

PROJECT MANUAL
for
Project C.O.R.E.
Creating Opportunities for Renewal and Enterprise

June 22, 2016



A JOINT PROJECT BETWEEN



I. PREAMBLE

The Maryland Stadium Authority entered into an MOU agreement for Demolition and Stabilization with the Baltimore City Department of Housing and Community Development and the Maryland Department of Housing and Community Development. As part of the agreement, the MSA will be responsible for the management of up to seventy-five million dollars (\$75,000,000) of demolition associated with the removal of blighted properties within Baltimore City.

This document was prepared for the Maryland Stadium Authority to serve as the technical basis for the execution of the abatement, deconstruction, demolition and site stabilization services.

II. LEAD ROLES, RESPONSIBILITIES AND AUTHORITY

The Maryland Stadium Authority

The Maryland Stadium Authority retains ultimate authority over the management of all Project CORE related tasks and will contract directly with both the Environmental Services / Testing and Inspection Consultant and the Deconstruction and Demolition Contractor.

The Environmental Services / Testing and Inspection Consultant

The Environmental Services/Testing and Inspection Consultant (Environmental Consultant) will be responsible for performing environmental site assessments to identify asbestos, lead and other hazardous materials, providing recommendations for the disposal of the identified hazardous materials, identifying materials that may be targeted for deconstruction/salvage/recycling and preparing and submitting a report highlighting the findings. The Consultant will then be responsible for the on-site oversight of the environmental remediation activities that are to be performed by the Contractor to ensure that proper protocols are followed and public safety is maintained.

The Environmental Consultant is responsible for conducting independent 3rd party testing and inspection services. This includes performance of air monitoring testing services associated with dust mitigation protocols, water testing, soil testing and concrete testing services.

The Environmental Consultant will also serve as the MSA's on-site "Environmental Compliance Officer". In this role, the Environmental Services Consultant will be responsible for monitoring and enforcing the project protocols and have authority to order the Contractor to stop work in the event that protocols are not adhered to or action levels are exceeded.

The Consultant is not responsible for employee safety environmental testing required by local and federal agencies. As noted below, the Contractor will still be responsible for performing testing services associated with employee/worker safety.

The Contractor

The Contractor will be the party responsible for the management and execution of the abatement, deconstruction and demolition of identified properties. The Contractor's Field Superintendent will serve as the on-site supervisor and is responsible for ensuring project protocols are adhered to and

work is completed in a safe manner. The Contractor will be responsible for providing its own independent Industrial Hygienist to monitor the safety of the employees completing the work. Additionally, the Contractor will be required to work cooperatively with the MSA’s Environmental Consultant.

See matrix of services which further clarifies the above outlined information:

| Task | Environmental Consultant | Contractor / Contractor’s Industrial Hygienist |
|--|--------------------------|--|
| Conduct Site Assessment, Hazmat Surveys and generate corresponding report / documentation. | ✓ | |
| Conduct pre-abatement / pre-demolition meetings to review HASP and demolition operations. | ✓ | Participate in meetings |
| Responsible for all employee safety testing and monitoring services as required by local, state and federal agencies. | | ✓ |
| Performance of hazardous / regulated materials abatement services inclusive of any waste removal, hauling and documentation. | | ✓ |
| Performance of deconstruction, demolition and site stabilization services inclusive of debris / salvageable materials removal and documentation . | | ✓ |
| Confirm abatement / remediation has been successfully completed in accordance with protocols. | ✓ | |
| Establish ambient background dust levels using dust fall monitoring. | ✓ | |
| Conduct dust monitoring via dust fall method at 50’ and 100’ from point of demolition. | ✓ | |
| Serve as the MSA’s onsite “Environmental Compliance Officer” during the abatement, deconstruction, demolition and debris removal process. Responsible for enforcement of the dust suppression protocols during demolition and debris removal operations. | ✓ | |
| Monitor and enforce weather related protocols inclusive of wind speed and cold weather restrictions. | ✓ | |
| Conduct independent onsite testing and inspection services inclusive of geotechnical, soils/compaction, water and concrete testing and inspection services. | ✓ | Coordinate with Environmental Consultant |

III. REQUIREMENTS

A. For Abatement, Salvage, Deconstruction, and Demolition Contractors:

1. Contractor(s) will be required to participate in a one-half day training session on this community-focused demolition protocol.
2. Contractor(s) will be required to hold all necessary demolition, asbestos and lead hazard reduction certifications. All supervisors, including Field Superintendent and the Prime Contractor's Project Manager must attend a 4-day MDE certified project manager lead training, and all workers must attend a MDE certified 2-day lead training.
3. Contractor(s) will be required to remain in compliance with all HUD, Maryland Occupational Safety and Health Administration (hereafter, "MOSH"), MDE demolition or relevant lead safety standards at all times.

Project CORE

Work Execution Protocols

- A. The work to be performed under this contract shall include, but not be limited to, all labor, services, material, tools, parts, equipment, transportation, fuels, maintenance and repairs etc. necessary and incidental to properly perform the demolition of building structures, repairs to the existing structures and related work.
- B. The Contractor shall furnish all tools, labor, materials, machinery, equipment and incidental work to perform and complete the work required for this contract, all in accordance with these specifications and applicable sections of the "Baltimore City Building, Fire and Related Codes 2015" or the latest version thereof.

I. GENERAL PROTOCOLS

- A. MSA makes no representation and assumes no responsibility for the condition of any building or structure thereon and the contents thereof in the condition in which they may be when released to them for demolition.
 - 1. All damages or losses whatsoever (whether by reason of fire, theft, breakage or other happenings) shall be at the sole risk of the Contractor.
 - 2. No such damages or loss shall relieve the Contractor from any obligation under this contract, nor shall the Contractor have any claim against MSA for any damage or loss to any building or structure to the Contractor.
 - 3. MSA will take all reasonable steps necessary to release structures to the Contractor as soon as practicable after they are vacated but assumes no liability whatsoever for any loss or damage caused by any delay in the release of structures for demolition.
- B. Debris removal is to begin no later than 48 hours from the start of demolition operations and is to be completed no later than 14 days from completion of demolition operations.
 - 1. Subject to the approval of the MSA, the Contractor will be allowed to separate and store onsite materials that are to be salvaged, provided that all of such materials are arranged thereon in a neat and orderly manner and further provided that the storing of such materials will not create a nuisance or interfere with progress of the work under this contract, or the work of others, or affect in any way, the Contractor's responsibility in carrying out all of the terms and conditions under this contract.
 - 2. All waste, whether salvage or debris, must be removed from the site no later than 14-calendar days from demolition completion.
- C. MSA reserves the right to cause the same to be removed from the site at the expense of the Contractor.
- D. From the commencement of the Work until the final completion of the Work, the Contractor shall ensure that no building or structure is left in a precarious, dangerous, or compromised

condition at any time.

- E. Once the Contractor initiates demolition operations, on a single structure or on a group of structures, the Contractor shall complete the entire demolition of these structures without interruption. Hours of work are to be in accordance with "Baltimore City Building, Fire and Related Codes 2015" or the latest version thereof. Interruptions for any reason other than these shall first be approved in writing by MSA.
- F. The Contractor shall take all proper precautions at all times to protect vehicular and pedestrian traffic from any damage or injury which may be caused, either directly or indirectly, by the work under the contract.
 - 1. Such precautions shall include, but not be limited to, the erection and maintenance of fences, barricades, railings, guards, scaffolding, signs, coverings, lights, etc., or any other precaution reasonably required by MSA to satisfy its reasonable concerns for the safety of citizens.
 - 2. If at any time MSA determines that the Contractor has not taken proper precautions, the Contractor shall, at no additional costs to MSA, install and maintain any and all additional protections as may be directed by MSA.
- G. The Contractor shall not, under any circumstances, burn any materials or have fires on the site at any time.
- H. The Contractor is absolutely prohibited from using dynamite or any other explosives in any of the work or operations covered in these specifications.
- I. The Contractor shall conduct all of its operations so as to prevent the raising of excessive dust and dirt. During the demolition operations, the work shall be kept thoroughly wetted down. The Contractor shall, at its own cost and expense, provide water lines for this purpose and it shall furnish all connections that may be required.
 - 1. The Contractor shall advise MSA how it proposes to keep the work properly wetted down and the Contractor shall receive approval of its proposal in this regard from MSA before proceeding with demolition work. Upon completion of the work, all temporary water lines installed by the Contractor shall be removed by the Contractor at its own cost and expense.
 - 2. At a minimum, the Contractor is required to use two (2) fire hoses with a minimum diameter of two (2) inches for wetting during the demolition operations with one hose directed at the point of demolition and one directed below the point of demolition where the debris hits the ground.. The Contractor will be responsible for providing additional hoses as may be required to sufficiently mitigate dust emissions.
 - 3. The Contractor will be responsible for maintaining adequate wetting of the debris pile to control dust emissions.
 - 4. The Contractor is required to apply water during the debris loading and removal process. At a minimum the Contractor is responsible for wetting of the debris pile and point of load-out by directing a hose at bucket at debris removal. Wetting is to be achieved via the use of fire hosing with a minimum diameter of 2".

- J. The Contractor shall ensure that a competent Field Superintendent is present on the job at all times during the operations. The Contractor's Field Superintendent must be fluent in the English language and accessible via cell phone at all times. The Field Superintendent will be responsible for monitoring jobsite safety and compliance with the project protocols and will be required to work cooperatively with the MSA's Environmental Consultant.
- K. The Contractor shall take the necessary measures to protect and secure the premises of the demolition area at all times.
 - 1. At a minimum, Contractor is required to provide driven post with chain link fencing or other substantial safety barriers. Safety barriers are to have a minimum height of eight (8') feet and include a wind-screen cover.
 - (a) The security measures are to extend to the curb lines at the front and sides of the properties and to the property line at the rear of the structures being demolished.
- L. The Contractor shall comply with local noise ordinances and permissible work hours as identified the contract documents.
- M. No demolition operations that require wetting will be permitted when temperatures fall below 32 degrees Fahrenheit for a period of time that could create a public icing hazard.
- N. Demolition operations are to stop when sustained winds reach fifteen miles per hour (15 MPH).
- O. The Contractor and its employees are to include Project C.O.R.E. imaging on project signage and employee safety vests. Project C.O.R.E. imaging will be provided to the Contractor in electronic formatting.
- P. All work is subject to the field decision by the MSA or the Environmental Compliance Officer.

II. AIR, DUST AND SOIL MONITORING

- A. MSA will retain an independent, certified third party environmental services/testing and inspection consultant to monitor potential dust emissions through air, dust and soil sampling.
- B. As appropriate, air and dust monitoring samples will be collected:
 - (i) Prior to demolition activities;
 - (ii) During demolition;
 - (iii) During debris removal; and
 - (iv) Following final debris removal and final site cleaning.

III. CONDITIONS TO BE MET

- A. The Contractor shall procure all necessary permits, including the razing permit, without cost to

MSA unless noted otherwise.

1. The Contractor shall comply with all laws and ordinances of the City of Baltimore and the State of Maryland relating to the work.
 2. The Contractor shall confirm the abandonment of the utility services to the structures to be razed and MSA shall bear the costs thereof.
- B. The Contractor shall exercise all care to ascertain in the utility services for the structure or structures that he is to demolish are disconnected.
1. The City of Baltimore will secure abandonment of utilities and bear the cost thereof. Prior to commencing work, the Contractor will certify that utility services for properties have been disconnected.
 2. In the event any of the utility services are not cut off, capped, or disconnected, the Contractor shall not perform any work and disturb same and will report to MSA.
- C. The Contractor shall ensure that existing utility services such as drains, sewers, water lines, gas lines, electrical feeders, telephone wires, etc., or any of their adjuncts, are completely safeguarded, and the Contractor shall conduct its operations accordingly.
1. If Contractor damages any such utilities, the Contractor shall, at its sole cost and expense, carefully repair the utilities as required by the Department of Public Works and Utility Companies having jurisdiction.
 2. Any damages incurred by the City and/or the Utility Companies shall be paid for by the Contractor.
- D. The Contractor shall keep all sidewalks, streets, and alleys open at all times where specified except as otherwise directed by MSA and adequate means shall be employed to protect pedestrian and vehicular traffic.
1. Once the structures are released to the Contractor for razing, and continuing for the term of the contract, it shall be the responsibility of the Contractor to remove and clear from the foot pavements fronting the structures snow, ice, and debris.
 2. Snow shall be removed and cleared away as required by Baltimore City Ordinance.
 3. Debris shall be removed and cleared from the streets, alleys and sidewalks by the end of each working day.
 4. Rodenticide
 - (a) Prior to commencing abatement, deconstruction and demolition operations, the Contractor shall rodenticide all interior and exterior areas of the property or properties to be demolished.
 - (i) Rodenticiding shall be performed by a business certified and licensed by the Maryland State Department of Agriculture and approved by the MSA.

- (ii) Standard baiting procedures will be followed, including the filling and re-inspection of rat burrows.
- (iii) The business performing such service shall strictly adhere and comply with all requirements on the labels of chemicals used, in addition to other State and Federal regulations.
- (iv) Signs shall be posted on the property twenty-four (24) hours prior to the treatment, and the Contractor shall notify the MSA at the same time that the signs are posted.
- (v) A certificate indicating fulfillment of all these requirements shall be furnished to MSA at the time the razing permit application is received.

5. Erosion and Sediment Control

- (a) The Contractor shall adhere to the Standards and Specifications for Soil and Erosion Sediment Control as approved and adopted by the Maryland Department of the Environment, Sediment and Storm Water Administration, as well as the provisions of the Baltimore City.
- (b) Erosion and Sediment Control Manual and as required by the contract document for each Project-specific RFP.
 - (i) These documents are available for examination at the office of Baltimore City Environmental Services, 1002 Abel Wolman Municipal Building, 200 N. Holliday Street, Baltimore, Maryland 21202.

6. Deconstruction

- (a) Salvage of components known to or suspected of containing lead or any other hazardous materials is strictly forbidden.
- (b) The Contractor shall provide for and ensure that demolition debris is placed in dumpsters.
 - (i) Prior to the placement of debris in dumpsters, Contractor shall determine whether any debris is a controlled hazardous substance (as defined by the Maryland Department of Environment) or otherwise poses hazards that warrant segregating such debris for disposal at an appropriate facility as required by law.
 - (ii) The Contractor shall classify all demolition debris in accordance with the definition of "Demolition Debris" found in COMAR 26.04.07.13 as follows:
 - (1) "Acceptable Demolition Debris" means debris which does not contain lead, asbestos or any other hazardous materials associated with the razing of buildings, roads, bridges, and other structures including structural steel, concrete, bricks (excluding refractory type), lumber, plaster and plasterboard, insulation material, cement, shingles and roofing material, floor and wall tile, asphalt, pipes and wires, and other items physically attached to the structure, including appliances if they have been or will be compacted to their smallest practical volume.

- (2) "Unacceptable Demolition Debris" includes industrial waste or byproducts, any waste materials contained within a structure on the grounds of the structure being demolished that are not physically part of the structure, or which are comprised of or contain materials that pose an undue risk to public health or the environment.
- (iii) It is the intention of MSA to recycle as much of the Acceptable Demolition Debris as feasible. The Contractor, therefore, may be required to source separate certain materials that have recycling potential.
 - (1) These items include structural steel, concrete, bricks (excluding refractory type), lumber, plaster and plasterboard, insulation material, cement, shingles and roofing material, floor and wall tile, asphalt, pipes and wires, and other items physically attached to the structure, including appliances.
- (iv) Upon placement into the dumpster (or other storage unit), the Contractor shall be deemed the generator of, and shall take title to, such debris, including any controlled hazardous substances.
 - (1) The Contractor shall cover all dumpsters with impermeable plastic after placement of debris therein and shall ensure that all dumpsters remain covered when not in use.
 - (2) Full dumpsters shall be removed promptly from the site and transported to the selected disposal site. Prior to removal from the site, the Contractor shall wet debris in the dumpster and verify that the impermeable plastic cover is properly secured for over-the-road transportation.
- (c) The Contractor shall arrange truck routes to haul away debris using MSA approved routes to the MSA approved disposal site with due care given to minimize noise, traffic, and other adverse impacts on residential communities.
 - (i) Waste materials shall undergo proper classification prior to removal from the site.
 - (1) Disposal of all waste materials shall be at facilities approved by MSA and properly certified to handle the disposal of general construction waste and/or hazardous waste.
 - (2) The Contractor is responsible for the tracking and documentation of all waste materials using the forms provided herein.

- (d) The Contractor shall leave in place all windowsills, window stools, window frames, window casings, doors, door casings, doorframes, baseboards, chair railings, and banisters that are known to contain lead-based paint as defined under COMAR 26.16.02.B.(3) and all other applicable law.
- (e) The Contractor shall not remove floors or walls without appropriate structural safety measures in place to prevent building collapse.

IV. CONDITIONS

- A. All deconstruction work shall be performed by the Contractor strictly in accordance with all applicable HUD, EPA, MDE and Baltimore City lead hazard reduction standards as well as any applicable MOSH standards.
- B. The Contractor shall notify MDE of all deconstruction/hazard reduction work
- C. The Contractor shall post warning signs and contain the work area as necessary to reduce lead dust contamination prior to the start of lead hazard work, in keeping with MDE lead hazard reduction standards.
 - 1. The Contractor shall wet all surfaces on the property scheduled to be deconstructed prior to their removal.
 - 2. Contractor shall contain the property to reduce any exterior dust emissions -including the covering of the exterior windows and other affected components with 6-mil plastic.
- D. All of Contractor's supervisory personnel shall be trained and certified as Demolition Supervisor and Lead Abatement Supervisors as accredited by the Maryland Department of the Environment.
- E. All of Contractor's workers shall be trained and certified as Lead Hazard Reduction Workers as accredited by MDE, EPA and OSHA, and as otherwise required by applicable law.
- F. All of Contractor's workers using Lifts shall receive appropriate training on operation of the Lift.
 - 1. Asbestos Containing Materials
 - (a) Contractor, during the Deconstruction phase, shall be responsible for the removal and disposal of all asbestos containing materials within the limits of the project.
 - (i) Removal of asbestos containing materials must be completed by personnel appropriately trained and accredited in asbestos abatement and in accordance with all applicable federal, state and local regulations.

- (b) This shall be accomplished prior to the releasing the site to the Contractor for demolition. However, if asbestos containing materials are discovered by the Contractor before or during its razing operations, the Contractor shall immediately cease operations and inform MSA of its finding.
 - (i) MSA will arrange verification of the existence of asbestos containing material and if confirmed, have it properly removed and disposed of.
 - (ii) The Contractor will not be eligible for delay claims during this phase of the operation.

2. Hazardous Materials

- (a) Contractor, during the Deconstruction phase, will be responsible for the removal and disposal of all hazardous materials within the limits of the project.
 - (i) The handling, removal and disposal of hazardous materials must be completed by personnel properly certified according to all applicable federal, state and local regulations.
 - (ii) Contractor will use personnel with all required credentials to handle hazardous materials.
 - (1) The project site will be released to the Contractor for demolition. However, if suspected hazardous materials are discovered by the Contractor before or during its razing operations, the Contractor shall immediately cease operations and inform MSA of its finding.
 - (2) Contractor will then immediately notify Maryland Department of the Environment and any other applicable governmental entities.
 - (3) If required by law or by MSA's directive, made in its sole and absolute discretion, Contractor shall request an analysis of the substance in question.
 - (4) Contractor will timely deliver to MSA a report of the analysis. The associated costs of the analysis and report shall be reimbursed to the Contractor by MSA.
 - (5) The Contractor will not be eligible for delay claims during this phase of the operation.

3. Demolition

- (a) All buildings or structures shall be razed in strict accordance with applicable sections of the "Baltimore City Building, Fire and Related Codes 2015" or the latest revision thereof.
 - (i) As directed by MSA, buildings and structures included in this Contract shall be completely razed and disposed of (above and below existing grade - including foundation walls, footers, basement floors, all subsurface utilities, and sidewalks as indicated, etc.).

- (b) All ancillary structures on the property shall be removed, including without limitation, storage facilities, garages, shacks, pet facilities, fencing, and other such structures. Furnace pits, elevator pits, hydraulic lifts, machinery foundations and all like structures shall also be removed and the resulting voids shall be backfilled as described in Paragraph.
- (c) Finish grade shall be generally construed as uniform sloping planes meeting the surfaces of abutting streets, alleys, sidewalks, walls, open area and abutting properties, etc. properly graded to insure adequate surface drainage.
- (d) The Contractor shall not remove or damage any trees, shrubs, streets, or alley pavements, public walks or curbs outside of the work area unless they are identified for removal in the specifications.
 - (i) Likewise, the Contractor shall not remove or damage any property constituting a part of any utility system such as poles, light standards, conduits, gas mains, sewers, steam or water pipes, fire hydrants, fire alarm boxes, police call boxes, meters, transformers, etc., whether owned by City of Baltimore or by a private utility company.
 - (ii) In the event the Contractor damages any such utilities or paving, the Contractor shall, at its own cost and expense, restore such utility or paving to a condition equal to that which existed before the damage was done.
- (e) The Contractor shall clean out all basements, areas, yards, etc. by removing all debris and rubbish, together with all equipment such as boilers, furnaces, piping, fixtures, etc.
- (f) The Contractor shall also remove all driveways, walks, wells, curbs, gates, fences, clothes poles, framework of any description, pavement, steps, and other material embedded in and appearing on or projecting above the surface of the ground within the work area.
- (g) The Contractor shall not close or obstruct streets adjacent to demolition areas unless it shall first have obtained all necessary permits to do so. The Contractor shall exercise all due care during demolition operations to ensure that debris is not allowed to fall where it will or may endanger pedestrian and vehicular traffic.
- (h) The Contractor shall take special care and precaution not to disturb or damage private property. Should any private property be damaged as a result of the Contractor's operations, it shall, at its own cost and expense, restore such private property to a condition equivalent to the existed before the damage was done, all to the satisfaction of MSA.
- (i) The Contractor shall not operate equipment such as cranes, power shovels, bulldozers, etc., in streets and alleys abutting the limits of the demolition area.
 - (i) Any deviation or exception to this requirement requires the written approval of MSA and then only after the Contractor has obtained necessary permits.
 - (ii) All such equipment shall be operated from within the demolition area.

- (iii) All demolition is to be performed in a controlled manner via the use of bucket / loader claw.
 - (1) The use of heavy weights suspend by a cable from a boom or hoist is strictly forbidden.
 - (2) Mechanical equipment may be used to demolish structures provided that such equipment is operated within the property lines and special care is taken by the Contractor to ensure that debris is not allowed to fall on the streets, alleys and sidewalks which are used by the public.
- (j) The Contractor will, prior to submitting its proposal, familiarize itself with all of the details pertaining to the work.
 - (i) Contractor will have no claim for extra compensation or any other claim because of misunderstandings, misinterpretations, or lack of information relative to these matters.
 - (ii) Contractor will be allowed to conduct a pre-bid site investigation.
 - (iii) Contractor will have no claim for extra compensation or any other claim because of misunderstandings, misinterpretations, or lack of information relative to these matters.
- (k) The Contractor shall do all propping, bracing, etc., of walls, etc., for each property in the manner that is necessary to safeguard the public or others.
- (l) The Contractor will take every precaution to guard against any movement or settlement of adjacent buildings or structures and shall provide and place, at its own expense, any bracing or shoring necessary or proper in connection therewith; and will be solely responsible for the safety and support of such buildings damage or injury caused thereby or resulting there from.
 - (i) If at any time, the safety of any adjacent building or structure appears to be endangered, the Contractor will immediately cease operations, notify MSA and, at its own expense, take all proper means to support such building or structure.
 - (ii) The Contractor will not resume operations until permission has been secured in writing from MSA.
 - (iii) If MSA considers additional bracing or shoring is necessary to safeguard and prevent any such movement or settlement, the Contractor shall promptly provide and place, at its own expense, any such bracing or shoring upon the directive of MSA.
 - (iv) If the Contractor fails to comply promptly with MSA's order, such bracing and shoring may be placed by MSA and back charged to the Contractor.

- (m) The Contractor shall take every precaution to guard against the movement, settlement or collapse of any sidewalks, alleys, or passage adjoining the property. If the Contractor causes any such damage, it shall promptly repair such damage at its sole expense when directed to do so by MSA.
- (n) The Contractor shall perform the work of demolishing the buildings or structures in a manner that will ensure that adjacent buildings or properties will not sustain any damage from falling debris or other causes, and the work shall be done in a manner so as not to interfere with the use of adjacent buildings or structures or the free and safe passage to and from them.
- (o) Masonry walls shall be demolished in small sections.
- (p) The Contractor will remove all of its property from the demolished area before the completion of the project and before the project will be considered completed.
- (q) It is possible that there may be historical or antique items such as, but not limited to, papers, plaques, books, documents, records, coins, utensils, and so forth, in the structures being demolished.
 - (i) MSA shall be the judge as to whether or not such materials or items are of historical or antique value.
 - (ii) The Contractor shall be responsible for the delivery of any such material to MSA, and shall become the property of MSA.
 - (iii) In addition, prior to razing operations, MSA reserves the right to remove and salvage antique architectural features which are part of the structures being demolished such as, but not limited to, cornices, fireplace mantles and trim molding, stair balusters, banisters and handrails, stained-glass windows, doors and doorframes, etc.
- (r) The Contractor shall maintain the streets cleaned of any litter or debris resulting from its operations.
 - (i) At a minimum the Contractor is responsible for performing street sweeping on a weekly basis and upon completion of the demolition and debris removal process.
 - (ii) The Contractor is responsible for additional street sweepings as may be needed to maintain debris free roadways around the project.
- (s) Prior to commencement of demolition, the Contractor shall secure the perimeter of the demolition site for site containment and security, and to prevent entry and vandalism.

4. Work Area Control

- (a) This required work of the Contractor is intended to define the boundaries of the site and indicate that the interior is a work zone that is not open to the public, and includes taking each of the following mandatory steps:
 - (i) At a minimum, erect driven post with chain link fencing or other substantial

barriers with a minimum height of eight (8') feet around the perimeter of the demolition site to prevent access. Barriers are to be covered with wind screens.

- (ii) Ensure no squatters are in the structure prior to and throughout the demolition operations.
- (iii) Provide monitoring to control site access and ensure the safety of pedestrians and vehicles during active demolition process. -

V. DEMOLITION DEBRIS REMOVAL

- A. Debris removal is to begin no later than 48-hours from the start of demolition operations and is to be completed no later than 14-days from completion of demolition operations.
- B. At the approval of the MSA the Contractor may be allowed to separate and store onsite materials that are to be salvaged by the Contractor, provided that all of such materials are arranged thereon in a neat and orderly manner, as directed by MSA and subject to its approval and further provided that the storing of such materials will not create a nuisance or interfere with progress of the work under this contract, or the work of others, or affect in any way, the Contractor's responsibility in carrying out all of the terms and conditions under this contract.
- C. All waste, whether salvage or debris, must be removed from the site no later than 14-calendar days from demolition completion.
 - (a) Roll-off bins and dump trucks shall not be parked in front of occupied houses during debris removal. At the conclusion of the razing of the structure(s), the contractor will:
 - (i) Provide effective wetting during debris removal, i.e. while moving debris to dumpsters, truck or container, debris will be regularly wetted to reduce dust emissions.
 - (ii) At a minimum the Contractor is responsible for wetting of the debris pile and point of load-out by directing a hose at bucket during debris removal.
 - (iii) Wetting is to be achieved via the use of fire hosing with a minimum diameter of 2".
 - (iv) Dumpsters will also receive regular wetting to reduce dust emissions.
 - (v) During the wetting down phase of any demolition the contractor will ensure that adequate runoff procedures are implemented.

- (b) Provide removal and hauling of demolition debris utilizing tightly sealed, secure and non-permeable coverings on trucks and dumpsters.
- (c) Ensure disposal of demolition debris to MSA and EPA approved lined landfill.

VI. LANDSCAPING, GREENING AND MAINTENANCE OF LOTS

- A. The Contractor will be responsible for backfilling of all excavations with approved clean fill.
- B. The Contractor will be responsible for site grading and preparing of site to receive seeding / site stabilization.
- C. The Contractor will be responsible for seeding and associated watering/maintenance to ensure mature vegetative growth.

TECHNICAL DOCUMENT

for

Project C.O.R.E

Creating Opportunities for Renewal and Enterprise

June 22, 2016



A JOINT PROJECT BETWEEN



TABLE OF CONTENTS

| | | |
|---------------|---|--|
| SECTION 01013 | - | SUMMARY OF WORK (HAZMAT) |
| SECTION 01043 | - | PROJECT COORDINATION (HAZMAT) |
| SECTION 01091 | - | DEFINITIONS AND STANDARDS (HAZMAT) |
| SECTION 01092 | - | CODES AND REGULATIONS (HAZMAT) |
| SECTION 01410 | - | AIR MONITORING |
| SECTION 01503 | - | TEMPORARY FACILITIES AND CONTROLS |
| SECTION 01513 | - | PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM |
| SECTION 01526 | - | TEMPORARY ENCLOSURES |
| SECTION 01560 | - | WORKER PROTECTION (HAZMAT) |
| SECTION 01562 | - | RESPIRATORY PROTECTION (HAZMAT) |
| SECTION 01563 | - | DECONTAMINATION UNITS |
| SECTION 01711 | - | PROJECT DECONTAMINATION |
| SECTION 01714 | - | WORK AREA CLEARANCE (HAZMAT) |
| SECTION 01732 | - | SELECTIVE DEMOLITION (DECONSTRUCTION) |
| SECTION 02081 | - | REMOVAL OF ASBESTOS-CONTAINING MATERIALS |
| SECTION 02084 | - | DISPOSAL OF ASBESTOS-CONTAINING MATERIALS |
| SECTION 02085 | - | REMOVAL AND DISPOSAL OF MATERIAL CONTAINING LEAD |
| SECTION 02086 | - | HAZARDOUS WASTE MANAGEMENT |
| SECTION 02221 | - | BUILDING DEMOLITION |
| SECTION 02230 | - | SITE CLEARING |
| SECTION 02300 | - | EARTHWORK |

SECTION 01013 - SUMMARY OF WORK (HAZMAT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The work of the Contract and related requirements and conditions that have an impact on the project include:

Section 01013 - Summary of the Work

Section 01043 - Project Coordination

Section 01091 - Definitions and Standards

Section 01092 - Codes and Regulations

Section 01410 - Air Monitoring

Section 01503 - Temporary Facilities and Controls

Section 01513 - Pressure Differential and Air Circulation System

Section 01526 - Temporary Enclosures

Section 01560 - Worker Protection (HAZMAT)

Section 01562 - Respiratory Protection (HAZMAT)

Section 01563 - Decontamination Units

Section 01711 - Project Decontamination

Section 01714 - Work Area Clearance (HAZMAT)

Section 01732 - Selective Demolition (Deconstruction)

Section 02081 - Removal of Asbestos-Containing Materials

Section 02084 - Disposal of Asbestos-Containing Waste Material

Section 02085 - Removal and Disposal of Material Containing Lead

Section 02086 - Hazardous Waste Management

Section 02221 - Building Demolition

Section 02230 - Site Clearing

Section 02300 – Earthwork

B. The work in summary consists of:

1. The safe and efficient demolition and site clearance of blocks, or partial blocks, of properties located within the City of Baltimore, Maryland. As part of this contract, sub-tasks will include:
 - a. Asbestos-Containing Materials (ACM): Work included under this contract involves the abatement and control of asbestos-containing materials from properties. The work shall be conducted to support the demolition of the buildings located on the subject site.
 - i. Estimates of the quantity of materials to be removed are identified in the Site-Specific Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey included in the Project Specific RFP's; however, it shall be the responsibility of the Contractor to estimate quantities to his own satisfaction prior to submitting a bid. If the Contractor bids for this work, this shall indicate acceptance of the Scope of Work that includes removal of all described materials, regardless of quantity.
 - b. Lead-Based Paint: Work included under this contract involves the abatement, control and disposal of lead-based paint from properties. The work shall be conducted to support the demolition of the buildings located on the subject site.
 - i. Estimates of the quantity of materials to be removed are identified in the Site-Specific Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey included in the Project Specific RFP's; however, it shall be the responsibility of the Contractor to estimate quantities to his own satisfaction prior to submitting a bid. If the Contractor bids for this work, this shall indicate acceptance of the Scope of Work that includes removal of all described materials, regardless of quantity.
 - c. PCBs, Mercury-Containing Waste and other Universal Waste or potentially hazardous materials: Work included under this contract involves the removal and disposal of polychlorinated biphenyls (PCBs), mercury containing waste materials and other universal or regulated wastes, such as lead batteries, unused hazardous products and/or potential hazardous wastes from properties. The following waste products are designated by MSA as non-salvageable and require specialized handling and disposal:
 - i. Waste Type A: PCB waste.
 1. PCB-containing systems
 - ii. Waste Type B: Mercury-containing waste.
 1. Mercury-vapor lamps, mercury containing thermostats
 - iii. Waste Type C: Universal and hazardous waste.
 1. Nickel-cadmium batteries, lead-acid batteries
 2. Pesticides, herbicides and rodenticides
 3. Above-ground Storage Tanks (ASTs)
 4. Chlorofluorocarbon containing systems
 5. Fluorescent bulbs and light fixtures
 6. Unidentified chemical mixtures
 7. Any material that contains lead, asbestos, etc.

The work shall be conducted to support the demolition of the buildings located on the subject site.

Estimates of the quantity of materials to be removed are identified in the Site-Specific Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey included in the Project Specific RFP's; however, it shall be the responsibility of the Contractor to estimate quantities to his own satisfaction prior to submitting a bid. If the Contractor bids for this work, this shall indicate acceptance of the Scope of Work that includes removal of all described materials, regardless of quantity.

1.02 CONTRACTOR USE OF PREMISES

- A. The Contractor shall limit his use of the premises to the work indicated.
- B. Confine operations at the site to the areas permitted under the Contract.
- C. Portions of the site beyond areas in which work is indicated are not to be disturbed. Conform to site rules and regulations affecting work while engaged in project demolition.
- D. Do not unreasonably encumber the site with materials/equipment storage. Confine stockpiling of materials and location of trailers and dumpsters to the areas directed by MSA's representative or the Environmental Consultant.
 - 1. Contractor is solely responsible for site security for unsecured equipment or materials left on-site overnight.
 - 2. Contractor is responsible for securing the site and all waste material during the demolition process to prevent mobilization of asbestos containing material, lead-based paint dust or other potentially hazardous materials into the community or surrounding environment.
- E. Maintain existing building in a safe, secure, and weather-tight condition throughout the demolition period.
- F. Take all precautions necessary to protect the building, workers and visitors during the construction period.
- G. Smoking or open flames will not be permitted within the building enclosure or on the premises; comply with National Fire Protection Association (NFPA) 101.
- H. Contractor must furnish portable toilet facilities for personnel, and maintain such facilities in a clean, sanitary manner.
- I. The Contractor shall be responsible for temporary lines connected to a water source and the removal of the temporary lines at the conclusion of the job. All connections shall conform with applicable provisions of the plumbing code as well as trade practices. Contractor shall be responsible for obtaining any and all required permits.

Contractor shall furnish all necessary equipment for provision of hot water during the duration of the project.
- J. The Contractor shall provide all necessary temporary electrical service for completion of the project, including the installation of generators, electrical lines, and subpanel units using a licensed electrician. This work shall be coordinated with MSA's designated representative. The Contractor shall remove temporary electrical service at the end of the project. All electrical lines, devices, and work shall conform with applicable local electrical codes.
- K. Control of Access: Unauthorized personnel shall be prohibited from entering or remaining in the work area at all times during hazard abatement work. Authorized personnel include:
 - 1. MSA's representatives.

2. Environmental Consultant (s)
3. Contractor employees.
4. Regulatory authorities' designees.

1.03 OCCUPANCY

- A. The property will not be occupied during demolition.

1.04 SUBMITTALS

- A. Plan of Action, including a task-specific Health and Safety Plan.
- B. Pre-work inspection report, including video and photographs.
- C. All items on the Submittal Checklist provided below.

SUBMITTAL CHECKLIST - ABATEMENT

The submittals required from the Contractor include, but are not limited to the following (submittal does not apply if Section is not included in this Specification):

Section 01013 - Summary of Work

Before Start of Work:

Plan of Action

Pre-Construction Inspection

Section 01043 - Project Coordination

Before Start of Work:

Contingency Plans

Telephone Numbers

Notifications sent to other entities at the work site.

Notifications sent to emergency service agencies.

Resume of general superintendent.

Accreditation of general superintendent

Periodically During Work:

Daily Logs

Event Reports

Accident Reports

Discovered Condition Reports

Section 01092 - Codes, Regulations, and Standards

Before Start of Work:

State of Maryland and local regulations

Licenses

Notifications

Permits

Disposal regulations for out of state disposal

Section 01410 - Air Monitoring

Before Start of Work:

Asbestos and lead dust monitoring plans

Mitigation and containment plans, including Safety Data Sheets (SDSs) and MDE approval for any chemical dust suppressants

Notifications under EPA 40 CFR 50 - National Ambient Air Quality Standards (NAAQS) for Particulate Matter

Stop work action levels

Implementation schedule

After Commencement of Work:

Daily site perimeter and worker breathing zone air monitoring results

Dust monitoring summary reports

Section 01503 - Temporary Facilities

Before Start of Work:

Scaffolding

Hot water heater

Decontamination unit sub-panel

Ground fault circuit interrupters (GFCI)

Lamps and light fixtures

Temporary heating and cooling units

Self-contained toilet units - product data, sub-contractor

First aid supplies

Fire extinguishers - product data, location schedule

Section 01513 - Pressure Differential & Air Circulation System

Before Start of Work:

Pressure differential/air circulation system design

HEPA filtered fan units: Product data

Monitoring equipment: Product data

Auxiliary generator: Product data

Power switch: Product data

Auxiliary power system: Shop drawing

After Commencement of Work:

Pressure differential monitoring results summary

Section 01526 - Temporary Enclosures

Before Start of Work:

Strippable Coatings: Product data, Test report on ASTM E84 test, Manufacturer's installation instructions, safety data sheet(s)

Spray Cement: Product data, Manufacturer's installation instructions, safety data sheet(s)

Sheet Plastic: Test reports on NFPA 701 test

After Commencement of Work:

Initial and daily barrier inspections using smoke tubes and other appropriate procedures

Section 01560 - Worker Protection - HAZMAT

Before Start of Work:

AHERA Accredited Training Certificate: for each worker1000

Maryland Licensure for Abatement: firm and each worker

Maryland and EPA lead-based paint removal certification: for each worker

Documentation of Training for Other Hazards: for each worker.

Maryland and Local License: for each worker.

Historical Airborne Fiber Data.

Report from Medical Examination: for each worker.

Certificates of Worker's Acknowledgment: for each worker

Section 01562 - Respiratory Protection - HAZMAT

Before Start of Work:

Product Data

NIOSH Certifications

Type "C" System Diagram & Operating Instructions

Respiratory Protection Program

Historical Airborne Fiber Exposure Data

Fit Test Documentation: for each worker using respiratory protection

After Commencement of Work:

Weekly air monitoring data from personal sampling summary

Section 01563 - Decontamination Units

Before Start of Work:

Personnel Decontamination Unit: Shop drawing

Filters: Product data

Signs: Samples

Section 01711 - Project Decontamination

Submittal Items as listed in Section 01711

Section 01714 - Work Area Clearance (HAZMAT)

Before Start of Work:

Clearance testing and monitoring plan

Clearance action levels

After Commencement of Work:

Testing and monitoring data summary

Section 01732 - Selective Demolition (Deconstruction)

Before Start of Work:

Hazardous material containment and abatement plan for salvage material

Task specific health and safety plan for salvage workers

Documentation of Training for Other Hazards: for each worker

Maryland and Local License: for each worker

Report from Medical Examination: for each worker

Certificates of Worker's Acknowledgment: for each worker

Section 02081 - Removal of Asbestos-Containing Materials

Before Start of Work:

Asbestos removal and monitoring plan

Task specific health and safety plan

EPA, MDE and City of Baltimore project notifications

Certificates: Contractor certification for licensed asbestos abatement,

Contractor EPA certification and MDE accreditation for Asbestos Abatement Supervisor,

Contractor EPA certification and MDE accreditation for proposed abatement workers,

Laboratory accreditation certificates (National Voluntary Laboratory Accreditation Program (NVLAP) or equivalent),

Contractor certifications for training, medical surveillance and respiratory fit test, as appropriate, for on-site workers

Surfactant: Product data, safety data sheet and MDE approval for use

Removal Encapsulant: Product data, safety data sheet and MDE approval for use

Section 02084 - Disposal of Asbestos-Containing Waste Material

Before Start of Work:

Asbestos disposal and monitoring plan

Task specific health and safety plan
Waste Hauler State/State of MD License
MDE Certified Waste Hauler License
Permitting and licensure of designated hazardous waste landfill
Landfill Contact Person and Telephone Number
Chain of Custody Form
Waste Manifest Form
Disposal Bag: Samples
Labels: Samples

After Commencement of Work:

On a weekly basis: copies of manifests and disposal site receipts, weekly safety meeting minutes, etc.

SUBMITTAL CHECKLIST - LEAD

The submittals required from the Contractor include, but are not limited to the following (submittal does not apply if Section is not included in this Specification):

Section 02085 - Removal and Disposal of Material Containing Lead

Submittal items as listed in Section 02085

SUBMITTAL CHECKLIST – HAZARDOUS WASTE

The submittals required from the Contractor include, but are not limited to the following (submittal does not apply if Section is not included in this Specification):

Section 02086 - Hazardous Waste Management

Submittal items as listed in Section 02086 - Hazardous Waste Management and Section 02221 - Building Demolition

Before Start of Work:

Environmental Consultant Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey

Contractor fugitive dust and demolition debris containment and monitoring plan

Contractor task specific health and safety plan

After Commencement of Work:

Weekly compliance reports

Section 02230 - Site Clearing

Before Start of Work:

Site management and temporary control plan

Section 02300 - Earthwork

Before Start of Work:

Materials management plan

1.05 SPECIAL REQUIREMENTS

- A. All Contractor personnel involved in activities related to the abatement of hazardous waste materials during this project must possess valid training certificates and licensing according to the requirements of all appropriate federal, state and local regulations. Evidence of training must be made available to the Environmental Consultant upon request and copies must be maintained on the project site **at all times**.
- B. Each accredited person involved in asbestos, lead-based paint or other hazardous material abatement activities must possess a valid Maryland Photo Identification Card on the job site **at all times**.
- C. Proper respiratory protection must be used **at all times** by all Contractor personnel when there is any possibility of disturbance of asbestos-containing materials, lead-painted materials or any other hazardous material which may lead to dust levels above OSHA's permissible exposure limit for that material.
- D. The Contractor must provide the services of a Certified Industrial Hygienist (CIH). The Contractor will oversee all asbestos, lead-based paint or other hazardous material abatement activities throughout the duration of the project including, but not limited to, all pre and post abatement inspections, air sampling, and project monitoring activities.
- E. Any Addendum (a) to this Specification issued prior to the bid due date are incorporated by reference and carry the same force. Where an Addendum may conflict with the original requirements, the Addendum shall prevail.
- F. Phase Contrast Microscopy (PCM) analytical methods will be used to determine if the work area meets asbestos exposure levels set-forth in these specifications. Clearance levels will be established utilizing PCM sampling and analytical methods as set forth in the AHERA regulation 40 CFR Part 763 Appendix A. The sampling and analytical methods are further described in Sections 01410 and 01714. The work area shall also achieve clearance-using PCM via NIOSH 7400 Method. If clearance is not achieved, the area shall be re-cleaned and re-tested until such time that the area meets the clearance requirements of Section 01714.
- G. During non-working hours, the work area shall be secured by locking the entrance to the work areas.
- H. Friable asbestos work areas will be placed under negative pressure in accordance with Section 01513. A pressure differential equal to or greater than 0.02 inches of water relative to adjacent areas, or the equivalent of four air changes per hour will be maintained at all times. At least one negative air pressure device shall be installed as a back-up unit.

- I. Minimum respiratory protection for this project shall be half-face air purifying respirators approved in accordance with requirements of 29 CFR 1926.1101.
- J. All contaminated metal items specified for removal and disposal are to be double bagged and placed into fiber drums for disposal as asbestos-containing waste.
- K. The Contractor shall install a ground fault circuit interrupter (GFCI) sub-panel adjacent to the electrical panel or outside the work area. If the sub-panel is installed within the work area the sub-panel shall be installed in a manner such that electrical components are elevated a minimum of 12" above the floor. The Contractor shall construct a barrier made of 2' x 4' lumber and two (2) layers of polyethylene sheeting to prevent water contact with the sub-panel. Other temporary electrical power sources must be approved by MSA's representative.
- L. The Contractor shall assume full responsibility and liability for the compliance with all standards, licensing requirements and patented systems pertaining to asbestos abatement, work practices, hauling, disposal, protection of workers, protection of visitors to the work site, and persons occupying areas adjacent to the work site. The Contractor shall hold harmless and indemnify MSA and MSA's representatives of any liability as a result of patent infringements, failure to comply with applicable standards, and licensing requirements on the part of the Contractor and the Contractor's employees and subcontractors.
- M. The Contractor must provide the following temporary utilities for each floor per building for the duration of the project:
 - (3) ABC Fire Extinguishers
 - Electrical Sub-panel (as may be necessary to complete work)
 - Temporary Lighting in Work Area
 - Two (2) Battery Powered Fire Alarms/Detectors
- N. Plywood barriers are to be erected at all entranceways to the work areas that will not be used by the Contractor.
- O. The Contractor shall ensure that water service to the shower and other outlets within the work area are turned off while the Contractor is not performing work.
- P. A negative pressure differential of greater than -0.02 inches of H₂O relative to outside pressure is required for this project in accordance with OSHA's construction standard (29 CFR 1926.1101). A stop work will be issued if the pressure differential falls below -0.01 inches H₂O.
- Q. The Certified Industrial Hygienist shall perform a pre-abatement inspection prior to the initiation of work. The Contractor is responsible to correct deficiencies noted by the CIH prior to beginning work. After successful completion of the pre-abatement inspection, the CIH will provide the Contractor a signed and dated written "AUTHORIZATION TO COMMENCE".
- R. The following is the sequence of major events for the project. As this sequence of events is not complete, the Contractor is instructed to thoroughly read this specification for other requirements not listed below.
 - Conduct pre-abatement inspection
 - Installation of electrical sub-panel or other source of grounded temporary power source
 - Installation of critical barriers
 - Installation of floor & wall sheeting (2 layers of polyethylene sheet on each); installation of ceiling sheeting (1 layer of polyethylene sheet)

Installation of HEPA filtration devices
Installation of decontamination chamber
Installation of pressure differential monitor
Conduct abatement mitigation system inspection
Gross material removal
Fine cleaning
Final visual inspection
Clearance air testing
Tear down

1.06 QUALIFICATIONS

Submit the following before start of any asbestos, lead-based paint or other hazardous material abatement work.

- A. Licenses and Qualifications: MSA reserves the right to make and be the final determination of the Contractor's qualifications for work. Requirements for the qualified Contractor include the following;
1. Contractor shall submit the following documentation with an accompanying statement notarized and signed (by a principle of the company) verifying accuracy and truth of information.
 - a. General Qualifications of the Contractor shall include documentation of successful completion of at least three (3) abatement projects of similar size, dollar value, scope, and complexity. Include air monitoring data from an independent monitoring firm demonstrating compliance with OSHA airborne hazardous particulate concentrations during the work.
 - b. Reference names, telephone numbers, and addresses of MSA representatives for the above referenced three (3) abatement projects.
 - c. Names of Contractor's Qualified Representatives who shall be qualified officials of the company, and shall have complete authority to speak for and make commitments for the Contractor including name, title, length of service, verified training records, specific experience (including size and dollar value) of individual projects previously supervised.
 2. Submit evidence of full compliance with medical surveillance and respiratory protection provisions of existing regulations; this shall include copies of written respiratory protection and medical surveillance programs.
 3. Contractor shall submit the following statement notarized and signed (by a principle of the company) verifying accuracy and truth of the following information;
 - a. Description of any asbestos abatement, or other environmental remediation projects which have been prematurely terminated, including the circumstances surrounding such termination.
 - b. List of any contractual penalties which the Contractor has incurred for breach or non-compliance with Contract Specifications on previous projects, such as overruns of completion time leading to liquidated damages.

- c. List of any citations levied against the Contractor by any governmental entity for violations related to lead-based paint abatement, asbestos abatement, or other environmental remediation work including the name and location of the project, date(s) of violation(s), and allegation resolution.
 - d. Description of all legal proceeding, lawsuits or claims which have been filed or levied against the Contractor or any of his past or present employees for lead-based paint abatement, asbestos abatement, or other environmental remediation related activities.
4. Acknowledgment of any of the above circumstances will not necessarily result in automatic disqualification.

1.07 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.
- B. 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.
- C. Submit 2 copies of each required submittal. MSA will retain one, and will return the second marked with action taken and corrections or modifications required.

1.08 MISCELLANEOUS SUBMITTALS

- A. Process safety data sheets as "product data".
- B. 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. 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 use by MSA's representative.

1.09 MSA'S REPRESENTATIVE'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, MSA's representative will review each submittal, mark to indicate action taken, and return promptly.
- B. Compliance with specified characteristics is the Contractor's responsibility.
- C. MSA's representative will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked to indicate the action taken.

1.10 PRODUCT MATERIALS, EQUIPMENT – DELIVERY, STORAGE & HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

- B. Schedule delivery to minimize long-term storage at the site and overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
- E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- F. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- G. Store heavy materials away from the project structure in a manner that will not endanger the supporting construction.
- H. 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.

1.11 QUALITY ASSURANCE

- A. To the fullest extent possible, provide products of the same generic kind, from a single source, for each unit of work.
- B. Compatibility of products is a basic requirement of product selection.
- C. When the Contractor is given the option of selecting between two or more products for use on the project, the product selected must be compatible with other products previously selected, even if the products previously selected were also Contractor options.

PART 2 - PRODUCTS

2.01 GENERAL PRODUCT COMPLIANCE

- A. Requirements for individual products are indicated in the contract documents; compliance with these requirements is in itself a contract requirement.
- B. Where some particular product or device is specified by brand name or manufacturer it is to be considered a standard.
- C. Fire resistant materials including polyethylene and plywood shall be used unless MSA's representative approves other materials. Specific approval is required for spray poly.
- D. The use of tear-off disposal bags is not allowed.
- E. If approved equal, items of other manufacturer than those mentioned may be used, unless specifically noted otherwise for purposes of standardization.
- F. Any method or material substitution must receive the written approval of the MSA's representative.

2.02 SUBSTITUTIONS

- A. The Contractor's request for a substitution will be received and considered when extensive revisions to the contract documents are not required, and one or more of the following conditions are met.
- B. Request is directly related to an "or equal" clause or similar language in the contract documents.
- C. Specified product or method cannot be provided within the Contract time. However, the request will not be considered if the product or method cannot be provided as a result of the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.
- D. Specified product or method cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
- E. Substantial advantage is considered by MSA to offer cost, time, energy conservation or other considerations of merit, after deducting of offsetting responsibilities MSA may be required to bear.
- F. Specified product or method cannot be provided in a manner which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.
- G. Specified product or method cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.
- H. Specified product or method cannot receive a warranty as required by the contract documents and where the Contractor certifies that the proposed substitution includes the required warranty.
- I. Requests for changes in the products, materials, equipment and methods of construction required by the contract documents are considered requests for "substitutions", and are subject to the requirements specified herein. Following are not considered as substitutions:
 - 1. Revisions to the contract documents, where requested by MSA's representative are considered as "changes" not substitutions.
 - 2. Specified Contractor options on products and construction methods included in the contract documents are not subject to the requirements for substitutions as herein specified.
 - 3. Except as otherwise provided in the contract documents, the Contractor's determination of and compliance with governing regulations and orders as issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders.
 - 4. Submit 3 copies of each request for substitution. In each request identify the product or fabrication or installation method to be replaced by the substitution; include related specification section and complete documentation showing compliance with the requirements for substitutions.
 - 5. Within one week of receipt of the Contractor's request for substitution, MSA's representative will request additional information or documentation as may be needed for evaluation of the request.
 - 6. Within 2 weeks of receipt of the request, or within one week of receipt of the requested additional information or documentation, whichever is later, MSA's representative will notify the Contractor of either the acceptance or rejection of the proposed substitution.

2.03 GENERAL PRODUCT REQUIREMENTS

- A. Provide products that comply with the requirements of the contract documents that are undamaged and, unless otherwise indicated, unused at the time of installation.

- B. Provide products that are complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- C. Where they are available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01013

SECTION 01043 - PROJECT COORDINATION (HAZMAT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Minimum administrative and supervisory requirements necessary for coordination of work on the project include but are not necessarily limited to the following.

1.02 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. Provide a full-time General Superintendent who is experienced in administration and supervision of asbestos, lead-based paint or other hazardous material abatement projects. This person is the Competent Person as required by OSHA in 29 CFR 1926 for the Contractor and the State of Maryland requirements. The Contractor's representative responsible for compliance with all applicable federal, state and local regulations.
- B. The General Superintendent must have completed and passed the exam for an Asbestos Hazard Emergency Response Act (AHERA) accredited Supervisor level course, have had a minimum of two (2) years demolition supervisory experience and meet all additional requirements set forth in 29 CFR 1926.1101 for a Competent Person.
- C. The General Superintendent must be acceptable to MSA's representative, based on submitted resume information and ongoing interaction with all parties involved in or affected by the project. The resume must include information regarding at least three similar projects for which the proposed General Superintendent has personally been the supervisor, including names and phone numbers for contact persons for MSA's representative on these projects. MSA reserves the right to reject any person proposed as the General Superintendent, who, in his sole judgment, does not serve the best interest of the State of Maryland.
- D. The General Superintendent must be on-site at all times this project has any activities on-site, including sub-contracting, regardless of whether asbestos work is taking place or not. A written request, including resume, for any substitute for this person for any period during the project must be submitted to the Contract Manager or his designee in writing, in advance of such an assignment.
- E. The General Superintendent, and any requested substitute, must have the full authority of the Contractor to commit resources, advise of Contractor's status and future plans and otherwise advise MSA's representative or the Environmental Consultant of issues that affect project quality and timeliness.
- F. Both the full-time on-site General Superintendent and the primary supervisor inside the containment area during abatement activities must be fully conversant in the English language and shall act as interpreters between the CIH or MSA's representative or the Environmental Consultant and any employees who are not English speaking, when so requested.

1.03 SPECIAL REPORTS

- A. Except as otherwise indicated, submit special reports directly to MSA within one day of occurrence requiring special report, with a copy sent to the MSA's representative and others affected by occurrence.

- B. When an event of unusual and significant nature occurs at the site (examples: failure of negative pressure system, rupture of temporary enclosures), prepare and submit a special report listing chain of events, persons participating, response by Contract's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise MSA in advance at earliest possible date.
- C. Prepare and submit reports of significant accidents at the 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, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

1.04 CONTINGENCY PLAN

- A. Prepare **and submit** a contingency plan for emergencies including fire, accident, power failure, negative air system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in plan, specific procedures for decontamination or work area isolation.
- B. Describe site-specific emergency egress procedures and how the work area will be marked to denote emergency egress paths and exits. Also describe lighting plan for emergency egress, should there be a power failure while work is in progress, specifically addressing use of daylight (if hours of work are compatible), building lighting not in the work area, temporary fixed emergency lighting and flashlights. Ensure the procedures for emergency egress lighting are as fail-safe as feasible and will adequately allow workers or visitors to safely escape from all portions of the work area in case of a power failure. Plan must incorporate prominent marking of pathways and exits.
- C. Note that nothing in this specification should impede safe exiting in accordance with NFPA 101 or providing of adequate medical attention in the event of an emergency.
- D. Post all portions of contingency plan in a prominent location, available to all employees and visitors (e.g. clean room). Post separately, in an immediately visible location, egress diagram and telephone numbers and location of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company.

1.05 NOTIFICATIONS

- A. Notify other entities at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials, requirements relative to asbestos set forth in these specifications, and applicable regulations.
- B. Notify local emergency agencies such as fire, police, ambulance and hospital services of nature of work.
- C. Notifications of Emergency: Any employee at the job site may notify emergency service agencies if necessary without effect on this Contract or the Contract Sum.

1.06 PRE-CONSTRUCTION CONFERENCE

- A. Meet at project site, with General Superintendent, MSA's representative or the Environmental Consultant and other entities concerned with the asbestos, lead-based paint or other hazardous material abatement work.

- B. This is an organizational meeting to review responsibilities and personnel assignments and to locate the containment and decontamination areas and temporary facilities including power, light, water, etc.

1.07 DAILY LOG

- A. Maintain a daily log documenting the dates and time of but not limited to, the following items:
 - 1. Meetings; purpose, attendees, brief discussion
 - 2. Visitations; authorized and unauthorized
 - 3. Personnel, by name, entering and leaving the work area
 - 4. Special or unusual events, i.e., barrier breeching, equipment failures, accidents
 - 5. Air monitoring tests and test results
 - 6. Inspection of work area preparation prior to start of removal and daily thereafter.
 - 7. Removal of any sheet plastic barriers
 - 8. Contractor's inspections prior to spray back, lock back, encapsulation, enclosure or any other operation that will conceal the condition of asbestos-containing materials or the substrate from which such materials have been removed.
 - 9. Removal of waste materials from work area
 - 10. Work accomplished that day, including % completion for phase and project.
 - 11. Decontamination of equipment (list items)
 - 12. Contractor's final inspection
 - 13. Other pertinent events that impact on health and safety, project schedule, or quality of work.
- B. Submit copies of this log at final closeout of project as a project closeout submittal.

1.08 PROGRESS MEETINGS

- A. In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, MSA's representative or the Environmental Consultant will hold general progress meetings as required.
- B. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting. Specifically, the Contractor's General Superintendent must attend all Meetings.

1.09 SUB-CONTRACTORS

- A. Unless approved by MSA, sub-contractors may not be used for any asbestos, lead-based paint or other hazardous material removal or handling task, except waste handling for disposal, provided that the waste hauler and its employees are fully licensed and trained to perform such handling.
- B. All proposed Sub-Contractors must be submitted to MSA's Field Representative or his designee for approval in a timely fashion, such that if any Sub-Contractor is disapproved, another can be retained without delay to the project. Specifically, information of the following Sub-Contractors must be submitted, or evidence shown that the Contractor and his employees have the capabilities

and licenses (as needed) to perform such tasks: electrician, plumber (if other than hose connections required), waste hauling, landfilling and training. The Contractor's CIH will perform sampling and analysis for OSHA compliance monitoring for asbestos particles, lead-paint dust and other potential hazardous exposures.

- C. Sub-Contractors are required to diligently follow all safety and administrative provisions of the specification. Sub-Contractors shall particularly take great care to not cause asbestos fiber release, if performing work prior to abatement.

1.10 SUBMITTALS

- A. Submit the following to the MSA for review within 5-days of Notice to Proceed. No work shall begin until these submittals are returned with MSA's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
- B. List of Contractor's principal staff assignments, including the Superintendent, mechanics, apprentices, and other personnel in attendance at the Site. Identify individuals, their duties and responsibilities. MSA reserves the right to require persons proposed for this position to interview with MSA, prior to acceptance for the position, if, in his sole judgment, there is any question regarding the qualifications of the proposed individual. Also provide, at a minimum, the cell phone numbers of the proposed General Superintendent and at least one alternate contact for the Contractor, with authority to respond to emergency situations.
- C. Post copies of submittals as required by Section 01043 in project meeting room, temporary field offices, and each temporary phone.
- D. Contingency Plans: for emergency actions.
- E. Notifications: to be sent to other entities at the work site through the MSA's Field Representative or his designee.
- F. Sub-Contractors: name, address, phone number, applicable licenses, etc. for any proposed sub-contractors.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Non-Applicable)

END OF SECTION 01043

SECTION 01091 - DEFINITIONS AND STANDARDS (HAZMAT)

PART 1 - GENERAL

1.01 DEFINITIONS

- A. Abatement: Procedures to control fiber release from asbestos-containing building materials. Includes encapsulation, enclosure and removal.
- B. Acceptable Demolition Debris: means debris which does not contain lead, asbestos or any other hazardous materials associated with the razing of buildings, roads, bridges, and other structures including structural steel, concrete, bricks (excluding refractory type), lumber, plaster and plasterboard, insulation material, cement, shingles and roofing material, floor and wall tile, asphalt, pipes and wires, and other items physically attached to the structure, including appliances if they have been or will be compacted to their smallest practical volume.
- C. Adequately Wetted: Sufficiently mixed or coated with water or other aqueous solution to prevent dust emissions.
- D. Aerosol: A system consisting of particles, solid or liquid, suspended in air.
- E. Air Cell: Insulation normally used on pipes and ductwork that is comprised of corrugated cardboard which is frequently comprised of asbestos combined with cellulose or refractory binders.
- F. Air Monitoring: The process of measuring the fiber content of a specific volume of air.
- G. Airlock: A system for permitting restricted ingress or egress while allowing air movement from an uncontaminated area to a contaminated area during negative air pressure conditions; typically includes two (2) curtained doorways at least six (6) feet apart.
- H. Amended Water: Water containing a wetting agent or surfactant.
- I. Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
- J. 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.
- K. Asbestos-Containing Waste Material: Any material that is or is suspected of being, or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.
- L. Authorized Visitor: MSA representative or designee, the Environmental Consultant, testing lab personnel or a representative of any federal and local agency with regulatory authority over the project.
- M. Barrier: Sheet plastic barrier installed after critical barrier, which protects building components and non-movable objects from water damage and asbestos contamination. The primary barrier is normally two independently attached plastic sheets. Further defined in Section 01526.

- N. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
- O. Ceiling Concentration: The concentration of an airborne substance that shall not be exceeded.
- P. Certified Asbestos Workers: Workers who have received training through an MDE accredited training center.
- Q. Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.
- R. Clean Room: An uncontaminated area or room that is part of the decontamination enclosure system that contains facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
- S. Clearance Air Sample: Air monitoring sample taken after abatement is completed and prior to deregulation of work areas.
- T. Construction Debris: Material emplaced by humans to include, but not limited to, bricks, trash, garbage, debris, concrete or any other material excluding asbestos or other hazardous material requiring specialized, handling, transport and disposal.
- U. Containment: An enclosure with filtered air and restricted access.
- V. Critical Barrier: Airtight barrier, usually of sheet plastic, which separates the contaminated work area from any other air space. Installed first, this barrier covers items such as, but not limited to: windows, doors, HVAC components, floor drains and containment walls, which are not at existing building walls. Further defined in Section 01526.
- W. Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- X. Decontamination Enclosure System: Designated part of the work area, for workers, materials and equipment, adjacent and connected to the regulated area. Includes an equipment room, shower room and clean room formed by connecting a series of rooms with curtained doorways forming airlocks between adjacent rooms.
- Y. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area and clean room used for the decontamination of workers, materials and equipment contaminated with asbestos.
- Z. Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.
- AA. Disposal Bag: A properly labeled 6-mil thick leak-tight plastic bag used for transporting asbestos waste from work and to disposal site.
- BB. Disturbance: Activities that disrupt the matrix of ACM or presumed ACM (PACM), crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. Prevent disturbance ACM or PACM in exceedance of levels that can be contained in one glove bag or waste bag measuring no more than sixty (60) inches in length and width.
- CC. Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.

- DD. Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix. Also referred to as a sealant when used to seal residual fibers left on a surface from which asbestos has been removed.
- EE. Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.
- FF. Encapsulation: The application of an encapsulant.
- GG. Enclosure: The construction of an airtight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
- HH. Equipment Room (change room): Contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
- II. Excursion Limit (EL): The maximum personal exposure concentration of asbestos fibers for a thirty (30)-minute period (one (1.0) fiber per cubic centimeter (f/cc) of air).
- JJ. Fiber: A particulate form of asbestos, five (5) micrometers or longer, with a length-to-diameter ratio of at least three (3) to one (1).
- KK. Filter: A media component used in respirators and mechanical equipment to remove solid or liquid particles from the inspired air.
- LL. Fitting: Within any piping system, any valve, tee, elbow, flange, union, reducer, or other piping connector, which may be insulated with asbestos.
- MM. Friable: Any asbestos-containing material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
- NN. Glovebag: Not more than a sixty (60) by sixty (60) inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.
- OO. High-Efficiency Particulate Air Filter (HEPA): A filter which removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometer.
- PP. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be 99.97% efficient for retaining fibers of 0.3 microns or larger.
- QQ. Intact: ACM has not crumbled, been pulverized, or otherwise deteriorated so the asbestos is no longer likely to be bound with its matrix.
- RR. Lock-out: Installation of a locking device to prevent activation of an electrical circuit, which has been deactivated for safety reasons. Always utilized in conjunction with tag-out procedures to advise who has deactivated the circuit and in compliance with OSHA 1910.147, "Control of Hazardous Energy Source."
- SS. Mini Enclosure Method: An abatement method that establishes an isolation zone as a sub-area of the total area. Air exchange requirements are a minimum of four (4) per hour. Decontamination facilities include two (2) air chamber airlock, double suiting and HEPA vacuuming.
- TT. Negative Initial Exposure Assessment: Demonstration by the employer that employee exposure during an operation is expected to be consistently below the permissible exposure limit (PEL).
- UU. 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.

- VV. Negative Pressure Ventilation System: Equipment that ensures the static pressure in an enclosed work area is lower than the environment outside the containment barriers.
- WW. Non-Friable Asbestos Material: Material that contains asbestos fibers locked in by a bonding agent, coating, binder or other material. Non-friable asbestos is well bound and will not release fibers in excess of the asbestos control limit during appropriate use, handling, demolition, storage, transportation, processing or disposal.
- XX. Particulate Asbestos Material: Finely divided particles of asbestos material.
- YY. Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
- ZZ. 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.
- AAA. Regulated Area: Area where airborne concentrations of asbestos exceed, or there is a reasonable possibility the concentrations may exceed, the asbestos PELs.
- BBB. Removal: Specified procedures necessary to strip ACMs from the designated areas and dispose of them in a permitted facility.
- CCC. Repair: returning damaged ACM to an undamaged condition to prevent fiber release.
- DDD. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres. Must be approved by NIOSH and used in accordance with the employer's respiratory protection program and all manufacturer's procedures.
- EEE. Secondary Barrier: Sheet plastic "drop cloth" installed on floors and/or walls of containment during removal activities to protect primary layers. Further defined in Section 02081.
- FFF. Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and suitably arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.
- GGG. Standard Isolation: An asbestos removal process that encloses the entire area prior to, and during, removal.
- HHH. Stripping: Removal of friable asbestos materials from a pipe, duct, boiler, tank, turbine, furnace or structural member or a building, structure, facility or installation.
- III. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- JJJ. Surgical Removal: A process by which small amounts of asbestos are removed with extreme care from substrates to which critical barriers or other seals are to be applied. This process usually involves scraping with small hand tools directly into the inlet of a HEPA vacuum.
- KKK. Thermal System Insulation: ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
- LLL. Time Weighted Average (TWA): An eight (8)-hour weighted average airborne concentration of fibers longer than five (5) micrometers per cubic centimeter of air.

MMM. Unacceptable Demolition Debris: includes industrial waste or byproducts, any waste materials contained within a structure on the grounds of the structure being demolished that are not physically part of the structure, or which are comprised of or contain materials that pose an undue risk to public health or the environment.

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

OOO. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.

PPP. Work Area: The area where asbestos related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

1.02 GENERAL APPLICABILITY OF STANDARDS

- A. Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards of the construction industry have the same force and effect (and are made a part of contract documents by reference) as if copied directly into contract documents, or as if published copies were bound herewith.
- B. Refer to the other contract documents for resolution of overlapping and conflicting requirements which result from the application of several different industry standards to the same unit of work.
- C. Refer to individual unit of work sections for indications of which specialized codes and standards the Contractor must keep at the project site available for reference.
- D. Referenced Standards (referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards, which are recognized in industry for applicability to work.
- E. Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.

1.03 COPIES OF STANDARDS

- A. The contract documents require that each entity performing work be experienced in that part of the work being performed.
- B. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work.
- C. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.
- D. Although certain copies of standards needed for enforcement of the requirements may be required submittals, MSA's Field Representative or his designee reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01091

SECTION 01092 - CODES AND REGULATIONS (HAZMAT)

PART 1 - GENERAL

- A. Governmental regulations and industry standards, which are included and incorporated herein by reference and made a part of the specification.
- B. Notices and permits which are known to MSA and which either must be applied for and received, or which must be given to governmental agencies before start of work.

1.01 CODES AND REGULATIONS

- A. Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, 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 are bound herewith.
- B. 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.
- C. Neither the Contractor, nor any sub-contractor for any part of the contract work, shall require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions, which are unsanitary, hazardous or dangerous to his health or safety.
- D. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations.
- E. The Contractor shall hold MSA, Environmental Consultant, Project Manager, and Certified Industrial Hygienist harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.

1.02 FEDERAL REQUIREMENTS

- A. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), including but not limited to:
 - 1. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules
 - 29 CFR 1926.95 - Personal Protective Equipment (PPE)
 - 29 CFR 1926.1101 - Asbestos in Construction
 - 29 CFR 1926.417 - Lockout and Tagging of Circuits
 - 29 CFR 1926 - Construction Industry - Entire Standard
 - 29 CFR 1910.134 - Respiratory Protection
 - 29 CFR 1910.20 - Access to Employee Exposure and Medical Records
 - 29 CFR 1910.145 - Specifications for Accident Prevention Signs and Tags

29 CFR 1910.1200 - Hazard Communication

29 CFR 1926.62 - Interim Final Lead Regulation

B. U.S. Department of Transportation

49 CFR 171 through 177 - Hazardous Substances

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

Federal Resource Conservation and Recovery Act (RCRA), Subtitle C

40 CFR 261 - Identification and Listing of Hazardous Waste

40 CFR 763, Sub-part E - Asbestos Hazard Emergency Response Act (AHERA) Regulation

40 CFR 763, Sub-part E, Appendix C - Training Requirements of (AHERA) Regulation Asbestos Containing Materials in Schools Final Rule & Notice

National Emission Standard for Hazardous Air Pollutants (NESHAP)

40 CFR 61, Sub-part A, and Sub-part M (Revised Sub-part B) - National Emission Standard for Asbestos

1.03 STATE REQUIREMENTS

A. MARYLAND (as published in the Code of Maryland Regulations - COMAR), including, but not limited to:

COMAR Title 09 - Department of Licensing and Regulation

Subtitle 12 - Division of Labor and Industry

Chapter 31 - Maryland Occupational Safety and Health Act (MOSHA)

Chapter 33 - MOSH Regulations for Access to Information about Hazardous and Toxic Substances

COMAR Title 26 - Department of the Environment

Subtitle 02 Lead-Based Paint and Lead Abatement

Subtitle 04 - Regulation of Water Supply, Sewage Disposal and Solid Waste

Chapter 07 - Solid Waste Management

Subtitle 11 - Air Quality

Chapter 21 - Control of Asbestos

Chapter 23 - School Asbestos Accreditation of Individuals, and Approval of Training Courses

Subtitle 13 - Disposal of Controlled Hazardous Substances

1.04 LOCAL REQUIREMENTS

- A. Abide by all local requirements, which govern asbestos abatement work; hauling and disposal of asbestos waste materials; fire protection; electrical work and plumbing work, and building construction/demolition.

1.05 FEDERAL NOTIFICATION

- A. U.S. Environmental Protection Agency

Send written notification as required by U.S. EPA 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. Send notification to the following address; send copies to Project Manager and Industrial Hygiene Services Contractor.

REGION III:

Asbestos NESHAP Contact

Air & Waste Management Division

USEPA

Region III

1650 Arch Street

Philadelphia, PA 19103-2029

(215) 814- 6552

Include the following information in the notification sent to the NESHAP Contact:

Name and address of MSA or operator.

Description of the facility being demolished or renovated, including the size, age, and prior use of the facility.

Estimate of the approximate amount of friable asbestos material present in the facility in terms of linear feet of pipe, and surface area on other facility components.

Location of the facility being demolished or renovated.

Scheduled starting and completion dates of demolition or renovation. Nature of planned demolition or renovation and method(s) to be used. Procedures to be used to comply with the requirements of USEPA

National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61 Subpart M).

Name and location of the waste disposal site where the friable asbestos and other identified hazardous waste material will be deposited.

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.

1.06 STATE AND LOCAL AGENCIES

- A. Send written Notification as required by state and local agencies prior to beginning any work on asbestos-containing materials. Send notification to the following address, as well as any local regulatory authority requiring such; send copies to Project Manager and Environmental Consultant.

Air & Radiation Management Administration

Maryland Department of the Environment

- B. Post Project Notification sign at least 5 days but no more than 10 days before beginning removal project at entrances and exits from the work site to inform the public in the immediate vicinity, in accordance with COMAR 26.11.21.06.A(2) & (4). Keep such signs posted until the Maryland Air & Radiation Management Administration receives the written notice of final air monitoring results required under COMAR 26.11.21.06.B(3)(f).
- C. Within 24 hours after receiving final written monitoring results, submit to the Maryland Air & Radiation Management Administration a record of Work Area Clearance results required in Section 01714, as required under COMAR 26.11.21.06.B(3)(f).
- D. is the Contractor's responsibility to obtain any variance(s) to the provisions of COMAR 26.11.21 from the Maryland Air & Radiation Management Administration, if any proposed means and methods would require such. The Contractor's failure to receive any anticipated variance does not relieve him from the obligation to perform the project as bid, nor shall such failure obligate the State to the Contractor for any additional cost or project completion time. In addition to receiving a variance from the Maryland Air Management Administration, written approval must be obtained from the Project Manger prior to implementing any such proposed alternate procedure. If, in the judgment of the Project Manager, the request for implementation of a variance is not deemed in the best interest of MSA, the Contract Manager will not approve it and the Contractor shall not implement it.

1.07 PERMITS

- A. Notify, obtain and maintain demolition permitting from state and local regulators.
- B. Ensure landfill which will dispose of waste from this project has permit conditions which allow acceptance of asbestos waste, if in the State of Maryland. If proposed disposal site is not in the State of Maryland, submit State and Local regulations from the jurisdiction covering the landfill and hauler, and demonstrate compliance with permit requirements for the landfill and hauler, if such apply.

1.08 LICENSES

- A. Contractor must maintain a current license or accreditation to remove asbestos or lead-based paint from the Maryland Department of the Environment, and any other licenses as may be required by applicable state or local jurisdictions for the removal, transport, disposal or other regulated activity relative to the work of this contract. If hauler will handle asbestos waste, demonstrate that firm has a current asbestos license from the State of Maryland Air & Radiation Management Administration.
- B. All workers involved with the removal, handling, transportation and disposal of asbestos-containing materials, or other asbestos regulated activity related to the work of this contract shall possess a valid Asbestos Worker license as approved by the State of Maryland, Air & Radiation Management Administration. For further information regarding proper licensing and training requirements for asbestos abatement workers reference Worker Training under Section 01560.
- C. Accredited personnel of the Contractor involved with the supervision of asbestos, lead-based paint or other hazardous material abatement activities related to this contract shall maintain a valid Supervisor license as approved by the State of Maryland. At least one Supervisor shall be on the premises of the work site to supervise abatement activities at all times.
- D. Each accredited person involved in asbestos abatement activities must possess a valid Maryland Photo Identification Card on the job site at all times.
- E. The Contractor must maintain a copy of each accredited person's valid asbestos, lead-based paint or hazardous material handler license and training certificate in the Contractor's office at all times.
- F. Maintain two (2) copies of applicable federal, state and local regulations above. Post one copy of each at the job site. Keep on file in Contractor's office one copy of each.

1.09 SUBMITTALS

- A. Before Start of Work submit the following to the MSA for review and approval.
 - 1. Notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.
 - 2. Copies of current valid permits required by state and local regulations.
 - 3. Copies of all State and Local licenses and permits necessary to carry out the work of this contract.
 - 4. Copies of notices required by federal, state, and local agencies together with proof of timely transmittal to the agency.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01092

SECTION 01410 - AIR MONITORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Pre-demolition background monitoring conducted by the Environmental Consultant to establish action levels for dust for use in the Contractor site-specific HASP during demolition activities.
- B. Air monitoring carried out by the Contractor's Certified Industrial Hygienist (CIH) to verify asbestos, lead-based paint or other hazardous airborne concentrations are maintained in the work zone and at the work site perimeter remain below site-specific HASP action levels.
- C. Contractor CIH establishment of airborne asbestos fiber, lead dust or other hazardous airborne action levels both inside and outside the work area.
- D. Mitigation steps required by the Contractor if an action level is met or exceeded.
- E. Additional air monitoring carried out by MSA's Environmental Consultant to verify control and containment of dust resulting from demolition/building razing operations. MSA additional air monitoring activities do not absolve the Contractor's responsibility to maintain safe working conditions.

1.02 DEFINITIONS

- A. Accepted Engineering Practice: Requirements compatible with standards of practice required by a registered Professional Engineer in the State of Maryland.
- B. Ambient Air Sample: An outdoor measurement of the gaseous mixture surrounding a home or building representative of the naturally occurring conditions upgradient of the construction site.
- C. Background Air Sample: A measurement of the gaseous mixture within the work zone representative of the naturally occurring conditions prior to the initiation of construction activities.
- D. Breathing Zone: Area three (3) to five (5) feet above the ground surface representative of typical human adult air intake.
- E. Chemical Dust Suppressants: Non-toxic chemical soil binders used to reduce dust on disturbed surfaces.
- F. Clearance Air Sample: A measurement of the gaseous mixture within the work zone taken after abatement activities are completed and prior to reentry.
- G. Disturbed Surface Area: Any portion of the earth's surface (or material placed thereupon) that has been physically moved, uncovered, destabilized or otherwise modified from its undisturbed native condition (including vehicular disturbances), thereby increasing the potential for the emission of fugitive dust. This definition does not include land that has been restored to a native condition, such that the vegetative ground cover and soil characteristics are equal to surrounding native conditions.
- H. Excavation: Subsurface construction activity conducted below grade in the earth's surface. Any manmade cut, cavity, trench or depression in an earth surface, formed by earth removal.
- I. Fugitive Dust: Any solid particulate matter (PM) that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of human activities.

- J. Oil-Contaminated Soil: Soil with a TPH concentration of ten (10) parts per million (ppm) or greater.
- K. PM10: Particles with an aerodynamic diameter less than or equal to ten (10) micrometers (μm).
- L. Professional Engineer: An engineer duly registered by the State of Maryland to practice engineering in accordance with the provisions of Business Occupations and Professions Article, Title 14, Annotated Code of Maryland.
- M. Silt: Any bulk material with a particle size less than seventy-five (75) μm in diameter that passes through a Number 200 sieve as determined by ASTM Test Method C 136 or any other test method approved by the EPA.
- N. Treatment: Any process that changes the physical, chemical or biological characteristics of a waste to minimize its threat to the environment.
- O. Work Zone: Any space temporarily occupied by workers during the course of construction activities.

1.03 WORK BY OTHERS

- A. Air monitoring required by OSHA is the Contractor's responsibility and is not covered in this section.

1.04 RELATED SECTIONS

- A. Section 01714 - Work Area Clearance: air monitoring required.

1.05 AIR MONITORING

- A. The purpose of the air monitoring by the Contractor's CIH will be to detect faults in the work area isolation such as:
 1. Contamination of the building outside of the work area with airborne asbestos fibers, lead dust or other hazardous materials resulting from demolition activities,
 2. Failure of filtration or rupture in the negative pressure system,
 3. Contamination of the exterior of the building with airborne asbestos fibers, lead dust or other contaminants generated by demolition activity.
- B. Should any of the above occur the, Contractor will immediately cease abatement activities until the fault is corrected. Work will not recommence until authorized by the Project Manager.
- C. The Contractor's CIH will monitor airborne fiber counts in the work area to detect airborne fiber counts which may significantly challenge the ability of the work area isolation procedures.
- D. Work area clearance will be determined by reaching a pre-defined airborne fiber count or dust levels in the work area following the completion of abatement operations. The Contractor's CIH will sample and analyze airborne hazard concentrations, per Section 01714 and MSA's Environmental Consultant will verify clearance of the work area.
- E. **See Section 3.03 – Dust Monitoring for details regarding the roles, responsibilities and tasks required for execution of the air monitoring program.**

1.06 STOP WORK ACTION LEVELS

- A. Maintain an average airborne count in the work area of less than 0.1 fibers per cubic centimeter. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. Airborne lead concentrations must remain below $50 \mu\text{g}/\text{m}^3$ averaged over an 8-hour period, with an action level of $30 \mu\text{g}/\text{m}^3$. Other hazardous airborne contaminant action levels will be established on an as needed basis.
- B. If the Time Weighted Average (TWA) fiber count for any work shift or 8-hour period exceeds 0.5 fibers per cubic centimeter, stop all work, leave negative air system in operation and notify the Project Manager then initiate corrective action. Do not recommence work until subsequent testing indicates acceptable fiber counts.
- C. If airborne fiber counts exceed 1.0 fibers per cubic centimeter for any 30-minute period, cease all work, except for corrective actions, until fiber counts fall below 0.1 fibers per cubic centimeter and notify the Project Manager. Do not recommence work until subsequent testing indicates acceptable fiber counts.
- D. If any air sample taken outside of the work area exceeds the base line established below or 0.01 f/cc, whichever is greater, the Contractor's CIH shall immediately make a determination if it appears the cause of the elevated sample is associated with the Contractor's disturbance of asbestos. If the CIH determines the elevation is caused by the Contractor's disturbance of asbestos, or if any air sample taken outside the work area exceeds 0.05 f/cc, immediately and automatically stop all work. If this reading was taken inside the building but outside the critical barriers immediately erect new critical barriers to isolate the affected area from the balance of the building. Decontaminate the affected area in accordance with Section 01712 Cleaning & Decontamination Procedures. Follow all protective measures as outlined in other sections of this Specification.
- E. The Contractor shall be responsible for costs for all additional air monitoring and clearance testing required due to the contamination.

1.07 FIBERS COUNTED

- A. 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. "Airborne Fibers" referred to above include all fibers regardless of composition as counted in the NIOSH 7400 Procedures.
- B. If work has stopped due to high airborne fiber counts and if the need for such is agreed upon by the Project Manager, MSA may request that air samples be secured by the Contractor's CIH for analysis by Phase Contrast Microscopy (PCM). "Airborne Fibers" counted in samples analyzed by PCM will only asbestos fibers, but of any diameter and length.
- C. If Phase Contrast Microscopy (PCM) is used to arrive at the basis for determining "Airborne Fiber" counts in accordance with the above paragraph, and if the average of airborne asbestos fibers in all samples taken exceeds 70 structures per squared millimeter, or if any one sample exceeds 70 structures per squared millimeter, then the cost of such analysis will be borne by the Contractor, at no additional cost to MSA.
- D. PCM utilized for this purpose will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

1.08 AIR SAMPLE

A. The number and volume of air samples taken by the Contractor's CIH will be in accordance with the following schedule or by alternate rationale determined by the CIH. Sample volumes given may vary depending upon the analytical method used.

B. Samples will be collected on 25 mm cassettes with 50 mm extension cowls.

PCM: 0.8 micrometer mixed cellulose ester.

TEM: 0.45 micrometer mixed cellulose ester.

1.09 BACKGROUND SAMPLES

A. The Contractor's CIH will secure air samples to establish a base line before start of work.

| Location Sampled | Number of Samples | Analytical Method | Sampling Sensitivity (fibers/cc) | <u>Minimum</u> Volume (liters) | Rate (LPM) |
|------------------------|-------------------|-------------------|-------------------------------------|--------------------------------------|---------------|
| Each Work Area | 2 | PCM | 0.005 | 1,200 | 1 -- 10 |
| Outside Each Work Area | 2 | PCM | 0.005 | 1,200 | 1 --10 |

1.10 DAILY SAMPLES

A. From start of work of Section 01526 Temporary Enclosures through the work of Section 01711 Project Decontamination, the Contractor's CIH may be taking the following samples on a **daily basis as a minimum.**

| Location Sampled | Number of Samples | Analytical Method | Sampling Sensitivity (fibers/cc) | Minimum Volume (liters) | Rate (LPM) |
|--|-------------------|-------------------|-------------------------------------|-------------------------------|---------------|
| Each Work Area OR AS REQUIRED BY CONDITIONS | 2 | PCM | 0.05 | 100 | 1 - 4 |
| Outside Work Area at Each Critical Barrier | 1 | PCM | 0.005 | 1000 | 1 - 10 |
| Clean Room | 1 | PCM | 0.005 | 1000 | 1 - 10 |
| Breathing Zone Excursion Sample | 1 | PCM | 0.01 | 60 | 1-4 |
| Breathing Zone Sample | 1 | PCM | 0.01 | 100 | 1-4 |
| HEPA Filtered Fan Unit Exhaust if Exhausted Inside the Building | 1 | PCM | 0.005 | 1000 | 1 - 10 |

- B. Additional samples may be taken at the discretion of the Project Manager. If airborne fiber counts exceed allowed limits additional samples will be taken as necessary to monitor fiber levels.
- C. Sample results shall be available onsite for inspectors' review.

PART 2 - PRODUCTS

2.01 CONTROLS

- A. Use one or more of the following controls, as necessary, under OSHA 29 CFR 1926.1101 – Toxic and Hazardous Substances, Asbestos, to achieve compliance with the PELs:
 - 1. Local exhaust ventilation equipped with HEPA filter dust collection systems.
 - 2. Enclosure or isolation of processes producing asbestos dust.
 - 3. Ventilation of the regulated area to move contaminated air away from the breathing zone to a filtration or collection device equipped with a HEPA filter.
 - 4. Supplement the controls with respiratory protection if insufficient to achieve compliance with the PELs.

2.02 ASBESTOS ENCLOSURE SYSTEMS

- A. If an enclosure system is used, build suitable enclosure framing and line with polyethylene sheeting, or equivalent, sealed with tape at lap joints in the plastic for asbestos enclosures and decontamination areas.
- B. For access between contaminated and uncontaminated areas, install an airlock system including a curtained doorway for access between two (2) areas within the decontamination enclosure systems. Provide a minimum distance between two (2) curtained doorways of six (6) feet. Modifications to the enclosure system due to work space constraints require approval by the Environmental Consultant.
- C. The decontamination enclosure installation requirements include:
- D. A three (3)-stage decontamination station for the removal of equipment and materials from the work area, allowing movement from the work area into a wash down room and finally a clean room while preventing cross-contamination outside the work area.
- E. The wash down room should contain two (2) curtained doorways. Filter shower water through a five (5) micrometer-filter system, or equivalent, prior to disposal.
- F. A clean area with one (1) curtained doorway into the rinsate area and one (1) entrance or exit to non-contaminated areas of the work area. Provide sufficient space for non-contaminated items.
- G. Provide and post decontamination and work procedures to be followed by workers.
- H. Ensure work site security and implementation of PPE requirements within the work area.
- I. Decontaminate workers and authorized visitors prior to exiting the work area. Maintain respirators until the completion of decontamination procedures. Store contaminated PPE in the equipment room when not in use. Upon completion of asbestos abatement, dispose of PPE as contaminated waste. Dispose of contaminated protective clothing in receptacles for disposal with other ACM.

- J. Ensure workers removing waste containers from the decontamination enclosure enter the rinsate area wearing a respirator and dressed in clean coveralls.
- K. Do not allow workers to eat, drink, smoke, or chew gum or tobacco at the project site except in designated areas.
- L. Ensure workers are fully protected with appropriate respirators and protective clothing prior to commencing actual asbestos abatement until completion of final clean-up.
 - 1. Establish methods for safe tie-ins of temporary and replacement lines to ACM insulated pipes.
- M. Visually inspect enclosures at the beginning of each work period. Dispersive smoke methods may be used to test effectiveness of barriers. Repair damage immediately at no additional cost to MSA.

PART 3 - EXECUTION

3.01 ADDITIONAL TESTING

- A. The Contractor may conduct his own air monitoring and laboratory testing. If it elects to do this the cost of such air monitoring and laboratory testing shall be at the Contractor's expense.

3.02 PERSONAL EXPOSURE AIR MONITORING

- A. Collect daily air samples as required under OSHA 29 CFR 1926.1101 – Toxic and Hazardous Substances, Asbestos unless 1) a negative exposure assessment confirms exposure consistently below the PELs or 2) site workers are equipped with supplied-air respirators operated in the pressure demand mode (or other positive pressure mode respirator). These may include pre-abatement, area and perimeter, personal, STEL and clearance samples.
- B. Ensure control methods listed in the standard are in place.
 - 1. Perform assessment and monitoring using a competent individual as specified in the regulations.
 - 2. The Environmental Consultant may elect to conduct additional air sampling for Quality Assurance/Quality Control (QA/QC) purposes for work within confined spaces.
- C. Collect air samples in accordance with current best practices (NIOSH Method 7400 or equivalent). Collect samples within the breathing zone, at an approximate height of sixty (60) inches. Maintain and regularly calibrate sample pumps.
- D. Analyze the samples by the phase contrast microscopy (PCM) method, or equivalent. Provide test results to the Environmental Consultant for review prior to initiation of the next work day.
- E. Ensure fiber concentrations inside the enclosure do not exceed one (1.0) f/cc. If such a concentration is detected, stop work immediately, evaluate work procedures and take corrective actions to resolve problems. Clean the work area with a HEPA vacuum and wet cleaning, or equivalent. Collect additional samples until the fiber count is below one one-hundredth (0.01) f/cc. The work may resume after cleaning and in accordance with procedural revisions agreed upon with the Engineer. Resolve filtration system problems at no additional cost to MTA.
- F. Take personal and short term exposure limit (STEL) samples as required by applicable regulations. Provide personal air sample test results to the Environmental Consultant within twenty-four (24) hours of collection.

- G. Limit the maximum flow rate for air sample collection to two and a half (2.5) liters per minute for personal samples and ten and a half (10.5) liters per minute for inside and outside work area air samples.

3.03 DUST MONITORING

- A. The Contractor will be responsible for controlling dust levels at the demolition site and ensuring worker exposure to airborne asbestos particles, lead paint dust and other airborne hazards are maintained below regulatory TWA threshold limits.
- B. The Environmental Consultant will be responsible for verifying that hazardous airborne particles and dusts are controlled and maintained below measurable action levels identified in the site-specific HASP.
- C. Prior to the initiation of demolition activities, the Environmental Consultant will collect background air and worksite perimeter monitoring data to establish background concentrations of PM₁₀. Background monitoring will be conducted at the same frequency as monitoring during demolition.
 - 1. Sample ambient air at the perimeter of the Site, both upwind and downwind, for approval by the Environmental Consultant. Two (2) air monitoring stations will be established at a distance of no more than 50-feet from the point of active demolition.
 - 2. Calibrate sampler airflow before and after sampling, or as recommended by the manufacturer.
 - 3. A second set of air monitoring stations will be established at a distance of 100-feet from the point of demolition.
 - 4. Background dust levels will be factored into the calculation of increased dust levels produced by demolition activities.
- D. The Contractor will be responsible for personal air monitoring and worker safety while the Environmental Consultant will conduct sufficient area monitoring and sampling to ensure the safety of the surrounding population. Both monitoring programs will comply with applicable federal, state and local requirements to ensure worker protection and the safety of the surrounding community and environment throughout demolition.
 - 1. A dust fall level goal of no more than 1-3µg/ft²/hour is established for this project. The sampling goal is considered an action level for the implementation of dust mitigation strategies, in conjunction with ongoing visual inspections.
 - 2. The Contractor will perform continuous air monitoring during demolition activities and report exceedances using 15-minute average monitoring for each workday.
 - 3. The Contractor will Apply dust suppression techniques if NAAQS or action levels are exceeded and suspend work until corrective measures are approved by the Environmental Consultant and applied.
 - 4. The Environmental Consultant will collect daily meteorological data concurrently with air monitoring and sampling data.
 - 5. The testing laboratory will hold a National Environmental Laboratory Accreditation Program (NELAP) certification and participate in the EPA National Lead Accreditation Program. The testing laboratory will provide MSA with Quality Assurance data and certifications confirming compliance with project requirements.

6. The analytical results will be delivered in electronic format and the Contractor will provide the data to the Environmental Consultant upon request.
7. The Environmental Consultant will conduct dust monitoring concurrent with demolition and debris removal and will cease monitoring activities following the cessation of dust generating activities at the site.

E. DUST MITIGATION

1. Prevent dust from demolition activities from creating a hazard and/or nuisance within the work zone or migrating off-site.
2. Control measures:
 - a. Use the best available technology to minimize fugitive dust emissions.
 - b. Use water or approved chemicals for control of dust during demolition and/or construction activities, as applicable:
 - i. Use appropriate application technology to uniformly spread liquid across the dust-generating surface at a rate that does not produce runoff.
 - ii. Install a shut-off valve to permit onsite operator control.
 - iii. Provide effective wetting during demolition and debris removal, i.e. while moving debris to dumpsters, truck or container, debris will be regularly wetted to reduce dust emissions.
 1. At a minimum the Contractor is responsible for wetting of the debris pile and point of load-out by directing a hose at bucket during debris removal.
 2. Wetting is to be achieved via the use of fire hosing with a minimum diameter of two inches (2").
 - iv. During the wetting down phase of any demolition the contractor will ensure that adequate runoff procedures are followed.
 - c. Cover and/or enclose material stockpiles or material stockpile areas to minimize dust generation.
 - i. Dumpsters and stockpiles will also receive regular wetting to reduce dust emissions.
 - d. Use paved roads, where possible, for vehicle movement of raw materials or products, and include the following dust prevention measures:
 - i. Keep maintenance areas clean.
 - ii. Repair damage immediately.
 - iii. Limit speed to ten (10) miles per hour within the work zone.
 - iv. Vacuum sweep and/or water flush surface.
 - e. Apply coverings, water or suitable chemicals on dirt roads, material stockpiles and other surfaces that are sources of airborne dusts.
 - f. Provide removal and hauling of demolition debris utilizing tightly sealed, secure and non-permeable coverings on trucks and dumpsters to prevent remobilization of impacted dust.
 - g. The Contractor is required to apply water during the debris loading and removal process. At a minimum the Contractor is responsible for wetting of the debris pile and point of load-out by directing a hose at bucket at debris removal. Wetting is to be achieved via the use of fire hosing with a minimum diameter of two inches (2").

END OF SECTION 01410

SECTION 01503 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.
- B. Coordinate all temporary connections with MSA.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Provide new or used materials and equipment that are undamaged and in serviceable condition.
- B. Provide only materials and equipment that are recognized as being suitable for the intended use in compliance with appropriate standards.

2.02 SCAFFOLDING

- A. Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract.
- B. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
 - 1. Only fiberglass ladders will be permitted on site. The use of metal ladders is not permitted.
- C. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.

2.03 WATER SERVICE

- A. All connections to on-site hydrants shall include back flow protection and be in accordance with all applicable local plumbing codes. All connections shall be coordinated with MSA.
- B. No water valves may be shut, or other effect caused to the water system, which affect the ongoing building operations without specific written permission of the MSA.
- C. Valves shall be temperature and pressure rated for operation at the temperatures and pressures encountered.
- D. After completion of use, connections and fittings shall be removed without damage or alteration to existing hydrants, water piping and equipment.
- E. Employ heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing hydrants or spouts.
- F. Contractor shall provide UL rated electric hot water heater of sufficient capacity that hot water is available for all needed use of the Decontamination Unit shower.

2.04 ELECTRICAL SERVICE

- A. Comply with applicable OSHA, NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.
- B. Provide service to a temporary sub-panel exterior to the work area. Sub-panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.
- C. Provide identification warning signs at power outlets that are other than 110-120-volt power. Provide polarized outlets for plug-in type outlets.
- D. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
- E. Provide all circuit breakers in the sub-panel equipped with ground fault circuit interrupters, reset button and pilot light.
- F. Use only hard-service grounded extension cords. Use single lengths or use waterproof connectors to connect separate lengths of electric cords.
- G. Provide general service exterior incandescent lamps of wattage required for adequate illumination. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations.
- H. Do not use any electrical equipment which is not properly equipped with fully operational, undamaged ground pin.

2.05 TEMPORARY HEAT

- A. Provide temporary heating units, if necessary that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed.
- B. 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.
- C. Ensure devices utilized for temporary heating are in full compliance with all applicable codes and regulations and do not present a fire hazard, especially in relation to use in the vicinity of plastic sheeting and other flammable materials. Ensure temporary heating devices do not present hazards to workers or building occupants, such as, but not limited to: exposure to carbon monoxide or other toxic gases or vapors or burn from contact with device.
- D. MSA's Representative or his designee may require the Contractor to remove any device which does not meet these requirements and replace it (them) with a system that meets the above requirements.

2.06 SELF-CONTAINED TOILET UNITS

- A. Submit method to be used for servicing, including frequency.
- B. Submit number and type of units to be deployed.

2.07 FIRST AID

- A. Comply with governing regulations and recognized recommendations within the construction industry.

2.08 FIRE EXTINGUISHERS

- A. Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil- flammable liquid fires.
- B. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.
- C. Ensure fire extinguishers are provided in numbers sufficient for the work and materials utilized in each specific area. The minimum number of extinguishers for projects of any size are:

| | |
|---|---------------|
| Each office - | one Type "A" |
| Each materials storage area - | one 10 LB ABC |
| Each decontamination unit - | one 10 LB ABC |
| Each contained work area/regulated area - | one 10 LB ABC |

- D. Provide product data and submit schedule indicating location at job site.

PART 3 - EXECUTION

3.01 SCAFFOLDING

- A. During the erection and/or moving of scaffolding, care must be exercised so that any polyethylene floor covering is not damaged.
- B. Clean, as necessary, debris from non-slip surfaces.
- C. At the completion of abatement work clean all construction aids within the work area, wrap in one layer of 6 mil polyethylene sheet and seal before removal from the work area.

3.02 INSTALLATION OF TEMPORARY SERVICES & FACILITIES

- A. Use qualified tradesmen, licensed as required by regulation or code, for installation of temporary services and facilities.
- B. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work.
- C. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

3.03 WATER SERVICE

- A. Water connection (without charge) shall be maintained at a maximum flow of ten gallons per minute (10 gpm) each to hot and cold water supply.
- B. Supply hot and cold running water to the Decontamination Unit.
- C. Maintain hose connections, outlet valves and any other water service connections in leak proof condition.

3.04 ELECTRICAL SERVICE

- A. Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period.
- B. Utilize only licensed electrician for constructing sub-panel, hooking up sub-panel to source and de-energizing circuits in the work area. All other electrical tasks performed herein must be either performed directly by the licensed electrician or under his direct supervision and by persons and in a manner approved by him.
- C. Provide circuits of adequate size and proper characteristics for each use.
- D. Temporary wiring in the work area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance.
- E. Provide liquid tight enclosures or boxes for wiring devices.
- F. Provide overload-protected disconnect switch for each temporary circuit located at the power distribution center.
- G. Distribution center should be located outside of work area.
- H. Lockout all existing power to or through the work area as described below. Unless specifically noted otherwise, existing power and lighting circuit to the Work Area are not to be used. All power and lighting to the Work Area and Decontamination facilities are to be provided by the temporary electrical panel as described above.
 - 1. Lockout power to the Work Area by switching off all breakers serving power or lighting circuit in the Work Area. Label breakers with tape over breakers with the notation "DANGER circuit being worked on". Sign and date label. Lock panel and have key under the control of Contract's Superintendent or MSA's designated representative.
 - 2. Lockout power through the Work Area whenever possible by switching off breakers serving these circuits. Label breakers with tape over breakers with the notation "DANGER circuit being worked on". Sign and date label. Lock panel and have key under the control of Contractor's Superintendent or MSA's designated representative. If circuits cannot be shut down for any reason, label at intervals not exceeding 4' with tags reading "DANGER live electrical circuit. Electrocutation Hazard."
- I. Provide sufficient branch circuits as required by the work. All branch circuits are to originate at the temporary electrical panel. At minimum provide the following:
 - 1. One circuit for each HEPA filtered fan unit.
 - 2. For power tools and task lighting, provide one temporary 4-gang outlet with separate 110-120 volt, 20-amp circuit (4 outlets per circuit) in the following locations:
 - a. One outlet per 2500 square feet of work area.
 - b. One outlet at each decontamination unit, located in the equipment room.
 - c. 110-120 volt 20-amp branch circuits with 4-gang outlet for the MSA's exclusive use for conducting air sampling during the work as follows:
 - i. One in each work area.
 - ii. One at the clean side of the decontamination unit.
 - iii. One at the exhaust location of the HEPA filtered fan units.

- d. 110-120 volt 20-amp branch circuits with 4-gang outlet for MSA's exclusive use for conducting final air sampling as set forth in Section 01714 Work Area Clearance as follows:
 - i. Five inside work area.
 - ii. Two outside work area in location designated by MSA's Field Representative.

3.05 TEMPORARY LIGHTING

- A. In all areas under Contractor's control, provide sufficient temporary lighting to ensure proper workmanship and safety of movement and egress; by combined use of daylight, general lighting, and portable plug-in task lighting.
 - 1. Do not use existing building lighting.
 - 2. All lighting is to be provided from the temporary electrical panel or other approved power source described above.
 - 3. Provide lighting as required to supply a 100-foot candle minimum light level at all areas where abatement or inspection occurs.
 - 4. MSA's Representative or designee or the Contractor's CIH may at any time require the Contractor to provide 100-foot candle level at any point in the Contractor's control for any inspection purpose deemed necessary by MSA.

3.06 SANITARY FACILITIES

- A. Provide on self-contained chemical toilet unit at the site for each 30 workers.
 - 1. Facilities shall be maintained throughout the Work.
 - 2. At the end of the job, facilities shall be decontaminated in accordance with these specifications.

3.07 FIRE EXTINGUISHERS

- A. Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers" and requirements of 29 CFR 1926, Subpart F, OSHA Construction Industry Fire Protection and Prevention regulations.
- B. Locate fire extinguishers where they are most convenient and effective for their intended purpose, but provide not less than one extinguisher in each Work Area in Equipment Room and one outside Work Area in Clean Room.

3.08 TEMPORARY HEAT

- A. Provide temporary radiant heat where needed for performance of the work, with the following minimum requirements:
 - 1. In Decontamination Chamber/Shower: 70°F
 - 2. In All Active Work Areas: 60°F
 - 3. In All Areas of Building under Contractor's Control: 40°F

- B. Ensure temporary heating devices are used in a manner consistent with manufacturer's recommendations and safety concerns discussed in paragraph 2.05.

END OF SECTION 01503

SECTION 01513 - PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Establishing, operating and maintaining a differential pressure ventilation system capable of ensuring the static pressure in an enclosed work area is lower than the environment outside of the containment barriers.

1.02 SUBMITTALS

- A. Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines. Include schematic diagram of power and auxiliary power supply to HEPA filtered fan units.
- B. Description of projected air flow within work area and methods required to provide adequate air flow in all portions of the work area.
- C. Description of the methods of testing for correct air flow and pressure differentials, and anticipated pressure differential across Work Area enclosures.
- D. Manufacturer's product data on the HEPA filtered fan units, equipment used to monitor pressure differential between inside and outside work area, main and auxiliary generators, and power switches.
- E. Location of the machines in the work space.
- F. Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power.
- G. Description of work practices to insure that airborne fibers travel downstream from workers.

1.03 QUALITY ASSURANCE

- A. Monitor pressure differential across Decontamination Unit, or other location with a differential pressure meter equipped with a strip chart recorder or data-logger/printer assembly.
 - 1. Meter shall be equipped with a warning buzzer which will sound if the negative pressure differential drops below -0.02" of water, relative to outside pressure.
- B. Provide HEPA filtered fan units which pass visual inspection by the Environmental Consultant for all parameters defined in this section and which pass a quantitative challenge test at the work site.
 - 1. The challenge test will be as recommended by the supervising CIH and approved by MSA's Representative or designee, by a method such as a Portacount or other instrument capable of providing at least a thousand-fold range.
 - a. Any unit showing more than 0.3% of the intake reading at the exhaust side shall be considered defective and shall not be approved for use until the problem is corrected.
 - b. The Environmental Consultant shall mark approved units with a label with indelible ink with a unique number and date.

- c. The challenge test shall not substitute for the requirement that the manufacturer to meet specified criteria certify each filter.

PART 2 - PRODUCTS

2.01 HEPA FILTERED FAN UNITS

- A. Cabinet shall be factory sealed to prevent asbestos, lead or other hazard-containing dust from being released during use, transport, or maintenance. Access to and replacement of all air filters shall be from intake end.
- B. Rate capacity of fan according to usable air-moving capacity under actual operating conditions.
- C. The final filter shall be the HEPA type. The filter media (folded into closely pleated panels) must be completely sealed on all edges with a structurally rigid frame.
- D. A continuous fully intact gasket, as provided by the manufacturer, shall be located between the filter and the filter housing to form a tight seal.
- E. Performance of every HEPA filter shall be in accordance with Federal Standard Number 209G and ASHRAE Standard 52-87.
- F. Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.
- G. Two stages of pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter.
- H. Each unit shall be equipped with a Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed.
 - 1. A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge shall be available at the job site at all times, indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) air delivery at that point.
- I. A warning light is required to indicate excessive pressure drop across the filters (i.e., filter overloading).
- J. Electrical components shall be approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL).
- K. Each unit shall be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet shall be grounded.

2.02 PRESSURE DIFFERENTIAL METER

- A. Pressure differential meter shall be recommended by its manufacturer for the intended purpose and shall have sufficient accuracy and resolution (minimum-0.02 0.005" H₂O) to perform as specified herein.
- B. Meter shall have an integral chart recording device (or be attached to one which is compatible with manufacturer's specification) which has equal accuracy and resolution to the meter.
- C. Meter shall have initial and periodic calibrations in accordance with the manufacturer's recommendations. Record of such shall be with the meter at all times.
- D. Meter shall be equipped with zero adjustment for both the meter and chart recorder.

PART 3 - EXECUTION

3.01 PRESSURE DIFFERENTIAL

- A. Provide a fully operational differential pressure and air circulation system within the work area, maintaining continuously a pressure differential between work area enclosure and adjacent area of building of at least -0.02" H₂O or greater, relative to outside pressure.
- B. Before disturbance of any ACM, demonstrate to the MSA's Consultant the adequacy of pressure differential and air flow by use of a pressure differential meter(s) and smoke tubes or bombs. Perform these at location(s) directed by the MSA's Consultant, upon commencement of the project and daily thereafter.
- C. Provide continuous monitoring and recording of the pressure differential between the work area and the building outside of the work area with the meter as defined in paragraph 2.02. Ensure chart recorder pen or other marking device and chart advance are fully operational, such that chart can be easily read.
- D. At a minimum of once per day, remove chart, mark start and stop time, initial by Project Superintendent, mount on 8 1/2" x 11" paper in a manner that is easily readable and submit to MSA's Consultant within 24 hours.
- E. Check zero of meter and recorder each time chart is restarted by removing tubing to work area from the back of the instrument. Ensure low pressure alarm is functional at this check. Do not perform abatement without meter and recorder in compliance with all provisions herein, unless specifically authorized by the MSA's Field Representative or his designee.
- F. Any apparent tampering with the meter, zero setting, or recorder will be grounds for removing the Project Superintendent from the job for its duration, at the discretion of the MSA's Field Representative or his designee.

3.02 PREPARATION OF THE WORK AREA

- A. Provide fully operational HEPA filtered fan units supplying a minimum of one air change every 15 minutes.
- B. Add one (1) additional HEPA filtered fan unit as a backup in case of equipment failure or machine shutdown for filter changing.
- C. Locate exhaust unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses the work area as much as possible.
- D. Place end of unit or its exhaust duct through an opening in the plastic barrier or wall covering. The plastic around the unit or duct shall then be securely sealed with tape or other approved method.
- E. Vent to outside of building, unless authorized in writing by the MSA's Representative or his designee.
- F. Locate auxiliary makeup air inlets as far as possible from the exhaust unit(s), off the floor (preferably near the ceiling), and away from barriers that separate the work area from occupied clean areas.

- G. Cover with flaps to reseal automatically if the negative pressure system should shut down for any reason. Spray flap and area around opening with spray adhesive so that flap seals if it closes.

3.03 START UP OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATING SYSTEM

- A. Each unit shall be serviced by a dedicated circuit in the Contractor's electrical subpanel of capacity recommended by the manufacturer.
- B. Before any asbestos or lead based paint-containing material is wetted or removed, and after the work area has been prepared, the decontamination facility set up, and the HEPA filtered fan unit(s) installed, start the unit(s) (one at a time) to demonstrate the system.
- C. Proper operation of the system will exhibit, 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 tubes to demonstrate a positive motion of air.
 - 5. Use a differential pressure meter to demonstrate a pressure difference of at least $-0.02''$ H₂O relative to outside pressure across every barrier separating the Work Area from the balance of the building or outside.
- D. Modify the system as necessary to successfully demonstrate the above.

3.04 USE OF SYSTEM DURING ABATEMENT OPERATIONS

- A. Start HEPA filtered fan units before beginning work.
- B. Do not begin abatement work or any work deemed contaminated work; such as, but not limited to opening a wall or ceiling space which is contaminated with asbestos fibers; until the operation of the Pressure Differential and Air Circulation System is inspected and approved in writing by the MSA's Consultant.
- C. After abatement work has begun, run units continuously to maintain a constant negative pressure until decontamination of the work area is complete.
- D. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.
- E. Do not shut down system during encapsulating procedures, unless authorized by the MSA's Representative or his designee in writing.
- F. Start abatement work at a location farthest from the exhaust units and proceed toward them.
- G. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and exhaust units are operating again.
- H. At completion of abatement work, allow exhaust 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.

3.05 DISMANTLING THE SYSTEM

- A. When a final inspection and the results of final air tests indicate that the area has met the work area clearance criteria of Section 01714, the exhaust units may be removed from the work area.
- B. Before removal from the work area, remove and properly dispose of pre-filter, and seal intake to the machine with 6 mil polyethylene to prevent environmental contamination from the filters. The machine shall be cleaned and wrapped with 6 mil polyethylene prior to removing from the work area.

END OF SECTION 01513

SECTION 01526 - TEMPORARY ENCLOSURES

PART 1 - GENERAL

1.01 SUBMITTALS

- A. Contingency Plans
- B. Strippable Coatings: Product data, safety data sheets
- C. Spray Cement: Product data, safety data sheets
- D. Sheet Plastic: Product data, safety data sheets
- E. Signs: Samples

PART 2 - PRODUCTS

2.01 POLYETHYLENE SHEET

- A. A single polyethylene film in the largest sheet size possible to minimize seams, "true" 6.0 mils thick (not nominal), clear, frosted, or black.
- B. Provide flame resistant polyethylene film for all work to be done where hot pipes or equipment are present or where there is a potential for fire that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame- resistant Textiles and Films.

2.02 SPRAY PLASTIC

- A. Spray plastic which is formulated to adhere to surfaces and peel off cleanly at the completion of the work may be used if approved by the MSA's Field Representative and Consultant.
- B. Damages to finish caused by application or removal of the spray plastic must be repaired and refinished to the satisfaction of the MSA's Field Representative or his designee at no additional cost to the MSA.

2.03 DUCT TAPE

- A. Provide duct tape in 2" to 4" widths as appropriate, with an adhesive which is formulated to aggressively stick to sheet polyethylene and the surface to which it is attached.
- B. Damages to finish caused by application or removal of the duct tape must be repaired and refinished to the satisfaction of the MSA's Field Representative or his designee at no additional cost to the MSA.

2.04 SPRAY ADHESIVE

- A. Provide spray adhesive which is specifically formulated to stick tenaciously to sheet polyethylene.

- B. Damages to finish caused by application or removal of the spray cement must be repaired and refinished to the satisfaction of the MSA's Field Representative or his designee at no additional cost to the MSA.

PART 3 - EXECUTION

3.01 GENERAL

- A. 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. The Contractor will be responsible for deactivation and lock-out of ventilating systems or any other system bringing air into or out of the work area.
- C. Completely Isolate the work area from the outside and other parts of the building by installing critical barriers to prevent asbestos-containing dust or debris from passing beyond the isolated area. If requested by the MSA's Field Representative or his designee, furnish plastic sheeting in black as a visual barrier.
- D. Should the area beyond the work area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, those areas shall be isolated and cleaned in accordance with the procedures indicated in a contingency plan submitted by the Contractor to the satisfaction of the MSA's Representative or his designee, at no additional cost to MSA.
- E. Place all tools, scaffolding, staging, etc. necessary for the work in the area to be isolated prior to erection of plastic sheeting temporary enclosure.
- F. The Contractor will remove all removable furniture, equipment and supplies that are designated as non-contaminated.
- G. Pre-clean all surfaces in the work area, including, but not limited to floors, walls and immovable or attached furniture, equipment and fixtures and completely cover with two (2) layers of polyethylene sheeting, securely taped in place with duct tape. One layer of polyethylene sheeting shall be secured in place using the above techniques.
- H. Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area.

3.02 EMERGENCY EXITS

- A. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work Area.
- B. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1" wide. Hang a razor knife on a string beside outline. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2" thick.
- C. Utilize existing emergency lighting signs, if this can be accomplished in keeping with OSHA lock-out requirements and is approved by the Contractor's licensed electrician.

3.03 CONTROL ACCESS

- A. Isolate the Work Area to prevent entry by unauthorized personnel into Work Area or surrounding controlled areas.

- B. Submit to MSA's Representative or his designee 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.
- C. Lock all doors into Work Area, or if doors cannot be locked, chain shut when work is not in progress. Cover any signs that direct emergency exiting to locked doors either outside or inside of Work Area. Provide MSA's Representative or his designee with a minimum of two keys to any locks installed.
- D. Do not obstruct doors required for emergency exits from Work Area or from building.
- E. Construct partitions or closures across any opening into Work Area.
- F. Replace passage sets on doors required for exiting from Work Area with temporary lock sets for duration of the project. Use entry type lock sets that are key lockable from one side and always operable from inside. After meeting release criteria set forth in Section 01714 Work Area Clearance reinstall original passage sets and adjust for proper operation.
- G. Arrange Work Area so that the only access into Work Area is through lockable doors for personnel and equipment decontamination units. If necessary, install temporary doors with entrance type lock sets that are key lockable from the outside and always unlocked and operable from the inside. Do not use dead bolts or padlocks. Provide a minimum of two keys to the MSA's Representative or his designee.
- H. Provide Warning Signs at each locked door leading to Work Area reading as follows:

KEEP OUT

CONSTRUCTION

WORK AREA

PROTECTIVE CLOTHING REQUIRED

BEYOND THIS POINT

- I. Immediately inside door and outside critical barriers post an approximately 20 inch by 14-inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED

IN THIS AREA

WARNING

HAZARD

NO SMOKING, EATING, OR DRINKING

- J. Provide spacing between respective lines at least equal to the height of the respective upper line.

3.04 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

3.05 CRITICAL BARRIERS

- A. Completely separate the Work Area from other portions of the building, and the outside by sealing all openings with two securely attached sheet plastic barriers. The closure assembly and materials shall comply with applicable local building and fire codes.
- B. Ventilation openings (supply, return and exhaust grilles; ducts and any other potential leakage points to HVAC systems) and floor drains must be sealed with two (2) independently attached layers for the critical barrier(s).
- C. Seal cracks leading out of Work Area with appropriate temporarily installed material which does not mar any building finish or permanent material, if approved in writing by the MSA's Field Representative or his designee.
- D. Individually seal all lighting fixtures, clocks, speakers, alarm system components (unless otherwise specified), thermostats and other fixed mechanical components with polyethylene sheeting, taped securely in place with duct tape. Ensure lighting circuits are deactivated prior to installation of critical barrier(s) to avoid melting or burning of sheeting.
- E. Maintain seal until all work including Project Decontamination is completed.
- F. Where a sheet plastic wall of a containment is a critical barrier, two independently attached layers of sheet plastic may serve as both the critical barrier and Primary Barrier, if approved by the Consultant.
- G. Where a critical barrier acts as a wall of a containment area, mechanically support sheet plastic independently of duct tape or spray cement so that seals do not support the weight of the plastic, such as with furring strips nailed into masonry joints. If the tape/glue comes loose on any other critical barrier, reinforce with furring strips, if so directed by the Consultant.
- H. Provide pressure differential and air circulation system per Section 01513.

- I. Thoroughly pre-clean all surfaces to which critical barriers or other seals are applied. Where required to properly isolate the work area or if specified in Section 01013, perform surgical removal of asbestos from any surface covered with ACM to which a barrier is to be applied.

3.06 PREPARE AREA

- A. If fixed scaffolding is to be used to provide access, HEPA vacuum and wet clean area prior to scaffolding installation.
- B. Remove or temporarily relocate all electrical and mechanical items, such as lighting fixtures, unit ventilators, clocks, diffusers, registers, escutcheon plates, etc. which cover any part of the surface to be worked on with the work.
- C. 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.
- D. Clean all surfaces in Work Area with a HEPA filtered vacuum or by wet wiping prior to the installation of primary barrier.

3.07 PRIMARY BARRIER

- A. After Critical Barriers are installed and approved by the consultant, protect building and other surfaces in the Work Area from water damage and asbestos contamination by covering with a primary barrier of polyethylene sheeting. The Primary Barrier is normally **two layers** of independently attached sheet plastic, except as may be otherwise specified in this section.
- B. Cover floors, ceilings, and walls of Work Area, including critical barriers, in a manner which prevents leakage of air or water. Take great care particularly at floor/wall connection areas, turning floor plastic up walls at least 12 inches (forming a sharp right angle bend so the wall attachment will not be pulled loose), or as otherwise approved by the Consultant. Use 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. In addition, attach one layer of poly to all ceilings in the work areas.
- C. Cover sheet plastic in areas where movable scaffolding is to be used with a single layer of minimum 1/2" CDX plywood or 1/4" masonite. Wrap edges and corners of each sheet with duct tape or take alternate steps to ensure the floor plastic is not torn. At completion of abatement work, thoroughly decontaminate or dispose of as an asbestos-contaminated waste material. Plywood must have been painted with two coats of paint prior to use to be decontaminated.
- D. 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.

3.08 STOP WORK

- A. If the critical or primary barrier falls or is breached in any manner stop work immediately. Do not recommence work until authorized in writing by the MSA's designated representative.

3.09 EXTENSION OF WORK AREA

- A. If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, 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.

3.10 SECONDARY BARRIER

- A. Install a secondary layer of plastic as a drop cloth to protect the primary layers from debris generated by the asbestos abatement work as specified in the appropriate work sections.

3.11 EXTERIOR ENCLOSURES

- A. Construct exterior enclosures as necessary to completely enclose the work.
 1. Fabricate from reinforced polyethylene sheeting and wood framework of minimum 2" x 4" dimension.
 2. Attach to existing building components or brace as necessary for stability.
 3. Construct walls to meet all local regulations for construction of temporary buildings.
 4. Construct to resist wind and slope ceiling to permit drainage of rain water.
 5. Exterior enclosures shall be completely separate from other required barriers or protective layers.

3.12 CONTAINMENT APPROVAL

- A. Do not begin abatement work or any work deemed contaminated work; such as, but not limited to opening a wall or ceiling space which is contaminated with asbestos fibers; until the Temporary Enclosure is inspected and approved in writing by MSA's Environmental Consultant.

END OF SECTION 01526

SECTION 01560 - WORKER PROTECTION (HAZMAT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Equipment and procedures required for protecting workers against asbestos, lead-based paint and other hazardous exposure.

1.02 RELATED SECTIONS

- A. Section 01562 - Respiratory Protection

1.03 WORKER TRAINING

- A. Train all workers in accordance with 29 CFR 1926 regarding the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures.
- B. All workers and supervisors must be AHERA accredited as described in the AHERA regulation 40 CFR 763 Appendix C to Subpart E, January, 1994. In addition, all supervisors shall have passed a written test given by the AHERA-accredited training facility. In addition, all workers must be licensed in accordance with State of Maryland regulatory requirements.
- C. Provide documentation of State of Maryland approved training and licensing, as required by State asbestos regulations.
- D. Train all workers and supervisors in potential job hazards and safety requirements other than asbestos, including, but not limited to: electrical; heat stress; slips, trips & falls; ladders, scaffolding & working surfaces; fire; power tools; noise; chemical exposures; sanitation; material handling; demolition; housekeeping; first aid; personal protective equipment; signs; etc.
- E. Ensure all training is provided in a language in which each employee is fully fluent. The training provider must teach in this language of fluency; translation by other students is not acceptable.

1.04 MEDICAL EXAMINATIONS

- A. Provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 f/cc or greater for an 8-hour time weighted average.
- B. In the absence of specific airborne fiber exposure data, provide medical examination for all workers who will enter the work area for any reason.
- C. Examination shall at a minimum meet OSHA requirements set forth in 29 CFR 1926.
- D. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

1.05 SUBMITTALS

- A. Submit a valid training certificate for each worker who will work on the project which fully complies with all applicable state and federal regulations.
- B. Submit evidence of training for each worker for other potential job hazards and safety requirements, as outlined in this section.
- C. Submit a completed Certificate of Worker's Acknowledgment for each worker, on the form provided at the back of this section. If any worker is not fluent in English, provide a written translation of this form in that worker's language of fluency and submit the signed, translated copy attached to the English version for any such workers.
- D. 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.
- E. Submit notarized 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

2.01 PROTECTIVE CLOTHING

- A. Ensure compliance with 29 CFR 1926.95 – Personal Protective and Life Saving Equipment.
 - 1. Provide disposable total body coveralls with attached hood or separate head covers, impenetrable by asbestos fibers (Tyvek® or equivalent) and in sizes appropriate for all members of the work crew and authorized visitors, and require that all persons in the work area wear them.
 - 2. Provide works boots with non-skid soles, and where required by OSHA, foot protection for all workers. Dispose of boots as asbestos contaminated waste at the end of the work. Disposable foot covers may be provided in lieu of disposing of work shoes where permitted by site conditions.
 - 3. Provide head protection (hard hats) as required by OSHA for all workers, and provide spares for use by others. Thoroughly clean and decontaminate hats before removing them from work area at the end of the work or dispose of them as contaminated waste.
 - 4. Provide eye protection (e.g. safety glasses, goggles, face shield), as required by OSHA, for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury.
 - 5. Provide work gloves, as required by OSHA, for all workers of various sizes and types, depending on task. Do not remove gloves from work area until disposed of as asbestos contaminated waste.

2.02 ADDITIONAL PROTECTIVE EQUIPMENT

- A. Respirators, disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for site visitors, including the Environmental Consultant, and other authorized representatives who may inspect the job site.
- B. Provide these items in sufficient quantity, such that these persons can properly and safely perform their duties within the contained asbestos work area.

PART 3 - EXECUTION

3.01 GENERAL

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work.
- B. The following procedures are minimums to be adhered to regardless of fiber count in the work area.
- C. 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.
- D. Proceed through shower room to equipment room and put on work boots.

3.02 DECONTAMINATION PROCEDURES

- A. Require all workers to adhere to the following applicable personal decontamination procedures whenever they leave the work area as a minimum:

3.03 TYPE C SUPPLIED AIR RESPIRATORS:

- A. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room, and dispose of as contaminated waste.
- B. Still wearing respirators, proceed to showers. Showering is mandatory, unless noted otherwise.
- C. Thoroughly wet body including hair and face.
- 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.
- E. Pay particular attention to seal between face and respirator and under straps.
- F. 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 breathe.
- G. Carefully wash face piece of respirator inside and out.
- H. If using PAPR; shut down in the following sequence, first cap inlets to filter cartridges, then turn off blower unit. Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Shower as above.
- I. Rinse shower room walls and floor prior to exit.
- J. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

3.04 AIR PURIFYING-NEGATIVE PRESSURE RESPIRATORS (FULL OR HALF FACE):

- A. When exiting area, remove disposable coveralls, disposable headcovers, and disposable footwear covers or boots in the equipment room, and dispose of as contaminated waste.
- B. Still wearing respirators, proceed to showers. Showering is mandatory, unless noted otherwise.
- 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, respiratory 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. Shower completely with soap and water.
- H. Rinse thoroughly.
- I. Rinse shower room walls and floor prior to exit.
- J. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

3.05 WITHIN WORK AREA

- A. Require that workers NOT eat, drink, smoke, chew gum, chew tobacco, or apply cosmetics in the work area. To eat, chew, drink or smoke, workers shall follow the decontamination procedure described above and dress in street clothes before entering the non-work areas of the building.

END OF SECTION 01560

SECTION 01562 - RESPIRATORY PROTECTION (HAZMAT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Use of respiratory protection appropriate for the fiber level or lead concentration encountered in the work place or as required for other demolition hazards encountered.

1.02 STANDARDS

- A. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.
- B. OSHA - U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910, Section 1001 and Section 134, and 29 CFR 1926 section 1101.
- C. CGA - Compressed Gas Association, Inc., New York, Pamphlet G-7, "Compressed Air for Human Respiration", and Specification G-7.1 "Commodity Specification for Air".
- D. CSA - Canadian Standard Association, Rexdal, Ontario, Standard Z180.1-1978, "Compressed Breathing Air".
- E. ANSI - American National Standard Practices for Respiratory Protection, ANSI Z88.2-1992.
- F. NIOSH - National Institute for Occupational Safety and Health
- G. MSHA - Mine Safety and Health Administration

1.03 TRAINING

- A. Comply with OSHA 29 CFR 1910.134 – Respiratory Protection.
- B. Instruct and train each worker involved in ACM abatement in proper respirator use. Each worker must wear a respirator, properly fitted, from the start of an operation potentially containing ACM. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations.

1.04 SUBMITTALS

- A. Manufacturer's product information for each component used, including NIOSH Certifications for each component in an assembly and/or for entire assembly.
- B. When a Type "C" 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 airlines to work area(s) from compressor.
- C. Level of respiratory protection intended for each operation required by the project.
- D. Airborne asbestos fiber count data to substantiate selection of respiratory protection proposed, both historical and as performed for this particular project.

- E. Respiratory Protection Program (RPP) manual including written approval from an industrial hygienist in accordance with 29 CFR 1910.134.
- F. Daily OSHA monitoring results
- G. Worker Fit Testing Documentation for each individual required to don a respirator.

1.05 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS

- A. Provide air used for breathing in Type "C" supplied air respiratory systems that meets or exceeds standards set for C.G.A. type 1 (Gaseous Air) Grade D.

PART 2 - EQUIPMENT

Provide workers with fit tested respirators equipped with HEPA filters approved by NIOSH to be worn in the designated work area and/or whenever a potential exposure to ACM exists. Provide sufficient filters for replacement as required by the workers or applicable regulations. Do not use disposable respirators.

2.01 AIR PURIFYING RESPIRATORS

- A. Half face or full face type respirators.
- B. Equip full-face respirators with a nose cup or other anti-fogging device.
- C. P100 type filters labeled with NIOSH Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2 (1992).
- D. A chemical cartridge section 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 Certification.
- E. Utilize Powered Air Purifying Respirators (PAPR), where indicated by exposure levels (or supplied air system) or requested by any employee.

2.02 SUPPLIED AIR RESPIRATOR SYSTEMS

- A. Provide equipment capable of producing air of the quality and volume required by the above referenced standards applied to the job site conditions and crew size.
- B. Full face piece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type "C" respirator assembly providing Grade D air and operating in pressure demand mode with an auxiliary back-up system.
- C. In atmospheres which contain sufficient oxygen (greater than or equal to 19.5% oxygen) provide a pressure-demand full-face piece supplied air respirator equipped with an emergency back up P100 filter.
- D. In atmospheres which are oxygen deficient (less than 19.5% oxygen) provide a pressure-demand full face piece self-contained breathing apparatus (SCBA).

NOTE: DO NOT ALLOW ANYONE TO ENTER OXYGEN DEFICIENT ATMOSPHERES WITHOUT SPECIFIC WRITTEN PERMISSION OF THE MSA'S REPRESENTATIVE OR HIS DESIGNEE, EXCEPT FOR EMERGENCIES. }

- E. Provide a reservoir of compressed air located outside the work area which will automatically maintain a continuous uninterrupted source of air automatically available to each connected face piece and hose assembly in the event of compressor shutdown, 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.
- F. Provide a warning device that will operate independently of the main 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. Perform field test with all equipment running, prior to beginning abatement, to ensure audibility. 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. Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sounded 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.
- H. Provide a compressor driven by an electric motor. Insure that electrical supply available at the work site is adequate to energize motor.
- I. Locate compressor outside of building in location that will not impede access to the building, and that will not cause a nuisance by virtue of noise or fumes.
- J. Locate air intake remotely from any source of automobile or other engine exhaust or any other source of toxic or irritating gases, vapors, fumes, dust, etc.
- K. Provide an after cooler at entry to filter system which is capable of reducing temperatures to outside ambient air temperatures.
- L. Configure system to permit the recharging of 1/2 hour 2260 PSI SCBA cylinders, if utilized.

PART 3 - EXECUTION

3.01 GENERAL

- A. Comply with ANSI Z88.2 -1992 (or more current edition, if published) "Practices for Respiratory Protection" and OSHA 29 CFR 1910 and 1926.
- B. Require that respiratory protection is used at all times when there is any possibility of disturbance of asbestos-containing materials or when there is any possibility of the disturbance of asbestos in excess of OSHA's exposure limits.
- C. At a minimum, an air purifying respirator with a tight-fitting "rubber" face-piece and P100 cartridges shall be used whenever friable asbestos containing materials are present, but work activities will not disturb the asbestos.
- D. At a minimum, a half-face, negative-pressure air purifying respirator with a tight fitting face-piece and P100 cartridges or higher level respirator devices, shall be used whenever asbestos containing materials will be disturbed. Half-face, negative-pressure air purifying respirators shall be used from the time asbestos containing materials are disturbed until clearance has been achieved.

- E. Require that a respirator be worn by anyone in a work area at all times, regardless of activity.

3.02 FIT TESTING

- A. Provide initial fitting of respiratory protection during a respiratory protection course of training set up and administered by a qualified Industrial Hygienist.
- B. Fit types of respirator to be actually worn by each individual.
- C. Allow an individual to use only those respirators for which he has been trained and fit.
- D. On at least a monthly basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube according to the Protocol in CFR 1926.1101, or preferably, with a quantitative fit testing device.
- E. Each time an air-purifying respirator is put on, it must be checked for fit with a positive and negative pressure fit test in accordance with the manufacturer's instructions or ANSI Z88.2 (1992).
- F. All fit testing shall be done in accordance with 29 CFR 1910.134.

3.03 TYPE OF RESPIRATORY PROTECTION REQUIRED

- A. Type "C" Supplied air respirators will be required during abatement or work conducted in oxygen deficient environments as provided in this section.
- B. Respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below 0.01 f/cc is the minimum level of protection allowed. The minimum respiratory protection required shall be a half face air-purifying respirator as defined in this Section.

3.04 PERMISSIBLE EXPOSURE LIMIT (PEL)

- A. Asbestos
 1. 8-Hour Time Weighted Average (TWA) of asbestos fibers to which any worker may be exposed shall not exceed the current OSHA PEL or the Contractor's internal standard, whichever is more stringent.
 2. For the purpose of determining respirator type, protection factors shall be applied to a maximum concentration of 0.01 f/cc inside the mask, so that the maximum use concentration for a half-face negative pressure respirator shall be 0.1 f/cc and for a PAPR shall be 0.5 f/cc, for example.
 3. Fibers are defined as all fibers regardless of composition as counted in the NIOSH 7400 procedure, or asbestos fibers of any size as counted using either a scanning or phase contrast microscope.
- B. Perform sufficient personal air monitoring on employees during this project to accurately determine both TWA and short-term exposures to asbestos and other contaminants which might be encountered so that OSHA compliance can be demonstrated and so that employees can be adequately protected from harmful exposures.

3.05 RESPIRATORY PROTECTION FACTOR

| <u>Respiratory Type</u> | <u>Protection Factor</u> |
|---|--------------------------|
| Air purifying: Negative pressure respirator High efficiency filter Half facepiece | 10 |
| Air purifying: Negative pressure respirator High efficiency filter Full facepiece | 50 |
| Powered-air purifying (PAPR): Positive pressure respirator High efficiency filter Full facepiece | 100 |
| Supplied air: Positive pressure respirator Continuous-flow Half or full facepiece | 100 |
| Type C supplied air: Positive pressure respirator Pressure demand mode Full facepiece | 1,000 |
| Type C supplied air: Positive pressure respirator Pressure demand mode Full facepiece Equipped with an auxiliary pressure demand Self-contained breathing apparatus (SCBA) | 10,000 |
| Self-contained breathing apparatus (SCBA): Pressure demand mode Full-face piece | 10,000 |

3.06 NEGATIVE PRESSURE RESPIRATORS - HALF OR FULL FACE MASK:

- A. Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the workday.
- B. Require that respirators be wet-rinsed, and filters discarded, each time a worker leaves the work area.
- C. Store respirators and filters at the job site in a clean environment and protect totally from exposure to asbestos when not in use.
- D. Ensure that if any chemical cartridge or combination cartridge is utilized, air monitoring has been performed to ensure the adequacy of protection factors. Utilize only full-facepiece respirators for chemical exposures, which can cause eye irritation.

3.07 POWERED AIR PURIFYING - HALF OR FULL FACE MASK:

- A. Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement. Ensure each employee with a PAPR has readily available and uses a flow-measuring device, as supplied by the manufacturer, to assist in determining adequacy of flow, if such a device is recommended by the manufacturer.
- B. Require that HEPA elements in filter cartridges be protected from wetting during showering.
- C. Require entire exterior housing of respirator including blower unit, filter cartridges, hoses, battery pack, facemask, belt, and cords to be washed each time a worker leaves the work area.
- D. 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. Require employees to properly exit the work area immediately, if PAPR flow decreases due to low battery or any other purpose, and not to re-enter until the cause of decreased flow is determined and remedied.

3.08 TYPE "C" RESPIRATOR

- A. 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.
- B. 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.

3.09 RESPIRATORY PROTECTION PROGRAM

- A. If requested by the MSA's Field Representative or his designee, submit a Respiratory Protection Program, indicating type of respiratory protection proposed for each portion of the work.
- B. Demonstrate to the MSA's Consultant compliance with the program and/or any requirements herein, at any time requested.

END OF SECTION 01562

SECTION 01563 - DECONTAMINATION UNITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Personnel and equipment decontamination facilities.
- B. Personnel Decontamination Unit as the only means of ingress and egress for the work area.
- C. Materials exit the work area through the Equipment Decontamination Unit.

PART 2 - PRODUCTS

2.01 PLASTIC SHEET AND ACCESSORIES

- A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mils thick, as indicated, clear, frosted, or black as indicated.
- B. 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 mils thick as indicated, frosted or black as indicated.
- C. Duct tape in 2" or 3" widths as appropriate, with an adhesive, which is formulated to aggressively stick to sheet polyethylene.
- D. Spray adhesive, which is specifically formulated to stick tenaciously to sheet polyethylene.

2.02 SHOWER

- A. One-piece waterproof shower pan, with rigid, impervious, waterproof walls. Structurally support as necessary for stability.
- B. Factory made showerhead producing a spray of water, which can be adjusted for spray size and intensity. Arrange so that control of water temperature, flow rate, and shut off is from inside shower.
- C. Cascaded filter units on drain lines from showers with disposable filter elements as indicated below.
 - 1. Primary Filter - Pass no particles larger than 20 microns
 - 2. Secondary Filter - Pass no particles larger than 1 micron
- D. Heavy bronze angle type hose bib with wheel handle, vacuum breaker, and 3/4" National Standard male hose outlet.

2.03 SUMP PUMP

- A. Provide totally submersible waterproof sump pump with integral float switch and proper size for application. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump.

PART 3 - EXECUTION

3.01 PERSONNEL DECONTAMINATION UNIT

- A. A serial arrangement of connected rooms or spaces, Changing Room, Drying Room, Shower Room, Equipment Room, that all persons pass through for entry into and exiting from the work area for any purpose.
- B. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100-foot candles.

3.02 CHANGING ROOM (CLEAN ROOM)

- A. Physically and visually separated from the rest of the building for the purpose of changing into protective clothing.
- B. Construct using polyethylene sheeting, at least 6-mil in thickness, to provide an airtight seal between the Changing Room and the rest of the building.
- C. Locate so that access to Work Area from Changing Room is through Shower Room.
- D. Separate Changing room from the building by a two-sheet polyethylene flapped doorway.
- E. Do not allow asbestos contaminated items to enter this room. Require Workers to enter this room either from outside the area dressed in street clothes, or naked from the showers.
- F. An existing room may be utilized as the Changing Room if it is suitably located and approved by the MSA's Field Representative or his designee. Protect all surfaces of room with sheet plastic.
- G. Maintain changing room dry and clean at all times. Do not allow overflow water from shower to wet floor in changing room.
- H. Damp wipe all surfaces twice after each shift change, or more often if indicated or requested by the MSA's Representative, with a disinfectant solution.
- I. Provide a continuously adequate supply of disposable bath towels.
- J. Post information for all emergency phone numbers and procedures.
- K. Provide 1 storage locker per employee.

3.03 DRYING ROOM

- A. A place for workers to dry after showering.
- B. Arrange so floor drains to shower room.
- C. Separate from the rest of the building with airtight walls of 6-mil polyethylene.
- D. Separate from change room with a sheet plastic flapped doorway.

3.04 SHOWER ROOM

- A. A completely water tight 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.

- B. Separate this room from the rest of the building with airtight walls fabricated of 6-mil polyethylene.
- C. Separate this room from the Changing and Equipment Rooms with airtight walls fabricated of 6-mil polyethylene.
- D. Provide splash proof entrances to Changing and Equipment Rooms with 2 doors.
- E. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.
- F. Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance.
- G. Pump waste water to drain or to storage for use in amended water. If pumped to drain, provide 20-micron and 1-micron wastewater filters in line to drain. Change filters daily or more often if necessary. Ensure water never accumulates to the level where employees showering are standing in water, which has not been pumped from the sump.

3.05 EQUIPMENT ROOM

- A. Work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.
- B. Separate this room from the work area by a 6-mil polyethylene flap doorway.
- C. Separate this room from the rest of the building with airtight walls fabricated of two separate layers 6 mil polyethylene.
- D. Separate this room from the Shower Room with airtight walls fabricated of two separate layers 6 mil polyethylene.

3.06 WORK AREA

- A. Separate work area from the Equipment Room by polyethylene barriers.
- B. If the airborne asbestos level in the work area is expected to be high, add an intermediate cleaning space between the Equipment room and the Work area.
- C. Damp wipe clean all surfaces after each shift change.
- D. Repair and replace damaged floor sections as required.

3.07 CONSTRUCTION OF DECONTAMINATION UNIT

- A. Air tight walls and ceiling using polyethylene sheeting, at least 6-mil in thickness. Attach to existing building components or a temporary framework.
- B. Use 2 layers (minimum) of 6-mil, polyethylene sheeting to cover floors in the Equipment, Shower (underneath shower pan), and Changing Rooms.
- C. Provide an additional layer in the Equipment Room for every shift change expected.
- D. Roll one layer of plastic from Equipment Room into Work Area after each shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.
- E. Fabricate doors from overlapping sheets with openings a minimum of three feet (3') wide. Configure so that sheeting overlaps adjacent surfaces. Weight sheets at bottoms as required so

that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel.

- F. If the decontamination area is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/2-inch plywood "ceiling" with polyethylene sheeting, at least 4-mil in thickness covering the top of the "ceiling".
- G. Visual barriers of opaque polyethylene sheeting at least 4-mil in thickness so that work privacy is maintained and work procedures are not visible.
- H. 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 1/2-inch plywood. Where the solid barrier is provided, sheeting need not be opaque.
- I. Provide sub-panel at Changing Room to accommodate all removal equipment. Power sub-panel directly from a building electrical panel. Connect all electrical branch circuits in decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.

3.08 DECONTAMINATION SEQUENCE

- A. Before leaving the work area, remove all gross contamination and debris from overalls and feet.
- B. Proceed to the Equipment Room and remove all clothing except respiratory protection equipment. Disposable coveralls are placed in a bag for disposal with other material.
- C. Decontamination procedures found in Section 01560 shall be followed by all individuals leaving the work area.
- D. After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

3.09 EQUIPMENT DECONTAMINATION UNITS

- A. A serial arrangement of rooms, Clean Room, Holding Room, Wash Room constructed with 6-mil polyethylene sheeting, supported as necessary for removal of equipment and material from work area, not personnel.
- B. Provide a wash down station located in the washroom as an equipment, bag and container cleaning station. Utilize hose or sprayer with a catch basin or enclosed shower such that wash water does not leak onto the plastic sheeting on the floor. Pump all wash water through a serial arrangement of 20 and 1-micron filters.
- C. Provide washroom for cleaning of bagged or containerized asbestos-containing waste materials passed from the work area after being wiped clean can be passed to the Holding Room. Separate this room from the work area by a single flap of 6-mil polyethylene sheeting.
- D. Provide Holding Room as a drop location for bagged asbestos-containing materials passed from the Wash Room located so that bagged materials cannot be passed from the Wash Room through the Holding Room to the Clean Room. Separate this room from the adjacent rooms by double flaps fabricated from 6-mil polyethylene.
- E. Provide Clean Room to isolate the Holding room from the building exterior. Separate this room from the exterior by a single flap of 6-mil polyethylene sheeting.

3.10 EQUIPMENT DECONTAMINATION SEQUENCE

- A. At wash down station, thoroughly wet-clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.
- B. When passing equipment or containers into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the doorway between the Wash Down Station and the Wash Room.
- C. Wet-clean the bags and/or equipment.
- D. Pass items into Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room.
- E. Workers from the building exterior enter Holding Area and remove decontaminated equipment and/or containers for disposal.
- F. Require these workers to wear full protective clothing and appropriate respiratory protection.
- G. At no time is a worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

3.11 CLEANING OF DECONTAMINATION UNITS

- A. Clean debris and residue from inside of Decontamination Units on a daily basis.
- B. Damp wipe all surfaces after each shift change.
- C. 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.

3.12 SIGNS

- A. Post an approximately 20-inch by 14-inch manufactured caution sign at each entrance to the work area as required by 29 CFR 1926.
- B. Post an approximately 10-inch by 14-inch manufactured sign at each entrance to each work area displaying the following legend:

LEGEND

No Food, Beverages or Tobacco Permitted

All Persons Shall Don Protective

Clothing (Coverings) Before

Entering the Work Area

All Persons Shall Shower Immediately

After Leaving Work Area and Before
Entering the Changing Area
Asbestos Work Area

END OF SECTION 01563

SECTION 01711 - PROJECT DECONTAMINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Cleaning of the primary barrier plastic prior to its removal.
- B. Cleaning of the room surfaces to remove any new or existing contamination.
- C. Operation of the pressure differential and air circulation system to remove airborne fibers.
- D. Project closeout procedures.

1.02 RELATED SECTIONS

- A. Section 02081 Removal of Asbestos Containing Materials
- B. Section 01714 Work Area Clearance

1.03 SUBMITTALS

- A. Evidence of suitability and compatibility of encapsulants with proposed finish materials.
- B. Certification of Visual Inspection (form follows this section).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL

- 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.
- B. Cleaning, decontamination, and removal of temporary facilities installed prior to abatement work.
- C. Cleaning, and decontamination of all surfaces (ceiling, walls, floor) of the Work Area, and all furniture or equipment in the Work Area.

3.02 PRIMARY BARRIER CLEANING

- A. 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 a High Efficiency Particulate Air (HEPA) filtered vacuum. (Note: A HEPA vacuum will fail if used with wet material.)
- B. Do not perform dry dusting or dry sweeping.
- C. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste.
- D. Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.

- E. Utilize leaf blower in all portions of the work area, in the same manner as if performing aggressive air sampling, to dislodge any asbestos particles, which may not have yet been cleaned.
- F. Perform cleaning by methods described above to clean any asbestos, which has been dislodged by leaf blower.
- G. Wait two hours to allow the HEPA filtered fan units to clean air and remove airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period.
- H. Maintain pressure differential and air circulation system in operation for the entire two-hour period.
- I. Have the MSA's Consultant visually inspect the work area to approve initial cleaning efforts.
- J. Remove outer layer of primary barrier sheet plastic and clean inner layer as needed, until no visible residue remains and cleaning is approved by the MSA's Consultant.
- K. As soon as the MSA's Consultant approves cleaning of the inner layer of primary barrier sheet plastic, spray with lockdown encapsulant. Take care spraying encapsulant to ensure it does not leak behind barriers or otherwise mar surfaces. Allow sufficient time for encapsulant to fully dry and then remove all remaining primary barrier sheeting, leaving only the critical barriers, decontamination units and fully operational pressure differential and air circulation system.
- L. Removal all filters in air handling system(s) and dispose of as asbestos-containing waste in accordance with requirements of Section 02084.

3.03 FINAL CLEANING

- A. 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 barrier layers. This cleaning is being applied to existing room surfaces and critical barriers. Critical barriers shall remain intact and shall be repaired as necessary or at the direction of the MSA's Representative.
- B. At the completion of cleaning of all surfaces except carpeting, HEPA vacuum carpeting designated to remain in work areas. Use a passive (non-power brush type) floor attachment with rubber floor seals and adjustable above-floor height.
- C. Wait two hours to allow HEPA filtered fan units to clean air and remove 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 and air circulation system in operation for the entire two-hour period.

3.04 VISUAL INSPECTION

- A. After two hours the MSA's Consultant will Perform a Complete Visual Inspection of the entire work area including: decontamination unit, all plastic sheeting, seals over ventilation openings, doorways, windows, and other openings; look for debris from any sources, residue on surfaces, dust or other matter. If deemed necessary by the MSA's Consultant, utilize a leaf blower (provided by the Contractor) during this inspection process to see if any dust is dislodged.
- B. If any such debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point, until visual inspection is approved by the MSA's Consultant.

- C. When the visual inspection is approved by the MSA's Consultant MSA's Consultant, the Asbestos Abatement Contractor shall complete the "Asbestos Abatement Contractor Certification" at the top of the Certification of Visual Inspection, the form for which follows this section.

3.05 FINAL AIR SAMPLING

- A. After the work area is found to be visually clean, air samples will be taken and analyzed in accordance with Phase Contrast Microscopy (PCM) or set forth in Section 01714.
- B. If Release Criteria is not met, repeat Final Cleaning and continue decontamination procedure from that point.
- C. If Release Criteria is met, proceed with completion of the Work.

3.06 COMPLETION OF ABATEMENT WORK

- A. Shutdown and remove the Pressure Differential and Air Circulation System. Seal HEPA filtered fan units with 6-mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from work area.
- B. Remove all critical barriers and critical barrier sheeting.
- C. Remove decontamination units.
- D. Remove all equipment, materials, and debris from the work site.
- E. Dispose of all asbestos containing waste material as specified in Section 02084 and provide receipts and chain of custody forms documenting proper disposal.
- F. Re-inspect all surfaces and finishes and re-clean as needed to remove all signs of stains, water marks, duct tape residue, smudges, smears and other visible marks. All interior finishes and surfaces shall be left in a condition suitable for application of wax or polish by the MSA. Glass surfaces shall be left sparkling clean.

3.07 PROJECT CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected and that Work is completed in accordance with the Contract Documents and ready for inspection by the MSA's Representative or his designee.
- B. Remove all temporary facilities, tools and accessories installed for the project and restore to original condition all permanent facilities used as temporary facilities.
- C. Obtain and submit releases enabling MSA's full unrestricted use of the site and access to services and utilities.
- D. Submit specific warranties, bonds and guarantees.
- E. Complete final cleaning requirements.
- F. Conduct a final inspection with the MSA's Consultant, MSA's Representative or his designee and Contractor's Representatives to examine condition of remaining surfaces.

3.08 FINAL CLEANING

- A. Provide final cleaning of the Work at the time indicated.
- B. Complete all cleaning operations before requesting inspection by the MSA's representative or his designee for certification of substantial completion.
- C. Remove exposed labels in finished spaces which are not required as permanent labels on materials supplied as part of the work, except for "Asbestos", "Asbestos Free", or Thermal Insulation Labels specified elsewhere.
- D. Clean exposed hard-surfaced finishes affected by the work, to a dirt-free condition, free of dust, stains, films and similar distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
- E. Clean project site (yard and grounds), including landscaped areas, of litter and foreign substances left during the course of the work. Sweep paved areas, which have been affected by the work to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits left by the work. Rake grounds, which are neither planted nor paved, to a smooth, even-textured surface where they have been disturbed by the work.
- F. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site. Do not bury debris or excess materials on the MSA's property. Do not discharge volatile or other harmful or dangerous materials into drainage systems, onto ground or otherwise release at or onto MSA's property.

CERTIFICATION OF VISUAL INSPECTION

Asbestos Abatement Contractor Certification

In accordance with Section 01711 - Project Decontamination, the undersigned employee of the Asbestos Abatement Contractor hereby certifies that he has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit, sheet plastic, etc.) and has found no dust, debris or residue.

By: (Signature)_____ Date_____

(Print Name)_____

(Print Title)_____

(Print Company Name)_____

Consultant's Certification

The undersigned employee of the Environmental Consultant hereby certifies that he has accompanied the Asbestos Abatement Contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Asbestos Abatement Contractor's Certification above is a true and honest one.

By: (Signature)_____ Date_____

(Print Name)_____

(Print Title)_____

(Print Company Name)_____

END OF SECTION 01711

SECTION 01714 - WORK AREA CLEARANCE (HAZMAT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section describes work performed by MSA's Environmental Consultant to measure post-abatement fiber levels.

1.02 CONTRACTOR RELEASE CRITERIA

- A. The Work is Complete when the work area has passed Visual Inspection and airborne fiber levels have been reduced to the level specified in this Section.

1.03 AIR MONITORING

- A. To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the MSA's Industrial Hygiene Services Contractor will secure samples and analyze them according to the following procedures.
- B. Fibers Counted: "Fibers" referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400, or asbestos fibers of any size as counted using a Phase Contrast Microscope.

1.04 AGGRESSIVE SAMPLING (IF NEEDED)

- A. Before sampling pumps are started the exhaust from forced air equipment (such as a leaf blower with at least 1 horsepower 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 cubic feet of work area volume.
- B. One 20-inch diameter fan per 10,000 cubic feet of room volume will be mounted in a central location, directed toward ceiling and operated at low speed for the entire period of sample collection.
- C. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors or vents.
- D. After air-sampling pumps have been shut off, fans will be shut off.

1.05 SCHEDULE OF AIR SAMPLES

- A. The number and volume of air samples taken and analytical methods used by the MSA's Industrial Hygiene Services Contractor will be in accordance with one of the following schedules in compliance with State and Federal regulations. Sample volumes given may vary depending upon the analytical instruments used.

1.06 PHASE CONTRAST MICROSCOPY (PCM)

- A. In each homogenous work area to be cleared by PCM, after completion of all cleaning work, a minimum of 7 samples will be taken and analyzed as follows:

| Location Sampled | Number of Samples | Filter Media | Acceptable Levels (fibers/cc) | Rate (LPM) | Minimum Air Volume |
|------------------|-------------------|--------------|----------------------------------|------------|--------------------|
| Each work area | 5 ¹ | 0.8 MCE | <0.01 | 2 - 10 | 1,200 |
| Field blank | 2 or 10% | 0.8 MCE | 3 fibers/100 fields ² | N/A | N/A |

¹ Or 1 sample per room, or 1 sample per 5,000 ft² of floor area, or 1 sample for every 50,000 cubic feet, whichever will result in the most number of samples.

² If this is exceeded, the analysis will cease and new samples will be collected.

- B. Fibers on each filter will be counted and measured using the NIOSH Method 7400 procedures. If counted in the field, the microscopist as well as the Contractor's CIH shall be rated board "Approved" and "Acceptable" in the Asbestos Analysts Registry (AAR) program, administered by the American Industrial Hygiene Association (AIHA). If counted in a laboratory, the laboratory shall be "Approved" and the analyst shall also be AAR "Acceptable" and the laboratory shall be accredited for asbestos by AIHA. The microscopist may also participate in Proficiency Analytical Testing (PAT) rounds through the Industrial Hygiene Services Contractor's company.
- C. One work area sample will be split and both halves analyzed separately for duplicate analysis.
- D. Decontamination of the work site is complete when every work area sample is below the applicable Acceptance Level. If any sample is above the Acceptance Level, then the decontamination is incomplete and recleaning is required.

1.07 PHASE CONTRAST MICROSCOPY (PCM)

- A. In each homogenous work area to be cleared by PCM (as shown in Section 01013), after completion of all cleaning work, a minimum of 13 samples will be taken and analyzed as follows:

| Location Sampled | Number of Samples | Filter Media (Structures/cc) | Acceptable Level | Rate (LPM) | Minimum Air Volume |
|------------------------|-------------------|------------------------------|------------------|------------|--------------------|
| Each Work Area | 5 ¹ | 0.45 MCE | <0.01 | 2 -10 | 2,000 |
| Outside Each Work Area | 5 ² | 0.45 MCE | Z - Test | 2 -10 | 2,000 |
| Work Area Blank | 1 | 0.45 MCE | | | |
| Outside Blank | 1 | 0.45 MCE | | | |
| Laboratory Blank | 1 | 0.45 MCE | | | |

¹ or 1 sample per 1,000 ft² of contained floor area (except 1 per 2,000 ft² in rooms > 5,000 ft²), whichever requires more samples.

² outside work area samples shall be taken as follows: 1) two at the entrance to the decontamination chamber, representing make-up air, 2) two outside the building, and 3) one at another location inside the building, determined by the MSA's Industrial Hygiene services contractor. Prior to taking these samples, the I. H. services contractor shall inspect the vicinity to ensure that neither the activities of the abatement contractor, nor other ACM in the building, are expected to create ambient fiber levels, which would be detected on these samples.

- B. Analysis will be performed using the method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A. The laboratory performing the analyses shall have current Accreditation for Airborne Asbestos Fiber Analysis through the National Voluntary Laboratory Accreditation Program (NVLAP), administered by the National Institute of Standards and Technology (NIST).
- 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 when one of the following two sets of conditions are met. Utilization of condition 2 (Z-test) will be only if, in the written judgments of the CIH of the Industrial Hygiene Services Contractor, it is necessary due to knowledge or reasonable suspicion that ambient air entering the work area through the decontamination chamber is > 0.01 s/cc for reasons unrelated to the actions of the abatement Contractor.
 - 1. Work Area Samples meet acceptance criteria

- a. All Work Area sample volumes are greater than 2,000 liters for a 25 mm sampling cassette.
 - b. The average concentration of asbestos on the Work Area Samples does not exceed the acceptance criteria of 70 structures per squared millimeter of air sampled.
2. Work Area Samples are not statistically different from outside samples
- a. All sample volumes except for blanks are greater than 2,000 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. The Industrial Hygiene Services Contractor has determined that neither abatement contractor activities nor remaining ACM in other portions of the building are expected to be detected on the outside work area samples and 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)
 - d. If these conditions are not met, then the decontamination is incomplete and the cleaning procedures of Section 01711 shall be repeated.
- E. If the arithmetic mean (average) asbestos concentration on the blank filters exceeds 70 structures per square millimeter of filter area the analysis will cease and new samples will be collected.

1.08 FAILED CLEARANCE TESTS

- A. If the release criteria is not met and the area must be recleaned and retested the Contractor will be responsible for cost of retesting.

1.09 PHASE CONTRAST MICROSCOPY

- A. The services of a testing laboratory will be employed by the Contractor to perform laboratory analysis of the air samples.
- B. A technician will be at the job site with a microscope so that verbal reports on air samples can be obtained within two (2) hours.
- C. A complete record, certified by the testing laboratory, of all air monitoring tests and results will be furnished to the Contractor and a copy delivered to the Environmental Consultant.

1.10 PHASE CONTRAST MICROSCOPY

- A. The services of a testing laboratory will be employed by the Contractor to perform laboratory analysis of the air samples.
- B. Verbal results will be available within 24 hours after taking the sample.
- C. A complete record, certified by the testing laboratory, of all Phase Contrast Microscopy (PCM) results will be furnished to the Contractor, who will forward a copy to MSA for compliance with COMAR 26.11.21.06 B.(3)(e)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01714

SECTION 01732 - SELECTIVE DEMOLITION (DECONSTRUCTION)

PART 1 - GENERAL

1.01 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. Project C.O.R.E. Work Execution Protocols

1.02 SUMMARY

- A. The purpose of this Section is to describe general procedures required for the abatement of lead containing materials within buildings to be removed. Specific requirements for lead removal are identified elsewhere in the Contract Documents. In addition, specific requirements for other hazardous material abatement that may be required (i.e., asbestos, mercury, PCBs, etc.) are identified elsewhere in the Contract Documents. This Section includes the following:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Sections include the following:
 - 1. Division 2 Section "Building Demolition" for demolition of entire buildings, structures, and site improvements.
 - 2. Division 2 Section "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.03 DEFINITIONS

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

Salvage in first paragraph below may add cost to Project; verify with MSA.

- B. Remove and Salvage: Detach items from existing construction and deliver them to the approved place of transfer.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to MSA that may be encountered during selective demolition remain MSA's property. Carefully

remove and salvage each item or object in a manner to prevent damage and deliver promptly to MSA.

1. Coordinate with MSA's historical adviser, who will establish special procedures for removal and salvage.

1.05 SUBMITTALS

- A. Qualification Data: For demolition firm, professional engineer, and refrigerant recovery technician.

Schedule below may be used to track Contractor's progress; it may also be used to determine that selective demolition will not interfere with MSA's operations. Delete schedule submittal if not required or if selective demolition will not interfere with MSA's operations.

- B. Schedule of Selective Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Locations of proposed dust- and noise-control temporary partitions and means of egress.
 2. Means of protection for items to remain and items in path of waste removal from building.
- C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged. Responsible for documentation of all removed / salvaged materials using the form provided herein.
- D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.06 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
 1. Inspect and discuss condition of construction to be selectively demolished.
 2. Review structural load limitations of existing structures.
 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

- F. Contractor will be required to hold all certifications and comply with all training requirements as identified in the Operations Protocol.

1.07 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by MSA as far as practical.
- B. Notify MSA of discrepancies between existing conditions and Drawings before proceeding with selective demolition and information provided herein
- C. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. The Contractor will be required to confirm information provided prior to bid to assess hazardous materials prior to demolition.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Engage a professional engineer to survey condition of buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations. Submit documentation of survey to the MSA for review and approval prior to commencing deconstruction and demolition operations.
- D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes and templates.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Confirm utility services have been disconnected, sealed or capped prior to commencing deconstruction or demolition operations. If active utilities are identified, notify the MSA. and await direction prior to proceeding with work.

3.03 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

3.04 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
 - 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 7. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until removal from the site.
 - 4. Transport items to approved location.
 - 5. Protect items from damage during transport and storage.

3.05 HAZARDOUS MATERIAL ABATEMENT

- A. Lead containing material removal: See related specifications in the Contract Documents.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be salvaged, or otherwise indicated to remain the MSA's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill. When recyclable debris from a site exceeds 5 tons, at least 30% of that recyclable debris must be immediately transported to a licensed recycling facility per the "Baltimore City Building, Fire, and Related Codes" dated 2015 or the latest version thereof.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off MSA's property and legally dispose of them.

3.07 CLEANING

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

END OF SECTION 01732

SECTION 02081 - REMOVAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General requirements for the safe removal and handling of asbestos containing material (ACM).
- B. Requirements for maintaining safe working conditions with hazardous and contaminated materials that may be encountered during the Work.

1.02 RELATED DOCUMENTS

- A. A Site-Specific Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey will be provided by MSA at the time the Contractor is authorized to initiate work on the site. The survey will summarize the type, location, quantity and condition of materials identified by the Environmental Consultant in each building included for demolition.
 - 1. The asbestos portions of the survey will comply with EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP), Subpart M, Section 61.145 for the identification of Category I and Category II ACM.
 - 2. The survey will include recommendations for proper handling and disposal of the identified ACM, if applicable.
- B. RELATED SECTIONS
 - 1. Section 01513 - Pressure Differential and Air Circulation System
 - 2. Section 01526 - Temporary Enclosures
 - 3. Section 01560 - Worker Protection
 - 4. Section 01562 - Respiratory Protection
 - 5. Section 01563 - Decontamination Units
 - 6. Section 01711 - Project Decontamination / Asbestos
 - 7. Section 01714 - Work Area Clearance
 - 8. Section 02084 - Disposal of Asbestos-Containing Materials

1.03 REMOVAL OF ACM

- A. Following review of the Site-Specific ACM, Lead-Based Paint and Hazardous Material Survey, the Contractor will conduct an inspection of the site and confirm existing conditions and requirements for the safe and proper removal ACM material from the site.
- B. Prior to initiation of onsite demolition work, the Contractor will submit to MSA an asbestos removal work plan and health and safety plan (HASP) for the safe removal and protection of onsite workers and the surrounding community. All plans will include sufficient detail of temporary control measures for the evaluation of proposed site-specific working conditions and

compliance with Federal, state and local regulations governing the removal and disposal of asbestos.

- C. Remove all friable or Category II non-friable ACM prior to the conclusion of asbestos abatement activities and commencement of building demolition.
- D. It is the responsibility of the Contractor to monitor and mitigate all asbestos present on the site to within acceptable OSHA PEL levels of one-tenth (0.1) f/cc of air as an eight (8)-hour TWA.
- E. The Environmental Consultant will determine the condition of potential asbestos containing material and the potential for friability which may occur during demolition.
- F. It will be the final decision of the Environmental Consultant to determine what Category I non-friable ACM could become friable during demolition activities and will require removal prior to building demolition.
- G. The Contractor must adhere to the requirements of the Environmental Consultant and view the determinations as final.
- H. Remove, handle, store and dispose of all friable ACM according to all applicable federal, state and local regulations.

1.04 SUBMITTALS

- A. Submit product data, use instructions, recommendations from manufacturer of surfactant or removal encapsulant intended for use and MDE approval for intended use. Include data substantiating that material complies with requirements.
- B. Submit certification from manufacturer of surfactant or removal encapsulant that, the material, if used in accordance with manufacturer's instructions, will wet asbestos containing materials to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M).
- C. Asbestos Removal and Monitoring Plan that includes, at a minimum:
 - 1. Detailed planning for the procedures proposed for compliance with the requirements and regulations included in this specification, including:
 - a. Schedule of activities and sequencing of asbestos removal and monitoring work.
 - b. Chain of command and project responsibilities, including the communication program for each trade involved in the work.
 - c. Monitoring plan to ensure compliance with applicable permits and regulations and ensure the safety of abatement workers, contractors, surrounding community and visitors to the site.
 - d. Methods, equipment and procedures for the identification, removal and cleanup of ACM or other hazardous materials.
 - i. Encapsulation procedures.
 - ii. Location and layout of decontamination areas, in accordance with Section 01563 - Decontamination Units.
 - iii. Pressure differential system including calculation used to arrive at the number of machines necessary to achieve four (4) air changes per hour or a negative pressure of two one-hundredths (-0.02) inches of water column, relative to outside pressure.

- e. Prepare a written respiratory protection program, as defined by OSHA 29 CFR 1910.134 – Personal Protective Equipment, Respiratory Protection and retain a permanent copy on-site during work activities.
 - f. Identification of National Voluntary Laboratory Accreditation Program (NVLAP)-certified laboratory, or equivalent, for analytical testing of ACM using phase contrast microscopy (PCM).
 - g. Methods of ACM removal and containment:
 - i. Identification and location of ACM and hazardous waste.
 - ii. Proposed ventilation system (HEPA or equivalent).
 - iii. ACM monitoring and abatement methods within the work area.
 - h. Contingency Plans:
 - i. Methods, equipment and procedures for preventing and handling accidental exposure and releases.
 - ii. Methods, equipment and procedures for the safe characterization of unidentified asbestos containing materials and structures.
- D. Task-specific Health and Safety Plan (HASP) that includes, at a minimum:
1. Worker Protection Compliance Program as required for disturbances of ACM and other hazardous wastes. Ensure compliance measures in accordance with 29 CFR 1926.1101 – Safety and Health Regulations for Construction, Asbestos and applicable OSHA worker protection requirements.
 2. Roles, responsibilities and notification procedures for documenting and reporting to the MSA and applicable regulatory agencies the identification and/or release of ACM.
 3. Safety, health and security requirements and procedures for the protection of workers and the public during ACM removal and containment activities.
 4. Work site monitoring equipment, methods and procedures for identifying and mitigating the presence of ACM and associated hazardous wastes.
 5. Equipment and personnel decontamination procedures, in accordance with Section 01563.
 6. Medical surveillance for personnel working within the control area in accordance with the regulations, as well as workers’ post-contract medical surveillance results.
 7. Copies of applicable permits and notifications required for asbestos removal work.
- E. Quality Control Submittals:
1. Include quality control procedures in the action/informational submittals documenting the methods for ensuring the implementation of policies and procedures identified in the submittal documents.
 2. Copies of personal air monitoring readings within seventy-two (72) hours of collection. Distribute results to the Environmental Inspector and on-site workers within twenty-four (24) hours of receipt from the laboratory.
 3. If negative pressure containment is implemented, copies of pressure differential strip charts for each work area.
- F. Certificates:
1. Copies of EPA and MDE project notifications.

2. Submit Contractor certification for licensed asbestos abatement.
3. Submit EPA certification and MDE accreditation for Asbestos Abatement Supervisor.
4. Submit EPA certification and MDE accreditation for proposed abatement workers showing compliance with COMAR 26.11.23 – Asbestos Accreditation of Individuals.
5. Submit laboratory accreditation certificates, such as NVLAP, for analytical testing of ACM and other hazardous waste.
6. Submit copies of current certifications for training, medical surveillance and respiratory fit test, as appropriate for on-site workers.
7. Submit a current, valid asbestos certification issued by the State of Maryland.

G. Quality Control Submittals:

1. Include quality control procedures in the action/informational submittals documenting the methods for ensuring the implementation of policies and procedures identified in the submittal documents.
2. Copies of personal air monitoring readings within seventy-two (72) hours of collection. Distribute results to the Environmental Consultant and on-site workers within twenty-four (24) hours of receipt from the laboratory.
3. If negative pressure containment is implemented, copies of pressure differential strip charts for each work area.

PART 2 - PRODUCTS

2.01 AMENDED WATER

- A. Provide water to which a surfactant has been added.
- B. For surfactant, use ENVIRO-WET, ASBESTO-WET, NANCOL or equivalent, as approved by the Environmental Consultant and in accordance with manufacturer's directions.
- C. Use a mixture of surfactant and water 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 the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

2.02 ENCAPSULANTS

- A. Encapsulants (sealants) will meet the EPA requirements and possess the following characteristics:
 1. Adherence: The sealant eliminates fiber dispersal by adhering to the fibrous substrate with sufficient penetration to prevent separation of the sealant from the sprayed asbestos material.
 2. Impact Penetration: The sealant withstands impact and penetration, protects the enclosed sprayed asbestos material, while not causing separation of the sprayed asbestos material from its original substrate.
 3. Flexibility: The sealant possesses enough flexibility to accommodate atmospheric changes and settling of the structure over time.
 4. Resistance to Smoke and Flame: The sealant shall have high flame retardant characteristics and a low toxic fume and smoke emission rating.

5. Ease of Application: The sealant must be easily applied with relative insensitivity to errors in preparation or application. Ease of repair by routine maintenance personnel is desirable.
6. Toxicity: The sealant must be neither noxious nor toxic to application workers and structure users thereafter.
7. Permeability: The sealant will have suitable stability to weathering and aging.

2.03 POLYETHYLENE SHEET

- A. Use polyethylene film in the largest sheet size possible to minimize seams, 6.0 mils thick, clear, frosted, or black.
- B. Use 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.

2.04 MISCELLANEOUS MATERIALS

- A. Provide duct tape in 2" or 3" widths, with an adhesive which is formulated to aggressively stick to sheet polyethylene.
- B. Provide spray adhesive, which is specifically formulated to stick tenaciously to sheet polyethylene.
- C. Provide 6 mil thick leak-tight polyethylene disposal bags labeled as indicated in Section 02084 - Disposal of Asbestos Containing Material.

2.05 ASBESTOS ENCLOSURE SYSTEMS

- A. If an enclosure system is used, build suitable enclosure framing and line with polyethylene sheeting, or equivalent, sealed with tape at lap joints in the plastic for asbestos enclosures and decontamination areas.
- B. For access between contaminated and uncontaminated areas, install an airlock system including a curtained doorway for access between two (2) areas within the decontamination enclosure systems. Provide a minimum distance between two (2) curtained doorways of six (6) feet. Modifications to the enclosure system due to work space constraints require approval by the Consultant.
- C. The decontamination enclosure installation requirements include:
 1. A three (3)-stage decontamination station for the removal of equipment and materials from work area, allowing movement from the work area into a wash down room and finally a clean room while preventing cross-contamination outside the work area.
 2. The wash down room will contain two (2) curtained doorways. Filter shower water through a five (5) micrometer-filter system, or equivalent, prior to disposal.
 3. A clean area with one (1) curtained doorway into the rinsate area and one (1) entrance or exit to non-contaminated areas of the work area. Provide sufficient space for non-contaminated items.
- D. Provide and post decontamination and work procedures to be followed by workers.
- E. Ensure work site security and implementation of PPE requirements within the work area.

- F. Decontaminate workers and authorized visitors prior to exiting the work area. Maintain respirators until the completion of decontamination procedures. Store contaminated PPE in the equipment room when not in use. Upon completion of asbestos abatement, dispose of PPE as contaminated waste. Dispose of contaminated protective clothing in receptacles for disposal with other ACM.
- G. Ensure workers removing waste containers from the decontamination enclosure enter the rinsate area wearing a respirator and dressed in clean coveralls.
- H. Do not allow workers to eat, drink, smoke, or chew gum or tobacco at the project site except in designated areas.
- I. Ensure workers are fully protected with appropriate respirators and protective clothing prior to commencing actual asbestos abatement until completion of final clean-up. Establish methods for safe tie-ins of temporary and replacement lines to ACM insulated pipes.
- J. Visually inspect enclosures at the beginning of each work period. Dispersive smoke methods may be used to test effectiveness of barriers. Repair damage immediately.

PART 3 - EXECUTION

3.01 REMOVAL OF ASBESTOS

- A. Spray ACM with sealant amended water, using equipment capable of providing appropriate application to reduce the release of fibers. Saturate the material sufficiently. Spray the asbestos material repeatedly during work process to maintain wet condition and minimize asbestos fiber dispersion.
- B. Wire brush and/or wet sponge to clean surfaces that contained asbestos or clean by an equivalent method to remove visible material. Keep surfaces wet during cleaning.
- C. Use encapsulant to ensure asbestos containing material is not remobilized after removal.
- D. Place ACM in labeled disposal bags immediately upon removal. Thoroughly clean the external surfaces of bags by wet sponging within the designated work area. Place the waste bags in a second, clean bag at the waste load out for disposal.
 - 1. Do not drop or drag the waste bags.
 - 2. Ensure removal of containers from the regulated area by workers entering from uncontaminated areas dressed in clean coveralls. Ensure workers do not enter from contaminated areas into the clean area during excavation and removal.
- E. Bag and secure ACM in a locked drum at the end of each workday. Do not leave debris, unsecured equipment or tools on the project site past the end of each workday.
- F. Conduct work in a manner that prevents the spread of ACM. Cleanup ACM migration outside the work areas.
- G. Use of mini enclosures and glove bags requires prior approved by the Consultant and MDE.
- H. Keep water out of the trench/pit; collect accumulated water and treat or dispose of in accordance with regulatory requirements.

3.02 SECONDARY BARRIER

- A. A drop cloth of clear 6 mil sheet plastic in all areas where asbestos removal work is to be carried out. Completely cover floor with sheet plastic.
- B. Where the work is within 10'-0" of a wall, extend the Secondary Barrier up wall to ceiling. The ceiling shall then be additionally covered with one layer of poly.
- C. 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.
- D. Provide cross strips of duct tape at wall support as necessary to support sheet plastic and prevent its falling during removal operations.
- E. Install Secondary Barrier at the beginning of each work shift.
- F. 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. The ceiling layer shall be kept in place until completion of the work.
- G. Install Walkways of black 6-mil 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.

3.03 WET REMOVAL

- A. Thoroughly wet asbestos-containing materials 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. Utilize wet removal methods of asbestos-containing materials at all times during the abatement project.
- B. Dry removal methods of asbestos-containing materials for this project are prohibited.
- C. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for water or removal encapsulant to penetrate material thoroughly.
- D. 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.
- E. 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 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.
- F. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.
- G. Remove saturated asbestos-containing material in small sections from all areas. As it is removed, pack material while still wet into disposal bags.
- H. Remove any residue with stiff bristle nylon hand brush.
- I. Evacuate air from disposal bags with a HEPA filtered vacuum cleaner. 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.

3.04 LOCK-DOWN ENCAPSULATION

- A. Upon completion of removal and cleaning of surfaces, have surfaces visually inspected by the Environmental Consultant. When surfaces have passed the visual inspection, they shall be sprayed with an approved lock-down.

3.05 AIR FILTRATION SYSTEM

- A. If necessary in order to meet work area fiber level specified in Section 01410, provide HEPA filtered fan units, one for each scraping activity, in addition to those required by Section 01513, in the vicinity of the work. Arrange so that exhaust is into the work area oriented in a direction away from the work. Extend a 12" diameter flexible non-collapsing duct from the intake end to a point no more than 4'-0" from any scraping or wire brushing activity.
- B. Utilize pressure differential equipment continuously from first disturbance of ACM until completion of successful removal and final inspection.
- C. Do not discharge unfiltered air outside the work area via air movement system or air filtering equipment.
- D. Maintain the exchange rate at no less than four (4) air changes per hour.
- E. Continuously monitor and record the pressure differential across isolated barriers using a pressure differential monitoring device. Maintain the pressure differential at a minimum of negative two-hundredths (-0.02) of an inch of water at four (4) degrees Celsius.
- F. Provide a continuous-read strip chart manometer, or equivalent, for ensuring negative air pressure differential within the workspace.
- G. Provide HEPA filter vacuums with disposable collection bags and filters that are ninety-nine point nine seven (99.97) percent efficient for retaining fibers of three-tenths (0.3) of a micron or larger.

3.06 AIRBORNE FIBER COUNTS

- A. Use work procedures that result in an 8-hour Time Weighted Average (TWA) airborne fiber count less than PEL of one-tenth (0.1) f/cc of air as an eight (8)-hour TWA or one (1.0) f/cc as averaged over a thirty (30)-minute period.
- B. If airborne fiber counts exceed these levels, immediately mist the area with amended water to lower fiber counts and revise work procedures to maintain airborne fiber levels within the required limit.

END OF SECTION 02081

SECTION 02084 - DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Asbestos Disposal
- B. Packaging of asbestos-containing waste materials.
- C. Execution

1.02 SUBMITTALS

- A. Removal and Disposal of Asbestos Pipe Insulation Work Plan that includes, at a minimum:
 - 1. Detailed planning for the procedures proposed for compliance with the requirements and regulations included in this specification, including:
 - a. Schedule of activities and sequencing of asbestos disposal work.
 - b. Chain of command and project responsibilities, including the communication program for each trade involved in asbestos disposal.
 - c. Monitoring plan to ensure compliance with applicable permits and regulations and ensure the safety of abatement workers, contractors, surrounding community during asbestos disposal activities.
 - d. Methods, equipment and procedures for the packaging, disposal and cleanup of ACM or other hazardous materials.
 - i. Encapsulation procedures.
 - ii. Location and layout of decontamination areas.
 - iii. Pressure differential system including calculation used to arrive at the number of machines necessary to achieve four (4) air changes per hour or a negative pressure of two one-hundredths (-0.02) inches of water column.
 - 2. Prepare a written respiratory protection program, as defined by OSHA 29 CFR 1910.134 – Personal Protective Equipment, Respiratory Protection and retain a permanent copy on-site during work activities.
 - 3. Methods of ACM containment, packaging, transport and disposal:
 - a. Packaging of removed asbestos debris.
 - b. Identification of licensed transporter and submission of contact information.
 - c. Name, location and contact information for a disposal facility meeting the requirements of COMAR 26.11.21.08 – Waste Disposal.
 - 4. Contingency Plans:
 - a. Methods, equipment and procedures for preventing and handling accidental exposure and releases.
- B. Task-specific Health and Safety Plan (HASP) that includes, at a minimum:

1. Worker Protection Compliance Program as required for disturbances of ACM and other hazardous wastes. Ensure compliance measures in accordance with 29 CFR 1926.1101 – Safety and Health Regulations for Construction, Asbestos and applicable OSHA worker protection requirements.
2. Roles, responsibilities and notification procedures for documenting and reporting to the Environmental Consultant and applicable regulatory agencies the release of ACM.
3. Safety, health and security requirements and procedures for the protection of workers and the public during ACM packaging, transport and disposal activities.
4. Equipment and personnel decontamination procedures.
5. Medical surveillance for personnel packaging, transporting and disposing of asbestos and other hazardous material in accordance with applicable regulations, as well as workers' post-contract medical surveillance results.
6. Copies of applicable permits and notifications required for transport and disposal.

C. Certificates:

1. Copies of EPA and MDE project notifications.
2. Submit MDE Certified Waste Hauler documentation identifying the use of a state-licensed ACM transporter.
3. Submit permitting and licensure identifying a designated hazardous or contaminated material disposal facility capable of accepting ACM and associated hazardous wastes.
4. Submit copies of current certifications for training, medical surveillance and respiratory fit test, as appropriate for on-site workers.
5. Submit a current, valid asbestos certification issued by the State of Maryland.

D. Quality Control Submittals:

1. Include quality control procedures in the action/informational submittals documenting the methods for ensuring the implementation of policies and procedures identified in the submittal documents.
2. Copies of personal air monitoring readings within seventy-two (72) hours of collection. Distribute results to the Environmental Consultant and on-site workers within twenty-four (24) hours of receipt from the laboratory.
3. If negative pressure containment is implemented, copies of pressure differential strip charts for each work area.

E. Chain of Custody form and form of waste manifest proposed.

F. Asbestos Cleaning

1. For friable and non-friable material, remove visible accumulations of ACM and debris using procedures approved in the work plan.
2. Include sealed drums and equipment for the clean-up and removal from work areas, via the decontamination enclosure system.
3. Conduct final inspections for each work area. The Consultant may conduct additional verification inspections, as needed. When final inspection and testing determine the area is free of visible accumulation of dust and ambient air measurements are less than one one-

hundredth (0.01) f/cc, breakdown decontamination enclosure systems and dispose of materials as contaminated waste.

PART 2 - PRODUCTS

2.01 PACKAGING OF ASBESTOS-CONTAINING WASTE MATERIALS.

- A. Provide and affix labels to ACM, scrap, waste, debris and other products contaminated with asbestos in accordance with 29 CFR 1910.145(d)(4) – Caution Signs.

First Label:

CAUTION
CONTAINS ASBESTOS FIBERS
AVOID OPENING OR BREAKING CONTAINER
BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH

Second 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 ASBESTOS, TREMOLITE, ANTHOPHYLLITE, OR
ACTINOLITE FIBERS IS HAZARDOUS TO YOUR HEALTH

Third Label: Provide in accordance with U.S. Department of Transportation regulation on hazardous waste marking, 49 CFR Parts 171 and 172:

ASBESTOS
NA 2212
RQ
CLASS 9 MISCELLANEOUS SOLID HAZARDOUS WASTE PLACARD

CONSIGNEE OR CONSIGNOR NAME & ADDRESS

Fourth Label:

NAME OF GENERATOR

NAME OF CONTRACTOR

CONTRACTOR'S REMOVAL LICENSE NUMBER

DATE BAG WAS SEALED

2.02 EQUIPMENT

- A. Furnish tools, equipment, devices, appurtenances, facilities and services for the containment, packaging, transportation and disposal of ACM.
- B. Use metal or fiberboard drums with locking ring tops; label in accordance with EPA 40 CFR 61.150(a)(1)(iv) and (v) – Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation and Spraying Operations.
 - 1. The use of tear-off bags is not allowed.
- C. Any non-suitable excavated material, including construction debris and man-made waste material, will be handled and disposed of by the Contractor.

PART 3 - EXECUTION

3.01 GENERAL PROCEDURES

- A. All waste shall be maintained in an adequately wet condition until sealed in air and leak tight containers.
- B. Prior to removing waste from the work area, each bag of waste shall be sealed and placed entirely within a second bag, which shall also be sealed in manner to prevent leakage.
- C. All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction.
- D. Load all asbestos-containing waste material in disposal bags or leak-tight drums.
- E. Protect interior of truck or dumpster with Critical and Primary Barriers.
- F. 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.
- G. Advise the landfill operator, MSA and Environmental Consultant, at least ten days in advance of transport, of the quantity of material to be delivered.
- H. Ensure asbestos waste storage and disposal complies with all aspects of Federal, State and local asbestos regulation, particularly regarding time periods for removing waste from project site and interim storage. Ensure compliance with all aspects of COMAR 26.11.21.08, particularly regarding time periods for removing waste from project site and interim storage.

- I. Dispose of ACM waste as the work progresses to prevent exceeding available storage capacity on-site.

3.02 UNANTICIPATED HAZARDS

- A. Should the Contractor suspect, encounter or have knowledge of any hazards not listed or described in the contract documents, the Contractor is responsible for informing the Environmental Consultant immediately and prior to disturbing or causing any action that could result in a release of any suspected or confirmed hazardous material to the work area or surrounding environment.
- B. If other hazardous materials are discovered during ACM removal activities, notify the Environmental Consultant immediately. Cordon off area to prevent contamination of clean areas. Collect a representative sample of the material for identification. Estimate quantities of additional suspect hazardous materials and submit documentation to the Environmental Consultant.

3.03 PRECAUTIONS

- A. Post "Danger" signs at entrances of ACM removal area.
- B. Remove friable asbestos before demolition.
- C. Wet asbestos, except asbestos to be encapsulated.
- D. Isolate and contain asbestos that is removed or encapsulated.
- E. Use appropriate work practices to minimize dispersal of particulate ACM.
- F. Leave no visible residue of ACM after completing the project.

3.04 DISPOSAL

- A. All asbestos waste shall be disposed of at an approved landfill within the State of Maryland.
- B. For hauling and disposal, comply with EPA 40 CFR 61 – National Emission Standards for Hazardous Air Pollutants, Subpart M, and state and local standards. Ensure workers unloading material wear appropriate PPE when handling asbestos materials at the disposal site.
- C. Sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for re-bagging. Clean entire truck and contents using procedures set forth in Section 01711 Project Decontamination.
- D. Retain receipts from landfill or processor for all materials disposed of.
- E. No later than 10 days after disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to the Consultant or his designee. Complete a waste disposal record at the time of shipment.

END OF SECTION 02084

SECTION 02085 - REMOVAL AND DISPOSAL OF MATERIAL CONTAINING LEAD

PART 1 - GENERAL

1.01 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2 (1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z88.2 (1992) Respiratory Protection

CODE OF FEDERAL REGULATIONS (CFR)

| | |
|-----------------|---|
| 29 CFR 1926.21 | Safety Training and Education |
| 29 CFR 1926.33 | Access to Employee Exposure and Medical Records |
| 29 CFR 1926.55 | Gases, Vapors, Fumes, Dusts, and Mists |
| 29 CFR 1926.59 | Hazard Communication |
| 29 CFR 1926.62 | Lead Exposure in Construction |
| 29 CFR 1926.65 | Hazardous Waste Operations and Emergency Response |
| 29 CFR 1926.103 | Respiratory Protection |
| 40 CFR 260 | Hazardous Waste Management Systems: General |
| 40 CFR 261 | Identification and Listing of Hazardous Waste |
| 40 CFR 262 | Generators of Hazardous Waste |
| 40 CFR 263 | Transporters of Hazardous Waste |
| 40 CFR 264 | MSAs and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 40 CFR 265 | Interim Status Standard for MSAs and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 40 CFR 268 | Land Disposal Restrictions |
| 40 CFR 745 | Lead; Requirements for Lead-Based Paint Activities |

| | |
|------------|---|
| 49 CFR 172 | Hazardous Materials, Tables, and Hazardous Materials Communications Regulations |
| 49 CFR 178 | Shipping Container Specification |

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD Guidelines (June 1995) Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing

UNDERWRITERS LABORATORIES INC. (UL) UL 586

(1990; R1995) High-Efficiency,

Particulate, Air Filter Units

STATE OF MARYLAND REGULATIONS

Annotated Code of Maryland (COMAR) –

Title 26 Department of the Environment

Subtitle 16 Lead (26.16.01 through 26.16.04)

1.02 DEFINITIONS

- A. Action Level: Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period.
- B. Area Sampling: Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).
- C. Competent Person (CP): As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current Federal and State of Maryland regulations, is a State of Maryland Lead Supervisor, and has the authority to take prompt corrective actions to control the lead hazard. An Industrial Hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals is preferred.
- D. Contaminated Room: Room for removal of contaminated personal protective equipment (PPE).
- E. Decontamination Shower Facility: That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.
- F. Eight-Hour Time Weighted Average (TWA): Airborne concentration of lead to which an employee is exposed, averaged over an 8-hour workday as indicated in 29 CFR 1926.62.
- G. High Efficiency Particulate Air (HEPA) Filter Equipment: HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3-micron diameter or larger size particles.

- H. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.
- I. Material Containing Lead (MCL): Any material which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section do not apply if no detectable levels of lead are found using a valid detection method.
- J. Lead-Based Paint (LBP): The definition for lead-based paint is based upon the Maryland Department of the Environment (MDE) and defined as any paint, or other surface coating, containing lead or lead in its compounds, in any quantity at or above the MDE standard of 0.7 mg/cm² by XRF, or 0.5% by dry weight, on one or more of the components or in any quantity sufficient to constitute a health or environmental hazard.
- K. Note that lead may still be present and hazardous leaded dust may be generated during modernization, renovation, remodeling, maintenance or other disturbances of painted surfaces.
- L. Lead Control Area: A temporary area or structure or containment, sometimes equipped with HEPA filtered local exhaust that prevents the spread of lead dust or debris. Usually critical barriers and physical boundaries are employed to isolate the lead control area and to prevent migration of lead contamination and unauthorized entry of personnel.
- M. Lead Permissible Exposure Limit (PEL): Fifty micrograms per cubic meter (50 µg/m³) of air as an 8-hour time weighted average as determined by 29 CFR 1926.62.
- N. Personal Sampling: Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of six to nine inches and centered at the nose or mouth of an employee.
- O. Physical Boundary: Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.03 DESCRIPTION OF WORK

- A. It is the intent of this specification to perform demolition of structures, which include materials that contain lead. The contractor shall adhere to all applicable regulations and the requirements contained or referenced by this specification in order to protect employees and the public from exposure to lead and other hazardous contaminants.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section entitled "Submittal Procedures."
 - 1. Manufacturer's Catalog Data
 - a. Vacuum filters
 - b. Respirators
 - 2. Instructions
 - a. Chemicals and equipment
 - b. Safety data sheets for all chemicals
 - 3. Statements

- a. Qualifications of Competent Person (CP), including State of Maryland Lead Supervisor Certification
 - b. Testing laboratory qualifications
 - c. Third party consultant qualifications
 - d. Material Containing Lead Removal Plan including CP approval (signature, date, and certification number)
 - e. Rental equipment notification
 - f. Respiratory protection program
 - g. Hazard communication program
 - h. EPA approved hazardous waste treatment or disposal facility for lead disposal
 - i. EPA approved hazardous waste transporter name, address, phone number and EPA identification number
 - j. Hazardous waste management plan
 - k. Assessment data report
 - l. State of Maryland Contractor Lead License as applicable
 - m. State of Maryland Lead "Abatement Worker Certification" as applicable
4. Qualifications of Competent Person: Submit name, address, and telephone number of the Component Person selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained, licensed and certified in accordance with all applicable Federal and State of Maryland laws.
 5. Contractor Testing Laboratory: Submit the name, address, and telephone number of the testing laboratory selected to perform the air sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis.
 6. Material Containing Lead Removal Plan (MCLRP): Submit a detailed job-specific plan of the work procedures to be used in the removal of MCL. The plan shall include sketches showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not reached or exceeded outside of the lead control area. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air-sampling portion of the plan.
 7. Contractor's Third Party Consultant Qualifications: Submit the name, address and telephone number of the third party consultant selected to perform the wipe sampling for determining

concentrations of lead in dust. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor authorized by the USEPA, State of Maryland certification and accreditation programs.

B. Field Test Reports

1. Sampling results
2. Assessment Data Report
3. Occupational and Environmental Sampling Results: Submit occupational and environmental sampling results to the MSA/MSA's Authorized Representative within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.
 - a. The sampling results shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead.
 - b. Submit worker exposure data conducted during the task-based trigger operations of 29 CFR 1926.62.
 - c. The initial monitoring shall determine the requirements for further monitoring and the need to fully implement the control and protective requirements including the compliance program (MCLRP) per 29 CFR 1926.62.
4. Occupational and Environmental Assessment Data Report: Some MCL removal work may not require full implementation of the requirements of 29 CFR 1926.62. Based on the experience of the Contractor and/or the use of a specific process or method for performing the work, the Contractor may be able to provide historic data (previous 12 months) to demonstrate that airborne exposures are controlled below the action level. Such methods or controls shall be fully presented in the MCLRP. In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation in an Assessment Data Report. Submit occupational and environmental assessment report to the MSA/MSA's Authorized Representative prior to start of work, signed by the testing laboratory employee performing the analysis, and the CP.
 - a. Submit a report that supports the determination regarding the reduction of the need to fully implement the requirements of 29 CFR 1926.62 and supporting the MCLRP. The exposure assessment shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.
 - b. Submit worker exposure data conducted during the task based trigger operations of 29 CFR 1926.62 with a complete process description in supporting a negative assessment.
 - c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the compliance program (MCLRP) per 29 CFR 1926.62.

C. Certificates

1. Vacuum filters

D. Records

1. Completed and signed hazardous waste manifest from treatment or disposal facility
2. Certification of medical examinations
3. Employee training certification

1.05 QUALITY ASSURANCE

A. Medical Examinations: Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103.

1. Medical Records: Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.
2. Medical Surveillance: Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62.

B. Competent Person (CP) Responsibilities: Certify training as meeting all Federal and State of Maryland requirements.

1. Review and approve Material Containing Lead Removal Plan (MCLRP) for conformance to the applicable referenced standards.
2. Continuously inspect MCL removal work for conformance with the approved plan.
3. Perform air and non-clearance type wipe sampling.
4. Ensure work is performed in strict accordance with specifications and all applicable regulations at all times.
5. Control work to prevent hazardous exposure to human beings and to the environment at all times.
6. Certify the conditions of the work as called for elsewhere in this specification.

C. Training: Train each employee performing lead removal work, MCL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and the State of Maryland regulations where appropriate.

1. Training Certification: Submit State of Maryland certificate of accreditation for each employee, stating that the employee has received the required lead training.

D. Respiratory Protection Program: Furnish each employee required to wear a respirator with a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

1. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

- E. Hazard Communication Program: Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.
- F. Hazardous Waste Management: The Hazardous Waste Management Plan shall comply with applicable requirements of Federal and State of Maryland hazardous waste regulations and address:
 - 1. Identification and classification of hazardous wastes associated with the work.
 - 2. Estimated quantities of wastes to be generated and disposed.
 - 3. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of USEPA and State of Maryland hazardous waste manifests and USEPA Identification numbers.
 - 4. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
 - 5. List of waste handling equipment to be used in performing the work, to include cleaning, and transport equipment.
 - 6. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.
 - 7. Work plan and schedule for waste containment, removal and disposal. Wastes will be cleaned up and containerized daily.
- G. Environmental, Safety and Health Compliance: In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal and State of Maryland authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the MSA/MSA's Authorized Representative for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply. All State of Maryland laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials apply. Licensing and certification in the State of Maryland is required.
- H. Pre-Construction Conference: Along with the CP, meet with the MSA/MSA's Authorized Representative to discuss in detail the Hazardous Waste Management Plan and the Material Containing Lead Removal Plan, including work procedures and precautions for the removal plan.

1.06 EQUIPMENT

- A. Respirators: Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators and cartridges shall comply with the requirements of 29 CFR 1926.62 and 42 CFR.
- B. Special Protective Clothing: Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. The level of protection may be reduced only after obtaining approval from the CP.

- C. Rental Equipment Notification: If rental equipment is to be used during MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the MSA/MSA's Authorized Representative.
- D. Vacuum Filters: UL 586 labeled HEPA filters.

PART 2 - PRODUCTS

2.01 CHEMICALS

- A. Submit applicable Safety Data Sheets (SDSs), compliant with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), for all chemicals used in lead removal work. Use the least toxic product approved by the MSA/MSA's Authorized Representative.

PART 3 - EXECUTION

3.01 PROTECTION

- A. Notification: Notify the MSA/MSA's Authorized Representative 10 days prior to the start of any lead work.
- B. Lead Control Area Requirements: Establish a lead control area by completely establishing critical barriers and physical boundaries around the area or structure where MCL removal operations will be performed.
- C. Protection of Existing Work to Remain: Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the MSA/MSA's Authorized Representative.
- D. Boundary Requirements:
 - 1. Physical Boundary: Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.
 - 2. Warning Signs: Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.
- E. Heating, Ventilating and Air Conditioning (HVAC) Systems: Shut down, lock out, and isolate 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.
- F. Decontamination Shower Facility: Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.
- G. Eye Wash Station: Where eyes may be exposed to injurious corrosive materials and chemicals, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.
- H. Mechanical Ventilation System: Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.

1. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with ANSI Z9.2.
 2. Vent local exhaust outside the building only and away from building ventilation intakes.
 3. Use locally exhausted, power actuated tools or manual hand tools.
- I. Personnel Protection: Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.
- J. Mass demolition will follow the wet / wet protocols described herein to protect the public from exposure to dust that may contain lead or other hazards.

3.02 WORK PROCEDURES

- A. Perform lead work in accordance with approved MCLRP. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when lead hazard abatement is performed in accordance with 29 CFR 1926.62 40 CFR 745, and as specified herein. Handle and dispose of all MCL and associated waste in compliance with Federal and State of Maryland requirements.
1. Personnel Exiting Procedures: Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:
 - a. HEPA vacuum themselves off.
 - b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.
 - c. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, and shower.
 - d. Change to clean clothes prior to leaving the clean clothes storage area.
 2. Air and Wipe Sampling: Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and non-clearance wipe sampling shall be directed or performed by the CP.
 - a. The CP shall be on the job site directing the air and non-clearance wipe sampling and inspecting the MCL removal work to ensure that the requirements of the contract have been satisfied during the entire MCL operation.
 - b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
 - c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken. Notify the MSA/MSA's Authorized Representative immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.
 - i. Air Sampling During Material Containing Lead Removal Work: Conduct area air sampling at least daily in areas immediately adjacent to the lead control area on each

shift in which lead hazard abatement operations are performed. Sufficient area monitoring shall be conducted to ensure unprotected personnel outside of the control area are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the condition(s) causing the increased levels. Notify the MSA/MSA's Authorized Representative immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after approval is given by the CP and the MSA/MSA's Authorized Representative. For outdoor operations, at least one sample on each work shift shall be taken on the downwind side of the lead control area at a site selected by the CP and approved in advance by the MSA/MSA's Authorized Representative.

- B. Material Containing Lead Removal: Manual or power sanding or grinding of MCL is not permitted. Provide methodology for removing MCL in the MCLRP. Select MCL removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris/waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this MCL removal process in the MCLRP.
1. Material Containing Lead - Indoor Removal: Perform removal in the lead control areas using enclosures, barriers or containments. This includes the construction of a durable critical partition between the portion of the structure to be demolished and the portion to remain. Collect debris for disposal in accordance with Federal and State of Maryland requirements.
 2. Material Containing Lead - Outdoor Removal: Perform outdoor removal as indicated in Federal and State of Maryland regulations and in the MCLRP. The work site preparation (barriers or containments) shall be job dependent and presented in the MCLRP.
 3. Sampling After MCL Removal: After the visual inspection, collect air samples inside and outside the lead control area. Collect wipe samples as required by all applicable Federal, State and local regulations.
- C. Cleanup and Disposal
1. Cleanup: Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the MCLRP. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before clearance testing.
 2. Clearance Certification: The CP shall certify in writing that the final air and wipe samples collected inside and outside the lead control area are less than 30 micrograms per cubic meter of air or less than established wipe sample clearance criteria; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62 and 40 CFR 745; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the MSA/MSA's Authorized Representative's acknowledgment of receipt of the CP certification. The durable critical barrier will remain until its removal is warranted by the renovation of the remaining structure.

3. Testing of Material Containing Lead Residue: Test MCL residue in accordance with 40 CFR 261 for hazardous waste.
4. Disposal: All material, whether hazardous or non-hazardous shall be disposed in accordance with all laws and provisions and all Federal and State of Maryland regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.
 - a. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261. Dispose of lead-contaminated waste material at an approved hazardous waste treatment, storage, or disposal facility.
 - b. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55-gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. The MSA/MSA's Authorized Representative or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.
 - c. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, and State of Maryland Regulations. Comply with land disposal restriction notification requirements as required by 40 CFR 268 and State of Maryland Regulations.
- D. Disposal Documentation: Submit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and State or local regulatory agencies. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.
- E. Final Payment: Final payment will not be made until signed copies of all manifests from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished.

END OF SECTION 02085

SECTION 02086 - HAZARDOUS WASTE MANAGEMENT

PART 1 - GENERAL

1.01 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.

1.02 RELATED SECTIONS

- A. Section 01092 Codes and Regulations
- B. Section 02081 Removal of Asbestos-Containing Materials
- C. Section 02084 Disposal of Asbestos-Containing Materials
- D. Section 02085 Removal and Disposal of Materials Containing Lead

1.03 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.

1.04 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 MSA and Designer 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:
 - i. Title 49, Part 171 and 172 of the Code of Federal Regulations
 - b. Hazardous Material Regulations:
 - i. General Awareness and Training Requirements for Handlers, Loaders and Drivers
 - ii. Title 49, Parts 171-180 of the Code of Federal Regulations

- c. Hazardous Material Regulations
 - i. Editorial and Technical Revisions
 - ii. Title 49, Parts 171-180 of the Code of Federal Regulations
- 2. EPA: U. S. Environmental Protection Agency (EPA), including but not limited to:
 - a. Management of Hazardous Wastes Resource Conservation and Recovery Act (RCRA)
 - i. Title 40, Parts 260- 268 of the Code of Federal Regulations
- D. State Requirements: which govern the management, hauling and disposal of hazardous waste include but are not limited to the following:
 - 1. MDE: Maryland Department of the Environment, including but not limited to:
 - a. Title 26, Subtitle 13, of the Code of Maryland Regulations Disposal of Controlled Hazardous Substances.
- E. Local Requirements: Abide by all local requirements which govern the management, hauling and disposal of hazardous waste.

1.05 DEFINITIONS

- A. Toxicity Characteristic Leaching Procedure (TCLP): A laboratory test method to determine the mobility of both organic and inorganic analyses present in liquid, solid, and multiphasic wastes performed in accordance with test methods required under 40 CFR Part 268.

1.06 SUBMITTALS

- A. Before Start of Work: Submit the following to the MSA for review. Do not start work until these submittals are returned with MSA's action stamp 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
 - 4. Specimen copy of Uniform Hazardous Waste Manifest form.
 - 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.
 - 8. Submit copies of a valid training certificate for all employees involved in work related to hazardous materials as defined by OSHA under 29 CFR 1910.120.
- 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 MSA.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Disposal Bags: Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags.
- B. DOT Hazardous Waste Disposal Drums: Provide DOT 17-H or equivalent Open -Top Drums (55 gallon) in accordance with DOT regulations title 49 CFR Parts 173, 178, and 179.
- C. DOT Hazardous Waste Labels: in accordance with DOT regulations Title 49 CFR parts 173, 178, and 179.

PART 3 - EXECUTION

3.01 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.
- C. Training Certification – Train each employee performing work related to the removal, handling, transportation, treatment, storage and/or disposal of hazardous materials prior to the time of the initial job assignment and annually thereafter, in accordance with 29 CFR 1910.120 and the State of Maryland regulations where appropriate. Submit proper valid documentation for each employee which illustrates that he has successfully completed an accredited training course as defined by applicable federal, state and local regulations.

3.02 HAZARDOUS WASTE DESIGNATION

- A. Where not otherwise designated by the MSA as Hazardous waste, characterize all suspect waste products by conducting representative TCLP testing.
- B. Representative sampling of waste products will be in accordance with EPA Document SW 846.
- C. TCLP test analysis will be performed in accordance with EPA Method 1311.

3.03 HAZARDOUS WASTE

- A. The following waste products are designated by the MSA 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.

3.04 SCOPE OF WORK

- A. Work included under this contract involves the removal and disposal of PCB and mercury containing waste materials from designated structures at the site. The work shall be conducted to support the demolition of the buildings located on the subject site. Quantities of materials to be removed are not provided. It shall be the responsibility of the Contractor to estimate quantities to his own satisfaction prior to submitting a bid.
 1. If the Contractor bids for this work, this shall indicate acceptance of the Scope of Work that includes removal of all described materials, regardless of quantity.

3.05 HAZARDOUS WASTE PACKAGING AND LABELING

- A. Package each segregated Hazardous Waste Type A and B, in specified containers as follows. **IMPORTANT: Do Not Mix Waste Streams:**
 1. Waste Type A
 - a. Package in DOT 17-H or equivalent Open-Top Drums
 - b. Fill to capacity only with Waste Type A (Do Not Mix Waste Stream types).
 - c. Install gasket on lid, apply lock ring, and seal.
 - d. Apply Hazardous Waste Label to drum side.
 - e. Enter DOT Shipping Data as follows: RQ Waste Polychlorinated Biphenyls, 9, UN-2315, PG-II, (M001).
 - f. 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 or equivalent 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 or equivalent Open-Top Drum and seal with duct tape.
 3. Install gasket on lid, apply lock ring, and seal.
 4. Apply Hazardous Waste Label to drum side.
 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.

3.06 TEMPORARY STORAGE

- A. Partially filled containers of hazardous waste may be stored at the work site for intermittent packaging provided that:
 - 1. Each container is properly labeled when it is first placed in service;
 - 2. Each container remains closed at all times except when compatible waste types are added; and
 - 3. When moved from site to site, each container remains within the geographic boundaries of the facility without moving nor crossing public access highways.

3.07 REMOVAL OF HAZARDOUS WASTES:

- A. 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.
- B. Transporting filled containers from the work site to an approved disposal site or recycling center.
- C. 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.
- D. Do not remove, or cause to be removed, hazardous waste from MSA's property without a legally executed Uniform Hazardous Waste manifest.
- E. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Designer.

3.08 RECYCLING AND RECOVERY

- A. 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.

3.09 BACK CHARGES

- A. Where Contractor fails to fulfill packaging, handling, transport or disposal requirements as outlined herein, MSA will charge back to the Contractor all costs associated with ensuring that hazardous wastes are segregated, packaged, transported and disposed of in accordance with all applicable Federal and State regulations.
 - 1. Environmental pollution of MSA's property or areas surrounding the project area resulting from Contractor's hazardous waste management activities will be promptly remediated to the MSA's sole satisfaction, and at the Contractor's sole expense.
 - 2. Contractor agrees to either reimburse the MSA, or reduce the Contract amount by change order to cover all costs associated with waste re-packaging, waste re-segregation, or pollution remediation efforts.

3.10 REMOVAL OF NON-HAZARDOUS WASTE MATERIALS

- A. Transport and legally dispose of non-hazardous waste products, materials, residues and refuse at a location in compliance with all Federal, state and local regulations.
- 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 Safety Data Sheet (SDS) 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 minimus* or trace contamination, as determined by visual inspection by MSA’s Representative.
- 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 02221 - BUILDING DEMOLITION

PART 1 - GENERAL

1.01 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. Project CORE Work Execution Protocols.
- C. Environmental Consultant Project Specific Inspection Report.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Pre-demolition activities
 - 2. Demolition and removal of buildings and site improvements.
 - 3. Abandoning in place and removing below-grade construction.
 - 4. Salvaging items for reuse.
- B. Related Sections include the following:
 - 1. Section 01732 - Selective Demolition (Deconstruction) for the partial demolition of buildings, structures, and site improvements associated with salvage operations.
 - 2. Section 02230 - Site Clearing for site clearing and removal of above- and below-grade site improvements not included under building demolition.

1.03 DEFINITIONS

- A. Demolish: Completely remove and legally dispose of off-site.
- B. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.
- C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to approved transfer location. Include fasteners or brackets needed for reattachment elsewhere.

1.04 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste removed from the site is the property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to MSA that may be uncovered during demolition remain the property of MSA.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to MSA.

1.05 SUBMITTALS

- A. Asbestos Containing Material (ACM), Lead-Based Paint and Hazardous Material Survey: Prior to the initiation of demolition activities, the Environmental Consultant will complete a Hazardous Material Survey. The survey will detail the locations, quantities, condition, and containment/removal procedures required for the safe and proper disposal of the material. MSA will provide the demolition Contractor with the Hazardous Material Survey as part of the contracting process.
 - 1. As identified in the Hazardous Material Survey, hazardous/regulated materials including, but not limited to: petroleum products, solvents, aerosol cans, above- and underground storage tanks, polychlorinated biphenyl (PCB) containing materials, chlorofluorocarbon (CFC) containing material, batteries, cathode ray tube (CRT) devices, exit signs, leaded glass, paints, fluorescent lighting, mercury containing equipment and unidentified chemical mixtures, will be removed and disposed of by a Contractor designated licensed hazardous waste handler.
 - 2. If an unidentified hazardous item is encountered during the work, the Contractor will immediately notify MSA and the Environmental Consultant for direction and implementation of proper handling procedures.
- B. Pre-Demolition Survey: No later than 5 days prior to start of demolition activities, the Contractor will complete and submit a report to MSA documenting the structural condition of all buildings to be removed and buildings to remain within and adjacent to the contract limits. The report will identify for each structure, areas suitable for deconstruction activities included in Section 01732 - Selective Demolition (Deconstruction); pre-demolition hazardous material abatement and removal; and other required pre-demolition activities. The report must be signed and sealed by a professional engineer licensed in the State of Maryland.
 - 1. Report will also include details describing the Contractor's proposed methods for any necessary temporary supports for building demolition.
- C. Qualification Data:
 - 1. All personnel working within the site perimeter will be properly trained to complete the required demolition task, familiarized with the site-specific health and safety plan prior to admittance onto the site.
 - 2. Hazardous material handling and disposal will only be performed by a licensed professional in accordance with the Site-Specific work plan and under applicable Maryland Occupational Safety and Health (MOSH) conditions.
 - a. Workplace air lead concentrations must be maintained below the Permissible Exposure Limit (PEL) of $50 \mu\text{g}/\text{m}^3$ of air, averaged over an 8-hour workday. Workplace air lead concentrations at or above the $30 \mu\text{g}/\text{m}^3$ action level requires periodic monitoring of worker blood lead levels.
- D. Proposed Protection Measures: Submit informational report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- E. Schedule of Building Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
- F. Building Demolition Plans: Drawings indicating the following:
 - 1. Locations of temporary protection and means of egress for adjacent occupied buildings.

- G. Inventory: Submit a list of items to be removed and salvaged and deliver to MSA prior to start of demolition.
- H. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- J. The City of Baltimore will prepare demolition permit application. Contractor shall complete all predemolition activities as required by the permit including rodenticide and hazardous material abatement. The Contractor will be responsible for obtaining the demolition permit from the City of Baltimore prior to commencing demolition

1.06 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Pre-demolition Conference: Review methods and procedures related to building demolition including, but not limited to, the following:
 1. Inspect and discuss condition of construction to be demolished.
 2. Review structural load limitations of existing structures.
 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review and finalize protection requirements.
 5. Review procedures for noise control and dust control.
 6. Review procedures for protection of adjacent buildings.
 7. Review items to be salvaged.

1.07 PROJECT CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area may be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 1. Provide ten (10) day Public Notice of Demolition .
 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

- a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. MSA assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Baltimore City as far as practical.
- D. Hazardous Materials: Hazardous materials are present in buildings and structures to be demolished. The Contractor will be required to confirm information provided prior to bid to assess hazardous materials prior to demolition
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
- E. On-site storage or sale of removed items or materials is not permitted.
- F. It is the intention of MSA to recycle as much of the acceptable demolition debris as feasible, with a minimum of 30% recycled per City of Baltimore requirement. The Contractor, therefore, may be required to source separate certain materials that have recycling potential. These items include structural steel, concrete, bricks (excluding refractory type), lumber, plaster and plasterboard, insulation material, cement, shingles and roofing material, floor and wall tile, asphalt, pipes and wires, and other items physically attached to the structure, including appliances if they have been or will be compacted to their smallest practical volume.

1.08 SCHEDULING

- A. Construction Scheduling – Within seven (7) calendar days of notice to proceed the Contractors shall submit a schedule conforming to Section 110 of the MSHA Standard Specifications for Construction and Materials (2001). All requirements for the initial activities chart, revisions, updates, meetings and time extensions will apply to these contracts.
- B. Two Week Coordination Schedule – The Contractor will submit two-week coordination schedules to MSA on a bi-weekly basis describing the planned work activities for each period. These schedules will be used for agency coordination, utility coordination, testing, and coordination with other parties.
- C. Special Work Hours – City regulations and noise ordinances apply. All work must be performed during permissible work hours. Special permission may be requested from the MSA for any necessary night work required on emergency basis only. Absolutely, no impact demolition equipment of any kind may be operated after 9 pm.

1.09 COORDINATION

- A. Reference is made to the Protocol Document included in the Contract. Each Demolition Contractor will coordinate with other parties that will have full access to the site (contract limits), as well as adjacent areas. Specifically:
 - 1. Each Demolition Contractor will provide full and unrestricted access for representatives, consultants, testing agencies, inspection agencies and agents of MSA to the sites. Testing, monitoring and inspection will be on-going activities throughout the durations of the contract.

2. Each Demolition Contractor will provide full and unrestricted access when requested by MSA for surveys, geotechnical sampling and investigation, engineering studies, evaluations, inspections, etc. that may be necessary for future construction in the work areas.
3. 6. Each Demolition Contractor will coordinate with MSA, City agencies, government agencies, and utilities (including but not limited to BGE, Verizon, Comcast, City Water & Sewer, and City Street Lighting & Electric). Access will be coordinated and provided to each agency or utility when required.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Division 2 Section "Earthwork."

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction provided by the MSA. The MSA does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Inventory and record the condition of items to be removed and salvaged.
- D. Engage a professional engineer to perform an engineering survey of condition of buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
 1. Submit report (no later than 5 days prior to start of demolition activities) certified by a Maryland Professional Engineer to MSA for review and acceptance.
 2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
 3. Existing buildings that are structurally unsound shall be identified in the report. These building will not incorporate deconstruction operations prior to demolition.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

- A. Refrigerant: Remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction before starting demolition.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of demolition.
- C. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until removed from the project site
4. Transport items to approved transfer location.
5. Protect items from damage during transport and storage.

3.03 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.
 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by MSA and authorities having jurisdiction.
 2. Provide temporary services during interruptions to existing utilities, as acceptable to MSA and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.
 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- D. Remove temporary barriers and protections where hazards no longer exist unless otherwise directed by MSA. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.04 DEMOLITION, GENERAL

- A. Demolition will be executed in a safe and coordinated manner, preventing or mitigating any additional risks for the general public or workers.

- B. All demolition contractors and sub-contractors must wear all appropriate Personal Protective Equipment (PPE) while onsite. The Contractor will enforce strict PPE use during demolition activities and the Environmental Consultant will monitor for implementation of the site-specific Health and Safety Plan (HASP). Monitoring activities do not relieve the Contractor of responsibility for implementation of health and safety on the demolition site.
- C. Demolish indicated existing buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and for at least 4-hours after flame cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
 - 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Avoid or minimize impediment of public roads, streets, walkways or neighboring properties.
 - 6. Ensure a safe route for the continued passage of pedestrians and vehicles around the demolition site.
- D. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.
- E. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from MSA and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. Use water in accordance with the Project Execution Protocols outlined herein to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- F. Explosives: Use of explosives is not permitted.

3.05 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 - 1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- D. Existing Utilities: Unless otherwise noted, demolish existing utilities and below-grade utility structures that are within the limits shown. Abandon utilities outside this area.

1. Remove existing utilities within 4' of finished grade.
2. Fill abandoned utility structures with satisfactory soil materials.
3. Piping: Disconnect piping at unions, flanges, valves, or fittings.
4. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.

3.06 SITE RESTORATION

- A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Division 2 Section "Earthwork."
- B. Site Grading:
 1. Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.
 2. Soil removal and backfill will not occur until whole block demolition (contiguous site) has occurred to avoid recontamination of backfill. Soil should be lightly wetted prior to removal.

3.07 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Removal of demolition debris should begin within 48 hours of commencing demolition operations and is to be completed no later than 14 days from the completion of demolition.
 4. Debris piles must not exceed height of temporary fencing installed around perimeter of the site.
 5. Roll off bins and dump trucks shall not be parked in front of occupied houses during debris removal.
 6. Provide effective wetting during debris removal to reduce dust emissions. Dumpsters will also receive regular wetting to reduce dust.
 7. Provide removal and handling of demolition debris utilizing tightly sealed secure and non-permeable coverings on trucks and dumpsters.
- B. Do not burn demolished materials.

3.09 CLEANING

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

END OF SECTION 02221

SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.01 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. Project C.O.R.E. Work Execution Protocols

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees to remain.
 - 2. Removing existing trees, shrubs, groundcovers, plants, and grass.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Temporary erosion and sedimentation control measures.
- B. Related Sections include the following:
 - 1. Division 1 Section "Selective Demolition" for partial demolition of buildings or structures undergoing alterations.
 - 2. Division 2 Section "Building Demolition" for demolition of buildings, structures, and site improvements.
 - 3. Division 2 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

1.03 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

1.04 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain Baltimore City owned property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.05 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from MSA and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."
 - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to MSA.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and sediment and erosion control Drawings.
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 UTILITIES

- A. Contractor will confirm that utilities have been disconnected, and sealed or capped off by others, as necessary, within Limit of Work.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by existing occupants or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify MDS not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without MSA's written permission.
- C. Excavate for and remove underground utilities indicated to be removed as necessary within Limit of Work.

3.04 CLEARING AND GRUBBING

- A. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
- B. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- C. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
- D. Use only hand methods for grubbing within tree protection zone.
- E. Chip removed tree branches and dispose of off-site.
- F. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of eight inches (8"), and compact each layer to a density equal to adjacent original ground.

3.05 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Dispose of excess topsoil as specified for waste material disposal.

3.06 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated.
- B. Remove slabs, paving, curbs, gutters, sidewalks and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.07 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off of Baltimore City property.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.01 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. Project C.O.R.E. Work Execution Protocols

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Preparing subgrades for future slabs-on-grade, pavements and foundations.
 - 2. Excavating and backfilling for buildings and structures.
- B. Related Sections include the following:
 - 1. Division 2 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.

1.03 DEFINITIONS

- A. Backfill: Satisfactory soil material or controlled low-strength material used to fill an excavation.
- B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- E. Fill: Soil materials used to raise existing grades.
- F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- G. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 SUBMITTALS

- A. Product Data: For the following:
 - 1. Geotextile.
 - 2. Controlled low-strength material, including design mixture.
- B. Samples: 12-by-12-inch sample of geotextile.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D 698 for each on-site and borrow soil material proposed for fill and backfill.
- D. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.05 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by MSA or others unless permitted in writing by MSA and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify MSA not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without MSA's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Confirm utility services shut-off prior to proceeding.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups; free of rock or gravel larger than 6-inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

2.02 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 - 3. Sewn Seam Strength: 142 lbf ASTM D 4632.
 - 4. Tear Strength: 56 lbf; ASTM D 4533.
 - 5. Puncture Strength: 56 lbf; ASTM D 4833.
 - 6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
 - 7. Permittivity: 0.5 per second, minimum; ASTM D 4491.
 - 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
 - 3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
 - 4. Tear Strength: 90 lbf; ASTM D 4533.
 - 5. Puncture Strength: 90 lbf; ASTM D 4833.
 - 6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 - 7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 - 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.03 CONTROLLED LOW-STRENGTH MATERIAL

- A. Produce conventional-weight, controlled low-strength material with 140-psi compressive strength when tested according to ASTM C 495.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.
- D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.02 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
- B. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
 - 1. 1. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

3.05 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.06 SUBGRADE INSPECTION

- A. Notify MSA when excavations have reached required subgrade.
- B. If MSA determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 - a. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by MSA, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by MSA, without additional compensation.

3.07 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation with engineered fill as directed by MSA.

3.08 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials: Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.09 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Testing and inspecting underground utilities.
 - 2. Removing trash and debris.
 - 3. Removing temporary shoring and bracing, and sheeting.
 - 4. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact engineered fill material in layers to required elevations.

- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Scarify and recompact top twelve inches (12") of existing subgrade and each layer of backfill or fill soil material at 95 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
 - 2. Walks: Plus or minus 1 inch.
 - 3. Pavements: Plus or minus 1/2 inch.

3.14 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
 - 1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place base course material over subbase course under hot-mix asphalt pavement.
 - 3. Shape subbase and base course to required crown elevations and cross-slope grades.

4. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 SEEDING

A. The disturbed areas shall be vegetated with permanent seeding as follows:

1. Seedbed preparation: Area to be seeded shall receive 4 inches of topsoil. Also, the areas to be seeded shall be amended with the addition of 2 inches of fully composted organic material. The compost shall be incorporated into the top 6 inches of soil through discing or roto-tilling.
2. Seeding Application (Hydrosee/Hydo-Mulch acceptable)
 - a. Spring Seeding Season (March 1 to May 31). Apply 3 lbs. per 1,000 square feet (130 lbs. per acre) Zoysiagrass (as per recommended cultivars, University of Maryland Turfgrass Technical Updated TT-77), plus 1 lb. per 3,000 square feet (13 lbs. per acre) White Clover.
 - b. Summer Seeding Season (Jun 1 to August 31). Apply the same as Spring Season. Reseed in the Fall season with Hard Fescue and White Clover
 - c. Fall Season (September 1 to October 31). Apply 3 lbs. per 1,000 square feet (130 lbs. per acre) Hard Fescue (as per recommended cultivars, University of Maryland Turfgrass Technical Updated TT-77), plus 1 lb. per 3,000 square feet (13 lbs. per acre) White Clover.
 - d. Winter Season (November 1 to February 28). Apply the same as Fall Season plus 22 lbs. per acre of Rye Grain.
3. When requested, the following alternative seed mix may be applied during any of the above seasons: Maryland State Highway Administration (SHA) Turfgrass Mixture (Pure Seed): 50% Houndog 5 Tall Fescue, 45% Bingo Tall Fescue & 5% Raven Kentucky Bluegrass (all 90% germination).
4. Seed shall be applied uniformly with a cyclone seeded frill, cultipacker seeder or hydroseeder (slurry includes seeds and fertilizer, recommended on steep slopes only) on a moist, firm seedbed. Maximum seed depth should be ½" in clayey soils and ½" in sandy soil when using other than the hydroseeder method. If soil moisture is deficient to support adequate growth, irrigation should be employed until vegetation is firmly established.
5. Hydroseeding
 - a. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
 - b. Mix slurry with non-asphaltic or asphalt-emulsion or fiber mulch manufacturer's recommended, as directed, tackifier.
 - c. Apply slurry uniformly to all areas to be seed in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1,500 lb/acre (15.6 kg / 92.9sq. m) dry weight, and seed component is deposited at not less than the specified

seed sowing rate. Or apply slurry uniformly to all areas to be seeded in a two step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre (5.2-kg/92.5 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydro mulching) at a rate of 1,000 lb/acre (10.4 kg /92.9 sq. m)

6. Topsoil

- a. ASTM D5268 topsoil, with PH range of 5.5 to 7, a minimum of 2 percent organic material content.

7. Mulching: Mulch shall be approved small grain straw or approved hydro-mulch. Mulch shall be un-chopped, un-rotted, small grain straw applied at a rate of 70 to 90 lbs. per 1,000 square feet. Mulch materials shall be relatively free of all kinds of weeds and shall be free of prohibited noxious weeds which are Canada Thistle, Johnson-grass and Quack-grass. Spread mulch mechanically or uniformly by hand; mulch anchoring shall be accomplished immediately after mulch placement to minimize loss by wind or water. This may be done by one of the following methods: Mulch anchoring tool, tracking, mulch netting, liquid mulch binders, wood cellulose fiber or peg and twine. Proper execution of these provisions, resulting in a full healthy growth of grass shall be a criterion for accepting the site as completed. The Contractor shall not be relieved of this responsibility in the event the site is accepted prior to a full healthy growth of grass being established.

8. Compost:

- a. Compost (observed characteristics)

Color – Brown

Particle Size – Less than ½ inch

Particle Composition – Free of sub-soil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable material

Odor – “earthy” (like the woods or a forest)

Weeds – Free of noxious weeds (including Quack-grass rhizomes, Elytrigia repens, and the nut-like tuber of nutsedge, Cyperus esculentus); Weeds may not be growing at the production site

- b. Compost (Laboratory test characteristics)

Moisture Content – 30- 50%

Organic Content - Greater than 30%

Ash Content – Less than 70%

Carbon to Nitrogen ratio – Below or equal to 30:1

Nitrogen – 0.5 – 3.0%

Phosphorus – Greater than 0.2%

pH – 6/0 to 7.5

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: The MSA will engage a qualified independent geotechnical engineering licensed to practice in the State of Maryland testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.
- E. Testing reports will be distributed to the MSA within 24-hours after completion of test.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off of Baltimore City property.

END OF SECTION 02300