

ASBESTOS REMOVAL SPECIFICATIONS

**Audie L. Murphy Memorial Veterans' Hospital
HVAC Unit Removal – Phases A through S
7400 Merton Minter
San Antonio, Texas**



ARIAS & ASSOCIATES
Geotechnical • Environmental • Testing

Prepared for:
Audie L. Murphy Memorial Veterans' Hospital
c/o McCall and Associates Architects

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SECTION 1.0 SUMMARY OF WORK

1.1 Purpose

This abatement removal specification plan gives general guidelines and detailed glovebag guidelines to be used for appropriate removal and disposal of asbestos-containing materials (ACM) from Audie L. Murphy Memorial Veterans' Hospital (ALMD) in San Antonio, Texas. The abatement to be performed is the removal of all ACM that will or may be disturbed by the renovation and demolition work involved with the removal of the existing heating, ventilating, and air conditioning (HVAC) units. The HVAC units will be removed in a series of phases, phase A through S.

This plan is to be used in coordination with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and all applicable federal, state, and local regulations. The abatement contractor (CONTRACTOR) is to comply with NESHAP and all applicable federal and local regulations while performing this work.

1.2 General Requirements

- A. The CONTRACTOR shall coordinate access to the site, vehicle parking and equipment locations, water and electrical power sources, and work schedules with the Owner and the Consultant (for staffing purposes) prior to initiating any work. Work is to be performed as required to meet the Owner's scheduling.
- B. The CONTRACTOR is responsible for preparation and submission of the Texas Department of State Health Services (TDSHS) demolition/renovation notification forms. The CONTRACTOR is also responsible for any revisions to subsequent notifications and submission of the amended forms to the TDSHS. The CONTRACTOR shall also inform local TDSHS inspectors of any changes prior to proceeding with such work.
- C. The CONTRACTOR is responsible for the removal of all asbestos containing, suspected asbestos containing, or assumed ACM that will be disturbed or affected by abatement activities. **The Abatement CONTRACTOR is responsible for determining the quantities to be abated prior to the start of work.** The TDSHS notification will be adjusted to reflect the results of the CONTRACTOR's inventory.
- D. Initial cleaning of the project areas shall be conducted using wet wipe or High Efficiency Particulate Air (HEPA) vacuum methods prior to containment preparation.
- E. The work area shall be regulated in accordance with applicable Occupational Safety & Health Administration (OSHA), EPA and TDSHS requirements. Personal air monitoring of the abatement personnel is required and is the responsibility of the Contractor

- F. CONTRACTOR shall provide all equipment and supplies necessary to complete the scope of work.
- G. Preparation and abatement work is to be performed only during periods when the Arias & Associates, Inc. project manager/air monitoring technician is on site.
- H. Only asbestos-containing waste materials (ACWM) from this project are to be placed in waste containers at the project site. The CONTRACTOR is to make arrangements prior to the removal of waste materials for the manifests to be signed by the Owner. The Consultant, Project Manager, and Abatement Contractor shall not sign waste manifests. All materials abated and any wastes generated during the abatement project are to be disposed of properly and in accordance with the applicable regulations. All manifests are to be reviewed and signed by the Owner prior to any waste disposal.
- I. A visual inspection will be made prior to the collection of clearance air samples and again after the removal of the all containment structures and equipment from the work area. The CONTRACTOR's on-site supervisor must sign the approval of visual inspection paperwork.
- J. The CONTRACTOR shall remove all water used in the abatement process and shall dry any materials or areas wetted during the abatement process. The CONTRACTOR is solely responsible for moisture sources and any moisture damage or leaks resulting from the abatement project.
- K. No flames or flammable materials are to be used or brought into the facility.
- L. The Contractor shall not have any materials on site with a flash point of 140 degrees Fahrenheit or below.

1.3 Scope of Work

This project consists of the removal and disposal of asbestos containing duct mastic, pipe insulation mastic (elbows), vibration vibration damper cloths, transite walls, and the component removal of the nineteen (19) HVAC units identified in the asbestos surveys conducted for the area. **The Abatement CONTRACTOR is responsible for determining the quantities to be abated prior to the start of work.** The following is a summary of material to be abated per phase:

Phase A: HV-PS-3A

- No transite walls
- 36 linear feet of mudded pipe elbows
- 15 linear feet of duct insulation mastic
- 556 square feet (surface area) of duct mastic on HVAC unit
- 3 vibration vibration damper cloths
- No fire doors

Phase B: HV-PS 2A

- No transite walls
- 57 linear feet of mudded pipe elbows
- No duct insulation mastic
- 556 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration vibration damper cloth
- 1 fire door

Phase C: HV-PS-1A

- No transite walls
- No mudded pipe elbows
- No duct insulation mastic
- 556 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration vibration damper cloth
- No fire doors

Phase D: HV-PS-1B

- No transite walls
- 76 linear feet of mudded pipe elbows
- No duct insulation mastic
- 556 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration vibration damper cloth
- 1 fire door

Phase E: AC-B-1A

- 689 square feet of transite walls
- 33 linear feet of mudded pipe elbows
- 10 linear feet of duct insulation mastic
- 742 square feet (surface area) of duct mastic on HVAC unit
- 2 vibration damper cloths
- 4 fire doors

Phase F: HV-B-1A

- 436 square feet of transite walls
- No mudded pipe elbows
- 31 linear feet of duct insulation mastic
- 742 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 2 fire doors
-

Phase G: AC-B-2A

- 364 square feet of transite walls
- No mudded pipe elbows
- 55 linear feet of duct insulation mastic
- 738 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 2 fire doors

Phase H: HV-B-2A

- 871 square feet of transite walls
- No mudded pipe elbows
- 25 linear feet of duct insulation mastic
- 742 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase I: AC-2-6A

- 871 square feet of transite walls
- 25 linear feet of mudded pipe elbows
- 115 linear feet of duct insulation mastic
- 654 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 5 fire doors

Phase J: AC-2-2B

- 527 square feet of transite walls
- 38 linear feet of mudded pipe elbows
- 141 linear feet of duct insulation mastic
- 699 square feet (surface area) of duct mastic on HVAC unit
- 6 vibration damper cloths
- 4 fire doors

Phase K: AC-2-1B

- 442 square feet of transite walls
- No mudded pipe elbows
- 86 linear feet of duct insulation mastic
- 720 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- No fire doors

Phase L: AC-3-1A

- 468 square feet of transite walls
- No mudded pipe elbows
- 56 linear feet of duct insulation mastic
- 530 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase M: AC-3-2A

- 559 square feet of transite walls
- 21 linear feet of mudded pipe elbows
- 55 linear feet of duct insulation mastic
- 530 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase N: AC-4-1A

- 468 square feet of transite walls
- 20 linear feet of mudded pipe elbows
- 58 linear feet of duct insulation mastic
- 208 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloths
- 4 fire doors

Phase O: AC-4-2A

- 559 square feet of transite walls
- 25 linear feet of mudded pipe elbows
- 53 linear feet of duct insulation mastic
- 232 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase P:

- 468 square feet of transite walls
- 15 linear feet of mudded pipe elbows
- 78 linear feet of duct insulation mastic
- 204 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase Q: AC-6-1B

- 598 square feet of transite walls
- 27 linear feet of mudded pipe elbows
- 61 linear feet of duct insulation mastic
- 584 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Phase R: AC-6-2B

- 553 square feet of transite walls
- 47 linear feet of mudded pipe elbows
- 30 linear feet of duct insulation mastic
- 568 square feet (surface area) of duct mastic on HVAC unit
- No vibration damper cloths
- 4 fire doors

Phase S: AC-7-1A

- 468 square feet of transite walls
- 25 linear feet of mudded pipe elbows
- 90 linear feet of duct insulation mastic
- 428 square feet (surface area) of duct mastic on HVAC unit
- 1 vibration damper cloth
- 4 fire doors

Other encountered hidden materials shall be abated according to the general guidelines in this work plan.

SECTION 2.0 DEFINITIONS

Air Lock – mechanisms on doors and curtains that control the airflow patterns in the doorways.

Air Monitoring – the collection of airborne samples for analysis of fiber content.

Amended Water – water to which a surfactant has been added.

ANSI – American National Standards Institute

Asbestos Abatement – the removal, the encapsulation or the enclosure of asbestos for the purpose of, that has the effect of, reducing or eliminating airborne concentrations of asbestos fibers or amounts of asbestos containing materials.

Asbestos Containing Material (ACM) – Materials or products that contain more than 1.0% of any kind or combination of asbestos, as determined by the Environmental Protection Agency (EPA) recommended methods as listed in EPA/600/R-93/116, July 1993 "Method for the Determination of Asbestos in Bulk Building Materials". This means any one material component of a structure or any layer of a material sample.

Asbestos-Related Activity – The disturbance (whether intentional or unintentional), removal, encapsulation, or enclosure of asbestos, including preparations or final clearance, the performance of asbestos surveys, the development of management plans and response actions, asbestos project design, the collection or analysis of asbestos samples, monitoring for airborne asbestos, bidding for a contract for any of these activities, or any other activity required to be licensed under the Texas Asbestos Health Protection Act.

ASTM – American Society for Testing and Materials

Building Owner – The owner of record of any building or any person, such as a property manager, who exercises control over such building to the extent that said person contracts for or permits renovation to or demolition of said building. A general contractor hired by the building owner for the purpose of performing a renovation or demolition cannot act as the building owner.

Clean Room – a chamber or area of the decontamination unit with provisions for storage of workers' street clothes and protective equipment.

Contractor – The appropriately licensed asbestos abatement contracting firm or company, its employees, and subcontractors retained by the Building Owner to perform the project scope of work for asbestos removal.

Consultant – The appropriately licensed asbestos consultant agency, its employees, and subcontractors retained by the Building Owner to provide asbestos consulting services required in performing the project scope of work for asbestos removal.

Critical Barrier – One or more layers of plastic (polyethylene) sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Decontamination Unit – a series of connected chambers separated by air locks that includes areas for worker or equipment decontamination. A decontamination unit shall consist of at least three chambers with two air locks to separate them.

Demolition – The wrecking or removal of any load-supporting structural member of a public building or facility or any related asbestos removal, stripping, or handling operations together with any related operations or the intentional burning of any public building or facility.

Encapsulation – a method of control of asbestos fibers in which the surface of asbestos containing material is penetrated by or covered with a liquid coating prepared for that purpose.

Enclosure – the construction of an airtight, impermeable, semi-permanent barrier surrounding asbestos to prevent the release of asbestos fibers into the air.

EPA – The United States Environmental Protection Agency.

Facility – Any institutional, commercial, public, industrial or residential structure installation or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; and any active or inactive disposal site. Any structure, installation or building that was previously subject to 40 CFR §61.141, Subpart M is not excluded, regardless of its current use or function.

Facility Owner – The owner of record of any facility or public building or any person who exercises control over a facility or public building to the extent that said person contracts for or permits renovation to or demolition of said facility or public building.

Friable Material – Materials that when dry can be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such previously nonfriable material becomes damaged to the extent that, when dry, it may be crumbled, pulverized, or reduced to powder by hand pressure.

Glove bag – a 6-mil to 12-mil polyethylene, polyvinyl chloride or equivalent sack, with a seamless bottom, and two sealed inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for a wand or HEPA vacuum wand.

HEPA Filter – A high efficiency particulate air filter, capable of trapping and retaining 99.97% of mono-dispersed airborne particles 0.3 micron or larger in diameter.

NESHAP – National Emissions Standard for Hazardous Air Pollutants

NEC – National Electric Code

NIOSH – National Institute for Occupational Safety and Health

OSHA – Occupational Safety and Health Administration

PEL – Permissible Exposure Limit as defined by OSHA regulations (29 CFR §1926.1101).

Public Building – The interior space of a building used or to be used for purposes that provide for public access or occupancy, including prisons and similar buildings. Interior space includes exterior hallways connecting buildings, porticos, and mechanical systems used to condition interior space. The term includes any building during a period of vacancy, including the period during preparations prior to actual demolition. The term does not include:

- A. an industrial facility to which access is limited principally to employees of the facility because of processes or functions that are hazardous to human safety or health;
- B. a federal building or installation (civilian or military);
- C. a private residence;
- D. an apartment building with no more than four dwelling units;
- E. a manufacturing facility or building that is limited to workers and invited guests under controlled conditions;
- F. a building, facility, or any portion of which has been determined to be structurally unsound and in danger of imminent collapse by a professional engineer, registered architect, or a city, county, or state government official.

Regulated Area – The demarcated area in which asbestos abatement activity takes place, and in which the possibility of exceeding the permissible exposure limits (PEL) for the concentrations of airborne asbestos exists. This area is to be designated with barrier warning tape as shown below.

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TEM – Transmission Electron Microscopy

Transportation of Asbestos Containing Material – Moving asbestos materials from one site to another.

Work – The work refers to the performance and completion of the asbestos abatement activities, described in the work plan or specifications, to best fulfill the Building Owner's requirements for renovation, demolition, or the removal of asbestos containing materials.

Working Days – Monday through Friday excluding holidays which fall on those days.

SECTION 3.0 SUBMITTALS

3.1 Construction Schedule

At least 72 hours prior to the start of abatement work, the CONTRACTOR will provide a proposed detailed schedule including work dates (preparation and abatement), work shift time, number of employees, and the date of completion. A plan indicating containment enclosure locations, negative air machine exhaust locations, bag-out, and waste removal routes shall also be submitted.

3.1 Submittals

- A. Submit the following to the Consultant regarding project coordination:
 - a. Contingency plans for emergency action,
 - b. Telephone numbers and locations of emergency services,
 - c. Notifications sent to emergency service agencies, and
 - d. Resume of asbestos abatement supervisor.
- B. Submittals related to regulatory requirements are as follows:
 - 1. Notices: Submit notices required by federal, state, and local regulations along with proof of timely transmittal to the agency requiring the notice as requested by the Owner;
 - 2. Permits: Submit copies of current valid permits required by federal, state, and local regulations;
 - 3. Licenses: Submit copies of all federal, state, and local licenses and permits necessary to carry out the work of this contract; and
 - 4. Certifications: Submit copies of TDSHS Asbestos Abatement Worker certificates.
- C. Physician's Written Statements: Submit copies of physician's written statements for each person performing abatement work.
- D. Copies of Certificate of Worker Acknowledgement for each person working on the project.
- E. Submit the following to Consultant for review upon project completion:
 - 1. Copies of daily logs and event reports for each day of work,
 - 2. Copies of applicable licenses/certificates for each employee that participated in the project.
 - 3. Copies of accident reports.

4. Certified copy of the Owner's final punch-list of itemized work to be completed or corrected stating that each item has been completed or corrected,
 5. Copies of all waste manifests and disposal site receipts, and
 6. Copies of all certificates of visual inspections signed by both the CONTRACTOR and the Consultant.
- F. The information will be provided to the Owner and is a condition of payment for work performed as part of this contract.

SECTION 4.0 EMERGENCY PLANNING

4.1 Procedures

- A. The CONTRACTOR will develop emergency planning procedures in writing prior to abatement initiation. This plan shall consist of, but not be limited to, emergency exit plans, notification procedures, and fire extinguisher locations. Both the CONTRACTOR and the Owner shall agree on these procedures.
- B. Telephone numbers of all emergency response personnel will be predominately posted in the clean room and equipment room. The location of the nearest telephone shall also be given.
- C. The CONTRACTOR will conspicuously mark the inside of the containment structure to indicated locations of exits from the containment in both English and Spanish.
- D. The CONTRACTOR will maintain copies of Material Safety Data Sheets (MSDS) for any chemicals, solvents, or other materials that will be on the site.
- E. The Consultant is not responsible for monitoring, enforcing, or ensuring adherence to OSHA regulations by the CONTRACTOR. This is solely the responsibility of the CONTRACTOR.

SECTION 5.0 PROTECTIVE CLOTHING, EQUIPMENT, AND MATERIALS

5.1 Protective Clothing

Protective clothing shall meet or exceed minimum protective clothing requirements of Title 29 CFR 1926.1101 and include safety glasses, cotton or leather gloves, full body disposable coveralls, disposable hood (separate or integral to coverall), and foot coverings (reusable footwear, 18-inch high boot type disposable foot coverings or foot coverings integral to coverall).

5.2 Respirators

- A. A minimum of half-mask air purifying respirators with dual HEPA filters shall be used during work area preparation as necessary and during removal of non-friable materials. A maximum of full-face powered, air-purifying respirators (PAPR) with dual HEPA filters shall be used during removal of friable materials. Depending on the results of a negative exposure assessment, PAPR requirements may be waived and abatement personnel are allowed to work in half-mask, air-purifying respirators. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.
- B. All respirators shall be approved by the National Institute of Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) to meet all anticipated requirements of the individual. Respirators must be maintained in safe working condition.
- C. Each worker must perform positive and negative air pressure fit tests each time a respirator is put on or as respirator designs permit. Supplied air respirators shall be tested for adequate flow as specified by the manufacturer.
- D. Any employee whose facial characteristics, hair, mustache, or beard preclude a tight fit of a negative-pressure respirator shall not be allowed to enter the containment area of an asbestos operation using this type of respirator.

5.3 Equipment

- A. Ground-fault circuit interrupter (GFCI) units shall be installed on all electrical circuits used within the regulated and containment areas and any wet areas or those with the potential to become wet. Electrical equipment within the containment areas shall be connected to GFCI circuits originating outside the containment areas.
- B. Decontamination system for personnel shall consist of a "clean room", a "shower room", and an "equipment room". Each room shall be separated from each other and the work area by a "Z" flap airlock or inverted "T" flaps.
- C. The differential pressure system shall include ventilation system equipment with HEPA filters and a digital or analog manometer or magnehelic gauge. If the manometer does not produce periodic documentation of date, time and differential pressure on paper tape or disk, then the Licensed Supervisor and/or Licensed Project Manager shall periodically read and document pressure readings. This system shall operate throughout the abatement process to provide air flow from outside the containment through the containment, assure at least four (4) air changes per hour, and maintain a differential pressure of -0.02 inches of water column between the inside and outside of the containment. The CONTRACTOR must achieve a

differential pressure of -0.03-inches of water column between the inside and outside of the containment before work will be allowed to begin. This will help compensate for bagout activities and minor containment pressure variations.

5.4 Materials

- A. For wetting prior to disturbance of Asbestos-Containing Materials, use either amended water or a removal encapsulant.

Amended water must result in the retardation of fiber release equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

Encapsulant shall be penetrating or bridging type designed to provide the same retardation of fiber release as the amended water in the above

- B. Polyethylene sheeting shall be 'true' 6-mil OR with a dart impact of 270 grams, tear resistance of 512 grams, and transverse direction of 2067 grams (provide manufacturer's specifications). Width of sheeting must be the largest size possible to minimize seams, clear, frosted or black, as indicated. Disposal bags and glove bags must meet the 'true' 6-mil requirement for disposal of ACM. Manufacturer's specifications must be on-site for any other thickness other than 'true' 6-mil poly
- C. Duct tape in 2" or 3" widths and spray cement formulated to stick aggressively to polyethylene sheeting.

SECTION 6.0 SITE PREPARATION FOR ASBESTOS REMOVAL

6.1 Worksite Enclosure

- A. The CONTRACTOR shall isolate the regulated area per OSHA Standard 29 CFR 1926.1101(e). The regulated areas shall be roped off and marked with clearly written warning labels in order to keep unauthorized personnel out of the regulated area. The regulated area shall encompass the whole area expected to have an airborne fiber concentration greater than 0.01 fibers per cubic centimeter (f/cc). All HVAC equipment in or passing through the work area shall be shut down and preventative measures taken to prevent accidental start-ups.
- B. The CONTRACTOR shall pre-clean all fixed objects in the work areas and other applicable areas using a HEPA vacuum and/or wet cleaning methods prior to abatement. Moveable objects shall be taken from the area prior to regulating the work area.

- C. The CONTRACTOR shall construct decontamination units at the entrances for the work areas. Decontamination units shall consist of clean room, shower, and equipment room with each section separated by an airlock as described in TDSHS Asbestos Regulatory Clarification 012 dated November 2001. The CONTRACTOR shall require all persons without exception to pass through the decontamination unit for entry into and exit from the work area for any purpose. The CONTRACTOR shall provide hot and cold running water for the decontamination unit shower. The CONTRACTOR shall keep the area around the decontamination unit dry.
- D. Filtration systems for drain lines from showers or other water sources carrying asbestos-contaminated water from the work area shall have disposable type primary and secondary filters and, if necessary, a sump pump. The primary filter shall pass particles 20 microns or smaller; secondary filters, 5 microns or smaller
- E. Danger signs in accordance with 29 CFR 1926.1101 shall be displayed in both Spanish and English, at all entrances to regulated areas, and on the outside of critical barriers.

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**AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

**PELIGRO
RIESGO DE ENFERMEDAD
CANCER Y PULOMES**

**SOLAMENTE PERSONAS AUTORIZADAS
RESPIRORES Y ROPA DE PROTECCION REQUIERE
EN ESTA AREA**

SECTION 7.0 – ASBESTOS REMOVAL AND DISPOSAL PROCEDURES

7.1 Removal Procedures (General)

- A. All asbestos containing materials shall be wetted with amended water (water to which surfactant has been added) prior to and continuously during removal or other handling. The material shall be saturated to the substrate without allowing excessive amounts of water to accumulate in the work area. All removed material

shall be kept wet enough to prevent fiber release until it is placed in disposal containers.

- B. Amended water to wet material shall be sprayed using an airless spraying machine with factory set controls to regulate the water in such a manner that the containment is not flooded.
- C. After completion of all removal work, surfaces from which asbestos has been removed shall be wet brushed and sponged and/or cleaned with HEPA vacuum to remove visible residue.
- D. After the work area has been cleaned of all visible ACM, all surfaces in the work area shall be coated with a thin coat of a satisfactory, penetrative encapsulant to seal any non-visible asbestos fibers.
- E. All non-friable materials should be removed as complete units as much as possible. Asbestos that is removed in complete units or sections shall be carefully lowered to the ground or a lower level without dropping or throwing the asbestos sections. Asbestos that is not removed in complete units or sections shall be immediately placed in disposal containers.
- F. After the work area has been cleaned of all visible asbestos, all surfaces in the work area shall be coated with a thin coat of a satisfactory, penetrative encapsulant to seal any non-visible asbestos fibers. Encapsulant shall be sprayed using airless spray equipment.
- G. In areas where deemed appropriate by the Consultant, Resilient Floor Covering Institute (RFCI) work practices may be utilized by the CONTRACTOR. Work practices from the January 1998 Recommended Work Practices for Removal of Resilient Floor Coverings is to be followed. Abatement personnel are to be trained in RFCI work practices and must be able to provide documentation of this training. A copy of the January, 1998 Recommended Work Practices for Removal of Resilient Floor Coverings and other required documents are to be on site during this work. Mastic solvents are acceptable for use to remove adhesives.
- H. The CONTRACTOR will verify the quantities abated with the Consultant on site. Any changes to this scope of work must be approved by the Owner prior to performing any additional work.

7.2 Glovebag Removal Procedures

All applicable OSHA requirements and glovebag manufacturer's recommendations shall be met during glove bagging operations.

- A. Mix the surfactant with water in the garden sprayer, following the manufacturer's directions.
- B. Have each employee put on a HEPA filtered respirator approved for asbestos and check the fit using the positive/negative fit check.
- C. Have each employee put on a disposable full-body suit. Remember, the hood goes over the respirator straps.
- D. Check closely the integrity of the glove bag to be used. Check all seams, gloves, sleeves, and glove openings. OSHA requires the bottom of the bag to be seamless.
- E. Attach glovebag with required tools per manufacturer's instructions.
- F. Using the smoke tube and aspirator bulb, test 10% of glovebags by placing the tube into the water porthole (two-inch opening to glove bag), and fill the bag with smoke and squeeze it. If leaks are found, they should be taped closed using duct tape and the bag should be retested with smoke.
- G. Insert the wand from the water sprayer through the water porthole.
- H. Insert the hose end from a HEPA vacuum into the upper portion of the glove bag.
- I. Wet and remove the duct mastic.
- J. When the work is complete, spray the upper portion of the bag and clean-push all residue into the bottom of the bag with the other waste material. Be very thorough. Use adequate water.
- K. Put all tools, after washing them off in the bag, in one of the sleeves of glove bag and turn it inside out, drawing it outside of the bag. Twist the sleeve tightly several times to seal it and tape it several tight turns with duct tape. Cut through the middle of the duct tape and remove the sleeve. Put the sleeve in the next glove bag or put it in a bucket of water to decontaminate the tools after cutting the sleeve open.
- L. Turn on the HEPA vacuum and collapse the bag completely. Remove the vacuum nozzle, seal the hole with duct tape, twist the bag tightly several times in the middle, and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
- M. Slip a disposal bag over the glove bag. Remove the tape securing the ends, and slit open the top of the glove bag and carefully fold it down into the disposal bag. Double bag and gooseneck waste materials. Bag must have waste labels as well as Asbestos Danger Warning label as shown below.

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7.3 Component Removal Procedures

- A. If an entire component is to be removed, it should be removed intact, or in large pieces, and in both cases, all of the regulated material must be adequately wetted before handling.
- B. Any visible mastic must be completely covered with tape and wetted to contain any fibrous debris.
- C. The component must be wrapped or contained prior to the disjoining operation to avoid excess debris.
- D. Once the pieces are removed, they must be carefully lowered to the ground onto 6-mil thickness polyethylene sheeting instead of being dropped, thrown, slid, or damaged.
- E. After being lowered down it is to be wrapped completely leaving no piece of the removed unit exposed.
- F. Waste is to be treated as any other Asbestos Containing Material and is to have generator labels placed upon the component as well as having an Asbestos Danger Warning Label as shown below.

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ASBESTOS
CANCER AND LUNG DISEASE HAZARD**

- G. In cases where wetting would cause damage to equipment or create an unsafe working environment, permission can be obtained to use alternative methods of emission control. For example, contractors can collection systems, establish glove bag systems, or use leak tight wrapping to contain all of the material prior to dismantling.

7.4 Waste Disposal (General)

- A. Disposal bags will be 'true' 6-mil thickness polyethylene bags, or an equivalent bag according to the Texas Department of Health regulations, that are preprinted with labels as required by EPA *NIESHAPS Standard 40 CFR Part 61, Subpart M*. Documentation from the manufacturer regarding bag criteria must be on site for the use of bags other than 'true' 6-mil thickness polyethylene bags. The CONTRACTOR shall ensure that materials placed in disposal bags are adequately

wet and remain wet for disposal. Each will be double-bagged and goose-necked at the top to prevent fiber release.

- B. The CONTRACTOR shall take care to prevent asbestos material from clinging to the outside of the filled bags or containers. The bags shall be HEPA vacuumed and/or wet wiped prior to leaving the work area.
- C. The waste transporter will have a TDSHS asbestos transporter license.
- D. Abatement personnel will be protected by disposable protective clothing and a minimum of half-face respirator while loading asbestos waste.
- E. The enclosed cargo area of the truck or dumpster will be lined with 6-mil polyethylene sheeting to prevent contamination from leaking containers.
- F. Waste containers will not be thrown into or out of the truck cargo area or dumpster.
- G. Asbestos waste shall be disposed of in an approved landfill according to current state requirements.
- H. A proper manifest shall be required of all off-site asbestos shipments per *Texas Natural Resources Conservation Commission (currently known as Texas Commission on Environmental Quality) regulations 21 TAC 335.10 and EPA NESHAPS Standard 40 CFR Part 61, Subpart M*. Neither the Consultant nor the CONTRACTOR shall sign any waste manifests. The CONTRACTOR is responsible for obtaining Owner signature of the manifests.

SECTION 8.0 - AIR MONITORING PLAN

8.1 General Procedures

Monitoring of airborne concentrations of asbestos fibers shall be in general accordance with *OSHA regulation 29CFR 1926.1101, Texas Asbestos Health Protection Rules*, and as specified in this plan.

8.2 Baseline Air Monitoring

Baseline air monitoring shall be performed in the asbestos work area prior to the disturbance of ACM. Air samples for analysis by Phase Contrast Microscopy (PCM) will be collected under normal building conditions prior to the disturbance of asbestos-containing building materials. A minimum of three (3) samples shall be collected on 0.8 micron mixed cellulose ester filters loaded in conducting cassettes with extension cowl. The minimum sample volume will be 1,250 liters.

8.3 Ambient Air Monitoring

Ambient samples may be collected from, but not limited to, the following areas, if applicable and as accessible: inside containment; outside containment but inside the building; the negative air unit discharge; immediately outside the entrance to the decontamination facility, and outside the bag out facility. Ambient samples shall be referenced in the daily log. If air monitoring outside the abatement area shows fiber concentrations greater than the action level, 0.01 fibers/cc Time Weighted Average, the CONTRACTOR will be notified immediately.

8.4 Personal Sampling

Monitoring of workers shall take place as required by *OSHA regulation 29CFR 1910.1001* and *Texas Asbestos Health Protection Rules*. Personal sampling is the responsibility of the CONTRACTOR. The CONTRACTOR must arrange for personal sampling prior to the start of the work.

8.5 Clearance Air Monitoring

The Consultant or the designated Project Manager shall conduct clearance monitoring upon completion of the removal process and the visual walkthrough inspection. Aggressive air sampling shall be used for all clearance sampling. Clearance samples shall be collected and analyzed by PCM methods. A minimum of 1,250 liters of air shall be collected for final clearance samples. Clearance will be achieved if no sample is reported greater than 0.01 fibers per cubic centimeter.

8.6 Air Sample Analysis

The air samples shall be analyzed in accordance with the latest edition of NIOSH 7400 protocol, counting rules A, using PCM. Collecting baseline, ambient, and clearance air samples will be the responsibility of the Consultant and/or air monitoring technician on-site.

SECTION 9.0 CLEANUP PROCEDURES

9.1 Work Area Cleanup

- A. The work area and the decontamination area shall be thoroughly cleaned after all work is finished.
- B. The area shall be cleaned with a HEPA vacuum and/or wet-wiped.
- C. After vacuuming and/or wet wiping, the inner layer of plastic sheeting that covers the floors, walls, and all non-removable equipment shall be sprayed with an encapsulant and removed.

- D. After the final cleanup has been completed, the Consultant, if requested, shall conduct a visual inspection of the work area. The CONTRACTOR and the Consultant shall then complete a certificate of visual inspection if the area has been sufficiently cleaned.

VISUAL INSPECTION DESIGNATION

The Texas Department of State Health Services (DSHS) licensed person listed below is hereby delegated authority to perform Asbestos Project Manager duties as described in the DSHS regulations, including visual inspection of abatement areas, for the project work described in this work-plan.

by: (Signature)

Kevin L. Wooster
Kevin L. Wooster, P.G.

Date _____

TDH License Number: 10-5663

Expiration Date: September 5, 2009

Project Manager Name:

Frank Ramirez, Melissa Martinez, Stephen Jimenez or James Garcia

Project Name: Asbestos Abatement – Audie L. Murphy Memorial Veterans' Hospital
HVAC Unit Removal – Phases A through S
7400 Merton Minter
San Antonio, Texas

Arias Job No.: 2009-249

Arias Job No.: 2009-249
Consultant's Signature:

Kevin L. Wooster²⁰

April 10, 2009 (Revised 04-28-09)

ABATEMENT CONTRACTOR CERTIFICATION

Texas Department of State Health Services (TDSHS) licensed Abatement Contractor hereby certifies that he has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit, sheet plastic, etc.) and has found no dust, debris, or residue.

by: (Signature) _____ Date_____

(Print Name) _____

Title _____

PROJECT MANAGER CERTIFICATION

The Texas Department of State Health Services (TDSHS) Project Manager hereby certifies that he has accompanied the Abatement Contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Abatement Contractor's Certification above is a true and honest one.

By: (Signature) _____ Date_____

(Print Name) _____

Project Name _____

Project Number _____

A Certification of Visual Inspection form must be completed for the inspection prior to clearance air monitoring and also for the inspection after removal of the containment structure and other materials.

POST-CLEARANCE CERTIFICATION OF VISUAL INSPECTION

ABATEMENT CONTRACTOR CERTIFICATION

The Texas Department of State Health Services (TDSHS) Abatement Contractor hereby certifies that he has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit, sheet plastic, etc.) and has found no dust, debris, or residue.

by: (Signature) _____ Date _____

(Print Name) _____

Title _____

PROJECT MANAGER CERTIFICATION

The Texas Department of State Health Services (TDSHS) Licensed Project Manager hereby certifies that he has accompanied the Abatement Contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Abatement Contractor's Certification above is a true and honest one.

By: (Signature) _____ Date _____

(Print Name) _____

Project Name _____

Project Number _____

A Certification of Visual Inspection form must be completed for the inspection prior to clearance air monitoring and also for the inspection after removal of the containment structure and other materials.