SECTION 028211 – REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 – GENERAL

1.1 CONTRACTOR REQUIREMENTS AND QUALIFICATIONS

A. All work involving the removal and disposal of asbestos-containing materials shall be accomplished by a State of New Jersey, Department of Labor and Workforce Development, licensed Asbestos Abatement Contractor.

B. All employees shall possess and maintain on their person a valid asbestos worker or supervisor certification issued by the State of New Jersey, Department of Labor and Workforce Development, while working on this project.

C. The Contractor shall furnish evidence that each worker and supervisor has been given medical examinations and respiratory fit tests within the previous twelve months in accordance with United States Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1910 and 29 CFR 1926 requirements.

D. The Contractor shall be responsible for securing the work area(s) at the end of the shift, and all on-site waste containers/dumpers. In addition, failure to comply with all site health and safety requirements, these Technical Specifications, and all applicable local, State and Federal regulations will require issuance of a Stop Work order by the Owner's Representative.

E. Temporary electric service for use during construction shall be provided by the Contractor. Temporary electrical service shall be made available to the Owner's Representative for sampling requirements. Temporary electrical service shall continue to operate at each work area until satisfactory clearance testing is achieved. The Contractor shall secure locations of all temporary electrical services (i.e., generators). The Contractor shall install GFCI protection at a point of source outside of containment.

F. All electrical connections, except to outlets and extension cords, will require the Contractor to utilize a State of New Jersey, licensed Electrician.

G. In buildings required by the Uniform Construction Code (UCC) to be of noncombustible constriction, all materials used to construct separation barriers must meet the UCC, building subcode requirements for that building. Polyethylene sheeting shall be a nominal six (6) mil and must be flame resistant.

1.2 NOTIFICATIONS

A. Send written notification as required by USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP), Asbestos Regulations (40 CFR, Part 61, Sub-part M), to the regional asbestos NESHAP Contact at least 10 business days prior to beginning any work on asbestos-containing materials. Send notification to

the following address for REGION 2:

1. United States Environmental Protection Agency- Region 2
   Division of Enforcement and Compliance Assistance
   Air Compliance Branch (DECA-ACB)
   290 Broadway - 21st Floor
   New York, NY 10007-1866

Send written notifications to the State Agencies listed, as applicable:

2. State of New Jersey
   Department of Environmental Protection
   Division of Solid and Hazardous Waste
   P.O. Box 414
   Trenton, NJ 08625-0414

3. State of New Jersey
   Department of Community Affairs
   Division of Codes and Standards
   Asbestos Safety Unit
   101 South Broad Street
   P.O. Box 816
   Trenton, NJ 08625-0816

4. State of New Jersey
   Department of Health
   Consumer, Environmental & Occupational Health Services
   P. O. Box 369
   Trenton, NJ 08625-0369

5. State of New Jersey
   Department of Labor & Workforce Development
   Division of Public Safety & Occupational Safety & Health
   Asbestos Control & Licensing Section
   1 John Fitch Plaza
   P.O. Box 949
   Trenton, NJ 08625-0949

1.3 CONTRACTOR SUBMITTALS

A. The Asbestos Abatement Contractor shall submit the following information to the Owner's Representative prior to mobilization at the worksite:

1. Notification forms submitted to State and Federal agencies;

2. Written description of emergency procedures to be followed in case of injury or fire. Include information regarding evacuation procedures, source of medical assistance and procedures to be used by medical personnel;

3. Inspection report of existing site conditions;

4. Supervisor's license;

5. Worker's license;

6. Telephone numbers and locations of emergency response personnel;

7. Written Respiratory Protection Program and proof of OSHA compliance with 29 CFR 134;

8. Material Safety Data Sheets (MSDS) for all materials and chemical agents brought onto the site;

B. After completion of work on this project the Asbestos Abatement Contractor shall submit the following information to the Owner:

1. Daily activity reports and personnel sign-in sheets

2. Waste material disposal manifests

1.4 DEFINITIONS

A. The following words, terms and abbreviations, when used in this section, shall have the following meanings unless the context clearly indicates otherwise.

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

2. Airlock - A serial arrangement of rooms whose doors are spaced a minimum of four (4) feet apart so as to permit ingress or egress through one (1) room without interfering with the next and constructed in such a manner as to prevent or restrict the free flow of air in either direction.

3. Air Monitoring - The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Method 7400. For clearance air monitoring, electron microscopy methods may be utilized for lower limits of detection and specific fiber identification.

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

5. Asbestos - The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, 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.

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

7. Asbestos-Containing Waste Materials - Any material that is or suspected of being or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.

8. Authorized Personnel - The Owner, the Owner's representative, Asbestos Abatement Contractor personnel, Asbestos Safety Control Monitor personnel, emergency personnel, or a representative of any Federal, State or local regulatory agency or other personnel under contract for or having jurisdiction over the project.

9. Barrier - Any surface that seals off the work area to inhibit the movement of fibers.

10. Breathing Zone - A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

11. Building Owner - The Owner or his authorized representative.

12. Category I Non-friable ACM - Asbestos-containing packing, gaskets, resilient floor covering and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.

13. Category II Non-friable ACM - Any material, excluding Category I non-friable ACM, containing more than l percent asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section l, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

14. Ceiling Concentration - The concentration of an airborne substance that shall not be exceeded.

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

16. Contractor - The Asbestos Abatement Contractor licensed by the State of New Jersey, Department of Labor and Workforce Development.

17. Critical Barrier - Two layers of nominal six (6) mil polyethylene sheeting that completely seals off the work area to prevent the distribution of fibers to the surrounding area, such as the opening between the top of a wall and the underside of ceiling construction, electrical outlets, non-removable lights, HVAC systems, windows, doorways, entranceways, ducts, grilles, grates, diffusers, wall clocks, speaker grilles, floor drains, sink drains, etc.

18. Curtained Doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three (3) weighted overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of the two outer sheets along one vertical side of the doorway and securing the vertical edge of the middle sheet along the opposite vertical side of the doorway. Other effective designs are permissible.

19. Decontamination Enclosure System - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers and equipment.

20. Disposal Bag – six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site. Each is labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS
AND
Asbestos, NA2212, RQ
AND
Class 9 Label

The Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

21. Encapsulant - A liquid material which can be applied to asbestos-containing material which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

22. Encapsulation - The application of an encapsulant to asbestos-containing materials to control the release of asbestos fibers into the air.

23. Filter - A media component used in respirators to remove solid or liquid particles from the inspired air.

24. Flame-Resistant Polyethylene Sheeting - A single polyethylene film in the largest sheet size possible to minimize seams, nominal six (6) mil thick, conforming to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films.

25. Friable Asbestos Material - Material that contains more than 1% asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

26. HVAC - Heating, Ventilation and Air Conditioning system.

27. HEPA Filter - A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.

28. 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 of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

29. Negative Pressure - Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).

30. Negative Pressure Respirator - A respirator in which the air pressure inside the respirator 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.

31. Negative Pressure Air Filtration Device (AFD) - A local exhaust system device, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.

32. Owner's Representative – USA Environmental Management, Inc., which will be represented on-site by an Industrial Hygiene Technician (IHT) for all non-permitted work and an Asbestos Safety Technician, certified by the New Jersey Department Affairs, for all permitted work. The IHT/AST shall ensure compliance with these Technical Specifications; all applicable local, State and Federal Regulations; perform air monitoring and analyze PCM air samples on-site.

33. Personal Monitoring - Sampling of the asbestos fiber concentrations within the breathing zone of an employee.

34. Prior Experience - Experience required of the contractor on asbestos projects of similar nature and scope to insure capability of performing the asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

35. Regulated Asbestos-Containing Material (RACM) - (a) Friable asbestos material, (b) Category I Non-friable ACM that has become friable, (c) Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II Non-friable ACM that

has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

36. Removal - The stripping of any asbestos-containing materials from surfaces or components of a facility.

37. Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.

38. Respirator - A device designed to protect the wearer from the inhalation of harmful atmospheres.

39. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination.

40. Surfactant - A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

41. Time Weighted Average (TWA) - The average concentration of a contaminant in air during a specific time period.

42. 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.

43. Water Column (w.c.) - a unit of measurement for pressure differential.

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

45. Work Area - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area that has been sealed, plasticized and equipped with a negative pressure air-filtration system.

46. Worker decontamination enclosure - A decontamination system consisting of a clean room, a shower room, and an equipment room separated from each other and from the work area by airlocks and curtained doorways. This system is used for all worker entrances and exists to and from the work area and for equipment pass out for small jobs.

1.5 CODES & STANDARDS RELATIVE TO ASBESTOS ABATEMENT

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. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state and local regulations. The Contractor shall hold the Owner and the Owner's Representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or subcontractors.

C. State of New Jersey requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. Asbestos Licenses and Permits

New Jersey Department of Labor & Workforce Development
Division of Public Safety & Occupational Safety & Health
Asbestos Control & Licensing Section
1 John Fitch Plaza
P.O. Box 949
Trenton, NJ 08625-0949
(609) 633-3760

2. Asbestos Hazard Abatement Sub-code - N.J.A.C. 5:23-8

New Jersey Department of Community Affairs
Division of Codes and Standards
Asbestos Safety Unit
101 South Broad Street
P.O. Box 816
Trenton, NJ 08625-0816
(609) 633-6224
Fax Number (609) 633-1040

3. Asbestos Training Courses - N.J.A.C. 8:60 and 12:120

New Jersey Department of Health and Senior Services
Indoor Environments Program
Consumer and Environmental Health Services
P. O. Box 360
Trenton, NJ 08625-0360
(609) 588-7864
Fax Number (609) 984-5370

4. Disposal Regulations - N.J.A.C. 7:26

New Jersey Department of Environmental Protection
Division of Solid and Hazardous Waste
P.O. Box 414
Trenton, NJ 08625-0414
Fax Number (609) 984-6985

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

1. American National Standards Institute (ANSI)
25 West 43rd Street, 4th floor
New York, NY 10036

- *Fundamentals Governing the Design and Operation of local Exhaust Systems Publication Z9.2-79.*
- *Practices for Respiratory Protection Publication Z88.2-80.*

2. American Society for Testing and Materials (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

- *Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82.*
- *Specification for Encapsulants for Friable Asbestos-Containing Building Materials Proposal P-189.*

PART 2 – SCOPE OF WORK

2.1 SUMMARY OF WORK

This section covers the furnishing of all labor, materials, facilities, equipment, services, permits and agreements necessary to perform the work required for asbestos abatement in accordance with these Technical Specifications, United States Environmental Protection Agency (USEPA) and OSHA regulations, NIOSH recommendations, State of New Jersey regulations and other applicable federal, state and local government regulations. Wherever there is a conflict or overlap of the above references the most stringent provisions shall apply. It shall be the Contractor's responsibility to verify exact quantities and locations of all asbestos-containing materials. The quantities shown are for informational purposes only. It is USA Environmental Management, Inc., understanding that the Contractor has verified the materials and quantities to be removed under this scope of work and has priced the work accordingly.

2.2 DESCRIPTION OF THE WORK

BASE BID:

A. Site:
Ramapo College of New Jersey
College Park Apartments
Phase I – International, Palm, Elm, Science
Phase II – Sycamore, Cypress, Tamarack, Mulberry, Butternut

B. Contractor shall remove and dispose of asbestos-containing drywall associated joint compound, adhesive on joists/studs and multi-layered resilient floor coverings. Removal shall be completed, as specified in the Contract Documents, as per N.J.A.C. 5:23-8.15 – Asbestos Hazard Abatement Projects within a full containment for unoccupied buildings.

1. Remove select areas of resilient floor coverings, per Resilient Floor Covering Institute's (RFCI's) "Recommended Work Practices for the Removal of Resilient Floor Coverings", at locations as indicated in the Contract Documents.

C. In addition:

1. Remove and dispose of all fixtures and equipment including, but not limited to, carpet, interior doors, door hardware, cover plates, surface mounted wiring, lighting fixtures, thermostats, fan coil units, signs, molding, trim, cabinets, sinks, faucets, stoves, refrigerators, shelving, mirrors, vanity, tubs, toilets, etc. Preform selective demolition that does not impact asbestos-containing materials. If asbestos-containing materials may be impacted during selective demolition activities, the items which may impact ACM shall remain and be removed within a negative pressure enclosure.

2. All existing, in wall, electrical/it/communication wiring, outlets, plumbing and fire detection/suppression shall remain.

3. Exterior and exposed decontamination unit(s) shall be sheathed with one-half inch (1/2") plywood and a single layer of six (6) mil polyethylene sheeting shall be affixed to the exterior/exposed walls and ceiling of the decontamination unit.

4. Phase I Construction: Prior to any preparatory work associated with N.J.A.C. 5:23-8 and to allow for the installation of the decontamination unit for N.J.A.C. 5:23-8 abatement work, the contractor shall remove multi-layered asbestos-containing floor tile and associated mastic contaminated plywood sub-floors from the entrances/foyers. Original (bottom layer) plywood sub-floor to remain. Removal shall be accomplished via non-friable methods, in accordance with the contract documents.

5. Phase I Construction: Prior to pre-commencement inspection of N.J.A.C. 5:23-8, the contractor shall install critical barriers sealing off the crawlspace from the exterior and attic from the second floor abatement work.

6. Remove and dispose of all layers of asbestos-containing resilient floor coverings (floor tile and linoleum) and associated mastic contaminated plywood sub-floors. Original (bottom layer) plywood sub-floor to remain.

7. Remove and dispose of all layers of carpet, padding, tack strips as construction debris. Resilient floor coverings (floor tile) which adhere to carpet shall be disposed of as asbestos waste.

8. Remove asbestos-containing double layer drywall and associated joint compound from all accessible locations, including, but not limited to, walls, ceilings, soffits, etc. Remove all fasteners (tracks, staples, screws, nails, etc.), glue and adhesives flush with studs/joists. Drywall which is inaccessible and requires any removal of existing wood structural components shall be scored flush with the adjoining surfaces and the exposed edges shall be encapsulated.

9. Remove all insulation (pipe, batt, blown-in, etc.), ceramic tile and non-asbestos finishes as asbestos contaminated waste.

10. Removal all sheetrock regardless of asbestos in crawlspace and 1st floor.

D. Refer to the Contract Drawings for the approximate location of all asbestos-containing materials to be removed, within the scope of this Contract.

E. Quantities:

The quantities shown are for informational purposes only and no guarantee is expressed or implied that the quantities are correct or that the asbestos-containing materials are easily removable from the substrate, surfaces or components. No allowances shall be made for failure of the Contractor to verify in the field amounts or existing field conditions.

Phase I Construction:

International:

Room Name/ Number	Material	Quantity
Apartments A – H	Drywall and Joint Compound	27,668 SF
Apartments A – H	Resilient Floor Coverings*	3,996 SF
Apartments A – H	Stud/Joist Adhesive	14,616 LF

Palm:

Room Name/ Number	Material	Quantity
Apartments A – H	Drywall and Joint Compound	27,668 SF
Apartments A – H	Resilient Floor Coverings*	3,996 SF
Apartments A – H	Stud/Joist Adhesive	14,616 LF

Elm:

Room Name/ Number	Material	Quantity

Apartments A – H	Drywall and Joint Compound	27,668 SF
Apartments A – H	Resilient Floor Coverings*	3,996 SF
Apartments A – H	Stud/Joist Adhesive	14,616 LF

Science:

Room Name/ Number	Material	Quantity
Apartments A – H	Drywall and Joint Compound	27,668 SF
Apartments A – H	Resilient Floor Coverings*	3,996 SF
Apartments A – H	Stud/Joist Adhesive	14,616 LF

Phase II Construction:

Sycamore:

Room Name/ Number	Material	Quantity
Apartments A – M	Drywall and Joint Compound	47,642 SF
Apartments A – M	Resilient Floor Coverings*	1,850 SF
Apartments A – M	Stud/Joist Adhesive	25,002 LF

Cypress:

Room Name/ Number	Material	Quantity
Apartments A – V	Drywall and Joint Compound	73,779 SF
Apartments A – V	Resilient Floor Coverings*	5,907 SF
Apartments A – V	Stud/Joist Adhesive	36,846 LF

Tamarack:

Room Name/ Number	Material	Quantity
Apartments A – W	Drywall and Joint Compound	87,912 SF
Apartments A – W	Resilient Floor Coverings*	3,614 SF
Apartments A – W	Stud/Joist Adhesive	46,620 LF

Mulberry:

Room Name/ Number	Material	Quantity
Apartments A – M	Drywall and Joint Compound	53,142 SF
Apartments A – M	Resilient Floor Coverings*	2,982 SF
Apartments A – M	Stud/Joist Adhesive	29,376 LF

Butternut:

Room Name/ Number	Material	Quantity
Apartments A – M	Drywall and Joint Compound	47,642 SF
Apartments A – M	Resilient Floor Coverings*	3,254 SF
Apartments A – M	Stud/Joist Adhesive	25,002 LF

Note: *Multi-Layered Resilient Floor Coverings (Floor Tile, Linoleum, etc.)

2.3 ADDITIONAL INFORMATION

A. The Contract Drawings are designed to compliment the Technical Specifications. Wherever conflicts arise between the Contract Drawings and the Technical Specifications, the more stringent shall apply.

B. Prepare all asbestos-containing materials for transportation and disposal in accordance with NEHAPS, OSHA and the United States Department of Transportation (USDOT) asbestos waste handling requirements.

C. The Contractor shall be aware that electrical, communication, other utility lines and HVAC duct system may exist in proximity to some locations where asbestos-containing material is to be removed. The Contractor shall exercise caution with his/her activities during preparation, removal, clean-up and final cleaning operations associated with asbestos abatement in these work areas, to prevent damaging said electrical, communication, other utility lines and HVAC ductwork. Where possible, the Contractor shall cautiously move and secure the aforementioned items.

1. Should the Contractor damage any electrical, communication, other utility lines and/or HVAC system components, the Contractor shall be responsible for either the cost to the Owner to repair/replace damaged lines/HVAC system or shall arrange for the lines/HVAC systems to be repaired/replace to the Owner's specifications with no additional cost to the Owner.

2. The Owner shall be the SOLE deciding factor as to which option referenced above the Contractor shall implement to repair/replace electrical, communication, other utility lines and/or HVAC system components that is damaged as a result of the asbestos abatement activities in these work area locations.

D. Damage caused by the Contractor to structural building components/members shall be restored to their existing conditions, The Contractor shall be responsible for either the cost to the Owner to restore damaged building components/members or shall arrange for the restoration to the Owner's specifications with no additional cost to the Owner.

E. The Contractor shall utilize proper protective equipment such as safety glasses, disposable gloves, protective suits, safety shoes and HEPA cartridge equipped full-face respirators and other appropriate personal protective equipment when handling asbestos contaminated materials during pre-cleaning activities.

2.4 STANDARD OPERATING PROCEDURES

A. The Contractor shall develop and implement a written standard operating procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, general public and the environment.

B. The standard operating procedure shall ensure:

1. Proper protective clothing and respiratory protection prior to entering the work area.

2. Safe work practices in the work place, including provisions for inter-room

communications, exclusion of eating, drinking, smoking or breaking of respiratory protection in any way.

3. Packing, labeling, loading, transporting and disposal of asbestos-containing materials in a way that minimizes exposure and contamination.

4. Proper exit practices from the workspace to the outside through the decontamination facility.

5. Emergency evacuation for medical or safety to minimize exposure.

6. Safety from accidents in the work area, especially from electrical shocks, slippery surfaces and entanglements in loose hoses, temporary wiring and other equipment.

7. Provisions for effective supervision and personnel air monitoring during work.

8. Engineering systems that minimize exposure to fibers in the work place.

C. Perform OSHA 8-hour Time Weighted Average personal exposure air monitoring in accordance with 29 CFR 1926.1101. OSHA monitoring is solely the responsibility of the Contractor, and the Contractor shall ensure that the Contractor's Supervisor performs OSHA monitoring in accordance with 29 CFR 1926.1101. The Owner's Representative is not responsible for the Contractor's compliance with OSHA monitoring.

D. Provide Personal Protective Equipment (PPE) to the Owner's Representative and inspector's representing Federal, State and local agencies, as required to perform progress inspections of the work.

2.5 NOTIFICATIONS, WARNING SIGNS, LABELS AND POSTERS

A. At the entrance to the work area and/or decontamination unit, the Contractor's ingress/egress point to the building and the exterior door that leads from the exterior of the building for the waste removal route, and all sides of the waste dumpster, post an approximate 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sized and styles of a visibility required by 29 CFR 1926:

LEGEND:

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

B. Disposal/Waste Bags/Containers shall be labeled as follows:

DANGER

CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS
AND
Asbestos, NA2212, RQ
AND
Class 9 Label

In addition, the Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

C. Provide other signs, labels, warnings and posted instructions that are necessary to protect, inform and warn people of the hazard form asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, USEPA and NIOSH.

D. Post 10-day Notifications to the USEPA, New Jersey Department of Community Affairs (when applicable), New Jersey Department of Labor and Workforce Development, New Jersey Department of Environmental Protection and New Jersey Department of Health and Senior Services, at the entrance to the work area(s).

E. Post Construction Permits, if applicable, at the entrance to the work area(s).

2.6 FULL CONTAINMENT WORK AREA PREPARATION

A. The Contractor shall ensure all HVAC systems within the proposed work area are shut-down prior to the Contractor commencing with preparation activities, relative to asbestos abatement.

B. Electric systems within each work area(s) shall be shut-down. If approved by the ASCM, electric systems within the work area may be used if they are ground fault circuit interrupter (GFCI) protected, cleanable and precautions are used to protect the safety of all within the work area. Temporary lighting shall be the incorporated in the work area(s), and shall be the responsibility of the Contractor.

C. The Contractor shall ensure that prior to abatement preparation, all moveable items within each work area(s) have been cleaned removed from the work area. Items that cannot be removed from the work area(s) shall be cleaned and sealed airtight with two (2) layers of six (6) mil flame resistant rated polyethylene sheeting. The Contractor shall clean all residual dust and debris from the floor and other horizontal surfaces within each work area using HEPA filter equipped vacuums, prior to the installation of the Full Containment.

D. The Contractor shall construct a Worker Decontamination Unit contiguous to the work area for use by abatement personnel for personal decontamination.

E. The Contractor shall install sufficient negative air filtration devices (AFDs) within each work area(s). The AFDs shall be exhausted to the exterior of the building.

1. The Contractor shall install sufficient negative AFDs to supply the asbestos work area with a minimum of four (4) air changes per hour. Calculations shall be derived from field measurements of the installed AFDs on-site, prior to beginning work.

2. The Contractor shall provide HEPA, secondary and pre-filters for all AFDs. All HEPA filters shall not have more than the manufacture's hours of usage time. The pre-filter shall be changed every four (4) hours or sooner as required during abatement.

3. The Contractor shall be responsible for the complete operation and maintenance of the AFDs and components.

4. Mechanically affix all exhaust ducts to the AFDs and seal with duct tape. Install AFD units as per design. Exhaust AFDs to the exterior of the building.

5. For full containment – Unoccupied building conditions, the exhaust capacity from the work area shall be sufficient to establish a pressure differential between the work area and all adjacent spaces greater than or equal to 0.03 inches water column ("w.c.).

6. The Contractor shall supply digital manometer(s), in sufficient quantity, for the duration of the project. The Contractor shall be responsible to ensure that the manometer(s) remains functional at all times and has sufficient tape and ink to carryover into the next work day.

7. All permitted work being performed in accordance with N.J.A.C. 5:23-8 shall require the Asbestos Safety Control Monitor to install a digital manometer that provides a continuous strip chart record. The Asbestos Safety Control Monitor shall install the digital manometer(s) near the entrance(s) to the work area and between the work area(s) and any interior spaces from which make-up air is drawn. The IHT/AST and Contractor's supervisor shall be qualified and proficient in both the operation of the manometer unit and in calculating to determine the number of AFDs necessary to achieve and maintain the required 0.03" w.c. in the work area. The IHT/AST shall zero and level the gauges each time a reading is taken.

F. Contactor to provide written request to the Owner's Representative for inspection and approval of the abatement work area prior to commencement of the abatement asbestos-containing materials.

G. Removal shall commence closest to the decontamination unit.

H. The Owner's Representative will perform a visual inspection and conduct final clearance air monitoring of the work area. If analytical results are obtained that

are higher than the allowable threshold, the Contractor shall re-clean the work area and the Owner's Representative will re-test the area. This sequence shall be repeated until the final test results are acceptable.

I. Upon receipt of acceptable final air tests, the Contractor shall demobilize all critical and separation barriers, decontamination unit and engineering controls from the abatement area. All waste containers shall be off-site and en-route to an USEPA ID #27 approved landfill for final disposal.

J. The Owner's Representative will perform a final visual inspection of the abatement work area, with all waste off the premises. If the inspection is satisfactory, the ASCM firm shall file for and for a Certificate of Occupancy from the local code official and/or New Jersey Department of Community Affairs for all PERMITTED WORK referenced herein.

2.7 FULL CONTAINMENT REMOVAL

A. Pre-Cleaning

1. Prior to the start of abatement activities, the Contractor shall ensure all electric coming into the work area(s) is shut down or GFI protected.

2. The Contractor shall wet clean and HEPA vacuum all non-ACM, non-removable objects and seal in two (2) independent layers of six (6) mil polyethylene sheeting.

3. All removable items; i.e., electrical, heating, ventilating and other non-ACM objects, attached to the asbestos-containing material shall be HEPA vacuumed, wet cleaned and removed from the work area. All other removable items; i.e., chairs, furniture, desks, bookcases, etc., not scheduled for disposal as ACM, shall be HEPA vacuumed, wet cleaned, removed from the work area and placed in an on-site temporary storage area by the Contractor.

B. Full Containment Construction

1. Within the work area extents, the Contractor shall seal all openings in floors, walls, ceilings with expanding foam insulation and/or with critical barriers.

   a. Critical barriers shall be composed of two (2) independent layers of six (6) mil flame resistant polyethylene sheeting.
   b. The critical barriers shall be affixed to the substrate either with duct tape or stapled or fastened with spray-on adhesives, glue beads or horizontal wood battens.
   c. The Contractor shall support critical barrier walls with 2"x4" wood/metal studs (or equivalent) at intervals of approximately 32".

2. The Contractor shall install floor coverings within the work area consisting of two (2) layers of six (6) mil flame resistant polyethylene

sheeting, unless, the floor is to be removed as part of the abatement work.

a. The first floor layer shall extend up the wall at least 12 inches.
b. The second floor layer shall extend up the wall at least 24 inches.
c. The Contractor shall minimize the number of seams on the floor and no seams shall be permitted between wall and floor joints.

3. After floor coverings are in place, the Contractor shall erect one (1), six (6) mil flame resistant polyethylene sheeting wall, extending from the ceiling to the floor, overlapping floor sheeting by at least 18 inches, unless, the wall is to be removed as part of the abatement work.

a. No seams shall be located at the corners.
b. Where no walls exist, the Contractor shall first construct critical barriers to create walls for the work area(s).

4. The Contractor shall install a ceiling consisting of one (1) layer of six (6) mil flame resistant polyethylene sheeting, unless, the ceiling is to be removed as part of the abatement work.

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5. AFDs shall be put in place, equipped with HEPA filters.

a. AFDs shall exhaust to the outside of the building.
b. Sufficient number of AFDs shall be utilized to ensure air changes every 15 minutes with an acceptable pressure established.
c. AFDs shall be field tested by the Owner's Representative, in accordance with N.J.A.C. 5:23-8.10(d)3.

6. The Contractor shall construct a decontamination unit as per N.J.A.C. 5:23-8.15(c) and install a digital manometer with continuous print out at the entrance of the decontamination unit. The Contractor's three (3) stage decontamination unit shall be contiguous with the work area. Entrance flaps for each chamber are to be weighted and installed so that the flaps will close if airflow into the work area is stopped for any reason.

a. Each chamber for the decontamination unit shall be minimum of 4'x4'. The decontamination unit shall be framed and each chamber enclosed with two (2) layers of six (6) mil flame resistant polyethylene sheeting. Three (3), six (6) mil flame resistant polyethylene flaps shall overlap at the entrance/exit to each chamber, the work area(s) and at the entrance into the decontamination unit to the work area(s).
b. The chambers shall consist of a clean room followed by a shower room, and finally an equipment room leading into the work area(s). The shower room shall have hot/cold running water with a shower and soap.

C. Removal

1. The asbestos-containing material(s) shall be sprayed with amended water

or a removal encapsulant by means of a low-pressure sprayer. The ACM shall remain adequately wet at all times of removal.

2. Removal shall commence from the decontamination unit, towards the AFDs.

3. All waste shall be wet and placed into labeled 6 mil polyethylene bags. All bags shall be doubled with OSHA labels visible.

   a. The Contractor may place the sealed double bagged waste bags in a sealable drum.

4. Sharp objects shall be cut into manageable pieces while wet. The objects shall then be placed in sealable, leak proof containers or wrapped in two (2) layers of six (6) mil polyethylene sheeting.

5. After removal of the asbestos-containing material, the Contractor shall fine clean all surfaces with nylon brushes, wet sponges or equivalent. Material shall remain adequately wet.

6. Waste bags and/or drums shall be cleaned and disposed of in an on-site dumpster or Contractor's vehicle, registered with the New Jersey Department of Environmental Protection.

7. All accessories and equipment shall be moved to the equipment room of the decontamination unit and cleaned prior to exiting the decontamination unit.

8. Water utilized for the shower room of the decontamination unit shall be collected and added to the asbestos waste or solidified in a leak proof drum with an acceptable polymer.

D. Final Clean-up

1. The Contractor shall fine spray and/or mist the work area with amended water or a removal encapsulant; the work area shall remain adequately wet at all times. All vertical and horizontal surfaces shall be wet wiped and cloths disposed of as asbestos contaminated waste.

2. After completion of cleaning all surfaces, the Contractor shall request a pre-sealant inspection in writing to the Owner's Representative. If the work area passes the pre-sealant inspection, the Contractor shall apply a sealant to all exposed surfaces. The sealant shall be tinted so as to be distinct from the underlying substrate.

3. Once the sealant is dry, the Contractor shall remove all floors, walls and ceilings by means of carefully rolling up the polyethylene sheeting, with the contaminated portion on the inside. The sheeting shall then be placed in labeled 6 mil waste bags, double bagged and disposed of properly.

4. The Contractor shall wet clean with amended water or a removal encapsulant all surfaces within the work area twice. All cloths used shall be disposed of as asbestos contaminated waste.

5. Critical and separation barriers shall remain in place until satisfactory air sample results are obtained.

E. Final Cleaning – Upon Receipt of Satisfactory Final Clearance Air Sample Results

1. The Contractor shall remove all critical barriers and dispose of properly.

2. Inside of windows shall be washed.

3. Transport all waste and waste containers off-site, to an USEPA ID #27 approved landfill.

2.8 WORK AREA CLEAN UP

A. All surfaces and Contractor equipment in the work area(s) shall be cleaned after completion of the removal activities.

B. All ceiling support system components and other ceiling-mounted, mechanical, electrical equipment etc. left in place in the work area shall be cleaned using a HEPA-filter equipped vacuum and wet cleaned with the water/surfactant mixture.

C. Walls shall be wet cleaned.

D. The polyethylene sheeting applied to the walls and floor shall be sprayed with the water/surfactant mixture, rolled up keeping the top surface to the inside and placed into six (6) mil asbestos disposal bags for disposal as asbestos contaminated waste.

E. Lastly, the walls and floor in the work area shall be cleaned with a HEPA-filter equipped vacuum.

F. AFDs, critical barriers and decontamination units shall remain. Upon issuance of a satisfactory Clean-up Inspection, the Owner's Representative shall proceed with the collection of final clearance air samples.

2.9 ASBESTOS WASTE HANDLING AND DISPOSAL

A. Disposal bags shall be six (6) mil, leak tight, and labeled in accordance with OSHA, NESHAPS, and the United States Department of Transportation (USDOT) regulations.

B. Load all asbestos-containing waste material in disposal bags or leak-tight drums. All materials are to be contained in one (1) of the following:

1. Two (2), six (6) mil disposal bags, or,

2. Two (2), six (6) mil disposal bags and a fiberboard drum, or

3. Two (2), six (6) mil disposal bags, and sealed steel drum.

C. Two (2) layers of six (6) mil flame resistant polyethylene sheeting shall be utilized for wrapping large components not suited for disposal bags or drums.

D. Duct tape shall be used to seal disposal bags and wrapped components.

E. The Contractor's vehicle and/or dumpster shall be lined with two (2) layers of six (6) mil flame resistant polyethylene sheeting. The Contractor's vehicle and/or dumpster utilized to transport the asbestos waste off-site, and the Waste Hauler shall be licensed by the New Jersey Department of Environmental Protection.

F. Maintain records of waste shipments in accordance with NESHAPS 40 CFR Part 61, section 61.150, (d) 1-5 and (e). Provide waste shipment records with all requests for payment associated with the Contractor's work.

G. Notify the USEPA ID #27 approved landfill within 10-days prior to transportation of the asbestos-containing waste to the landfill. Provide the name and address of the landfill. Retain manifest from the landfill for all materials disposed. At the completion of asbestos abatement forward all manifests to the Owner.

H. On-site activities shall not be considered complete until all waste is off-site, upon demobilization of the work area(s), after receipt of satisfactory final clearance air sample results.

PART 3 – AIR MONITORING

3.1 DESCRIPTION OF THE WORK

A. This Section describes air monitoring to verify that the building beyond the work area and the outside environment remains uncontaminated. This Section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.

B. AIR MONITORING REQUIRED BY OSHA IS WORK OF THE CONTRACTOR AND IS NOT COVERED IN THIS SECTION.

3.2 BACKGROUND AIR MONITORING

A. The Asbestos Safety Control Monitoring firm shall conduct background environmental/daily air monitoring to detect faults in the work area isolation, such as:

1. Contamination of the building outside of the work area with airborne asbestos fibers,

2. Failure of filtration or rupture in the differential pressure system,

B. Should any of the above occur, immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Asbestos Safety Control Monitoring firm.

C. Fiber Concentrations Outside the Work Area(s):

1. If any air sample taken outside of the work area(s) exceeds 0.010 fibers per cubic centimeter, immediately and automatically stop all work except corrective action.

2. The Asbestos Safety Control Monitoring firm will determine the source of the high reading and so notify the Contractor in writing.

3. If the high reading was the result of a failure of work area isolation measures, initiate the following actions:

a. Immediately erect new critical barriers to isolate the affected area(s) from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g., wall, ceiling, floor).
b. Clean and decontaminate the affected area utilizing wet wiping and HEPA vacuuming techniques.
c. Require that respiratory protection be worn in affected areas until the area is cleared for re-occupancy via air sampling.
d. Leave critical barriers in place until completion of work and ensure that the operation of the pressure differential system in the work area results in a flow of air from the balance of the building into the affected area.
e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a shower room and changing room at entry point to affected area.
f. After certification of visual inspection, by the Asbestos Safety Control Monitoring firm, in the work area remove critical barrier separating the work area from the affected area.
g. Final air samples will be taken within the entire area as set forth in Part 3.3.

4. If the high reading was the result of other causes, initiate corrective action as determined by the Asbestos Safety Control Monitoring firm.

5. The Contractor shall complete all corrective work with no change in the Contract sum.

C. Daily Air Monitoring shall be performed from the start of work to project decontamination, per shift. The Asbestos Safety Control Monitoring firm shall collect, at a minimum, air samples from locations adjacent to the work area,

including critical barriers, the clean room of the decontamination unit and the waste removal route.

D. Phase Contrast Microscopy (PCM) sampling and analysis will be performed using the latest revision of NIOSH Method 7400. Where required, this analysis will be carried out at the job site so that results can be obtained within four hours from start of sampling. The analyst shall be listed in the Asbestos Analyst Registry of the AIHA for PCM analysis.

3.3 FINAL CLEARANCE AIR MONITORING

A. The Owner's Representative shall collect final clearance air samples at the completion of the abatement activities and after a satisfactory clean-up Inspection.

B. Engineering controls, critical barriers and the decontamination unit shall remain during final clearance air sampling.

C. All final clearance air samples will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started, the exhaust from forced-air equipment (leaf blower with 1 HP electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for five (5) minutes per 10,000 cubic feet of air volume.

2. One 20" diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 2 meters above the floor, directed towards the ceiling and operated at low speed for the entire period of sample collection.

3. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors or vents.

D. A minimum of five (5) samples will be collected from the work area and analyzed in accordance with the method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

1. Final clearance samples shall be analyzed utilizing Transmission Electron Microscopy (TEM).

2. TEM samples shall be analyzed at a laboratory accredited by the American Industrial Hygiene Association, participating in the National Voluntary Laboratory Accreditation Program (NVLAP). Analytical results shall be available to the Owner's Representative within six (6) hours upon receipt by the laboratory.

3. Acceptable Clearance Criteria for work area demobilization and re-occupancy shall be as follows:

a. TEM: Average of less than 70 Structures per millimeter squared for all five (5) samples analyzed.

PART 4 – PROJECT COMPLETION

4.1 FINAL INSPECTION

A. The Owner's Representative shall perform a final inspection of the work area in accordance with New Jersey Department of Labor and Workforce Development requirements. If analytical results are obtained that are higher than the allowable threshold the Contractor shall re-clean the work area and the Owner's Representative shall re-test the area. This sequence shall be repeated until the final test results are acceptable.

1. The Contractor shall be financially responsible for additional cleaning, Owner's Representative services and final clearance air sampling and analysis at no cost to the Owner.

B. Upon receipt of acceptable final air tests the Contractor shall demobilize all critical and separation barriers, decontamination unit and engineering controls from the abatement work areas. All waste containers shall be off-site and en-route to an USEPA ID #27 approved landfill for final disposal.

C. The Owner's Environmental Representative will perform a final visual inspection of the abatement work area(s) to document the project has been completed in accordance with these Technical Specifications and all applicable Local, State and Federal regulations.

END OF SECTION 028211