluate alternate controls, allowed if one plans to use them when there less than 25 linear or 10 square feet of TSI and surfacing. For larger amounts a CIH or PE shall review and approve any alternate control methods.
- 5.3.7.1.2 For Class I, and II asbestos work, the Competent Person shall be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; The contents of Calif. Code of Regulations, Title 8, Section 1529; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors, such as a course conducted by an EPA-approved and California state approved training provider.
- 5.3.7.1.3 For Class III and IV asbestos work, the Competent Person shall be trained in aspects of asbestos handling that is appropriate for that particular work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of Calif. Code of Regulations, Title 8, Section 1529; and the identification of asbestos. Such training shall be obtained in a comprehensive course for supervisors, such as a course conducted by an EPA-approved and California state approved training provider.
- 5.3.7.1.4 The Competent Person shall conduct the in house final visual inspection of all work to ensure that all dust and debris have been removed prior to calling for the owner's CAC to conduct the final visual and air monitoring inspection. Nielsen Construction does not conduct air monitoring or the

duties of the CAC or CSST. See Section [5.4.18](#)

5.3.7.2 **Methods of Compliance**

5.3.7.2.1 Engineering controls and work practices.

5.3.7.2.1.1 Nielsen Construction shall use one or any combination of the following engineering control methods, regardless of the levels of exposure:

5.3.7.2.1.1.1 Vacuum cleaners equipped with HEPA filters to collect all debris and dust containing ACM and PACM except as provided in subsection (g)(8)(B) of Calif. Title 8 1529 in the case of roofing material.

5.3.7.2.1.1.2 Wet methods, or wetting agents, to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup, except where Nielsen Construction can demonstrate that the use of wet methods is infeasible due to, for example, the creation of electrical hazards, equipment malfunctions, and, in roofing, except as provided in subsection (g)(8)(B) of Calif. Title 8 1529; and

5.3.7.2.1.1.3 Prompt cleanup and disposal of wastes and debris contaminated with asbestos in leak-tight containers except in roofing operations, where the procedures specified in subsection (g)(8)(B) of Calif. Title 8 1529 apply.

5.3.7.2.1.2 In addition to the above requirements, Nielsen Construction uses the following control methods to achieve compliance with the TWA permissible exposure limits and excursion limits:

5.3.7.2.1.2.1 Local exhaust ventilation equipped with HEPA filter dust collection systems;

5.3.7.2.1.2.2 Enclosure or isolation of processes producing asbestos dust

5.3.7.2.1.2.3 Ventilation of the regulated area to move contaminated air away from the breathing zones of the employees and toward a filtration or collection device equipped with a HEPA filter;

5.3.7.2.1.2.4 Use of other work practices or other engineering controls that Nielsen Construction can show to be feasible.

5.3.7.2.1.2.5 Whenever the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the permissible exposure limit and/or excursion limit, Nielsen Construction shall use them to reduce employee exposure to the lowest level attainable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of subsection (h) of Calif. Title 8 1529.

5.3.7.3 **Stop Work / Modify Work**

5.3.7.3.1 Nielsen Construction shall stop work when a work practice or other factor has caused an unintended condition. Work shall stop except for work conducted to correct the unintended or faulty situation. Effort shall be made to isolate the source of the problem and correct it. Nielsen Construction may elect to retain a Certified Industrial Hygienist who is also a California Certified Asbestos Consultant to assist with the management or correction of the condition. Factors that

could cause a Stop Work/Modify Work include, but are not limited to weather conditions, elevated fiber counts (greater than 1 fiber per cubic centimeter), fire or natural disaster. Nielsen Construction carefully plans all the work it conducts, however the possibility still exists the an unforeseen condition may occur. See Sections [5.7.2.4](#) and [5.3.22](#)

5.3.7.4 **Prohibitions**

5.3.7.4.1 Nielsen Construction shall not engage in the following work practices and engineering controls which disturb ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessment:

5.3.7.4.1.1 High speed abrasive disc saws that are not equipped with a point of cut ventilators or enclosures with HEPA filtered exhaust air.

5.3.7.4.1.2 Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

5.3.7.4.1.3 Dry sweeping, shoveling or other dry cleanup of dust and debris containing ACM and PACM.

5.3.7.4.1.4 Employee rotation as a means of reducing employee exposure to asbestos.

5.3.8 **Respiratory Protection Program** (See Respirator Manual, Fit Test Instructions and Documentation Information)

5.3.9 **Protective Clothing**

Nielsen Construction both provides and requires the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the permissible exposure limit and/or excursion limit, or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations. Nielsen Construction prohibits the removal of asbestos from protective clothing and equipment by blowing, shaking, or brushing.

5.3.10 **Laundering**

5.3.10.1 Nielsen Construction ensures that laundering of contaminated clothing is done so as to prevent the release of airborne asbestos in excess of the permissible exposure limit and/or excursion limit.

5.3.10.2 When contaminated clothing is given to another person for laundering, Nielsen Construction informs such person of the requirement to effectively prevent the release of airborne asbestos in excess of the permissible exposure limit and/or excursion limit.

5.3.10.3 Contaminated clothing is transported in labeled, sealed water soluble, impermeable bags, and closed, impermeable containers.

5.3.11 **Protective Clothing Inspection**

5.3.11.1 The Competent Person shall examine work suits worn by employees at least once per work shift for rips or tears that may occur during the performance of the work.

5.3.11.2 Rips and tears shall be immediately mended, or the work suit immediately replaced, when rips and tears are detected while an employee is working.

5.3.12 **Clean Rooms**

Nielsen Construction provides clean change areas for employees required to work in regulated areas or required to wear protective clothing. Change areas are equipped with separate storage facilities for protective clothing and street clothing. The clean room is usually constructed at the decontamination shower. Workers remove street clothes and don protective clothing in this area, before entering the control area.

5.3.13 **Lunch Areas**

Nielsen Construction provides lunch areas in which the airborne concentrations of asbestos are below the permissible exposure limit and/or excursion limit whenever food or beverages are consumed at the worksite where employees are performing Class I asbestos work.

5.3.14 **Decontamination Area**

Requirements for removal, demolition, and renovation operations or employees performing Class I asbestos jobs involving more than 25 linear or 10 square feet of TSI or surfacing ACM and PACM: Nielsen Construction establishes a decontamination area that is adjacent and connected to the regulated areas for the decontamination of employees contaminated with asbestos, tremolite, anthophyllite, or actinolite. The decontamination area consists of an equipment room, shower area, and clean room in series. Nielsen Construction ensures that employees enter and exit the regulated area through the decontamination area.

5.3.15 **Shower Facilities**

5.3.15.1 Where feasible, shower facilities are provided which comply with 3366(f) of the General Industry Safety Orders and 29 CFR 1910.14(d)(3). The showers shall be contiguous both to the equipment room and the clean change room, unless this location is demonstrably infeasible. In such situations, Nielsen Construction shall ensure that employees:

5.3.15.1.1 Remove asbestos, tremolite, anthophyllite, or actinolite contamination from their work suits using a HEPA vacuum before proceeding to the shower that is not contiguous to the work area; or

5.3.15.1.2 Remove their contaminated work suits, don clean work suits, and proceed to a shower that is not contiguous to the work area.

5.3.15.2 Water heaters shall be provided to ensure tempered shower water (minimum 85 degrees). Soap shampoo and clean towels shall be provided. The equipment room is supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective clothing and equipment. One shower facility with hot and cold water feeding a common discharge line [e.g. shower head] for each ten employees showering during the same shift. When there are less than five employees, the shower room may be used for both sexes provided the shower room can be locked from the inside.

5.3.15.3 After filtration the shower waste water is drained to a sanitary sewer drain.

5.3.16 **Decontamination Entry Procedures**

Nielsen Construction ensures that employees:

5.3.16.1 Enter the decontamination area through the clean room;

5.3.16.2 Remove and deposit all street clothing (outer and inner wear) within a locker provided for their use; and

5.3.16.3 Put on protective clothing and respiratory protection before leaving the clean room.

5.3.16.4 Before entering the enclosure, the employees pass through the equipment room.

5.3.17 **Decontamination Exit Procedures**

Nielsen Construction ensures that employees:

5.3.17.1 Before leaving the regulated area, employees must remove all gross contamination and debris from their protective clothing, using a HEPA vacuum or wet methods.

5.3.17.2 Remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.

5.3.17.3 Employees do not remove their respirators in the equipment room.

5.3.17.4 Employees completely decontaminate and shower prior to entering the clean room. After entering the shower, the employees shall shampoo thoroughly while still wearing the respirator, wet their whole body, remove the respirator, shampoo the face and respirator, placing the used filters in a labeled contaminated waste bag, clean the face, entire body and respirator prior to leaving the shower area.

5.3.17.5 After showering, employees enter the clean room and dry off before changing into street clothes.

5.3.18 **Decontamination Requirements for Class I, II, and III Work**

For Class I work involving less than 25 linear or 10 square feet of TSI or Surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed a PEL or where there is no negative exposure assessment produced before the operation, Nielsen Construction shall ensure the following:

5.3.18.1 Establish an equipment room or area that is adjacent to the regulated area for the decontamination of employees and their equipment which are contaminated with asbestos which shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface.

5.3.18.2 Provide an area of sufficient size as to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area (as determined by visible accumulations).

5.3.18.3 All employees shall enter and exit the regulated area through the equipment room or area.

5.3.18.4 Work clothing must be cleaned with a HEPA vacuum before it is removed.

5.3.18.5 All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area.

5.3.19 **Decontamination Requirements for Class IV Work**

Nielsen Construction shall ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area. Otherwise Nielsen Construction employees cleaning up debris and material which are

TSI or surfacing ACM or identified as PACM shall be provided decontamination facilities as required by subsection (j)(2) of Calif. Title 8 1529.

5.3.20 **Employee Work Practices**

5.3.20.1 Employees shall not enter or exit a regulated area without following outlined procedures.

5.3.20.2 Employees shall not enter regulated areas without proper respiratory protection. Respirators are never removed in the work area.

5.3.20.3 Employees shall follow all safety practices that pertain to ladders, scaffolding, slips and falls, and explosion, and housekeeping procedures as outlined in this training manual, and or company policy.

5.3.20.4 Employees shall comply with the "NO DRINKING, EATING, OR SMOKING" restriction in the work place.

5.3.21 **Employee Work Procedures**

Commencement of work shall not occur until after the pre job meeting and:

5.3.21.1 Enclosure systems have been constructed and tested.

5.3.21.2 A decontamination unit is installed and shower facility and waste water filtration system is functioning properly. That waste water is placed in a sanitary drain or collected and then placed in a sanitary drain.

5.3.21.3 Negative pressure ventilation systems are functioning adequately.

5.3.21.4 All HVAC and electrical lockout procedures are accomplished.

5.3.21.5 All electrical systems inside the NPE are protected with a GFCI.

5.3.21.6 All pre-abatement submissions, state and federal notifications and permits have been provided and are satisfactory to the building owner.

5.3.21.7 All emergency exits, fire and safety procedures have been established.

5.3.21.8 All protective equipment and personal hygiene supplies are provided for.

5.3.21.9 All equipment for abatement, cleanup and disposal are on hand.

5.3.21.10 All OSHA required warning signs are posted and the regulated area is demarcated with barrier tape.

5.3.21.11 All worker training and employee certification is completed.

5.3.21.12 Appropriate air sampling program has begun.

5.3.21.13 Preparation for waste hauling and waste dump manifest are secured.

5.3.21.14 Procedures described in this specification are to be utilized at all times.

5.3.22 Emergency Procedures for Sudden Fiber Release

5.3.22.1 For a minor fiber release (the falling or dislodging of 3 square or linear feet of less) of friable ACM:

5.3.22.1.1 Thoroughly saturate the debris using wet methods.

5.3.22.1.2 Clean the area using HEPA vacuum (HEPA steam clean carpets), then wet wipe all hard floors and other surfaces.

5.3.22.1.3 Dispose of all debris, filters, mopheads, and cloths in sealed, leak-tight, appropriately labeled containers.

5.3.22.1.4 Repair the area of damaged ACM with appropriate asbestos free materials.

5.3.22.2 In the event of a breach in containment or other defect in the containment control system all work shall stop, all effort shall be directed to correcting the condition causing the breach or failure of the containment. The failure shall be documented and reported to agencies if the event meets the criteria of an uncontrolled release. For any ongoing major fiber release episodes (more than 3 square or 10 linear feet) of friable ACM, the response action must be designed by a Certified Asbestos Consultant preferably a CIH who has experience and is also a CAC. It must be managed and conducted by persons specially trained to conduct response actions. Like a normal asbestos mitigation, an emergency cleanup will trigger the need for the establishment of a regulated area, a decontamination area and depending on the exposure assessment enclosure, isolation of the work area or other engineering controls. See Sections [5.7.2.4](#) and [5.3.22](#)

5.3.23 Waste Disposal

The following is Nielsen Construction standard procedure for asbestos waste handling. Asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal are collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled, impermeable containers.

5.3.23.1 Disposal Procedures.

5.3.23.1.1 As the work progresses, sealed and labeled containers of asbestos containing waste shall be removed and transported to the prearranged disposal location to prevent exceeding available storage capacity on the site.

5.3.23.1.2 Disposal must occur at an authorized site in accordance with regulatory requirements of NESHAP and applicable State and Local guidelines and regulations, including the California State Department of Health Services, Toxic Substances Control Division.

5.3.23.1.3 All dump receipts, trip tickets, transportation manifests or other documentation of disposal shall be delivered to the Project Manager for his records. The Nielsen Construction Record keeping format utilizes a chain of custody form which includes the names and addresses of the Generator, pickup site, and disposal site, the estimated quantity of the asbestos waste and type of containers used. The form should be signed by the Generator, Nielsen Construction Project Manager, and the Disposal Site Operator, as the responsibility for the material changes hands. If a separate hauler is employed, his name, address, telephone number and signature should also appear on the

form.

5.3.23.2 Transportation to the Landfill.

- 5.3.23.2.1 Once drums, bags and wrapped components have been removed from the work area, they shall be loaded into an enclosed truck for transportation.
- 5.3.23.2.2 When moving containers, utilize hand trucks, carts and proper lifting techniques to avoid back injuries. Trucks with lift gates are helpful for raising drums during truck loading.
- 5.3.23.2.3 The enclosed cargo area of the truck shall be free of debris and lined with 6 mil polyethylene sheeting to prevent contamination from leaking or spilled containers. Floor sheeting shall be installed first and extend up the sidewalls. Wall sheeting shall be overlapped and taped into place.
- 5.3.23.2.4 Drums shall be placed on level surfaces in the cargo area and packed tightly together to prevent shifting and tipping. Large structural components shall be secured to prevent shifting and bags placed on top. Do not throw containers into truck cargo area.
- 5.3.23.2.5 Personnel loading asbestos containing waste shall be protected by disposable clothing including head, body and foot protection and at a minimum, half-face piece, air-purifying, dual cartridge/respirators equipped with high efficiency filters.
- 5.3.23.2.6 Any debris or residue observed on containers or surfaces outside of the work area resulting from cleanup or disposal activities shall be immediately cleaned-up using HEPA filtered vacuum equipment and/or wet methods as appropriate.
- 5.3.23.2.7 Large metal dumpsters are sometimes used for asbestos waste disposal. These should have doors or tops that can be closed and locked to prevent vandalism or other disturbance of the bagged asbestos debris and wind dispersion of asbestos fibers. Unbagged material shall not be placed in these containers, nor shall they be used for non-asbestos waste. Bags shall be placed, not thrown, into these containers to avoid splitting.

5.3.23.3 Disposal at the Landfill

- 5.3.23.3.1 Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos containing waste.
- 5.3.23.3.2 Bags, drums and components shall be inspected as they are off-loaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags as necessary. (Local requirements may not allow the disposal of asbestos waste in drums. Check with appropriate agency and institute appropriate alternative procedures).
- 5.3.23.3.3 Waste containers shall be placed on the ground at the disposal site, not pushed or thrown out of trucks (weight of wet material could rupture containers).
- 5.3.23.3.4 Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-face piece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- 5.3.23.3.5 Following the removal of all containerize waste, the truck cargo area shall be decontaminated using HEPA vacuums and/or wet methods to meet the no visible residue criteria. Polyethylene sheeting shall be removed and discarded, along with contaminated cleaning materials and

protective clothing, in bags or drums at the disposal site.

NIELSEN CONSTRUCTION
WORK PRACTICES
AND ENGINEERING CONTROLS FOR MAJOR
ASBESTOS REMOVAL, RENOVATION, AND
DEMOLITION OPERATIONS

5.4 **CLASS I WORK**

5.4.1 "Class I asbestos work" means activities involving the removal of TSI and surfacing ACM and PACM. This is a guideline that Nielsen Construction has adopted from Title 8 1529 and is considered the minimal performance guideline for any asbestos removal or mitigation site that our firm is active. Specifically, Title 8 1529 describes the equipment, methods, and procedures that are to be used in major asbestos removal projects conducted to abate a recognized asbestos hazard or in preparation for building renovation or demolition. These projects require the construction of negative-pressure temporary enclosures to contain the asbestos material and to prevent the exposure of bystanders and other employees at the worksite. Nielsen Construction shall establish negative-pressure enclosures before commencing asbestos removal, demolition, or renovation operations. Nielsen Construction is aware that, when conducting asbestos removal projects, they may be required under the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61 Subpart M, or EPA regulations under the Clean Water Act 17 CFR 10(864)9.

5.4.2 Construction of a negative-pressure enclosure is a simple but time consuming process that requires careful preparation and execution; however, if the procedures below are followed, we are assured of achieving a temporary barricade that will protect employees and others outside the enclosure from exposure to asbestos and minimize to the extent possible the exposure of asbestos workers inside the barrier as well.

5.4.3 The equipment and materials required to construct these barriers are readily available and easily installed and used. In addition to an enclosure around the removal site, Title 8 1529 requires Nielsen Construction to provide hygiene facilities that ensure that their asbestos-contaminated employees do not leave the work site with asbestos on their persons or clothing; the construction of these facilities is also described below. The steps in the process of preparing the asbestos removal site, building the enclosure, constructing hygiene facilities, removing the asbestos-containing material, and restoring the site include:

- 5.4.3.1 Planning the removal project;
- 5.4.3.2 Procuring the necessary materials and equipment;
- 5.4.3.3 Preparing the work area;
- 5.4.3.4 Removing the asbestos-containing material;
- 5.4.3.5 Cleaning the work area, and
- 5.4.3.6 Disposing of the asbestos-containing waste.

5.4.4 **Planning the Removal Project**

The planning of an asbestos removal project is critical to completing the project safely and cost-effectively. A written asbestos removal plan should be prepared that describes the equipment and procedures that will be used throughout the project. The asbestos abatement plan will aid not only in executing the project, but also in complying with the reporting requirements of the USEPA asbestos regulations (40 CFR 61, Subpart

M), which call for specific information such as a description of control methods and control equipment to be used and the disposal sites the contractor proposes to use to dispose of the asbestos-containing materials. (See Model Asbestos Removal Plan)

5.4.5 Nielsen Construction insures that all sites have the following items covered in planning documentation. (See Asbestos Checklist on Page [107](#)) The asbestos abatement plan contains the following information:

- 5.4.5.1 A physical description of the work area;
- 5.4.5.2 A description of the approximate amount of material to be removed;
- 5.4.5.3 A schedule for turning off and sealing existing ventilation systems;
- 5.4.5.4 Personnel hygiene procedures;
- 5.4.5.5 Labeling procedures;
- 5.4.5.6 A description of personal protective equipment and clothing to be worn by employees;
- 5.4.5.7 A description of the local exhaust ventilation systems to be used;
- 5.4.5.8 A description of work practices to be observed by employees;
- 5.4.5.9 A description of the methods to be used to remove the asbestos-containing material;
- 5.4.5.10 The wetting agent to be used;
- 5.4.5.11 A description of the sealant to be used at the end of the project;
- 5.4.5.12 An air monitoring plan;
- 5.4.5.13 A description of the method to be used to transport waste material; and
- 5.4.5.14 The location of the dump site.

5.4.6 **Materials and Equipment Necessary for Asbestos Removal**

Although individual asbestos removal projects vary in terms of the equipment required to accomplish the removal of the material, some equipment and materials are common to most asbestos removal operations. As a minimum, Nielsen Construction provides the following equipment and materials at the beginning of each project: (1) rolls of polyethylene sheeting; (2) rolls of gray duct tape; (3) HEPA filtered vacuum(s); (4) HEPA-filtered portable ventilation system(s); (5) a suitable wetting agent; (6) an airless sprayer; (7) a portable shower unit; (8) appropriate respirators; (9) disposable coveralls; (10) signs and labels; (11) preprinted disposal bags; and (12) a manometer or pressure gauge. See Part V(g) for complete List of Control Equipment and manufacturers.

5.4.6.1 Rolls of Polyethylene Plastic and Tape.

Rolls of polyethylene plastic (6 mil in thickness) are available to construct the asbestos removal enclosure and to seal windows, doors, ventilation systems, wall penetrations, and ceilings and floors in the work area. Gray duct tape or clear plastic tape shall be used to seal the edges of the plastic and to seal any holes in the plastic enclosure. Polyethylene plastic sheeting is purchased in rolls up to 12-20 feet in width and up to 100

feet in length.

5.4.6.2 HEPA-filtered Vacuum.

An HEPA-filtered vacuum is essential for cleaning the work area after the asbestos has been removed. Such vacuums are designed to be used with an HEPA (High Efficiency Particulate Air) filter, which is capable of removing 99.97 percent of the asbestos particles from the air. Various sizes and capacities of HEPA vacuums are at the disposal of our site managers (See Equipment List). All models range in capacity from 5.25 gallons to 17 gallons. All of these models are portable, and all have long hoses capable of reaching out-of-the-way places, such as areas above ceiling tiles, behind pipes, etc.

5.4.6.3 Exhaust Air Filtration System.

A portable ventilation system is necessary to create a negative pressure. Such units are equipped with an HEPA filter and are designed to exhaust and clean the air inside the enclosure before exhausting it to the outside of the enclosure. Systems are available from several manufacturers. All units filter particles of 0.3 micron in size with an efficiency of 99.97 percent. The number and capacity of units required to ventilate an enclosure depend on the size of the area to be ventilated. To determine the required number of units to meet the air flow requirements of the work area, apply the following formula: figure out the size of the work area in cubic feet by multiplying the floor length by the width times the ceiling height. Divide the air exchange rate in minutes (four times per hour = 15 minutes) into the volume of the work area in cubic feet. Divide the resulting number by 70% of the rated capacity of each unit (Safety factor for pressure drop, etc). Refer to the following example.

Example:		
Work area	= 240' x 30' x 8'	= 57,600 cubic feet
Exchange rate	= 60 minutes ÷ 4	= 15 minutes
Capacity of unit	= 1,900 CFM x 0.70 (efficiency)	= 1,330 CFM
Work Area /Exchange Rate	= 57,600 ÷ 15	= 3,840
Divided by Capacity	= 3,840 ÷ 1,330	= 2.89 units needed.
For this example, three air handlers will be needed.		

See more specific discussion of negative pressure equipment use and parameters in paragraph [5.4.15](#).

5.4.6.4 Wetting Agent

5.4.6.4.1 Wetting agents (surfactant) are added to water (which is then called amended water) and used to soak asbestos-containing materials; amended water penetrates more effectively than plain water and permits more thorough soaking of the asbestos-containing material which reduces the number of fibers that will break free and become airborne when the asbestos-containing material is handled or otherwise disturbed. Asbestos-containing materials should be thoroughly soaked before removal is attempted; the dislodged material should feel spongy to the touch. Wetting agents are generally prepared by mixing 1 to 3 ounces of wetting agent to 5 gallons of water. One type of asbestos, amosite, is relatively resistant to soaking, either with plain or amended water. When working with amosite-containing material, soak the material as much as possible and then bag it immediately for prompt removal so that the material has no time to dry and be ground into smaller

particles that are more likely to liberate airborne asbestos. In a very limited number of situations, it may not be possible to wet the asbestos-containing material before removing it. Examples of such rare situations are: (1) removal of asbestos material from a "live" electrical box that was over sprayed with the material when the rest of the area was sprayed with asbestos-containing coating; and (2) removing asbestos-containing insulation from a live steam pipe. In both of these situations, the preferred approach would be to turn off the electricity or steam, respectively, to permit wet removal methods to be used. Removed asbestos-containing material shall be immediately bagged or wrapped until transferred to a closed receptacle, no later than the end of the work shift.

5.4.7 **Alternate Removal Methods**

5.4.7.1 Removal may be performed using a control method which is not referenced in or modifies a control method in Title 8 1529 subsection (g) if the following provisions are complied with:

5.4.7.1.1 The control method shall enclose, contain or isolate the processes or source of airborne asbestos dust, or otherwise capture or redirect such dust before it enters the breathing zone of employees.

5.4.7.1.2 A certified industrial hygienist or a licensed professional engineer who is also qualified as a project designer as defined in Title 8 1529 subsection (b) of Title 8 1529, shall evaluate the work area, the projected work practices and the engineering controls and shall certify in writing that the planned control method is adequate to reduce direct and indirect employee exposure to less than the PELs under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria in Title 8 1529 subsection (g).

5.4.7.2 Where the TSI or surfacing material to be removed is 25 linear or 10 square feet or less, the evaluation required in subsection Title 8 1529 (g) may be performed by a "competent person", and may omit consideration of perimeter or clearance monitoring otherwise required.

5.4.7.3 The evaluation of employee exposure required in Title 8 1529 subsection (g), shall include and be based on sampling and analytical data representing employee exposure during the use of such method under worst-case conditions and by employees whose training and experience are equivalent to employees who are to perform the current job.

5.4.8 **Airless Sprayer**

Airless sprayers are used to apply amended water to asbestos-containing materials. Airless sprayers are inexpensive and readily available.

5.4.9 **Decontamination Facilities**

Nielsen Construction shall provide an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

5.4.10 **Respirators**

5.4.10.1 Nielsen Construction provides all employees involved in asbestos removal projects with appropriate NIOSH-approved respirators. Selection of the appropriate respirator is based on the class of work and the

level of asbestos fibers in the air. If the concentration of asbestos fibers is unknown, employees are provided with respirators that will provide protection against the highest concentration of asbestos fibers that can reasonably be expected to exist in the work area. PAPR respirators are the highest level expected to be used on a typical site. See the **respirator program** for the specific discussion. Disposable face mask respirators (single-use) are never used and are never provided to protect employees from exposure to asbestos fibers.

5.4.10.2 For all employees within the regulated area where Class I work is being performed for which a negative exposure assessment has not been produced and, the exposure assessment indicates the exposure level will not exceed 1 f/cc as an 8-hour time weighted average, Nielsen Construction shall provide a tight-fitting powered air purifying respirator equipped with high efficiency filters. If the exposure levels above 1 f/cc as an 8-hour time weighted average it is our policy to modify the work procedures to lower the fiber level.

5.4.10.3 Nielsen Construction shall inform any employee required to wear a respirator that the employee may require Nielsen Construction to provide a powered, air-purifying respirator in lieu of a negative pressure respirator.

5.4.11 Disposable Coveralls.

Employees involved in asbestos removal operations are provided with disposable impervious coveralls that are equipped with head and foot covers. The coverall has a zipper front and elastic wrist and ankles.

5.4.12 Signs and Labels.

Before work begins, a supply of signs to demarcate the entrance to the work are provided. Signs are available that have the wording required by the final OSHA standard. The required labels are also commercially available as press-on labels and preprinted on the 6-mil polyethylene plastic bags used to dispose of asbestos containing waste material are used exclusively. (Refer to "Communication of Hazards" above)

5.4.13 **Preparing the Work Area**

5.4.13.1 Pre-cleaning of a janitorial nature, that does not disturb PACM or ACM shall be done to eliminate non-asbestos dust or material that would interfere with the installation of critical barriers, wall and floor sheeting etc. When there is an asbestos contaminated area where PACM or ACM is disturbed or non-intact, prior to pre-cleaning, Nielsen Construction shall establish critical barriers, decontamination facilities, and ventilation directing contaminated air away from workers toward an HEPA Filter exhaust system and meet all the requirements in section [5.3.21](#). Before installation of the NPE Precleaning shall be accomplished using wet wipe and HEPA vacuum methods.

5.4.13.2 HVAC systems for Class I jobs shall be shut down and isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent. Impermeable dropcloths shall be placed on surfaces beneath all removal activity. Establish critical barriers and seal all penetrations of the floor, walls, and ceiling with 6-mil polyethylene plastic and tape to prevent airborne asbestos from escaping into areas outside the work area or from lodging in cracks around the penetrations. Penetrations that require sealing are typically found around electrical conduits, telephone wires, and water supply and drain pipes.

5.4.13.3 All objects within the regulated area shall be removed or covered with impermeable dropcloths or plastic sheeting which is secured by duct tape or an equivalent to ensure that these objects do not become contaminated with asbestos

5.4.14 **Constructing the Enclosure**

- 5.4.14.1 A single entrance to be used for access and egress to the work area is selected, and all other doors and windows are sealed with tape or covered with 6-mil polyethylene plastic sheeting and securely taped. Covering windows and unnecessary doors with a layer of polyethylene before covering the walls provides a second layer of protection and saves time in installation because it reduces the number of edges that must be cut and taped.
- 5.4.14.2 All other surfaces such as support columns, ledges, pipes, and other surfaces are covered with polyethylene plastic sheeting and taped before the walls themselves are completely covered with sheeting.
- 5.4.14.3 A thin layer of spray adhesive is sprayed along the top of all walls surrounding the enclosed work area, close to the wall-ceiling interface, and a layer of polyethylene plastic sheeting is attached stuck to this adhesive and taped. The entire inside surfaces of all wall areas are covered in this manner, and the sheeting over the walls is extended across the floor area until it meets in the center of the area, where it is taped to form a single layer of material encasing the entire room except for the ceiling. A final layer of plastic sheeting is then laid across the plastic-covered floor area and up the walls to a level of 2 feet or so; this layer provides a second protective layer of plastic sheeting over the floor, which can easily be removed after the asbestos-containing material that has dropped to the floor has been bagged and removed.

5.4.15 **Establishing Negative Pressure Within the Enclosure**

After construction of the enclosure is completed, a ventilation system(s) shall be installed to create a negative pressure within the enclosure with respect to the area outside the enclosure. Such ventilation systems must be equipped with HEPA filters to prevent the release of asbestos fibers to the environment outside the enclosure and should be operated 24 hours per day during the entire project until the final cleanup is completed; and the results of final air samples are received from the laboratory. A sufficient amount of air shall be exhausted to create a pressure of -0.02 inches of water within the enclosure with respect to the area outside the enclosure. At least 4 air changes per hour shall be maintained in the negative pressure enclosure. The formula is $4 \times \text{Room Volume} / 60 = \text{actual capacity of HEPA} = \text{the number of machines needed.}$ ($4v/60h=m$). Usually the actual capacity of the HEPA Exhaust is .70 of the rated capacities. These ventilation systems shall exhaust the HEPA-filtered clean air outside the building in which the asbestos removal, demolition, or renovation is taking place. If access to the outside is not available, the ventilation system can exhaust the HEPA-filtered asbestos-free air to an area within the building that is as far away as possible from the enclosure. Care shall be taken to ensure that the clean air is released either to an asbestos-free area or in such a way as not to disturb any asbestos-containing materials. A manometer or pressure gauge for measuring the negative pressure within the enclosure should be installed and should be monitored frequently throughout all work shifts during which asbestos removal, demolition, or renovation takes place. Several types of manometers and pressure gauges are available for this purpose. All asbestos removal, renovation and demolition operations shall have a program for monitoring the concentration of airborne asbestos and employee exposures to asbestos. Before beginning work within the enclosure and at the beginning of each shift, the negative pressure enclosure shall be inspected for breaches and smoke-tested for leaks, and any leaks shall be sealed. The filters shall be changed on a regular basis. Usually the outer filter is changed daily, the secondary filter is changed weekly and the HEPA is changed per the manufacturers recommendation, or when the filter clogs and/or the HEPA manometer indicates a clogged filter. The NPE shall be inspected continuously for leaks and failures of the enclosure. (See Checklist on page [107](#))

5.4.16 Removing Asbestos Materials

Paragraph (e)(6)(ii) of Title 8 1529 requires that Nielsen Construction designate a competent person to completely follow these procedures. We have developed a checklist that entails the following in detail, it is on page [107](#) in the appendix of this document:

- 5.4.16.1 Set up the regulated area, enclosure, or other containment;
- 5.4.16.2 Ensure the integrity of the enclosure;
- 5.4.16.3 Control entry to and exit from the enclosure and/or regulated area;
- 5.4.16.4 Supervise all employee exposure monitoring required by Calif. Title 8 1529 ensure that the monitoring is correctly implemented and in compliance with Title 8 1529 f;
- 5.4.16.5 Ensure the use of protective clothing and equipment;
- 5.4.16.6 Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment Ensure that the employees set up control equipment, use engineering controls, and use the work practices and personal protective equipment in compliance with all requirements;
- 5.4.16.7 Ensure the use of hygiene facilities and the observance of proper decontamination procedures;
- 5.4.16.8 Ensure that engineering controls are functioning properly. The competent person will be an AHERA Trained Competent Person with experience in the handling of asbestos, a person who has such training and experience as a result of on-the-job training and experience.
- 5.4.16.9 Ensure (by on-site inspection) the integrity of the enclosure or containment and that engineering controls are functioning properly and employees are using proper work practices.
- 5.4.16.10 Inspect the HEPA exhaust fans prior to use, Check the filter holders, the HEPA filter retaining device. Ensure that the filters are covered with plastic sheeting prior to being relocated or transported. Reject any HEPA filter systems that do not have current registration with the Local AQMD or APCD. Reject any HEPA exhaust systems that have broken or severely damaged components. Reject any HEPA exhaust system components that are defective or missing parts. At the conclusion of each project prepare the HEPA systems for shipment, clean all components, and cover all openings with plastic sheeting. Mark any damaged systems for repair.
- 5.4.16.11 Ensure that notification requirement in subsection (k) of Title 8 1529 are met.
- 5.4.16.12 Proper work practices are necessary during asbestos removal, demolition, and renovation to ensure that the concentration of asbestos fibers, inside the enclosure remains as low as possible. One of the most important work practices is to wet the asbestos-containing material before it is disturbed. After the asbestos-containing material is thoroughly wetted, it should be removed by scraping (as in the case of sprayed-on or troweled-on ceiling material) or removed by cutting the metal bands or wire mesh that support the asbestos-containing material on boilers or pipes. Any residue that remains on the surface of the object from which asbestos is being removed should be wire brushed and re-wiped. Bagging asbestos waste material promptly after its removal is another work practice control that is effective in reducing the airborne concentration of asbestos within the enclosure.

- 5.4.16.13 Whenever possible, the asbestos should be removed and placed directly into bags for disposal. If a significant amount of time elapses between the time that the material is removed and the time it is bagged, the asbestos material is likely to dry out and generate asbestos laden dust when it is disturbed by people working within the enclosure. Asbestos material must be promptly cleaned up. The work area must be free of debris and asbestos material at the end of each work period or work shift. It is the policy of Nielsen Construction that the work area be maintained as clean as feasible during all work.
- 5.4.16.14 Any asbestos contaminated supplies and equipment that cannot be decontaminated should be disposed of in pre-labeled bags; items in this category include plastic sheeting, disposable work clothing, respirator cartridges, and contaminated wash water.
- 5.4.16.15 A checklist is one of the most effective methods of ensuring adequate surveillance of the integrity of the asbestos removal enclosure. Filling out the checklist at the beginning of each shift in which asbestos removal is being performed will serve to document that all the necessary precautions will be taken during the asbestos removal work. The checklist contains entries for ensuring that:
- 5.4.16.15.1 The work area enclosure is complete;
- 5.4.16.15.2 The negative-pressure system is in operation;
- 5.4.16.15.3 Necessary signs and labels are used;
- 5.4.16.15.4 Appropriate work practices are used;
- 5.4.16.15.5 Necessary protective clothing and equipment are used; and
- 5.4.16.15.6 Appropriate decontamination procedures are being followed.

5.4.17 **Cleaning the Work Area**

- 5.4.17.1 After all of the asbestos-containing material is removed and bagged, the entire work area shall be cleaned until it is free of all visible asbestos dust. All surfaces from which asbestos has been removed should be cleaned by wire brushing the surfaces, HEPA vacuuming these surfaces, and wiping them with amended water. The inside of the plastic enclosure shall be vacuumed with an HEPA vacuum and wet wiped until there is no visible dust in the enclosure. Particular attention is given to small horizontal surfaces such as pipes, electrical conduits, lights, and support tracks for drop ceilings. All such surfaces shall be free of visible dust before the final air samples are collected. Additional sampling should be conducted inside the enclosure after the cleanup of the work area has been completed. The enclosure shall not be dismantled unless the final samples show asbestos concentrations that meet EPA Criteria for clearance. CFR 40 763 E. The competent person shall conduct a final inspection before the owners consultant inspects the work area. The final visual inspection by the competent person shall confirm the above information.
- 5.4.18 Nielsen Construction also relies on a Certified Asbestos Consultant for Clearance Notification. It is our policy to ensure that the building owner retains a Certified Asbestos Consultant to conduct all clearance testing. We require the services of an independent firm to provide a non-interested opinion as to the completion of our projects. §7180(b)(3) and §7187 forbids contractors from performing clearance monitoring on behalf of a building owner. Only DOSH certified consultants can do so. Conflict of interest provisions in the Business & Professions Code §7187 prevents a certified Asbestos Consultants hired by a building owner from having a “financial or proprietary interest in an asbestos abatement contractor hired for the same project.”

5.4.19 **Housekeeping Procedures**

The requirement for good housekeeping practices in asbestos abatement is a critical precaution for workers' safety and health. In addition to the potential risk for injury that may occur in a dirty, unsafe work area, the release of airborne asbestos fibers is of major concern at all times. The following housekeeping procedures are required:

- 5.4.19.1 Never allow an accumulation of waste to occur in the work area. Maintain waste in a wet condition at all times and place in plastic bags or other containers as soon as reasonably possible. Be sure not to overfill the disposable bags.
- 5.4.19.2 Removal should be conducted in manageable sections ensuring that the material is never removed in a dry condition.
- 5.4.19.3 Gross amounts of debris should be removed from scaffolding, ladders, and tools. A "buddy system" should be used for removing debris from each individual's clothing and person before leaving the regulated area.
- 5.4.19.4 Apply a misted water application to all walls, floors and air throughout the work period and a final wetting at the end of the work shift will assist in controlling airborne fibers.
- 5.4.19.5 Use an HEPA wet vacuum and remove excess water buildups on floors.
- 5.4.19.6 Any discarded clothing and equipment should be containerized and handled as disposable waste.

5.4.20 **Housekeeping -Vacuuming**

Where vacuuming methods are selected, only HEPA filtered vacuuming equipment is used. The equipment is used and emptied in a manner to minimize the reentry of asbestos fibers into the workplace.

5.4.21 **Removal of Small Amounts of Asbestos-Containing Materials**

Several methods can be used to remove small amounts of asbestos-containing materials during renovation or maintenance tasks. These include the use of glove bags, the removal of an entire asbestos-covered pipe or structure, and the construction of mini-enclosures.

5.4.21.1 Glove Bags.

The following describes criteria and procedures for Class I glovebag systems as specified in Title 8 1529(g).

5.4.21.1.1 Glove Bag Installation.

Glove bags are approximately 40-inch-wide times 64-inch-long bags fitted with arms through which the work can be performed. When properly installed and used, they permit workers to remain completely isolated from the asbestos material being removed or replaced inside the bag. Glove bags can thus provide a flexible, easily installed, and quickly dismantled temporary small work area enclosure that is ideal for small-scale asbestos renovation and maintenance jobs. These bags are single use control devices that are disposed of at the end of each job. The bags are made of transparent 6-mil thick polyethylene plastic with arms of Tyvek material (the same material used to make the disposable protective suits used in demolition operations and in protective gloves). Glove

bags are readily available from safety supply stores or specialty asbestos removal supply houses. Glove bags come pre-labeled with the asbestos warning label prescribed by OSHA and EPA for bags used to dispose of asbestos waste.

5.4.21.1.2 Glove Bag Equipment and Supplies.

Supplies and materials that are necessary to use glove bags effectively include:

5.4.21.1.2.1 Tape to seal the glove bag to the area from which asbestos is to be removed;

5.4.21.1.2.2 Amended water or other wetting agents;

5.4.21.1.2.3 An airless sprayer for the application of the wetting agent;

5.4.21.1.2.4 Bridging encapsulant (a paste-like substance for coating asbestos) to seal the rough edges of any asbestos-containing materials that remain within the glove bag at the points of attachment after the rest of the asbestos has been removed;

5.4.21.1.2.5 Tools such as razor knives, nips, and wire brushes (or tools suitable for cutting wire, etc.);

5.4.21.1.2.6 An HEPA filter-equipped vacuum for evacuation the glove bag (to minimize the release of asbestos fibers) during removal of the bag from the work area and for cleaning any material that may have escaped during the installation of the glove bag; and

5.4.21.1.3 Glove Bag Work Practices.

For all Class I jobs involving the removal of more than 25 linear or 10 square feet of thermal system insulation or surfacing material, or for other Class I jobs where Nielsen Construction cannot produce a negative exposure assessment, or where employees are working areas adjacent to the regulated area while Class I work is being performed, one of the following methods shall be used to ensure that airborne asbestos does not migrate from the regulated area:

5.4.21.1.3.1 Critical barriers shall be place over all the openings in the regulated area, except where activities are performed outdoors; or

5.4.21.1.3.2 Nielsen Construction shall use another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible asbestos dust; and perimeter area monitoring showing that clearance levels contained in 40 CFR Part 763, Subpart E, of the EPA Asbestos in Schools Rule are met, or that perimeter area levels, measured by Phase Contrast Microscopy (P.M.) are no more than background levels representing the same area before the asbestos work began. The results of such monitoring shall be made known to Nielsen Construction no later than 24 hours from the end of the work shift represented by such monitoring.

5.4.21.1.4 EXCEPTION: For work completed outdoors where employees are not working in areas adjacent to the regulated areas, this shall be satisfied when the specific control methods of work practices for glove bags are used.

- 5.4.21.1.5 HVAC systems shall be isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent;
- 5.4.21.1.6 Impermeable dropcloths shall be placed on surfaces beneath all removal activity;
- 5.4.21.1.7 All objects within the regulated area shall be covered with impermeable dropcloths or plastic sheeting which is secured by duct tape or an equivalent.
- 5.4.21.1.8 Where Nielsen Construction cannot produce a negative exposure assessment, or where exposure monitoring shows that a PEL is exceeded, Nielsen Construction shall ventilate the regulated area to move contaminated air away from the breathing zone of employees toward an HEPA filtration or collection device.
- 5.4.21.2 The proper use of glove bags requires the following steps:
- 5.4.21.2.1 Glove bags must be installed so that they completely cover the pipe or other structure where asbestos work is to be done. Glove bags are installed by cutting the sides of the glove bag to fit the size of the pipe from which asbestos is to be removed. The glove bag is attached to the pipe by folding the open edges together and securely sealing them with tape. All openings in the glove bag must be sealed with duct tape or equivalent material.
- 5.4.21.2.2 Glove bag systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections with specifications and work practices. Glovebags used on elbows and other connections must be designed for that purpose and used without modifications. The work Practices include but are not limited to:
- 5.4.21.2.3 At least two persons shall perform Class I glovebag removal operations.
- 5.4.21.2.3.1 Each glovebag shall be installed so that it completely covers the circumference of pipe or other structure where the work is to be done.
- 5.4.21.2.3.2 Glovebags shall be smoke-tested for leaks and any leaks sealed prior to use.
- 5.4.21.2.3.3 Glovebags may be used only once and may not be moved.
- 5.4.21.2.3.4 Glovebags shall not be used on surfaces whose temperature exceeds 150° F.
- 5.4.21.2.3.5 Prior to disposal, glovebags shall be collapsed by removing air within them using an HEPA vacuum.
- 5.4.21.2.3.6 Before beginning the operation, loose and friable material adjacent to the glovebag/box operation shall be wrapped and sealed in two layers of six mil plastic or otherwise rendered intact,
- 5.4.21.2.4 The removed asbestos material from the pipe or other surface that has fallen into the enclosed bag must be thoroughly wetted with a wetting agent applied with an airless sprayer through the precut port provided in most glove bags or applied through a small hole cut in the bag.
- 5.4.21.2.5 Once the asbestos material has been thoroughly wetted, it can be removed from the pipe, beam or other surface. The choice of material depends on the type of material to be

removed. Asbestos-containing material depends on the type of material to be removed. Asbestos-containing materials are generally covered with painted canvas and/or wire mesh. Painted canvas can be cut with a razor knife and peeled away from the asbestos-containing material underneath. Once the canvas has been peeled away, the asbestos-containing material underneath may be dry in which case it should be re-sprayed with a wetting agent to ensure that it generates as little dust as possible when removed. If the asbestos-containing material is covered with wire mesh, the mesh should be cut with nips, tin snips, or other appropriate tool and removed. A wetting agent must then be used to spray any layer of dry material that is exposed beneath the mesh, the surface of the stripped underlying structure, and the inside of the glove bag.

- 5.4.21.2.6 After removal of the layer of asbestos-containing material, the pipe or surface from which asbestos has been removed must be thoroughly cleaned with a wire brush and wet wiped with a wetting agent until no traces of the asbestos containing material can be seen.
- 5.4.21.2.7 Any asbestos containing insulation edges that have been exposed as a result of the removal or maintenance activity must be encapsulated with bridging encapsulant to ensure that the edges do not release asbestos fibers to the atmosphere after the glove bag has been removed.
- 5.4.21.2.8 When the asbestos removal and encapsulation have been completed, a vacuum hose from an HEPA filtered vacuum must be inserted into the glove bag through the port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (as close to the top as possible), twisted, and sealed with tape, to keep the asbestos materials safely in the bottom of the bag. The HEPA vacuum can then be removed from the work area to be disposed of properly.
- 5.4.21.2.9 Where system uses attached a waste bag, such bags shall be connected to collection bag using hose or other material which shall withstand pressure of ACM waste and water without losing its integrity:
- 5.4.21.2.10 Sliding valve or other device shall separate the waste bag from the hose to ensure 'no exposure' when a waste bag is disconnected:

5.4.21.3 Mini-enclosures.

In some instances, such as removal of asbestos from a small ventilation system or from a short length of duct, a glove bag may not be either large enough or to the proper shape to enclose the work area. In such cases, a mini enclosure can be built around the area where asbestos maintenance or renovation work is to be performed. Such an enclosure should be constructed of 6-mil thick polyethylene plastic sheeting and can be small enough to restrict entry to the asbestos work area to one worker. For example, a mini-enclosure can be built in a small, utility closet when asbestos-containing duct covering is to be removed. The enclosure is constructed by:

- 5.4.21.3.1 Affixing plastic sheeting to the walls with spray adhesive and tape;
- 5.4.21.3.2 Covering the floor with plastic and sealing the plastic covering the floor to the plastic on the walls;
- 5.4.21.3.3 Sealing any penetrations such as pipes or electrical conduits with tape; and
- 5.4.21.3.4 Constructing a small change room (approximately 8 feet square) made of 6-mil thick

polyethylene plastic supported by 2-inch by 4-inch lumber (the plastic should be attached to the lumber supports with staples or spray adhesive and tape). For removal of more than 10 sq. ft. Or 25 linear feet of TSI or surfacing ACM or PACM, a full three stage decontamination unit shall be established. The change room or decontamination unit should be contiguous to the mini-enclosure and is necessary to allow the worker to vacuum off his protective coveralls and remove them before leaving the work area. While inside the enclosure, the workers should wear Tyvek* disposable coveralls and use the appropriate respiratory protection amended water, HEPA Vacuum, etc. The advantage of mini-enclosures are that they limit the spread of asbestos contamination, reduce the potential exposure of by working in adjacent areas, and are quick and easy to install. Mini Enclosures must be inspected, smoke tested, movable mini enclosures must be cleaned between use. All the restrictions and requirements for an NPE follow for a Mini Enclosure. Air movement must be controlled and directed away from the control area.

5.4.21.4 Removal of Entire Structures

When pipes are insulated with asbestos-containing materials, removal of the entire pipe may be more protective, easier, and more cost effective than stripping the asbestos insulation from the pipe. Before such a pipe is cut, the asbestos-containing insulation must be wrapped with 6-mil polyethylene plastic and securely sealed with duct tape or equivalent. The insulation itself must never be cut with a regular saw. Any dust must be collected by using special fittings on the saw and an HEPA Vacuum. A Standard saw cannot be used to cut asbestos insulation, and cutting asbestos insulation is specifically prohibited. This plastic covering will prevent asbestos fibers from becoming airborne as a result of the vibration created by the power saws used to cut the pipe. The pipes shall be cut at locations that are not insulated to avoid disturbing the asbestos. If a pipe is completely insulated with asbestos-containing materials, small sections must be stripped using the glove bag method described above before the pipe is cut at the stripped material. This method does not replace or relieve the need for the specific requirements for glove bag projects listed above. It is a method to facilitate the intact removal of asbestos whenever possible.

5.4.22 Enclosure

The decision to enclose rather than remove asbestos-containing material from an area depends on the building owner's preference, i.e., for removal or containment. Owners consider such factors as cost effectiveness, the physical configuration of the work area, and the amount of traffic in the area when determining which abatement method to use. The construction of an enclosure will require the placement of an NPE during the construction of the enclosure. All the control methods previously mentioned for removal must be initiated. Drop cloths, critical barriers, in the end the project will prevent any contact or disturbance of the ACM, but during the enclosure installation the material will be presumed to be disturbed. If the owner chooses to enclose the structure rather than to remove the asbestos-containing material insulating it, a solid structure (airtight walls and ceilings) must be built around the asbestos-containing materials into the area beyond the enclosure and to prevent disturbing these materials by casual contact during future maintenance operations. Such a permanent (i.e., for the life of the building) enclosure should be built of new construction materials and should be impact resistant and airtight. Enclosure walls should be made of tongue and groove boards, boards with spine joints, or gypsum boards having taped seams. The underlying structure must be able to support the weight of the enclosure. (Suspended ceilings with laid in panels do not provide airtight enclosures and should not be used to enclose structures covered with asbestos-containing materials). All joints between the walls and ceiling of the enclosure should be caulked to prevent the escape of asbestos fibers. During the installation of enclosures, tools that are used (such as drills or rivet tools) should be equipped with HEPA-filtered vacuums. Before constructing the enclosure, all electrical conduits, telephone lines, recessed lights, and pipes in the area to be enclosed should be moved to ensure that the enclosure will not have to be reopened later for routine or emergency

maintenance. If such lights or other equipment cannot be moved to a new location for logistic reasons, or if moving them will disturb the asbestos containing materials, removal rather than enclosure of the asbestos-containing materials is the appropriate control method to use.

NIELSEN CONSTRUCTION
WORK PRACTICES
AND ENGINEERING CONTROLS FOR MAJOR
ASBESTOS REMOVAL, RENOVATION, AND
DEMOLITION OPERATIONS

5.5 **CLASS II WORK**

- 5.5.1 "Class II asbestos work" means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics. Before beginning Class II work a regulated area must be established, and decontamination procedures determined and facilities present. Critical barriers must be in place and impermeable drop cloths used. The competent person is responsible for checking that the material is intact. "Intact" means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. If the Class II material is not intact, Nielsen Construction treats the material as if the material becomes Class I and all the worker training, qualification, and requirements of class I mitigation are immediately implemented.
- 5.5.2 Class II work also may be performed using a method allowed for Class I work, except that glove bags and glove boxes are allowed if they fully enclose the Class II material to be removed.
- 5.5.3 Class II asbestos work shall also be performed by complying with the work practices and controls designated for each type of asbestos work to be performed, set out in this subsection. Where more than one control method may be used for a type of asbestos work, Nielsen Construction may choose one or a combination of designated control methods.
- 5.5.4 For removing vinyl and asphalt flooring materials which contain ACM and in compliance with section (8)(A) or for which, in buildings constructed no later than 1980 Nielsen Construction shall ensure that employees comply with the following work practices and that employees are trained in these practices:
- 5.5.4.1 Flooring or its backing shall not be sanded.
- 5.5.4.2 Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) shall be used to clean floors.
- 5.5.4.3 Resilient sheeting shall be removed by cutting with wetting of the snip point and wetting during delamination. Rip-up of resilient sheet floor material is prohibited.
- 5.5.4.4 All scraping of residual adhesive and/or backing shall be performed using wet methods.
- 5.5.4.5 Dry sweeping is prohibited.
- 5.5.4.6 Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Commercially available shot blast systems are available for flooring removal. They are a self contained unit and must be carefully monitored for leaks or breaks in the ventilation hoses, and filter systems. The equipment typically leaves an area near walls and other barriers incomplete and hand clean up is required, care must be taken to preserve the intact state of the material that is removed by hand or when the edges are abated. There is a significant potential exposure if the equipment is not emptied and cleaned in a manner that prevents exposure to dust during the procedure. The use of this type of equipment still requires the use of critical barriers and all of the

other components described in this section.

- 5.5.4.7 Tiles shall be removed intact, unless Nielsen Construction demonstrates that intact removal is not possible.
- 5.5.4.8 When tiles are heated and can be removed intact, wetting may be omitted.
- 5.5.4.9 Resilient flooring material including associated mastic and backing shall be assumed to be asbestos-containing unless an industrial hygienist determines that it is asbestos-free using recognized analytical techniques.
- 5.5.4.10 Flooring mastic remover is available, typically an organic citrus based oil is used. Respirators must be fitted with dual cartridges the provide protection for both the asbestos fibers and the organic solvent used in the mastic remover.
- 5.5.5 For removing roofing material which contains ACM Nielsen Construction shall ensure that the following work practices are followed:
 - 5.5.5.1 Roofing material shall be removed in an intact state to the extent feasible.
 - 5.5.5.2 Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.
 - 5.5.5.3 Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases workers' safety.
 - 5.5.5.4 When removing built-up roofs with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation shall be collected by an HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line. When removing built-up roofs with asbestos containing roofing felts and a smooth surface using a power roof cutter, the dust resulting from the cutting operation shall be collected either by an HEPA dust collector or HEPA vacuuming along the cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line. The dust and debris shall be immediately bagged or placed in covered containers.
 - 5.5.5.5 Asbestos-containing material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist:
 - 5.5.5.5.1 Any ACM that is not intact shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift. While the material remains on the roof it shall either be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.
 - 5.5.5.5.2 Intact ACM shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.
 - 5.5.5.6 Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.
 - 5.5.5.7 Roof level heating and ventilation air intake sources shall be isolated or the ventilation system shall be shut down.

- 5.5.5.8 Notwithstanding any other provision of Title 8 1529, removal or repair of sections of intact roofing less than 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods which do not render the material nonintact are used to remove the material and no visible dust is created by the removal method used. In determining whether a job involves less than 25 square feet, Nielsen Construction shall include all removal and repair work performed on the same roof on the same day.
- 5.5.6 When removing cementitious asbestos-containing siding and shingles or transite panels containing ACM on building exteriors (other than roofs, where subsection (g)(8)(B) of Title 8 1529 applies) Nielsen Construction shall ensure that the following work practices are followed:
- 5.5.6.1 Cutting, abrading or breaking siding, shingles, or transite panels, shall be prohibited unless Nielsen Construction can demonstrate that methods less likely to result in asbestos fiber release cannot be used.
- 5.5.6.2 Each panel or shingle shall be sprayed with amended water prior to removal.
- 5.5.6.3 Unwrapped or unbagged panels or shingles shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.
- 5.5.6.4 Nails shall be cut with flat, sharp instruments.
- 5.5.7 When removing gaskets containing ACM, Nielsen Construction shall ensure that the following work practices are followed:
- 5.5.7.1 If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall be undertaken within a glovebag.
- 5.5.7.2 The gasket shall be immediately placed in a disposal container.
- 5.5.7.3 Any scraping to remove residue must be performed wet.
- 5.5.8 When performing any other Class II removal of asbestos containing material for which specific controls have not been established, Nielsen Construction shall ensure that the following work practices are complied with:
- 5.5.8.1 The material shall be thoroughly wetted with amended water prior to and during its removal.
- 5.5.8.2 The material shall be removed in an intact state unless Nielsen Construction demonstrates that intact removal is not possible.
- 5.5.8.3 Cutting, abrading or breaking the material shall be prohibited unless Nielsen Construction can demonstrate that methods less likely to result in asbestos fiber release are not feasible.
- 5.5.8.4 Asbestos-containing material removed, shall be immediately bagged or wrapped, or kept wetted until transferred to a closed receptacle, no later than the end of the work shift.

5.5.9 **Alternative Work Practices and Controls**

Instead of the work practices and controls listed in subsection (g)(8)(A) through (E) of Title 8 1529, Nielsen Construction may use different or modified engineering and work practice controls if the following

provisions are complied with:

- 5.5.9.1 Nielsen Construction shall demonstrate by data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used, that employee exposure will not exceed the PELs under any anticipated circumstances.
- 5.5.9.2 A competent person shall evaluate the work area, the projected work practices and the engineering controls, and shall certify in writing, that the different or modified controls are adequate to reduce direct and indirect employee exposure to below the PELs under all expected conditions of use and that the method meets the requirements of this standard. The evaluation shall include and be based on data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the current job, and by employees whose training and experience are equivalent to employees who are to perform the current job.

NIELSEN CONSTRUCTION
WORK PRACTICES
AND ENGINEERING CONTROLS FOR MAJOR
ASBESTOS REMOVAL, RENOVATION, AND
DEMOLITION OPERATIONS

5.6

CLASS III WORK

"Class III asbestos work" means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed. Class III asbestos work shall be conducted using engineering and work practice controls as for Class I and II work which minimize the exposure to employees performing the asbestos work and to bystander employees.

- 5.6.1 The work shall be performed using wet methods and a regulated area shall be established. Appropriate decontamination facilities shall be provided.
- 5.6.2 To the extent feasible, the work shall be performed using local exhaust ventilation.
- 5.6.3 Where the disturbance involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material, Nielsen Construction shall use impermeable dropcloths, and shall isolate the operation using mini-enclosures or glove bag systems pursuant of Title 8 1529 or another isolation method.
- 5.6.4 Where the Nielsen Construction does not produce a "negative exposure assessment" for a job, or where monitoring results show the PEL has been exceeded, Nielsen Construction shall contain the area using impermeable dropcloths and plastic barriers or their equivalent, or shall isolate the operation using a control system listed in and in compliance with of Title 8 1529.
- 5.6.5 Employees performing Class III jobs, which involve the disturbance of thermal system insulation or surfacing material, or where Nielsen Construction does not produce a "negative exposure assessment" or where monitoring results show a PEL has been exceeded, shall wear respirators which are selected, used and fitted pursuant to provisions of the Part V(b) "Respiratory Protection Program."

5.7 **Respiratory Protection Program**

- 5.7.1 Nielsen Construction provides its employees with their choice of respirators, and ensures that they are used appropriately. Respirators, and all other parts of the Nielsen Construction's medical surveillance, training, and respiratory protection programs are provided to all effected employees at no cost to the employees. Respirators are used in the following circumstances:
- 5.7.1.1 This is Nielsen Construction's procedures for the proper use of respirators. We prohibit conditions that may result in facepiece seal leakage, by preventing employees from removing respirators in hazardous environments, and taking actions to ensure continued effective respirator operation throughout the work shift.
- 5.7.1.1.1 Facepiece seal protection.
- 5.7.1.1.1.1 Nielsen Construction shall not permit respirators with tight-fitting facepieces to be worn by employees who have:
- 5.7.1.1.1.1.1 Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
- 5.7.1.1.1.1.2 Any condition that interferes with the face-to-facepiece seal or valve function.
- 5.7.1.1.1.2 If an employee wears corrective glasses or goggles or other personal protective equipment, Nielsen Construction ensures that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
- 5.7.1.2 Nielsen Construction does not work in atmospheres that are IDLH, and does not accept projects that would expose workers to IDLH atmospheres.
- 5.7.1.3 Class I asbestos work.
- 5.7.1.4 Class II work where the ACM is not removed in a substantially intact state.
- 5.7.1.5 During all Class II and III work which is not performed using wet methods, except for removal of ACM from sloped roofs when a negative exposure assessment has been made and the ACM is removed in an intact state.
- 5.7.1.6 Class II and III asbestos work for which a "negative exposure assessment" has been established.
- 5.7.1.7 Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.
- 5.7.1.8 Class IV asbestos work performed within regulated areas where employees performing other work are required to use respirators.
- 5.7.1.9 Work operations covered by Title 8 1529 where employees are exposed above the TWA or excursion limit.

5.7.2 Respirator Program

5.7.2.1 Nielsen Construction implements a respiratory protection program in accordance with section Title 8 5144 (b) through (d) (except (d)(1)(C)), and (f) through (m). Preplacement and Annual Medical Examinations are provided to all workers. The Program Administrator of the respirator program is Kevin Nielsen. The Program Administrator is responsible for determining the proper respirators and assigning them to the persons wearing the respirators. The program administrator is responsible for managing and implementing our asbestos medical surveillance program. All workers using respirators are included in the medical surveillance program.

5.7.2.2 No employee shall be assigned to asbestos work that requires respirator use if, based on their most recent medical examination, the examining physician determines that the employee will be unable to function normally while using a respirator, or that the safety or health of the employee or other employees will be impaired by the employee's respirator use. Such employees must be assigned to another job or given the opportunity to transfer to a different position that they can perform. If such a transfer position is available, it must be with the same Nielsen Construction, in the same geographic area, and with the same seniority, status, rate of pay, and other job benefits the employee had just prior to such transfer.

5.7.2.3 Respirator Selection.

5.7.2.3.1 Nielsen Construction shall select and provide the appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability. Nielsen Construction anticipates that the only need for respiratory protection will be that associated with asbestos mitigation. For asbestos-related work an appropriate respirator shall be selected as specified in Table 1, the criteria noted in [5.7.1.3](#) & [5.7.2.3.5](#).

5.7.2.3.2 Nielsen Construction shall select respirators certified by the National Institute for Occupational Safety and Health (NIOSH). The respirator shall be used in compliance with the conditions of its certification.

5.7.2.3.3 The NIOSH labels on respirator cartridges shall be legible or the cartridge shall no longer be used.

5.7.2.3.4 Nielsen Construction shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

5.7.2.3.5 Nielsen Construction shall provide a tight-fitting powered, air-purifying respirator in lieu of any negative-pressure respirator specified in Table 1 whenever:

5.7.2.3.5.1 An employee chooses to use this type of respirator; and

5.7.2.3.5.2 This respirator will provide adequate protection to the employee.

TABLE 1

RESPIRATORY PROTECTION FOR ASBESTOS FIBERS

Airborne concentration of asbestos or conditions of use	Required respirator
Disposable respirators shall not be used	
Not in excess of 1 f/cc (10 X PEL), or otherwise as required independent of exposure	Half-mask air purifying respirator other than a disposable respirator, equipped with high efficiency filters.
Not in excess of 5 f/cc (50 X PEL).	Full facepiece air-purifying respirator equipped with high efficiency filters.
Not in excess of 10 f/cc (100 X PEL).	Any powered air-purifying respirator equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1,000 X PEL).	Full facepiece supplied air respirator operated in pressure demand mode.
Greater than 100 f/cc (1,000 X PEL) or unknown concentration.	Full facepiece supplied air respirator operated in pressure demand mode, equipped with an auxiliary positive pressure Self-contained breathing apparatus.

NOTE: a. Respirators assigned for high environmental concentrations may be used at lower concentrations, or when required respirator use is independent of concentration.

NOTE: b. A high efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.

5.7.2.3.6 Nielsen Construction shall provide a half-mask air purifying respirator, other than a disposable respirator, equipped with high efficiency filters whenever the employee performs:

5.7.2.3.6.1 Class II and III asbestos work and a negative exposure assessment has not been conducted by Nielsen Construction;

5.7.2.3.6.2 Class III jobs where TSI or surfacing ACM or PACM is being disturbed.

5.7.2.3.7 In addition to the above selection criteria, when employees are in a regulated area where Class I work is being performed, a negative exposure assessment of the area has not been produced, and the exposure assessment of the area indicates the exposure level will not exceed 1 f/cc as an 8-hour time weighted average, Nielsen Construction shall provide its employees with a tight-fitting powered air-purifying respirator equipped with high efficiency filters.

5.7.2.4 Otherwise A Stop Work /Modify Procedures shall be implemented. It is our policy to maintain the fiber count to less than 1 fiber per cubic centimeter.

5.7.3 **Fit Testing Procedures**

5.7.3.1 Fit Testing Procedures Nielsen Construction will use “saccharine, irritant smoke or banana oil” types of fit testing, however we may utilize quantitative fit testing for full face respirators as an adjunct method to our qualitative fit test procedures. See Appendix A for fit testing methods and procedures. All workers who are assigned a negative or positive tight fitting facepiece respirator shall be fit-tested before their initial work assignment (starting work) and annually thereafter. All workers who use PAPR Respirators shall be fit tested using the PAPR in a negative pressure mode to ensure that the respirator meets the minimum PF 10. We shall conduct an additional fit test whenever the employee reports, or Nielsen Construction, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight. If after passing a QLFT or QNFT, the employee subsequently notifies Nielsen Construction, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested. Specifically we have adopted the standard as our fit testing procedure. See Page [87](#). The results of the fit test is recorded on the “Fit Test Form” found on Page [105](#).

5.7.3.2 A negative and positive user seal check is done each time an employee dons a respirator. See Appendix B-1 of 8CCR 5144. A copy is located in the Appendix of this document.

5.7.3.2.1 Nielsen Construction requires all workers who use a tight-fitting respirator are to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in the OSHA appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests. Those checks are as follows.

5.7.3.2.1.1 Facepiece Positive and/or Negative Pressure Checks.

5.7.3.2.1.1.1 Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

5.7.3.2.1.1.2 Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

5.7.4 **Maintenance and Care of Respirators**

5.7.4.1 Nielsen Construction shall provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by its employees.

5.7.4.1.1 Cleaning and disinfecting. Nielsen Construction shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. Nielsen Construction shall ensure that respirators are cleaned and disinfected using the following procedures, or procedures

recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness:

5.7.4.1.2 Respirator Cleaning.

5.7.4.1.2.1 The respirators shall be cleaned and disinfected at the following intervals:

5.7.4.1.2.1.1 Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;

5.7.4.1.2.1.2 Employees who wear respirators are required to clean respirators thoroughly after each shift to prevent skin irritation and keep the respirators in good condition.

5.7.4.1.2.1.3 Employees are also permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

5.7.4.1.2.1.4 Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;

5.7.4.1.2.1.5 Respirators used in fit testing and training shall be cleaned and disinfected after each use.

5.7.4.1.2.2 Respirator Cleaning Procedures.

5.7.4.1.2.2.1 Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

5.7.4.1.2.2.2 Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

5.7.4.1.2.2.3 Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

5.7.4.1.2.2.4 When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

5.7.4.1.2.2.4.1 Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

5.7.4.1.2.2.4.2 Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

5.7.4.1.2.2.4.3 Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

- 5.7.4.1.2.2.5 Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- 5.7.4.1.2.2.6 Components should be hand-dried with a clean lint-free cloth or air-dried.
- 5.7.4.1.2.2.7 Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- 5.7.4.1.2.2.8 Test the respirator to ensure that all components work properly.
- 5.7.4.1.2.2.9 Check the facepiece seal for adequate protection and lack of distortion.
- 5.7.4.1.2.2.10 Check the respirator for continuing effectiveness, overall condition.

5.7.5 **Respirator Storage**

Nielsen Construction shall ensure that respirators are stored as follows:

5.7.5.1 Respirator Storage Procedures.

Competent Persons are responsible for the proper sanitization and storage facilities at each job site. Minimally, the storage areas shall prevent any distortion from heat, sunlight or other factors. Nielsen Construction employees shall store their respirators in clean hermetically sealed storage bags (Heavy Duty Ziploc Bags). Nielsen Construction has found that special care must be taken to insure that the disinfectant is thoroughly removed from respirators and that they are completely dry prior to storage. All of the above items are the responsibility of the Project Manager, and seen as a co-operative venture. Users are responsible for maintaining their respirators and Nielsen Construction is responsible for providing everything that is needed to insure that the respirators are maintained in working condition.

- 5.7.5.2 All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

5.7.6 **Respirator Inspection**

- 5.7.6.1 Nielsen Construction shall ensure that respirators are inspected as follows:

- 5.7.6.1.1 All respirators used in routine situations shall be inspected before each use and during cleaning;

- 5.7.6.2 Nielsen Construction shall ensure that respirator inspections include the following:

- 5.7.6.2.1 A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters.

- 5.7.6.2.2 A check of elastomeric parts for pliability and signs of deterioration.

- 5.7.6.2.3 Test the respirator to ensure that all components work properly.

- 5.7.6.2.4 Check the facepiece seal for adequate protection and lack of distortion.

- 5.7.6.2.5 Check the respirator for continuing effectiveness, overall condition.
- 5.7.6.2.6 A check that the worker does not have facial hair in the respirator seal area.
- 5.7.6.2.7 A check that the glasses or goggles that the worker may be wearing do not interfere with the face seal.
- 5.7.6.2.8 A check for any other item that could interfere with the face seal.

5.7.6.3 Respirator Repairs.

- 5.7.6.3.1 Nielsen Construction shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:
 - 5.7.6.3.1.1 Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;
 - 5.7.6.3.1.2 Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

5.7.6.4 Respirator Cartridges.

Nielsen Construction maintains an adequate supply of filter elements to permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected, or at the beginning of each shift.

5.7.6.5 Training and Information.

Nielsen Construction provides effective training to employees who are required to use respirators. The training shall be comprehensive, understandable, and recur annually, and more often if necessary.

- 5.7.6.5.1 Nielsen Construction shall ensure that each employee can demonstrate knowledge of at least the following:
 - 5.7.6.5.1.1 Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
 - 5.7.6.5.1.2 What the limitations and capabilities of the respirator are;
 - 5.7.6.5.1.3 How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
 - 5.7.6.5.1.4 How to inspect, put on and remove, use, and check the seals of the respirator;
 - 5.7.6.5.1.5 What the procedures are for maintenance and storage of the respirator;
 - 5.7.6.5.1.6 How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

- 5.7.6.5.2 General requirements:
 - 5.7.6.5.2.1 The training shall be conducted in a manner that is understandable to the employee.
 - 5.7.6.5.2.2 Nielsen Construction shall provide the training prior to requiring the employee to use a respirator in the workplace.
 - 5.7.6.5.2.3 Nielsen Construction is not required to repeat such training provided that the employee can demonstrate knowledge of proper respirator procedure. Previous training not repeated initially by Nielsen Construction must be provided no later than 12 months from the date of the previous training.
 - 5.7.6.5.2.4 Retraining shall be administered annually, and when the following situations occur:
 - 5.7.6.5.2.4.1 Changes in the workplace or the type of respirator render previous training obsolete;
 - 5.7.6.5.2.4.2 Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or
 - 5.7.6.5.2.4.3 Any other situation arises in which retraining appears necessary to ensure safe respirator use.
 - 5.7.6.5.2.5 The basic advisory information on respirators shall be provided by Nielsen Construction in any written or oral format, to employees who wear respirators when such use is not required by Title 8 1529 or by Nielsen Construction.

5.7.6.6 Respirator Written Records.

- 5.7.6.6.1 Documentation of the respirator program is maintained under the Nielsen Construction's record keeping program.

5.7.6.7 Program Evaluation.

Title 8 1529 requires Nielsen Construction to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

- 5.7.6.7.1 Nielsen Construction shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.
- 5.7.6.7.2 Nielsen Construction shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:
 - 5.7.6.7.2.1 Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
 - 5.7.6.7.2.2 Appropriate respirator selection for the hazards to which the employee is exposed;
 - 5.7.6.7.2.3 Proper respirator use under the workplace conditions the employee encounters; and
 - 5.7.6.7.2.4 Proper respirator maintenance.

NIELSEN CONSTRUCTION AIR MONITORING PROGRAM

5.8 Exposure Monitoring Program

5.8.1 Air monitoring is conducted on Class I or II work daily, with ten percent of the workers represented for each operation. Class I and II operations. Nielsen Construction shall conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area who is performing Class I or II work, unless Nielsen Construction pursuant to subsection (f)(2)(C) of 1529, has made a negative exposure assessment for the entire operation. Monitoring is continued until a NEA (negative exposure assessment) is issued. Representative 8-hour TWA employee exposure shall be determined on the basis of one or more samples representing full-shift exposure for employees in each work area. Representative 30-minute short-term employee exposures shall be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area.

5.8.2 Nielsen Construction conducts additional monitoring under certain conditions. Those conditions are notwithstanding the provisions of subsections (f)(2), (f)(3), and (f)(4) of 1529, Nielsen Construction shall institute the exposure monitoring required under subsection (f)(3) of 1529 whenever there has been a change in process, control equipment, personnel or work practices that may result in new or additional exposures above the permissible exposure limit and/or excursion limit or when Nielsen Construction has any reason to suspect that a change may result in new or additional exposures above the permissible exposure limit and/or excursion limit. Such additional monitoring is required regardless of whether a "negative exposure assessment" (NEA) was previously produced for a specific job.

5.8.3 It is our policy that fiber levels are maintained well below the PEL as a primary protection factor for our personnel. As already mentioned in the respiratory program we have the policy of modifying work practices rather than relying on respirators that provide higher protection levels than PAPR respirators. All projects provide the highest level of personal protection feasible as well as the most effective fiber control. We ensure that no employee is exposed to an airborne concentration of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals in excess of 0.1 fiber per cubic centimeter of air as an eight (8)-hour time-weighted average (PEL). We recognize the (EL) of 1 fiber per cubic centimeter for a thirty minute period, and insure that exposure level is never exceeded. We monitor constantly, closely following best available practices, using NIOSH 7400 Revision March 1988 and the OSHA ORM as our methods. We require that the laboratory calculate the TWA for our workers based on the information provided. For clarification the formula is $0.1/8 = (\text{Measured fibers/cc}) / \text{Actual work time}$. or

$$\text{TWA} = \frac{C1T1 + C2T2 + \dots + CnTn}{8}$$

5.8.4 **Sampling and Analytical Procedure**

5.8.4.1 Nielsen Construction shall use sampling mixed cellulose ester filter membranes for sampling medium. These shall be designated by the manufacturer as suitable for asbestos counting. See 8. below for rejection of blanks.

5.8.4.2 The preferred collection device shall be the 25-mm diameter cassette with an open-faced 50-mm extension cowl. The 37-mm cassette may be used if necessary but only if written justification for the need to use the 37-mm filter cassette accompanies the sample results in the employee's exposure monitoring record. Do not reuse or reload cassettes for asbestos sample collection.

- 5.8.4.3 An air flow rate between 0.5 liter/min and 2.5 liters/min shall be selected for the 25-mm cassette. If the 37-mm cassette is used, an air flow rate between 1 liter/min and 2.5 liters/min shall be selected.
- 5.8.4.4 Where possible, a sufficient air volume for each air sample shall be collected to yield between 100 and 1,300 fibers per square millimeter on the membrane filter. If a filter darkens in appearance or if loose dust is seen on the filter, a second sample shall be started.
- 5.8.4.5 Samples shall be shipped in a rigid container with sufficient packing material to prevent dislodging the collected fibers. Packing material that has a high electrostatic charge on its surface (e.g., expanded polystyrene) cannot be used because such material can cause loss of fibers to the sides of the cassette.
- 5.8.4.6 Personal sampling pump shall be calibrated before and after use with a representative filter cassette installed between the pump and the calibration devices.
- 5.8.4.7 Personal samples shall be taken in the "breathing zone" of the employee (i.e., attached to or near the collar or lapel near the worker's face).
- 5.8.4.8 Each set of samples taken will include 10% field blanks or a minimum of 2 field blanks. These blanks must come from the same lot as the filters used for sample collection. The field blank results shall be averaged and subtracted from the analytical results before reporting. A set consists of any sample or group of samples for which an evaluation for this standard must be made. Any samples represented by a field blank having a fiber count in excess of the detection limit of the method being used shall be rejected.

5.8.5 **Sampling Medium**

5.8.5.1 Sample medium assembly: Conductive filter holder consisting of a 25-mm diameter, 3-piece cassette having a 50-mm long electrically conductive extension cowl, Backup pad, 25-mm, cellulose. Membrane filter, mixed-cellulose ester (MCE), 25-mm, plain, white, 0.4- to 1.2- μ m pore size.

5.8.5.2 Notes:

5.8.5.2.1 DO NOT RE-USE CASSETTES.

5.8.5.2.2 Fully conductive cassettes are required to reduce fiber loss to the sides of the cassette due to electrostatic attraction.

5.8.5.2.3 Purchase filters which have been selected by the manufacturer for asbestos counting or analyze representative filters for fiber background before use. Discard the filter lot if more than 4 fibers/100 fields are found.

5.8.5.2.4 To decrease the possibility of contamination, the sampling system (filter-backup pad-cassette) for asbestos is usually preassembled by the manufacturer.

5.8.5.2.5 Other cassettes, such as the Bell-mouth, may be used within the limits of their validation.

5.8.5.2.6 Gel bands for sealing cassettes.

5.8.6 **Sampling Pump**

5.8.6.1 Each pump must be a battery operated, self-contained unit small enough to be placed on the monitored employee and not interfere with the work being performed. The pump must be capable of sampling at the collection rate for the required sampling time.

5.8.6.2 Use flexible tubing, 6-mm bore to connect to sampling media.

5.8.7 **Pump Calibration**

5.8.7.1 Stopwatch or sweep second hand and bubble tube/burette or electronic meter is required, a rotameter or other device that is traceable to a primary standard can be used. Pumps must be calibrated at the beginning of the test period and at the end of the test period. Do not turn the pump off and then turn it on again to check the flow rate because some pumps will recover after being off and provide a false flow rate.

5.8.8 **Sampling Procedure**

5.8.8.1 Workers who are most likely to have the highest exposure shall be monitored daily for the full shift; each work category shall be monitored to develop representative sampling for job categories, and sufficient samples shall be taken to ensure that all work categories are documented. A minimum of ten percent of each work category shall be documented, until an NEA is established.

5.8.8.2 Excursion limits (EL) shall be implemented daily at the point in time when the highest levels are anticipated.

5.8.9 Seal the point where the base and cowl of each cassette meet with a gel band or tape.

5.8.10 Charge the pumps completely before beginning.

5.8.11 Connect each pump to a calibration cassette with an appropriate length of 6-mm bore plastic tubing. Do not use luer connectors -- the type of cassette specified above has built-in adapters.

5.8.11.1 Select an appropriate flow rate for the situation being monitored. The sampling flow rate must be between 0.5 and 2.5 liters/min for personal sampling and is commonly set between 1 and 2 liters/min. Always choose a flow rate that will not produce overloaded filters.

5.8.11.2 Calibrate each sampling pump before and after sampling with a calibration cassette in-line (Note: This calibration cassette should be from the same lot of cassettes used for sampling). Use a primary standard (e.g. bubble burette) or a device traceable to a primary standard (rotameter) to calibrate each pump. Calibrate at the sampling site when you start and end each test.

5.8.11.3 If sampling site calibration is not possible, environmental influences may affect the flow rate. The extent is dependent on the type of pump used. Consult with the pump manufacturer to determine dependence on environmental influences. If a difference greater than 5% in ambient temperature and/or pressure is noted between calibration and sampling sites and the pump does not compensate for the differences, correct the flow rate using the following sampling flow rate correction formula:

$$Q_{act} - Q_{cal} * \text{sq rt.} ((P_{cal}/P_{act}) * (T_{act}/T_{cal}))$$

Where:

Q_{act} = actual flow rate

Q_{cal} = calibrated flow rate (if a rotameter was used, the rotameter value)

P_{cal} = uncorrected air pressure at calibration

P_{act} = uncorrected air pressure at sampling site

T_{act} = temperature at sampling site (K)

T_{cal} = temperature at calibration (K)

- 5.8.11.4 Connect each pump to the base of each sampling cassette with flexible tubing. Remove the end cap of each cassette and take each air sample open face. Assure that each sample cassette is held open side down in the employee's breathing zone during sampling. The distance from the nose/mouth of the employee to the cassette should be about 10 cm. Secure the cassette on the collar or lapel of the employee using spring clips or other similar devices.
- 5.8.11.5 A suggested minimum air volume when sampling to determine TWA compliance is 25 L. For Excursion Limit (30 min sampling time) evaluations, a minimum air volume of 48 L is recommended.
- 5.8.11.6 The most significant problem when sampling for asbestos is overloading the filter with non-asbestos dust. Suggested maximum air sample volumes for specific environments are:

Environment	Air Vol. (L)
Asbestos removal operations (visible dust)	100
Asbestos removal operations (little dust)	240
Office environments.	400 to 2,400

CAUTION: Do not overload the filter with dust. High levels of non-fibrous dust particles may obscure fibers on the filter and lower the count or make counting impossible. If more than about 25 to 30% of the field area is obscured with dust, the result may be biased low. Smaller air volumes may be necessary when there is excessive non-asbestos dust in the air.

- 5.8.11.7 While sampling, observe the filter with a small flashlight. If there is a visible layer of dust on the filter, stop sampling, remove and seal the cassette, and replace with a new sampling assembly. Before removing the cassette check and record the flow rate. The total dust loading should not exceed 1 mg.
- 5.8.11.8 Blank samples are used to determine if any contamination has occurred during sample handling. Prepare two blanks for the first 1 to 20 samples. For sets containing greater than 20 samples, prepare blanks as 10% of the samples. Handle blank samples in the same manner as air samples with one exception: Do not draw any air through the blank samples. Open the blank cassette in the place where the sample cassettes are mounted on the employee. Hold it open for about 30 seconds. Close and seal the cassette appropriately. Store blanks for shipment with the sample cassettes.
- 5.8.11.9 Immediately after sampling, close and seal each cassette with the base and plastic plugs. Do not touch or puncture the filter membrane as this will invalidate the analysis.
- 5.8.11.9.1 Attach and secure a sample seal around each sample cassette in such a way as to assure that the end cap and base plugs cannot be removed without destroying the seal. Tape the ends of the seal together since the seal is not long enough to be wrapped end-to-end. Also wrap tape around the cassette at each joint to keep the seal secure.

5.8.12 **Sample Shipment**

- 5.8.13 Send the samples to the laboratory with paperwork requesting asbestos analysis. List any known fibrous interferences present during sampling on the paperwork. Also, note the workplace operation(s) sampled.

This is the sample sheet and the instructions for filling out the sample sheet. The numbers are keyed to the following form. Nielsen Construction provides the form and instructions in a packet

so the Competent Person can easily fill out the form and send the appropriate information to the laboratory.

- 5.8.13.1 P O #--The first item is a purchase order number, this helps the accounting people at your company and the laboratory identify the sample and the bill. You can use any numbers or letters for this field the space allowed is eleven (11) characters. Many companies use this field to identify jobs or projects. This cannot be changed at a later date, be certain that the information is correct.
- 5.8.13.2 Date--The next line is the date, this is the date of the sample, the day the sample started. Sometimes the sample is started on one day and ends on the next, 2200 hours and ending 0415. Notice that military time was used not 1100 to 4:15, why because one meant that the sample was during the day and the other meant that the sample was at night. More about that later.
- 5.8.13.3 Sample #--The sample number is the next and the most important item on this sheet. Once issued this identification number will never be changed.
- 5.8.13.4 Rush Y N --This area tells the Laboratory to assign very high priority to the sample. The fiber count is completed within two hours after it is received at the Laboratory. The charge associated with this request is usually a one hundred percent surcharge. The charge could be higher if the sample is received on weekend or holiday hours.
- 5.8.13.5 Media pore size: 0.8 1.2--This is the size of the holes in the media, it is noted on the outside of the box of samples. The ORM and NIOSH 7400 require that 1.2 or 0.8 ug (micrometer) filter paper be used. The method also requires the use of 25 millimeter cassettes with a non conductive cowl. That means that the filter holder must have a black plastic cowl and be 25 mm in diameter. 1.2 ug paper is easier to draw through and 0.8 is usually more available.
- 5.8.13.6 Area of sample/The worker was in--This field is specifically for the identification of the work area, the immediate work area. The report will read The sample was taken in the _____. For example you would put 23 floor Central area as the area description. The report line would read "The sample was taken in the 23 floor Central area. Do not use the phrases Personal Monitoring area or Area sample because the report already says that. The goal of every air sample is to clearly identify the area so at some later date the report will have some meaning. The field is 35 spaces long and will be used in a sentence beginning with "The person was in the _____." for personal samples and "The area sample was taken in the _____." If this is a Blank please put the word Blank on this line, no other information is necessary on this line. Fill in the address lines and your name, do not fill in flow rate, calibration data or personal equipment information. The method requires that two blanks be submitted with each set of samples, unless there are more than thirty samples then ten percent of the samples submitted must be blanks. To prepare a blank take a cassette from the batch you are using and open it in the area used to set up your pumps close the cassette. You must number it as you do all other samples. Take it to the laboratory in the same bag as the exposed cassettes. Any fibers on the Blanks are averaged and subtracted from the exposed cassettes. In the event that the blanks have more than seven fibers per mm², they are considered to be heavily exposed and all the tests sent in with that set of blanks will be declared invalid and retesting will be required.
- 5.8.13.7 Person--This field is for the name of the person who wore the sampling pump, not your name, you will get to put your name on later. Do not put anything else here or the report will read the person who wore the pump was Chiller Room, or some other equally foolish statement.
- 5.8.13.8 SSNO--Social Security Number--This is of course the number of the person who wore the pump.
- 5.8.13.9 Company & Client--Put your Nielsen Construction company here, you can put a job name or whatever you

choose, but the Company represented by the sample is most appropriate.

- 5.8.13.10 Address--Put the job address here, that is the address of the area that was sampled. Not the address of the company somewhere in Egypt but, the area that was sampled. If you put a home address here the report will read as though the air sample was taken in the company office.
- 5.8.13.11 City--Again the city of the study.
- 5.8.13.12 What was the worker doing/Worker Job Title--many people have problems with this space. Put simple descriptions like (Glove Bag Removal or Gross scrape) here perhaps you may want to say Supervisor or laborer, but your best bet is the specific thing the worker was doing in three words or less. OSHA requires that you describe the operation involving exposure to asbestos that is being monitored.
- 5.8.13.13 Personal Protection Used--Place a very brief description of the PPE (Personal Protective Equipment) here. for example -- Tyvec FBC, Type "C", boots, gloves (That means Tyvec full body covering, Type "C" respirators, boots and gloves were worn by the individual who wore the sampling pump). This field is 30 characters long.
- 5.8.13.14 Pump Manufacturer/Serial Number--This is a simple item, if the pumps you are using do not have a serial number, assign on with a permanent marker. This assures you that the data that you collected can be traced to a valid method using the correct type of sampling equipment.
- 5.8.13.15 Rotameter #--We assume that a rotameter is used before and after the sampling period to accurately estimate the flow rate. If you use a bubble meter or Buck Calibrator or some other Primary Standard, write bubble here, if not put the serial number of your rotameter here. There are eleven spaces. (By the way in the old days these rotameters used a complicated rotating finned ball that actually rotated so the word rotameter, the accent is not on the 'tam', but on the first syllable 'rot' and the second syllable is a long but soft a.)
- 5.8.13.16 Date Calibrated--Again we assume that you are using a rotameter to measure the flow rate, and that it was calibrated against a Primary Standard within the last six months or less. Put the date that the Rotameter was calibrated against a primary standard. Do not put the date you put the pump on the worker, that is already on the report. If the rotameter is not calibrated, bring it into An AIHA Accredited Laboratory and get it calibrated, usually about a two day process. If you used a primary standard you do not need to fill in this date, unless you want to engage in a waste of your time.
- 5.8.13.17 Start Time-- The exact time you put the air sampling pump on the individual or when you restart the sample. Please use twenty four hour time (the morning hours are the same, but anything from noon to midnight add twelve hours. 1:00 PM becomes 1300, etc.) Please go ahead and enter the minutes, we do all calculations and we do not mind the extra work. The sample is more credible when the start and stop times are accurate to the minute rather than the hour. Many people are very confused with the minimum volume necessary for an accurate fiber level, this is a fairly complicated concept and does merit further discussion. The laboratory needs about ten fibers in one hundred fields but no more than 1500 fibers in one hundred fields to provide an accurate fiber count, that means several things. If you have a work area that has asbestos fibers in the air you must lower the flow and time of the air sample or you will have too many fibers on the filter. However if you have a clean area that must be measured to 0.005 fibers per cubic centimeter f/cc you must pass almost 1000 liters of air through the filter to meet that 0.005 f/cc standard. 0.01 f/cc is about 500 liters. If you want to submit air samples for TEM analysis the minimum volume is 1400 liters for 0.005 f/cc.

- 5.8.13.18 Start time flow rate--The exact flow rate as you set the air sampling pump with the cassette that you are using, not a "test" cassette used for air sampling. The flow rate must be between 2500 milliliters (2.5 liters) and 500 milliliters (.5 liters) per minute for ORM personal sampling. Area sampling can be done from 500 milliliters (.5 liters) to 15000 milliliters (15 liters) per minute. Please enter the milliliters per minute in the blank space. Be certain to put the cassette in a downward direction with the cap off, the whole cap, not just the little plug, the whole cap. We recommend that electricians tape be put on the back of the cassette to keep it from falling apart. If the sample is a personal sample it must be above the breast line and not more than six inches above the wearers head. Area samples should be about 36 inches above the floor, but the height above the floor is not critical.
- 5.8.13.19 Stop time--The exact time that you took the pump off the individual.
- 5.8.13.20 Stop time flow rate--this is the flow rate that you measure with a rotameter with the cassette in line, make this measurement just before you turn off the pump, many personal pumps will recover if you turn them off for a few minutes. Usually the pumps will drop some during a work day. Again the report has more credibility if you have an accurately measured end flow rate, we use milliliters so that you can estimate more easily the flow rate with more accuracy. Use the rotameter curve to estimate the end flow rate.
- 5.8.13.21 Technician taking this sample--Here it is your name. We know that your signature is a powerful statement of you individualism and flair and we appreciate that, but please clearly print your name so we have a chance to recognize the letters. Your name will become a part of the permanent records and often a persons signature is so individualized that it is a code that even the NAZI'S couldn't crack. Please print your name clearly, no matter how well you are known, the poor slob in the lab could be a new guy and he or she won't have a clue.
- 5.8.13.22 The bottom of the form has a set of lines for the names and social security numbers of the other people at the site who are represented by the person who wore the air sampling pump. This item if completed should be photocopied for your records.
- 5.8.13.23 Print the results of the lab report here.
- 5.8.14 The form along with the sampling cassette should now be placed in a Ziploc bag with the blanks and taken to the nearest AIHA approved Laboratory. The sample should be carried in an upright position and kept away from electrostatic charges. The laboratory will analyze the sample, prepare a document that you can provide to the worker who wore the equipment and the co-workers as soon as possible following receipt from the laboratory. The original records both your's and the laboratory's should be maintained for thirty years. Attach the lab report to the air monitoring submission sheet. When you get the lab results put the result on the form, display a copy at the job site, and keep the original for thirty years with all the other job information.

AIR SAMPLE SUBMISSION SHEET

This must be attached to the original laboratory report.

P. O. # 1 DATE: 2 SAMPLE # 2

Test Result 23 f/cc
RUSH : Y N 4 MEDIA PORE SIZE : 0.8 1.2 5 METHOD _____

AREA OF SAMPLE: 6

PERSON: 7 SSNO# - - - 8

COMPANY: 9

ADDRESS: 10 CITY: 11

OPERATION: 12

PERSONAL PROTECTION USED: 13

PUMP MANUFACTURER: 14 SERIAL NUMBER: 14

ROTAMETER #: 15 DATE COMPARED TO PRIMARY STANDARD : 16 *

Start Time: 17 Flow Rate: 18 ML/minute
Stop Time: 19 Flow Rate: 20 ML/minute
Start Time: 17 Flow Rate: 18 ML/minute
Stop Time: 19 Flow Rate: 20 ML/minute ***

Please use military time. Please express volume in milliliters.

Check if EL **

TECHNICIAN TAKING THIS SAMPLE: 21

PERSONS REPRESENTED BY THIS SAMPLE SOCIAL SECURITY NUMBER

22 _____ - - -
_____- - -
_____- - -

- * Attach or have available the calibration data for the rotameter.
- ** Use a separate form for the Excursion Limit test.
- *** Indicate to the lab that the exposure must be corrected for over an 8 hour shift.

AIR SAMPLE SUBMISSION SHEET

This must be attached to the original laboratory report. Test Result _____ f/cc

P. O. # _____ DATE: _____ SAMPLE # _____

RUSH : Y N MEDIA PORE SIZE : 0.8 1.2 METHOD _____

AREA OF SAMPLE: _____

PERSON: _____ SSNO# ____ - ____ - ____

COMPANY: _____

ADDRESS: _____ CITY: _____

OPERATION: _____

PERSONAL PROTECTION USED: _____

PUMP MANUFACTURER: _____ SERIAL NUMBER: _____

ROTAMETER #: _____ DATE COMPARED TO PRIMARY STANDARD : ____ *

Start Time: _____ Flow Rate: _____ Ml/minute
Stop Time: _____ Flow Rate: _____ Ml/minute
Start Time: _____ Flow Rate: _____ Ml/minute
Stop Time: _____ Flow Rate: _____ Ml/minute ***

Please use military time. Please express volume in milliliters. Check if EL **

TECHNICIAN TAKING THIS SAMPLE: _____

PERSONS REPRESENTED BY THIS SAMPLE SOCIAL SECURITY NUMBER

_____-_____-_____
_____-_____-_____
_____-_____-_____

- * Attach or have available the calibration data for the rotameter.
- ** Use a separate form for the Excursion Limit test.
- *** Indicate to the lab that the exposure must be corrected for over an 8 hour shift.

5.9

Medical Surveillance Program

5.9.1 Nielsen Construction has a medical surveillance program for all employees and while doing so, adheres fully to these work practices specified in Calif. Title 8 1529.

5.9.1.1 In the event that workers or supervisors provide their own copy of a record of medical surveillance, Nielsen Construction contacts the medical provider to ascertain the validity of the document. A copy of the document is sent to the medical service provider and a written response is requested testifying to the validity of the document, and that the medical service provider met the following sections and qualifications. See Section [5.3.4.1.1](#) for documents regarding training.

5.9.2 For employees otherwise required by Calif. Title 8 1529 to wear a negative pressure respirator, Nielsen Construction shall ensure that employees are physically able to perform the work and use the equipment. This determination shall be made under the supervision of a physician.

5.9.2.1 Medical examinations and consultations are available to each employee on the following schedules:

5.9.2.1.1 Prior to assignment of the employee to an area where negative pressure respirators are worn;

5.9.2.1.2 When the employee is assigned to an area where exposure to asbestos may be at or above the permissible limit for 30 or more days per year, or engage in Class I, II, or III work for a combined total of 30 or more days per year, a medical examination must be given within 10 working days following the thirtieth day of exposure;

5.9.2.1.3 And at least annually thereafter.

5.9.2.1.4 If the examining physician determines that any of the examinations should be provided more frequently than specified, Nielsen Construction provides such examinations to affected employees at the frequencies specified by the physician.

5.9.2.1.5 Exception: No medical examination is required of any employee if adequate records show that the employee has been examined in accordance with this paragraph within the past 1-year Period.

5.9.2.1.6 Nielsen Construction shall provide a medical examination at the termination of employment for any employee who has been exposed to airborne concentrations of asbestos at or above the permissible exposure limit and/or excursion limit. The medical examination shall be given within 30 calendar days before or after the date of termination of employment.

5.9.3 Examination by a physician. All medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided at no cost to the employee and at a reasonable time and place.

5.9.4 Persons other than such licensed physicians who administer the pulmonary function testing complete a training course in spirometry sponsored by an appropriate academic or professional institution.

5.9.4.1 Medical examinations made available to employees include:

5.9.4.1.1 A medical and work history with special emphasis directed to the pulmonary, cardiovascular, and gastrointestinal systems.

- 5.9.4.1.2 On initial examination, the standardize questionnaire contained in Title 8 1529 Appendix D, part 1, and, on annual examination, the abbreviated standardize questionnaire contained in Title 8 1529 Appendix D, Part 2.
- 5.9.4.1.3 A physical examination directed to the pulmonary and gastrointestinal systems, including a chest roentgenogram to be administered in accordance with the following table, and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV(1)). Interpretation and classification of chest roentgenogram shall be conducted in accordance with Appendix E of Title 8 1529.

FREQUENCY OF CHEST X-RAYS

YEARS SINCE FIRST EXPOSURE	AGE OF EMPLOYEE	
0 -10	LESS THAN 40	40 AND OLDER
10+	EVERY 3 YRS.	ANNUALLY*
	ANNUALLY*	ANNUALLY*

*Oblique x-rays need only be performed every 3 years.

- 5.9.4.1.4 Any other examinations or tests deemed necessary by the examining physician.
- 5.9.4.2 Nielsen Construction provides the following information to the examining physician:
 - 5.9.4.2.1 A copy of Calif. Title 8 1529 including appendices D, E, and I;
 - 5.9.4.2.2 A description of the affected employee's duties as they relate to the employee's exposure;
 - 5.9.4.2.3 The employee's representative exposure level or anticipated exposure level;
 - 5.9.4.2.4 A description of any personal protective and respiratory equipment used or to be used;
 - 5.9.4.2.5 Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician; and the following guidelines; and
 - 5.9.4.2.6 Information from previous medical examinations of the affected employee that is not otherwise available to he examining physician.

5.9.5 Physician's Written Opinion

- 5.9.5.1 Nielsen Construction obtains a written opinion from the examining physician. This written opinion contains the results of the medical examination and includes:
 - 5.9.5.1.1 The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
 - 5.9.5.1.2 Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and
 - 5.9.5.1.3 A statement that the employee has been informed by the physician of the results of the

medical examination and of any medical conditions that may result from asbestos, tremolite, anthophyllite, or actinolite exposure.

- 5.9.5.1.4 A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.
- 5.9.6 Nielsen Construction instructs the physician not to reveal in the written opinion given to Nielsen Construction specific findings or diagnoses unrelated to occupational exposure to asbestos, tremolite, anthophyllite, or actinolite.
- 5.9.7 Nielsen Construction shall provide a copy of the physician's written opinion to the affected employee within 30 days from its receipt.

Medical Questionnaires

Title 8 1529 contains the medical questionnaires that must be administered to all employees who are exposed to asbestos, tremolite, anthophyllite, and actinolite above the permissible exposure level, and who will therefore be included in their Nielsen Construction's medical surveillance program. Part 1 contains the Initial Medical Questionnaire, which must be obtained for all new employees who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated Periodical Medical Questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical examinations under the medical surveillance provisions of the standard.

PART 1
INITIAL MEDICAL QUESTIONNAIRE

1. NAME _____
2. SOCIAL SECURITY NUMBER _____
3. CLOCK NUMBER _____
4. PRESENT OCCUPATION _____
5. PLANT _____
6. ADDRESS _____
7. _____
(Zip Code)
8. TELEPHONE NUMBER _____
(Area Code)
9. INTERVIEWER _____
10. DATE _____
11. Date of Birth _____
12. Place of Birth _____
13. Sex: Male _____ Female _____
14. What is your marital status?
Single _____
Married _____
Widowed _____
Separated/
Divorced _____
15. Ethnic origin:
White _____
Black _____
Asian _____
Hispanic _____
Native _____
American _____
Other _____
16. What is the highest grade completed in school? (For

example, 12 years is completion of high school.) _____
OCCUPATIONAL HISTORY

17A. Have you ever worked full time (30 hours per week or more) for six months or more?

Yes _____ No _____

If Yes to 17A:

B. Have you ever worked for a year or more in any dusty job?

Yes _____ No _____ Does not apply _____

Specific job/industry _____

Total years worked _____

Was dust exposure:

Mild _____ Moderate _____ Severe _____

C. Have you ever been exposed to any hazardous substances in your work? Yes _____ No _____

Specific job/industry _____

Total years worked _____

Was exposure:

Mild _____ Moderate _____ Severe _____

D. What has been your usual occupation or job - the one you have worked at the longest?

Job/occupation _____

Number of years employed in this occupation _____

Position/job title _____

Business, field or industry _____

(Record on lines the years in which you have worked in any of these industries, e.g. 1960-1969.)

Have you ever worked:

Yes No

E. In a mine?

- F. In a quarry? _____
- G. In a foundry? _____
- H. In a pottery? _____
- I. In a cotton, flax or hemp mill? _____
- J. With asbestos? _____

PAST MEDICAL HISTORY

18A. Do you consider yourself to be in good health?

Yes _____ No _____

IF NO, STATE REASON: _____

B. Do you have any defect of vision?

Yes _____ No _____

IF YES, STATE NATURE OF DEFECT: _____

C. Do you have any hearing defect?

Yes _____ No _____

IF YES, STATE NATURE OF DEFECT: _____

D. Are you suffering from or have you ever suffered from:

	Yes	No
a. Epilepsy (or fits, seizures, convulsions)?	_____	_____
b. Rheumatic fever?	_____	_____
c. Kidney disease?	_____	_____
d. Bladder disease?	_____	_____
e. Diabetes?	_____	_____
f. Jaundice?	_____	_____

CHEST COLDS AND CHEST ILLNESSES

19A. If you get a cold, does it usually go to your chest?
 (Usually means more than half the time).

Yes _____ No _____ Don't get colds _____

20A. During the past three years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?

Yes _____ No _____

IF YES TO 20A:

B. Did you produce phlegm with any of these chest illnesses?

Yes _____ No _____ Does not apply _____

C. In the last three years, how many such illnesses with (increased) phlegm did you have which lasted a week or more?

Number of illnesses _____ No such illnesses _____

21. Did you have any lung trouble before the age of 16?

Yes _____ No _____

22. Have you ever had any of the following?

1A. Attacks of bronchitis? Yes _____ No _____

IF YES TO 1A:

B. Was it confirmed by a doctor?

Yes _____ No _____ Does not apply _____

C. At what age was your first attack?

Age in years _____ Does not apply _____

2A. Pneumonia (include bronchopneumonia)?

Yes _____ No _____

IF YES TO 2A:

B. Was it confirmed by a doctor? Yes _____ No _____

C. At what age did you first have it?

Age in years _____ Does not apply _____

3A. Hayfever? Yes _____ No _____

IF YES TO 3A:

B. Was it confirmed by a doctor?

Yes _____ No _____ Does not Apply _____

C. At what age did it start?

Age in Years _____ Does not apply _____

23A. Have you ever had chronic bronchitis?

Yes _____ No _____

IF YES TO 23A:

B. Do you still have it?

Yes _____ No _____ Does not apply _____

C. Was it confirmed by a doctor? Yes _____ No _____

D. At what age did it start?

Age in years _____ Does not apply _____

24A. Have you ever had emphysema? Yes _____ No _____

IF YES TO 24A:

B. Do you still have it?

Yes _____ No _____ Does not apply _____

C. Was it confirmed by a doctor?

Yes _____ No _____ Does not apply _____

D. At what age did it start?

Age in years _____ Does not apply _____

25A. Have you ever had asthma? Yes _____ No _____

IF YES TO 25A:

B. Do you still have it?

Yes _____ No _____ Does not apply _____

C. Was it confirmed by a doctor?

Yes _____ No _____ Does not apply _____

D. At what age did it start?

Age in years _____ Does not apply _____

E. If you no longer have it, at what age did it stop?

Age stopped _____ Does not apply _____

26. Have you ever had:

A. Any other chest illnesses? Yes _____ No _____

If YES, please specify _____

B. Any chest operations? Yes _____ No _____

If YES, please specify _____

C. Any chest injuries? Yes _____ No _____

If YES, please specify _____

27A. Has a doctor ever told you that you had heart trouble?

Yes _____ No _____

IF YES TO 27A:

B. Have you ever had treatment for heart trouble in the past ten years?

Yes _____ No _____ Does not apply _____

28A. Has a doctor ever told you that you had high blood pressure? Yes _____ No _____

IF YES TO 28A:

B. Have you had any treatment for high blood pressure (hypertension) in the past ten years?

Yes _____ No _____ Does not apply _____

29. When did you last have your chest X-rayed?

Year: _____

30. Where did you last have your chest X-rayed (if known)?

What was the outcome? _____

FAMILY HISTORY

31. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:

	FATHER			MOTHER		
	Yes	No	Not Known	Yes	No	Not Known
A. Chronic Bronchitis?	___	___	___	___	___	___
B. Emphysema?	___	___	___	___	___	___
C. Asthma?	___	___	___	___	___	___
D. Lung Cancer?	___	___	___	___	___	___
E. Other chest conditions?	___	___	___	___	___	___
F. Is parent currently alive?	___	___	___	___	___	___
G. Please specify	___	Age if living		___	Age if living	
	___	Age at death		___	Age at death	
	___	Unknown		___	Unknown	
H. Please specify cause of death	_____					

COUGH

32A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) If NO, skip to 31C. Yes _____ No _____

B. Do you usually cough as much as 4 to 6 times a day, 4 or more days out of the week? Yes _____ No _____

C. Do you usually cough at all on getting up or first thing in the morning? Yes _____ No _____

D. Do you usually cough at all during the rest of the day or at night? Yes _____ No _____

IF YES TO ANY OF ABOVE (32A,B,C, OR D), ANSWER THE FOLLOWING.
IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO 33A.

E. Do you usually cough like this on most days for 3 consecutive months or more during the year?

Yes _____ No _____ Does not apply _____

F. For how many years have you had the cough?

Number of years: _____

33A. Do you usually bring up phlegm from your chest? (Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) If NO, skip to 32C.

Yes _____ No _____

B. Do you usually bring up phlegm like this as much as twice a day, 4 or more days out of the week?

Yes _____ No _____

C. Do you usually bring up phlegm at all on getting up or first thing in the morning?

Yes _____ No _____

D. Do you usually bring up phlegm at all during the rest of the day or at night?

Yes _____ No _____

IF YES TO ANY OF THE ABOVE (33A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK "DOES NOT APPLY" AND SKIP TO 34A.

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year?

Yes _____ No _____ Does not apply _____

F. For how many years have you had trouble with phlegm?

Number of years _____ Does not apply _____

EPISODES OF COUGH AND PHLEGM

34A. Have you had periods or episodes of (increased*) cough and phlegm lasting for 3 weeks or more each year?
(* For persons who usually have cough and/or phlegm.)

Yes _____ No _____

If YES to 34A:

B. For how long have you had at least 1 such episode per year?

Number of years _____ Does not apply _____

WHEEZING

35A. Does your chest ever sound wheezy or whistling:

	Yes	No
1. When you have a cold?	_____	_____
2. Occasionally apart from colds?	_____	_____
3. Most days or nights?	_____	_____

IF YES TO 1, 2, OR 3 IN 35A:

B. For how many years has this been present?

Number of years _____ Does not apply _____

36A. Have you ever had an attack of wheezing that has made you feel short of breath? Yes _____ No _____

IF YES TO 36A:

B. How old were you when you had your first such attack?

Age in years _____ Does not apply _____

C. Have you had two or more such episodes?

Yes _____ No _____ Does not apply _____

D. Have you ever required medicine or treatment for the(se) attack(s)?

Yes _____ No _____ Does not apply _____

BREATHLESSNESS

37. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 39A. Nature of condition(s): _____

38A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill?

Yes _____ No _____

IF YES TO 38A:

B. Do you have to walk slower than people of your age on the level because of breathlessness?

Yes _____ No _____ Does not apply _____

C. Do you ever have to stop for breath when walking at your own pace on the level?

Yes _____ No _____ Does not apply _____

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level?

Yes _____ No _____ Does not apply _____

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs?

Yes _____ No _____ Does not apply _____

TOBACCO SMOKING

39A. Have you ever smoked cigarettes? (No means less than 20 packs of cigarettes or 12 ounces of tobacco in a lifetime or less than 1 cigarette a day for 1 year).

Yes _____ No _____

IF YES TO 39A:

B. Do you now smoke cigarettes (as of one month ago)?

Yes _____ No _____ Does not apply _____

C. How old were you when you first started regular cigarette smoking?

Age in years _____ Does not apply _____

- D. If you have stopped smoking cigarettes completely, how old were you when you stopped?

Age stopped _____ Check here if still smoking _____

- E. How many cigarettes do you smoke per day now?

Cigarettes per day _____ Does not apply _____

- F. On the average of the entire time smoked, how many cigarettes did you smoke per day?

Cigarettes per day _____ Does not apply _____

- G. Do or did you inhale the cigarette smoke?

Does not apply _____
Not at all _____
Slightly _____
Moderately _____
Deeply _____

- 40A. Have you ever smoked a pipe regularly? (Yes means more than 12 ounces of tobacco in a lifetime.)

Yes _____ No _____

IF YES TO 40A:

FOR PERSONS WHO HAVE EVER SMOKED A PIPE:

- B. 1. How old were you when you started to smoke a pipe regularly? Age _____

2. If you stopped smoking a pipe completely, how old were you when you stopped?

Age stopped _____
Check here if still smoking pipe _____
Does not apply _____

- C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week?

_____ oz. per week (a standard pouch of tobacco contains 1 ½ oz.)

_____ Does not apply

D. How much pipe tobacco are you smoking now?

Ounces per week _____

Not currently smoking a pipe _____

E. Do you or did you inhale the pipe smoke?

Never smoked _____

Not at all _____

Slightly _____

Moderately _____

Deeply _____

41A. Have you ever smoked cigars regularly? (Yes means more than 1 cigar a week for a year.)

Yes _____ No _____

IF YES TO 41A:

FOR PERSONS WHO HAVE EVER SMOKED CIGARS:

B. 1. How old were you when you started smoking cigars regularly? Age _____

2. If you have stopped smoking cigars completely, how old were you when you stopped?

Age stopped _____

Check here if still smoking cigars _____

Does not apply _____

C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week?

Cigars per week _____ Does not apply _____

D. How many cigars are you smoking per week now?

Cigars per week _____

Check here if not smoking cigars currently _____

E. Do or did you inhale the cigar smoke?

Never smoked _____

Not at all _____

Slightly _____

Moderately _____

Deeply _____

Signature _____ Date _____

PART 2
PERIODIC MEDICAL QUESTIONNAIRE

1. NAME _____
2. SOCIAL SECURITY NUMBER _____
3. CLOCK OR BADGE NUMBER _____
4. PRESENT OCCUPATION _____
5. PLANT _____
6. ADDRESS _____
7. _____
(Zip Code)
8. TELEPHONE NUMBER _____
(Area Code)
9. INTERVIEWER _____
10. DATE _____
11. What is your marital status?
- Single _____
- Married _____
- Widowed _____
- Separated/ _____
- Divorced _____

12. OCCUPATIONAL HISTORY

12A. In the past year did you work full time (30 Hours per week or more) for six months or more?

Yes _____ No _____

If Yes to 12A:

12B. In the past year, did you work in a dusty job?

Yes _____ No _____ Does not apply _____

12C. Was dust exposure:

Mild _____ Moderate _____ Severe _____

12D. In the past year, were you exposed to gas or chemical fumes in your work?
Yes _____ No _____

12E. Was exposure:

Mild _____ Moderate _____ Severe _____

12F. In the past year, what was your:

1. Job, Occupation _____

2. Position/job title _____

13 RECENT MEDICAL HISTORY

13A. Do you consider yourself to be in good health?

Yes _____ No _____

IF NO, STATE REASON: _____

13B. In the past year have you developed:

	Yes	No
a. Epilepsy (or fits, seizures, convulsions)?	_____	_____
b. Rheumatic fever?	_____	_____
c. Kidney disease?	_____	_____
d. Bladder disease?	_____	_____
e. Diabetes?	_____	_____
f. Jaundice?	_____	_____

14. CHEST COLDS AND CHEST ILLNESSES

14A. If you get a cold, does it usually go to your chest?
(Usually means more than half the time).

Yes _____ No _____ Don't get colds _____

15A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?

Yes _____ No _____ Does not apply _____

IF YES TO 15A:

15B. Did you produce phlegm with any of these chest illnesses?

Yes _____ No _____ Does not apply _____

15C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?

Number of such illnesses _____

No such illnesses _____

16. RESPIRATORY SYSTEM

In the past year have you had:

Yes or No

Further comment on
Positive Answers

Asthma
Bronchitis
Hay Fever
Other Allergies
Pneumonia
Tuberculosis
Chest Surgery
Other Lung Problems
Heart Disease

Do you have:

Yes or No

Further comment on
Positive Answers

Frequent Colds

Shortness of breath
when walking or
climbing one flight
of stairs

Do you:

Wheeze

Cough up phlegm

Smoke cigarettes

Packs per day _____
How many

years _____

Signature _____ Date _____

5.10

RECORD KEEPING PROGRAM

5.10.1 Objective Data for Exempted Operations

5.10.1.1 Where Nielsen Construction has relied on objective data that demonstrate that products made from or containing asbestos, tremolite, anthophyllite, or actinolite are not capable of releasing fibers of asbestos, tremolite, anthophyllite, or actinolite or a combination of these minerals, in concentrations at or above the permissible exposure level under the expected conditions of processing, use, or handling to exempt such operations from the initial monitoring requirements under paragraph (f)(2) of Calif. Title 8 1529, Nielsen Construction has established and maintains an accurate record of objective data reasonably relied upon in support of the exemption.

5.10.1.2 The record shall include at least the following information:

5.10.1.2.1 The product qualifying for exemption;

5.10.1.2.2 The source of the objective data;

5.10.1.2.3 The testing protocol, results of testing, and/or analysis of the material for the release of asbestos, tremolite, anthophyllite, or actinolite;

5.10.1.2.4 A description of the operation exempted and how the data support the exemption; and

5.10.1.2.5 Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

5.10.1.2.6 Nielsen Construction shall maintain this record for the duration of Nielsen Construction's reliance upon such objective data.

5.10.1.3 Exposure measurements.

5.10.1.3.1 Nielsen Construction keeps an accurate record of all measurements taken to monitor employees and Nielsen Construction keeps an accurate record of all measurements taken to monitor employee exposure to asbestos, tremolite, anthophyllite, or actinolite as prescribed in paragraph (f) of Calif. Title 8 1529.

Note: Nielsen Construction may utilize the services of competent organizations such as industry trade associations and employee associations to maintain the records required by Calif. Title 8 1529.

5.10.1.3.2 This record shall include at least the following information:

5.10.1.3.2.1 The date of measurement;

5.10.1.3.2.2 The operation involving exposure to asbestos, tremolite, anthophyllite, or actinolite that is being monitored;

5.10.1.3.2.3 Sampling and analytical methods used and evidence of their accuracy;

5.10.1.3.2.4 Number, duration, and results of samples taken;

5.10.1.3.2.5 Name, social security number, and exposure of the employees whose exposures are represented.

- 5.10.1.3.3 Nielsen Construction maintains these records for at least thirty (30) years, in accordance with 8 CCR 3204.
- 5.10.1.3.4 Respirator records.
 - 5.10.1.3.4.1 Nielsen Construction has established and retains written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.
 - 5.10.1.3.4.1.1 Medical evaluation. Records of medical evaluations required by this section are retained and made available in accordance with section 8 CCR 3204.
 - 5.10.1.3.4.2 Fit testing.

Nielsen Construction maintains a record of the qualitative and quantitative fit tests administered to an employee including:

 1. The name or identification of the employee tested;
 2. Type of fit test performed;
 3. Specific make, model, style, and size of respirator tested;
 4. Date of test; and
 5. The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.
 - 5.10.1.3.4.2.1 Fit test records shall be retained for respirator users until the next fit test is administered.
 - 5.10.1.3.4.2.2 A written copy of the current respirator program shall be retained by Nielsen Construction.
 - 5.10.1.3.4.2.3 Written materials required to be retained under this subsection shall be made available upon request to affected employees and to the OSHA compliance officers, Chief or designee for examination and copying.
- 5.10.1.3.5 Medical surveillance.
 - 5.10.1.3.5.1 Nielsen Construction has established and maintains an accurate record for each employee subject to medical surveillance by paragraph (m) of Calif. Title 8 1529.
 - 5.10.1.3.5.2 The record includes at least the following information:
 - 5.10.1.3.5.2.1 The name and social security number of the employee;
 - 5.10.1.3.5.2.2 A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physician's recommendations;
 - 5.10.1.3.5.2.3 Physician's written opinions;

- 5.10.1.3.5.2.4 Any employee medical complaints related to exposure to asbestos, tremolite, anthophyllite, or actinolite; and
- 5.10.1.3.5.2.5 A copy of the information provided to the physician as required by paragraph (m) of Calif. Title 8 1529.
- 5.10.1.3.5.3 Nielsen Construction ensures that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 8 CCR 3204 by providing permanent secure storage of all employment records.
- 5.10.1.3.5.4 Training records.
- 5.10.1.3.5.4.1 Nielsen Construction maintains all employee training records for one (1) year beyond the last date of employment by that Nielsen Construction.
- 5.10.1.3.5.4.2 Records availability.
- 5.10.1.3.5.4.2.1 Nielsen Construction, upon written request, shall make all records required to be maintained by Calif. Title 8 1529 available to the Chief of DOSH and the Director of NIOSH for examination and copying.
- 5.10.1.3.5.4.2.2 Nielsen Construction, upon request, makes any exposure records required by paragraphs (f) and (n) of Calif. Title 8 1529 available for examination and copying to affected employees, former employees, designated representatives, and the Chief of DOSH.
- 5.10.1.3.5.4.3 Transfer of records.
- 5.10.1.3.5.4.3.1 Nielsen Construction complies with the requirements concerning transfer of records set forth in 8 CCR 3204).
- 5.10.1.3.5.4.3.2 Whenever Nielsen Construction ceases to do business and there is no successor Nielsen Construction to receive and retain the records for the prescribed period, Nielsen Construction shall notify the director at least 90 days prior to disposal and, upon request, transmit them to the Director of NIOSH.

Part
5.11

List of Control Equipment

Air Filtration

Negative Air Machine - *Red Baron "Safety Line" Negative Air Machine*
HEPA Vacuums - *HAKO-Minuteman 800 Series HEPA-Equipped Vacuums*
HEPA Filters - *B & B Technologies HEPA Filters*
Negative Pressure Measurement Instrument - *Ominiguard Differential Pressure Recorder*

Air Sampling

Pumps - *Abatement Technologies Series 2400 High Volume Air Sampler*
- *BDX High & Low Flow Asbestos Pumps*
- *DuPont Model P-2500 Constant Flow Sampler*
Calibration Equipment - *SKC Precision Dual-Ball Rotameter; Soap Film Flow Meter*
Sampling Media - *SKC Filters in Preloaded Cassettes for Asbestos*

Disposable Materials

Plastic, 6 Mil./Fire-Retardant - *Oly-America Reinforced Flame Retardant*
Plastic Waste Bags - *IPCO Bags*
Glove Bags - *ACTI Glove Bags*
Wetting Agent/Surfactant - *Certane 2075 Raincoat Wetting Agent*
Encapsulant - *American Coatings Corp. 22P Powerlock Lock-Down Encapsulant*
Spray Adhesive - *Nashua 357 Spray Adhesive*
Tapes - *Nashua Asbestos-Free Duct Sealer*

Other Equipment

Portable Shower & Water Heater - *Abatement Technologies Portable Shower System*
Water Filtration Unit - *US Filter Water Champ*
Water Sprayer - *Tri-Con Water Spray Guns*
Heat Guns - *Wattson Enterprises Heat Guns*
Drill with HEPA Vacuum - *3M DrillVac*
GFCI Receptacles/Boxes/Panels - *AirGas Safety Portable GFCI*
- *AirGas Safety Protect Tri-Cord*
- *AirGas Safety GFCI Plug*
Signs/Labels - *ACTI 3500 Series Asbestos Warning Signs & Labels*
Decontamination Equipment - *Abatement Technologies Personal Decontamination Products*
Decontamination Chamber - *Fiberlock Technologies Decontamination Chambers*
Mastic Remover - *American Coatings Citra Blend Orange Based Mastic Remover & Cleaner*
Tile Removal - *American Coatings "Tile Popper" Tile Remover*

Personal Protective Equipment

Coveralls - *DuPont Tyvek Coveralls*
Gloves (disposable/work) - *Memphis Industrial Hand Protection*
Safety Goggles - *Crews Protective Eyewear*
Hard Hats - *Roughneck/Superglas Head Protection*
Rubber Boots - *Bata HAZMAX Boots*

Respiratory Protection

Respirator Makes, Models & Styles - *North 7700 Half Mask*

- MSA Advantage 200 & 1000 Respirators
- *Racal Powerflow PAPR Respirators*

Cartridge Type - *P100 HEPA Cartridges*

Fit Test Equipment - *3M Fit Test Kit*

PART VI & VII

ASSURANCES OF APPLICANT TO SAFELY PERFORM WORK
AND DECLARATION OF APPLICANT

Please see application form under Part I: Basic Information. Attached and appended to this document is our Safety Program Policy statement and specific responsibilities for everyone at Nielsen Construction.

Please see application form under Part I: Basic Information. Nielsen Construction maintains a Safety Program, Illness and Injury Prevention program IIPP, there are specific responsibilities and obligations for everyone at Nielsen Construction under that program.

Nielsen Construction has a strict accountability policy, Kevin Nielsen is the Owner, and has the responsibility of overseeing the Competent Person or Persons supervising our jobs on a day to day basis.

I, Kevin Nielsen have read the SOP, and I will take all reasonable steps to within my authority to ensure that competent persons follow Nielsen Construction policies and Procedures.

Signed This _____ day of _____ 20____ at _____

Kevin Nielsen _____

Appendix A to Section 5144: Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures--General Requirements. The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.
3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator.
 - (a) Position of the mask on the nose
 - (b) Room for eye protection
 - (c) Room to talk
 - (d) Position of mask on face and cheeks
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
 - (a) Chin properly placed;
 - (b) Adequate strap tension, not overly tightened;

- (c) Fit across nose bridge;
- (d) Respirator of proper size to span distance from nose to chin;
- (e) Tendency of respirator to slip;
- (f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which would interfere with respirator fit.

14. Test Exercises.

(a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:

- (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
- (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- (3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
- (4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
- (5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor.

The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

(a) Odor Threshold Screening. Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) Three 1 liter glass jars with metal lids are required.

(2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.

(3) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be

prepared at least weekly.

(4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.

(7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

(1) The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.

(2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

(3) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(5) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

(7) If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time

(9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.

(10) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to subsection 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall get thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except for plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with the tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10, or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed. (11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

(12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol. The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste Threshold Screening. The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.

(2) The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

- (10) The test conductor will take note of the number of squeezes required to solicit a taste response.
- (11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.
- (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.
- (13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
- (14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Bitrex Solution Aerosol Fit Test Procedure.

- (1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
- (2) The fit test uses the same enclosure as that described in 4. (a) above.
- (3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).
- (4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall not be clearly marked to distinguish it from the screening test solution nebulizer.
- (5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.
- (6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.
- (7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.
- (8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
- (9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).
- (10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.
- (11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol. This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions.

(1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Only stannic chloride smoke tubes shall be used for this protocol.

(3) No form of test enclosure or hood for the test subject shall be used.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

(5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

(b) Sensitivity Screening Check. The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

(1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

(3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

(2) The test subject shall be instructed to keep his/her eyes closed.

(3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

(4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

(6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

(7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

(8) If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols. The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

(a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

(1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.

(2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.

(6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be

designed and used to that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.

(7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.

(8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

(1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.

(2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.

(4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.

(5) A stable test agent concentration shall be obtained prior to the actual start of testing.

(6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.

(7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

Overall Fit Factor =

Number of exercises

$$1/ff1 + 1/ff2 + 1/ff3 + 1/ff4 + 1/ff5 + 1/ff6 + 1/ff7 + 1/ff8$$

Where ff1, ff2, ff3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol. The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount TM) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be

explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used by the fit test (e.g. NIOSH 42 CFR 84 series 100, 99 or 95 particulate filter) per manufacturer's instruction.

(2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instruction for operating the Portacount and proceed with the test.

(6) the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

(b) Portacount Test Instrument.

(1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

(2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol. The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as

milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to conduct of the screening test.

(a) CNP Fit Test Requirements

- (1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
- (2) The CNP system defaults selected for test pressure shall be set at -15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

(Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

- (3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
- (4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
- (5) The test subject shall be trained to hold his or her breath for at least 20 seconds.
- (6) The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.
- (7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

- (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
- (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
- (3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.
- (4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for

10 seconds during test measurement.

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds (7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

(c) CNP Test Instrument.

(1) The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test subject may be refitted and retested.

(2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or
2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

NIELSEN CONSTRUCTION
RESPIRATOR PROTECTION MANUAL

RECORD KEEPING. (TEST RESULTS)

A summary of all test results shall be maintained in each office for 3 years. the summary shall include:

1. Name of test subject.
2. Date of testing.
3. Name of test conductor.
4. Respirators selected (indicate manufacturer, model, size and approval number).
5. testing agent.

RESPIRATOR FIT TESTING FORM

EMPLOYEE Name: _____

Last 4 S.S. No. _____

RESPIRATOR Manufacturer: _____

Model: _____

Approval Number: _____

Size: _____

TEST conductor: _____

Date of test: _____

Circle the type of test protocol SACCHARINE BANANA OIL or IRRITANT SMOKE PROTOCOL: NB This is a guide to help document the complete test protocol. Complete all the items in the test protocol.

1. Put on and adjust respirator, wear for at least 10 minutes before starting the test. Be certain that the respirator is comfortable.
2. Perform positive and negative user seal checks. Place the correct cartridges on the respirator for the test medium. Use the challenge media around the respirator. Do not use a chamber for irritant smoke.
3. Challenge procedure each activity must be done for one minute, except the grimace, 15 seconds:
 - A. Breathe normally for one minute.
 - B. Breathe deeply for one minute.
 - C. Turn head from side to side for one minute.
 - D. Nod head up and down for one minute.
 - E. Read the "Rainbow passage" or talk for one minute:
 "When the sunlight strikes raindrops in the air they act like a prism and form a Rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow."
 - F. Grimace for 15 Seconds
 - G. Bend over as in touching your toes, or if not possible Jog in place. for one minute
 - H. Breathe normally for one minute.

If you smell the banana oil or taste the Saccharine you have failed the respirator test. You must select a different respirator and retake this test, until you do not smell or taste the challenge media.

PASSED _____

FAILED _____

Remarks: _____ Test conductor initial _____

DAILY ABATEMENT CHECK LIST

Building _____ Date _____

Location _____

Supervisor on Job _____ Title _____

II. Work-site

1. Area non-accessible to general public
2. Air Monitoring results from previous day available at site
3. Signage
 - A. Proper caution signs at entrances and exits
 - B. Bags Labeled
 - C. Dumpster Labeled
4. Airlock-Decontamination Area
 - A. Clean room-1st Stage
 1. Lockers/clothing storage provided
 2. "Z" doors at entrance and exit, intact
 - B. Shower Area-2nd Stage
 1. Showers operating
 2. Shower waste water properly filtered
 3. "Z" doors at entrance and exit, intact
 4. Clean towels
 5. Finger-nail brush
 6. Soap
 7. Used by all personnel
 - C. Equipment Room-3rd stage
 1. "Z" doors at entrance and exit, intact
 2. Labeled bag for disposal of used suits
5. Work Site Perimeter Barrier Preparation
 - A. Floor covered with plastic (2 layers), intact
 - B. Walls covered with plastic, intact & in place
 - C. Proper sealing of:
 1. Doors
 2. Windows
 3. Ventilation Systems
 - (1) Vents
 - (2) Ducts
 - (3) Grilles
 - (4) System turned off
 4. Pipes and conduit
 5. Light fixtures
 6. Sprinkler heads
 7. All other openings into work area
 - D. Penetration through ceiling properly sealed
6. Negative Air Pressure
 - A. HEPA filtration systems in order, filters changed on schedule
 - B. Constant operation log in order
 - C. Negative pressure maintained, manometer strip charts, log entries

7. Work Practices
 - A. Removed material promptly bagged
 - B. Material worked wet
 - C. HEPA vacuum used
 - D. No Smoking
 - E. No eating, drinking
 - F. Work area cleaned after completion
 - G. Personnel decontaminated each departure
8. Protective Equipment
 - A. Disposable clothing used one time
 - B. Proper NIOSH approved respirators
9. Site condition at shift end
 - A. Floor clear of any asbestos debris
 - B. Negative Pressure System on
 - C. Respirators properly sanitized
 - D. Respirators properly stored
 - E. Air Monitoring Cassettes sent to Laboratory

Please List any discrepancies, refer to the outline number for reference. State how the discrepancies were corrected and when, all corrective measures must be documented.

PHYSICIAN'S WRITTEN OPINION

On _____ I examined _____

Social Security Number _____

Section (m)(4)(i) of 29 CFR 1926.1101 and California Administrative Code Title 8 1529; requires that the examining physician provide the employer with a written opinion in regards to the individuals ability to wear respiratory device,(both positive and negative pressure) and any medical condition that would put the individual at an increased risk of material health impairment from exposure to asbestos. I have informed the individual named above the results of the medical examination and of any medical condition that may result from their exposure to asbestos. I have discussed the effect of Smoking or using Tobacco products and the increase risk of lung cancer or other cancer with the above individual.

I have been provided A copy of Calif. Title 8 1529 including appendices D, E, and I; The Contractor has provided me with information about the type of respiratory protection that the individual will use, and I understand the physical requirements of that equipment. The Contractor has instructed me not to discuss any finding not related to the exposure from asbestos with the contractor.

_____ Based on my findings this individual may use respiratory protection equipment.

_____ The results of this examination have not detected any medical condition which would place this individual at an increased risk of material health impairment from exposure to asbestos.

_____ Based on my findings this individual may not use respiratory protection equipment.

_____ The results of this examination have detected a medical condition which would place this individual at an increased risk of material health impairment from exposure to asbestos.

The complete medical examination report, except any findings not related to exposure to asbestos, of this individual will be forwarded to the employer pending final conclusion and interpretation of any additional medical data collected during the examination. A complete copy of all findings will be provided to the above individual a copy of the results of this examination within the next thirty (30) days.

Signed: _____
EXAMINING PHYSICIAN

Important Notes for completing this form:

The first section is self explanatory but be certain to include the street address and the job contact.

The items on the first column may or may not be present, attach as much information as is available.

All of the items in the second column must be present, and copies attached.

Discussion of What type of work will be accomplished must be completed. The following items must be on the form: The amount of asbestos, Types of Asbestos I II IV; The condition of the asbestos, the percentage and square or linear feet. The types of ACM (roofing, floor tile, insulation, fire retardant etc.)

Proposed work practices must be completed. This should say the class of work, describe all of the following: Critical barriers; Negative Pressure Enclosure (NPE); Glove Bag; mini enclosure; types of decontamination facility; protective clothing; Respiratory protection; air monitoring; drop cloths; and any other relevant issues. The following items could be used here-- Construct NPE for the Ceiling removal in room I254. Place critical barriers on the system HVAC. Place electrical lock out on Panel # 45I in room J45. Water is in the janitor closet as is the sanitary drain. Workers will use ½ Face P100 respirators, with full body protection. The showers will be located in the hall in... etc. See the Policy and Procedure manual (P&P) for more specific requirements.

Special Conditions This is an optional section for conditions such as fall protection requirements, or special requirements for high rolling scaffolding. The presence of special electrical services, holes in the floor. The presence of alarm systems or fire suppression systems. Lock out tagout procedures for the electrical services.

Exposure potential must be completed. We better not have an exposure potential of more than 1 (<1 f/cc) if we are proposing ½ face respirators. Support for the PPE and the experience that we are relying on should be attached with this form if we expect to use a low level of PPE. See the Policy and Procedure manual (P&P) for the respirator requirements. Very Important. The Class of work determines the type of respirator and other work practices. Refer to the Policy and Procedure manual.