UNIVERSITY OF COLORADO
KITTREDGE COMPLEX REMODEL – ANDREWS HALL
ASBESTOS ABATEMENT, PR002573
HAZARDOUS MATERIALS DESIGN CRITERIA
OCTOBER 05, 2007
HERRON® PROJECT NO. 0621079
October 05, 2007

This Hazardous Materials Design Criteria has been contracted to and developed by HERRON® Enterprises USA, Inc. (HERRON®) for the use of the Client(s). HERRON® has specifically prepared this Hazardous Materials Design Criteria in compliance with the submitted requirements, in conjunction with and approval of the University of Colorado Department of Environmental Health & Safety, as defined for:

HERRON® Project No.: 0621079
Client Job No.: HSG 066851-100752, Work Order #PR002573
Location: Kittredge Complex Remodel-Andrews Hall, University of Colorado, Boulder, CO 80309
Services Requested: Environmental Consultation/ Hazardous Materials Design Criteria

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E-Mail: Steve.Hecht@Colorado.EDU
c/o: Mr. Steve Hecht

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University of Colorado at Boulder
Department of Environmental Health and Safety
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Boulder, CO 80309-0413
(303) 492 6168 / Fax (303) 492 2854
E-Mail: Michael.Yanker@Colorado.EDU
c/o: Mr. Michael Yanker

General Contractor
TO BE DETERMINED

prepared by Designer
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(303) 763 9639 / Fax (303) 763 9686
Email: Lennie.Herron@comcast.net
Mr. L.P. (Lennie) Herron, Industrial Hygienist

This Hazardous Materials Design Criteria is developed for the use of the Client(s) at the aforementioned location and specific project, and is not intended for use at any other location or project. Use of this Hazardous Materials Design Criteria by other than the intended Client(s) and/or their authorized Representatives, and/or unauthorized reproduction without the express written permission of an officer of HERRON®, is strictly prohibited (excluding included forms for project use).

The Project Administrator, Asbestos Project Manager, and/or Designer retain the rights to waive any formalities contained herein, which may be in the best interest of the Client, with Client authorization.

CONTRACT DOCUMENT DEVELOPED BY
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Email: Lennie.Herron@comcast.net
Mr. L.P. (Lennie) Herron, Industrial Hygienist

Certification No. 2572

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Mr. Michael Yanker

Signed: _________________________ Date: _______
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**Client Job No.: HSG 066851-100752, Work Order #PR002573**  
**Location: Kittredge Complex Remodel-Andrews Hall, University of Colorado, Boulder, CO 80309**  
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END
SECTION 01013 - SUMMARY OF WORK - ASBESTOS ABATEMENT

PART 1. - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. The following Drawings, Project Manual, and Addenda from the Contract Documents:

   1. Set(s) of Architectural Drawings titled:

      a. Not applicable.

C. Addenda: All Addenda issued prior to bidding.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of

   1. Project Location:

   

   HERRON® Project No.: 0621079
   Client Job No.: HSG 066851-100752, Work Order #PR002573
   Location: Kittredge Complex Remodel - Andrews Hall, University of Colorado, Boulder, CO 80309
   Services Requested: Environmental Consultation/ Hazardous Materials Design Criteria

   2. Owner/Project Administrator:

       University of Colorado at Boulder
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       Boulder CO 80309-0375
       (303) 492 3323 / Fax (303) 735 4311
       E-Mail: Steve.Hecht@Colorado.EDU
       c/o: Mr. Steve Hecht

   3. Asbestos/LBP Project Manager:

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       c/o: Mr. Michael Yanker

   4. General Contractor:

       TO BE DETERMINED
5. Designer:

HERRON® Enterprises USA, Inc.
7261 W. Hampden Ave., Lakewood, CO 80227-5305
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Email: Lennie.Herron@comcast.net
Mr. L.P. (Lennie) Herron, Industrial Hygienist

B. Contract Documents dated October 05, 2007 were prepared for the Project by HERRON® Enterprises USA, Inc., Mr. L.P. (Lennie) Herron, Industrial Hygienist/Certified Project Designer/Certified Management Planner, in conjunction with the University of Colorado at Boulder Department of Environmental Health & Safety, Asbestos/Lead Office.

C. The Work consists of removal of Asbestos Containing Materials (ACM) from various locations, specific to the Project.

1. In accordance with local, state, and/or federal regulations, during the course of the Renovations should materials be discovered which were not previously presented as Asbestos Containing Materials, or should the Renovation Scope of Work expand beyond that as defined in Section 01013 - Summary of Work - Asbestos Abatement, Appendix A, Schedule of Asbestos-Containing Materials, assessments/diagrams, the Contractor(s) are required to cease with operations which may disturb friable ACM, or make non-friable ACM friable, until such a time that these ACM materials are removed.

2. Locations, approximate quantities affected, approximate areas affected have been offered as an informational tool, and are estimates observed at the time of assessments and development of this document. As will be included in the Bid Instructions, quantity determinations are the responsibility of the Contractor, and therefore, it is recommended that field verification be made by the Contractor, prior to Bid Submittal.

3. As the Architectural Plans do not necessarily indicate the Asbestos Scope of Work which may be affected by the Renovation Scope of Work, the Asbestos Scope of Work, as approved by the Owner is located in Section 01013 - Summary of Work - Asbestos Abatement, Appendix A, Schedule of Asbestos-Containing Materials at the end of this section.

D. The Work will be constructed under a single prime contract, through the General Contractor.

1.3 WORK UNDER OTHER CONTRACTS

A. Separate Contract(s): The Owner may award a separate contract(s) for performance of certain construction operations at the site. Those operations may be scheduled to be substantially complete before work under this Contract begins. The separate contract(s) may include the following:

1. Contract: A separate contract has been awarded to: Not applicable.

B. Separate Contract(s): The Owner may award a separate contract(s) for performance of certain construction operations at the site. Those operations may be conducted simultaneously with work under this Contract. The separate contract(s) may include the following:

1. Contract: A separate contract has been awarded to: HERRON® Enterprises USA, Inc. to assist with the Hazardous Materials Design Criteria, and for Air Monitoring, including but not limited to Section 01410 - Air Monitoring - Test Laboratory Services.

C. Sub-Contract(s): The General Contractor will award a separate contract(s) for performance of Asbestos Abatement operations at the site. The General Contractor will select from pre-qualified Abatement Contractors from the State of Colorado State Buildings approved list.
D. Cooperate fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.4 FUTURE WORK

A. Future Contract(s): The Owner may award a separate contract(s) for additional work to be performed at the site following Substantial Completion. Completion of that work may depend on successful completion of preparatory work under this Contract. The separate Contract(s) for future work may include the following:

1. Contract: A separate contract may be awarded to: a separate Asbestos Abatement Contractor may be awarded a separate Contract for work discovered which is not part of the original Scope of Work.

1.5 WORK SEQUENCE

A. The Work will be conducted in phases.

1. Phase: Work of the phases shall be substantially complete, ready for reconstruction prior to that phase of the Contract, as indicated in the Contract, and in accordance with the following Project Schedule:

   a. Although it is recommended that the building be split into four phases, phase for each wing of the building, and a phase for the exterior windows and doors, the schedule is to be determined by the Contractor and submitted to the Project Administrator, Project Manager, and Designer.

   b. The Contractor may perform certain functions, i.e., mobilization, set-up, etc., however, any performance which would require Project Administrator, Project Manager, Designer, Air Monitoring Specialist oversight, visual inspection, or air monitoring within these Specifications will occur during normal working hours, Monday through Friday. Written notification to perform during weekends or holidays will be required by the Contractor, 72 hours in advance of performance.

   c. As there is a preference from the Owner within the phasing of the Asbestos Abatement, the Contractor shall include phasing of the Work Areas in the Plan of Action.

   d. The Base Bid Scope of Work is scheduled in phases as indicated. The Contractor is required to perform within this chronological order and within the required Work Areas. Should the Contractor request changes within this schedule of Work Areas, or request changes in the number of Work Areas, an effect on the Contract Sum shall be submitted and will include:

      i. all Test Laboratory Services and Consultant Services, additional PCM and/or TEM analysis, per Work Area as described in Section 01013 Summary of Work - Asbestos Abatement.

      ii. all costs incurred by the Owner, General Contractor, Occupants, Owner Employees, Work under other Contracts, etc., per Work Area.

2. Mandatory pre-bid conference: TO BE DETERMINED

3. Last Date for receipt of written questions/requests for substitutions/approvals: TO BE DETERMINED (via email to):

   HERRON® Enterprises USA, Inc.
   Email: Lennie.Herron@comcast.net
   Mr. L.P. (Lennie) Herron, Industrial Hygienist
4. Last Date of issue of Addenda: **TO BE DETERMINED**

5. **Bids Due: TO BE DETERMINED** (by hand delivered) to:

   **General Contractor**

   B. The Work will be constructed under a single prime contract, through the General Contractor.

### 1.6 ASBESTOS-CONTAINING MATERIALS

A. The Work of this contract involves activities that will disturb asbestos-containing materials (ACM) or presumed asbestos-containing materials (PACM). The location and type of ACM known to be present at the worksite is set forth in the drawings and/or the Section 01013 - Summary of Work - Asbestos Abatement, Appendix A, Schedule of Asbestos Containing Materials at the end of this section. If any other ACM or PACM is found, cease work within this area and notify the General Contractor, Asbestos Project Manager, Designer, other employers and employees about the location and quantity of the ACM or PACM within 24 hours of the discovery.

B. As indicated in the Hazardous Materials Design Criteria, ‘…Locations, approximate quantities affected, approximate areas affected have been offered as an informational tool, and are estimates observed at the time of assessments in conjunction with the use of UCB submitted CAD plans, and development of this document. Quantity determinations are the responsibility of the Contractor, and therefore, it is recommended that field verification be made by the Contractor, prior to Bid Submittal…’. The Contractor is advised that ‘all’ quantities are estimates, whether indicated as Units or as Linear or Square Feet, and that the Contractor is to base their Bid Response on Contractor quantification ‘within the Work Area’.

C. In accordance with AQCC Regulation 8 (State), the Maximum Allowable Asbestos Level (MAAL) may not be exceeded, at any time. HERRON® has previously determined that the various materials within the Building are not Asbestos Materials, however, may contain Traces of Asbestos. This document serves as a Hazard Communication that should either the Abatement Contractor or other Contractors not comply with local, state, and/or federal regulations and these Specifications, i.e., wet methods, engineering controls, etc. during any Non-Asbestos Demolition activities, that the MAAL could be exceeded. Should this occur, the area, areas, and or Building in its entirety could be considered contaminated, and a Major Spill Response may be responded to at the expense of the responsible Contractor(s), in accordance with these Specifications.

### 1.7 ASBESTOS HEALTH RISK

A. The disturbance or dislocation of ACM may cause asbestos fibers to be released into the building's atmosphere, thereby creating a potential health risk to workers and building occupants. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the risk and of proper work procedures which must be followed.

B. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified ACM, take appropriate continuous measures as necessary to protect all building occupants from the risk of exposure to airborne asbestos. Such measures shall include
the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

1.8 CONTRACTOR USE OF PREMISES

A. General: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Emergency Owner access. Public access to the property is prohibited.

2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, General Contractor, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of the Existing Building: Maintain the existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1. Use of Existing Elevators: Except for the Freight Elevator, use of elevators by the Contractor will not be permitted. The Contractor will be permitted to use the freight elevator for temporary freight service and the transportation of construction personnel during the construction period. This elevator must also be available to the Owner at all times; coordinate freight elevator usage with the General Contractor. Provide protective pads for the elevator car and other appropriate protective measures for the car and entrance doors and frames. During asbestos abatement activities the car is to be protected as set forth in the Division 1 Section on Temporary Enclosures.

2. Smoking: Smoking or open fires will not be permitted within the building enclosure or on the premises.

3. Toilet Rooms: Except for toilet rooms designated for use by the Contractor's personnel, use of existing toilets within the building, by the Contractor’s personnel, will not be permitted.

1.9 OCCUPANCY REQUIREMENTS

A. Emergency Owner Occupancy: The Owner/Owner Representative may require access on a limited basis during the project. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage.

1. The Asbestos Project Manager/Designer will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.

1.10 AIR MONITORING BY THE OWNER

A. The Owner will contract for air monitoring as described in Section 01410 - Air Monitoring - Test Laboratory Services.

1.11 ADDITIONAL TESTING

A. The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner or General Contractor, and will be in compliance with all local, state and/or federal regulations. AQCC Regulation 8 requires that an Air Monitoring Specialist, independent of the Abatement Contractor, obtain all required air monitoring samples, i.e., final clearance air monitoring, negative air exhaust inside of building, and/or MAAL air monitoring. As described, 'any' air monitoring performed in conjunction with or adjacent to an Abatement Project is considered MAAL air monitoring. Should such air monitoring be requested, prior authorization from the Asbestos Project Manager shall be made, and the results shall be furnished to the Owner, General Contractor, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist within 24 hours.
1.12 PERSONAL MONITORING

A. The Owner will not be performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose. The Contractor will conduct his own air monitoring and laboratory testing. The cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner or General Contractor, and shall be in compliance with all local, state and/or federal regulations, and shall be performed by a qualified Air Monitoring Specialist. Daily written reports shall be posted, and furnished to the Asbestos Project Manager/Designer prior to the commencement of the next shift.

1.13 MISCELLANEOUS PROVISIONS

A. The following items are not to be damaged, and are to be salvaged and returned to the General Contractor/Owner:

1. As directed by General Contractor/Owner Representative(s).

B. The following items are not to be damaged, and are to remain in place:

1. As directed by the General Contractor/Owner.

2. ‘All’ Non-ACM Finish Materials.

3. ‘All’ mechanical, plumbing, electrical, telecom systems, black iron, ceiling panel hangers, lighting, cables, wiring, speakers, fixed furniture/fixtures, carpeting, etc., and their components, which have not been specified as being removed, demolished, and/or disposed of.

4. All fiberglass insulated pipe is to remain undamaged.

5. Contractor is to protect ‘all’ Walls, Ceilings, and Finished Flooring (Client does not want any mastic remover staining on areas of Walls or Finished Flooring, or damage to ceiling), etc. from ‘any’ damage, i.e., tape, spray glue, mastic remover, etc.

C. The following items are to be demolished and disposed of as ACM waste:

1. ‘All’ Asbestos Containing Material(s) and Debris.

D. The following items are to be demolished and disposed of as Non-ACM waste:

1. The Non-Asbestos Carpeting within the Work Areas may be demolished and disposed of as Non-ACM waste, however, may not be cross contaminated with Asbestos Floor Tile. Should cross contamination be evident, i.e., Asbestos Floor Tile attached to the Carpeting, or should the Floor Tile be dislodged during carpet removal, then the Carpeting will be considered contaminated, removed as part of the abatement, and disposed of as ACM waste.

2. Non-Asbestos Cove Base located within the Work Area (without damage to Wall System).

E. The following general items are to be observed as directed by General Contractor/Owner:

1. This project will require a permit under AQCC Regulation 8.

2. Contractor will be required to forward ‘all’ permit applications and/or requests for ‘any’ variances to EH&S and the Designer for written response indicating that the submittal is returned for unrestricted use.

3. Project will require a regulatory "Asbestos Project Manager". This is the entity described as the Project Manager in accordance with local, state, and/or federal regulations, including but not limited to AQCC Regulation 8. The project manager shall be responsible for assessing that: the project is conducted in accordance with this regulation; the project design is followed; the abatement project is cleared in accordance with this regulation; and the asbestos
waste generated by the project is properly manifested and disposed of in accordance with this regulation. The project manager shall be responsible for communicating these assessments to the building owner or contractor. Project managers must sign the original copy of the permit for the permit to be valid. The Asbestos Project Manager will be:


4. Asbestos Abatement: due to multiple Work Areas coinciding with General Contractor activities, the Contractor can anticipate changes in the scheduling and multiple mobilizations during the project. As these changes are anticipated, they will be without change to the Contract Sum.

5. All open ends of piping, after abatement, will be sealed to the pipe in accordance with Section 15254 - Repair of Insulation and Lagging.

6. All non-Steam Mechanical systems will not be active during abatement.

7. The Steam Mechanical systems will be active during abatement.

8. Contractor will be responsible for re-insulation of pipe insulation removed in accordance with UCB design and construction standards.

9. Relative Pressure in Work Area: the Contractor will continuously maintain ‘all’ work areas at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of -0.02 inches of water, with the use of ‘negative air machines’, recorded by manometers with strip charts, with exception for Mini-Enclosure Areas approved by the Asbestos Project Manager/Designer.

10. Elevator will not be used as an ACWM Load Out Chamber, and will be ‘locked out/tagged out’ on active abatement floors.

11. Fire extinguishers area to be located in each Work Area.

12. Contractor is to exhaust the Negative Air through a secured window in the work area (General Contractor/Owner will select and provide access through a window), ensuring that the window remains secured until conclusion of the project.

13. Contractor will install a charcoal filter in the Negative Air Machines.

14. Contractor is to use a ‘no’ or ‘low’ odor Mastic Remover.

15. During Floor Tile Mastic removal, Contractor is to provide monitoring devices (photo ionization detector) able to detect hydrocarbons and 10% of the Lower Explosive Limit (LEL) used constantly throughout the workday to monitor each Work Area (the Owner will monitor the negative air exhaust).

16. Prior to demobilizing, at the conclusion of the project, the Contractor will neutralize the floor.

17. It has been advised that the General Contractor will remove Non-ACM materials and substrates, without disturbance of ACM Materials which are not intended to be affected, having been trained in accordance with 29 CFR 1926.1101 minimum requirements in order to conduct these activities. Should it be anticipated that ‘any’ disturbance may occur, or should the General Contractor discover ‘any’ disturbed suspect ACM Materials through the course of the project, the General Contractor is to cease with operations in that area and contact the Asbestos Project Manager/Designer for instruction in compliance with local, state, federal regulations, and Specification Sections where applicable.

18. Pre-Abatement Submittal Processing: Contractor will be required to forward the following items to the General Contractor, EH&S and the Designer, prior to mobilization, and in accordance with Specifications and Contract:
a. Section 01301 - Submittals - Asbestos Abatement - Checklist

19. During and Post-Abatement Submittal Processing: Contractor will be required to forward the following items to the General Contractor, EH&S and the Designer, during abatement, and immediately on job completion, and in accordance with Specifications and Contract:

a. Section 01301 - Submittals, including but not limited to:

   i. Daily Logs.
   ii. Entry/Exit Logs.
   iii. Pressure Differential Monitoring Results (if applicable).
   iv. Copies of manifests and disposal site receipts.
   v. Any Special Reports.

20. Power Requirements:

   a. The Contractor will not be allowed to use “house power”. The General Contractor will provide a location and connection point of the Contractor supplied sub panel to an appropriate power source. The Contractor is responsible for coordination with the General Contractor (72 hour notice).

   b. Locate GFCI's exterior to Work Area so that circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.

   c. Contractor shall supply extensions from the electrical supply for Owner’s use while conducting daily air monitoring, visual inspections, and final clearance air monitoring as follows:

      (i). Two in each work area (during abatement).
      (ii). One at clean side of each Decontamination Unit/Waste Load Out.
      (iii). One at clean side of each Critical Barrier.
      (iv). One at each exhaust location for HEPA filtered fan units.
      (v). One outside of the Building(s).
      (vi). Ten inside work area (or as otherwise directed for final clearance to accommodate pumps and fans).

21. Water Requirements:

   a. The Contractor will not be allowed to use “house water”. The General Contractor will provide a location and connection point of the Contractor supplied temporary water service connections. The Contractor is responsible for coordination with the General Contractor (72 hour notice).

   b. Temporary Water Service Connection: Connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment. Provide separate hoses and/or pumps for shower water and amended water, without the possibility of cross connection.

      (i). Contractor will install using vacuum breakers or other backflow preventer as required by local authority.

   c. Water Hoses: Provide , heavy-duty, abrasion-resistant, flexible hoses in diameters and lengths necessary to adequately serve temporary facilities, and with a pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
d. Provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment, as follows:

(i). Located adjacent to Work Areas to be determined at Preconstruction meeting.

e. Contractor will filter waste water in accordance with local, state, and federal regulations and specifications, and may dispose of filtered water through UCB sanitary sewer system (not storm water system).

22. Staging Area:

a. Roll-Offs may be permitted on site (Contractor to arrange with General Contractor). Roll-off locations that are coordinated with Parking Services and Housing and Dining Services are acceptable for trucks to be loaded and unloaded. The Contractor understands that he must have his trucks, used for hauling material off site, not parked where they would block Dock areas and that a driver must be with the truck at all times when in a Dock. All asbestos containing waste material must be inspected by the EH&S Asbestos/Lead office prior to the removal from the Boulder Campus.

b. Landfill must have prior approval from the EH&S Asbestos/Lead Manager.

c. Contractor Parking will be the responsibility of the Contractor, and may be arranged through the General Contractor.

d. Staging Areas will be determined by the General Contractor.

e. Staging/Temporary Offices: the Contractor ‘may’ provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes, or may utilize empty portions of the Project Buildings for staging up until the time that the Owner/General Contractor needs these areas.

23. In accordance with 29 CFR 1910.146 (OSHA), these Tunnels are ‘Confined Spaces’.

a. Prior to and during entry into a Confined Space, the Contractor will comply at a minimum by:

(c)(5)(ii)(C)
Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

(c)(5)(ii)(C)(1)
Oxygen content,

(c)(5)(ii)(C)(2)
Flammable gases and vapors, and

(c)(5)(ii)(C)(3)
Potential toxic air contaminants.

(d)(6)
Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

NOTE: Attendants may be assigned to monitor more than one permit space provided the duties described in paragraph (i) of this section can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as the duties described in paragraph (i) of this section can be effectively performed for each permit space that is monitored.
b. These Confined Spaces have indicated safe readings during each entry and during execution of the Contract.

c. It is regulatory that the Contractor require each and every employee which enters these areas to perform these initial and continuous tests to ensure the safety of the employees.

24. Lead Based Paint Requirements:

Based on the information generated by this report, we conclude that the aforementioned property does have Regulated Lead Based Paint (LBP) at the locations inspected by XRF. It is understood that there may be Regulated Lead Based Paint (LBP) in other locations, in accordance with 29 CFR 1926.62 (OSHA), and/or may require a more specific protocol as required under AQCC Regulation 19 for Child Occupied Facilities. Requests for the services provided are specific to an ‘overall’ screening, however, the Client understands that additional services may be required dependent on the intent of the use and impact of the property.

HERRON® performed the Environmental Consultation/Lead Based Paint Screening of the property, and collected samples according to local, state and/or federal regulations, and/or accepted industry practices. Each material reading has been described and itemized for your use in the following tabular format. For those materials and test results which met or exceeded the ‘action level’ of 1.0 mg/cm2, or was ‘inconclusive’ by XRF, or the ‘action level’ of 0.5% by weight, by NIOSH 7042 (AAS), the tabular line item has been indicated as bold font per the attached Niton XTRAS table format. Suspect materials and test results which were below the ‘action’ level of 1.0 mg/cm2 by XRF, or the ‘action level’ of 0.5% by weight, by NIOSH 7042 (AAS), the tabular line item has been indicated as regular font, per the attached Niton XTRAS table format (Note: Readings were performed with THERMO NITON XLP, Serial #12072).

<table>
<thead>
<tr>
<th>Reading No</th>
<th>Component</th>
<th>Substrate</th>
<th>Side</th>
<th>Condition</th>
<th>Color</th>
<th>Floor</th>
<th>Room</th>
<th>Results</th>
<th>PbL</th>
<th>PbL Error</th>
<th>PbK</th>
<th>PbK Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 WALL</td>
<td>Plaster</td>
<td>South</td>
<td>Intact</td>
<td>White</td>
<td>3rd</td>
<td>320 hall</td>
<td>2nd 220 hall</td>
<td>Positive &lt; LOD</td>
<td>0.08 1.4 0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34 WALL</td>
<td>Plaster</td>
<td>East</td>
<td>Intact</td>
<td>White</td>
<td>2nd</td>
<td>220 hall</td>
<td>2nd 220 hall</td>
<td>Positive &lt; LOD</td>
<td>0.05 1.5 0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 WALL</td>
<td>Plaster</td>
<td>West</td>
<td>Intact</td>
<td>White</td>
<td>2nd</td>
<td>common area</td>
<td>2nd 247 hall</td>
<td>Positive &lt; LOD</td>
<td>0.2 1.6 0.5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>47 WALL</td>
<td>Plaster</td>
<td>South</td>
<td>Intact</td>
<td>White</td>
<td>2nd</td>
<td>247 hall</td>
<td>2nd 247 hall</td>
<td>Positive &lt; LOD</td>
<td>0.25 1.4 0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49 WALL</td>
<td>Plaster</td>
<td>West</td>
<td>Intact</td>
<td>White</td>
<td>2nd</td>
<td>j250 hall</td>
<td>2nd j250 hall</td>
<td>Positive &lt; LOD</td>
<td>0.13 1.4 0.4</td>
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<td></td>
</tr>
<tr>
<td>57 hand rail</td>
<td>Metal</td>
<td>South</td>
<td>Intact</td>
<td>Black</td>
<td>3rd</td>
<td>stairwell n wing</td>
<td>Positive</td>
<td>1 0.1 1.1 0.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58 hand rail</td>
<td>Metal</td>
<td>North</td>
<td>Intact</td>
<td>Black</td>
<td>2nd</td>
<td>stairwell n wing</td>
<td>Positive</td>
<td>1.4 0.3 &lt; LOD 2.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59 hand rail</td>
<td>Metal</td>
<td>East</td>
<td>Intact</td>
<td>Black</td>
<td>1st</td>
<td>stairwell n wing</td>
<td>Positive</td>
<td>1.3 0.3 1.7 0.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>89 WINDOW</td>
<td>Metal</td>
<td>North</td>
<td>Intact</td>
<td>Black</td>
<td>1st</td>
<td>common area</td>
<td>1st common area</td>
<td>Positive</td>
<td>1.1 0.1 1.6 0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hazard Disposal Determination by Toxicity Characteristic Leachate Procedure (TCLP):

Materials which were sampled, composited, and determined to be below the action level of 5.0 mg/l Lead (per attached analyses and custody sheets) by Lead by Flame AA, SW846 1311/3050A/7420, for the wastestreams/populations of the property are:

is BDL mg/l of Lead for Metal Stair Handrail, and .33 mg/l of Lead for Plaster Walls and Ceilings, which is below the action level of 5.0 mg/l of Lead for the Composition of the ‘highest XRF test’ (worse case scenario) of the Waste Stream for purposes of demolition (as specifically indicated).

Based on the Submitted Previous Inspection, Lead Based Paint exists in the Building. Although there is not a requirement to remove lead based paint in a State Building (not target housing), there are requirements for safe work practices, and creating a safe work environment in accordance with OSHA’s 29 CFR 1910, and 1926.

General Contractor

a. Initial Training: site specific lead paint training in accordance with 29 CFR 1926.62 (OSHA).
Section 02075 - Lead Based Paint Hazard Control Plan: a site specific hazard control plan has been developed, integrating the LBP data with construction activities on this project, etc. The General Contractor should utilize worker protection as described, however, this project will not require pre- or post-surface sampling, or visual inspections.

c. Lead Based Paint Abatement (to facilitate renovation or demolition): coordinated with Client, should the material be required to be removed prior to a renovation or demolition activity.

d. Management Plan to include an Operations and Maintenance Program (O&M) which could effectively manage the material, dependent on the renovation activities, use of the structure, occupants, etc.

25. General Abatement Certificate Holder (GAC, Abatement Contractor)

a. Lead Based Paint exists within the Asbestos Removal Work Areas. The Contractor will utilize appropriate controls during the Asbestos Abatement as indicated in the Section 02075 - Lead Based Paint Hazard Control Plan.

b. Section 02075 - Lead Based Paint Hazard Control Plan: a site specific hazard control plan has been developed, integrating the LBP data with construction activities on this project, etc. The Contractor will be required to utilize worker protection as described, however, this project will not require pre- or post-surface sampling, or visual inspections. Limit submittals to evidence of OSHA training, pre- and post-medical monitoring.

Locations, and quantity determinations are the responsibility of the Contractor, and therefore, it is recommended that field verification be made by the Contractor, prior to Bid Submittal. The Contractor is advised that their Bid Response should be based on ‘all’ of these materials.

26. Hazardous Waste Collection and Disposal Requirements: The Owner has instructed that the Contractor will include in their Scope of Work the Collection/Removal, Handling and proper Disposal of ‘all’ Hazardous Materials throughout the interior of the Building which includes:

1. Requirements including but not limited to Sections 01121 Hazardous Material Procedure, 02062 Non-Asbestos Demolition, 02086 Hazardous Waste Management, local, state, and federal regulations, etc.

2. Hazardous Waste Collection and Disposal – It is assumed that the following materials exist in the building:

   Exit lighting
   PCB ballasts
   PCB transformers
   Mercury Thermostats
   Mercury and Sodium Vapor Lights
   Smoke Detectors/Fire Alarms
   etc.

Locations, and quantity determinations are the responsibility of the Contractor, and therefore, it is recommended that field verification be made by the Contractor, prior to Bid Submittal. The Contractor is advised that their Bid Response should be based on ‘all’ of these materials.

As detailed in the attached CDPHE Compliance Bulletin Hazardous Waste Lighting Waste bulletin, many manufacturers produce low-mercury (green-tipped) lamps. Although lamps may contain less mercury than standard bulbs, they may, or may not, fail the toxicity test for metals. Mercury-containing lighting wastes from non-residential sources that are not hazardous may either be disposed of in a properly managed municipal solid waste landfill or sent to a legitimate recycler. The cost of recycling the lamps...
may be similar to or less than the cost of segregating the lamps, conducting toxicity characteristic leaching procedure (TCLP) testing, and land-filling only portions and recycling portions of the lamps. We recommend, that all lamps be recycled.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION - 01013
APPENDIX A. SCHEDULE OF ASBESTOS-CONTAINING MATERIALS

A. Refer to attached additional Owner Submittal for specific analysis (if applicable). Specific analysis for Asbestos Containing Materials is available through the Asbestos Project Manager. To review this information contact the Asbestos Project Manager for arrangements.

1. Specific AHERA RATINGS have been applied for the type of Asbestos Containing Materials from the following table:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Surfacting Material</th>
<th>TSI</th>
<th>Miscellaneous Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Damaged or Significantly Damaged</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Damaged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Significantly Damaged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Damaged or Significantly Damaged</td>
</tr>
<tr>
<td>5</td>
<td>Good Condition with Potential for Damage</td>
<td>Good Condition with Potential for Damage</td>
<td>Good Condition with Potential for Damage</td>
</tr>
<tr>
<td>6</td>
<td>Good Condition with Potential for Significant Damage</td>
<td>Good Condition with Potential for Significant Damage</td>
<td>Good Condition with Potential for Significant Damage</td>
</tr>
<tr>
<td>7</td>
<td>Good Condition with Low Potential</td>
<td>Good Condition with Low Potential</td>
<td>Good Condition with Low Potential</td>
</tr>
</tbody>
</table>

Asbestos Forms
C = Chrysotile
A = Amosite

B. Scope of Work Areas are defined as:

1) Gross Removal within Full-Enclosure Area(s) (Requires all elements of local, state, and federal regulations, including but not limited to AQCC Regulation 8, 29 CFR 1926.1101, etc.)
2) Gross Removal within Mini/Secondary-Enclosure Area(s)
3) Glove Bag Removal within Mini/Secondary-Enclosure Area(s)
4) Component Removal within Mini/Secondary-Enclosure Area(s)
5) Gross Removal within Mini/Secondary-Enclosure Area(s) (Floor Tile/Mastic, AQCC Regulation 8, Appendix B)
6) O&M, all activities defined within these Hazardous Materials Design Criteria, including but not limited to patching (and wrapping unprotected insulation), repairing, cleaning, labeling, etc., within Regulation Area(s)
7) The Contractor may combine Work Areas so long as they remain within regulatory and specification compliance. The Contractor is to identify Work Area(s) with Room locations where applicable.
C. Base Bid Work Areas have been defined as follows, and are indicated as Appendix A., Base Bid.

1. Locations, approximate quantities affected, approximate areas affected have been offered as an informational tool, and are estimates observed at the time of assessments and development of this document. As will be included in the Bid Instructions, quantity determinations are the responsibility of the Contractor, and therefore, it is recommended that field verification be made by the Contractor, prior to Bid Submittal:

**West Wing**

a. Mechanical Room 137 Pipe Insulation – 168 LF (active)
b. Mechanical Room 137 Tank Insulation – 265 SF (active)
c. Mechanical Room 137 Fiberglass Batt Insulation Adhesive – 3,500 SF
b. Basement, 1st, and 2nd Floor Levels, Ceramic Tile and Floor Leveling Material - 922
d. Basement, 1st, and 2nd Floors Floor Tile/Mastic – 14,086 SF
e. Crawl Tunnel 6” Steam Pipe Insulation – 20 LF (active)

**North Wing**

a. 1st, 2nd, and 3rd Floor Levels, Ceramic Tile and Floor Leveling Material – 609 SF
b. 1st, 2nd, and 3rd Floors, Floor Tile/Mastic – 8,901 SF
c. 2nd Floor HVAC Flex Connectors - 6 SF

**East Wing**

a. 1st, 2nd, and 3rd Floor Levels, Ceramic Tile and Floor Leveling Material – 591 SF
b. 1st, and 2nd Floors (includes stairs to 3rd Floor) Carpet, Floor Tile/Mastic – 9,063 SF
c. 2nd Floor HVAC Flex Connectors - 18 SF

**Exterior Windows and Doors**

a. 287 Window Units (4,281 LF X ¼”= 89.75 SF)
b. 8 Door Units (135 LF X ¼”= 3 SF)

**TOTALS:**

a. Pipe Insulation - 178 LF
b. Mechanical Room Tank Insulation – 265 SF
c. Floor Tile/Mastic – 32,050
d. HVAC Flex Connectors - 12 SF
e. Mechanical Room 137 Fiberglass Batt Insulation Adhesive – 3,500 SF
f. Exterior Windows – 287 Window Units (4,281 LF X ¼”= 89.75 SF)
g. Exterior Doors - 8 Door Units (135 LF X ¼”= 3 SF)
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Homogeneous Material Description</th>
<th>Approximate Quantity</th>
<th>AHERA Rating</th>
<th>Asbestos Laboratory Results</th>
<th>Layer/Physical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>Multi-colored Floor Tile and Mastic on concrete substrate, Miscellaneous Material (M), Non-Friable, Good Condition (Current Condition), throughout Building</td>
<td>32,050 SF</td>
<td>6</td>
<td>&gt;1.0% C</td>
<td>Floor Tile and Mastic</td>
</tr>
<tr>
<td></td>
<td>Quantification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basement Level - 6,634 SF</td>
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<td></td>
<td>1st Floor Level, N Wing - 2,958 SF</td>
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<tr>
<td></td>
<td>1st Floor Level, E Wing - 5,111 SF</td>
<td></td>
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<td></td>
<td>1st Floor Level, W Wing - 3,233 SF</td>
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<td>2nd Floor Level, N Wing - 2,921 SF</td>
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<tr>
<td></td>
<td>2nd Floor Level, E Wing - 1,918 SF</td>
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<tr>
<td></td>
<td>2nd Floor Level, W Wing - 4,219 SF</td>
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<td>3rd Floor Level, N Wing - 3,022 SF</td>
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<td></td>
<td>3rd Floor Level, E Wing - 2,034 SF</td>
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<tr>
<td>Confirmed</td>
<td>Multi-colored Ceramic Tile with Floor Filler on Concrete substrate, Surfacing Material (S), Non-Friable, Good Condition (Current Condition), throughout Bathrooms</td>
<td>2,116 SF</td>
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<td>&gt;1.0% C</td>
<td>Floor Filler</td>
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<tr>
<td></td>
<td>Quantification:</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Basement Level</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>RR24 - 93 SF</td>
<td></td>
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<tr>
<td></td>
<td>RR05 - 167 SF</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>1st Floor Level, N Wing - 151 SF</td>
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<tr>
<td></td>
<td>RR102 - 151 SF</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>1st Floor Level, E Wing - 40 SF</td>
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<tr>
<td></td>
<td>RR169 - 40 SF</td>
<td></td>
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<tr>
<td></td>
<td>144B - 24 SF</td>
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<td></td>
<td>RR174 - 167 SF</td>
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<td></td>
<td>RR172 - 193 SF</td>
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<td></td>
<td>1st Floor Level, W Wing - 240 SF</td>
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<tr>
<td></td>
<td>RR128 - 148 SF</td>
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<tr>
<td></td>
<td>RR122 - 40 SF</td>
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<tr>
<td></td>
<td>RR130 - 148 SF</td>
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<tr>
<td></td>
<td>2nd Floor Level, N Wing - 151 SF</td>
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<tr>
<td></td>
<td>RR200 - 151 SF</td>
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<tr>
<td></td>
<td>2nd Floor Level, E Wing - 167 SF</td>
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<td></td>
<td>RR253 - 167 SF</td>
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<td></td>
<td>2nd Floor Level, W Wing - 240 SF</td>
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<td>RR224 - 148 SF</td>
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<td>RR225 - 178 SF</td>
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<td></td>
<td>3rd Floor Level, N Wing - 151 SF</td>
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<td>RR302 - 151 SF</td>
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<tr>
<td></td>
<td>RR318 - 150 SF</td>
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</tr>
</tbody>
</table>

**Assessment:** Good Condition with Potential for Significant Damage (AHERA Rating: 6)

**Recommendation:** Abatement
**Scope of Work:**

| | Abate all existing **Floor Tile and Mastic Materials** and **Ceramic Tile with Floor Filler Materials by Gross Removal within Secondary-Enclosure Area(s) (as required and in accordance with AQCC Regulation 8), and Decontaminate entire area(s) within Single Work Area(s) as submitted by Contractor in Plan of Action (PCM Clearance Protocol)**
<p>| | (Contractor will include in Plan of Action removal concurrently of all ACM Materials). |</p>
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Homogeneous Material Description</th>
<th>Approximate Quantity</th>
<th>AHERA Rating</th>
<th>Asbestos Laboratory Results</th>
<th>Layer/Physical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>White Pipe Insulation, Thermal System Insulation (TSI), Straights, Fittings, Joints, etc., Friable, Good Condition (Current Condition), throughout Mechanical Room 137</td>
<td>168 LF</td>
<td>6</td>
<td>&gt;1.0% C&amp;A</td>
<td>Pipe Insulation</td>
</tr>
<tr>
<td></td>
<td>Quantification:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>101 LF, 6”, Steam Line straights and fittings</td>
<td></td>
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<tr>
<td></td>
<td>21, LF, 4” HWS and HWR fittings</td>
<td></td>
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<tr>
<td></td>
<td>14L, 2” HWS, HWR, and W, fittings</td>
<td></td>
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<tr>
<td></td>
<td>32 LF, 3” HWS and HWR fittings</td>
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<td></td>
<td>Straights, Fittings, Joints, etc. is based on the estimated Linear Footage of the Pipe Straight with these associated units for calculation purposes, etc.</td>
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<tr>
<td></td>
<td>White Tank Insulation, Thermal System Insulation (TSI), Friable, Good Condition (Current Condition), throughout Mechanical Room 137</td>
<td>265 SF</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Quantification:</td>
<td></td>
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<td></td>
<td>Tank - 2 Units (8’ length X 18” diameter)</td>
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<td></td>
<td>Tank - 1 Unit (10’ length X 72” diameter)</td>
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<td></td>
<td>Note: Steam will be active.</td>
<td></td>
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</tr>
<tr>
<td>Confirmed</td>
<td>Yellow Fiberglass Batt Adhesive on Concrete Substrate Walls and Ceilings, Miscellaneous Material (M), Non-Friable, Good Condition (Current Condition), throughout Mechanical Room 137</td>
<td>*3,500 SF</td>
<td>6</td>
<td>&gt;1.0% C</td>
<td>Flex Connector</td>
</tr>
<tr>
<td></td>
<td>*Quantification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Based on total square footage of fiberglass batt surface area</td>
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</tr>
</tbody>
</table>

Assessment: Good Condition with Potential for Significant Damage (AHERA Rating: 6)

Recommendation: Abatement

Scope of Work: Abate all existing **Pipe Insulation and Adhesive Materials** by Gross Removal, within Full-Enclosure Area(s) (as required and in accordance with AQCC Regulation 8), and Decontaminate entire area(s) within Single Work Area(s) as submitted by Contractor in Plan of Action (**PCM Clearance Protocol**) (Contractor will include in Plan).
### Work Area: #3

**Location:** West Wing, Tunnel  
**Quantity Affected:** As indicated (required Contractor determination and field verification, Refer to Section 01013-2, 1.2, C.2.).1

**Accessibility:** Although some Areas are accessible, some Areas will require Contractor removal or demolition of Non-ACM materials in order to adequately access the ACM materials

**To Building Occupants:** Yes

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Homogeneous Material Description</th>
<th>Approximate Quantity</th>
<th>AHERA Rating</th>
<th>Asbestos Laboratory Results</th>
<th>Layer/Physical Description</th>
</tr>
</thead>
</table>
| Confirmed  | White Pipe Insulation, Thermal System Insulation (TSI), 6” Steam Line, Fittings and Straights, Friable, Good Condition (Current Condition), throughout W Tunnel to Main CU Tunnel  
Quantification:  
W Tunnel, 6” Steam Pipe Insulation - 20 LF Straights, Fittings, Joints, etc. is based on the estimated Linear Footage of the Pipe Straight with these associated units for calculation purposes, etc. |
| 20 LF      | 6                                                 | >1.0% C&A             | Pipe Insulation |

**Assessment:** Good Condition with Potential for Significant Damage (AHERA Rating: 6)

**Recommendation:** Abatement

**Scope of Work:** Abate all existing Pipe Insulation Materials by Gross Removal, within Mini Enclosure Area(s) (as required and in accordance with AQCC Regulation 8), and Decontaminate entire area(s) within Single Work Area(s) as submitted by Contractor in Plan of Action (PCM Clearance Protocol)

(Contractor will include in Plan of Action removal concurrently of all ACM Materials).

### Work Area: #4

**Location:** Room 252 and ST312  
**Quantity Affected:** As indicated (required Contractor determination and field verification, Refer to Section 01013-2, 1.2, C.2.).1

**Accessibility:** Although some Areas are accessible, some Areas will require Contractor removal or demolition of Non-ACM materials in order to adequately access the ACM materials

**To Building Occupants:** Yes

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Homogeneous Material Description</th>
<th>Approximate Quantity</th>
<th>AHERA Rating</th>
<th>Asbestos Laboratory Results</th>
<th>Layer/Physical Description</th>
</tr>
</thead>
</table>
| Confirmed  | White HVAC Flex Connectors, Miscellaneous Material (M), Non-Friable, Good Condition (Current Condition), throughout Attic Rooms 252, and ST312  
Quantification:  
Room 252, 2 Units, 12 SF  
ST312, 1 Unit, 6 SF |
| 18 SF      | 6                                                 | >1.0% C               | Flex Connector |

**Scope of Work:** Abate all existing HVAC Flex Connector Materials by Component Removal, within Regulated Area (as required and in accordance with AQCC Regulation 8), and Decontaminate entire area(s) within Single Work Area(s) as submitted by Contractor in Plan of Action (PCM OSHA Compliance) (Contractor will include in Plan of Action).
## Work Area:

**#5**

## Location:

**Exterior**

## Quantity Affected:

As indicated (required Contractor determination and field verification, Refer to Section 01013-2, 1.2, C.2.).

## Accessibility:

Although some Areas are accessible, some Areas will require Contractor removal or demolition of Non-ACM materials in order to adequately access the ACM materials.

## To Building Occupants?

Yes

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Homogeneous Material Description</th>
<th>Approximate Quantity</th>
<th>AHERA Rating</th>
<th>Asbestos Laboratory Results</th>
<th>Layer/Physical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>Light Gray Window Caulking around Metal Window Frames, Miscellaneous Material (M), Non-Friable, Good Condition (Current Condition), throughout Exterior</td>
<td>89.75 SF (287 Units, 4,281 LF X ¼”)</td>
<td>6</td>
<td>&gt;1.0% C</td>
<td>Caulking</td>
</tr>
<tr>
<td></td>
<td>3X4’ - 250 Units</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>21.5X4’ - 3 Units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.5X6.5’ - 15 Units</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3.5X7.5’ - 10 Units</td>
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<td></td>
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<tr>
<td></td>
<td>7.5X1.5’ - 9 Units</td>
<td></td>
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<tr>
<td></td>
<td>Light Gray Door Caulking on Metal Doors, Miscellaneous Material (M), Non-Friable, Good Condition (Current Condition), throughout Exterior</td>
<td>3 SF (8 Units, 135 LF X ¼”)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>6X6’ – 5 Units</td>
<td></td>
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<tr>
<td></td>
<td>6X3’ – 3 Units</td>
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</tbody>
</table>

## Scope of Work:

Abate all existing **Window Materials** by Component Removal, within Regulated Area (as required and in accordance with AQCC Regulation 8), and Decontaminate entire area(s) within Single Work Area(s) as submitted by Contractor in Plan of Action (**PCM OSHA Compliance**) (Contractor will include in Plan of Action).
D. Alternates: Alternate Bid Work Areas have been defined as follows, and are indicated as Appendix A., Alternate Bid:

1. Additive Alternates for work of Materials in the Summary of Work, and in the following tables:
   a. Not applicable.

2. Deductive Alternates
   a. Not applicable.

E. Unit Prices: Unit Price Work Areas have been defined as follows, and are indicated as Appendix A., Unit Price Bid:

1. Additive Lump Sum Unit Prices
   a. Not applicable.

2. Deductive Lump Sum Unit Prices
   a. Not applicable.

F. Areas reviewed and assessed, but not within Summary of Work, have been defined as follows, and are indicated as Appendix A., No Work or Removed from Summary of Work:

1. ‘Any’ confirmed or suspect ACM inside or outside of the current work area(s) which is not within the Summary of Work which at this time is not directly affected by the renovation. The following items are not to be damaged, are to remain in place, and are to be protected from ‘any’ damage.

2. During the course of the inspection, should Asbestos be discovered they would have been quantified by visual inspections. These visual inspections are limited due to obstructions blocking the Inspectors viewing, i.e., HVAC Systems, Firewalls, Chases, Conduit, fiberglass insulation, Ceramic Tile, Carpeting, etc. Although a thorough inspection would have been performed in conjunction with the use of Owner as-builts, it is not possible to investigate 'all' areas of a building, therefore, caution should be exercised by all Contractors during the course of a renovation/demolition.

3. HERRON® recommends extreme caution during a renovation or demolition of these areas in the event that an area which was not suspect, visible, accessible and/or specified during the inspection, is discovered to contain or is suspected of containing an Asbestos Containing Material (ACM). Under local, state and/or federal regulations, should such an event occur, the Client and or Contractor is required to cease operations which may effect this (these) material(s) until an inspection is concluded and a determination is made by an AHERA and State Certified Asbestos Building Inspector.

4. Disturbance of these areas could create a potential health hazard.

**PART 2 - PRODUCTS (NOT APPLICABLE).**

**PART 3 - EXECUTION (NOT APPLICABLE).**

**END OF SECTION 01013**
Typical Job Site Photographs
(this section is not intended to depict all areas of work, but is submitted for informational purposes)
Summary of Work-Asbestos Abatement

Section 01013 - Appendix A (Site Photographs)
Summary of Work - Asbestos Abatement

Section 01013 - Appendix A (Floor Plans)

WA #1, Asbestos Multi-colored Floor Tile and Mastic on Concrete
WA #1, Asbestos Multi-colored Ceramic Tile with Floor Filler on Concrete substrate
WA #3, Asbestos White Pipe Insulation
WA #5, Asbestos Light Grey Metal Window Frames, Metal Door Frames

Note: Plans copied by permission, not to scale. Approximate Asbestos Locations.
Summary of Work-Asbestos Abatement

Section 01013 - Appendix A (Floor Plans). - 2

Note: Plans copied by permission, not to scale. Approximate Asbestos Locations.

WA #1, Asbestos Multi-colored Floor Tile and Mastic on Concrete and
WA #1, Asbestos Multi-colored Ceramic Tile with Floor Filler on Concrete substrate
WA #2, Asbestos White Pipe Insulation and Yellow Fiberglass Adhesive on Concrete Substrate Walls and Ceilings
WA #5, Asbestos Light Gray Metal Window Frames, Metal Door Frames
WA #1, Asbestos Multi-colored Floor Tile and Mastic on Concrete and
WA #1, Asbestos Multi-colored Ceramic Tile with Floor Filler on Concrete substrate
WA #4, Asbestos White HVAC Flex Connectors
WA #5, Asbestos Light Gray Metal Window Frames, Metal Door Frames
Note: Plans copied by permission, not to scale. Approximate Asbestos Locations.
Kittredge Complex Remodel – Andrews Hall
Hazardous Materials Design Criteria

HERRON® Project No. 0621079

Summary of Work – Asbestos Abatement

Section 01013 - Appendix A (Floor Plans) - 4

WA #1, Asbestos Multi-colored Floor Tile and Mastic on Concrete and
WA #1, Asbestos Multi-colored Ceramic Tile with Floor Filler on Concrete substrate
WA #4, Asbestos White HVAC Flex Connectors
WA #5, Asbestos Light Gray Metal Window Frames, Metal Door Frames

Note: Plans copied by permission, not to scale. Approximate Asbestos Locations.
SECTION 01028 - APPLICATIONS FOR PAYMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment. Section 01028 - Applications for Payment - Asbestos Abatement instructions shall be followed as required in the 'Bid Form', the ‘Instructions to Bidders’, and/or the ‘Agreement’.

1. Coordinate the Schedule of Values and Application for Payment with the Contractor’s Construction Schedule, Submittal Schedule, and List of Subcontracts.

B. Related Sections - The following Sections contain requirements that relate to this Section.

1. Contractor’s Construction Schedule: The Contractor's Construction Schedule is specified in Division 1 Section "Coordination - Asbestos Abatement."

2. Submittal Schedule: The Submittal Schedule is specified in Section 01301, Division 1 Section "Submittals."

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Asbestos Project Manager/Designer and paid for by the General Contractor.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the Final Application for Payment involve additional requirements.

B. Payment Application Times: Each progress payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use State of Colorado forms as the form for Application for Payment (as provided by the General Contractor).

D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The General Contractor will return incomplete applications without action.

1. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to the General Contractor by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the General Contractor.

F. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the
final Application for Payment include the following:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
10. Change of door locks to Owner's access.
11. Disposal receipts, bills of lading and other required documentation of transportation and disposal of asbestos-containing waste to the Asbestos Project Manager.

PART 2 - PRODUCTS (NOT APPLICABLE).

PART 3 - EXECUTION (NOT APPLICABLE).

END OF SECTION 01028
SECTION 01043 - COORDINATION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.
2. Conservation.
5. Project Directory.
7. Pre-Construction Inspection.
8. Contractor’s Construction Schedule.
9. Administrative and supervisory personnel.
10. Pre-Construction Conference
11. Progress Meetings
12. Coordination meetings.
13. Record Keeping.
14. Special Reports.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. “Section 01301 - Submittals - Asbestos Abatement” for administrative procedures regarding submittals.
2. “Section 01601 - Materials and Equipment - Asbestos Abatement” for coordinating general installation.
3. “Section 01701 - Project Closeout - Asbestos Abatement” for coordinating contract closeout.

1.3 COORDINATION

A. Owner Occupancy: Coordinate construction operations and scheduling with partial occupancy requirements of the Owner and the Owner’s use of utilities.
B. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly completion of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the sequence required to obtain the best results where execution of one part of the Work depends on execution of other components, before or after its own execution.

2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

3. Make provisions to accommodate items scheduled for later installation.

C. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.

2. Installation and removal of temporary facilities.

3. Delivery and processing of submittals.

4. Progress meetings.

5. Project closeout activities.

E. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 PLAN OF ACTION

A. Prepare a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination areas, waste load out areas, HEPA ventilation systems (with air calculations), the sequencing of asbestos work, the interface of trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, a detailed description of the methods to be employed to control pollution, and emergency exits. Additionally, the Plan of Action is to include all of the requirements of “Project Design” in accordance with AQCC Regulation 8, Part B. The written project design shall be developed by a project designer certified under these regulations. A signed copy of the project design shall be available on site at all times.

1. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

   a. Submittals: Submit 3 copies of the Plan of Action. The Asbestos Project Manager/Designer will retain two, and will return the one marked with action taken and corrections or modifications required.

      i. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the
1.5 CONTINGENCY PLAN

A. Contingency Plan: Prepare a contingency plan for emergencies or any other event that may require breaching of work area containment or modification or abridgement of decontamination or work area isolation procedures. Include in this plan procedures for performing electrical and mechanical repairs inside containment after abatement work has begun. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Items to be addressed in the plan include, but are not limited to the following:

1. Fire
2. Accident
3. Life threatening injury
4. Non life threatening injury
5. Rescue
6. Power Failure
7. Pressure differential system failure
8. Breach of containment
9. Electrical faults or shock
10. Excessive heat / cold (if/when such limits are specified)
11. Supplied air system failure
12. Water leaks
13. Waste spills
14. Unauthorized entry into work area
15. Elevated air samples outside of containment
16. Repairs inside containment

1.6 PROJECT DIRECTORY

A. Develop a directory of all entities involved in the project. Include the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site. Identify individuals, their duties and responsibilities. List business name, contact person, normal business and emergency telephone, pager and fax numbers and addresses of:

1. Owner, Project Administrator, Asbestos Project Manager, Designer and Air Monitoring Specialist.
2. Contractor’s General Superintendent, supervisory personnel and Contractor’s home office.
3. Emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company,
telephone company.

4. Local, state, and federal agencies with jurisdiction over the project.

B. Post: Post copies of the Project Directory in the project meeting room, the temporary field office, each temporary telephone, and at entrance to clean room of Personnel Decontamination Unit

1.7 NOTIFICATIONS

A. The Owner, through the Asbestos Project Manager, will notify other entities at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials (ACM), requirements relative to asbestos set forth in these specifications and applicable regulations. Advance notification will be made to:

1. Owners of the building/facility.

B. The Contractor will notify other entities at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials (ACM), requirements relative to asbestos set forth in these specifications and applicable regulations. Advance notification will be made to:

1. Employees who will perform asbestos abatement work or related activities, or who will be in the work area during the course of the work of this contract.

2. Employers of employees who work and/or will be working in adjacent areas during the course of the work of this contract.

B. The Owner, through the Asbestos Project Manager, will notify emergency service agencies including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations, modifications to fire notification or firefighting equipment, and other information needed by agencies providing emergency services.

C. Notifications of Emergency: Any individual at the job site may notify emergency service agencies if necessary without effect on this Contract or the Contract Sum.

1.8 PRE-CONSTRUCTION INSPECTION

A. Inspect areas in which work will be performed, prior to commencement of work. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit to the General Contractor/Asbestos Project Manager/Designer for record purposes prior to starting work.

1.9 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, Contractor's construction schedule. Submit within 10 days after the date established for "Commencement of the Work."

1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."

2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.

3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.

6. Indicate Clearance of each Work Area in advance of the dates established for Clearance. Allow time for testing and other Asbestos Project Manager’s/Designer's procedures necessary for certification of Clearance.

7. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Asbestos Project Manager’s/Designer's procedures necessary for certification of Substantial Completion.

B. Phasing: On the schedule, show how requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner affect the sequence of Work.

C. Work Stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.

   1. Non-asbestos demolitions.
   2. Preparation of the Work Area.
   3. Asbestos removal.
   4. Clearance testing.
   5. Substantial Completion.

D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

E. Cost Correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.

   1. Refer to Division 1 Section "Applications for Payment" for cost reporting and payment procedures.

F. Distribution: Following response to the initial submittal, print and distribute copies to the Owner/Project Administrator/Asbestos Project Manager/Designer, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

   1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

G. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.10 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. Project Supervisor: Provide a full-time Project Supervisor at the work site who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, project scheduling, management, etc. This person is the Contractor’s Representative, and will
function as the ‘competent person’ at the work site responsible for compliance with all applicable federal, state and local regulations, particularly those relating to ACM.

1. Training: The General Superintendent must have a current certification from a state approved trainer for a course that meets the requirements of the EPA Model Accreditation Plan for Asbestos Abatement Contractor/Supervisor (40 CFR part 763, Subpart E, Appendix C).

2. Experience: The General Superintendent must have demonstrable experience in the successful management of asbestos abatement projects that are similar to the work of this contract.
   
   a. The General Superintendent must have a minimum of two (2) years experience in the on-site management of asbestos abatement projects.
   
   b. The General Superintendent must have had responsible charge of a minimum of ten (10) asbestos abatement projects similar in size and type to the work of this contract.

3. Competent Person: The General Superintendent is to be a Competent Person as required by OSHA in 29 CFR 1926.

B. Supervisors/Forepersons: Provide full-time Supervisors / Forepersons who are experienced in the supervision of asbestos abatement work areas including work practices, building and personnel, disposal practices, etc. These persons are contractor employees directly responsible to the General Superintendent.

C. Accreditation: The General Superintendent, Supervisors and Forepersons are to be accredited and certified as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C, and the Colorado Department of Public Health & Environment regulation AQCC Regulation 8 Part B.

1.11 PRE-CONSTRUCTION CONFERENCE

A. An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by the General Contractor prior to start of any work. The preconstruction conference will be scheduled before start of construction, at a time convenient to the Owner, Project Administrator, Asbestos Project Manager, Designer, and the Air Monitoring Specialist, but no later than 15 days after execution of the Agreement. Meet at the project site, or as otherwise directed, with General Superintendent, Owner, Project Administrator, Asbestos Project Manager, Designer, Air Monitoring Specialist and other entities concerned with the asbestos abatement work.

B. Attendees: Authorized representatives of the Owner, Project Administrator, Asbestos Project Manager, Designer, Air Monitoring Specialist and their consultants will be in attendance. An authorized representative of the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

   1. 24 hours advance notice will be provided to all participants prior to convening Pre-Construction Conference.

C. Agenda: This is an organizational meeting, to review responsibilities and personnel assignments, to locate regulated areas and temporary facilities including power, light, water, etc. Items of significance that could affect progress will be discussed, including the following:

   1. Tentative construction schedule.
   
   2. Critical work sequencing.
   
   3. Designation of responsible personnel.

   4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.


7. Submittal of Shop Drawings, Product Data, and Samples.

8. Preparation of record documents.

9. Use of the premises.


11. Office, work, and storage areas.

12. Equipment deliveries and priorities.

13. Safety procedures.

14. First aid.


17. Working hours.

1.12 PROGRESS MEETINGS

A. General: In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, the General Contractor will hold general progress meetings as required. These meeting will be scheduled, where possible, at time of preparation of payment request.

B. Attendees: Representatives of the Owner, Project Administrator, Asbestos Project Manager, Designer and Air Monitoring Specialist will attend these meetings. In addition to representatives of the Contractor, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting.

C. Agenda: Be prepared to discuss the following items at the progress meetings. Review other items of significance that could affect progress.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:
   a. Interface requirements.
   b. Time.
   c. Sequences.
d. Status of submittals.

e. Deliveries.

f. Access.

g. Site utilization.

h. Temporary facilities and services.

i. Hours of work.

j. Hazards and risks.

k. Housekeeping.

l. Quality and work standards.

m. Change Orders.

n. Documentation of information for payment requests.

D. Reporting: Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule no later than 24 hours after each meeting. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1.13 COORDINATION MEETINGS

A. Attend project coordination meetings that will conducted by the General Contractor at regular intervals convenient for all parties involved. Project coordination meetings are intended to coordinate the work of all contractors performing work on the site, and are in addition to specific meetings held for other purposes, such as regular progress meetings.

1.14 RECORD KEEPING

A. Daily Log: Maintain a Daily Log (posted in an area accessible to the Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist) as a bound, sequential, hand-written record carefully prepared daily that documents but is not limited to the following items:

1. Meetings; purpose, attendees, brief discussion

2. Special or unusual events, i.e. barrier breeching, equipment failures, accidents

3. Documentation of Contractor's completion of the following:

   a. Inspection of work area preparation prior to start of removal and daily thereafter.

   b. Removal of any sheet plastic barriers

   c. Contractor's inspections prior to spray back, lock back, encapsulation, enclosure or any other operation that will conceal the condition of ACM or the substrate from which such materials have been removed.

   d. Removal of waste materials from work area

   e. Decontamination of equipment (list items)

   f. Contractors final inspection/final air test analysis.
B. Entry/Exit Log: Maintain within the Decontamination Unit a daily log documenting the dates and time of but not limited to, the following items:

1. Visitations; authorized and unauthorized with the following information
   a. Name
   b. Organization
   c. Entry time
   d. Exit Time
   e. Respiratory protection

2. Personnel, by name, entering and leaving the work area with the following information
   a. Printed Name
   b. Identification Number
   c. Entry Time
   d. Exit Time
   e. Respiratory Protection

C. Air Monitoring Results: Post personnel and area air monitoring results in Decontamination Unit within 24 hours of sample collection. Post the respiratory protection requirements for the work in progress.

D. Records in Decontamination Unit: Maintain the following documentation in the Decontamination Unit, in a location accessible to workers.

1. Documentation of inspections by OSHA, EPA, State or local authority
2. Respiratory Protection Program.

E. Other records: Maintain other documentation (posted in an area accessible to the Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist) including:

1. Waste Manifests and shipping records.
2. Landfill receipts.
3. Accident reports.
4. State Certification ID Cards.

1.15 SPECIAL REPORTS

A. General: Except as otherwise indicated, submit special reports directly to Owner within one day of occurrence requiring special report, with copy to Owner, Project Administrator, Asbestos Project Manager, Designer and others affected by occurrence.

B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures), prepare and submit report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise General Contractor/Asbestos Project Manager/Designer.
in advance at earliest possible date.

C. Reporting Accidents: Prepare and submit 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, or where work was stopped for over four hours during a scheduled shift.

D. Report Discovered Conditions: When an unusual condition of the building is discovered during the work (e.g. leaks, termites, corrosion) prepare and submit a special report indicating condition discovered.

1.16 SUBMITTALS

A. Before Start of Work: Submit the following to the General Contractor/Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with General Contractor’s/Asbestos Project Manager’s/Designer’s written response indicating the submittal status:

1. Plan of Action.

2. Contingency Plans.


4. Notifications: copy of notification sent to other appropriate entities and agencies at the work site, and to emergency service agencies.

5. Pre-Construction Inspection: Report on inspection carried out as required by this section. Include copies of all photographs, video tapes, etc.

6. Contractor’s Construction Schedule.

7. Accreditation: Submit evidence in the form of training course certificates for the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors in accordance with AHERA requirements. Submit evidence in the form of training course certificates that each worker is trained as an asbestos abatement worker in accordance with AHERA requirements.

8. Certification: Submit evidence in the form of State Certification for the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors. Submit evidence in the form of State Certification that each worker is certified as an asbestos abatement worker.

9. Resume: Submit resume of General Superintendent

C. Submit daily: Provide one (1) copy for information purposes of all documents indicated in the following sub-sections to Project Administrator, Asbestos Project Manager, Designer and Air Monitoring Specialist by end of the next working day after the day they are received by Contractor.

1. Section on Record Keeping.

2. Section on Special Reports.

D. Submit prior to entry in a Regulated Area: Submit one (1) copy of evidence in the form of training course certificates and state certifications for changes or additions in the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors, and for changes or additions of each worker as an asbestos abatement worker in accordance with AHERA requirements and the Colorado Department of Public Health & Environment regulation AQCC Regulation 8 Part B to the Project Administrator, Asbestos Project Manager, Designer and Air Monitoring Specialist, at least 24 hours
prior to the change or addition to the work site.

E. Project Close-out: Submit three (3) copies for information purposes of all documents indicated in the following sections at final closeout of project as a project close-out submittal.

1. Section on Record Keeping.

2. Section on Special Reports.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION - 01043
SECTION 01046 - CUTTING AND PATCHING - ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Procedures for building small containment areas are specified in Section 01529 Mini Enclosures and Glovebags
B. Procedures for sealing exposed edges are specified in Section 09805 Encapsulation of Asbestos-Containing Materials
C. Procedures for disposal of waste are specified in Section 02084 Disposal of Regulated Asbestos Containing Materials

1.3 SUBMITTALS

A. Before the Start of Work: Submit Product Data Sheets for the following to the Asbestos Project Manager/Designer for review. Begin no work until these submittals are returned with Asbestos Project Manager’s/Designer's written response indicating the submittal status:

1. Tools: equipped with HEPA vacuum dust collection attachments

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Provide local exhaust ventilation systems that comply with ANSI Z9.2

2.2 PRODUCTS

A. Products for encapsulation are specified in Section 09805.

PART 3 - EXECUTION

3.1 WORK PRACTICES

A. Before beginning work of this section, comply with:

1. Section 01527 - Regulated Areas
2. Section 01561 - Worker Protection - Repair & Maintenance
3. Section 01562 - Respiratory Protection

B. Perform cutting, drilling, abrading, or otherwise penetrating any asbestos-containing material in a manner that will minimize the dispersal of asbestos fibers into the air.

C. Provide adequate local exhaust to capture fibers produced by cutting, drilling, or abrading by means of an approved High Efficiency Particulate Absolute (HEPA) filter vacuum. Use specialized equipment such as drills or saws having integral ventilation hoods which are connected to a HEPA vacuum with a flexible hose. Handle and dispose of HEPA filters as contaminated material in accordance with requirements of Section 02084 “Disposal of Regulated Asbestos-
Containing Material.”

D. Thoroughly saturate absorbent surfaces of asbestos-containing material to be penetrated with a penetrating type encapsulant. Allow encapsulant to penetrate to substrate before working on materials.

E. Seal edges of asbestos-containing material exposed by cutting, drilling, or abrading, etc. with two (2) coats of an approved penetrating encapsulant applied in accordance with manufacturers' printed instruction for use of the encapsulant as an asbestos coating and requirements of Section 09805.

END OF SECTION - 01046
SECTION 01097 - REFERENCE STANDARDS AND DEFINITIONS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic contract definitions are included in the Conditions of the Contract.

1. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.

2. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Asbestos Project Manager/Designer, requested by the Asbestos Project Manager/Designer, and similar phrases.

3. "Approved": The term "approved," when used in conjunction with the Asbestos Project Manager’s/Designer's action on the Contractor's submittals, applications, and requests, is limited to the Asbestos Project Manager's/Designer's duties and responsibilities as stated in the Conditions of the Contract.

4. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

5. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

6. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

7. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

8. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

a. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.

b. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

c. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for
those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

(i). This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

9. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

10. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

11. "Designer": This is the entity described as the “Project Designer” or “Designer” in accordance with local, state, and/or federal regulations, including but not limited to AQCC Regulation 8 for the development of these Specifications on behalf of the Owner. All references to Architect or Engineer in the Contract Documents in all cases refer to the Designer. The Designer will represent the Owner during construction and until final payment is due. The Designer will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Designer.

12. "Designer": This is the entity described as the “Project Designer” or “Designer” in accordance with local, state, and/or federal regulations, including but not limited to AQCC Regulation 8 for the development of the Contractor Project Design (Plan of Action) in order to comply with these Specifications on behalf of the Contractor.

13. "Project Administrator": This is the entity described as the "Project Administrator". The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon written or verbal order if requirements of the Contract Documents are not met, or if in the sole judgment of the Owner, Project Administrator, Asbestos Project Manager, or Designer, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work. The Owner’s instructions to the Contractor will be forwarded through the Project Administrator.

14. “Stop Work Order”: is a written order to cease asbestos removal, encapsulation or enclosure activities. The Contractor must maintain work area enclosure, pressure differential isolation and ventilation of the work area, and decontamination units during the period that a Stop Work Order is in effect.

15. "General Superintendent": This is the Contractor's Representative at the work site. This person must be a Competent Person as defined by OSHA in 29 CFR 1926.

16. "Asbestos Project Manager": This is the entity described as the Project Manager in accordance with local, state, and/or federal regulations, including but not limited to AQCC Regulation 8. The project manager shall be responsible for assessing that: the project is conducted in accordance with this regulation; the project design is followed; the abatement project is cleared in accordance with this regulation; and the asbestos waste generated by the project is properly manifested and disposed of in accordance with this regulation. The project manager shall be responsible for communicating these assessments to the building owner or contractor. Project managers shall be independent of the asbestos abatement contractor and work strictly on behalf of the building owner to the extent feasible, unless the abatement is being performed in-house. Project managers must sign the original copy of the permit for the permit to be valid (where required). The Asbestos Project Manager will represent the Owner during construction and until final payment is due. The Asbestos Project Manager will advise and consult with the Owner.

17. "Air Monitoring Specialist” means a person contracted or employed to conduct air monitoring, and who has successfully completed an Air Monitoring Specialist course at an Approved EPA Training Center.

18. “Project Design” in accordance with AQCC Regulation 8, Part B, “...means the preparation of plans,
specifications, project procedures, containment design/placement, descriptions of engineering controls, and shop drawings for an asbestos abatement project or response action. It shall include an accurate and detailed scope of work, quantities of material to be removed, removal methods, and air exchange calculations. Drawings shall include locations of ACM to be abated, location of the decontamination unit, waste load out, negative air units, air intake and exhaust, and emergency exits when applicable. Prior to the start of any asbestos abatement involving 1,000 linear feet on pipes, or 3,000 square feet on other surfaces, a written project design shall be developed by a project designer certified under these regulations. A signed copy of the project design shall be available on site at all times during the abatement activities for review by inspectors, the Project Manager and Air Monitoring Specialist...", Owner, Project Administrator, and Designer.

B. Definitions Relative to Asbestos Abatement:

1. “Adequately Wet” means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from the asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

2. "Asbestos": The asbestiform varieties of chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite, actinolite, and any of these minerals that has been chemically treated and/or altered. For purposes of the contract documents materials described in the contract documents as asbestos are to be considered as asbestos.

3. "Asbestos-Containing Material (ACM)". Any material containing more than 1% asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.

4. "Asbestos-Containing Waste Material": any waste that contains asbestos. This term includes filters or other materials contaminated with asbestos. This term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.

5. "Asbestos debris": pieces of ACM that can be identified by color, texture, or composition, or dust, if the dust is determined by an accredited inspector to be ACM.

6. "Certified Industrial Hygienist (C.I.H.)": one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

7. "Competent person": an individual who meets the requirements of OSHA as a “competent person” for the specific activity involved in the work. The “competent person” must meet the requirements of 29 CFR 1926.32(f), and 29 CFR 1926.1101.

8. "Filter": A media component used to remove solid or liquid particles from air and water.

9. "Friable Asbestos": any asbestos-containing material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

10. "Grinding": to reduce to powder or small fragments and includes manual or mechanical chipping or drilling.

11. "HEPA Filter": A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of all mono-dispersed particles of 0.3 microns in diameter.

12. "HEPA Filter Vacuum Collection Equipment (or vacuum cleaner)”: High efficiency particulate air filtered vacuum collection equipment with a HEPA filter.

13. "Industrial Hygienist” (as defined by Colorado SB 97-119): 1.2) means an individual who has obtained a baccalaureate or graduate degree in industrial hygiene, biology, chemistry, engineering, physics, or a closely related physical or biological science from an accredited college or university. The special studies and training of such individual shall be sufficient in the cognate sciences to provide the ability and competency to:
(a) anticipate and recognize the environmental factors and stresses associated with work and work operations and to understand their effects on individuals and their wellbeing;

(b) evaluate on the basis of training and experience and with the aid of quantitative measurement techniques the magnitude of such environmental factors and stresses in terms of their ability to impair human health and well-being;

(c) (i) prescribe methods to prevent, eliminate, control, or reduce such factors and stresses and their effects.

(ii) any individual who has practiced within the scope of the meaning of industrial hygiene for a period of not less than five years immediately prior to July 1, 1997, is exempt from the degree requirements set forth in this subsection (1.2).

(iii) any individual who has a two-year associate of applied science degree in environmental science from an accredited college or university and in addition not less than four years practice immediately prior to July 1, 1997, within the scope of the meaning of industrial hygiene is exempt from the degree requirements set forth in this subsection (1.2).

14. "Intact": that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

15. "Leak-tight": that solids or liquids cannot escape or spill out. It also means dust-tight.

16. "Negative Pressure Enclosure (NPE)": A pressure differential and ventilation system where the work area is maintained at a negative pressure relative to air pressure outside the work area.

17. "Nonfriable Material": any material that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure and has not been rendered friable.

18. "Personal Monitoring": Sampling of the asbestos fiber concentrations within the breathing zone of an employee.

19. "Surfacing material": material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

20. "Thermal system insulation (TSI)": insulation applied to pipes, fittings, boilers, breeching, tanks, ducts or other components to prevent heat loss or gain.

21. "Time Weighted Average (TWA)": The average concentration of a contaminant in air during a specific time period as determined by the method prescribed in Appendix A of 29 CFR part 1926.1101.

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

23. "Working Day": Monday through Friday and includes holidays that fall on any of the days Monday through Friday as indicated in the notification requirements.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections typically based on CSRF's 16-Division format and MasterFormat's numbering system.
B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Streamlined Language: The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Asbestos Project Manager/Designer before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Asbestos Project Manager/Designer for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Standards: which apply to asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Address</th>
<th>Standards</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>b. Practices for Respiratory Protection Publication Z88.2</td>
</tr>
<tr>
<td>American Society for Testing and Materials (ASTM)</td>
<td>100 Bar Harbor Drive West Conshocken, PA 19428-2959 (610) 832-9585</td>
<td>a. Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849</td>
</tr>
</tbody>
</table>
F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

G. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

<table>
<thead>
<tr>
<th>Acronym or Abbreviation</th>
<th>Organization</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
<td>P.O. Box 19150 Detroit, MI 48219(313) 532-2600</td>
</tr>
<tr>
<td>ACIL</td>
<td>American Council of Independent Laboratories</td>
<td>1629 K St., NW Washington, DC 20006 (202) 887-5872</td>
</tr>
<tr>
<td>ACPA</td>
<td>American Concrete Pipe Assoc.</td>
<td>8300 Boone Blvd., Suite 400 Vienna, VA 22182 (703) 821-1990</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists</td>
<td>1330 Kemper Meadow Dr. Cincinnati, OH 45240 (513) 742-2020</td>
</tr>
<tr>
<td>AIA</td>
<td>The American Institute of Architects</td>
<td>1735 New York Ave., NW Washington, DC 20006 (202) 626-7300</td>
</tr>
<tr>
<td>AIHA</td>
<td>American Industrial Hygiene Assoc.</td>
<td>2700 Prosperity Ave., Suite 250 Fairfax, VA 22031 (703) 849-8888</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
<td>11 West 42nd St., 13th Floor New York, NY 10036 (212) 642-4900</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air-Conditioning Engineers</td>
<td>1791 Tullie Circle, NE Atlanta, GA 30329 (404) 636-8400</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
<td>345 East 47th St. New York, NY 10017 (212) 705-7722</td>
</tr>
<tr>
<td>ASPE</td>
<td>American Society of Plumbing Engineers</td>
<td>3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362 (805) 495-7120</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
<td>100 Barr Harbor Drive West Conshohocken, PA 19428-2959 (610) 832-9585</td>
</tr>
<tr>
<td>CGA</td>
<td>Compressed Gas Assoc.</td>
<td>1725 Jefferson Davis Highway, Suite 1004 Arlington, VA 22202-4100 (703) 412-0900</td>
</tr>
<tr>
<td>FM</td>
<td>Factory Mutual Systems</td>
<td>1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062 (617) 762-4300</td>
</tr>
<tr>
<td>GA</td>
<td>Gypsum Association</td>
<td>810 First St., NE, Suite 510 Washington, DC 20002 (202) 289-5440</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronic Engineers</td>
<td>345 E. 47th St. New York, NY 10017 (212) 705-7900</td>
</tr>
<tr>
<td>IETA</td>
<td>International Electrical Testing Assoc.</td>
<td>P.O. Box 687 Morrison, CO 80465 (303) 697-8441</td>
</tr>
<tr>
<td>IRI</td>
<td>Industrial Risk Insurers</td>
<td>P.O. Box 5010</td>
</tr>
</tbody>
</table>
**Acronym or Abbreviation** | **Organization** | **Address**
---|---|---
ISA | Instrument Society of America | P.O. Box 12277, 67 Alexander Dr., Research Triangle Park, NC 27709 (919) 549-8411
ISO | International Standards Organization | 
NEC | National Electrical Code (from NFPA) | 
NECA | National Electrical Contractors Assoc. | 3 Bethesda Metro Center, Suite 1100, Bethesda, MD 20814 (301) 657-3110
NEMA | National Electrical Manufacturers Assoc. | 2101 L St., NW, Suite 300, Washington, DC 20037 (202) 457-8400
NFPA | National Fire Protection Assoc. | One Battymarch Park, P.O. Box 9101, Quincy, MA 02269-9101 (617) 770-3000 (800) 344-3555
NRCA | National Roofing Contractors Assoc. | 10255 W. Higgins Rd., Suite 600, Rosemont, IL 60018-5607 (708) 299-9070
RFCI | Resilient Floor Covering Institute | 966 Hungerford Dr., Suite 12-B, Rockville, MD 20805 (301) 340-8580
UL | Underwriters Laboratories | 333 Pfingsten Rd., Northbrook, IL 60062 (708) 272-8800
White Lung Association | PO Box 1483, Baltimore, MD 21203 | 

**H. Federal Government Agencies:** Names and titles of federal government standard- or specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard- or specification-producing agencies of the federal government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

<table>
<thead>
<tr>
<th>Acronym or Abbreviation</th>
<th>Organization</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>Corps of Engineers (U.S. Department of the Army)</td>
<td>Chief of Engineers - Referral Washington, DC 20314 (202) 272-0660</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
<td>N. Capitol St. between G and H St., NW Washington, DC 20402 (202) 783-3238 (Available from the Government Printing Office) (Material is usually first published in the &quot;Federal Register&quot;)</td>
</tr>
<tr>
<td>CPSC</td>
<td>Consumer Product Safety Commission</td>
<td>5401 Westbard Ave., Bethesda, MD 20207 (800) 638-2772</td>
</tr>
<tr>
<td>DOC</td>
<td>Department of Commerce</td>
<td>14th St. and Constitution Ave., NW Washington, DC 20230 (202) 482-2000</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation</td>
<td>400 Seventh St., SW Washington, DC 20590 (202) 366-4000</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
<td>401 M St., SW</td>
</tr>
</tbody>
</table>
### Hazards Materials Design Criteria

#### Reference Standards and Definitions - Asbestos Abatement

<table>
<thead>
<tr>
<th>Acronym or Abbreviation</th>
<th>Organization</th>
<th>Address</th>
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</thead>
<tbody>
<tr>
<td>FS</td>
<td>Federal Specification (from GSA)</td>
<td>Washington, DC 20460 (202) 260-2090</td>
</tr>
<tr>
<td>GSA</td>
<td>General Services Administration</td>
<td>F St. and 18th St., NW Washington, DC 20405 (202) 708-5082</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
<td>(U.S. Department of Commerce) Gaithersburg, MD 20899 (301) 975-2000</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
<td>(U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210 (202) 219-6091</td>
</tr>
<tr>
<td>USPS</td>
<td>U.S. Postal Service</td>
<td>475 L'Enfant Plaza, SW Washington, DC 20260-0010 (202) 268-2000</td>
</tr>
</tbody>
</table>

I. Trade Union Jurisdictions: The Contractor shall maintain, and require subcontractors to maintain, complete current information on jurisdictional matters, regulations and pending actions, as applicable to construction activities. The manner in which Contract Documents have been organized and subdivided is not intended to be indicative of trade union or jurisdictional agreements.

1. Discuss new developments at project meetings at the earliest feasible dates. Record relevant information and actions agreed upon.

2. Assign and subcontract construction activities, and employ tradesmen and laborers in a manner that will not unduly risk jurisdictional disputes that could result in conflicts, delays, claims and losses.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION 01097**
SECTION 01098 - CODES, REGULATIONS AND STANDARDS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.2 SUMMARY

A. This section sets forth governmental regulations which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.

1. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.

2. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

1.3 CODES, REGULATIONS AND STANDARDS

A. General Applicability of Codes, Regulations and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes and regulations have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the Contractor, the Contractor’s employees, or subcontractors.

C. Federal Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

   a. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite;
   Final Rules Title 29, Part 1910, Section 1001 of the Code of Federal Regulations
   Final Rules Title 29, Part 1926, Section 1101 of the Code of Federal Regulations

   b. Respiratory Protection
   Title 29, Part 1910, Section 134 of the Code of Federal Regulations (Revised Section 139)
   Title 29, Part 1926, Section 103 of the Code of Federal Regulations

   c. Personal Protective Equipment for General Industry
   Title 29, Part 1910, Section 132 of the Code of Federal Regulations
   Title 29, Part 1926, Sections 95 - 107 of the Code of Federal Regulations
d. Access to Employee Exposure and Medical Records
Title 29, Part 1926, Section 33 of the Code of Federal Regulations

e. Hazard Communication
Title 29, Part 1926, Section 59 of the Code of Federal Regulations

f. Specifications for Accident Prevention Signs and Tags
Title 29, Part 1910, Section 145 of the Code of Federal Regulations

g. Permit Required Confined Space
Title 29, Part 1910, Section 146 of the Code of Federal Regulations

h. Construction Industry
Title 29, Part 1910, Section 1001 of the Code of Federal Regulations
Title 29, Part 1926, Section 1101 of the Code of Federal Regulations

i. Construction Industry - General Duty Standards
Title 29, Part 1926, Sections 20 through 35 of the Code of Federal Regulations

j. Shipyard Industry
Title 29 Part 1915 Section 1001 of the Code of Federal Regulations

2. DOT: U.S. Department of Transportation, including but not limited to:

a. Hazardous Substances
Title 49, Part 171 and 172 of the Code of Federal Regulations

b. Hazardous Material Regulations
General Awareness and Training Requirements for Handlers, Loaders and Drivers
Title 49, Parts 171-180 of the Code of Federal Regulations

c. Hazardous Material Regulations
Editorial and Technical Revisions
Title 49, Parts 171-180 of the Code of Federal Regulations

3. EPA: U.S. Environmental Protection Agency (EPA), including but not limited to:

a. Asbestos Abatement Projects; Worker Protection Rule
Title 40 Part 763, Sub-part G of the Code of Federal Regulations

b. Asbestos Hazard Emergency Response Act (AHERA) Regulation
Title 40, Part 763, Sub-part E of the Code of Federal Regulations

c. EPA Model Accreditation Plan - Asbestos Containing Materials Final Rule & Notice
Title 40, Part 763, Sub-part E, Appendix C of the Code of Federal Regulations

d. National Emission Standard for Hazardous Air Pollutants (NESHAP)
National Emission Standard for Asbestos
Title 40, Part 61, Sub-part A, and Sub-part M (Revised Sub-part B) of the Code of Federal Regulations
D. State Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

a. State of Colorado Department of Health and Environment, Air Pollution Control Division  
   4300 Cherry Creek Drive South  
   Denver, CO 80222-1530  
   (303) 692 2000 / Fax (303) 782 0278  
   c/o: Asbestos Unit

E. Local Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

a. refer to local municipal, city and county regulatory requirements.

b. abide by all local requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials.

1.4 NOTICES

A. U.S. ENVIRONMENTAL PROTECTION AGENCY

1. Postmark or Deliver Written Notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAP Contact at least 10 working days prior to beginning any work on asbestos-containing materials (ACM). Send notification to the following address:

   a. REGION 8  
      Asbestos NESHAP Contact  
      Air & Waste Management Division  
      USEPA  
      One Denver Place  
      999 18th Street, Suite 500  
      Denver, CO 80202-2405  
      (303) 293-7685

2. Notification: Include the following information in the notification sent to the NESHAP contact:

   a. Indication whether the notification is the original or revised notification

   b. Name, address, and telephone number of Owner or operator.

   c. Name, address, and telephone number of Contractor.

   d. Type of Operation (demolition or renovation).

   e. Description of the facility or affected part of the facility being demolished or renovated, including the size (square feet [square meters], number of floors), age, present and prior use of the facility.

   f. Estimate of the approximate amount of RACM to be removed from the facility in terms of linear meters [linear feet] of pipe, and surface area in square meters [square feet] of other facility components. Also estimate the approximate amount of Category I and Category II nonfriable ACM in the affected part of the facility that will not be removed before demolition.

   g. For facilities in which the amount of friable asbestos materials less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) or 1 cubic meter (35 cubic feet) if the length and width
could not be measured. On other facility components, explain techniques of estimation.

h. Location and street address (including building number or name and floor or room number, if appropriate), city county, and state, of the facility being demolished or renovated.

i. Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of 40 CFR 61.145.

j. Scheduled starting and completion dates of demolition or renovation.

k. Nature of planned demolition or renovation and method(s) to be used, including demolition or renovation techniques to be used and description of affected facility components.

l. Procedures to be used to comply with the requirements of USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61 Subpart M).

m. Name and location of the waste disposal site where the asbestos containing waste material will be deposited.

n. A certification that at least one person trained as required by paragraph (c)(8) of 40 CFR 61.145 will supervise the stripping and removal described by this notification.

o. For facilities being demolished under an order of a State or local governmental agency, issued because the facility is structurally unsound and in danger of imminent collapse, the name, title, and authority of the State or local governmental representative who has ordered the demolition. A copy of the order shall be attached to the notification.

p. For emergency renovations described in paragraph (a)(4)(iv) of 40 CFR 61.145, the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.

q. Description of procedures to be followed in the event that the unexpected RACM is found or Category II nonfriable ACM becomes crumbled, pulverized, or reduced to powder.

r. Name, address, and telephone number of the waste transporter.

B. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

1. Send a copy of evaluation and certification of alternative work procedures to the national office of OSHA, Office of Technical Support, Room N3653, 200 Constitution Avenue, NW, Washington, DC 20210 before work which involves the removal of more than 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of thermal system insulation or surfacing material is begun using an alternative method.
C. STATE AND LOCAL AGENCIES:

1. Send written notification as required by state and local regulations prior to beginning any work on ACM.
   
   a. Postmark or Deliver Written Notification as required by Colorado Air Quality Control Division (AQCC) Asbestos Regulations (AQCC Regulation 8, Part B) to the Asbestos Contact at least 10 working days prior to beginning any work on asbestos-containing materials (ACM). Send notification to the following address:
      
      (i). State of Colorado Department of Health and Environment, Air Pollution Control Division
      4300 Cherry Creek Drive South
      Denver, CO  80222-1530
      (303) 692 2000 / Fax (303) 782 0278
      c/o: Asbestos Unit

2. Notification: Include all required information in the notification sent to the Asbestos contact:

1.5 PERMITS

A. Permit: All asbestos containing waste is to be transported by an entity maintaining a current "Industrial waste hauler permit" specifically for ACM, as required for transporting of waste ACM to a disposal site.

B. Contractor is responsible for obtaining any demolition, building, renovation or other permits, and for paying application fees, if any, where required by State or Local jurisdictions.

1.6 LICENSES

A. Licenses: Maintain current licenses as required by applicable state or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract.

1.7 POSTING AND FILING OF REGULATIONS

A. Posting and Filing of Regulations: Post all notices required by applicable federal, state and local regulations. Maintain two (2) copies of applicable federal, state and local regulations and standard. Maintain one copy of each at job site. Keep on file in Contractor's office one copy of each.

1.8 SUBMITTALS

A. Before Start of Work: Submit the following, including but not limited to Notification Applications, Permit Applications Variance Requests and/or Waiver Requests to the Asbestos Project Manager/Designer for review. No work shall begin until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use or final-but-restricted use.

   1. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work including:
      
      a. State and Local Regulations: Submit copies of codes and regulations applicable to the work.

2. Notices: Submit notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.

   a. Evaluation and certification of alternative work procedures or the use of a alternative methods (including variance requests), prior to application to any local, state and/or federal regulatory agency.
3. Permits: Submit copies of current valid permits required by state and local regulations.

4. Licenses: Submit copies of all State and local licenses and permits necessary to carry out the work of this contract.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION - 01098
SECTION 01301 - SUBMITTALS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:

1. Submittal schedule.
2. Daily construction reports.
3. Shop Drawings.
4. Product Data.
5. Samples.
6. Quality Assurance Submittals

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors

C. RELATED SECTIONS

1. The following Sections contain requirements that relate to this Section:

a. Division 1 Section "Applications for Payment - Asbestos Abatement" specifies requirements for submittal of the Schedule of Values.

b. Division 1 Section "Coordination" specifies requirements governing submittal and distribution of meeting and conference minutes.

c. Division 1 Section "Project Closeout-Asbestos Abatement" specifies requirements for submittal of Project Record Documents and warranties at project closeout.
1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
   a. The Asbestos Project Manager/Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

1. Allow 2 weeks for initial review. Allow additional time if the Asbestos Project Manager/Designer must delay processing to permit coordination with subsequent submittals.

2. If an intermediate submittal is necessary, process the same as the initial submittal.

3. Allow 2 weeks for reprocessing each submittal.

4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Asbestos Project Manager/Designer sufficiently in advance of the Work to permit processing.

C. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.
   a. Project name.
   b. Date.
   c. Name and address of the Designer.
   d. Name and address of the Contractor.
   e. Name and address of the subcontractor.
   f. Name and address of the supplier.
   g. Name of the manufacturer.
   h. Number and title of appropriate Specification Section.
   i. Drawing number and detail references, as appropriate.

3. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
D. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Asbestos Project Manager/Designer using a transmittal form. The Asbestos Project Manager/Designer will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 SUBMITTAL SCHEDULE

A. Listing: At the end of this section is a listing of the principal submittals required for the work. This listing is not necessarily complete, nor does the listing reflect the significance of each submittal requirement. The listing is included only for the convenience of users of the Contract Documents.

B. Submittal Schedule: After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.

2. Prepare the schedule in chronological order. Provide the following information:
   a. Scheduled date for the first submittal.
   b. Related Section number.
   c. Submittal category (Shop Drawings, Product Data, or Samples).
   d. Name of the subcontractor.
   e. Description of the part of the Work covered.
   f. Scheduled date for resubmittal.
   g. Scheduled date for the Asbestos Project Manager’s/Designer's final release or approval.

C. Distribution: Following response to the initial submittal, print and distribute copies to the Asbestos Project Manager/Designer, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.5 SHOP DRAWINGS

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and
similar Drawings. Include the following information:

1. Dimensions.

2. Identification of products and materials included by sheet and detail number.

3. Compliance with specified standards.

4. Notation of coordination requirements.

5. Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (890 by 1220 mm).

D. Initial Submittal: Submit 2 blue- or black-line prints for the Asbestos Project Manager’s/Designer's review. The Asbestos Project Manager/Designer will return one print, if requested.

E. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Asbestos Project Manager/Designer for distribution. The Asbestos Project Manager/Designer will retain 2 prints and return the remainder, if requested.

1.6 PRODUCT DATA

A. Collect Product Data into a single submittal. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

   a. Manufacturer's printed recommendations.

   b. Compliance with recognized trade association standards.

   c. Compliance with recognized testing agency standards.

   d. Application of testing agency labels and seals.

   e. Notation of dimensions verified by field measurement.

   f. Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

B. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

C. Submittals: Submit 3 copies of each required submittal. The Asbestos Project Manager/Designer will retain two, and will return the one marked with action taken and corrections or modifications required.

1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

D. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and
others required for performance of construction activities. Show distribution on transmittal forms.

1. Do not proceed with installation until a final submittal is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.7 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. Mount or display Samples in the manner to facilitate review of qualities indicated. Prepare Samples to match the General Contractor’s sample. Include the following:

   a. Specification Section number and reference.

   b. Generic description of the Sample.

   c. Sample source.

   d. Product name or name of the manufacturer.

   e. Compliance with recognized standards.

   f. Availability and delivery time.

2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

   a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.

3. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

B. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. The General Contractor will return one set marked with the action taken.

1. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.

2. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

3. Sample sets may be used to obtain final acceptance of the construction associated with each set.

C. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.

   a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a...
1.8 QUALITY ASSURANCE SUBMITTALS

A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

1.9 MISCELLANEOUS SUBMITTALS

A. Material Safety Data Sheets: Process material safety data sheets as “product data.” These are submitted for information purposes only, they will be returned with the written response, “Approved As Noted.”

B. Inspection and Test Reports: Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.

C. Project Photographs: Furnish 2 prints each of 3 project photographs at monthly intervals. Comply with Project Administrator’s/Asbestos Project Manager’s/Designer's direction concerning desired vantage points for shots.

D. Records of Actual Work: Furnish 4 copies of records of actual work, one of which will be returned for inclusion in the record documents as specified in section "Project Closeout".

E. Standards: Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Asbestos Project Manager’s/Designer's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the work.

F. Closeout Submittals: Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information.

G. Record Documents: Furnish set of original documents as maintained on the project site. Along with original marked-up record drawings provide 2 photographic copies of marked-up drawings, which, at the Contractor's option, may be reduced to not less than half size.

1.10 ASBESTOS PROJECT MANAGER'S/DESIGNER'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Asbestos Project Manager/Designer will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Response: The Asbestos Project Manager/Designer will provide a written response for each submittal. The Asbestos Project Manager/Designer will respond appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When the Asbestos Project Manager/Designer marks a submittal "Approved," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. Approved as Noted: When the Asbestos Project Manager/Designer marks a submittal "Approved as Noted," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.

3. Returned for Resubmittal: When the Asbestos Project Manager/Designer marks a submittal "Not Approved, Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
   a. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

4. Received - Not Reviewed: When the Asbestos Project Manager/Designer marks a submittal "Received - Not Reviewed" this acknowledges that the submittal has been received. This action applies to materials that are to be submitted for information purposes only, and where no review or action by the Asbestos Project Manager/Designer is required.

5. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Asbestos Project Manager/Designer will return the submittal marked "Action Not Required."

C. Unsolicited Submittals: The Asbestos Project Manager/Designer will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01301
SECTION 01301 - SUBMITTALS - ASBESTOS ABATEMENT

SUBMITTAL CHECKLIST

The following is a listing of the submittals required by each section. This is a listing of the principal submittals required for the work. This listing is not necessarily complete, nor does the listing reflect the significance of each submittal requirement. The listing is included only for the convenience of users of the Contract Documents.

<table>
<thead>
<tr>
<th>SUBMITTAL CHECKLIST</th>
<th>Comments</th>
<th>Initials</th>
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</thead>
<tbody>
<tr>
<td>Insurance/Bonds (01000)</td>
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<td>Plans, Designs, Details (01000, 01013, 01043)</td>
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<td>Pre-Existing Conditions (01010, 02062)</td>
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<td>Pre-construction Inspection (01013, 01043)</td>
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<td>Contingency Plans (01043)</td>
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<td>Project Directory (01043)</td>
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<td>Notices (01098)</td>
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<td>Samples (01301, 01526, 01527, 01529, 01563, 02084, 15254)</td>
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<td>Progress Photographs (01301)</td>
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<td>Drawings (01301, 01513, 01529, 01563)</td>
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<td>Scaffolding (01503)</td>
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<td>Ground Fault Circuit Interrupters (GFCI) (01503)</td>
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<td>Lamps and Light Fixtures (01503)</td>
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<td>Spray Cement: Manufacturer's installation instructions. (01526, 01529)</td>
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<td>Sheet Plastic: Test reports on NFPA 701 test. (01526, 01529)</td>
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<td>Historic Airborne Fiber Data (01528, 01529, 01560, 01561, 01562)</td>
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<td>AHERA Accreditation: for each worker. (01560, 01561)</td>
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<td>State and Local License: for each worker. (01560, 01561)</td>
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<td>Certificate Worker Acknowledgment: for each worker. (01560, 01561)</td>
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<td>Training Program: course outline. (01560, 01561)</td>
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<td>SUBMITTAL CHECKLIST</td>
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<td>Report from Medical Examination: of each worker. (01560, 01561)</td>
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<td>Personnel Air Samples for Analysis (01560, 01561)</td>
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<td>Product List Schedule (01601)</td>
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<td>Fire Test Data on Lock Back Encapsulants used. (01711)</td>
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<td>Copy of pre-demolition renovation notification sent to the Regional EPA Office. (02061)</td>
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<td>Documentation on Initial and Negative Exposure Assessments (02083)</td>
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<td>Waste Hauler State License (02084)</td>
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<td>Waste Hauler Local License (02084)</td>
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<td>Landfill contact person and telephone number. (02084)</td>
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<td>Chain of Custody form (02084)</td>
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<td>Waste Manifest Form. (02084)</td>
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<td>On a weekly basis: copies of manifests and disposal site receipts. (02084)</td>
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<td>Installation Instructions. (09805)</td>
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<td>Performance Warranty (09805)</td>
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<td>Certification. (09805)</td>
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<td>Notification of unsatisfactory substrate. (09805)</td>
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<td>Signature</td>
<td>Date/Time</td>
<td>Certification No.</td>
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</tr>
</tbody>
</table>

END OF SUBMITTAL CHECKLIST
SECTION 01410 - AIR MONITORING - TEST LABORATORY SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.

A. The Owner has contracted for air monitoring as described in Section 01410 - Air Monitoring - Test Laboratory Services. Air monitoring may be conducted both outside and inside of the work area during the work, and for clearance sampling at the end of the project:

1. Outside of the Work Area: The Owner's Air Monitoring Specialist firm may sample air outside of the work area to detect faults in the work area isolation such as:
   a. Contamination of the building outside of the work area with airborne asbestos fibers,
   b. Failure of filtration or rupture in the differential pressure system,
   c. Contamination of air outside the building envelop with airborne asbestos fibers.

2. Inside the Work Area: The Owner’s Air Monitoring Specialist firm may monitor airborne fiber counts in the Work Area. The purpose of this air monitoring is to detect airborne asbestos concentrations which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

B. Work area clearance: Clearance air sampling by the Owner’s Air Monitoring Specialist at the completion of asbestos abatement work is described in Section 01711 Project Decontamination.

C. Air monitoring required by OSHA is work of the Contractor and is not covered in this section

1.2 SCHEDULE OF AIR SAMPLES BY OWNER

A. Sample cassettes: Samples will be collected on 25 mm. cassettes as follows:

1. PCM: 0.8 micrometer mixed cellulose ester.

2. TEM: 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

B. Number and Volume of Samples: The number, volume, and rate of air samples given in the schedules is approximate. The exact number, volume, and rate of samples collected by the Owner may vary depending upon job conditions and the analytical method used.
C. Sample Volume and Sensitivity:

1. PCM: The sample volumes collected by the Owner’s Air Monitoring Specialist will be determined by the following formula:

\[ \text{Volume} = \frac{(((\text{Number of Fibers})/\text{Area of 100 fields})) \times \text{Total Filter Area}}{/(\text{Limit Value}/4))} \]

Where:
- Number of fibers = 5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm\(^2\) on the filter
- Area of 100 fields = 0.785mm\(^2\)
- Total Filter Area = 385mm\(^2\)
- Limit Value = as specified in the schedules of samples below

a. For purposes of this specification, the sample volume calculated above will be considered to be of sufficient size so that there is a 95% level of confidence that the value measured by each individual sample at the limit of detection (LOD) is less than or equal to the limit values specified below.

b. For purposes of this specification, the Limit of Detection (LOD) is defined as 7 fibers/mm\(^2\) on the filter or 5 fibers/100 fields.

c. For purposes of this specification overloaded samples will be considered as exceeding the applicable limit value.

2. TEM: Analytical Sensitivity of 0.005 structures/cc as set forth in the AHERA regulation.

D. Base Line:

1. Before Start of Work: The Owner may secure air samples to establish a base line.

2. PCM Samples

<table>
<thead>
<tr>
<th>Typical Location(s) Sampled</th>
<th>No. of Samples</th>
<th>Limit Value (Fibers/cc)</th>
<th>Approximate Volume (Liters)</th>
<th>Rate (Liters Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Each Work Area</td>
<td>Typically 1-2 Per Area</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Outside Each Work Area at locations of Critical Barriers, i.e., Common Area(s), locations for Clean Room, Load Out, Output of Pressure Differential System, etc.</td>
<td>Typically 1 Per Area</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Ambient Outside Building</td>
<td>1</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
</tbody>
</table>
3. TEM Samples:

<table>
<thead>
<tr>
<th>Typical Location(s) Sampled</th>
<th>No. of Samples</th>
<th>Analytical Sensitivity (Structures/cc)</th>
<th>Approximate Volume (Liters)</th>
<th>Rate (Liters Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Each Work Area</td>
<td>Typically 1-2 Per Area</td>
<td>0.005</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Outside Each Work Area at locations of Critical Barriers, i.e., Common Area(s), locations for Clean Room, Load Out, Output of Pressure Differential System, etc.</td>
<td>Typically 1 Per Area</td>
<td>0.005</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Ambient Outside Building</td>
<td>1</td>
<td>0.005</td>
<td>1,300</td>
<td>1-14</td>
</tr>
</tbody>
</table>

4. Base Line: a level expressed in fibers per cubic centimeter which is equal to the lessor of each of the following:

   a. Average of the PCM samples collected outside each Work Area
   
   b. Average of the PCM samples collected outside the building
   
   c. 0.01 fibers per cubic centimeter (at no time shall the MAAL be exceed)

5. Samples collected for TEM analysis will be held without analysis. These samples will be analyzed under the conditions and terms set forth in "Fibers Counted" and "Affect On Contract Sum".

E. Daily:

1. From start of work of Section 01526 Temporary Enclosures through the work of Section 01711 Project Decontamination, the Owner may take samples.

2. Sample volume and sensitivity: inside the work area may vary depending upon conditions in the work area. If samples are overloaded at the sample volume required for a limit value equal to the “Stop Action Levels” or “Immediate Stop Action Levels” given later in this section, the level is considered to have been exceeded.

3. PCM Samples:

<table>
<thead>
<tr>
<th>Typical Location(s) Sampled</th>
<th>No. of Samples</th>
<th>Limit Value (Fibers/cc)</th>
<th>Approximate Volume (Liters)</th>
<th>Rate (Liters Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Each Work Area</td>
<td>Typically 1-2</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Outside Each Work Area at Critical Barrier(s)</td>
<td>1</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Clean Room</td>
<td>1</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
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<tr>
<td>Equipment (Load Out) Room</td>
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<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
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<td>Ambient Outside Building</td>
<td>1</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Output of Pressure Differential System</td>
<td>1</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
</tbody>
</table>
F. Additional samples may be taken at Owner's, Project Administrator’s, Asbestos Project Manager’s, Designer’s, or Air Monitoring Specialist’s discretion. If airborne fiber counts exceed allowed limits additional samples may be taken as necessary to monitor fiber levels.

1.3 ANALYTICAL METHODS USED BY THE OWNER

A. The following methods will be used by The Owner in analyzing filters used to collect air samples. Sampling rates may be varied from printed standards to allow for high volume sampling.

1. Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.

2. Transmission Electron Microscopy (TEM) may be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A. or, at the Owner’s, Project Administrator’s, Asbestos Project Manager’s or Designer’s discretion;

and/or

3. Transmission Electron Microscopy (TEM) may be performed using the Level II analysis per EPA Provisional Method and Update (USEPA 1977, Yamate 1984), with either polycarbonate or mixed cellulose ester filters.

1.4 LABORATORY TESTING BY OWNER

A. The services of a testing laboratory may be employed by the Owner to perform laboratory analyses of the air samples. A microscope and technician may be set up at the job site, or samples will be sent overnight on a daily basis, so that verbal reports on air samples can be obtained within 24 hours. The Contractor will have access to all air monitoring tests and results.

1.5 FIBERS AND STRUCTURES

A. Fibers Counted: The following procedure will be used to resolve any disputes regarding fiber types when a project has been stopped due to excessive airborne fiber counts.

1. Large Fibers: "Airborne Fibers" referred to above include all fibers regardless of composition as counted by phase contrast microscopy (PCM), unless additional analysis by transmission or scanning electron microscopy demonstrates to the satisfaction of the Asbestos Project Manager/Designer that non-asbestos fibers are being counted. "Airborne Fibers" counted in samples analyzed by transmission electron microscopy shall be asbestos fibers, greater than 5 microns in length. For purposes of stop action levels, subsequent to analysis by electron microscopy, the number of "Airborne Fibers" shall be determined by multiplying the number of fibers, regardless of composition, counted by PCM by the proportion of fibers that are asbestos as determined by TEM (a number equal to, asbestos fibers counted, divided by all fibers counted in the electron microscopy analysis).

2. Small Structures: "Airborne Fibers" referred to above include asbestos structures (fibers, bundles, clusters or matrices) of any diameter and any length greater than 0.5 microns.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION
3.1 STOP ACTION LEVELS

A. Inside Work Area: Maintain an average airborne count in the work area of less than the Stop Action Level given below for the type of respiratory protection in use. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8 hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify Asbestos Project Manager/Designer. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Asbestos Project Manager/Designer.

<table>
<thead>
<tr>
<th>Stop Action Level (f/cc)</th>
<th>Immediately Stop Level (f/cc)</th>
<th>Minimum Respirator Required</th>
<th>Protection Factor</th>
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<tr>
<td>0.1</td>
<td>0.5</td>
<td>Half face</td>
<td>10</td>
</tr>
<tr>
<td>0.5</td>
<td>2.5</td>
<td>PAPR</td>
<td>50</td>
</tr>
<tr>
<td>1.0</td>
<td>5.0</td>
<td>Supplied Air Pressure Demand</td>
<td>100</td>
</tr>
</tbody>
</table>

1. If airborne fiber counts exceed Immediate Stop Level given above for type of respiratory protection in use for any period of time cease all work except corrective action. Notify Asbestos Project Manager/Designer. Do not recommence work until fiber counts fall below Stop Action Level given above for the type of respiratory protection in use. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Asbestos Project Manager/Designer.

B. Outside Work Area: If any air sample taken outside of the Work Area exceeds the base line established in Part 1 of this section, immediately and automatically stop all work except corrective action. The Asbestos Project Manager/Designer will determine the source of the high reading and so notify the Contractor in writing.

1. If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:
   a. Immediately erect new critical barriers as set forth in Section 01526 Temporary Enclosures to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor).
   b. Decontaminate the affected area in accordance with Section 01712 Cleaning & Decontamination Procedures.
   c. Require that respiratory protection as set forth in Section 01562 Respiratory Protection be worn in affected area until area is cleared for re-occupancy in accordance with Section 01711 Project Decontamination.
   d. Leave Critical Barriers in place until completion of work and insure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.
   e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a Shower Room and Changing Room as set forth in Section 01563 Decontamination Units at entry point to affected area.
   f. After Certification of Visual Inspection in the Work Area remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Section 01711 Project Decontamination.

2. If the high reading was the result of other causes initiate corrective action as determined by the Asbestos Project Manager/Designer.
C. Affect on Contract Sum:

1. Complete corrective work with no change in the Contract Sum (adjustment may be in the form of a deduction) if high airborne fiber counts were caused by Contractor's activities, as follows:

   a. for any and all Test Laboratory Services and Consultant Services, additional PCM and/or TEM confirmation analysis, per Work Area as described in Section 01013 Summary of Work - Asbestos Abatement, which do not meet the Specification criteria, and are determined to be caused by Contractor's activities, during the requirements of Section 01410 Air Monitoring - Test Laboratory Services.

   b. for any and all Test Laboratory Services and Consultant Services, additional PCM and/or TEM confirmation analysis, per Work Area as described in Section 01714 Work Area Clearance, which do not meet the Specification criteria.

   c. for any and all costs incurred by the Owner, Occupants, Owner Employees, Work under other Contracts, etc., per Work Area which do not meet the Specification criteria.

2. The Contract Sum and schedule may be adjusted for additional work (adjustment may be made in the form of an addition) caused by high airborne fiber counts beyond the Contractor's control, as follows:

   a. for additional work caused by high airborne fiber counts beyond the Contractor's control, as determined by the Project Administrator, Asbestos Project Manager, Designer and Air Monitoring Specialist.

3.2 STOP WORK

A. If the Owner, Project Administrator, Asbestos Project Manager, Designer or Air Monitoring Specialist presents a written stop work order, immediately and automatically conform to that stop work order, while maintaining temporary enclosures and pressure differential. Do not recommence abatement work until authorized in writing by Owner/Project Administrator/Asbestos Project Manager/Designer.

B. Immediately initiate the following actions: After being presented with a stop work order immediately:

   1. Cease all asbestos removal activities, or any other activities that disturbs ACM.

   2. Repair any fallen, ripped or otherwise failed work area isolation measures.


   4. Maintain all worker protections including those required by Sections 01560 “Worker Protection - Asbestos Abatement,” and 01562 “Respiratory Protection.”

   5. Fog the air in the work area with a mist of amended water to reduce airborne fiber levels.

C. Do not recommence work until authorized in writing by the Owner/Project Administrator/Asbestos Project Manager/Designer.

3.3 ADDITIONAL TESTING

A. The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner, and will be in compliance with all local, state and/or federal regulations. AQCC Regulation 8 requires that an Air Monitoring Specialist, independent of the Abatement Contractor, obtain all required air monitoring samples, i.e., final clearance air monitoring, negative air exhaust inside of building, and/or MAAL air monitoring. As described, 'any' air monitoring performed in conjunction with or adjacent to an Abatement Project is considered MAAL air monitoring. Should such air monitoring be requested, prior
authorization from the Asbestos Project Manager shall be obtained, and the results shall be furnished to the Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist within 24 hours.

3.4 PERSONAL MONITORING

A. The Owner will not be performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose. The Contractor will conduct his own air monitoring and laboratory testing. The cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner, and shall be in compliance with all local, state and/or federal regulations, and shall be performed by a qualified Air Monitoring Specialist. Daily written reports shall be posted, and furnished to the Asbestos Project Manager/Designer prior to the commencement of the next shift.

END OF SECTION - 01410
## STOP WORK ORDER

<table>
<thead>
<tr>
<th>Building</th>
<th>Work Area/Containment</th>
<th>Material(s)</th>
<th>Quantity(ies)</th>
<th>Type of Containment (Full/Mini/Regulated Area)</th>
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### Stop Work Order

In accordance with local, state and/or federal regulations, and/or the Hazardous Materials Design Criteria, the Asbestos Abatement Contractor is hereby ordered to stop work in the aforementioned Work Area. The Asbestos Abatement Contractor is to immediately and automatically conform to this stop work order, while maintaining temporary enclosures and pressure differential. The Asbestos Abatement Contractor is to immediately initiate all of the actions as described in Section 01410 “Air Monitoring - Test Laboratory Services” after being presented with a stop work order, as well as any other actions, as deemed necessary by the Owner, Project Administrator, Asbestos Project Manager, and/or Designer, etc. Do not recommence abatement work until authorized in writing by Owner/Project Administrator/Asbestos Project Manager/Designer.

### Stop Work Order Cause

Stop Work Order was issued due to:

___________________________________________________________________________________________________________
___________________________________________________________________________________________________________
___________________________________________________________________________________________________________
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### Stop Work Order Issued By

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### Stop Work Order Acknowledged By Asbestos Abatement Contractor

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### Recommence Work Order

The Stop Work Order Cause was corrected by means of:

___________________________________________________________________________________________________________
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___________________________________________________________________________________________________________
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and therefore, the Asbestos Abatement Contractor may recommence work in accordance with local, state, and/or federal regulations, and Hazardous Materials Design Criteria.

### Recommence Work Order Issued By

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<tr>
<th>Designer Signature</th>
<th>Date/Time</th>
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<th>Asbestos Project Manager Signature</th>
<th>Date/Time</th>
<th>Certification No.</th>
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<th>Project Administrator Signature</th>
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SECTION 01503 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution.
2. Temporary electric power and light.
3. Temporary heat.
4. Ventilation.
5. Telephone service.
6. Sanitary facilities, including drinking water.
7. Storm and sanitary sewer.

C. Support facilities include, but are not limited to, the following:

1. Field offices, laboratories and storage sheds.
2. Temporary enclosures.
3. Hoists and temporary elevator use.

D. Security and protection facilities include, but are not limited to, the following:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.

1.3 DESCRIPTION OF REQUIREMENTS

A. General: Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.

1.4 SUBMITTALS

A. Before the Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Begin no work until these submittals are returned with Asbestos Project Manager’s/Designer's written response indicating that the
1. Hot water heater: Submit manufacturer's name, model number, size in gallons (liters), heating capacity, power requirements.

2. Decontamination Unit Sub-panel: Submit product data.


4. Lamps and Light Fixtures: Submit product data.

5. Temporary Heating Units: Provide product data.

6. Temporary Cooling Units: Provide product data and installation instructions.

7. Self Contained Toilet Units: Provide product data and name of sub-contractor to be used for servicing self contained toilets. Submit method to used for servicing.

   a. Fire prevention measures and hot work permit(s).

9. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

10. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility, where required.

1.5 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements.

2. Health and safety regulations.

3. Utility company regulations.

4. Police, fire department, and rescue squad rules.

5. Environmental protection regulations.


C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
1.6 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. General: Provide new materials and equipment. If acceptable to the Project Administrator/Asbestos Project Manager/Designer, the Contractor may use undamaged, previously used materials and equipment in serviceable condition. Provide materials and equipment suitable for use intended.

B. Lumber and Plywood/Framing Materials:

1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding, or metal framing materials.

2. For fences and vision barriers, provide minimum 3/8-inch- (9.5mm) thick exterior plywood.

C. Scaffolding: Provide scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of scaffolding shall comply with applicable OSHA provisions.

1. Equip rungs of metal ladders, etc. with an abrasive non-slip surface.

2. Provide a nonskid surface on scaffold surfaces subject to foot traffic.

2.2 WATER SERVICE

A. Water: Provide potable water approved by local health authorities.

B. Temporary Water Service Connection: Connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment. Provide separate hoses and/or pumps for shower water and amended water, without the possibility of cross connection.

1. Connection to the Owner’s water system is to be made by qualified personnel (a licensed plumber where applicable and required). Request by the Contractor 72 hours in advance of use, authorized in writing by the Project Administrator, Asbestos Project Manager or Designer, is required.

C. Water Hoses: Provide heavy-duty, abrasion-resistant, flexible hoses in diameters and lengths necessary to adequately serve temporary facilities, and with a pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

1. Provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for...
connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

D. Hot Water Heater: Provide UL rated minimum 40 gallon (150 liters) electric hot water heater to supply hot water for the Decontamination Unit shower. Activate from 30 amp circuit breaker located within the Decontamination Unit subpanel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 12" X 12" X 6" (30 cm. X 30 cm. X 15 cm) deep pan, made of 19 gauge galvanized steel, with handles. A 3-quart (3 liter) kitchen saucepan may be substituted for this purpose. Drip pan shall be securely fastened to the hot water heater with bailing wire or similar material. Wiring of the hot water heater shall be in compliance with NEMA, NECA, and UL standards.

E. Hot Water: may be secured from the building hot water system, provided backflow protection is installed at point of connection as described in this section under Temporary Water Service connection, and if authorized in writing by the Asbestos Project Manager/Designer.

2.3 ELECTRICAL SERVICE

A. General: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

B. Temporary Power: Provide service to Decontamination Unit subpanel with minimum 60 amp, 2 pole circuit breaker or fused disconnect connected to the building’s main distribution panel. Subpanel and disconnect shall be sized and equipped to accommodate electrical equipment required for completion of the work.

1. Connection to the building’s main distribution panel is to be made by a licensed electrician. Request by the Contractor 72 hours in advance of use, authorized in writing by the Project Administrator, Asbestos Project Manager or Designer, is required.

C. Voltage Differences: Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.

D. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters (GFCI), reset button, and pilot light for connection of power tools and equipment.

1. Locate GFCI's exterior to Work Area so that circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.

E. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

F. Lamps and Light Fixtures: Provide general service incandescent lamps or fluorescent lamps of wattage indicated or required for adequate illumination as required by the work or this section. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations. Provide vapor tight fixtures in work area and decontamination units. Provide exterior fixtures where fixtures are exposed to the weather or moisture.

2.4 TEMPORARY HEAT (if required)

A. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from a branch circuit with ground fault circuit interrupter.
2.5 TEMPORARY COOLING (if required)

A. Cooling Units: Provide temporary cooling units consisting of a fan coil unit inside the work area with a compressor and heat rejection coil outside.

2.6 TEMPORARY STRUCTURES (if required)

A. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

B. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

2.7 FIRST AID

A. First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.

2.8 FIRE EXTINGUISHERS

A. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

B. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Require that personnel accomplishing this work be licensed as required by local authority for the work performed.

D. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

3.2 SCAFFOLDING

A. During the erection and/or moving of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged.

B. Clean as necessary debris from non-slip surfaces.

C. At the completion of abatement work clean construction aids within the work area, wrap in one layer of 6 mil (0.15 mm) polyethylene sheet and seal before removal from the Work Area.
3.3 TEMPORARY UTILITY INSTALLATION (if required)

A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner, Project Administrator, Asbestos Project Manager or Designer. Neither the Owner, Project Administrator, Asbestos Project Manager, nor Designer will accept cost or use charges as a basis of claims for Change Orders.

B. Water Service:

1. Water connection (without charge) to Owner's existing potable water system is limited to one 3/4" (19 mm ) pipe-size connection, and a maximum flow of 10 g.p.m. (38 liters / minute) each to hot and cold water supply. Install using vacuum breakers or other backflow preventer as required by local authority. Hot water shall be supplied at a minimum temperature of 100 degrees F (35 degrees C). Supply hot and cold water to the Decontamination Unit in accordance with Section 01563.

   a. Maintain hose connections and outlet valves in leakproof condition. Where finish work below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. Drain water promptly from pans as it accumulates.

2. Sterilization: Sterilize temporary water piping prior to use.

C. Electrical Service:

1. Lock out: Lock out all existing power to or through the work area as described below. Unless specifically noted otherwise existing power and lighting circuits to the Work Area are not to be used. All power and lighting to the Work Area and Decontamination facilities are to be provided from temporary electrical panel described below.

   a. Comply with requirements to OSHA 29 CFR 1910.147 the control of hazardous energy lock out/tag out.

   b. Lock out power to Work Area by switching off breakers serving power or lighting circuits in work area. Tag out breakers with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who has locked pane.

   c. Lock out power to circuits running through Work Area wherever possible by switching off and locking all breakers serving these circuits. Tag out breakers with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to authorized person who has applied locks. If circuits cannot be shut down for any reason, label at intervals of 4-feet" (1.25 meter) on center with signs reading, "DANGER live electric circuit. Electrocution hazard." All asbestos abatement work in the vicinity of the live circuit is to be performed dry. All necessary notifications and procedures for dry removal are to be followed.

   d. Lock out power to electrical equipment located in the work area, and to any fans or other equipment that is going to be worked on.

2. Temporary Electrical Panel: Provide temporary electrical panel sized and equipped to accommodate electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical system. Protect with circuit breaker or fused disconnect. Locate temporary panel as directed by Owner, Project
Administrator, Asbestos Project Manager or Designer. Panel is to be installed by a licensed electrician.

3. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

4. Circuit Protection: Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel. Do not use outlet type GFCI devices.

5. Temporary Wiring: in the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide liquid tight enclosures or boxes for wiring devices.

6. Number of Branch Circuits: Provide sufficient branch circuits as required by the work. Branch circuits are to originate at temporary electrical panel. At minimum provide the following:
   a. One Circuit for each HEPA filtered fan unit
   b. For power tools and task lighting, provide one temporary 4-gang outlet in the following locations. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).
   c. One outlet in the work area for each 2500 square feet (225 square meters) of work area
   d. One outlet at each decontamination unit, located in equipment room

7. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's exclusive use while conducting visual inspection and air sampling during the work as follows:
   a. One in each work area.
   b. One at clean side of each Decontamination Unit.
   c. One at each exhaust location for HEPA filtered fan units.

8. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's exclusive use for conducting visual inspection and final air sampling as set forth in Section 01711 Project Decontamination as follows:
   a. Five inside work area.
   b. Two outside work area in location designated by Asbestos Project Manager/Designer.

D. Temporary Lighting:

1. Lock out: Lock out existing power to lighting circuits in Work Area as described in section 01526 Temporary Enclosures. Unless specifically noted otherwise existing lighting circuits to the Work Area are not to be used. All lighting to the Work Area and Decontamination facilities is to be provided from temporary electrical panel described above.

2. Provide the following or equivalent where natural lighting or existing building lighting does not meet the required light level:
   a. One 200-watt incandescent lamp per 1000 square feet (92.9 square meters) of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 50 feet (15.2 meters). In stair ways and at ladder runs, provide one lamp minimum per story, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general
lighting, and portable plug-in task lighting.

b. Provide lighting in areas where work is being preformed as required to supply a 100 foot candle (1,076 lumens/sq. meter) minimum light level.

c. Provide lighting in any area being subjected to a visual inspection as required to supply a 100 foot candle (1,076 lumens/sq. meter) minimum light level.

d. Provide lighting in the Decontamination Unit as required to supply a 50 foot candle (538 lumens/sq. meter) minimum light level.

3. Number of Lighting Circuits: Provide sufficient lighting circuits as required by the work. Lighting circuits are to originate at temporary electrical panel.

4. Circuit Protection: Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel.

E. Temporary Heat:


2. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP-gas or fuel-oil heaters with individual space thermostatic control.

   a. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

3. Maintain a minimum temperature of 70 degrees F (21 degrees C) where finished work has been installed.

4. Maintain a minimum temperature of 75 degrees F (24 degrees C) in the shower of the decontamination unit.

5. Maintain a minimum temperature of 65 degrees F (18 degrees C) in the Work Area at all times that work is going on. At all other times and at completion of removal work, but before start of reconstruction work, maintain a minimum temperature of 50 degrees F (10 degrees C).

F. Temporary Cooling:

1. Required Cooling: Provide units sufficient to supply 20,000 BTU/hr (5,862 w) of cooling per 8,000 cubic feet (225 cubic meters) of work area.

G. Temporary Utilities (if required)

1. Temporary Telephones: Provide temporary telephone service throughout the construction period for personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station.

   a. At each telephone, post a list of emergency telephone numbers.

H. Sanitary Facilities:

1. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

   a. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
2. Toilets: Use of the Owner's existing toilet facilities will be permitted, so long as facilities are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to the condition prevalent at the time of initial use.

3. Toilets (required): Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

4. Provide separate facilities for male and female personnel.

5. Wash Facilities (required): Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.

6. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
   a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7.2 to 12.8 deg C) (if available).

7. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
   a. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
   b. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
   c. Hazardous waste, chemicals and other pollutants may not be discharged to the sanitary or storm sewer systems at anytime. Releases to the environment must be immediately reported to the Asbestos Project Manager.

3.4 SUPPORT FACILITIES INSTALLATION (where required)

A. Locate field offices, field laboratories, storage sheds, and other temporary construction and support facilities for easy access.
   1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet (9 m) of building lines. Comply with requirements of NFPA 241.

C. Project Administrator's, Asbestos Project Manager's, Designer's Field Office (where required)

D. Field Laboratory (where required): Provide air conditioned, heated office space near the Work Area solely for the use of the Air Monitoring Specialist, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. (25 sq meters) floor area. Equip field laboratory with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36 inches X 96 inches (1 m X 2.5 m ) plan table, and one 24 inches X 48 inches (0.62 m X 1.25 m ) work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.
1. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.

E. Field Offices (required): Provide insulated, weather tight temporary offices of sufficient size to accommodate required personnel at the Project Site. Keep the office clean and orderly for use for small progress meetings. Furnish utilities and phone, and equip office as required.

F. Storage and Fabrication Sheds (where required): Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.

G. Temporary Enclosures (where required): Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood or similar materials.

3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

H. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 FIRE PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Project Administrator.

B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires.

4. Prohibit smoking within any building, structure, other enclosures or in hazardous fire-exposure areas.

5. Prohibit smoking in hazardous fire-exposure areas.

6. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

E. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Asbestos Project Manager/Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

   a. Replace air filters and clean inside of ductwork and housings.

   b. Replace significantly worn parts and parts subject to unusual operating conditions.

   c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 01503
SECTION 01513 - TEMPORARY PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 RELATED SECTIONS

A. Heating and cooling requirements (if required) are set forth in Section 01503 Temporary Facilities - Asbestos Abatement.

1.3 MONITORING

A. The Contractor shall continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder at each location as identified in the Specifications (e.g. strip chart).

B. The Air Monitoring Specialist shall monitor and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder at each location as identified in the Specifications (e.g. strip chart), at least twice per operating shift and any time there is a question regarding the integrity of the enclosure.

1.4 SUBMITTALS

A. Before Start of Work: Submit design of pressure differential system to the Asbestos Project Manager/Designer for review. Do not begin work until submittal is returned with the Asbestos Project Manager’s/Designer's written response indicates that the submittal is returned for unrestricted use. Include in the submittal at a minimum:

1. Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines

2. Description of projected air flow within Work Area and methods required to provide adequate air flow in all portions of the work area

3. Anticipated pressure differential across Work Area enclosures

4. Description of methods of testing for correct air flow and pressure differentials

5. Manufacturer's product data on the HEPA filtered fan units to be used

6. Location of the machines in the Work Area

7. Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power.

8. Description of work practices to insure that airborne fibers travel away from workers

9. Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of Work Area.

10. Manufacturer's product data on auxiliary generator to be used
11. Manufacturer's product data on auxiliary power switch to be used

12. Schematic diagram of power and auxiliary power supply to HEPA filtered fan units

B. On a weekly basis: Submit printout from pressure differential monitoring equipment to the Asbestos Project Manager, with copies to the Designer/Air Monitoring Specialist. Mark printout with date and start of time for each day. Use printout paper that indicates elapsed time in intervals no greater than hours. Indicate on each days record times of starting and stopping abatement work, type of work in progress, breaks for lunch or other purposes, periods of stop work, and filter changes. Cut printout into segments by day, attach to 8 ½" by 11" [215 X 280 mm] paper. Label with project name, Contractors name and date.

1.5 QUALITY ASSURANCE

A. Monitor pressure differential at Personnel and Equipment Decontamination Units with a differential pressure meter equipped with a continuous recorder. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops below 0.02 inch [0.50 mm] of water.

PART 2 - PRODUCTS

2.1 HEPA FILTERED FAN UNITS

A. General: Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Use units that meet the following requirements.

B. Cabinet: Constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches [0.76 meters] to fit through standard-size doorways. Provide units whose cabinets are:

1. Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance

2. Arranged to provide access to and replacement of all air filters from intake end

3. Mounted on casters or wheels

C. Fans: Rate capacity of fan according to usable air-moving capacity under actual operating conditions.

D. HEPA Filters: Provide units whose final filter is the HEPA type with the filter media (folded into closely pleated panels) completely sealed on all edges with a structurally rigid frame.

1. Provide units with a continuous rubber gasket located between the filter and the filter housing to form a tight seal.

2. Provide ‘new’ HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.

3. Provide filters that are marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

4. ‘New’ Pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. Provide units with the following pre-filters:

   a. First-stage pre-filter: low-efficiency type (e.g., for particles 100 um and larger)
b. Second-stage (or intermediate) filter: medium efficiency (e.g., effective for particles down to 5 um)

c. 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.

E. Instrumentation: Provide units equipped with:

1. Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed

2. A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge 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

3. Elapsed time meter to show the total accumulated hours of operation

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

1. Electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter

2. Automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge

3. Warning lights to indicate normal operation (green), too high a pressure drop across the filters (i.e., filter overloading) (yellow), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge) (red) Audible alarm if unit shuts down due to operation of safety systems

G. Electrical components: Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL). Each unit is to be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be grounded.

H. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. HEPA filtered Fan Units: The following machines are standard 2000 CFM machines used in typical asbestos abatement jobs.

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Aero-Clean 2000&quot;</td>
<td>Aerospace America, Inc.</td>
<td>900 Truman Parkway P.O. Box 189 Bay City, Michigan 48707 (517) 684-2121</td>
</tr>
<tr>
<td>&quot;HEPA-AIRE 1990 and HEPA-AIRE 2000&quot;</td>
<td>Abatement Technologies</td>
<td>3305 Breckinridge Blvd. #118 Deluth, GA 30136 (800) 634-9091 or (404) 925-2761</td>
</tr>
<tr>
<td>Micro-Trap, Alumina II</td>
<td>M-Tec Corp.</td>
<td>1300 W. Steel Rd., Unit #2 Morrisville, PA 19067 (215) 295-8208</td>
</tr>
</tbody>
</table>
2. Large Capacity: The following are large capacity 5000-6000 CFM machines used on large asbestos abatement jobs.

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;HEPA-AIRE 5000&quot; model H5000C</td>
<td>Abatement Technologies</td>
<td>3305 Breckinridge Blvd., #118 Deluth, GA 30136 (800) 634-9091 or (404) 925-2761</td>
</tr>
</tbody>
</table>

3. Hazardous Locations: The following are pneumatically powered machines for use in asbestos abatement jobs in hazardous locations where electric motors are prohibited.

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;HEPA-AIRE PNEUMATIC&quot; model H2000P</td>
<td>Abatement Technologies</td>
<td>3305 Breckinridge Blvd., #118 Deluth, GA 30136 (800) 634-9091 or (404) 925-2761</td>
</tr>
</tbody>
</table>

2.2 AUXILIARY GENERATOR

A. Auxiliary Generator: Be prepared to provide a gasoline-powered self-starting generator with a capacity adequate to power a minimum of 50% of the HEPA filtered fan units in operation at any time during the work, if it is anticipated that there will be a loss of power, or if required.

2.3 AUXILIARY POWER SWITCH

A. Auxiliary Power Switch: Be prepared to provide a switching relay which will automatically start auxiliary generator and switch over power supplied to HEPA filtered fan units to auxiliary generator, if it is anticipated that there will be a loss of power, or if required.

PART 3 - EXECUTION

3.1 PRESSURE DIFFERENTIAL ISOLATION

A. Isolate the Work Area from all adjacent areas or systems of the building with a Pressure Differential that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area.

B. Relative Pressure in Work Area: Continuously maintain the work area at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of:

1. 0.02 inches (0.50 mm) of water.

2. If at any time the pressure differential when measured across any physical or critical barrier does not equal or exceed a static pressure of 0.02 inches (0.50mm) of water, immediately and automatically conform to stop work order as described in Section 01410 “Air Monitoring - Test Laboratory Services”, “3.2 Stop Work”, while maintaining temporary enclosures and pressure differential. Make immediate correction to work area until such a time that the static pressure of 0.02 inches (0.50mm) of water is maintained. Do not recommence abatement work until authorized in writing by Owner/Project Administrator/Asbestos Project Manager/Designer.

3. The Air Monitoring Specialist shall monitor and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder at each location as identified in the Specifications (e.g. strip chart), at least twice per operating shift and any time there is a question regarding the integrity of the enclosure. If at any time the pressure differential when measured across any physical or critical barrier does not equal or exceed a static pressure of 0.02 inches (0.50mm) of water, immediately and automatically conform to stop work order as described in Section 01410 “Air Monitoring - Test Laboratory Services”, “3.2 Stop Work”.
Services”, “3.2 Stop Work”, while maintaining temporary enclosures and pressure differential. Make immediate correction to work area until such a time that the static pressure of 0.02 inches (0.50mm) of water is maintained. Do not recommence abatement work until authorized in writing by Owner/Project Administrator/Asbestos Project Manager/Designer.

C. Accomplish the pressure differential by exhausting a sufficient number of HEPA filtered fan units from the work area. The number of units required will depend on machine characteristics, the seal at barriers, and required air circulation. The number of units will increase with increased make-up air or leaks into the Work Area. Determine the number of units required for pressure isolation by the following procedure:

1. Establish required air circulation in the work area, personnel and equipment decontamination units.
2. Establish isolation by increased pressure in adjacent areas or as part of seals where required.
3. Exhaust a sufficient number of units from the work area to develop the required pressure differential.
4. The required number of units is the number determined above plus one additional unit.
5. Vent HEPA filtered fan units to outside of building unless authorized in writing by the Asbestos Project Manager/Designer.
6. Mount units to exhaust directly or through disposable ductwork.
7. Use only new ductwork except for sheet metal connections and elbows.
8. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit.
9. Use inflatable, disposable plastic ductwork in lengths not greater than 100 feet (30 meters).
10. Use spiral wire-reinforced flex duct in lengths not greater than 50 feet (15 meters).
11. Arrange exhaust as required to inflate duct to a rigidity sufficient to prevent flapping.
12. If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet (2 meters) of spiral wire reinforced flex duct after direction change.

D. Isolation of elevators, stair towers, and return air intakes: Erect seals with an air space at doors to elevators and stair towers. Pressurize this space with HEPA-filtered air so that it is at a pressure greater than either the Work Area elevator shaft or stair tower.

1. Fabricate seal by first sealing door with duct tape and 6 mil polyethylene. Construct a barrier from ½" (13 mm) gypsum board supported by 3-5/8" (92 mm) x 25 gauge metal studs at 16" (410 mm) on centers. Space face of barrier a minimum of 3" (76 mm) from face of door. Seal barrier with 6 mil (0.15 mm) sheet plastic and duct tape.
2. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 inches (0.50 mm) of water higher in static pressure than any adjacent space.
3. Locate HEPA filtered fan unit outside of work area. Fabricate a manifold as required to distribute air to individual spaces to be isolated. Provide relief venting at unit as required to prevent shut down due to low air flow while still maintaining required air pressure.

E. Isolation of chases and enclosed stairs: Pressurize chases and enclosed stairs with HEPA filtered air so that it is at a pressure greater than any adjacent work area.

1. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with...
this space a minimum of 0.02 (0.50 mm) inches of water higher in static pressure than any adjacent work area.

F. Isolation of return air ductwork: Return air duct work which must be kept operating may be located in the Work Area. This duct work is to be isolated from the Work Area by an enclosure forming an annular space around the duct which is positively pressurized with HEPA filtered air.

1. Wrap the duct with 6 mil (0.15 mm) polyethylene. Seal all polyethylene seams with spray glue and duct tape.

2. Enclose wrapped duct with two layers of polyethylene. Fabricate inner layer from 6 mil (0.15 mm) polyethylene with all seams sealed with spray glue and duct tape. Arrange outer layer to support inner layer. Fabricate out of reinforced sheet plastic with seams sealed with spray glue and duct tape and reinforced with staples. Support outer layer with a frame work fabricated from 2” x 4”s (51 mm x 102 mm) at 24” (610 mm) on center. Enclosures less than 2'-6' in diameter may be reinforced with box strapping in lieu of wood framing.

3.2 AUXILIARY GENERATOR

A. Be prepared to provide an auxiliary gasoline-powered generator located outside of the building in a location protected from the weather, if it is anticipated that there will be a loss of power, or if required. Install the generator in a location so that the exhaust from the generator does not flow to any building ventilation or supplied air intakes. Arrange so that if a power failure occurs the generator automatically starts and supplies power to a minimum of 50% of the HEPA filtered fan units in operation.

3.3 AIR CIRCULATION IN THE WORK AREA

A. Air Circulation: For purposes of this section air circulation refers to either the introduction of outside air to the Work Area or the circulation and cleaning of air within the Work Area.

B. Air circulation in the Work Area is a minimum requirement intended to help maintain airborne fiber counts at a level that does not significantly challenge the work area isolation measures. The Contractor may also use this air circulation as part of the engineering controls in the worker protection program.

C. Determining the Air circulation Requirements: The air flow volume (cubic meters per minute) exhausted (removed) from the workplace must exceed the amount of makeup air supplied to the enclosure. Provide a fully operational air circulation system supplying a minimum of the following air circulation rate:

1. 4 air changes per hour

D. Determine Number of Units needed to achieve required air circulation according to the following procedure:

1. Determine the volume in cubic feet of the work area by multiplying floor area by ceiling height. Determine total air circulation requirement in cubic feet per minute (CFM) for the work area by dividing this volume by 60 and multiplying by the air change rate.

2. Air Circulation Required in Cubic Feet of Air per Minute (CFM) = (((Volume of work area cu.ft.)/(60 minutes per hour))*Number of air changes per hour)

3. Divide the air circulation requirement (CFM) above by capacity of HEPA filtered fan unit(s) used. Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics.

4. Number of Units Needed = ((Air circulation Requirement CFM)/(Capacity of Unit with Loaded Filters CFM))

5. Add one (1) additional unit as a backup in case of equipment failure or machine shutdown for filter changing.
3.4 EXHAUST SYSTEM

A. Pressure differential isolation and air circulation and pressure differential in the Work Area are to be accomplished by an exhaust system as described below.

1. Exhaust all units from the Work Area to meet air circulation requirement of this section.

2. Location of HEPA Filtered Fan Units: Locate fan unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the HEPA filtered fan unit(s) at a maximum distance from the worker access opening or other makeup air sources.

3. The end of the unit or its exhaust duct should be placed through an opening in the plastic barrier or wall covering. Seal plastic around the unit or duct with tape.

4. Vent to Outside of Building, unless authorized in writing by the Asbestos Project Manager/Designer.

5. Air Handling Unit Exhaust: The exhaust plume from air handling units should be located away from adjacent personnel and intakes for HVAC systems.

6. Decontamination Units: Arrange Work Area and decontamination units so that the majority of makeup air comes through the Decontamination Units. Use only personnel or equipment Decontamination Unit at any time and seal the other so that make up air passes through unit in use.

7. Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Designer by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Cover with flaps to reseal automatically if the pressure differential system should shut down for any reason. Spray flap and around opening with spray adhesive so that if flap closes meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry.

3.5 RECIRCULATION SYSTEM (not applicable)

3.6 AIR CIRCULATION IN DECONTAMINATION UNITS

A. Pressure Differential Isolation: Continuously maintain the pressure differential required for the work area in the:

1. Personnel Decontamination Unit: across the Shower Room with the Equipment Room at a lower pressure than the Clean room.

2. Equipment Decontamination Unit: Across the Holding Room with the Wash Room at a lower pressure than the Clean Room.

B. Air Circulation: Continuously maintain air circulation in Decontamination Units at same level as required for Work Area.

C. Air Movement: Arrange air circulation through the Personnel Decontamination Unit so that it produces a movement of air from the Clean Room through the Shower Room into the Equipment Room. At each opening, the air flow velocity must be sufficient to provide visible indications of air movement into the work area. The velocity of air flow within the enclosure must be adequate to remove airborne contamination from each worker's breathing zone without disturbing the asbestos-containing material on surfaces.

3.7 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

A. General: Each unit shall be serviced by a dedicated minimum 115V-20A circuit with ground fault circuit interrupter
(GFCI) supplied from temporary power supply installed under requirements of Section 01503 "Temporary Facilities." Do not use existing branch circuits to power fan units.

B. Air Flow Tests: Air flow patterns will be checked before removal operations begin, at least twice per operating shift and any time there is a question regarding the integrity of the enclosure. The primary test for air flow is to trace air currents with smoke tubes or other visual methods. Flow checks are made at each opening and at each doorway to demonstrate that air is being drawn into the enclosure and at each worker's position to show that air is being drawn away from the workers location and toward the HEPA filtration unit.

C. Demonstrate Condition of Equipment for each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of the following:

1. Squareness of HEPA Filter
2. Condition of Seals
3. Proper operation of all lights
4. Proper operation of automatic shut down if exhaust is blocked
5. Proper operation of alarms
6. Proper operation of Magnehelic gauge
7. Proper operation and calibration on pressure monitoring equipment

D. Demonstrate Operation of the pressure differential system to the Asbestos Project Manager/Designer will include, but not be limited to, the following:

1. Plastic barriers and sheeting move lightly in toward Work Area,
2. Curtain of decontamination units move lightly in toward Work Area,
3. There is a noticeable movement of air through the Decontamination Unit.
4. Use smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room.
5. Use smoke tubes to demonstrate a definite motion of air across all areas in which work is to be performed.
6. Use a differential pressure meter or manometer to demonstrate the required pressure differential at every barrier separating the Work Area from the balance of the building, equipment, ductwork or outside.
7. Modify the Pressure Differential System as necessary to demonstrate successfully the above.

E. Use of System During Abatement Operations:

1. Start fan units before beginning work. After abatement work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.

2. Monitoring Pressure Within the Enclosure: After the initial air flow patterns have been checked, the static pressure must be monitored within the enclosure. Monitoring may be made using manometers, pressure gauges, or combinations of these devices. It is required that they be attached to alarms and strip chart recorders

3. Do not shut down air pressure differential system during encapsulating procedures, unless authorized by the Asbestos Project Manager/Designer in writing. Supply sufficient pre-filters to allow frequent changes.
4. 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 fan units are operating again.

5. Corrective Actions: If the manometers or pressure gauges demonstrate a reduction in pressure differential below the required level, work should cease and the reason for the change investigated and appropriate changes made. The air flow patterns should be retested before work begins again.

6. At completion of abatement work, allow fan units to run as specified under section 01711, to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

F. Dismantling the System:

1. When a final inspection and the results of final air tests indicate that the area has been decontaminated, fan units may be removed from the Work Area. Before removal from the Work Area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 6 mil (0.15 mm) polyethylene to prevent environmental contamination from the filters.

END OF SECTION - 01513
SECTION 01526 - TEMPORARY ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

1.2 SUBMITTALS

A. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Strippable Coatings (if requested, and approved for the project): Submit following:
   a. Product description including major components and solvents.
   b. Test report on ASTM E84 test of surface burning characteristics.
   c. Manufacturer’s installation instructions. Indicate portions applicable to the project and selected assemblies where the manufacturer offers alternatives.

2. Spray Cement: Submit following:
   a. Product description including major components and solvents.
   b. Manufacturer’s installation instructions. Indicate portions applicable to the project.
   c. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.
   d. Signs: Submit samples of signs to be used.

B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Approved As Noted.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
   a. Strippable Coating.
   b. Spray Cement.

PART 2 - PRODUCTS

2.1 SHEET PLASTIC

A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

B. Polyethylene Sheet: Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide largest
size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated.

C. Reinforced Polyethylene Sheet: Where plastic sheet constitutes the only barrier between the work area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame-resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.

2.2 STRIPPABLE COATINGS (if requested, and approved for the project)

A. Strippable Coatings: Provide strippable coatings in aerosol cans or premixed for spray application formulated to adhere gently to surfaces and remove cleanly by peeling off at the completion of the work.

   1. Provide only water-based latex materials.

   2. Provide materials manufactured for the specific application required.

B. Wall coating: designed to be easy to remove.

C. Floor coating: designed to provide a tough film which resists spread of water beneath plastic layer.

D. Window coating: recommended by the manufacturer for use on windows. Supply materials that are designed to be stable on glass in sunlight and resist the transmission of ultraviolet radiation.

E. Fire Safety: Provide materials that meet the following requirements:

   1. When wet or while being installed:

      a. Do not create combustible vapors

      b. Have no flash point

      c. Are not noxious

      d. Department of Transportation category of non-flammable.

   2. When dry, material must have a Class A rating as a building material and meet the following requirements when tested in accordance with ASTM E-84:

      a. Flame Spread no greater than 20

      b. Fuel Contributed 0

      c. Smoke Developed no more than 110

F. Deliver materials to the job site in unopened, factory-labeled containers.
G. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spray Poly</td>
<td>Isotek Corporation</td>
<td>P.O. Box 29799 New Orleans, LA 70189-0799 (504)367-9856</td>
</tr>
<tr>
<td>Spray Poly Part no. 3256</td>
<td>H.B. Fuller Co.</td>
<td>3900 Jackson St., NE Minneapolis, MN 55421 (800) 328-4594</td>
</tr>
</tbody>
</table>

2.3 MISCELLANEOUS MATERIALS

A. Duct Tape: Provide duct tape in 2 inch or 3 inch (50 mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

B. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

PART 3 - EXECUTION

3.1 SEQUENCE OF WORK

A. Carry out work of this section sequentially. Complete each of the following activities in accordance with requirements before proceeding to the next.

1. Provide emergency exits and emergency lighting.

2. Control access

3. Provide respiratory and worker protection.


5. Prepare Area.

6. Provide Primary Barriers.

7. Provide Isolation Areas as required.

8. Provide Secondary Barrier.

3.2 GENERAL

A. Work Area: the location where asbestos abatement work occurs. The Work Area is a variable of the extent of work of the Contract. It may be a portion of a room, a single room, or a complex of rooms. A "Work Area" is considered contaminated during the work, and must be isolated from the balance of the building, and decontaminated at the completion of the asbestos control work.

B. Completely isolate the Work Area from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas in accordance with the procedures indicated in Section 01711. Perform all such required cleaning or decontamination at no additional cost to Owner.
C. Construct enclosures to provide an air-tight seal around ducts and openings into existing ventilation systems and around penetrations for electrical conduits, telephone wires, water lines, drain pipes, etc. Construct enclosures to be both airtight and watertight except for those openings designed to provide entry and/or air flow control.

D. Size: Construct enclosure with sufficient volume to encompass all of the working surfaces yet allow unencumbered movement by the worker(s), provide unrestricted air flow past the worker(s), and ensure walking surfaces can be kept free of tripping hazards.

E. Shape: The enclosure may be any shape that optimizes the flow of ventilation air past the worker(s).

F. Structural Integrity: The walls, ceilings and floors must be supported in such a manner that portions of the enclosure will not fall down during normal use.

G. Barrier Supports: Provide frames as necessary to support all unsupported spans of sheeting.

H. Openings: It is not necessary that the structure be airtight; openings may be designed to direct air flow. Such openings are to be located at a distance from active removal operations. They are to be designed to draw air into the enclosure under all anticipated circumstances. In the event that negative pressure is lost, they are to be fitted with either HEPA filters to trap dust or automatic trap doors that prevent dust from escaping the enclosure. Openings for exits are to be controlled by an airlock or a vestibule.

I. Place all tools, scaffolding, staging, etc. necessary for the work in the area to be isolated prior to completion of Work Area isolation.

J. Areas Within an Enclosure: Each enclosure consists of a work area, a decontamination area, and waste storage area. The work area where the asbestos removal operations occur are to be separated from both the waste storage area and the contamination control area by physical curtains, doors, and/or airflow patterns that force any airborne contamination back into the work area.

K. Removing Mobile Objects: Clean movable objects and remove them from the work area before an enclosure is constructed unless moving the objects creates a hazard. Mobile objects will be assumed to be asbestos contaminated and are to be either cleaned with amended water and a HEPA vacuum and then removed from the area or wrapped and then disposed of as asbestos-contaminated waste.

L. Disabling HVAC Systems: The power to the heating, ventilation, and air conditioning systems that service the regulated area must be deactivated or locked out when feasible. All ducts, grills, access ports, windows and vents must be sealed off with two layers of plastic to prevent entrainment of contaminated air.

M. Operating HVAC Systems in the regulated Area: If components of a HVAC system located in the regulated area are connected to a system that will service another zone during the project, the portion of the duct in the regulated area must be sealed and pressurized. Necessary precautions include caulking the duct joints, covering all cracks and openings with two layers of sheeting, and pressurizing the duct throughout the duration of the project by restricting the return air flow. The power to the fan supplying the positive pressure should be locked "on" to prevent pressure loss.

   1. If fan providing positive pressure fails for any reason, immediately stop asbestos removal work, mist the area to reduce airborne fiber levels. Notify the Asbestos Project Manager/Designer. Do not re-start asbestos removal work until authorized by the Asbestos Project Manager/Designer.

N. Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. A lock and tag shall be placed on each breaker used to de-energize circuits and equipment with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who has applied the locks.

O. Lockout power to circuits running through work area wherever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who applied locks. If circuits cannot be shut down for
any reason, label at intervals 4 feet (1.22 m) on center with signs reading, "DANGER live electric circuit. Electrocution hazard." Label circuits in hidden locations but which may be affected by the work in a similar manner.

P. Inspection Windows: Install inspection windows in locations shown on the plans or as directed by the Asbestos Project Manager/Designer. Each inspection window is to have a 12 inch X 12 inch viewing area fabricated from 1/4 inch (6.35 mm) acrylic or polycarbonate sheet. Install window with top at 6 feet-6 inches (1.98 m) above floor height in a manner that provides unobstructed vision from outside to inside of the Work Area. Protect window from damage from scratching, dirt or any coatings used during the work. A sufficient number of windows are to be installed to provide observation of all portions of the Work Area that can be made visible from adjacent areas. Inspection windows that open into uncontrolled area are to be covered with a removable plywood hatch secured by lock and key. Provide keys to Asbestos Project Manager/Designer for all such locks.

3.3 EMERGENCY EXITS

A. Provide emergency exits and emergency lighting as set forth below:

1. Emergency Exits: At each existing exit door from the Work Area provide the following means for emergency exiting:

2. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work Area.

3. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1 inch (25.4 mm) wide. Hang a razor knife on a string beside outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2 inches (50.8 mm) wide.

4. Provide lighted EXIT sign at each exit, where required.

5. Provide battery-operated emergency lighting that switches on automatically in the event of a power failure, where required.

3.4 CONTROL ACCESS

A. Isolate the Work Area to prevent entry by building occupants into Work Area or surrounding controlled areas. Accomplish isolation by the following:

1. Submit to Project Administrator/Asbestos Project Manager/Designer a list of doors and other openings that must be secured to isolate Work Area. Include on list notation if door or opening is in an indicated exit route.

2. After receiving written authorization from the Project Administrator/Asbestos Project Manager/Designer lock all doors into Work Area, or, if doors cannot be locked, chain shut. Notify the Asbestos Project Manager of the list of doors/or other openings which must be chained or otherwise secured shut. Cover any signs that direct emergency exiting, either outside or inside of Work Area, to locked doors. Do not obstruct doors required for emergency exits from Work Area or from building.

3. After receiving written authorization from the Project Administrator/Asbestos Project Manager/Designer, construct partitions or closures across any opening into Work Area. Partitions are to be a minimum of 8 feet (2.44 meters) high.

4. Fabricate partitions from 3-5/8 inch (9.21 cm), 25 gage metal studs with ½ inch (1.27 cm) gypsum board on both faces. Brace at intervals of 4 feet (1.22 m) on center.

5. Modify elevator controls to prevent elevators from stopping at doors in Work Areas. This work is to be performed by a qualified elevator technician.
6. Replace passage sets on doors required for exiting from Work Area with temporary locksets for duration of the project. Use entry type locksets that are key lockable from one side and always operable from inside. Install locksets with key side in stair tower and escape side on Work Area side. Provide one key to Owner and maintain one key in clean room of decontamination unit. After meeting Contractor release criteria set forth in Section 01711 Project Decontamination, reinstall original passage sets and adjust for proper operation.

B. Locked Access: Arrange Work Area so that the only access into Work Area is through lockable doors to personnel and equipment decontamination units.

1. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Do not use deadbolts or padlocks.

2. Replace locksets or passage sets on doors leading to decontamination units with temporary locksets for duration of the project. Remove any deadbolts or padlocks. Use entry type locksets that are key lockable from outside and always unlocked and operable from inside. After meeting Contractor release criteria set forth in Section 01711 Project Decontamination reinstall original locks, passage sets and locksets and adjust for proper operation.

3. Provide one key for each door to Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist, and maintain one key in clean room of decontamination unit (5 total).

C. Visual Barrier: Where the Work Area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that the 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 Project Administrator/Asbestos Project Manager/Designer.

D. Demarcation. Demarcate the regulated area in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area.

E. Access. Limit access to regulated areas to authorized persons as defined by OSHA, and to the Owner, Project Administrator, Asbestos Project Manager, Designer, Air Monitoring Specialist, or a representative authorized by one of these entities.

F. Provide Warning Signs at each locked door leading to Work Area reading as follows:

1. Print text in both English and Spanish

Legend       Notation
KEEP OUT      3 inch (77 mm) Sans Serif Gothic or Block
BEYOND THIS POINT 1 inch (25.4 mm) Sans Serif Gothic or Block
ASBESTOS ABATEMENT WORK 1 inch (25.4 mm) Sans Serif Gothic or Block
IN PROGRESS
BREATHING ASBESTOS DUST MAY BE 1 inch (25.4 mm) Sans Serif Gothic or Block
HAZARDOUS TO YOUR HEALTH 14 Point Gothic

2. Provide Warning Signs at each Visual Barrier leading to Work Area, or as appropriate, reading as follows:

Legend       Notation
KEEP OUT      3 inch (77 mm) Sans Serif Gothic or Block
CONSTRUCTION 1 inch (25.4 mm) Sans Serif Gothic or Block
WORK AREA
PROTECTIVE CLOTHING REQUIRED 1 inch (25.4 mm) Sans Serif Gothic or Block
BEYOND THIS POINT 14 Point Gothic
3. Immediately inside door and outside critical barriers post an approximately 20 inch by 14 inch (508 mm X 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend

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

4. Provide spacing between respective lines at least equal to the height of the respective upper line.

3.5 ALTERNATE METHODS OF ENCLOSURE

A. Alternate methods of containing the Work Area may be submitted to the Asbestos Project Manager/Designer for approval in accordance with procedures set forth in Section 01632 Substitutions. Do not proceed with any such method(s) without prior written approval of the Asbestos Project Manager/Designer.

B. Notification: Before work which involves the removal of more than 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of thermal system insulation or surfacing material is begun using an alternative method which has been the subject of required evaluation and certification. Send a copy of such evaluation and certification to the national office of OSHA, Office of Technical Support, Room N3653, 200 Constitution Avenue, NW, Washington, DC 20210 and to the Asbestos Project Manager/Designer.

C. Use a control method that encloses, contains or isolates the processes or source of airborne asbestos dust, or otherwise captures or redirects such dust before it enters the breathing zone of employees.

D. Certification: Submit a certification from a certified industrial hygienist (CIH) or licensed professional engineer who is also qualified as a project designer, who has evaluated the work area, the projected work practices and the engineering controls and who certifies in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs and any requirements of Section 01562 “Respiratory Protection” under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria of OSHA 1926.1101, and as determined in accordance with the portion of Section 01410 “Air Monitoring - Test Laboratory Services” that describes the Owner’s monitoring of the project.

3.6 RESPIRATORY AND WORKER PROTECTION

A. Before proceeding beyond this point in providing Temporary Enclosures:

1. Provide Worker Protection per Section 01560

2. Provide Respiratory Protection per Section 01562

3. Provide Personnel Decontamination Unit per Section 01563

3.7 CRITICAL BARRIERS

A. Completely Separate the Work Area from other portions of the building, and the outside by closing all openings with sheet plastic barriers at least 6 mil (0.15 mm) in thickness, or by sealing cracks leading out of Work Area with duct tape.

B. Individually seal all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, and other openings into the Work Area with duct tape alone or with polyethylene sheeting at least 6 mil (0.15 mm) in thickness, taped securely in place with duct tape. Maintain seal until all work including Project
Decontamination is completed. Take care in sealing of lighting fixtures to avoid melting or burning of sheeting.

C. Provide Sheet Plastic barriers at least 6 mil (0.15 mm) in thickness as required to seal openings completely from the Work Area into adjacent areas. Seal the perimeter of all sheet plastic barriers with duct tape or spray cement.

D. Mechanically Support sheet plastic independently of duct tape or spray cement seals so that seals do not support the weight of the plastic. Following are acceptable methods of supporting sheet plastic barriers. Alternative support methods may be used if approved in writing by the Asbestos Project Manager/Designer.

1. Plywood squares 6 inch x 6 inch x 3/8 inch (152 mm x 152 mm x 9.53mm) held in place with one 6d smooth masonry nail or electro-galvanized common nail driven through center of the plywood and duct tape on plastic so that plywood clamps plastic to the wall. Locate plywood squares at each end, corner and at maximum 4 feet (1.22 m) on centers.

2. Nylon or polypropylene rope or wire with a maximum unsupported span of 10 feet (3.05 m), minimum 1/4 inch (6.35 mm) in diameter suspended between supports securely fastened on either side of opening at maximum 1 foot (304.8 mm) below ceiling. Tighten rope so that it has 2 inches (50.8 mm) maximum dip. Drape plastic over rope from outside Work Area so that a two foot long flap of plastic extends over rope into Work Area. Staple or wire plastic to itself 1 inch (25.4 mm) below rope at maximum 6 inches (152 mm) on centers to form a sheath over rope. Lift flap and seal to ceiling with duct tape or spray cement. Seal loop at bottom of flap with duct tape. Erect entire assembly so that it hangs vertically without a "shelf" upon which debris could collect.

E. Provide Pressure Differential System per Section 01513.

1. Clean housings and ducts of all overspray materials prior to erection of any Critical Barrier that will restrict access.

3.8 PREPARE AREA

A. Scaffolding: If fixed scaffolding is to be used to provide access HEPA vacuum and wet clean area prior to scaffolding installation.

B. Remove all electrical and mechanical items, such as lighting fixtures, clocks, diffusers, registers, escutcheon plates, etc. which cover any part of the surface to be worked on with the work.

C. Remove all general construction items such as cabinets, casework, door and window trim, moldings, ceilings, trim, etc., which cover the surface of the work as required to prevent interference with the work. Clean, decontaminate and reinstall all such materials, upon completion of all removal work with materials, finishes, and workmanship to match existing installations before start of work, if required.

D. Clean all contaminated furniture, equipment, and or supplies with a HEPA filtered vacuum cleaner or by wet cleaning, as specified in Section 01712 Cleaning and Decontamination Procedures, prior to being moved or covered. All equipment furniture, etc. is to be deemed contaminated unless specifically declared as uncontaminated on the drawings or in writing by the Asbestos Project Manager/Designer.

E. Clean All Surfaces In Work Area with a HEPA filtered vacuum or by wet wiping prior to the installation of primary barrier.

F. Cleaning and Sealing Surfaces: After cleaning with water and a HEPA vacuum, surfaces of stationary objects should be covered with two layers of plastic sheeting. The sheeting should be secured with duct tape or an equivalent method to provide a tight seal around the object.
3.9 PRIMARY BARRIER

A. Protect building and other surfaces in the Work Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below.

1. Strippable Coating: Protect surfaces in the Work Area with a strippable coating. Perform all work in strict compliance with manufacturer's instructions. Carry out work in the following sequence.

   a. Inspect: Before start of coating work inspect all surfaces to be coated. Report on any surfaces that may be damaged by the material or any condition that may interfere with adhesion of the coating to a surface to the Asbestos Project Manager/Designer before application of coating.

   b. Photograph or videotape existing damage to affected surfaces and submit documentation to Project Administrator/Asbestos Project Manager/Designer.

   c. Test Patches: Apply test patches as directed by Asbestos Project Manager/Designer. Apply a small area of strippable coating to a hidden or obscure area of each surface in the Work Area to be coated. Allow to dry and peel off. Demonstrate results to Asbestos Project Manager/Designer prior to coating entire area. Commence coating of area only after receiving written authorization from the Asbestos Project Manager/Designer.

   d. Cover surfaces and equipment in work area from which coating may not strip cleanly.

   e. Cover shelving, clocks, light fixtures and other equipment with one layer of 6 mil (0.15 mm) sheet plastic.

   f. Cover fabric, paper, cork wall coverings or unpainted gypsum board with one layer of 6 mil (0.15 mm) sheet plastic.

   g. Tape over any cracks that are larger than 1/16 inch (1.59 mm).

   h. Tape over electrical outlets, switches, door locks etc.

   i. Cover wood paneling in Work Area with one layer of 6 mil (0.15 mm) sheet plastic.

   j. Cover carpeting with three (3) layers of polyethylene sheeting at least 6 mil (0.15 mm) in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.

   k. Do not use strippable coating as an adhesive to hold sheet plastic in place.

   l. Cover windows with one layer of 6 mil (0.15 mm) plastic.

   m. Protect critical barriers: Install strippable coating so that it will not remove critical barriers during stripping of coating. Cover critical barriers comprised of sheet plastic with a second layer of sheet plastic configured to be removed with strippable coating. Protect critical barriers made from tape with a protective layer of sheet plastic or duct tape.

   n. Coat all surfaces in Work Area with strippable coating in following order.

      1) Walls: Coat seams, corners, and junctions vertically. Coat balance of walls horizontally lapping over vertical sprayed areas by 50%.

      2) Floor: Coat floor lapping wall by 12 inches (305mm). Start at point furthest from entrance to Work Area and work toward door.

      3) Use straight edge to shield ACM from coating during spray application.
o. Apply: to a minimum of the following thickness. Thickness is to be measured when material is wet using a wet film thickness gauge.

<table>
<thead>
<tr>
<th>Surface to be Coated</th>
<th>Minimum Thickness When Wet</th>
<th>Required Coating Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Barriers</td>
<td>Not Applicable</td>
<td>Sheet Plastic Covers</td>
</tr>
<tr>
<td>Glass</td>
<td>10 mil (0.254 mm)</td>
<td>Window Coating</td>
</tr>
<tr>
<td>Plastic Over Glass</td>
<td>2 mil (0.051 mm)</td>
<td>Wall Coating</td>
</tr>
<tr>
<td>Paneling</td>
<td>12 mil (0.305 mm)</td>
<td>Wall Coating</td>
</tr>
<tr>
<td>Glazed Tile</td>
<td>15 mil (0.381 mm)</td>
<td>Wall Coating</td>
</tr>
<tr>
<td>Smoothly Painted Brick</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painted Concrete Block</td>
<td>15 mil (0.381 mm)</td>
<td>Floor Coating</td>
</tr>
<tr>
<td>Floors</td>
<td>15 mil (0.381 mm)</td>
<td>Floor Coating</td>
</tr>
<tr>
<td>Unpainted Brick</td>
<td>20 mil (0.51 mm)</td>
<td>Wall Coating</td>
</tr>
<tr>
<td>Unpainted Concrete Block</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Coat brick and concrete block with a sufficient thickness of coating to obscure color of substrate completely.

2) Do not apply over tacky or chalky adhesives remaining from carpet or other flooring covering removal.

p. Respiratory protection: Require that all workers in Work Area from start of spray operation until all surfaces are dry use as a minimum requirement a half-face negative pressure respirator equipped with combination ammonia and HEPA type filter cartridges or other appropriate respiratory protection as required by OSHA 29 CFR 1926.1101(h)(2) and as specified in Section 01562 Respiratory Protection.

q. Worker protection: Equip all workers in Work Area during spray operation with eye protection, disposable gloves, and disposable paper suits.

r. Ventilation: during spraying operation maintain a minimum of 4 air changes per hour in the entire Work Area. Operate one additional HEPA filtered fan unit per spray operator in area while spraying is taking place.

2. Sealing Elevators: If an elevator shaft is located in the regulated area, it should be either shut down or isolated by sealing with two layers of plastic sheeting. The sheeting should provide enough slack to accommodate the pressure changes in the shaft without breaking the air-tight seal.

3. Sheet Plastic: Protect surfaces in the Work Area that are not part of the work with two (2) layers of plastic sheeting on floor and walls, and one (1) layer of plastic sheeting on ceiling, or as otherwise directed on the Contract Drawings or in writing by the Asbestos Project Manager/Designer. Perform work in the following sequence.

a. All seams in the sheeting should overlap, be staggered and not be located at corners or wall-to-floor joints.

b. Cover Floor of Work Area with 2 individual layers of clear polyethylene sheeting, each at least 6 mil (0.15 mm) in thickness, turned up walls at least 12 inches (305 mm). Form a sharp right angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.

c. Cover Carpeting with three (3) layers of polyethylene sheeting at least 6 mil (0.15 mm) in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.
d. Cover Sheet Plastic in areas where scaffolding is to be used with a single layer of 1/2 inch (13 mm) CDX plywood or 1/4 inch (6.5 mm) tempered hardboard. Wrap edges and corners of each sheet with duct tape. At completion of abatement work wrap plywood or hardboard with 2 layers of 6 mil (0.15 mm) polyethylene and move to next Work Area or dispose of as an asbestos-contaminated waste material in accordance with section 02084 of this specification.

e. Cover all walls in Work Area including "Critical Barrier" sheet plastic barriers with one layer of polyethylene sheeting, at least 4 mil (0.15 mm) in thickness, mechanically supported and sealed with duct tape or spray-glue in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated on the Contract Documents or in writing by the Asbestos Project Manager/Designer.

f. Elevator: Cover walls, floor and ceiling of elevator with 2 layers of 6 mil (0.15 mm) polyethylene. Arrange entry to Work Area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section 01711. Refer to Section 01013 Summary of the Work for additional requirements for protection of elevator.

g. Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4 inch (19.1 mm) exterior grade plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials.

h. Repair of Damaged Polyethylene Sheet: Remove and replace plastic sheeting which has been damaged by removal operations or where seal has failed allowing water to seep between layers. Remove affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry.

3.10 ISOLATION AREA

A. Maintain isolation areas between the Work Area and adjacent building area, where required.

B. Form isolation area by controlling access to the space in the same manner as a Work Area, where required. Physically isolate the space from the Work Area and adjacent areas. Accomplish physical isolation by:

1. Installing critical barriers in unoccupied space.

2. Erecting a second Critical Barrier a minimum of 3 feet (1.0 m) away from Work Area.

3.11 STOP WORK

A. If the Critical or Primary barrier falls or is breached in any manner stop asbestos removal work immediately and comply with “Stop Work” requirements of Section 01410 “Air Monitoring - Test Laboratory Services”. Do not start work until authorized in writing by the Asbestos Project Manager/Designer.

3.12 EXTENSION OF WORK AREA

A. Extension of Work Area: If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, then add affected area to the Work Area, enclose it as required by this Section of the specification and decontaminate it as described in Section 01711 Project Decontamination.

3.13 SECONDARY BARRIER

A. Secondary layer of plastic as a drop cloth to protect the primary layer from debris generated by the asbestos abatement work is specified in the appropriate work sections.
3.14 EXTERIOR ENCLOSURES

A. Construct exterior enclosures as a Critical Barrier as necessary to completely enclose the work. Fabricate from reinforced polyethylene sheeting and 2 inch x 4 inch (51mm X 102 mm) wood framework. Attach to existing building components or brace as necessary for lateral stability. Construct walls to meet all state and local regulations for construction of temporary buildings. Construct to resist a wind of 30 MPH (13.41 m/s), slope ceiling to permit drainage of rain water.

END OF SECTION - 01526
SECTION 01527 - REGULATED AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Worker Protection: is specified in Section 01561 “Worker Protection - Repair and Maintenance”.

B. Respiratory Protection: is specified in Section 01562 “Respiratory Protection”

C. Wet Decontamination Facilities: are described in Section 01563 “Decontamination Units.”

1.3 DESCRIPTION OF WORK

A. Work of this section consists of preparing a Regulated Area for work of the following specification sections only. Do not use procedures set forth in this section in connection with any other work.

1. Section 01046 Cutting & Patching Asbestos Containing Materials

2. Section 01528 Entry Into Controlled Areas

3. Section 01529 Mini Enclosures and Glovebags

4. Section 01712 Cleaning and Decontamination Procedures

5. Section 02083 Disturbance of ACM During O&M Work

6. Section 09251 Gypsum Drywall - Asbestos Enclosures

7. Section 15254 Repair of Insulation and Lagging

1.4 SUBMITTALS

A. Before the Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Begin no work until these submittals are returned with Asbestos Project Manager’s/Designer's written response indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. HEPA Filtered Vacuum Cleaners: Submit product data.

2. Signs: Submit samples of each type of sign to be used.

3. Warning Tape: Submit samples.
PART 2 - EQUIPMENT

2.1 PRODUCTS

A. HEPA Filter Vacuum Cleaners:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEPA filtered Vacuums</td>
<td>Nilfisk of America, Inc.</td>
<td>225 Great Valley Parkway Malvern, PA  19355 (800) 645-3475</td>
</tr>
<tr>
<td>Minuteman HEPA Vacuums</td>
<td>Minuteman International</td>
<td>111 South Route 53 Addison, IL  60101 (708) 627-6900</td>
</tr>
<tr>
<td>HEPA Filtered Vacuums</td>
<td>Pullman-Holt (White) Corp.</td>
<td>PO Box 16647 Tampa, FL  33617 (813) 645-3475</td>
</tr>
</tbody>
</table>

B. Plastic Sheet:

1. Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

PART 3 - EXECUTION

3.1 SECURING WORK AREA

A. Secure work area from access by occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area, by scheduling work for periods of time that the building is unoccupied, or by constructing temporary wood stud and plywood barriers.

3.2 DEMARCATION OF REGULATED AREA

A. Demarcation. Demarcate the Regulated Area with a sheet plastic drop cloth, signs and barrier tape. Configure the regulated area in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos.

1. Drop Cloth: Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

2. Signs: Post warning signs that carry the following legends in both English and Spanish:

   a. First Sign: Provide warning signs at each locked door leading to the controlled area reading as follows:

      Legend

      KEEP OUT        Notation
      3 inch (76.2 mm) Block
b. Second Sign: Immediately inside the locked door and outside the controlled area post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend:

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

3. Barrier Tape: Where the controlled area is in a large area such as on part of a boiler room or open office area, delineate area with 3 inch (76.2 mm) wide polyethylene ribbon with the printed warning, "CAUTION ASBESTOS REMOVAL". Install this ribbon at between 3 and 4 feet (0.91 and 1.22 meters) above the floor.

3.3 SCHEDULING

A. Work may be carried out during normal working hours in those areas which can be completely secured by lockable doors from access by building occupants and staff, and which have HVAC equipment that can be shut down and locked off. Otherwise, work is to be carried out after building occupants and cleaning staff have left.

3.4 GENERAL PROCEDURES

A. The following precautions and procedures have application to work of this section. Workers must exercise caution to avoid release of asbestos fibers into the air:

1. Setup and management of the controlled area is to be under the supervision of a OSHA Competent Person as described in Section 01043 Project Coordination - Asbestos Abatement.

2. Before start of work comply with requirement for worker protection in section 01561, and respiratory protection in section 01562.

3. Do not allow eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in the Regulated Area.

4. Shut down any air handling equipment bringing air into or out of the Regulated Area.

5. Clean any existing dust or debris from the floor and walls, and other surface in the immediate location of the work prior to commencing work by damp-mopping or by use of a High Efficiency Particulate Air (HEPA) filtered vacuum.

6. Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

7. Seal all openings, supply and exhaust vents, and convectors within ten (10) feet (3.05 meters) of the Work Area with 6 mil (0.15 mm) polyethylene sheeting secured and completely sealed with duct tape.

8. Perform the work per the appropriate specification section while on plastic drop sheet.

9. Immediately remove any asbestos-containing debris which collects on the drop sheet either by using a HEPA vacuum or by spraying with amended water or removal encapsulant, collecting with wet paper towels, placing in a disposal bag while still wet, and cleaning surface of plastic sheet with wet paper towels.
10. Complete the following at completion of work in an area before stepping off drop sheet

   a. While standing on plastic sheet thoroughly HEPA vacuum ladder and any tools used and pass to worker standing off sheet.

   b. Worker standing off the sheet HEPA vacuum thoroughly the worker standing on the sheet.

   c. Worker on the sheet thoroughly HEPA vacuum all surfaces of the plastic sheet, bags, and any other items on the sheet including the worker’s feet.

11. If moving to the next Work Area in the same secured area: Worker on the drop sheet is to don clean foot covers, placing each foot, in turn, off the sheet as the foot cover is put on. Remove clean foot covers at the next Work Area while standing on the sheet. Dispose of the used foot covers along with the plastic sheet at completion of work in that area. Do not reuse foot covers to move off the sheet.

12. If work day is complete or if next Work Area is in another secured area: all workers remove paper suits turning them inside out while doing so. The person on the sheet steps with each foot off the sheet as the foot covers are removed.

13. Fold sheet and all its contents toward the center.

14. Place the sheet in a properly labeled disposal bag.

15. Neck down the bag and collapse it with the HEPA vacuum.

16. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.

17. Clean all surfaces of the Work Area by use of a HEPA filter vacuum until no visible residue remains.

B. At completion of work require all workers to complete wet decontamination procedures in accordance with Section 01560 Worker Protection - Asbestos-Abatement.

END OF SECTION - 01527
SECTION 01528 - ENTRY INTO CONTROLLED AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division -1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. The provisions of this section apply when entry is required into an area where such entry could cause contamination of portions of the building and/or where respiratory or other worker protection measures are required.

B. Unless authorized in writing by the Asbestos Project Manager/Designer, the provisions of this section apply to only the following situations:

1. Entry into the space above a suspended ceiling where there is exposed friable asbestos-containing fire proofing, thermal system insulation, etc., visible asbestos-containing debris, or other friable asbestos-containing surfacing or thermal system insulation materials when the ceiling tiles in an area are to be removed.

2. Entry through sealed access (access door, hatchway, locked door) into an area with friable asbestos-containing surfacing or thermal system insulation materials or visible debris.

C. Worker Protection: Use procedures of this section only where a negative exposure assessment has been made for these procedures. Historic airborne fiber data demonstrate that personal airborne fiber counts in the breathing zone of those performing the work can be continuously maintained at less than 0.1 fibers per cubic centimeter can be used as a part of this assessment.

D. Area Protection: Use procedures of this section only where historic airborne fiber data demonstrate that area samples in the work area can be continuously maintained at less than 0.01 fibers per cubic centimeter.

1.3 SUBMITTALS

A. Before the Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Begin no work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. Historic Airborne Fiber Data: Submit airborne asbestos fiber count data from an independent air monitoring firm to demonstrate:

   a. The ability to perform work of this section while maintaining an airborne fiber count below 0.1 fibers per cubic centimeter in the breathing zone of the individual performing the work.

   b. The ability to perform work of this section while maintaining an airborne fiber count below 0.01 fibers per cubic centimeter in the work area.

2. Include the following data for each procedure required by the work:

   a. Date of measurements

   b. Operations monitored

   c. Sampling and analytical methods used and evidence of their accuracy
d. Number, duration, and results of samples taken

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 REGULATED AREA

A. Prior to beginning work in this area establish a regulated area as described in Section 01527 Regulated Areas.

3.2 ACCESS THROUGH SUSPENDED CEILINGS

A. Remove acoustical panels from ceiling suspension system using the following sequence:

1. Follow worker protection procedures including disposable coveralls and respirators required by Section 01560, and Section 01562.

2. Follow local area protection procedures of Section 01528. Spread layer of 6 mil (0.15 mm) polyethylene sheet on floor 6 feet (1.83 meters) further in extent than the size of the ceiling opening to be made.

3. HEPA vacuum around edges of all panels to be removed.

4. While holding nozzle of HEPA vacuum in vicinity slowly lift one edge of center ceiling panel. Immediately HEPA vacuum space at lifted edge. Lift entire panel straight up and HEPA vacuum all four sides.

5. Place panel on top of adjacent ceiling.

6. Place intake duct to HEPA Filtered Fan Unit per Section 01513 in space above ceiling and fasten in place. Operate machine continuously while ceiling is open.

7. Note that the operation of the HEPA vacuum is intended to clean the air in the location of the work. As such the nozzle should be kept above the ceiling as much as possible and the canister on the floor.

8. Climb to a position which permits access to the top of the ceiling adjacent to the removed panel.

9. Working in the space above the ceiling, HEPA vacuum both sides of the ceiling panel first removed and hand it down into a 6 mil (0.15 mm) polyethylene bag for storage.

10. Remove loose material hanging from the friable asbestos-containing material with the suction from the HEPA vacuum.

11. Pass wand of operating HEPA vacuum through air between asbestos-containing material and top of ceiling.

12. HEPA vacuum the tops of all ceiling panels which are in reach.

13. Carefully HEPA vacuum the crack between the suspension system and ceiling panels from the top for all ceiling panels within reach.

14. Remove ceiling panels as required while constantly HEPA vacuuming all four edges of panel and suspension system.

15. Working in space above ceiling HEPA vacuum both sides on each panel removed and hand each down into a 6 mil (0.15 mm) polyethylene bag which is labeled as set forth is Section 02084.

16. Maintain HEPA vacuum in operation with nozzle above ceiling and exhaust at floor for the entire time that the
ceiling is open and work is being done above the ceiling.

17. When above-ceiling work is complete replace ceiling panels.

18. HEPA vacuum worker's head, arm, and shoulders before climbing down from ceiling.

19. HEPA vacuum ladder while climbing down.

20. While standing on plastic sheet thoroughly HEPA vacuum ladder and pass it to person standing off sheet.

### 3.3 ENTRY INTO CONTROLLED AREAS

A. Use same procedure as above except that ceiling tiles do not need to be removed.

B. If access is through a wall hatch or door, duct tape floor sheet to wall or threshold.

C. If access is into large area such as crawl tunnel, comply with worker protection requirements but use HEPA vacuum only for work procedures in the area.

### 3.4 PERSONNEL DECONTAMINATION

A. At the end of all work change to a clean disposable coverall and leaving respirator in place proceed to a remote shower and decontaminate as required by Section 01560 Worker Protection - Asbestos Abatement.

or

B. Complete dry decontamination procedures set forth in Section 01561 “Worker Protection - Repair & Maintenance”, as applicable.

END OF SECTION - 01528
SECTION 01529 - MINI ENCLOSURES AND GLOVEBAGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF THE WORK

A. Work of this section consists of preparing a Regulated Area for work for which there is no negative exposure assessment or that involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material. This is Class III OSHA work, and is limited in size to operations that generate small amounts of ACM, i.e., no more than can be contained in one standard (60 inch x 60 inch) glove or waste bag filled no more than 1/3 to 1/2 full.

1.3 SUBMITTALS

A. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

2. Removal Encapsulant: Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.

3. NESHAP Certification: Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet ACM to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

4. Material Safety Data Sheet: Submit Material Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communications Standard (29 CFR 1910.1200) for each surfactant and encapsulating material proposed for used. Submit in the same manner as product data. Submittal is for information purposes only. Submittal will not be reviewed by Asbestos Project Manager/Designer.

5. Spray Cement: Submit following:

   a. Product description including major components and solvents

   b. Manufacturer's installation instructions. Indicate portions applicable to the project.

6. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.

7. Glovebags: Submit product data.

8. HEPA Vacuums: Submit product data

9. Signs: Submit samples of signs to be used.

10. Mini-enclosure: Provide shop drawing of mini-enclosure arrangement to used.
B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Approved As Noted.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
   a. Surfactants.
   b. Spray Cement.
   c. Encapsulants.

PART 2 - PRODUCTS

2.1 GLOVE BAGS

A. Glovebags: Provide minimum 6 mil (0.15 mm) thick polyethylene, polyvinyl chloride or equivalent plastic sack, with a seamless bottom, and two sealed inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for wand or HEPA vacuum wand. Glove bag is to be not more than 60 inches by 60 inches in size.

B. Negative Pressure Glove Bag Systems: Provide glovebags as specified above that are equipped for attachment to a HEPA vacuum, and that has a device to prevent the bag from collapsing during use.

2.2 SHEET PLASTIC

A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

B. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, and required.

C. Reinforced Polyethylene Sheet: Where plastic sheet constitutes the only barrier between the Work Area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, and required.

2.3 MISCELLANEOUS MATERIALS

A. Duct Tape: Provide duct tape in 2 inch or 3 inch (51 mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

B. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

C. Wetting Materials: For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:
   1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a solution of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.
2. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a solution of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water, where required.

D. Encapsulants are specified in Section 09805.

E. Garden Sprayer: Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure.

PART 3 - EXECUTION

3.1 GENERAL

A. Before Start of Work: Complete the following before start of work of this section:

1. 01527 Regulated Areas

3.2 WORKER PROTECTION

A. Before beginning work with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

3.3 GLOVE BAGS AND BOXES

A. Complete requirements of the following:

1. 01562 Respiratory Protection

2. 01561 Worker Protection - Repair and Maintenance

B. Glovebag: Remove ACM inside a glove bag according to the following procedure:

1. Use at least two persons to perform glovebag removals operations.

2. Use each glovebag only once

3. Do not move glovebag once it has been mounted in place.

4. Do not use glovebag on surface whose temperature exceeds 150°F (65.6°C).

5. Check materials adjacent to locations where glovebag will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6 mil (0.15 mm) plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove bag will be attached.

6. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter) and allow additional so that the top of the glove bag will be clear of the pipe after installation.

7. Place necessary tools into pouch located inside glove bag. This will usually include: bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-wetted cloth.

8. Place a strip of duct tape along both edges of the open top slit of glove bag for reinforcement.
9. Place the glove bag around section of pipe to be worked on and staple top together through reinforcing duct tape. Staple down sides approximately 6 inches so that top of the glove bag is clear of pipe. Seal top and sides with duct tape. Next, duct tape the ends of glove bag to pipe itself, where previously covered with plastic or duct tape.

10. Install glovebag so that it completely covers the circumference of pipe or other structures where the work is to be done.

11. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and re-test.

12. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage.

13. Thoroughly wet material to be worked on with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate.

14. One person places their hands into the long-sleeved gloves while the second person directs garden sprayer at the work.

15. Use bone saw, if required, to cut insulation at each end of the section to be removed. A bone saw is a serrated heavy gauge wire with ring-type handles at each end. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum.

16. Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping.

17. Rinse all tools with water inside the bag and place back into pouch.

18. Using scrub brush, rags and water, scrub and wipe down the exposed pipe.

19. Thoroughly wash and wipe down interior of glovebag to a point below the location where the bag will be twisted and taped to seal waste in bottom of bag.

20. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.

21. Remove the vacuum nozzle, twist water sleeve closed and seal with duct tape.

22. From outside the bag, pull the tool pouch away from the bag. Place duct tape over twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. Contaminated tools may then be placed directly into next glove bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste.

23. With removed insulation in the bottom of the bag, twist the bag several times and tape it to seal material in the bottom during removal of the glove bag from the pipe.

24. Slip a 6 mil (0.15 mm) disposal bag over the glove bag (still attached to the pipe). Remove tape or cut bag and open the top of the glove bag and fold it down into disposal bag.

25. Clean all surfaces in the Work Area using disposable cloths wetted with water with surfactant or removal encapsulant added. When these surfaces have dried, clean with a HEPA filtered vacuum. Material adhered to a surface with removal encapsulant may require the application of additional removal encapsulant to facilitate cleaning.

26. Seal exposed ends of remaining pipe insulation in accordance with Section 15254.
27. Remove disposable suits and place these into bag with waste.

28. Collapse the bag with a HEPA vacuum twist top of bag, seal with at least 3 wraps of duct tape, bend over and seal again with at least 3 wraps of duct tape.

C. Negative Pressure Glove Bag Systems. Remove ACM inside a negative pressure glove bag system according to the following procedure:

1. Use at least two persons to perform glovebag removals operations.

2. Use each glovebag only once

3. Do not move glovebag once it has been mounted in place.

4. Do not use glovebag on surface whose temperature exceeds 150°F (65.6°C).

5. Check materials adjacent to location where glovebag will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6 mil (0.15 mm) plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove bag will be attached.

6. Install glovebag so that it completely covers the circumference of pipe or other structure where the work is to be done.

7. Install device used to prevent collapse of bag by negative pressure.

8. Smoke test Glovebags for leaks and seal any leaks prior to use.

9. Run HEPA vacuum cleaner or other device used to create a negative pressure in the bag continuously during the operation.

10. Prior to disposal, collapse glovebag by removing air within it using a HEPA vacuum.

11. Where system uses attached waste bag, connect waste bag to collection bag using hose or other material which will withstand pressure of ACM waste and water without losing its integrity.

   a. Use sliding valve or other device to separate waste bag from hose to ensure no exposure when waste bag is disconnected.

12. Where a separate waste bag is used along with a collection bag and waste bag is discarded after one use, the collection bag may be reused if rinsed clean with amended water before reuse.

3.4 MINI-ENCLOSURES

A. A mini enclosure is a small walk-in enclosure which accommodates no more than two persons. Provide a fabricated or job made enclosure constructed of 6 mil (0.15 mm) plastic or equivalent. Place the enclosure under negative pressure by means of a HEPA filtered vacuum or similar HEPA filtered ventilation unit.

B. Provide a remote personnel decontamination unit meeting requirements of Section 01563 “Decontamination Units” for worker decontamination.

C. Sequence of Work: Before beginning work of this sub-section complete the following:

   1. Isolation of area in accordance with Section 01527 “Regulated Area.”
2. Construction of a personnel decontamination unit in accordance with Section 01563 Decontamination Units.

D. Work Room: Construct Work Room in the same manner as a Primary Barrier fabricated from 6 mil (0.15 mm) sheet plastic. Arrange so that Primary Barrier provides both a Critical and Primary Barrier. Line walls and floor of Work Room with a continuous Secondary Barrier.

E. Change Room: Provide an approximately 3 feet by 3 feet (0.9 m x 0.9 m) Change Room, with additional space as required for storage, attached to each Work Room. Fabricate Change Room from 6 mil (0.15 mm) sheet plastic in the same manner as a Primary Barrier. Locate so that access to Work Area is through Change Room.

F. Step Off Area: Cover floor in front of entry to Change Room with one layer of 6 mil (0.15 mm) sheet plastic. Securely anchor sheet plastic to prevent slipping.

G. Flapped Door Construction: Provide flapped door as entry to Change Room and entry from Change Room to Work Room. Fabricate each flapped door from overlapping contacting layers of sheet plastic. Fasten each layer on the top and one side. Each flap is to be 3 inches (76 mm) longer than door opening. Reinforce free side and bottom of each sheet with duct tape. Alternate sides that are fastened on each layer. Form arrows pointing to entry side from duct tape on inside and outside of door.

H. Signage: At entry to Change Room post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

1. Legend

   DANGER

   ASBESTOS

   CANCER AND LUNG DISEASE HAZARD

   AUTHORIZED PERSONNEL ONLY

   RESPIRATORS AND PROTECTIVE CLOTHING

   ARE REQUIRED IN THIS AREA

2. Provide spacing between respective lines at least equal to the height of the respective upper line.

I. Complete requirements of the following:

1. Section 01560 Worker Protection - Asbestos Abatement

2. Section 01562 Respiratory Protection

3. Section 01513 Temporary Pressure Differential & Air Circulation System: HEPA filtered vacuum cleaner with vacuum in space outside Mini-Enclosure may be used for compliance with this section. Provide a minimum of 8 air changes per hour in the Work Room.

J. Testing: The mini-enclosure shall be inspected for leaks and smoke tested to detect breaches, and breaches sealed.

K. Entry to Work Room: Require that any time a worker enter the Work Room the following procedure is followed.

1. Outside of Change Room remove all street clothes and don clean coveralls and respirator. A swim suit or second disposable suit may be worn beneath outer coveralls.

2. Enter Change Room be sure that entry is completely closed.
3. Enter Work Room be sure that entry is completely closed.

L. Work Procedures: Arrange work area within the mini-enclosure so that during use air movement is directed away from the worker’s breathing zone.

M. Worker Decontamination: Require that any time a worker leaves the mini-Enclosure the following procedure be followed.

1. Maintain a bucket of clean potable water in the Work Area. Do not amend with a wetting agent.

2. Remove contaminated suit inside the Work Area. Leave respirator in place.

3. Wash hands, face and surface of respirator with water and wet paper towels. Use caution to avoid breaking seal between respirator face-piece and face.

4. Proceed with respirator in place to Change Room.

5. Be sure that entry to Work Area is completely closed.

6. In Change Room don clean disposable suit leaving respirator in place.

7. Exit change room be sure that entry to Change Room is completely closed. Proceed to next Mini-Enclosure, or a remote shower.

8. At end of work day decontaminate fully in accordance with procedures in appropriate specification section describing Worker Protection.

N. Material Decontamination: Require that the following procedure be used in removing equipment and bagged debris from the Work Room.

1. Three workers are required. One in the Work Room, one in the Change Room, and one on Step Off Area.

2. Equipment and bagged debris are to be removed from the Mini-Enclosure in separate operations.

3. Worker in Work Room cleans equipment and bagged debris and hands one piece of equipment or one bag of debris at a time to worker in Change Room.

4. Worker in Change Room wet cleans each piece of equipment or bag and stores them in Change Room. Equipment is sealed completely in 6 mil (0.15 mm) sheet plastic in the Change Room.

5. When the amount of stored material in the Change Room becomes large enough that the worker cannot clean incoming material without contacting previously cleaned material the door between the Work and Clean Room is closed.

6. The worker in the Changing Room then passes each item into a new disposal bag held open in the doorway between the Changing Room and Step Off Area by the worker on the Step Off Area. The Worker on the Step Off Area places each bag in a sealed cart for transport to the load out area. No bags are to be stored outside of the Mini-Enclosure.

7. All bags are to be transported through the building in clean sealed containers that have never been in a asbestos Work Area, Mini-Enclosure or decontamination unit.

O. Mini-Enclosure Decontamination: At completion of all work decontaminate the Work and Changing Rooms as set forth in Section 01711 Project Decontamination for non-friable materials.
END OF SECTION - 01529
SECTION 01560 - WORKER PROTECTION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Respiratory Protection: is specified in Section 01562.

1.4 WORKER TRAINING

A. AHERA Accreditation: All workers are to be accredited as Abatement Workers as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

B. State and Local License: All workers are to be trained, certified and accredited as required by state or local code or regulation, including but not limited to AQCC Regulation 8, Part B.

C. Training - Class I: Train in accordance with 29 CFR 1926.1101. Provide training for all workers who will perform Class I operations that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

D. Training - Class II Intact (Non-Friable): Provide training for workers who will be performing Class II work involving only the removal and/or disturbance of one generic category of building material, such as roofing materials, flooring materials, siding materials or cement asbestos panels; which includes as a minimum the specific work practices and engineering controls which specifically relate to that category. Provide a course that includes "hands-on" training and takes at least 8 hours. Provide training that includes the elements set forth in 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63.

E. Training - Class II Non-Intact (Friable): Provide training for workers who will be performing Class II work on materials that are friable, or will become friable during the work that is the equivalent in curriculum, training method and length to the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

1.5 MEDICAL SURVEILLANCE

A. Provide a medical surveillance program for all employees who are:

1. engaged in Class I, II and III work for a combined total of 30 or more days per year or,

   a. For the purposes of this paragraph, any day in which a worker engages in Class II or Class III work or a combination thereof for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in the OSHA standard (29 CFR 1926.1101) is not counted.

2. are exposed at or above the permissible exposure limit or excursion limit or,
3. before an employee can be assigned to work requiring use of a respirator.

B. Provide a medical surveillance program and physician’s opinion before a respirator is assigned as required by 29 CFR 1910.139 and 29 CFR 1926.103(e)(10).

C. Provide medical examination that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individual’s ability to work in environments capable of producing heat stress in the worker.

1.6 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. AHERA Accreditation: Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

2. State and Local License: Submit evidence that all workers have been trained, certified and accredited as required by state or local code or regulation, including but not limited to AQCC Regulation 8, Part B.

3. Certificate Worker Acknowledgment: Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.

4. Training Program: Submit a course outline of the worker training course. Include date and time course was given, name and title of teacher.

5. Report from Medical Examination: conducted within last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the Work Area. Submit, at a minimum, for each worker the following:

a. Name and Certification Number

b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure (29 CFR 1926.1101(m)).

f. A legible typed version of the physician’s name, the physician’s signature, and date of examination.

6. Notarized Certifications: Submit certification signed by an officer of the abatement contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.
PART 2 - EQUIPMENT

2.1 PROTECTIVE CLOTHING

A. General. Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of TSI or surfacing ACM or PACM.

B. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.

1. Coveralls will be of a type which is designed approved for Asbestos Abatement, and will be of a quality which will not readily rip or tear during simple activity.

2. Coveralls will be of a type The on-site Supervisor shall periodically examine work coveralls worn by employees for damage (rips and tears) which may occur during performance of the work. When damage is discovered while an employee is working in a negative pressure enclosure, the damaged area(s) will be immediately repaired, of the coveralls will be immediately replaced.

3. The on-site Supervisor shall periodically examine work coveralls worn by employees for damage (rips and tears) which may occur during performance of the work. When damage is discovered while an employee is working in a negative pressure enclosure, the damaged area(s) will be immediately repaired, of the coveralls will be immediately replaced.

C. Additional Protective Clothing: Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.

D. Cold Weather Gear: Provide each worker with an insulated jacket, pants, gloves, and hat. Require that cold weather gear be removed in Equipment Room of Personnel Decontamination Unit. Dispose of cold weather gear as asbestos waste at completion of all work.

E. Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protectives, for all workers. Provide boots at no cost to workers. Paint uppers of all boots red with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with ACM. Dispose of boots as asbestos-contaminated waste at the end of the work.

F. Hard Hats: Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean, decontaminate and bag hats before removing them from Work Area at the end of the work.

G. Goggles: Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.

H. Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.
2.2 ADDITIONAL PROTECTIVE EQUIPMENT

A. Disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Owner, Project Administrator, Asbestos Project Manager, Designer, Air Monitoring Specialist, and other authorized representatives who may inspect the job site. Provide an adequate supply to facilitate a normal work day, with a minimum of six (6) complete coveralls per day.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. The following procedures are minimums to be adhered to regardless of fiber count in the Work Area.

B. Each time Work Area is entered remove all street clothes in the Changing Room of the Personnel Decontamination Unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.

3.2 DECONTAMINATION PROCEDURES

A. Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:

1. Type C Supplied Air or Powered Air-Purifying Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area:

   a. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.

   b. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum:

      c. Thoroughly wet body including hair and face. If using a Powered Air-Purifying Respirator (PAPR) hold blower unit above head to keep canisters dry.

      d. With respirator still in place thoroughly wash body, hair, respirator face piece, and all parts of the respirator except the blower unit and battery pack on a PAPR. Pay particular attention to seal between face and respirator and under straps.

      e. Take a deep breath, hold it and/or exhale slowly, completely wet hair, face, and respirator. While still holding breath, remove respirator and hold it away from face before starting to breath.

      f. Carefully wash facepiece of respirator inside and out.

2. If using PAPR: shut down in the following sequence, first cap inlets to filter cartridges, then turn off blower unit (this sequence will help keep debris which has collected on the inlet side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.

   a. Shower completely with soap and water.

   b. Rinse thoroughly.
c. Rinse shower room walls and floor prior to exit.

d. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

3. Air Purifying-Negative Pressure Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area with a half or full face cartridge type respirator:

a. When exiting area, remove disposable coveralls, disposable headcovers, and disposable footwear covers or boots in the Equipment Room.

b. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator and filters to avoid asbestos fibers while showering. The following procedure is required as a minimum:

c. Thoroughly wet body from neck down.

d. Wet hair as thoroughly as possible without wetting the respirator filter if using an air purifying type respirator.

e. Take a deep breath, hold it and/or exhale slowly, complete wetting of hair, thoroughly wetting face, respirator and filter (air purifying respirator). While still holding breath, remove respirator and hold it away from face before starting to breath.

f. Dispose of wet filters from air purifying respirator.

g. Carefully wash facepiece of respirator inside and out.

h. Shower completely with soap and water.

i. Rinse thoroughly.

j. Rinse shower room walls and floor prior to exit.

k. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

B. Within Work Area:

1. Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. To eat, chew, drink or smoke, workers shall follow the procedure described above, then dress in street clothes before entering the non-Work Areas of the building.

3.3 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

A. Following this section is a Certificate of Worker's Acknowledgement for Class I, II Work. After each worker has been included in the Contractor's Respiratory Protection Program, completed the training program and medical examination, secure a fully executed copy of this form.

END OF SECTION - 01560
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT
CLASS I, II WORK

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WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that employees of the Contractor be supplied with the proper respirator and be trained in its use, trained in safe work practices and in the use of the equipment found on the job, and receive a medical examination. These things are to be at no cost to the employee.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. This training must have been the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

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SECTION 01561 - WORKER PROTECTION-REPAIR AND MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. This section describes the equipment and procedures for protecting workers against asbestos contamination and other workplace hazards, except for respiratory protection, where asbestos fibers are collected at the point of generation so that contamination of workers is unlikely.

B. This section applies only where the airborne fiber counts as measured in accordance with 29 CFR 1926.1101 are below 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) and the excursion limit of 1.0 f/cc.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Respiratory Protection: is specified in Section 01562.

B. Worker Protection: for asbestos abatement work where workers will be in areas that contain or may contain airborne fiber counts measured in accordance with 29 CFR 1926 above 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) or above 1.0 fibers per cubic centimeter for a 30 minute Excursion Limit (EL) is specified in Section 01560.

1.4 DESCRIPTION OF REQUIREMENTS

A. Worker protection requirements of this section are appropriate for asbestos maintenance and repair work. This differs from asbestos abatement in that the work is not performed in an asbestos-fiber-contaminated area. As such, the worker decontamination procedures are carried out with a HEPA-filtered vacuum cleaner rather than a shower facility.

B. Requirements of this section apply only when work is being performed in accordance with the limitations and requirements of the following sections of this specification:

1. 01527 Regulated Areas

2. 01528 Entry Into Controlled Areas

3. 01529 Mini Enclosures and Glovebags for glovebag work.

4. 01712 Cleaning and Decontamination Procedures

5. 02083 Disturbance of ACM During O&M Work

6. 15254 Repair of Insulation and Lagging

C. When the work being performed is governed under any other specification section or required by any of the above sections or during work in a mini-enclosure the requirements of Section 01560 Worker Protection - Asbestos Abatement apply.
1.5 WORKER TRAINING

A. AHERA Accreditation: All workers are to be accredited as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

B. State and Local License: All workers are to be trained, certified, accredited, or licensed as required by state or local code or regulation, including but not limited to AQCC Regulation 8, Part B.

C. Training: Provide training for all workers that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C), for the appropriate level of training as Class I, II, or III levels as specified in the OSHA standard (29 CFR 1926.1101).

1.6 MEDICAL EXAMINATIONS

A. Provide a medical surveillance program for all employees who are engaged in Class I, II and III work for a combined total of 30 or more days per year or are exposed at or above the permissible exposure limit or excursion limit. A medical exam also is required before an employee can be assigned to work requiring the use of a respirator.

   1. For the purposes of this paragraph, any day in which a worker engages in Class II or Class III work or a combination thereof for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in the OSHA standard (29 CFR 1926.1101) is not counted.

B. Provide a medical surveillance program and physician’s opinion before a respirator is assigned as required by 29 CFR 1910.139 and 29 CFR 1926.103(e)(10).

C. Provide medical examination that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individual’s ability to work in environments capable of producing heat stress in the worker.

1.7 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

   1. AHERA Accreditation: Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

   2. State and Local License: Submit evidence that all workers have been trained, certified, accredited or licensed as required by state or local code or regulation, including but not limited to AQCC Regulation 8, Part B.

   3. Historic Airborne Fiber Data: Submit airborne asbestos fiber count data from an independent air monitoring firm to verify that work procedures will result in an airborne fiber level as measured in accordance with 29 CFR 1926 below 0.1 fibers per cubic centimeter as an 8 hour Time Weighted Average (TWA). Include at least the following data for each procedure required by the work:

      a. Date of measurements

      b. Operation monitored

      c. Sampling and analytical methods used and evidence of their accuracy
d. Number, duration, and results of samples taken

4. Certificate Worker Acknowledgment: Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.

5. Training Program: Submit a course outline of the worker training course. Include date and time course was given, name and title of teacher and attendance sheet listing all attendees of the course. Submittal shall be in the form of a letter signed and dated by the course teacher.

6. Report from Medical Examination: Conducted within last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the Work Area. Submit, at a minimum, for each worker the following:

a. Name and Certification Number

b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.

f. A legible typed version of the physician’s name, the physician’s signature, and date of examination.

7. Notarized Certifications: Submit certification signed by an officer of the abatement contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

PART 2 - EQUIPMENT

2.1 PROTECTIVE CLOTHING

A. General. Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of TSI or surfacing ACM or PACM.

B. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.

1. Coveralls will be of a type which is designed approved for Asbestos Abatement, and will be of a quality which will not readily rip or tear during simple activity.

2. Coveralls will be of a type The on-site Supervisor shall periodically examine work coveralls worn by employees for damage (rips and tears) which may occur during performance of the work. When damage is discovered while an employee is working in a negative pressure enclosure, the damaged area(s) will be immediately repaired, of the coveralls will be immediately replaced.

3. The on-site Supervisor shall periodically examine work coveralls worn by employees for damage (rips and tears)
which may occur during performance of the work. When damage is discovered while an employee is working in a negative pressure enclosure, the damaged area(s) will be immediately repaired, of the coveralls will be immediately replaced.

C. Additional Protective Clothing: Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.

D. Cold Weather Gear: Provide each worker with an insulated jacket, pants, gloves, and hat. Require that cold weather gear be removed in Equipment Room of Personnel Decontamination Unit. Dispose of cold weather gear as asbestos waste at completion of all work.

E. Boots Covers: Provide disposable latex boot covers with non-skid soles, and where required, OSHA approved foot protectives, for all workers. Boot covers shall not be worn out of the Work Area or off the sheet plastic drop layer for any reason. Boot covers may be decontaminated, bagged and carried from one Work Area to another.

F. Hard Hats: Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Hats shall be thoroughly cleaned and decontaminated before being worn from one Work Area to another. At the end of the work, clean and decontaminate hats and bag for storage in a properly labeled asbestos disposal bag.

G. Goggles: Provide eye protectives (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Goggles shall be thoroughly cleaned and decontaminated before being worn from one Work Area to another. At the end of the work, clean and decontaminate goggles and bag for storage in a properly labeled asbestos disposal bag.

H. Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos contaminated waste at the end of the work.

I. Hearing Protection: Provide hearing protection as required by OSHA for all workers using noisy equipment or working in noisy environments. Thoroughly clean and decontaminate headset or ear-muff type hearing protectors and reusable ear stopples before they are worn from one Work Area to another or at the end of work. Dispose of disposable ear stopples before leaving work area and provide new ear stopples at each work area.

PART 3 - EXECUTION

3.1 GENERAL

A. Work and Decontamination procedures involve a person in the work area on the plastic sheet and one off the sheet. The person on the sheet carries out the work and never leaves the sheet until the work is complete and dry decontamination procedures are completed. The person off the sheet supplies materials to and accepts material from the on-sheet person. The off sheet person never enters the Work Area. If the work involves more than one person then the team shall consist of two (or more) on-sheet persons and one off-sheet person.

B. Do not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the Work Area. To eat, drink, chew, or smoke, workers shall follow the procedures described below and leave the Work Area.

C. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. The following procedures are minimums to be adhered to regardless of fiber count in the Work Area.
3.2 AIR MONITORING

A. Monitor Air as follows at all times that the work is going on:

1. The Owner will not be performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose. The Contractor will conduct his own air monitoring and laboratory testing. The cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner, and shall be in compliance with all local, state and/or federal regulations, and shall be performed by a qualified Air Monitoring Specialist. Daily written reports shall be posted, and furnished to the Asbestos Project Manager/Designer prior to the commencement of the next shift.

   a. Collect excursion and personal air monitoring samples on the on-sheet persons at all times that work is being carried out, for each type of activity being performed. Collect samples at or about 2 liters per minute for the entire time that work is being carried out. Use cellulose ester filters with 0.8 to 1.2 micron pore size to collect samples.

2. Area Samples: the Owner may collect area samples inside and outside of each area during and/or at completion of the work.

3.3 ADDITIONAL TESTING

A. The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner, and will be in compliance with all local, state and/or federal regulations. AQCC Regulation 8 requires that an Air Monitoring Specialist, independent of the Abatement Contractor, obtain all required air monitoring samples, i.e., final clearance air monitoring, negative air exhaust inside of building, and/or MAAL air monitoring. As described, 'any' air monitoring performed in conjunction with or adjacent to an Abatement Project is considered MAAL air monitoring. Should such air monitoring be requested, prior authorization from the Asbestos Project Manager shall be obtained, and the results shall be furnished to the Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist within 24 hours.

3.3 RESPIRATORS

A. Instruct and train each worker in proper respirator use and require that each worker always wear a respirator, properly fitted on the face, in the Work Area.

3.4 COVERALLS

A. At the Start of Each Work Shift: Put on new disposable coveralls, new head covers, new footwear covers over street shoes, and put on a clean respirator.

B. All workers shall wear disposable, full-body coveralls and disposable head and footwear covers in the Work Area.

C. Follow procedures under "Dry Decontamination" whenever leaving a Work Area.

3.5 ADDITIONAL PROTECTIVE EQUIPMENT

A. At the work site maintain 2 complete sets of protective equipment including disposable coveralls, head covers, and footwear covers for use by the Owner, Project Administrator, Asbestos Project Manager, Designer or the Air Monitoring Specialist.
3.6 DECONTAMINATION PROCEDURES

A. Require all Workers to adhere to the following personal decontamination procedures whenever they leave the Work Area or at end of work shift:

1. Dry Decontamination: Complete the following before leaving any Regulated Area.
   a. Each person HEPA vacuum thoroughly the other person. Use brush attachment on the HEPA vacuum.
   b. While still wearing respirator each person removes their paper suit, turning it inside out while removing it. Roll up suit and pack in hood.
   c. Place suits in a disposal bag.
   d. Suck air out of bag with HEPA vacuum.
   e. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.

2. End Of Shift: Require that each worker decontaminate according to the following procedure at the end of the days work or before removing respiratory protection.
   a. Each person HEPA vacuum hands, hair, face, and respirator.
   b. Each person HEPA vacuum area of respirator seal to face on the other person.
   c. Remove respirator and, HEPA vacuum face at respirator seal and all surfaces of the respirator. HEPA vacuum any parts of hair or head covered by respirator straps.
   d. If using PAPR, shut down in the following sequence: first cap inlets to filter cartridges, then turn off blower unit (this sequence will help keep debris which has collected on the inlet side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.
   e. Wash respirator face piece inside and outside.
   f. At completion of above, thoroughly wash face and hands with soap and water.
   g. Require that each worker follow the wet decontamination procedures set forth in Section 01560 at the end of each day’s work before changing into street clothing, if required.

3.7 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

A. Following this section is a Certificate of Worker's Acknowledgment for Class III Work. After each worker has been included in the Contractor's Respiratory Protection Program and completed the training program and medical examination, secure a fully executed copy of this form.

END OF SECTION - 01561
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT  
CLASS III WORK

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WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that employees of the Contractor be supplied with the proper respirator and be trained in its use, trained in safe work practices and in the use of the equipment found on the job, and receive a medical examination. These things are to be at no cost to the employee.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained at a course the equivalent in curriculum and training method to the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers who conduct activities that will result in the disturbance of ACM. [40 CFR 763.92(a)(2)]. This course must have included "hands-on" training in the use of respiratory protection and work practices and shall take at least 16 hours.

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

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SECTION 01562 - RESPIRATORY PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Instruct and train each worker involved in asbestos abatement or maintenance and repair of friable asbestos-containing materials (ACM) in proper respiratory use and require that each worker always wear a respirator, properly fitted on the face in the Work Area from the start of any operation which may cause airborne asbestos fibers until the Work Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

1.3 DEFINITIONS

A. "Negative Pressure Respirator": A respirator in which the air pressure inside the respiratory inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

B. "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.

C. "Respirator": A device designed to protect the wearer from the inhalation of harmful atmospheres.

1.4 STANDARDS

A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the latest edition of the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.


5. NIOSH - National Institute for Occupational Safety and Health
   - NIOSH Respirator Decision Logic (May 1987) DHHS/NIOSH Publication No. 87-108;
   - NIOSH/EPA, “A Guide to Respiratory Protection for the Asbestos Abatement Industry” EPA-560-OPTS-86-001 (September 1986);
   - 42 CFR 84, NIOSH Standard for Certification of Non-Powered Air Purifying Respirator filters;
- 30 CFR 11, NIOSH - Certification of Respirators

6. MSHA - Mine Safety and Health Administration

1.5 SUBMITTALS

A. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Product Data: Submit manufacturer's product information for each component used, including NIOSH and MSHA Certifications for each component in an assembly and/or for entire assembly.

2. System Diagram: When a supplied air respiratory system is required by the work, submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in Work Area(s), routing of air lines to Work Area(s) from compressor.

3. Operating Instruction: Submit complete operating and maintenance instructions for all components and systems as a whole. Submittal is to be in bound manual form suitable for field use.

4. Respiratory Protection Program: Submit Contractor's written respiratory protection program manual as required by OSHA 1926.1101.

5. Initial Exposure Assessment: Submit level of respiratory protection intended for each operation required by the project. Base this selection on an “Initial Exposure Assessment” as required by OSHA 29 CFR 1926.1101. Submit information to support this "Initial Exposure Assessment" on the form included at the end of this Section.

   a. Submit data from exposure monitoring for the PEL and EL from prior asbestos jobs within 12 months;

   b. Submit monitoring and analysis that were performed in compliance with the OSHA asbestos standard in effect;

   c. Submit data that was obtained under workplace conditions "closely resembling" those that will exist during the Work;

   d. Submit data from past asbestos jobs where the type of asbestos abatement and other work, material, control methods, work practices, and environmental conditions closely resemble those that will exist during the Work;

   e. Submit exposure date from prior asbestos jobs where the work that was conducted by employees whose training and experience are no more extensive than that of employees performing the current job;

   f. Based on the exposure data from the previous asbestos jobs, select respiratory protection for the Work that will, to a high degree of certainty, prevent worker exposures (inside the respirator) that exceed the Permissible Exposure Limits (PEL) set forth in this Section of the specifications.

6. Resume information: Submit resume and information on training for individual monitoring the operation of supplied air respiratory systems. Submit training certifications where applicable.

1.6 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS

A. Provide air used for breathing in supplied air respiratory systems that meets or exceeds standards set for C.G.A. type 1 (Gaseous Air) Grade H or CSA Z180.1 whichever presents the more stringent quality standard:
1.7 ALLOWABLE CONTAMINANTS

A. Supply air that has an asbestos concentration no greater than outside ambient conditions.

B. Supply air that meets the level of contaminants allowed according to the air quality standard specified.

C. The following table sets forth the quantity of any given contaminant allowed according to the referenced standards:

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Grade D</th>
<th>CGA Type 1 (Gaseous Air Grade E)</th>
<th>Grade H</th>
<th>CSA Z180.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide, PPM/v</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Carbon Dioxide, PPM/v</td>
<td>1000</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Condensed Hydrocarbons, mg./cu. meter</td>
<td>5</td>
<td>5</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Gaseous Hydrocarbons - as methane, PPM/v</td>
<td></td>
<td>10</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Water Vapor - PPM/v</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
<td>27</td>
</tr>
<tr>
<td>dewpoint</td>
<td>-50F</td>
<td>-50F</td>
<td>-50F</td>
<td>-63F</td>
</tr>
<tr>
<td>Objectionable Odors</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Nitrogen Dioxide, PPM/v</td>
<td>-</td>
<td>-</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Nitrous Oxide, PPM/v</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Sulfur Dioxide, PPM/v</td>
<td>-</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>Halogenated solvents, PPM/v</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Other gaseous contaminants</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(2)</td>
</tr>
<tr>
<td>Inorganic particulates, mg./cu. meter</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

- Indicates that the standard shows no limiting characteristics

(1) The CGA standards do not indicate a specific moisture limit when the ambient temperature is above freezing. However, since a moisture content no greater than a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint (66 PPM/v) is necessary for carbon monoxide elimination, the CO limits could not be met unless the air were dried to a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint or better.

(2) Maximum allowable content of trichlorotrifluoroethane, dichlorodifluoromethane, and chlorodifluoromethane is 2 PPM/v for each. Unlisted contaminants shall not exceed one-tenth of the Threshold Limit Values (TLV's) for Chemical Substances in Workroom air adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

1.8 DELIVERY

A. Deliver replacement parts, etc., not otherwise labeled by NIOSH or MSHA to job site in manufacturer's containers.

PART 2 - EQUIPMENT

2.1 AIR PURIFYING RESPIRATORS

A. Respirator Bodies: Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit (0 degrees Celsius).
B. Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with 42 CFR Part 84 and ANSI Z228.2. Also, additional cartridge sections may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.

C. Non-permitted respirators. Do not use single use, disposable or quarter face respirators.

2.2 SUPPLIED AIR RESPIRATOR SYSTEMS

A. Provide equipment capable of producing air of the quality and volume required by the above reference standards applied to the job site conditions and crew size. Comply with provisions of this specification if more stringent than the governing standard.

B. Facepiece and Hose: Provide full facepiece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure facepiece.

C. Auxiliary backup system: In atmospheres which contain sufficient oxygen (greater than or equal to 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator equipped with an emergency backup HEPA filter.

D. Escape air supply: In atmospheres which are oxygen deficient (less than 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator incorporating an auxiliary self-contained breathing apparatus (SCBA) which automatically maintains an uninterrupted air supply in pressure demand mode with a positive pressure face piece.

E. Backup air supply: Provide a reservoir of compressed air located outside the Work Area which will automatically maintain a continuous uninterruptable source of air automatically available to each connected facepiece and hose assembly in the event of compressor shut-down, contamination of air delivered by compressor, power loss or other failure. Provide sufficient capacity in the back-up air supply to allow a minimum escape time of one-half hour times the number of connections available to the Work Area. Air requirement at each connection is the air requirement of the respirators in use plus the air requirement of an average-sized adult male engaged in moderately strenuous activity.

F. Warning device: Provide a warning device that will operate independently of the building's power supply. Locate so that alarm is clearly audible above the noise level produced by equipment and work procedures in use, in all parts of the Work Area and at the compressor. Connect alarm to warn of:

   1. Compressor shut down or other fault requiring use of backup air supply
   2. Carbon Monoxide (CO) levels in excess of 5 PPM/V

G. Carbon Monoxide (CO) Monitor: Continuously monitor and record on a strip chart recorder Carbon Monoxide (CO) levels. Place monitors in the air line between compressor and back-up air supply and between backup air supply and workers. Connect monitors so that they also sound an alarm as specified under "Warning Devices".

H. Compressor Shut Down: Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sound if any of the following occur:

   1. Carbon Monoxide (CO) concentrations exceed 5 PPM/v in the air line between the filter bank and backup air supply
   2. Compressor temperature exceeds normal operating range

I. Compressor Motor: Provide a compressor driven by an electric motor. Do not use a gas or diesel engine to drive compressor. Insure that electrical supply available at the work site is adequate to energize motor.
PART 3 - EXECUTION

3.1 GENERAL


B. Require that respirators be used in the following circumstances:

1. During all Class I asbestos jobs.
2. During all Class II work where the ACM is not removed in a substantially intact state,
3. During all Class II and III work which is not performed using wet methods.
4. During all Class II and III asbestos jobs where the employer does not produce a "negative exposure assessment".
5. During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed.
6. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
7. During all work covered by this section where employees are exposed above the OSHA PEL (TWA, or excursion limit).
8. In emergencies. During emergencies where the airborne asbestos fiber concentration is not known, a self-contained breathing apparatus (SCBA) must be used.

C. Require that respiratory protection be used at all times that there is any possibility of disturbance of ACM whether intentional or accidental.

D. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until the area has been cleared for re-occupancy in accordance with Section 01711.

E. Regardless of Airborne Fiber Levels: Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.

F. Do not allow the use of single-use, disposable, or quarter-face respirators for any purpose.

3.2 FIT TESTING

A. Initial Fitting: Provide initial fitting of respiratory protection during a respiratory protection course of training set up
and administered by an individual qualified to do fit testing. Fit types and sizes of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing has been provided.

B. On a Weekly Basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube.

C. Upon Each Wearing: 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.

3.3 TYPE OF RESPIRATORY PROTECTION REQUIRED

A. General: After reducing airborne asbestos levels to the lowest feasible level with engineering controls and work practices, provide respiratory protection as necessary to ensure that workers are not exposed to an airborne concentration of asbestos in excess of the Specified Permissible Exposure Limits (SPEL) set forth in this Section.

B. Level of Respiratory Protection: Determine the proper level of respiratory protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. 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 Specified Permissible Exposure Limits (PEL) set forth in this Section is the minimum level of protection allowed.

C. Specific Respiratory Protection Requirements: Provide respiratory protection as indicated below as a minimum requirement:

1. Half-face Negative Pressure Air-Purifying Respirators: Provide half-face negative pressure air-purifying respirators during installation of Critical or Primary Barriers or other activities where there has been an “Initial Exposure Assessment” that has determined that airborne asbestos fiber levels will not exceed 0.1 fiber per cubic centimeter (0.1 f/cc). Provide a PAPR where a half-face negative pressure air-purifying respirator is allowed to any worker who so requests.

2. Powered Air-Purifying Respirators (PAPR): Provide powered air-purifying respirators (PAPR) during removal of asbestos-containing thermal system insulation (TSI) or surfacing material where there has been an “Initial Exposure Assessment” that has determined that airborne asbestos fiber levels will not exceed 1.0 fiber per cubic centimeter (1.0 f/cc).

3. Type "C" Supplied-air respirators: full facepiece pressure demand supplied air respirators are to be used by all workers engaged in the removal of thermal system insulation (TSI) or surfacing materials, or demolition of pipes, structures, or equipment covered or insulated with asbestos, in the removal or demolition of asbestos insulation or coverings, or any other activity which results in or may result in airborne asbestos fiber levels above 1.0 fibers per cubic centimeter (1.0 f/cc).

D. Provide a full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus for all workers within a regulated area where Class I work is being performed and for which an initial exposure assessment has not been produced. After an initial exposure assessment is made, use the level of respiratory protection required by that assessment and requirements of this specification and the OSHA Asbestos Construction Standard 29 CFR 1926.1101.

3.4 SPECIFIED PERMISSIBLE EXPOSURE LIMITS (SPEL)

A. Specified Permissible Exposure Limits (SPEL): Ensure that no worker is exposed to an airborne concentration of asbestos in excess of the Time-Weighted Average (TWA) limit, and Excursion Limit (EL) set forth below.

1. Time Weighted Average (TWA) limit - Concentration of airborne asbestos fibers to which any worker may be exposed as an eight (8) hour time-weighted average (TWA) shall not exceed the following.

   a. 0.1 fibers per cubic centimeter
2. Excursion Limit (EL) - Concentration of airborne asbestos fibers to which any worker may be exposed as averaged over a sampling period of thirty (30) minutes shall not exceed the following.

   a. 1.0 fibers per cubic centimeter

B. Fibers: For purposes of this section, fibers are defined as all fibers regardless of composition as counted in the OSHA Reference Method (ORM), or NIOSH 7400 procedure.

   1. Electron Microscopy: If Electron Microscopy is used to determine airborne fiber levels, only asbestos fibers will be enumerated, but fibers of any size detected by the testing of Section 01711 Project Decontamination will be counted.

### 3.5 RESPIRATORY PROTECTION FACTOR

<table>
<thead>
<tr>
<th>A. Respirator Type</th>
<th>Protection Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Air Purifying:</strong></td>
<td></td>
</tr>
<tr>
<td>Negative pressure respirator</td>
<td></td>
</tr>
<tr>
<td>High efficiency filter</td>
<td></td>
</tr>
<tr>
<td>Half facepiece</td>
<td></td>
</tr>
<tr>
<td><strong>2. Air purifying:</strong></td>
<td></td>
</tr>
<tr>
<td>Negative pressure respirator</td>
<td></td>
</tr>
<tr>
<td>High efficiency filter</td>
<td></td>
</tr>
<tr>
<td>Full facepiece</td>
<td></td>
</tr>
<tr>
<td><strong>3. Powered Air Purifying (PAPR):</strong></td>
<td></td>
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<tr>
<td>Positive pressure respirator</td>
<td></td>
</tr>
<tr>
<td>High efficiency filter</td>
<td></td>
</tr>
<tr>
<td>Half facepiece</td>
<td></td>
</tr>
<tr>
<td><strong>4. Supplied air:</strong></td>
<td></td>
</tr>
<tr>
<td>Positive pressure respirator</td>
<td></td>
</tr>
<tr>
<td>Pressure demand or other positive pressure mode</td>
<td></td>
</tr>
<tr>
<td>Full facepiece</td>
<td></td>
</tr>
<tr>
<td>Equipped with an auxiliary HEPA cartridge or positive pressure</td>
<td></td>
</tr>
<tr>
<td>Self-contained breathing apparatus (SCBA) for escape</td>
<td></td>
</tr>
</tbody>
</table>

### 3.6 AIR PURIFYING RESPIRATORS

A. Negative pressure - half or full face mask: Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the work day. Require that respirators be wet-rinsed, and filters discarded, each time a worker leaves the Work Area. Require that new filters be installed each time a worker re-enters the Work Area. Store respirators and filters at the job site in the changing room and protect totally from exposure to asbestos prior to their use.

B. Powered air purifying - half or full face mask: Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the facepiece decreases to the level at which the manufacturer recommends filter replacement. Require that regardless of flow, filter cartridges be replaced after 40 hours of use. Require that HEPA elements in filter cartridges be protected from wetting during showering. Require entire exterior housing of respirator, including blower unit, filter cartridges, hoses, battery pack, face mask, belt, and cords, be washed each time a worker leaves the Work Area. Caution should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

### 3.7 SUPPLIED AIR RESPIRATOR

A. Air Systems Monitor: Continuously monitor the air system operation including compressor operation, filter system...
operation, backup air capacity and all warning and monitoring devices at all times that system is in operation. Assign an individual, trained by manufacturer of the equipment in use or by a Certified Industrial Hygienist, in the operation and maintenance of the system to provide this monitoring. Assign no other duties to this individual which will take him away from monitoring the air system.

END OF SECTION - 01562
### INITIAL EXPOSURE ASSESSMENT (PREVIOUS EXPERIENCE)

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Project Name</th>
<th>Date</th>
<th>Facility</th>
<th>Work Area(s)</th>
<th>Reference Job</th>
<th>Description of Work</th>
</tr>
</thead>
<tbody>
<tr>
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#### Asbestos Containing Materials

<table>
<thead>
<tr>
<th>Task</th>
<th>Personal High</th>
<th>Monitoring Low</th>
<th>Level Average</th>
<th>Respirator Worn</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prep / Set up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of Surface Trt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of TSI</td>
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</tr>
<tr>
<td>Removal of Misc Mat.</td>
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<tr>
<td>Bag Out</td>
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<tr>
<td>Clean Up</td>
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<tr>
<td>Other</td>
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</tr>
</tbody>
</table>

**Experience Level of Work Force**

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Project Name</th>
<th>Date</th>
<th>Facility</th>
<th>Work Area(s)</th>
<th>Reference Job</th>
<th>Description of Work</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
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<tr>
<th>Task</th>
<th>Personal High</th>
<th>Monitoring Low</th>
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<th>Respirator Worn</th>
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<tr>
<td>Prep / Set up</td>
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<td>Other</td>
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**Experience Level of Work Force**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Witness</th>
</tr>
</thead>
<tbody>
<tr>
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</table>
## INITIAL EXPOSURE ASSESSMENT (ANTICIPATION)

### Expected Conditions of this Job

<table>
<thead>
<tr>
<th>Asbestos Containing Materials</th>
<th>Asbestos/Type Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Task</th>
<th>Anticipated Level (f/cc)</th>
<th>Respirator Worn</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Prep / Set up Removal of Surface Trt</td>
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### Signature

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<tr>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Witness</th>
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</table>
SECTION 01563 - DECONTAMINATION UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Provide separate Personnel and Equipment Decontamination facilities. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Refer to Section 01503 Temporary Facilities - Asbestos Abatement for electrical requirements and requirements relative to connection of decontamination facilities to building systems such as water, sewer, and electrical.

1.4 SUBMITTALS

A. Before the Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. Personnel Decontamination Unit: Provide shop drawing showing location and assembly of personnel decontamination units.

2. Equipment Decontamination Unit: Provide shop drawing showing location and assembly of equipment decontamination units.


5. Shower Head and Controls: Provide product data.

6. Filters: Provide product data and shop drawing of installation on decontamination unit.


8. Shower Stall: for Wash Down Station provide product data and shop drawing showing and modifications.


12. Signs: Submit samples of signs to be used.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

B. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, and required.

C. Reinforced Polyethylene Sheet: Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, and required.

D. Duct Tape: Provide duct tape in 2 inch or 3 inch (51mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

E. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

F. Shower Pan: Provide one piece waterproof shower pan 3 feet x 3 feet x 6 inches deep (.91 m x .91 m x 152 mm deep).

G. Shower Walls: Provide 8 feet (2.44 m) long by approximately 7 feet (2.13 m) high walls fabricated from rigid, impervious, waterproof material, either corrugated fiberglass roofing or equivalent. Structurally support as necessary for stability.

H. Shower Head and Controls: Provide a factory-made shower head producing a spray of water which can be adjusted for spray size and intensity. Feed shower with water mixed from hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid.

I. Filters: Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.

1. Primary Filter - Passes particles 20 microns and smaller

2. Secondary Filter - Passes particles 5 microns and smaller

J. Hose Bib: Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4 inch (19.05 mm) National Standard male hose outlet.

K. Shower Stall: For Wash Down Station provide leak tight shower enclosure with integrated drain pan fabricated from fiberglass or other durable waterproof material, approximately 3 feet x 3 feet (0.91m x 0.91 m) square with minimum 6 feet (1.83 m) high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4 feet (1.22 m) above drain pan. Connect drain to a reservoir, pump water from reservoir through filters to a drain or store and use for amended water. Mount filters inside shower stall on back wall beneath hose bib.

L. Elastomeric membrane: Provide uniform flat sheets of flexible sheet roofing material fabricated from EPDM (ethylene propylene diene monomers) or Neoprene (polychloroprene), in a nominal 45 mil (1.14 mm) thickness.
1. Material is to be placed directly under the shower stall and extend a minimum of 3 feet (0.91 m) in both directions of egress. Material is to be formed to provide protection against spills, flooding, etc.

M. Lumber: Provide kiln dried lumber of any grade or species.

N. 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 3 inch (76 mm) remains between top of liquid and top of sump pan.

PART 3 - EXECUTION

3.1 PERSONNEL DECONTAMINATION UNIT

A. Provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces, Changing Room, Drying Room, Shower Room, Equipment Room. Require all persons without exception to pass through this Decontamination Unit for entry into and exiting from the Work Area for any purpose. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 100 foot candles (1076 lumens / sq. meter).

B. Changing Room (clean room): Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.

1. Construct using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness, to provide an airtight seal between the Changing Room and the rest of the building.

2. Locate so that access to Work Area from Changing Room is through Shower Room.

3. Separate Changing Room from the building by a sheet plastic flapped doorway.

4. Require workers to remove all street clothes in this room, dress in clean, disposable coveralls, and don respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require Workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.

5. An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workers may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic as set forth in Section 01526 Temporary Enclosures. Authorization for this must be obtained from the Asbestos Project Manager/Designer in writing prior to start of construction. Submit written request in accordance with Section 01632 "Substitutions" detailing layout and protective measures proposed.

6. Maintain floor of changing room dry and clean at all times. Do not allow overflow water from shower to wet floor in changing room.

7. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

8. Provide posted information for all emergency phone numbers and procedures.

9. Provide 1 storage locker per employee.

10. Provide all other components indicated on the contract drawings.
C. Drying Room: Provide a drying room as an airlock and a place for workers to dry after showering.

1. Construct room by providing a pan continuous with or draining to Shower Room pan. Install a freely draining wooden or non-skid metal floor in pan at elevation of top of pan.

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Changing Room and Shower Room with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Separate from Changing Room by a sheet plastic flapped doorway.

5. Provide a continuously adequate supply of disposable bath towels.

D. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room.

1. Construct room by providing a shower pan and 2 shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining wooden floor in shower pan at elevation of top of pan.

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Drying Room and Airlock with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Provide splashproof entrances to Drying Room and Airlock with doors arranged in the following configuration:

   a. At each entrance to the Shower Room construct a door frame out of nominal 2 inch x 4 inch (51 mm X 102 mm) lumber with 1-1/2 inch (39 mm) jambs (sides) and 1-1/2 inch (39 mm) head (top) and sill (bottom). Attach to this door frame two overlapping flaps of elastomeric membrane material, fastened at the head (top) and jambs (sides) (by clamping between a 1-1/2 inch (39 mm) x 3/4 inch (19mm ) batten and frame). Overlap the flaps a minimum of 6 inch (152 mm) in a direction that presents a shingle-like configuration to the water stream from the shower. Overlap sill (bottom) by 1-1/2 inch (39 mm) minimum. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.

5. Provide shower head and controls.

6. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower.

7. Provide a soap dish and a continuously adequate supply of soap and maintain in sanitary condition.

8. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.

9. 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 Work Area.

10. Provide flexible hose shower head.

11. Pump waste water to drain or to storage for use in amended water. If pumped to drain, provide 20 micron and 5 micron waste water filters in line to drain or waste water storage. 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.

12. Provide hose bib.
13. Provide all other items indicated on contract drawings.

E. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.

1. Separate this room from the Work Area by a 6 mil (0.15 mm) polyethylene flapped doorway.

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

F. Work Area: Separate Work Area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the Work Area is expected to be high, in dry removal, add an intermediate cleaning space between the Equipment Room and the Work Area. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil (0.15 mm) polyethylene per shift change and remove contaminated layer after each shift.

G. Decontamination Sequence: Require that all workers adhere to the following sequence when entering or leaving the Work Area.

1. Entering Work Area: Worker enters Changing Room and removes street clothing, puts on clean disposable overalls and respirator, and passes through the Shower Room into the Equipment Room.

2. Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.

3. Worker proceeds to Work Area.

H. Exiting Work Area:

1. Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet.

2. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment.

3. Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Equipment Room.

4. Disposable coveralls are placed in a bag for disposal with other material.

5. Require that Decontamination procedures found in Section 01560 be followed by all individuals leaving the Work Area.

6. After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

3.2 EQUIPMENT DECONTAMINATION/WASTE LOAD OUT UNIT

A. Provide an Equipment Decontamination Unit consisting of a serial arrangement of rooms, Clean Room, Holding Room, Wash Room, and Containment Area for dismantling equipment from the Work Area. Do not allow personnel to enter or exit the Equipment Decontamination Unit.
Work Area through Equipment Decontamination Unit.

B. Arrange with airlocks between rooms as required below.

C. Wash Down Station: Provide an enclosed Shower Unit located in Work Area just outside Wash Room as an equipment, bag and container cleaning station.

1. Fabricate waterproof floor extending 6 feet (1.83 m) beyond Wash Down station in all directions. Install seamless waterproof membrane over area and extend over curbs on all four sides. Form curbs from 2 inch x 4 inch (51 X 102 mm) lumber laid on the flat.

2. Waterproof membrane is to be fabricated from elastomeric membrane or

3. Waterproof membrane is to be fabricated from minimum 10 mil (.254 mm) polyethylene.

4. Do not allow water to collect on waterproof membrane. Remove continuously with a wet vacuum or mops.

D. Wash Room: provide wash room for cleaning of bagged or containerized asbestos-containing waste materials passed from the Work Area.

1. Construct wash room of nominal 2 inch x 4 inch (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that packaged materials, after being wiped clean, can be passed to the Holding Room.

2. Separate this room from the Work Area by a single flapped door of 6 mil (0.15 mm) polyethylene sheeting.

3. Provide a drop cloth layer of plastic on floor in the Wash Room for every load-out operation. Roll this drop cloth layer of plastic from Wash Room into Work Area after each load-out. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

E. Holding Room: Provide Holding Room as a drop location for bagged asbestos-containing materials passed from the Wash Room. Construct Holding Room of nominal 2 inch x 4 inch (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that bagged materials cannot be passed from the Wash Room through the Holding Room to the Clean Room.

1. Separate this room from the adjacent rooms by flapped doors fabricated from 1/16 inch (1.59 mm) +/- thick single ply elastomeric membrane material either EPDM or Neoprene or

2. Separate this room from the adjacent rooms by flap doors fabricated from 6 mil (0.15 mm) sheet plastic.

F. Clean Room: provide Clean Room to isolate the Holding Room from the building exterior. If possible locate to provide direct access to the Holding Room from the building exterior.

1. Erect Critical and Primary Barriers as described in Section 01526 "Temporary Enclosures" in an existing space. If no space exists construct Clean Room of 2 x 4 (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness.

2. Separate this room from the exterior by a single flap door of 6 mil (0.15 mm) polyethylene sheeting.

G. Load-out Area: The load-out area is the transfer area from the building to a truck or dumpster. It may be the Clean Room of the Equipment Decontamination unit or a separate room or loading dock area. Erect Critical and Primary barriers as described in Section 01526 "Temporary Enclosures" in load-out area.

1. During transfer of material from load-out area erect primary barriers as described in Section 01526 "Temporary Enclosures" as necessary to seal path from load-out area to truck or dumpster.
H. Decontamination Sequence: Take all equipment or material from the Work Area through the Equipment Decontamination Unit according to the following procedure:

1. At washdown station, thoroughly wet clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.

2. When passing equipment or containers into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the doorway between the Washdown Station and the Wash Room. Keep all outside personnel clear of the Equipment Decontamination Unit.

3. Once inside the washroom, wet clean the bags and/or equipment.

4. When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Holding room and the Clean Room.

5. Workers from the building exterior enter Holding Area and remove decontaminated equipment and/or containers for disposal.

6. Require these workers to wear full protective clothing and appropriate respiratory protection.

7. At no time is a worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

3.3 CONSTRUCTION OF THE DECONTAMINATION UNITS

A. Walls and Ceiling: Construct airtight walls and ceiling using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness. Attach to existing building components or a temporary framework.

B. Floors: Use 2 layers (minimum) of 6 mil (0.15 mm) polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.

C. Flap Doors: Fabricated from three (3) overlapping sheets with openings a minimum of three feet (3') (0.91 meters) wide. Configure so that sheeting overlaps adjacent surfaces. Weights at bottom of sheets as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') (1.22 meters) between entrance and exit of any room. Provide a minimum of three feet (3') (0.91 meters) between doors to airlocks.

D. If the Decontamination area is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/4 inch (6.4 mm) hardboard or 1/2 inch (12.7 mm) plywood "ceiling" with polyethylene sheeting, at least 6 mil (0.15 mm) in thickness covering the top of the "ceiling".

E. Visual Barrier: Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/4 inch (6.4 mm) thick hardboard or 1/2 inch (12.7 mm) plywood. Where the solid barrier is provided, sheeting need not be opaque.

F. Alternate methods of providing Decontamination facilities may be submitted to the Asbestos Project Manager/Designer for approval. Do not proceed with any such method(s) without written authorization of the Asbestos Project Manager/Designer.

G. Electrical: Provide subpanel at Changing Room to accommodate all removal equipment. Power subpanel directly from a building electrical panel.

1. Connect all electrical branch circuits in Decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.
3.4 CLEANING OF DECONTAMINATION UNITS

A. Clean debris and residue from inside of Decontamination Units on a daily basis or as otherwise indicated on Contract Drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

B. If the Changing Room of the Personnel Decontamination Unit becomes contaminated with asbestos-containing debris, abandon the entire Decontamination Unit and erect a new Decontamination Unit. Use the former Changing Room as an inner section of the new Equipment Room.

3.5 SIGNS

A. Post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

1. Provide signs in both English and Spanish.

2. Legend:

   DANGER

   ASBESTOS

   CANCER AND LUNG DISEASE HAZARD

   AUTHORIZED PERSONNEL ONLY

   RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

3. Provide spacing between respective lines at least equal to the height of the respective upper line.

B. Post an approximately 10 inch by 14 (254 mm x 356 mm) inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

1. Provide signs in both English and Spanish.

2. Legend

   NO FOOD, BEVERAGES OR TOBACCO PERMITTED 3/4 inch (19 mm) Block

   ALL PERSONS SHALL DON PROTECTIVE CLOTHING (COVERINGS) BEFORE ENTERING THE WORK AREA 3/4 inch (19 mm) Block

   ALL PERSONS SHALL SHOWER IMMEDIATELY AFTER LEAVING WORK AREA AND BEFORE ENTERING THE CHANGING AREA 3/4 inch (19 mm) Block

END OF SECTION - 01563
SECTION 01601 - MATERIALS AND EQUIPMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. The Contractor's Construction Schedule is included under Section 01043 Coordination - Asbestos Abatement.

2. The Contractor's Schedule of Submittals is included under Section 01301 Submittals - Asbestos Abatement.

3. The applicability of industry standards to products specified is included under Section 01097 Reference Standards and Definitions - Asbestos Abatement.

4. The administrative procedures for handling requests for substitutions made after award of the Contract is included under Section 01632 Substitutions - Asbestos Abatement.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

2. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

3. "Foreign Products" as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

4. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

5. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

6. "Equipment" are products that may be either operational or fixed.

a. Operational Equipment are products with operating parts, whether motorized or manually operated, that
requires temporary or permanent service connections, such as wiring or piping.

b. Fixed Equipment are products necessary for accomplishing the work that are used as a temporary facility during the work and removed afterward.

1.4 SUBMITTALS

A. Required submittals: A general listing of products requiring submittals is included at the end of Section 01301 "Submittals." This listing may not be complete. Submittal requirements are found in each specification section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

B. Product List: Prepare a list showing products specified in tabular form acceptable to the Asbestos Project Manager/Designer. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Form: Prepare product list with information on each item tabulated under the following column headings:
   a. Related Specification Section number.
   b. Generic name used in Contract Documents.
   c. Proprietary name, model number, and similar designations.
   d. Manufacturer's name and address.
   e. Supplier's name and address.
   f. Installer's name and address.
   g. Projected delivery date or time span of delivery period.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
   a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

5. Asbestos Project Manager’s/Designer's Action: The Asbestos Project Manager/Designer will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Asbestos Project Manager’s/Designer’s written response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.
1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Asbestos Project Manager/Designer to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. The Contractor is responsible for providing products and construction methods that are compatible with products and construction methods to be installed after completion of the work of this contract.

2. If a dispute arises between Contractors over concurrently selectable, but incompatible products, the Designer will determine which products shall be retained and which are incompatible and must be replaced.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

   a. Name of product and manufacturer.
   
   b. Model and serial number.
   
   c. Capacity.
   
   d. Speed.
   
   e. Ratings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.

2. Semiproprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.

   a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.

   a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

7. Visual Matching: Where Specifications require matching an established Sample, the Asbestos Project Manager’s/Designer’s decision will be final on whether a proposed product matches satisfactorily.

   a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category.

8. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Asbestos Project Manager/Designer will select the color, pattern, and texture from the product line selected.

9. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

   A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

      1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01601
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. Related Sections: The following Sections contain requirements that relate to the Section:

1. Division 1 Section “Reference Standards and Definitions - Asbestos Abatement” specifies the applicability of industry standards to products specified.

2. Division 1 Section “Coordination - Asbestos Abatement” specifies requirements for submitting the Contractor’s Construction Schedule.

3. Division 1 Section “Submittals - Asbestos Abatement” specifies requirements for submitting the Submittal Schedule.

4. Division 1 Section “Materials and Equipment - Asbestos Abatement” specifies requirements governing the Contractor’s selection of products and product options.

1.3 DEFINITIONS

A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to the Contract Documents requested by the Owner, Project Administrator, Asbestos Project Manager or Designer.

3. Specified options of products and construction methods included in the Contract Documents.

4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS
A. Substitution Request Submittal: The Project Administrator/Asbestos Project Manager/Designer will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Project Administrator/Asbestos Project Manager/Designer.

1. Submit 1 copy of each request for substitution for consideration to the Project Administrator and 2 copies to the Asbestos Project Manager/Designer. Submit requests in the form and according to procedures required for change-order proposals.

2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.

3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

   a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will be necessary to accommodate the proposed substitution.

   b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.

   c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.

   d. Samples, where applicable or requested.

   e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

   f. Cost information, including a proposal of the net change, if any in the Contract Sum.

   g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.

   h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Project Administrator’s/Asbestos Project Manager’s/Designer’s Action: If necessary, the Project Administrator/Asbestos Project Manager/Designer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Project Administrator will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

   a. Use the product specified if the Project Administrator/Asbestos Project Manager/Designer cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS
2.1 SUBSTITUTIONS

A. Conditions: The Project Administrator/Asbestos Project Manager/Designer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Project Administrator/Asbestos Project Manager/Designer. If the following conditions are not satisfied, the Asbestos Project Manager/Designer will return the requests without action except to record noncompliance with these requirements.

1. Extensive revisions to the Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of the Contract Documents.

3. The request is timely, fully documented, and properly submitted.

4. The specified product or method of construction cannot be provided within the Contract Time.

5. The Project Administrator/Asbestos Project Manager/Designer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

6. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.

7. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Asbestos Project Manager/Designer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.

8. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

9. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.

10. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.

11. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

B. The Contractor's submittal and the Project Administrator’s/Asbestos Project Manager’s/Designer’s acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01632
SECTION 01701 - CONTRACT CLOSEOUT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   4. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
      b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

   2. Advise the General Contractor of pending insurance changeover requirements.

   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

   4. Obtain and submit releases enabling the Owner, General Contractor, Project Administrator, Asbestos Project Manager, and Designer unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

   5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.

   6. Make final changeover of permanent locks and transmit keys to the General Contractor. Advise the General Contractor’s personnel of changeover in security provisions.
7. Complete startup testing of systems and instruction of the General Contractor’s operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.

8. Complete final cleanup requirements, including touch up painting.

9. Touch up and otherwise repair and restore marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Asbestos Project Manager/Designer will either proceed with inspection or advise the Contractor of unfilled requirements. The Asbestos Project Manager/Designer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Asbestos Project Manager/Designer will repeat inspection when requested and assured that the Work is substantially complete.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Asbestos Project Manager’s/Designer’s final inspection list of items to be completed or corrected, endorsed and dated by the Asbestos Project Manager/Designer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Asbestos Project Manager/Designer.

4. Submit consent of surety to final payment.

5. Submit a final liquidated damages settlement statement.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Asbestos Project Manager/Designer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Asbestos Project Manager/Designer.

1. Upon completion of reinspection, the Asbestos Project Manager/Designer will prepare a certificate of final acceptance. If the Work is incomplete, the Asbestos Project Manager/Designer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.
1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Asbestos Project Manager’s/Designer’s reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related change-order numbers where applicable.

4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and Product Data.

4. Upon completion of the Work, submit record Specifications to the Asbestos Project Manager/Designer for the Owner’s records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer’s installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3. Upon completion of markup, submit complete set of record Product Data to the Asbestos Project Manager/Designer for the Owner’s records.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Asbestos Project Manager/Designer for...
the Owner's records.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls." The cleaning in this Section is in addition to cleaning which is part of decontamination work. This section is intended to return the facility to the Owner in presentable condition.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

   a. Remove labels that are not permanent labels.

   b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials.

   c. Replace chipped or broken glass and other damaged transparent materials.

   d. Clean exposed exterior and interior hard-surfaces finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

   e. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

   f. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

   1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01701
SECTION 01711 - PROJECT DECONTAMINATION

PART 1 - GENERAL

1.1 SUMMARY:

A. Work of This Section includes the decontamination of air in the Work Area which has been, or may have been, contaminated by the elevated airborne asbestos fiber levels generated during abatement activities, or which may previously have had elevated fiber levels due to friable asbestos-containing materials (ACM) in the space.

B. Work of This Section includes the cleaning, decontamination, and removal of temporary facilities installed prior to abatement work, including:
   1. Primary and Critical Barriers erected by work of Section 01526
   2. Decontamination Unit erected by work of Section 01563
   3. Pressure Differential System installed by work of Section 01513

C. Work of This Section includes the cleaning, and decontamination of all surfaces (ceiling, walls, floor) of the Work Area, and all furniture or equipment in the Work Area.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

1.3 DESCRIPTION OF REQUIREMENTS

A. General: Decontamination of the Work Area following asbestos abatement.

B. If the asbestos abatement work is on damaged or friable materials the work is a three step procedure with two cleanings of the Primary Barrier plastic prior to its removal and one cleaning of the room surfaces to remove any new or existing contamination. Unless specifically indicated otherwise all materials are considered damaged or friable for purposes of this section.

C. If the asbestos abatement work is on undamaged and non-friable materials the decontamination procedure is a two step procedure with two cleanings of the Primary Barrier plastic to remove contamination, thus preventing contamination of the building when the Work Area isolation barriers are removed.

D. In both cases operation of the pressure differential system is used to remove airborne fibers generated by the abatement work.

1.4 RELATED WORK SPECIFIED ELSEWHERE

A. Removal of Gross Debris is integral with the performance of abatement work and as such is specified in the appropriate work section(s) of these specifications:
   1. Section 02081 Removal of Asbestos-Containing Materials
   2. Section 02082 Removal of Asbestos-Contaminated Soil
   3. Section 09251 Gypsum Drywall - Asbestos Enclosures
4. Section 09805 Encapsulation of Asbestos-Containing Materials

1.5 AGGRESSIVE SAMPLING BY THE OWNER

A. All Air Samples will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower (746 watts) electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10,000 (283 cubic meters) cubic feet of room volume.

2. One 20 inch (508 mm) diameter fan per 10,000 cubic feet (283 cubic meters) of room volume will be mounted in a central location at approximately 6 feet-6 inches (2 meters) above floor, directed toward ceiling and operated at low speed for the entire period of sample collection.

3. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors of vents.

4. After air sampling pumps have been shut off, fans will be shut off.

5. In work areas where a dirt floor or exposed fibrous glass insulation is in the space, but outside the work area, maintain a critical barrier to prevent disturbance of these surfaces during aggressive sampling.

1.6 SCHEDULE OF CLEARANCE AIR SAMPLES BY OWNER

A. Sample cassettes: Samples will be collected on 25 mm. cassettes as follows:

1. PCM: 0.8 micrometer mixed cellulose ester.

2. TEM (Schools): 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

B. Number and Volume of Samples: The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner may vary depending upon job conditions and the analytical method used.

C. Sampling sensitivity:

1. PCM: Based on a limit of detection (LOD) of 7 fibers/mm² on the filter (approximately 5 fiber counted in 100 fields) and a 95% confidence limit, a sample volume of sufficient size that a single sample indicates compliance with the limit values given below. A sample must be at or below the LOD to indicate that it is at or below the limit value. Note: This is different from quantifying a concentration which is a stricter requirement and would need a larger sample volume.

   a. Clearance samples - a limit value of 0.01 f/cc.

2. TEM: Analytical Sensitivity as set forth in the analytical method used or the AHERA regulation.
D. Phase Contrast Microscopy:

1. In each Work Area after completion of all cleaning work, a minimum of 7 samples will be taken and analyzed as follows:

<table>
<thead>
<tr>
<th>Location Sampled</th>
<th>No. of Samples</th>
<th>Limit Value (Fibers/cc)</th>
<th>Approximate Volume (Liters)</th>
<th>Rate (Liters Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Work Area</td>
<td>5</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Or Each Room of Work Area</td>
<td>1 (5 min.)</td>
<td>0.01</td>
<td>1,300</td>
<td>1-14</td>
</tr>
<tr>
<td>Work Area Blank</td>
<td>1</td>
<td>0.01</td>
<td>0</td>
<td>open for 30 seconds</td>
</tr>
<tr>
<td>Laboratory Blank</td>
<td>1</td>
<td>0.01</td>
<td>0</td>
<td>Do Not Open</td>
</tr>
</tbody>
</table>

2. Analysis: Fibers on each filter will be measured using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, or the OSHA Reference Method (ORM) (29 CFR 1926.1101 Appendix A).

3. Fibers: referred to in this section include fibers regardless of composition as counted by the phase contrast microscopy method used.

4. Split Sample: One Work Area sample may be split and both halves analyzed separately for duplicate analysis.

5. Release Criteria: Decontamination of the work site is complete when every Work Area sample is at or below the Detection Limit above. If any sample is above the Detection Limit then the decontamination is incomplete and recleaning per section 01711 Project Decontamination is required.

1.7 TRANSMISSION ELECTRON MICROSCOPY

A. In each Work Area after completion of all cleaning work, a minimum of *13 samples will be taken and analyzed as follows (if required):

<table>
<thead>
<tr>
<th>Location Sampled</th>
<th>No. of Samples</th>
<th>Analytical Sensitivity (Structures/cc)</th>
<th>Approximate Volume (Liters)</th>
<th>Rate (Liters Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Work Area</td>
<td>5</td>
<td>0.005</td>
<td>1,300</td>
<td>1-10</td>
</tr>
<tr>
<td>Outside Each Work Area</td>
<td>5</td>
<td>0.005</td>
<td>1,300</td>
<td>1-10</td>
</tr>
<tr>
<td>Work Area Blank</td>
<td>1</td>
<td>0.005</td>
<td>0</td>
<td>open for 30 seconds</td>
</tr>
<tr>
<td>Outside Blank</td>
<td>1</td>
<td>0.005</td>
<td>0</td>
<td>open for 30 seconds</td>
</tr>
<tr>
<td>Laboratory Blank</td>
<td>1</td>
<td>0.005</td>
<td>0</td>
<td>Do Not Open</td>
</tr>
</tbody>
</table>

*13 Samples utilized in accordance with AHERA protocol in Schools, and is obtained at a Rate between 1-10 Liters Per Minute. Where TEM analysis is used as the Release Criteria in Facilities other than Schools, 5 samples will be obtained from Each Work Area, and may be obtained at a Rate between 1-14 Liters Per Minute.

B. Analysis will be performed using the analysis method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

C. Asbestos Structures referred to in this Section include asbestos fibers, bundles, clusters or matrices, as defined by method of analysis.
D. Release Criteria: Decontamination of the work site is complete if either of the following two sets of conditions are met:

1. Work Area Samples are below filter background levels
   a. All Work Area sample volumes are greater than 1,199 liters for a 25 mm. sampling cassette.
   b. The average concentration of asbestos of the five Work Area Samples does not exceed the filter background level of 70 structures per square millimeter of filter area.

2. Work Area Samples are not statistically different from Outside samples
   a. All sample volumes except for blanks are greater than 560 liters for a 25 mm. sampling cassette.
   b. The average asbestos concentration of the three blanks is below the filter background level of 70 structures per square millimeter of filter area.
   c. Average asbestos concentrations in Work Area Samples are not statistically different from Outside samples, as determined by the Z-test calculation found in 40 CFR Part 763, Subpart E, Appendix A (Z is less than or equal to 1.65)

E. If these conditions are not met then the decontamination is incomplete, repeat the cleaning procedures of this section.

F. Termination of Analysis: if the arithmetic mean (average) asbestos concentration on the blank filters exceed 70 structures per square millimeter of filter area the analysis will cease and new samples collected.

1.8 LABORATORY TESTING BY THE OWNER

A. Phase Contrast Microscopy by the Owner:
   1. The services of a testing laboratory will be employed by the Owner to perform laboratory analysis of the air samples. A microscope and technician may be set up at the job site, or samples will be sent daily by overnight mail, so that verbal reports on air samples can be obtained within 2 hours. A complete record, certified by the testing laboratory, of all air monitoring tests and results will be furnished to the Owner, Project Administrator, Asbestos Project Manager, Designer, and the Contractor.

B. Transmission Electron Microscopy by the Owner:
   1. Samples will be sent by courier for analysis by Transmission Electron Microscopy. Samples will not be carried on weekends, so that samples shipped on Friday will arrive on the following Monday. Verbal results will normally be available during the following working day after receipt of samples by the laboratory (dependent on Owner requirements) so that verbal reports on air samples can be obtained within 6 hours. A complete record, certified by the testing laboratory, of all air monitoring tests and results will be furnished to the Owner, Project Administrator, Asbestos Project Manager, Designer, and the Contractor.

1.9 SUBMITTALS

A. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for “Unrestricted Use” or “Final But Restricted Use.”
   1. Submit test report from an independent testing laboratory on the fire resistance rating of the assembly of the sprayback fireproofing on the lock-back sealer used.
B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Approved As Noted.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 START OF WORK

A. Previous Work: During completion of the asbestos abatement work specified in other sections, the Secondary Barrier of polyethylene sheeting will have been removed and disposed of along with any gross debris generated by the asbestos abatement work.

B. Visual inspection: Perform visual inspections of the work area along with the Asbestos Project Manager/Designer/Air Monitoring Specialist at each step of the decontamination process (where required, and at the discretion of the Asbestos Project Manager/Designer).

   1. Contractor will provide a 24 hour notification, in writing, to the Asbestos Project Manager/Designer/Air Monitoring Specialist that the Work Area(s) is ready for Visual Inspection(s).

   2. Contractor will provide an adequate notification, in writing, to and mutually agreeable with the Asbestos Project Manager/Designer/Air Monitoring Specialist of any additional requests for Visual Inspection(s), either due to previously failed Visual Inspection(s), or Courtesy Visual Inspection(s) for 1st, 3rd, or Final Cleaning Visual Inspection(s).

   3. Follow inspection procedures in EPA Purple Book;

   4. Follow inspection procedures in the American Society for Testing and Material (ASTM) standard for visual inspections, ASTM E1368, and;

   5. Follow inspection procedures in AQCC Regulation 8 standard for visual inspections, requirement for visual inspections, Section III.C.7.a., Clearing Abatement Projects.

C. Start of Work: Work of this section begins with the cleaning of the Primary Barrier. At start of work the following will be in place:

   1. Primary Barrier: Two layers of polyethylene sheeting on floor and one layer on walls.

   2. Critical Barrier: An airtight barrier between the Work Area and other portions of the building or the outside.

   3. Critical Barrier Sheetings: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers and other openings.

   4. Decontamination Units: For personnel and equipment in operating condition.

   5. Pressure Differential System: In operation.
3.2 FIRST CLEANING

A. First Cleaning: Carry out a first cleaning of all surfaces of the work area including items of remaining sheeting, tools, scaffolding and/or staging by use of damp-cleaning and mopping, and/or a High Efficiency Particulate Air (HEPA) filtered vacuum. (Note: A HEPA vacuum may fail if used with wet material.) Do not perform dry dusting or dry sweeping. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.

   1. Remove All Filters in Air Handling System(s) and dispose of as asbestos-containing waste in accordance with requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material.

B. Contractor’s Testing: After the surfaces have passed a visual inspection by the Contractor verifying that all debris and residue has been removed from the sheet plastic, allow a waiting period that is long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain Pressure Differential System in operation for the entire 96 air change period.

3.3 SECOND CLEANING

A. Second Cleaning: Carry out a second cleaning of all surfaces in the work area in the same manner as the first cleaning.

B. Visual inspection: Before the application of any sealer to abated surfaces as a lock-back, perform a visual inspection to determine if all ACM including debris and residue has been removed. Perform visual inspections along with Asbestos Project Manager/Designer/Air Monitoring Specialist. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by the Asbestos Project Manager. After this visual inspection is passed, lock-back sealants can be applied and the work area decontamination process can be initiated.

C. Sealing of substrate: Perform sealing of substrate or installation of spray-applied finishes or fireproofing, where required, at this time. Maintain Pressure Differential System in operation during encapsulation work. Perform work only after meeting the following requirements:

   1. Surfaces to be covered with sealer have met the requirements for a visual inspection in this section.

   2. Airborne fiber counts in the Work Area are at or below 0.01 fibers per cubic centimeter as measured by phase contrast microscopy.

D. Removal of Primary Barriers:

   1. Immediately following the second cleaning of the Primary plastic, remove all Primary Barrier sheeting and Material Decontamination Unit, if there is one, leaving only:

      a. Critical Barrier: Which forms the sole barrier between the Work Area and other portions of the building or the outside.

      b. Critical Barrier Sheet: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers, and other openings.

      c. Decontamination Unit: For personnel, in operating condition.

      d. Pressure Differential System: Maintain in continuous operation.
3.4 FINAL CLEANING

A. Final cleaning: Carry out a final cleaning of all surfaces in the work area in the same manner as the first cleaning immediately after removal of Primary plastic. This cleaning is now being applied to existing room surfaces. Take care to avoid water marks or other damage to surfaces.

B. Contractor's Testing: At the completion of the above cleaning visually inspect all surfaces. Reclean if any dust, debris, etc. is found. At completion of this inspection sweep entire Work Area including walls, ceilings, ledges, floors and other surfaces in the Work Area with exhaust from forced-air equipment (leaf blower with approximately 1 horsepower (745.7 watts) electric motor or equivalent). Do not direct forced-air equipment at any seal in any Critical Barrier. If any debris or dust is found repeat the cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced-air equipment.

C. Cleaning Carpeting: At the completion of cleaning of all surfaces except carpeting, HEPA vacuum carpeting designated to remain in Work Areas using a floor cleaning attachment adjusted so that rubber skirting is in contact with carpet surface. Use a passive (non-power brush type) floor attachment with rubber floor seals and adjustable above-floor height. Completely clean carpeting in one direction with each pass of the floor attachment overlapping the previous pass by one-half the attachment width. At the completion of one such cleaning, vacuum clean in the same manner in a direction at right angles to the initial cleaning. Perform a visual inspection of the carpet at the completion of cleaning, in accordance with inspection standards of the American Society for Testing and Material (ASTM) standard for visual inspections, ASTM E1368.

D. After a visual inspection, again wait for a period of time long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to allow HEPA filtered fan units to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain pressure differential system in operation for the entire 96 air change period.

3.5 FINAL VISUAL INSPECTION

A. After Final Cleaning Perform a Complete Final Visual Inspection of the entire Work Area including: all surfaces, ceiling, walls, floor, decontamination unit, all plastic sheeting, seals over ventilation openings, doorways, windows, and other openings; look for debris from any source, residue on surfaces, dust or other matter. During visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by the Asbestos Project Manager.

B. Temporary lighting: Provide a minimum of 100 foot candles (1075 Lumens / sq. meter) of lighting on all surfaces in the areas to be subjected to visual inspection. Provide hand held lights providing 150 foot candles (1600 lumens / sq. meter) at 4 feet (1.25 meter) capable of reaching all locations in work area.

C. Lifts: Provide ladders, scaffolding, and lifts as required to provide access to all surfaces in the area to be subjected to visual inspection. Access is to allow touching of all surfaces.

3.6 CLEARANCE AIR SAMPLING BY OWNER (TEM)

A. Phase Contrast Microscopy (PCM): After the Work Area is found to be visually clean, air samples will be taken and analyzed by the Owner in accordance with the procedure for Phase Contrast Microscopy set forth in Part 1 of this section.

1. If Release Criteria are not met, repeat Final Cleaning and continue decontamination procedure from that point.

2. If Release Criteria are met, remove work area isolation in accordance with requirements of this section, or;
B. Transmission Electron Microscopy (TEM): After the work area is found to be visually clean, air samples will be taken and analyzed by the Owner in accordance with the procedure for Transmission Electron Microscopy set forth in Part 1 of this section.

1. If Release Criteria are not met, repeat Final Cleaning and continue Decontamination procedure from that point.

2. If Release Criteria are met, remove work area isolation in accordance with requirements of this section.

3.7 AFFECT ON CONTRACT SUM

C. Affect on Contract Sum:

1. Complete corrective work with no change in the Contract Sum (adjustment may be in the form of a deduction), as follows:

   a. for any and all Test Laboratory Services and Consultant Services, additional PCM and/or TEM confirmation analysis, per Work Area as described in Section 01711 Project Decontamination, which do not meet the Specification criteria.

   b. for any and all Test Laboratory Services and Consultant Services, additional PCM and/or TEM confirmation analysis, per Work Area as described in Section 01714 Work Area Clearance, which do not meet the Specification criteria.

   c. for any and all costs incurred by the Owner, Occupants, Owner Employees, Work under other Contracts, etc., per Work Area which do not meet the Specification criteria.

3.8 FINAL AIR SAMPLING BY OWNER (PCM)

A. Work Area Size Limitation: PCM without TEM sampling may be used to clear Work Areas where the ACM involved in the work are less than or equal to 160 square feet (15 sq. meters), or 260 linear feet (80 linear meters), or as otherwise directed by the Owner, Project Administrator, Asbestos Project Manager, Designer or Air Monitoring Specialist, in compliance with local, state, and/or federal regulations.

3.9 LOCK-BACK

A. Encapsulation of substrate: Perform encapsulation of substrate or installation of spray-applied finishes or fireproofing, where required, before Removal of Work Area Isolation as specified below. Maintain Pressure Differential System in operation during encapsulation work.

3.10 REMOVAL OF WORK AREA ISOLATION

A. After all requirements of this section and Section 01714 Work Area Clearance have been met:

1. Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil (0.15 mm) polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

2. Remove Personnel Decontamination Unit.

3. Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Asbestos Project Manager/Designer, are found then the entire area affected shall be decontaminated as specified in Section 01712 Cleaning & Decontamination Procedures.
4. Remove all equipment, materials, debris from the work site.

5. Dispose of all asbestos-containing waste material as specified in Section 02084 Disposal of Regulated Asbestos-Containing Material.

3.11 SUBSTANTIAL COMPLETION OF ABATEMENT WORK

A. Asbestos Abatement Work is Substantially Complete upon meeting the requirements of this section including submission of:

1. Certificate of Visual Inspection(s)

2. Receipts Documenting proper disposal as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

3. Punch list detailing repairs to be made and incomplete items.

3.12 CERTIFICATE OF VISUAL INSPECTION

A. Following this section is a "Certificate of Visual Inspection(s)". This certification is to be completed by the Contractor and certified by the Asbestos Project Manager. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

END OF SECTION - 01711
CERTIFICATION OF VISUAL INSPECTION(S)

<table>
<thead>
<tr>
<th>Building</th>
<th>Work Area/Containment</th>
<th>Material(s)</th>
<th>Quantity(ies)</th>
<th>Type of Enclosure</th>
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</table>

**Asbestos Abatement Contractor Certification**
In accordance with local, state, federal regulations, and the Hazardous Materials Design Criteria, including but not limited to Section 01711, "Project Decontamination" the Asbestos Abatement Contractor hereby certifies that he or she has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit(s), sheet plastic, etc.) and has found no dust, debris or residue.

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<tr>
<th>Certification</th>
<th>Date/Time</th>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Title</th>
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**Air Monitoring Specialist/Asbestos Project Manager Certification**
The Air Monitoring Specialist/Asbestos Project Manager hereby certifies that he or she has accompanied the Asbestos Abatement Contractor on this (these) visual inspection(s) and verifies that this (these) visual inspection(s), as indicated, have been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Asbestos Abatement Contractor's Certification above, as indicated and where applicable, is a true and honest one.

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<th>Certification</th>
<th>Date/Time</th>
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**Asbestos Project Manager Certification**
The Asbestos Project Manager hereby certifies that he or she has reviewed the Asbestos Abatement Contractor and Air Monitoring Specialist Certification on completion of this final visual inspection and believes that this final visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Asbestos Abatement Contractor's and Air Monitoring Specialist’s Certification’s above are true and honest ones.

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SECTION 01712 - CLEANING AND DECONTAMINATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF THE WORK

A. The extent of cleaning and decontamination work is shown on the drawings.

1.  The work includes decontamination of the areas indicated in Section 01013 Summary of Work.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Work Area Clearance: Specified in Section 01714 Work Area Clearance.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL

A. Complete the following before start of work of this section:

1. 01527 Regulated Areas

2. 01562 Respiratory Protection

3. 01561 Worker Protection - Repair and Maintenance

3.2 WET CLEANING

A. Accomplish wet cleaning during decontamination with paper towels or disposable rags:

B. Immerse paper towel or rag in container of amended water or dilute removal encapsulant.

C. Wring out,

D. Fold into quarters,

E. Wipe surface once and refold to a fresh face of cloth. Proceed in this manner until all available faces of paper towel or rag have been used.

F. Dispose of paper towel or rag,

G. Do not place rag back in container to rinse out or for any other purpose. If a used towel or rag comes in contact with water, empty container and refill.

H. Material adhered to a surface with removal encapsulant may require the application of additional removal encapsulant to facilitate cleaning.
3.3 REMOVAL OF ASBESTOS-CONTAINING DEBRIS

A. Work of this Section is limited to the cleanup of a small quantity of amassed debris which has fallen from an architectural finish, fire-proofing, or thermal insulation on pipes, boilers and other equipment.

B. Remove asbestos-containing debris and decontaminate the area involved using the following sequence:

1. Shut down all ventilation into room.

2. Seal entry to work area with 6 mil (0.15 mm) polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

3. Start HEPA vacuum before entering the area.

4. Use the HEPA vacuum to clean a path at least 6 feet (1.83 m) wide from the entry point of the work area to the site of the fallen material.

5. Remove all small debris with the HEPA vacuum.

6. HEPA vacuum surfaces of all pieces too large to be removed by the suction of the HEPA vacuum.

7. Pick up such pieces and place in the bottom of a 6 mil (0.15 mm) polyethylene disposal bag conforming to the requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material. Place pieces in the bag without dropping and avoiding unnecessary disturbance and release of material.

8. Remove all remaining visible debris with HEPA vacuum.

9. HEPA vacuum an area 3 feet (0.91 m) beyond the location in which any visible debris was found in two directions each at right angles to the other.

10. Place a 6 mil (0.15 mm) polyethylene drop cloth in accordance with Section 01527, Local Area Protection, immediately on top of the HEPA vacuumed area before performing any repair work on site from which fall-out occurred.

11. HEPA vacuum the site from which material fell removing all loose material which can be removed by the vacuums suction.

12. Repair or remove remaining material.

13. HEPA vacuum ladder and/or any tools used and pass out of the work area.

C. HEPA vacuum all surfaces in the room starting at the top of wall and working downward to the floor. Then start at corner of floor farthest from Work Area entrance and work towards entrance.

1. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch (1.6 mm) of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one-half the width of the floor attachment. At the completion of one cleaning vacuum the floor a second time at right angles to the first.

D. Secure area from occupancy until air monitoring results per Section 01714 Project Decontamination indicate that area is safe for reoccupancy.
3.4 CLEANING AND DECONTAMINATING OBJECTS

A. Perform all work of decontaminating objects wherever possible on a plastic drop sheet installed in conformance with Section 01527.

B. HEPA vacuum all surfaces of object and immediate area before moving the object.

C. Pick-up object, if possible, and HEPA vacuum all surfaces.

D. Hand to off-sheet worker who will wet-clean object, if possible, and place in storage location.

E. Decontaminate area where object was located by HEPA vacuuming twice, in two perpendicular directions. Wet clean if necessary to remove any debris.

F. Return object to its original location.

3.5 DECONTAMINATION OF ROOMS

A. Shut down all ventilation into space.

B. Seal entry to Work Area with 6 mil (0.15 mm) polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

C. Install Differential Pressure System in accordance with Section 01513.

D. Recirculate HEPA filtered fan units in space by operating them so that discharge from machine is back into room. Use one HEPA filtered fan unit for each 2,500 cubic feet (70.8 cubic meters) of room volume.

E. HEPA vacuum all surfaces in the room starting at the ceiling, then top of wall and working downward to the floor.

F. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch (1.6 mm) of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one half the width of the floor attachment. At the completion of one cleaning, vacuum the floor a second time at right angles to the first.

G. Operate HEPA filtered fan unit in space for 96 air changes minimum.

H. At completion of Decontamination Work workers decontaminate in accordance with Section 01561 Worker Protection - Repair and Maintenance.

I. Secure area from occupancy until air monitoring results per Section 01714 Work Area Clearance indicate area is safe for reoccupancy.

END OF SECTION - 01712
SECTION 02062 - NON-ASBESTOS DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Extent of non-asbestos selective demolition work is indicated on drawings.

B. Non-Asbestos Demolition Work: Non-asbestos demolition requires the selective removal and subsequent offsite disposal of the following non-asbestos containing installations:

1. All Interior components of the structure as indicated on drawings and as required to accommodate new construction.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02086 Hazardous Waste Management describes the management and disposal of hazardous waste such as PCB Ballasts, fluorescent light tubes, and mercury containing thermostats encountered during the work of this section.

1.4 SUBMITTALS

A. Schedule: Submit schedule indicating proposed methods and sequence of operations for non-asbestos demolition work to Project Administrator/Asbestos Project Manager/Designer for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

2. Coordinate with Owner's continuing occupation of portions of existing building.

1.5 JOB CONDITIONS

A. Occupancy: Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will impact Owner's normal operations.

B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of commencement of Contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

C. Partial Demolition and Removal: Items indicated to be removed but of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items on site will not be permitted.
D. Protections: Provide temporary barricades and other forms of protection as required to protect Owner’s personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of building.

2. Erect temporary covered passageways as required by authorities having jurisdiction.

3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.

4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

5. Protect floors with suitable coverings when necessary.

6. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

7. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.

8. Remove protections at completion of work.

B. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

C. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

D. Explosives: Use of explosives will not be permitted.

E. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

F. Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions, such as ice, flooding, or pollution.

PART 2 - PRODUCTS (Not Applicable)
PART 3 - EXECUTION

3.1 INSPECTION

A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions of structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from selective demolition work. Submit copies of photographs to Project Administrator/Asbestos Project Manager/Designer prior to starting work.

3.2 PREPARATION

A. Decontamination Unit: Prior to beginning work of this Section complete installation of a Personnel Decontamination Unit as described in Section 01563 Decontamination Units.

B. Competent Person: Work of this Section is to be supervised by an OSHA Competent Person as described in Section 01043 Project Coordination.

C. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.
   1. Cease operations and notify the Project Administrator immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

D. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.
   1. Erect and maintain dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
   2. In areas where asbestos abatement work is to follow selective demolition erect barriers to control access as described in section 01562 “Temporary enclosures.”
   3. Where no asbestos abatement work is to follow selective demolitions and the work is immediately adjacent to occupied portions of the building, construct dustproof partitions of minimum 4 inch (100 mm) studs, 5/8 inch (16 mm) drywall (joints taped) on occupied side, ½ inch (13 mm) fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.
   4. Provide weatherproof closures for exterior openings resulting from demolition work.

3.3 DEMOLITION

A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power driven impact tools.

C. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

D. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

E. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Project
Administrator/Asbestos Project Manager/Designer in written, accurate detail. Pending receipt of directive from Project Administrator/Asbestos Project Manager/Designer rearrange selective demolition schedule as necessary to continue overall job progress without delay.

F. Asbestos contamination: If a disturbance of ACM occurs remove any released material and decontaminate the immediate vicinity of the release in accordance with the requirements of Section 01712 Cleaning & Decontamination Procedures.

3.4 SALVAGE MATERIALS

A. Salvage Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store and turn over to Owner and obtain receipt.

   1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the Owner. Notify Project Administrator/Asbestos Project Manager/Designer if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

B. Carefully remove, clean, and deliver to Owner the following items:

   1. Not applicable.

3.5 HAZARDOUS WASTE MANAGEMENT AND DISPOSAL

A. All hazardous waste management and disposal will be coordinated with the Project Administrator/Asbestos Project Manager/Designer, and designated Owner Representative(s).

B. Manage and dispose of hazardous waste such as PCB ballasts, fluorescent light tubes, batteries, and mercury thermostats, etc., in accordance with the requirements of Section 02086 - Hazardous Waste Management.

C. Do not mix potentially hazardous waste streams. Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

D. Segregate, package, label, transport and dispose of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

B. If hazardous non-asbestos containing materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

C. Burning of removed materials is not permitted on project site.

D. Disposal of asbestos-containing waste is not in the work of this section. Disposal of this material is specified in Section 02084 Disposal of Regulated Asbestos Containing Material.

3.7 CLEANUP AND REPAIR

A. Upon completion of demolition work, remove tools, equipment and demolished materials from site.
B. In areas where no asbestos abatement work is to occur, remove protections and leave interior areas broom clean.

C. In areas where asbestos abatement work is to occur, leave protections in place as required by abatement work. Leave area broom clean. Additional cleaning as required for abatement work is not in work of this section.

D. Repair demolition performed in excess of that required. Return structures and surfaces to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

E. Perform all repair work in asbestos abatement Work Areas after completion of asbestos abatement work.

END OF SECTION - 02062
SECTION 02075 - LEAD BASED PAINT HAZARD CONTROL PLAN

PART 1  GENERAL

1.1  RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

B. This specification covers the abatement of existing building components which have been tested and determined to be covered with lead-based paint (LBP).

1.2  DESCRIPTION OF WORK

A. This section details all areas where LBP abatement work is to be performed and lists areas requiring special protection during the abatement work (however, does not cover target housing described under AQCC Regulation 19). The Contractor shall furnish all labor, materials, services, training, insurance, and equipment as needed to complete removal of LBP located as indicated below. The Contractor shall follow all local, state, and/or federal regulations and rules pertaining to lead, including its storage, transportation and disposal as described in Paragraph 1.4.

B. The following Lead Based Painted items are to be demolished. The Contractor will remove these waste streams in accordance with local, state, and/or federal regulations, including but not limited to full compliance to the work practices specified in the OSHA standard (29 CFR 1926.62), and Section 02075 Lead Based Paint Hazard Control Plan, and disposed of as a ‘Hazardous’ waste:

   1. Refer to Section 01013, Miscellaneous Provisions (as indicated).

C. Floors or other surfaces requiring special protection, such as the use of plywood, canvas drop cloths or additional layers of plastic sheet, include the following:

   1. All floors walls and ceilings shall be protected from lead containing dust during all lead based paint abatement or shall be cleaned of lead containing dusts prior to asbestos abatement.

1.3  DEFINITIONS AND ABBREVIATIONS

A. The following definitions apply to the work of this specification:


   2. “AC” - Alternating current.

   3. “Accredited Laboratory” - A laboratory which is accredited by the American Industrial Hygiene Association, and successfully participates in the Environmental Lead Laboratory Accreditation Program for paint samples and dust wipes or in the Industrial Hygiene Laboratory Accreditation Program for metals on filters for airborne lead samples.

   4. “Accuracy” - The degree to which a measurement process determines a known amount of lead or other component in a particular reference material.

   5. “Action Level” - An employee exposure, without regard to the use of respirators, to the OSHA action level of an airborne concentration of lead as defined in 29 CFR 1926.62.

   6. “Air Monitoring” (air sampling) - The process of measuring the lead content of a specific volume of air using the National Institute for Occupational Safety and Health (NIOSH) method or other method approved by the
Asbestos/Lead Project Manager. Flow rate and sample volume shall be in accordance with the method chosen. 
(Also see Area Monitoring and Exposure Monitoring.)

7. “Air Monitoring Specialist” means a person contracted or employed to conduct air monitoring, and who has successfully completed an Air Monitoring Specialist course at an Approved EPA Training Center.


9. “Area Monitoring” - Air monitoring of lead concentrations within the lead control area and outside the lead area, which is a representative of the ambient airborne concentration of lead (Also see Exposure Monitoring).


11. “ASME” - American Society of Mechanical Engineers.


13. “Authorized Visitor” - The Asbestos/Lead Project Manager and/or it's delegated personnel, Project Administrator, Designer, Air Monitoring Specialist, a visitor authorized by the Asbestos/Lead Project Administrator, or a representative of any regulatory or other agency having jurisdiction over the project.

14. “Biological Monitoring” - The sampling and analysis of a person's blood for lead and zinc protoporphyrin levels.


16. "Certified Industrial Hygienist (C.I.H.)": one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.


18. “Change Room and Shower Facilities” - Rooms within the designated physical boundary around the lead control area equipped with separate storage facilities for clean protective work clothing and equipment and for street clothes which prevent cross-contamination.

19. “Characteristics” - EPA has identified four characteristics of a hazardous waste: ignitability; corrosivity; reactivity; and toxic characteristic leaching procedure (TCLP). Any solid waste that exhibits one or more of these characteristics is classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA).

20. “Chemical Remover” - A pre-mixed chemical penetrating agent designed specifically for removal of lead containing material.

21. “Contaminated/Equipment Room” - A contaminated area or room within the decontamination enclosure system which adjoins the work area, with provisions for storage of contaminated clothing or equipment.

22. “Decontamination Area” - An area adjacent and connected to a regulated area and consisting of an equipment room, shower area, and a clean room, which is used for the decontamination of workers, materials, equipment contaminated with lead without carrying out lead dust to uncontaminated areas.

23. “Designer” - This is the entity described as the “Project Designer” or “Designer” in accordance with local, state, and/or federal regulations. All references to Architect or Engineer in the Contract Documents in all cases refer to the Designer. The Designer will represent the Owner during construction and until final payment is due. The Designer will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Designer.
24. “Disposal” - All procedures necessary to transport lead-containing waste removed from the building and deposit it in a waste disposal site in compliance with applicable regulations.

25. “Disposal Site” - A site approved by the EPA and/or applicable State and local hazardous waste control agencies for the disposal of lead-containing wastes.

26. “DOT” - The United States Department of Transportation.

27. “Encapsulant” (sealant) - A liquid which can be applied to lead containing areas and which controls the possible release of LBP from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

28. “Encapsulation” - Involves resurfacing or covering a surface, and sealing or caulking with durable materials, so as to prevent or control chalking and flaking of lead-containing substances.

29. “EPA” - The United States Environmental Protection Agency.

30. “EPA Identification” - The unique number assigned by EPA to each generator or transporter of hazardous waste, and each treatment, storage, or disposal facility.

31. “Exposure Assessment” - An initial determination to determine if any employee may be exposed to lead at or above the action level. The Contractor shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

32. “Exposure Monitoring” - Worker air monitoring to establish initial or to document on-going lead exposure levels. Shall be done to enable each employee's exposure level to be reasonable represented by at least one full-shift (at least 7 hours) air sample in accordance with 29 CFR 1926.62.

33. “Final Inspection” - Inspection by a qualified inspector or industrial hygienist to determine whether lead control work and clean up are complete.

34. “Fixed Object” - A unit of equipment or furniture in the work area or beneath the work area which cannot be removed from the work area.

35. “Generator” - Any person who first creates a hazardous waste subject to 40 CFR 260-299 regulation (i.e., imports a hazardous waste; initiates a shipment of a hazardous waste from a hazardous waste treatment, storage, or disposal facility (TSD); or mixes hazardous wastes of different Department of Transportation (DOT) shipping descriptions by placing them into a single container).

36. “Hazardous Waste” - As defined in RCRA, a solid waste or combination of solid wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may:

   Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness;

   or

   Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

   As defined in the regulations, solid waste is hazardous if it meets one of four conditions:

   1) Exhibits a characteristic of a hazardous waste (40 CFR Section 261.20 through 262.24).
2) Has been listed as hazardous (40 CFR Section 261.31 through 261.33).

3) Is a mixture containing a listed hazardous waste and a nonhazardous solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste).

4) Is not excluded from regulation as a hazardous waste.

37. “HEPA Filter” - A High Efficiency Particulate Air filter capable of trapping and retaining 99.97% of particles with aerodynamic equivalent diameters greater than or equal to 0.3 micrometers.

38. “HEPA Filtered or Vacuum Equipment” - Equipment equipped with a HEPA filter in the exhaust outlet, and so designed and maintained that 99.97% of particles with aerodynamic equivalent diameters greater than or equal to 0.3 micrometers in the inlet air are collected and retained.

39. “High Phosphate Detergent” - Detergent which contains at least 5% trisodium phosphate (TSP).

40. “HVAC System” - The heating/ventilation/air conditioning system of the building.

41. “ICP, AES” - Inductively coupled plasma, atomic emission spectroscopy.

42. “Industrial Hygienist” (as defined by Colorado SB 97-119): 1.2) means an individual who has obtained a baccalaureate or graduate degree in industrial hygiene, biology, chemistry, engineering, physics, or a closely related physical or biological science from an accredited college or university. The special studies and training of such individual shall be sufficient in the cognate sciences to provide the ability and competency to:

(a) anticipate and recognize the environmental factors and stresses associated with work and work operations and to understand their effects on individuals and their well being;

(b) evaluate on the basis of training and experience and with the aid of quantitative measurement techniques the magnitude of such environmental factors and stresses in terms of their ability to impair human health and well-being;

(c) (i) prescribe methods to prevent, eliminate, control, or reduce such factors and stresses and their effects.

(ii) any individual who has practiced within the scope of the meaning of industrial hygiene for a period of not less than five years immediately prior to July 1, 1997, is exempt from the degree requirements set forth in this subsection (1.2).

(iii) any individual who has a two-year associate of applied science degree in environmental science from an accredited college or university and in addition not less than four years practice immediately prior to July 1, 1997, within the scope of the meaning of industrial hygiene is exempt from the degree requirements set forth in this subsection (1.2).

43. “Industrial Hygiene Technician” - A person qualified by training or experience to collect air samples for lead. Shall be familiar with sampling techniques, sampling equipment, calibration procedures and work practices useful for controlling air contamination.

44. “Landfill” - A disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a land treatment facility, a surface impoundment, or an injection well.

45. “LBP” - Lead Based Paint.

46. “LBP Project Manager” - This is the entity described as the Project Manager in accordance with local, state, and/or federal regulations. The Asbestos Project Manager will advise and consult with the Owner.
47. “LBP Removal” - A strategy of paint removal which entails stripping (mechanically or chemically) LBP from surfaces of components.

48. “Lead” - Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

49. “Lead Control Area” - An enclosed area to prevent the spread of lead dust, paint chips, or debris from lead-containing paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

50. “Listed - Hazardous wastes that have been placed on one of three lists developed by EPA” - non-specific source wastes; specific source wastes; or commercial chemical products. These lists were developed by examining different types of waste and chemical products to see if they exhibit one of the four hazardous waste characteristics, meet the statutory definition of hazardous waste, are acutely toxic or acutely hazardous, or are otherwise toxic.

51. “Manifest” - The shipping document, EPA form 8700-22 or state manifest form (if applicable), used for identifying the quantity, composition, origin, routing, and destination of hazardous waste during its transportation from the point of generation to the point of treatment, storage, or disposal.

52. “Material Safety Data Sheet (MSDS)” - Information on a product, supplied by the manufacturer, which provides the information listed by OSHA in 29 CFR 1910.1200(g)(2).

53. “Medical Removal” - The temporary removal of workers due to elevated blood lead levels.

54. “mg/cm2” - Milligrams per square centimeter.

55. “Movable Object” - A unit of equipment or furniture in or beneath the work area which can be removed.


58. “OSHA” - The Occupational Safety and Health Administration of the U.S. Department of Labor.

59. “PAPR” - Powered air purifying respirator.

60. “Permissible Exposure Limit (PEL)” - The OSHA standard for airborne concentration of lead as defined in 29 CFR 1926.62.

61. “Permit” - An authorization license or equivalent control document issued by EPA or an authorized State to implement the regulatory requirements of 40 CFR 264 and 265 for TSDs.

62. “Project Administrator” - This is the entity described as the "Project Administrator". The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon written or verbal order if requirements of the Contract Documents are not met, or if in the sole judgment of the Owner, Project Administrator, LBP Project Manager, or Designer, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work. The Owner's instructions to the Contractor will be forwarded through the Project Administrator.


64. “Replacement” - A strategy of lead control which entails the removal of components such as windows, doors, and trim that have lead-painted surfaces and installing new components free of lead paint.
65. “Scraping” - The process of wetting down with amended water and removing loose, peeling or chipped LBP from the substrate; collection of debris and disposal as a hazardous waste. Usually performed with hand tools such as a broad blade putty knife; does not include sanding (manual or powered).

66. “Solid Waste” - As defined in RCRA, any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solid or dissolved materials in irrigation return flows or industrial discharges which are point source subject to permits under the Clean Water Act, or special nuclear or by-product material as defined by the Atomic Energy Act of 1954.


68. “Time-Weighted Average (TWA)” - An 8-hour, time-weighted average of airborne concentration for lead per cubic meter of air which represents the employee's 8-hour workday.

69. “TSD” - Hazardous waste treatment, storage, or disposal facility.

70. “TSP” - Trisodium phosphate.

71. “Work Area” - an isolated area of the building where lead abatement activities are performed.

1.4 DOCUMENTS INCORPORATED BY REFERENCE

A. The current issue of each document shall govern. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.

1. Hazardous waste regulations:


3. 40 CFR 300-399 (Comprehensive Environmental Response, Compensation and Liability Act; CERCLA).

4. Occupational Safety and Health Administration (OSHA) regulations, with special attention to the following:

   a. 29 CFR 1926.62 (lead in construction).
   b. 29 CFR 1910 (general industry).
   d. 29 CFR 1910.300-399 (electrical).
   e. 29 CFR 1926 (construction safety).
   f. 29 CFR 1926.52 (noise).
   g. 29 CFR 1926.59 (hazard communication).
   h. 29 CFR 1926.400-449 (electrical).
   i. 29 CFR 1926.450-452 (ladders and scaffolding).
   j. 29 CFR 1926.16 (Contractors responsibilities).
   k. 29 CFR 1926.20 (general safety and health provisions).
l. 29 CFR 1926.21 (safety training and education).

m. 29 CFR 1926.25 (housekeeping).

n. 29 CFR 1926.28 (personal protective equipment).

o. 29 CFR 1926.51(f) (washing facilities).

p. 29 CFR 1926.55 (gases, vapors, fumes, dusts and mists).

5. U.S. Department of Transportation (DOT) regulations, with special attention to the Hazardous Materials Regulations, 49 CFR 171-180, in particular:


b. 49 CFR 172.300-308, 324 (marking).

c. 49 CFR 172.400, 466 (labeling).

d. 49 CFR 172.500, 504, 560 (placarding).


a. Standard for Electrical Safety Requirements for Employee Workplaces, NFPA 70E.

8. Housing and Urban Development (HUD) documents

a. Guidelines for the Evaluation and Control of Lead-Based Hazards in Housing.

9. State and local environmental and occupational safety and health regulations, where applicable, with special attention to lead, respirator, construction safety, electrical safety, and hazardous waste regulations.

1.5 SUBMITTALS AND NOTICES

A. Approval by the Project Administrator/LBP Lead Project Manager/Designer is required of the following submittals required prior to commencement of work. A checklist of compliance with these submittal requirements is attached as Appendix A.

1. Submit a statement which demonstrates the Contractor's qualifications and experience as a firm of established reputation, regularly engaged in, and maintaining a regular force of workers that are trained and skilled in LBP removal, and which has successfully performed LBP abatement work on comparable previous projects. The statement shall include, as a minimum:

a. Years firm has been engaged in LBP abatement. Acceptable experience shall include at least the last 3 years of LBP abatement work in comparable projects.

2. A list of projects performed in the last 3 years that are similar to this project. Acceptable experience shall include at least five (5) comparable LBP abatement projects. Include name, address and telephone numbers of the purchaser(s) of services; the industrial hygienist, if any, overseeing the work; location; and type and physical amount of work.
3. A description of the qualifications and experience of all supervisors (such as project managers, on-site supervisors, foremen, etc.) proposed for this project including:
   a. Evidence of current training in LBP abatement by a EPA accredited school, a State program, or equivalent successful completion of LBP worker training (describing the training provider, subject matter, and dates and duration of course, and qualifications of the training provider(s)).
   b. Evidence of previous supervision of at least five LBP abatement projects similar in scope and nature to the present project and the name, address and telephone number of each of the purchasers of services.

4. A statement of the qualifications and experience of the workforce, including a description of the LBP training program for the workforce. This shall include a statement that workers have successfully completed LBP worker training (describing the training provider, subject matter, and dates and duration of course, and qualifications of the training provider). Describe any special expertise of any of the workers.

5. Industrial hygienist(s) and industrial hygiene technicians. A statement of the qualifications and experience of the industrial hygienist(s) and, if used, industrial hygiene technicians, including:
   a. A record of experience qualifying the industrial hygienist(s) as a professional and specialist in LBP abatement. As a minimum this shall include at least 2 years of industrial hygiene experience in LBP abatement project inspection. Include the name and address of the purchaser of the service, location of the work performed, and a review of the industrial hygiene activities performed for each such project in the last 2 years.
   b. If an industrial hygiene technician(s) will participate in this project, a description, for each technician, of training in air monitoring and a review of previous air monitoring experience in LBP removal projects. Include the name and address of the purchaser of the service, location of the work performed and a review of all air monitoring and other inspection activities performed for each such project in the last 2 years.

6. The Contractor's Personal Protective Equipment (PPE) Program including its Respiratory Protection Program shall be submitted. Minimum qualifications are as specified in 29 CFR 1926.62 and, where applicable, State regulations. See this specification for minimum respiratory protective equipment requirements under this contract.

7. A list of all LBP equipment, tools and materials available for use on this project. Include certification by manufacturers that all HEPA equipment meets ANSI Z9.2.

8. A description of the Contractor's medical surveillance program for persons under the supervisory control of the Contractor who may be occupationally exposed to airborne lead dust or other hazardous substances under this contract. Minimal qualifications shall be as specified in 29 CFR 1926.62, or, where applicable, State regulations.

B. A statement containing the following information:

1. A record of any citations, fines, settlements or confirmed violations issued by any regulatory or legal agency concerning performance on hazardous materials abatement contracts in the last 3 years. For each such occurrence, describe the circumstances, citing the project, persons involved, type of action, stoppage of work, if any, agency involved, and resolution.

2. A list of all occasions in the last 3 years in which the Contractor has been issued a Stop Work Order due to negligence or noncompliance with LBP or other hazardous materials abatement or related project specifications. Briefly describe the circumstances and outcome of each occurrence, including liquidated damages, overruns in scheduled time limitations, and resolution.

3. A description of all situations in the last 3 years in which a hazardous materials-related contract has been terminated, specifying project, dates and reasons for termination.
4. Listing of any hazardous materials-related litigation or arbitration in the last 3 years in which the Contractor (or any of its employees proposed for work on this project) has participated or is currently involved arising out of performance on an LBP related contract. Include descriptions of role, issue, and resolution to date including any liquidated damages assessed. Note that participation in litigation or arbitration is not itself a disqualifying factor, since, for example, it may reflect assertion of Contractor's rights.

C. A statement regarding the Contractor's insurance status, including:

1. Proof of coverage under the State Workers Compensation insurance system.

2. Certificate of general liability insurance. Such insurance shall provide coverage for lead-related occupational illness or death as well as other occupational illness or death, personal injury and property damage, on either an occurrence basis or a claims-made basis with at least a 10-year tail. Specify coverage limits and identify any exclusions to the coverage. If not currently covered by such insurance, provide a copy of the most recent certificate of such insurance and a statement from an insurer that such insurance will be provided if the Contractor is awarded this contract.

D. Submit a plan of action for handling LBP and other hazardous materials throughout the project. This plan shall contain at least:

1. Overall statement of procedures proposed for use in complying with the regulations and requirements included in this specification.

2. The submittals listed in the Safety and Health, paragraphs on Submittals.

3. Submit the Contractor's Lead Exposure Compliance Program. Minimum requirements are specified in 29 CFR 1926.62(e)(2), and, where applicable, State regulations. The Contractor shall review and update the plan when applicable and submit revisions to the Project Administrator, Asbestos/Lead Project Manager, and Designer/Air Monitoring Specialist.

4. The description of the quality assurance program, to include at least:

a. Measures to assure control of unsafe or unhealthy conditions, ensure low levels of lead inside and outside the work area, prevent release of lead dust outside the work area, damage to the building or its furnishings, avoid buildup of uncontained lead-contaminated materials inside the work area, and ensure reliability of sampling and analysis.

b. Waste cleanup procedures and disposal plan, including on-site waste packaging method, name and location of disposal site(s), each having an EPA Identification Number as a hazardous waste disposal site; and copies of applicable Identification Numbers, certificates and registrations for hazardous waste transporter(s), transferor(s), treater(s) and disposal site(s).

c. Detailed description of the methods to be employed to control pollution and minimize generation of hazardous and non-hazardous waste.

d. Methods to be used to assure the protection of the safety and health of building occupants and visitors to the site from the effects of work under this contract.

e. Assured equipment grounding conductor program, if established.

f. Closing out of the building's HVAC system, identifying specific components of the building HVAC system which shall be sealed off from the subject work area, and methods to be employed to secure it.
E. Emergencies:

1. The Contractor shall develop procedures to be followed in the event of untoward circumstances including, but not limited, to fire, electric shock, life-threatening bodily injury inside or outside of the work area, the detection of airborne lead levels that exceed the OSHA action level outside the work area, or splitting/spilling of lead waste bags in route to the waste truck.

2. Contact information, including a list of names and telephone numbers (with area codes) of the Contractor's contact persons, the Project Administrator, Lead Project Manager, Designer, Air Monitoring Specialist, other contact persons as designated by the Project Administrator/LBP Project Manager, the fire department, police department, general emergency number (if used), and local hospital or similar emergency care unit shall be available to the Contractor's employees at all times work is performed. A copy of this emergency contact information is to be kept at the job site, available for inspection by the Project Administrator, LBP Project Manager, Designer, and/or Authorized Visitor, and updated as required.

F. Materials:

1. Submit information on the chemical strippers (if applicable) to be used, including evidence that each possesses the characteristics given in this specification.

2. Submit information on the encapsulant, (if applicable), to be used, including evidence that each possesses the characteristics given in this specification.

3. Submit the Material Safety Data Sheets (MSDS’s) for any materials brought to the facility site, for which MSDS’s are provided.

G. Submit a statement describing the proposed organization of the LBP work, including:

1. Sequencing of LBP work.

2. Length and projected times of day of work shifts.

3. Interface of trades involved in the work.

4. A detailed description of any proposed methods of special LBP abatement procedures, where used. Submit manufacturer's technical specifications and product description literature for the methods and equipment used.

H. Submit a statement describing the proposed environmental monitoring program, including:

1. The names of the industrial hygienist(s) and, where used, industrial hygiene technician(s) taking samples, the type(s) of sampling equipment and procedures, sampling schedules, analytical method(s) for air, calibration equipment and procedures, chain-of-custody procedures and documentation, laboratory and analyst qualifications, and record keeping program.

2. The identification and qualifications of analytical laboratory(ies) and personnel. Each laboratory used shall be accredited by the American Industrial Hygiene Association (AIHA) Industrial Hygiene Laboratory Accreditation Program for metals on filters for airborne lead samples; wipe and paint scraping samples shall be analyzed by a laboratory qualified by the AIHA Environmental Lead Proficiency Analysis Testing Program.

3. The analytical quality assurance program shall provide that complete explanations shall be given to the Project Administrator/LBP Project Manager/Designer at the time that analytical results are delivered for any samples found to be contaminated or damaged, and for any air samples which are voided or judged to be of uncertain or suspicious quality.
I. The Contractor shall provide a statement describing the proposed work force, including certification that each person under the supervisory control of the Contractor who may be occupationally exposed to airborne lead levels under this contract have been examined by a licensed physician within the past year. The physician shall have certified that each such worker has been found to be medically suited to perform LBP abatement work, that the worker's blood lead levels are less than 40 micrograms per deciliter, and that the worker can wear a respirator and impervious garments while performing vigorous physical labor. Minimum qualifications are as specified in 29 CFR 1926.62 and, where applicable, State regulations.

J. Provide regulatory agencies with project notifications.

1. For work in a state which requires certification or registration of LBP abatement Contractors, supervisors and/or workers, proof of all such certifications or registrations. Such certifications or registrations shall be maintained in force as a condition of continuation of work under this contract. Copies of renewals of such certifications or registrations shall be provided as they become effective, and notices of cancellation or expiration shall be provided if the affected organization or person continues to perform work under this contract thereafter.

2. Documentation that all required permits, certificates, licenses, and other arrangements for transportation, treatment, storage and disposal and in accordance with applicable regulations in one or more approved sites have been obtained. Proof that the LBP disposal site(s) comply(ies) with the requirements for an active waste site, in accordance with 40 CFR 61.154. Proof that hazardous waste treatment, storage, transportation and disposal complies with RCRA requirements under 40 CFR 260-299.

3. A statement that all commercial licenses required, if any, have been procured by the Contractor, who will comply with their provisions, holding the Owner harmless for deficiencies and/or failures thereto.

4. A description of the arrangement for posting the Contractor's air monitoring sampling analytical data and updating the posting when necessary. This information shall be available for inspection by the LBP Project Manager/Designer and/or representatives, Authorized Visitors, and Owner's building occupants.

1.6 PERFORMANCE REQUIREMENTS

A. Project/site conditions.

1. Establish and maintain emergency and fire exits from the work area.

2. Keep the building in a condition that it be able to function as usual during normal working hours, except as otherwise specified.

3. Certain building areas involved in the work under this contract may contain exposed live electrical equipment, hazardous chemicals or other hazardous conditions. The Contractor shall be responsible for identifying such areas and instructing its workers in all necessary safety procedures.

4. The Contractor shall post in the clean room work practices to be followed by the Contractor's workforce and Authorized Visitors.

5. The Contractor shall provide physical boundaries around the lead control area by roping off the area (designated on the plans) or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach the OSHA action level outside of the lead control area.

6. The Contractor shall shut down, lock out, and isolate the HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6-mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.
B. Personal Protective Equipment.

1. Until the employee exposure assessment is complete, the following personal protective equipment shall be worn. The level of protection can be increased or reduced if determined by the employee exposure assessment and approval of the LBP Project Manager/Designer.

2. The Contractor shall repair or replace required protective clothing and equipment as need.

3. Workers shall wear coveralls or similar full-body work clothing while performing all operations. If the likelihood of heat stress is significant, breathable disposable suits shall be used, except when using caustic or chemical strippers. When caustic or chemical strippers are used, chemically resistant coveralls shall be used (refer to the MSDS to determine type of coverall).

4. The Contractor shall provide the clean and dry protective clothing at least weekly, and daily if airborne lead levels exceed 200 micrograms/cubic meter as an 8-hour TWA.

5. The Contractor shall provide for the cleaning, laundering, and disposal of protective clothing.

6. All contaminated protective clothing which is to be cleaned, laundered, or disposed of, shall be placed in a closed, labeled container in the change area.

7. The Contractor shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

8. Head and hair covering will be used when large amounts of dust, water, or aerosol are generated. Hard hats are required when there is a possible danger of head injury from impact, falling or flying objects, or electrical shock and burns. Head protection used shall comply with 29 CFR 1926.100.

9. Gloves are required at all times, except during taping for set-up or when the loss of dexterity interferes significantly with job performance. Heat resistant gloves are required when using heat guns. Refer to the MSDS if caustics or chemical strippers are used to determine type of gloves.

10. Steel-toe, steel-shanked safety boots with non-skid soles shall be worn. Disposal shoe coverlets shall be provided when appropriate.

11. Face shields, vented goggles, or other appropriate protective equipment which complies with 29 CFR 1910.133, will be used if an eye hazard exists. Provide an eyewash station when chemical or caustic strippers are used that meet the requirements of 29 CFR 1910.151(c).

12. Hearing protection shall be required if operations produce noise levels that exceed OSHA permissible noise exposure levels given in 29 CFR 1926.52. Hearing protection selected shall control employee exposures to comply with OSHA permissible noise standards. If noise levels exceed OSHA permissible noise levels, employees shall be enrolled in a hearing conservation program, and trained in the proper fit and care of hearing protection equipment.

13. Appropriate respiratory protection shall be provided in accordance with 29 CFR 1926.62(f). At a minimum, respiratory protection equipment shall meet the requirements of 29 CFR 1926.62(f). Powered, air-purifying respirator, equipped with HEPA/organic vapor cartridges shall be when using heat guns. All workers shall be fit tested according the protocols given in Appendix D of 29 CFR 1926.62.

14. The Contractor shall select and provide at no cost to its employees the appropriate respirator as specified in 29 CFR 1926.62(f). The respirator selected shall be certified by the National Institute for Occupational Safety and Health.
15. The Contractor shall provide a powered, air-purifying respirator in lieu of any negative-pressure respirator whenever the worker chooses to use this type of respirator and the respirator will provide adequate protection to the worker.

16. As part of the Contractor's Respiratory Protective Program, each worker shall be provided by the employer with a personally issued, properly fitted, and marked respirator and shall be trained in its proper use. For negative pressure respirators, if permitted, each worker shall be provided with a selection of brands and sizes of respirators to be assured of finding one that fits properly. Workers shall check respirator fit each time the respirator is put on or adjusted.

17. Replacement filter cartridges shall be supplied by the employer as required, such as when filter loading increases breathing resistance to the point of discomfort.

C. Worker Protection Procedures

1. The Contractor shall provide workers with the following interim controls until the employee exposure assessment is completed: change areas and hand washing facilities; biological monitoring, to consist of blood sampling and analysis for lead and zinc protoporphyrin; and training on lead hazards, in addition to OSHA Hazard Communication Training. The level of controls may be increased or decreased as determined by the employee exposure assessment.

2. In addition to these requirements for the prevention of exposure to lead, all normal safety requirements, including electrical safety and fall protection, shall be enforced.

3. Workers shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics while in the work area.

4. All worker protection procedures, including assurance of respirator fit, and decontamination procedures shall apply to all Contractor employees and all Authorized Visitors, except in the event of emergency requiring entrance of emergency or security personnel, in which case respiratory protection alone shall be provided.

5. All electric power in regulated areas and other areas which may become wet or pose other electrical hazards shall be disconnected or turned off at a panel distribution box to reduce the hazard of electrical shock to workers, except as provided herein. The Contractor shall coordinate with the Project Administrator to determine any electrical outlets and equipment which is to be operated without power interruption, and to identify and obtain reasonable access to alternate sources of electrical power if needed.

6. Workers shall not leave the workplace wearing any clothing or equipment worn during the work day. When exiting the lead-controlled area, workers shall vacuum themselves off with a HEPA vacuum, remove protective clothing in the decontamination room and place clothing in an approved, labeled container. The worker shall shower, and change to clean clothes prior to leaving the job site.

D. Access to Work Area

1. The Contractor shall limit access to the work area to its personnel, emergency personnel, applicable regulatory agency personnel, and Authorized Visitors.

2. The Contractor shall provide at least 2 sets of personal protective equipment specified under this contract per eight (8) hour work shift for Authorized Visitors.

3. All Authorized Visitors shall be subject to the worker protection provisions of this Contract.

E. Emergency Procedures

1. The Contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination.

2. Adequate emergency lighting shall be available to permit safe egress of personnel from the work area.
3. The Contractor shall prepare a plan, train employees in emergency procedures to contain and clean up spills outside the work area, and implement the plan upon if an emergency occurs.

F. Employee Lead Exposure Assessment and Air Monitoring Requirements by Contractor

1. The Contractor shall perform an employee lead exposure assessment to determine if any employee is exposed to lead at or above the action level, in accordance with 29 CFR 1926.62(d). The Contractor shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead. The Contractor may alternatively use its data from projects within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in this contract, in accordance with 29 CFR 1926.62(d)(3)(iii).

   a. Worker samples shall be taken in the breathing zones of workers performing LBP abatement in sufficient numbers to permit estimation of peak and Time Weighted Average (TWA) exposures. At a minimum, at least one sample for each job classification one personal sample on a worker with the highest probable exposure is required in each work area, per 8 hour shift. Air sampling results shall be provided to the LBP Project Manager/Designer within 1 working day after sampling.

2. Frequency of worker air monitoring shall be determined by the following lead levels:

   a. Less than the OSHA action level - no further monitoring required, except if there is a change of equipment, process, control, personnel or a new task initiated that may result in lead exposure.

   b. Less than or equal to the OSHA action level but less than the PEL - at least every 6 months, until two consecutive measurements, taken at least 7 days apart, are below the action level (monitoring can be discontinued at this point).

   c. Greater than or equal to the PEL - every 3 months, until two consecutive measurements, taken at least 7 days apart, are below the PEL. If lead levels are greater than or equal to the OSHA action level but less than the PEL, monitoring shall be done at least every 6 months, until two consecutive measurements, taken at least 7 days apart, are below the OSHA action level (monitoring can be discontinued at this point).

G. The Contractor shall notify the LBP Project Manager, Designer, and Air Monitoring Specialist immediately of exposure to lead at or in excess of the action level of 30 micrograms/cubic meter of air outside of the lead control area.

H. All air monitoring shall be performed under the supervision of an industrial hygienist. Personnel and procedures are subject to approval of the LBP Project Manager/Designer.

I. The Contractor shall furnish and maintain all monitoring equipment and shall show calibration records as required by the LBP Project Manager/Designer. The Contractor shall bear all costs of air monitoring, analysis, and reporting required herein.

J. Documentation on each sample shall be as specified by the LBP Project Manager/Designer and shall include at least the date and time, sample number, exact sampling location, printed name and signature of each sampler, a description of work being performed at the time of sampling, sampling rate, sampling volume.

K. The method of monitoring and analysis shall have an accuracy (to a confidence level of 95%) of not less than plus or minus 25 percent for airborne concentrations of lead equal to or greater than 30 micrograms/cubic meter.

L. Airborne lead samples should be analyzed by a laboratory qualified by the American Industrial Hygiene Association's Laboratory Accreditation Program for metals on filters. The Contractor shall submit signed permanent laboratory records of all analyses to the LBP Project Manager within two weeks of the date of each analysis.
M. Documentation on each analysis shall be as specified by the LBP Project Manager/Designer and shall include at least the date and time, sample number, name and signature of each analyst, analytical method, analytical results, limit of detection as per the analytical method, and printed name and signature of a responsible laboratory official.

1.7 INSPECTIONS AND AIR MONITORING BY THE OWNER UNDER SEPARATE CONTRACT

A. The Owner's Air Monitoring Specialist shall collect public outside work area samples. Samples shall be taken outside the work area within 10 feet (9 meters) of each exit of the work area if required by the LBP Project Manager/Designer. Samples shall be taken daily while the LBP abatement work is being performed. Air sampling results shall be provided to the Asbestos/LBP Project Manager/Designer, and Contractor 24 hours after sampling.

1. The Air Monitoring Specialist shall notify the LBP Project Manager, Designer, and Contractor immediately of exposure to lead at or in excess of the action level of 30 micrograms/cubic meter of air outside of the lead control area.

2. All air monitoring shall be performed under the supervision of an industrial hygienist. Personnel and procedures are subject to approval of the Asbestos/Lead Project Manager.

3. The Air Monitoring Specialist shall furnish and maintain all monitoring equipment and shall show calibration records as required by the LBP Project Manager/Designer.

4. Documentation on each sample shall be as specified by the LBP Project Manager/Designer and shall include at least the date and time, sample number, exact sampling location, printed name and signature of each sampler, a description of work being performed at the time of sampling, sampling rate, sampling volume.

5. The method of monitoring and analysis shall have an accuracy (to a confidence level of 95%) of not less than plus or minus 25 percent for airborne concentrations of lead equal to or greater than 30 micrograms/cubic meter.

6. Airborne lead samples should be analyzed by a laboratory qualified by the American Industrial Hygiene Association's Laboratory Accreditation Program for metals on filters. The Air Monitoring Specialist shall report all results within 24 hours and shall submit signed permanent laboratory records of all analyses to the LBP Project Manager, Designer, and Contractor within two weeks of the date of each analysis.

7. Documentation on each analysis shall be as specified by the LBP Project Manager and shall include at least the date and time, sample number, name and signature of each analyst, analytical method, analytical results, limit of detection as per the analytical method, and printed name and signature of a responsible laboratory official.

B. The Project Administrator, LBP Project Manager, Designer, and Air Monitoring Specialist may perform site visits and inspections. The LBP Project Manager/Designer may require worker and/or area air sampling inside and immediately adjacent to the work area during work.

C. The LBP Project Manager/Designer may sample other building areas during work to assess the potential exposures to staff, building tenants and visitors.

D. The Project Administrator, LBP Project Manager, Designer, and/or Air Monitoring Specialist may inspect the project including integrity of protective coverings; plumbing; electrical equipment safety and grounding; worker protection program; air monitoring program; performance of abatement measures including work area preparation, removal, and disposal; emergency equipment and procedures; and conformance to EPA, OSHA, State environmental and occupational safety and health agency (where applicable) and other Owner requirements.

E. If, at any time, the LBP Project Manager, Designer, or Air Monitoring Specialist determines that Contractor practices or procedures are in violation of the provisions of this contract or are endangering workers, tenants, the general public or the facility, the LBP Project Manager will immediately notify the Contractor orally that corrective action shall be taken followed by a written stop work order. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppages.
F. If personal or work area lead concentrations are measured above the PEL or concentrations outside of the work area are above baseline levels all abatement work in that work area shall stop and the Contractor shall undertake corrective action as approved by the LBP Project Manager/Designer. The Contractor may resume abatement work in that area only after it receives written authorization from the LBP Project Manager/Designer. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppages.

G. Prior to the LBP Project Manager, Designer, and Air Monitoring Specialist beginning visual and physical inspection for clearance, the Contractor shall certify the following: all LBP specified to be abated has been abated; surfaces from which LBP has been removed have been cleaned; LBP waste and debris inside and outside the work area have been collected and bagged in accordance with this Plan; and that the work area is ready for clearance inspection.

H. The Air Monitoring Specialist will take pre-abatement and post-abatement surface wipes using the procedures detailed in section 3.8 to determine if the Contractor has met the clearance criteria.

PART 2 PRODUCTS

2.1 PRODUCTS - GENERAL

A. Deliver all materials in the original packages, containers, or bundles, bearing the name of the manufacturer, the brand name and any Material Safety Data Sheets which pertain to the materials.

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

C. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Materials that become contaminated with lead shall be disposed of in accordance with applicable regulations.

D. No materials, equipment or tools belonging to the Owner, it's representatives, Designer, or Air Monitoring Specialist shall be used by the Contractor, except in case of an emergency upon explicit authorization by the Project Administrator.

2.2 MATERIALS

A. Chemical removers used shall not contain methylene chloride. Chemical removers shall be compatible with, and not harmful to the substrate that they are applied to. Chemical removers used on masonry surfaces shall contain anti-stain formulation that inhibits discoloration of stone, granite, brick, and other masonry construction. Chemical removers used on interior surfaces shall not raise or discolor the surface being abated.

B. Chemical stripping agent neutralizers shall be compatible with and not harmful to the substrate that they are applied to. Neutralizers shall be compatible with the stripping agent that has been applied to the surface substrate.

C. Plastic bags shall be 6 mil (0.15 mm) minimum polyethylene, or sufficiently thicker for large bags so as to prevent release of lead dust through tearing, separation or other reasonably foreseeable means. Bags shall be labeled with lead warning or capable of being so labeled.

D. Lead disposal packaging shall be suitable to receive and retain any lead-contaminated materials until disposal or conversion at an approved site. The packaging shall be both air and water tight.

E. Packaging of lead-contaminated material shall be labeled in accordance with regulations of EPA (e.g., 40 CFR 262.31), and DOT (e.g., 49 CFR 172), and State or local occupational safety and health, or environmental agencies (where applicable), and this Plan.
2.3 TOOLS AND EQUIPMENT

A. Machine sanding equipment shall be of the dual action, rotary action, orbital or straight line system type, capable of being fitted with a high efficiency particulate absolute (HEPA) dust pick-up system, in accordance with local, state, and/or federal regulations.

B. Heat gun equipment shall be DI type (non-grounded) 120V, AC application. Heat guns shall be equipped with various nozzles to cover all common applications (cone, fan, glass protector, spoon reflector, etc.).

C. Vacuum equipment used for cleaning shall be HEPA-filtered. At least one HEPA vacuum shall be equipped with floor (hard surface and carpet) cleaning attachments.

D. Scaffolding and staging shall meet OSHA safety regulations, including 29 CFR 1926.450-452.

E. Transportation equipment shall be suitable for loading, temporary storage, transport, and unloading of LBP contaminated materials without exposure to persons or property. Shall be currently registered with the State for transport of hazardous wastes and be currently certified by the State for vehicle inspection.

F. The Contractor shall furnish all equipment such as lumber, nails, ladders, HEPA vacuums, and hardware and supplies which may be required to construct and dismantle the barriers that isolate the work area. The Contractor shall provide other suitable tools for the abatement activities including but not limited to: hand scrapers, wire brushes, sponges, mops, and shovels.

G. Electrical tools and equipment shall meet all applicable codes and regulations, including, in particular, 29 CFR 1910.304(f)(5)(v) and 29 CFR 1926.400-449.

H. Ground fault circuit-interrupters shall be used at all times for all electrical equipment, as permitted by the National Electrical Code (Paragraph 215-9 "Ground-Fault Protection for Personnel").

I. If an assured equipment grounding conductor program, under 29 CFR 1926.404(b)(1)(iii), is established, it shall be implemented as provided in the Plan of Action.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

A. The Contractor shall coordinate all electrical service connections, requirements and equipment with the Project Administrator. Service connections and electrical equipment shutdowns shall be coordinated with the Project Administrator at least 72 hours prior to commencement of work in each work area.

B. All HVAC or other anticipated building service disruptions shall be coordinated with the Project Administrator.

C. The Contractor shall provide for adequate lighting, heating and cooling of equipment during all phases of the set up, removal, and clean up.

D. If scaffolding is necessary, it shall be constructed during times specified by the Project Administrator.

E. The Contractor shall post adequate warning signs denoting the potential danger of lead at designated entrances to work areas including, as a minimum, those described at 29 CFR 1926.62(m), and State occupational safety and health and fire safety regulations (where applicable). The Contractor shall prevent access to posted areas by unauthorized or inadequately protected persons.

F. Existing services, facilities and functions outside of the work area shall remain in use throughout the abatement process, unless otherwise specified by the Project Administrator. The Project Administrator shall be immediately notified in the event of disruption.
G. Adequate portable fire extinguisher equipment shall be maintained within the work area meeting at least the requirements of 29 CFR 1910.157 and (where applicable) State occupational safety and health regulations and fire safety regulations.

H. Care shall be taken to protect adjacent surfaces such as drywall, paneling, plaster, glass, etc. from damage during LBP abatement procedures. In the event of damage to existing building equipment, the Project Administrator, LBP Project Manager, and Designer shall be notified immediately. Damages to non-protected adjacent surfaces shall be repaired at the Contractor's expense where applicable.

I. Movable and Fixed Objects

1. The Contractor shall HEPA vacuum the area before removing movable objects from the work area. Wet down carpets and other items to be removed. Do not rip or shake carpets or draperies when removing. Remove items from worksite.

2. The Contractor shall protect all existing fixed objects, existing building finishes that are to remain, and existing systems and functions from damage during the abatement process.

3.2 WORK AREA ISOLATION

A. Isolate the work area to ensure that airborne concentrations of lead will not reach 30 micrograms/cubic meter outside of the lead control area. Use 6 mil (0.15 mm) plastic sheeting to cover doors and windows. If windows are to be scraped, stripped or removed and replaced, enclose windows from the outside with plastic sheeting and staples.

B. Disable HVAC or any other system bringing air into, out of, or through the Work Area. Disable system by lockout, disconnecting wires, removing circuit breakers by lockable switch and/or other positive means that will prevent accidental premature restarting of equipment.

C. From the time the Contractor is ready to begin LBP removal until all barriers are removed, all personnel, equipment, materials, and waste containers leaving the work area shall be decontaminated as per applicable provisions of this Plan.

D. Provisions for toilet facilities will be provided by the Contractor. Contractor employees and Authorized Visitors shall comply with the worker protection procedures of provisions of this contract when leaving the work area to use the toilets, and upon reentry into the work area.

E. Floors shall be covered with enough plastic sheeting to prevent damage. Additional layers of 4 mil (0.10 mm) minimum plastic sheet may be used as drop cloths to aid in cleanup of bulk materials.

3.3 CONTAMINATED EQUIPMENT, SHOWER, LUNCHROOM AND CLEAN AREAS

A. The contaminated equipment area shall be separated from the lead control area and shall include storage for contaminated clothing and equipment as needed, disposal facilities for contaminated personal protective equipment and a utility sink for decontamination of equipment. A walk-out mat shall be used to connect the work area and the contaminated equipment area.

B. Set up a portable shower with 5 micron filter near the contaminated equipment area. At least one shower head with hot and cold, or warm water shall be supplied by a connection from the building water system. There shall be additional provision (flexible hose/spray head or the like) for boot/equipment washing. Refer to Section 01503 Temporary Facilities and Section 01563 Decontamination Units.

C. The clean area room shall be connected to the shower area. The Contractor shall supply and maintain clean towels in this room at all times. The Contractor shall ensure the secure and sanitary storage of workers' street clothing and valuables in the clean room. Change areas shall have separate storage facilities for street clothes and protective work clothing and equipment to prevent cross-contamination. Workers shall change into work clothes and shoes at the worksite.
D. Waste water shall be filtered through a water filter with pore size of 5 micrometer or smaller, before discharge to the sanitary sewer (use of one or more larger pore sized prefilters may be considered to minimize final filter clogging and filter changing costs). Any more stringent requirements of Federal, state, regional and local authorities governing the discharge of lead to the sewer system shall be followed.

E. Lunchroom facilities or eating areas shall be provided for workers. The eating areas shall be as free from lead contamination and readily accessible to workers. Workers shall not enter eating areas with protective work clothing or equipment unless lead dust has been removed.

### 3.4 ENTRY AND EXITING PROCEDURES

A. Workers shall change out of their work clothes in the clean area and don personal protective clothing and equipment at the beginning of their shift.

B. Upon exiting the work area, each worker shall remove lead dust from clothing and equipment before leaving the work area by using a HEPA vacuum. Workers shall proceed to the contaminated equipment room and remove all protective equipment and shoes. Each worker shall proceed to the shower area and remove all protective clothing. Workers shall then thoroughly wash and shampoo themselves.

1. Following showering, each worker shall proceed directly to the clean room and dry off. Each worker shall dress in the change area. Before reentering the work area, each worker shall repeat the procedures specified under this contract.

C. Contaminated work footwear shall be stored in the contaminated/equipment room when not in use in the work area. Upon completion of LBP abatement, the footwear shall be disposed of as contaminated waste or placed in a plastic bag and moved to the next job site if it cannot be decontaminated. If the shoes can be decontaminated, such as non-leather shoes, the shoes shall be thoroughly cleaned inside and out using soap and clean water before removal to the uncontaminated area.

### 3.5 LEAD-BASED PAINT ABATEMENT PROCEDURES

A. Abrasive Removers

1. All machine sanding equipment shall be fitted with a HEPA dust pick-up system. Sanding shall only be done on flat surfaces for which the HEPA dust collection system comes into tight contact with the surface being sanded. Surfaces to be sanded shall be wide enough to allow maximum efficiency of the HEPA dust collection system, in accordance with local, state, and/or federal regulations.

2. All LBP shall be removed down to the bare substrate surface. In case some pigment remains embedded in wood grain and similar porous substrate, care shall be taken to avoid damage to the substrate. If the pigment cannot be removed without damaging the substrate, the Contractor shall notify the Project Administrator, LBP Project Manager, and Designer for further instructions.

B. On-Site Chemical Removers

1. Chemical stripping agents and neutralizers shall be applied in accordance with the recommendations of the manufacturer. Care shall be taken to adhere to all health/safety code and other specification section requirements. Stripping agents shall not be allowed to penetrate wood or other fibrous substrates. Water blasting shall not be used to remove caustic stripper. The softened paint shall be removed by scraping or wire brush.

2. The Contractors shall provide local exhaust with HEPA-filtered negative air machines when chemical removers are in use. All exhaust shall be directed away from public walkways and other public areas around the work area.

3. Softened paint shall be removed down to the substrate surface as completely as possible by scraping and/or brushing. In case some pigment remains embedded in wood grain and similar porous substrate, care shall be taken to avoid damage to the substrate with the scraping or brushing. If the pigment cannot be removed without damaging
the substrate, the Contractor shall notify the Project Administrator, LBP Project Manager, and Designer for further instructions.

C. Heat Guns

1. The hot air stream from the heat gun shall be directed at the painted surface and the paint allowed to blister and soften. Heat guns should not be operated at more than 700 °F. Powered air-purifying respirators, equipped with HEPA/organic vapor cartridges, shall be worn while using the heat gun.

2. The Contractors shall use local exhaust with HEPA-filtered negative air machines when a heat gun is in use.

3. Softened paint shall be removed down to the bare substrate surface. In case some pigment remains embedded in porous materials, care shall be taken to avoid damage to the substrate with the blasting operation. If the pigment cannot be removed without damaging the substrate, the Contractor shall notify the Project Administrator, LBP Project Manager, and Designer for further instructions.

D. Encapsulation with Interior and Exterior Coatings

1. Encapsulation coatings shall be applied in accordance with the manufacturer's recommendations.

2. Remove surface dust and debris by scrubbing with detergent (trisodium phosphate 5% to 10% solution). Workers shall keep surfaces moist when scraping paint/plaster. Remove loose paint until a sound, intact edge is achieved. Loose plaster shall be removed. Collect paint debris, perform TCLP test, and dispose of in accordance with Local, State and Federal regulations.

3. Encapsulation coatings shall be applied to the substrate in a continuous system as to seal the surface being coated. The number of coats required and coverage rates shall be in accordance with the manufacturers' recommendations. Workers shall leave the work area during the drying process.

4. Areas that are lifting and peeling after the application of the coating shall be repaired by scraping until sound adhesive is obtained, feathering the edges and repainting.

5. Obstacles in the surface to be coated, such as electrical receptacles, switches, exhaust fans, hardware, etc. are to be removed or covered so to prevent them from being coated.

E. Off-Site Stripping

1. Extreme care shall be taken to remove elements to be taken off-site as not to damage or cause harm to those elements. Elements shall be marked and identified using an inconspicuous engraving. Hardware associated with an element shall be bagged and marked as to which element the hardware is associated with. If needed, hardware shall be chemically stripped, cleaned or reconditioned as required.

2. Wet down items to be removed that will not be harmed by wetting. Wrap all items in two 4 mil (0.10 mm) or one 6 mil (0.15 mm) polyethylene sheeting or bags. Seal ends with tape and remove items from worksite.

3. Chemical stripping agents shall be applied and the LBP removed in accordance with recommendations of the manufacturer. Stripping agents shall not be allowed to penetrate wood or other fibrous substrates.

4. The Owner under separate contract will reinstalled stripped elements and hardware to their original locations.

F. Removal and Replacement of Lead-Based Painted Components

1. Care shall be taken to avoid damage during the removal of building components to be replaced.
2. Building components that are removed for replacement shall be wrapped and stored for disposal or disposed of in accordance with the applicable codes and sections of this specification.

3. The Owner under separate contract will installed new building components elements and hardware in locations where lead-based painted components have been removed.

### 3.6 IN-PLACE MANAGEMENT PROCEDURES

**A. Repainting**

1. Use 4 mil (0.10 mm) polyethylene sheeting in the immediate work area. Use polyethylene sheeting below area to be repainted to contain debris.

2. Remove surface dust and debris by scrubbing with detergent (trisodium phosphate 5% to 10% solution). Workers shall wear coveralls, and impermeable gloves while washing the surface. After washing the surface, workers shall keep surfaces moist when scraping paint/plaster. Remove loose paint until a sound, intact edge is achieved. Collect paint debris, perform TCLP test, and dispose of in accordance with local, state and/or federal regulations.

3. When scraping is completed HEPA vacuum the area.

4. Workers shall wear coveralls and a negative pressure respirator, equipped with HEPA filters, while performing preparation work. Workers shall shower and change out of work clothes before leaving the work site.

5. The Contractor shall repaint the area using paint specified by the Project Administrator.

6. Workers shall wear coveralls, and a negative pressure respirator, equipped with combination HEPA/organic vapors cartridges when repainting.

**B. Enclosing or Encapsulating**

1. Use 4 mil (0.10 mm) polyethylene sheeting in the immediate work area. Tape polyethylene sheeting below area to be repainted to contain debris.

2. Workers shall wear coveralls and a negative pressure respirator, equipped with HEPA filters. Additional cartridges may be required based on the MSDS for the encapsulant. Workers shall shower and change out of work clothes before leaving the work site.

3. The Contractor shall provide adequate ventilation if Encapsulants are used. Workers shall leave the work area during the drying process for liquid encapsulant.

### 3.7 CLEAN-UP

**A.** The work site when abatement is taking place shall be cleaned at the end of each day's abatement activities. HEPA vacuuming shall be used to clean-up floors and other surfaces. Disposable supplies, such as mop heads, sponges, and rags shall be replace regularly and disposed of according to this specification. Durable equipment, such as power and hand tools, generators, and vehicles shall be cleaned monthly. All equipment shall be cleaned by HEPA vacuuming and high-phosphate washing.

**B.** Areas in which abatement operations have been completed, shall be cleaned before repainting or replacement of building components. Cleaning shall start at the ceilings and working down to the floors, by vacuum cleaning using a HEPA vacuum, followed by a wet cleaning with high-phosphate (trisodium phosphate) wash. The Contractor may use a garden or similar type sprayer to wet all surface with a 5% to 10% trisodium phosphate cleaning solution. After spraying the surface, a wet and dry HEPA vacuum shall be used to vacuum the water from the surface. The waste water from cleanup shall be contained and disposed of according to this specification.
C. Surfaces to be cleaned include ceilings, walls, floor, windows (sash, jamb, sill), doors, fixtures (lights), and any kind, built-in cabinets, and appliances. All surfaces shall be cleaned, except in areas which were found free of lead, were not abated, were properly sealed, or were never entered during the abatement.

D. The Contractor shall obtain training in the use of the HEPA vacuum from the manufacturer prior to use. The Contractor shall use HEPA vacuum attachments, such as various size brushes, crevice tools, and angular tools for varied application, and service the HEPA vacuum routinely to assure proper operation. Caution shall be used any time the HEPA is opened for filter replacement of debris removal. Operators shall wear a full set of protective clothing and equipment, including respirators, when using the HEPA vacuuming equipment, or changing its bag or filter. The Contractor shall bag and seal HEPA vacuum bags and filters in two 4-mil (0.10 mm) or one 6-mil (0.15 mm) plastic bags.

E. Large debris from demolition (e.g., doors, windows, baseboards) shall be wrapped in plastic sheets at least 6 mil (0.15 mm) thick, sealed with heavy duct tape, and stored in the designated area. This debris will be removed according to this specification.

F. Prior to picking-up or collecting small debris, the surface to be cleaned will be sprayed with a fine mist of water. The debris will be picked up, collected, and placed into a single plastic bag at least 6 mil (0.15 mm) thick, or double bags of 4 mil (0.10 mm) thick plastic. The bags shall not be overloaded, shall be securely tied, and shall be stored in the designated area until disposal.

G. The Contractor shall place solvent and/or stripper residues in drums made out of materials that cannot be dissolved or corroded by chemicals. Solvents, caustics and acid waste must be segregated and not stored in the same containers.

H. The Contractor shall contain and properly dispose of all liquid waste, including lead-contaminated wash water.

I. After the area has been cleaned, any surfaces requiring painting shall be primed with an approved primer. Window sills and wells shall be finished coated with a Project Administrator approved high gloss enamel. All primers or finish coating materials shall have labeling stating, in equal or appropriate wording "does not contain lead greater than 600 parts per million" as per Consumer Products Safety Commission regulations.

3.8 CLEARANCE CRITERIA

A. Work of this section will not begin until the visual inspection described has been completed and certified by LBP Project Manager and Air Monitoring Specialist.

B. The Contractor shall clean the area to meet clearance criteria based on pre and post abatement surface wipe samples. The Air Monitoring Specialist will be performing the wipe sampling and analysis. Decontamination is complete when every sample is at or below the following levels. If clearance levels are not satisfactory, the decontamination is incomplete and recleaning is required at no additional cost to the Owner. The clearance criteria are:

1. Floors: 40 micrograms/square foot

2. Interior Window Sills: 250 micrograms/square foot

3. Window Troughs: 400 micrograms/square foot

4. Exterior Window Sills: 500 micrograms/square foot

5. Exterior Surfaces: 800 micrograms/square foot

6. Soil Play Areas: 400 micrograms/square foot

7. Soil Areas outside of Play Areas: 1,200 micrograms/square foot
C. The Air Monitoring Specialist shall perform pre-abatement surface wipe sampling before the LBP abatement work begins, taking one sample outside the containment area, within 10 feet (3 meters), in 20% of the abated rooms.

D. The Air Monitoring Specialist shall perform clearance surface wipe sampling after cleanup is finished by the LBP abatement Contractor. The Air Monitoring Specialist shall take at least the following number of samples:

1. On-site paint abatement throughout: 3 wipe samples in each room or area. One sample will be taken at the following locations: window well, window sill, and floor.

2. On-site paint abatement in limited areas: 3 wipe samples in each room or area. One sample will be taken at the following locations: window well, window sill, floor and 1 sample outside the containment area, within 10 feet (3 meters) in 20% of the abated rooms.

3. Replacement and/or encapsulation throughout: one wipe sample in each area, divided equally between window wells, window sills, and floors.

4. Replacement and/or encapsulation in limited areas: one wipe sample in each area, divided equally between window wells, window sills, floors, and 1 sample outside the containment area, within 10 feet (3 meters) in 20% of the abated rooms.

E. The Air Monitoring Specialist will compare samples taken outside of the containment area to pre-abatement wipe samples to determine if dust from the abatement process has contaminated unabated areas. The Air Monitoring Specialist will notify the Contractor if additional cleaning is required or if the surface wipe samples indicate lead levels meet the clearance criteria.

F. The Contractor shall begin final cleanup after all abatement work is complete and all materials, equipment, debris, and plastic sheeting have been removed. The entire work area shall be HEPA vacuumed, washed with a cleaning solution containing tri-sodium phosphate detergent, and HEPA vacuumed again. The LBP Project Manager and/or Designer and Air Monitoring Specialist will then visually inspect the entire work area to ensure all abated surfaces and floors have been primed, painted or sealed. All disposable supplies used during cleanup, such as mop heads, sponges, etc., shall be disposed of according to this specification.

3.9 DISPOSAL

A. The Contractor shall contact the regional EPA, State, and local authorities to determine lead-contaminated debris disposal requirements. The requirements of the Resource Conservation and Recovery Act (RCRA) and applicable state solid waste plan requirements shall be complied with.

B. During the actual abatement, the Contractor shall not leave uncontained debris outside, incinerate debris, dump waste by the road or in an unauthorized dumpster, or introduce lead-contaminated water into storm or sanitary sewers.

C. The Industrial Hygienist shall test representative lead abatement wastes to determine if materials are regulated under RCRA, 40 CFR Part 261. The Industrial Hygienist shall use the Toxicity Characteristic Leaching Procedure (TCLP) to determine if a lead contaminated material is covered under RCRA. If the TCLP determines that the lead concentration is 5 parts per million or greater, the waste is regulated by RCRA.

D. The following materials shall be tested to determine whether or not they are classified as hazardous waste or shall be presumed to be:

1. Paint chips.
2. Waste water.
3. Dust from HEPA filters and from damp sweeping.
4. Woodwork, plaster, windows, doors, and other components removed from building.

5. Plastic sheets, duct tape, or tape used to cover floors and other services during the LBP removal.

6. Solvents and caustics used during the stripping process.

7. Liquid waste, such as wash water used to decontaminate wood after solvents have been used, and liquid waste from exterior water blasting.

8. Rags, sponges, mops, HEPA filters, respirator cartridges, scrapers, and other materials used for testing, abatement and cleanup.

9. Disposable work clothes and respirator filters.

10. Any other items contaminated with lead.

E. The Contractor shall dispose of non-hazardous solid waste (as determined by testing) as follows:

1. Solid waste which has been evaluated and determined not to be hazardous can be disposed of in a State and Owner approved landfill. Large debris such as doors, windows, and trim shall be wrapped in 6-mil (0.15 mm) plastic, sealed with tape, and moved to the trash storage area. Small debris, such as disposable clothing shall be placed in two 4-mil (0.10 mm) or one 6-mil (0.15 mm) plastic bags, sealed, and placed in the trash storage area.

2. Waste shall be transported to a landfill in covered vehicles. Residential or commercial trash collection services shall not be used.

3. If the Contractor subcontracts the removing of the LBP waste, the Contractor shall ensure that the company removing the waste material adequately covers all loads to ensure that no dust or debris is released. The Sub-Contractor shall be informed by the Contractor of the presence of lead.

F. The Contractor shall dispose of hazardous solid waste (as determined by testing or presumptions) as follows:

1. The Contractor will be required to comply with RCRA and applicable state and local hazardous waste regulations.

2. The Contractor shall coordinate with the LBP Project Manager for all EPA generator numbers as they pertain to the disposal of hazardous solid and liquid wastes for this project.

3. The Contractor will comply with EPA and DOT regulations for containers. The Contractor shall contact the state and local authorities to determine their criteria for containers. The more stringent regulation shall apply.

4. If the Contractor is not a certified hazardous waste transporter, a contract shall be entered into with a certified transported to move the waste. The Contractor shall require the certified hazardous waste transport to follow RCRA regulation.

5. DOT shipping labels shall be applied to or be printed on each packaging of lead-contaminated materials.

6. Temporary storage of sealed double containers of LBP waste outside the decontamination enclosure. After the sealed double containers have been passed out of the decontamination enclosure or the containment barrier, they shall immediately be taken to a specified transportation vehicle or a designated holding area and the containers shall be placed therein. Each vehicle transporting lead-contaminated waste shall be marked with LBP danger signs during loading and unloading of the waste.
G. Hazardous waste manifests.

1. Upon submitting the hazardous waste manifests for a shipment of LBP waste to the LBP Project Manager for signature, the Contractor shall make available the transport vehicle and the lead-contaminated waste packages for inspection by the LBP Project Manager so that the LBP Project Manager can check for significant discrepancies in the amount of waste (for example, number of bags or drums, or volume of waste) and its condition (for example, whether the bags or drums appear to be sealed and not leaking).

2. Hazardous waste manifests signed by the LBP Project Manager, the Contractor and the initial transporter shall be provided to the LBP Project Manager when lead-contaminated wastes are removed from the facility property.

3. Completed waste manifest(s) signed by the Contractor, all transporter(s), transferor(s), disposal and/or conversion facility(ies), shall be provided to the LBP Project Manager within 30 days of the time at which the lead-contaminated wastes are received at the disposal facility(ies), which shall be no longer than 40 days after the waste was accepted by the initial transporter.

H. The Contractor shall:

1. Properly transport, treat, store, dispose and lead-contaminated waste, other hazardous wastes generated in accordance with the contract and all applicable regulations.

2. Notify the Owner, Project Administrator, Asbestos/Lead Project Manager, National Response Center (800-424-8802) of the release of a reportable quantity of a hazardous substance generated in accordance with the contract (40 CFR 302.4 [Table], 302.6(a),(b)).

3. Hold the Owner harmless from any release or threat of release following its acceptance of any hazardous substance generated in accordance with the contract (CERCLA sections 101(20)(B)(i), 107(a)(4),(b),(e)).

3.10 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

A. When cleanup is complete the Contractor shall perform follow-up work as directed by the Project Administrator, LBP Project Manager, and/or Designer.

B. The Contractor shall proceed with Asbestos Abatement work as described in these Specifications.

3.11 AFFECT ON CONTRACT SUM

C. Affect on Contract Sum:

1. Complete corrective work with no change in the Contract Sum (adjustment may be in the form of a deduction), as follows:

   a. for any and all Test Laboratory Services and Consultant Services, additional AAS, ICP, and/or XRF confirmation analysis, etc., per Work Area as described in Section 02075 Lead Based Paint Hazard Control Plan, which do not meet the Specification criteria.

   b. for any and all costs incurred by the Owner, Occupants, Owner Employees, Work under other Contracts, etc., per Work Area which do not meet the Specification criteria.

3.12 CERTIFICATE OF PRE-ABATEMENT VISUAL INSPECTION

A. Following this section is a "Certificate of Pre-Abatement Visual Inspection". This certification is to be completed by the Contractor and certified by the Project Administrator, Asbestos/Lead Project Manager, Designer, and Air Monitoring Specialist. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.
3.13 CERTIFICATE OF VISUAL INSPECTION

A. Following this section is a "Certificate of Visual Inspection(s)". This certification is to be completed by the Contractor and certified by the Project Administrator, Asbestos/Lead Project Manager, Designer, and Air Monitoring Specialist. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

END OF SECTION 02075
APPENDIX A, CHECKLIST OF BID SUBMITTALS FOR LEAD-BASED PAINT ABATEMENT
CONTRACTOR

The following is a listing of the submittals required by each section. This is a listing of the principal submittals required for the work. This listing is not necessarily complete, nor does the listing reflect the significance of each submittal requirement. The listing is included only for the convenience of users of the Contract Documents.

<table>
<thead>
<tr>
<th>SUBMITTAL CHECKLIST</th>
<th>Comments</th>
<th>Initials</th>
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<td>1.5.A.8  Medical surveillance</td>
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<td>1.5.B  Regulatory/litigation/work status</td>
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<td>1.5.B.1  Notices</td>
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<td>1.5.B.2  Work stoppage</td>
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<td>1.5.B.3  Termination</td>
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<td>1.5.C.2  Liability insurance</td>
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<th>Signature</th>
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END OF SUBMITTAL CHECKLIST
APPENDIX B, CHECKLIST OF BID SUBMITTALS FOR LEAD-BASED PAINT ABATEMENT CONTRACTOR

The following is a listing of the submittals required by each section. This is a listing of the principal submittals required for the work. This listing is not necessarily complete, nor does the listing reflect the significance of each submittal requirement. The listing is included only for the convenience of users of the Contract Documents.

![SUBMITTAL CHECKLIST](image)

END OF SUBMITTAL CHECKLIST
### CERTIFICATION OF PRE-ABATEMENT VISUAL INSPECTION(S)

<table>
<thead>
<tr>
<th>Building</th>
<th>Work Area/Containment</th>
<th>Material(s)</th>
<th>Quantity(ies)</th>
<th>Full/Mini/Regulated Area</th>
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#### Lead Based Paint Abatement Contractor Certification

In accordance with local, state, federal regulations, and the Lead Based Paint Abatement Specification, the Lead Based Paint Abatement Contractor hereby certifies that he or she has properly prepared and has visually inspected the Work Area (all posting of permits and certifications, installation and proper operation or implementation of all work practices, decontamination units, waste load out areas, manometers (where required), disposal containers, integrity of enclosures, water, surfactants, equipment, materials, protective clothing, respiratory protection, etc.) and that the Lead Based Paint Abatement Contractor is ready to proceed with active abatement.

<table>
<thead>
<tr>
<th>Lead Based Paint Abatement Contractor Signature</th>
<th>Date/Time</th>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Title</th>
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</table>

#### Air Monitoring Specialist/Lead Project Manager Certification

The Air Monitoring Specialist/Lead Project Manager hereby certifies that he or she has accompanied the Lead Based Paint Abatement Contractor on this visual inspection and verifies that this visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Lead Based Paint Abatement Contractor’s Certification above is a true and honest one.

<table>
<thead>
<tr>
<th>Air Monitoring Specialist/Lead Project Manager Signature</th>
<th>Date/Time</th>
<th>Certification No.</th>
<th>Printed Name</th>
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</table>

#### Comments:

#### Designer/Project Administrator Certification

The Designer/Project Administrator hereby certifies that he or she has reviewed the Lead Based Paint Abatement Contractor, Air Monitoring Specialist/Lead Project Manager Certification on completion of this final visual inspection and believes that this final visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Lead Based Paint Abatement Contractor's and Air Monitoring Specialist’s/Lead Project Manager’s Certification’s above are true and honest ones.

<table>
<thead>
<tr>
<th>Designer Signature</th>
<th>Date/Time</th>
<th>Certification No.</th>
<th>Printed Name</th>
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<th>Project Administrator Signature</th>
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**Lead Based Paint Abatement Contractor Certification**
In accordance with local, state, federal regulations, and the Lead Based Paint Hazard Control Plan, the Lead Based Paint Abatement Contractor hereby certifies that he or she has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit(s), sheet plastic, etc.) and has found no dust, debris or residue.

<table>
<thead>
<tr>
<th>Lead Based Paint Abatement Contractor Signature</th>
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**Air Monitoring Specialist/Lead Project Manager Certification**
The Air Monitoring Specialist/Lead Project Manager hereby certifies that he or she has accompanied the Lead Based Paint Abatement Contractor on this visual inspection and verifies that these visual inspection(s), as indicated, have been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Lead Based Paint Abatement Contractor's Certification above, as indicated and where applicable, is a true and honest one.

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<thead>
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<th>Air Monitoring Specialist/Lead Project Manager Signature</th>
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**Final Visual Inspection**

**Designer/Project Administrator Certification**
The Designer/Project Administrator hereby certifies that he or she has reviewed the Lead Based Paint Abatement Contractor, Air Monitoring Specialist/Lead Project Manager Certification on completion of this final visual inspection and believes that this final visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Lead Based Paint Abatement Contractor's and Air Monitoring Specialist's/Lead Project Manager’s Certification’s above are true and honest ones.

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SECTION 02081 - REMOVAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Worker Protection requirements are set forth in Section 01560 Worker Protection - Asbestos abatement.

B. Installation of Critical and Primary Barriers, and Work Area Isolation Procedures are set forth in Section 01526 Temporary Enclosures.

C. Project Decontamination procedures after removal of the Secondary Barrier are specified in Section 01711 Project Decontamination.

D. Disposal of asbestos-containing waste is specified in Section 02084 Disposal of Regulated Asbestos-Containing Material.

E. Section 02086 Hazardous Waste Management describes the management and disposal of hazardous waste such as PCB Ballasts, fluorescent light tubes, and mercury containing thermostats encountered during the work of this section.

1.3 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

2. Removal Encapsulant: Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.

3. NESHAP Certification: Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet Asbestos-Containing Materials (ACM) to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Approved As Noted.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:

   a. Surfactants.
   b. Encapsulants.
   c. Solvents.
C. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Contractor will provide a 24 hour notification, in writing, to the Asbestos Project Manager/Designer that the Work Area(s) is ready for Pre-Abatement Visual Inspection.

2. Contractor will also provide a 24 hour notification, in writing, to the Air Monitoring Specialist that the Work Area(s) is ready for Pre-Abatement Visual Inspection.

3. There is a copy of the Certification at the end of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wetting Materials: For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:

B. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

C. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether in five gallons (19 liters) of water.

D. Polyethylene Sheet: A single polyethylene film in the largest sheet size practicable to minimize seams, 6.0 mil (0.15 mm) thick clear, frosted, or black as indicated.

E. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated, if required.

F. Duct Tape: Provide duct tape in 2 inch or 3 inch (50mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

G. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

H. Disposal Bags: Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled as required by Section 02084 Disposal of Regulated Asbestos Containing Material.

I. Drums: Provide heavy duty leak tight DOT approved drums with tight sealing locking metal tops.

J. Paper board Boxes: Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

K. Felt: Standard felt approximately 1/16 inch (1.6 mm) thick and 36 inches (900 mm) to 72 inches (1800 mm) in width.
PART 3 - EXECUTION

3.1 SECONDARY BARRIER

A. Secondary Barrier: Over the Primary Barrier, install as a drop cloth a clear 6 mil (0.15 mm) sheet plastic in all areas where asbestos removal work is to be carried out. Completely cover floor with sheet plastic. Where the work is within 10 feet (3 m) of a wall extend the Secondary Barrier up wall to ceiling. Support sheet plastic on wall with duct tape, seal top of Secondary plastic to Primary Barrier with duct tape so that debris is unable to get behind it. Provide cross strips of duct tape at wall support as necessary to support sheet plastic and prevent its falling during removal operations.

1. Install Secondary Barrier at the beginning of each work shift. Install only sufficient plastic for work of that shift.

2. Remove Secondary Barrier at end of each work shift or as work in an area is completed. Fold plastic toward center of sheet and pack in disposal bags. Keep material on sheet continuously wet until bagged.

3. Install Walkways of black 6 mil (0.15 mm) plastic between active removal areas and decontamination units to protect Primary Layer from tracked material. Install walkways at the beginning of, and remove at the end of, each work shift.

3.2 WORKER PROTECTION

A. Before beginning work with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

3.3 WET REMOVAL

A. Thoroughly wet to satisfaction of Asbestos Project Manager/Designer/Air Monitoring Specialist, ACM to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water or removal encapsulant to penetrate material thoroughly. If amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions. Perforate outer covering of any installation which has been painted and/or jacketed in order to allow penetration of amended water or removal encapsulant, or use injection equipment to wet material under the covering. Where necessary, carefully strip away while simultaneously spraying amended water or removal encapsulant on the installation to minimize dispersal of asbestos fibers into the air.

1. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.

2. Remove saturated ACM in small sections from all areas. Do not allow material to dry out. As it is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over and seal with minimum three wraps of duct tape. Clean outside and move to Wash Down Station adjacent to Material Decontamination Unit.

3. Evacuate air from disposal bags with a HEPA filtered vacuum cleaner before sealing.

B. Surfacing Materials: Spray asbestos-containing surfacing materials with a fine mist of amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate materials to substrate. Do not over-saturate to cause excess dripping. Scrape materials from substrate. Remove materials in manageable quantities and control the descent to staging or floor below, if over 20 feet (6000 mm) use drop chute to contain material during descent. If using amended water, spray mist surface continuously during work process. If using removal encapsulant follow manufacturer's written instructions. Remove residue remaining on substrate after scraping using stiff nylon bristled hand brush. Use high pressure washer only with written authorization of Asbestos Project Manager/Designer. If a removal encapsulant is used remove residue completely before encapsulant dries. If substrate dries before complete removal of residue re-wet with amended water or removal encapsulant.
C. Surfacing Materials on Wire Lath (when lathe is being removed): Spray asbestos-containing surfacing materials with a fine mist of amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate material completely. Do not over-saturate to cause excess dripping. If surface of material has been painted or otherwise coated cut small holes as required and apply amended water or removal encapsulant from above. Cut wire lath into manageable sections and cut hanger wires. Roll or fold up complete with ACM and hand place in container. Do not drop on floor. After removal of lath and ACM remove any overspray on decking and structure above using stiff nylon bristled brush. Use high pressure washer only with written authorization from Asbestos Project Manager/Designer. Use one of the following methods for containing waste.

1. Deposit material in corrugated paper board box. When box is full duct tape closed and place in disposal bag.

2. Wrap material in felt and place in drum lined with two disposal bags. Use caution to insure that all edges of wire lath that could cut plastic are covered with felt.

3. Place material directly in a steel drum. Seal drums when full with leak tight seal. Drum is to be leak tight in any orientation.

D. Pipe Insulation: Spray with a mist of amended water or removal encapsulant. Allow amended water or removal encapsulant to saturate material to substrate. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cut bands holding preformed pipe insulation, slit jackets at seams, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks and hand place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with stiff bristle nylon hand brush. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6" (150 mm) from the point where it contacts the asbestos-containing insulation.

E. Ceiling Tile/Panels: Spray with a mist of amended water or removal encapsulant. Allow amended water or removal encapsulant to saturate material to substrate. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Remove and hand-place in a disposal bag. Do not drop to floor. Remove any residue on substrate or suspension system with stiff bristle nylon hand brush.

3.4 DRY REMOVAL

A. EPA Authorization: Do not begin dry removal work until authorized in writing by the EPA NESHAP coordinator and the Asbestos Project Manager/Designer.

B. OSHA Notification: Do not begin dry removal work until notification to OSHA required by 29 CFR 1926.1101(g)(4)(6) is made.

3.5 LOCALIZED CONTROL OF MATERIAL RELEASE

A. Pipe Insulation: HEPA vacuum surface of pipe insulation. Cut bands holding preformed pipe insulation, slit jackets at seams while holding HEPA vacuum under cut, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks, using nozzle of HEPA vacuum to collect debris generated, and hand-place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with wire brush. Brushing toward the nozzle of a HEPA vacuum. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6 inches (150 mm) from the point where it contacts the asbestos-containing insulation. Use a two worker crew for work, with one worker removing material and one worker holding the nozzle of a HEPA vacuum in the location of disturbance.

B. Material sprayed on wire lath: Hold the nozzle from an operating HEPA filtered vacuum cleaner in the immediate vicinity of and below the work while cutting the wire lath or otherwise disturbing the ACM. Use a two-worker crew for cutting, with one worker cutting and one worker holding the HEPA vacuum nozzle.
3.6 LOCAL VENTILATION AND COLLECTION SYSTEM

A. Provide local ventilation and collection systems as described below for each area where amosite or dry ACM is being removed or otherwise disturbed:

1. Provide HEPA filtered fan units in addition to those required by section 01513, in the vicinity of the work. Arrange so that the units exhaust into the Work Area oriented in a direction away from the work. Extend a 12 inch (300 mm) diameter flexible non-collapsing duct from the intake end to a point no more than 4 feet (1200 mm) from any scraping or wire brushing activity.

2. Locate intake of duct so that air flow is horizontally and slightly downward into intake. Replace primary filters on HEPA filtered fan units at an interval of no greater than 30 minutes. Allow no more than one scraping or wire brushing activity per fan unit.

3. Attach a job-built 4 feet X 4 feet (1200 mm x 1200 mm) flared end piece on intake end of duct. Support end piece horizontally at a point 4 feet (1200 mm) below the work, so that airflow is downward into intake.

3.7 HAZARDOUS WASTE MANAGEMENT AND DISPOSAL

A. Manage and dispose of hazardous waste such as PCB ballasts, fluorescent light tubes, and mercury thermostats in accordance with the requirements of Section 02086 - Hazardous Waste Management.

B. Do not mix potentially hazardous waste streams. Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

C. Segregate, package, label, transport and dispose of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.8 CERTIFICATE OF PRE-ABATEMENT VISUAL INSPECTION

A. Following this section is a "Certificate of Pre-Abatement Visual Inspection". This certification is to be completed by the Contractor and certified by the Asbestos Project Manager. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

END OF SECTION - 02081
**CERTIFICATION OF PRE-ABATEMENT VISUAL INSPECTION(S)**

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<tr>
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**Asbestos Abatement Contractor Certification**

In accordance with local, state, federal regulations, and the Hazardous Materials Design Criteria, the Asbestos Abatement Contractor hereby certifies that he or she has properly prepared and has visually inspected the Work Area (all posting of permits and certifications, installation and proper operation or implementation of all work practices, decontamination units, waste load out areas, pre-cleaning of surfaces, manometers, disposal containers, integrity of enclosures, water, surfactants, equipment, materials, protective clothing, respiratory protection, etc.) and that the Asbestos Abatement Contractor is ready to proceed with active abatement.

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<th>Asbestos Abatement Contractor Signature</th>
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**Air Monitoring Specialist/Asbestos Project Manager Certification**

The Air Monitoring Specialist/Asbestos Project Manager hereby certifies that he or she has accompanied the Asbestos Abatement Contractor on this visual inspection and verifies that this visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Asbestos Abatement Contractor's Certification above is a true and honest one.

<table>
<thead>
<tr>
<th>Air Monitoring Specialist/Asbestos Project Manager Signature</th>
<th>Date/Time</th>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Title</th>
<th>Pass/Fail</th>
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<td>*Final</td>
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If 'Failed', Required Corrective Action

**Asbestos Project Manager Certification**

The Asbestos Project Manager hereby certifies that he or she has reviewed the Asbestos Abatement Contractor and Air Monitoring Specialist Certification on completion of this final visual inspection and believes that this final visual inspection has been thorough where visible/accessible, and to the best of his or her knowledge and belief, the Asbestos Abatement Contractor's and Air Monitoring Specialist’s Certification's above are true and honest ones.

<table>
<thead>
<tr>
<th>Asbestos Project Manager Signature</th>
<th>Date/Time</th>
<th>Printed Name</th>
<th>Title</th>
</tr>
</thead>
</table>

*Required as indicated.
SECTION 02082 - REMOVAL OF ASBESTOS-CONTAMINATED SOIL

PART 1 - GENERAL

PART 1.1 - RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

PART 1.2 - RELATED WORK SPECIFIED ELSEWHERE

A. Asbestos abatement project requirements to be completed prior to start of the work of this section are set forth in the following sections:

01503 Temporary Facilities - Asbestos Abatement

01513 Temporary Pressure Differential & Air Circulation System

01526 Temporary Enclosures - Complete Work Except Delete Floor Plastic.

01560 Worker Protection - Asbestos abatement

01562 Respiratory Protection

01563 Decontamination Units

B. Asbestos abatement project requirements to be completed at completion of the work of this section are set forth in the following sections:

01711 Project Decontamination

C. Amended water and removal encapsulant are specified in Section 02081 Removal of Asbestos-Containing Materials.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

PART 3.1 - PROCEDURES

A. Wet Soils: After removal of the Secondary Barrier and floor layer of Primary Barrier, remove the top one inch (1") (25 mm) of soils which are damp or wet and place in disposal bags. Start removal at the point of work farthest from the entrance to the soil floor area and proceed toward the entrance. Do not permit traffic into the fresh soil surface. Arrange Pressure Differential System so that air flow is the starting point of work toward the entrance. After the entire first layer of soil is removed completely change coveralls and at the entrance to the soil removal area don clean boot covers. Remove the second one inch (1") (25 mm) of soil in the same manner as the first. Carry out the decontamination procedures set forth in the "Project Decontamination" section of this specification at this time.

B. Dry Soils: Use the same procedure for dry soils, except saturate soil with amended water or a removal encapsulant as specified in other Division 2 sections of the specification. If a removal encapsulant is used, use in accordance with manufacturer's instructions. Saturate soil beyond the inch of soil currently being removed. If amended water is used keep the surface of the soil continuously wet throughout removal and decontamination.

END OF SECTION - 02082
SECTION 02083 - DISTURBANCE OF ACM DURING O&M WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF THE WORK

A. Work of this section is repair or maintenance work that may disturb ACM, but where the OSHA PEL is not exceeded and release of ACM, dust and debris is confined to the immediate location of the disturbance. In the OSHA construction standard (29 CFR 1926.1101), it is Class III work on TSI or Surfacing ACM with a negative exposure assessment, Class IV work activities to clean up waste and debris containing ACM and PACM, or Class IV work without a negative exposure assessment. Class III asbestos work includes repair and maintenance operations, where ACM, including thermal system insulation and surfacing material, is likely to be disturbed. If the quantity of material disturbed exceeds the capacity of one 60 inch x 60 inch glovebag or waste bag or is more than 25 linear feet or 20 square feet, the activity is Class I or II and exceeds the limitation of the work practices in this section.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Worker Protection: is specified in Section 01561 “Worker Protection - Repair and Maintenance”.

B. Respiratory Protection: is specified in Section 01562 “Respiratory Protection”

C. Clean up of waste, debris and accompanying dust that are not from construction activities, and where the PEL is not exceeded is specified in Section 01712 “Cleaning and Decontamination Procedures.”

D. Aggressive Operations: Work where TSI or surfacing are worked on using “aggressive” methods, such as drilling, cutting, abrading, etc. are specified in Section 01529 “Mini-Enclosures and Glovebags.”

1.4 SUBMITTALS

A. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Exposure Monitoring: Before starting any work submit to the Asbestos Project Manager/Designer data demonstrating that the following exposure goals will be met during the work of this contract.

a. Area Samples: Submit data from previous asbestos jobs demonstrating that area samples collected in the area of the work will, to a high degree of certainty, not be expected to exceed 0.01 f/cc.

   (i). Submit data from past asbestos jobs where workplace conditions, the type of O&M work, material, control methods, work practices, and environmental conditions closely resemble those that will exist during the Work.

   (ii). Submit exposure date from prior asbestos jobs where the work was conducted by workers whose training and experience are no more extensive than that of workers who will be performing the work of this contract.

b. Negative Exposure Assessment (NEA): Before starting any work submit to the Asbestos Project Manager/Designer a Negative Exposure Assessment, as required by OSHA 29 CFR 1926.1101, certified by a
Competent Person. If a Negative Exposure Assessment cannot be made, report the reasons and any corrective action that would result in a Negative Exposure Assessment. The certification must be signed and dated by a Competent Person and be based on an Initial Assessment of the work specified in this section.

2. Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

3. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.

4. HEPA Vacuums: Submit product data

5. Signs: Submit samples of signs to be used.

6. Warning Tape: Submit samples.

B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Approved As Noted.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
   a. Surfactants.
   b. Encapsulants.

PART 2 - PRODUCTS

2.1 SHEET PLASTIC

A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

B. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, if required.

C. Reinforced Polyethylene Sheet: Where plastic sheet constitutes the only barrier between the Work Area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated, if required.

2.2 MISCELLANEOUS MATERIALS

A. Duct Tape: Provide duct tape in 2 inch or 3 inch (50 mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

B. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

C. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a solution of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons of water.
D. Encapsulants are specified in Section 09805.

E. Garden Sprayer: Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure.

**PART 3 - EXECUTION**

**3.1 GENERAL**

A. Before Start of Work: Complete the following before start of work of this section:

1. 01527 Regulated Areas

**3.2 WORKER PROTECTION**

A. Before beginning work provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

B. Complete requirements of the following:

1. 01562 Respiratory Protection
2. 01561 Worker Protection - Repair and Maintenance
3. 01527 Regulated Area

**3.3 EXPOSURE GOALS**

A. This section describes airborne fiber limits established by the Owner to insure that the building remains uncontaminated during asbestos operations and maintenance work. The following exposure levels are not to be exceeded during performance of the work under this contract:

1. Personal Air Samples: Perform work in a manner that maintains airborne fiber levels below the 0.1 f/cc and that results in a negative exposure assessment as defined by OSHA in 29 CFR 1926.1101.

2. Area Samples: Perform work in a manner that maintains airborne fiber levels in the vicinity of the work below the 0.01 f/cc as measured by phase contrast microscopy (PCM) using the NIOSH 7400 or OSHA reference method. Samples may be collected at a rate of up to 10 liter per minute for this purpose.

B. Should any of the above levels be exceeded in sampling by either the Owner or Contractor, immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Asbestos Project Manager/Designer.

C. Air monitoring by Owner: The Owner's may perform air monitoring to verify that work is being performed in a manner that meets the exposure goals set forth in this section.

D. Air monitoring required by OSHA is work of the Contractor and is not covered in this section.

**3.4 REMOVE ACM DEBRIS**

A. General: Use the following procedures to remove ACM debris to permit repair or maintenance work. Use of this procedure is limited to situations where the amount of waste generated is not greater in size than the OSHA limit on Class III work (operation will generate no more waste than will fit into one 60 inch by 60 inch glovebag or disposal bag).
B. Drop Cloth: Prepare work area with drop cloth in accordance with requirements of Section 01527 “Regulated Areas.”

C. Access: If access above ceiling is required, obtain access using procedures of Section 01028 “Entry into Controlled Areas.” Place tools, equipment and materials needed onto drop cloth.

D. Pick up any bulk debris from top of equipment and within reach on top of ceiling and place into disposal bags.

E. Remove dust and debris from top equipment and ceiling with HEPA vacuum.

F. Thoroughly wet wipe equipment and surfaces that will be contacted during repair or maintenance work with amended water to remove all residue of ACM.

G. HEPA vacuum top side of ceiling within reach from access area.

H. O&M work: Performed required repair or maintenance work on exposed substrate.

I. Complete work: Perform clean-up, tear-down and worker decontamination work of Section 01527 “Regulated Areas,” to complete the work.

3.5 INSTALL WIRING IN PLENUM SPACE (SPECIFICALLY)

A. General: Installing new plenum rated computer or telephone cables that will lay on top of ceiling, where there is dust or debris from ACM surfacing treatment or other ACM material on top of the ceiling tiles or if the ACM surfacing material is close enough to the work that it could be disturbed.

B. Limits: Use of this procedure is limited to situation where the amount of waste generated is not greater in size than the OSHA limit on Class III work (operation will generate no more waste than will fit into one 60 inch by 60 inch glovebag or disposal bag).

C. Drop Cloth: Prepare work area with drop cloth in accordance with requirements of Section 01527 “Regulated Areas.”

1. Install a continuous drop cloth under area where cabling is to be run. Secure continuous drop cloth in place to minimize slipping hazards.

2. Install a second drop cloth at each ceiling opening on top of the continuous drop cloth. Secure drop cloths in place to minimize slipping hazards.

D. Access: Obtain access to plenum above using procedures of Section 01028 “Entry into Controlled Areas.” Place tools, equipment and materials needed onto drop cloth.

E. HEPA vacuum top side of ceiling within reach from access area.

F. Observe top of ceiling in direction that cables are to be run. Determine conditions at the next location where access above the ceiling is required:

1. If there is any ACM debris or dust on top of ceiling tiles use work procedures from Section 01528 “Entry Into Controlled Areas.”

G. Locate the next ceiling access so that all parts of the ceiling top between access locations can be cleaned.

H. Remove any ACM debris in the path to be followed by cables. If there is any ACM debris remove with a HEPA vacuum. Spray a lock-back encapsulant on ceiling tile tops wherever debris is removed.

I. Open enough ceiling tiles that the cables can be passed by hand from opening to opening.

J. Install cable(s) by passing leading end of cable(s) from opening to opening. DO NOT TOSS CABLES OR ANY
OTHER OBJECT ABOVE THE CEILING.

K. Run cables passing the cable from opening to opening as required without dragging cable across ceiling. Lift cables from floor into ceiling plenum. Do not drag cables from floor across ceiling grid up into ceiling plenum. Do not contact exposed ACM surfacing above ceiling. Minimize disturbance of ceiling system and other components above ceiling while running wiring.

L. Complete work: Perform clean-up, tear-down and worker decontamination work of Section 01527 “Regulated Areas,” to complete the work.

3.6 REMOVE A SMALL AMOUNT OF ACM

A. General: Use the following procedures to remove a small amount of ACM as part of repair or maintenance operations. Use of this procedure is limited to situations where the amount of waste generated is not greater in size than the OSHA limit on Class III work (operation will generate no more waste than will fit into one 60 inch by 60 inch glovebag or disposal bag).

B. Drop Cloth: Prepare work area with drop cloth in accordance with requirements of Section 01527 “Regulated Areas.”

C. Access: If access above ceiling is required, obtain access using procedures of Section 01028 “Entry into Controlled Areas.” Place tools, equipment and materials needed onto drop cloth.

D. Drop Sheet: Install polyethylene drop sheet or a pan immediately below location of work to catch any falling debris.

E. Wet: Adequately wet area where hole is to be drilled. Wet sufficiently so that ACM is wetted completely. Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM it to be removed.

1. If the surface is coated with paint, mist surface and scarify paint sufficiently for ACM to be wetted. Remove paint by peeling or scraping off as necessary. Wet surface of exposed ACM. Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM it to be removed.

F. Remove ACM surfacing material using one of the following procedures.

1. Scrape away surfacing material to at least ½ inch (13 mm) beyond where hole is needed. Hold a pan immediately under area to catch debris while scraping. If any dry ACM is encountered stop scraping and wet ACM. Maintain scraping area and any dust or debris generated wet at all times.

2. Scrape away surfacing material to at least ½ inch (13 mm) beyond where hole is needed. Scrape material directly into the nozzle of an operating HEPA vacuum or use nozzle of HEPA vacuum directly as tool to remove ACM. Continuously maintain HEPA vacuum nozzle within 6 inches (150 mm) of where work is occurring. If any dry ACM is encountered stop scraping and wet ACM. Maintain scraping area and any dust or debris generated wet at all times.

G. Remove residue: After acoustical plaster is removed wet surface of substrate and remove all residue with a stiff nylon brush. Remove water and residue from surface with paper towels. Immediately dispose of towels in an asbestos waste bag. Repeat brushing and paper towel process three (3) times. If substrate is a scratch coat, wet substrate and scrape off 1/16 inch of scratch coat to remove any residual ACM that may be trapped in the texture of the scratchcoat.

H. Spray substrate and edges of acoustical plaster with clear penetrating encapsulant.

I. O&M work: Performed required repair or maintenance work on exposed substrate.

J. Complete work: Perform clean-up, tear-down and worker decontamination work of Section 01527 “Regulated Areas,” to complete the work.
3.7 DRILL ACM WITH A HEPA EQUIPPED DRILL

A. General: Use the following procedures to remove a small amount of ACM as part of repair or maintenance operations. Use of this procedure is limited to situations where the amount of waste generated is not greater in size than the OSHA limit on Class III work (operation will generate no more waste than will fit into one 60 inch by 60 inch glovebag or disposal bag).

B. Drop Cloth: Prepare work area with drop cloth in accordance with requirements of Section 01527 “Regulated Areas.”

C. Access: If access above ceiling is required, obtain access using procedures of Section 01028 “Entry into Controlled Areas.” Place tools, equipment and materials needed onto drop cloth.

D. Drop Sheet: Install polyethylene drop sheet or a pan immediately below location of work to catch any falling debris.

E. Wet: Adequately wet area where hole is to be drilled. Wet sufficiently so that ACM is wetted completely. Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM it to be removed.

   1. If the surface is coated with paint, mist surface and scarify paint sufficiently for ACM to be wetted. Remove paint by peeling or scraping off as necessary. Wet surface of exposed ACM. Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM it to be removed.

F. Drill holes through ACM with drill equipped with dust collection collar attached to a HEPA vacuum. Follow manufacturer’s instruction for use of equipment. Perform work in a manner that will keep the collar against the surface and the maintain the HEPA vacuum in operation during entire process of drilling hole.

   1. If hole is being drilled through a surface, such as a suspended ceiling, where back side is inaccessible, at completion of drilling place HEPA vacuum hose near or through hole and run for several minutes to collect any airborne dust on backside of surface.

   2. If hole is drilled from top side of deck: Wet ACM on underside of deck with amended water. Hold pan with sheet plastic drop cloth against surface of underside of deck to catch any falling debris, including material from hole. Drill hole through surface. Wet any debris in pan or on drop cloth on underside, package up debris and drop cloth/enclosure and dispose of as ACM.

G. HEPA vacuum hole and surfaces in vicinity of hole.

H. Wash and wipe out drill enclosure to remove all dust and residue from ACM.

I. Spray substrate and edges of acoustical plaster with clear penetrating encapsulant.

J. O&M work: Performed required repair or maintenance work.

K. Complete work: Perform clean-up, tear-down and worker decontamination work of Section 01527 “Regulated Areas” to complete the work.

END OF SECTION - 02083
SECTION 02084 - DISPOSAL OF REGULATED ASBESTOS-CONTAINING MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Worker protection requirements are set forth in Sections 01560 Worker Protection - Asbestos abatement

B. Section 01098 Codes, Regulations and Standards - Asbestos Abatement describes applicable federal, state and local regulations.

1.3 DESCRIPTION OF THE WORK

A. This section describes the disposal of Regulated Asbestos-Containing Materials (RACM). Disposal includes packaging of Regulated Asbestos-Containing Materials. Disposal may be accomplished either by land filling or converting Regulated Asbestos Containing Materials to non Asbestos waste.

1.4 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

   1. Copy of state or local license for waste hauler.

   2. Name and address of landfill where Regulated Asbestos Containing Materials are to be buried. Include contact person and telephone number.

   3. Chain of Custody form and form of waste manifest proposed

   4. Sample of disposal bag and any added labels to be used.

B. On a weekly basis submit copies of all manifests and disposal site receipts to Asbestos Project Manager/Designer.

C. Waste Shipment Record: Maintain a waste shipment record as required by the NESHAP regulation which indicates the waste generator, transporter, and disposal site, and which describes the nature, size, type of container, and form of asbestos waste. Submit to Asbestos Project Manager/Designer within 35 days of departure from building.

PART 2 - PRODUCTS
2.1 MATERIALS

A. Disposal Bags: Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled with three labels with text as follows:

1. First Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:

   DANGER
   CONTAINS ASBESTOS FIBERS
   AVOID CREATING DUST
   CANCER AND LUNG DISEASE HAZARD
   BREATHING AIRBORNE FIBERS IS
   HAZARDOUS TO YOUR HEALTH

2. Second Label: Provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances

   RQ-ASBESTOS WASTE
   CLASS 9
   NA2212-PG III

3. Third Label: Provide the name of the waste generator (Owner's name), the location from which the waste was generated and the names and addresses of the Contractor and transporter. This label must be durable, able to repel dirt and moisture (e.g., permanent marker). Label must be placed directly on disposal bag(s) in a legible format. Peel and stick type labels are expressly prohibited.

PART 3 - EXECUTION

3.1 SEQUENCE

A. Comply with the following sections during all phases of this work:

1. Section 01560 Worker Protection - Asbestos Abatement

2. Section 01562 Respiratory Protection

3.2 GENERAL

A. All waste is to be hauled by a waste hauler with all required licenses from all state and local authority with jurisdiction.

B. Liquid waste: Mix all liquid asbestos-containing waste or asbestos contaminated waste with a bladeable material so that it forms a bladeable (non-liquid) form, and have the concurrence of the landfill operator prior to disposal.

C. Load all adequately wetted Regulated Asbestos-Containing Material in disposal bags or leak-tight containers. All materials are to be contained in one of the following

1. Two 6 mil (0.15 mm) disposal bags or

2. Two 6 mil (0.15 mm) disposal bags and a fiberboard drum or steel drum

D. Protect interior of truck or dumpster with Critical and Primary Barriers as described in Section 01526 Temporary Enclosures.

E. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.
F. Warning Signs: During loading and unloading mark dumpsters, receptacles and vehicles with a sign complying with requirements of the EPA NESHAP regulation (40 CFR Part 61), in a manner and location that a person can read the following legend:

```
DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
Authorized Personnel Only
```

G. Do not store containerized materials outside of the Work Area. Take containers from the Work Area directly to a sealed truck or dumpster.

H. Do not transport disposal bagged materials on open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as Regulated Asbestos-Containing Material and dispose of in accordance with this specification.

I. Advise the landfill operator, at least ten days in advance of transport, of the quantity of material to be delivered.

J. At disposal site unload containerized waste:

1. At the disposal site, sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for rebagging. Clean entire truck and contents using procedures set forth in section 01711 Project Decontamination.

2. The Owner will only accept landfill of asbestos-containing materials at the following sites for friable asbestos-containing materials:
   a. Landfill must have prior approval from the EH&S Asbestos/Lead Manager.

3. The Owner will only accept landfill of asbestos-containing materials at the following sites for non-friable asbestos-containing materials:
   a. Landfill must have prior approval from the EH&S Asbestos/Lead Manager.

K. Retain receipts from landfill or processor for materials disposed of.

L. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Asbestos Project Manager/Designer.

END OF SECTION - 02084
SECTION 02085 - RESILIENT FLOORING REMOVAL - RESILIENT FLOOR COVERING MANUFACTURERS’ RECOMMENDED WORK PRACTICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Work described by this section relates to work practices as currently set forth in "Recommended Work Practices for the Removal of Resilient Floor Coverings,” revised August, 1995, published by:

1. Resilient Floor Covering Institute
   966 Hungerford Drive
   Suite 12-B
   Rockville, MD  20850

2. Armstrong World Industries, Inc.
   P.O. Box 3001
   Lancaster, PA  17604

1.2 SUMMARY

A. This Section includes work practices for removal of resilient floor covering materials which are “intact,” and are likely to remain intact during the removal, and can be removed under a negative exposure assessment in compliance with the OSHA standard by appropriately trained workers using the Recommended Work Practices.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 2 Section 02084 "Disposal of Regulated Asbestos-Containing Material" for disposal of friable asbestos-containing waste. Note, that resilient floor covering is defined by the EPA NESHAP regulation as Category 1 non-friable ACM and as such is not covered by Section 02084. Resilient floor covering materials should be disposed of in accordance with any applicable state and local regulations.

1.3 DEFINITIONS

A. Compliant Work Practices: Work practices for the removal of flooring material which OSHA has determined will consistently result in exposures below the TWA and excursion limit established by 29 CFR 1926.1101. Recommended Work Practices described in this Section have been recognized by OSHA as Compliant Work Practices.


C. Friable: Material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

D. Intact: means that ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. The incidental breakage of flooring materials, or slicing of sheet vinyl floor covering with a sharp edged instrument, during removal operations conducted in accordance with the Recommended Work Practices does not mean that the materials are not removed in an intact conditions. Intact resilient floor covering materials will be rendered friable if subjected to sanding, sawing or other aggressive operations.

E. Competent Person: An individual with the training and experience required by OSHA for a Competent Person involved in removal of intact flooring material using compliant work practices (12 hours of training). The competent
person will supervise the work of this section, and is responsible for the health and safety of workers at the flooring material removal job site. The competent person must have authority to stop work, and take corrective action.

F. Initial Exposure Assessment: An inspection made by a Competent Person of the job site prior to the start of removal operations for the purpose of determining if the requirements of a negative exposure assessment are met.

G. Negative Exposure Assessment: Based on data in the rulemaking record, OSHA has determined that worker exposures will consistently be below the TWA and excursion limit during removal of intact flooring material when compliant work practices are used. As such, a Competent Person may make a negative exposure assessment when:

1. Recommended Work Practices will be used.
2. Workers are properly trained.
3. The resilient flooring is intact and is likely to remain intact throughout the removal process.

1.4 WORKER PROTECTION

A. Worker Training: Workers using the Recommended Work Practices for the intact removal of resilient floor covering materials must have completed an 8-hour training program as required by the OSHA regulation 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63 Appendix D, covering asbestos subjects as well as training in the Recommended Work Practices. Workers with this amount of training only are not permitted to continue working if the material becomes non-intact.

B. Competent Person: Engage a person experienced in the use of the Recommended Work Practices who has completed an 8-hour worker training program and additional 4 hours of training as required by the OSHA regulation 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63 Appendix D, for a Competent Person involved in removal of intact flooring material using compliant work practices. Competent Persons with this amount of training only are not permitted to continue working if the material becomes non-intact.

C. State and Local Requirements: All workers are to be trained, certified and accredited as required by state or local regulation, including but not limited to AQCC Regulation 8, Part B.

D. Medical Surveillance: Workers who engage in the removal of asbestos-containing flooring materials for more than 30 days per year (one hour or more per day) must receive medical surveillance. This requires a medical examination within 10 working days following the 30th day of exposure.

E. Prohibitions in work area: Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area.

F. Certificate of Worker Acknowledgment: Have each worker who is at the job site or who will enter the work area, fill out and sign a copy of the Certificate of Worker's Acknowledgment found at the end of this section.

1.5 QUALITY ASSURANCE

A. Notifications: Before the start of Work notify the following of the presence and location of ACM and of the planned removal activity:

1. Employees performing the work.
2. Employers of employees working in the area (not separated from the work area by either a wall, closed door or window or other impermeable barrier).
3. The building Owner.
B. Regulatory Compliance: Comply with provisions of the following:

1. OSHA Construction Standard for Asbestos 29 CFR 1926.1101


3. OSHA 29 CFR 1926.2 through 35

4. AHERA Regulation 40 CFR 763 Sub-Part E

5. Applicable state and local regulations, including but not limited to AQCC Regulation 8, Part B.

C. Non-Intact Material: If the resilient flooring materials become non-intact during the work, stop work until the job can be evaluated by a competent person. Do not resume work until:

1. The job can be evaluated and supervised by a competent person who has completed a training course meeting the criteria of EPA’s Model Accreditation Plan for supervisors, and

2. The work will be carried out by workers who have completed training meeting the criteria of the EPA’s Model Accreditation Plan for asbestos abatement workers.

3. The work will be carried out in accordance with worker and area protection specified in Section 02087.

1.6 SUBMITTALS

A. Negative Exposure Assessment: Before starting any work submit a Negative Exposure Assessment certified by a Competent Person to the Asbestos Project Manager/Designer. If a Negative Exposure Assessment cannot be made, report the reasons and any corrective action that would result in a Negative Exposure Assessment. The certification must be signed and dated by a Competent Person and be based on an Initial Assessment of the work of this contract. A copy of the negative exposure assessment should be retained by the employer of the Competent Person. The certification must include:

1. The name and signature of the Competent Person making the Assessment.

2. Certification that the Competent Person has been trained as required by OSHA for work on intact resilient flooring.

3. A description of the work including:

   a. Name and address of facility where the work is to occur.

   b. Description of location within the facility where work is to occur.

4. Certification that:

   a. Recommended Work Practices will be used.

   b. Workers will be properly trained as required by OSHA for work on intact resilient flooring.

   c. The resilient flooring is intact and is likely to remain intact throughout the removal process.

5. Complete and submit to the Asbestos Project Manager/Designer the job form from “Using Compliant Work Practices to Remove Resilient Floor Covering” published by the Resilient Floor Covering Institute (RFCI) and Armstrong World Industries, Inc. This form is to be signed by a Competent Person. Retain a copy of the form.
6. Certificate of Worker Acknowledgment: Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or who will enter the work area.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wetting Materials: For wetting prior to disturbance of asbestos-containing sheet flooring or asphaltic adhesive, use liquid dishwashing detergent that contains anionic, nonionic, and amphoteric surfactants.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

a. 

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivory Liquid</td>
<td>Procter &amp; Gamble</td>
<td>Cincinnati, OH 45202</td>
</tr>
</tbody>
</table>

B. Waste Bag: Large size heavy-duty impermeable trash bag made from 6 mil (0.15 mm) thick polyethylene. Identify with a label stating “DANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD.”

C. Waste Container: Closed leak-tight container. Identify with a label stating “DANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD.”

D. Scrapers: Broad stiff-bladed wall or floor scrapers. Heavy-duty short or long handled scraper.

E. Cutting Sand: No. 1 sandblasting sand (clean, sharp, coarse cutting sand).

F. Terrazzo Floor Machine: Terrazzo or low-speed floor machine fitted with a floor plate attachment (similar to Clark Assembly 500202-6).

G. Removal Solution: Solution used to remove adhesive residue. e.g. Mop on, mop off, no machine scrub - wax stripping solution.

H. Floor Pad: Black floor scrubbing pad.

I. HEPA Filter Vacuum Cleaners: Use wet/dry tank-type vacuum cleaner equipped with a filter and metal floor attachment (no brush).

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEPA filtered Vacuums</td>
<td>Nilfisk of America, Inc.</td>
<td>225 Great Valley Parkway Malvern, PA 19355 (800) 645-3475</td>
</tr>
<tr>
<td>Minuteman HEPA</td>
<td>Minuteman International</td>
<td>111 South Route 53 Addison, IL 60101 (708) 627-6900</td>
</tr>
<tr>
<td>HEPA Filtered Vacuums</td>
<td>Pullman-Holt (White) Corp.</td>
<td>PO Box 16647 Tampa, FL 33617 (813) 645-3475</td>
</tr>
</tbody>
</table>
J. Thermal Equipment with Automatic Control:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Delta T&quot; series</td>
<td>Enviromethods, Inc.</td>
<td>P.O. Box 6151 Wolcott, CT 06716</td>
</tr>
<tr>
<td>&quot;ATR&quot; (Automated Tile Removal) series</td>
<td>UAS Automation Systems, Inc.</td>
<td>4524 Parkway Commerce Blvd. Orlando, FL 32808</td>
</tr>
</tbody>
</table>

K. Miscellaneous Equipment: Provide as needed the following equipment: utility or hook knife, ground fault circuit interrupter, hand sprayer, hammer or mallet, commercial-type, hand-held, hot-air gun or radiant heat source, hand-held rubbing stones, slip resistant shoes or boots, chisel, heavy gloves, duct tape, safety glasses.

L. Use a Ground Fault Circuit Interrupter (GFCI) for any electrical connections in a wet environment.

PART 3 - EXECUTION

3.1 GENERAL

A. Assume an asbestos content: Unless indicated in the contract documents that a flooring material is a non-asbestos product, assume it contains asbestos and treat it in the manner prescribed by the following procedures which are based on the "Recommended Work Practices for the Removal of Resilient Floor Coverings," published by the Resilient Floor Covering Institute and Armstrong World Industries. Do not sand, dry sweep, dry scrape, drill, saw, beadblast, or mechanically chip or pulverize existing resilient flooring, backing lining felt or asphaltic “cut back” adhesives.

B. Before beginning removal of any resilient flooring materials complete the following

1. Negative Exposure Assessment: Before starting any work require that a Competent Person make an Initial Exposure Assessment of the resilient flooring to be removed. Begin work only if the Competent Person makes a Negative Exposure Assessment. Based on data in the rulemaking record, OSHA has determined that worker exposures will consistently be below the TWA and excursion limit during removal of intact flooring material when compliant work practices are used. As such, a Competent Person may make a negative exposure assessment when:

   a. Recommended Work Practices will be used.
   
   b. Workers are properly trained.
   
   c. The resilient flooring is intact and is likely to remain intact throughout the removal process.

   If a Negative Exposure Assessment cannot be made, report the reasons and any corrective action that would result in a Negative Exposure Assessment.

2. Notifications: Before the start of Work notify the following of the presence and location of ACM and of the planned removal activity:

   a. Employees performing the work.
   
   b. Employers of employees working in the area (not separated from the work area by either a wall, closed door or window or other impermeable barrier).
c. The building Owner.

3. Demarcation: The work area must be demarcated or access must be limited to workers performing the removal. Post warning signs that read:

```
DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
```

4. Preparation: Prior to beginning the removal of resilient floor covering complete the following:
   a. Remove appliances and furniture from the work area.
   b. Remove binding strips or other restrictive molding from doorways, walls, etc.
   c. Mix a detergent solution (16 ounces (0.473 liters) of liquid dishwashing detergent to 1 gallon (3.79 liters) of water) and pour into a garden sprayer.
   d. Clean the entire floor using a wet/dry vacuum cleaner equipped with a HEPA filtration system with disposable bag and metal floor attachment (no brush). Do not dry sweep; do not create dust.
   e. Precaution: Resilient flooring becomes slippery when wet with a detergent solution. Use caution to contain the solution in the immediate work area. Stand on a sheet of plywood or non-slip surface while working on wet surfaces.
   f. After vacuuming, used HEPA filters and cleaner bags should be removed according to manufacturer’s instructions and place in a waste bag or waste container.

C. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.2 REMOVAL OF PERIPHERALLY-ADHERED RESILIENT SHEET VINYL FLOORING

A. Use the following procedures to remove adhered portions of the sheet vinyl floor covering:

1. The manufacturer’s recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

2. Make a slice with a sharp knife into the adhered floor covering 4 to 8 inches (102 to 203 mm) wide, parallel with the walls, around the perimeter of the room.

3. Starting on either side of the entrance door, pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

4. Roll the strip tightly as it is removed. Tie or tape securely and immediately place in a waste bag or waste container for disposal.

5. Remove all of the exposed residual felt by wet scraping, using the procedures under, "Wet Scraping Residual Felt," in this section, before proceeding with removal of the unadhered portion of the floor covering. Residual felt
must be removed by wet scraping. Do not sand or dry scrape in any way. Do not dry sweep. Avoid creating dust.

6. Remove additional strips, following the above procedure, as necessary to expose unadhered subfloor area.

7. Continue around the room completely removing the adhered flooring along the perimeter, one strip at a time following the procedures above. Do not remove the flooring at the entrance doorway until all other flooring has been completely removed.

8. Vacuum up any residue of wet felt scrapings immediately with a wet/dry vacuum equipped with a HEPA filter and metal floor attachment (no brush).

9. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

10. Remove the unadhered flooring as detailed in the article in this Section on “Removal of Unadhered Resilient Floor Covering.”

B. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.3 REMOVAL OF UNADHERED RESILIENT FLOOR COVERING

A. Use the following procedure to remove loose laid or the unadhered portion of peripherally adhered sheet resilient floor covering:

1. The manufacturer’s recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

2. Start at the end of the room farthest from the entrance doorway and slice a strip 18 inches (0.46m) wide in the unadhered flooring.

3. Remove the sliced strips while spraying the detergent solution into the separation nip point. Do not stand or kneel on the exposed subfloor during the removal process.

4. Roll the wet strip tightly and tie or tape to secure. Continue working toward the doorway, slicing each strip and removing it while spraying the separation nip point with the detergent solution. Place the strips while still wet into a waste bag or waste container.

5. After removing three strips of flooring, vacuum the exposed floor using a wet/dry vacuum equipped with a HEPA filter with metal floor attachment (no brush).

6. Seams and other adhered areas should be removed as they are encountered. Strip the wear surface while spraying the detergent solution into the delamination nip point. Wet scrape the residual felt as described under, "Wet Scraping Residual Felt" in this section.

7. Continue removing flooring, doing only one three-strip area at a time, until the entire floor has been completely removed.

8. When the whole floor has been completely removed, let it dry. Vacuum up any dust using a vacuum with a HEPA filtration system and a metal floor attachment (no brush). Stand only in vacuumed areas as work proceeds across the floor. Position the vacuum cleaner so that discharge air does not blow on the floor being cleaned. Do not dry sweep. Avoid creating dust.
9. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

10. When floor is dry, install new resilient floor covering following manufacturers’ installation recommendations.

B. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.4 REMOVAL OF ADHERED RESILIENT SHEET VINYL FLOORING

A. Use the following procedure to completely remove adhered resilient sheet flooring.

1. The manufacturer’s recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

2. Make a series of parallel slices, with a knife, 4 to 8 inches (102 to 203 mm) apart parallel to a wall.

3. Start at the end of the room farthest from the entrance door. Pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

4. Roll the strip tightly as it is removed. Tie or tape securely and immediately place in a waste bag or waste container for disposal.

5. If parts of the foam inner-layer remain stuck to the backing, attempt to eliminate this condition by pulling the strips loose from the opposite end. Peel the foam inner-layer from the floor while spraying the detergent solution into the delamination nip point.

6. Some resilient flooring is not readily strippable by hand. When these conditions are encountered, a sharp stiff blade scraper may be used to assist cleavage of the wear layer from felt. If this procedure is used the distance between slices must be narrowed to a width of 3 to 5 inches (76 to 127 mm).

7. Regardless of whether stripping of the wear surface is accomplished by hand peeling alone or with the assistance of a stiff blade scraper, detergent solution must be sprayed into the delamination nip point to minimize any airborne dust particles.

8. After removing three strips of the wear surface, remove the remaining residual felt by wet scraping using the procedures "Wet Scraping Residual Felt," in this section. During the stripping process, do not stand or walk on the exposed felt.

9. After removing the three strips of flooring and residual felt vacuum the exposed floor using a wet/dry vacuum equipped with a HEPA filter and metal floor attachment (no brush).

10. Repeat the operation (wetting the delamination nip point while removing the next three strips, then wet scrape the residual felt, then vacuum the exposed floor). Do only one three-strip area at a time until the entire floor has been completely removed.

11. Place all flooring strips and felt scrapings immediately while wet into waste bags or waste containers. Close full bags and containers tightly and seal securely for disposal.

12. Do not dry sweep. Avoid creating dust.
13. When all floor covering has been completely removed, let the floor dry. Vacuum up any dirt using a vacuum with a HEPA filtration system and a metal floor attachment (no brush). Stand only in the vacuumed area as the work proceeds across the floor. Position the vacuum cleaner so the discharge air does not blow on the floor being cleaned.

14. After vacuuming, used HEPA filters and cleaner bags should be removed according to manufacturer’s instructions and place in a waste bag or waste container.

15. When the floor is dry, it is ready to have a new resilient floor covering installed. Follow the floor covering manufacturer’s instructions.

B. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.5 WET SCRAPING RESIDUAL FELT

A. Remove any residual felt remaining on the floor after removal of the wear layer of adhered vinyl sheet flooring by using the following procedure:

1. Thoroughly wet residual felt with detergent solution. Avoid excessive wetting or standing water. Wait a few minutes to allow solution to soak into felt.

2. Stand on the remaining floor covering (not the felt) and use a stiff-bladed scraper or a floor scraper with a replaceable blade to remove the wet felt.

3. Re-wet the felt if the solution has not completely penetrated, if drying occurs or if dry felt is exposed during scraping. Scrape all felt from each three-strip area before proceeding further. Pick up the scrapings as they are removed from the floor and place in a waste bag or waste container.

4. Wet residual felt as above but do not excessively soak or flood wood floors with detergent solution. Excessive water can damage wood floors to the extent that new underlayment could be required. A floor that has been wet scraped must be allowed to dry thoroughly before new resilient flooring is installed.

5. As removal progresses, vacuum the area using a vacuum cleaner equipped with a HEPA filter and metal floor attachment (no brush).

6. After removal is complete and the entire floor has dried, vacuum using a HEPA vacuum with a metal floor attachment (no brush).

7. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

B. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.6 REMOVAL OF RESILIENT TILE FLOOR COVERING

A. Use the following procedure to remove resilient tile floor covering:

1. Begin removal in an area that receives the minimum foot traffic.

2. Floor tiles must be wetted (misted with a garden sprayer) before actual removal begins, unless heat will be used to remove tiles.

3. Start removal by carefully wedging a wall scraper in the seam of two adjoining tiles and gradually forcing the edge of one of the tiles up and away from the floor. Continue to force the balance of the tile up by working the
scraping beneath the tile. Exert both a forward pressure and a twisting action on the blade to promote release of the tile from the adhesive and the floor.

4. When the first tile is removed place it, without breaking it further into smaller pieces, in a waste bag or waste container.

5. After the first tile is removed and accessibility to other tiles is improved, force the wall scraper under the exposed edge of another tile. Continue to exert a prying twisting force to the scraper as it is moved under the tile until the tile releases from the floor. Again, dispose of the tile, and succeeding tiles, by placing in a waste bag or waste container without additional breaking.

6. Force the scraper through tightly-adhered areas by striking the scraper handle with a hammer using blows of moderate force while maintaining the scraper at a 25 to 30 degree angle to the floor. The resilient floor covering manufacturers’ work practices recommend use of safety goggles during this work.

7. Continue to wet (mist) the tiles throughout the procedure.

8. It should be the goal to remove individual tiles as a complete unit, although breakage of tiles is unavoidable.

9. If the procedure above is inadequate to loosen tiles use heat to soften adhesive, or alternatively, without first prying up floor tiles using a scraper, thoroughly heat the tile(s) with a hot air gun or radiant heat source until the heat penetrates through the tile and softens the adhesive, and remove tiles by hand or by using a scraper. The resilient floor covering manufacturers work practices recommend that the hot air gun or radiant heat source, tiles and adhesive be carefully handled to avoid burns, and that heated tiles and adhesive be handled only with suitable glove protection for hands. Caution: Over-heating resilient tile might produce harmful vapors, and a respirator with organic cartridges might be needed.

10. Deposit tiles in a waste bag or leak-tight container. Do not attempt to break tiles after they are in bag.

B. Wet Scrape Residual Adhesive: As small areas of subfloor are cleared of tile, wet scrape residual asphaltic “cut-back” adhesive so that no ridges or puddles are evident and what remains is a thin, smooth film.

1. Start in the corner of the room farthest from the entrance door and moisten an area of the adhesive (approximately 3 by 10 feet) (0.91m by 3.05m) with water mixed with liquid dishwashing detergent (to aid in wetting the adhesive). Wet scrape with a stiff-bladed wall or floor scraper removing ridges and any loose adhesives.

2. Place loosened adhesive residues into a waste bag or waste container

3. Wet vacuum standing water with HEPA wet/dry vacuum.

4. Continue the above steps until what remains of the residual asphaltic “cut-back” adhesive is a thin, smooth film.

C. Wet Remove residue of adhesive from Concrete: Completely remove residue of adhesive left after removal of resilient floor tile using the following procedure:

1. Place cutting sand (enough to cover an area of approximately 6 by 6 foot (1.83 by 1.83 m) into a container, add water mixed with liquid detergent (1 ounce (30 ml) of liquid dishwashing detergent to 1 gallon (3.79 liters) of water) to dampen the sand (20 pounds (9.07 kg) of sand to ½ gallon (1.89 liters) of solution).

2. Place sand over a 6 by 6 foot (1.83 by 1.83 m) area and wet remove the existing adhesive residue using a terrazzo floor machine. Keep sand under rubbing stones when operating the machine. The sand and subfloor must be continuously kept wet.

3. Occasionally push away cutting sand from the subfloor with a wall or floor scraper to check for complete
removal.

4. Remove adhesive around the edge of the room and missed areas with dampened, clean, sharp, cutting sand and a hand held rubbing stone.

5. Wet-scrape sand into a pile using a stiff-bladed floor or wall scraper and place sand and adhesive residue in a waste bag or waste container.

6. Rinse area with clear clean water using a hand sprayer. Worker’s boots should also be rinsed and cleaned.

7. Wet-vacuum standing water with HEPA wet/dry vacuum with a metal floor attachment (no brush).

8. Continue with the above steps until the entire room is complete.

9. Allow subfloor to dry and vacuum up any remaining dirt or sand using a vacuum equipped with a HEPA filter and metal floor attachment (no brush).

10. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

11. Wet-wipe and/or wash down all equipment used during the work.

D. Wet Remove residue of adhesive from Concrete: Completely remove residue of adhesive left after removal of resilient floor tile using the following procedure:

1. Start in the corner of the room farthest from the entrance door. Put the removal solution onto the residual adhesive with a hand sprayer or mop over a 6’ X 6’ (1.82m X 1.82m) Put enough removal solution (e.g. “mop on, mop off, no machine scrub” stripping solution) to ensure that the area is thoroughly wet. Allow the area to soak for 5-10 minutes. Remove the adhesive using a floor machine equipped with a black floor pad (or equivalent). The subfloor must be kept continuously wet.

2. Occasionally push away the adhesive slurry from the subfloor with a wall or floor scraper to check for complete removal. Continue to use the floor machine, equipped with the black pad, in the same area until the concrete subfloor is cleaned to the desired degree.

3. Remove adhesive around the edge of the room, from missed areas, and from areas difficult to reach with the machine with a hand held piece of the black floor pad using the above procedure.

4. Wet HEPA vacuum the adhesive slurry. When the HEPA vacuum is full, place a commercially suitable water absorbent into the HEPA container until the adhesive slurry is absorbed. Place adhesive waste in a waste bag or waste container.

5. Rinse area with clear clean water using a hand sprayer or mop. Worker’s boots should also be rinsed and cleaned.

6. Wet-vacuum standing water with HEPA wet/dry vacuum with a metal floor attachment (no brush).

7. Continue with the above steps until the entire room is complete.

8. Allow subfloor to dry and vacuum using a vacuum equipped with a HEPA filter and metal floor attachment (no brush).

9. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.
10. Wet-wipe and/or wash down all equipment used during the work.

E. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.7 REMOVAL OF THIN WOOD UNDERLAYMENT

A. Thin wood underlayment covered with existing sheet vinyl. Remove thin wood underlayment covered with existing sheet-vinyl-resilient flooring, with the flooring adhered. Use the following procedure:

1. Locate the joints of the underlayment panel farthest from the entrance door.

2. Slice a strip of the flooring 4 to 8 inches (102 to 203 mm) wide centered over the underlayment joint in the panel being removed.

3. Pry up the corner of the strip separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

4. Roll the strip tightly as it is removed. Tie or tape securely and place in a waste bag or waste container for disposal.

5. Remove all of the exposed residual felt by wet scraping using the procedures of, "Wet Scrapping Residual Felt," in this section before proceeding.

6. Drive a cold chisel using a hammer or mallet into the joint at a corner of the panel. Now use the chisel to pry the panel up far enough to insert a pry bar. Continue working around the panel, lifting all edges slowly. Use one or two pry bars to pry up the underlayment panel a little at a time until the panel is completely loose and can be removed. Attempt to remove the panel in one piece.

7. If the panel breaks, slice the resilient flooring at the break and spray the detergent solution onto the exposed felt. Allow the solution to penetrate for a few minutes, then continue lifting the broken underlayment.

8. Remove each underlayment panel or piece from the work areas as it is lifted. The resilient floor covering manufacturers work practices recommend that workers wear heavy gloves when handling removed panels, and be very careful of wood splinters and protruding fasteners. Flatten the fasteners with a hammer and stack the panels back to back on pallets or place in dumpster. Identify panels with a label stating, “DANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD.” Dispose of in an approved landfill only.

9. Place any small wood or flooring scrapes in a waste bag or waste container.

10. If the underlayment extends under cabinets or wall partitions, slice through the flooring with a knife as close to the vertical surface as possible, deeply scoring the panel.

11. After each panel has been lifted and removed from the work area, pull up any remaining nails or fasteners in the subfloor.

12. Continue removing each underlayment panel in sequence following the above procedures.

13. When the underlayment / resilient flooring removal is complete, vacuum with a HEPA filter and metal floor Attachment (no brush).
14. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

B. Removal of thin wood underlayment covered with existing tile. Remove the underlayment with the tile adhered using the following procedure:

1. Floor tiles must be wetted (misted with a garden sprayer) before actual removal begins, unless heat will be used to remove tiles.

2. Starting at the doorway or a floor ventilation vent, locate a joint in an underlayment board.

3. Start removal by carefully wedging a wall scraper in the seam of two adjoining tiles and gradually force the edge of one of the tiles up and away from the floor. Continue to force the balance of the tile up by working the scraper beneath the tile. Exert both a forward pressure and a twisting action on the blade to promote release of the tile from the adhesive and the floor.

4. When the first tile is removed place it, without breaking it further into smaller pieces, in a waste bag or waste container.

5. After the first tile is removed and accessibility to other tiles is improved, force the wall scraper under the exposed edge of another tile. Continue to exert a prying twisting force to the scraper as it is moved under the tile until the tile releases from the floor. Again, dispose of the tile, and succeeding tiles, by placing in a waste bag or waste container, without additional breaking.

6. Force the scraper through tightly adhered areas by striking the scraper handle with a hammer using blows of moderate force while maintaining the scraper at a 25 to 30 degree angle to the floor. Use eye protectives and other protective equipment required for the work.

7. Continue to wet (mist) the tiles throughout the procedure.

8. It should be the goal to remove individual tiles as a complete unit, although breakage of tiles is unavoidable.

9. If the procedure above is inadequate to loosen tiles use heat to soften adhesive. Thoroughly heat the tile(s) with a hot air gun or radiant heat source until the heat penetrates through the tile and softens the adhesive. The resilient floor covering manufacturers work practices recommend that the hot air gun or radiant heat source, tiles and adhesive be carefully handled to avoid burns, and that heated tiles and adhesive be handled only with suitable glove protection for hands.

10. After all tiles have been removed from the underlayment joints, drive a chisel, using a hammer or a mallet, between the underlayment board and the subfloor. Use the chisel to pry up the underlayment enough to insert a pry bar and remove the chisel. Slowly and carefully use pry bars to pry up the underlayment board a little at a time until the board is completely loose and can be removed.

11. Use caution to avoid breaking the underlayment board. The underlayment board should be removed in one piece. If the underlayment board breaks, heat and slice the tile at the break, then continue to remove broken underlayment.

12. The Resilient floor covering manufacturers work practices recommend that workers wear heavy gloves and be careful of wood splinter and fasteners sticking out the back of the underlayment. Remove each underlayment board (or piece of board) from the work area as soon as it has been pried up to avoid injuries (such as stepping on a nail). Flatten with a hammer fasteners protruding from a removed board. Place removed underlayment boards on skids with the nails pointing downward. Wrap skid with 6 mil (0.15 mm) polyethylene sheet plastic and secure with duct tape. Label panels in the same manner as waste bags.
13. After each board has been removed, pull out any nails or fasteners still in the subfloor. Dispose of these and any other nails or fasteners which have been removed but are still lying in the work area.

14. After the first board has been removed a chisel is not needed to start removal of boards. Work pry board under the exposed edge of the next board.

15. When removal of underlayment/existing tile floor is complete, thoroughly check the exposed subfloor. Re-nail loose areas and reset "popped" nails and fasteners.

16. Vacuum up any dirt in the area using a vacuum cleaner equipped with a HEPA filter and metal floor attachment (no brush).

17. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturers’ instructions and placed in a waste bag or waste container.

C. Disposal of materials: Dispose of friable materials in accordance with Section 02084 “Disposal of Regulated Asbestos Containing Material”. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.8 CERTIFICATE OF PRE-ABATEMENT VISUAL INSPECTION

A. Following Section 02081 is a "Certificate of Pre-Abatement Visual Inspection". This certification is to be completed by the Contractor. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

3.9 WORK AREA CLEARANCE

A. After completion of all resilient flooring and adhesive removal work and prior to removal of critical barriers, decontamination units, and shut down of pressure differential and ventilation system; complete project decontamination and clearance in accordance with section 01711 "Project Decontamination."

END OF SECTION - 02085
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Date</th>
<th>Project Address</th>
<th>Contractor’s Name</th>
</tr>
</thead>
</table>

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be trained in safe work practices and in the use of the equipment found on the job. If you do OSHA Class II work (such as removing asbestos-containing resilient flooring) you may be required to receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have completed an 8-hour training course that covers asbestos subjects as well as use of the Manufacturer’s Recommended Work Practices (Compliant Work Practices) for removing resilient flooring. This training is adequate for the removal of intact resilient flooring. If this is the only training you have had then you are not allowed to remove resilient flooring that is not intact, or has become non-intact (as defined by OSHA) during removal.

MEDICAL EXAMINATION: Removal of asbestos-containing resilient flooring is OSHA Class II work. If you perform OSHA Class I, II and III work (including removal of resilient flooring) for more than one hour per day (taking into account the entire time spent on the removal operation including cleanup) for 30 or more days per year, then a medical examination must be made available to you by your employer at no cost to you, within 10 working days following the thirtieth day of such work. This examination must include: health history, pulmonary function tests and may include an evaluation of a chest x-ray.

YOUR TRAINING ALLOWS YOU TO REMOVE ONLY INTACT RESILIENT FLOORING THAT REMAINS INTACT DURING REMOVAL. IF YOU ENCOUNTER NON-INTACT RESILIENT FLOORING OR IF THE FLOORING BECOMES NOT-INTACT (AS DEFINED BY OSHA) DURING REMOVAL THEN STOP WORK AND REPORT TO YOUR SUPERVISOR.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Certification No.</th>
<th>Printed Name</th>
<th>Witness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION 02086 - HAZARDOUS WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 RELATED SECTIONS

A. Section 01092 Codes and Regulations - Asbestos Abatement describes federal, state and local regulations applicable to asbestos.

B. Section 02084 Disposal of Regulated Asbestos-Containing Material describes the handling and disposal of asbestos-containing waste.

1.3 DESCRIPTION OF THE WORK

A. This section describes the segregation, packaging, labeling, transport, and disposal of waste materials generated by demolition activities and the subsequent shipment of properly packaged and labeled waste materials to an approved disposal site.

B. This project may contain components which contain Lead Based Paint. The Contractor is required to comply with all local, state, and/or federal regulations, including but not limited to 29 CFR 1926.62 (OSHA) in the handling of such components.

C. This project may contain components which contain:

   Fume hoods
   Hood exhaust duct work
   Exhaust fans
   Laboratory casework and equipment
   Lead Based Painted Components
   Exit lighting
   PCB ballasts
   PCB transformers
   Mercury Thermostats
   Mercury and Sodium Vapor Lights
   Smoke Detectors/Fire Alarms (to be salvaged for the Owner)
   Refrigerants (CFC’s)
   Mold
   etc.

D. The Contractor is required to comply with all local, state, and/or federal regulations.

1.4 CODES AND REGULATIONS

A. General Applicability of Codes and Regulations: Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes and regulations have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to hazardous waste management and disposal. Hold the
Owner, Project Administrator, Asbestos Project Manager, Designer, and Air Monitoring Specialist harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the Contractor, the Contractor’s employees, or Subcontractors.

C. Federal Requirements: which govern the management, hauling and disposal of hazardous waste include but are not limited to the following:

1. DOT: U. S. Department of Transportation, including but not limited to:
   
   a. Hazardous Substances  
      Title 49, Part 171 and 172 of the Code of Federal Regulations
   
   b. Hazardous Material Regulations  
      General Awareness and Training Requirements for Handlers, Loaders and Drivers  
      Title 49, Parts 171-180 of the Code of Federal Regulations

   c. Hazardous Material Regulations  
      Editorial and Technical Revisions  
      Title 49, Parts 171-180 of the Code of Federal Regulations

2. EPA: U. S. Environmental Protection Agency (EPA), including but not limited to:

      Title 40, Parts 260-268 of the Code of Federal Regulations

D. State Requirements: Abide by all state requirements which govern the management, hauling and disposal of hazardous waste.

E. Local Requirements: Abide by all local requirements which govern the management, hauling and disposal of hazardous waste.

1.5 DEFINITIONS

A. Toxicity Characteristic Leaching Procedure (TCLP): A laboratory test method to determine the mobility of both organic and inorganic analytes present in liquid, solid, and multiphasic wastes performed in accordance with test methods required under 40 CFR Part 268.

1.6 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

   1. Copy of state and local licenses for waste hauler.
   
   2. U.S. EPA Identification Number of waste hauler.
   
   3. Name and address of waste disposal facility where hazardous waste materials are to be disposed including:
      
      a. Contact person and telephone number.
      
      b. Copy of state license and permit
      
      c. Disposal facility permits

5. Copy of EPA “Notice of Hazardous Waste activity” form

6. Copy of forms requires by state and local agencies

7. Sample of disposal label to be used.

B. During Work: Submit the following as required by the work.

1. TCLP test results, as required to characterize waste for segregation and packaging purposes.

2. Submit copies of all executed manifests and disposal site receipts to the Asbestos Project Manager/Designer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Disposal Bags: Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags.


C. DOT Hazardous Waste Labels: in accordance with DOT regulations Title 49 CFR parts 173, 178, and 179.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not mix potentially hazardous waste streams. Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

B. Segregate, package, label, transport and dispose of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.2 HAZARDOUS WASTE DESIGNATION

A. Where not otherwise designated by the Owner as Hazardous waste, characterize all suspect waste products by conducting representative TCLP testing, with written authorization by the Owner.

B. Testing of components by use of TCLP will be the responsibility of the Contractor, with written authorization by the Owner, prior to initiating this project.

1. A schedule of materials that must be managed as hazardous waste will be submitted by the Contractor.

2. Any TCLP testing performed by the Owner or the Contractor indicating materials designated as “Hazardous Materials” are to be managed according to requirements of this section.

3. Any TCLP testing obtained at the site for Contractor’s use in fulfilling waste management requirements is at Contractor’s expense.

4. Representative sampling of waste products will be in accordance with EPA Document SW 846, and under the supervision of the Owner.

5. TCLP test analysis will be performed in accordance with EPA Method 1311, and under the Supervision of the Owner.
B. Testing of components for PCB waste, Mercury-containing waste, etc. will be the responsibility of the Contractor, with written authorization by the Owner, prior to initiating this project.

1. A schedule of materials that must be managed as hazardous waste will be submitted by the Contractor.

2. Any PCB waste, Mercury-containing waste, etc. testing performed by the Owner or the Contractor indicating materials designated as “Hazardous Materials” are to be managed according to requirements of this section.

3. Any PCB waste, Mercury-containing waste, etc. testing obtained at the site for Contractor’s use in fulfilling waste management requirements is at Contractor’s expense.

4. Representative sampling of PCB waste, Mercury-containing waste, etc. will be in accordance with local, state, and/or federal regulations, and under the supervision of the Owner.

5. PCB waste, Mercury-containing waste, etc. test analysis will be performed in accordance with local, state, and/or federal regulations, and under the supervision of the Owner.

3.3 HAZARDOUS WASTE

A. The following waste products are typically designated as non-salvageable and as Hazardous Waste Types:

1. Waste Type A: PCB waste.
   a. PCB-containing ballasts from fluorescent light fixtures.

2. Waste Type B: Mercury-containing waste.
   a. Thermostats with mercury switches. Individually bagged mercury-containing thermostats.
   b. Fluorescent, and mercury-vapor lamps.

3.4 HAZARDOUS WASTE PACKAGING AND LABELING: Package each segregated Hazardous Waste Type, A and B, in specified containers as follows. IMPORTANT: Do Not Mix Waste Streams:

A. Waste Type A

1. Package in DOT 17-H Open-Top Drums
2. Fill to capacity only with Waste Type A (Do Not Mix Waste Stream types).
3. Install gasket on lid, apply lock ring, and seal.
5. Enter DOT Shipping Data as follows: RQ Waste Polychlorinated Biphenols, 9, UN-2315, PG-II, (M001).
6. Adjacent to each label, enter the date indicating when waste was first placed in each drum.

B. Waste Type B

1. Package in DOT 17-H Open-Top Drums with Polyethylene disposal Bag liners
2. Fill liner bags only with Waste Type B (Do Not Mix Waste Stream types); then neck liner bags down into DOT 17-H Open-Top Drum and seal with duct tape.
3. Install gasket on lid, apply lock ring, and seal.

5. Enter DOT Shipping Data as follows: RQ Hazardous Waste Solid, NOS, 9, NA3077, PG-III, (D009).

6. Adjacent to each label, enter the date indicating when waste was first placed in each drum.

C. Sealed and Labeled Containers: maintain all containers in a continuously sealed condition after they have been sealed.
   1. Do not reopen sealed containers.
   2. Do not place additional waste in sealed containers.

3.5 TEMPORARY STORAGE: Partially filled containers of hazardous waste may be stored at the work site for intermittent packaging provided that:

   A. Each container is properly labeled when it is first placed in service;

   B. Each container remains closed at all times except when compatible waste types are added; and

   C. When moved from site to site, each container remains within the geographic boundaries of the facility without moving nor crossing public access highways.

3.6 REMOVAL OF HAZARDOUS WASTES: Immediately seal containers of hazardous waste as each the container is filled. Remove containers of hazardous waste from the work site within seventy-two (72) hours of being filled.

   A. Transporting filled containers from the work site to an approved disposal site or recycling center.

   B. Continuously maintain custody of all hazardous material generated at the work site including security, short-term storage, transportation and disposition until custody is transferred to an approved disposal site or recycling center. Document continuous chain-of custody.

   C. Do not remove, or cause to be removed, hazardous waste from Owner’s property without a legally executed Uniform Hazardous Waste manifest.

   D. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Asbestos Project Manager/Designer.

3.7 RECYCLING AND RECOVERY: Turn over waste which contains materials for which recovery and/or recycling is possible to an approved recycling center. Materials subject to recycling include:

   1. Fluorescent light tubes.

   2. Thermostats with mercury switches.

   3. Lead acid batteries

   4. Combustible lead-based painted building components and lead-based paint chips.

3.8 BACKCHARGES

A. Where Contractor fails to fulfill packaging, handling, transport or disposal requirements as outlined herein, Owner will charge back to the Contractor all costs associated with insuring that hazardous wastes are segregated, packaged, transported and disposed of in accordance with all applicable Federal and State regulations.

B. Environmental pollution of Owner’s property or other environments resulting from Contractor’s hazardous waste management activities will be promptly remediated under Owner’s direction, to the Owner’s sole satisfaction, and at the
Contractor’s sole expense.

C. Contractor agrees to either reimburse the Owner, or reduce the Contract amount by change order to cover all costs associated with waste re-packaging, waste re-segregation, or pollution remediation efforts.

3.9 REMOVAL OF NON-HAZARDOUS WASTE MATERIALS

A. Transport and legally dispose of non-hazardous waste products, materials, residues and refuse at approved and designated locations only.

B. Non-hazardous waste products, materials, residues and refuse include, but are not necessarily limited to:

1. Materials which are determined to be non-hazardous wastes through objective sampling in accordance with EPA Document SW-846 and laboratory analysis in accordance with EPA Method 1311.

2. Emptied hazardous material containers: containers holding a material with constituents listed on the MSDS as hazardous.
   a. When a container is emptied of its hazardous contents by pouring or scraping so that less than one inch of material remains in the bottom of the container, the container is considered “empty” and is not in itself a hazardous waste.
   b. Emptied hazardous material containers may be disposed of as construction debris waste (i.e. non-hazardous).

3. Personnel protective clothing and safety equipment with de minimis or trace contamination, as determined by visual inspection by Owner.

C. Keep premises in a clean and orderly condition during performance of abatement work.

D. Place non-hazardous construction debris wastes on a daily basis in secure containers for local landfill disposal.

END OF SECTION - 02086
SECTION 02087-RESILIENT FLOORING REMOVAL-AGGRESSIVE ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Asbestos abatement project requirements to be completed prior to start of the work of this section are set forth in the following sections:

1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential & Air Circulation System
3. 01526 Temporary Enclosures - Complete Work Except Delete Floor Plastic.
4. 01527 - Regulated Areas
5. 01560 Worker Protection - Asbestos abatement
6. 01561 - Worker Protection - Repair & Maintenance
7. 01562 Respiratory Protection
8. 01563 Decontamination Units

B. Asbestos abatement project requirements to be completed at completion of the work of this section are set forth in the following sections:

1. 01711 Project Decontamination

1.3 SUBMITTALS

A. Before Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not start work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use.

1. Wetting Materials: Submit product data, use instructions and recommendations from manufacturer of wetting material (surfactant and/or removal encapsulant) intended for use. Include data substantiating that material complies with requirements.

2. NESHAP Compliance Documentation: Submit manufacturer's documentation for removal encapsulant proposed for use that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will comply with the wetting requirements of National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

4. Plan of Action for Dry Ice Use: Submit a plan of action as required by this section for protection of workers from carbon dioxide and cold hazards associated with use of dry ice. Testing and protective measures proposed are to be certified by a Certified Industrial Hygienist (CIH) as defined in Section 01097 "Definitions & Standards - Asbestos Abatement".

5. Adhesive Removal Solvent: Submit product data, use instructions and recommendations from manufacturer of adhesive removal solvent intended for use. Include data substantiating that material complies with requirements.

B. Before Start of Work submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been “Received - Not Reviewed.”

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for all materials proposed for use on the work including:

   a. Surfactants.
   
   b. Adhesive Removal Solvents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wetting Materials: For wetting prior to disturbance of asbestos-containing materials use:

1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos-containing material (ACM) and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

2. Removal Encapsulant: Provide a penetrating-type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

3. Dishwashing detergent that contains anionic, nonionic, and amphoteric surfactants.

B. Foam or Viscous Liquid: Provide material that contains no organic materials, is non-flammable, presents no physical hazard due to reactivity, presents no acute or chronic health hazard, and does not require special skills, knowledge, or equipment for application.

C. Tile Adhesive Removal Solvent: Provide a slow-drying solvent intended to remove tile adhesive. Provide material that is not flammable, does not create combustible vapors and has no significant inhalation hazard.

1. Provide materials that have less than 250 g/l of volatile organic solvents (VOCs).

D. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

E. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated.

F. Duct Tape: Provide duct tape in 2 inch or 3 inch (50 or 75 mm) widths as indicated, with an adhesive formulated for...
use on sheet polyethylene.

G. Spray Cement: Provide, in aerosol cans, spray adhesive which is formulated for use on sheet polyethylene. Provide materials that do not contain methylene chloride.

H. Disposal Bags: Provide 6 mil (0.15 mm) thick leak tight polyethylene bags labeled as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

I. Fiberboard Drums: Provide heavy duty leak-tight fiberboard drums with tight sealing locking metal tops.

J. Steel Drums: Provide leak-tight steel drums with tight-sealing locking metal tops.


L. Paper board Boxes: Provide heavy-duty corrugated paperboard boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

M. Polyethylene Boxes: Provide heavy-duty polyethylene boxes. Provide leak-tight boxes or boxes in sizes that will easily fit in disposal bags.

2.2 PRIMARY RESILIENT FLOORING REMOVAL EQUIPMENT

A. Manual Spades:


2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various manual scrapers/strippers</td>
<td>Crain Cutter Co., Inc.</td>
<td>156 So. Milpitas Blvd. Milpitas, CA 95035 408-946-6100</td>
</tr>
<tr>
<td>Various manual scrapers/strippers</td>
<td>Beno J. Gundlach Company</td>
<td>P.O. Box 544 Belleville, IL 62222 618-233-1781</td>
</tr>
<tr>
<td>Taylor Tools, &quot;Spud Bar&quot; and other manual scrapers/strippers</td>
<td>Roofing Equipment, Inc.</td>
<td>11075 East 47th Avenue Denver, CO 80239 303-371-7667</td>
</tr>
<tr>
<td>&quot;The Slam Scraper&quot;</td>
<td>Red Devil, Inc.</td>
<td>2400 Vauxhall Road Union, NJ 07083-1933 201-688-6900 or 800-4-A-DEVIL</td>
</tr>
</tbody>
</table>

B. Powered Spades:

1. Long-handled scraper/chisels used in a full-standing position that have replaceable blades and are pneumatically or electrically-powered to move in a reciprocating (in and out) motion.

2. Provide powered spades that are equipped with pneumatic vents and piston seals that prevent compressed air or blow by from sweeping floor.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Air Powered Tile Removal System&quot;</td>
<td>Aramsco</td>
<td>1655 Imperial Way Thorofare, NJ 08086 800-666-6933</td>
</tr>
<tr>
<td>&quot;A-LR-5&quot;</td>
<td>Equipment Development Co., Inc.</td>
<td>100 Thomas Johnson Drive Frederick, MD 21701 301-663-1600 or 800-638-EDCO</td>
</tr>
</tbody>
</table>

C. Stripper Machines:

1. These are walking units with blades at the front, driven by electric motors, and move either in a reciprocating (in and out) or an oscillating orbital motion.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 700 &quot;Bearcat&quot; Stripper</td>
<td>Crain Cutter Co., Inc.</td>
<td>156 So. Milpitas Blvd. Milpitas, CA 95035 408-946-6100</td>
</tr>
<tr>
<td>No. 500, No. 525</td>
<td>Beno J. Gundlach Company</td>
<td>P.O. Box 544 Belleville, IL 62222 618-233-1781</td>
</tr>
<tr>
<td>&quot;The Big Rip-Off&quot;</td>
<td>Inventive Manufacturing</td>
<td>1440 South Seneca Wichita, KS 67213 316-267-2443</td>
</tr>
<tr>
<td>Model 460, Model PG 101, Model PG 102</td>
<td>Palmer Distributing &amp; Sales Co.</td>
<td>P.O. Box 6327 Glendale, CA 91225-0327 818-244-7261 or 800-423-2733</td>
</tr>
<tr>
<td>Taylor Tools</td>
<td>Roofing Equipment, Inc.</td>
<td>11075 East 47th Avenue Denver, CO 80239 303-371-7667</td>
</tr>
<tr>
<td>No. 7079 Warner Floor Stripper</td>
<td>Warner Manufacturing</td>
<td>13435 Industrial Park Blvd. Minneapolis, MN 55441 612-559-4740 or 800-328-0606</td>
</tr>
</tbody>
</table>

D. Rotary Cutters:

1. Machine with rotating discs facing flat against the floor with spring-loaded cutters that follow the profile of the floor and removes soft resilient materials by cutting them into thin strips and scraping them from the floor.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Strip-Dek&quot; fitted for connection to HEPA Vac</td>
<td>Critical Industries, Inc.</td>
<td>5815 Gulf Freeway Houston, TX 77023 800-624-7030</td>
</tr>
<tr>
<td>&quot;Strip-Dek&quot;</td>
<td>Equipment Development Co. Inc.</td>
<td>100 Thomas Johnson Drive Frederick, MD 21701 301-663-1600 or 800-638-EDCO</td>
</tr>
</tbody>
</table>
E. Shot Blast/Bead Blast Machines:

1. Machines that send steel shot at high velocity at the floor surface, arranged to provide a high-vacuum flow in the blast region to collect dust. Exhaust air is filtered through a HEPA filter. Shot is recollected, separated, and recycled continuously.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEPA filter on turret model only</td>
<td>Goff Corporation</td>
<td>One Pleasant Grove Road Seminole, OK 74866</td>
</tr>
<tr>
<td>&quot;Blast N' Vac&quot;</td>
<td>Inventive Machine Corporation</td>
<td>P.O. Box 369 Bolivar, OH 44612</td>
</tr>
<tr>
<td>JJ2000, EC72</td>
<td>Nelco Mfg. Corp.</td>
<td>6215 Aluma Valley Drive Oklahoma City, OK 73121</td>
</tr>
<tr>
<td>&quot;Blastrac&quot;</td>
<td>Wheelabrator Corporation</td>
<td>1606 Executive Drive La Grange, GA 30240</td>
</tr>
</tbody>
</table>

2.3 THERMAL EQUIPMENT WITH AUTOMATIC CONTROL

A. Thermal Equipment with Automatic Control:

1. Equipment utilizing controlled infrared radiant heat to make the resilient floor tiles and adhesive soft and pliable for removal.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Delta T&quot; series</td>
<td>Enviromethods, Inc.</td>
<td>P.O. Box 6151 Wolcott, CT 06716</td>
</tr>
<tr>
<td>&quot;ATR&quot; (Automated Tile Removal) series</td>
<td>UAS Automation Systems, Inc.</td>
<td>4524 Parkway Commerce Blvd. Orlando, FL 32808</td>
</tr>
</tbody>
</table>

2.4 HIGH PRESSURE WATER JET

A. High Pressure Water Jet

1. Tools using very high pressure water jets to hydraulically lift tiles.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressures of 35,000 psi (240 Pa) and up, 0-5.6 g.p.m. and up</td>
<td>Flow Systems, Inc.</td>
<td>21440 68th Ave. South Kent (Seattle), WA 98032 206-872-4900</td>
</tr>
</tbody>
</table>

2.5 OTHER TECHNOLOGIES APPLIED TO THE WORK

A. Rotary Grinders/Surfacers:

1. Machine with discs facing flat against the floor that removes hard materials with a grinding action.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 021006 grinders; diamond (wet cut) with dust extraction kit - gasoline, electric, propane</td>
<td>Allen Engineering Corporation</td>
<td>P.O. Box 819 Paragould, AR 72451 501-236-7751 or 800-643-0095</td>
</tr>
<tr>
<td>EDCO grinders diamond (wet cut) w/HEPA vac connectors models: SEC, 2EC, 2GC, 411</td>
<td>Equipment Development Co. Inc.</td>
<td>100 Thomas Johnson Drive Frederick, MD 21701 301-663-1600 or 800-638-EDCO</td>
</tr>
</tbody>
</table>

B. Surfacers/Planers/Scarifiers:

1. Machine with a series of small cutters freewheeling on axles mounted on a drum so that the cutters contact the floor surface with a flailing action.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Thunderbird 8&quot; planer w/dust extraction kit &quot;Multi-Duty Planer&quot; diamond head grinder with dust extraction kit</td>
<td>Allen Engineering Corporation</td>
<td>P.O. Box 819 Paragould, AR 72451 501-236-7751 or 800-643-0095</td>
</tr>
<tr>
<td>Handheld units (no vac) and small walking units</td>
<td>Aurand</td>
<td>1210 Ellis Street Cincinnati, Ohio 45223 513-541-7200</td>
</tr>
<tr>
<td>&quot;Surface Preparation System&quot; - machine and cutter</td>
<td>Bartell Power Products</td>
<td>56 Harvester Avenue Batavia, NY 14020 716-344-0850 or 800-247-8577</td>
</tr>
</tbody>
</table>
### PART 3 - EXECUTION

#### 3.1 RESILIENT FLOOR COVERINGS

A. Pre-requisite activities: Before starting removal of ACM using the procedures of this section complete work of the following sections:

1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential & Air Circulation System
3. 01526 Temporary Enclosures - Complete work except delete floor plastic.
4. 01527 - Regulated Areas
5. 01560 Worker Protection - Asbestos abatement
6. 01561 - Worker Protection - Repair & Maintenance
7. 01562 Respiratory Protection
8. 01563 Decontamination Units

B. Preparation: Prior to beginning the removal of any resilient floor covering complete the following:

1. Remove appliances and furniture from the work area.
2. Mix a detergent solution (16 ounces (0.5 liters) of liquid dishwashing detergent to 1 gallon (4 liters) of warm water) and pour into a garden sprayer.

C. Seal Floor Penetrations: Before using wet methods to remove resilient flooring, seal openings, and penetrations in the floor to prevent water leakage.

1. Remove surface mounted junction boxes (doghouses) from raceway system.
2. Remove hatch and trench covers that are covered with resilient flooring. Seal opening with plywood. Seal edges...
of plywood to floor with urethane foam caulk. Remove resilient flooring from cover in a later operation during wet removal of flooring.

3. Seal openings with a wooden or plywood plug. Seal with urethane foam caulk.

4. Remove flooring material in the immediate area of floor penetrations with a hand spade or scraper.

5. Remove adhesive by hand scraping as necessary to permit installation of seals.

6. Remove any adhesive residue from slab where cover on openings and penetrations must seal to floor to accomplish a water tight assembly. Remove this residue by abrasion using dampened, clean, sharp, cutting sand and a hand-held rubbing stone as necessary. Use minimum wetting required to permit removal. Use caution to prevent water leakage into opening or penetration.

7. Cover sealed plywood hatch assemblies with 6 mil (0.15 mm) sheet plastic. Seal plastic to floor with spray glue or urethane caulk.

8. Cover sealed openings with sheet plastic. Seal plastic to floor with spray glue or urethane caulk.

D. Remove Resilient Flooring: Use the three step process described in the following sections:

1. First Step: "Removal of Resilient Tile Floor Covering," and/or "Removal of Resilient Sheet Flooring." This step involves removal of tiles or the wear layer of sheet flooring using a powered spade or stripper machine.

2. Second Step: "Removal of Heavy Residue of Adhesive" and/or "Removal of Residual Backing." This step involves the use of a rotary cutter to remove the bulk of these residual materials. As an alternative hand scraping can be used for this purpose.

3. Third Step: "Removal of Adhesive Residue." After completion of the first two steps there will be a thin residue of adhesive left on the floor. This is removed using a shot/bead blast machine. If the thickness of adhesive residue is too thick to permit effective use of the shot/bead blast machine, repeat the second and third steps.

4. At the completion of all work, leave the substrate in such a state as to comply with all requirements and recommendations of manufacturer of replacement flooring.

3.2 STEP ONE REMOVAL OF RESILIENT TILE FLOOR COVERING

A. Remove resilient tile floor covering using the following procedure:

1. General:
   a. Remove binding strips or other restrictive molding from doorways, walls, etc. clean and dispose of as non-asbestos waste. Dispose of any materials that have glue or floor mastic on them as asbestos-containing waste.

2. Wet Floor:
   a. Wet floor with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cover with sheet polyethylene to allow humidity to release tile from floor. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.
   b. Keep floor continuously wet throughout removal operation.
   c. Remove tiles using a manual or powered spade, or stripping machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated
as necessary to keep continuously wet. Keep floor where tile has been removed continuously wet until after completion of heavy adhesive residue removal.

3. Foam or Viscous Liquid:
   a. Distribute dry foam in a uniform manner over floor. Use sufficient powder to form 1 inch (25 mm) of foam. Wet powder to produce foam. Add additional powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

   b. Remove tiles using a manual or powered spade, or stripping machine. Add additional dry foam powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process. Maintain layer of foam on floor where tile has been removed until after completion of heavy adhesive residue removal.

B. Debris and Waste

1. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

C. Dry Ice: Place block (approximately 20 pounds (9 kg)) of dry ice on tile to be removed. Allow to remain in place until the bond between the floor and tile is broken. Do not allow dry ice to remain in one location for more than 15 minutes to avoid frost damage to substrate. Relocate dry ice block to next location to be removed. Store dry ice in ice chest when not in use. Require that workers use insulated gloves while handling dry ice. Provide adequate ventilation to prevent a buildup of carbon dioxide in the work area. Use exhaust-type ventilation as described in Section 01513 Pressure Differential and Ventilation System. Do not use a recirculation ventilation system. Provide at a minimum one air change per hour for each block of dry ice in use. Use no more than one block of dry ice per 100 square feet (30 sq. meters) of work area.

   a. Develop a plan of action for preventing a hazard from carbon dioxide and cold. Include in this plan of action: a description of type, location, and frequency of air testing that will be performed to detect in advance workers potentially overexposed to carbon dioxide; stop work and evacuation levels, method of correcting and preventing high carbon dioxide levels; protective equipment and work methods to prevent frost bite and protect workers from cold. Automatically and voluntarily stop work and evacuate the work area if a stop work level is measured, or if requested by the Owner, Project Administrator, Asbestos Project Manager, or Designer on the basis of potentially high carbon dioxide levels. If a stop work has occurred, do not restart work until a method has been developed to control carbon dioxide levels and written authorization has been given by the Owner/Project Administrator/Asbestos Project Manager/Designer.

3.3 STEP ONE - REMOVAL OF ADHERED SHEET RESILIENT FLOORING

A. Use the following procedure to remove adhered resilient sheet flooring completely:

1. Wet Floor
   a. Wet floor with amended water, removal encapsulant, or detergent solution so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions.

   b. Keep floor continuously wet throughout removal operation.

   c. Remove wear layer using a manual or powered spade, or stripping machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet. Keep floor where wear layer has been removed continuously wet until after completion of heavy residue removal.

2. Foam or Viscous Liquid
a. Distribute dry foam in a uniform manner over floor. Use sufficient powder to form 1 inch (25 mm) of foam. Wet powder to produce foam. Add additional powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

b. Remove wear layer using a manual or powered spade, or stripping machine. Add additional dry foam powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process. Maintain layer of foam on floor where the wear layer has been removed until after completion of heavy adhesive residue removal.

3. Debris and Waste:

   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

B. Manual Removal:

1. Make a series of parallel cuts, with a knife, 4 to 8 inches (100 to 200 mm) apart parallel to the wall, keeping cut lines wet.

2. Start at the end of the room farthest from the entrance door. This will help avoid tracking of debris from the removal operation. Pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

   a. PRECAUTION: Resilient flooring becomes slippery when wet with, amended water, removal encapsulant, or a detergent solution. Use caution to contain the solution in the immediate work area. Stand on a new sheet of plywood or non-slip surface while working on wet surfaces.

3. Debris and Waste:

   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

4. Occasionally parts of the foam inner-layer will remain stuck to the backing. This condition can sometimes be eliminated by pulling the strips loose from the opposite end. Peel the foam inner-layer from the floor while spraying the detergent solution into the delamination nip point.

5. Some resilient flooring is not readily strippable by hand. When these conditions are encountered, a sharp stiff blade scraper may be used to assist cleavage of the wear layer from felt. If this procedure is used the distance between cuts should be narrowed to 3 to 5 inches (75 to 125 mm) wide.

6. Regardless of whether stripping of the wear surface is accomplished by hand peeling alone or with the assistance of a stiff blade scraper, amended water, removal encapsulant or detergent solution must be sprayed into the delamination nip point to minimize any airborne dust particles.

7. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.4 STEP TWO - REMOVAL OF HEAVY RESIDUE OF ADHESIVE

A. Remove the heavy residue of adhesive left after removal of resilient tile flooring using the following procedure. If the residual adhesive is sufficiently thin that a shot/bead blast machine or slurry removal can effectively remove the mastic, this step may be skipped and step three started.

1. Dampen Floor
a. Dampen floor by misting with amended water, removal encapsulant, or detergent solution so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions.

b. Keep floor continuously damp throughout removal operation.

2. Foam or Viscous Liquid:
   a. Add additional foam dry powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

3. Adhesive Removal:
   a. Begin removal at a point farthest from the entrance to the work area. Work of this step may proceed concurrently with work of removal of tile.

   b. Remove heavy residue of adhesive backing using a rotary cutting machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet.

4. Disposal and Debris
   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

5. Wet vacuum standing water with HEPA wet/dry vacuum.

6. Mop floor with amended water, removal encapsulant, or liquid detergent solution to remove all debris and residue.

7. Continue the above steps until the adhesive is sufficiently reduced in thickness that it can be effectively removed with shot/bead blast equipment.

8. Start in the corner of the room farthest from the entrance door and moisten an area of the adhesive approximately 3 by 10 feet (1 m by 3 m) with amended water, removal encapsulant, or detergent solution. Wet scrape with a stiff-bladed wall or floor scraper removing ridges and any loose adhesives until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, heat with a hot-air blower prior to scraping.

   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

9. Wet vacuum standing water with HEPA wet/dry vacuum.

10. Mop floor with amended water, removal encapsulant, or liquid detergent solution to remove all debris and residue.

11. Continue the above steps until the adhesive is sufficiently reduced in thickness that it can be effectively removed with shot/bead blast equipment.

3.5 STEP TWO - REMOVAL OF RESIDUAL BACKING MATERIAL

A. Remove any residual felt or rubber backing remaining adhered to the floor after removal of the wear layer of adhered vinyl sheet flooring by using the following procedure:

1. Wetting:
a. Thoroughly wet residual backing with amended water, removal encapsulant, or detergent solution. Wait a few minutes to allow solution to soak into felt.

2. Foam or Viscous Liquid:
   a. Add additional foam dry powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

3. Backing Removal:
   a. Concrete floors: Use a rotary cutter, a stiff-bladed scraper, or a floor scraper with a replaceable blade to remove the wet backing.

      (i). Re-wet the backing if the solution has not completely penetrated, if drying occurs or if dry felt is exposed during scraping. Pick up the scrapings as they are removed from the floor and place in a disposal bag or impermeable container.

   b. Wood floor: Wet residual felt as above but do not excessively soak or flood wood floors with detergent solution. Excessive water can damage wood floors to the extent that new underlayment could be required. If this occurs, the Contractor will provide new underlayment at no increase in the Contract Sum. Do not use a rotary cutter on wood floors. Use manual scraping only.

3.6 STEP THREE - REMOVAL OF ADHESIVE RESIDUE

A. After removal of resilient flooring and any heavy residue of adhesive, mastic, or backing material, in the previous step, remove all residue of adhesive from the floor using the following procedure:
   1. Do not use solvents other than water to remove adhesive residue.
   2. Allow floor to dry after completion of the wet removal procedures used in previous steps.
   3. Begin removal at a point farthest from the entrance to the work area.
   4. Remove adhesive residue by either shot/bead blast machine or by slurry removal at the Contractor's option.

3.7 SHOT/BEAD BLAST

A. Remove residue of adhesive from floor using a shot/bead blast machine with dust collection equipment attached to a HEPA-filtered vacuum cleaner.

B. If the previous work did not reduce the thickness of adhesive sufficiently to allow effective removal by the shot/bead blast machine, repeat the second step.

C. Remove residue at walls and other hard to reach locations with a shot/bead blast edging machine or using dampened, clean, sharp, cutting sand and a hand-held rubbing stone.

D. Continue this operation until there is no residue of adhesive on the floor.

E. After removal of all residue rinse area with clear clean water using a hand sprayer.

F. Wet vacuum standing water with HEPA wet/dry vacuum.

G. Continue with the above steps until the entire room is complete.

H. Allow floor to dry and vacuum up any remaining dust or dirt using a vacuum equipped with a HEPA filter and metal floor tool (no brush).
3.8 SLURRY REMOVAL

A. Remove residue of adhesive from floor using slurry removal in a manner that keeps the floor in the area of the work continually wet with a slurry of sand and water.

B. Place cutting sand (enough to cover an approximate 6 foot by 6 foot (1800 mm x 1800 mm) area) into a container and add either amended water or water mixed with liquid detergent (1 ounce of liquid dishwashing detergent to 1 gallon of water (31.5 ml detergent to 4 liters water)) to dampen the sand (20 pounds (9 kg) of sand to ½ gallon (2 liters) of solution).

C. Place sand over a 6 foot by 6 foot (1800 mm x 1800 mm) area and wet remove the existing adhesive residue using a terrazzo floor machine. Keep sand under rubbing stones when operating the machine. The sand and subfloor must be continuously kept wet.

D. Replace cutting sand periodically as needed to maintain adequate cutting and cleaning of floor. Add sand periodically as required.

E. Occasionally push away cutting sand from the subfloor with a wall or floor scraper to check for complete removal.

F. Remove adhesive around the edge of the room and missed areas with dampened, clean, sharp, cutting sand and a hand-held rubbing stone.

G. Wet scrape sand into a pile using a stiff-bladed floor or wall scraper and place sand and adhesive residue in a disposal bag or other impermeable container and dispose of, as required, by Section 02084 Disposal of Regulated Asbestos-Containing Material.

H. Rinse area with clear, clean water using a hand sprayer.

I. Wet-vacuum standing water with HEPA wet/dry vacuum.

J. Continue with the above steps until the entire room is complete.

K. Allow subfloor to dry and vacuum up any remaining dirt or sand using a vacuum equipped with a HEPA filter and metal floor tool (no brush).

3.9 ADHESIVE SOLVENT

A. Adhesive: Remove adhesive residue by using adhesive removal solvents. Use solvents in accordance with manufacturers' instructions. Saturate adhesive with removal solvent and allow adhesive to soften. Remove by scraping, wet sanding, or wet scrub with floor cleaning machine with abrasive pad. Provide worker protection as required by material safety data sheet (MSDS) for any material used.

1. Mop floor with removal solvent as required by manufacturer's directions as required to completely remove all residue of adhesive.

2. Clean Floor after completion of removal of ACM by wet mopping with amended water. Mop three times allowing a drying time between each mopping.

3. Encapsulate cleaned floor with one coat of an encapsulant. Use an encapsulant that has been determined not to prevent the bond of new resilient flooring. Follow manufacturer's recommendations for new floor covering installation.

4. Dispose of all rags, plastic sheet, etc. in accordance with requirements of Section 02084 "Disposal of Regulated Asbestos-Containing Material".
B. Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work of this section. Accomplish decontamination as required by the section on Project Decontamination.

3.10 CERTIFICATE OF PRE-ABATEMENT VISUAL INSPECTION

A. Following Section 02081 is a "Certificate of Pre-Abatement Visual Inspection". This certification is to be completed by the Contractor and certified by the Asbestos Project Manager. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

3.11 WORK AREA CLEARANCE

A. After completion of all resilient flooring and adhesive removal work and prior to removal of critical barriers, decontamination units, and shut down of pressure differential and ventilation system; complete project decontamination and clearance in accordance with section 01711 "Project Decontamination."

END OF SECTION 02087
SECTION 09805 - ENCAPSULATION OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. The Extent of encapsulation work is shown on the drawings and as herein specified.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Asbestos abatement project requirements to be completed prior to start of the work of this section are set forth in the following sections:

1.  01503  Temporary Facilities - Asbestos Abatement
2.  01513  Temporary Pressure Differential & Air Circulation System
3.  01526  Temporary Enclosures
4.  01560  Worker Protection - Asbestos abatement
5.  01562  Respiratory Protection
6.  01563  Decontamination Units

B. Asbestos abatement project requirements to be completed at completion of the work of this section are set forth in the following sections:

1.  01711  Project Decontamination

1.4 DEFINITIONS

A. "Encapsulant": A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.

1. Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.
2. Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.

B. "Encapsulation": Treatment of asbestos-containing materials, with an encapsulant. Application of a sealer to a substrate following completion of removal of ACM is not considered encapsulation.
1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical information including label analysis and application instructions for each material proposed for use.

B. Installation Instructions: Submit manufacturer's installation instructions with specific project requirements noted.

C. Performance Warrantee: Submit manufacturer's performance guarantee.

D. Certification: Submit written approval of entity installing the encapsulant from encapsulant manufacturer.

E. Before Start of Work submit the following to the General Contractor/Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with the General Contractor/Asbestos Project Manager’s/Designer’s written response indicating that the submittal has been ‘Approved As Noted.”

   1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:

      a. Surfactants.

      b. Encapsulants.

1.6 DELIVERY AND STORAGE

A. Deliver materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

   1. Name or title of material

   2. Manufacturer's stock number and date of manufacture

   3. Manufacturer's name

   4. Thinning instructions

   5. Application instructions

B. Deliver materials together with a copy of the OSHA Material Safety Data Sheet for the material.

1.7 JOB CONDITIONS

A. Apply encapsulating materials only when environmental conditions in the work area are as required by the manufacturer's instructions.

1.8 QUALITY ASSURANCE

A. Installation of Spray-On Encapsulation Materials: Install spray-on materials by a firm and personnel approved by the manufacturer of the primary materials.


C. Performance Warranty: Submit written Performance Warranty, executed by the manufacturer and co-signed by the Contractor, agreeing to repair/replace spray-on work which has cracked, fallen from substrate, or otherwise deteriorated to a condition where it would not perform effectively for its intended purposes due substantially to defective materials or
workmanship and not due to abuse by occupants, improper maintenance, unforeseeable ambient exposures or other causes beyond anticipated conditions and manufacturer's /Contractor's control.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Encapsulants: Provide penetrating or bridging type encapsulant specifically designed for application to ACM.

   1. Draft Standards: 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".

   2. Fire Safety: Use only materials that have a flame spread index of less than 25, when dry, when tested in accordance with ASTM E-84.

   3. Provide Encapsulants that will be compatible with General Contractor’s finishing materials.

2.2 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work shall be submitted for the following:

   1. Penetrating Encapsulants

   2. Bridging Encapsulants

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to applying any encapsulating material, ensure that application of the sealer will not cause the base material to fail and allow the sealed material to fall of its own weight or separate from the substrate. Should Contractor doubt the ability of the installation to support the sealant, request direction from the Asbestos Project Manager/Designer before proceeding with the encapsulating work.

B. Do Not Commence Application of encapsulating materials until all removal work within the work area has been completed.

3.2 WORKER PROTECTION

A. Before beginning work with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

B. In addition to protective breathing equipment required by OSHA requirements or by this specification, use painting pre-filters on respirators to protect the dust filters when organic solvent based encapsulant are in use.
3.3 SCRATCH COAT PLASTER

A. Apply two (2) coats of encapsulant to the scratch coat plaster after all ACM has been removed. Apply in strict accordance with the manufacturer's printed instructions for use of the encapsulant as an asbestos coating. Any deviations from such printed instructions must be approved by the Asbestos Project Manager/Designer in writing prior to commencing work.

1. Apply encapsulant with an airless spray gun with air pressure and nozzle orifice as recommended by the encapsulant manufacturer.

2. Apply the first coat encapsulant while the scratch coat is still damp from the asbestos removal procedures. If the surface has been permitted to dry, vacuum surface with a HEPA filtered vacuum cleaner prior to spraying with the encapsulant.

3. Apply second coat over first coat in strict conformance with manufacturer's instructions.

4. Color the encapsulant contrasting colors in alternate coats so that visual confirmation of complete and uniform coverage of each coat is possible. Adhere to manufacturer's instructions for coloring. At the completion of work the encapsulated surface must be a uniform third color produced by the mixture.

3.4 SEALING EXPOSED EDGES

A. Seal edges of ACM exposed by removals up to an inaccessible spot such as a sleeve, wall penetration, etc. with two (2) coats of encapsulant.

1. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the sealer.

2. Color the encapsulant contrasting colors in alternate coats so that visual confirmation of complete and uniform coverage of each coat is possible. Adhere to manufacturer's instructions for coloring. At the completion of work the encapsulated surface must be a uniform third color produced by the mixture.

3.5 ARCHITECTURAL FINISH AND FIREPROOFING

A. Examine Existing Conditions: Determine if the friable ACM to be encapsulated remains sufficiently bonded to receive the encapsulation process and if encapsulation process will effectively prevent release of asbestos fibers from the material. If the existing ACM is loose and deteriorated, the Contractor must immediately notify the Asbestos Project Manager/Designer that removal of friable ACM must be accomplished before encapsulation.

B. Encapsulants used on fireproofing materials must have an Underwriters Laboratories classification and be listed in the current edition of the UL Fire Resistance Directory.

C. Before start of work on an architectural finish complete the work of the following:

1. Section 01560 Worker Protection - Asbestos Abatement

2. Section 01562 Respiratory Protection

3. Section 01526 Temporary Enclosures

4. Section 01563 Decontamination Units

D. Comply with all manufacturer's instructions for particular conditions of installation in each case. Consult with manufacturer's technical representative for conditions not covered.

E. Encapsulate all surfaces in full compliance with manufacturer's procedures.
F. At completion of Encapsulation and before removal of Work Area enclosures and Pressure Differential System, decontaminate space in accordance with requirements of section 01711.

G. At completion of work submit manufacturer's record of inspection of completed work and Manufacturer's Performance Guarantee executed by both manufacturer and Contractor.

3.6 DRYING ENCAPSULATED SURFACES

A. General: Following encapsulation work allow the HEPA filtered fan units to operate for a sufficient length of time that all encapsulated surfaces dry thoroughly. Use oscillating fans as necessary to assure circulation of air in all parts of the work area during this period. During period of drying operate Temporary Pressure Differential & Air Circulation System as an Exhaust System to as great an extent as possible.

B. For encapsulation projects do not start the work of Section 01711 “Project Decontamination” until all encapsulated surfaces are completely dry.

END OF SECTION - 09805
SECTION 15254 - REPAIR OF INSULATION AND LAGGING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections apply to work of this Section.

1.2 DESCRIPTION OF WORK

A. Repair of insulation on all piping upon which asbestos-containing insulation is to remain.

B. Repair of lagging on boilers, breeching and equipment upon which asbestos-containing lagging and/or insulation is to remain.

C. Extent of pipe insulation and lagging to be repaired is shown on the drawings.

D. Labeling of repaired Asbestos-Containing Materials (ACM).

1.3 SUBMITTALS

A. Before the Start of Work: Submit the following to the Asbestos Project Manager/Designer for review. Do not begin work until these submittals are returned with Asbestos Project Manager’s/Designer’s written response indicating that the submittal is returned for unrestricted use or final-but-restricted use.


2. Waterproof Cement: Provide product data.


4. Open Weave Glass Fiber Mat: Provide product data.


PART 2 - PRODUCTS

2.1 MATERIALS

A. Mineral Wool Insulating Cement: Provide job-mixed insulating plaster manufactured for use on plumbing equipment.

B. Waterproof Cement: Provide premixed or job mixed cement manufactured for coating of thermal insulation lagging.

C. Nonwoven Fibrous Glass Mat: Provide felt approximately 3/32 inch (2.4 mm) thick fabricated from glass fibers.

D. Open Weave Glass Fiber Mat: Provide cloth with approximately 1/4 inch (6 mm) openings in weave, fabricated from glass fibers twisted or braided into strands approximately 1/128 inch (0.198 mm) in diameter.

E. Bridging Type Encapsulant: as specified in section 09805.
PART 3 - EXECUTION

3.1 GENERAL

A. Before starting work of this section complete the following:
   1. Section 01513 - Temporary Pressure Differential & Air Circulation System
   2. Section 01563 - Decontamination Units
   3. Section 01526 - Temporary Enclosures
   4. Section 01560 - Worker Protection - Asbestos Abatement
   5. Section 01562 - Respiratory Protection
   6. Section 01527 - Regulated Areas
   7. Section 01529 -Mini Enclosures and Glovebags
   8. Section 01561 - Worker Protection - Repair & Maintenance
   9. Section 01562 - Respiratory Protection

B. Piping: Remove any loose material with HEPA vacuum. No existing jacket material is to be removed.

C. Reinforced Bridging Encapsulant: Repair with reinforced bridging encapsulant:
   1. Fill holes with mineral wool insulating cement and cover damaged areas with nonwoven fibrous glass mat completely saturated with bridging type encapsulant.
   2. Wrap open joints with nonwoven fibrous glass mat embedded in bridging type encapsulant.
   3. Smooth mat to a wrinkle free condition. Allow to dry and coat entire surface of mat with an additional coat of bridging type encapsulant and brush to a smooth uniform appearance.

D. Fittings: Remove any loose material with HEPA vacuum. No existing jacket material is to be removed.

E. Reinforced Bridging Encapsulant: Repair with reinforced bridging encapsulant:
   1. Patch damaged fittings as required, using mineral wool insulating cement. Smooth insulation to a uniform appearance, continuous with and not overlapping adjacent straight insulation runs.
   2. Cover entire surface of fitting with nonwoven fibrous glass mat embedded in bridging type encapsulant. Stretch to conform to shape of fitting and smooth to a uniform appearance without wrinkles.
   3. Overlap jackets of adjacent straight insulation sections by 3 inches (75 mm).
   4. Allow to dry and coat entire surface of mat with bridging type encapsulant and brush to a smooth finished appearance.

F. Equipment Lagging: (hot water tanks, converters, etc.) Fill damaged portion of lagging as required with mineral wool insulating cement and cover with nonwoven fibrous glass mat completely embedded in bridging type encapsulant. Coat area of repair and six inches on all sides with bridging type encapsulant, brush out to a uniform appearance. Completely coat lagging which do not possess a canvas jacket with two coats of bridging type encapsulant.
G. Boiler and Smoke Hoods Breeching Lagging: Fill damaged portions of lagging, as required, with mineral wool insulating cement. Coat entire surface of lagging with 1/4" (6 mm) minimum thickness of mineral wool insulating cement reinforced with open weave glass fiber mat. Trowel surface smooth finish.

H. Labeling: all labeling is to be in complete conformance to local, state, and federal regulations, including but not limited to those as required by EPA and OSHA standards. Label all asbestos-containing piping insulation, fitting insulation lagging, etc. in unoccupied areas with a 3 inch x 5 inch (75 mm x 125 mm) stickers, and apply labels minimum 2 per side or maximum of five feet (5’) (1500 mm) apart on boilers, breeching and equipment and a minimum of one per section and a maximum of eight feet (8’) (2400 mm) apart on pipe runs. Apply labels to both sides of pipe runs which are accessible from both sides.

1. In unoccupied areas, provide labels with text reading:

   a.  
      
      DANGER
      
      CONTAINS ASBESTOS FIBERS
      
      AVOID BREATHING DUST
      
      CANCER AND LUNG DISEASE HAZARD
      
      AVOID BREATHING ASBESTOS

2. In occupied areas, provide labels with text reading:

   a.  
      
      CAUTION
      
      ASBESTOS HAZARD
      
      DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT

J. Additional requirements: Owner requirements include, as a minimum, that at least 10% of all fitting insulation be properly labeled in all areas.

END OF SECTION - 15254