ASBESTOS SPECIFICATIONS

FOR

BUILDINGS 1, 3, 4, 5, 6 AND 7
MUIR ELEMENTARY SCHOOL
1951 MABURY STREET
SANTA ANA, CALIFORNIA 92705

Presented To:

1601 E. CHESTNUT AVENUE
SANTA ANA, CA 92701

Presented by:

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February 16, 2012

SECTION 02080 - ASBESTOS ABATEMENT

PART 1 – GENERAL

The work required to be performed by the Contractor comprises the following:

Project Title: Muir Elementary School – Buildings 1, 3, 4, 5, 6 and 7
Client: Santa Ana Unified School District
Location: 195 Mabury Street, Santa Ana, CA 92705

1.1 WORK DESCRIPTION

The work included consists of furnishing labor, materials, permits, equipment, services, insurance including but not limited to the handling and transportation and disposal of asbestos-containing materials and waste resulting from the removal of asbestos-containing materials in various areas. This work shall be conducted by a licensed abatement contractor and certified personnel in accordance with all applicable Federal, State, and local regulations.

A. Materials and their quantities to be abated shall be verified by the General Contractor/Abatement Contractor prior to the abatement work. Abatement work shall be cross-referenced and shall be coordinated with Santa Ana Unified School District. Refer to Bainbridge Comprehensive Asbestos and Lead-Based Paint Inspection Survey Report for Buildings 1, 2, 3, 4, 5, 6 and 7 dated February 16, 2012 for a full and complete description of the materials and locations surveyed. The asbestos-containing materials to be abated and their general location(s) and estimated quantities are as follows:

Sample ID No.	Building	Sample Location	Material Description/Color	Material Location	Approximate Combined Area Quantities	Asbestos Detected
--	Building 1	Inaccessible	Fire Doors	Throughout	--	Assumed
--	Building 3	Inaccessible	Fire Doors	Throughout	--	Assumed
--	Building 4	Inaccessible	Fire Doors	Throughout	--	Assumed
23a	Building 5	Rooftop at Pipe Penetration – South	Roof Penetration Paint/Silver	Roof Penetration Mastics Throughout	400 SF	2% Chrysotile
24a	Building 5	Rooftop at HVAC Penetration – West	Roof Penetration Paint/Silver			2% Chrysotile
25a	Building 5	Rooftop at Seams and Patches – Northwest	Roof Penetration Paint/Silver			2% Chrysotile
--	Building 5	Inaccessible	Fire Doors	Throughout	--	Assumed
1	Building 6	Exterior Wall – North	Stucco/Beige	Exterior Walls Throughout	20,000 SF	<1% Chrysotile
2	Building 6	Exterior Wall – Northeast	Stucco/Beige			<1% Chrysotile
6	Building 6	Exterior Wall - West	Stucco/Beige			<1% Chrysotile
14	Building 6	Classroom 112B – Breezeway	Vinyl Sheet Flooring/Yellow	Flooring Only	400 SF	15% Chrysotile
25	Building 6	Classroom 112B Window Base/Transom	Transite Window Panel	Window Bases/Transoms Throughout	400 SF	10% Chrysotile

Sample ID No.	Building	Sample Location	Material Description/Color	Material Location	Approximate Combined Area Quantities	Asbestos Detected
26a	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT)/Off-White	Classroom 112B Flooring Throughout	500 SF	<1% Chrysotile
26b	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT) Mastic/Black			7% Chrysotile
27a	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT)/Off-White	Classroom 112B Flooring Throughout	500 SF	<1% Chrysotile
27b	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT) Mastic/Black			7% Chrysotile
28a	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT)/Off-White			<1% Chrysotile
28b	Building 6	Classroom 112b Floor Beneath Carpet	Vinyl Tile (VAT) Mastic/Black			7% Chrysotile
--	Building 6	Inaccessible	Fire Doors	Throughout	--	Assumed
1a	Building 7	Exterior Wall – North	Stucco/Beige – Skim Coat/ Olive	Exterior Walls Throughout	10,000 SF	<1% Chrysotile
2a	Building 7	Exterior Wall – Northeast	Stucco/Beige – Skim Coat/ Olive			<1% Chrysotile
3a	Building 7	Exterior Wall – East	Stucco/Beige – Skim Coat/ Olive			<1% Chrysotile
4a	Building 7	Exterior Wall – South	Stucco/Beige – Skim Coat/ Olive			<1% Chrysotile
5a	Building 7	Exterior Wall – Southwest	Stucco/Beige – Skim Coat/ Olive			<1% Chrysotile
6a	Building 7	Exterior Wall – West	Stucco/Beige – Skim Coat/ Olive			<1% Chrysotile
8c	Building 7	Room 112 Wall	4" Rubber Basecove w Adhesive/Brown	Basecoves Throughout	2,400 LF	2% Anthophyllite
15c	Building 7	Room 124	12" Floor Tile Mastic/Black	12" Floor Tiles Throughout	800 SF	15% Chrysotile
16c	Building 7	Room 128	12" Floor Tile Mastic/Black			15% Chrysotile
17a	Building 7	Room 131/Storage Room Walls	Plaster/Gray – Skim Coat/Gray	Walls & Ceilings Throughout	3,000 SF	<1% Chrysotile
27	Building 7	Rooftop at Pipe Penetration – West	Roof Penetration Mastic/Black	Roof Penetration Mastic Throughout	400 SF	<1% Chrysotile
28	Building 7	Rooftop at Pipe Penetration – East	Roof Penetration Mastic/Black			<1% Chrysotile
--	Building 7	Inaccessible	Fire Doors	Throughout	--	Assumed

In the event that other materials are found to be similar or homogenous to the materials sampled and determined to contain asbestos, those similar or homogenous materials will be considered assumed asbestos containing materials. Prior to bid, contractor is responsible for field verification of those materials, their quantities and measurements.

Federal regulations define asbestos-containing materials as any material containing more than one percent (1%) by weight. California Labor Code, Section 6501.8 defines "asbestos containing construction materials (ACCM)" as any manufactured construction material that contains more than one tenth of one percent (0.1%) by weight.

B. Asbestos abatement observation services shall be conducted by a third party consultant and shall be contracted directly by Santa Ana Unified School District.

C. All applicable codes and regulations revised and updated are made part of these specifications by reference herewith.

1. Code of Federal Regulations (CFR):

40 CFR Part 763	Asbestos Containing Materials In Schools
29 CFR 1910.1001	Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite
29 CFR 1910.1101	Asbestos
29 CFR 1910.1200	Hazard Communication
29 CFR 1910.20	Access to Employee Exposure and Medical Records
29 CFR 1910.132	General Requirements - Personal Protective Equipment
29 CFR 1910.133	Eye and Face Protection
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.145	Specifications for Accident Prevention, Signs and Tags
29 CFR 1926.1101	Asbestos Standard for construction Industry
40 CFR 61	Sub-part A General Conditions
40 CFR 61	Sub-part M National Emission Standards for Asbestos
40 CFR 61.152	Standard for Waste Disposal for Manufacturing, Demolition, Renovation, Spraying and Fabrication Operations

2. U. S. Environmental Protection Agency (EPA):
Publication No.

560/5-85-024	Guidance for Controlling Asbestos-Containing Materials in Buildings

3. National Institute of Occupational Safety and Health (NIOSH):
Manual of Analytical Methods, 2nd Ed., Vol. 1.
Physical and Chemical Analysis Method (P&CAM):
Method 239, Asbestos Fibers in Air
Method 7400, Fibers (N1, 3rd Ed., Vol. 1.)

4. American National Standard Institute (ANSI):

Z9.2-1979	Fundamentals Governing The Design and Operation of Local Exhaust Systems
Z88.2-1980	Practices for Respiratory Protection

5. National Fire Protection Association (NFPA):

Standard 90A	Installation of Air Conditioning and Ventilation Systems.

6. American Society for Testing Materials (ASTM):

E 849-82	Safety and Health Requirements Relating to Occupational Exposures to Asbestos
P-189	Specifications for Encapsulants for Friable Asbestos-Containing Materials

7. Underwriters Laboratories, Inc. (UL):

586-77 (R1982)	Test Performance of High Efficiency, Particulate, Air Filter Units

8. Title 8 California Code of Regulations (CCR):

Section 1529	Asbestos
Section 5208	General Industry Safety Orders
Section 5144	Respirator Regulations

9. South Coast Air Quality Management District – Rule 1403

10. Local and other regulations

1.2 CONTRACTOR'S QUALITY ASSURANCE

A. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, regional, and local authorities and publications regarding handling, storing, transporting, and disposing of asbestos waste materials. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent requirement shall apply.

B. Contractor shall have at least one copy each of 29 CFR Part 1910 - Occupational Safety and Health Standards, 29 CFR 1926.1101, 40 CFR Part 61, sub-parts A & M, and all pertinent state and local regulations at his office and at the job site.

C. Before the commencement of any work at the site, the contractor shall post EPA and OSHA caution signs in and around the work area to comply with EPA and OSHA regulations.

D. Personal monitoring and other monitoring, which are required by law, or considered necessary by the Contractor for worker protection shall be the responsibility of the Contractor.

E. Area monitoring will be performed by the Observation Service. A predetermined number of air samples will be collected at various stages of the Work, in designated places inside and outside the Work areas.

1.3 SUBMITTALS AND NOTIFICATIONS

A. At the pre-construction meeting, Contractor shall submit (1) declaration certifying that all Contractor's employees have been adequately trained, and (2) a photocopy of training certificates for each employee from their respective training agency or organization. When certified or other formal worker training is required by state or local agencies, Contractor may submit a photocopy of the employee's asbestos worker certification card in lieu of training certificates.

B. Submit at Pre-construction Meeting manufacturer's certification that the respirators to be used in this Project comply with government agency requirements. Contractor's certifications for each employee must clearly state that each employee has been fit tested and properly trained for respirators.

C. Submit proof that all persons providing labor and/or professional services who will be entering abatement work areas have had current (less than one year prior to the date of their participation on the Project) medical examinations. Furnish physician's interpretation of said examinations to the State on the Certificate of Medical Compliance form provided in the Supplementary General Conditions section of these Construction Documents at the Pre-construction Meeting, or prior to that person's commencing work on this Project, and for each person subsequently providing labor and/or professional services at the job site for whom a certificate was not initially furnished. Refer to Article 2.5, A. NOTE: In lieu of the above certificate, current medicals will be acceptable providing that a statement in the medical exam declares that the worker can wear a negative pressure respirator while performing their work. Contractor shall resubmit physician's interpretation of medical examination for each worker or professional employed by him whose physician or regulatory required annual or employment termination examination becomes due while said worker or professional is participating in the Project. This requirement can be waived or modified only by Santa Ana Unified School District in writing or verbally, followed up in writing.

D. Immediately after Contractor has received the SAUSD's Notice of Award, submit manufacturer's catalogue, samples, Material Data Safety Sheets, (MSDS) and other items needed to demonstrate the quality of the proposed abatement materials. Under no circumstances shall proposed materials be used before written approval from Santa Ana Unified School District, Santa Ana Unified School District's Representative or Observation Service. Submittals are required if the following materials are proposed:

1. Encapsulant
2. Surfactant
3. Protective packaging
4. Lagging adhesive
5. Glove bags
6. Resaturant
7. Solvents

E. Submit at Pre-construction Meeting proof satisfactory to Santa Ana Unified School District, or the Observation Service that all required permits have been

obtained and notifications have been sent. Contact and notify the following government agencies in writing ten working days prior to the commencement of Work:

1. EPA Regional Asbestos Coordinator,

2. Occupational Safety and Health Administration,

3. Local Air Quality Management District,

4. Local Fire Department if required,

All notifications shall contain as a minimum the following information:

1. Name, address and telephone number of Santa Ana Unified School District including the contact person.

2. Name, address, EPA numbers, license number and telephone number of the Contractor including the contact person.

3. Name, address and description of the building, including size, age, and prior use of building.

4. The type and quantity of asbestos material involved and the description of the Work.

5. Scheduled starting and completion dates for Abatement Work.

6. Procedures that shall be employed to comply with the regulations.

7. The name, address, EPA number and telephone number of the Transporter.

8. The name and address of the Hazardous Waste Disposal Facility where the Asbestos Waste shall be deposited.

F. Submit at Pre-Construction Meetings copies of all government agency correspondence and proof of delivery. No work shall commence until verification of required notifications is made by the Observation Service.

G. Submit at Pre-construction Meeting the method of transport of hazardous and non-hazardous waste, including the name, address, EPA ID number, and telephone number of the transporter(s).

H. Submit for approval at the Pre-construction Meeting the name, address, EPA ID number, and telephone number of the hazardous and non-hazardous waste disposal facility(s) to be used.

I. Submit at the Pre-construction Meeting for approval a detailed plan of the work procedures to be used in the abatement of the asbestos-containing materials. The asbestos plan must be approved in writing by the Observation Service and

the Santa Ana Unified School District before the start of any work, including work mobilization. The plan shall include:

1. Location of Asbestos Work Areas.

2. Layout and construction details of Decontamination Enclosure Systems.

3. Project schedule including critical paths, interface of other trades, and completion dates of abatement stages and work areas.

4. Personal air monitoring procedures.

5. Detailed description of the method to be employed in order to control pollution, including negative air equipment calculations.

6. Names of Superintendent, Foremen, Project Manager and other key personnel, and their day time, emergency telephone numbers and pagers.

7. Security Plan including sketches necessary to clearly describe the plan.

8. Emergency evacuation plan for injured workers, compressor failure, fire and other emergencies.

J. Submit at Pre-construction Meeting manufacturer's certification that vacuums, equipment filters, and other local exhaust ventilation equipment conform to ANSI Z9.2-1979.

K. Provide proof of Contractor's License and Asbestos Certification from the Contractor Licensing Board, and proof of registration with the Division of Occupational Safety and Health in accordance with California Labor Code, Section 6501.

PART 2 - PRODUCTS

2.1 GENERAL

A. Contractor shall furnish, provide and utilize the following products in the Work as specified herein.

B. The Work is based on the materials, equipment and methods described in these specifications. The Santa Ana Unified School District or the Observation Service will consider proposals for substitutions of materials and equipment only when such proposals are accompanied by written technical product data.

C. No materials or equipment shall be substituted unless approved in writing by Santa Ana Unified School District or the Observation Service.

2.2 PROTECTIVE COVERING (PLASTIC) AND DISPOSAL BAGS

A. Shall be fire retardant plastic or equivalent with a thickness of ten mil, six mil, four mil and three mil polyethylene sheets. Disposal bags shall be pre-printed with labels as required by CFR 40 Part 60 or applicable CAL-OSHA requirements.

2.3 TAPE AND GLUE

A. Duct Tape 2" or wider, or equal, and capable of sealing joints of adjacent sheets of plastic, and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials. The bonding strength and seal must not be affected by mist, water, encapsulating agent or any other materials used in the Work.

2.4 PROTECTIVE PACKAGING

A. Appropriately labeled clear, double six (6) mil sealable polyethylene bags as a minimum.

B. Bilingual labels (English and other appropriate language) on containment glove bags, waste packages, contaminated material packages and other containers shall be in accordance with EPA or OSHA standards.

2.5 WARNING LABELS AND SIGNS

A. As required by 29 CFR 1910.1001, 29 CFR 1910.1200, 29 CFR 1926.58 and other pertinent state and local codes and regulations.

2.6 WETTING AGENT OR SURFACTANT

A. Surfactant, or wetting agent, for amending water will be 50 percent polyoxyethylene polyglycol ether and 50 percent polyoxyethylene ether, or equivalent, at a concentration of one (1) ounce per five (5) gallons of water. The material must be odorless, non-flammable, non-toxic, non-irritant and non-carcinogenic.

2.7 ENCAPSULATING SEALER

A. Shall be a penetrating or bridging type, pollution-free, water based, nontoxic, with a Class A fire classification as specified herein. Encapsulants with the ingredient Methylene Chloride are not acceptable unless the contractor can prove to the Santa Ana Unified School District's satisfaction that equal substitute materials are not available. If substitutes are not used, the Contractor shall submit with the asbestos plan, for approval, respiratory protection and negative air discharge procedures to protect workers, authorized personnel and the public from Methylene Chloride exposure. Material shall be flexible when cured, resistant to weathering, oxidation, aging and abuse.

2.8 LAGGING ADHESIVE

A. Shall meet NFPA 90A Code, such as Arabol, Childers CP52, Insul-Coustic 102, or approved equal.

2.9 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos removal and encapsulation.

B. HEPA vacuums shall comply with ANSI Z9.2-1979

C. Ladders and scaffolds shall be of required OSHA dimensions and quantities so that all work surfaces can be easily and safely accessed.

D. Electrical equipment shall be UL-listed and approved, and shall have ground-fault interrupt.

E. Airless spray equipment shall have a nozzle pressure with an adjustable range of 400-1500 psi.

PART 3 - REQUIREMENTS FOR WORKER PROTECTION

3.1 TRAINING PROGRAM

A. Each employee shall receive training in the proper handling of materials that contain asbestos, including all aspects of work procedures and protective measures, use of protective clothing and respiratory protection, use of showers, entry and exit procedures from Work areas and in OSHA regulations. Each employee shall also understand the health implications and risks involved, including the illness possible from exposure to airborne asbestos fibers and the increased risk of lung cancer associated with smoking cigarettes and asbestos exposure, understand the use and limits of the respiratory equipment to be used, and understand the purpose of medical surveillance and the monitoring of airborne quantities of asbestos as related to health and respiratory equipment. The training program shall comply with federal, state and local regulatory requirements.

B. Emergency evacuation procedures to be followed in the event of Worker injury or shall be included in the worker training program.

3.2 DRESS AND EQUIPMENT

A. Work clothes shall consist of disposable full-body coveralls, head covers, boots, rubber gloves or equivalent. Sleeves at wrists and cuffs at ankles shall be secured. Fire retardant full-body coveralls are required in areas of open flame, or where required by local regulations.

B. Eye protection and hard hats shall be available as appropriate or as required by applicable safety regulations.

C. Provide authorized visitors with suitable protective clothing, headgear, eye protection, and footwear whenever they are required to enter the Work area.

3.3 RESPIRATORS

A. Respiratory protective equipment shall be MSHA/NIOSH approved in accordance with the provisions of 30 CFR Part 11. Respiratory instructions shall be posted in the clean room or work area.

B. Half-mask or full-face air-purifying respirators with HEPA filters may be worn during the preparation and work being performed.

C. The Contractor shall provide Workers with approved, permanently personally-issued and marked respirators with changeable filters. The Contractor shall provide a sufficient quantity of filters approved for Asbestos so that Workers can change filters during the workday. Filters shall not be used any longer than one (1) workday or whenever an increase in breathing resistance is detected. The respirator filters shall be stored at the job site in the Clean Room and shall be totally protected from exposure to asbestos before their use.

D. Workers shall always wear a respirator, properly fitted on the face, in the Work Area, from the start of preparation work until all areas have been given written clearance by the Observation Service.

3.4 WORKER PROTECTION PROCEDURES

Bilingual (English and other appropriate language) Worker protection procedures must be posted in the Clean Room or Work Area. If the first language of all Workers is English, the bilingual procedures are excepted.

A. Each Worker and Authorized Visitor shall, upon entering the job site: remove street clothes and put on a respirator and clean protective clothing before entering the Work Area.

B. All Workers shall, each time they leave the Work Area: 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 naked to the showers; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves.

C. Following showering and drying off, each Worker shall proceed directly to the Clean Room and dress in their personal clothing. Before reentering the Work Area, each Worker and Authorized Visitor shall put on a clean respirator and shall dress in clean protective clothing.

D. Contaminated protective clothing and work footwear shall be stored in the Equipment Room when not in use in the Work Area. At appropriate times or upon completion of Asbestos Abatement, dispose of protective clothing and footwear as contaminated waste, or launder in accordance with government regulations.

E. Workers removing waste containers from the Equipment Decontamination Enclosure shall enter the Holding Area from outside wearing a respirator and dressed in clean disposable coveralls. No Worker shall use this system as a means to leave or enter the Washroom or the Work Area.

F. The disposable clothing worn outside the Work Area shall be of different color or markings from the disposable clothing worn inside the Work Area.

G. Workers shall not eat, drink, smoke, or chew gum or tobacco while in the Work Area. Workers and Authorized Visitors with beards or who are unshaven shall not enter the Work Area.

3.5 MEDICAL DOCUMENTS

A. Before exposure to airborne Asbestos, the Contractor will provide each employee providing labor or professional services at the Project site with a current comprehensive medical exam, including a history of respiratory and gastrointestinal diseases, meeting the general definition outlined in 29 CFR 1910.1001, 29 CFR 1910.134, 29 CFR 1926.1101 and California Administrative Code Title 8, CAC Section 5208, page 442.2.l sub-part 1. The contractor shall submit a current medical examination report. The medical report shall contain a statement from the examining physician that the employee can function normally wearing a respirator or that the safety or health of the employee or other employees will not be impaired by his use of a respirator. No employee will be allowed to enter the Work Area without having first provided the completed copy of their medical examination to Santa Ana Unified School District's Representative and until the medical report has been approved by the Observation Service.

3.6 EMPLOYEE IDENTIFICATION

A. Each employee shall bring to the job at least two forms of identification, one of which has his/her photograph.

PART 4 - WORK EXECUTION - ASBESTOS ABATEMENT PROCEDURES

4.1 WORK AREA PREPARATION AND REMOVAL FOR ASBESTOS MATERIALS

A. Preparation procedures for the Work including the removal the asbestos-containing materials and associated debris. Removal of these materials or other friable asbestos-containing materials**,** unless specified otherwise, shall be executed inside a fully "Contained" Work area.

1. All surfaces and fixed objects including carpets in the Work areas shall be pre-cleaned using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Methods that would raise dust, such as dry sweeping or vacuuming with equipment with non HEPA filters must not be used. Asbestos-containing materials must not be disturbed during the pre-cleaning phase.

2. Contractor shall isolate the Work area for the duration of the Work by sealing all openings including, but not limited to, HVAC ducts, diffusers and grilles, skylights, doorways, and windows, with six (6) mil polyethylene taped securely to a clean surface. Spray adhesive, used on finished surfaces, should be avoided where possible. Construct barriers that enclose or separate Work Areas with wood or metal framing members and sheathed with 3/8" min. plywood. Barriers shall form a seal at vertical walls and at the floor deck above and below.

3. HVAC systems shall be shut down. Contractor shall design the Work area preparation and engineering controls as specified and/or as required to prevent damage to and contamination of the affected HVAC system. Contractor shall remove HVA system filters, and pack them in protective six (6) mil polyethylene sheeting for proper disposal. The Contractor shall install new filters upon completion of all Work.

4. Contractor shall remove all movable objects including but not limited to carpets from the Work area. All fixed and movable objects requiring cleaning shall be washed with amended water or cleaned with a HEPA filtered vacuum.

5. Clean and cover fixed and movable objects that remains in the Work area with six (6) mil polyethylene sheeting taped securely in place.

6. The objects removed shall be stored in a location designated by Santa Ana Unified School District, and in a manner that will prevent contamination or damage to the objects. Damaged and missing objects will be replaced by the Contractor at his own expense and to the satisfaction of Santa Ana Unified School District.

7. Seal and protect all light fixtures, exit signs and other electrical items, etc., that will remain within the Work area, with six (6) mil polyethylene, taped securely. The polyethylene cover shall be kept away from heat-generating electrical devices where fire or damage to the device is possible. Light fixtures and all other electrical items shall be thoroughly cleaned before covering.

8. Contractor shall cover entire Work area floors with a heavy duty tarpaulin (reinforced polyethylene) underneath a minimum of two (2) six (6) mil protective coverings. Cover wall and column surfaces with a minimum of two (2) four (4) mil protective coverings. Floor coverings shall extend a minimum of 12" up vertical surfaces and behind wall covers. All seams shall be staggered and securely taped.

9. Install 2' x 2' plexiglass observation window(s) at strategic location(s) in the "Containment" barrier to allow observation of work from outside the Work Area.

10. Seal all wall, plumbing, duct and other cavities to prevent asbestos materials contamination "fallout" from falling into cavities during the Work.

11. The Contractor shall check regularly (at beginning, middle and end of each shift as a minimum) all polyethylene isolation and containment (protective) barriers for punctures, loose seals, contact with heat-generating devices, etc. Problem areas shall be repaired or mended immediately.

12. Maintain existing emergency exits from the building**.** Maintain a minimum of two (2) exits from Work Areas where possible. The first exit shall be the Worker the Decontamination Enclosure System. The second exit may be the Equipment Decontamination Enclosure System or a ripcord type, emergency only exit in the plastic containment at a door, window or other appropriate location. Exits, where possible, shall be on opposite ends of the Work Area. All exits shall be labeled in bright letters or signage. The second exit shall be labeled "Emergency Exit Only." Establish alternative exits satisfactory to fire officials where existing building or Work Area emergency exits are unavoidably blocked by activities of this project.

13. Provide and maintain appropriate fire extinguishers inside and outside the Work.

14. All electrical power must be shut down during the wet removal or encapsulation phase of the Work. Provide temporary power and lighting when necessary, and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements including appropriate ground fault protection. Temporary light fixtures will be explosion proof. Provide and maintain auxiliary diesel generator equipment where existing facility power is insufficient. Locate generator or vent generator exhaust in a manner that will prevent carbon monoxide hazards to workers and the public. When power shutdown is required, the Contractor shall check for conditions where shutdown will pose a danger to the building or to the building's components. Contractor shall take all precautions necessary, including inspections and testing, to insure the safety of his employees and other building occupants from electrical hazards during the course of the Work. Existing fire, smoke detection and other life safety systems shall be kept in operation at all times, or, the Contractor shall install and maintain a temporary system or alternate acceptable to Santa Ana Unified School District and local fire officials.

15. The Contractor shall install and maintain negative air pressure equipment during the abatement and decontamination phases of the Work until the clearance test has passed. A sufficient amount of air shall be exhausted by the unit(s) to create a pressure of -0.02 inches of water within the Work area with respect to the area outside the Work area. A backup negative air unit must be in place in the event that the initial unit fails. In the event of a power failure, the backup emergency unit must be self-starting with a diesel generator back-up power. Locate the generator or vent generator exhaust in a manner that will prevent carbon monoxide hazards to workers and others in the building When more than one negative air pressure unit is required, emergency power back-up is required for at least half of all the units.

16. Install and maintain a manometer from the time abatement begins until the clearance test has passed in all Work areas. All ratings must be recorded in writing for the duration of the Work. Report the readings to the Observation Service at the start and end of each work shift.

17. Notify the Observation Service twenty-four hours in advance of when preparatory steps will be completed. Asbestos Abatement Work shall not commence until: all preparation requirements have been completed; all tools, equipment, and materials are on hand; all required submittals, notices and permits have been approved, and until the Observation Service authorizes that Work may commence.

18. Daily log: Maintain for the duration of the project from the first disturbance of asbestos-containing material, a sign-in/sign-out log. All persons performing work or visiting the site must print, sign, and date the logbook along with their company name showing duration at work site.

B. Removal procedures for "Contained" Work:

1. Remove all visible accumulations of asbestos material and debris. Wet-clean all surfaces within the Work area to remove asbestos residue.

2. Upon completion of the cleaning, the Contractor shall perform a complete visual inspection of the Work area to ensure that the Work area is free of any visible debris or residue.

3. Upon completion of the visual inspection, the Contractor shall notify the Observation Service in advance that the Work area is ready for an inspection.

4. Upon proper notification, the Observation Service will inspect the Work area for general conformance with the Specifications. Any nonconformance of the Work shall be remedied by the Contractor until the Work area is in compliance, and at the Contractor's expense.

5. Once the inspection is performed and the Work is approved by the Observation Service, the Contractor shall encapsulate the surfaces where asbestos materials have been removed. All surfaces within ceiling and other accessible cavities where spray-applied or trowel-applied materials have been removed shall also be encapsulated. The encapsulant shall be compatible with the existing substrate and replacement materials and shall be rated to safely withstand the temperature of the items to which it will be applied.

6. Upon completion of the encapsulation work, the Contractor shall notify the Observation Service in advance that the encapsulated surfaces are ready for inspection.

7. Upon proper notification, the Observation Service will inspect the encapsulated surfaces for general conformance with the Specifications. Any

nonconformance of the Work shall be remedied by the Contractor until the Work is in compliance and at the Contractor's expense.

8. Upon successful compliance with the encapsulation inspection by the Observation Service, the Contractor shall remove the outer layer of plastic on the walls, floors, and ceilings (where applicable). The inner plastic layer and isolation barriers on vents, grilles, diffusers, etc., shall remain in place.

9. The Contractor shall repeat the necessary steps to remedy and correct the decontamination and encapsulation procedures in the event that the Contractor does not pass the inspection as conducted by the Observation Service. Remedial work shall be conducted by the Contractor at the Contractor's expense.

10. Wet-clean the Work area, wait twenty-four hours to allow for the settlement of dust, and again wet-clean, or clean with HEPA vacuum equipment, all surfaces within the Work area. After completing the second cleaning operation the Contractor shall perform a complete visual inspection of the Work Area to ensure that the Work Area is free of contamination.

11. Sealed drums and bags, and all equipment used in the Work area, shall be included in the cleanup and shall be removed from the Work area via the equipment decontamination enclosure system, at the appropriate time in the cleaning sequence.

12. Upon completion of the second cleaning operation, the Contractor shall notify the Observation Service twenty-four hours in advance that the Work area is ready for final inspection and air clearance testing. Contamination found during the final inspection shall be remedied by the Contractor at his expense.

13. Upon notification from the Observation Service that the Work area has passed the clearance testing, the Contractor shall proceed**,** where applicable in the Contract, the application of asbestos-free replacement materials and re-establish objects and systems as specified in these specifications. The inner plastic layer and isolation barriers may be removed by the Contractor at any time after the Work Area inspection has passed the clearance testing.

14. Upon completion of the application of replacement materials (where applicable), or after the removal of the inner plastic layer, isolation barriers and the re-establishment of objects and systems, the Contractor shall notify the Observation Service twenty-four hours in advance that the Work area is ready for Review.

15. Upon notification, the Observation Service and Santa Ana Unified School District's Representative will review the Work area. Improper application of replacement materials, unapproved damage to the facility or its contents, or improper re-establishment of objects and systems discovered during the review shall be itemized on a punch list for correction by the Contractor at his expense. If no deficiencies are discovered the Contract or this portion of

the Contract shall be approved in writing by the Observation Service and Santa Ana Unified School District's Representative as complete. If deficiencies are noted, continue with the subsequent procedures.

16. Upon correction of the punch list deficiencies the Contractor shall notify the Observation Service and Santa Ana Unified School District 's Representative in advance that the Work area is ready for final review.

    Upon notification, the Observation Service and Santa Ana Unified School District's Representative will review the corrected Punch List deficiencies. If deficiencies have not been properly corrected, the Contractor shall repeat, at his expense, the above mentioned procedures until all deficiencies have been corrected and approved.

4.2 DECONTAMINATION ENCLOSURE SYSTEMS

A. Decontamination enclosure system for asbestos abatement work in "Contained" Work areas:

1. Construct a decontamination enclosure system for the Work area consisting of three separate enclosed chambers as follows:

    a. Equipment chamber with an air lock to the Work area and a curtained doorway to the shower room.

    b. Shower chamber with two curtained doorways, one to the equipment chamber and one to the clean chamber. The shower chamber shall contain one shower with hot and cold or warm water. Careful attention shall be paid to the shower enclosure to ensure against air and water leaks. Trap shower waste using filters having a maximum pore size of 1.0 micron, and drain into a sanitary sewer. Replace filters when they become clogged. Ensure a supply of soap and disposable towels at all times in the shower chamber.

    c. Clean chamber with one curtained doorway into the shower and one entrance or exit to non-contaminated areas of the building. The clean chamber shall have sufficient space for storage of the worker's street clothes, towels, and other non-contaminated items.

2. Construct an equipment decontamination enclosure system consisting of two totally enclosed chambers as follows:

    a. Washroom with an air lock to a designated staging area of the Work Area and a curtained doorway to the holding chamber.

    b. Holding chamber with a curtained doorway to the washroom and a doorway to an uncontaminated area.

4.3 DISPOSAL

A. Waste Transportation: Submit the method of transport of hazardous and non-hazardous waste including name, address, EPA I.D. number and telephone number of transporter.

B. Waste Site: Submit for approval the name, class, address, EPA I.D. number and telephone number of hazardous waste site(s) to be utilized for disposal.

C. Waste Manifest: Submit for approval at the Pre-Construction meeting a filled out Waste Manifest form. For Waste Manifest purposes the Generator is the facility of the subject work. Obtain necessary information for this purpose from Santa Ana Unified School District. Give a copy of the Waste Manifest to Observation Service for each required shipment.

D. Containers to be loaded for transportation from the Holding Area must be removed by Workers who have entered from uncontaminated areas, dressed in clean overalls. Workers must not enter from the Holding Area into the Washroom or the Work Area.

1. The sealed asbestos containers shall be delivered to Contractor's pre designated approved non-hazardous waste site for burial; in accordance with local Air Pollution Control District Regulations.

F. Notify Santa Ana Unified School District 48 hours in advance of the time when asbestos materials are to be removed from the site.

G. Contractor shall be responsible for safe handling and transportation of waste generated by this Contract to the designated waste site.

H. Contractor shall hold Santa Ana Unified School District harmless for claims, damages, losses, and expenses against Santa Ana Unified School District, including attorney's fees arising out of or resulting from asbestos spills on the site or spills en route to the disposal site.

4.4 ASBESTOS WHICH REMAINS

A. For asbestos-containing materials which cannot be removed as originally specified in these Contract Documents:

1. Apply a mist of encapsulating sealer into concealed areas with an airless sprayer, set at low pressure, to obtain absorption, good coverage, and penetration.

2. Contractor shall follow safety precautions required by manufacturer when handling sealer.

4.5 AIR MONITORING AND TESTING

A. Area Air Monitoring:

1. Throughout the removal and cleaning operations, area air monitoring shall be conducted by the Observation Service to ensure that the Contractor's work practices are minimizing worker and public exposures to airborne asbestos fibers in accordance with applicable codes, regulations, and ordinances. Fiber counting shall be done by the PCM Method No. 7400 established by NIOSH, with the following as minimum samples recommended by the EPA:

Areas To Be Sampled	Minimum No of Samples	Minimum Volume
Benchmark	1/work area	1300L
Work Area	1/work shift	1300L
Adjacent to Work Area	1/work shift	1300L
At Negative Air Equipment Exhaust	1/work shift	1300L

2. The Observation Service shall report the area air monitoring results to the Contractor on the following day. If area air monitoring results are exceed the required threshold, the Contractor shall make changes in their work practices to assure compliance with the following standards. Unsatisfactory results are fiber counts within the Work area in excess of the maximum acceptable level (0.1 fibers/cc) or fiber counts outside the Work area in excess of the benchmark.

B. Contractor Personal Air Monitoring:

1. The Contractor shall perform periodic personnel air monitoring at their own cost. Initial and periodic eight (8) hour TWA and thirty (30) minute excursion limit air monitoring of Worker exposures to airborne concentrations of asbestos fibers shall be in accordance with OSHA - CFR 1926.1101 requirements.

2. The Contractor shall report personal monitoring results to the Observation Service within 24 hours from the end of each work shift. Worker exposures to airborne asbestos concentrations shall not exceed the permissible exposure limit (PEL) of 8-hour time-weighted average (TWA) of 0.1 fibers per cubic centimeter of air, or the 1f/cc 30-minute period excursion limit.

C. Clearance Testing:

1. Contained Work Areas: The Contractor will not be released until final inspection and air testing are performed according to Phase Contrast Microscopy (PCM) Methods (dependent on the quantity of ACM removed in each containment) in accordance with the guidelines set forth in the Environmental Protection Agency's 40 CFR Part 763 Appendix A to subpart E.

2. If the air tests show that the Work area has not been decontaminated, the Contractor must repeat the cleaning and/or encapsulation application until the Work area is cleaned to the satisfaction of the Observation Service.

   The contractor will be released only after final air clearance according to the AHERA air clearance criteria has been achieved.

4.6 REIMBURSEMENT OF COSTS OF SANTA ANA UNIFIED SCHOOL DISTRICT OR THE OBSERVATION SERVICE

A. In the event that inspections and/or air testing by the Observation Service or regulatory agencies shows that the Work area or any portion of the Work area is not decontaminated or if the Work is not in conformance with the Contract Documents, Santa Ana Unified School District and the Observation Service will record all time, tests and project related expenses spent to monitor the Work until the work is in compliance. All time, and expenses recorded by Santa Ana Unified School District and the Observation Service to monitor the above work, and all time, tests and project related expenses incurred by Santa Ana Unified School District and the Observation Service beyond the contract time shall, at the discretion of Santa Ana Unified School District, be paid for by the Contractor. The Contractor, promptly upon receipt of the invoice from Santa Ana Unified School District, or the Observation Service, shall reimburse Santa Ana Unified School District at the normal billing rate of Santa Ana Unified School District or the Observation Service or the Santa Ana Unified School District is authorized to withhold funds from the Contract for all time spent by the Santa Ana Unified School District and the Observation Service.

4.7 STOPPING THE WORK

A. If, at any time, the Observation Service decides that work practices are violating pertinent regulations, these contract documents or, in their opinion, endangering workers or the public, the Observation Service will immediately notify the Contractor that operations shall cease until corrective action is taken, and the Contractor shall take such corrective action before proceeding with the Work. Cost for losses or damages due to a stop of the work shall be borne by the Contractor.

4.8 REPAIR AND PAINTING

A. N/A

4.9 CLEANUP

A. Contractor shall maintain a clean Project site during and upon completion of the Work. Cleaning shall be in accordance with these contract documents.

PART 5 - DEFINITIONS AND STANDARDS (General Industry Definitions)

- Abatement: Procedures to control fiber release from asbestos-containing building materials. Includes removal, encapsulation, and enclosure, repair, demolition and renovation activities.

- Air Lock**:** A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area. (See decontamination enclosure system plan in the drawing section of this Contract Document).

- Air Monitoring: The process of measuring the fiber content of a specific volume of air in a stated period of time.

- Air Sampling Professional**:** The professional contracted or employed to supervise air monitoring and analysis schemes. This individual is also responsible for recognition of technical deficiencies in Worker protection equipment and procedures during both planning and on-site phases of an abatement project. Acceptable Air Sampling Professionals include Industrial Hygienists, Environmental Engineers and Environmental Scientists with equivalent experience in asbestos air monitoring and worker protection.

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

- Area Monitoring: Sampling of airborne fiber concentrations within the asbestos work area and outside the asbestos work area which are representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.

- Asbestos: Means fibrous forms of various hydrated minerals including Chrysotile, (fibrous serpentine), Crocidolite (fibrous Riebeckite), Amosite (fibrous Cummintonite-Grunerite), Fibrous Tremolite, fibrous Actinolite, and fibrous Anthophyllite.

- Asbestos-Containing Material (ACM) Material composed of asbestos of any type in an amount greater than 1 percent and by weight, either alone or mixed with other fibrous or non-fibrous materials.

- Asbestos-Containing Construction Material (California definition): Means any manufactured construction material which contains more than 1/10th of 1% asbestos by weight.

- Asbestos Fibers: Asbestos fibers having an aspect ratio of at least 3:1 and 5 micrometers in length.

- Authorized Visitor: Santa Ana Unified School District's Project Team members, Santa Ana Unified School District 's Representative, Observation Service and any representative of a regulatory or other agency having jurisdiction over the Work.

- Clean Room: An uncontaminated area or room which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.

- Contained Work Area: A Work Area which has been Isolated, Plasticized, and equipped with a Decontamination Enclosure System.

- Curtained Doorway: A device to allow ingress or egress from one area to another while permitting minimal air movement between the areas, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, and securing the vertical edge of the outer two sheets along the opposite vertical side of the doorway (see detail on

Decontamination Enclosure System Plan in the Drawing section of this Project Manual.)

- Decontamination Enclosure System: A series of connected rooms, with Air Locks or Curtained Doorways between any two adjacent rooms, for the decontamination of Workers and of materials and equipment. A Decontamination Enclosure System always contains at least one Air Lock to the Work Area (see standard Decontamination Enclosure System Plan in the Drawing section of this Project Manual.)

- Encapsulant (sealant): A liquid material which can be applied to Asbestos-Containing material and 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).

- Encapsulation: All herein-specified procedures necessary to apply an encapsulant to Asbestos-Containing building materials to control the possible release of Asbestos fibers into the ambient air.

- Enclosure: All herein-specified procedures necessary to enclose completely Asbestos-Containing Material behind airtight, impermeable, permanent barriers.

- Excursion Limit: An exposure of airborne concentrations of Asbestos fibers of one fiber per cubic centimeter of air (1f/cc) as averaged over a sampling period of thirty (30) minutes.

- Equipment Room: A contaminated area or room which is part of the Worker Decontamination Enclosure with provisions for storage of contaminated clothing and equipment.

- Equipment Decontamination Enclosure: That portion of a Decontamination Enclosure System designed for controlled transfer of materials, waste containers and equipment, typically consisting of a Washroom and a Holding Area.

- Friable Asbestos Material (40 CFR, sub-part M Definition): Material that contains more than one percent (1%) asbestos by weight and that can be broken, crumbled, pulverized, or reduced to powder by hand pressure when dry.

- Fixed Object: A unit of equipment or furniture or other building component which cannot be detached from the building or can only be detached by destructive methods resulting in irreparable damage to the item.

- Glove bag Method: A method with limited applications for removing small amounts of friable Asbestos-Containing material from HVAC ducts, short piping runs, valves, joints, elbows, and other non-planar surfaces in an Isolated (non-contaminated) Work Area. The glove bag (typically constructed of six [6] mil transparent WT plastic) has two inward-projecting long sleeve rubber gloves, one inward-projecting WT sleeve, an internal tool pouch, and an attached, labeled receptacle for Asbestos waste. The glove bag is constructed and installed in such a manner that it surrounds

the object or area to be decontaminated and contains all Asbestos fibers released during the removal process. All Workers who are permitted to use the Glove bag Method must be highly trained, experienced, and skilled in this method.

- HEPA Filter: A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97 percent of all mono-dispersed particles (Asbestos fibers) equal to or greater than 0.3 microns in mass median aerodynamic equivalent diameter.

- HEPA Vacuum Equipment: Vacuuming equipment with a HEPA filter system.

- Holding Area: A room in the Equipment Decontamination Enclosure located between the Washroom and an uncontaminated area. The Holding Area comprises an Air Lock.

- Isolation: The sealing of all openings into a Work Area.

- Isolated (non-contained) Work Area: A Work Area which is Isolated, but has not been Plasticized and may or may not be equipped with a Decontamination Enclosure System.

- Movable Object: A unit of equipment, furniture or other building component which is detached or can be detached from the building without destructive methods or results.

- Negative Air Pressure Equipment: A portable local exhaust system equipped with HEPA filtration and capable of maintaining a constant, low velocity air flow into contaminated areas from adjacent uncontaminated areas.

- Non-friable Asbestos-Containing Material: Material that contains more than one (1) percent Asbestos by weight in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the Asbestos is well bound and will not release fibers during any appropriate end-use, handling, demolition, storage, transportation, processing, or disposal.

- Observation Service: The agent of Santa Ana Unified School District or Santa Ana Unified School District Representative who shall observe the Work, perform tests, verify that abatement methods and procedures specified by the Contract Documents are being complied with, and reports all observations and test results to Santa Ana Unified School District or Santa Ana Unified School District 's Representative.

- Owner: Santa Ana Unified School District.

- Permissible Exposure Limit (PEL): An airborne concentration of asbestos, Tremolite, Anthophyllite, Actinolite, or a combination of these minerals in excess of 0.1 fibers per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by OSHA 29 CFR standards 1926.1101.

- Personal Monitoring: Sampling of Asbestos fiber concentrations within the breathing zone of an Asbestos Worker.

- Plasticize: To cover floors, walls and other structural elements of a Work Area with plastic sheeting as herein specified with all seams securely taped.

- Removal: All herein-specified procedures necessary to remove Asbestos-Containing materials from the designated areas and to dispose of these materials at an acceptable site.

- 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, and suitably arranged for complete showering during decontamination. The Shower Room comprises an Air Lock between contaminated and clean areas.

- Surfactant: A chemical wetting agent added to water to reduce surface tension and improve penetration.

- Washroom: A room between the Work Area and the Holding Area in the Equipment Decontamination Enclosure System where equipment and waste containers are decontaminated. The Washroom comprises an Air Lock.

- Wet Cleaning: The process of eliminating Asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as Asbestos-contaminated waste.

- Work Area (Also known as "Regulated Area"): Designated rooms, spaces, or areas of the Project in which Asbestos Abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A Contained Work Area is a Work Area which has been Isolated, Plasticized, and equipped with a Decontamination Enclosure System. An Isolated (non-contaminated) Work Area is a Work Area which is Isolated, but has not been Plasticized and may or may not be equipped with a Decontamination Enclosure System.

- Worker Decontamination Enclosure System: That portion of a Decontamination Enclosure System designed for controlled passage of Workers, and other personnel and Authorized Visitors, typically consisting of a Clean Room, a Shower Room, and an Equipment Room.

END OF SECTION