KENTFIELD CAMPUS
FUSSELMAN HALL WINDOW REPLACEMENT
PROJECT
#15-0324

Marin Community College District, Novato, CA

Addendum No. 1
4/24/2015

PROJECT MANUAL

Item #1  1.15  NOTICE OF AWARD
Replace document in entirety with revised/updated document

Item #2  1.16  AGREEMENT
Replace document in entirety with revised/updated document

Item #3  1.22  GENERAL CONDITIONS
8. Revise Heading to: RESPONSIBILITY OF GENERAL CONTRACTOR

Item #4  1.22  GENERAL CONDITIONS
8.d  Add the following to examples of applicable District policies and procedures:
   • Speed limits
   • Use of flaggers guiding equipment and vehicles on campus
   • No Smoking

Item #5  1.22  GENERAL CONDITIONS
40. CONSTRUCTION WASTE MANAGEMENT REQUIREMENTS
Revise alpha section numbers to be “a” thru “j”. (There were two “b” sections previously.)

Item #6  2.1  SUMMARY OF WORK
1.02  SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS
Replace Section 1.02 with:

A. The Work of this Contract may consist of the following:

Abatement of lead from painted windows, frames, sills and other trim pieces or adjacent plaster as well as potential abatement of asbestos containing material such as window putty. Selective demolition of existing window coverings, protection rails, wood windows and building framing/finishes as required to replace windows with visually and operationally similar aluminum windows set into the existing or retrofitted building wood framing. The existing wood remains at the
head, jam and sill per drawing details. The work also includes patching and painting of adjacent surfaces to achieve a matching/cohesive finish.

**Work must occur during the summer break starting no sooner than May 23, 2015 and completing by August 16, 2015. Contractor may be allowed to work weekends, at the sole discretion of the District to achieve the August 16, 2015 date.**

B. The work may also include the abatement of lead paint on existing double hung wood windows (Similar in size and shape to Type C windows) that are part of existing façade (stucco) panels that were salvaged from campus buildings that were recently demolished. There are two panels, one being approximately 20 feet wide by 12 feet high and the other being smaller, which contain 3 each of the referenced windows.

The panels are located in and outside of cargo containers near the Kentfield campus athletic fields at 700 College Avenue. Contractor shall coordinate moving and staging the panels for access with the District.

C. The work may also include the demolition the lattice woodwork and roofing at the entry of Fusselman Hall that faces the Science, Math, Nursing building/Orbit Court. There may be asbestos containing roofing mastic or other materials that would require special handling. Exterior finishes will need to be patched to match.

D. The work does not include the overall painting of the exterior building. Only touch-up/patch to match painting is required. Interior patching may require wall-to-wall painting where work is performed.

E. The work does not include the reinstallation of existing window coverings/blinds or the installation of new window coverings/blinds.

F. Perform the Work under a single, fixed-price Contract.

**Item #7 2.1 SUMMARY OF WORK**
Revise numerical sections to be “1.01” thru “1.10”. (1.03 was previously omitted)

**Item #8 ADD SPECIFICATION and APPENDIX SECTIONS (ATTACHED):**

- 02 41 19 SELECTIVE REMOVAL
- 02 82 13 ASBESTOS ABATEMENT
- 02 83 00 LEAD-IMPACTED CONSTRUCTION AND ABATEMENT
- 07 92 00 JOINT SEALANTS
- 08 51 13 ALUMINUM WINDOWS
- 09 91 00 PAINTING

APPENDIX G – ASBESTOS & LEAD INSPECTION FORM
**DRAWINGS:**

**A-202:** The asterisk at the “B₁” windows to be abated and replaced in Room 122 indicates the need to remove and replace the existing window mounted air conditioning unit.

**A-202 & A-501:** The “B₁” windows to be abated and replaced in Restroom 121 shall have “obscure” glass rather than clear as appropriate for privacy.

**A-302:** The “N” designation at the upper set of three windows between column lines 1 & 2 indicate “No Work”. These windows were previously removed and replaced with an aluminum sliding door set that is shown on the plan in Room 223 on sheet A-202. The elevations on A-302 were not revised to show existing conditions in this area.

**A-303:** “A₁” windows shall have fixed MapeSpan, or equal spandrel glass (color selected by District) in the MIDDLE SECTION to conceal the upper level floor structure.

The UPPER SECTIONS of these windows will require existing wood protection bars to be removed and replaced with code compliant protection due to their proximity to the floor level.

**A-501:** “N” Windows shall receive no work except cleaning at the end of the project for a uniform look.

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**Acknowledge receipt of this Addendum #1 below and attach and return with bid.**

**Name of Company:**

________________________________________________________________

**Signature of Individual authorized to sign for company:**

Name Printed: ____________________________________________

Date: _________________________________

END
SECTION 02 41 19

SELECTIVE REMOVAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Removal of selected portions of building or structure.
2. Salvage of existing items to be reused, recycled, or returned to Owner.

B. Related Requirements:

1. Division 01 Section "Summary of Work" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Division 01 Section "Cutting and Patching" for cutting and patching procedures.

1.3 DEFINITIONS

A. "Reinstall": Carefully detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall as indicated.

B. "Remove": Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

C. "Remove and Deliver to Owner" or "Salvage and Deliver to Owner": Carefully detach from existing construction, in a manner to prevent damage, and deliver to location designated by Owner, within School District.

D. "Replace": Remove items and provide new items as indicated per specifications.

E. "Salvage and Stock Pile for Reuse": Detach items from existing construction, prepare for reuse, and stockpile on site. Reinstall where indicated.

F. "Existing to Remain": Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed or salvaged.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, removal waste becomes property of Contractor.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.
B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Removal Activities: Indicate the following:

1. Detailed sequence of selective removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.

D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner or stock piled on site for reuse prior to start of removal work. Provide report for each item to be salvaged and condition.

E. Pre-Removal Photographs or Video: Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged, either delivered to Owner or reinstalled.

1.7 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective removal.

C. Storage or sale of removed items or materials on-site is not permitted.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective removal operations.

1. Maintain fire-protection facilities in service during selective removal operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective removal required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, or preconstruction videotapes.
1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective removal or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

A. Site Access and Temporary Controls: Conduct selective removal and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities".

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective removal area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective removal of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective removal operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being removed.
   1. Strengthen or add new supports when required during progress of selective removal.

3.3 SELECTIVE REMOVAL, GENERAL

A. General: Remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective removal systematically, from higher to lower level. Complete selective removal operations above each floor or tier before disturbing supporting members on the next lower level.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
   5. Maintain adequate ventilation when using cutting torches.
   6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   8. Locate selective removal equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of removed items and materials promptly.

B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not remove building elements beyond what is indicated on Drawings without Architect's approval.

C. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to Owner's storage area off-site designated by Owner, within School District.
   5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective removal. When permitted by Architect, items may be removed to a suitable, protected storage location during selective removal and cleaned and reinstalled in their original locations after selective removal operations are complete.

3.4 DISPOSAL OF REMOVED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Do not allow removed materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn removed materials.

C. Disposal: Transport removed materials and dispose of at designated spoil areas on Owner's property.

D. Disposal: Transport removed materials off Owner's property and legally dispose of them.

3.5 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective removal operations. Return adjacent areas to condition existing before selective removal operations began.

END OF SECTION
PART 1 - GENERAL

1.1 Introduction

1.1.1 Perform all planning, administration, execution, and cleaning necessary to safely remove asbestos-containing or contaminated materials.

1.2 Description of the Abatement Work

1.2.1 The asbestos abatement shall also include, but not be limited to the following:

(a) Notification to regulatory agencies
(b) Regulatory permits, licenses and approvals
(c) Worker health and safety program
(d) Air monitoring
(e) Construction of temporary containment barrier/decontamination enclosures
(f) Preparation for abatement operations
(g) Removal of existing asbestos-containing material
(h) Transport and disposal of asbestos-containing material
(i) Decontamination and cleaning
(j) Application of lockdown encapsulants
(k) Removal of temporary containment barrier/decontamination enclosures
(l) Final job close-out

1.2.2 Summary Listing of Work Locations and Approximate Quantity: The Contractor shall review all contract documents and make a site visit to make their own determination about quantity values prior to applying for the required federal, state, or local permits from agencies having authority or jurisdiction.

1.2.3 Drawings and Other Information: Drawings of the project area(s) and the reference location(s) within the buildings will be provided to assist in the Contractor's planning of the abatement work effort for protection of workers, occupants, and contents.

1.2.4 Other Work Not Included: Concurrently with this contract, the District’s representative reserves the right to collect and analyze samples or retain an independent testing laboratory to provide supplemental sampling services. These
services will in no way relieve the Contractor from compliance liability nor from providing the testing required by these specifications or any other requirements of other agencies with jurisdiction authority.

NOTE: The District has contracted independent air monitoring and testing services. The Contractor shall use a different firm for air monitoring and testing on this project (as applicable).

1.3 Definitions

1.3.1 Abatement: Procedures to control or eliminate fiber release from asbestos-containing building materials to include encapsulation, enclosure, and removal.

1.3.2 Abatement Work Area (regulated area): An area established by the employer to demarcate areas where Class I, II, III and IV asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

1.3.3 Airlock: Two curtained doorways spaced a minimum of one meter apart from an airlock in the abatement worker/equipment decontamination and waste load-out enclosures.

1.3.4 Air Filtration Units: A local exhaust unit, utilizing HEPA filtration and capable of maintaining a minimum negative pressure differential of 0.025 inches of water within the containment barrier with respect to that of the environment surrounding the containment barrier. The unit also cleans recirculated air or generates a constant air flow from adjacent areas into the abatement work area through the decontamination enclosure.

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

1.3.6 Air Pressure Monitoring: The process of measuring the air pressure differential between the containment barrier and the surrounding area using a micromanometer unit.

1.3.7 Amended Water: Water to which a surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

1.3.8 ANSI: American National Standards Institute.

1.3.9 ASTM: American Society for Testing and Materials.

1.3.10 Asbestos: Asbestiform varieties of chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

1.3.11 Asbestos-Containing Construction Material (ACCM): Any manufactured construction material which contains more than 0.1% asbestos but less than 1% asbestos by weight.

1.3.12 Asbestos-Containing Material (ACM): Any material containing more than 1% asbestos by volume of any type or mixture of types.
1.3.13 **Authorized Person**: Any person authorized by the District and required by work duties to be present in a regulated area.

1.3.14 **Caulking**: High-grade rubber base caulk for masonry and/or for other materials to be used or existing, as appropriate.

1.3.15 **Clean Room**: An uncontaminated area or room which is part of the abatement worker/equipment decontamination enclosure, with provisions for storage of workers’ or visitors’ street clothing, protective equipment and uncontaminated materials and equipment. It may be used for changing clothes.

1.3.16 **Competent Person**: In addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32 (f). In addition, the competent person shall have successfully completed training for Class I, Class II, Class III, and Class IV projects meeting the criteria set forth in the EPA Model Accreditation Plan (40 CFR 763) for project designer or supervisor, and operations and maintenance training.

1.3.17 **Containment Barrier**: A temporary enclosure constructed with fire-retardant plastic sheeting, suitable framing, and duct tape and other adhesives within the abatement work area. This barrier serves to confine the asbestos abatement and decontamination work, and to contain the release of asbestos containing dust and debris through the action of pressure differential ventilation and air filtration systems. The only entrance is via the abatement worker/equipment decontamination enclosure.

1.3.18 **Contractor**: Approved abatement contractor conducting hazardous materials abatement related to the alterations/renovations of the College of Marin, Kentfield campus.

1.3.19 **Critical Barrier**: Those portions of the containment barrier which represent the minimum structural components necessary to maintain the asbestos removal area in airtight isolation from the surrounding areas. Critical barriers shall be placed at floors, windows, ventilation louvers and other openings as necessary to achieve abatement work area isolation before putting up the double-layer plastic sheeting containment enclosure within which abatement work is performed. If a temporary plastic sheeting/stud wall must be erected, it shall be treated as a critical barrier. The double-layer plastic sheeting containment enclosure shall then be erected on that wall. Wrappings on lights, control boxes, etc., do not constitute part of the critical barrier.

1.3.20 **Curtained Doorway**: A minimum 2-flap passageway to allow access or egress from one room to another while permitting minimal air movement between the rooms of the decontamination enclosure system. It is constructed by placing 2-3 overlapping sheets of plastic sheeting at least three feet wide over an existing or temporarily framed doorway. The sheets shall be weighted at the bottom so that they close quickly after being released.

1.3.21 **Decontamination Enclosure**: A series of connected rooms with curtained doorways between each room, for the decontamination of the abatement workers and equipment/materials. A decontamination enclosure contains a minimum of three (3) separate rooms (typically with airlocks located between the rooms).
consisting of an equipment room, shower room, and clean room. The system is constructed of an air-tight, impermeable, temporary barrier. Framing for enclosure shall be metal or fire retardant pressure impregnated wood.

1.3.22 **Disposal Bag**: A properly labeled minimum 0.15 mm thick, leak-tight plastic bag used for transporting asbestos waste from the abatement work area to an EPA-approved disposal site for ACM waste.

1.3.23 **Disturbance**: Contact which releases fibers from ACM or PACM or debris containing ACM or PACM. This term includes activities that disrupt the matrix of ACM or PACM, render ACM or PACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 1.52 m in length and width.

1.3.24 **Encapsulant**: A material applied after the removal of ACM or to the ACM-edges of partially abated substrates which surrounds or embeds residual asbestos fibers in an adhesive matrix to prevent their release into the atmosphere. Encapsulation for purpose of final lockdown is not to be accomplished until after the project has passed final air clearance tests and the District’s representative has authorized removal of the containment.

1.3.25 **Enclosure**: Procedures necessary to completely enclose material containing asbestos behind airtight, impermeable, permanent barriers.

1.3.26 **Equipment Room**: A contaminated area or room which is part of the decontamination enclosure, with provisions for storage of contaminated clothing and equipment and cleaning supplies for decontamination of equipment. Airlocks are required at all entrances to the equipment room.

1.3.27 **EPA**: United States Environmental Protection Agency.

1.3.28 **Fiber**: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.

1.3.29 **Fixed Object**: A unit of equipment or furniture in the abatement work area which cannot be removed from the abatement work area.

1.3.30 **Glove Bag**: A pouch, typically constructed of a minimum 0.15 mm thick, 1.5 m x 1.5 m (maximum), transparent polyethylene or polyvinylchloride plastic, with inward projecting sleeve gloves to abate ACM in a sealed micro-environment with designated inlets for amended water and sealant application, and a HEPA filtered vacuum unit attachment. The pouch has capacity for tool storage and to hold removed ACM.

1.3.31 **GFCI (Ground Fault Circuit Interrupter)**: A type of ground fault protection in areas where personnel are at high risk of receiving electrical shocks (for example, in damp locations); makes use of a device designed to trip at a ground current in the milliampere range, i.e., very much below currents that are normally harmful.

1.3.32 **HEPA Filter**: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of all mono-dispersed particles 0.3 micrometer in diameter or larger.
1.3.33 **HEPA-Filtered Vacuum Cleaner**: HEPA-filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers.

1.3.34 **Holding Area**: A chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system.

1.3.35 **Impermeable Waste-Disposal Containers**: Containers suitable to receive and retain any asbestos-containing or contaminated material until disposal at an approved site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1910.1001 and 29 CFR 1926.1101. Containers must be both water-tight and air-tight.

1.3.36 **Lockdown**: The process of applying encapsulant as a finishing coat to abated surfaces after project has successfully passed final air clearance tests and the District’s representative has authorized removal of containment.

1.3.37 **Movable Object**: A unit of equipment or furniture in the abatement work area which can be removed from the abatement work area.

1.3.38 **MSHA**: Mine Safety and Health Administration.

1.3.39 **Negative Exposure Assessment**: A demonstration by the contractor, which complies with the criteria in OSHA 29 CFR 1926.1101(f)(2)(iii), that employee exposures during an operation are expected to be consistently below the PELs. Such assessment is to be used to justify level of respiratory protection to be used on the job.

1.3.40 **NESHAPs**: National Emissions Standard for Hazardous Air Pollutants.

1.3.41 **N.E.C.**: National Electrical Code.

1.3.42 **NIOSH**: National Institute for Occupational Safety and Health.

1.3.43 **OSHA**: Occupational Safety and Health Administration.

1.3.44 **PACM**: Presumed Asbestos-Containing Material, meaning thermal system insulation and surfacing material found in buildings constructed no later than 1980.

1.3.45 **PEL**: Permissible Exposure Limit.

1.3.46 **Personal Monitoring**: Sampling of asbestos fiber concentrations within the breathing zone of an employee. Breathing zone is defined as a radius of 150 mm to 250 mm around the employee’s head.

1.3.47 **Personal Protective Equipment**: Equipment which may consist of coveralls, shoes, gloves, helmet, goggles, respirator used for protection against asbestos exposure.

1.3.48 **Plastic Sheeting**: Fire retardant Polyethylene sheet material of specified thickness used for protection of walls, floors, etc., and critical barriers in the abatement work area.

1.3.49 **Protection Factor**: The ratio of the ambient concentration of an airborne
substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

1.3.50 **Respirator**: A device designed to protect the wearer from the inhalation of harmful atmospheres and approved by NIOSH or MSHA for a specific category of use.

1.3.51 **Surfactant**: A chemical wetting agent added to water to decrease surface tension and improve material penetration.

1.3.52 **Tape**: Glass fiber or other tape capable of sealing joints of adjacent sheets of plastic (0.15 mm polyethylene) and for attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions, including use of amended water. Minimum tape width shall be 51 mm.

1.3.53 **Warning Labels and Signs**: As required by OSHA regulations 29 CFR 1910.1001 and 1926.58.

1.3.54 **Waste Water Filters**: Discharged liquids shall pass through a primary filter and the output shall be particles 20 microns or smaller. The secondary filter shall have output particles 5 microns or smaller.

1.3.55 **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 amended water.

1.4 **Regulations and References**

1.4.1 **Regulations**: Contractor shall comply with the most current edition of all federal, state, county, and city codes and ordinances as applicable. Contractor shall make available for review at the site one copy of all applicable federal, state, county and city regulations governing the abatement work, including but not limited to:

1.4.1.1 **Occupational Safety and Health Administration (OSHA), U.S. Department of Labor**

(a) 29 CFR 1910 (General Industry) and 29 CFR 1926 (Construction) Occupational Safety and Health Standards

(b) 29 CFR 1910.1001 and 29 CFR 1926.1101 Asbestos

(c) 29 CFR 1910.134 Respiratory Protection

(d) 29 CFR 1910.1200 Hazard Communication

1.4.1.2 **U. S. Department of Transportation**

(a) 49 CFR 171 Subchapter C, Hazardous Materials Regulations

(b) 49 CFR 172 Subchapter C, Shipping Container Specifications

1.4.1.3 **U.S. Environmental Protection Agency**
(a) 40 CFR 763, Toxic Substances Control Act; particularly Subpart E, Asbestos Containing Materials in Schools

(b) 40 CFR 61, Sub-parts A and M, National Emission Standard for Hazardous Air Pollutants (NESHAPS)

1.4.1.4 American National Standards Institute (ANSI), 1430 Broadway, New York, New York 10018. Telephone (212)354-3300

(a) ANSI Publication Z88.2 Practices for Respiratory Protection

1.4.1.5 American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103. Telephone (215) 299-5400

(a) ASTM Standard P-189 Specification for Encapsulants for Friable Asbestos Containing Building Materials Proposal

1.5 Daily Reports

1.5.1 The Contractor shall correspond with the District representative for all matters related to this construction project, unless otherwise directed.

1.5.2 All correspondence with the District’s representative shall be in the English language, signed and dated by the Contractor.

1.5.3 Reference General Conditions (Construction Contract Clauses) and Specifications Division 1 for Supplementary Conditions for Construction.

1.5.4 The Contractor shall maintain daily logs and reports of job-site activities and personnel exposure monitoring at the site and shall provide copies to the District’s representative for inspection upon request.

1.5.5 The Contractor shall maintain daily reports. Reports shall be numbered consecutively and all sections shall be completed or noted as 'not applicable.’ Each day’s report shall contain detailed remarks including but not limited to progress on the job, problems discovered, and discussions with District’s representative. Reports shall be submitted to the District’s representative each day for the previous work day. Copies shall be maintained at the job-site and made available to the District upon request.

1.5.6 Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures, equipment or power failure, high airborne fiber reading), prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information.

1.5.7 Accident Reporting: Report all accidents to the District and/or District’s representative. Prepare reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury. Report shall be submitted to the District and/or District’s representative.
1.5.8 Waste Manifest-Asbestos: At completion of hauling and disposal of each load, submit a copy of waste manifest, chain of custody form, and landfill receipt to the District and/or District’s representative. Waste manifest to be submitted shall be signed by the contractor, waste transporter, and the disposal facility. A copy of all manifests will be included in the post-job submittal.

1.5.9 Waste Manifest-Hazardous Waste: Any hazardous waste generated as a result of asbestos abatement activities will be disposed of by a Certified Hazardous Waste Disposal Contractor. A copy of the Hazardous Waste Manifest generated by this disposal is to be submitted to the District and/or District’s representative. A copy of all manifests will be included in the post-job submittal.

1.6 Product Handling

1.6.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

1.6.2 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

1.6.3 Remove from the premises all damaged or deteriorated materials. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards and these specifications.

PART 2 - PRODUCTS

2.1 Materials

2.1.1 Caulking: High-grade rubber base caulk for masonry and/or for other materials.

2.1.2 Encapsulant: Product shall be rated as acceptable for use intended when field tested in accordance with ASTM Proposed Specification P-189 “Specification for Encapsulants for Friable Asbestos Containing Building Materials”. Use only materials that have a flame spread index of 25 or less when dry, when tested in accordance with ASTM E-84.

2.1.3 Glove-Bag: 0.15 mm thick, 1500 mm x 1500 mm, transparent polyethylene or polyvinylchloride plastic with long sleeve gloves, designated inlets for HEPA vacuum attachment, and storage pouch.

2.1.4 Impermeable Waste-Disposal Containers: Suitable to receive and retain any asbestos-containing or contaminated material until disposal at an approved site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1910.1001 and 29 CFR 1926.1101. Containers must be both water-tight and air-tight.

2.1.5 Plastic Sheeting: Product Standard PS 17-69 and OSHA Regulation 29 CFR 1926.1101; Polyethylene plastic sheeting material 0.15 mm thickness for covering floors and walls, providing air locks, and sealing doors and windows; supply in appropriate widths to minimize seams. Must be flame-resistant material and must meet test criteria in NFPA 701. Reinforced sheeting is required for applications subject to wear and tear.
2.1.6 Surfactant (Wetting Agent): 50% polyoxyethylene ester and 50% polyoxyethylene ether, or approved equal, shall be mixed with water to provide a concentration of 2 ml surfactant to 1 liters—of water, or manufacturer's recommended concentration.

2.1.7 Tape: Glass fiber or other tape capable of sealing joints of adjacent sheets of plastic sheeting and for attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions, including use of amended water. Minimum tape width shall be 50 mm.

2.1.8 Warning Labels and Signs: As required by OSHA regulations 29 CFR 1910.1001 and 1926.58.

2.1.9 Waste Water Filters: Discharged liquids shall pass through a primary filter and the output shall be particles 20 microns or smaller. The secondary filter shall have output particles 5 microns or smaller.

2.2 Equipment

2.2.1 Air Filtration Units: Shall be equipped with HEPA filters (final), pre-filters, instrumentation to monitor pressure differential, and safety and warning devices.

2.2.1.1 Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL).

2.2.1.2 Access to the units for replacement of all air filters shall be from intake end. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps. The filter media shall be completely sealed on all edges with a structurally rigid frame with a continuous rubber gasket.

2.2.1.3 HEPA Filters: Provide units equipped with HEPA filters. Filters shall be individually tested and certified by the manufacturer.

2.2.1.4 Pre-filters: Provide a two-stage pre-filtration to extend the life of the primary HEPA filter. The first-stage pre-filter is a low-efficiency type effective for particles 100 micrometers and larger. The second-stage (or intermediate) filter has a medium efficiency effective for particles down to 5 micrometers.

2.2.1.5 Instrumentation: Provide units equipped with a magnehelic gauge or manometer to measure the pressure drop across filters and to indicate when filters have become loaded and need to be changed. A table indicating the usable air-handling capacity for various static pressure readings on the magnehelic gauge shall be affixed near the gauge for reference, or the magnehelic reading indicating at what point the filters should be changed, noting cubic feet per minute (CFM) air delivery at that point. Provide an elapsed time meter to show the total accumulated hours of operation.

2.2.1.6 Safety and Warning Devices: Provide units with the following safety and warning devices:

(a) Warning lights to indicate normal operation, too high a
pressure drop across the filters (i.e., filter overloading), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge)

(b) GFCIs.

(c) Audible alarm if unit shuts down due to operation of safety systems.

(d) Electrical overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be grounded.

2.2.2 Respirators and Respirator Systems

222.1 Product Data: Must possess NIOSH and MSHA approval for each component in an assembly and/or for entire assembly.

PART 3 - EXECUTION

3.1 Controlled Access to Site

3.1.1 Access to the abatement work area shall be restricted to contractor's workers and authorized visitors as defined in these specifications.

3.1.2 Authorized visitors shall have access to the work site at all times following notification to the District and/or District's representative. Contractor shall supply protective clothing and equipment for visitors as necessary, except for respirators which are to be provided by the visitor in accordance with Section 3.4 of this document.

3.1.3 Contractor shall prominently post signs at all potential entry points to the abatement work area which clearly state: "Restricted Area Under Construction-Admittance by Special Permission Only - Protective Clothing Required Beyond This Point". Immediately inside entry point and outside critical barriers post a warning sign meeting specifications of OSHA 29 CFR 1910 and 1926. Suggested format is a sign of minimum size 508 mm by 356 mm displaying the following legend:

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

3.1.4 All workers and authorized visitors shall enter the abatement work area only through the abatement worker/equipment decontamination enclosure, in accordance with Section 3.3 of this document.
3.1.5 All workers and authorized visitors, before entering the abatement work area, shall read and be familiar with all posted regulations, personal protection requirements, and emergency procedures and exit routes.

3.1.6 Contractor shall maintain a daily job-site personnel log listing names and social security numbers of individuals who entered the abatement work area, and the times of entering and leaving the area.

3.2 Worker and Visitor Protection

3.2.1 No eating, drinking, smoking, or chewing gum is permitted within the abatement work area. The District and/or District’s representative shall designate a "break area" where these activities, except for smoking, are permitted. Smoking is prohibited in all District facilities/buildings.

3.2.2 Workers and Visitors shall be fully protected with respirators and protective clothing during any work which may disturb asbestos-containing materials and result in fiber release. Full protection is not required during pre-abatement inspections of the containment, while abatement work is not being conducted.

3.2.3 Protective Clothing and Equipment: Provide workers and visitors with sufficient sets of protective full-body clothing, to include full body coveralls with hood, boots (for workers) and footwear coverings (for workers and visitors), and gloves. Provide eye protection and hard hats as required by applicable safety regulations. Contaminated non-disposal clothing and footwear shall be left in the equipment room until the end of the asbestos abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos or asbestos-containing material. Contractor shall have at least six (6) sets of disposable protective full body clothing for District’s representative and authorized visitors for each work day. Provide storage facilities for visitors and workers for removed street clothing in the clean room.

3.2.3.1 Boots: Provide workers non-skid type work boots with protective shields as required by OSHA. Paint uppers of boots with red waterproof enamel paint as a permanent marking that the boots have been exposed to ACM abatement work areas. These boots are to be handled as asbestos-contaminated materials.

3.2.3.2 Hard Hats: Provide hard hats that meet ANSI Z89.1 for use where work is overhead, scaffolding is being used, or as otherwise required by OSHA. Label hats with same warning labels as required for ACM disposal bags.

3.2.3.3 Goggles: Provide goggles that meet ANSI Z87.1 as required by OSHA.

3.2.3.4 Gloves: Provide disposable work gloves for use in the abatement work area.

3.2.3.5 Coveralls with Hood: Provide disposable coveralls with hoods for use in the abatement work area.

3.2.3.6 Respirators: Provide workers with personally issued and marked respirator equipment approved by NIOSH/MSHA and, in accordance with these specifications, suitable for the asbestos exposure level in the abatement work area. Where respirators with disposable filters are
employed, provide sufficient filters for replacement as necessary by the
abatement worker, or as required by the applicable regulation. Authorized
visitors must provide their own respirators, with fresh filters or cartridges as
necessary, to enter the abatement work area. These are minimum
requirements. Section 3.4 of this document is to be consulted for more detail.

3.3 Abatement Work Area Entry and Exit Procedures

3.3.1. Each time the abatement work area is entered workers/visitors will remove all
street clothes in the clean room of the decontamination enclosure and put on new
disposable coveralls, new head cover, and a clean respirator. Proceed through
shower room to equipment room and put on work boots.

3.3.2 Each time the abatement work area is exited, the following procedures shall
be followed:

3.3.2.1 Before leaving the regulated area, employees shall remove all
gross contamination and debris from their protective clothing.

3.3.2.2 Employees shall remove their protective clothing in the equipment
room and deposit the clothing in labeled impermeable bags or containers.

3.3.2.3 Employees shall not remove their respirators in the equipment room.

3.3.2.4 Employees shall shower prior to entering the clean room.

3.3.2.5 After showering, employees shall enter the clean room before
changing into street clothes.

3.4 Respiratory Protection

3.4.1 Contractor is hereby advised that asbestos has been determined by the U.S.
Government to be a CANCER-CAUSING AGENT. Provide workers with respirators
[which, as a minimum, meet the requirements of OSHA 29 CFR 1926.1101] and
protective clothing during all phases of the abatement work and until final air tests
are accepted by District and/or District’s representative.

3.4.2 The Contractor shall select respirators from among those jointly approved as
being acceptable for protection by the MSHA and the NIOSH under the provisions of
30 CFR Part 11.

3.4.3 The Contractor shall select and provide respirators (at no cost to the
employee) and shall ensure that the employee uses the respirator provided.

3.4.4 Instruct and train each worker involved in asbestos abatement or
maintenance and repair of asbestos-containing materials in proper respiratory use
and require that each worker always wear in the abatement work area a
respirator, properly fitted on the face. The respirator shall be worn from the start of
any operation which may cause airborne asbestos fibers until the abatement
work area is completely decontaminated.

3.4.5 Allow an individual to use only those respirators for which training and fit-
testing has been provided. Require that each time an air-purifying respirator is put
on it be checked for fit with a positive and negative pressure fit test in accordance with the manufacturer’s instructions or ANSI Z88.2.

3.4.6 For all jobs that involve the removal of thermal system insulation (TSI) or surfacing materials (OSHA definition of Class I work) the employer shall provide respirator protection in accordance with 29 CFR 1926.1101 (h) Table 1 - Respiratory Protection for Asbestos Fibers. This level of respiratory protection shall be maintained until the employer can produce a negative exposure assessment.

3.4.7 For all other abatement work, use respiratory protection appropriate for the fiber level encountered in the abatement work area or as required for other toxic or oxygen-deficient situations encountered. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the permissible exposure limit (PEL) is the minimum level of protection allowed. (Table 1, Respiratory Protection for Asbestos Fibers, 29 CFR 1926.1101) Do not use single-use, disposable, or quarter-face respirators.

3.4.8 Authorized visitors are responsible for providing their own respirator and replacement filters and cartridges, with the exception of Type C which shall be provided by Contractor, and for having been previously and properly trained and fit-tested, for the respirator used.

3.4.9 For use with air-purifying respirators provide, at a minimum, HEPA-type filters certified by NIOSH and MSHA for protection against asbestos fibers. In addition, a chemical cartridge may be added, if required for protection against chemicals used on this job.

3.4.10 For use with powered air purifying respirators, supply a sufficient quantity of HEPA filters approved for asbestos, so workers can change filters at any time when flow through the face piece might decrease to the level at which the manufacturer recommends filter replacement.

3.4.11 For supplied-air respirator systems, provide equipment capable of producing air used for breathing in Type "C" supplied air respiratory systems that meets or exceeds standards set for C.G.A. Type 1, Gaseous Air, Grade D. (See 1.5.2.15) System must be certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure face-piece including as a minimum the following:

- Auxiliary backup
- system Escape air
- supply Backup air
- supply Warning
- Alarm Device
- Compressor Shut Down
- Compressor Motor (electric)
- Compressor Location (outside building) Air Intake
- After-Cooler
3.5 Air Monitoring; Stop Action and Clearance Levels

3.5.1 This section describes work being performed by the District’s representative. The District’s representative will not be performing air monitoring to meet Contractor’s OSHA requirements for personal sampling or any other purpose. The Contractor is to conduct air monitoring required by OSHA for Contractor personnel.

3.5.2 Analytical Methods: The following method will be used by the District’s representative in analyzing filters used to collect air samples. Minimum sample volumes will be 1200 liters for clearance samples.

   3.5.2.1 Phase Contrast Microscopy (PCM) - will be performed using the OSHA Reference Method, Appendix A to 29 CFR 1926.1101, or NIOSH Method 7400 (non-aggressive methods).

3.5.3 Daily: From start of abatement work through project decontamination, the District’s representative may be taking samples on a daily basis inside and outside each abatement work area.

3.5.4 Stop Action: If any air sample taken outside of the abatement work area exceeds 0.01 f/cc, immediately and automatically stop all work except corrective action. The District’s representative and the abatement contractor will determine the source of the high reading.

3.5.5 Abatement Work Area Final Clearance Levels: The District’s representative standard for abatement work area final clearance for removing the containment and re-occupancy is less than 0.01 f/cc by PCM. All final air samples will meet these criteria.

3.6 Initial Isolation of Abatement Work Area

3.6.1 Contractor shall completely separate the abatement work area from other portions of the building, and the outside, by sealing all openings (windows, doorways, elevator openings, corridor entrances, drains, ducts, grill, diffusers, skylights, etc.) with barriers of 0.15 mm polyethylene sheeting and tape, or by sealing cracks leading out of the abatement work area. Contractor shall caulk the joints and seal holes in that portion of the walls, ceiling, and floor inside the abatement work area that could allow airborne asbestos fibers to be carried into adjoining spaces, or the exterior. Note in particular where pipes, conduit, and ductwork penetrate walls, ceilings and floor. Doorways and corridors which will not be used for passage during work must be sealed with 9.5 mm plywood, wood framing and plastic sheeting with tape.

3.6.2 All heating, ventilating, and air conditioning (HVAC) components that are in, supply, or pass through the abatement work area shall be shut down. During asbestos removal and until job completion, elevators, exhaust fans, and HVAC vents and intakes will be key-locked to not operate in the abatement work area.

Coordinate with the District’s representative which areas are to be shut down and for what duration. Seal all intake and exhaust vents, and seams in system components, with a double layer of 0.15 mm polyethylene sheeting.

3.6.3 If it becomes necessary to shut down electric power to the enclosed

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abatement work area, then the contractor shall provide temporary power and lighting and ensure safe installation of temporary power sources and equipment in accordance with NFPA 70 electric code requirements.

3.6.4 Arrange for the abatement work area to be locked during non-work hours. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Remove deadbolts and padlocks. Provide one key (to be held by District’s representative on site) to the District.

3.7 Preparation of Abatement Work Area and Temporary Enclosures

3.7.1 Methods for surface decontamination and/or disposal of unsalvageable objects shall be determined with the input from the District and/or District’s representative.

3.7.2 Clean all contaminated furniture, equipment, and supplies with a HEPA-filtered vacuum cleaner or by wet wiping, as directed by the District’s representative, prior to being moved or covered.

3.7.3 Before removal, clean by HEPA-filtered cleaner and/or by wet wiping, all electrical and mechanical items, (such as lighting fixtures, clocks, diffusers, registers, etc.) and general construction items (such as cabinets casework, door and window trim, moldings, etc.) which cover the surface of the abatement work as required to prevent interference with the abatement work. Re-install all such materials upon completion of the removal work with materials, finishes, and workmanship to match existing installations before start of work (as applicable).

3.7.4 Remove all removable furniture, equipment, and supplies that have been deemed by the District’s representative to be uncontaminated, or completely cover with 2 layers of polyethylene sheeting, at least 0.15 mm in thickness, securely taped in place with duct tape. Such furniture, equipment, and supplies shall be considered outside the abatement work area unless covering plastic or seal is breached.

3.7.5 Clean all surfaces in abatement work area with a HEPA-filtered vacuum cleaner or by wet methods prior to installation of primary barrier.

3.7.6 All critical barriers, including ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, speakers, and other openings into the abatement work area shall be individually sealed with 2 layers of 0.15 mm plastic sheeting and tape. Elevator doors, fire extinguisher cabinets and all other penetration in the floor, walls, or ceiling shall be sealed in the abatement work area. If a temporary polyethylene/stud wall must be erected, that wall shall be treated as a critical barrier. The double layer polyethylene containment enclosure shall then be erected on that wall. Critical barriers shall be sealed prior to installation of primary barriers.

3.7.7 Take care in sealing of lighting fixtures and control boxes to avoid melting or burning of sheeting. The inside of unsealed lighting fixtures, control boxes, and busslines are to be cleaned by asbestos workers specially certified to work on high voltage lines.

3.7.8 Cover floor of abatement work area with 2 layers of clear polyethylene, at least 0.15 mm in thickness, turned up at the walls at least 600 mm. Both spray-glue and duct tape all seams in floor covering. Size to minimize seams.
Locate seams in top layer 2.0 meters from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer. Do not locate seams at wall/floor interface.

3.7.9 If carpeting is to remain, cover carpeting with three layers of polyethylene sheeting at least 0.15 mm in thickness. Place one layer of corrugated cardboard sheets between the top and middle layers of polyethylene.

3.7.10 Cover plastic sheeting in areas where scaffolding is to be used with a single layer of 12.7 mm fire retardant plywood. Wrap edges and corners of each sheet with duct tape.

3.7.11 Cover all walls in abatement work area including critical barrier sheet plastic with primary barrier of 2 layers of 0.15 mm polyethylene sheeting, mechanically supported and sealed with duct tape or spray-glue in the same manner as critical barrier sheet plastic. Size to minimize seams. Seams shall be staggered and separated by at least 600 mm. Wall sheeting shall overlap floor sheeting by at least 406 mm beyond wall/floor joint. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated by the District's representative.

3.7.12 Cover interior surfaces of any existing elevator with 2 layers of 0.15 mm plastic sheeting (as needed). Arrange entry to abatement work area so that elevator door is in a positively pressurized space outside the clean room of the decon unit.

3.7.13 When installing the critical and primary barriers, automatic sprinkler heads and fire detectors shall not be covered or altered to prevent or delay operation. Smoke detectors should be protected (but not completely masked) to avoid nuisance alarms during paint or demolition operations. The covers on the smoke detectors shall be removed directly after such operations and at the end of the abatement workday.

3.7.14 A secondary barrier of plastic as a drop cloth shall be used to protect the primary layer from debris and shall be rolled and disposed as contaminated waste at the end of each workday.

3.7.15 Provide emergency exiting from the enclosure as required by NFPA 101, Life Safety Code. Arrange exit door(s) so that it is secure from outside the abatement work area but permits exiting from the abatement work area. Mark outline of door on barriers with luminescent paint at least 250 mm wide. Hang a razor knife on a string beside outline. Post a sign identifying "EMERGENCY EXIT", using letters at least 150 mm high, inside outline with luminescent paint. Arrows shall be taped on the polyethylene wall covering at eye level and at floor level to indicate location of exits. At entrance to decontamination chamber, post building floor plan and escape routes, plus locations of nearest exits and phone numbers of District. Emergency lighting shall be required, in accordance with the Life Safety Code.

3.7.16 A 4.5 kg ABC type portable fire extinguisher shall be located by each exit and clean room.

3.7.17 Install inspection windows in the containment barrier enclosure system walls. Each window shall have a minimum 600 mm x 600 mm viewing area fabricated from 6.0 mm acrylic or polycarbonate sheeting. Install window with top at 2.0 m above floor height in a manner that provides unobstructed vision from outside to inside of the abatement work area. A sufficient number of windows are to be installed to provide observation of all portions of the abatement work area that can be made.
visible from adjacent areas. Provide also for viewing to be blocked from the inside with opaque plastic flap.

3.7.18 Where the abatement work area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 0.15 mm in thickness so that the abatement work procedures are not visible to building occupants. Where this visual barrier would block natural light, substitute frosted or woven rip-stop sheet plastic in locations approved by the District’s representative.

3.7.19 Provide GFCI protection for all electrical equipment.

3.7.20 Provide temporary lighting inside the decontamination enclosure facility.

3.8 Construction of Worker/Equipment Decontamination and Waste Load-Out Enclosures

3.8.1 Worker/equipment decontamination enclosures shall be provided at each location where workers shall enter or exit the abatement work area.

3.8.2 The Contractor shall construct a worker/equipment decontamination enclosure consisting of at least a clean room, a shower room, and an equipment room, each separated by 900 mm air locks. Narrower air locks may be built if approved by the District’s representative.

3.8.2.1 All rooms shall be constructed of or fully lined with 0.15 mm thick polyethylene sheeting and suitable framing to make them as air-tight as possible. Where joining separate sheets of polyethylene is necessary, the two sheets of polyethylene shall be over-lapped at least 150 mm and adhered with an unbroken line of tape in such a manner to prohibit air movement. Stagger joints. Tape shall then be used to further seal the joint on the other side of the containment barrier so that both loose edges of the overlap are completely sealed.

3.8.2.2 Doorways will consist of three 3 sheets of 0.15 mm polyethylene from ceiling to floor. The width of these polyethylene sheets shall be sufficient to prevent air movement through the doorways when closed.

These doorways shall be the only source of make-up air for the HEPA negative air filtration units under normal circumstances, unless other sources are specifically approved by the District’s representative.

3.8.2.3 Provide GFCI protection for all electrical equipment.

3.8.2.4 Provide temporary lighting inside the decontamination enclosure facility.

3.8.3 The Clean Room shall have a curtained doorway leading to the outside of the abatement work area, and an airlock leading to the shower room. The clean room shall be of sufficient size to accommodate at least one worker, and a supply of clean disposable coveralls and storage facilities for street clothing, and uncontaminated equipment.

3.8.4 The Shower Room shall have two airlocks, one adjacent to the clean room and one adjacent to the equipment room. The shower room shall provide hot and cold running water and soap and towels. It should have adequate space for a shower
stall. Waste water from the shower shall be discharged through a water filtration unit efficient to 5 microns, then to a sanitary sewer. Shower room shall have opaque walls.

3.8.4.1 **Shower Stall**: Provide leak tight shower enclosure unit with integrated drain pan fabricated from fiberglass or other durable waterproof material. Equip with hose bibs for hot and cold water. Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the abatement work area. Provide splash proof entrances. Provide back flow prevention device and vacuum breaker, where required. Connect drain to a reservoir, pump water from reservoir through filters to a drain. Mount filters inside shower stall in manner that allows for access for filters to be changed from inside the shower. Change filters daily or more often if necessary. Locate filters inside shower unit so that water lost during filter changes is caught by shower pan. Provide temporary extensions of existing (if available and authorized for Contractor use by District’s representative) hot and cold water and drainage, as necessary for a complete and operable shower.

3.8.4.2 **Filtered Waste Water Drainage**: Provide cascaded disposable HEPA filter units on drain lines from showers or any other fluid source carrying ACM. Connect so that discharged water passes primary filter and output of primary (particles 20 microns and smaller) filter passes through secondary (particles 5 microns and smaller) filter.

3.8.4.3 **Sump Pump**: Provide totally submersible waterproof sump pump with integral float switch. Provide unit sized to pump 2 times the flow capacity of all showers or hoses supplying water to the sump, through the filters specified herein when they are loaded to the extent that replacement is required. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump. Adjust float switch so that a minimum of 75 mm remains between top of liquid and top of sump pan.

3.8.5 The **Equipment Room** shall have two airlocks, one adjacent to the abatement work area and one adjacent to the shower room. The room shall be of sufficient size so as to accommodate at least one worker to change clothes, and temporarily house any equipment which the contractor wishes to store when not in use. The area shall have facilities for decontaminating material and equipment, and a container lined with 0.15 mm polyethylene bag for collection of disposable coveralls and foot coverings.

3.8.6 **Waste Load-Out Enclosure**: Asbestos-contaminated waste that has been containerized shall be transported out of the abatement work area either through the personnel/equipment decontamination enclosure or through a separate waste load-out enclosure. If a separate enclosure is used, it shall be built with two airlocks, with curtained doorways: one to the abatement work area and one to an uncontaminated area outside the abatement work area.

3.9 **Air Circulation Inside Containment Barrier**

3.9.1 **Formula for Quantity of Air-Filtration Units**: The number of air filtration units needed to achieve the required air circulation rate shall be determined by the following formula:
### Calculate

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calculate</strong></td>
<td>Volume of abatement work area (CF)</td>
</tr>
<tr>
<td><strong>Multiply by</strong></td>
<td>Number of air changes per hour, four to ten.</td>
</tr>
<tr>
<td><strong>Multiply by</strong></td>
<td>1/60 (hr/minutes)</td>
</tr>
<tr>
<td><strong>Divide by</strong></td>
<td>Capacity of air filtration unit fully loaded with all filters (pressure differential activates warning light for loaded filters)</td>
</tr>
<tr>
<td><strong>Multiply by</strong></td>
<td>80% expected efficiency</td>
</tr>
<tr>
<td><strong>Add</strong></td>
<td>One additional unit as backup for machine failure or shutdown</td>
</tr>
<tr>
<td><strong>Equals</strong></td>
<td>Minimum number of units required</td>
</tr>
</tbody>
</table>

### 3.9.2 Supplemental Makeup Air Inlets

As necessary to achieve air flow throughout the abatement work area, locate auxiliary makeup air inlets as far away as possible from the air filtration units, preferably near the ceiling and away from barriers that separate the containment barriers and enclosures from surrounding areas. Cover inlet with plastic sheeting flaps to reseal automatically if the pressure differential system should shut down for any reason. Provide rigid framing around the opening. Spray the flap and around opening with spray adhesive so that if flap closes, the meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry. If used during clearance monitoring, tape or seal HEPA filters over inlets.

### 3.9.3 Penetrations through masonry and/or fire walls, required for improving air circulation, shall be protected with a fire damper.

### 3.9.4 Accomplish the pressure differential by exhausting a sufficient volume of HEPA filtered air from the abatement work area. Efforts to achieve pressure isolation shall first address:

1. **3.9.4.1** Establishing required air circulation
2. **3.9.4.2** Verifying seals are complete as practical
3. **3.9.4.3** Establishing increased pressure in adjacent areas, if available
4. **3.9.4.4** Exhausting sufficient volume of HEPA filtered air with additional air filtration units.
5. **3.9.4.5** Decreasing the size of abatement work area to affect a smaller volume required for filtration

### 3.10 Placement of Air Filtration System Units

1. **3.10.1** Equipment shall be located so as to optimize air movement throughout the abatement work area by positioning air filtration units as far away as practical from the access opening or other supplemental make-up air inlets.
2. **3.10.2** The auxiliary air-filtration unit shall be located on site and available and ready.
to run at any time.

3.10.3 Air movement shall be established in such a way that airborne fibers will be carried away from workers' breathing zones.

3.10.4 Dead air pockets shall be minimized by proper ducting of make-up air if necessary, and by optimum location of the negative air filtration units.

3.10.5 The Contractor shall use smoke tubes to determine if dead air spots are present, and shall take corrective action as outlined above when they are found. Report such actions to the District’s representative immediately.

3.10.6 The air filtration units shall be placed so that access for changing the filters is inside the containment barrier. The unit is to run continuously during filter changing. A supply of filters shall be kept on site outside of containment area. If a unit must be turned off for servicing, an auxiliary unit must be in place and turned on.

3.10.7 Vent to the outside of the building, whenever practical, as determined by the District's representative. Units may be vented inside the building only if outside venting is impractical. Units venting inside a building must be vented through an expansion chamber or diffuser system (self-contained water baffle) to reduce exhaust air velocity. A secondary HEPA unit may also be used after the expansion chamber/diffuser. Terminal exhaust ductwork must be placed as far away as possible from occupied areas. Special provisions for air monitoring shall be implemented by the District’s representative.

3.10.8 Mount units to exhaust directly or through disposable ductwork. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit. Use spiral wire-reinforced flex duct in lengths not greater than 15 meters. If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet of spiral wire reinforced flex duct after direction change.

3.10.9 All HEPA units shall be tested in-place before removal begins. Test will be the responsibility of the Contractor.

3.11 Pressure Differential Isolation

3.11.1 The abatement work area and the decontamination enclosure system shall be maintained at a negative pressure relative to adjacent areas. The relative pressure differential when measured across any physical or critical barrier must continuously equal or exceed a static pressure of 0.025 inches (0.025”) of water. Measurement shall be by manometer or magnahelic gauge.

3.11.2 Minimum 4 air changes per hour. Continuous HEPA filtered exhaust unit is to be in operation until job is completed.

3.11.3 Make-up air shall be obtained only through the decontamination enclosure facilities, or as provided in Section 3.9.2 of these specifications.

3.11.4 Where asbestos-containing material covers an opening or joint, provide negative air pressure sufficient to draw air from the adjoining space into the containment barrier when the opening or joint is exposed after asbestos removal. Seal newly exposed openings and joints immediately to prevent contamination of adjoining spaces.
3.11.5 Supply sufficient pre-filters to allow frequent changes.

3.11.6 During and after the pre-abatement test, run the air filtration units continuously to maintain a constant pressure differential and air circulation until decontamination, cleaning, and encapsulation of the abatement work area is complete.

3.11.7 The HEPA-filtered units shall be left on continuously until after final clearance air measurement of 0.01 f/cc or the pre-removal background level, whichever is lower is achieved, and the District’s representative authorizes the shut-down of the units. Where feasible, the units shall be left on until the enclosure is completely removed.

3.11.8 HEPA units must be set up to cause an alarm-bell or buzzer to sound should the HEPA filter become clogged or the exhaust unit fails in operation after working hours. The alarm must be loud enough to alert the District’s representative of the equipment failure. The Contractor and/or District’s representative will phone a previously-designated contractor employee whose 24-hour number shall have been recorded at the beginning of the project. The notified contractor will immediately dispatch a repair crew to the job site. A spare HEPA unit shall always be available to immediately restore negative air pressure.

3.11.9 If the pressure differential between inside and outside the containment barrier drops to 0.025” of water, the Contractor will immediately inspect the containment for sources of pressure leaks and report actions taken to the District’s representative. The system warning alarm shall sound if pressure drops below 0.025” of water, and work shall stop.

3.12 Pre-Abatement Inspection, Testing, and Approval

3.12.1 Pre-Abatement Testing Requirements: Contractor must demonstrate with continuous data log that abatement work area can hold negative pressure of 0.025” of water for a minimum of 2 hours, prior to commencement of actual asbestos removal, unless the system is exhausted through an isolated ventilation system. In this case, the test period shall be long enough to ensure that the lock-out ventilation controls are not over-ridden and the HVAC system does not reactivate. As a minimum, the Contractor shall make all arrangements to demonstrate satisfactory equipment operation and set-up for compliance with these specifications.

3.12.1.1 Show proper condition of equipment seals including results of in-place HEPA-filter testing.

3.12.1.2 Show proper operation of safety and warning devices.

3.12.1.3 Show proper operation and calibration of instrumentation.

3.12.1.4 Show identification of equipment unit and fan capacity.

3.12.1.5 Use smoke tubes to demonstrate adequate air circulation, elimination of dead air pockets, positive air motion through the decontamination enclosure system into the abatement work area.

3.12.1.6 Show the installation method for pre-filters and the HEPA primary
filter in the air filtration unit. Show supply of filters available on site.

3.12.1.7 Demonstrate and record that a minimum 0.025” of water pressure differential has been achieved and can be maintained.

3.12.1.8 Demonstrate procedures for how workers will enter and exit the decontamination enclosure system.

3.12.1.9 Demonstrate procedures for handling emergencies and for the prevention of contamination of surrounding areas.

3.12.1.10 With District’s representative, identify disabled building ventilation systems and the positive means that will prevent accidental or premature re-starting. Confirm means to have unit re-started at the conclusion of the abatement work. With District’s representative, verify that all equipment affected is secured at the main breaker.

3.12.1.11 Demonstrate how contaminated shower water is filtered and drained.

3.12.1.12 Use a pressure differential meter or manometer to demonstrate the required pressure differential at every barrier separating the abatement work area from the balance of the building, equipment, ductwork or outside.

3.12.1.13 Demonstrate that each air filtration unit is serviced by a dedicated minimum 115V-20A circuit with GFCI protection.

3.12.1.14 Demonstrate how asbestos will be removed and bagged for transport. Identify procedures for hauling through the building to the loading dock.

3.13 Maintenance of Containment Barrier and Enclosures

3.13.1 Ensure that the containment barrier, decontamination enclosure rooms, and other sealed doors, vents, etc., and plastic linings are effectively sealed and taped for the duration of the abatement work.

3.13.2 Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosure at the beginning of each work period.

3.13.3 Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes exposed to (and contaminated with) asbestos shall be decontaminated or disposed of in accordance with the applicable regulations and special requirements.

3.13.4 Clean debris and residue from inside of the decontamination enclosure system on a daily basis. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

3.13.5 Maintain floors in the clean room and airlocks as dry as possible to minimize slips and trips. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

3.14 Removal of Asbestos-Containing Materials (ACM) - General
3.14.1 The following work shall be done only after the decontamination facilities have been constructed, the area has been isolated and can be maintained under negative air pressure as specified in the previous section, pre-abatement background sampling has been conducted, and arrangements have been made for disposing waste at an acceptable site.

3.14.2 Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and negative air filtration units are operating again. Immediately notify District's representative of occurrence. Any torn or unsealed plastic sheeting shall be immediately repaired. Floor sheeting shall be replaced if damaged.

3.14.3 Wet Removal: Prior to stripping and/or tooling, the asbestos material shall be sprayed using an airless pump and wetting agents (amended water or removal encapsulant) to enhance penetration and reduce fiber dispersal into the air.

3.14.3.1 A fine spray of amended water shall be applied to reduce fiber release preceding the removal of the asbestos material. The material shall be sufficiently saturated to prevent emission of excessive airborne fibers.

3.14.3.2 Spray material repeatedly during the abatement work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's instructions. Perforate outer covering of any insulation which has been painted and/or jacketed in order to allow penetration of water, amended water or removal encapsulant. Where necessary, carefully strip away while simultaneously wetting the insulation to minimize dispersal of asbestos fibers into the air.

3.14.3.3 Remove materials in manageable quantities and control the descent to the staging or floor below. If over 6 meters, use drop chutes to contain material during descent.

Gross removal of dust and debris from contaminated material, material containers, and equipment shall be accomplished in the containment barrier before removal to the equipment decontamination room for wet sponging before leaving the abatement work site.

3.15 Requirements for Specific ACM and Methods - Vinyl Floor Tile (VFT) and Mastic

The removal of the VFT and mastic shall be performed as a Class II work activity in accordance with the procedure outlined below. Dispose of as ACM.

3.15.1 Full containment barriers, with pressure differential ventilation units, shall be used.

3.15.2 Removal of asbestos-containing VFT and mastic shall be performed in accordance with the procedure outlined below.

(a) Prepare abatement work area as previously specified for the abatement work.

(b) All critical barriers, including ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, speakers, and other openings into the work area shall be individually sealed with 0.15 mm plastic sheeting and tape. Elevator doors, fire extinguisher cabinets and all other
penetrations in the floor, walls, or ceiling shall be sealed in the abatement work area.

(c) Prepare a worker and/or equipment decontamination and waste load-out enclosure as previously specified.

(d) Cover all walls in the abatement work area with two layers of 0.15 mm polyethylene sheeting and seal with duct tape or spray-glue. The sheeting shall be applied to a height of 1.5 m above the floor. The seams shall be staggered and separated by at least 150 mm.

(e) Wet asbestos-containing materials with amended water to minimize fiber release during removal. Use amended water sparingly to eliminate standing water and to prevent water from traveling on the floor.

(f) Remove tiles individually and minimize breakage. Heat guns may be used to heat tile and soften the adhesive. Immediately place tiles in disposal bags.

(g) Non-toxic organic solvents may be used to remove mastic (as applicable).

(h) Wet clean all surfaces to remove residual material. Continue cleaning until abatement work area is free of visible material.

(i) Proceed to clearance testing following approval from District’s representative that abatement work area is visually free of asbestos-containing materials.

3.16 Requirements for Specific ACM and Methods – Roof Penetration Mastic and Silver Paint (as applicable)

The removal of all roof penetration mastic shall be performed as a Class II work activity in accordance with the procedure outlined below. Use the wet removal method for ACM to eliminate visible emissions in accordance with NESHAP regulations. Controls shall be used to prevent re-entrainment into building HVAC system. Dispose of as ACM.

(a) Spray large areas of asbestos-containing roof penetration mastic thoroughly with amended water using spray equipment recommended by surfactant manufacturer capable of providing a “mist” application to reduce the release of fibers. Spray the asbestos material repeatedly during the abatement work process to maintain wet conditions, but do not use excessive amounts of water that result in ponding or entry into building.

(b) Remove the asbestos-containing material in small sections. Do not allow material to dry out. As it is removed, place the material in sealable plastic bags of 0.15 mm minimum thickness. Place sealed asbestos debris in second 0.15 mm plastic bag, appropriately labeled, and remove from abatement work area.

(c) Carefully lower removed and bagged asbestos-containing material to the ground without dropping or throwing, or transport to the ground via dust-tight chutes or containers, in accordance with the procedures set forth in EPA 40 CFR 61.147 Code of Federal Regulations.
(d) Clean area of all debris and notify District’s representative for visual inspection.

3.17 Requirements for Specific ACCM and Methods - Gypsum Wallboard/Taping Compound
The removal of gypsum wallboard and associated asbestos-containing taping compound shall be performed as a Class II work activity in accordance with the procedure outline below. Dispose of as non-hazardous construction debris.

(a) All critical barriers, including ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, speaker, and other openings into the abatement work area shall be individually sealed with 0.15 mm plastic sheeting and tape. Elevator doors, fire extinguisher cabinets and all other penetrations in the floor wall, or ceiling shall be sealed in the abatement work area.

(b) Prepare worker/equipment decontamination and waste load-out enclosure as previously specified.

(c) Isolate the abatement work area by constructing a temporary double layered 0.15 mm polyethylene/stud wall.

(d) Cover the floor of the abatement work area with 2 layers of 0.15 mm polyethylene sheeting turned up at walls at least 600 mm.

(e) Wet the asbestos-containing materials with amended water to minimize fiber and dust release during removal. Use amended water sparingly to eliminate standing water and to prevent water from traveling on the floor.

(f) Remove the gypsum wallboard and taping compound assemblies in small sections. Do not allow the material to dry out. As it is removed, place the material in sealable plastic bags of 0.15 mm minimum thickness. Place sealed debris in a second 0.15 mm plastic bag, and remove from the work area.

(g) Carefully lower the material to the floor without dropping or throwing.

(h) After removal of the material, HEPA vacuum and wet-clean all surfaces in the abatement work area to remove residual accumulated material. Continue cleaning until the surfaces are visibly free of material.

3.18 Requirements for Specific ACM and Methods – Transite Sheeting
The removal of the Transite sheeting shall be performed as a Class II work activity in accordance with the procedure outlined below. Dispose of as non-friable ACM.

3.18.1 Removal of asbestos-containing Transite sheeting (assumed) shall be performed in accordance with the procedure outlined below.

(a) Prepare abatement work area as previously specified for the abatement work.

(b) All critical barriers, including ventilation openings (supply and
exhaust), lighting fixtures, clocks, doorways, windows, speakers, and other openings into the work area shall be individually sealed with 0.15 mm plastic sheeting and tape. Elevator doors, fire extinguisher cabinets and all other penetrations in the floor, walls, or ceiling shall be sealed in the abatement work area.

(c) Prepare a worker and/or equipment decontamination and waste load-out enclosure as previously specified.

(d) Cover all walls in the abatement work area with two layers of 0.15 mm polyethylene sheeting and seal with duct tape or spray-glue. The sheeting shall be applied to a height of 1.5 m above the floor. The seams shall be staggered and separated by at least 150 mm.

(e) Wet asbestos-containing materials with amended water to minimize fiber release during removal. Use amended water sparingly to eliminate standing water and to prevent water from traveling on the floor.

(f) Remove the Transite sheets individually and minimize breakage. Immediately place the Transite sheeting in disposal bags or plastic sheeting (as applicable).

(g) Wet clean all surfaces to remove residual material. Continue cleaning until abatement work area is free of visible material.

(h) Proceed to clearance testing (as applicable) following approval from District’s representative that abatement work area is visually free of assumed asbestos-containing materials (Transite sheeting).

3.19 Requirements for Specific ACCM and Methods - Leveling Compound

The removal of leveling compound from beneath carpet on the second floor hallway of Harlan Center shall be performed as a Class II work activity in accordance with the procedure outlined below. Dispose of as non-hazardous construction debris.

3.19.1 Removal of asbestos-containing leveling compound shall be performed in accordance with the procedure outlined below.

(a) Prepare abatement work area as previously specified for the abatement work.

(b) All critical barriers, including ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, speakers, and other openings into the work area shall be individually sealed with 0.15 mm plastic sheeting and tape. Elevator doors, fire extinguisher cabinets and all other penetrations in the floor, walls, or ceiling shall be sealed in the abatement work area.

(c) Prepare a worker and/or equipment decontamination and waste load-out enclosure as previously specified.

(d) Cover all walls in the abatement work area with two layers of 0.15 mm polyethylene sheeting and seal with duct tape or spray-glue. The sheeting shall be applied to a height of 1.5 m above the floor. The seams shall be staggered and separated by at least 150 mm.
(e) Wet asbestos-containing materials with amended water to minimize fiber release during removal. Use amended water sparingly to eliminate standing water and to prevent water from traveling on the floor.

(f) Remove the leveling compound material and immediately place it in disposal bags.

(g) Wet clean all surfaces to remove residual material. Continue cleaning until abatement work area is free of visible material.

(h) Proceed to clearance testing (as applicable) following approval from District’s representative that abatement work area is visually free of assumed asbestos-containing materials (Transite sheeting).

3.20 Post Removal: Cleaning and Clearance

3.20.1 Provide general clean-up of abatement work area concurrent with the removal of all asbestos-containing materials. Do not permit accumulation of debris on workspace floor.

3.20.2 Do not perform dry dusting or dry sweeping.

3.20.3 Maintain the minimum required pressure differential of 0.025” of water inside the abatement work area enclosure at all times, and until the District’s representative authorizes the Contractor to remove the enclosure.

3.20.4 Initial Phase Cleanup Sequence

(a) Remove all visible accumulations of asbestos-containing material and debris.

(b) Wet clean and HEPA-vacuum all surfaces in the abatement work area.

(c) Clean all equipment (excluding that which will be needed for further cleaning phases) used in the abatement work area and remove from abatement work area via the Equipment Decontamination Enclosure.

(d) Remove the top layer (secondary barrier) of plastic sheeting, change all air filtration system pre-filters, and proceed with the second cleaning.

(e) Replace all HEPA-filters and pre-filters in air filtration air machines with clean filters. Clean all air filtration machines.

(f) Notify District’s representative for observation of cleaning to determine completeness. Plastic sheeting surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

3.20.5 Secondary Phase Cleanup Sequence

(a) Wet clean and HEPA-vacuum all surfaces in abatement work area at least one more time.
(b) Notify District’s representative for observation to determine completeness of cleaning.

(c) District’s representative will perform a visual observation of the abatement work area in general accordance with ASTM 1368, *Standard Practice for Visual Inspection of Asbestos Abatement Projects*.

(d) If visual clearance is not attained, then subsequent re-cleaning will be required. This sequence will continue until visual clearance is attained.

(e) When visual clearance has been obtained, the plastic barriers down to the critical barriers may be removed.

### 3.20.6 Pre-Clearance: Application of Lockdown Encapsulant To Base Material

(a) Apply encapsulant only when environmental conditions in the abatement work area are as required by the manufacturer's instructions and the District’s representative.

(b) Prior to applying any encapsulant, ensure that its application will not cause the base material to fail and allow the encapsulated material to fall of its own weight or separate from the substrate.

(c) Apply encapsulant with an airless spray gun with air pressure and nozzle orifice or as otherwise recommended by the encapsulant manufacturer.

(d) A minimum period of two (2) hours will be established between the application of the lockdown encapsulant and the initiation of final air clearance testing.

### 3.20.7 Final Air Clearance Testing

(a) District’s representative will test for the final air clearance levels when areas have passed the visual clearance phase and after a minimum of two (2) hours after the application of the lockdown encapsulant.

(b) Analytical Methods: The following methods will be used by the District’s representative in analyzing filters used to collect air samples. Minimum sample volumes will be 1,200 liters for clearance samples.

   a. Phase Contrast Microscopy (PCM) - will be performed using the OSHA Reference Method, Appendix A to 29 CFR 1926.1101, or NIOSH Method 7400.

   b. Transmission Electron Microscopy (TEM) - will be performed (as needed) using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A, or NIOSH Method 7402, whichever is deemed more appropriate by District’s representative in each case.

(c) Daily: From start of abatement work through project decontamination, the District’s representative may be taking samples on a daily basis inside and outside each abatement work area.
(d) **Stop Action**: If any air sample taken outside of the abatement work area exceeds 0.01 f/cc, immediately and automatically stop all work except corrective action. The District's representative and the abatement contractor will determine the source of the high reading.

(e) **Abatement Work Area Final Clearance Levels**: The District’s representative standard for abatement work area final clearance for removing the containment and re-occupancy is: less than 0.01 f/cc by PCM. All final air samples will meet these criteria.

(f) Re-clean and continue to clean at Contractor's expense, areas which do not comply with the specified final clearance level.

(g) After all areas pass final air clearance, dismantle the decontamination enclosure systems and thoroughly HEPA-vacuum and wet clean these areas and materials.

(h) Dispose of debris from removal operation, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated, and dispose of accordingly.

3.20.8 Consider abatement work areas and all other decontaminated and cleaned areas clean when:

(a) All phases of cleanup have been completed and level of cleanliness is approved by the District’s representative.

(b) All final clearance air samples obtained by the District’s representative indicate that airborne fiber concentrations are less than 0.01 f/cc (via PCM analysis) of air or less after the final cleaning.

3.20.9 The "Certification of Visual Inspection and Final Air Sampling for Asbestos Abatement" form or equivalent shall be completed, signed by the Contractor and the District’s representative and included with the District’s project records.

3.21 **Containment Barrier Removal**

3.21.1 Following area final clearance, leave pressure differential units running as long as feasible during containment barrier removal.

3.21.2 Equipment, machinery, scaffolding, tools, etc., within the abatement work area shall not be removed without first being thoroughly cleaned with amended water or in the case of delicate items susceptible to rust, an acceptable substitute.

3.21.3 After the abatement work area is found to be in compliance, the remaining sealed areas and exits are unsealed and the plastic sheeting, tape, and any other trash and debris are disposed of in sealable plastic bags and treated as asbestos waste. The District’s representative will conduct a final walkthrough and document results for the District.

3.21.4 Before removal from the abatement work area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine.
with 0.15 mm polyethylene to prevent environmental contamination from the filters.

3.21.5 The contractor shall patch and paint and repair all damaged areas and restore them to their original, precontract condition.

3.22 Waste Disposal

3.22.1 The District reserves the right to restrict when containerized ACM will be moved outside of the abatement work area and pass through the building. Times chosen to move containerized ACM in the building shall be during non-public hours and when limited staff is in attendance or under other appropriate conditions as determined by the District’s representative.

3.22.2 Asbestos-contaminated waste that has been containerized shall be transported out of the abatement work area either through the personnel/equipment decontamination enclosure or through a separate waste load-out enclosure. Waste load-out procedures shall be performed by two teams. The team inside the abatement work area shall clean the outside of properly labeled asbestos waste containers using HEPA vacuums and/or wet wiping, and place them into the waste load-out enclosure. No personnel from the inside team shall exit any further from the abatement work area. The team inside the waste load-out area (wearing protective clothing and respirators) shall retrieve the waste containers from the load-out enclosure, double-bag the waste and pass them to an uncontaminated area outside the enclosure. No unprotected personnel from the outside team shall enter this enclosure. As applicable, routes to the elevator, the elevator itself, and route to covered carts shall be lined with polyethylene sheeting.

3.22.3 For Amosite Fibers: If the material contains amosite fibers, evacuate air from disposal bags with a HEPA vacuum before sealing.

3.22.4 Water not disposed of with the asbestos-containing materials shall be filtered to remove asbestos fibers and debris before disposal into sanitary sewer.

3.22.5 Do not store containerized materials outside of the abatement work area. Take containers from the abatement work area directly to a sealed truck or dumpster.

3.22.6 Bulk and containerized asbestos waste shall be packed, labeled, and transported according to DOT Regulations 49 CFR 173.216 and 49 CFR 173.240. All removed ACM, plastic sheeting, tape, cleaning material, clothing, and all other disposable material or items used in the abatement work area shall be packed into double bagged sealable 0.15 mm plastic bags or double containerized with one bag and one drum. The bags shall be marked with the labels required by OSHA 29 CFR 1910.1001 and/or 1910.1200, and 1926.1101.

3.22.6.1 If the asbestos waste can reasonably be expected to damage double bagged 0.15 mm plastic bags, the following barrel decontamination procedures shall be followed.

(a) Line barrels with a 0.15 mm plastic liner to prevent leaking of contaminated material from the containers.

(b) As bags are moved out through the decontamination system, wet wipe bags to remove all contamination from them before they are moved into an uncontaminated space.
(c) Place bagged waste into appropriately labeled barrels for transport to landfill.
(d) After bagged contaminated waste is placed in barrels, seal lids on barrels.

3.22.6.2 Minimum labeling

required: First
Label:

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

Second Label:

==========================================
PROVIDE IN ACCORDANCE WITH U.S. DEPARTMENT OF TRANSPORTATION REGULATION ON HAZARDOUS WASTE MARKING. 49 CFR PART 172,

SUBPART D: "RQ ASBESTOS NA 2212". PROVIDE A "CLASS 9" LABEL, PER 49 CFR PART 172, SUBPART E.
===========================================

3.22.6.3 Notify District prior to removing each trailer or other waste transport from the jobsite.

3.22.6.4 Notify District and/or District’s representative not less than 48 hours prior to the proposed time of delivery of contaminated waste to the landfill.

3.22.6.5 The Contractor shall transport the approved sealed drums to an approved waste disposal site.

3.22.6.6 Allow only sealed plastic bags or impermeable containers to be deposited in landfill. Leave damaged, broken, or leaking plastic bags in the impermeable container and deposit entire barrel in landfill.

3.22.6.7 Ensure that there are no visible emissions to the outside air from site where materials and waste are deposited.

3.22.7 Contractor shall submit a disposal certificate from the EPA approved landfill confirming final disposal in accordance with EPA standards and regulations before final payment. Retain receipts from landfill or processor for materials disposed of. At completion of hauling and disposal of each load, submit copy of waste manifest, chain of custody form, and landfill receipt to the District.
3.23 ** Job Close-Out **

3.23.1 The Contractor shall submit to the District and/or District’s representative, Post Abatement Drawings to indicate location of the asbestos material removed. Post Abatement Drawing is not required if asbestos material removed is the same as that shown in the Project Drawing. If required, the Contractor may edit the Project Drawing to show the actual or additional abatement work completed.

3.23.2 The Contractor shall remove from the site all other debris and rubbish resulting from removal and disposal operations and the temporary construction of containment barriers and enclosures.

3.23.3 The Contractor shall use positive means to demonstrate to the District and/or District’s representative that any building utilities that were temporarily disabled are now in full service. Notify the District and/or District’s representative when disabled building ventilation, systems, electrical power, smoke detectors, building access/egress passages may safely be re-started or used.

** END OF SECTION 028213**
CERTIFICATION OF VISUAL INSPECTION AND FINAL AIR SAMPLING FOR ASBESTOS ABATEMENT

The District, Contractor, and District’s representative, hereby certify that the abatement work areas have been visually inspected (all surfaces including pipes, beams, ledges, walls, ceiling and floor, plastic sheeting, etc.) and there is no dust, debris, or residue. The District and/or District’s representative also certifies that final air sample results meet abatement work area clearance specifications.

ODC Project No_________________________ SI Contract No._________________________

Project Title/Location_________________________________________________________

________________________________________________________

Date of Inspection_________________________________________________________

Date and results of final air sample

ASBESTOS Firm_________________________________________________________
    ABATEMENT Print Name_________________________________________________
    CONTRACTOR Print Title_________________________________________________
    Signature_________________________________________________________

SI Firm_________________________________________________________
    INDUSTRIAL Print Name_________________________________________________
    HYGIENIST Print Title_________________________________________________
    Signature_________________________________________________________

SI Firm_________________________________________________________
    DISTRICT Print Name_________________________________________________
    Print Title_________________________________________________________Signature________

_________________________________
SECTION 02 83 00

LEAD-IMPACTED CONSTRUCTION AND ABATEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section specifies requirements for lead-impacted construction and lead hazard abatement including but not limited to:

1. Submittals

2. Contractor's Monitoring Program

3. Products

4. Abatement Execution including:
   a. Work Area preparation
   b. Worker protection and decontamination
   c. Removal of Lead containing components
   d. Removal of Lead containing coatings by chemical stripping
   e. Removal of Lead containing coatings by mechanical removal
   f. Drilling and Anchoring of Lead containing surfaces
   g. LBP and Lead coating stabilization
   h. Cleaning and decontamination
   i. Clearance inspection testing
   j. Waste characterization and disposal

5. Stop work orders

6. Project closeout

1.02 REGULATIONS

A. The Contractor shall comply with the requirements of the current issue of the following regulations and guidelines governing lead abatement and disposal and other applicable Federal, State, and Local Government regulations. The regulations listed herein are incorporated by reference.

   a. 29 CFR 1926, Construction Standards
   b. 29 CFR 1926.62, Lead in Construction
   c. 40 CFR Part 50.12, Ambient Air Quality Standard for Lead
   d. 40 CFR Parts 261, 265 and 268, Hazardous Waste Management
   e. 40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead
   f. 49 CFR Part 172, 173, 178, 179, Hazardous Material Transportation

2. California Code of Regulations:
   a. 8 CCR Division 1, Chapter 4, Subchapter 4, Construction Safety Orders
   b. 8 CCR 1532.1, Lead in Construction
c. 8 CCR 5144, Respiratory Protection
d. 26 CCR Division 22, Hazardous Waste
e. 17 CCR Division 1, Chapter 8, Accreditation, Certification and Work Practices for Lead-based Paint and Lead Hazards.


1.03 RELATED DOCUMENTS

A. Contract Documents including hazardous material-related plans and specifications and all other project construction documents.

1.04 DEFINITIONS

A. In addition to the definitions in found elsewhere in this manual the following definitions are specific to work of this section:

1. Abatement – Any set of measures designed to reduce or eliminate lead hazards or lead-based paint but does not include containment or cleaning.

2. Certified Lead Inspector / Assessor – An individual who has received a certificate or an interim certificate from the Department as a “Certified Lead Inspector / Assessor”.

3. Certified Lead Project Designer – An individual who has received a certificate from the Department as a “Certified Lead Project Designer”.

4. Certified Lead Project Monitor – An individual who has received a certificate or an interim certificate from the Department as a “Certified Lead Project Monitor”.

5. Certified Lead Sampling Technician – An individual who has received a certified or an interim certificate from the Department as a “Certified Lead Sampling Technician”.

6. Certified Lead Supervisor – An individual who is responsible for implementing lead-related construction work and enforcing work practices that ensure worker safety in residential or public buildings and who has received a certificate or an interim certificate from the Department as a “Certified Lead Supervisor”.

7. Certified Lead Worker – An individual who performs lead-related construction work in residential or public buildings under the direction of a certified lead supervisor and has received a certificate from the Department as a “Certified Lead Worker”.

8. Certificate – “Certificate” means the document issued by the Department to an individual who meets the requirements for certification as described in sections 35083, 35085, 35087, 35089, or 35091 of Title 17.

9. Certified Industrial Hygienist – An individual who has met the education, experience, and examination requirements of an industrial hygiene certification organization governed by the American Board of Industrial Hygiene.


11. Component – A structural element or fixture, including but not limited to a wall, floor, ceiling, door, window, molding, trim, trestle, tank, stair, railing, cabinet, gutter, or downspout.
12. Containment – A system, process, or barrier used to contain lead hazards inside a work area such as described in “Guidelines for the Evaluation and Control of Lead-based Paint Hazards in Housing,” U.S. Department of Housing and Urban Development, June 1995, Chapter 8, “Containment and Barrier Systems,” Table 8.1, Table 8.2 and Table 8.3, or “Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations,” Society for Protective Coatings, Technology Guide 6, October 1, 2004.


14. Deteriorated Paint – Paint or surface coating that is cracking, chalking, flaking, chipping, peeling, non-intact, failed or otherwise separating from a component.

15. Encapsulation – All herein specified procedures necessary to coat or seal Lead containing coatings/surfaces with some durable coating which is applied as a liquid to the painted surface. Lead-free paint is not to be considered as an encapsulant. The encapsulating material shall be airtight, impermeable, and provide a semi-permanent barrier that can be expected to last 20 years. The encapsulant shall be approved for use by the District and Environmental Consultant.

16. Enclosure -- Accomplished by enclosing the Lead containing surface with a rigid and durable substance such as drywall, paneling, metal, vinyl or wood siding, or some other construction material. The enclosure must be dust-tight or sealed at all edges to provide a dust-tight enclosure. The construction materials used shall be approved for use by the District and Environmental Consultant.

17. Hazardous Waste – Lead debris shall be classified as hazardous due to the characteristic of toxicity, as determined by testing in accordance with the California Code of Regulations, Title 22, Division 4, Chapter 30, Article 11. Any substance(s) listed in Article 11 Section 66699 at concentrations greater than their listed Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTLC) may need to be further characterized by the Toxicity Characteristic Leaching Procedure (TCLP) in accordance with 40 CFR 261 and other tests prior to disposal as a hazardous waste. Note: whole painted components or architectural debris with intact LBP is not typically expected to exceed hazardous waste criteria and may be evaluated by a consideration of the ratio of all materials in the waste to the lead content of the associated paint.

18. Industrial Building – A structure that is used primarily for industrial activity, which is generally not open to the public, including but not limited to, warehouses, factories, and storage facilities. Industrial building does not include any structure which fits the definition of a public building or a residential building.

19. Intact LBP Components – LBP components removed substantially intact with LBP firmly adhering to the surface. Examples are door, door trim, baseboards, etc., with intact paint. Also referred to as architectural debris with intact paint.

20. Job Tasks – “Job Tasks” mean the specific activities performed in the context of work.

21. Lead Activities – “Lead Activities” means abatement, lead hazard evaluation, lead-related construction work, or any activity which disturbs lead-based paint, presumed lead-based paint, or creates a lead hazard.

22. Lead-Based Paint (LBP) – The concentration of lead in paint or other surface coatings that contain an amount of lead equal to, or in excess of 0.5% lead by weight when analyzed by AAS or ICP-AES or 1.0 milligrams of lead per square centimeter (mg/cm²) as determined by XRF testing or as identified by specification.

23. Lead-Based Paint Related Waste – Paint chips, vacuum dust, and debris, used cleaning articles, waste water, plastic sheets and other disposable items which were used during the Lead abatement process and as a result are considered lead contaminated waste or assumed hazardous waste pending further characterization.
24. **Lead-Containing Paint/Surface Coatings** – The concentration of lead in paint or other surface coating that contain an amount of lead less than 0.5% lead by weight when analyzed by AAS or ICP-AES or 1.0 mg/cm² as determined by XRF testing or as identified by specification.

25. **Lead-Contaminated Dust** – The amount of lead equal to, or in excess of 40 micrograms per square foot (µg/ft²) for interior floor surfaces, 250 µg/ft² for interior horizontal surfaces or 400 µg/ft² for exterior floor and exterior horizontal surfaces.

26. **Lead-Contaminated Soil** – Bare soil that contains an amount of lead equal to, or in excess of 400 parts per million (ppm) in children’s play areas and 1,000 ppm in all other areas.

27. **Lead Hazard** – Deteriorated lead-based paint or lead-containing surface/coating material, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or lead-containing surfaces/coating materials or presumed lead-containing surfaces without containment, or any other nuisance which may result in persistent and quantifiable lead exposure and environmental lead contamination.

28. **Lead Hazard Abatement** – Special abatement activities undertaken with the specific intent to eliminate or reduce existing lead hazards as defined herein. Not to be confused with abatement controls on normal lead-related construction work in construction areas with restricted access to the general public. In this latter case, lead is present in or on construction materials and is impacted by the work but is not the focus of the work to be undertaken.

29. **Lead Hazard Evaluation** – The on-site investigation, for compensation, of lead-based paint or lead hazards for public and residential buildings, but does not include activities intended to determine adequacy of containment; air monitoring for lead as specified in Title 8, California Code of Regulations, Section 1532.1 and Title 17, California Code of Regulations, Sections 70100 and 70200; and testing components removed from a residential or public building for lead to determine the applicability of hazardous waste requirements specified in Title 22, California Code of Regulations, Division 4.5, Chapters 10, 11, 12, 13 and 18, and California Health and Safety Code, Section 25163, subdivision (c).


31. **Lead-Related Construction Work** – Any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup that, by using or disturbing lead-containing materials, surfaces or soil, may result in significant exposure of adults or children to lead.

32. **Lead Safe Work Practices** – Any individual conducting lead activities, excluding lead hazard evaluation shall use containment; ensure that the work area has no visible dust or debris following the completion of a project; and demonstrate compliance of the above requirements to the Department or local enforcement agency, as defined in Section 105251 of the Health and Safety Code, upon request.

33. **Lead Stabilization** – Process of controlled surface preparation using containment and wet methods and/or HEPA vacuuming to prepare a deteriorated LBP surface for painting and followed by application of approved primer and finish coats of paint. Process may be incorporated in a normal painting process for environmental protection.
34. Presumed Lead-Based Paint – Any paint or surface coating affixed to a component in or on a structure, excluding paint or surface coating affixed to a component in or on a residential dwelling constructed on or after January 1, 1978 or a school constructed on or after January 1, 1993.

35. Public Building – A structure or part of a structure, and its land, which is generally accessible to the public, including but not limited to schools, daycare centers, museums, airports, hospitals, stores, convention centers, government facilities, office buildings and any other building which is not an industrial building or a residential building.

36. Qualified Person – The individual identified by the Contractor to be responsible for conducting air sampling, calibration of air sampling pumps, evaluating sampling results, and conducting respirator fit tests.

37. Removal – All herein specified procedures necessary to remove and clean-up all LBP and lead-containing surface coatings, lead-contaminated dust, and lead-contaminated soil from the designated areas and to dispose of these materials at an acceptable site in accordance with Federal, State and Local Regulations.

38. Residential Building – A structure or part of a structure, and its land, which is used or occupied, or intended to be used or occupied, in whole or in part, as the home or residence of one or more persons.

39. Visually Clean – Free of visible dust, paint chips, dirt, debris, or films removable by vacuuming or wet cleaning methods specified. For outside soil or ground cover areas, visually clean shall mean free of construction or paint debris, chips or dust distinguishable from the initial soil or ground conditions.

40. Work Area – An area where lead activities are conducted.

1.05 HAZARD COMMUNICATION

A. The Contractor shall refer to Specification Section 00 31 26 – Existing Hazardous Materials Conditions for a list of all known or assumed hazardous materials including lead, asbestos, PCBs and other materials. All lead-related work shall be conducted with full consideration of any other hazardous materials impacted and required protective measures and controls.

1.06 SUBMITTALS AND NOTICES

A. Refer to Section 01 33 00 Submittal procedures for submittal requirements applicable to this Section and unless otherwise noted.

1.07 ENVIRONMENTAL CONSULTANT

A. The Environmental Consultant is authorized to provide compliance observation and monitoring, testing, and technical oversight services for the lead-impacted construction and abatement work of this project without limitation.

1.08 CONTRACTOR'S COMPLIANCE AND QUALITY ASSURANCE

A. The Contractor shall have a Competent Person who is a Department Certified Lead Supervisor onsite at all times while lead-related work or Lead/LBP abatement is in progress. The Contractor's Competent Person shall communicate and coordinate with the Environmental Consultant with regard to work schedules, inspections, daily submittals, and compliance issues.

B. The Contractor's Competent Person shall:

1. Ensure the Contractor's compliance with the plans and specifications.

2. Conduct worker exposure monitoring using a Qualified Person and provide results to the Environmental
3. Pre-inspect Work Areas for compliance and completion prior to notifying the Environmental Consultant of the Work Area's readiness for inspection.

4. Accompany the Environmental Consultant during Work Area pre-start and clearance inspections.

5. Ensure all of the Contractor's workers have current and valid medical, blood-lead test, training, and respirator fit test records and provide copies of all new or updated records to the Environmental Consultant for approval before assigning the workers to any work within Work Areas.

6. Take timely and appropriate corrective actions to ensure compliance with the abatement plans and specifications and to eliminate unsafe, unhealthful, and environmentally unsound work practices regardless of whether or not they are brought to the Contractor's attention by the Environmental Consultant.

7. Adhere by the results for the characterization of waste for proper packaging, labeling, storage, transportation and disposal of waste.

8. Provide completed daily project documentation to the Environmental Consultant at the end of each work day. This includes daily rosters, entry/exit logs, foreman reports, and any other project information.

1.09 SPECIAL PROVISIONS

A. The Contractor shall hold the District, District's Representatives, Agents and Environmental Consultant harmless for claims, damages, losses, and expenses, including attorney's fees, arising out of or resulting from the Contractor's lead or other hazardous materials work, lead and hazardous materials spills on the site or enroute to the disposal site, or any other condition resulting from the Contractor's non-compliance with regulation or the Contract Documents.

PART 2 - PRODUCTS

2.01 PROTECTIVE COVERING

A. Polyethylene sheets, of 6 mil thickness in size (dimensions) to minimize the frequency of joints.

2.02 CLEANERS

A. For clean-up and decontamination a lead-specific wash solution shall be used. Alternative cleaning and decontamination agents shall be subject to approval by the Environmental Consultant and District.

2.03 TAPE

A. Duct tape (or approved equivalent) two (2) inches or wider, capable of sealing joints of adjacent sheets of polyethylene sheeting and for attachment of polyethylene sheeting to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions.

2.04 PRIMER/SEALER

A. The primer/sealer paint applied after Lead removal and/or stabilization shall be compatible with the painting systems to follow under this contract.
2.05 ENCAPSULANT

A. Design is based on the following manufacturers. Products with like attributes may be considered.
   1. Lead coat by Certane.
   2. Encapsulastic 7000 series by Encapsulation Technologies Corporation.
   3. Heavy Duty Trim Coating by Fibertec Coating Corp.
   4. Lead Lock\textsuperscript{TM} Encasement System by Global Encasement, Inc.

B. If material cannot be tinted to desired color, two coats of approved latex enamel paint are to be applied over encapsulant.

C. Elastic acrylic coatings shall be warranted by the manufacturer to be heavy-bodied and compatible with the substrate they are applied to. Elastic acrylic coatings shall be long-lasting and resist cracking, peeling, algae, and fungus. Elastic formula should allow for some movement in walls without cracking. Coatings shall contain no hazardous ingredients by OSHA definition and be non-flammable.

2.06 SPRAY ADHESIVE

A. Provide spray adhesive in aerosol cans which is specifically formulated to stick to sheet polyethylene.

2.07 DISPOSAL CONTAINERS

A. Provide six (6) mil thick polyethylene sheeting, six (6) mil leak-tight polyethylene bags and other impervious containers as required by applicable regulations. All waste shall be labeled as hazardous or potentially hazardous waste unless proven otherwise by appropriate sampling and laboratory analysis.

B. All hazardous waste shipping containers shall meet applicable DOT requirements.

2.08 WARNING SIGNS AND LABELS

A. Caution Signs: To be minimum of 20 x 14 inches and includes phrase "Caution Lead Hazard, Keep Out Unless Authorized" in minimum 2-inch high letters. These shall be posted at each approach to each lead Work Area.

B. CAL/OSHA Lead Warning Posters: "Warning - Lead Work Area, Poison, No Smoking or Eating" shall be posted at the entrance to each Work Area.

C. Labels: Hazardous waste shall be labeled according to Federal, State and Local regulations including but not limited to the California Code of Regulations, Title 22, Chapter 30 and the U.S. Department of Transportation 49 CFR Parts 172, 173, 178 and 179.

2.09 PERSONAL PROTECTIVE EQUIPMENT

A. Personal protective equipment shall comply with the requirements of 8 CCR 1532.1 Lead.

B. Minimum protective clothing and equipment shall consist of fire-retardant, disposable, full-body coveralls, disposable boots, gloves, or equivalent in accordance with ANSI Z41. Sleeves at wrists and cuffs at ankles shall be secure.

C. Eye protection and hard hats shall be available and worn as required by applicable safety regulations and shall conform to ANSI 87.1 and ANSI 89.1. Eye protection shall be worn during demolition and paint removal work. Hard hats shall
be worn during all exterior demolition work.

D. The Contractor shall provide Authorized Visitors with suitable disposable protective clothing, headgear, respirators, and footwear whenever authorized visitors are required to enter the Work Area. Up to an average of ten sets per day of suitable personal protective equipment shall be made available for authorized visitors.

E. All disposable clothing worn during each work shift shall be removed prior to exiting the Work Area and shall be properly segregated and placed in containers for proper waste characterization. The Contractor shall bear full responsibility for additional costs associated with waste profiling and disposal if wastes are not properly segregated.

2.10 RESPIRATORS

A. Provide workers with personally-issued respiratory equipment approved by NIOSH and suitable for the lead exposure level in the Work Area. Where respirators with disposable filters are employed, provide sufficient filters for replacement as required by the worker or applicable regulation. HEPA Type P100 cartridges shall be used with respirators. Each respirator shall be washed whenever the worker wearing it showers or at least daily prior to storage. The following general conditions shall apply to respirator use:

1. All respirators used must be certified by NIOSH and a respirator program shall be established and implemented.

2. The minimum respiratory protection required for this project, unless otherwise specified in writing by the Environmental Consultant shall be a half-face negative pressure air purifying respirator. Otherwise, the respirators worn shall be selected based on measured or reasonably expected airborne concentrations of lead as follows:

   a. Half-face negative pressure air purifying respirator: up to 0.5 mg/m³
   b. Powered air purifying respirator: up to 2.5 mg/m³
   c. Type C supplied air respirator full face piece pressure demand mode: up to 100 mg/m³.

   Note: Disposable respirators are not acceptable at any time. It is always permissible to upgrade to a more protective type of respirator.

3. During all segments of lead removal and clean-up activities, respirator usage shall be required of all persons within the designated Work Areas at all times regardless of airborne lead concentrations.

B. The Contractor is responsible for determination of airborne lead concentration levels for the Contractor's personnel and for providing and enforcing use of appropriate personnel respirator protection based upon airborne lead concentrations and this specification.

C. Respirators shall not be removed inside the Work Area. Workers shall proceed to the designated washing area and clean the external surface of the respirator body before removing the respirator.

2.11 TOOLS AND EQUIPMENT

A. Provide suitable tools for the removal of Lead containing materials and contamination including required HEPA negative pressure units, HEPA vacuums, ground fault interrupters (GFIs), ladders, scaffold, garden sprayers and airless sprayers. All tools and equipment brought onsite shall be clean and free of lead and other hazardous material contaminants. HEPA vacuums shall be labeled with a lead warning label and dedicated to Lead-related construction work to prevent commingling of lead wastes with asbestos and other wastes.
B. Provide enough support equipment, including but not limited to, lumber, nails, hardware, shower stalls, hoses, plumbing, drain pans, sump pumps, and waste water storage drums to construct and operate the Decontamination Enclosure System(s) with showers. The number of showers shall be sufficient for the number of workmen scheduled on the job. The water hose used to connect the drain to the showers will not be used for any other purpose. The supply side water hose shall have a check valve to prevent backflow under any circumstance.

PART 3 - EXECUTION

3.01 GENERAL

A. All designated lead related work shall be conducted in accordance with this specification section, Section 01 11 00 and the project drawings. In addition, refer to Section 00 31 26 and coordinate lead-related work with requirement for other hazardous materials as applicable. The Contractor shall utilize the requirements as set forth for the method chosen and approved.

B. Public Warning and Safety Information to be Posted:

1. Post signs at all approaches to the Work Area entrance to read "Caution Lead Hazard - Keep Out Unless Authorized." In addition, post the CAL-OSHA Lead Hazard Warning Poster at the immediate Work Area entrance.

2. A list of phone numbers for the local hospital and for emergency squad, the local fire department, a representative of the Contractor who may be reached 24 hours a day, the Contractor's main office, the District's Representative and Environmental Consultant and any other professional consultants directly involved in the project.

3.02 PREPARATION FOR INTERIOR REMOVAL/ABATEMENT WORK

A. Shut down electric power to the Work Area to the greatest extent possible. Consult with the District and District's Representative before shutting down power. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements and provide ground-fault interrupter circuits as power source for electrical equipment.

B. Shut down and isolate heating, cooling, ventilation air systems to prevent contamination and dispersal to other areas of the structure. If shut down is not feasible, duct capping and sealing will be required according to an approved plan. During the Work, vents within the Work Area shall be sealed with tape and plastic sheeting and as indicated on plans (if available).

C. Move all non-fixed objects out of the Work Area(s). Such items shall be moved at least five (5) feet from Work Area(s).

D. Pre-clean entire floor area and all horizontal surfaces inside and within five (5) feet of the Work Area using HEPA vacuums and wet methods.

E. Cover all non-moveable objects within five (5) feet of the Work Area with six (6) mil polyethylene sheeting and seal with duct tape.

F. Cover all floors within the Work Area with two layers of six (6) mil polyethylene sheeting and seal with duct tape. All heater vents and registers shall be sealed with six (6) mil plastic sheeting and duct tape.

G. Install air lock flaps on all doorways into Work Area with plastic sheeting to form curtained doorways. Doors secured from the inside need not be sealed.

H. Provide, at minimum, 30 foot candle illumination lighting to the Work Area.
I. Install a Decontamination Enclosure System or equivalent prefabricated portable decontamination unit(s) as approved. This system will be the primary entrance and exit to the Work Area.

J. Install Differential Pressure Equipment where specified in accordance with the requirements herein.

K. Install lead caution signage at each approach to the Work Area and lead warning signage just outside each Work Area entry/exit point.

L. Complete any additional preparation work required by the specific component abatement/lead-related construction work requirements specified elsewhere in this section.

M. Establish and maintain emergency and fire exits from Work Areas at all times.

N. When Work Area preparation is complete, notify the Environmental Consultant and request an inspection. No abatement/lead-related construction work is to proceed in any Work Area until that Work Area preparation has been inspected and approved by the Environmental Consultant.

3.03 PREPARATION FOR EXTERIOR REMOVAL/ABATEMENT WORK

A. Cordon off the Work Area extending at a minimum of 10 feet horizontally beyond the area of work with barrier tape and warning signs as specified herein.

B. Pre-clean visible suspect lead-based paint dust and debris around and under areas where lead-based paint or LBP components will be removed. Use HEPA vacuums and wet methods to perform this cleaning which shall include, at minimum, the designated Work Area.

C. Cover ground and horizontal surfaces of Work Area (area within barrier tape) with a minimum of one layer of six (6) mil polyethylene sheeting. Secure the plastic on the building foundation as possible. Horizontal surfaces include scaffolding and/or other work platforms. Extend the plastic from the foundation to 10 feet beyond the Work Area. Seal all seams with tape and secure plastic to prevent undesired movement.

D. Where elevated Lead-containing components are likely to generate airborne dust or paint chips, devise a suitable containment to control such dust and prevent dispersal by wind. Exterior removal which generates Lead dust and debris shall not be attempted when winds or air currents (i.e., greater than 15 mph) prevent containment of such waste material within the designated Work Area. To conduct exterior removal under windy conditions, the Contractor shall implement special, safe and effective countermeasures to ensure containment of Lead dust and debris. These countermeasures include but are not limited to protective shrouds or mini-containments on work platforms.

E. Provide a designated entry/exit point to exterior Work Areas suitable for workers to properly decontaminate and exit from the Work Area as specified herein. Install lead caution and warning signage as specified above.

F. Complete any additional preparation work required for the specific abatement method to be used.

G. Notify the Environmental Consultant when the Work Area is ready for inspection. Abatement and lead-related work shall not proceed until the Environmental Consultant has checked and approved Work Area preparations.

3.04 WORKER PROTECTION AND DECONTAMINATION PROCEDURES

A. The Contractor shall use only workers medically qualified and trained for lead work and respirator usage.
1. Medically-qualified shall mean that the worker has had an occupational medical exam for lead exposure and respirator usage within 12 months of abatement start-up and at any time during abatement or lead-related construction work. The contents of the medical exam must be in conformance with 8 CCR 1532.1 and must include a blood-lead test within 30 days of starting work on the project. At no time shall the abatement worker exceed six months between each blood-lead testing.

2. Each lead abatement worker shall have successfully completed at least 24 hours of formal documented training in lead hazards and lead abatement methods and be a current Department Certified Lead Worker. Non-abatement workers performing lead related construction work shall have documented lead hazard communication training in accordance with 8 CCR 1532.1.

3. The Contractor's Competent Person shall have received at least 40 hours of formal training in lead hazards and lead abatement.

4. The Contractor's Supervisor(s) and workers shall be certified through the Department lead accreditation program for lead-related construction. Copies of each employee's certification shall be provided.

5. The Contractor shall ensure that no worker is allowed onsite to perform lead-related work until the Environmental Consultant has received and approved all of that worker's medical, training and fit testing certifications.

B. Each worker and Authorized Visitor shall, upon entering the job site, enter the designated clean change room and remove street clothes, put on an inner reusable or disposable coverall and work shoes and then put on an outer set of full body disposable coveralls, booties or shoe covers, respirator with HEPA filters, and gloves before entering the Work Area.

C. Each worker and Authorized Visitor shall HEPA vacuum contamination from protective clothing and then remove shoe covers before leaving one Work Area for another Work Area inside the same Work Area unless the Work Areas have been interconnected with a secured plastic sheet at least three feet wide.

D. When exiting an interior or exterior Work Area and leaving the specific building worked on, proceed to the designated area for unsuiting and remove outer protective clothing and equipment. Dispose of outer protective clothing as suspect Lead waste. Proceed to a designated shower area, remove and clean the respirator and store in a clean container. Wash hands and face and proceed to clean change area to re-suit for the next area.

E. At the end of the work day, all workers are to do the following in addition to those procedures described above: Place disposable outer garments and shoe covers in separate labeled waste containers dedicated to PPE for proper waste characterization; place reusable clothing for laundering in a closed container, clean protective gear including respirator, shower or wash hands and face at minimum, and put on clean street clothes in the clean room area.

F. All tools and equipment shall be decontaminated by HEPA vacuuming and wet wiping prior to being taken out of the Work Area. Tools and equipment with inaccessible internals shall be externally wet-wiped, bagged and sealed prior to being removed from the Work Area.

G. Workers shall not eat, drink, smoke, or chew gum or tobacco at the work site within 20 feet of any Work Area as specified by the Environmental Consultant.

H. Provide and post the decontamination and work procedures to be followed by workers in the equipment area and in the clean area.

I. Each worker shall have a final medical blood-lead laboratory test within one week of job completion and before engaging in other lead related work.
3.05 REMOVAL OF LEAD CONTAINING COMPONENTS

A. Remove any associated non-Lead containing hardware or construction interference (electrical and telephone utilities, conduit, piping, etc.) as required and store in construction area until final disposition is determined by the District's Representative.

B. Remove Lead containing components as specified herein and by the Contract Drawings. Scrape painted seam at edge of each component with utility knife or blade tool and remove any exposed accessible fasteners. Spray the affected surfaces of the Lead containing component being removed lightly with a fine mist of amended water.

C. Special precautionary controls shall be used as necessary to prevent Lead dust or debris from being carried or blown out of the controlled area by wind or air currents.

D. Using appropriate tools, begin to remove the Lead containing component by prying first behind nailing locations and/or removing accessible fasteners. Continue prying up the Lead containing component being careful not to break or create chipping until the Lead containing component is completely removed. Take necessary precautions to avoid damage to adjoining walls and/or associated surfaces.

E. Each component shall be carefully lowered to the ground, not dropped or thrown. Clean up dust and debris as removal proceeds.

F. Once removed, remove or flatten any remaining fasteners and wrap the Lead containing component in six (6) mil polyethylene sheeting, seal with duct tape, wet-wipe and transfer to secure waste storage for waste characterization.

G. HEPA vacuums and wet-wiping shall be used to ensure any resulting Lead dust, paint chips or debris have been cleaned up from horizontal surfaces and polyethylene sheeting prior to moving ladders, scaffolding, man-lifts or other working platforms to the next Work Area to be abated.

3.06 REMOVAL OF LEAD CONTAINING SURFACES BY CHEMICAL REMOVAL

A. Removal of Lead containing surfaces shall be by a Chemical Removal System approved for use by the Environmental Consultant.

B. The Contractor shall provide additional security measures as necessary to ensure non-abatement workers cannot gain access to chemicals and chemically-treated surfaces.

C. Material safety data sheets for each chemical substance and product used shall be onsite at all times and available for review by workers and Environmental Consultant.

D. The Competent Person shall review the contents of the material safety data sheets and the safe removal procedures with the workers prior to chemical removal.

E. Workers shall wear chemical goggles, face shields, impervious gloves, aprons, and booties over the standard protective clothing prior to starting chemical removal.

F. Stage or install a temporary emergency eyewash capable of providing a 15-minute flush within the immediate Work Area if corrosive organic or corrosive inorganic paint removal (stripping) products are used. In addition, a shower shall be available onsite within 50 feet of the removal operation.

G. Chemical stripping agents (and neutralizers) shall be applied in accordance with the recommendations of the manufacturer. Remove all paint and/or glazing compounds down to the bare substrate. Ensure that the chemicals used and the associated removal methods leave a clean and smooth surface capable of accepting a suitable primer/sealer coating after final cleaning.
H. Containerize all paint and chemical waste in impervious containers labeled as hazardous waste.

I. Package all contaminated rags and protective equipment, and disposable cleaning items and plastic sheets in labeled impervious containers and transfer waste containers to secure waste storage units. The Contractor shall assume all such waste to be hazardous unless proven otherwise by objective waste characterization data.

J. Clean and decontaminate the Work Area in accordance with the procedures outlined herein.

K. Decontaminate all tools and equipment before removing them from the Work Area. Seal or bag up such equipment for transfer to the next Work Area or operation.

3.07 REMOVAL OF LEAD CONTAINING SURFACES BY MECHANICAL REMOVAL

A. Removal of lead containing surfaces by mechanical removal shall be performed within negative pressure enclosures.

B. All mechanical removal equipment and systems shall be approved by the Environmental Consultant. Such equipment includes but is not limited to needle guns, abrasive wheels, and roto-peen equipment.

C. All power tools shall be designed and equipped with HEPA-filtered exhaust systems.

D. The Contractor shall submit a separate workplan for containment of fugitive dust and debris emissions.

E. Work Area preparation and Lead coating removal shall be in accordance with approved work plan.

3.08 DRILLING/ANCHORING/CUTTING/ABRADING LEAD CONTAINING SURFACES

A. Prepare the Work Area as specified herein for lead abatement.

B. Remove all interfering structures (security bars, etc.) and store for replacement when work is complete.

C. Where installation of materials requires drilling, cutting, anchoring or abrading the Lead containing surfaces, the Contractor shall take additional appropriate precautions including, but not limited to, use of protective drop cloths, clean-up and decontamination of Lead dust and debris as specified herein.

D. Place plastic drop sheet below area of impaction.

E. Lightly moisten lead containing surface to be impacted.

F. Conduct impaction operations (i.e. drilling, anchoring, abrading, etc.)

G. Continue misting lead containing surface during impaction to control airborne dust.

H. HEPA vacuum and wet-wipe frequently to prevent accumulation and spread of lead-containing dust and debris.

3.09 LBP AND LEAD GLAZING STABILIZATION

A. Prepare the Work Area as specified herein for lead abatement.

B. Remove all interfering structures (security bars, etc.), if any, and store for replacement when stabilization work is complete.
C. Surface Preparation - Remove all loose, flaking, peeling and/or deteriorated paint and/or glazing compounds using wet methods and prepare the surface within the work area as follows:

1. Lightly moisten exposed Lead containing surfaces to be prepared;

2. Wet-scrape and/or wet-sand surfaces as necessary to remove all loose and deteriorated paint or glazing compounds to obtain a like new surface with any remaining coating soundly bonded to the substrate;

3. Periodically re-moisten as necessary to control airborne dust;

4. HEPA vacuum and wet-wipe frequently to prevent accumulation and spread of lead-containing dust and debris;

5. Promptly dispose of all spent cleaning materials in labeled impervious containers;

6. Surface preparation is complete when the surface is sound, smooth, clean and can be painted to provide a like new surface.

D. Surface Preparation Clean-up

1. Upon completion of surface preparation, wet-scraping, and/or wet sanding, clean and decontaminate the entire Work Area using procedures outlined herein;

2. Decontaminate all tools and equipment before removing them from the Work Area. Seal or bag up such equipment for transfer to the next Work Area or operation;

3. Visually inspect prepared surfaces and the cleaned Work Area prior to applying any paints or coatings to ensure all loose paint, dust and debris has been cleaned up and the surface is properly prepared for painting.

E. Painting - Apply primer and finish coats of paint to obtain a like new surface in accordance with the manufacturer's specifications and requirements of the contract.

F. Conduct preliminary cleaning and decontamination of the entire Work Area and notify the Environmental Consultant to arrange for a preliminary visual clearance inspection. The Work Area containments shall not be removed until the Contractor has been notified by the Environmental Consultant of a satisfactory preliminary visual inspection result.

G. Remove containments and conduct final cleaning and decontamination of entire Work Area. Notify Consultant at least 24 hours in advance to arrange for final clearance inspection and testing. A mutually agreeable date and time shall be established by the Environmental Consultant, District and the Contractor for clearance inspections.

3.10 CLEANING AND DECONTAMINATION OF WORK AREAS

A. Daily Clean-up: Perform the following clean-up procedures daily.

1. Clean Work Areas until they are free of loose dust and debris to the satisfaction of the Environmental Consultant and/or District using HEPA and/or wet-wiping after pick-up of large debris.

2. Wet debris with a fine mist of water and collect material. All material to be properly segregated, bagged in 6-mil plastic bags, sealed, and moved to a designated, secure, waste storage area for waste characterization.

3. At the end of each work day the Environmental Consultant and/or District and the Contractor's Competent Person shall inspect work performed that day to ensure the work has been completed and no dust or residue remains on the areas removed and/or in the Work Area.
B. Final Clean-up and Decontamination: At completion of abatement perform cleaning as follows:

1. Remove all visible dust and debris as specified above.

2. Clean all Work Areas where abatement was performed by vacuuming all surfaces with a HEPA vacuum followed by wet-wiping with a high phosphate (tri-sodium phosphate) wash. The Contractor shall spray surfaces with a 5-10 percent tri-sodium phosphate (or approved equivalent) cleaning solution applied with a garden sprayer and wipe or mop surfaces with frequently changed clean towels, rags or mops.

3. Disassemble and remove containment barriers at each Work Area location after cleaning as specified above. Place polyethylene sheeting and tape into waste bags and remove to the temporary waste storage area.

4. Remove six (6) mil polyethylene sheeting on immovable objects and floors (where present) after misting with a high phosphate wash and wet-wiping. Place polyethylene sheeting and waste rags in segregated six (6) mil plastic bags, seal and store in a designated, secure, waste storage area for waste characterization.

5. Detergent solutions shall be replaced after each individual room is washed unless the spray application is used. If the wet vacuuming method is used, waste water shall be contained and disposed of properly after waste characterization testing.

6. The cleaning procedure used shall prevent spread of contamination and effectively clean surfaces while producing minimal waste.

7. All tools and equipment shall be sealed in six (6) mil plastic bags after being decontaminated using a high phosphate wash and wet-wiping prior exiting the Work Area.

8. Liquid cleaning wastes shall be filtered prior to containerizing for temporary storage pending hazardous waste characterization. Filter systems shall be able to remove particulate two microns and larger in diameter. Permits, if required, are the responsibility of the Contractor.

9. At least eight hours prior to completion and again upon completion of final clean-up and decontamination, notify the Environmental Consultant to obtain a final clearance inspection and testing.

3.11 FINAL CLEARANCE INSPECTION AND TESTING

A. Interior Clearance Inspection and Testing.

1. After the final clean-up, the Contractor shall perform a complete visual inspection of the Work Area under adequate lighting to ensure the Work Area is free from visible debris, dust, waste bags, containers, and unnecessary equipment. The Contractor shall ensure that additional cleaning is completed if the area is not acceptably clean. The Contractor’s request for inspection will be recognized upon receipt of a completed and signed copy of the Asbestos and Lead Inspection Form– Appendix G. No inspections will be conducted without a completed and signed copy of the Asbestos and Lead Inspection Form (Appendix G).

2. Upon receipt of the Asbestos and Lead Inspection Form (Appendix G), the Environmental Consultant will perform the final visual clearance inspection. The clearance inspection will at minimum consists of the requirements as described in Chapter 15: Clearance, Sections II-VI, “Guidelines for the Evaluation and Control of Lead-based Paint Hazards in Housing,” dated June 1995.

3. If the Work Area is not visibly clean, as determined by the Environmental Consultant, the Contractor shall re-clean and decontaminate as described herein at his own cost until the work area passes inspection.

4. A minimum of two hours is required between cessation of clean-up procedures and clearance dust wipe testing.
5. All clearance dust wipe samples will be taken using the HUD sampling protocol by the Environmental Consultant.

6. Dust wipe samples will be collected using commercial wipes moistened with a non-alcohol wetting agent. When possible, areas of approximately one square foot will be selected from horizontal surfaces below or adjacent to where LBP components were removed.

7. One dust wipe sample will be collected per abated area (doorway, utility room) and sent under proper chain of custody protocol to an accredited AIHA or EPA-CPL laboratory or equivalent as specified by the Environmental Consultant.

8. All dust wipe samples will be analyzed for lead using either AAS or ICP-AES for lead and results will be provided to the Contractor within two days of receipt of sample results.

9. The Contractor shall be released from each Work Area when all dust wipe samples from the area are below the following levels of lead:
   a. Interior Floor Surfaces: 40 micrograms per square foot (µg/ft²)
   b. Interior Horizontal Surfaces: 250 µg/ft²
   c. Exterior Floor and Horizontal Surfaces: 400 µg/ft²

10. A Work Area shall be considered completed and cleared only after all areas within the Work Area have met the above criteria.

11. If any of the dust wipe samples exceed the clearance criteria, the entire Work Area must be cleaned and retested until the clearance criteria are met. As the building may be occupied, the Contractor shall coordinate with the District and Environmental Consultant to gain access for cleaning and re-inspection and clearance testing by the Environmental Consultant at the earliest time possible.

12. If a Work Area fails the clearance criteria specified above, the Contractor shall clean the entire Work Area at no additional cost nor increase to the contract sum and shall be responsible for associated additional Environmental Consultant fees. The Contractor shall pay all laboratory and delivery charges for additional dust wipe samples taken in each Work Area upon clearance failure.

B. Exterior Clearance Inspection. After the final clean-up by the Contractor, the Environmental Consultant shall conduct a visual inspection to ensure that all visible dust and debris has been properly removed. The Contractor must provide the Environmental Consultant at least 8 hours notice prior to scheduling final inspections. If the results of the final visual inspection are satisfactory to the Environmental Consultant, clearance dust wipe samples may be collected from exterior floor and exterior horizontal surfaces. Upon obtaining acceptable clearance sample results, the exterior Work Area shall be released for unrestricted access. If the results of the inspection are unsatisfactory the contractor shall re-clean and decontaminate the Work Area prior to requesting another inspection by the Environmental Consultant.

C. Upon acceptance of the final results for clearance dust wipe sampling, the Environmental Consultant shall complete the Asbestos and Lead Inspection Form (Appendix G) and submit this information to the District and retain the original.

3.12 RE-INSTALLATION ON INTERFERENCE COMPONENTS

A. Upon completion of abatement and lead-related construction work, re-install fixtures, electrical utilities, telephone utilities and other components removed as construction interferences except for components scheduled for removal and disposal.

3.13 LEAD CONTAMINATION OF BUILDING OR ENVIRONMENT

A. In the event that removed paint dust or debris is not properly contained within the Work Area and thereby escapes,
bypasses or penetrates established barriers, the Contractor shall stop work immediately, notify the Environmental Consultant immediately, and commence clean-up and decontamination procedures as described herein or directed by the Environmental Consultant.

B. For soil contamination, the Contractor shall remove all visible signs of paint dust and debris and, at minimum, the upper one-half inch of soil in the area contaminated and at least five feet beyond in each direction. Successful completion of soil decontamination shall be subject to evaluation by sampling at the discretion of the District and Environmental Consultant. Soil sample(s) with lead concentrations below pre-abatement composite soil sample results or 400 ppm if background samples were not collected shall be the criteria for completion of soil clean-up and decontamination. The Contractor shall be responsible for all costs associated with disposal of any debris and contaminated soil, including waste characterization testing.

3.14 WASTE STORAGE, SEGREGATION, AND CHARACTERIZATION

A. The Contractor shall provide for secure onsite temporary storage of Lead related waste. Waste storage location, equipment, containers and methods are subject to prior approval by the District and Environmental Consultant.

B. Construction materials removed from lead abatement must be evaluated to determine waste characteristics prior to disposal. Except intact Lead containing components, all waste streams and waste categories shall be considered hazardous until proven otherwise. The Contractor shall be responsible for segregating waste into the following categories and conducting appropriate waste testing for lead:

1. **Paint (LBP & non-LBP) and glazing, chips, dust and debris, HEPA vacuum waste, and used cleaning materials.** The Contractor shall handle, store and dispose of these items as a hazardous lead waste without further characterization.

2. **Plastic sheeting and tape.** Except for plastic sheeting from chemical removal areas, these used items, if properly cleaned, should be non-hazardous. However, they shall be considered hazardous unless proven otherwise by lead waste testing.

3. **Disposable Protective Clothing and Equipment (PPE).** Disposable work clothes and other items potentially contaminated with LBP or lead, if properly cleaned, should be non-hazardous. However, they shall be considered hazardous unless proven otherwise by lead waste testing.

4. **Intact Lead containing components.** Architectural debris with intact Lead coatings will be considered a special non-hazardous construction debris as long as the coating remains intact unless otherwise noted.

5. **Plaster debris.** Plaster debris with lead-based paint shall be considered hazardous pending laboratory results.

6. **Ceramic tile debris.** Ceramic tile debris with lead levels greater than 1.0 mg/cm² shall be considered hazardous pending laboratory results.

7. **Chemically Removed Paint/Glazing - shall be considered hazardous waste.**

C. Each Lead-related waste produced shall be placed in properly segregated, labeled and sealed, impervious containers.

D. Removed intact Lead containing components shall be properly segregated, wrapped in six-mil polyethylene sheeting, labeled and securely sealed with duct tape.

E. All waste containers, bags, and packaged waste shall be stored in a designated, secure, locked waste storage area and be labeled "PENDING ANALYSIS" with the following information:

1. Waste Category
2. Date Accumulated

3. Name, address, District

4. Origin of waste

F. HEPA vacuum and wet-wipe the exterior of all waste containers prior to removing them from the Work Area to the designated storage area.

G. All Lead-related waste, except architectural components with intact Lead coatings, shall be considered hazardous until waste characterization has been performed under the California Code of Regulations, Title 22. Architectural debris with intact coatings is a special category which may not be subject to testing as determined by the Environmental Consultant.

H. Each category of waste, except components with intact paint or coatings, will be tested and characterized by the Contractor using one or more of the following testing protocols:

1. Cal-EPA testing protocol:
   a. Total Threshold Limit Concentration (TTLC): 1,000 ppm
   b. Soluble Threshold Limit Concentration (STLC): 5 ppm

2. Federal-EPA testing protocol:
   a. Toxicity Characteristic Leaching Procedure (TCLP): 5 ppm

I. All testing by the Contractor shall be subject to direct observation and review by the Environmental Consultant. At minimum, a TTLC shall be performed on each suspect waste stream. Based on the testing protocols, any waste greater than or equal to five (5) ppm lead using STLC or TCLP tests or any waste greater than or equal to 1,000 ppm lead using the TTLC test shall be considered a hazardous waste.

J. When the TTLC is less than 50 ppm lead, no further testing is required for that waste category sampled. It will be the responsibility of the Contractor to ensure representative samples are taken from each category of segregated waste.

K. The Contractor shall package, store, handle, transport and dispose of each category of waste generated based on the testing results obtained by the Contractor and reviewed by Environmental Consultant. Where landfills have more stringent requirements, the Contractor shall be responsible for all additional disposal costs. The proposed landfill shall be subject to approval by the Environmental Consultant.

L. Upon verbal request of the Environmental Consultant, the Contractor shall collect samples of Lead-related waste. The Contractor shall collect samples within full view and presence of the Environmental Consultant. Samples taken may entail cutting and removing sections of a component and clean-up of any resulting dust or debris.

M. The cost of all waste characterization or waste profiling required by the approved landfill will be the responsibility of the Contractor.

N. In the event that the Environmental Consultant has determined that waste is not properly segregated, additional waste testing may be conducted of the mixed waste stream. The Contractor shall be responsible for the costs associated with this additional testing.

O. The Contractor shall bear full responsibility for additional costs associated with waste disposal and characterization if waste is not properly segregated as required herein.
3.15 HAZARDOUS WASTE DISPOSAL:

A. Site Storage and Handling: The Contractor shall pay strict attention to the requirements of 40 CFR 262 and 265 and Title 22, Chapter 30 for the onsite handling of debris, with special attention given to the time of storage, amount of material stored at any one time, use of proper containers, and personnel training. All waste shall be stored in secure, locked, labeled, sealed impervious containers and not placed on the unprotected ground. All containers shall be shielded adequately to prevent dispersion of the debris by wind or rain and shall be labeled as hazardous waste. Any evidence of improper storage shall be cause for immediate shutdown of the project until a corrective action is taken.

B. Transportation and Disposal of Waste:

1. The Contractor shall arrange to have the Lead-related waste and debris transported from the site in accordance with the requirements of 40 CFR 263 and 264, and disposed of properly in accordance with 40 CFR 268, GISO 8 CCR Articles 40 and 41, 49 CFR Parts 172, 173, 178, and 179 and Title 22, Chapter 30, Articles 5, 6, 6.5 and 8.

2. The Contractor shall submit to the District and Environmental Consultant the Name, Class, and EPA I.D. Number of the waste disposal site(s) to be used for each waste category which has been determined by testing to exceed the hazardous waste thresholds provided in Article 3.14, Paragraph H and Paragraph I and any Intact LBP component waste.

3. Where Lead related construction debris is to be disposed of as a non-hazardous, a waste shipping is still required and a copy shall be provided to the District and Environmental Consultant.

4. The Contractor shall prepare waste shipping manifests for review by the District. Upon waste or material pickup by the selected waste transporter, manifests shall be signed by the District or District's Representative and copies retained to verify that all steps of the handling and disposal process have been completed properly.

5. Copies of the landfill weight tickets shall be provided to the District and Environmental Consultant to verify the amount of waste disposed of at that site. The Contractor shall be responsible for all costs associated with transportation and disposal of all wastes generated at the result of this work.

C. No waste characterized as hazardous waste shall be stored onsite for more than 90 days prior to being properly transported for disposal.

D. All equipment, materials, and waste generated on this project must be removed offsite to their proper locations by the Contractor within seven (7) calendar days from successful abatement completion and receipt of final clearance wipe testing results for lead related work.

E. Containers to be loaded for transportation from the storage area must be removed by workers who have entered from uncontaminated areas, dressed in clean coveralls.

3.16 STOP WORK ORDERS

A. The Environmental Consultant has the authority to stop work. Examples of such conditions that might result in a work stoppage include but are not limited to:

1. Uncontrolled visible emissions which escape the established Work Area or breach physical protective barriers within the Work Area; and/or,

2. Ambient airborne levels of lead measured outside the construction area at more than 4.5 micrograms per cubic meters of air (mg/m³) of lead averaged over an eight work period or the equivalent of 1.5 (mg/m³) for any 24 hour period.
3. Unsecured Waste Storage Area and/or improper containment of abatement waste or LBP contamination.

3.17 PROJECT CLOSEOUT

A. Prior to approval of final payment request, the Contractor must provide the following information:

1. Copies of hazardous waste manifests, profile sheets and weight tickets for all hazardous wastes and manifests and weight tickets for non-hazardous wastes or recyclables consisting of architectural debris with intact paint.

B. All surfaces damaged during this work must be restored to their original condition except those surfaces scheduled for demolition as part of the renovation project.

END OF SECTION
SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: Joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
2.2 URETHANE JOINT SEALANTS


1. Products: Subject to compliance with requirements, provide one of the following:
   a. BASF Building Systems; Sonolastic NP1.
   b. Sika Corporation, Construction Products Division; Sikaflex - 1a.
   c. Tremco Incorporated; Vulkem 116.
   d. Or approved equal.

2.3 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
a. Concrete and asphalt.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
   4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

   A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

   A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

   A. Joint-Sealant Application:

      1. Joint Locations:
         a. Isolation and contraction joints in cast-in-place concrete slabs.

      2. Urethane Joint Sealant: Single component, nonsag, traffic grade.

      3. Joint-Sealant Color: As selected by Architect from manufacturer’s full range of colors.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install aluminum architectural windows complete with hardware and all related components as shown on drawings and specified in this section.

B. Related Sections:

1. Division 07 Section “Joint Sealants”.

1.3 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units


B. Test Procedures and Performances: All windows shall conform to ANSI/AAMA/NWWDA 101/I.S.2-97 requirements. In addition, the following specific performance requirements shall be met:

1. Air Infiltration Test:
   a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 283 at static air pressure of 6.24 psf.
   b. Air infiltration shall not exceed 0.1 cfm per square foot.

2. Water Resistance Test:
   a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 331 at a static pressure difference of 12 psf.
   b. There shall be no uncontrolled water leakage.

3. Uniform Load Deflection Test:
   a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference (positive and negative) of 120 psf.
   b. During the course of the test, no member shall deflect more than 1/175 of its span.

4. Uniform Load Structural Test:
   a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 120 psf.
b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage, which would cause the window to be inoperable.

5. Condensation Resistance Test (CRF):
   a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
   b. Condensation Resistance Factor (CRF) shall not be less than 54.

6. Life Cycle Test:
   a. Tested in accordance with AAMA 910, there shall be no damage to fasteners, parts, support arms, activating mechanisms, or any other damage, which would make the window inoperable. Subsequent air infiltration and water resistance tests shall not exceed specified requirements.

7. Projected Windows: Comply with AAMA/NWWDA 101/I.S.2 for the following tests:
   a. Sash Torsion Test.
   b. Torsion Test.
   c. Horizontal Concentrated Load Test on Latch Rail.
   d. Vertical Concentrated Load Test on Latch Rail.
   e. Torsion Load Test on Intermediate Frame Rails.
   g. Balance Arm Load Tests.

1.4 QUALITY ASSURANCE
   A. Provide test reports from AAMA accredited laboratory certifying the performance as specified in TESTING AND PERFORMANCE REQUIREMENTS article.
   B. Test reports shall be accompanied by the window manufacturer’s letter of certification stating that the tested window meets or exceeds the criteria for the appropriate ANSI/AAMA/NWWDA 101/I.S.2-97.
   C. Installer shall be approved by manufacturer.

1.5 SUBMITTALS
   A. Contractor or window manufacturer shall submit shop drawings, finish samples, test reports, and warranties.
      1. Shop Drawings: Include typical unit elevations, full or half scaled detail sections and typical installation details. Include type of glazing, screening, and window finish.
      2. Product Data: Manufacturer's specifications, recommendations and standard details for window units.
      3. Samples of materials may be requested without cost to Owner, for example, frame sections, corner samples, mullions, extrusions, anchors, and glass.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Store and handle windows and other components in strict compliance with manufacturer's instructions.
   B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.
1.7 Warranties

A. Total Window System:

1. The Contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation, which includes that of the windows hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings.

2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the Contractor at his expense during the warranty period.

PART 2 - PRODUCTS

2.1 Basis-of-Design Product

A. Basis-of-Design Product: Subject to compliance with requirements, provide Winco Window Company products specified, or approved equal.

B. Products: Provide and install Winco 1150S Series, 2 inch, AW, Architectural Grade, Thermally Improved Fixed and Project Out Awning Windows, AAMA Rated AW-80, factory glazed, with all hardware, custom break metal and installation accessories indicated or required for complete installation.

2.2 Materials

A. Aluminum Frames:

1. Alloy: 6063-T6, 24,000 PSI.

2. Frame Wall Thickness: All aluminum frame and vent extrusions shall have a minimum wall thickness of 0.125 inches.

3. Frame Depth: 2 inches minimum with integral exterior sloped glazing leg.

4. Vent Depth: 2 inches minimum with integral exterior sloped glazing leg.

5. Frame Construction: Frame components shall be assembled by means of mechanical fastening with screws. Joinery shall be sealed with small joint sealant.

6. Ventilators:

   a. All vent extrusions shall be tubular on all 4 sides.

   b. Each corner shall be mitered and assembled by means mechanical fastening with screws. Joinery shall be sealed with small joint sealant.

   c. Each vent shall have two rows of Santoprene® weather stripping installed in a specifically designed weather strip pocket for the extrusion.

7. Weather-Stripping: Full perimeter, double ‘Santoprene thermoplastic rubber or equal.

8. Frame Finish:

   a. Finish all exposed areas of aluminum windows and components with electrolytically deposited bronze color in accordance with Aluminum Association Designation AA-M10-C22-A42, Class I, Bronze Anodized, 0.7 mils minimum, AAMA Guide Specification 611-98.

9. Thermal Barrier:

   a. Poured-in-place structural thermal barrier shall transfer shear during bending and provide composite action between frame components.
b. Thermal barrier pocket on aluminum extrusions shall be Azo-Braided to create a mechanical lock to improve the adhesion properties between the polyurethane polymer and the surface of the thermal barrier pocket.

c. Window manufacturer must provide a warranty from the manufacturer of the polyurethane thermal barrier that warrants against product failure as a result of thermal shrinkage beyond 1/8 inch from each end and fracturing of the polyurethane for a period not to exceed ten years from the date of window manufacture.

d. Thermal barrier’s made of crimped in place polyamide (insulbar®) strips are not acceptable unless all strips are covered and tooled with Dow 795 silicone caulking to eliminate water migration.

B. Custom Break Metal and Snap Trim:

1. Window manufacturer shall provide custom 20 gauge aluminum break metal and snap trim, finish to match window frames, broken to shapes indicated on drawings.

C. Glazing:

1. Glazing: Factory, Dual-Glazed, 1/2 inch air space, 1/4 inch thick, clear, fully tempered glass both panes.
2. “Obscure” finish as indicated on drawings.
3. Glazing Beads 0.050 inch thick extruded aluminum glazing bead.
4. All units shall be glazed with butyl tape, silicone cap bead on the exterior, with glazing vinyl and extruded snap-in aluminum glazing bead on the interior.

D. Insulated Spandrel Glass Panels:

1. A1 Windows shall have fixed center pane with insulated spandrel glass to conceal the floor structure behind it.
2. MapeSpan, or approved equal.

E. Hardware

1. Provide left and right handed (as required) pole ring cam locking handles manufactured from a bronze alloy with a brushed bronze finish.
2. Operating arms shall consist of 4-bar stainless steel arms or equal.
3. Provide four - 10 foot long standard poles with wall mounted pole hangers for the two large classrooms on the main level.

F. Screens for Operable Windows:

1. NO SCREENS

G. Sealants: Provide sealants specified as recommended by window manufacturer in color matching window frame.

PART 3 - EXECUTION

3.1 INSPECTION

A. Job Conditions

1. Field verify and field measure all existing window openings and record all field dimensions of shop drawings. Verify that openings are dimensionally correct and within allowable tolerances. Openings must be plumb, level, and clean. Provide a solid anchoring surface that is in accordance with approved shop drawings.
3.2 INSTALLATION

A. Use only skilled craftsmen approved by manufacturer for work to be done in accordance with approved shop drawings, architectural drawings and specifications.

B. Set square and level aligning window faces in a single plane for each opening. Windows and materials must be set square and level. Adequately anchor window so when subjected to normal thermal movement, specified building movement, and specified wind loads, so windows will maintain a permanent position.

C. Adjust windows for proper ease of operation after installation has been completed.

D. Furnish and install sealant, per manufacturer’s recommendations, to provide a weather-tight installation at all opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth. Provide window flashings, sub-sills and end dams on all window installations.

3.3 WINDOW POLE HANGER MOUNTING

A. Install one pole hanger each side of each large classroom on the main level (four total) at locations as directed by Architect or District.

3.4 PROTECTION AND CLEANING

A. After completion of window installation, windows shall be inspected, adjusted, and left in working order. Windows shall be left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the building occupant.

END OF SECTION
SECTION 09 91 00
PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes surface preparation and the application of paint systems on interior and exterior sides of exterior wood window frames. Do not paint adjacent walls or prefinished aluminum window frames.
   B. Related Sections include the following:
      1. Division 08 “Aluminum Windows” for factory finished aluminum window frames.

1.3 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Product List: For each product indicated, include the following:
      1. Printout of current Manufacturer’s Data Sheet for each product category specified in Part 2, with the proposed products highlighted.

1.4 REFERENCE STANDARDS
   A. Manufacturer’s written recommendations and standards; and Master Painters Institute (MPI) Standards.
      1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
      1. Maintain containers in clean condition, free of foreign materials and residue.
      2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS
   A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
   B. Do not apply paints in rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish 1 gallon of each color and gloss level applied. Provide all extra materials in new unopened cans clearly marked with manufacturer’s name, product name, color name, and color formula.

1.8 GLOSS LEVEL DEFINITIONS

A. Gloss Level 1, Drawing Mark FL: A traditional matte finish – flat. Maximum of 5 units gloss at 60 degrees. Maximum of 10 units sheen at 85 degrees.

B. Gloss Level 2, Drawing Mark SF: A high side sheen flat – a “velvet like” finish. Maximum of 10 units gloss at 60 degrees. 10 - 35 units sheen at 85 degrees.

C. Gloss Level 3, Drawing Mark ES: A traditional “eggshell like” finish. 10 - 25 units gloss at 60 degrees. 10 – 35 units sheen at 85 degrees.

D. Gloss Level 4, Drawing Mark SA: A “satin like” finish. 25 - 30 units gloss at 60 degrees. Minimum of 35 units sheen at 85 degrees.

E. Gloss Level 5, Drawing Mark SG: A traditional semigloss. 35 - 70 units gloss at 60 degrees.

F. Gloss Level 6, Drawing Mark GL: A traditional gloss. 70 - 85 units gloss at 60 degrees.

G. Gloss Level 7, Drawing Mark HG: A traditional high gloss. More than 85 units gloss at 60 degrees.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Kelly Moore, or approved equal.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors As selected by Architect from manufacturer’s full range.

2.3 WOOD PRIMERS

A. Acrylic Wood Primer:

1. Kelly Moore, Acrylic Prime 255, or approved equal.
2.4 LATEX PAINTS

A. Acrylic Semigloss: (Gloss Level 5).
   1. Kelly Moore, Acry-Luster Semigloss, 1250, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with applicator present, for compliance with requirements, for maximum moisture content, and for other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Moisture content shall be less than 18%. Allow two days for wood frames to dry after cleaning and washing.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

C. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
   1. Use applicators and techniques suited for paint and substrate indicated.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
3.4 FIELD QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to engage the services of a qualified testing agency to sample paint materials being used at any time, and as often as Owner deems necessary during the period when paints are being applied for compliance of paint materials with product requirements:

1. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 PAINTING SCHEDULE

A. Paint interior and exterior sides of existing exterior wood window frames and interior and exterior finishes to match that are affected by the work.

B. Wood Substrates.

1. Latex System: Eggshell
   c. Topcoat: Acrylic Semigloss.

END OF SECTION
APPENDIX G
ASBESTOS AND LEAD INSPECTION FORM

LOCATION OF ZONE / WORK AREA: __________________________________________________________

BUILDING NAME: ____________________________________________________________

DISTRICT NAME: College of Marin #15-0324

PROJECT TITLE: Kentfield – Fusselman Hall Window Replacement Project

DESCRIPTION OF ASBESTOS WORK:

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Material Description</th>
<th>Quantity Removed (Sq.Ft. or Ln.Ft.)</th>
<th>Abatement Method</th>
<th>Quantity Remaining (Sq.Ft. or Ln. Ft.)</th>
</tr>
</thead>
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</table>

DESCRIPTION OF LEAD WORK:

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Material Description</th>
<th>Quantity Removed (Sq.Ft. or Ln.Ft.)</th>
<th>Abatement Method</th>
<th>Quantity Remaining (Sq.Ft. or Ln. Ft.)</th>
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</table>

CONTRACTOR’S PRE-START VISUAL INSPECTION

CONTRACTOR hereby certifies that he has visually inspected the Work Area and has found it to be prepared in accordance with the Contract Documents and associated Regulations and is ready to start abatement operations.

NAME: ________________________________________ INSPECTION DATE: _______________________

SIGNATURE: __________________________________ CERTIFICATION #: _______________________

CONTRACTOR’S FINAL VISUAL INSPECTION

CONTRACTOR hereby certifies that he has visually inspected the Work Area and has found no dust, debris or residue. This inspection included all surfaces including pipes, beams, ledges, walls, ceiling, floor, Decontamination Unit, sheet plastic, etc.

NAME: ________________________________________ INSPECTION DATE: _______________________

SIGNATURE: __________________________________ CERTIFICATION #: _______________________

CONSULTANT PRE-START VISUAL INSPECTION

CONSULTANT hereby certifies that he has conducted a pre-abatement visual inspection of the referenced Work Area, and verifies that the Contractor has prepared the Work Area in accordance with the Contract Documents and is ready to start abatement operations.

NAME: ________________________________________ INSPECTION DATE: _______________________

SIGNATURE: __________________________________ CERTIFICATION #: _______________________

Page 1 of 2
APPENDIX G
ASBESTOS AND LEAD INSPECTION FORM

LOCATION OF ZONE / WORK AREA: ____________________________________________

BUILDING NAME: __________________________________________________________

CONSULTANT FINAL VISUAL INSPECTION

CONSULTANT hereby certifies that he has performed the final visual inspection of the referenced Work Area, and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Contractor's Certification above is a true and honest one.

NAME: ___________________________ INSPECTION DATE: ___________________

SIGNATURE: ________________________ CERTIFICATION #: ___________________

ASBESTOS CLEARANCE AIR SAMPLING

CONSULTANT hereby certifies that the results of air samples collected and analyzed in this work area meet the clearance criteria indicated below:

☐ Not Applicable – No Asbestos Related Work Completed Within The Area Of Work / Zone.
☐ Not Applicable – Cleared by Visual Inspection Only – Exterior Work Area.
☐ Not Applicable – Cleared by Visual Inspection Only for the following Reasons: ___________________________________

☐ Aggressive PCM Samples at or below 0.01 Fibers/cc
☐ Non-aggressive PCM Samples at or below 0.01 Fibers/cc
☐ Aggressive TEM Samples at or below 70 Structures/mm²
☐ Non-aggressive TEM Samples at or below 70 Structures/mm²

SES Clearance Air Sample Numbers:

NAME: ___________________________ INSPECTION DATE: ___________________

SIGNATURE: ________________________ CERTIFICATION #: ___________________

CLEARANCE DUST WIPE SAMPLING FOR LEAD

CONSULTANT hereby certifies that the results of dust wipe samples collected and analyzed in this work area meet the clearance criteria indicated below:

☐ Not Applicable – No Lead Related Work Completed Within The Area Of Work / Zone
☐ Not Applicable – Cleared by Visual Inspection Only for the following Reasons: ___________________________________

☐ 40 µg/ft² for Interior Floor Surfaces
☐ 250 µg/ft² for Interior Horizontal Surfaces
☐ 400 µg/ft² for Exterior Floor and Exterior Horizontal Surfaces

SES Dust Wipe Sample Numbers:

NAME: ___________________________ INSPECTION DATE: ___________________

SIGNATURE: ________________________ CERTIFICATION #: ___________________