CHABOT- LAS POSITAS COMMUNITY COLLEGE DISTRICT

Facilities Planning & Management Department

March 16, 2011

Addendum No. 2
INVITATION FOR BID NO.: 11-02.1
Hazmat Remediation for Math-Science Modernization, Building 1800 – Chabot College

(CFIS Reference #40.62.116)

All Prospective Bidders:

This addendum is issued to clarify, add, delete, correct and/or change the contract documents to the extent indicated and is hereby made a part of the above noted contract documents on which the contract will be based. Any modifications/changes made by this addendum affect only the portions or paragraphs specifically identified herein; all remaining portions of the proposal to remain in force. It is the responsibility of all bidders to conform to this addendum. Acknowledge receipt of this addendum in the space provided on the bid form. Failure to do so may subject Bidder to Disqualification.

The original Bid Documents are modified by the revision as follows:

1. Exhibit A – "Requirements for the Disturbance of Asbestos" has been hereby re-issued in its entirety and is attached.

If you have any questions regarding this Addendum No.2, please contact the Office of the Facilities Planning & Management in **writing, via facsimile or email.** All other terms and conditions of BID No. 11-02.1 are to remain the same.

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Revised EXHIBIT A
Addendum No.2

EXHIBIT A

REQUIREMENTS FOR THE DISTURBANCE OF ASBESTOS

Chabot - Las Positas Community College District

Chabot College Projects

Building 1800

Chabot College
25555 Hesperian Boulevard,
Hayward, CA 94545

Prepared By:

Hazard Management Services, Inc. (HMS, Inc.)

TABLE OF CONTENTS

REQUIREMENTS FOR THE DISTURBANCE OF ASBESTOS

GENERAL REQUIREMENTS

SECTION 1. INTRODUCTION TO THESE SPECIFICATIONS AND SITE SPECIFIC INFORMATION

Part 1.1 - Introduction To These Specifications

These specifications are designed to minimize and control potential asbestos hazards that may be encountered during this project. The primary focus of these specifications is to address the practices and procedures that an asbestos abatement contractor must follow when disturbing asbestos on this project.

Chabot College, (known as the "Owner" in these specifications) has retained the services of an environmental consulting firm, Hazard Management Services, Inc. (HMS, Inc.) to advise them on the disturbance of hazardous materials on this project. HMS, Inc. is responsible for the development of these specifications and ensuring that the environmental contractor, (known as the "Contractor" in these specifications), is in compliance with the requirements as stated in these specifications.

The term "Project Monitor," utilized throughout these specifications, refers to the employees of HMS, Inc. responsible for monitoring compliance with these specifications. HMS, Inc. anticipates rigorously enforcing Cal/OSHA and the local National Emission Standards for Hazardous Air Pollutants (NESHAP) enforcement agency regulations regarding the disturbance of asbestos. The requirements for disturbing asbestos as reflected in these specifications primarily reflect regulatory requirements. In some cases, however, HMS, Inc. requirements are designed to protect the legal liability of the Owner and may be more stringent that the regulatory agency requirements.

These specifications are organized in the following manner. This Section 1 provides an introduction to the specification as well as site-specific information and the results of any sampling that may have been conducted by the Owner. Sections 2 - 22 list basic requirements for work disturbing asbestos. This includes information on definitions, submittal requirements, respiratory protection, negative pressure containments, decontamination and waste load-out procedures, air testing, and much more. Section 23 provides specific requirements for work the Contractor may conduct using glovebags, mini-enclosures, or while removing floor tile and mastic, carpet mastic, baseboards and mastic or roofing.

At the end of this specification, there is a pre-work submittal form that lists all documents the Contractor must provide before being allowed to disturb asbestos on this project. The Contractor

will be required to complete this list, sign it, and provide it along with the submittal documents to the Owner and/or Project Monitor before being allowed to start work.

The disturbance of the asbestos-containing material on this project must be done in compliance with this entire specification, as stated in Sections 2 - 23. These specifications may include requirements or procedures that some asbestos contractors may not be familiar with or are not accustomed to providing. **Contractors bidding on work and planning on disturbing asbestos on this project must read these specifications prior to providing a cost estimate for their work**. HMS, Inc. believes, however, that the summary information provided near the end of Section 1.3 will provide sufficient information for Contractors to prepare bid specifications as long as they are familiar with basic Cal/OSHA regulations and the local agency's enforcement of the National Emission Standards for Hazardous Air Pollutants (NESHAP). Our summary will emphasize only those requirements that may be more stringent than or in addition to those requirements specified by regulations. **Contractors bidding on this project must be familiar with the information presented in Section I of this specification.**

Hazard Management Services, Inc. plans to enforce these specifications. The Contractor's Competent Person assigned to this project will be required to sign a statement stating that he or she has read and is familiar with the requirements of the work, including this specification, and will comply with the Competent Person requirements as listed in 8 CCR 1529.

Part 1.2 - Contact Information For This Site

Michael C. Sharp
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Part 1.3 - Scope of Work For Building 1800

For these specifications "remediation contractor" and "contractor" are synonymous.

To be eligible to bid this project, the contractor must be a properly licensed and registered asbestos abatement contractor.

Removal of all interior finishes, some substrate materials and asbestos containing-materials within this building will be conducted as a prime contract with Chabot Los Positas Community College District.

The Scope of Work for this project is limited to Building 1800 on the campus of Chabot College, located at 25555 Hesperian Boulevard in Hayward, California. **THIS SPECIFICATION DOES NOT OUTLINE THE QUANTITY OF ASBESTOS-CONTAINING MATERIALS, NOR THE QUANTITY OF OTHER MATERIALS TO BE REMOVED. THIS SPECIFICATION ONLY ADDRESSES MATERIALS, PLUS THE PRACTICES AND PROCEDURES TO BE FOLLOWED WHEN THE CONTRACTOR IS DISTURBING ASBESTOS-CONTAINING MATERIALS. Contractors are responsible for their own measurements of materials, both asbestos and non-asbestos, to be removed.**

Contractor is required to protect building during remediation and materials removal work with construction fence. Location of construction fencing is to be coordinated with District. Placement of waste dumpsters must be within this construction fencing.

At completion of project, contractor is to protect all roof, window, door and other building penetrations from unauthorized entry and inclement weather by placing plywood over these openings and securing the plywood to the building in an appropriate fashion.

Contractor will be removing exterior windows and some exterior doors – these components have sealant between the frames and the walls of the building that is not currently visible. There are also visible sealants, such as window putty, on some of these components. Both visible and hidden sealants on these components for this building contain asbestos.

The Contractor must refer to the construction drawings made available during the bid process to determine the full scope of the work. The plans issued for this work include drawings for Building 1700, however, only work in Building 1800 is taking place under this contract. All interior finishes are to be removed by the remediation contractor, plus all demolition noted on the plumbing, mechanical, electrical and architectural demolition sheets, other than load bearing structural components and wall studs, is to be conducted by the remediation contractor.

For clarification – remediation contractor is to conduct mechanical demolition including, but not limited, to radiators, coils, pipes, ducts, mechanical equipment and heat shields (asbestos containing or not) expected to be present behind or within radiators, and equipment shown on the mechanical drawings to be removed (heat shields are to be removed whenever found, but will not be shown on the plans, nor necessarily listed in the functional space notes). This is the same for plumbing, architectural and electrical systems and drawings.

Remediation contractor is responsible for protecting and restoring to start of project condition any surfaces not removed during this project. This includes, but is not limited to, interior moisture barrier and exterior stucco, concrete walls and floor, roofing (especially structural supports).

Contractor is required to remove and dispose of all transite table tops, whether listed in Functional Space Notes or not as asbestos containing material.

Please note that the Contractor must comply with Chabot College waste recycling policy (see section 01 74 19, and others, of specifications supplied by the Project Architect). This policy is referenced in other contract documents. In summary, the Contractor will need to provide documentation to the Owner that non-contaminated construction debris is recycled when possible. Also – all waste from this site must be manifested (hazardous or not). Manifests must indicate both weight and volume of various waste streams disposed of by remediation contractor.

Please note that the Contractor will remove much of the mechanical system (see page M2.21D), so in addition to standard demolition drawings you will need to refer also to the mechanical drawings to determine the extent of that demolition work. This may include exterior work in order to remove mechanical systems (such as equipment on the roof) as described on plans. <u>However, contractor is not responsible for removing any services below current slab or floor finish level (Note 8 on page M2.21D) and is not responsible for removal of floor slabs sections.</u> All services are to be capped or “Safed Off” and locations are to be indicated on as built drawings and/or flagged within the building.

The Contractor is responsible for estimating the amount of asbestos-containing materials as well as non-asbestos-containing materials that will need to be removed and disposed. This can be determined on the bid walk and by reviewing the construction drawings in combination with HMS, Inc. Functional Space Notes. Measurements on the Functional Space Notes are estimates only and are not to be used for bidding purposes. **Contractors are responsible for their own measurements of materials to be removed.**

For Building 1800, the Contractor shall remove and properly dispose of all wall, ceiling, and floor materials to the base substrate material such as concrete, wood, or metal. This includes the removal of both asbestos-containing and non-asbestos-containing materials. Contractor is to assume that 50% of concrete floor slab is covered with floor filler (This is 15,000 square feet of floor filler in the contractor’s

base project). This floor filler is to be removed, whether asbestos-containing or not, down to the concrete slab. This filler material is to be removed within containment, due to potential silica exposure, by workers wearing suits and respirators whether or not it contains asbestos. Contractor will submit an additive/deductive square foot price for finding more or less floor filler than expected. This filler will be tested for asbestos content as it is exposed.

NOTE: ALL DRYWALL REMOVED FROM THIS BUILDING IS TO BE DISPOSED OF AS HAZARDOUS WASTE NO MATTER WHAT RESULTS ARE LISTED ON THE BUILDING SURVEY(s).

All current interior floor, wall and ceiling surfaces are to be removed by the contractor from Building 1800, whether noted on the plans or not.

Unless directed otherwise by the Owner, where wall finishes are removed from interior walls, studs will not be removed. Studs shall be clean of attachments, nails, and residue construction dusts and mastics.

The Contractor shall review the drawings to determine which casework, equipment, blackboards, clocks, doors, etc. are to be removed and disposed, and which are to be salvaged for the Owner. The Contractor shall coordinate and verify with the Owner which materials are to be salvaged. Mastics found behind these items are to be assumed to be asbestos-containing and handled as asbestos-containing materials. HMS, Inc. will sample these materials as they are exposed and determine their asbestos content.

The Contractor shall remove all ceiling materials to the base substrate. This includes the removal and disposal of suspended ceiling panels and their tracks, glue or nailed-on adhered ceiling tiles and their associated mastic, and gypsum board ceilings. Ceiling insulation, if existing above asbestos containing false ceiling panels or drywall, shall be removed and disposed of as hazardous waste. Floor filler compound will be removed from concrete slab subfloor by remediation contractor (floor filler will be tested for asbestos content as it is exposed).

Lighting fixtures, ballasts, and tubes shall be disposed of or recycled. Exhibit B covers the management of PCBs and mercury in ballasts, tubes, and thermostats.

The Contractor shall remove all wall materials to the wooden or metal studs. All attachments such as nails and brackets shall be removed from the studs. Wall insulation, if existing, shall be removed and disposed of as hazardous waste.

The Contractor shall remove all floor materials to the base substrate such as concrete or wood. This includes the removal of all floor tiles, vinyl sheet flooring, and carpet and their associated mastics and the removal of all floor filler materials.

The Contractor shall remove all mudded elbows and junctions on piping. The Contractor shall remove and dispose of any fiberglass insulation currently existing on heating system piping. Fiberglass insulation on pipes scheduled to be left in place, shall remain – though no asbestos is to be left in place on any pipes.

The Contractor shall remove all wall heater units and associated piping. Some of these units may have asbestos cement heat shields inside the wall heaters. Heat shields were observed in behind wall heaters and behind casework in other buildings at this site. If heat shields are discovered upon removal of the walls, casework and heaters, the Contractor shall treat such heat shields as containing asbestos. Contractor is to assume 500 square feet of heat shields exists and must submit a square foot price for the handling of heat shields at this site in greater or lesser quantities.

The following information summarizes information found in Section 1.5 and provides direction on materials that must be treated as asbestos-containing.

Nine inch floor tile and mastic contain asbestos. (Both the nine-inch tile and the mastic under the tile contain asbestos.) The disturbance of these materials is not regulated by the local air district and the

material may be disposed of as asbestos-containing non-hazardous waste unless the Contractor uses mechanical means to remove or disturb these materials.

The presence of asbestos in the gypsum board walls and ceilings is in the skim-coat of the gypsum wall/ceiling systems. Joint compounds contain asbestos as well. **Contractor shall treat all gypsum board walls and ceilings as containing an "add-on" type material as defined by the local air district. This means that all of the gypsum board within the building must be treated as a Regulated Asbestos Containing Material (RACM) and disposed of as asbestos-containing hazardous waste.**

All mudded thermal system insulation shall be treated as containing asbestos and removed. Therefore these mudded materials must be treated as RACM and disposed of as asbestos-containing hazardous waste.

Wall sealants, door sealants and window putty contain asbestos in Building 1800. The roof has been recently replaced and is assumed to not contain asbestos though sampling was not conducted on the current roof materials. Sampling of the roof will be conducted, if roofing disturbance is necessary, prior to that disturbance.

Most buildings at this site have been discovered to have an asphaltic moisture barrier behind current wall finishes, on the interior side of exterior walls. Unless noted in the plans, this moisture barrier is to be disturbed as little as possible during contractor's project.

False ceiling panels within this building contain asbestos in some areas and not in others. Contractor is to use the HMS, Inc. supplied Functional Space Notes to determine where these panels are asbestos-containing and where they are not.

Transite table tops within this building are to be removed and disposed of as non-hazardous asbestos containing waste, unless made friable or contaminated with other asbestos-containing materials. In the case that these table tops are made friable, or are contaminated by other asbestos-containing materials, these transite table tops must be disposed of as hazardous waste.

Schedule

The Contractor shall use sufficient staffing on this project to ensure that the work is completed no longer than 30 working days after the execution of a contract.

Pre-work Site Visits and Meetings

Contractors bidding on this project are expected to attend the pre-bid site visit in order to measure areas/materials and determine if factors not addressed in these Specifications may affect their work or price estimates.

Mandatory Pre-Start Meeting

There will be a mandatory pre-start meeting with the Owner and the Project Monitor prior to the expected start of work. This meeting is designed to answer questions about the project and address issues of concern of either the Contractor or Project Monitor. The Contractor is expected to have provided the submittal package in advance of that meeting and the start of work may be delayed if for some reason the Contractor has not provided submittals by the time of this meeting.

Notifications, Submittals and Postings

The requirements listed below are summaries. The full information is listed elsewhere in this specification under the relevant section titles.

Notifications

Contractor must notify the Cal/OSHA District Office in San Francisco at least twenty-four hours in advance of disturbing asbestos on this project.

The Contractor shall notify the Bay Area Air Quality Management District (BAAQMD) at least one working day in advance of disturbing Regulated Asbestos-containing Material on this project. The Contractor is responsible for the submittal of this notice and all costs associated with this submittal. The Contractor shall ensure that the submittal information is on time and accurate. All costs and penalties for providing false or untimely information shall be the sole responsibility of the Contractor.

Contractor must coordinate with the Owner and the Project Monitor at least one week before starting work. Exact work start times must be communicated to the Project Monitor at least twenty-four hours prior to the start of work or the work may not be allowed to proceed. The Project Monitor and Owner have final authority in determining whether or not to allow the Contractor to proceed with the work.

Submittals

Section 3 includes all required submittals including pre-bid submittals, pre-work submittals, submittals provided during the project, and submittals required at the end of the project before the project will be deemed fully complete and final payment will be made. **A mandatory checklist form to be supplied with the submittals is included at the end of this specification.**

The Contractor must review the submittal list prior to bidding on this project. There may be more or different submittals required for this project than expected by the Contractor. The Contractor will not be allowed to begin work until the submittal package has been approved by the Project Monitor. The Contractor will be held responsible for all delays resulting from the failure to provide the required submittals in the time frame stated in this specification.

Hours of Work

The work is currently scheduled to be done during daytime hours, Monday through Friday. Saturday or overtime or night time work may be allowed with a minimal of 48-hour notice in advance to the Project Monitor and the Owner.

Site Limitations

Contractor will need to coordinate with the Owner for parking, delivery of supplies, and location of any needed waste receptacles.

Electricity and Water

Power must be shut off in the building to facilitate a safe interior demolition process. The Contractor must plan to utilize temporary power set up by a licensed electrician. Please note that a significant number of air purifying ventilation units will be required to maintain adequate negative pressure, and we expect many HEPA-filtered vacuums will be needed. Therefore the Contractor will need to ensure that there is adequate electrical power capacity.

All electrical equipment used by the Contractor must have ground fault circuit interrupter protection at the source of the power to the equipment.

Water will remain on to the building.

Part 1.4 - Summary of Required Work Practices and Procedures

The Contractor will not be allowed to proceed until the Project Monitor has received the submittal documents and the completed checklist of documents found at the end of this specification. In addition, the Contractor must provide a minimum of 48 hour advance notice to the Project Monitor before being allowed to begin work.

The Contractor shall conduct the work in compliance with all applicable regulations. Some, but not all, of these regulations are listed in the definition of "Regulations" in Section 2 of this document. The following information summarizes the work practice and containment requirements for this project.

Negative Pressure Containment, Manometers, Challenge Testing

The Contractor must create a negative pressure containment in which to conduct the disturbance of asbestos. Unless already enclosed within the negative pressure containment, all glovebag removal work must be done within a secondary enclosure system such as a mini-enclosure.

Unless directed otherwise or given approval from the Project Monitor, the Contractor shall make reasonable efforts to create large containments in order to reduce the number of sets of clearance air tests that must be conducted. For example, HMS, Inc. assumes the Contractor will create containments encompassing entire floors or entire buildings rather than containing individual rooms.

All poly sheeting used on this project must be fire resistant.

All critical barriers such as exterior doors, windows, and other penetrations must be sealed by a minimum of a dual system combining tape and poly sheeting. The cracks around doors and window must first be sealed by duct tape. Then a poly sheet of at least six mil thick, fire-resistant poly must be attached over the entire critical barrier (door, window, vent, etc.).

Critical barriers such as the windows are installed in gypsum board walls which will be removed during the project. The Contractor will need to establish a method of sealing these critical barriers that does not involve attachment to the gypsum board scheduled for removal. For example, the Contractor should anticipate covering windows only to their metal frames, not the adjoining gypsum board. The Project Monitor will seriously evaluate the effectiveness of the critical barriers since these barriers will be the primary containment strategy for this project. For example, the Project Monitor anticipates checking the effectiveness of the critical barriers using smoke tubes after the Contractor establishes a negative pressure differential system for the whole containment.

Non-asbestos-containing materials scheduled for disposal must either be removed and disposed of prior to the disturbance of asbestos, or covered with poly in a manner that they will not be exposed to asbestos in the air or in debris. For example, the twelve-inch vinyl floor tile and associated mastic, located in the hallways, does not contain asbestos. That material must be covered with at least one layer of taped-down fire-resistant six mil thick poly prior to the disturbance of asbestos if it is not removed prior to the disturbance of asbestos. Similarly, other materials scheduled to be salvaged must be protected from exposure to airborne asbestos or asbestos debris if they will not be removed prior to the disturbance of asbestos.

Please note that the Contractor must comply with Chabot College waste recycling policy. This policy is referenced in other contract documents. In summary, the Contractor will need to provide documentation to the Owner that non-contaminated construction debris is recycled when possible. **Also – all waste from this site must be manifested (hazardous or not). Manifests must indicate both weight and volume of various waste streams disposed of by remediation contractor.**

Exposed surfaces that will be abated separately, or that will not be abated must be to be sealed with poly sheeting. The Contractor should note that the Project Monitor will collect air sampling using aggressive sampling techniques. The Contractor will need to clean surfaces to the extent that they will pass this clearance air testing process. For example, the Contractor must place poly on asbestos-containing floor

tiles during removal of drywall and or false ceiling panels.

Cal/OSHA regulations require the use of drop cloths. Therefore poly drop sheets must be used in areas undergoing gypsum board removal in order to protect the underlying substrate even if that substrate, such as floor tile, will be removed and disposed of as containing asbestos. **Under no circumstances will wall or ceiling materials be allowed to be dropped to unprotected floors.**

Since the gypsum board walls and various ceilings create a hazardous waste stream, prior to removing the nine-inch floor tile, the flooring must be visually clean of any gypsum board dust and debris in order for it not to need treatment as a hazardous waste. The Contractor may choose to protect this flooring carefully during wall and ceiling demolition work or to remove the floor tiles prior to the wall and ceiling removal work.

Please note that since non-asbestos materials need to be protected, the poly sheeting protecting non-asbestos-containing floor tile must be taped down securely at the base of the walls during wall and ceiling removal.

The Project Monitor recognizes that the Contractor may choose to use a HEPA-vacuum shrouded blasting system to remove floor mastic. Water blasting with vacuum recovery may take place with the containment described in the previous paragraphs. However, the Project Monitor is concerned that vacuum recovery bead blasting may create significant asbestos fiber or other dust release making clearance air testing difficult. Should bead or other non-water blasting technique be used, the Contractor will need to fully contain with poly the walls and ceilings. This activity may cause significant silica exposures as well. Contractor must conduct personal air sampling on the workers conduct bead blasting for silica exposures as well as for asbestos.

The Project Monitor believes it will be difficult to maintain adequate negative pressure in the building as the perimeter walls and ceilings are removed. In order to ensure that the Contractor has sufficient negative air filtration devices tested and ready for use, the Contractor will not be allowed to start work disturbing asbestos until demonstrating a negative pressure differential of no less than -0.05 inches as measured by a recording manometer acceptable to the Project Monitor.

The Project Monitor expects it will be difficult to maintain negative pressure as walls and ceilings are removed from the perimeter of the building. Therefore as work progresses, the Contractor must maintain a negative pressure of no less than -0.03 inches. The Contractor must anticipate the need to add negative air filtration devices as the work proceeds. We anticipate many additional units will be needed as the work progresses.

Printing manometers, acceptable to the Owner, must be used 24 hours a day from the onset of disturbance of asbestos to the completion of the work as determined by the Owner. Circular charts are preferred. Strip charts will be allowed but only if the Contractor provides the results in dated, chronological order, taped on $8^1/_2$" x 11" paper in a format acceptable to the Project Monitor.

All vacuums and air filtration devices (negative air machines) must be challenge tested (DOP tested) on site by an independent third party testing firm acceptable to the Owner. Machines will need to be retested if moved off the site or turned on their side or upside down.

The Contractor may not begin disturbing asbestos until the Project Monitor has approved the containment set up in writing.

Wet Methods and Prompt Cleanup of Debris

Contractor shall use wet methods in compliance with Cal/OSHA and local air district requirements. This means wetting the material before disturbing it and keeping it visually moist until sealing it in leak-tight containers. The Contractor shall take steps to ensure that water does not leak out of the contained work area.

The Contractor shall clean up bulk debris prior to any work stoppages such as lunch or end of the workday. Unless authorized otherwise by the Project Monitor, the contractor will not be allowed to leave debris in the work area and simply cover it with poly sheeting.

Decontamination System

HMS, Inc. expects the amount of gypsum board removal and floor tile removal will create a significant risk of "take-home" dust on workers' clothing. Therefore the Contractor must develop a three-stage decontamination system that includes a shower no matter what level of exposure is seen on personal air samples nor what Cal/OSHA category of work is conducted. The Contractor shall ensure that workers fully utilize the shower and are not allowed to exit the decontamination system wearing any clothes, head scarfs or other clothing that was worn in the work area. The Contractor should anticipate the need to provide disposable underwear or double suits in order for workers to not wear clothing inside the work area.

Site Security

The general contractor will be responsible for erecting construction fencing around the building. The Contractor will need to coordinate with the general contractor to the timing of this fencing to ensure it is in place before any work by the Contractor takes place.

The Contractor will need to have a burglar-resistant system of securing the decontamination area and entrance to the work area. While it may be possible to keep all doors to the building locked, that may not be possible while still allowing adequate make-up air to enter the area. Therefore the Contractor shall anticipate building a decontamination area of hard barriers such as wood that can be locked and which will restrict access to the entrance during off work hours.

Any portion of containment that exists on the exterior of the building must be protected by a solid plywood structure, including a roof.

Determining Completion of the Work

Upon completion of the removal work within each containment, the Contractor must pass a visual inspection of the work area by the Project Monitor. Sufficient advance notice must be given to the Project Monitor to allow the Project Monitor to schedule this inspection. The Contractor must remove all non-critical barrier poly in order for the Project Monitor to verify that non-abated surfaces are clean. The work area must be dry in order for the Project Monitor to conduct the visual inspection. The Contractor should remember this in the scheduling process.

The visual standard of cleanliness will be no visible dust or debris (asbestos or non-asbestos) and no three-dimensional material. For example the Project Monitor will allow reasonable staining of substrates such as from mastic on concrete floors. However three-dimensional material will not be allowed to remain.

Following completion of the visual inspection process, the Contractor will be allowed to lightly encapsulate abated surfaces. HMS, Inc. does not recommend the encapsulation of flooring surfaces in order to ensure that encapsulation does not negatively affect the adhesion of future installed flooring products. While the Project Monitor will allow encapsulant to be sprayed on floors, the Contractor is responsible for determining that the encapsulant will not affect the installation of future products such as floor tile. HMS, Inc. recommends that the Contractor discuss this specific issue with the Owner prior to the decision to apply the encapsulation.

Upon passage of the visual inspection, the Project Monitor will proceed with clearance air testing using aggressive sampling procedures. The clearance testing criteria will be the Asbestos Hazard Emergency Response Act (AHERA) criteria of less than seventy structures per square millimeter for testing by Transmission Electron Microscopy (TEM) and less than 0.01 fibers per cubic centimeter by Phase

Contrast Microscopy (PCM). The Project Monitor anticipates using TEM analysis.

The Owner is responsible for the costs associated with implementing the first round of clearance testing in each work area. Should the samples fail the testing process, the Contractor is responsible for all costs associated with the collection, transport, and analysis of all subsequent clearance sampling by the Project Monitor. The fees for all retesting will be charged at the same rates as used for the Owner. This cost is $1250 for a set of TEM air samples and $500 for a set of PCM air samples.

Unless determined otherwise by the Project Monitor, the Contractor shall assume that there will be a 24 hour waiting period between the application of a lock-down encapsulant and the Project Monitor conducting clearance air testing. The Contractor should plan on this delay in their scheduling of the work.

Waste Management

Please note that the Contractor must comply with Chabot College waste recycling policy. This policy is referenced in other contract documents. In summary, the Contractor will need to provide documentation to the Owner that non-contaminated construction debris is recycled when possible. **(see section 01 74 19 of specifications supplied by Steinberg) Also – all waste from this site must be manifested (hazardous or not). Manifests must indicate both weight and volume of various waste streams disposed of by remediation contractor.**

Contractor is responsible for cost of disposal of all waste generated by his work during this project. These costs include, but are not limited to, packaging, storage, hauling, disposal and disposal taxes for all types and forms of waste generated on this project by the remediation contractor.

Asbestos-containing floor tile and mastic may be handled as asbestos-containing non-hazardous waste as long as mechanical methods are not used to remove it and it is not contaminated by other asbestos containing materials. Should mechanical methods, such as blasting or buffers be used, the material shall be treated as an asbestos hazardous waste. Non-hazardous asbestos-containing waste must be labeled with the Cal/OSHA waste label before leaving the job site. Transite table tops may be handled as non-hazardous waste as long as they are not made friable during removal.

The gypsum board wall and ceiling systems are all being treated as containing an “add-on material” which triggers the material be treated as asbestos-containing hazardous waste. At a minimum, the waste must be double-bagged in containers of a minimum of six mil thick poly. The outer bag at least must be sealed in a “goose-neck” fashion. The containers must be labeled in accordance with hazardous waste labeling. Containers must be labeled before they leave the regulated area.

False ceiling panels and all TSI that contain asbestos are to be removed and disposed of as hazardous asbestos containing waste.

The Contractor may not allow both sides of an air lock curtain to be open at the same time during the entry/exit process for personnel or during waste load. For example, at no time may there be a tunnel-like opening through the chambers. The containerization process, waste load-out process, and labeling requirements for asbestos-containing non-hazardous waste are discussed in detail in Sections 17 and 18. The contractor must provide the Owner and/or Project Monitor with a minimum of 24 hour advance notice of the transportation of the waste. This is necessary in order for the Project Monitor to have time to inspect the waste to determine if it was packed properly. In general, the contractor must also notify the Owner a minimum of 24 hours in advance of the need for a signature on the hazardous waste manifest.

Hazardous waste cannot be transported without an authorized signature so it is the responsibility of the contractor to coordinate with the Owner the time waste transporters will need the signature. Delays

resulting from the failure of the contractor to obtain an authorized signature from the Owner will be the sole responsibility of the contractor, unless the Owner was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner.

Personal Air Sampling

The Contractor shall comply with the personal air sampling requirements of Title 8 Section 1529 and conduct air sampling on a representative number of workers and work activities during each shift. The results of these air samples and record keeping linking them to individual workers must be shared with the Owner at the conclusion of the project.

Personal Protection

The Contractor shall ensure that all employees entering the regulated work area are properly wearing respiratory protection and protective clothing in accordance with, or in excess of the requirements of Title 8 Section 1529.

Contractor must start this project wearing PAPR respirators. Air samples indicating exposures within containment are below the PEL on a daily basis – for a minimum of five working days – will allow the contractor to reduce personal protection to disposable coveralls and half mask respirators with HEPA cartridges.

Postings

The Contractor must post the Cal/OSHA specified signs identifying asbestos regulated areas at the entrance to the regulated areas. See Section 16.1.2 for additional information on the posting of regulated areas.

Worker Documents and Training and Certification

All those disturbing asbestos or supervising the disturbance of asbestos must be AHERA accredited as either a worker or supervisor. Workers will not be allowed into an asbestos-regulated area without currently valid proof of AHERA accreditation, a respirator fit test for the respirator they are wearing, and successful completion of an asbestos medical surveillance examination.

Prevailing Wage Requirements

The Contractor is fully and totally responsible at all times for compliance with payment of prevailing wage rates pursuant to provisions of the California Labor Code, for compliance with Division 2, Part 7, Chapter 1, California Labor Code, including but not limited to Section 1776; and for compliance with California Labor Code, Section 1777.5 for all apprentice occupations.

Part 1.5 - Sampling Results For This Site

The following paragraphs partially summarize the results of sampling done on this site by HMS, Inc.

Asbestos is in skimcoat and joint compound of all gypsum (drywall) materials within this building. All gypsum materials removed from this building will be disposed of as friable, hazardous asbestos containing waste. This includes drywall with wallpaper.

Asbestos is in both the floor tiles and mastic below.

Mudded thermal system insulation junctions contain asbestos.

Heat shields, if they exist, contain asbestos.

On the exterior of the building, the sealants and window putty contain asbestos. There is an asbestos-containing sealant between the concrete wall panels and at junctions of doors and windows.

The roofing materials are new and not expected to contain asbestos but they were not sampled. Roofing materials will be sampled by HMS, Inc. if they are to be disturbed during this project.

Transite table tops contain asbestos.

See attached Functional Space Notes – for a room by room breakdown of materials found during the asbestos inspection for this site. If materials other than those listed in the functional space notes, or the next paragraph, must be disturbed during this project, they must be handled as asbestos-c0ntaining materials until sampled and proven otherwise. If any such materials are discovered during the project, they must be reported to HMS, Inc.'s Project Monitor and Swinerton prior to their disturbance.

Materials that will, or may, be encountered on this project that are known to contain asbestos, nut which are not necessarily listed in the Functional Space Notes include:

- Asphaltic Moisture Barrier
- Heat Shields
- Floor Filler (this will be sampled by Project Monitor as it is exposed)
- Blackboard, ACT and tackboard mastics

SECTION 2. DEFINITIONS

Abatement - Procedures done to control fiber release from asbestos-containing materials or remove asbestos-containing materials from a building. Includes removal, encapsulation, enclosure, repair.

ACGIH - American Conference of Governmental Industrial Hygienists

AHERA - Asbestos Hazard Emergency Response Act

AIHA - American Industrial Hygiene Association

Air Filtration Unit or Device - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow into contaminated areas from adjacent uncontaminated areas. At a minimum, the air intake for the air filtration device, must have a pre-filter on it which can be changed within the containment area. In most cases, air filtration devices will need to pass challenge testing before they are allowed to be used on site.

Airlock - A system that permits the passage between a contaminated area and an uncontaminated area while allowing minimum air movement between the areas. Airlocks typically consist of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off before proceeding through the second doorway. This prevents flow-through contamination from one area to the other.

Air Monitoring - The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure normally utilized for asbestos follows the NIOSH Standard Analytical Method for Asbestos in Air P&CAM 239 or Method 7400. For clearance air monitoring, electron microscopy methods may be utilized for lower delectability and specific fiber identification.

Air Sampling Professional - The professional contracted or employed by the Owner to supervise and/or conduct air monitoring and analysis schemes. This individual, if qualified, may also function as the Asbestos Project Monitor. Supervision of air sampling and evaluation of results should be performed by an individual having specialized experience in air sampling for asbestos such as an individual certified in the Comprehensive Practice of Industrial Hygiene (C.I.H.), Certified Asbestos Consultant, Certified Site

Surveillance Technician, or others with equivalent experience in asbestos air monitoring. This individual shall not be affiliated in any way other than through this contract with the contractor performing the abatement work.

Ambient Air - The air outside the buildings and structures or the air as it normally exists in a space prior to abatement.

Amended Water - Water to which a surfactant has been added.

ANSI - American National Standards Institute

Asbestos - Means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite grunerite (amosite), anthophyllite, actinolite, and tremolite.

Asbestos-Containing Construction Material (ACCM) - Cal/OSHA term used to describe construction materials that contain asbestos in amounts greater than one-tenth of one percent (0.1%) either alone or mixed with fibrous or non-fibrous materials. With the exception of waste issues, for the purposes of this contract the terms ACM and ACCM shall be interchangeable.

Asbestos-Containing Material (ACM) - Cal/OSHA - Material composed of asbestos of any type and in an amount greater than one percent (1%) either alone or mixed with fibrous or non-fibrous materials.

Asbestos-Containing Hazardous Waste - Materials required by the State of California to be packaged, labeled, transported, and disposed of as an asbestos hazardous waste. This includes all friable asbestos-containing material over one-percent (1%) asbestos. This also includes all friable asbestos-containing material containing less than one-percent asbestos for which one or more bulk samples have not been point counted and found to contain less than one-percent (1%) asbestos.

Asbestos-Containing Waste Material - Asbestos-containing material or asbestos-contaminated objects requiring disposal.

Asbestos Project Management or Monitoring Firm – The firm hired by Owner to provide third-party oversight of the asbestos removal work performed on the Owner's property by the Contractor.

Asbestos Project Monitor - An individual qualified by virtue of experience and education, designated as the Owner's representative and responsible for overseeing the asbestos abatement project. This person is employed by or subcontracted to the Asbestos Project Management Firm.

ASTM - American Society for Testing and Materials

Authorized Visitor - The Owner (and any designated representative) and any representative of a regulatory or other agency having jurisdiction over the project.

Bidder - A duly licensed asbestos contractor who has submitted a bid. If a bid walk is mandatory, bidder must attend the walk in order for bid to be considered responsive.

Burrito Wrap Waste Container - Technique for wrapping large pieces of debris in a minimum of six-mil thick poly and sealing with tape to create a leak-tight container acceptable for OSHA and EPA NESHAP compliance purposes.

Cal/OSHA - California Division of Occupational Safety and Health. A California agency that implements and enforces numerous health and safety standards regarding asbestos.

Certified Asbestos Consultant: An individual certified by the State of California Division of Occupational Safety and Health as authorized by Section 7180 et. seq. of the Business and Professions Code.

Certified Asbestos Site Surveillance Technician: An individual certified by the State of California Division of Occupational Safety and Health as authorized by Section 7180 et. seq. of the Business and Professions Code.

Certified Industrial Hygienist (CIH) - An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

Challenge Testing - Process used to verify that HEPA-filtered equipment does not leak or exhaust asbestos fibers. Normally done by a testing company, not affiliated with the Contractor, and approved by the Owner and Project Monitor. Challenge testing normally uses an oil mist such as DOP as the challenge agent and measures how much, if any, of the agent is exhausted from the machine being tested.

Class I, II, III, or IV Work - Work classes described in 8 CCR 1529 that describe different levels of asbestos work.

Cleaning Barriers - Cleaning barriers are used in addition to critical barriers and are primarily to aid in the decontamination of the area after the completion of asbestos removal work. Cleaning barriers are normally comprised of plastic sheeting placed over non-asbestos-containing surfaces (e.g. wall, floors, ceilings, casework, etc...), and asbestos-containing surfaces in the regulated area that are not scheduled for removal.

Clean room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of workers' street clothes and clean protective equipment. The term also includes the uncontaminated area or room of a Waste Transfer Airlock.

Clear Skies and Favorable Weather Conditions - Terms used as a means of indicating favorable weather conditions particularly in regards to conducting work outside. These terms are not meant to imply that the sky must be clear and free of clouds, fog, or other meteorological conditions as long as those conditions are not reasonably expected or forecast to produce measurable amounts of rain.

Competent Person - The Contractor's employee who meets the requirements of and is responsible for the activities of the Competent Person as described in Title 8 CCR 1529. This includes but is not limited to an individual who has current AHERA Contractor/Supervisor accreditation, and who has the responsibility and authority to ensure that the Contractor's employees comply with the contract documents and all relevant Cal/OSHA regulations.

Containment - Isolation of the work area from the rest of the building to prevent escape of asbestos fibers.

Contractor - The Contractor is the person or entity identified as such in the Contract Documents as being responsible for the environmental work as done in response to and in accordance with this document. References to the "Contractor" include the Contractor's authorized representatives. The Contractor may be a sub-contractor to the Primary Contractor.

Contractor/Supervisor - A person who successfully completed an initial U.S. EPA and/or state-approved five-day AHERA-accreditation course, who has maintained that training through approved annual refresher training, and possesses current and valid AHERA-accreditation documentation as a AHERA-accredited Contractor/Supervisor.

Critical Barrier - Critical Barriers are used to restrict water and airflow. Critical Barriers are the barriers placed over openings in the walls and ceilings of a work area in order to ensure that airborne fibers cannot escape the work area via these openings. The Contractor will construct impermeable barriers at all exits or openings, including doorways, duct chases, mechanical shafts, elevator shafts, floor openings, drains, and the like, so that all possible exit or entrance routes are effectively barricaded and sealed.

Unless otherwise specified in these Specifications, critical barriers shall be constructed of at least one layer of six-mil thick poly.

Critical Barrier Negative Pressure Test - Required test for negative pressure with only critical barriers and air filtration units installed. This test must be conducted prior to the installation of cleaning barriers, but may be conducted with or without the decontamination unit in place.

Curtained Doorway - A device to allow passage from one room to another while permitting minimal air movement between the rooms. These are typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. Other effective designs are permissible as long as they are approved by the Project Monitor.

Decontamination Enclosure System - (Also known as Decon or Waste Transfer Decon.) A series of connected rooms, separated from the work area and from each other by airlocks, for the decontamination of workers, containers, and equipment. This unit shall be constructed with at least two layers of six-mil poly for the floors, walls, and ceiling. The floor of the dirty room shall consist of two layers of six-mil poly plus a third layer of poly, four-mil or thicker, to be used as a removable drop layer. Drop layer is to be removed as needed, but at least daily.

Demolition - The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations.

DOP - Dioctylphthalate particles, a testing agent for efficiency of filters.

DOT - Department of Transportation, a Federal agency which has regulations and labeling requirements for the transportation of hazardous waste.

DTSC - Department of Toxic Substances Control, a department within the California Environmental Protection Agency charged with implementing and enforcing hazardous waste regulations.

Dust or Debris - Any visible dust or debris remaining in an abatement area will be considered asbestos-containing residue.

Encapsulant, Bridging/Penetrating - A liquid material which can be applied to asbestos-containing material in order to control the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

EPA - U.S. Environmental Protection Agency, a Federal agency that developed and enforces various asbestos regulations.

Equipment Decontamination Enclosure System - That portion of a decontamination enclosure system designed for controlled transfer of materials and equipment into or out of the work area, typically consisting of a washroom and holding area.

Equipment Room - A contaminated area or room which is part of the worker decontamination enclosure system with provisions for storage of contaminated clothing and equipment.

Excursion Limit - Airborne concentration of asbestos as described in 8 CCR 1529.

Exterior of Containment HEPA Filtered Pressure Differential Unit - An air-purifying unit positioned outside, rather than inside the regulated work area. The face, or filter portion of the unit is integrated within the work area, and the remainder of the unit (housing, wheels, rivets, control panel, etc.) is located outside of the work area. This allows filters on the air intake to be changed from within the regulated area but access to the machine itself is available to those outside the area. Pressure differential units which

pass challenge testing across the HEPA filter, but fail at rivets, control panels, wheels, etc. may be used in this fashion as long as the failure point of the unit can remain on the exterior of containment while the face of the unit and filters are inside containment.

Facility - Any institutional, commercial or industrial structure, installation, or building.

Facility Component - Any pipe, duct, boiler, tank, reactor, turbine, or furnace at or in a facility or any structural member or a facility.

Federal OSHA or OSHA - Federal Occupational Safety and Health Administration.

Fixed object - A piece of equipment or furniture in the work area which cannot be removed from the work area, or is determined by the Owner not to be removed from the work area.

Friable asbestos - Asbestos-containing material which, when dry, can be crumbled to dust with hand pressure.

Full Regulated Area or Sign - An area where Class I, II, or III work will take place, and where airborne exposure to asbestos is expected to or may exceed the PEL or Excursion Limit. This area must be posted with an OSHA-approved sign stating: DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD. AUTHORIZED PERSONNEL ONLY. RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA.

Glovebag Technique - A method with limited applications for removing small amounts of friable asbestos-containing materials from ducts, short piping runs, valves, joints, elbows, and other non-planar surfaces. The glovebag assembly is a manufactured or fabricated device consisting of a glovebag (typically constructed of six-mil transparent polyethylene or polyvinylchloride plastic), two inward projecting long sleeves, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. All workers who are permitted to use the glovebag technique must be highly trained, experienced and skilled in this method. All techniques and procedures employed by the contractor shall be approved by the Project Monitor. Glovebags must meet the specification requirements for glovebags as listed in 8 CCR 1529.

Gooseneck Seal - Method of sealing waste bags which is required for bags containing asbestos hazardous waste. The method involves tightening the top of the bag and twisting it. Then, while twisted, the top of the bag is bent over on itself and the two sides taped together tightly in order to create a leak-tight seal.

HMS, Inc. - Hazard Management Services Inc. This is the Asbestos Project Monitoring/Management Firm for this project, and is the employer of the Project Monitor used on this project.

HVAC - Heating, ventilation and air conditioning system.

HEPA Filter - A high efficiency particulate air filter capable of removing particles 0.3 microns in diameter from an air stream with 99.97% efficiency.

HEPA Vacuum - A vacuum system equipped with HEPA filtration.

Holding Area - A clean space where clean supplies and equipment are stored before being placed into containment. Also, a contaminated space, adjacent to a shower or equipment washing chamber, where dirty equipment or packaged waste is stored prior to removal from containment.

Local NESHAP Authority - The local agency, where the work will be conducted, that implements and enforces their version of the NESHAP regulation. This typically will be an air quality management district or an air pollution control district.

Lock-down - To mist the air and to wet surfaces with an agent designed to bind asbestos fibers together and adhere them to surfaces.

Magnehelic Gauge - See manometer.

Manometer - Instrument for measuring the static air-pressure differential across a barrier. Unless stated otherwise in these specifications or approved by the asbestos project monitor, the manometer must be operating continuously from the start of disturbance of asbestos until the work is determined completed by the asbestos project monitor (normally following the successful completion of clearance air testing.) Unless stated otherwise, the manometer must be a recording manometer. Circular recording charts are preferred over strip chart recorders. Strip chart recorders are allowed but the Contractor must provide the strip chart printouts in chronological and date order, taped to 8" by 11" stationary in a format ready for photocopying.

Mil - Term used to measure the thickness of plastic sheeting (poly).

Mini-Enclosures - Mini-enclosures may be used where glovebags are not feasible or when in the judgment of the asbestos project monitor, they are an appropriate containment option for the disturbance of asbestos. Mini-enclosures shall be constructed of a minimum of six-mil thick poly (attached with tape and/or glue to walls and floors) and shall be small enough for only one or two workers. When appropriate, the asbestos program monitor may require an enclosed change room adjacent to the mini-enclosure work area in order for the worker to change out of protective clothing without risking contamination of adjacent spaces.

Movable Object - An unattached piece of equipment or furniture in the work area which can be removed from the work area.

Negative Air Machines - See Air Filtration Units or Devices

NVLAP - National Voluntary Laboratory Accreditation Program.

NESHAP - The National Emissions Standards for Hazardous Air Pollutants

NIOSH - The National Institute for Occupational Safety and Health

Non-Regulated, Non-Hazardous, Asbestos-Containing Waste - Waste containing less than one percent asbestos, as proven by point-counting that is not regulated under the U.S. EPA NESHAP regulation and will be disposed of as asbestos-containing, non-hazardous waste.

On-site Project Monitor - See Asbestos Project Monitor.

OSHA - Occupational Safety and Health Administration

Outside Air - The air outside buildings and structures.

Owner - Property owner where the disturbance of asbestos will take place. For example, this may be a private building owner or manager, a government body such as a city or county agency, a military base, or a school district. This includes the Owner's authorized representatives and employees.

Partial Regulated Area or Sign - An area where Class I, II, or III work may take place, but where airborne exposure to asbestos is considered very unlikely to exceed the PEL or Excursion Limit. This area must be posted with an OSHA-approved sign stating: DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD. AUTHORIZED PERSONNEL ONLY. (This area does not require wearing of respirators and protective clothing.)

PCM - Phase contrast microscopy according to NIOSH Method 7400.

Permissible Exposure Limit (PEL) - Airborne concentration of asbestos as defined in 8 CCR 1529.

Poly - Flame-retardant polyethylene sheeting used to seal critical barriers, create cleaning barriers and drop clothes, and to protect surfaces from damage or contamination.

Pressure Differential Unit (PDU) - See Air Filtration Unit or Device

Primary Contractor - The Contractor may not work directly for the Owner but instead subcontract with another contractor such as a general contractor or demolition contractor. The Primary Contractor is the entity responsible for hiring the Contractor.

Pre-start Meeting - Meeting held before the beginning of the project in which final details of the project are discussed and Contractor provides project monitor with pre-job submittal packet.

Prior Experience - Experience required of the contractor on asbestos projects of similar nature and scope to ensure capability of performing the asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

Project Monitor - See asbestos project monitor.

Project Monitoring - Activities undertaken by the Asbestos Project Monitoring Firm done for the purpose of monitoring the work done by the Contractor on this project.

Regulated Area - An area established by a Contractor to demarcate areas where Class I, II, or III work will be performed or airborne concentrations of asbestos exceed, or may exceed the permissible exposure limit. Additionally, "Regulated Area" means any measure used to restrict access to an area where personnel impacting asbestos-containing materials are required to wear respiratory protection and/or protective clothing by the project specifications regardless of airborne asbestos concentration levels.

"Regulations" - Shall include but are not be limited to:

a. U.S. Environmental Protection Agency Regulations for Asbestos (Title 40, Code of Federal Regulations, Part 61, Subparts A & B)

b. Title 8, Chapter 4, Subchapters 1 through 21, California Administrative Code,

c. General Industry Safety orders, Section 5208 "Asbestos" or the applicable sections of the Federal Asbestos Regulations.

d. Cal/OSHA Construction Safety Orders, Section 1529 "Asbestos Standard for the Construction Industry" or the applicable sections of the Federal Asbestos Regulations.

e. "Asbestos Hazard Emergency Response Act", U. S. Environmental Protection Agency, 40 CFR, Part 763. Final Rule and Notice.

f. Applicable local county air pollution control district or air quality management district regulation applicable for compliance with NESHAP.

g. Local codes and ordinances relevant to construction or environmental work.

h. All other codes and ordinances governing the work as described in these specifications.

Regulated Asbestos-Containing Material (RACM) - Materials that meet the local enforcement agencies' definition of Regulated Asbestos-Containing Materials (RACM) for NESHAP compliance purposes. Normally this will include all friable materials, or materials made friable by the activity conducted, that contain more than one percent asbestos as determined by the Polarized Light Microscopy Method (PLM) or materials that contain less than one percent asbestos unless the materials has been proven to contain less than one percent by the point-counting technique.

Removal - The stripping of any asbestos-containing materials from the surface of or the components of a facility.

Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.

Scope of Work - Job specific information and specifications used in combination with these Asbestos General Requirements. If conflicts exist, the stricter requirement will be enforced unless the conflict is specifically addressed in writing.

Shower Room - A room between the clean room and the equipment room in the decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination. Unless specified elsewhere in these specifications, or determined otherwise by the program monitor, the shower shall be on a metal pan to contain water splashed, leaked or spilled out of the shower unit.

Specifications - These written requirements describing procedures the Contractor must follow for this project.

Staging Area - The secured area outside of containment where clean equipment and supplies are stored. Waste must not be stored within the staging area unless placed within an additional lockable container or area approved by the on-site Project Monitor.

Strip - To take off asbestos materials from any part of a facility.

Structural Member - Any load-supporting member of a facility, such as beams and load-supporting walls or any non-load-supporting member, such as ceilings and non-load supporting walls.

Submittals - Pre-construction, interim construction, and post construction documents submitted by the contractor to the Owner as indicated in General Requirements and bidding requirements.

Supervisor - Contractor's on-site supervisor. This person shall meet the requirements of the Competent Person, as required by Cal/OSHA 8 CCR 1529. (See Competent Person.)

Surfactant - A chemical wetting agent added to water to improve penetration.

TEM - Transmission Electron Microscopy

View Ports - Clear windows into the regulated work area that allow authorized persons to view work activities inside the regulated area without entering the area. The view ports must be of sufficient number, constructed of materials of sufficient clarity, and be located in areas determined and/or approved of by the Project Monitor. All regulated work areas including mini-enclosures will require view ports unless specifically determined not to be feasible by the Project Monitor.

Visible Emissions - Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

Waste Load-out/Transfer System - A decontamination system utilized for transferring containerized waste from inside to outside of the work area. A series of connected rooms used for the load-out of asbestos-containing materials that have been properly containerized. The waste load-out chamber

system shall normally consist of three connected chambers adjacent to the work area. Each chamber shall be constructed with at least two layers of six-mil thick poly for the floors, walls, and ceiling. The chamber located closest to the work area is known as the dirty chamber, and in addition to the two layers of six-mil thick poly on the floor, shall also have a third layer of poly, four-mil or thicker, to be used as a removable drop layer. The drop layer is to be removed as needed but at least daily. The chamber located closest to the outside the work area is known as the clean chamber.

Waste Bags - Waste bags for asbestos-containing waste must, at a minimum, be a minimum of six-mil thickness. In general, double bagging will be required. Asbestos-containing hazardous waste bags must have a gooseneck-type seal. If the waste is double-bagged, only the final seal must be of the gooseneck type.

Waste Containers - Waste containers are the containers into which asbestos-containing waste is placed. They may be bags of at least six-mil thickness, metal or fiber barrels, or other containers such as cardboard boxes approved by the Project Monitor. The Contractor is responsible for assuring that the type of container chosen is acceptable to the waste landfill to which the waste will be transported. Waste containers must be labeled according to the requirements of the California Department of Occupational Safety and Health (Cal/OSHA), Department of Toxic Substances Control (DTSC), Department of Transportation (DOT), and the Environmental Protection Agency (EPA).

Waste Transfer Airlock - A decontamination system utilized for transferring containerized waste from inside to outside of the work area.

Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

Work Area - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area which has been sealed off from adjacent areas.

Work Plan - Contractor's written plan describing how the Contractor will perform the work in compliance with these specifications. The work plan shall include information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. It will also list decontamination procedures for personnel, work area and equipment, abatement methods and procedures, required air monitoring program, procedures for handling and disposing of waste materials and procedures for final decontamination and clean up.

Worker - A person who successfully completed an initial U.S. EPA and/or state-approved four-day AHERA-accreditation course and who has maintained that training through approved annual refresher training, and possesses current and valid AHERA-accreditation documentation as an AHERA-accredited asbestos worker.

8 CCR 1529 - Chapter 8 of the Labor Code, California Code of Regulations, Section 1529: Asbestos Standard for the Construction Industry. Should the work covered by this specification be covered by Federal OSHA, then the citation is 1926.1101.

8 CCR 5144 - Chapter 8 of the Labor Code, California Code of Regulations, Section 5144: Respiratory Protection Standard.

SECTION 3. NOTIFICATIONS, SUBMISSIONS, POSTINGS

Part 3.1 - Notification

Prior to beginning work, the Contractor shall send all required notices of the work to be completed to the agencies listed below with a copy of each to be provided to the Owner and/or Project Monitor. This notice should be provided no later than the pre-start meeting.

i. NESHAP Compliance Notification: Send to the appropriate local air district responsible for NESHAP compliance and enforcement.

j. Cal/OSHA Disturbance of Asbestos Notification: Send to the appropriate local office of Cal/OSHA.

These notices shall include, at a minimum, the name and address of the Contractor, the name and address of the work site, the type of work to be done including the percent asbestos content of the material, the methods used to prevent migration of the fibers, personal protective measures, the number of workers involved, any union representation of the workers and the methods of disposal including the names and EPA numbers of both the certified hauler and the waste disposal site. The notices shall also include start and finish dates. Changes in start and completion dates shall be reported immediately to the proper agency. Use forms provided by agency whenever possible.

Unless stated elsewhere in these specifications, the Contractor is responsible for complying with required notifications, paying fees associated with those notifications, and must meet all notification time frames as determined by these regulatory agencies. Delays resulting from the failure of the Contractor to adequately notify these agencies in the appropriate time frames will be the sole responsibility of the Contractor.

Part 3.2 - Pre-Construction Submittals

The following items must be submitted to the Owner and/or Project Monitor a minimum of five days before work is allowed to begin that disturbs asbestos.

3.2.1 - Proof of Basic Qualifications

The following items must have been provided at the time of bid award. However, even if already submitted, the Contractor must again submit these documents with this submittal package in order to have all documents in one package.

a. Successful asbestos abatement contractor shall submit a certificate of general liability insurance protecting against liability for bodily injury and property damage arising from the asbestos abatement contractor's activities under this contract.

Such certificate of insurance must contain the following provisions:

1. The limit of liability shall not be less than $1,000,000.00 per occurrence for bodily injury and property damage liability combined.

2. The Owner, Owner's Agents, and Hazard Management Services, Inc. (HMS, Inc.) must be named as additional insured, but only in respect to liability arising or resulting from activities under this contract.

3. In the event of cancellation of the insurance policy, the Owner shall be given thirty days advance written notice.

4. The insurance certificate must state that the insurance includes liability coverage for asbestos abatement work.

b. The asbestos abatement contractor shall be duly licensed in the State of California with the Contractors State License Board (CSLB) in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code, as amended. This includes certification for asbestos-related work, and all other trades or work required under this contract and within these specifications.

c. In addition, the Contractor must be currently registered with the Cal/OSHA Contractors' Asbestos Registration Unit and be approved to disturb more than 100 square feet of asbestos-containing construction materials.

d. The asbestos abatement contractor shall submit a statement, signed by an officer of the company, containing the following information:

1. A record of any citations issued by Federal, State, or Local regulatory agencies within the last 3 years, relating to asbestos abatement activity. Include projects, dates, and resolutions.

2. A list of penalties incurred through non-compliance with asbestos abatement project specifications, including liquidated damages, overruns in scheduled time limitations, and resolutions.

3. Situations in which an asbestos-related contract has been terminated including projects, dates, and reasons for terminations.

4. A list of any asbestos-related legal proceedings/claims in which the Contractor (or employees scheduled to participate in this project) has participated or is currently involved. Include descriptions of role, issue, and resolution to date.

3.2.2 - Pre-Start Work Submittals

k. Submit copies of notifications to government agencies. For example, ten-day in advance NESHAP notification, Cal/OSHA notification to disturb asbestos, possible Cal/OSHA lead notification if 1532.1(p) is relevant.

l. Submit proof satisfactory to the Owner that required permits have been acquired applicable to the project being performed and specific to the project site and location. If no city, county, or other permits for parking, waste bin location, or variances for scheduled work hours are required, this should be stated in writing and submitted to the Owner.

m. Submit Subcontractors' information or statement that subcontractors will not be required or used during this project. This statement should also include that if it becomes necessary to use a subcontractor during this project that subcontractor will not be allowed to perform work until all required documentation has been submitted for review by the Owner and/or the Project Monitor and the Contractor receives written approval for use of the subcontractor on this project.

n. Submit a complete list of all rented equipment, or equipment expected to be rented from an outside contractor for use in Regulated Areas, or where the equipment may be exposed to elevated levels of airborne asbestos. If no equipment is to be rented, a statement should be submitted stating no rental equipment will be used on the project. The statement should also include that if it becomes necessary to use rented equipment, written statements from each rental company will be provided to the Owner prior to its use. The statements from the rental company shall indicate the rental company's acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos may be present.

o. Submit non-emergency telephone numbers, other than 911, for the appropriate Police, Sheriff,

and Fire Departments. This list of numbers shall also include the name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor.

p. Submit detailed written directions from the project site to the medical facility to be used in case of an emergency. Also include a map which sufficiently shows the route to be taken from the site to the designated medical facility.

q. Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

r. Submit detailed work plan information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. Also list decontamination procedures for personnel, work area and equipment, abatement methods and procedures, required air monitoring program, procedures for handling and disposing of waste materials and procedures for final decontamination and clean up.

s. Submit a detailed work schedule. The schedule shall have, as a minimum, the work area and the day/month for beginning and terminating work in each work area. During progress of work, it shall be the Contractor's responsibility to keep the schedule current and up to date.

t. Submit documentation satisfactory to the Owner that the Contractor's employees, including foremen, supervisor, and any other company personnel or agents who may be exposed to airborne asbestos fibers or who may be responsible for any aspects of abatement activities, have received required US EPA AHERA training. This shall normally be proof of current and valid AHERA accreditation.

u. Submit documentation from a physician that all employees or agents of the Contractor who will enter Regulated Areas have completed an asbestos medical surveillance examination as described in 8 CCR 1529 and have been approved to conduct work involving asbestos. This examination shall include documentation that the workers or agents of the Contractor may work while wearing respirators. Asbestos medical surveillance and respirator approval must be currently applicable as described in 8 CCR 1529. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g., high temperatures, humidity, chemical contaminants) that may impact on the employee's ability to perform work activities.

v. Submit documentation of respirator fit-testing for all the Contractor’s employees and agents who must enter a Regulated Area. Fit testing shall be in accordance with qualitative or quantitative procedures as required by 8 CCR 5144.

w. Submit copy of waste transporter’s Department of Toxic Substances Control, Hazardous Waste Transporter Registration if hazardous asbestos-containing waste is to be removed during the project. If hazardous asbestos-containing waste will not be generated, submit the name, address, and registration information for the waste hauler to be used for transporting the waste.

x. Submit documentation listing the name and site address of the waste facility designated to receive asbestos-containing waste generated during this project. This documentation shall also include the EPA Identification number, and a copy of the current permit authorizing the waste facility to accept and dispose of asbestos-containing waste.

y. Submit Material Safety Data Sheets (MSDS) for any and all applicable materials, supplies, etc. These documents must be legible and completely reveal information required to be communicated to the Contractor’s employees, visitors, and representatives of the Owner.

z. Submit manufacturers' certifications that high efficiency particulate air (HEPA) vacuums, pressure

differential units and other local exhaust ventilation equipment conform to ANSI Z9.2-79.

aa. Name and contact information of independent testing company who will challenge test all vacuums and air filtration devices used on this project (in interior spaces).

bb. Submit name of laboratory/person to be used for Phase Contrast Microscopy (PCM) analysis and copy of current NVLAP Certificate of Accreditation (if applicable), and most recent NIOSH Proficiency Analytical Testing Program results.

cc. Submit a written statement that personal air sampling will be conducted according to the requirements of 8 CCR 1529. This statement must be on the Contractor's company letterhead, dated, include name of the site or project being worked on, and signed by an authorized agent of the Contractor performing the asbestos-related work.

dd. Submit manufacturers' documentation pertaining to the capability of waste water filters to filter particles of 5.0 micron in size.

The above-listed documents must be provided a minimum of five working days prior to the start of work that will disturb asbestos. Exceptions will be made for individual worker and supervisor documentation of training, medical approval, and respirator fit test since we recognize the Contractor may not know the identity of those individuals five working days in advance. However, under no circumstances will workers or supervisors be allowed to work on this project prior to the receipt of this documentation by the Owner and/or Project Monitor. In addition, the five-day in advance documentation will not be enforced for rental equipment, but must be provided before the equipment may be used in a regulated area. All delays resulting from the failure of the Contractor to provide this information in the required time frame is solely the responsibility of the Contractor and/or subcontractor.

Part 3.3 - Submittals During the Work Process

The following items are to be submitted to the Owner or Project Monitor on a daily or weekly basis as determined by the Project Monitor.

ee. Copies of work site entry/exit logs as well as information on worker and visitor access.

ff. Copies of job progress reports and project documentation. This must include the names of all employees on site, the hours worked and a brief description of the work completed at the site(s).

gg. Copies of results of air sampling data collected during the course of the abatement including OSHA compliance air monitoring results. Contractor shall submit sample results within 24 hours of collection of the samples for samples to be considered valid indicators of employee exposures within containment. Lack of valid exposure assessments may, at on-site Project Manager's discretion, result in the contractor being required to raise worker personal protection levels.

hh. Copies of on-site safety meeting documentation. Each safety meeting must be signed by all employees working on the project for that week.

ii. Copies of air-differential manometer graphs and HEPA filter change logs. Recordings must be organized in a fashion that can be photocopied. Circular chart recorders are preferred but strip charts will be accepted so long as they are taped in dated, chronological order on 8"x 11" paper and ready for photocopying. Contractor will not be in compliance with this contract unless the strip charts are presented in this format, or another format approved by the project monitor. Should the recording system fail for any reason, the contractor shall immediately begin a written log of the pressure and record the pressure at least every 30 minutes. This log must be submitted along with the manometer print out records. A written log is not an acceptable alternative for a

recording manometer. The log may only be used during temporary breakdowns of the recording system.

jj. Copies of all transport manifests, trip tickets, weights and disposal receipts as applicable for all asbestos waste materials removed from the site during the abatement process.

kk. Copies of current insurance certificates, notifications, worker documentation, etc. if these items expire during the course of the project.

Submit upon request during or after completion of the project, all other documentation deemed by the Owner to be pertinent to the project.

Part 3.4 - Clean-Room Area Postings and Documentation

The following items shall be posted near the entrance to the regulated work areas where respiratory protection or protective clothing is required by this Specification. These items must be posted near the work area. They may not be kept in a vehicle or storage area away from the work area.

ll. A Cal/OSHA Information poster and a Cal/OSHA Construction Site poster.

mm. A copy of the CAL-OSHA asbestos and lead notifications and, if required, the NESHAP notification to the local air district.

nn. Non-emergency telephone numbers, other than 911, for the appropriate Police, Sheriff, and Fire Departments. This list of numbers shall also include the name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor. Detailed written directions from the project site to the medical facility to be used in case of an emergency. Also a map which sufficiently shows the route to be taken from the site to the designated medical facility.

oo. Written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

pp. Entry/exit log for work performed in all regulated work areas.

qq. Copies of Material Safety Data Sheets (MSDS) for all materials on-site.

rr. Asbestos regulated area sign that meets the requirements of 8 CCR 1529 (k)(7)(A, B, C). Only persons authorized by the Contractor, Owner, or Project Monitor will be allowed inside the regulated area and then only while wearing appropriate personal protective clothing and equipment.

The following items shall be in the possession of the Contractor's supervisor at each job site. These items must be at the job site and readily available to the Project Monitor. They may, however, be stored in a vehicle or on site storage area.

ss. All contract specifications to include change orders, etc.

tt. Signed statement by Contractor's competent person that he or she has read and understands the specifications and will comply with the Cal/OSHA list of competent person responsibilities as listed on the form as repeated from 8 CCR 1529 and 1532.1.

uu. Written Injury and Illness Prevention Program. (Only the components relevant to asbestos, lead, safety hazards and other aspects relevant to this project need to be at the site.)

vv. Written Respiratory Protection Program.

ww. An updated list of all contractor employees who have worked on this job.

xx. Documentation of training necessary for this project.

yy. Medical surveillance records that document compliance with the requirements for this project.

zz. Respiratory fit test records for all contractor employees

Part 3.5 - Project Close-out Documents

Contractor shall submit post-construction submittals to the Owner or the Project Monitor within thirty days of the completion of asbestos-related work. This documentation shall include, at a minimum, any and all applicable documents as outlined in Part 3.2 and Part 3.3 of this Section.

In addition, the contractor shall provide the Owner in writing a list of materials known to contain asbestos that were left in the work area. For example, if the contractor was not able to access certain materials, or asbestos-containing materials exist in the work area but were not part of the contractor's scope of work, the Contractor must provide that information in writing within thirty days.

SECTION 4. SITE SECURITY

The Regulated Area is to be restricted to authorized, trained and protected personnel. Authorized persons shall include the employees of the Contractor, the employees of the Asbestos Project Management Firm, and others approved by the Project Monitor and/or Owner who meet the training, medical approval, and respirator requirements to enter the area.

Contractor shall report to the Owner immediately entry into the work area by unauthorized individuals.

A Regulated Area Entry/Exit log shall be maintained during the project. Anyone who enters the Regulated Area must record name, affiliation, time in, and time out for each entry.

Access to all Regulated Areas shall be through a designated entry point. All other means of access (doors, windows, hallways, etc.) shall be blocked or locked so as to prevent entry to or exit from these areas. The only exceptions for this rule are the waste pass out air-lock, and emergency exits in case of fire or accident.

Emergency exits shall NOT be locked. However they shall be sealed with polyethylene sheeting and tape until needed. All emergency exits shall be clearly designated. They shall also have a razor knife permanently in place to facilitate emergency exit.

Contractor should have control of site security during abatement operations in order to protect work efforts and equipment. During off-hours access to the abatement area shall be restricted by a lockable, burglar-resistant entry. The Contractor is responsible for developing the decontamination chambers, clean room, establishment of air purifying machines, location of manometer, and equipment storage in a manner that will ensure that they are secure from theft during off work hours. This will normally require the Contractor to erect burglar resistant barriers or locking devices on this equipment.

Contractor will have the Owner's assistance in the enforcement of restricted access by the Owner's employees.

Storage of debris will be such that access to it is limited to the Contractor. Lockable bins shall be utilized and they shall be locked at all times except when loading occurs. No soft covers will be allowed for any storage containers. When a container with rolling tops is being used, all access points to the interior of the container must be secured by the Contractor with locks of sufficient strength to require special effort to gain access to the interior of the waste container.

SECTION 5. EMERGENCY PLANNING

Emergency planning and procedures shall be developed by the Contractor prior to the start of work and agreed to by the Owner. These emergency procedures shall be established and presented to all employees and the Owner prior to the beginning of any work. A written emergency plan shall be posted or in the possession of the on-site supervisor for the Contractor regardless of the work being performed.

Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, and heat related injury. A copy of the written Injury and Illness Prevention Program shall be posted or in the possession of the on-site supervisor for the Contractor regardless of the work being performed.

Employees shall be trained in evacuation procedures in the event of workplace emergencies. Telephone numbers of all emergency response personnel shall either be in the possession of the on-site supervisor, or be prominently posted in the clean change area and equipment room, along with the locations of the nearest telephone indicated on a map or diagram.

The Contractor must provide special on-site training on equipment and procedures unique to this job site. The Contractor must provide training in emergency response and evacuation procedures unique to this job site.

At least two fire extinguishers shall be present on site and in close proximity to the work being performed regardless of the type of work being conducted. At least one fire extinguisher shall be present outside of any containment. Additional extinguishers shall be distributed according to Cal/OSHA requirements or as identified in this Specification.

When open abatement is being performed in large areas where communication with distant workers may be difficult, the Contractor must have a means of providing immediate notice to all those in the area in case of the need for an emergency evacuation. For example, an emergency blast horn (canned air horn) may be utilized for this purpose.

When open abatement is being performed in large areas where communication with distant workers may be difficult, the Contractor must develop a means of communication acceptable to the Project Monitor. This may include the use of radios or other communication devices approved by the Project Monitor.

The Contractor shall pay special attention to the possibility of heat stress and burns during hot working conditions, such as in an attic space during summer, or in work areas where live steam or hot water lines are exposed. The Project Monitor may make recommendations for work breaks for employees, but the supervisor is ultimately responsible for his or her workers. However, the Project Monitor has the authority to stop work and require work breaks if in his or her judgment the Contractor is jeopardizing the health of the workers in the Regulated Area.

SECTION 6. PRE-CONSTRUCTION MEETING

A pre-construction meeting will be held at a time and location to be determined by the Owner. The Primary Contractor, the Contractor, as well as if at all possible, the Contractor's on-site supervisory personnel, representatives of the Owner and the Asbestos Project Management Firm and other individuals as necessary shall be present at this meeting.

At this meeting the Contractor shall provide all required submittals, as indicated above in Section 3, Part 3.2. The Contractor shall submit these documents along with a signed copy of the submittal checklist as supplied in these specifications.

SECTION 7. WORK SITE FACILITIES

Unless specified elsewhere in these specifications, the Owner shall provide sanitary facilities for abatement personnel outside of the enclosed work area. To use these facilities all workers shall wear normal street clothes, not bathing suits or protective clothing.

Unless specified elsewhere in these specifications, the Owner shall provide water for construction purposes. Contractor shall connect to the existing Owner's system.

Unless specified elsewhere in these specifications, the Owner shall provide the electrical source.

Unless specified elsewhere in these specifications, the Owner or its representative shall specify the waste water discharge location and location of waste bins.

Unless specified elsewhere in these specifications, the Owner shall specify on-site parking areas, if available, and access to the site.

SECTION 8. Work Schedule

The Contractor shall schedule work as required to meet the needs of the project.

However, unless stated otherwise in these specifications, the Project Monitor must be notified at least 48 hours in advance of the Contractor starting work. Providing less notice may result in the work not being allowed to proceed.

In addition, should the Contractor wish to change the original work schedule as approved by the Project Monitor, such as to work longer than ten hours, work on weekends, holidays, or evenings/nights or implement another significant change in hours, the Contractor must submit a written request to the Project Monitor at least 48 hours prior to the Contractor wishing to implement the change. If 48 hours notice is not given, the work shift may be canceled by the Owner and/or Project Monitor.

The Owner and/or Project Monitor reserves the right to deny any changes in the work schedule.

Unless stated otherwise in these specifications, if the Contractor wishes to work more than five days a week, or more than eight hours a day, the Contractor becomes responsible for costs incurred by the Owner to cover the extended hours. At no time shall a work shift extend beyond 12 hours in a day.

SECTION 9. PATENTS

The Contractor shall pay all royalties and license fees required for the performance of the work. The Contractor shall defend suits or claims resulting from contractor's or any subcontractor's infringement of patent rights and shall indemnify the Owner and Hazard Management Services, Inc. (HMS, Inc.) from losses on account thereof.

MATERIALS AND EQUIPMENT

SECTION 10. CONSUMABLE MATERIALS

Warning signs and tape signs as required by OSHA shall be provided and posted per regulations.

Deliver all consumable materials in the original packages, containers or bundles bearing the name of the manufacturer and brand name (where applicable). These must be approved by the Owner. For example, this includes polyethylene (poly) sheeting, of appropriate thicknesses for walls, floors, and ceilings, and which is sized to minimize the frequency of joints.

All poly shall be flame-retardant. This includes all poly used on this project regardless of whether it is used inside or outside of buildings.

Poly sheeting utilized for the worker decontamination enclosure shall be opaque white or black in color and each layer shall be a minimum of six-mil thick. At least two layers shall be required. Modesty barriers are to be erected whenever and wherever the Contractor and/or the Project Monitor determine one is needed.

Disposal bags shall be constructed of at least six-mil thick poly. Unless stated elsewhere in these specifications, or determined otherwise by the Project Monitor, all asbestos-containing waste shall be placed in a minimum of two waste bags. Disposal drums may be metal or fiber board with locking ring tops and may be used only if required and/or allowed by the selected waste facility. Other containers, such as cardboard boxes, may be used only if approved by the Project Monitor. All waste containers must be considered “leak-tight” and in compliance with the local NESHAP authorities’ requirements for packaging and must be acceptable to the landfill to which the waste will be transported.

Contractor shall label each waste container according to the proper requirements for that waste. Waste bags must be individually labeled if they contain Regulated Asbestos Containing Waste and are not put into an approved secondary container such as a drum or box for transport to the waste hauling container (dumpster or truck). Bags put into secondary containers do not need to be labeled as long as the drum or box is properly labeled. Burrito wrapped containers of Regulated Asbestos Containing Waste must be individually labeled.

Waste bags or drums containing non-regulated, non-hazardous asbestos-containing waste need to be labeled in a manner that meets OSHA requirements and properly informs transport workers and landfill workers that the material contains asbestos. All such containers when stored outside the regulated area or in the waste transport vehicle (dumpster or truck) must be labeled individually or be covered with a sealed layer of poly that is labeled properly and easily visible to those encountering the packaged material. For example, leak-tight bags, barrels, or burrito-wrapped containers of non-regulated, non-hazardous asbestos containing waste such as gypsum-board with asbestos-containing joint compound may be covered with a sealed layer of poly in the storage area or in the dumpster and that layer of poly must be properly labeled with the OSHA-required asbestos waste labels.

Part 10.1 - Amended Water

When amended water is required by these specifications or by OSHA regulations, the Contractor must use a product designed for use on the type of asbestos the Contractor will be disturbing. The name and MSDS for the product must be given to the Owner and/or Project Monitor in the pre-start submittal package. The Contractor may not use products not approved by the Project Monitor. The Contractor must then follow the manufacturer’s directions for use of the product.

Part 10.2 - Air Filtration Devices and Vacuums

The Contractor must supply a sufficient quantity of air filtration devices to obtain the negative air pressure differential and air exchange rates required by this specification. Each air filtration unit shall be equipped with HEPA filtration and operated in accordance with ANSI Z9.2-79 and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, Appendix F: Recommended Specifications and Operating Procedures for the Use of Negative Pressure Systems for Asbestos Abatement. All HEPA filtration equipment used on this site must arrive on site sealed and free of debris and the filters must be sealed with a minimum of one layer of six-mil poly. Prior to use on this project, unless specified elsewhere in these specifications or determined otherwise by the Project Monitor, all units must be challenged tested as described later in these specifications.

The Contractor shall provide a sufficient supply of HEPA-filtered vacuum systems. All vacuums used on this site must utilize HEPA filtration. All HEPA filtration equipment used on this site must arrive on site sealed and free of debris and the filters and hose must be sealed with a minimum of one layer of six-mil poly. Prior to use on this project, unless specified elsewhere in these specifications or determined otherwise by the Project Monitor, all units must be challenged tested as described later in these specifications.

Part 10.3 - Ladders, Scaffolds, Man Lifts, Other Tools, Etc.

A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed. Rubber dustpans and rubber squeegees shall be provided for clean up. Electrical tools, cords, ground fault circuit interrupters, and other equipment must be inspected by the Contractor and comply with all OSHA requirements for use. The Project Monitor may require the use of additional equipment if he feels the number or amount of certain items or materials is not sufficient.

All equipment must be used in a safe manner, in compliance with applicable OSHA regulations, and in the manner designed by the manufacturer. The safe use of equipment by the Contractor's employees is the responsibility of the Contractor. However, should the Project Monitor determine that equipment is not being used safely or in compliance with applicable regulations, the Project Monitor may stop work until the Contractor's employees follow the appropriate safety precautions.

The decision of the Project Monitor regarding the safe use of equipment shall be final.

The Project Monitor must be informed 24 hours prior to the delivery of any rental equipment.

Part 10.4 - Respirators and Protective Clothing

An adequate number of respirators for the work force shall be on hand. These respirators will include, when specified:

a. Supplied Air Respirators (SARs) operated in positive pressure or pressure demand mode with full face pieces and P-100 (HEPA) filtered disconnects.

b. Powered-Air-Purifying respirators (PAPR) with P-100 (HEPA) filters, full face piece.

c. Half mask or full face air-purifying respirators (APR) with P-100 (HEPA) filters.

All respirators shall be NIOSH-approved and be equipped with supplies for immediate replacement of defective parts.

Full body disposable protective clothing, including head, body, hand, and foot coverings consisting of material designed to protect workers from asbestos and/or other hazardous materials, shall be provided

to all workers and authorized visitors in sizes adequate to accommodate movement without tearing. Damaged coveralls shall be immediately repaired or replaced.
Additional safety equipment (e.g., hard hats, eye protection, safety shoes, gloves), as necessary, shall be provided to all workers and authorized visitors.

Non-skid, and when appropriate, protective, footwear shall be provided to all abatement workers.

If launderable clothing is to be worn underneath disposable protective clothing, it shall be provided by the Contractor to all abatement workers. Laundering must occur in accordance with applicable OSHA requirements.

Part 10.5 - Rental Equipment and Supplies

Any equipment rented and delivered to the site for the purpose of conducting asbestos abatement work or that will enter a regulated area must be accompanied with documentation verifying that the rental agency has been notified, and acknowledges receipt of notification that the equipment being rented will be used for asbestos abatement work. This documentation must be submitted to the Owner and/or Project Monitor prior to the equipment being delivered to the job site. Rental equipment, including scaffolding, will be held to the same standard of cleanliness as all other equipment on this project.

All rented equipment must be inspected and accepted by the on-site Project Monitor as it arrives on site. Any equipment covered with dust (no matter the source of dust), plaster debris, multiple layers of encapsulant and/or spray glue, or any other debris will not be accepted. Delays caused by a lack of clean equipment will not extend Contractor's schedule. Equipment rejected due to a lack of cleanliness must be removed from Owner's grounds in order to be cleaned. Dirty equipment wrapped in plastic will not be acceptable.

The Project Monitor and/or Owner have final authority over the acceptance of the cleanliness of rental equipment used on this project.

Part 10.6 - Cleanliness of Equipment

All equipment that will be used on this site, particularly equipment that will be used in the regulated work area, must arrive on the site clean. The Contractor must provide at least a 24 hour in advance notice to the Owner and/or Project Monitor as to when the Contractor's equipment will be delivered to the job site. The Contractor must provide the Project Monitor with the opportunity to inspect equipment for cleanliness prior to the equipment being moved onto the job site or into the work area. The Project Monitor may not approve for use at this project any equipment covered with dust, debris, plaster, multiple layers of encapsulant, or any other debris that in the opinion of the Project Monitor may contain asbestos, or may create difficulty for the Contractor to clean the equipment adequately at the end of the project.

Material known to be contaminated with asbestos, such as work boots, may be allowed to be used on this site, or be transported to different locations on this site, if they arrive on site and are transported in sealed, leak-tight containers, and in the judgment of the Project Monitor are unlikely to create contamination problems for this project.

Part 10.7 - Approval for Use

No product or material may be used on the project unless the product data sheets and all MSDS's have been submitted, reviewed, and approved by the Owner and/or Project Monitor. Any product or material found on the project which has a product data sheet and/or MSDS available and has not been approved will be removed from the site by the Contractor until review and approval has been completed by the Owner or Project Monitor.

The Contractor must utilize all tools, equipment, and supplies in a safe manner and in compliance with applicable regulations and following manufacturers' instructions. Failure to comply with these requirements may result in the Project Monitor not allowing equipment or tools to be used on this project. All delays resulting from the need for the Contractor to clean equipment, not use expected equipment, or use alternative equipment are totally the responsibility of the Contractor and will not be cause to extend the Contractor's schedule or time obligations.

SECTION 11. RESPIRATORY PROTECTION

Part 11.1 - General Respiratory Protection Requirements

All respiratory protection shall be provided to workers in accordance with the Contractor's submitted written respiratory protection program. This program shall include all items as required by 8 CCR 5144. This written program shall be at the job site and available for use by the workers, supervisor, and Project Monitor if needed.

The Contractor shall ensure that all workers entering the regulated area wear appropriate respiratory protection. At a minimum, respiratory protection provided workers shall be in accordance with 8 CCR 1529, and 8 CCR 5144 and the respiratory protection program submitted by the Contractor. These contract documents may specify additional respiratory protection, more protective than required by OSHA.

The Contractor shall provide each worker needing respiratory protection with his or her own, individually identified, NIOSH-approved respirator. At a minimum, these respirators will be equipped with a P-100 series HEPA filter. The Contractor shall provide additional filter types if that becomes necessary for specific hazards discovered on the job site or if required in the contract documents.

The Contractor shall ensure and provide written records to the Project Monitor that all workers wearing tight-fitting respirators have been appropriately fit tested in accordance with the requirements of 8 CCR 5144 for the respirator they will wear into the regulated work area. The fit test records must demonstrate the test was done within the time frames specified in 8 CCR 5144.

The Contractor shall ensure that nothing interferes with the seal of the respirator to the face of the worker. This includes but is not limited to facial hair, clothing, protective clothing, equipment or anything else that comes between the respirator and the face of the worker. Respirators must be worn as designed by the manufacture, and in the manner in which they were worn during fit-testing.

Each time they put on their respirator, workers must perform positive and negative respirator seal checks. Each time a worker puts on a powered air purifying respirator (PAPR) in preparation for entering a regulated work area, he or she must check for proper airflow rate according to the requirements of 8 CCR 5144 and the manufacturer's directions. The Contractor's written respiratory protection program must detail how this testing is to be preformed by each worker. Respirators that do not meet the minimum flow as specified by OSHA requirements shall be taken out of service or repaired as necessary.

For some project sites, the Project Monitor may determine it necessary for the Contractor to have workers record their PAPR airflow prior to entering the work area. Should this be required at a particular site, the Project Monitor will provide the Contractor with a form for this purpose and require the Contractor's employees to complete the form on a daily basis.

Whenever powered-air-purifying respirators (PAPR's) are used, the Contractor must provide a sufficient supply of replacement batteries and HEPA filter cartridges. At least one spare fully charged battery must be available on-site for each PAPR in use.

The Contractor shall supply sufficient P-100 filters for use by workers on this project. Disposable respirators shall not be used.

At no time will the Contractor be allowed to have workers exposed to an estimated fiber concentration inside the respirator that exceeds 0.01 f/cc. This is calculated by taking the air sample results and dividing them by the assigned protection factor for the respirator worn by the worker. Should this occur, the Project Monitor will stop the work. The Contractor must then implement additional engineering controls to reduce airborne fiber concentrations and increase the type of respiratory protection worn by the workers.

Workers conducting any work that may create an airborne release of asbestos must wear appropriate respiratory protection. This includes, but is not limited to, the pre-cleaning of asbestos contamination of furniture, equipment and floors, and the set up of contaminated work areas.

When appropriate for the type of material being utilized or when, in the judgment of the Project Monitor, additional respiratory precautions are necessary, the Contractor shall provide workers with combination filters that provide protection for both asbestos and the other hazardous airborne materials that may be released by the Contractor's work practices or the chemicals used on the project.

NIOSH-approved respirators must be worn during application of spray-poly.

Part 11.2 - Proper Respirator Wear

The Project Monitor may deny access to the regulated area to anyone who, in the final judgment of the Project Monitor, is not properly wearing adequate respiratory protection for the project conditions. This includes but is not limited to those wearing unidentified respirators, those with improperly sealed respirators, those wearing respirators in an improper manner such as over their protective suit hood, or in any other fashion judged by the Project Monitor to be improper or inadequate to protect the individual from the airborne asbestos at the project site.

In general, if a worker in a regulated area is seen wearing a respirator inappropriately, such as with respirator straps over his or her hood, the Contractor will be required to remove the worker from the regulated area, and re-train him or her on proper respirator wear before allowing him or her to re-enter the regulated area.

Part 11.3 - Minimum Respiratory Protection for OSHA Class I Work

Unless specified differently in the contract documents, the Contractor's employees conducting Class I work will wear tight-fitting, full-face powered air purifying respirators for all Class I work that will take more than one hour to complete. They must wear a minimum of a half-face negative pressure air-purifying respirator for Class I work lasting less than one hour. Contract documents may require additional respiratory protection, such as the use of supplied air respirator systems if, in the opinion of the Project Monitor, the airborne asbestos levels are expected to exceed one fiber per cubic centimeter of air (1 f/cc).

After work has begun, if the Contractor wishes to lower respiratory protection requirements, such as for glovebag or other work, the Contractor must demonstrate to the Project Monitor that personal air sampling results from this project prove that airborne fiber levels are below the Permissible Exposure Limit. The Project Monitor will normally require sampling results used for this purpose to include several days of sampling taken during the work expected to generate the highest airborne levels. The Project Monitor will have final authority regarding whether or not the respiratory protection may be reduced below the need for powered air purifying respirators.

Unless stated otherwise in the contract documents, for the purposes of respiratory protection, Class I work will include the removal of materials such as plaster, stucco, and gypsum board surfaces that are covered with a texturing or skim coat material that contains over one percent asbestos. Unless stated otherwise in these specifications, or unless determined otherwise by the Project Monitor, the Contractor shall assume that workers removing these types of materials must wear PAPRs during the bulk removal and clean up of these materials. However, unless OSHA compliance sampling requires otherwise, the Contractor can expect to utilize non-powered air-purifying respirators for the final detailed cleaning work. The Contractor may not stop utilizing PAPRs without receiving written permission from the Owner and/or Project Monitor.

Part 11.3.1 - Exception For Glovebag Removal Work

Contractors conducting Class I glovebag removal work may provide the Owner and/or Project Monitor with a Negative Exposure Assessment (as defined in 8 CCR 1529) documenting their ability to conduct glovebag work without exceeding the Permissible Exposure Limit (PEL). This negative exposure assessment must be done in compliance with all the requirements of 8 CCR 1529 and be acceptable to the Project Monitor. If such negative exposure assessment is approved by the Project Monitor, the Contractor may utilize half-face or full-face air-purifying respirators in lieu of PAPRs to start the glovebag removal work. The Contractor's OSHA compliance air sampling on this project will then be utilized to determine if the Contractor's employees may continue to use non-powered air-purifying respirators.

This Negative Exposure Assessment data must be provided with the pre-start submittal package given to the Owner and/or Project Monitor before the start of work. Failure to provide the Negative Exposure Assessment at that time, or a minimum of 48 hours prior to the start of work, will likely lead to the Project Monitor rejecting the Contractor's wish to lower respiratory protection below that of a PAPR.

Part 11.4 - Minimum Respiratory Protection for Class II and III Work Practices

Unless specified differently in the contract documents, the Contractor's employees conducting Class II or III work will wear a minimum of half-face, air-purifying respirators. Contract documents may require additional respiratory protection, such as the use of full face air-purifying respirators or powered-air-purifying respirators. The result of OSHA compliance air-monitoring taken during the work may lead to increase the required type of respiratory protection.

After work has begun, if a Contractor wishes to lower respiratory protection requirements, he or she must demonstrate to the Project Monitor that personal air sampling results from this project prove that airborne fiber levels are below the limit of quantification for the phase contrast microscopy method. The Project Monitor will normally require sampling results used for this purpose to include several days of sampling taken during the work expected to generate the highest expected airborne levels. The Project Monitor will have final authority regarding whether or not the respiratory protection may be reduced or eliminated. For example, the Project Monitor may require personal samples be analyzed by TEM before determining that asbestos does not pose an airborne health risk. The Contractor should understand that is very unlikely that the Project Monitor will allow any work that disturbs asbestos to be done without the worker wearing a respirator, regardless of air sampling results that may appear to indicate that there is no airborne exposure.

Part 11.5 - Respiratory Protection for Unclassified Work

If not addressed elsewhere in this specification, the Project Monitor will have full authority to determine the level of respiratory protection required to be worn by the Contractor's employees potentially exposed to airborne asbestos. At a minimum, this requirement will follow the requirements of 8 CCR 1529 and 5144, but in his or her judgment, the Project Monitor may decide that additional respiratory precautions are needed on this project.

The Contractor should understand that it is very unlikely, regardless of OSHA compliance air sampling results that the Project Monitor will allow the Contractor's employees to disturb asbestos-containing construction materials (ACCM) or clean up debris thought contaminated with asbestos, without wearing respiratory protection.

Waste transport and disposal personnel must wear at least half-face; negative air-purifying HEPA-cartridge type respirators when handling intact sealed bags. If any bags are broken and the clean up will involve more material than will fit in one waste bag, then HEPA-filtered PAPR's must be worn.

Part 11.6 - Supplied Air Systems

Should air sampling results or these specifications require the use of supplied air systems, the Contractor shall ensure that those setting up and monitoring the system are appropriately trained and qualified to develop and monitor such a system.
Whenever supplied air respiratory protection is used, compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer specifications. The compressed air system shall have a reservoir of adequate capacity to allow the escape of all respirator wearers from contaminated areas in the event of compressor failure.

At a minimum, compressors must meet the requirements of 29 CFR 1910.134(d).

Compressors must have an in-line carbon monoxide monitor. The Contractor must periodically inspect for and record information on the presence or absence of carbon monoxide. Documentation of adequacy of compressed air systems/respiratory protection systems must be retained on site. This documentation will include a list of compatible components with the maximum number and type of respirators that may be used with the system. Periodic testing of compressed air shall insure that systems provide air of sufficient quality (Grade D breathing air). Documentation of this testing, including a description of the process used to perform the test and results of each test must be submitted to the Project Monitor.

EXECUTION

SECTION 12. PERSONNEL PROTECTION REQUIREMENTS AND TRAINING

Prior to beginning abatement activities, all personnel who will enter the regulated work area or handle containerized asbestos-containing materials must have received adequate training in accordance with the Cal/OSHA, EPA AHERA and NESHAP regulations.

All respiratory protection shall be provided to workers in accordance with the submitted written respiratory protection program, which shall include all items as required by OSHA. This written program shall be at the job site and available for use by the workers, supervisor, and Project Monitor if needed.

Respiratory protection is discussed in more detail elsewhere in this specification. Emergency and safety training and planning is discussed in more detail elsewhere in this specification.

Disposable clothing, including head, hand, foot, and full body protection, shall be provided in sufficient quantities and adequate sizes for all workers and authorized visitors. Damaged coveralls shall be immediately repaired or replaced.

Hard hats, protective eye-wear, gloves, rubber boots and/or other footwear shall be provided as required for workers and authorized visitors. Safety shoes may be required for some activities.

Part 12.1 - Class I Work or Work When a Shower Decontamination System Is Required

The Contractor's personnel shall not wear street clothes or clothes of any type other than disposable garments underneath the protective disposable clothing. Upon exiting the work area, no items worn in the work area, such as disposable garments, personal protective gear (other than respirator), footwear, or hair coverings will be allowed to be worn or carried out past the shower of the decontamination unit. Contractor's workers have the option of wearing disposable undergarments underneath protective clothing, or they may be nude underneath one or two layers of disposable protective clothing.

Each time workers enter the work area they will don new disposable clothing and undergarments (if used). Street clothes (including underwear and shoes) shall not be allowed inside the work area, except during visual clearance activities.

The Project Monitor may allow authorized personal to wear street clothes under protective clothing for brief visits into the work area during the conduction of final visual inspections or other short-duration visits into the regulated area during times when asbestos is not being disturbed and gross debris is not present. In these situations, approved by the Project Monitor, the authorized person shall deposit the protective clothing on the dirty side of the decontamination system and may proceed through the shower and clean room wearing the clothes they wore under their protective clothing.

Part 12.2 - Class II or III Work or Work When A Shower Is Not Required

The Contractor's employees are encouraged to not wear street clothes under their protective clothing, but for Class II or III Work where no shower is required, the Contractor's employees and authorized visitors may wear limited street clothes into the work area. Protective clothing must completely cover the street clothing. For example, protective clothing booties must cover the workers' shoes during the time the worker is in the regulated work area.

SECTION 13. WORKER DECONTAMINATION SYSTEMS

Worker decontamination enclosure systems shall be provided at all locations where workers will enter or exit Class I, II, or III work areas. One system at a single location for each contained work area is preferred.

Part 13.1 - Decontamination Systems When A Shower Is Required

Enclosure systems may be constructed out of metal, wood or plastic support as appropriate. For some projects the Contractor may be required to provide the Project Monitor written plans for the construction of the decontamination unit, including materials and layout, in order for the Project Monitor to review the plan prior to the start of work.

The worker decontamination enclosure system shall consist of at least a clean room, a shower room, and an equipment room, separated from the work area by airlock chambers. The airlock chambers shall be at least three feet square in size. All fabricated units shall have, at a minimum, two layers of six-mil poly sheeting.

Unless stated otherwise in these specifications or determined otherwise by the Project Monitor, all decontamination units located outside of buildings shall be enclosed in a burglar resistant manner that will prevent unauthorized persons from accessing the unit or removing the Contractor's equipment.

Entry and exit from all airlock chambers and the decontamination enclosure system chambers shall be through doorways designed to restrict air movement between chambers when not in use. The dirty side shall have an extra layer of six-mil poly sheeting on the floor as an extra drop cloth and it shall be replaced at least daily.

The clean room shall be sized and equipped to adequately accommodate the work crew. Lighting, heat and electricity shall be provided as necessary for comfort. This area must remain clean. If in the judgment of the Project Monitor, equipment storage or other activities taking place in this area affect the cleanliness of the area, the Contractor may be required to move that storage and those activities away from the designated clean area.

The shower room shall contain one or more showers as necessary to adequately accommodate workers and shall meet Cal/OSHA requirements for temporary shower facilities. The shower enclosure shall be constructed to ensure against leakage of any kind. In addition, the shower shall be a separate unit from the decon walls. For example, the shower unit cannot be made from poly. Metal or hard plastic is acceptable. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and available at all times. Shower water shall be drained, collected and filtered through a system with at least a 5.0 micrometer particle size collection capability. Filtered waste water shall be disposed of into a sanitary sewage system. Under no circumstances may it be released where it might enter a storm drain.

The shower chamber shall be, at a minimum, three feet by three feet wide by a minimum of six feet in height. The shower chamber shall be constructed so that no water from the shower can spray out of the chamber, nor any water run down the sides and escape the chamber system. The Contractor must have a back-up containment system to control leaks from the shower, connections and hoses. This can be either a secondary metal pan under the shower or a series of poly barriers, separate from the construction of the chamber, that are solely for the purpose of collecting water that might leak out of the shower system.

Each decontamination chamber shall have, at least, a four inch lip of poly from the floor up the wall to prevent possible transfer of water and debris between chambers. Excess poly at the corners of this floor is to be fitted to the sides of the chamber by folding and taping, as opposed to cutting away excess poly and taping seams. For some projects, particularly those where the decontamination chambers are located on surfaces needing special protection from water, the Project Monitor may determine additional

precautions are necessary such as requiring the shower chamber to have an overflow pan, in which the shower unit sits, that is capable of holding two inches of water. The filter system and any hose connections transferring contaminated water shall be located in a secondary containment, such as a metal pan. Any leakage shall be double-bagged or re-filtered. Should this requirement for an additional metal pan under the shower be required, it will be identified elsewhere in these specifications and discussed at the bid walk.

Unless otherwise specified in these specifications, the minimum size of the decontamination chambers shall be the following:

Clean Change Room	five feet x six feet x six feet high
Shower	three feet x three feet x six feet high
Dirty Change Room	five feet x six feet x six feet high
Air Lock Chambers	three feet x three feet x six feet high

Abatement work will be stopped if the Project Monitor determines that the decontamination system is not kept in acceptable condition.

The Contractor shall not permit the storage or consumption of food and/or beverages inside the containment or within any of the decontamination chambers. Food or drink consumption within containment may result in dismissal of the abatement worker(s) from the site for the duration of the project.

Part 13.2 - Decontamination Systems When A Shower Is NOT Required

Shower decontamination systems may not be required for some Class II work where materials will be removed intact, for small floor removal projects, for roofing work, and other similar actions. Class III work will also typically not require a shower decontamination system.

If a mini-enclosure-type system (or other small negative pressure enclosure system) is used, the regulated area will typically be required to have at least one, usually two, airlock chamber adjacent to the regulated area. Inside this chamber, the Contractor shall provide a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. They must first vacuum or wet the suit if it is visually contaminated with dust or debris. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers may then leave the airlock chamber and go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area. If two chambers are required, then the workers shall remove their suits in the first chamber and their respirator in the second chamber.

When an airlock system is not required, such as for exterior work, the Contractor must provide the following minimal decontamination system. This system, at a minimum, must include a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. If protective clothing is visibly covered with bulk debris, the workers shall either first vacuum off the debris or wet the debris before removing their suit. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers should then go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area. This may require the Contractor to have two separate, side-by-side drop layers of poly. One layer is used for the removal of protective suits,

since the poly may become contaminated by the debris on the footwear worn by the workers. After removing their suits, the workers then would step onto the second poly drop layer (not contaminated by foot-borne debris) to remove their respirators. The Competent Person would then be required to clean only the first poly layer. At a minimum, all contaminated poly layers must be cleaned before the next time they will be needed for decontamination.

SECTION 14. WORKPLACE ENTRY AND EXIT PROCEDURES

All workers and authorized personnel shall enter the work area through the worker decontamination enclosure system. This section is designed to provide instructions for entering a regulated work area through a full, three-stage decontamination system. Lesser precautions are needed for other types of decontamination systems.

All personnel, before entering the work area, shall read and be familiar with all posted regulations, personal protection requirements (including workplace entry and exit procedures) and emergency procedures.

All personnel who enter the work area must sign the entry log, located in the clean room. This log shall have space for the workers name, time in, time out, and be identified with the project name, date, and containment location. This log shall also state that those entering understand the decontamination entry and exit procedures. **This log is required for entering all regulated areas, whether they are for Class I, II, or III work, and regardless of the type of decontamination system being utilized.**

All persons entering the regulated area shall proceed first to the clean room (or area), remove all street clothes and don appropriate respiratory protection and disposable coveralls, head covering and foot covering. Hard hats, eye protection and gloves shall also be worn, as appropriate. Clean respirators and protective clothing shall be provided and utilized by each person for **each separate entry** into the work area. **Disposable protective clothing may not be reused unless specifically approved by the Project Monitor.**

Personnel wearing designated personal protective equipment shall proceed from the clean room through the first air lock chamber, the shower room, and the second air lock chamber before entering the equipment room and the main work area.

Before leaving the regulated work area, all persons shall remove gross contamination from the outside of respirators and protective clothing by gentle brushing and/or wet-wiping procedures. (Small HEPA vacuums with brush attachments may be utilized for this purpose.) Each person shall clean bottoms of protective footwear just prior to entering the equipment room.

Personnel shall proceed to the equipment room where they will remove all protective equipment except respirators. They shall deposit disposable clothing into appropriately labeled containers for disposal.

Reusable, contaminated footwear shall be stored in the equipment room when not in use. This footwear shall be cleaned prior to being removed from the work area. Placing footwear in two six-mil poly bags is sufficient for moving from one containment to another, but not for moving from one site to another.

Still wearing respirators, personnel shall proceed to the shower area, where they shall clean the outside of the respirators and the exposed face area under running water prior to removing their respirator. They will then shower and shampoo to remove residual asbestos contamination. Various types of respirators will require the workers to slightly modify these procedures.

After showering and drying off, personnel shall proceed to the clean room and put on clean clothing.

These procedures shall be posted in the clean room and equipment room.

At no time will workers be allowed to exit the containment area, once abatement has begun disturbing asbestos, without showering prior to entering the clean chamber of the decon. (Exception to this may be made, at the Project Monitor's discretion, for the Project Monitor and Contractor's supervisor after they have made brief visits into the work area or visits such as to conduct a clearance visual inspection.)

At no time shall workers exit the clean room/changing area wearing anything other than street clothes,

including pants and shirt. Unless specifically authorized by the Project Monitor, the Contractor's employees may not wear protective clothing and/or respirators outside the regulated area or clean change area, and certainly not in any areas visible to those in adjacent work spaces.

SECTION 15. NEGATIVE AIR PRESSURE DIFFERENTIAL SYSTEMS

Part 15.1 - Negative Air Pressure Differential System

The Contractor shall provide negative air pressure differential systems for each work area where a negative pressure differential is required. At a minimum, this shall be done in accordance with the requirements for negative pressure enclosures as stated in 8 CCR 1529 and in accordance with Appendix J of EPA "Guidance for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5-85-024. This specification normally requires additional requirements than are listed in those reference documents.

All HEPA-filtered mechanical systems such as vacuums and air filtration units used on this project must be tested and certified on-site prior to use. This testing must be done by an independent testing company experienced in such testing and acceptable to the Owner and/or the Project Monitor.

The tested units and vacuums shall meet ANSI Z9.2, using a testing agent. Documentation of these tests shall be provided to the Project Monitor prior to the use of any HEPA-filtered mechanical system used on this project.

Testing must be done again if the tested unit or vacuum leaves the job site or if the HEPA filters are changed. In addition, if in the reasonable judgment of the Project Monitor, the unit or vacuum has suffered a fall or treatment that is likely to have altered the seal of the HEPA filter to the unit or vacuum, the Project Monitor may require the unit to be retested.

Unless stated otherwise in these specifications, the work area shall have an air pressure differential of minus 0.04 inches water (-0.04) whenever the work is being performed including removal, gross clean up, encapsulation of surfaces, bag-out operations and worker entry and exit procedures. If the pressure differential ever drops below -0.025 inches water, all work, other than clean up of waste on the floor of containment, must be halted until the reason for the pressure differential drop has been determined and corrected.

Only unused, pre-manufactured, wire-reinforced flexible ducting, or other ducting approved by the Project Monitor shall be used within the containment area for the exhausting of filtered air. The Contractor may not construct ducting using poly or other materials. The Contractor shall carefully install the air exhaust ducting and inspect it frequently (at least once a shift) in order to ensure there are no visible leaks or tears.

Unless stated otherwise in these specifications or by the Project Monitor, exhaust air shall be vented only to the exterior of the building at locations approved by the Project Monitor. The Contractor must use adequately-sized extension ducting made of reinforced flexible tubing or other material acceptable to the Project Monitor. Openings made in the enclosure system to accommodate air purifying units or flex ducting shall be made air-tight with tape and/or caulking as needed. Such outlets shall not be near building intake vents or louvers or at entrances to the building. Air filtration exhaust openings shall be protected from objects being thrown or placed into them if they are accessible to unauthorized people. In some situations the Project Monitor may require the flex ducting to be supported by a solid surface at the point of exit from containment. This may require contractor to install plywood, or a similar solid structure to support the exhaust ducting.

Air filtration units located outside the containment area shall be secured as necessary to the building or ground. Air filtration units must operate 24 hours a day from the start of work disturbing asbestos until the Project Monitor notifies the Contractor that the work is complete, usually after the results of air testing are known. The Contractor is responsible for securing all equipment in a manner that allows it to be used 24 hours a day without reasonable risk from theft.

Part 15.2 - Negative Air Pressure Differential Requirements

Unless stated elsewhere in this specification, or determined appropriate by the Project Monitor, negative pressure shall be maintained at a minimum of -0.04 inches water differential at all times during abatement activities, including entry/exit and bag-out procedures. Contractor shall assign crew members to determine cause of loss of pressure any time containment's negative pressure drops below -0.04 inches water differential. All work will be stopped in any containment for which the negative pressure drops below -0.025 inches water differential, until the problem is resolved and pressure returns to -0.04 inches water differential or better.

In the event that containment cannot be brought up to 0.04 inches water differential, the abatement contractor must increase the number of negative pressure differential units until ten air changes per hour is taking place. If this fails to raise negative pressure to acceptable levels, contractor may request in writing a reduction in negative pressure requirements. If the Project Monitor agrees that contractor has tried all possible remedies, the Project Monitor may grant a reduction in the negative pressure requirement. The Project Monitor is under no obligation to grant this request.

All negative pressure units installed, but not operating, must be sealed at both the exhaust location and the intake of the machine. This will prevent back draft which could allow asbestos fiber contamination from the HEPA filter.

In case of a power outage, contractor must seal exhaust ducts against back draft into containment.

All negative air units will have the filter sealed with poly and tape before being shut down to prevent back drafting.

Part 15.3 - Challenge Testing of Negative Air Pressure Differential System and HEPA Vacuums

All HEPA filtered systems such as vacuums and air filtration units used on this project shall be tested and certified by an independent company, approved in advance by the Owner and/or Project Monitor, on the site and prior to use. Contractors may not test their own equipment. All vacuums and pressure differential units shall meet ANSI Z9.2, using an appropriate testing agent. Documentation of these tests shall be provided to the on-site Project Monitor prior to the use of any HEPA-filtered mechanical system.

DOP, or equivalent, testing must be conducted on site, unless stated otherwise in these specifications. All HEPA filtered units, including but not limited to vacuums, air pressure differential units, and make-up air filters, must be tested on site. Testing of air pressure differential units must include testing of the wheel attachments, control panel, and seam and rivets of the housing, as well as the HEPA filter itself. A unit which passes DOP testing across the filter, but which fails testing for any component of the housing may be certified as an "Exterior of Containment HEPA Filtered Unit" only.

All HEPA equipped equipment to be used on the project must be delivered to the site empty of all debris, clean and free of dust, and in full operating condition. Covering dirty units with poly, other than the HEPA filter surface, will not be acceptable.

DOP or equivalent testing is required when any HEPA filters are changed.

All HEPA filtered machines, including but not limited to vacuums and negative pressure differential machines, shall be utilized in the manner in which they were DOP tested. The DOP testing certificate on the machine must identify if the machine was tested upside down or on its side. Otherwise units will be assumed to have been tested in their upright position and will not be allowed to be used upside down or on their sides. **Any negative pressure unit turned upside down, or on its side, must be returned to an upright position and re-DOP tested**.

Part 15.4 - Differential Pressure Recording Requirements

Differential air pressure shall be continuously monitored by the Contractor using a manometer. The manometer must be a recording instrument, of similar quality as a Dwyer Instrument Co., "Photohelic Gauge" or equivalent, connected to an appropriate circular chart recorder or a comparable recorder that maintains a record of dates, times and pressure differentials. The location of the pressure measurement tap shall be approved in advance by the Project Monitor. During the operation of the unit, circular charts shall be collected on a daily basis, dated, and signed by the Contractor's Competent Person present on site. Pressure differential shall be checked a minimum of every hour during the work shift by a person familiar with the operation of the pressure differential air filtration units, as well as the recording device. Each check shall be documented with a time and date notation on the circular chart and "Manometer Readings" form along with the initials of the person performing the check. A copy of the circular chart record shall be submitted to the on-site Project Monitor on a daily basis. The circular chart shall record time, date, pressure differential, coordinates, and location.

In the event the manometer recording mechanism fails, the Contractor shall be responsible for manually recording the pressure differential at a minimum of thirty minute intervals. The log shall be kept until the recording device is operational. The log shall be provided to the on-site Project Manager on a daily basis. This log shall not substitute for a printing manometer, except on a temporary basis until the printing manometer is repaired or replaced.

The "Manometer Readings" form shall be a record of dates and times of pressure readings and instrument stability. The circular chart or strip chart shall record time, date, pressure differential, coordinates, and location and building. The supervisor is responsible for identifying all manometer graphs with the building, containment, site. The chart or strip shall be adhered in chronological and date order on an 8½" x 11" sheet of paper prior to submission to the Owner and/or Project Monitor.

Circular chart recording manometers are preferred. Strip chart recording manometers will be allowed but only if the Contractor agrees to provide the strip chart recordings to the Owner and/or Project Monitor in the following fashion. By using a strip chart recording system, the Contractor is agreeing with the following requirements. The Contractor must provide the strip chart printouts in chronological and date order, taped to 8 ½ " by 11" stationary in a format ready for photocopying. Failure of the Contractor to provide the printouts in such a fashion, or in another fashion accepted by the Project Monitor, will result in the Contractor being charged the cost incurred by the Asbestos Project Monitoring Firm for organizing the recordings in an acceptable fashion.

In the event that the manometer recording mechanism fails, the Contractor shall be responsible for manually recording the pressure differential at thirty minute intervals. The log shall be kept until the recording device is operational. The log shall be signed by the Contractor's on site competent person and provided to the on-site Project Manager on a daily basis.

The manometer shall be connected to an audible alarm which will activate at pressure differential of-0.025 inches water gauge air pressure or higher. Defective or non-operating instrumentation may require temporary stoppage of work until instrumentation is replaced.

Lack of a functioning manometer on the site will normally result in the Project Monitor not allowing work disturbing asbestos to continue. Work will not be allowed to begin again until the Contractor provides an appropriate recording manometer for the site.

SECTION 16. WORK AREA SET UP

Part 16.1- Set Up

This section describes basic requirements for the set up of the work area. Additional details on many of these topics, such as the development of the negative air pressure differential system, are discussed elsewhere in this specification.

When clearance air testing will be conducted at the end of the project, the Contractor is required to group rooms, spaces, and/or areas into a single containment whenever feasible. The Project Monitor and/or an AHERA-accredited project designer employed by the Asbestos Project Monitoring Firm shall have final authority regarding whether or not rooms, spaces, or areas can be appropriately grouped into single containment systems.

Part 16.1.1 - Pre-Abatement Condition of the Site

The Contractor and Owner and/or Project Monitor shall investigate the work area and agree (in writing, if necessary) on the pre-abatement condition of the work area.

Part 16.1.2 - Posting of The Work Area

The Contractor shall post regulated area signs meeting the requirements of 8 CCR 1529 at all entrances to the regulated area, whether locked or unlocked, and any other locations and approaches to locations where airborne concentrations of asbestos may exceed ambient background levels. The Contractor may utilize regulated area signs that require respirators and protective clothing only for those areas where such precautions are to be followed. Regulated area signs that do not require respirators and protective clothing may be used to keep unauthorized persons away from the clean room, equipment storage areas, or approaches to the work area.

These specifications may require, or the Project Monitor may require additional signs, such as DANGER, CONSTRUCTION, for some projects depending on the location and the occupancy of adjacent areas.

Part 16.1.3 - Electrical Power

The Contractor, in conjunction with the Owner, shall shut down and lock out electric power to all work areas where demolition activity will take place or is necessary based on the judgment of the Project Monitor. The Contractor shall provide temporary power and lighting sources, ensure safe installation (including ground faulting) of temporary power sources and equipment by complying with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. Unless stated otherwise in these specifications, the Owner shall provide electric power to the job site, but is not responsible for the costs of producing temporary power inside the work area. Only licensed electricians shall establish electrical connections that require more than simply plugging in cords.

Part 16.1.4 - Water and Plumbing

Unless stated elsewhere in this specification, the Owner is responsible for providing a source of water at the job site but not necessarily within the work area. The Contractor is responsible for transferring water from the Owner's source to the work area. The Contractor must ensure that all connections are secure and that the water system developed by the Contractor does not damage the Owner's property inside or outside of the work area.

When necessary due to the type of removal work, the Contractor is responsible for capping off plumbing in the work area in a way that will not allow leaks.

Part 16.1.5 - Heating, Ventilation, and Air Conditioning Systems (HVAC)

The Contractor shall shut down and lock out all heating, ventilating and air-conditioning-system (HVAC) components that are in, supply, or pass through the work area. The Contractor shall seal all intake and exhaust vents in the work area with a minimum of tape and six-mil poly as well as seal any seams in system components that pass through the work area. When determined necessary by the Project Monitor, usually due to pre-existing contamination of the work site, the Contractor shall remove all HVAC system filters in the work area and place them in labeled six-mil poly bags for storing and eventual disposal as asbestos-contaminated waste. Specific job sites may require that additional precautions be taken in order to seal off HVAC systems. If required, these additional precautions will be discussed in these specifications and discussed during the bid walk.

The Contractor shall coordinate with the Primary Contractor and/or the Owner to ensure that the manner used to seal off or turn off the HVAC system will not damage the HVAC system or other aspects of the building's operation. The Contractor must determine how the HVAC system will be handled sufficiently in advance of the work, and coordinate this with the Primary Contractor and/or Owner, in order for the Owner to prepare for the impact of the shut down or limitation of the HVAC system on the building and its occupants.

Part 16.1.6 - Removal and Salvage of Non-Stationary Materials in the Work Area

Unless specified otherwise in these specifications, the Owner will be responsible for removing furniture and non-fixed items from the work area. The Contractor must coordinate with the Owner the timing for the removal of these items.

Part 16.1.7 - Pre-cleaning of the Work Area

The Contractor will pre-clean all fixed objects in the work areas using HEPA-filtered vacuums and/or wet-cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination significant. After pre-cleaning, the Contractor will enclose fixed objects in a minimum of four-mil poly sheeting and seal securely in place with tape.

The Contractor will pre-clean all horizontal surfaces in the work areas using HEPA filtered vacuums and/or wet cleaning methods as appropriate. The Contractor shall not disturb asbestos-containing materials during the pre-cleaning phase of the work.

Part 16.1.8 - Sealing Critical Barriers

The Contractor shall seal all critical barriers such as windows, doorways, elevator openings, corridor entrances, drains, ducts, grills, grates, diffusers, skylights, electrical outlets, and other openings through which air can pass between the work area and uncontaminated areas outside of the work area. These openings must be sealed with a minimum of six-mil poly sheeting and/or tape. In general, all major critical barriers such as windows and doors will require a double seal as described in the next paragraph. Non-opening, decorative windows shall be treated as critical barriers and sealed.

The first step in sealing critical barriers will be for the Contractor to seal all cracks in critical barrier areas with tape, caulk, or foam. The Contractor must then apply tape over the cracks and junctions around windows and doors and other framed openings. This is to prevent air from being pulled in through those areas once the negative pressure system is in operation. The final critical barrier seal shall consist of a minimum of one layer of six-mil thick poly applied over the entire critical barrier. This second layer of protection stops air that may have leaked past the initial tape layer.

The sealing of critical barriers as described above is in addition to, and does not replace, the Contractor's responsibility to apply additional layers of poly on walls, floors, and ceiling surfaces when required by these specifications.

On some projects, these specifications, or the Project Monitor, may allow less than a double seal on some or all critical barriers. This will be discussed in these specifications or must be determined appropriate by the on-site Project Monitor. The Contractor shall assume a double layer of protection will be required for each critical barrier and may only reduce that layer of protection if approved by the Project Monitor or that reduction is specifically addressed in these specifications.

Part 16.1.8.A - Verification and Checking of Critical Barriers

The Contractor's Competent Person shall personally inspect the integrity of the critical barriers prior to notifying the Project Monitor that the critical barriers have been sealed. **Unless directed otherwise by the Project Monitor, the Project Monitor must approve the installation and integrity of the critical barrier seals before the Contractor will be allowed to cover the critical barriers with additional layers of wall, floor, or ceiling poly**. The Project Monitor may require the Contractor to turn on the air filtration units in order to establish a negative pressure differential. This will allow the Project Monitor to use smoke tubes to check the critical barrier seals. **Therefore the Contractor must have the air filtration units on site and challenge tested before the Contractor has completed the erection of critical barriers**.

Part 16.1.9 - Removal of Materials and Objects That Will Trigger Disturbance of ACM

All items attached to asbestos-containing materials and items which cannot be removed without disturbing asbestos-containing materials shall be removed by the Contractor after establishment of containment and negative air pressure. If these items are to be "saved and returned" or "reused" by the Owner, the Contractor must remove and clean them without damage. These items must be cataloged and a list provided to the Owner.

Part 16.1.10 - Covering Wall, Ceiling, and Floor Surfaces in the Work Area

Building surfaces not being abated shall not be exposed to asbestos dust, debris or airborne fibers released as a result of the Contractor's disturbance of asbestos. Unless directed otherwise by these specifications or by the Project Monitor, the Contractor shall cover with poly all building surfaces in the regulated work areas that are not being abated. This may include walls, floors, and ceilings in the regulated work area.

In addition, the removal of asbestos-containing materials that will become a hazardous waste stream shall not come in contact with asbestos-containing materials also scheduled for removal, but which are not normally a hazardous waste. For example, floor tile scheduled for removal, but which on some projects may be treated as a non-hazardous waste, must be covered if surfacing type materials are removed on the walls or ceiling of the area.

These specifications may allow on some projects, or the Project Monitor may choose to allow the Contractor, alternatives to covering those materials that are not normally a hazardous waste stream but which are also scheduled for removal. The Contractor may be allowed to treat normally non-hazardous waste as a hazardous waste and then not cover those surfaces. For example, the Contractor may be allowed to avoid covering flooring scheduled for removal, but the Contractor must then treat the flooring as an asbestos-containing, hazardous waste. Should the Contractor be allowed these options by these specifications or by the Project Monitor, the Contractor must take additional steps to ensure that water or any other visible emission does not leak out of the work area. For example, the Contractor normally will be required to seal the perimeter of the floor and walls or provide some other method of leak protection to ensure water does not escape under the walls of the regulated work area.

At a minimum, building surfaces required to be covered with poly shall be covered in the following manner.

aaa. Unless stated otherwise in these specifications or by the Project Monitor, the Contractor will cover

floors in the regulated area with a minimum of two layers of six-mil poly sheeting. Poly shall be sized to minimize seams. A distance of at least six feet between seams is sufficient. The Contractor shall not locate any seams at wall/floor joints. Floor sheeting shall extend at least twelve inches up the side walls of the work area unless determined infeasible by the Project Monitor. Poly sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material. A layer of ten-mil poly sheeting and/or plywood will be required in some cases to protect certain valuable flooring materials. If appropriate, this requirement will be listed in these specifications and discussed at the bid walk.

bbb. Unless stated otherwise in these specifications or by the Project Monitor, the Contractor will cover walls and ceilings in the regulated work area with poly sheeting. Walls shall be covered with a minimum of two layers of four-mil poly sheeting. Ceilings shall be covered with a minimum of one layer of four-mil poly. For some projects, these specifications or the Project Monitor may allow two-mil poly to be used to cover ceilings. Wall and ceiling poly shall be sized to minimize seams. Seams shall be staggered and separated by a distance of at least six feet. Wall sheeting shall overlap floor sheeting by at least twelve inches beyond the wall/floor joint to provide a better seal against water damage and for pressure differential maintenance. Ceiling poly shall overlap wall poly. Wall and ceiling poly shall be secured adequately to prevent it from falling away from the walls and ceiling.

The Contractor must take adequate precautions that this poly will adhere to the wall surfaces for the entire length of the project. The Contractor may need to take additional steps such as using furring strips or other mechanisms to ensure adherence.

These specifications or the Project Monitor may allow the Contractor to avoid sealing some or all exposed surfaces in the work area under certain specific situations. This typically will only be considered if all of the following circumstances exist.

a. The potentially exposed surfaces such as walls or ceilings are hard surfaces and, in the judgment of the Project Monitor, can be easily cleaned by the Contractor.

b. The potentially exposed surfaces will not be encapsulated following the completion of the work.

c. Aggressive air testing will be conducted and the analysis will be by TEM.

d. The Project Monitor determines that the interests of the Owner are adequately protected without the need for the Contractor to seal the potentially exposed surfaces.

Part 16.1.10.A - Damage to Wall, Floor, and Ceiling Surfaces

Unless stated otherwise in these specifications, the Owner expects reasonable damage to building surfaces from the installation of wall, floor, and ceiling poly. Excessive damage will be determined by industry standards. In some situations, these specifications will require additional precautions be taken to avoid damaging building surfaces. Unless the removal work is being done prior to a demolition, or the wall and/or ceiling surfaces are to be removed by the Primary Contractor following the Contractors removal of asbestos-containing materials, the Contractor will be responsible for patching holes and repairing damage to the substrate of those surfaces that resulted from the erection of containment barriers. Unless stated elsewhere in these specifications, this does not include the repair of normal paint damage as determined by industry standards.

Part 16.1.11 - View Ports

The Contractor shall add view ports into the containment work area at locations determined by the Project Monitor. These view ports must be of a size, and clarity acceptable to the Project Monitor. In general, view ports are expected to be, at a minimum, approximately 12 inches by 12 inches in size.

Part 16.1.12 - Equipment Room

The equipment room shall be used for storage of equipment and tools at the end of a shift after they have been decontaminated using a HEPA-filtered vacuum and/or wet-cleaning techniques. A walk-off drop layer of poly shall be located in the work area just outside the equipment room. A six-mil poly disposal bag or a drum lined with a six-mil poly bag shall be located in this room for the collection of disposable clothing.

Part 16.1.13 - Air Filtration and Pressure Differential Equipment

The Contractor shall install and initiate operation of pressure differential equipment as needed to maintain an air pressure differential of -0.04 inches of water. There shall be a sufficient number of differential air pressure units to maintain a minimum of four air changes per hour. These specifications may, for some projects, require additional negative pressure differential or additional air changes per hour.

Unless stated otherwise in these specifications or specifically approved by the Project Monitor, all air filtration units shall have pre-filters at the intake of the system which must be changeable from inside the containment area. Openings made in the enclosure system to accommodate these units shall be made airtight with tape and/or caulking as needed. They shall NOT be exhausted into occupied areas of the building. Unless approved by the Project Monitor, ducting used to reach from the work area to the outside must be adequately sized (usually twelve inches or larger) and must be a wire-reinforced flex tubing or other ducting acceptable to the Project Monitor. Careful installation, air monitoring and daily inspections shall be done to ensure that the ducting does not release fibers into uncontaminated building areas.

Upon completion of the establishment of the negative air pressure differential system, the Contractor shall inspect the containment barriers and smoke test the enclosure for leakage and air flow. At a minimum, the Contractor must verify that there is significant air flow through the decontamination chambers and that critical barriers are secure.

All HEPA-filtered mechanical systems used on this project shall be tested and certified on site by an independent company prior to use. All vacuums and pressure differential units shall meet ANSI Z 9.2 using DOP or equivalent testing agent. Documentation of these tests shall be provided to the Project Monitor prior to the use of any HEPA-filtered mechanical system. Re-testing is required when HEPA filters are changed.

Contractor shall submit logs documenting filter changes for each pressure differential unit.

All flex tubing and filters used inside the abatement area, or in the pressure differential system train prior to the HEPA filter, shall be discarded and treated as the same waste stream as the removed asbestos-containing material. A flex tube may be used for two separate containments on the same job as long as it is moved from one containment to another in two six-mil poly bags.

Part 16.1.14 - Emergency Exits and Fire Extinguishers

The Contractor shall clearly mark and keep access open to emergency exits. Safety meetings must include discussion of emergency exit strategies.

The Contractor must, at a minimum, meet Cal/OSHA requirements for fire protection equipment on site. At a minimum, one fire extinguisher is expected to be placed in or near the clean room, and at least one must be in the regulated work area. Safety meetings and training must ensure that workers on this project know the location of the fire suppression equipment and how to use it.

Part 16.1.15 - Approval for Start of Work

Work shall not begin each day until:

e. All pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the Owner and/or Project Monitor.

f. All required proof of worker and supervisor training, medical surveillance, and respirator fit-testing has been provided to the Owner and/or Project Monitor and the Contractor has a copy of such documents on the job site.

g. The Contractor has sufficient equipment for the abatement, clean up and disposal of the work that is planned for that day.

h. All documents and information required by Cal/OSHA and/or these specifications have been posted or are on the work site.

i. All HEPA-filtered pressure-differential units and vacuums have received and passed on-site challenge testing.

j. The containment and decontamination systems, or modifications thereof, have been designed and built by the Contractor and each step approved by the Project Monitor. Should the Contractor determine it is necessary to alter the design of the containment or system in any significant manner after it has been approved by the Project Monitor, the Contractor shall submit to the Project Monitor a written explanation as to why such a change is necessary. The Project Monitor is under no obligation to approve such changes but is likely to approve changes that improve the security of the containment and enclosure system.

k. The pressure-differential systems are functioning and meeting the required pressure differential and air changes per hour requirements.

l. The Contractor has installed view ports acceptable to the Project Monitor.

m. The Contractor has at least one Competent Person at each site in which work is taking place. The competent person must meet the requirements of a competent person as listed in 8 CCR 1529 and any other requirements as may be specified in these specifications.

Unless stated otherwise in these specifications, or determined otherwise by the Project Monitor, no work may begin that disturbs asbestos until the Project Monitor has conducted a visual inspection of the work area and authorized the Contractor that work may proceed. Failure of the Contractor to wait for this authorization of work may result in the shutting down of work and the Contractor may incur significant delays.

SECTION 17. REMOVAL PROCEDURES

Part 17.1 - Wetting Materials

The Contractor shall ensure that the asbestos-containing materials are wetted before being disturbed. Depending on the type of materials being removed, the requirements of these specifications, and/or the requirements of the Project Monitor for a specific material, the Contractor may be required to utilize amended water. Typically, amended water will be required whenever the Contractor disturbs materials containing amphibole asbestos.

The Contractor shall saturate the material to the substrate but must not allow excessive water to accumulate in the work area. The Contractor shall keep all debris wet enough to prevent fiber release until it can be containerized for disposal. The Contractor shall maintain high humidity in the work area. This may require the Contractor to use misting or spraying to assist in fiber settling and the reduction of airborne concentrations.

The Contractor may on some projects need to conduct dry removal because of safety or other concerns. **Prior to the initiation of any dry removal, the Contractor must provide the Owner and/or the Project Monitor with a copy of a written statement from the local regulatory authority charged with enforcing the NESHAP regulation. The written statement must give the Contractor permission to utilize dry removal methods or the Contractor will not be allowed to proceed.**

Wetting procedures are not equally effective on all types of asbestos-containing materials but shall none-the-less be used in all cases.

Part 17.2 - Intact Removal and the Use of Power Tools

The Contractor shall attempt to remove materials as intact as reasonably possible. In general, demolition or stripping of asbestos off substrates must be done using hand tools.

When required by this contract, or required by the Project Monitor, the Contractor shall remove whole components rather than stripping asbestos off the components. If components are removed intact, they must be wrapped in a leak tight seal of at a minimum two layers of six-mil thick poly.

Power tools may not be used to disturb asbestos unless specifically approved for use in these specifications or approved by the Project Monitor. Power tools that cut, saw, or significantly abrade asbestos-containing materials probably will be required to utilize a HEPA-vacuum-attached shroud system.

Part 17.3 - Prompt Clean Up of Debris

Removed asbestos-containing material shall be kept wet and promptly placed in the type of waste containers required by this specification. The Contractor is encouraged to place debris in containers shortly after it has been removed. However, at a minimum, all bulk debris must be containerized before any work stoppages such as for breaks, lunch, or the end of a shift. Bulk debris must be kept adequately wet until it is containerized. The Contractor must plan to disturb only amounts of asbestos-containing materials that can be cleaned up and containerized before the next work stoppage. Delays and additional costs incurred by the Contractor for failing to adequately calculate the amount of time needed to clean up debris will be the sole responsibility of the Contractor. For example, if a crew must work overtime to containerize debris before ending the shift, those additional costs are the sole responsibility of the Contractor.

Material should be removed intact as sections or components whenever possible and carefully lowered to

the floor. In general, intact materials may not be dropped. When materials must be stripped from the building substrate, such as surfacing materials, the Contractor must take reasonable steps to reduce the distance those materials may fall. These specifications may, for some projects, require that the Contractor develop chute systems or other means of keeping materials from falling substantial distances. If required, these restrictions will be discussed in these specifications and will be discussed during the bid walk.

Part 17.4 - Waste Containers

All debris generated in the regulated work area shall be placed in approved containers. The containers shall be leak tight and meet the requirements as stated in these specifications. Bags and other containers shall not be overfilled.

Bags containing asbestos-containing hazardous waste must be sealed in a gooseneck fashion. If the material is going to be double-bagged, only the second or final bag must be gooseneck sealed. The method of sealing the containers must be approved by the Project Monitor.

Unless stated otherwise in these specifications, or determined otherwise by the Project Monitor, the Contractor shall assume asbestos-containing waste with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which will tear the bags and/or poly sheeting shall first be placed into a container such as burlap or similar material before being wrapped or bagged in poly.

These specifications may require the Contractor to utilize rigid-walled containers such as fiber drums or cardboard boxes (approved by the Project Monitor) as the final container for hard-edged materials such as floor tile, gypsum board, ceramic tile, and other materials that may tear bags. Should these containers be required, it will be stated in the specifications and discussed at the bid walk.

However, if in the judgment of the Project Monitor, the Contractor's method of containerizing debris is inadequate and either results in the release of visible emissions or is reasonably expected to result in such a release, the Contractor will be forbidden to continue waste load out until the containers meet the approval of the Project Monitor.

This might result in the Contractor being required to change from poly bags to rigid-walled containers. For example, if the waste load-out procedure initially utilized by the Contractor results in visible debris or other visible emissions on the Owner's property outside of the regulated area, the Project Monitor typically will stop the load-out process and require the Contractor to address the problem. This is likely to result in the Contractor being required to utilize rigid-walled secondary containers. Should this be necessary due to the Contractor's failure to adequately containerize and handle the initial waste load-out process, all costs incurred by the Contractor to change to rigid-walled secondary containers is the sole responsibility of the Contractor, and will not be considered a change in the contract requirements.

The Contractor must properly label all containers before they leave the job site. Hazardous waste materials must be labeled before they leave the regulated area. Non-hazardous, asbestos-containing waste may be transported to the transport vehicle (dumpster or truck) without labels, but then must be labeled.

For example, the final container of hazardous waste, which will be either the second bag or rigid-walled container (box or barrel), must be properly labeled for the transport of hazardous waste before leaving the waste load-out decontamination system. This will include the required labels by OSHA, DTSC, NESHAP, and DOT. The Contractor is encouraged to use stick-on type labels that are specific to this job site and waste stream.

Non-hazardous, asbestos-containing waste must be containerized in leak-tight containers approved by the Project Monitor before leaving the regulated area. The Contractor may choose one of the following

options regarding the labeling of asbestos-containing, non-hazardous waste. The Contractor may label each container with the Cal/OSHA label required for materials that contain over one percent asbestos, or unlabeled containers may taken to and placed into a dumpster or truck bed that has been lined with a minimum of six-mil thick poly. A minimum of one layer of six-mil thick poly must then be wrapped and sealed over the load. That poly layer must then be labeled with the required Cal/OSHA labeling for materials that contain more than one percent asbestos.

The dumpster or truck in which the asbestos-containing material will be transported must first be lined with a minimum of one layer of six-mil thick poly. **This layer of poly must be wrapped over the entire load and sealed before the waste will be allowed to be transported.**

For all hazardous waste that requires an EPA manifest, the Contractor must coordinate with the Owner for signature of the manifest. In general, the Contractor must notify the Owner a minimum of 24 hours in advance of the need for a signature. Hazardous waste cannot be transported without an authorized signature so it is the responsibility of the Contractor to coordinate with the owner the time waste transporters will need the signature. Delays resulting from the failure of the Contractor to obtain an authorized signature from the Owner will be the sole responsibility of the Contractor, unless the Owner was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner.

For projects that generate asbestos-containing, non-hazardous waste, the Contractor will need to obtain a non-hazardous waste manifest form for the waste load. In general, the Contractor must notify the Owner or Project Monitor, a minimum of 24 hours in advance of the need for a signature. This waste should not be transported without an authorized signature so it is the responsibility of the Contractor to coordinate with the Owner and/or Project Monitor the time waste transporters will need the signature. Delays resulting from the failure of the Contractor to obtain an authorized signature from the Owner or Project Monitor will be the sole responsibility of the Contractor, unless the Owner and/or Project Monitor was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner and/or Project Monitor.

Part 17.5 - Air Movement and Air Scrubbing

Airborne asbestos fibers will stay in the air for a very long time unless efforts are made to remove them from the air. The Owner anticipates that much of the air in the regulated area will be relatively still regardless of the level of negative pressure differential and the rate of air exchange generated by the negative air pressure differential system. **The Contractor must take steps to remove asbestos from the air of the still areas within the regulated work area**.

For example, there is usually a considerable amount of air exchange near the personal decontamination system and in the vicinity of rooms where air filtration units are positioned. However in other areas of the regulated area, particularly in discrete rooms that do not contain air filtration units, there is a strong likelihood that airborne fibers exist and will remain in the air of those spaces until they are intentionally filtered out.

For this reason, on some projects, the Project Monitor may require that the Contractor utilize additional air filtration units to “scrub” the air in discrete spaces where otherwise there may be inadequate air exchange. The units do not need to exhaust air outside of the work area. They simply filter the air in a particular area and the exhaust from the unit circulates in the area to increase the chances of airborne fibers being collected by the unit.

If required for a particular project, these specifications will identify the need for additional air filtration units to be used as scrubbing units and this will be discussed at the bid walk.

However, Contractor's are strongly encouraged to consider the effect stagnant air in discrete spaces will have on their ability to successfully pass clearance air testing, particularly if the analysis will be by TEM. When clearance air testing will be conducted on a project, and the Project Monitor identifies discrete areas within the regulated area where he or she believes there might have been limited air exchange during the removal work, the Project Monitor is very likely to collect one or more clearance air test samples in those discrete areas. Therefore it is very much in the interest of the Contractor to provide additional air filtration units at the site and have the competent person move those units around on a periodic basis to filter the air in discrete areas thought not to have much normal air exchange. Using techniques such as scrubbing the air in discrete areas where regular air filtration units are not located will greatly increase the chances of the area passing clearance air testing on the first attempt.

SECTION 18. WASTE LOAD OUT

Asbestos-contaminated waste that has been containerized shall be transported out of the work area through the worker decontamination enclosure or through an approved waste load-out system.

Part 18.1 - Waste Load-Out System

In general, a three-stage waste load-out system will be required unless stated elsewhere in this specification or determined otherwise by the Project Monitor. The three stages shall include the following:

n. "Dirty Chamber" closest to the work area but separated from the work area by a poly curtain designed to reduce airflow. While called dirty, this room should not at any time contain visible debris. Visible debris should be removed from waste containers before they arrive in this chamber.

o. "Airlock Chamber" between the "Dirty Chamber" and the "Clean Chamber" designed to keep air from flowing from the "Dirty" to "Clean" areas.

p. "Clean Chamber" closest to the exit from the regulated area.

Each chamber must meet the basic requirements of the personal decontamination chambers discussed earlier in this specification. For example, the walls, ceiling and floor must be constructed of at least two layers of six-mil thick poly, and the dirty room must have an additional drop cloth layer. Entrances and exits of each chamber must have poly curtains that restrict the flow of air between the chambers. The System must have a water source in order to wash containers. Waste water generated by this process shall not be allowed to leak out of the area. Captured waste water must be filtered to the same level as water generated by the personal decontamination system.

The Contractor must secure the exterior entrance to the waste load-out system in order to avoid unauthorized personnel from entering the area.

Part 18.2 - Waste Load-Out Procedures

Waste load out procedures shall utilize two teams of workers, an "inside" team and an "outside" team. The inside team, wearing appropriate protective clothing and respirators for inside the work area, shall clean the outside, including bottoms, of properly labeled initial containers such as bags. The initial container shall then be moved into the first chamber of the waste load-out system where it will be placed into a secondary container such as another bag or a rigid-walled container such a barrel or drum. **The poly curtain between the middle, airlock chamber, and the dirty room must be closed before the container is passed into the dirty chamber.**

The outside of that container must then again be either washed or vacuumed if needed before the container is passed into the middle chamber of the waste load-out system. The Contractor may apply the proper labels to the container either in this chamber or in the middle, airlock chamber.

The inside team may pass the final waste container into the middle chamber only if the dirty chamber poly curtain leading to the work area is closed.

Once the container is in the middle chamber and the air lock is closed between the middle chamber and the dirty chamber, the outside team of workers may reach into the middle chamber, collect the waste container and move it to the clean chamber. Once the poly curtain is closed between the clean chamber and the middle, airlock chamber, the outside team may pass the container out of the clean chamber for transport to the transport vehicle, either dumpster or truck.

The Contractor must never allow all waste load-out chamber curtains to be open at the same time allowing a tunnel-like effect into the work area. Inside workers may never open or be in the middle chamber when the poly curtain between the middle and clean chamber is open. Likewise, outside workers may never open or be in the middle chamber when the poly curtain leading to the dirty room is open. Visible debris must never be present in the dirty chamber. If for some reason debris does occur in the dirty chamber, the Contractor must stop, clean the floor poly, and at a minimum install a new layer of drop cloth poly in the dirty chamber before continuing with the waste load out process.

The Contractor will be required to maintain the negative pressure differential required by this specification during the waste load-out process. This may require the Contractor to use additional units or temporarily close the personal decontamination system during the waste load-out process.

The personal decontamination system used by workers for entrance and exit to the work area may be used for waste load out for small jobs or when this specification does not require a separate waste load-out system. The shower chamber will be treated as the middle airlock chamber. **Workers are not allowed to create a tunnel effect when loading out waste. Workers inside the work area must never enter or be in the shower room if the poly curtain from the shower room to the clean room is open. Likewise, outside workers may never open or enter the shower room if the poly curtain between the shower room and the dirty room is open.**

SECTION 19. CLEAN UP PROCEDURE

Following completion of the stripping of asbestos from the building surfaces or the removal of components containing asbestos, the Contractor shall remove and containerize all visible accumulations of asbestos-containing material and asbestos-contaminated debris. The Contractor shall utilize rubber or plastic dust pans, shovels, and squeegees to collect and move material. The Contractor shall take special care to minimize damage to floor sheeting.

After the clean up of all visible accumulations of debris, the Contractor shall thoroughly wet clean and HEPA vacuum all surfaces from which asbestos-containing materials have been removed as well as all surfaces potentially exposed to asbestos debris or airborne fibers released during the work. The Contractor shall use rags, mops, sponges as appropriate, taking care that the cleaning method or tools do not leave a residue on the cleaned surface. For example, cloth rags may leave threads on rough wood surfaces. Airless water sprayers may be used to assist in this process unless they are specifically prohibited elsewhere in these specifications. However, the Contractor must take great care that the water used by this method does not damage building surfaces or leak out of the work area.

The Contractor shall remove all containerized waste from the work area.

The Contractor shall thoroughly decontaminate all tools and equipment. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the Project Monitor must inspect the tools and equipment used in the regulated area for cleanliness before allowing them to be removed from the regulated area. **Should the Contractor remove tools and/or equipment from this area prior to receiving authorization from the Project Monitor, the Project Monitor may require the Contractor to move the material back into the work area and clean it again**. The Project Monitor will also require the Contractor to clean the area where the unauthorized tools were stored in the interim.

Before allowing tools and equipment to be removed, they must be clean of dust and debris including virtually all three-dimensional material. The Contractor must keep this standard of cleanliness in mind before allowing the Competent person to bring into the work area tools or equipment that have hardened, cementitious-type materials already present. Regardless of whether or not the material on the tools was generated during this project, the tools must be clean before being allowed to leave the work area.

Tools, equipment, and personal protective equipment such as boots may be cleaned and then sealed in leak-tight containers if they are being moved to other locations on the same property. They must be fully cleaned or disposed of if they are going to leave the Owner's property.

The Contractor's competent person must tour the regulated area after this cleaning work is completed to visually verify that the removal work and cleaning is complete. If two layers of poly are present on walls and floor, the Contractor may remove the first layer after the Competent person determines the work area is clean. If only one layer of poly is present, the Contractor must wait to remove the poly until given approval by the Project Monitor as discussed below.

If allowed to be removed, the first layer of poly must be cleaned before it is removed. The Contractor should ensure that the poly is carefully pulled down and is shaken as little as possible. The poly should be rolled up gently, sealed, and treated as the same waste stream as the removed asbestos-containing material. The competent person must then inspect the work area for, and clean up any dust or debris that may have migrated behind the first poly barrier or have been released during the removal of that poly.

For some projects, the Contractor will need to wait a minimum of 24 hours after this initial cleaning before again wet wiping and HEPA vacuuming all surfaces. If required, this will be stated in these specifications and discussed at the bid walk.

Once the competent person has determined the area is clean, he or she must contact the Project Monitor and explain that the area is ready for a final visual inspection. Unless stated otherwise in this

specification or determined otherwise by the Project Monitor, the Competent Person must notify the Project Monitor a minimum of 24 hours in advance of a final visual inspection being needed, and a minimum of one hour prior to the exact time needed for the visual inspection. The Project Monitor will make reasonable efforts to schedule this inspection in a manner that is efficient for the Contractor.

The surface areas to be visually inspected must be thoroughly dry or the Project Monitor will not conduct the visual inspection.

When conducting the visual inspection, if the Project Monitor determines the area will need substantial re-cleaning, the Project Monitor may decide to leave the area and return again, only with a minimum of an hour in advance notice and assurance that the area has now been properly cleaned. If, on the second visit to conduct a final visual inspection, the Project Monitor determines that the area will still need much more cleaning, the Project Monitor is authorized to delay returning to conduct another inspection for a minimum of 24 hours.

The Project Monitor will thoroughly visually inspect the work area for dust and debris. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the standard of cleanliness will be no visible dust or three-dimensional debris. While it may change somewhat depending on the project, unless stated otherwise, visual staining of the substrate will be allowable as long as the stain doesn't rub off with hand pressure.

The Contractor must conduct any additional cleaning necessary to pass this visual clearance inspection. Any additional cleaning necessary to meet this visual clearance standard is the sole responsibility of the Contractor. **The time necessary to complete such cleaning will not affect the Contractor's scheduling of work as required by this contract.**

If the work area passes the visual clearance inspection conducted by the Project Monitor, the Contractor will be allowed to apply a thin coat of a lock-down encapsulant on the abated surfaces and remaining poly barriers, **unless stated otherwise in these specifications**. For example, Contractors normally will not be allowed to spray encapsulant on floor substrates when **new flooring will be installed** on those surfaces.

Contractors are responsible for damage to the building resulting from the use of lock-down encapsulants.

Once the encapsulation has dried, the Contractor shall remove the remaining poly barriers in the area, except for those covering critical barriers. The Contractor shall clean up with wet wiping and/or HEPA vacuuming any visible debris that has migrated behind those barriers. For some projects, such as floor tile work, the specifications may require wall and ceiling poly barriers, and poly on fixed objects to remain in place at this time.

The negative air pressure differential system shall remain in operation during this entire time and, unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the required negative air pressure differential and air exchange rates required by this specification shall continue to be enforced. Unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the decontamination system must remain in place and be utilized as described in these specifications.

The Project Monitor will provide the Contractor with a written statement acknowledging that the work area has passed the final visual clearance test, and that if appropriate, the Contractor is authorized to encapsulate the area and remove all poly barriers except those sealing critical barriers.

If clearance testing will not be conducted, the Contractor will be allowed to remove all remaining barriers.

The Contractor must remove all poly, signs, barriers, equipment, debris and any other materials associated with the work before the Owner will consider the work to be complete.

SECTION 20. CLEARANCE TESTING

Unless stated otherwise in these specifications, the Owner will determine the need to conduct a clearance testing and what process will be used to collect and analyze air samples if used for clearance air testing. If such testing is required, the criteria for completion will be listed in these specifications.

Unless stated otherwise in these specifications, the Owner is responsible for the costs associated with implementing the first round of clearance testing. **The Contractor is responsible for all costs associated with the collection, transport, and analysis of all subsequent clearance sampling**.

Clearance testing for asbestos will normally involve the collection and analysis of air samples. Some projects may require alternative testing mechanisms such as if the project involves soil contamination.

The Project Monitor will authorize clearance air testing to be done only after the Contractor has passed the final visual clearance inspection. **For most work areas, this will mean that the work area is dry, and that there is no residue of encapsulant or other material in the area that may affect the clearance air-testing process.**

Unless stated elsewhere in these specifications, or determined otherwise by the Project Monitor, the Contractor shall assume that there will be a 24 hour waiting period between the application of a lock-down encapsulant and the Project Monitor conducting clearance air testing. The Contractor should plan on this delay in his or her scheduling of the work! This delay may be even longer if in the judgment of the Project Monitor the area or encapsulant is not dry or there is some other reason why clearance air testing must be delayed in order to obtain valid results.

Unless stated otherwise in these specifications or determined otherwise by the Project Monitor, all clearance air testing will be done using “aggressive” air sampling techniques. Prior to starting the collection of samples, the Project Monitor will typically use a leaf blower to sweep surface areas in the regulated area. Fans will normally be positioned to move air around the work area. These fans will remain on during the air collection process. The Project Monitor may determine that it is necessary to alter these procedures for specific work areas such as those areas where asbestos-containing materials remain in the work area, or where there are substances such as soil or fiberglass that could affect the testing process.

Unless stated otherwise in these specifications, the Contractor shall assume that air test analysis will be by Transmission Electron Microscopy (TEM) except for very small areas where, in the judgment of the Project Monitor, Phase Contrast Microscopy (PCM) analysis will provide adequate assurance of air quality for the Owner.

The Contractor shall assume that, at a minimum, the Project Monitor will follow the air testing requirements of AHERA regarding the number of samples to be collected, the type of analysis, and the results indicating passage of clearance air testing. For non-AHERA sites, these specifications may state, or the Project Monitor may determine, that another sampling protocol is more appropriate.

Unless stated elsewhere in these specifications, or determined otherwise by the Project Monitor, the following results will indicate passage of clearance air testing.

q. TEM: The average of the samples must be below 70 structures per millimeter squared.

r. PCM: Each sample must be equal to or below 0.01 fibers per centimeter squared. (In general, results above 0.01, including 0.011 or higher, will indicate failure. However, in some circumstances, such as when there are other fibrous materials in the area that may have affected clearance testing, the Project Monitor may determine it appropriate to round off decimal results above 0.01. For example, results equal to or below 0.014 will be rounded down and may under certain circumstances be deemed to pass clearance testing. Results of 0.015 or higher will indicate failure regardless of the

existence of other, non-asbestos fibrous materials in the work area.)

Should the Project Monitor determine that the clearance air testing results do not pass the clearance testing requirement, the Contractor shall re-clean areas and take other steps as determined appropriate by the Project Monitor. For example, the Contractor may be required to utilize additional air filtration devices to scrub the air in parts of the work area. The Contractor is responsible for all costs associated with re-cleaning the area, taking additional steps to meet the clearance criteria, and delays in work scheduling resulting from the failure to pass clearance air testing.

Once the Contractor has completed the additional steps required by the Project Monitor, the Project Monitor will return to collect a second round of clearance air tests. The costs and delays associated with the collection of the clearance air testing process, after the first test, shall be the responsibility of the Contractor. The Contractor will pay for the labor, shipping, and analysis of all additional clearance air testing according to the same price schedule used by the Project Monitor for the Owner for the first round of testing.

Once the Project Monitor has notified the Contractor that he has successfully passed clearance air testing, the Contractor will be permitted to remove the remaining layers of poly, the decontamination systems, and turn off, seal, and remove all air filtration units. As the barriers are removed, the Contractor shall inspect for, and clean up any visible dust or debris found behind the poly.

Unless stated otherwise in these specifications, or determined otherwise by the Project Monitor, all clearance air testing results will be submitted to the laboratory for analysis on a 24 hour turnaround basis. This does not include the time it may take to transport the samples to the laboratory. Therefore the Contractor shall assume that it will take a minimum of 48 hours following the collection of air samples before the Contractor will know the results of those samples. This, plus the 24 hour delay between encapsulation and the collection of samples, means that Contractors should anticipate approximately 72 hours between the time they finish encapsulating an area (following the final visual approval) and being provided the results of the clearance air testing process. **Costs and delays resulting from the Contractor's failure to schedule for these delays are the sole responsibility of the Contractor**.

The Contractor must remove all poly, signs, barriers, equipment, debris and any other materials associated with the work before the Owner will consider the work to be complete.

SECTION 21. PROJECT MONITORING

The Owner reserves the right to use the Asbestos Project Monitoring Firm and its authorized representatives to monitor the work of the Contractor. The Asbestos Project Monitoring Firm will assign a Project Monitor and/or Monitors to represent the Owner for this project.

The Project Monitor is authorized to conduct whatever environmental sampling he or she deems appropriate in order to ensure the safe execution of the work covered by these specifications. This may include conducting sampling such as air sampling in or around the work area, or on the Contractor's employees. The Contractor must comply with any reasonable requests by the Project Monitor as to the collection of personal air samples on the Contractor's employees. When necessary, the Contractor shall allow the Project Monitor the use of electrical equipment established by the Contractor in order for the Project Monitor to collect air samples.

The Project Monitor may determine it necessary to take additional samples such as of dust, paint, soil, or other materials in order to protect the interests of the Owner. The Contractor shall provide reasonable assistance in the collection of such samples if assistance is requested by the Project Monitor. For example, the Project Monitor may need to use ladders, scaffolds, or man lifts used by the Contractor.

The Project Monitor will typically monitor the performance of the Contractor's employees and verify compliance with these specifications and published regulations. The Contractor shall ensure that the contractor's employees and Competent Person provide reasonable assistance, and take no steps that, in the judgment of the Owner and/or Project Monitor, inhibit the Project Monitor from successfully completing his or her work.

The Contractor is required to ensure that the Competent Person comply with Cal/OSHA personal air sampling requirements for the work covered by this project. Unless stated otherwise in these specifications, or determined otherwise by the Project Monitor, **the Contractor's own negative exposure assessment data from other projects shall have no impact on the need to collect personal air samples on this project.**

The Contractor must provide the Owner and/or Project Monitor with the results of personal air sampling collected on this project within 72 hours of the collection of those samples. The Contractor must provide the Owner and/or Project Monitor a copy of the laboratory results within seven days of the collection of those samples. Failure to collect or provide the results of this required sampling will be interpreted as non-compliance with these specifications, and may result in the Project Monitor not allowing work to continue until such results are provided. Delays and costs associated with the Contractor's failure to provide this information in the specified time frame are solely the responsibility of the Contractor.

The Owner and/or Project Monitor are authorized to issue a STOP WORK order whenever the Contractor's work or protective measures are not in accord with published regulations or these written specifications. Should that action be taken, the Contractor is solely responsible for the costs resulting from such delays. Those delays caused by the Contractor's failure to comply with these specifications or published regulations, shall not affect the responsibility of the Contractor to meet the time and schedule requirements of this contract.

SECTION 22. DISPOSAL PROCEDURES

Part 22.1 - Disposal Procedures

All asbestos-containing waste must be sealed in leak-tight containers and properly labeled as discussed elsewhere in these specifications.

The Contractor shall ensure that no visible emissions such as dust, debris, or water are released during the handling of waste containers outside the regulated work area. If such debris is discovered, or if a container breaks, the Contractor shall immediately clean up the material using workers dressed in protective clothing and wearing, at a minimum, P-100 (HEPA) cartridge respirators.

The Contractor shall schedule work in order to avoid exceeding the waste storage capacity at the job site.

Waste containing asbestos must be stored in a locked and properly labeled container. If the waste will be temporarily stored on site before being taken to the transport vehicle, the storage area must be in a locked area only accessible to authorized persons.

The transport vehicle, either the dumpster or truck, must be lined with a minimum of one layer of six-mil thick poly wherever the containers will be located. **Before transporting, the poly layer must be pulled up and over the waste and sealed with tape.**

The Contractor must ensure that the transport vehicle is labeled in accordance with the local NESHAP authority during the waste load-out process.

The Contractor is solely responsible for damage to the owner's property due to the storage or movement of waste vehicles and containers on the Owner's property. The Contractor must take steps to protect the location and ground area where the waste container, such as a dumpster, will be stored. For example, the Contractor shall plan to put wood or another substance under dumpster wheels in order to prevent the weight of the dumpster from damaging the Owner's property.

The Contractor must dispose of the waste at the location provided in the pre-work submittal documents. Should the Contractor choose to change to a different facility, the Contractor must provide the name of the new site in writing to the Owner and/or Project Monitor a minimum of 48 hours in advance of the waste leaving the job site. The Contractor must transport the waste to an authorized site in accordance with regulatory requirements of NESHAP and applicable state and local guidelines and regulations, including the California Environmental Protection Agency, Department of Toxic Substances Control and the Water Resources Control Board.

Prior to transporting the waste, the Contractor is responsible for determining whether the type of waste, the waste containers, and the labeling of the containers as required by this specification are acceptable to the waste facility.

For all hazardous waste that requires an EPA manifest, the Contractor must coordinate with the Owner for signature of the manifest. In general, the Contractor must notify the Owner a minimum of 24 hours in advance of the need for a signature. Hazardous waste cannot be transported without an authorized signature so it is the responsibility of the Contractor to coordinate with the owner the time waste transporters will need the signature. Delays resulting from the failure of the Contractor to obtain an authorized signature from the Owner will be the sole responsibility of the Contractor, unless the Owner was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner.

For projects that generate asbestos-containing, non-hazardous waste, the Contractor will need to obtain a non-hazardous waste manifest form for the waste load. In general, the Contractor must notify the Owner or Project Monitor, a minimum of 24 hours in advance of the need for a signature. This waste should not

be transported without an authorized signature so it is the responsibility of the Contractor to coordinate with the Owner and/or Project Monitor the time waste transporters will need the signature. Delays resulting from the failure of the Contractor to obtain an authorized signature from the Owner or Project Monitor will be the sole responsibility of the Contractor, unless the Owner and/or Project Monitor was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner and/or Project Monitor.

The Contractor shall provide to the Owner and/or Project Monitor all dump receipts, trip tickets, waste manifests, NESHAP Waste Shipment Record (WSR), Notice and Certification, and other waste disposal documentation.

All manifests for asbestos hazardous waste shall have the waste identified as: "RQ, Asbestos, 9 NA2212, III." This requirement may be changed as new regulations are issued.

Part 22.2 - Transportation to the Landfill

The Contractor shall remove approved waste containers from the work area and load them into an enclosed transport vehicle (truck or dumpster) with solid walls, ceiling and floor. The transport vehicle (truck or dumpster) must be lined with six-mil poly sheeting on the walls and floor of the compartment where the waste will be stored.

No waste containers shall be on site which contains other hazardous waste or waste from any other source or job site. The Contractor may transport waste from multiple sites owned by the same Owner as long as each load has a separate manifest.

If Contractor is storing waste from various sites of one owner, all transportation vehicles shall be covered by the same regulations as the dumpster or truck being used to haul the waste to the landfill. If equipment or supplies are to be left in vehicles during the hauling of waste, the waste and the equipment and supplies must be separated by a solid (wood or metal) barrier which has been sealed as a critical barrier. A poly wall barrier is not sufficient.

The Contractor is responsible for ensuring that all waste storage areas are locked at all times except for when they are actively being used to load or unload containers.

The Contractor is responsible for ensuring that all dumpsters, trucks, and storage bins arrive on site completely free from debris. The Contractor is responsible for determining the integrity of the waste containers' structure, stability, locking abilities, etc.

The Project Monitor has authority to reject a dumpster, waste container, or storage bin if it arrives on site with debris present, cannot be adequately cleaned by the Contractor, or using reasonable judgment the Project Monitor determines the container is unsafe or inadequate for use on this project.

Part 22.3 - Disposal at the Landfill

Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos-containing waste.

Waste containers shall be inspected as they are off-loaded at the disposal site. Material in damaged containers shall be re-packed in empty drums or bags as necessary.

While the Owner does not control nor have authority over the work practices utilized at the waste landfill, the Owner encourages the landfill to follow the following precautions.

Waste containers should be placed on the ground at the disposal site, not pushed or thrown out of the trucks.
Personnel off-loading containers at the disposal site should wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-face, air-purifying cartridge respirators equipped with P-100 (HEPA) filters.

Following the removal of all containerized waste, the truck cargo area should be decontaminated using HEPA vacuums and/or wet methods until there is no visible residue. Poly sheeting shall be removed and discarded, along with contaminated cleaning materials and protective clothing, in bags or drums at the disposal site.

SECTION 23 SPECIFIC REMOVAL PROCEDURES AND REQUIREMENTS

Part 23.1 - General Repair of Damaged Thermal System Insulation (TSI)

Unless stated elsewhere in these specifications or determined otherwise by the Project Monitor, the following procedures shall be followed when it is feasible to repair the small nicks, cuts, and exposed ends of TSI. The Contractor shall:

s. Place a piece of four or six-mil poly sheeting directly under the area to be worked in order to collect any fallen debris or repair compound.

t. The worker shall, at a minimum, wear protective clothing and a half-face, cartridge respirator equipped with P-100 (HEPA) cartridges.

u. The area shall be posted with the proper Cal/OSHA regulated area sign in order to keep unauthorized persons out of the area.

v. A HEPA-vacuum must be in the immediate area to pre-clean any debris observed surrounding the damaged section, or in the event of a mishap.

w. HVAC systems in the immediate work area shall be sealed off as critical barriers including intake ducts if the work is being done outside.

x. Adjacent materials such as fiberglass must be removed if contaminated by the damaged area of TSI.

y. HEPA vacuum the damaged section in order to collect loose and friable material prior to proceeding with the repair.

z. Very small cracks, holes, nicks, and cuts can be repaired with joint compound or with a single layer of rewettable cloth and an appropriate bridging encapsulant. Two layers of rewettable cloth will be needed to repair larger sections of damaged TSI.

aa. Where the TSI cannot be removed completely from penetrations in the walls, floors, or ceilings, the TSI shall be removed at least one inch into the opening and sealed with a bridging encapsulant. The Contractor may choose to fill large gaps with fiberglass insulation, prior to sealing with the encapsulant.

bb. The Contractor shall remove all equipment, tape, poly barriers, signs, etc. from the work area following completion of the work.

Part 23.2 - Glovebag Procedures

Part 23.2.1- Procedures

Unless stated elsewhere in these specifications or determined otherwise by the Project Monitor, the following procedures shall be followed on glovebag work conducted in compliance with these specifications.

cc. At a minimum, the Contractor shall follow the procedures recommended by the manufacturer of the glovebags, and the specifications required by Federal OSHA and Cal/OSHA regulations.

dd. Unless stated otherwise in these specifications or determined otherwise by the Project Monitor, all glovebag work will be done within a secondary containment such as a small mini-enclosure-type system or an otherwise fashioned containment area accepted by the Project Monitor. The decision

on whether or not to require a secondary containment will be based on the type of material being removed, the amount and location of the material, and the feasibility of establishing a secondary containment. While a secondary containment may be required for smaller areas, the Contractor should assume that a secondary containment will be required whenever more than six linear feet of TSI will be removed. Should a secondary containment not be erected, the Project Monitor will typically require the Contractor to take additional steps to isolate the entire room from the adjacent areas. This may require the Contractor to erect poly walls and floor barriers in the whole work area. In all cases, regardless of the level of additional containment, the Contractor will place a six-mil thick layer of poly on the floor under the area to be disturbed.

ee. All critical barriers inside the secondary containment system shall be sealed. If a secondary containment is not used, the Contractor must seal all critical barriers in the work area unless specifically authorized by the Project Monitor not to do so.

ff. Stationary objects inside the secondary containment (or in the work area if a secondary containment is not used) which cannot be removed must first be cleaned and then covered with at least one layer of four-mil poly.

gg. Unless stated otherwise elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor must establish a negative pressure differential in the secondary containment or if one is not used, in the entire work area, if more than six linear feet of TSI is being removed. In addition, unless determined otherwise by the Project Monitor, the Contractor will need to meet the requirements for establishing, maintaining, and recording pressure differentials as stated elsewhere in this specification.

hh. The Contractor must have a HEPA-filtered vacuum in the immediate area for use in conjunction with the use of glovebags or in case of a spill.

ii. Glovebags may not be used on surfaces where temperatures exceed 150 degrees Fahrenheit.

jj. Glovebags may be used only once, and may not be moved or slid for removal of a second section of TSI.

kk. At least two persons shall perform Class I glovebag removal as defined by Federal OSHA and Cal/OSHA.

ll. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in minimum two layers of six-mil poly sheeting or otherwise rendered intact.

mm. Where the system uses an attached waste bag, such bag shall be connected to a collection bag using a hose or other materials which shall withstand pressure of asbestos-containing waste and water without losing its integrity.

nn. The Contractor shall apply a sufficient volume of water to all TSI scheduled for removal while it is enclosed in the glovebag. Amended water must be used if the TSI is known to contain amphibole asbestos or has not been tested and proved to not contain an amphibole type of asbestos.

oo. A sliding valve or other device shall separate the waste bag from the hose to ensure no exposure when the waste bag is disconnected.

pp. Prior to placement in the disposal bag, glovebags shall be collapsed by removing air within them using a HEPA vacuum. The bag must then be sealed using a “gooseneck” sealing technique.

qq. The glovebag shall then be placed into a properly labeled waste container consisting of, at a minimum, a six-mil thick waste bag. That bag must also be sealed using a gooseneck sealing

technique. The waste container then must be properly labeled as discussed elsewhere in this specification.

rr. Where pipes enter walls, floors, or ceilings which are not within the scope of the project, the TSI shall be removed at least one inch into the structure and the end of the TSI must be sealed with bridging encapsulant and/or rewettable cloth.

ss. If the Contractor chooses to use a Negative Pressure Glove Bag System, Negative Pressure Glove Box System, or Water Spray Process System in lieu of the traditional Glovebag System, the Contractor shall submit to the Owner and/or Project Monitor detailed written procedures on how the system will be used. In addition, air sampling data, generated by the Contractor, must be provided to the Owner and/or Project Monitor that documents the effectiveness of the technique as intended for use by the Contractor. The Owner and/or Project Monitor must provide prior approval to alternate techniques and approaches to those specifications detailed here.

tt. The Contractor is responsible for salvage and decontamination of all pipe system supports, hangers, brackets, saddles, etc. These items shall be inventoried by the Contractor and verified by the Owner and/or Project Monitor before and after abatement. The Contractor will be responsible for replacement of any items lost or damaged.

uu. The Contractor shall be responsible for ensuring the piping system remains adequately supported at all times. This may be achieved by readjusting existing hanger brackets as insulation is removed, or by other approved methods, such as inserting wood blocks to replace the thickness of the removed insulation.

vv. The Contractor may not start work before being given authorization to proceed by the Project Monitor. Typically the Project Monitor will need to be notified 24 hours in advance of the work, and then a minimum of one hour in advance of the exact time the Contractor desires a visual inspection of the work area set up. The Project Monitor will make all reasonable efforts to schedule a visual inspection in time frame that does not negatively affect the Contractor's schedule. **However, unless specifically authorized otherwise by the Project Monitor, the Contractor may not begin disturbing asbestos until the Project Monitor has visually approved the set up and authorized the Contractor to begin.**

Part 23.2.2 - Decontamination Area and Procedures

Unless stated otherwise elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor shall erect and utilize a three stage decontamination unit with a shower contiguous with the containment for areas requiring removal of more than 25 linear feet of TSI, or if a glovebag is used for surfacing removal work, the removal of ten or more square feet of surfacing material. Should a shower system be required, the Contractor shall construct the system and ensure workers follow the procedures as described elsewhere in this specification for Class I work where a shower is required.

Should less than this amount be disturbed, the Contractor shall provide a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers should then go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area. At a minimum, all contaminated poly layers must be cleaned before the next time they will be needed for decontamination.

Part 23.3.1 - Procedures

ww. For the purposes of these specifications, "mini-cube enclosure," “enclosure," "mini-enclosure," and "mini-cube" are all used interchangeably and mean the same. The mini-enclosure is required to be constructed whenever small sections of walls, ceilings, or pipe insulation are to be removed for electrical, plumbing, mechanical, or other similar work. The purpose is to create an enclosed and controlled work environment while removing asbestos or accessing a contaminated attic space.

xx. Enclosure walls and floors must be constructed of at least two layers of six-mil poly sheeting. No visible holes, cracks, penetrations, etc. shall be within this enclosure. The upright frame shall be adjustable in order to butt the top of the enclosure to the wall or ceiling area. A single drop layer of six-mil poly sheeting shall be put down and removed daily at the end of the work shift. For work involving removal of TSI by glovebag technique, only one layer of six-mil poly sheeting is required for construction of the mini-enclosure.

yy. **Unless stated otherwise in these specifications or determined otherwise by the Project Monitor, the mini-enclosure shall be constructed with at least two chambers**. The chambers shall be separated by flapped poly sheeting doors. The first chamber upon entrance will be called the "clean" chamber, while the second chamber will be called the work chamber.

zz. Since the top of the enclosure must be open in the chamber where ceiling access will take place, special care must be taken prior to moving the enclosure. If the mini-enclosure is designed to be portable, the enclosure must be sealed at the top prior to being moved to the next location. This may be achieved by temporarily sealing the top with poly and tape from the inside.

aaa. For access to an attic space, position the enclosure at the location to be worked. The enclosure must be butted up to the ceiling surface to form a semi-seal between the top of the enclosure and the ceiling. The enclosure can then be completely sealed to the ceiling, using tape. After a seal has been established, access into the ceiling can then proceed.

bbb. A HEPA vacuum shall be used to establish negative pressure or at least airflow into the enclosure. This shall be verified by using ventilation smoke tubes.

ccc. Prior to starting work, the Contractor shall ensure that he has sufficient equipment and tools in the mini-enclosure to complete the work. This includes, but is not limited to:

1. A water source for wetting the materials as well as for worker decontamination.

2. A HEPA vacuum.

3. All necessary tools and equipment.

4. Waste containers.

h. The outside of the poly-flapped entry to the mini-cube must be posted with warning signs as required by Cal/OSHA for a regulated area.

i. Clean disposable coveralls must be worn entering the mini-enclosure, and must be removed prior to leaving the mini-enclosure. Depending upon the work being performed, the Contractor may choose to "double suit" in disposable coveralls.

j. If there is removal of greater than three linear feet of TSI, or greater than three square feet of surfacing material (regardless of the removal method used), the enclosure must remain in place until

a final visual is passed. In general, clearance air testing will be done in these areas following the completion of a visual inspection. Typically, where work involves less than these quantities, the Project Monitor will only need to conduct a visual inspection, and the Contractor will be allowed to dismantle or move the containment following passage of the visual inspection.

k. The Contractor may not start work before being given authorization to proceed by the Project Monitor. Typically the Project Monitor will need to be notified 24 hours in advance of the work, and then a minimum of one hour in advance of the exact time the Contractor desires a visual inspection of the work area set up. The Project Monitor will make all reasonable efforts to schedule a visual inspection in time frame that does not negatively affect the Contractor's schedule. **However, unless specifically authorized otherwise by the Project Monitor, the Contractor may not begin disturbing asbestos until the Project Monitor has visually approved the set up and authorized the Contractor to begin.**

Part 23.3.2 - Decontamination Area and Procedures

Unless stated otherwise elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor shall erect and utilize a three stage decontamination unit with a shower contiguous with the containment for areas where the work will require the disturbance of 25 or more linear feet of TSI, or ten or more square feet of surfacing material. Should a shower system be required, the Contractor shall construct the system and ensure workers follow the procedures as described elsewhere in this specification for Class I work where a shower is required.

Should less than this amount be disturbed, the mini-enclosure will typically be required to have at least one airlock chamber adjacent to the mini-enclosure. Inside this chamber, the Contractor shall provide a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers may then leave the airlock chamber and go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area.

Work that is particularly dusty, such as the removal of large sections of gypsum board or plaster, will require the mini-enclosure to have two adjacent airlock chambers.

Part 23.4 - Roofing Abatement Requirements

Typically, buildings will not be occupied by the Owner during the removal of asbestos-containing materials on the roof. These roof removal procedures are designed for work done on roofs when the buildings are not occupied. **The Contractor may be required to take additional precautions if a building will be occupied during the removal work.**

Part 23.4.1 - General Requirements

The removal of roofing materials that are not Regulated Asbestos-Containing Materials is designated as Cal/OSHA Class II work.

The Contractor must stop work and notify the Owner and/or Project Monitor if the condition of materials change or new materials are discovered which may be defined as Regulated Asbestos-Containing Materials.

If the Contractor must remove roofing materials determined to be Regulated Asbestos Containing Materials (RACM) as defined by the local NESHAP authority, the requirements for that work will be

described elsewhere in these specifications.

The Contractor is responsible for determining if the asbestos removal work done on the roof will damage building materials inside the building or may result in the release of asbestos-containing materials from interior building materials.

The Contractor shall be responsible for all clean up and costs associated with the decontamination of occupied spaces should those spaces become contaminated by roofing materials or other building material contamination resulting from the Contractor's work.

Unless stated otherwise in these specifications, the Contractor is responsible for any contamination of the attic space above the existing ceilings caused by their work unless stated otherwise elsewhere in this specification.

All work hours at the site shall be determined by the Owner or as defined in other sections of this specification.

The Contractor is responsible for obtaining all necessary permits to perform this work, including any local permits for work done during the evening or night hours.

The Contractor shall coordinate all roof removal work with the other trades involved on this project that may be affected by the roof removal work.

The Owner and/or Project Monitor must be notified a minimum of 24 hours in advance of projects or as stated otherwise in this specification.

Part 23.4.1A - Weather Conditions

The work shall be coordinated and scheduled when there are favorable weather conditions, such as, performing the abatement work when the forecast is for "clear skies" and no rain forecast for three or more consecutive days. The Contractor shall remove only that amount of roofing material which can be re-roofed or covered, and secured from the weather.

Work may be halted at the discretion of the Owner and/or Project Monitor if wind conditions occur which can or does cause removed roofing materials to be blown off the roof area, or beyond the perimeter of the designated removal area.

The Contractor shall be responsible for securing all exposed roof surfaces, including any roof penetrations against weather after roofing materials have been removed. Protection of the roof must be made with an impermeable barrier to prevent water from entering the building structure.

Part 23.4.1B - Safety Conditions

The Contractor shall provide worker safety according to all Cal/OSHA regulations, including use of tie-offs, harnesses, and lanyards. Particular attention shall be given to the placement and securing of access to the roof. The Contractor shall only use ladders in compliance with Cal/OSHA requirements. For example, the ladders shall extend at least three feet above the roof line, and shall be tied off to the building to prevent them from sliding.

The Contractor is solely responsible for the safety of the Contractor's employees working on this project. This includes ensuring that the Contractor's Competent Person on the site fully understands all Cal/OSHA fall protection requirements for the type of work that will be conducted.

The Project Monitor may choose to inspect the Contractor's fall protection equipment and practices, but is not responsible for the construction or use of that equipment. However, if in the judgment of the Project

Monitor, he or she feels the work practices, equipment, or behavior of the Contractors' employees are by reasonable standards of caution jeopardizing their health and safety, the Project Monitor has authority to stop the work until the Contractor addresses the Project Monitor's concerns.

All workers entering all regulated areas must wear footwear consistent with the hazards associated with the project. Typically this means that they must wear work boots with hard soles. No athletic, street, or dress shoes are to be worn during work activities.

Part 23.4.1C - Equipment

The Contractor shall provide all necessary equipment, tools, materials, lighting, labor, etc. to perform the work. If the work is performed at night, the Contractor shall provide sufficient lighting to illuminate the entire removal and transit areas, and for the final visual inspection by the Project Monitor.

HEPA equipment to be used inside any building must have been challenge tested (as discussed elsewhere in these specifications) within the last 90 days. This challenge testing certification must be verified by Owner and/or Project Monitor prior to the use of the units on site.

Part 23.4.2 - Pre-Abatement Roof Preparation Requirements

The Owner is responsible for closing all windows in the building where the asbestos roofing material will be removed. The Owner shall also be responsible for removing, cutting or trimming back all vegetation which may significantly inhibit the Contractor's work.

The Contractor shall coordinate with the Owner and/or Primary Contractor to ensure the Owner is notified sufficiently in advance regarding the need to close the windows and/or remove vegetation. Delays resulting from failure to provide this advance notice are the sole responsibility of the Contractor.

The Contractor must implement the following actions prior to beginning any work that disturbs asbestos.

ddd. The Contractor shall seal all critical barriers on or directly adjacent to the roof removal work. This includes skylights, attic openings, window-mounted fan units, louvers, air intakes associated with the HVAC units, the HVAC units themselves, and any other equipment, objects, or openings as determined necessary by the Owner and/or Project Monitor. The Project Monitor will also typically require the Contractor to seal significant critical barriers in adjacent downwind areas where in the judgment of the Owner and/or Project Monitor there is a significant risk of contamination from the roof removal work.

eee. The Contractor shall seal the critical barriers with a minimum of six-mil thick poly and tape. The Contractor may need to utilize hard barriers such as metal or wood to seal some critical barriers. Should this be required, it will be stated elsewhere in these specifications.

fff. The critical barriers must be installed prior to the disturbance of asbestos on the roof. The critical barriers may remain in place for the duration of the work unless the building will be occupied by the owner prior to the completion of the work. If the building will be occupied, the precautions listed below must be taken.

ggg. Should the building be occupied during the time the Contractor is not working, but before the completion of the work, the Contractor will be required to remove the critical barriers that affect normal interior air quality prior to the re-occupancy of the building. For example, barriers must be removed from HVAC units and other similar air-exchange units or machinery prior to the Owner re-occupying the building.

hhh. The Contractor is responsible for coordinating with the Owner and/or Project Monitor all steps necessary for the successful sealing off of critical barriers. For example, should the HVAC system

need to be turned off by the Owner, the Contractor must arrange for this to be done and provide enough advance notice to the Owner that there will not be delays to the work. In addition the Contractor is responsible for determining if any special precautions will be necessary to successfully seal off the critical barriers, particularly the HVAC intake and mechanical units. It is the sole responsibility of the Contractor to determine whether the sealing of critical barriers, particularly the sealing of HVAC units, will have a significant negative effect on building operation or in some manner damage the HVAC equipment or equipment inside the building that is dependant on the operation of that HVAC equipment. **In summary, the Contractor is strongly encouraged to discuss the implications of sealing off the HVAC system operation with the Owner sufficiently in advance of the work in order to have time to plan and implement any special precautions that may be necessary**.

iii. The Contractor must place poly sheeting on the ground or on adjacent lower roof surfaces where asbestos-containing roofing debris may be reasonably expected to potentially fall during the removal work. This poly must extend a minimum of ten feet out from the building wall, or whatever distance is necessary, in the judgment of the Project Monitor, to ensure that any debris that falls from the work area will land on and remain on the poly. The Contractor shall secure the poly to the ground in order to ensure that it remains effective in capturing debris. At a minimum, the poly must be secured sufficiently that wind does not blow it away or have it become a trip or other type of safety hazard. Should the methods used by the Contractor fail to secure this poly, the Project Monitor has the authority to stop the work until the Contractor successfully secures this material, regardless of whether or not the material is currently contaminated with asbestos.

jjj. The Contractor shall properly post all work areas according to the requirements of 8 CCR 1529 regarding asbestos regulated work areas. The following posting recommendations are designed to restrict the access of unauthorized persons near the work area, while allowing the Contractor's employees to avoid wearing respirators and protective clothing in areas where those precautions are unnecessary. The Contractor may establish more stringent posting requirements or may be required by the Project Monitor to establish more stringent posting requirements for a specific project.

1. Should work be limited to only portions of the roof, the Contractor must first erect a system of either barrier tape or tape and signage a minimum of 20 feet from the actual roof removal area that provides the language required for a partial asbestos regulated area. For example this tape may say DANGER, KEEP OUT, or similar message, as long as signs bearing the following language are also posted on or adjacent to the tape in sufficient numbers to keep away unauthorized people: DANGER, ASBESTOS, CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY. (Tape itself bearing this wording is sufficient for this first barrier.) This is known as a partial regulated area and sign.

2. The work area itself, where asbestos roofing materials will be disturbed, must be posted with a Cal/OSHA-approved sign that includes the language stated above but in addition states: Respirators and Protective Clothing Are Required in This Area. This is known as the full regulated area and full regulated area sign.

3. The full regulated area may include the entire roof area or may be limited to localized areas of the roof, depending on the needs of this project. Typically the Project Monitor will require the full regulated area sign to be posted at least ten feet away from the disturbance of asbestos if asbestos is being removed from only limited areas of the roof. If the whole roof will be considered a full regulated area, this sign should be posted where the workers access the roof and at all other points of access to the roof. This location may be at the top of a ladder, a roof access door, an access point from an adjacent roof, or other similar locations.

4. The Contractor shall place barrier tape and/or signage around the area on the ground or lower roof in a manner that limits unauthorized personnel from accessing the area covered by the poly designed to collect dropped material. This posting should meet the language requirements stated

above for a partial regulated area. In other words, respirators and protective clothing are not required for those entering the area beyond these signs.

The Contractor may not start work before being given authorization to proceed by the Project Monitor. Typically the Project Monitor will need to be notified 24 hours in advance of the work, and then a minimum of one hour in advance of the exact time the Contractor desires a visual inspection of the work area set up. The Project Monitor will make all reasonable efforts to schedule a visual inspection in a time frame that does not negatively affect the Contractor's schedule. **However, unless specifically authorized otherwise by the Project Monitor, the Contractor may not begin disturbing asbestos until the Project Monitor has visually approved the set up and authorized the Contractor to begin.**

Part 23.4.3 - Protection of Interior Spaces Below Roof

This section addresses concerns that the roofing removal work may contaminate interior spaces.

Roof removal may cause dust and debris to enter attic areas through gaps between roof deck boards. This dust and debris could enter interior building areas through gaps and penetrations in the ceilings. To prevent this from occurring, the Contractor shall caulk all identifiable gaps in the ceilings under the roof removal work, unless those areas are already covered by poly barriers. Typically this will require the Contractor to caulk along curtain tracks, lower lighting trim to caulk around junction boxes, and caulk gaps around the ceiling edges.

The Contractor shall only apply caulk that has been approved by the Owner and is paintable material which matches the existing color of the surface. The Contractor shall apply the caulk to industry standards with a smooth finish. Caulking must be performed at least five days prior to roof removal work to allow Owner's agent/site representative time to inspect the work completed.

The Contractor does not need to seal the areas underneath exterior corridor areas. However, when necessary by the type of roof construction, the Contractor shall put a poly barrier on the ground under the walkway in order to catch any material that is likely to fall through during the roof removal work.

Sometimes roof substrate construction will indicate that there is a strong likelihood that roofing materials will fall through major portions of the roof as the roof materials are removed. For example, the removal of roofing materials above tongue and grove roofing, or above roofing where there are gaps between each roof deck plank, is likely to result in roofing materials falling through to the space below.

The Contractor may determine that rather than trying to caulk all gaps from below the roof, it will be more effective to place poly barriers under roofs in order to protect the interior spaces below. These poly barriers must be air tight and secured to the building surfaces. The installation of these barriers may not damage building surfaces unless the Contractor has been specifically directed otherwise by the Project Monitor.

These poly barriers shall remain in place for the duration of the roof removal and roof replacement activities. During the roof removal work, the Contractor shall take additional care to promptly capture debris, either by wetting, HEPA vacuuming, or both, to reduce the amount of material that falls through the roofing substrate. Following the removal of the roofing and application of the new roof, the Contractor is responsible for carefully removing the poly barriers in a manner that does not release dust or debris into the work area.

Should interior areas become contaminated with roofing dust or debris as a result of the Contractor's roof work, the Contractor will be responsible for immediately cleaning up the debris using HEPA vacuuming and wet wiping. In addition, the Contractor shall be responsible for all costs of additional decontamination that the Owner and/or Project Monitor may deem necessary. The Contractor will also be responsible for the costs of any air testing of occupied interior areas determined necessary by the Owner and/or Project Monitor. The Contractor is responsible for any damages to interior surfaces, and shall repair all finishes to

the Owner's satisfaction.

When the roof deck is not composed of solid sheet metal or plywood, plumber's plenums below the roof will need to be protected in order to prevent roof material from contaminating that space. The Contractor will need to install poly barriers where necessary to prevent this contamination. The Contractor will be responsible for cleaning up debris that enters these spaces as the result of the roof removal work. The Project Monitor will conduct a final visual inspection of each area before the Contractor is allowed to move onto another roof area.

Part 23.4.4 - Roof Removal Procedures (For Non-Regulated Asbestos-Containing Materials)

kkk. The Contractor is responsible for damage to the roofing substrate, and will be responsible for repair or replacement if damaged.

lll. The Contractor is responsible for removal of all roofing layers and associated materials such as roofing nails, insulation, fiberboard, etc. down to the wood or metal substrate regardless of asbestos content, unless stated otherwise in these specifications. Where it is unknown how many layers of roofing materials exist, it must be assumed that there are multiple roofing layers present. The Contractor may, upon request and approval by the Owner, collect core samples of any roof to be removed for the purpose of determining its depth and structure. If coring is conducted, it is the responsibility of the Contractor to repair the areas affected to industry standards using non-asbestos materials.

mmm. The Contractor is responsible for removing all roofing nails, and driving in all nails used for securing the roofing substrate after roof material has been removed.

nnn. Unless stated otherwise in these specifications, roofing materials that will be disposed of such as conduit, roof jacks, flashing, HVAC or plumbing equipment or vents, and other objects as determined by the Owner, may be removed intact, containerized, and disposed of as asbestos containing waste by the Contractor. The Contractor must strip the asbestos off similar materials that will be reused by the Owner and clean them sufficiently to meet the visual inspection standard describe below.

ooo. The Contractor is responsible for removal and replacement of wood block or metal supports which may be present under conduit, gas lines, piping, HVAC units, ducting, etc. when the removal of such supports are required to perform the work. The Contractor is also responsible for temporarily installing wood blocks for any existing roof structures during the roofing removal, or when it is necessary to remove existing support members to accomplish the work.

ppp. The Contractor is responsible for damage to all equipment and existing cables which are present on the roof. The Contractor is responsible for damage to electrical wiring, telephone lines, antenna wires, and other conduits which are present. The Contractor is responsible for identifying pre-existing damage and pointing that damage out to the Project Monitor prior to the start of the work, if that damage is not to be assumed later to be caused by the Contractor.

qqq. The Contractor shall remove roofing materials in as intact a condition as reasonably possible.

rrr. The Contractor shall wet asbestos-containing roofing materials before and during disturbance of those materials and keep the materials wet until they are containerized. Roofing materials known to contain amphibole asbestos or materials not tested and proved not to contain amphibole asbestos must be wetted with amended water.

sss. The Contractor is responsible for appropriate use of water. The amount of water used must be adequate to keep dust levels as low as reasonably feasible without creating a safety hazard for workers or risking damage to the roof substrate.

ttt. The Contractor must promptly containerize all asbestos-containing materials that have been

removed. Unless stated otherwise in these specifications or determined otherwise by the Project Monitor, the Contractor must containerize all removed materials prior to any work stoppages such as breaks, lunch, or end of the shift. The Contractor must coordinate the amount of material removed in order to ensure that the workers containerize the material prior to the next work stoppage.

uuu. If poly barriers are required on the ground to catch debris, the Contractor shall assign a worker to routinely inspect the poly barriers and HEPA vacuum up debris that may be present. At a minimum, debris on these barriers or barriers on lower roofs must be cleaned of visible debris prior to work stoppages.

vvv. After removal of the roofing materials, the Contractor shall HEPA vacuum the roof area prior to a visual inspection being conducted by the Project Monitor. Particular attention shall be given to the cracks or junctions in the roofing substrate material.

Part 23.4.5 - Decontamination Area and Procedures

The Contractor shall provide the following type of decontamination system adjacent to the roof removal location. This system can be on an adjoining roof or may be at the bottom of the ladder used to access the roof.

This system, at a minimum, must include a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. If protective clothing is visibly covered with bulk debris, the workers shall either first vacuum off the debris or wet the debris before removing their suit. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers should then go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area. This may require the Contractor to have two separate, side-by-side drop layers of poly. One layer is used for the removal of protective suits, since the poly may become contaminated by the debris on the footwear worn by the workers. After removing their suits, the workers then would step onto the second poly drop layer (not contaminated by foot-borne debris) to remove their respirators. The Competent Person would then be required to clean only the first poly layer. At a minimum, all contaminated poly layers must be cleaned before the next time they will be needed for decontamination.

The removal of regulated asbestos-containing roofing materials will typically require the erection and use of a full three-stage decontamination unit with a shower. Most roofing removal work will not include regulated material, therefore, unless stated otherwise in these specifications, or determined necessary by the Project Monitor, a shower decontamination system will not be necessary. Should a shower system be necessary, that requirement will be listed in these specifications and discussed at the bid walk. If required, shower decontamination systems and their use must be in compliance with the requirements stated elsewhere in this specification.

Part 23.4.6 Waste Management for Roofing Materials (Non-RACM)

Non-RACM roofing debris will typically be considered non-hazardous, asbestos-containing waste.

The Contractor must promptly containerize asbestos-containing debris.

Prior to leaving the job site, the material must be sealed in a leak-tight container that is labeled with the required OSHA label for asbestos-containing materials: DANGER CONTAINS ASBESTOS FIBERS. AVOID CREATING DUST. CANCER AND LUNG DISEASE HAZARD. The container used to dispose of the asbestos-containing roofing material may be either individual waste bags or an entire storage bin or

dumpster depending on the project.

Should individual waste bags be used as the final waste container, the bags must be a minimum of six-mil thick poly and be sealed leak tight. They must be placed in a transport vehicle (storage bin, dumpster, or truck) with the area under the bags lined with a minimum of six-mil thick poly. Should the removed materials be too big for bags, they must be wrapped in a minimum of six-mil thick poly and sealed with tape. The individual bags must each be labeled properly or the Contractor must burrito wrap the collection of bags and tape the proper Cal/OSHA label to that wrap in a location visible to the employees at the designated landfill. The Contractor may choose to use the waste bin or dumpster as the final container.

The Contractor shall not drop or throw asbestos-containing waste materials into a storage bin, dumpster, or onto the ground. Asbestos-containing materials may only be transported from the roof to the ground, storage bin, or dumpster, if they are handed down, transported down intact via a crane or hoist, or passed through a dust-tight chute directly into the storage bin or dumpster.

Should the project require the use of a dust-tight chute, the chute developed by the Contractor must be approved by the Project Monitor prior to use. The Project Monitor has the authority to require the Contractor to make adjustments to the chute system if in the judgment of the Project Monitor, the system is releasing unacceptable dust, debris, or other visible emissions.

The Project Monitor will typically allow adequately wet roofing materials to be transported loose in wheel barrows or similar vehicles to a dust-tight chute for lowering to the storage container or dumpster. However these materials may first need to be containerized on the roof, if in the judgment of the Project Monitor, the release of dust cannot be adequately controlled without using containers. Should containers be required, the containers must be approved by the Project Monitor and not release dust, debris, or water en route to the waste chute.

Part 23.4.6A Waste Storage Bins and Dumpsters

The Contractor is responsible for ensuring that all dumpsters, trucks, and storage bins arrive on site completely free from debris. The Contractor is responsible for determining the integrity of the waste containers' structure, load worthiness, stability, locking abilities, etc. The Project Monitor has authority to reject a dumpster, waste container, or storage bin if it arrives on site with debris present cannot be adequately cleaned by the Contractor, or using reasonable judgment the Project Monitor determines the container is unsafe or inadequate for use on this project.

The Contractor shall schedule work in order to avoid exceeding the waste storage capacity at the job site.

Waste containing asbestos must be stored in a locked and properly labeled container (storage bin or dumpster). Once the container contains asbestos-containing debris, the container must be locked unless actively being loaded or utilized.

The storage bin or dumpster must be lined with a minimum of one layer of six-mil thick poly. Before transporting, the poly layer must be pulled up and over the waste and sealed with tape. The top of this poly layer must be labeled with the required OSHA label for materials containing more than one percent asbestos. That labeling must say: DANGER CONTAINS ASBESTOS FIBERS. AVOID CREATING DUST. CANCER AND LUNG DISEASE HAZARD.

The Contractor is solely responsible for damage to the owner's property due to the storage or movement of waste vehicles and containers on the Owner's property. The Contractor must take steps to protect the location and ground area where the waste container, such as a storage bin or dumpster, will be stored. For example, the Contractor shall plan to put wood or another substance under dumpster wheels in order to prevent the weight of the dumpster from damaging the Owner's property.

Part 23.4.7 Visual Clearance Of The Work Area

Following completion of the removal work and the HEPA vacuuming of the work area, the Contractor's Competent Person shall visually inspect the roof area for cleanliness and compliance with the requirements of this contract. For example, the Competent Person shall ensure that nails have been removed or flattened and that there is no visual debris in cracks, gutters, or junctions of the roof substrate.

Once the Competent Person has determined the area is clean and the work complete, he or she must contact the Project Monitor and explain that the area is ready for a final visual inspection. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the Competent Person must notify the Project Monitor a minimum of 24 hours in advance of the need for a visual inspection and a minimum of one hour prior to the exact time needed for the visual inspection. The Project Monitor will make reasonable efforts to schedule this inspection in a manner that is efficient for the Contractor. When conducting the visual inspection, if the Project Monitor determines the area will need substantial re-cleaning, the Project Monitor may decide to leave the area and return again, only with a minimum of an hour in advance notice and assurance that the area has now been properly cleaned. If, on the second visit to conduct a final visual inspection, the Project Monitor determines that the area will still need much more cleaning, the Project Monitor is authorized to delay returning to conduct another inspection for a minimum of 24 hours.

The Project Monitor will thoroughly visually inspect the work area for dust and debris. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the standard of cleanliness will be no visible dust or three dimensional debris. While it may change somewhat depending on the project, unless stated otherwise, visual staining of the substrate will be allowable.

The Contractor must conduct any additional cleaning necessary to pass this visual clearance inspection. Any additional cleaning necessary to meet this visual clearance standard is the sole responsibility of the Contractor. The time necessary to complete such cleaning will not affect the Contractor's scheduling of work as required by this contract.

Part 23.4.7.A - Visual Clearance Of Fluted Metal Decking

The Contractor should typically be able to remove the asbestos-containing roofing materials without breaking through or removing the light grey insulation normally found below the asbestos materials and attached to the metal decking. The Project Monitor will be able to visually inspect the roof area while this grey, non-asbestos layer remains in place. The Project Monitor will inspect the area for visible debris associated with the asbestos-containing roofing materials.

Once the Contractor passes the visual inspection for this area, the Contractor will be allowed to remove the grey insulation layer of material. The Contractor will be required to remove the material and clean the area until a minimal amount of non-asbestos debris remains. The Contractor will not be required to completely clean or vacuum all the flute channels in order to remove this non-asbestos material. The channels must, however, meet the standard of cleanliness required for the re-roofing contractor, if that work will take place.

Part 23.4.8 - Completion of The Project

Upon approval from the Project Monitor following completion of the visual inspection, the Contractor will be allowed to remove all poly barriers, signs, and equipment from the work site.

The Contractor must coordinate with the Owner regarding any re-roofing activities. The Contractor must take reasonable precautions to protect the roof following completion of the work until the roof can be re-roofed. For example, the Contractor would be expected to protect the roof over a weekend if the re-roofing work were scheduled for Monday. Any requirements for protection of the roof for a significantly

longer duration must be stated in these specifications or be negotiated with the Owner as a separate agreement.

The Contractor shall remove all poly, signs, equipment and debris related to the abatement work prior to the Owner determining that the work is complete. Exceptions for this will be made if the Contractor is required to protect the roof until another contractor arrives to conduct re-roofing work.

Part 23.5 - Vinyl Floor Tile (VFT) and Associated Adhesive Abatement Requirements

Part 23.5.1 General Requirements

The removal of flooring materials will be considered Cal/OSHA Class II work. The Contractor shall attempt to remove materials as intact as reasonably possible.

The use of mechanical means to remove materials, including the use of buffers to remove mastic, will trigger the notification requirement to the local NESHAP authority and treatment of the waste stream as an asbestos-containing hazardous waste.

Unless specifically stated in these specifications or approval in writing is provided by the Project Monitor, the Contractor shall not use abrasive tools or machines which may pulverize flooring materials including mastic. For example, bead blasting or powered razor scraping tools may not be used unless the Project Monitor provides the Contractor with written permission.

Unless specified otherwise elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor shall include the removal of any existing adjacent base cove along with the removal of the flooring materials. Base cove adhesive shall be removed completely on hard surfaced walls where damage to the substrate will not occur, or only to a point of smoothing out high spots on walls which will become damaged due to the work to be performed. Full removal is not expected unless the Contractor is notified in writing on these types of soft substrate surfaces.

Unless specified elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor shall remove all floor mastic associated with the flooring material regardless of whether or not the mastic contains asbestos. This is normally not required if the mastic does not contain asbestos and the work is being done prior to the demolition of the structure.

Unless stated otherwise below, elsewhere in these specifications or determined otherwise by the Project Monitor, for all removal of flooring materials where the amount of contiguous material exceeds 100 or more square feet, the Contractor shall comply with all the requirements stated earlier in Sections 1 through 22 of this specification. In summary, this means that the Contractor must develop a negative pressure containment, cover exposed surfaces in the work area (including ceilings) with poly, develop a negative pressure differential, use only challenge-tested HEPA equipment, utilize a full personal decontamination system including a shower, and follow the procedures for waste load-out, storage containers, clearance testing, and all other related sections. **Contractors must be familiar with those sections of these specifications and not just this section.**

Unless stated otherwise in these specifications for this specific project, the following exceptions will be made for the removal of flooring materials (as opposed to requirements that may differ in Sections 1 - 22.)

www. Critical barriers must be sealed as described earlier in this specification. However, the Contractor may be allowed to “tent” the work area rather than tightly attach wall poly to the walls. This allows the contractor to avoid sealing off all fixed objects remaining in the work area but which are located behind the wall or ceiling barriers. The tenting process must, at a minimum, include floor to ceiling poly and will typically require the ceiling to also be covered. The poly used to “tent” the work area must be a minimum of six-mil thick poly for the walls. There must be an

additional “splash guard” poly barrier on the inside of the wall barriers and extend from the floor up at least three feet. The ceilings may be covered with either four or two-mil thick poly. While the Contractor shall plan on fully covering all non-abated surfaces in the work area, the Project Monitor may allow some surfaces to be exposed to the removal work based on the criteria discussed in Section 16, Part 16.1.10 - Covering Wall, Ceiling, and Floor Surfaces in the Work Area. For example, ceiling poly may not be required if the ceiling is an easily cleanable surface that will not be encapsulated and the area will undergo aggressive air testing with analysis by TEM.

xxx. Following the removal of the asbestos-containing materials, the Contractor must wash the abated surfaces with a detergent solution and rinse the area thoroughly. **The Contractor shall not encapsulate the floor area unless these specifications state that it is allowed or it is determined appropriate by the Project Monitor**. The Contractor may lightly encapsulate exposed poly barriers as long as precautions are taken to ensure the floor is not encapsulated.

yyy. For flooring removal done prior to the demolition of a building, the Contractor will not be required to remove associated mastic, unless it contains or is suspected to contain asbestos. The Contractor will not be required to wash the floor with a detergent solution. The Contractor **shall encapsulate** the floor substrate after being given permission to do so by the Project Monitor.

zzz. If clearance air testing is conducted, critical barriers must remain sealed and the negative air pressure system must remain in operation. However, the Contractor may remove wall and ceiling poly barriers, but is not required to remove those barriers prior to the conduction of the air testing. In summary, the Project Monitor will not object to conducting the air testing within the containment barriers erected by the Contractor. Should the Contractor fail air testing, the Contractor will be required to clean all room surfaces that were exposed during the clearance air testing process.

When clearance air testing will be conducted at the end of the project, the Contractor is required to group rooms, spaces, and/or areas into a single containment whenever feasible. The Project Monitor and/or an AHERA-accredited project designer employed by the Asbestos Project Monitoring Firm shall have final authority regarding whether or not rooms, spaces, or areas can be appropriately grouped into single containments.

23.5.2 Use Of Solvents For Mastic Removal

Contractors utilizing solvents for the removal of mastic must take the following precautions in addition to providing the MSDS for such solvents.

All those entering the work area must wear respirator cartridges that provide appropriate protection for both asbestos and the use of the solvent.

Contractors shall utilize low odor mastic removal solvents. The Contractor must take all necessary steps to ensure that those occupying adjacent areas are not bothered by the odor of the solvent. Typically the Contractor must expect to exhaust air filtration units in a manner likely to reduce complaints. For example, they should be exhausted as far away as feasible from locations where the odors may bother occupants. If in the judgment of the Owner and/or Project Monitor, building occupant complaints are justified, the Contractor will be required to put additional filters, such as charcoal filters, on the air filtration units. Additional costs to the Contractor resulting from building occupant complaints regarding solvent odors are the sole responsibility of the Contractor.

The Contractor must ensure that the solvent does not migrate under barriers and leach into building surfaces. For example, the Contractor should take extra precaution when applying the solvents near the perimeter of the work area or near any fixed objects in the work area. **The Contractor will be solely responsible for any costs incurred by the Owner resulting from damage to building substrates due to improper application of removal solvents.**

If the removal work is being done prior to new flooring being installed on the same substrate, the Contractor shall chose a solvent removal solution that will not affect the installation of new flooring onto that substrate. Regardless of the solution used, the Contractor must wash and rinse the floor and ensure that no solvent or detergent remains on the floor substrate. The Contractor must also ensure that any lock- down encapsulant used on poly surfaces does not coat the floor substrate. **The Contractor remains solely responsible if the removal work is later determined to be the cause or a contributing cause for problems with the new flooring installation**.

Part 23.5.3 - Decontamination Area and Procedures

Unless stated otherwise elsewhere in this specification or determined otherwise by the Project Monitor, the Contractor shall erect and utilize a three-stage decontamination unit with a shower contiguous with the containment for areas requiring removal of more than 100 square feet of flooring material. Should a shower system be required, the Contractor shall construct the system and ensure workers follow the procedures as described elsewhere in this specification for Class I work where a shower is required. Should less than this amount be disturbed, the room enclosure will typically be required to have at least one, usually two airlock chambers adjacent to the regulated area. Inside this chamber, the Contractor shall provide a drop layer of a minimum of six-mil thick poly on which the workers will stand and conduct the following decontamination procedures. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. They must first either vacuum off the suit or wet the suit if the suit if visibly contaminated with dust and/or debris. Once the suit is containerized such as in a six-mil poly bag, the workers can remove their respirator and clean it according to the Contractor's respiratory protection program. The workers may then leave the airlock chamber and go to a location where they can wash their hands and face. The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area. This may require the Contractor to have two separate, side-by-side drop layers of poly. One layer is used for the removal of protective suits, since the poly may become contaminated by the debris on the footwear worn by the workers. After removing their suits, the workers then would step onto the second poly drop layer (not contaminated by foot-borne debris) to remove their respirators. The Competent Person would then be required to clean only the first poly layer. At a minimum, all contaminated poly layers must be cleaned before the next time they will be needed for decontamination.

23.5.2 Floor Material Waste Management

Unless stated otherwise in these specifications, floor tile that was not a Regulated Asbestos-Containing Material prior to the beginning of work may be treated as a non-hazardous, asbestos-containing waste for disposal purposes. Floor tile or mastic removed using mechanical methods must be treated as asbestos-containing hazardous waste. If however, in the judgment of the Project Monitor, the type of material or removal method used by the Contractor makes the floor tile debris into Regulated Asbestos-Containing Material, then such material must be disposed of as asbestos-containing hazardous waste. Normal breakage of tile is expected during the removal process, however, should the Contractor pulverize the material or should the average piece of tile be less than an inch in size, the Project Monitor will typically determine that the material must now be treated as a hazardous waste. All additional costs resulting from the change from non-hazardous to hazardous waste are the sole responsibility of the Contractor.

The debris associated with linoleum or other flooring materials determined to be Regulated Asbestos-Containing Materials will be treated as asbestos-containing hazardous waste.

Debris must be containerized, labeled, passed out of the work area, stored, and disposed of as discussed earlier in this specification for all asbestos-containing waste. For the removal of tile in larger areas, these specifications will typically require all debris to be containerized in rigid-walled containers such as drums or boxes.

23.5.3 Visual Inspection And Clearance Air Testing

Following the removal of the flooring material, and the washing and rinsing of the floor, the Contractor's Competent Person shall inspect the area to determine if the removal work is complete and the area is clean.

Once the Competent Person has determined the area is clean, he or she must contact the Project Monitor and explain that the area is ready for a final visual inspection. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the Competent Person must notify the Project Monitor a minimum of 24 hours in advance of the need for a visual inspection and a minimum of one hour prior to the exact time needed for the visual inspection. The Project Monitor will make reasonable efforts to schedule this inspection in a manner that is efficient for the Contractor.

The surface areas to be visually inspected must be thoroughly dry or the Project Monitor will not conduct the visual inspection.

When conducting the visual inspection, if the Project Monitor determines the area will need substantial re-cleaning, the Project Monitor may decide to leave the area and return again, only with a minimum of an hour in advance notice and assurance that the area has now been properly cleaned. If, on the second visit to conduct a final visual inspection, the Project Monitor determines that the area will still need much more cleaning, the Project Monitor is authorized to delay returning to conduct another inspection for a minimum of 24 hours.

The Project Monitor will thoroughly visually inspect the work area for dust, debris, and if appropriate, mastic residue. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the standard of cleanliness will be no visible dust or three dimensional debris or mastic residue. While it may change somewhat depending on the project, unless stated otherwise, visual staining of the substrate will be allowable as long as the stain doesn't rub off with hand pressure.

The Contractor must conduct any additional cleaning necessary to pass this visual clearance inspection. Any additional cleaning necessary to meet this visual clearance standard is the sole responsibility of the Contractor. The time necessary to complete such cleaning will not affect the Contractor's scheduling of work as required by this contract.

If the work area passes the visual clearance inspection conducted by the Project Monitor, the Contractor will be allowed to apply a thin coat of a lock-down encapsulant on exposed poly barriers. The Contractor must take steps to ensure that the encapsulant does not coat the floor surface.

The negative air pressure differential system shall remain in operation during this entire time and, unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the required negative air pressure differential and air exchange rates required by this specification shall continue to be enforced. Unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the decontamination system must remain in place and be utilized as described in these specifications.

The Project Monitor will provide the Contractor with a written statement acknowledging that the work area has passed the final visual clearance test after a successful visual inspection.

If clearance testing will not be conducted, the Contractor will now be allowed to remove all remaining barriers. If clearance testing will be conducted, clearance testing will be conducted according to the procedures described earlier in these specifications unless stated otherwise in these specifications.

Once the Contractor has passed clearance air testing, or if air testing is not required, passed the visual inspection, the Contractor must remove all poly, signs, barriers, equipment, debris and any other materials associated with the work before the Owner will consider the work to be complete.

Part 23.6 - Work Practice Requirements for Carpet and Mastic Removal

Unless stated elsewhere in these specifications or determined otherwise by the Project Monitor, the following procedures shall be followed when removing carpeting that is adhered to the floor by an asbestos-containing mastic

Part 23.6.1- Regulated Work Area Set Up

The removal of carpet and asbestos-containing mastic will be considered Class II work under 8 CCR 1529. However these specifications will require additional precautions that are in the interest of the Owner that may not be required by Cal/OSHA.

The use of mechanical means to remove materials, including the use of buffers to remove mastic, will trigger the notification requirement to the local NESHAP authority and treatment of the waste stream as an asbestos-containing hazardous waste.

The Contractor shall attempt to remove materials as intact as reasonably possible. Unless specifically stated in these specifications or approval in writing is provided by the Project Monitor, the Contractor shall not use abrasive tools or machines which may pulverize flooring materials including mastic. For example, bead blasting or powered razor scraping tools may not be used unless the Project Monitor provides the Contractor with written permission.

Unless stated otherwise in these specifications for this specific project, the following exceptions will be made for the removal of flooring materials (as opposed to requirements that may differ in Sections 1 - 22.)

aaaa. Critical barriers must be sealed as described earlier in this specification. Non-opening windows do not need to be sealed as critical barriers. However it may be difficult to establish the negative pressure requirement of 0.04 inches pressure differential without at least a tape sealing of window junctions.

bbbb. Hard surface, easily cleanable wall surfaces and structures that cannot be removed from the work area do not need to be sealed with poly. (However, aggressive air testing with analysis by TEM will take place at the end of the project. The Contractor may wish to seal walls or other structures with poly in order to facilitate the cleaning necessary to pass clearance air testing.)

cccc. The HVAC supply and return will need to be sealed as critical barriers. These are long and narrow.

dddd. The entire ceiling (underneath suspended ceiling tiles) must be sealed with poly. The Contractor may use two-mil thick poly for sealing the ceilings. It, may, however, be difficult to find a two-mil thick fire-resistant poly. The Project Monitor expects the Contractor will need to use fire-resistant four-mil poly to seal the ceiling. The Project Monitor believes it will be necessary to install guide wires across the ceiling in order to suspend the ceiling poly.

eeee. The Contractor will need to determine, in conjunction with the Primary Contractor, the extent of damage to wall surfaces that is permissible in order to successfully attach containment barriers. For example, the Project Monitor assumes guy wires needed to support the ceiling poly will need to be attached to walls using a screw-in type application.

ffff. The Project Monitor recognizes that it may be difficult to maintain 0.04 inches pressure differential without damaging the ceiling poly installation. At the start of work, the Contractor will be expected to turn negative air purifying machines on gradually while watching, along with the Project Monitor, the effect on the ceiling poly. The Contractor must establish negative pressure. The Project Monitor may allow less than 0.04 inches differential, if the Contractor demonstrates that

amount is not feasible. The Contractor will be expected to install a sufficient number of guy wires to support the ceiling before the Project Monitor will consider lowering the negative pressure criteria.

gggg. Baseboard mastic will be removed according to the requirements listed below in Section 23.3.

hhhh. Carpet shall be cut and rolled up in sections that can be wrapped in poly. While the Project Monitor recognizes that most dust created by this process will not contain asbestos, nevertheless the Contractor shall use dust suppression techniques to reduce the creation of airborne dust. For example, the Contractor will need to wet the bottom of the carpet as it is being pulled up off the floor.

iiii. The Contractor must erect "splash guards" along all wall and structural surfaces in order to protect those surfaces from exposure to the mastic or mastic removal solvents.

jjjj. All stationary objects inside the containment that do not have hard, easily cleanable surfaces, must be either be removed from the area or covered with at least one layer of four-mil poly.

kkkk. The Contractor may not start work before being given authorization to proceed by the Project Monitor. Typically the Project Monitor will need to be notified 24 hours in advance of the work, and then a minimum of one hour in advance of the exact time the Contractor desires a visual inspection of the work area set up. The Project Monitor will make all reasonable efforts to schedule a visual inspection in time frame that does not negatively affect the Contractor's schedule. **However, unless specifically authorized otherwise by the Project Monitor, the Contractor may not begin disturbing asbestos until the Project Monitor has visually approved the set up and authorized the Contractor to begin.**

llll. Following the removal of the asbestos-containing materials, the Contractor must wash the abated floor surfaces with a detergent solution and rinse the area thoroughly. **The Contractor shall not encapsulate the floor area unless that it is determined appropriate by the Project Monitor**. The Contractor may lightly encapsulate exposed poly barriers (including the ceiling poly) as long as precautions are taken to ensure the floor is not encapsulated or pools of encapsulant do not result from spraying the ceiling poly.

mmmm. Critical barriers must remain sealed and the negative air pressure system must remain in operation until and during the clearance air-testing process. However, the Contractor may remove wall and ceiling poly barriers, but is not required to remove those barriers prior to the conduction of the air testing. In summary, the Project Monitor will not object to conducting the air testing within the containment barriers erected by the Contractor. Should the Contractor fail air testing, the Contractor will be required to clean all room surfaces that were exposed during the clearance air testing process.

When clearance air testing will be conducted at the end of the project, the Contractor is required to group rooms, spaces, and/or areas into a single containment whenever feasible. The Project Monitor and/or an AHERA-accredited project designer employed by the Asbestos Project Monitoring Firm shall have final authority regarding whether or not rooms, spaces, or areas can be appropriately grouped into single containments.

For this project, the floor tile and mastic removal work will need to be done as one containment and kept separate from the carpet and mastic removal work done in the main library. The floor tile work will undergo clearance air testing separate from the carpet mastic removal process in the other rooms. The Project Monitor presumes that all carpet mastic and baseboard removal done in the main library and computer rooms will be done as one containment.

23.6.2 Use Of Solvents For Mastic Removal

Contractors utilizing solvents for the removal of mastic must take the following precautions in addition to providing the MSDS for such solvents.

All those entering the work area must wear respirator cartridges that provide appropriate protection for both asbestos and the use of the solvent.

Contractors shall utilize low odor mastic removal solvents. The Contractor must take all necessary steps to ensure that those occupying adjacent areas are not bothered by the odor of the solvent. Typically the Contractor must expect to exhaust air filtration units in a manner likely to reduce complaints. For example, they should be exhausted as far away as feasible from locations where the odors may bother occupants. If in the judgment of the Owner and/or Project Monitor, building occupant complaints are justified, the Contractor will be required to put additional filters, such as charcoal filters, on the air filtration units. Additional costs to the Contractor resulting from building occupant complaints regarding solvent odors are the sole responsibility of the Contractor.

The Contractor must ensure that the solvent does not migrate under barriers and leach into building surfaces. For example, the Contractor should take extra precaution when applying the solvents near the perimeter of the work area or near any fixed objects in the work area. **The Contractor will be solely responsible for any costs incurred by the owner resulting from damage to building substrates due to improper application of removal solvents.**

If the removal work is being done prior to new flooring being installed on the same substrate, the Contractor shall chose a solvent removal solution that will not affect the installation of new flooring onto that substrate. Regardless of the solution used, the Contractor must wash and rinse the floor and ensure that no solvent or detergent remains on the floor substrate. The Contractor must also ensure that any lock-down encapsulant used on poly surfaces does not coat the floor substrate.

The Project Monitor strongly suggests that the Contractor notify the Primary Contractor regarding the process and chemicals that will be used to remove the flooring. This will allow the Primary Contractor to explain to and gain approval for the anticipated methods and chemicals from the contractor installing the new floor. The Contractor remains solely responsible if the removal work is later determined to be the cause or a contributing cause for problems with the new flooring installation.

Part 23.6.3 - Decontamination Area and Procedures

The Contractor may use a two or three-stage decontamination system for the work that involves only the removal of baseboard and carpet mastic. The decontamination chambers must be contiguous to the work area. There must be a minimum of two airlock chambers between the work area and the outside the work area. A shower decontamination system is not required for carpet mastic removal work.

The following procedures must be utilized when leaving the work area. The workers shall remove their protective suits and boots either before entering the first chamber, closest to the work area, or inside this first chamber. While still wearing their respirator, the workers will slowly roll down their protective suit and remove it without shaking it. They must first either vacuum off the suit or wet the suit if the suit if visibly contaminated with dust and/or debris. If suits and boots are removed in the first chamber, the Contractor must have a drop poly layer in this chamber and change it frequently enough to keep debris from being tracked from the work area into the second chamber, closest to the outside the work area. Once the suit is containerized such as in a six-mil poly bag, the workers can step into the second chamber (closest to the outside the work area) and remove their respirator and clean it according to the Contractor's respiratory protection program. The Contractor must utilize a poly drop layer directly outside the second

chamber to ensure that no debris is tracked out of the decontamination system. The workers may leave the second airlock chamber and go to a location where they can wash their hands and face.

The Competent Person shall ensure that any visible dust and/or debris on the poly drop layer is promptly cleaned up using a HEPA vacuum. The poly drop layer must always be visually clean of dust and/or debris that may come from the work area.

23.6.4 Carpet and Mastic Waste Management

Carpet will be treated as asbestos-containing non-hazardous waste. Mastic will be treated as non-hazardous, asbestos-containing waste as long as it is removed with non-mechanical methods. The mastic must be treated as asbestos-containing hazardous waste if a buffer is used to assist in the removal of the mastic.

Debris must be containerized, labeled, passed out of the work area, stored, and disposed of as discussed earlier in this specification for all asbestos-containing waste.

Carpet must be rolled, wrapped and sealed in a minimum of one layer six mil poly. Mastic debris must be put in leak tight containers such as double-bagged in clear, six mil poly bags, or single bagged and placed in a lined fiber barrel or box.

Wrapped carpet must be labeled with the OSHA label before they leave the job site. Mastic debris will be labeled properly depending on whether or not it is a hazardous waste. See Section 17.4 for further information on waste containers, labeling, and handling.

23.6.5 Visual Inspection And Clearance Air Testing

Following the removal of the flooring material, and the washing and rinsing of the floor, the Contractor's Competent Person shall inspect the area to determine if the removal work is complete and the area is clean.

Once the Competent Person has determined the area is clean, he or she must contact the Project Monitor and explain that the area is ready for a final visual inspection. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the Competent Person must notify the Project Monitor a minimum of 24 hours in advance of the need for a visual inspection and a minimum of one hour prior to the exact time needed for the visual inspection. The Project Monitor will make reasonable efforts to schedule this inspection in a manner that is efficient for the Contractor.

The surface areas to be visually inspected must be thoroughly dry or the Project Monitor will not conduct the visual inspection.

When conducting the visual inspection, if the Project Monitor determines the area will need substantial re-cleaning, the Project Monitor may decide to leave the area and return again, only with a minimum of an hour in advance notice and assurance that the area has now been properly cleaned. If, on the second visit to conduct a final visual inspection, the Project Monitor determines that the area will still need much more cleaning, the Project Monitor is authorized to delay returning to conduct another inspection for a minimum of 24 hours.

The Project Monitor will thoroughly visually inspect the work area for dust, debris, and mastic residue. This means all areas exposed to the removal work must be clean. For example horizontal wall surfaces such as window sills, tops of door frames, etc. will be inspected for dust. All visible dust is assumed to be asbestos-containing and must be cleaned before the Project Monitor will proceed with air testing.

Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the standard of cleanliness will be no visible dust or three dimensional debris or mastic residue. While it may change somewhat depending on the project, unless stated otherwise, visual staining of the substrate will be allowable as long as the stain doesn't rub off with hand pressure.

The Contractor must conduct any additional cleaning necessary to pass this visual clearance inspection. Any additional cleaning necessary to meet this visual clearance standard is the sole responsibility of the Contractor. The time necessary to complete such cleaning will not affect the Contractor's scheduling of work as required by this contract.

If the work area passes the visual clearance inspection conducted by the Project Monitor, the Contractor will be allowed to apply a thin coat of a lock-down encapsulant on exposed poly barriers. The Contractor must take steps to ensure that the encapsulant does not coat the floor surface.

The negative air pressure differential system shall remain in operation during this entire time and, unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the required negative air pressure differential and air exchange rates required by this specification shall continue to be enforced. Unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the decontamination system must remain in place and be utilized as described in these specifications.

The Project Monitor will provide the Contractor with a written statement acknowledging that the work area has passed the final visual clearance test after a successful visual inspection.

Following the completion of the visual inspection, and once any applied encapsulant is thoroughly dry, clearance air test testing will be conducted. Clearance air testing will be conducted according to the procedures described earlier in these specifications unless stated otherwise in these specifications.

In brief, full aggressive air testing will be done. The Project Monitor will "sweep" all exposed areas, including remaining poly barriers, with a leaf blower. Fans will be utilized during the air-testing process to stir up the air in the work area during the collection of the air samples. The samples will be analyzed by Transmission Electron Microscopy (TEM) and passage of testing will be determined by the samples meeting the criteria established in the AHERA.

Once the Contractor has passed clearance air testing, the Contractor must remove all poly, signs, barriers, equipment, debris and any other materials associated with the work before the Owner will consider the work to be complete.

Part 23.7 - Baseboard and Mastic Removal Procedures

Unless stated elsewhere in these specifications or determined otherwise by the Project Monitor, the following procedures shall be followed when removing carpeting that is adhered to the floor by an asbestos-containing mastic

Part 23.7.1- Regulated Work Area Set Up

The removal of carpet and asbestos-containing mastic will be considered Class II work under 8 CCR 1529. However these specifications will require additional precautions that are in the interest of the Owner that may not be required by Cal/OSHA. This work must be done within a regulated work area as described in Sections 23.1 and 23.2.

The Contractor shall attempt to remove materials as intact as reasonably possible. Unless specifically stated in these specifications or approval in writing is provided by the Project Monitor, the Contractor shall not use abrasive tools or machines which may pulverize materials including mastic. For example, bead blasting or powered razor scraping tools may not be used unless the Project Monitor provides the

Contractor with written permission.

Most baseboards are on gypsum board walls. Most of these walls will be removed by the Primary Contractor as part of this project. The Contractor must coordinate with the Primary Contractor as to the amount of damage that may be inflicted on wall surfaces as part of the baseboard and mastic removal process.

The Project Monitor recommends that the following procedures be followed. However, other methods may be used if approved in advance by the Project Monitor.

Once the work area is fully contained, and the Project Monitor has authorized the start of work, the Contractor may pull the baseboards off the wall and pillar surfaces using hand methods.

The following procedures are recommended for mastic residue on gypsum board surfaces. The Contractor is encouraged to simply cut the gypsum board paper with a knife several inches above any exposed mastic and pull the paper off the wall surface.

The following procedures are recommended for mastic residue on plaster, metal, or other non gypsum board surfaces. The contractor shall use a combination of hand scraping and solvents to remove the mastic from these surfaces. The Contractor shall coordinate with the Primary Contractor the amount of damage that may be inflicted on these surfaces. Many of these surfaces will remain after the renovation.

Part 23.7.2 - Decontamination Area and Procedures

See Section 23.6.3.

23.7.3 Baseboard and Mastic Waste Management

Baseboards and paper with mastic residue, or removed mastic debris will be treated as asbestos-containing non-hazardous waste.

Debris must be containerized, labeled, passed out of the work area, stored, and disposed of as discussed earlier in this specification for all asbestos-containing waste.

All debris from this process must be put in leak tight containers such as double-bagged in clear, six mil poly bags, or single bagged and placed in a lined fiber barrel or box.

See Section 17.4 for further information on waste containers, labeling, and handling.

23.7.4 Visual Inspection and Clearance Air Testing

Following the removal of the baseboards and mastic, the Contractor's Competent Person shall inspect the area to determine if the removal work is complete and the area is clean.

Once the Competent Person has determined the area is clean, he or she must contact the Project Monitor and explain that the area is ready for a final visual inspection. Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the Competent Person must notify the Project Monitor a minimum of 24 hours in advance of the need for a visual inspection and a minimum of one hour prior to the exact time needed for the visual inspection. The Project Monitor will make reasonable efforts to schedule this inspection in a manner that is efficient for the Contractor.

The surface areas to be visually inspected must be thoroughly dry or the Project Monitor will not conduct the visual inspection.

When conducting the visual inspection, if the Project Monitor determines the area will need substantial re-cleaning, the Project Monitor may decide to leave the area and return again, only with a minimum of an hour in advance notice and assurance that the area has now been properly cleaned. If, on the second visit to conduct a final visual inspection, the Project Monitor determines that the area will still need much more cleaning, the Project Monitor is authorized to delay returning to conduct another inspection for a minimum of 24 hours.

The Project Monitor will thoroughly visually inspect the work area for dust, debris, and mastic residue. This means all areas exposed to the removal work must be clean. For example horizontal wall surfaces such as window sills, tops of door frames, etc. will be inspected for dust. All visible dust is assumed to be asbestos-containing and must be cleaned before the Project Monitor will proceed with air testing.

Unless stated otherwise in this specification or determined otherwise by the Project Monitor, the standard of cleanliness will be no visible dust or three dimensional debris or mastic residue. While it may change somewhat depending on the project, unless stated otherwise, visual staining of the substrate will be allowable as long as the stain doesn't rub off with hand pressure.

The standard of cleanliness for baseboard mastic will be the following. For gypsum board walls, no visible mastic residue is allowed. Staining will be allowed for plaster surfaces, but no three-dimensional material will be allowed.

The Contractor must conduct any additional cleaning necessary to pass this visual clearance inspection. Any additional cleaning necessary to meet this visual clearance standard is the sole responsibility of the Contractor. The time necessary to complete such cleaning will not affect the Contractor's scheduling of work as required by this contract.

If the work area passes the visual clearance inspection conducted by the Project Monitor, the Contractor will be allowed to apply a thin coat of a lock-down encapsulant on the non-gypsum board surfaces. The Contractor must take steps to ensure that the encapsulant does not coat the floor surface.

The negative air pressure differential system shall remain in operation during this entire time and, unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the required negative air pressure differential and air exchange rates required by this specification shall continue to be enforced. Unless stated elsewhere in this specification or determined otherwise by the Project Monitor, the decontamination system must remain in place and be utilized as described in these specifications.

The Project Monitor will provide the Contractor with a written statement acknowledging that the work area has passed the final visual clearance test after a successful visual inspection.

Following the completion of the visual inspection, and once any applied encapsulant is thoroughly dry, clearance air test testing will be conducted as described in Sections 23.1 and 23.2.

Once the Contractor has passed clearance air testing, the Contractor must remove all poly, signs, barriers, equipment, debris and any other materials associated with the work before the Owner will consider the work to be complete.

Part 23.8 - Limited Class III Work Drilling and/or Cutting Non-Friable Asbestos-Containing Materials

This section of this specification is aimed at contractors who normally do not disturb hazardous materials and are not generally familiar with environmental work practices and standards. However, this section does apply to all contractors, including the Primary Contractor, the Contractor, and other associated subcontractors working on this project who may be required to disturb very small amounts of non-friable asbestos-containing materials.

This section specifically applies to employers of employees who drill, cut, or screw attachments into gypsum board or plaster that contains asbestos in either the gypsum board, add-on non-friable surfacing material, joint compound, or plaster. **This section does not address the disturbance of friable materials such as TSI, textured acoustic plasters, other friable surfacing materials, and asbestos cement pipe or sheeting (transite)**. **Those materials must only be disturbed by the Contractor (asbestos abatement contractor) following the requirements listed throughout this specification.**

Employees of abatement contractors or other employers conducting work in association with this contract must follow all applicable Cal/OSHA regulations regarding asbestos.

Part 23.8.1 - Training

Employers must provide the Owner and/or Project Monitor with written proof, acceptable to the Project Monitor, that those workers who will contact but not disturb asbestos-containing materials during their work on this project, at a minimum, meet the training requirements specified in 8 CCR 1529 (k)(9)(F). This training is generally described as “Two-Hour Asbestos Awareness” or “Class IV” training. This includes all employees who will screw attachments into asbestos-containing building surfaces. At some project sites this training may be required for all employees conducting work in certain areas. The Contractor may utilize Hazard Management Services, Inc. (HMS, Inc.) to provide this training or may utilize another source of training as long as the training meets the requirements as stated in 8 CCR 1529 (k)(9)(F), and the employer believes the training is conducted by a qualified person.

Employers must provide the Owner and/or Project Monitor with written proof, acceptable to the Project Monitor, that those workers who will conduct minimal disturbance of asbestos on this project, as described in this section of these specifications, at a minimum meet the training requirements specified in 8 CCR 1529 (k)(9)(E). This training is generally described as “Class III Training.” HMS, Inc. believes that, if work is limited to and conducted in accordance with the requirements listed in this section of these specifications, the employer may take advantage of the “Exception” listed in 8 CCR 1529 (k)(9)(E) and does not need to provide the employees a total of sixteen hours of training. However, this training must cover the subjects listed and meet the other requirements listed in 8 CCR 1529 (k)(9)(E) and **must be a minimum of four hours in duration.**

The training described in the above paragraph is the minimum training requirement for those employees who drill or cut into the asbestos-containing materials described in this section of these specifications.

The Contractor may utilize HMS, Inc. to provide this training or may utilize another source of training as long as the training meets the requirements as stated in 8 CCR 1529 (k)(9)(E), and the employer believes the training is conducted by a qualified person.

The Project Monitor will accept the validity of the employer’s written proof of training, unless the work practices demonstrated by the employees do not indicate that they have had adequate training. If, after talking with the employees, the Project Monitor determines that the employees are grossly ignorant of the proper work practices, controls, and hazards of asbestos, the Project Monitor will reject the employer’s training of these workers. The workers covered by that training will not be allowed to further disturb asbestos on this project.

Employers should note that lead may be present in or on materials at many projects. Should that be the case for this project, the employer will also need to provide "Hazard Communication Training" for lead as described in 8 CCR 1532.1 (l)(1)(A). This training is required for all employees who may be exposed to lead on this project, regardless of whether the lead is in paint, ceramic tile, lead sheeting, or other construction materials. This training normally can be done in less than an hour but must meet the requirements for hazard communication training described in 8 CCR 1532.1(l)(1)(A) and 8 CCR 5194, the Hazard Communication Standard.

Part 23.8.2 - Equipment

Employers who will have employees screw attachments into asbestos-containing materials or drill or cut into such materials must have a working vacuum with High Efficiency Particulate Air Filters (HEPA) on site in the vicinity of the work. The Project Monitor has authority to stop work that disturbs asbestos if the employer does not have a HEPA vacuum on site and in the vicinity of the work.

Those employers who will have employees drill or cut into asbestos-containing materials must also have poly sheeting for placing under the work area, and a means of gently wetting the materials such as a spray bottle of water. The employees must also have a means of containing fibers released by their work. This may include vacuum-attached tools, tape, shaving cream or gel, or similar materials that are used as described in this section. The employees must also have a Cal/OSHA-approved asbestos regulated area sign that will be used to "post" the Class III regulated work area. Unless the employer anticipates the employees wearing respirators and protective clothing while conducting the work, the sign should say: DANGER ASBESTOS. CANCER AND LUNG DISEASE HAZARD. AUTHORIZED PERSONNEL ONLY.

The Owner and Project Monitor recommend that all employees disturbing asbestos, even in very limited situations and amounts, should wear proper respirators for protection against airborne asbestos. However, HMS, Inc. believes that if the employer complies with the limitations of work, and the procedures described in this section of the specifications, there should be no reasonably expected release of airborne asbestos and respirator wear is not required.

Should the employer follow the Owner and Project Monitor's recommendation to wear respirators, the employer must comply with all the requirements of 8 CCR 1529, and 8 CCR 5144 regarding respirator wear. This will include the employer developing a written respiratory protection program meeting the requirements of 8 CCR 5144. The employer will need to provide the employees with non-disposable cartridge respirators with P-100 (HEPA) cartridges; conduct proper fit-testing and medical approval; and ensure the employees are properly trained to wear and care for the respirators.

The Contractor may determine it appropriate to conduct exposure monitoring (personal air sampling) as described in 8 CCR 1529 and related appendices. Should the employer determine that necessary, the employer will need personal sampling pumps and air sampling cassettes that will allow the employer to comply with the requirements of sampling as described in 8 CCR 1529.

The following procedures, however, are designed for employees who will conduct minor disturbance of asbestos-containing material where they should not reasonably be expected to be exposed to any airborne asbestos. They certainly should not be exposed at or above the Permissible Exposure Limit (PEL) or Excursion Limit for airborne asbestos as described in 8 CCR 1529. Despite that assumption, employers are strongly encouraged to conduct exposure monitoring (personal air sampling) to verify that their employees are not being exposed to airborne fibers.

While HMS, Inc. believes it unlikely that properly trained employees following the required procedures will be exposed to airborne asbestos, Cal/OSHA, the Owner, the Project Monitor, and HMS, Inc. all recognize that the employer is responsible, by Cal/OSHA standards, for ultimately determining whether or not his or her employees are being exposed to airborne asbestos. **The Owner and Project Monitor strongly encourage the employer to conduct exposure monitoring in compliance with the requirements of 8**

CCR 1529 and the associated appendices. While the regulatory requirements are somewhat unclear, HMS, Inc. does not believe such monitoring is required for this type of work. *(Should the employer wish it, HMS, Inc. can conduct exposure monitoring for the employer that will meet the requirements of 8 CCR 1529.)*

Part 23.8.3 - Required Work Practices and Procedures

These procedures and precautions are designed to be used only under the following situations:

nnnn. The employees will disturb non-friable asbestos-containing materials such as joint compound, texture/skim coat add-on materials, plaster or stucco. These materials do not include friable materials such as "cottage cheese or popcorn" type sprayed-on acoustic materials, textured acoustic plasters, and transite panels, sheets, or piping.

oooo. The employee disturbing the asbestos, if drilling or cutting into the material, **will only do the activity that disturbs the matrix of the asbestos-containing material for less than sixty minutes in an eight-hour shift**. For example, the employee may drill multiple holes, but the drilling activity alone must not exceed a total of sixty minutes during an eight-hour work shift. **If the employee must disturb asbestos for periods longer than sixty minutes in a shift, the employee must wear a respirator until the employer provides a negative exposure assessment (by air sampling that complies with the requirements of 8 CCR 1529) acceptable to the Project Monitor**. The work practices remain the same regardless of the duration of the work. However employees potentially exposed over sixty minutes must wear respirators until it is confirmed that they are not being exposed to airborne fibers.

pppp. The employee follows the procedures described below for disturbing small amounts of asbestos.

Employees simply screwing attachments into painted asbestos-containing materials must have a HEPA vacuum on site and must use it to clean up any debris that may be created by their work. No other precautions are required unless they find it necessary to drill into materials.

Employees who drill or cut into materials must, at a minimum, take one or more of the following precautions, or similar precautions approved by the Project Monitor.

qqqq. The employee shall restrict access to the immediate work area and post the regulated area sign described above under "equipment."

rrrr. The employee shall place a poly drop layer below the area where asbestos will be disturbed.

ssss. Unless determined to create additional dust or clean-up problems, or conflicts with the containment method chosen, the employee shall wet the area that will be disturbed.

tttt. The employee must contain the disturbance of asbestos by either using a HEPA-vacuum-attached shroud system, shaving cream or gel, duct tape, or another containment strategy approved by the Project Monitor for the type of work. (The employer's training program should have discussed and practiced various containment techniques.) The containment system must demonstrate to the Project Monitor that no visible emissions of potential asbestos-containing materials are released during the disturbance process.

uuuu. The employer is not expected to protect the inside of walls from debris resulting from this work. However the employer shall take precautions to protect the opposite side of any surface that will be drilled all the way through and has the potential for releasing asbestos-containing dust and debris into currently occupied areas or areas that will be occupied in the future. (The employer's training program should have discussed and practiced methods of protecting the far side of a wall.)

vvvv. The employee must use a HEPA vacuum to clean up any debris associated with the work that may fall onto the poly ground cloth or building surfaces.

Part 23.8.4 - Advance Notice Prior To Conducting Work

Prior to conducting any work described under this section of these specifications, the employer must:

a. Provide the Owner and/or Project Monitor with appropriate proof of training to do the work.

b. Provide the Project Monitor with 24 hour in advance notice of when the employer plans to conduct the work and then a minimum of one hour advance notice of the exact time the work will commence. This will allow the Project Monitor to visually monitor the work of the employees to confirm that they are following the requirements of this specification and that the procedures are working successfully.

c. Provide the Project Monitor all necessary assistance in monitoring the work practices of the employees as requested by the Project Monitor. Depending on the results of the first visual inspection of the employees' work, the Project Monitor may or may not determine that additional scheduled visits are necessary. Regardless of the quality of the work demonstrated during the first monitoring visit, the Project Monitor is likely to make repeat, unannounced visits to the work site to verify compliance with these requirements.

Part 23.8.5 - Care Of HEPA Vacuums And Waste Management

The employer shall not empty or open HEPA vacuums without additional training and without taking the proper precautions. The Owner recommends that the employers utilizing HEPA vacuums for the work described in this section of the specifications hire professional abatement contractors to empty the vacuums. The employer will need to empty these vacuums very infrequently if they are used solely for the work described in this section and not used for general clean up of non-asbestos-containing debris.

The small amount of non-friable asbestos-containing debris created by this work is not expected to create a hazardous waste. However, should the employer generate waste from this process that is not picked up by the HEPA vacuum (such as hole plugs from conduit drilling), those materials should be bagged in a leak-tight container and taken either to a household hazardous waste site or, if agreeable with the Contractor, given to the Contractor working on this project for proper disposal.

Pre-Start Submittal Form For BUILDING 1800 REMEDIATION

This form must be completed, signed, and submitted with the Contractor's documents prior to the start of work. This form and these documents must be submitted to the Owner and/or Project Monitor no less than five days prior to the start of work disturbing asbestos.

Please attach submittals in the order listed below. Please check off each item that is submitted. Write NA in spaces for which you believe the requirement is Not Applicable.

3.2.1 - Proof of Basic Qualifications

The following items must have been provided at the time of bid award. However, even if already submitted, the Contractor must again submit these documents with this submittal package in order to have all documents in one package.

a. ____ Successful asbestos abatement contractor shall submit a certificate of general liability insurance protecting against liability for bodily injury and property damage arising from asbestos abatement contractor's activities under this contract.

   1. ____ The limit of liability shall not be less than $1,000,000.00 per occurrence for bodily injury and property damage liability combined.

   2. ____ The Owner, Owner's Agents, and Hazard Management Services, Inc. (HMS, Inc.) must be named as additional insured, but only in respect to liability arising or resulting from activities under this contract.

   3. ____ In the event of cancellation of the insurance policy, the Owner shall be given thirty days advance written notice.

   4. ____ The insurance certificate must state that the insurance includes liability coverage for asbestos abatement work.

b. ____ Copy of State of California Contractor License Issued by CSLB and
   ____ Copy of State of California CSLB Asbestos Certification

c. ____ Copy of Department of Industrial Relations; Division of Occupational Safety and Health; Certificate of Registration for Asbestos-related Work

d. ____ The asbestos abatement contractor shall submit a statement, signed by an officer of the company, containing the following information:

   1. ____ A record of any citations issued by Federal, State, or Local regulatory agencies within the last 3 years, relating to asbestos abatement activity. Include projects, dates, and resolutions.
   2. ____ A list of penalties incurred through non-compliance with asbestos abatement project specifications, including liquidated damages, overruns in scheduled time limitations, and resolutions.
   3. ____ Situations in which an asbestos-related contract has been terminated including projects, dates, and reasons for terminations.
   4. ____ A list of any asbestos-related legal proceedings/claims in which the Contractor (or employees scheduled to participate in this project) has participated or is currently involved. Include descriptions of role, issue, and resolution to date.

d. ___Submit copies of all required notifications to government agencies. For example, ten-day in advance NESHAP notification, Cal/OSHA notification to disturb asbestos, possible Cal/OSHA lead notification if 1532.1 (p) is relevant.

e. ___Submit proof satisfactory to the Owner that required permits have been acquired applicable to the project being performed and specific to the project site and location. If no city, county, or other permits for parking, waste bin location, or variances for scheduled work hours are required this should be stated in writing and submitted to the Owner.

f. ___Submit Subcontractor information or statement that subcontractors will not be required or used during this project.

g. ___Submit a complete list of all rented equipment for use in asbestos regulated areas along with written statements from each rental company indicating the rental company's acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos may be present.

h. ___Submit non-emergency telephone numbers, other than 911, for the appropriate Police, Sheriff, and Fire Departments. This list of numbers shall also include the name, pager or cell phone numbers of the on-site supervisor and his or her immediate company supervisor.

i. ___Submit detailed written directions from the project site to the medical facility to be used in case of an emergency. Also include a map which sufficiently shows the route to be taken from the site to the designated medical facility.

j. ___Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

k. ___Submit detailed work plan information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. Also list decontamination procedures for personnel, work area and equipment, abatement methods and procedures, required air monitoring program, procedures for handling and disposing of waste materials and procedures for final decontamination and clean up.

l. ___Submit a detailed work schedule. The schedule shall have, as a minimum, the work area and the day/month for beginning and terminating work in each work area. During progress of work, it shall be the Contractor's responsibility to keep the schedule current and up to date.

m. ___Copy of current AHERA accreditation as a worker or supervisor for all workers. At a minimum, proof must include name and date of course and name of training provider.

n. ___Copy of medical surveillance for asbestos in compliance with 8 CCR 1529 or 1926.1101 and approval to wear respirator.

o. ___Copy of current respirator fit test for the respirator the worker will wear.

p. ___Copy of waste transporter's Department of Toxic Substances Control, Hazardous Waste Transporter Registration if hazardous asbestos-containing waste is to be removed during the project. If hazardous asbestos-containing waste will not be generated, submit the name, address, and registration information for the waste hauler to be used for transporting the waste.

q. ___Submit documentation listing the name and site address of the waste facility designated to receive asbestos-containing waste generated during this project. This documentation shall also include the

EPA Identification number, and a copy of the current permit authorizing the waste facility to accept and dispose of asbestos-containing waste.

r. ___Submit Material Safety Data Sheets (MSDS) for any and all applicable, materials, supplies, etc.

s. ___Submit manufacturers' certifications that high efficiency particulate air (HEPA) vacuums, pressure differential units and other local exhaust ventilation equipment conform to ANSI Z9.2-79.

t. ___Name and contact information of independent testing company who will challenge test all vacuums and air filtration devices used on this project (in interior spaces).

u. ___Submit name of laboratory/person to be used for Phase Contrast Microscopy (PCM) analysis and copy of current NVLAP Certificate of Accreditation (if applicable), and most recent NIOSH Proficiency Analytical Testing Program results.

v. ___Submit a written statement that personal air sampling will be conducted according to the requirements of 8 CCR 1529. This statement must be on the Contractor's company letterhead, dated, include name of the site or project being worked on, and signed by an authorized agent of the Contractor performing the asbestos-related work.

w. ___Submit manufacturer's documentation pertaining to the capability of waste water filters to filter particles of 5.0 micron in size.

The above-listed documents must be provided a minimum of five working days prior to the start of work that will disturb asbestos. *Exceptions will be made for individual worker and supervisor documentation of training, medical approval, and respirator fit test and for the documentation of rental equipment. However no workers will be allowed to work without this documentation and no rental equipment will be allowed inside a regulated area without the documentation.* All delays resulting from the failure of the Contractor and/or subcontractors to provide this information in the required time frame is solely the responsibility of the Contractor and/or subcontractor.

Name, Signature, and Contact Information of Contractor's Personnel Completing Pre-Start Submittal Package

Mailing Address: _____

NAME: _____
(Print or Typed)

_____

SIGNATURE: _____ _____

Telephone: _____ Fax: _____

END of EXHIBIT A