

SET _____
October 22, 1996

*Abatement Plan for the Removal
of Asbestos at*

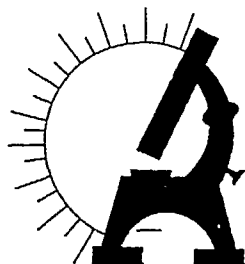
ASARCO, Inc.

DROSS REVERB Towers

FOR:

ASARCO, Inc.
Gregory A. Parham, Project Engineer Manager
P.O. Box 1111
El Paso, Texas 79999

PREPARED BY:



SUN
CITY
ANALYTICAL
INC.

ENVIRONMENTAL SERVICES

1409 Montana Avenue
El Paso, Texas 79902
(915) 533-8840

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October 22, 1996

ABATEMENT SPECIFICATIONS

Design For:

Asbestos Removal
of
ACM Roof Duct Panels & Gaskets

FOR
ASARCO Inc.
P.O. Box 1111
El Paso, Texas 79999

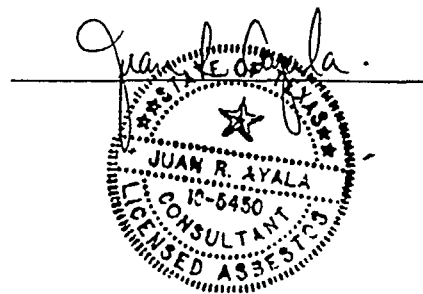
LICENSED ASBESTOS CONSULTANT AGENCY:



TEXAS LICENSE #10-0011
SUN CITY ANALYTICAL, INC.
1409 MONTANA
EL PASO, TEXAS 79902

LICENSED INDIVIDUAL ASBESTOS CONSULTANT:

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ASARCO ELP 0010498

SECTION 01010 SUMMARY OF WORK

PART I - GENERAL

- 1.01 Statement of Work: The work consists of furnishing all labor, plant, and materials and performing all work in strict accordance with this plan. Work shall include but not be limited to: preparation, removal of ACM gaskets and ACM roofing mastic on ducts and all OSHA, EPA air monitoring and air sampling.
- 1.02 Project Objectives:
- A. Remove All asbestos containing roofing material and gaskets on ducts of approximately 9,000 s.f.
 - B. No individual shall be exposed to asbestos fibers in excess of levels shown in these specifications.
 - C. The Contractor shall ensure that no asbestos contamination occurs outside any containment erected.
 - D. The Contractor shall ensure that all asbestos waste is disposed of in accordance to these specification and all applicable laws. All construction waste contaminated with asbestos containing waste from this project shall be disposed of in an EPA approved landfill.
 - E. The Contractor shall document all activities pertaining to this project in accordance with these specifications and all applicable laws. At the conclusion of the project, contractor shall submit this documentation to the Owner after it has been reviewed by the Industrial Hygienist (IH).
 - F. Contractor shall ensure that all special precautions, as stated in these documents, have been taken to protect from water damage and contamination into adjacent areas to the work area.
- 1.03 Scope of Work:
- A. Remove all ACM roofing material on ducts indicated by the Owner and/or his representative in the initial walk through. The estimated amounts are:
 - 1. Remove and dispose of approximately 9,000sf of ACM roof material on ducts.
 - 2. Remove and dispose ACM gaskets located between a few of the sections of the duct work.
 - 3. Set up wind breaker containment around all ducts.

SECTION 01030 SPECIAL PROCEDURES OR CONDITIONS

1.01 ASARCO Duct Work

- A. Before beginning abatement the Contractor shall do the following:
 - 1. Ensure that no high voltage exists in the containment.
 - 2. Ensure all necessary permits are obtained.
 - 3. Ensure that all parties involved in the project are notified of start date.

1.02 Schedule of abatement

- A. The Contractor shall schedule all work to be done during daytime hours otherwise as approved by the Owner. The normal working hours of this project are from 7 a.m to 5 p.m.

1.03 Site Security

- A. The Contractor shall provide a qualified site security during all the abatement phase. The intent of this precaution is to guard against unauthorized entry into the regulated areas as well as a fire watch.
 - 1. Site Security shall have EPA certification to enter the containment
 - 2. Site Security shall have an OSHA physical.
 - 3. Site Security shall have communication equipment to notify the IH, contractor, fire and or police if the need arises.
- B. Site security personnel shall ensure that air filtration equipment is operational at all times, shall restrict unauthorized entry into the regulated area and ensure that the containment is intact at all times. Site security personnel shall keep a daily log of all events.

1.04 Emergency Repairs

- A. The Contractor shall immediately notify the IH of any damages, repair any pipe leaks, or electrical failures that might occur during abatement.
- B. All personnel on job site shall know where a telephone is located and what the emergency phone number are.
- C. Emergency phone numbers shall not be limited to but shall include the Industrial Hygienist (IH), Project Manager, Contractor, Etc). All emergency phone numbers shall be posted at the control center.

1.05 Medical Emergencies

- A. The Contractor shall provide at least one person on site who is qualified in First Aid and Cardiac Pulmonary Resuscitation (CPR). The contractor shall submit this persons name and qualification to the IH at the pre-construction meeting.

1.06 Rental Equipment

- A. The Contractor shall obtain written permission for any rental equipment (includes rental trucks or vehicles) to be used on the asbestos project. The rental company shall be notified of the intended use of equipment and shall submit notice to the Industrial Hygienist (IH) that the equipment may be used on this asbestos abatement project. The Industrial Hygienist (IH) has the right to reject any rental equipment that does not confirm with said letter of understanding. The Contractor assumes all liability for failure to disclose the use of rental equipment for an asbestos abatement project.

1.07 Patented Products

- A. The Contractor shall submit a license or equivalent, or written permission to use any patented product and/or procedure in connection with this project. In the event that no patented product and/or procedure is used, the contractor shall submit a notarized statement acknowledging that he is not using patented products or procedures on this project. The contractor assumes all liabilities for failure to disclose the use of a patented product and/or procedure.

1.08 Electrical Work

- A. All of the electrical work shall be performed by either a licensed electrician or a licensed apprentice electrician under direct supervision of a licensed electrician. All electrical work shall meet electrical code requirements.
- B. Any electrical work performed in the regulated area shall be done by a licensed electrician who has met the requirements of OSHA 1910.1001, AHERA 40 CFR 763 (32 hour worker Course), OSHA medical exam, respirator fit test.

END OF SECTION

SECTION 01043 PROJECT COORDINATION

1.01 Work Requirements:

- A. RESERVED
- B. Before starting work at any location the Contractor shall inform the Industrial Hygienist (IH) or his authorized representative of the intent to start such work. Strict adherence with NESHAPS 10 day notice is required.
- C. The contractor shall maintain the area clean of any and all debris that results from the performance of this project.
- D. The contractor shall ensure safe working conditions and abide by all applicable OSHA safety regulations during the performance of the contract.
- E. The Industrial Hygienist (IH) on site does not have the authority to approve any additional work or change the scope of work set forth in these documents. Contractor shall not be paid for any unauthorized work. For any additional work or change of scope of work the Contractor shall follow the directions for additional work set forth in these documents.

1.02 Personnel Qualifications:

- A. All Contractor personnel involved with this project must be trained and have EPA approved certification showing they are fully qualified to do asbestos removal. Contractor shall ensure every worker is thoroughly familiar with the standard operating procedure of the Contractor for abatement work and with all Applicable Laws. All personnel shall have current OSHA (1910.1001) medical examinations and be trained in the use and care of respirators. Anyone without the proper qualifications listed herein shall not be allowed to work in the abatement area at any time.
- B. Supervisor Qualifications are as follows:
 - 1. Meet requirements of OSHA competent person.
 - 2. Must have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos and asbestos containing materials and subsequent cleaning of affected environment.
 - 3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of asbestos.
 - 4. This person shall remain on the job site during working hours at all times. In the event the supervisor leaves the job site, the Industrial Hygienist (IH) has an obligation to stop work until the supervisor returns to the site. Any and all extra cost arising from said event shall be the responsibility of the Contractor.
 - 5. Persons shall have all current OSHA Medical & EPA approved Supervisors Certificates.

C. Worker Requirements:

1. Meet requirements of OSHA (1910.1001).
2. Must have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos and asbestos containing materials and subsequent cleaning of affected environment.
3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of friable asbestos.
4. Workers shall have all current OSHA Medical & EPA approved 32 hour Abatement Worker Certificates.

1.03 Permits:

A. The Contractor shall obtain all necessary permits from the City Building Inspection Department, Police, Fire Department and any other Agencies having Jurisdiction prior to commencement of work. Some permits required are, but not limited to:

1. Electrical Permits where new or reinstalled electrical devices are performed.
2. Building Permits where any structure of the building is disturbed. This includes removal of asbestos pipe insulation.
3. EPA NESHAPS 10 day notice
4. Texas State Health Department Notice
5. Local permits such as fire, police etc.

END OF THIS SECTION

SECTION 01091 DEFINITIONS AND STANDARDS

1.01 Applicable Publications:

- A. The regulations listed below form a part of this specification to the extent referenced. The regulations are referred to in the text by basic designation only. The following regulations shall be on site during all operations of this project.
- B. OSHA Regulations:
 - 1. 29 CFR 1910.20 Access to Employee Exposure and Medical Records
 - 2. 29 CFR 1910.134 Respiratory Protection
 - 3. 29 CFR 1910.1001 OSHA - Asbestos Industry Standard.
 - 4. 29 CFR 1926.1101 Asbestos, Tremolite, Anthophyllite, and Actinolite Construction Standard.
 - 5. 29 CFR Parts 1910 and 1926 Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules; Amendment
 - 6. 29 CFR 1910.1200 Hazard Communications
 - 7. 29 CFR 1910 Occupational Safety and Health Standards
 - 8. 29 CFR 1926.55 Gases, Vapors, Fumes, Dusts and Mists
 - 9. 29 CFR 1926.57 Ventilation
 - 10. All applicable OSHA regulations such as but not limited to Heat Stress, Noise, Electrical Standards (Lockout and Tagout) Scaffolding, Ladders, OSHA 200, Slips, Trips, and Falls, and Fire Safety-Contingency Plans.
- C. Environmental Protection Agency
 - 1. 40 CFR 61 Subparts A & M (Revised Subpart B) National Emission Standards for Hazardous Air Pollutants.
 - 2. 40 CFR Part 763, Subpart E Asbestos Containing Material in Schools; Final Rules and Notice.
 - 3. 40 CFR Part 763, Subpart G Asbestos Abatement Projects; Worker Protection; Final Rule.
 - 4. Environmental Protection Agency (EPA) Publication, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, June 1985.

- D. Department of Transportation (DOT):
 - 1. 49 CFR Part 173, Subpart J.
 - 2. 49 CFR 172 Hazardous Materials Tables & Communications Regulations
 - 3. 49 CFR 178 Shipping Container Specification
- E. American National Standards Institute, Inc., (ANSI), Standards:
 - 1. ANSI Z88.2-1980 Practices for Respiratory Protection
 - 2. ANSI Z9.2-1979 Fundamentals Governing Design & Operation of Local Exhaust Systems
- F. Testing Standards
 - 1. NIOSH Method 7082 Lead
 - 2. NIOSH Method 7400 Fiber Analysis of Asbestos using PCM
 - 3. NIOSH Method 7402 Fiber Analysis of Asbestos using TEM

1.02 Definitions:

- A. Abatement - Means all activities associated with the control of Asbestos containing materials for Buildings during removal.
- B. ACGIH - American Conference of Governmental Industrial Hygienists 6500 Glenway Avenue Building D-5 Cincinnati, Ohio 45211
- C. AIHA - American Industrial Hygiene Association, 345 White Pond Dr. Akron, Ohio 44320
- D. Aggressive Air Sampling - Means using extreme efforts to simulate actual building conditions. Occupancy characteristics by causing air circulation patterns with equipment such as fans or leaf blowers.
- E. Airlock - A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow through contamination.
- F. Air Monitoring - Means the process of collecting air samples on a fiber membrane cassette and then having them analyzed to determine the number of fibers present. Analytical results are expressed in terms of fibers per cubic centimeter of air.
- G. Air Monitoring Professional - A specially trained individual, who has successfully completed a NIOSH 582 Training Course, employed by the Owner, who is qualified by education and/or experience to obtain and test air samples in and around the work areas to determine airborne concentrations of asbestos fibers.
- H. Amended Water - Water to which surfactant has been added. Surfactant should be 50% polyoxyethylene ester and 50% polyethylene ether according to EPA recommendations.

- I. A.N.S.I.- American National Standards Institute, 1430 Broadway, New York, New York 10018.
- J. Asbestos - means a mineral that readily separates into long flexible fibers suitable for use as a noncombustible, nonconducting or chemically resistant material. Asbestiforms include chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- K. Asbestos Containing Material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
- L. Asbestos Containing Waste Material - Asbestos containing material or asbestos contaminated objects requiring disposal.
- M. Asbestos Fibers - Means asbestos fibers longer than 5 micrometers.
- N. Asbestos Project Manager - An individual designated as the Owner's representative and responsible for overseeing the asbestos abatement project.
- O. Asbestos Worker - Means employees that meet all the requirements outlined in OSHA Regulations 29 CFR 1910.1001.
- P. ASTM - American Society For Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
- Q. Authorized Visitor - The Building Owner [and any designated representatives] and any representative of a regulatory or other agency having jurisdiction over the project.
- R. Bidder - Each prospective Contractor who bids on the work specified herein, and has been pre-qualified by Sun City Analytical, Inc.
- S. Building Owner - Owner of the building or his representative.
- T. Bulk Sample - The collection of any building material section suspected of containing asbestos. A small portion of suspected material is removed from sample area and placed in a plastic bag or air tight container.
- U. CIH- An Industrial Hygienist who by virtue of their education and passing the American Board of Industrial Hygiene Core Examination in either the Comprehensive Practice or an Aspect Examination has been given the right to use CIH by AIHA.
- V. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
- W. Clean Air Sample - Means air sample collected immediately following the completion of corrected action. These samples are routinely collected to determine the effectiveness of the corrected action and establish the contractual requirements of acceptable fiber concentrations levels prior to breaking down of abatement control area.
- X. Containment - When used in this specifications means the same as regulated area, shrouding, bubble, temporary enclosure, or controlled area. The means of using plastic to establish work areas and using air filtration pressure to prevent fiber contamination of building and occupants.
- Y. Contractor - Means the Asbestos Abatement Contractor performing the abatement.

- Z. Control Center - Means the area in close proximity of the entrance to the regulated area where the supervisor or outside man is stationed. This center should be where all documentation required by specifications are, along with emergency numbers and first-aid kits, are available.
- AA. CSP - A Safety Professional who by virtue of their education and passing the Board of Certified Safety Professionals Core Examination has been given the right to use CSP by BCSP.
- AB. Curtained Doorway - Means a device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, 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 door and along the opposite vertical side of the doorway. Other effective designs are permissible.
- AC. Designated Decontamination Area - Means an area designated by the Industrial Hygienist (IH). The area is used for the purpose of decontaminating asbestos contaminated objects and shall be located adjacent to the work area and meet Industrial Hygienist (IH) approval.
- AD. Designated Clean Area - Means an area designated by Industrial Hygienist (IH). The area is within site of the work area free of any asbestos for the purpose of storing decontaminated objects.
- AE. Designated Holding Area - Means an enclosed area designated by Industrial Hygienist (IH). The enclosure is used for the storing of sealed containers of asbestos containing materials and asbestos contaminated waste.
- AF. Decontaminate - Means to remove all visible asbestos dust from the surface to be decontaminated by the means of damp cleaning and/or vacuuming with HEPA filtration equipment.
- AG. Encapsulant - A liquid material which can be applied to asbestos containing material which controls 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).
- AH. Enclosure - The construction of an air-tight, impermeable, permanent barrier around asbestos containing material to control the release of asbestos fibers into the air.
- AI. EPA - U.S. Environmental Protection Agency 401 M Street S.W., Washington, D.C. 20460
- AJ. Equipment Decontamination Enclosure System - Means that a 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.
- AK. 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.
- AL. Filtered Exhaust System - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow through contaminated areas from adjacent uncontaminated areas and maintaining a lower pressure in the containment area as compared to the adjacent uncontaminated areas.
- AM. Fixed Object - A piece of equipment or furniture in the work area which cannot be removed from the work area.

- AN. Friable Asbestos - Asbestos containing material which can be crumbled to dust, when dry, under hand pressure.
- AO. HEPA Filter - Means High Efficiency Particulate Air Filter that is capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micro meters in diameter or larger.
- AP. HEPA Vacuum - Means a special type of vacuum cleaner used in the abatement project that must be equipped with a HEPA filter.
- AQ. Glovebag - Means a special purpose custom containment bag with protective gloves and arm sleeves, tool pouch and side port for the use of repairing or removing pipe insulation.
- AR. HVAC - Means heating, ventilation and air conditioning system.
- AS. Industrial Hygiene - "Is that science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community."
- AT. Industrial Hygienists (IH) - An individual who by education or experience has gained competence in the field of industrial hygiene. In this manual the IH is the owners representative and/or the air monitoring professional.
- AU. Movable Object - A piece of equipment or furniture in the work area which can be removed from the work area.
- AV. Air Filtration System - 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.
- AW. NESHAPS - The National Emission Standards for Hazardous Air Pollutants.
- AX. NIOSH - The National Institute for Occupational Safety and Health. CDC -NIOSH Building J N.E. Room 3007 Atlanta, GA 30333
- AY. OSHA - The Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, D.C. 20210. For work in New Mexico the regional office the Environmental Improvement Division (505) 827-2452. In Texas the Regional OSHA office is 1-800-692-4202.
- AZ. Regulated Area - The demarcated areas in which asbestos train personnel activity takes place. This includes any area roped off by the contractor or owner with asbestos warning signs and/or tape.
- BA. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controlled at the tap and suitably arranged for complete showering during decontamination.
- BB. Shrouding (Full) - Means the process of covering all the interior surfaces (floor, walls, doorways, windows, ceiling) of a room with polyethylene sheeting.
- BC. Semi-Shrouding - Means the process of covering a portion of the interior surfaces (floor, walls doorways, windows, ceiling, etc.) of a room with polyethylene sheeting.

- BD. Surfactant - A chemical wetting agent added to water to improve penetration.
- BE. Tunneling - Means the forming of connected enclosed corridors with plastic sheeting for passageways between shrouded and/or semi-shrouded enclosures.
- BF. 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.
- BG. Waste Transfer Airlock - A decontamination system utilized for transferring containerized waste from inside to outside of the work area.
- BH. Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
- BI. Work Area - Means the portion of the building (or structure) comprised of the room(s) and connecting passageway(s) (such as other rooms, hallway, corridors, etc.) required to gain access to the designated material(s) to be removed.
- BJ. Work day - Means any day between the project start and the completion date, with the exception of weekends. Weekends may become work days if authorized by the Owner.

END OF THIS SECTION

SECTION 01300 SUBMITTALS

1.01 Submittals required following issuance of Notice to Proceed:

- A. RESERVED.
- B. Supervisor OSHA medical, and his EPA approved supervisor training certificate to work as a supervisor.
- C. Workers OSHA medical, and his EPA approved worker training certificate to work as a worker.
- D. All enclosures, shrouding complete with detailed layout of decontamination facilities, air filtration system units, emergency exit waste load out and control center.
- E. RESERVED.
- F. Work force to be used, supply number and work schedule for completion of project. Show back up personnel capabilities in the event Contractor falls behind schedule. Submit all Texas State license and current training certifications.
- G. Truck or vehicle to be used to transport ACM waste to the EPA approved landfill. Show load capabilities and condition of vehicle.
- H. Proof that notice has been submitted for permission to dump waste at EPA approved Landfill.
- I. Decontamination center to be used. (To be used as a back up if needed)
 - 1. Pre-fab or portable showers to be used have Hot and Cold water taps, and made of non-porous materials.
 - 2. Waste water filtration system to be used shall have a 20 micron primary filter and 5 micron secondary filter. Also submit data on replacement filters.
- J. All respiratory protection equipment brochures describing:
 - 1. Air purifying respirator with HEPA filters and NIOSH approval number. (Only to be used during preparation on this project).
 - 2. Powered Air Purifying respirators with full-facepiece, HEPA filters and NIOSH number.
 - 3. RESERVED
- K. Samples of the following:
 - 1. Plastic sheeting.
 - 2. Duct tape.
 - 3. Plastic bags.
 - 4. RESERVED.
 - 5. Warning signs, labels and barrier tape.
 - 6. Disposable clothing.
- L. Brochures for other equipment and supplies:
 - 1. Wetting agent (surfactant).

2. Encapsulants.
3. Plastic lined drum.
4. Vacuum equipment along with HEPA filter to be used.
5. Air sampling apparatus.
6. Ground fault interpreters.
7. Communication system between regulated area and control area.

M. RESERVED.

N. Proof that they meet the ASARCO Fire and Emergency Procedures and Spill Response Plan, Safety Plan and any other required plans. (Contractor shall be instructed prior to entering the Plant of all safety and related issues).

O. Respiratory Program.

P. Hazard Communication Program.

1.02 Submittals at the end of the project which include the following:

- A. Air monitoring results from all days of sampling.
- B. Daily narrative log of work progress, to include delays, potential change orders, stoppage of work and results of visitors' inspections and security shift documentation.
- C. Documentation of inspection of all areas and equipment. The Contractor shall note corrections or planned actions for correction.
- D. Notification of any accident or emergency requiring a doctor's treatment or evacuation of any employee.
- E. Documentation of all personnel entering and leaving regulated area.
- F. Documentation of any ACM waste that has been taken to an approved landfill site.
- G. Documentation of filter changes on respirators, HEPA vacuums, filtered Air Filtration System, and other engineering controls.

END OF THIS SECTION

SECTION 01410 TESTING LABORATORY SERVICES

1.01 Personnel Air Monitoring and Sampling:

- A. General Requirements: Air monitoring and sampling shall be in accordance with standards and methods required by all applicable regulations.
- B. The Contractor shall obtain the services of an Industrial Hygienist or Professional Air Monitor specialized with the OSHA medical, and his EPA approved air monitoring technician and supervisor training certificates.
- C. The Contractor shall retain a list of qualifications and experience of the individuals who shall be responsible for air monitoring and sampling.
- D. Throughout the removal and subsequent cleaning operations, AMBIENT (AREA) MONITORING will be conducted by the Owner's representative to ensure compliance with all regulations and is conducting the work in a manner which minimizes airborne asbestos levels as well as minimizes the contamination of other areas of the building. Analytical results will be available at the Control Center.
- E. For each set of air samples submitted to the laboratory by the Contractor for analysis, the Contractor shall submit blank cassettes for analysis (minimum of 10%). Each blank cassette shall be submitted as a part of the Contractors's quality control program.
- F. The Industrial Hygienist (IH) may request to QC sample taken by the Contractor. The Industrial Hygienist (IH) will randomly ask for wedge of cassette filter or read a percentage of the Contractors samples.
- G. Air monitoring results shall include as a minimum for each sample the following: sample ID, laboratory ID, date sample taken, flow (liters/minutes), time (minutes), blank count (fibers/field), fibers/cc, detection limit (fibers/cc), location, employee's name, type of activity and the name of the analyst and the date the sampled was analyzed.
- H. All personnel samples for asbestos shall be in accordance with 29 CFR 1910.1001 and as specified in this manual. The Contractors shall sample employees who are anticipated to have the greatest risk of exposure as determined by the industrial hygienist. At least 25% of the work crew or a minimum of two employees, whichever is greater, during a work shift shall be sampled.

1.02 Third-party Air Monitoring:

- A. General Requirements: Third party area monitoring and project clearance for airborne concentrations of asbestos fibers during an abatement project shall be performed by a project monitor under contract to the building owner to collect samples by and for the owner of the facility being abated.
- B. Project monitors observe abatement activities performed by contractors and generally serve as a building owner's representative to ensure that abatement work is completed according to specification and in compliance with all relevant statutes and regulations.
- C. Project monitors perform the vital role of air monitoring for purpose of determining final clearance.
- D. Project monitor is required to comply with ASHARA, have EPA 5-day supervisor course, NIOSH 582 or 3-day Air Monitoring course and the OSHA medical.

E. Schedule of Air Samples:

1. Baselines: The owner's representative will secure the following air samples to establish a baseline before start of work.

The samples will be taken in accordance with the following schedule:

LOCATION	SAMPLES	VOLUME	RATE
Inside work area	3	1,250 liters	< 10 LPM
Outside work area	2	1,250 liters	< 10 LPM

Baseline will be an action level expressed in fibers per cubic centimeter (f/cc) which is the larger of the following:

- Average of PCM samples collected in work areas.
- 0.01 fibers per cubic centimeter.

2. Daily: From start of work through the end of the project, the owner's representative shall take the following samples on a daily basis. The samples should be taken in accordance with the following schedule:

LOCATION	VOLUME	RATE
Inside containment	1,250 liters	< 10 LPM
Outside containment but inside the building	1,250 liters	< 10 LPM
At negative air unit discharge	1,250 liters	< 10 LPM
Immediately outside the entrance to the decontamination facility	1,250 liters	< 10 LPM
Outside the bag out facility (during gag out activities)	1,250 liters	< 10 LPM

3. Additional samples may be taken at the owner's representative's discretion. If airborne fiber counts exceed allowed limits, additional samples may be taken as necessary to monitor fiber levels.

1.03 Methods of Analysis:

- A. Air samples shall be analyzed by Phase Contrast Microscopy method using the NIOSH 7400 method.

B. Air samples shall be analyzed by an analytical laboratory who possess the following:

1. Lab shall use the NIOSH 7400 method for analysis according to 29 CFR 1910.1001, Appendices A or B which describes the OSHA ORM method and which utilizes the acetone/triacetin sample preparation or equal.
2. Lab to used shall be independent of the Contractor and shall be approved by the Industrial Hygienist.
3. Lab shall have technicians who have their NIOSH 582 Class. Certificate must be submitted to Industrial Hygienist (IH) upon request.
4. Lab shall be a successful participate in the Proficiency Analytical Testing Program (PAT) for the last 4 rounds and have National Institute of Standards and Technology (NIST) certification.
5. Lab shall be capable of delivering results within 24 hours of sampling to the client so the can be posted on the job site.
6. Lab shall have current Texas State License.

1.04 Clearance Samples

A. Transmission Electron Microscopy - is not required on this contract. If the contractor requests such testing, then he shall bear all costs associated with TEM sampling and analysis.

1. Any TEM analysis shall follow 40 CFR 763 AHERA regulations sampling and analysis protocols.

B. On this project Phase Contrast Microscopy with NIOSH 7400 method in accordance with SECTION 01714 WORK AREA CLEARANCE, shall be the method used for clearance testing. Clearance samples shall be done in the normal work shift of the contract and shall be noted in the contractors construction schedule and abatement plan. The clearance level has been established as <.005f/cc.

END OF THIS SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

1.01 Temporary Buildings

- A. Provide first aid facilities at control center and in waste disposal vehicle.

1.02 Water for Construction

- A. The Owner will furnish water used during construction so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide piping, valves, and other items required to properly transport the water to the location where it is needed.

1.03 Electricity for Construction

- A. The Owner will provide electrical energy from existing panels as required to operate power tools and equipment and to provide temporary light so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide temporary wiring and outlets as required and temporary lighting if necessary.

1.04 Employee Conduct

- A. The Contractor shall be responsible for ensuring that all employees comply with all Applicable Laws and perform work in a safe manner. Any employees entering the work area under the influence of alcohol or drugs shall be immediately removed by the Contractor from the job site.
- B. The Contractor shall instruct all his employees to refrain from talking with anyone about this project. Any interviews or discussions about the asbestos project shall be done only by written consent from the building owner or his representative.

1.05 Barricades

- A. The Contractor shall provide sufficient barricades, walkways to protect all personnel from injury or exposure to asbestos. All work areas shall be barricaded with proper signs.

END OF THIS SECTION

SECTION 01513 AIR FILTRATION SYSTEM

1.01 Air filtration system will not be required but may be used by the contractor. If the contractor chooses to used air filtration, then the following shall apply:

- A. Air Filtration must be established in the work area by means of a local exhaust system. The equipment shall exhaust through a three-(or more) stage HEPA filtration system to outside of the building. The equipment shall be in operation for 24 hours per day until final air clearance is achieved.
- B. The system shall have the following characteristics:
 - 1. Filtration equipment in compliance with ANSI Z9.2, Local Exhaust Ventilation.
 - 2. Capable of maintaining a minimum pressure differential of minus 0.02 inches of water gauge in the work area relative to adjacent areas.
 - 3. Air filtration system pressure system units shall be employed in sufficient quantity to provide four (4) air changes per hour in the work place. Use the formula to determine total air flow requirement.

$$\text{Total CFM} = \text{Volume of work area} / 15 \text{ min}$$
$$\text{Number of units} = \text{Total CFM} / 80\% \text{ capacity of unit}$$
 - 4. The hose used to duct the exhaust shall be either new temporary plastic tubing or new wire reinforced ducts.
 - 5. The air filtration unit shall have a warning sound or horn if any restriction is found in the intake or exhaust.
- C. Provide a chart recording measuring device or equivalent for use to verify the pressure differential. This data shall be submitted to the IH at the end of the work shift.
- D. Contractor shall install on the containment one fully operational (including filters) backup ventilation machine.
- E. Units shall be placed to provide maximum air flow and prevent short circuiting air flow.
- F. Pre-filter shall be changed as needed as conditions warrant.
- G. The HEPA filters will be checked by the Industrial Hygienist (IH) for integrity and usage, and shall be changed by Contractor if damaged or overloaded.

END OF SECTION

SECTION 01527 WORK AREA PROTECTION

1.01 Preparation of Work Areas

- A. Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 at any location and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. Contractor shall post warning signs in both English and Spanish.
- B. All electrical power to all work areas shall have GFI hookups. Ensure safe installation (including ground faulting) to temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems.
- C. Abatement workers pick up and dispose of any loose ACM debris. Any damaged asbestos material shall be encapsulated prior to any work being done.
- D. Welder shall cut away all duct brackets to allow asbestos workers to access ACM.
- E. Install 6 foot high wind breaker (black poly) containment around all duct work. This ACM is non-friable material and should not be made friable during removal.
- F. Install plastic 3 feet wide around all duct work to catch any debris falling during the removal process.
- G. The Contractor shall provide a 4A/60BC chemical extinguishers for every 1000 square feet, or fraction, of containment area (IAW Texas Department of Health regulations 295.60(m)(1)). All Workers shall be within a maximum of 100 feet travel distance of a fire extinguisher.
- H. Cleanroom and/or Decontamination Unit:
 - 1. A smoke and/or heat detector shall be located in the cleanroom area.
 - 2. 4A/60BC chemical extinguishers shall be located at either end of the decontamination unit.

END OF THIS SECTION

SECTION 01528 ENTRY INTO CONTROLLED AREAS

1.01 Entry and Exit of Work Area if work is done by ASARCO Employees:

- A. General Requirements: Unless otherwise indicated (such as contract drawing, emergency evaluation, and these specifications) entry and exiting of the work area shall be through the "Worker and Equipment Enclosure" or an "Airlock".
- B. Entry and Exit through "Worker and Equipment Enclosure":
- C. Entering the Work Area: Each worker and/or authorized visitor shall enter the clean room, remove street cloths, put on a clean approved respirator and two sets of protective clothing. From this point, workers and/or visitors shall not eat, drink, smoke, chew gum or tobacco while in the work area. Respirator shall be tested for proper fit and operation.
- D. To exit the work area the workers shall dust them selves off and then use the buddy system to vacuum each other off in the dry-decon. Remove one suit and dispose of it in a provided 6 mill bag inside the containment.
- E. With one suit and and your respirator on proceed to the ASARCO bathhouse.
- F. FOLLOW ALL ASARCO DECONTAMINATION PROCEDURES WHEN USING THE BATHHOUSE.

1.02 Entry and Exit of Work Area if work is done by NON-ASARCO Employees:

- A. General Requirements: Unless otherwise indicated (such as contract drawing, emergency evaluation, and these specifications) entry and exiting of the work area shall be through the "Worker and Equipment Enclosure" or an "Airlock".
- B. Entry and Exit through "Worker and Equipment Enclosure":
- C. Entering the Work Area: Each worker and/or authorized visitor shall enter the clean room, remove street cloths, put on a clean approved respirator and two sets of protective clothing. From this point, workers and/or visitors shall not eat, drink, smoke, chew gum or tobacco while in the work area. Respirator shall be tested for proper fit and operation.
- D. To exit the work area the workers shall dust them selves off and then use the buddy system to remove any excess asbestos in the work area. Proceed to the dirty/equipment room.
- E. In the dirty/equipment room remove contaminated tyvek suit and dispose of it in an asbestos disposal bag. Non-disposable footwear shall be removed and stored. Still wearing respirator, proceed naked to showers.
- G. Still wearing respirator, while showering wash and soak filters; remove respirator and continue to wash respirator with soap and water. Then proceed to wash body and hair with soap and shampoo. Then drying off and proceed to clean room.
- G. In the clean room, worker and/or visitor shall proceed to dress in street their clothes or clean coveralls. Coveralls worn outside the clean room of the enclosure shall be of a different color or marked for easy identification from those worn in the work area.

- H. Before re-entering the work area from the clean room, each worker and/or authorized visitor shall put on a clean respirator and dress in clean protective clothing and follow the above procedures.
- I. In the vestibule airlock remove protective clothing while still wearing the respirator and place into a disposable bag. The exterior of the respirator shall then be wiped with a damp rag or disposable towel which is placed in the disposable bag. While still wearing the respirator, exit the airlock after the disposable bag is sealed and left in vestibule.
- J. Once outside the airlock, the respirator shall be removed, respirator cartridges removed and disposed as asbestos contaminated waste. The respirator shall then be washed, new cartridges installed and placed in a the appropriate storage container.

END OF THIS SECTION

SECTION 01560 RESPIRATORY PROTECTION

1.01 Respiratory Protection

- A. Respiratory protection shall be provided to workers in conjunction with a Respiratory Protection Program which shall meet the requirements of 29 CFR 1910.134, 1926.1001 and 1910.1001. This program shall be posted at the work site. Respirators shall be personally issued, fitted and marked. All workers shall be familiar with the contents of the respiratory program.
- B. The Contractor shall provide documentary evidence that all personnel required to wear respiratory protection have been trained in accordance with 40 CFR Part 763, 29 CFR 1910.134, 1910.1001 and 1926.1001.
- C. The Contractor shall provide the workers with clean and properly maintained respiratory equipment approved by NIOSH/MSHA during all work phases in this project.
- D. Air purifying respirators (half-mask or full-face) with high efficiency particulate (HEPA) filters shall be minimum respirator used on this project.

END OF THIS SECTION

SECTION 01562 PERSONNEL PROTECTION

1.01 Personnel Protection:

- A. General Requirements: The Contractor shall provide all personnel training, equipment, materials, services and liability insurance required to perform the work in accordance with applicable Federal, State and Local regulations and this specification.
- B. Prior to commencement of work, workers shall be instructed, and be knowledgeable of the specific Asbestos Removal Procedures to be used in this project. In addition to the instructions, on-site training in the use of equipment and facilities unique to the job site shall be performed, to include emergency procedures, such as equipment power failures, fires, evacuations, etc.

1.02 Worker and Visitor Protection

- A. Provide workers with sufficient sets of protective full-body clothing. Such clothing shall consist of full-body coveralls and respirator. Provide eye protection and hard hats as required by applicable safety regulations. Non-disposable type protective clothing and footwear shall be left in the contaminated equipment room until the end of the abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos containing waste. Disposable type clothing, and footwear may be used and shall be disposed of as asbestos waste. Bare feet will not be permitted.
- B. Provide authorized visitors with suitable protective clothing, respirator, headgear, eye protection and footwear, as described in paragraph A. above, whenever they are required to enter the work area.
- C. Each worker shall, upon entering the job site: Remove street clothes in the clean change room, put on a respirator and clean protective clothing before entering the equipment room or work area, the exception shall be that workers intending to reuse contaminated protective shall enter equipment room wearing respirators.
- D. Each time the worker leaves the work area: the worker shall remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except respirators; Still wearing the respirator, proceed to the shower; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves, remove filters (where required) and place them in the container provided for the purpose; and wash and rinse the inside of respirator.
 - 1. Contractor is responsible for providing soap, shampoo, clean and dry towels daily to employees and visitors.
- E. After showering, each worker shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking or drinking. Before re-entering the work area from the clean change room, each worker and authorized visitor shall put on a clean respirator with filters (where required) and shall dress in clean protective clothing, the exception shall be that workers intending to reuse contaminated protective clothing stored in the equipment room shall enter the equipment room wearing respirators.
- F. Asbestos contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement, dispose of footwear as asbestos contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access area.

Store asbestos contaminated protective clothing in the equipment room for reuse or place in receptacles for disposal with other asbestos contaminated materials.

- G. Workers shall not eat, drink, smoke or chew gum or tobacco, or utilize sanitary toilet facilities at the worksite except in established locations outside the work and containment areas, and enclosures.
- H. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbances of asbestos-containing or asbestos contaminated waste materials and until final clean-up is completed. This includes removal of fixtures, ceilings, or anything else which may disturb the ACM.
- I. Provide and post, in the Equipment Room and Clean Room, the decontamination and work procedures to be followed by workers.

END OF THIS SECTION

- J. Filtration System: The shower drain and equipment room drain (if any) shall be connected to a filtration system before being discharged to the sanitary sewer. Filters shall be arranged in parallel banks with a 100 micron pre-filters feeding into a 1 micron final filters. Replaced filters shall be treated as asbestos contaminated waste and disposed of properly.
- K. Holding Area (Waste Storage and Load-Out): Shall consist of at least 1 (one) compartment with an air lock between the compartment and the intended disposal vehicle. The envelope of the compartment and air-lock shall be leak free. Passage between compartment and work area shall have two sheets of plastic overlapping each other.
- L. Separation(s) shall be constructed as follows:
1. Framing of suitable materials such as 2 x 4 wood or metal studs shall be erected between floor with a bottom plate and ceiling with a top plate for distance. Support as required.
 2. Cover both sides with double layer of plastic sheeting (4 mil) with joints staggered and sealed with tape.
 3. Seal all edges of separation at floor, walls and ceiling with caulking to be airtight.
- M. Maintenance of enclosure systems shall be performed by the Contractor.

END OF THIS SECTION

SECTION 01632 PRODUCTS

1.01 Materials:

A. General Requirements: Materials shall conform to the following:

1. All material shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
2. Store all materials subject to damage off the ground, away from wet or damp surfaces, under cover sufficient to prevent damage or contamination.
3. Damaged or deteriorating materials shall not be used and shall be removed from the premises and properly disposed of.
4. All material not in original containers will be reviewed by Industrial Hygienist (IH).

B. Plastic (polyethylene) sheets, of four (4) mil thickness or greater as specified in scope of work of this document, in sizes to minimize the frequency of joints. Submit a sample of each thickness intended to be used.

C. Tape: Capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces or dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water. Submit a sample of each type to be used.

D. Surfactant (Wetting Agent): Shall consist of 50 percent polyoxyethylene ether and 50 percent of polyoxyethylene polyglycol ether, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to five (5) gallons of water.

E. Impermeable Containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposed of. The containers must be both airtight and watertight. The containers shall be labeled in accordance with OSHA Regulations 29 CFR 1910.1001. The container shall be of six (6) mil plastic bag (submit sample), or plastic lined drum (submit brochure), etc. Submittal required for each type intended to be used in this delivery order.

F. The Glovebag shall consist of a 6-12 mil bag equipped with long-sleeve gloves, a tool pouch, and side port opening used for water and vacuum application. The glovebag with a zipper arrangement is preferable but not mandatory.

G. Warning Labels: Container shall have the following notation in accordance with Applicable Laws 29 CFR 1926.158.

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

H. Encapsulant: A sealant specifically designed to be used after the removal of asbestos to capture any fibers which may be left on surfaces in accordance with requirements of the U.S. Environmental Protection Agency (EPA).

- I. Warning Signs: Signs shall have the following notation in accordance with Applied Laws:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

- J. Other Materials - provide all other materials as specified in drawings; also, other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

1.02 Equipment:

- A. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI 29.2-79. See Section 01513. This equipment:
1. Shall be portable and equipped with a high efficiency particulate absolute (HEPA) Filtration systems in compliance with ANSI 29.2-79.
 2. Deliver its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place.
 3. The HEPA filter shall be certified capable of removing particles to 0.3 microns at a minimum efficiency of 99.97 percent.
 4. Shall be able to deliver no less than 70 percent rated capacity when the HEPA filter is installed or measure 2.5 inches of static pressure differential on a manometric gage.
 5. Shall provide manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0%.
 6. Shall have an electric mechanism which automatically shuts the machine off in the event of a filter breach or absence of a filter.
 7. Shall have an audible horn which sounds an alarm when the machine has shut itself off.
 8. Shall have an automatic safety mechanism which prevents a workman from improperly inserting the main HEPA filter.
- B. Vacuum equipment: Shall be portable and equipped with High Efficiency Particulate Absolute (HEPA) filters.
- C. Respirator Equipment:
1. Respirators shall be selected from among those approved by the Bureau of Mines, Department of the Interior, or the National Institute for Occupational Safety and Health Department, of Health, Education and Welfare, under the provisions of 30 CFR Part II and shall be used in accordance with Applied Laws 29 CFR 1910.1001.

END OF THIS SECTION

SECTION 01712 CLEANING AND DECONTAMINATION PROCEDURES

1.01 Clean-up Procedures:

NOTE: The clean up procedures can be started by the Contractor whenever his supervisor and the Industrial Hygienist inspect and approve the asbestos abatement areas. The encapsulation shall not be done until the contractor is given approval by the Industrial Hygienist on site.

- A. Remove and containerize all visible accumulations of asbestos containing material and asbestos contaminated debris. Do not use metal shovels to pick up or move accumulated waste. Special care shall be taken to minimize damage to floor sheeting. All equipment not required on the project shall be decontaminated and removed from the area. All ACM disposal bags shall be removed from the containment prior to receiving approval for encapsulation or lockdown.
- B. Wet clean all surfaces in the work area using rags, mops and sponges as appropriate. (Note: Some HEPA vacuums may not be wet-dry vacuums. To pick up excess water and gross wet debris, a wet-dry shop vacuum may be used. This will be contaminated and require cleaning prior to removal from the work area).
- C. Visually inspect all areas where asbestos removal has taken place. Any dust, debris or residue in the containment area shall be considered to be contaminated and shall be treated as asbestos. The area inspection shall be accomplished using good Industrial Hygiene practices and ASTM E-1368-90, AHERA 40 CFR 763 and all applicable asbestos regulations concerning clearance and testing.
- D. The Contractor shall provide the Industrial Hygienist with all proper lighting, ladders, or scaffolding and any necessary tools to perform the clearance inspection.
- E. The Industrial Hygienist (IH) shall ensure that a thorough job of removal and clean up has been conducted. The IH has the right to terminate his inspection and re-direct further cleanup of the whole area if upon discovery of incomplete removal or discovery of debris.
- F. Upon written approval by the Industrial Hygienist in the Contractors logbook, encapsulation or lockdown shall be done on all surfaces including all poly. If the inspection fails, Contractor shall re-clean using all the above mentioned steps.
- G. When encapsulation or lockdown has been applied the Contractor shall wait for a drying period of not less than six (6) hours or at the discretion of the on-site Industrial Hygienist.
- H. When encapsulation has dried, the Contractor shall remove all poly and properly dispose of it.
- I. Following the satisfactory removal of all poly, another inspection shall be performed by the on-site Industrial Hygienist (IH). If any debris is found, the IH shall instruct the Contractor to re-clean the entire area. If the area is clean the IH shall begin with his first step of pre-clearance testing. (See section 01714) Clearance Testing).
- L. Upon achieving the clearance criteria for final clearance the Contractor can begin to remove all critical barriers, air filtration machines and begin his demobilization process.

END OF THIS SECTION

SECTION 01714 WORK AREA CLEARANCE

1.01 Clearance Air Monitoring:

- A. This project is being done in the open ambient air and therefore no clearance air monitoring will be done.
- B. The clearance shall be accomplished when the Industrial Hygienist has been satisfied that all debris has been pickup and visual inspection passes.
- C. At the discretion of ASARCO and/or Industrial Hygienist the contractor may be required to pass a wipe sample of the duct work. Wipe samples shall be taken by the IH on site and submitted for PLM analysis. The wipe samples should show no asbestos fibers present. The back ground to be used for this testing (if required) shall be a wipe sample of a surrounding vessel near these duct.

END OF THIS SECTION

SECTION 01716 DISPOSAL PROCEDURES

1.01 Disposal Procedures

- A. The Contractor is responsible for disposal of all the asbestos waste. The disposal Contractor shall be responsible for transportation of all asbestos containing waste to the storage areas, and proper containerizing of the asbestos waste. Contractor shall abide by all regulations and policies for handling regulated waste set forth by all regulatory agencies.
- B. On a daily basis or at the discretion of the Industrial Hygienist (IH) contractor shall remove ACM waste from containment. Contractor shall not allow excess debris to accumulate on the floor of the containment, Industrial Hygienist (IH) has the right to stop work and direct clean-up.
- C. The Contractor shall coordinate transportation of waste to the EPA approved landfill with the Industrial Hygienist on site.
- D. The Contractor shall fill out and sign the Waste Manifest prior to departure to the EPA approved landfill.
- E. All dump receipts, trip tickets, and manifests must be submitted within 48 hours of dumping, unless contractor has made other written agreement with the owner or IH.
- F. Transportation of ACM waste shall be done in an enclosed compartment vehicle. The truck driver shall be knowledgeable of ACM spill plan carried in the vehicle. The Contractor shall be responsible for developing a spill plan in accordance with current city, state, federal regulations.
- G. All double bagged ACM shall be placed inside approved safety containers prior to being removed from building. Approved safety containers shall be:
 - 1. DOT approved steel drums.
 - 2. Cardboard type drums with sealable tops.
- H. Approved containers shall be moved by use of buddy system, hand trucks, or carts.
- I. Truck cargo or container used to transport ACM waste shall be lined with one layer of six mil poly to prevent contamination and spillage.
- J. Truck cargo or container shall have appropriate warning labels and shall be locked to prevent entry by unauthorized personnel. Warning signs in accordance with 40 CFR part 61 NESHAPS regulations shall be placed on the vehicle when loading and unloading vehicle.
- K. Personnel loading asbestos containing waste shall be protected by disposable clothing including head, body and foot protection and at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- L. Loading of any vehicle shall be closely monitored to avoid overloading vehicle capacity. Contractor shall ensure proper load bearing distribution of ACM waste.
- M. The disposal Contractor shall have a spill plan in effect for spills that may occur in transportation or unloading. Any bag found to be broken at landfill shall be re-bagged and area of contamination shall be cleaned up immediately.

- N. Asbestos waste containers shall be placed on the ground at the disposal site. The Contractor shall ensure that bags are not pushed or thrown out of the transport vehicle.
- O. Personnel unloading containers at the Storage Site shall wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- P. Upon completion of un-loading vehicle the poly used to protect the vehicle shall be discarded as ACM waste. Any spillage discovered shall be cleaned and area decontaminated immediately by the disposal contractor.

END OF THIS SECTION

SECTION 02081 GENERAL REMOVAL PROCEDURES

1.01 Removal Procedures

NOTE: No asbestos removal shall be done without the Industrial Hygienist (IH) being on site.

- A. See Section 01560 and Section 01563 for minimum personnel protection. Industrial Hygienist (IH) shall authorize commencement of removal procedures. Clean and isolate the work area in accordance with Section 01527. Containers or drum shall mean containers that meet DOT 49 CFR 178.
- B. Spray all asbestos containing material with amended water solution, removal encapsulant, or chemical remover using spray equipment capable of delivering a low pressure mist to reduce the release of asbestos fibers. Adequately wet the ACM to the substrate and spray the ACM continuously during the removal practices to maintain adequate wet conditions and minimize fiber release and dispersion. Follow all manufacturers recommended procedures if a manufactured product is used for removal processes.
- C. Saturated asbestos containing material shall be removed in manageable sections. As ACM is removed, material will be placed in a suitable 6 mil polyethylene bags or drum. Material shall not be allowed to dry out prior to containerizing. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.
- D. All material removed shall not be thrown or dropped to the floor. Removal of intact and manageable sections is highly recommended as it will reduce fiber dispersion. All ACM containerized shall be carefully lowered to the ground floor by asbestos personnel.
- E. Containers (6-mil polyethylene bags or drums) shall be sealed when full. All ACM containerized shall be double lined. Bags shall not be overfilled as wet material is heavier than dry material. All containerized material shall be sealed with suitable duct tape, do not use wire or cord as it may break the container. All containerized material shall be decontaminated on the exterior surfaces before leaving the work area.
- F. Large components removed intact shall be wrapped in 2 layers of 6-mil polyethylene sheeting secured with tape for transport to the landfill.
- G. Asbestos containing waste with sharp-edged components (e.g. nails, screws, metal lath, tin sheeting) will tear the polyethylene bags and should be placed into drums for disposal.
- H. After completion of all stripping work, surfaces from which asbestos containing materials have been removed shall be wet brushed and sponged or cleaned by some equivalent method to remove all visible residue.
- I. Clean-up shall proceed in accordance with Section 01712.
- J. After the work area has been rendered free of visible residues, and the Industrial Hygienist (IH) has inspected and approved the area, a thin coat of a satisfactory encapsulating agent shall be applied to all surfaces in the work area including structural members, building components and plastic sheeting on walls, floors and covering non-removable items, to seal in non-visible residue. (Note: 1) High temperature components such as boilers and pipes may not permit the application of some encapsulants. 2) If insulation or acoustical materials are to be reapplied to the abated area, be certain that the encapsulant selected will permit good adhesion to the substrate. A small area should be tested before application).

- K. Special circumstances (e.g. live electrical equipment, high amosite content of material, materials previously coated with an encapsulant or paint) may prohibit the adequate use of wet methods to reduce fiber concentrations. For these situations, a dry removal method may be required. The contractor will have to acquire special permits, different from those mentioned herein from the NESHAP enforcement agency.

END OF THIS SECTION

SECTION 02088 REMOVAL OF ASBESTOS DUCT WRAP

1.01 Procedures

- A. Lock out all electrical power where actual asbestos removal will occur.
- B. Asbestos removal of asbestos containing roofing material (Category I non-friable ACM) shall be performed using all personal protective equipment to include half face respirator with HEPA filter cartridges. A decontamination station shall be erected, as specified, in its respective section on all areas of abatement.

1.02 Removal of ACM duct wrap

- A. Set up barrier tape, warning signs, and control center.
- B. Preclean all surfaces, using the wet methods and/or HEPA filter equipment. Pick up and bag up any debris, spray encapsulant on all ACM.
- C. Prior to setting up poly, welders shall cut all steel reinforcement plates to gain access to ACM. Strict adherence to the ASARCO safety procedures for hot work shall be followed.
- D. When welders have completed all the cutting of the metal, the certified supervisor shall inspect the areas to insure no hot metal or fire hazards exist in the work area prior to erection of wind breaker.
- E. Wind breakers shall be installed, as specified. This wind breaker will consist of six feet high walls around the work area, those walls shall be made of two layers of 6 mil (black) poly. Wind breaker shall be connected to a decontamination unit.
- F. Set up decontamination unit according with the procedures before mentioned in its section.
- G. Minimum respirator shall be half mask with hepa cartridges. Asbestos workers shall use gloves, rubber boots and tyvek suits (or equivalent).
- H. Removal of ACM shall be accomplished using a certified two man team. One man shall spray amended water with equipment capable of a "mist", and the other shall remove the mastic with putty knives and nylon brushes. No sand grinding or drill machine shall be used to remove the material.
- I. All ACM material and debris shall be double bagged and disposal procedures specified in Section 01716 of this manual shall be followed.
- J. Section of Cleaning and Decontamination Procedures shall be followed when directed by the facility IH. The facility IH shall be notified 24 hours in advance for scheduling of the visual inspection.
- K. Clearance testing shall be performed by a third party independent air monitor supervised by the facility IH. The results of this testing shall be the final word on clearance levels.

- L. Upon acceptable clearance levels, re-establish work areas and systems back to normal operations. Repair/Restore any and all damaged areas back to original condition.

END OF SECTION

SECTION 02089 REMOVAL OF ACM GASKETS

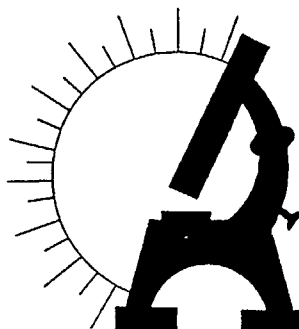
1.01 Procedures

- A. Lock out all electrical power where actual asbestos removal will occur.
- B. Asbestos removal of asbestos containing gasket material (Category I non-friable ACM) shall be performed using all personal protective equipment to include half face respirator with HEPA filter cartridges. A decontamination station, as specified, shall be erected in its respective section on all areas of abatement.

1.02 Removal of ACM Gaskets

- A. Set up barrier tape, warning signs, and control center.
- B. Minimum respirator shall be half mask with HEPA cartridges. Asbestos workers shall use gloves, rubber boots and tyvek suits (or equivalent).
- C. Removal shall be accomplished using a two man team. A spray penetrating encapsulant shall be spray on gaskets prior to beginning abatement. One man shall be equipped with water sprayer (amended water) while the other man removes gasket.
 - 1. Spray amended water/or encapsulation on areas around where gaskets rested on.
 - 2. Hepa vacuum all duct (where feasible) that is accessible.
- D. All ACM material and debris shall be double bagged and disposal procedures in SECTION 01716 of this Manual shall be followed.
- E. Section 01712 Cleaning and Decontamination Procedures shall be followed when the facility IH approves abatement of the gaskets. When ACM gaskets have been removed, the remaining duct system shall be HEPA vacuumed by connecting a HEPA unit to the end which once had the gasket. This procedure will create sufficient vacuum for decontamination.
- F. When directed by the facility IH proceed with SECTION 01714 Clearance Testing procedures.

END OF THIS SECTION



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Environmental Services

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Dross Reverb stack Lead Breaching Flue

SET 01
Revision 2
February 07, 1997

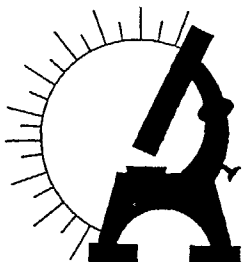
*Abatement Plan for the Removal
of Asbestos*

~~Pipe~~ & Heat Exchanger Insulation at
ASARCO, Inc.

FOR:

ASARCO, Inc.
Gregory A. Parham, Project Engineer Manager
P.O. Box 1111
El Paso, Texas 79999

PREPARED BY:



SUN
CITY
ANALYTICAL
INC.

ENVIRONMENTAL SERVICES

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February 07, 1997

ABATEMENT SPECIFICATIONS

Design For:

Asbestos Removal

at

~~Plum~~ Heat Exchanger Insulation at

FOR

ASARCO, Inc.

**Dross Reverb Stack
Lead Branching & Me**

LICENSED ASBESTOS CONSULTANT AGENCY:



TEXAS LICENSE #10-0011
SUN CITY ANALYTICAL, INC.
1409 MONTANA
EL PASO, TEXAS 79902

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Juan R. Ayala
02-2-97

SECTION 01010 SUMMARY OF WORK

PART I - GENERAL

- 1.01 Statement of Work: The work consists of furnishing all labor, plant, and materials and performing all work in strict accordance with this plan. Work shall include but not be limited to: preparation, removal of ACM gaskets and ACM roofing mastic on ducts and all OSHA, EPA air monitoring and air sampling.
- 1.02 Project Objectives:
- A. Remove All asbestos containing roofing material and gaskets on ducts of approximately 9,000 s.f.
 - B. No individual shall be exposed to asbestos fibers in excess of levels shown in these specifications.
 - C. The Contractor shall ensure that no asbestos contamination occurs outside any containment erected.
 - D. The Contractor shall ensure that all asbestos waste is disposed of in accordance to these specification and all applicable laws. All construction waste contaminated with asbestos containing waste from this project shall be disposed of in an EPA approved landfill.
 - E. The Contractor shall document all activities pertaining to this project in accordance with these specifications and all applicable laws. At the conclusion of the project, contractor shall submit this documentation to the Owner after it has been reviewed by the Industrial Hygienist (IH).
 - F. Contractor shall ensure that all special precautions, as stated in these documents, have been taken to protect from water damage and contamination into adjacent areas to the work area.
- 1.03 Scope of Work:
- A. Remove all ACM roofing material on ducts indicated by the Owner and/or his representative in the initial walk through. The estimated amounts are:
 - 1. Remove and dispose of approximately 9,000 sf of ACM roof material on ducts.
 - 2. Remove and dispose ACM gaskets located between a few of the sections of the duct work.
 - 3. Set up wind breaker containment around all ducts.
 - 4. Remove and dispose of approximately 125 sf of ACM insulation from the endcap of one heat exchanger using full containment method described in this manual.
 - 5. Set up scaffolds to access stack. Owner shall indicate at the walk through the stack that needs abatement.
 - 6. Remove 3,956 SF of roof material on ducts.

SECTION 01030 SPECIAL PROCEDURES OR CONDITIONS

1.01 ASARCO Duct Work

- A. Before beginning abatement the Contractor shall do the following:
 - 1. Ensure that no high voltage exists in the containment.
 - 2. Ensure all necessary permits are obtained.
 - 3. Ensure that all parties involved in the project are notified of start date.

1.02 Schedule of abatement

- A. The Contractor shall schedule all work to be done during daytime hours otherwise as approved by the Owner. The normal working hours of this project are from 7 a.m to 5 p.m.

1.03 Site Security

- A. The Contractor shall provide a qualified site security during all the abatement phase. The intent of this precaution is to guard against unauthorized entry into the regulated areas as well as a fire watch.
 - 1. Site Security shall have EPA certification to enter the containment
 - 2. Site Security shall have an OSHA physical.
 - 3. Site Security shall have communication equipment to notify the IH, contractor, fire and or police if the need arises.
- B. Site security personnel shall ensure that air filtration equipment is operational at all times, shall restrict unauthorized entry into the regulated area and ensure that the containment is intact at all times. Site security personnel shall keep a daily log of all events.

1.04 Emergency Repairs

- A. The Contractor shall immediately notify the IH of any damages, repair any pipe leaks, or electrical failures that might occur during abatement.
- B. All personnel on job site shall know where a telephone is located and what the emergency phone number are.
- C. Emergency phone numbers shall not be limited to but shall include the Industrial Hygienist (IH), Project Manager, Contractor, Etc). All emergency phone numbers shall be posted at the control center.

1.05 Medical Emergencies

- A. The Contractor shall provide at least one person on site who is qualified in First Aid and Cardiac Pulmonary Resuscitation (CPR). The contractor shall submit this persons name and qualification to the IH at the pre-construction meeting.

1.06 Rental Equipment

- A. The Contractor shall obtain written permission for any rental equipment (includes rental trucks or vehicles) to be used on the asbestos project. The rental company shall be notified of the intended use of equipment and shall submit notice to the Industrial Hygienist (IH) that the equipment may be used on this asbestos abatement project. The Industrial Hygienist (IH) has the right to reject any rental equipment that does not confirm with said letter of understanding. The Contractor assumes all liability for failure to disclose the use of rental equipment for an asbestos abatement project.

1.07 Patented Products

- A. The Contractor shall submit a license or equivalent, or written permission to use any patented product and/or procedure in connection with this project. In the event that no patented product and/or procedure is used, the contractor shall submit a notarized statement acknowledging that he is not using patented products or procedures on this project. The contractor assumes all liabilities for failure to disclose the use of a patented product and/or procedure.

1.08 Electrical Work

- A. All of the electrical work shall be performed by either a licensed electrician or a licensed apprentice electrician under direct supervision of a licensed electrician. All electrical work shall meet electrical code requirements.
- B. Any electrical work performed in the regulated area shall be done by a licensed electrician who has met the requirements of OSHA 1910.1001, AHERA 40 CFR 763 (32 hour worker Course), OSHA medical exam, respirator fit test.

1.09 Scaffolds

- A. During this project the Contractor might need to erect scaffolding to gain access to the duct. Contractor shall comply with OSHA 1910 subparts D walking-Working surfaces.
- B. When powered work platforms are used the Contractor shall comply with OSHA 1910 Subpart F. Powered Platforms, Manlifts, and Vehicle-Mounted work platforms.

END OF SECTION

SECTION 01043 PROJECT COORDINATION

1.01 Work Requirements:

- A. RESERVED
- B. Before starting work at any location the Contractor shall inform the Industrial Hygienist (IH) or his authorized representative of the intent to start such work. Strict adherence with NESHAPS 10 day notice is required.
- C. The contractor shall maintain the area clean of any and all debris that results from the performance of this project.
- D. The contractor shall ensure safe working conditions and abide by all applicable OSHA safety regulations during the performance of the contract.
- E. The Industrial Hygienist (IH) on site does not have the authority to approve any additional work or change the scope of work set forth in these documents. Contractor shall not be paid for any unauthorized work. For any additional work or change of scope of work the Contractor shall follow the directions for additional work set forth in these documents.

1.02 Personnel Qualifications:

- A. All Contractor personnel involved with this project must be trained and have EPA approved certification showing they are fully qualified to do asbestos removal. Contractor shall ensure every worker is thoroughly familiar with the standard operating procedure of the Contractor for abatement work and with all Applicable Laws. All personnel shall have current OSHA (1910.1001) medical examinations and be trained in the use and care of respirators. Anyone without the proper qualifications listed herein shall not be allowed to work in the abatement area at any time.
- B. Supervisor Qualifications are as follows:
 - 1. Meet requirements of OSHA competent person.
 - 2. Must have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos and asbestos containing materials and subsequent cleaning of affected environment.
 - 3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of asbestos.
 - 4. This person shall remain on the job site during working hours at all times. In the event the supervisor leaves the job site, the Industrial Hygienist (IH) has an obligation to stop work until the supervisor returns to the site. Any and all extra cost arising from said event shall be the responsibility of the Contractor.
 - 5. Persons shall have all current OSHA Medical & EPA approved Supervisors Certificates.

C. Worker Requirements:

1. Meet requirements of OSHA (1910.1001).
2. Must have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos and asbestos containing materials and subsequent cleaning of affected environment.
3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of friable asbestos.
4. Workers shall have all current OSHA Medical & EPA approved 32 hour Abatement Worker Certificates.

1.03 Permits:

A. The Contractor shall obtain all necessary permits from the City Building Inspection Department, Police, Fire Department and any other Agencies having Jurisdiction prior to commencement of work. Some permits required are, but not limited to:

1. Electrical Permits where new or reinstalled electrical devices are performed.
2. Building Permits where any structure of the building is disturbed. This includes removal of asbestos pipe insulation.
3. EPA NESHAPS 10 day notice
4. Texas State Health Department Notice
5. Local permits such as fire, police etc.

END OF THIS SECTION

SECTION 01091 DEFINITIONS AND STANDARDS

1.01 Applicable Publications:

- A. The regulations listed below form a part of this specification to the extent referenced. The regulations are referred to in the text by basic designation only. The following regulations shall be on site during all operations of this project.
- B. OSHA Regulations:
 - 1. 29 CFR 1910.20 Access to Employee Exposure and Medical Records
 - 2. 29 CFR 1910.134 Respiratory Protection
 - 3. 29 CFR 1910.1001 OSHA - Asbestos Industry Standard.
 - 4. 29 CFR 1926.1101 Asbestos, Tremolite, Anthophyllite, and Actinolite Construction Standard.
 - 5. 29 CFR Parts 1910 and 1926 Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules; Amendment
 - 6. 29 CFR 1910.1200 Hazard Communications
 - 7. 29 CFR 1910 Occupational Safety and Health Standards
 - 8. 29 CFR 1926.55 Gases, Vapors, Fumes, Dusts and Mists
 - 9. 29 CFR 1926.57 Ventilation
 - 10. All applicable OSHA regulations such as but not limited to Heat Stress, Noise, Electrical Standards (Lockout and Tagout) Scaffolding, Ladders, OSHA 200, Slips, Trips, and Falls, and Fire Safety-Contingency Plans.
- C. Environmental Protection Agency
 - 1. 40 CFR 61 Subparts A & M (Revised Subpart B) National Emission Standards for Hazardous Air Pollutants.
 - 2. 40 CFR Part 763, Subpart E Asbestos Containing Material in Schools; Final Rules and Notice.
 - 3. 40 CFR Part 763, Subpart G Asbestos Abatement Projects; Worker Protection; Final Rule.
 - 4. Environmental Protection Agency (EPA) Publication, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, June 1985.

- D. Department of Transportation (DOT):
 - 1. 49 CFR Part 173, Subpart J.
 - 2. 49 CFR 172 Hazardous Materials Tables & Communications Regulations
 - 3. 49 CFR 178 Shipping Container Specification
- E. American National Standards Institute, Inc., (ANSI), Standards:
 - 1. ANSI Z88.2-1980 Practices for Respiratory Protection
 - 2. ANSI Z9.2-1979 Fundamentals Governing Design & Operation of Local Exhaust Systems
- F. Testing Standards
 - 1. NIOSH Method 7082 Lead
 - 2. NIOSH Method 7400 Fiber Analysis of Asbestos using PCM
 - 3. NIOSH Method 7402 Fiber Analysis of Asbestos using TEM

1.02 Definitions:

- A. Abatement - Means all activities associated with the control of Asbestos containing materials for Buildings during removal.
- B. ACGIH - American Conference of Governmental Industrial Hygienists 6500 Glenway Avenue Building D-5 Cincinnati, Ohio 45211
- C. AIHA - American Industrial Hygiene Association, 345 White Pond Dr. Akron, Ohio 44320
- D. Aggressive Air Sampling - Means using extreme efforts to simulate actual building conditions. Occupancy characteristics by causing air circulation patterns with equipment such as fans or leaf blowers.
- E. Airlock - A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow through contamination.
- F. Air Monitoring - Means the process of collecting air samples on a fiber membrane cassette and then having them analyzed to determine the number of fibers present. Analytical results are expressed in terms of fibers per cubic centimeter of air.
- G. Air Monitoring Professional - A specially trained individual, who has successfully completed a NIOSH 582 Training Course, employed by the Owner, who is qualified by education and/or experience to obtain and test air samples in and around the work areas to determine airborne concentrations of asbestos fibers.
- H. Amended Water - Water to which surfactant has been added. Surfactant should be 50% polyoxyethylene ester and 50% polyethylene ether according to EPA recommendations.

- I. A.N.S.I. - American National Standards Institute, 1430 Broadway, New York, New York 10018.
- J. Asbestos - means a mineral that readily separates into long flexible fibers suitable for use as a noncombustible, nonconducting or chemically resistant material. Asbestiforms include chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- K. Asbestos Containing Material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
- L. Asbestos Containing Waste Material - Asbestos containing material or asbestos contaminated objects requiring disposal.
- M. Asbestos Fibers - Means asbestos fibers longer than 5 micrometers.
- N. Asbestos Project Manager - An individual designated as the Owner's representative and responsible for overseeing the asbestos abatement project.
- O. Asbestos Worker - Means employees that meet all the requirements outlined in OSHA Regulations 29 CFR 1910.1001.
- P. ASTM - American Society For Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
- Q. Authorized Visitor - The Building Owner [and any designated representatives] and any representative of a regulatory or other agency having jurisdiction over the project.
- R. Bidder - Each prospective Contractor who bids on the work specified herein, and has been pre-qualified by Sun City Analytical, Inc.
- S. Building Owner - Owner of the building or his representative.
- T. Bulk Sample - The collection of any building material section suspected of containing asbestos. A small portion of suspected material is removed from sample area and placed in a plastic bag or air tight container.
- U. CIH- An Industrial Hygienist who by virtue of their education and passing the American Board of Industrial Hygiene Core Examination in either the Comprehensive Practice or an Aspect Examination has been given the right to use CIH by AIHA.
- V. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
- W. Clean Air Sample - Means air sample collected immediately following the completion of corrected action. These samples are routinely collected to determine the effectiveness of the corrected action and establish the contractual requirements of acceptable fiber concentrations levels prior to breaking down of abatement control area.
- X. Containment - When used in this specifications means the same as regulated area, shrouding, bubble, temporary enclosure, or controlled area. The means of using plastic to establish work areas and using air filtration pressure to prevent fiber contamination of building and occupants.
- Y. Contractor - Means the Asbestos Abatement Contractor performing the abatement.

- Z. Control Center - Means the area in close proximity of the entrance to the regulated area where the supervisor or outside man is stationed. This center should be where all documentation required by specifications are, along with emergency numbers and first-aid kits, are available.
- AA. CSP - A Safety Professional who by virtue of their education and passing the Board of Certified Safety Professionals Core Examination has been given the right to use CSP by BCSP.
- AB. Curtained Doorway - Means a device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, 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 door and along the opposite vertical side of the doorway. Other effective designs are permissible.
- AC. Designated Decontamination Area - Means an area designated by the Industrial Hygienist (IH). The area is used for the purpose of decontaminating asbestos contaminated objects and shall be located adjacent to the work area and meet Industrial Hygienist (IH) approval.
- AD. Designated Clean Area - Means an area designated by Industrial Hygienist (IH). The area is within site of the work area free of any asbestos for the purpose of storing decontaminated objects.
- AE. Designated Holding Area - Means an enclosed area designated by Industrial Hygienist (IH). The enclosure is used for the storing of sealed containers of asbestos containing materials and asbestos contaminated waste.
- AF. Decontaminate - Means to remove all visible asbestos dust from the surface to be decontaminated by the means of damp cleaning and/or vacuuming with HEPA filtration equipment.
- AG. Encapsulant - A liquid material which can be applied to asbestos containing material which controls 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).
- AH. Enclosure - The construction of an air-tight, impermeable, permanent barrier around asbestos containing material to control the release of asbestos fibers into the air.
- AI. EPA - U.S. Environmental Protection Agency 401 M Street S.W., Washington, D.C. 20460
- AJ. Equipment Decontamination Enclosure System - Means that a 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.
- AK. 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.
- AL. Filtered Exhaust System - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow through contaminated areas from adjacent uncontaminated areas and maintaining a lower pressure in the containment area as compared to the adjacent uncontaminated areas.
- AM. Fixed Object - A piece of equipment or furniture in the work area which cannot be removed from the work area.

- AN. Friable Asbestos - Asbestos containing material which can be crumbled to dust, when dry, under hand pressure.
- AO. HEPA Filter - Means High Efficiency Particulate Air Filter that is capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micro meters in diameter or larger.
- AP. HEPA Vacuum - Means a special type of vacuum cleaner used in the abatement project that must be equipped with a HEPA filter.
- AQ. Glovebag - Means a special purpose custom containment bag with protective gloves and arm sleeves, tool pouch and side port for the use of repairing or removing pipe insulation.
- AR. HVAC - Means heating, ventilation and air conditioning system.
- AS. Industrial Hygiene - "Is that science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community."
- AT. Industrial Hygienists (IH) - An individual who by education or experience has gained competence in the field of industrial hygiene. In this manual the IH is the owners representative and/or the air monitoring professional.
- AU. Movable Object - A piece of equipment or furniture in the work area which can be removed from the work area.
- AV. Air Filtration System - 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.
- AW. NESHAPS - The National Emission Standards for Hazardous Air Pollutants.
- AX. NIOSH - The National Institute for Occupational Safety and Health. CDC -NIOSH Building J N.E. Room 3007 Atlanta, GA 30333
- AY. OSHA - The Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, D.C. 20210. For work in New Mexico the regional office the Environmental Improvement Division (505) 827-2452. In Texas the Regional OSHA office is 1-800-692-4202.
- AZ. Regulated Area - The demarcated areas in which asbestos train personnel activity takes place. This includes any area roped off by the contractor or owner with asbestos warning signs and/or tape.
- BA. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controlled at the tap and suitably arranged for complete showering during decontamination.
- BB. Shrouding (Full) - Means the process of covering all the interior surfaces (floor, walls, doorways, windows, ceiling) of a room with polyethylene sheeting.
- BC. Semi-Shrouding - Means the process of covering a portion of the interior surfaces (floor, walls doorways, windows, ceiling, etc.) of a room with polyethylene sheeting.

- BD. Surfactant - A chemical wetting agent added to water to improve penetration.
- BE. Tunneling - Means the forming of connected enclosed corridors with plastic sheeting for passageways between shrouded and/or semi-shrouded enclosures.
- BF. 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.
- BG. Waste Transfer Airlock - A decontamination system utilized for transferring containerized waste from inside to outside of the work area.
- BH. Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
- BI. Work Area - Means the portion of the building (or structure) comprised of the room(s) and connecting passageway(s) (such as other rooms, hallway, corridors, etc.) required to gain access to the designated material(s) to be removed.
- BJ. Work day - Means any day between the project start and the completion date, with the exception of weekends. Weekends may become work days if authorized by the Owner.

END OF THIS SECTION

SECTION 01300 SUBMITTALS

1.01 Submittals required following issuance of Notice to Proceed:

- A. RESERVED.
- B. Supervisor OSHA medical, and his EPA approved supervisor training certificate to work as a supervisor.
- C. Workers OSHA medical, and his EPA approved worker training certificate to work as a worker.
- D. All enclosures, shrouding complete with detailed layout of decontamination facilities, air filtration system units, emergency exit waste load out and control center.
- E. RESERVED.
- F. Work force to be used, supply number and work schedule for completion of project. Show back up personnel capabilities in the event Contractor falls behind schedule. Submit all Texas State license and current training certifications.
- G. Truck or vehicle to be used to transport ACM waste to the EPA approved landfill. Show load capabilities and condition of vehicle.
- H. Proof that notice has been submitted for permission to dump waste at EPA approved Landfill.
- I. Decontamination center to be used. (To be used as a back up if needed)
 - 1. Pre-fab or portable showers to be used have Hot and Cold water taps, and made of non-porous materials.
 - 2. Waste water filtration system to be used shall have a 20 micron primary filter and 5 micron secondary filter. Also submit data on replacement filters.
- J. All respiratory protection equipment brochures describing:
 - 1. Air purifying respirator with HEPA filters and NIOSH approval number. (Only to be used during preparation on this project).
 - 2. Powered Air Purifying respirators with full-facepiece, HEPA filters and NIOSH number.
 - 3. RESERVED
- K. Samples of the following:
 - 1. Plastic sheeting.
 - 2. Duct tape.
 - 3. Plastic bags.
 - 4. RESERVED.
 - 5. Warning signs, labels and barrier tape.
 - 6. Disposable clothing.
- L. Brochures for other equipment and supplies:
 - 1. Wetting agent (surfactant).

2. Encapsulants.
3. Plastic lined drum.
4. Vacuum equipment along with HEPA filter to be used.
5. Air sampling apparatus.
6. Ground fault interpreters.
7. Communication system between regulated area and control area.

M. RESERVED.

N. Proof that they meet the ASARCO Fire and Emergency Procedures and Spill Response Plan, Safety Plan and any other required plans. (Contractor shall be instructed prior to entering the Plant of all safety and related issues).

O. Respiratory Program.

P. Hazard Communication Program.

1.02 Submittals at the end of the project which include the following:

- A. Air monitoring results from all days of sampling.
- B. Daily narrative log of work progress, to include delays, potential change orders, stoppage of work and results of visitors' inspections and security shift documentation.
- C. Documentation of inspection of all areas and equipment. The Contractor shall note corrections or planned actions for correction.
- D. Notification of any accident or emergency requiring a doctor's treatment or evacuation of any employee.
- E. Documentation of all personnel entering and leaving regulated area.
- F. Documentation of any ACM waste that has been taken to an approved landfill site.
- G. Documentation of filter changes on respirators, HEPA vacuums, filtered Air Filtration System, and other engineering controls.

END OF THIS SECTION

SECTION 01410 TESTING LABORATORY SERVICES

1.01 Personnel Air Monitoring and Sampling:

- A. General Requirements: Air monitoring and sampling shall be in accordance with standards and methods required by all applicable regulations.
- B. The Contractor shall obtain the services of an Industrial Hygienist or Professional Air Monitor specialized with the OSHA medical, and his EPA approved air monitoring technician and supervisor training certificates.
- C. The Contractor shall retain a list of qualifications and experience of the individuals who shall be responsible for air monitoring and sampling.
- D. Throughout the removal and subsequent cleaning operations, AMBIENT (AREA) MONITORING will be conducted by the Owner's representative to ensure compliance with all regulations and is conducting the work in a manner which minimizes airborne asbestos levels as well as minimizes the contamination of other areas of the building. Analytical results will be available at the Control Center.
- E. For each set of air samples submitted to the laboratory by the Contractor for analysis, the Contractor shall submit blank cassettes for analysis (minimum of 10%). Each blank cassette shall be submitted as a part of the Contractors's quality control program.
- F. The Industrial Hygienist (IH) may request to QC sample taken by the Contractor. The Industrial Hygienist (IH) will randomly ask for wedge of cassette filter or read a percentage of the Contractors samples.
- G. Air monitoring results shall include as a minimum for each sample the following: sample ID, laboratory ID, date sample taken, flow (liters/minutes), time (minutes), blank count (fibers/field), fibers/cc, detection limit (fibers/cc), location, employee's name, type of activity and the name of the analyst and the date the sampled was analyzed.
- H. All personnel samples for asbestos shall be in accordance with 29 CFR 1910.1001 and as specified in this manual. The Contractors shall sample employees who are anticipated to have the greatest risk of exposure as determined by the industrial hygienist. At least 25% of the work crew or a minimum of two employees, whichever is greater, during a work shift shall be sampled.

1.02 Third-party Air Monitoring:

- A. General Requirements: Third party area monitoring and project clearance for airborne concentrations of asbestos fibers during an abatement project shall be performed by a project monitor under contract to the building owner to collect samples by and for the owner of the facility being abated.
- B. Project monitors observe abatement activities performed by contractors and generally serve as a building owner's representative to ensure that abatement work is completed according to specification and in compliance with all relevant statutes and regulations.
- C. Project monitors perform the vital role of air monitoring for purpose of determining final clearance.
- D. Project monitor is required to comply with ASHARA, have EPA 5-day supervisor course, NIOSH 582 or 3-day Air Monitoring course and the OSHA medical.

E. Schedule of Air Samples:

1. Baselines: The owner's representative will secure the following air samples to establish a baseline before start of work.

The samples will be taken in accordance with the following schedule:

LOCATION	SAMPLES	VOLUME	RATE
Inside work area	3	1,250 liters	< 10 LPM
Outside work area	2	1,250 liters	< 10 LPM

Baseline will be an action level expressed in fibers per cubic centimeter (f/cc) which is the larger of the following:

- Average of PCM samples collected in work areas.
- 0.01 fibers per cubic centimeter.

2. Daily: From start of work through the end of the project, the owner's representative shall take the following samples on a daily basis. The samples should be taken in accordance with the following schedule:

LOCATION	VOLUME	RATE
Inside containment	1,250 liters	< 10 LPM
Outside containment but inside the building	1,250 liters	< 10 LPM
At negative air unit discharge	1,250 liters	< 10 LPM
Immediately outside the entrance to the decontamination facility	1,250 liters	< 10 LPM
Outside the bag out facility (during gag out activities)	1,250 liters	< 10 LPM

3. Additional samples may be taken at the owner's representative's discretion. If airborne fiber counts exceed allowed limits, additional samples may be taken as necessary to monitor fiber levels.

1.03 Methods of Analysis:

- A. Air samples shall be analyzed by Phase Contrast Microscopy method using the NIOSH 7400 method.

B. Air samples shall be analyzed by an analytical laboratory who possess the following:

1. Lab shall use the NIOSH 7400 method for analysis according to 29 CFR 1910.1001, Appendices A or B which describes the OSHA ORM method and which utilizes the acetone/triacetin sample preparation or equal.
2. Lab to used shall be independent of the Contractor and shall be approved by the Industrial Hygienist.
3. Lab shall have technicians who have their NIOSH 582 Class. Certificate must be submitted to Industrial Hygienist (IH) upon request.
4. Lab shall be a successful participant in the Proficiency Analytical Testing Program (PAT) for the last 4 rounds and have National Institute of Standards and Technology (NIST) certification.
5. Lab shall be capable of delivering results within 24 hours of sampling to the client so the can be posted on the job site.
6. Lab shall have current Texas State License.

1.04 Clearance Samples

A. Transmission Electron Microscopy - is not required on this contract. If the contractor requests such testing, then he shall bear all costs associated with TEM sampling and analysis.

1. Any TEM analysis shall follow 40 CFR 763 AHERA regulations sampling and analysis protocols.

B. On this project Phase Contrast Microscopy with NIOSH 7400 method in accordance with SECTION 01714 WORK AREA CLEARANCE, shall be the method used for clearance testing. Clearance samples shall be done in the normal work shift of the contract and shall be noted in the contractors construction schedule and abatement plan. The clearance level has been established as <.005 f/cc.

END OF THIS SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

1.01 Temporary Buildings

- A. Provide first aid facilities at control center and in waste disposal vehicle.

1.02 Water for Construction

- A. The Owner will furnish water used during construction so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide piping, valves, and other items required to properly transport the water to the location where it is needed.

1.03 Electricity for Construction

- A. The Owner will provide electrical energy from existing panels as required to operate power tools and equipment and to provide temporary light so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide temporary wiring and outlets as required and temporary lighting if necessary.

1.04 Employee Conduct

- A. The Contractor shall be responsible for ensuring that all employees comply with all Applicable Laws and perform work in a safe manner. Any employees entering the work area under the influence of alcohol or drugs shall be immediately removed by the Contractor from the job site.
- B. The Contractor shall instruct all his employees to refrain from talking with anyone about this project. Any interviews or discussions about the asbestos project shall be done only by written consent from the building owner or his representative.

1.05 Barricades

- A. The Contractor shall provide sufficient barricades, walkways to protect all personnel from injury or exposure to asbestos. All work areas shall be barricaded with proper signs.

END OF THIS SECTION

SECTION 01513 AIR FILTRATION SYSTEM

- 1.01 Air filtration system will not be required but may be used by the contractor. If the contractor chooses to used air filtration, then the following shall apply:

- A. Air Filtration must be established in the work area by means of a local exhaust system. The equipment shall exhaust through a three-(or more) stage HEPA filtration system to outside of the building. The equipment shall be in operation for 24 hours per day until final air clearance is achieved.
- B. The system shall have the following characteristics:
 - 1. Filtration equipment in compliance with ANSI Z9.2, Local Exhaust Ventilation.
 - 2. Capable of maintaining a minimum pressure differential of minus 0.02 inches of water gauge in the work area relative to adjacent areas.
 - 3. Air filtration system pressure system units shall be employed in sufficient quantity to provide four (4) air changes per hour in the work place. Use the formula to determine total air flow requirement.

$$\text{Total CFM} = \text{Volume of work area} / 15 \text{ min}$$
$$\text{Number of units} = \text{Total CFM} / 80\% \text{ capacity of unit}$$
 - 4. The hose used to duct the exhaust shall be either new temporary plastic tubing or new wire reinforced ducts.
 - 5. The air filtration unit shall have a warning sound or horn if any restriction is found in the intake or exhaust.
- C. Provide a chart recording measuring device or equivalent for use to verify the pressure differential. This data shall be submitted to the IH at the end of the work shift.
- D. Contractor shall install on the containment one fully operational (including filters) backup ventilation machine.
- E. Units shall be placed to provide maximum air flow and prevent short circuiting air flow.
- F. Pre-filter shall be changed as needed as conditions warrant.
- G. The HEPA filters will be checked by the Industrial Hygienist (IH) for integrity and usage, and shall be changed by Contractor if damaged or overloaded.

END OF SECTION

SECTION 01527 WORK AREA PROTECTION

1.01 Preparation of Work Areas

- A. Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 at any location and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. Contractor shall post warning signs in both English and Spanish.
- B. All electrical power to all work areas shall have GFI hookups. Ensure safe installation (including ground faulting) to temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems.
- C. Abatement workers pick up and dispose of any loose ACM debris. Any damaged asbestos material shall be encapsulated prior to any work being done.
- D. Welder shall cut away all duct brackets to allow asbestos workers to access ACM.
- E. Install 6 foot high wind breaker (black poly) containment around all duct work. This ACM is non-friable material and should not be made friable during removal.
- F. Install plastic 3 feet wide around all duct work to catch any debris falling during the removal process.
- G. The Contractor shall provide a 4A/60BC chemical extinguishers for every 1000 square feet, or fraction, of containment area (IAW Texas Department of Health regulations 295.60 (m)(1)). All Workers shall be within a maximum of 100 feet travel distance of a fire extinguisher.
- H. Cleanroom and/or Decontamination Unit:
 - 1. A smoke and/or heat detector shall be located in the cleanroom area.
 - 2. 4A/60BC chemical extinguishers shall be located at either end of the decontamination unit.

1.02 Preparation of Work Areas on Scaffolds

- A. Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 at any location and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. Contractor shall post warning signs in both English and Spanish.
- B. All electrical power to the scaffolds shall have GFI hookups. Ensure safe installation (including ground faulting) to temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems.

- C. Install one layer of plastic liner around all scaffolds walls to be used as a wind breaker (black poly) containment. This ACM is non-friable material and should not be made friable during removal.
- G The Contractor shall provide a 4A/60BC chemical extinguisher on the working surface of the scaffold or lift. An additional 4A/60BC chemical extinguishers shall be located at floor level of the scaffold or control center.

END OF THIS SECTION

SECTION 01528 ENTRY INTO CONTROLLED AREAS

1.01 Entry and Exit of Work Area if work is done by ASARCO Employees:

- A. General Requirements: Unless otherwise indicated (such as contract drawing, emergency evaluation, and these specifications) entry and exiting of the work area shall be through the "Worker and Equipment Enclosure" or an "Airlock".
- B. Entry and Exit through "Worker and Equipment Enclosure":
- C. Entering the Work Area: Each worker and/or authorized visitor shall enter the clean room, remove street cloths, put on a clean approved respirator and two sets of protective clothing. From this point, workers and/or visitors shall not eat, drink, smoke, chew gum or tobacco while in the work area. Respirator shall be tested for proper fit and operation.
- D. To exit the work area the workers shall dust them selves off and then use the buddy system to vacuum each other off in the dry-decon. Remove one suit and dispose of it in a provided 6 mill bag inside the containment.
- E. With one suit and and your respirator on proceed to the ASARCO bathhouse.
- F. FOLLOW ALL ASARCO DECONTAMINATION PROCEDURES WHEN USING THE BATHHOUSE.

1.02 Entry and Exit of Work Area if work is done by NON-ASARCO Employees:

- A. General Requirements: Unless otherwise indicated (such as contract drawing, emergency evaluation, and these specifications) entry and exiting of the work area shall be through the "Worker and Equipment Enclosure" or an "Airlock".
- B. Entry and Exit through "Worker and Equipment Enclosure":
- C. Entering the Work Area: Each worker and/or authorized visitor shall enter the clean room, remove street cloths, put on a clean approved respirator and two sets of protective clothing. From this point, workers and/or visitors shall not eat, drink, smoke, chew gum or tobacco while in the work area. Respirator shall be tested for proper fit and operation.
- D. To exit the work area the workers shall dust them selves off and then use the buddy system to remove any excess asbestos in the work area. Proceed to the dirty/equipment room.
- E. In the dirty/equipment room remove contaminated tyvek suit and dispose of it in an asbestos disposal bag. Non-disposable footwear shall be removed and stored. Still wearing respirator, proceed naked to showers.
- G. Still wearing respirator, while showering wash and soak filters; remove respirator and continue to wash respirator with soap and water. Then proceed to wash body and hair with soap and shampoo. Then drying off and proceed to clean room.
- G. In the clean room, worker and/or visitor shall proceed to dress in street their clothes or clean coveralls. Coveralls worn outside the clean room of the enclosure shall be of a different color or marked for easy identification from those worn in the work area.

- H. Before re-entering the work area from the clean room, each worker and/or authorized visitor shall put on a clean respirator and dress in clean protective clothing and follow the above procedures.
- I. In the vestibule airlock remove protective clothing while still wearing the respirator and place into a disposable bag. The exterior of the respirator shall then be wiped with a damp rag or disposable towel which is placed in the disposable bag. While still wearing the respirator, exit the airlock after the disposable bag is sealed and left in vestibule.
- J. Once outside the airlock, the respirator shall be removed, respirator cartridges removed and disposed as asbestos contaminated waste. The respirator shall then be washed, new cartridges installed and placed in a the appropriate storage container.

END OF THIS SECTION

SECTION 01560 RESPIRATORY PROTECTION

1.01 Respiratory Protection

- A. Respiratory protection shall be provided to workers in conjunction with a Respiratory Protection Program which shall meet the requirements of 29 CFR 1910.134, 1926.1001 and 1910.1001. This program shall be posted at the work site. Respirators shall be personally issued, fitted and marked. All workers shall be familiar with the contents of the respiratory program.
- B. The Contractor shall provide documentary evidence that all personnel required to wear respiratory protection have been trained in accordance with 40 CFR Part 763, 29 CFR 1910.134, 1910.1001 and 1926.1001.
- C. The Contractor shall provide the workers with clean and properly maintained respiratory equipment approved by NIOSH/MSHA during all work phases in this project.
- D. Air purifying respirators (half-mask or full-face) with high efficiency particulate (HEPA) filters shall be minimum respirator used on this project.

END OF THIS SECTION

SECTION 01562 PERSONNEL PROTECTION

1.01 Personnel Protection:

- A. General Requirements: The Contractor shall provide all personnel training, equipment, materials, services and liability insurance required to perform the work in accordance with applicable Federal, State and Local regulations and this specification.
- B. Prior to commencement of work, workers shall be instructed, and be knowledgeable of the specific Asbestos Removal Procedures to be used in this project. In addition to the instructions, on-site training in the use of equipment and facilities unique to the job site shall be performed, to include emergency procedures, such as equipment power failures, fires, evacuations, etc.

1.02 Worker and Visitor Protection

- A. Provide workers with sufficient sets of protective full-body clothing. Such clothing shall consist of full-body coveralls and respirator. Provide eye protection and hard hats as required by applicable safety regulations. Non-disposable type protective clothing and footwear shall be left in the contaminated equipment room until the end of the abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos containing waste. Disposable type clothing, and footwear may be used and shall be disposed of as asbestos waste. Bare feet will not be permitted.
- B. Provide authorized visitors with suitable protective clothing, respirator, headgear, eye protection and footwear, as described in paragraph A. above, whenever they are required to enter the work area.
- C. Each worker shall, upon entering the job site: Remove street clothes in the clean change room, put on a respirator and clean protective clothing before entering the equipment room or work area, the exception shall be that workers intending to reuse contaminated protective shall enter equipment room wearing respirators.
- D. Each time the worker leaves the work area: the worker shall remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except respirators; Still wearing the respirator, proceed to the shower; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves, remove filters (where required) and place them in the container provided for the purpose; and wash and rinse the inside of respirator.
 - 1. Contractor is responsible for providing soap, shampoo, clean and dry towels daily to employees and visitors.
- E. After showering, each worker shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking or drinking. Before re-entering the work area from the clean change room, each worker and authorized visitor shall put on a clean respirator with filters (where required) and shall dress in clean protective clothing, the exception shall be that workers intending to reuse contaminated protective clothing stored in the equipment room shall enter the equipment room wearing respirators.
- F. Asbestos contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement, dispose of footwear as asbestos contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access area.

Store asbestos contaminated protective clothing in the equipment room for reuse or place in receptacles for disposal with other asbestos contaminated materials.

- G. Workers shall not eat, drink, smoke or chew gum or tobacco, or utilize sanitary toilet facilities at the worksite except in established locations outside the work and containment areas, and enclosures.
- H. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbances of asbestos-containing or asbestos contaminated waste materials and until final clean-up is completed. This includes removal of fixtures, ceilings, or anything else which may disturb the ACM.
- I. Provide and post, in the Equipment Room and Clean Room, the decontamination and work procedures to be followed by workers.

END OF THIS SECTION

SECTION 01563 DECONTAMINATION UNITS

1.01 Enclosures: (Used as a Backup System)

- A. General Requirements: Several types of enclosures are used, one for the workers and equipment entry and exit of the work area, a second as a holding area for waste storage and load-out area, and a third as a separation between the work area and the non-work area. Enclosure types required for this project shall be governed by special instructions on this specification.
- B. Enclosures can be portable pre-fabricated units or site fabricated units. Contractor shall submit for approval the type of enclosures to be used for this project. The submittal shall be submitted in conjunction with Section 1300 of this specification and included, but not be limited to the following:
 - 1. Floor Plan layout with dimensions showing all components.
 - 2. Material list with sizes and thickness.
 - 3. Plumbing layout showing shower(s), piping, drains, filtration systems(s) and water heater (if used).
 - 4. Electrical (if used) a layout showing lighting and/or outlets.
 - 5. Photographs may be submitted in conjunction with the above items.
- C. The minimum width of any way of exit access shall in no case be less than 28 inches. Where a single way of exit access leads to an exit, its capacity in terms of width shall be at least equal to the required capacity of the exit to which it leads. Where more than one way of exit access leads to an exit, each shall have a width adequate for the number of persons it must accommodate.
- D. Worker and Equipment Enclosure: Shall consist of 3 (three) compartments; clean room, shower room and equipment room separated by airlocks. The envelope of the enclosure shall be leak free.
- E. Clean Room: This room shall be provided with a locker or container for each worker's street clothing, respirators, respirator cartridges, clean work clothing, towels, and personnel supplies. Joint use of this space for other functions, such as office, storage of equipment, materials or tools, shall be prohibited.
- F. Shower Room: This room shall have an adequate number of showers, soap, shampoo and containers (plastic bags) for respirator cartridges. Shower(s) shall be piped with hot and cold or warm water. The room is to be free of any leaks. Under no circumstance shall the shower room be used for cleaning equipment.
- G. Equipment Room: This room shall be used for storage of equipment such as ladders, vacuums, scraping tools, non-disposable footwear, hardhats, goggles and any additional asbestos contaminated work items. This room shall be provided with receptacles, such as plastic bags or approved containers, for the use of disposable coveralls (if used) and asbestos contaminated waste before exiting to the shower. The room may also be provided with a wash area for equipment.
- H. This area shall be cleaned daily (several times a day is recommended) to prevent asbestos debris from being tracked into the shower area.
- I. Airlocks: Airlock curtain (door) shall be formed by two (2) overlapping sheets of plastic (4 mil, minimum) the full height and width of the passageway, each sheet being attached at the ceiling and one side. Each sheet is to be attached on opposite sides of the passageway. The sets of curtains (overlapping sheets) are required, one at each end of a space forming a vestibule, dead space. The space (vestibule) shall be two (2) feet in length by the width of passageway for enclosures and four (4) to six (6) feet in length by width of passageway for other location requiring airlocks.

- J. Filtration System: The shower drain and equipment room drain (if any) shall be connected to a filtration system before being discharged to the sanitary sewer. Filters shall be arranged in parallel banks with a 100 micron pre-filters feeding into a 1 micron final filters. Replaced filters shall be treated as asbestos contaminated waste and disposed of properly.
- K. Holding Area (Waste Storage and Load-Out): Shall consist of at least 1 (one) compartment with an air lock between the compartment and the intended disposal vehicle. The envelope of the compartment and air-lock shall be leak free. Passage between compartment and work area shall have two sheets of plastic overlapping each other.
- L. Separation(s) shall be constructed as follows:
 - 1. Framing of suitable materials such as 2 x 4 wood or metal studs shall be erected between floor with a bottom plate and ceiling with a top plate for distance. Support as required.
 - 2. Cover both sides with double layer of plastic sheeting (4 mil) with joints staggered and sealed with tape.
 - 3. Seal all edges of separation at floor, walls and ceiling with caulking to be airtight.
- M. Maintenance of enclosure systems shall be performed by the Contractor.

END OF THIS SECTION

SECTION 01632 PRODUCTS

1.01 Materials:

A. General Requirements: Materials shall conform to the following:

1. All material shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
2. Store all materials subject to damage off the ground, away from wet or damp surfaces, under cover sufficient to prevent damage or contamination.
3. Damaged or deteriorating materials shall not be used and shall be removed from the premises and properly disposed of.
4. All material not in original containers will be reviewed by Industrial Hygienist (IH).

B. Plastic (polyethylene) sheets, of four (4) mil thickness or greater as specified in scope of work of this document, in sizes to minimize the frequency of joints. Submit a sample of each thickness intended to be used.

C. Tape: Capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces or dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water. Submit a sample of each type to be used.

D. Surfactant (Wetting Agent): Shall consist of 50 percent polyoxyethylene ether and 50 percent of polyoxyethylene polyglycol ether, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to five (5) gallons of water.

E. Impermeable Containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposed of. The containers must be both airtight and watertight. The containers shall be labeled in accordance with OSHA Regulations 29 CFR 1910.1001. The container shall be of six (6) mil plastic bag (submit sample), or plastic lined drum (submit brochure), etc. Submittal required for each type intended to be used in this delivery order.

F. The Glovebag shall consist of a 6-12 mil bag equipped with long-sleeve gloves, a tool pouch, and side port opening used for water and vacuum application. The glovebag with a zipper arrangement is preferable but not mandatory.

G. Warning Labels: Container shall have the following notation in accordance with Applicable Laws 29 CFR 1926.158.

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

H. Encapsulant: A sealant specifically designed to be used after the removal of asbestos to capture any fibers which may be left on surfaces in accordance with requirements of the U.S. Environmental Protection Agency (EPA).

- I. Warning Signs: Signs shall have the following notation in accordance with Applied Laws:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

- J. Other Materials - provide all other materials as specified in drawings; also, other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

1.02 Equipment:

- A. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI 29.2-79. See Section 01513. This equipment:
1. Shall be portable and equipped with a high efficiency particulate absolute (HEPA) Filtration systems in compliance with ANSI 29.2-79.
 2. Deliver its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place.
 3. The HEPA filter shall be certified capable of removing particles to 0.3 microns at a minimum efficiency of 99.97 percent.
 4. Shall be able to deliver no less than 70 percent rated capacity when the HEPA filter is installed or measure 2.5 inches of static pressure differential on a magnehelic gage.
 5. Shall provide manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0%.
 6. Shall have an electric mechanism which automatically shuts the machine off in the event of a filter breach or absence of a filter.
 7. Shall have an audible horn which sounds an alarm when the machine has shut itself off.
 8. Shall have an automatic safety mechanism which prevents a workman from improperly inserting the main HEPA filter.
- B. Vacuum equipment: Shall be portable and equipped with High Efficiency Particulate Absolute (HEPA) filters.
- C. Respirator Equipment:
1. Respirators shall be selected from among those approved by the Bureau of Mines, Department of the Interior, or the National Institute for Occupational Safety and Health Department, of Health, Education and Welfare, under the provisions of 30 CFR Part II and shall be used in accordance with Applied Laws 29 CFR 1910.1001.

END OF THIS SECTION

SECTION 01712 CLEANING AND DECONTAMINATION PROCEDURES

1.01 Clean-up Procedures:

NOTE: The clean up procedures can be started by the Contractor whenever his supervisor and the Industrial Hygienist inspect and approve the asbestos abatement areas. The encapsulation shall not be done until the contractor is given approval by the Industrial Hygienist on site.

- A. Remove and containerize all visible accumulations of asbestos containing material and asbestos contaminated debris. Do not use metal shovels to pick up or move accumulated waste. Special care shall be taken to minimize damage to floor sheeting. All equipment not required on the project shall be decontaminated and removed from the area. All ACM disposal bags shall be removed from the containment prior to receiving approval for encapsulation or lockdown.
- B. Wet clean all surfaces in the work area using rags, mops and sponges as appropriate. (Note: Some HEPA vacuums may not be wet-dry vacuums. To pick up excess water and gross wet debris, a wet-dry shop vacuum may be used. This will be contaminated and require cleaning prior to removal from the work area).
- C. Visually inspect all areas where asbestos removal has taken place. Any dust, debris or residue in the containment area shall be considered to be contaminated and shall be treated as asbestos. The area inspection shall be accomplished using good Industrial Hygiene practices and ASTM E-1368-90, AHERA 40 CFR 763 and all applicable asbestos regulations concerning clearance and testing.
- D. The Contractor shall provide the Industrial Hygienist with all proper lighting, ladders, or scaffolding and any necessary tools to perform the clearance inspection.
- E. The Industrial Hygienist (IH) shall ensure that a thorough job of removal and clean up has been conducted. The IH has the right to terminate his inspection and re-direct further cleanup of the whole area if upon discovery of incomplete removal or discovery of debris.
- F. Upon **written approval** by the Industrial Hygienist in the Contractors logbook, encapsulation or lockdown shall be done on all surfaces including all poly. If the inspection fails, Contractor shall re-clean using all the above mentioned steps.
- G. When encapsulation or lockdown has been applied the Contractor shall wait for a drying period of not less than six (6) hours or at the discretion of the on-site Industrial Hygienist.
- H. When encapsulation has dried, the Contractor shall remove all poly and properly dispose of it.
- I. Following the satisfactory removal of all poly, another inspection shall be performed by the on-site Industrial Hygienist (IH). If any debris is found, the IH shall instruct the Contractor to re-clean the entire area. If the area is clean the IH shall begin with his first step of pre-clearance testing. (See section 01714) Clearance Testing).
- L. Upon achieving the clearance criteria for final clearance the Contractor can begin to remove all critical barriers, air filtration machines and begin his demobilization process.

END OF THIS SECTION

SECTION 01714 WORK AREA CLEARANCE

1.01 Clearance Air Monitoring:

- A. This project is being done in the open ambient air and therefore no clearance air monitoring will be done.
- B. The clearance shall be accomplished when the Industrial Hygienist has been satisfied that all debris has been pickup and visual inspection passes.
- C. At the discretion of ASARCO and/or Industrial Hygienist the contractor may be required to pass a wipe sample of the duct work. Wipe samples shall be taken by the IH on site and submitted for PLM analysis. The wipe samples should show no asbestos fibers present. The back ground to be used for this testing (if required) shall be a wipe sample of a surrounding vessel near these duct.

END OF THIS SECTION

SECTION 01716 DISPOSAL PROCEDURES

1.01 Disposal Procedures

- A. The Contractor is responsible for disposal of all the asbestos waste. The disposal Contractor shall be responsible for transportation of all asbestos containing waste to the storage areas, and proper containerizing of the asbestos waste. Contractor shall abide by all regulations and policies for handling regulated waste set forth by all regulatory agencies.
- B. On a daily basis or at the discretion of the Industrial Hygienist (IH) contractor shall remove ACM waste from containment. Contractor shall not allow excess debris to accumulate on the floor of the containment, Industrial Hygienist (IH) has the right to stop work and direct clean-up.
- C. The Contractor shall coordinate transportation of waste to the EPA approved landfill with the Industrial Hygienist on site.
- D. The Contractor shall fill out and sign the Waste Manifest prior to departure to the EPA approved landfill.
- E. All dump receipts, trip tickets, and manifests must be submitted within 48 hours of dumping, unless contractor has made other written agreement with the owner or IH.
- F. Transportation of ACM waste shall be done in an enclosed compartment vehicle. The truck driver shall be knowledgeable of ACM spill plan carried in the vehicle. The Contractor shall be responsible for developing a spill plan in accordance with current city, state, federal regulations.
- G. All double bagged ACM shall be placed inside approved safety containers prior to being removed from building. Approved safety containers shall be:
 - 1. DOT approved steel drums.
 - 2. Cardboard type drums with sealable tops.
- H. Approved containers shall be moved by use of buddy system, hand trucks, or carts.
- I. Truck cargo or container used to transport ACM waste shall be lined with one layer of six mil poly to prevent contamination and spillage.
- J. Truck cargo or container shall have appropriate warning labels and shall be locked to prevent entry by unauthorized personnel. Warning signs in accordance with 40 CFR part 61 NESHAPS regulations shall be placed on the vehicle when loading and unloading vehicle.
- K. Personnel loading asbestos containing waste shall be protected by disposable clothing including head, body and foot protection and at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- L. Loading of any vehicle shall be closely monitored to avoid overloading vehicle capacity. Contractor shall ensure proper load bearing distribution of ACM waste.
- M. The disposal Contractor shall have a spill plan in effect for spills that may occur in transportation or unloading. Any bag found to be broken at landfill shall be re-bagged and area of contamination shall be cleaned up immediately.

- N. Asbestos waste containers shall be placed on the ground at the disposal site. The Contractor shall ensure that bags are not pushed or thrown out of the transport vehicle.
- O. Personnel unloading containers at the Storage Site shall wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- P. Upon completion of un-loading vehicle the poly used to protect the vehicle shall be discarded as ACM waste. Any spillage discovered shall be cleaned and area decontaminated immediately by the disposal contractor.

END OF THIS SECTION

SECTION 02081 GENERAL REMOVAL PROCEDURES

1.01 Removal Procedures

NOTE: No asbestos removal shall be done without the Industrial Hygienist (IH) being on site.

- A. See Section 01560 and Section 01563 for minimum personnel protection. Industrial Hygienist (IH) shall authorize commencement of removal procedures. Clean and isolate the work area in accordance with Section 01527. Containers or drum shall mean containers that meet DOT 49 CFR 178.
- B. Spray all asbestos containing material with amended water solution, removal encapsulant, or chemical remover using spray equipment capable of delivering a low pressure mist to reduce the release of asbestos fibers. Adequately wet the ACM to the substrate and spray the ACM continuously during the removal practices to maintain adequate wet conditions and minimize fiber release and dispersion. Follow all manufacturers recommended procedures if a manufactured product is used for removal processes.
- C. Saturated asbestos containing material shall be removed in manageable sections. As ACM is removed, material will be placed in a suitable 6 mil polyethylene bags or drum. Material shall not be allowed to dry out prior to containerizing. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.
- D. All material removed shall not be thrown or dropped to the floor. Removal of intact and manageable sections is highly recommended as it will reduce fiber dispersion. All ACM containerized shall be carefully lowered to the ground floor by asbestos personnel.
- E. Containers (6-mil polyethylene bags or drums) shall be sealed when full. All ACM containerized shall be double lined. Bags shall not be overfilled as wet material is heavier than dry material. All containerized material shall be sealed with suitable duct tape, do not use wire or cord as it may break the container. All containerized material shall be decontaminated on the exterior surfaces before leaving the work area.
- F. Large components removed intact shall be wrapped in 2 layers of 6-mil polyethylene sheeting secured with tape for transport to the landfill.
- G. Asbestos containing waste with sharp-edged components (e.g. nails, screws, metal lath, tin sheeting) will tear the polyethylene bags and should be placed into drums for disposal.
- H. After completion of all stripping work, surfaces from which asbestos containing materials have been removed shall be wet brushed and sponged or cleaned by some equivalent method to remove all visible residue.
- I. Clean-up shall proceed in accordance with Section 01712.
- J. After the work area has been rendered free of visible residues, and the Industrial Hygienist (IH) has inspected and approved the area, a thin coat of a satisfactory encapsulating agent shall be applied to all surfaces in the work area including structural members, building components and plastic sheeting on walls, floors and covering non-removable items, to seal in non-visible residue. (Note: 1) High temperature components such as boilers and pipes may not permit the application of some encapsulants. 2) If insulation or acoustical materials are to be reapplied to the abated area, be certain that the encapsulant selected will permit good adhesion to the substrate. A small area should be tested before application).

- K. Special circumstances (e.g. live electrical equipment, high amosite content of material, materials previously coated with an encapsulant or paint) may prohibit the adequate use of wet methods to reduce fiber concentrations. For these situations, a dry removal method may be required. The contractor will have to acquire special permits, different from those mentioned herein from the NESHAP enforcement agency.

END OF THIS SECTION

SECTION 02088 REMOVAL OF ASBESTOS DUCT WRAP

1.01 Procedures

- A. Lock out all electrical power where actual asbestos removal will occur.
- B. Asbestos removal of asbestos containing roofing material (Category I non-friable ACM) shall be performed using all personal protective equipment to include half face respirator with HEPA filter cartridges. A decontamination station shall be erected, as specified, in its respective section on all areas of abatement.

1.02 Removal of ACM duct wrap

- A. Set up barrier tape, warning signs, and control center.
- B. Preclean all surfaces, using the wet methods and/or HEPA filter equipment. Pick up and bag up any debris, spray encapsulant on all ACM.
- C. Prior to setting up poly, welders shall cut all steel reinforcement plates to gain access to ACM. Strict adherence to the ASARCO safety procedures for hot work shall be followed.
- D. When welders have completed all the cutting of the metal, the certified supervisor shall inspect the areas to insure no hot metal or fire hazards exist in the work area prior to erection of wind breaker.
- E. Wind breakers shall be installed, as specified. This wind breaker will consist of six feet high walls around the work area, those walls shall be made of two layers of 6 mil (black) poly. Wind breaker shall be connected to a decontamination unit.
- F. Set up decontamination unit according with the procedures before mentioned in its section.
- G. Minimum respirator shall be half mask with hepa cartridges. Asbestos workers shall use gloves, rubber boots and tyvek suits (or equivalent).
- H. Removal of ACM shall be accomplished using a certified two man team. One man shall spray amended water with equipment capable of a "mist", and the other shall remove the mastic with putty knives and nylon brushes. No sand grinding or drill machine shall be used to remove the material.
- I. All ACM material and debris shall be double bagged and disposal procedures specified in Section 01716 of this manual shall be followed.
- J. Section of Cleaning and Decontamination Procedures shall be followed when directed by the facility IH. The facility IH shall be notified 24 hours in advance for scheduling of the visual inspection.
- K. Clearance testing shall be performed by a third party independent air monitor supervised by the facility IH. The results of this testing shall be the final word on clearance levels.

- L. Upon acceptable clearance levels, re-establish work areas and systems back to normal operations. Repair/Restore any and all damaged areas back to original condition.

END OF SECTION

SECTION 02089 REMOVAL OF ACM GASKETS

1.01 Procedures

- A. Lock out all electrical power where actual asbestos removal will occur.
- B. Asbestos removal of asbestos containing gasket material (Category I non-friable ACM) shall be performed using all personal protective equipment to include half face respirator with HEPA filter cartridges. A decontamination station, as specified, shall be erected in its respective section on all areas of abatement.

1.02 Removal of ACM Gaskets

- A. Set up barrier tape, warning signs, and control center.
- B. Minimum respirator shall be half mask with HEPA cartridges. Asbestos workers shall use gloves, rubber boots and tyvek suits (or equivalent).
- C. Removal shall be accomplished using a two man team. A spray penetrating encapsulant shall be spray on gaskets prior to beginning abatement. One man shall be equipped with water sprayer (amended water) while the other man removes gasket.
 - 1. Spray amended water/or encapsulation on areas around where gaskets rested on.
 - 2. Hepa vacuum all duct (where feasible) that is accessible.
- D. All ACM material and debris shall be double bagged and disposal procedures in SECTION 01716 of this Manual shall be followed.
- E. Section 01712 Cleaning and Decontamination Procedures shall be followed when the facility IH approves abatement of the gaskets. When ACM gaskets have been removed, the remaining duct system shall be HEPA vacuumed by connecting a HEPA unit to the end which once had the gasket. This procedure will create sufficient vacuum for decontamination.
- F. When directed by the facility IH proceed with SECTION 01714 Clearance Testing procedures.

END OF THIS SECTION