SECTION 02.41.00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Building demolition.
   B. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS
   A. Section 01.10.00 - Summary: Limitations on Contractor's use of site and premises.
   B. Section 01.50.00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
   C. Section 01.57.23 - Temporary Storm Water Pollution Control
   D. Section 01.70.70 - Closeout Procedures: Project conditions; protection of bench marks, survey control points; and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
   E. Section 02.82.13 - Asbestos Abatement: Procedures for abating asbestos containing materials.
   F. Section 02.82.16 - Engineering Control of Asbestos-Containing Materials.
   G. Section 02.82.33 - Removal and Disposal of Asbestos-Containing Materials.
   H. Section 02.84.00 - Work With Other Hazardous Materials: Procedures for abating hazardous materials that are not classified as "Asbestos Containing Materials", including but not limited to, Chlorofluorocarbons, Mercury containing equipment, Polychlorinated Biphenyls (PCBS) containing equipment, lead/acid, Lithium, and Nickel/Cadmium containing equipment.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.
   B. Site Plan: Showing:
      1. Vegetation to be protected.
      2. Areas for temporary construction and field offices.
      3. Areas for temporary and permanent placement of removed materials.
   C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
      1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
      2. Identify demolition firm and submit qualifications.
      3. Include a summary of safety procedures.
   D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE
   A. Demolition Firm Qualifications: Company specializing in the type of work required.
      1. Minimum of five years of documented experience.
PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE
A. Remove the buildings designated on demolition plans in their entirety.
B. Remove paving and curbs as required to accomplish new work.
C. Remove all other paving and curbs within site boundaries.
D. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
E. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
F. Remove concrete slabs on grade within site boundaries.
G. Remove manholes and manhole covers, curb inlets and catch basins.
H. Remove fences and gates.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
  10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
B. Do not begin removal until receipt of notification to proceed from Owner.
C. Do not begin removal until built elements to be salvaged or relocated have been removed.
D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.
F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB’s, and mercury.
H. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or
   point of reuse.
   I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES
   A. Coordinate work with utility companies; notify before starting work and comply with their requirements;
      obtain required permits.
   B. Protect existing utilities to remain from damage.
   C. Do not disrupt public utilities without permit from authority having jurisdiction.
   D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior
      written notification to Owner.
   E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3
      days prior written notification to Owner.
   F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility
      type; protect from damage due to subsequent construction, using substantial barricades if necessary.
   G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and
      abandoned utilities.
   H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone;
      identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 DEBRIS AND WASTE REMOVAL
   A. Remove debris, junk, and trash from site.
   B. Leave site in clean condition, ready for subsequent work.
   C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION
SECTION 02.82.13
ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 PROJECT DIRECTORY

Owner: East Tennessee State University
        Johnson City, Tennessee 37614

Representative: Mr. William Rasnick
Telephone: (423) 439-7900

Asbestos Abatement Consultant
S&ME, Inc.
644 Eastern Star Road
Kingsport, Tennessee 37663
Representative: Ms. Carol Goldinger Ford
Telephone: (423) 349-2817

1.02 PROJECT/WORK IDENTIFICATION

A. Project name is ETSU New Football Stadium, Johnson City, Tennessee (SBC No. 166/005-02-2013). This Work involves abatement or removal of the following materials:

Building 151

1. Remove and dispose of asbestos-containing tan and cream vinyl floor with pebble pattern. For a total of about 160 square feet of asbestos-containing flooring in Building 151.

2. Remove and dispose of asbestos-containing black sink coating. For a total of 2 kitchen sinks in Building 151.

3. Remove and dispose of drywall and joint compound in Building 151. The joint compound was found to contain 3% asbestos and the composite of the wall system was found to contain <1% asbestos.

Building 150

1. Remove and dispose of asbestos-containing window caulk on 2’ x 4’ windows adhered to brick on the basement, first, and second floor windows for Building 150. For a total of about 420 linear feet on about 35 windows.

2. Remove and dispose of asbestos-containing exterior door caulk adhered to brick in Building 150. For a total of about 30 linear feet of asbestos-containing caulk.

3. Remove and dispose of asbestos-containing 9-inch brown floor tile in the basement of Building 150. For a total of about 600 square feet of asbestos-containing flooring.

4. Remove and dispose of asbestos-containing vinyl floor with square and leaf pattern (2 layers) in Building 150. For a total of about 350 square feet of asbestos-containing flooring.
5. Remove and dispose of asbestos-containing gray sink coating. For a total of 2 kitchen sinks in Building 150.

**Building 45**

1. Remove and dispose of assumed asbestos-containing explosion lights. For a total of about 5 lights in Building 45.

B. Project scope includes disposal of confirmed asbestos-containing flooring, sinks, window caulking, and door caulking; assumed asbestos-containing explosion proof light gaskets; and drywall and joint compound determined to have <1% asbestos as a composite. These materials shall be removed prior to demolition of the buildings. Any waste stream that these materials are included in should be demolished in accordance with NESHAP and OSHA regulations and disposed of as asbestos-containing waste in accordance with federal, state, and local landfill regulations.

C. The relative location of each of these areas and the locations of abatement work to be performed are indicated on the project drawings.

**1.03 SUMMARY OF WORK**

A. The Work includes removal and disposal of asbestos-containing materials in the areas mentioned above and as shown on the project drawings. A copy of the asbestos evaluation report is available for review at the Owner’s and Asbestos Abatement Consultant’s Office. The Work shall be conducted and techniques used as specified in the documents and drawings.

B. Asbestos removal shall be performed by a Tennessee licensed abatement contractor using non-friable methods for removal. Removal methods shall be performed as outlined in this specification.

C. The Contractor is responsible for verifying quantities and locations of asbestos-containing materials at these facilities. All conditions, quantities and locations of applicable materials are accepted by the Contractor upon receipt of bid. “Complete” is defined as passing final visual inspection and removal of contractor’s equipment and waste from site.

**1.04 POTENTIAL ASBESTOS HAZARD**

A. The disturbance or dislocation of asbestos materials may cause asbestos fibers to be released into the atmosphere, thereby creating a potential health hazard to workmen and building occupants. All personnel involved in removal activities shall be licensed in the state of Tennessee.

B. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

C. Where in the performance of the Work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos. Such measures will include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.
1.05 **ASBESTOS-CONTAINING MATERIALS**

A. The known asbestos-containing materials to be removed are identified in these specifications and on the project drawings. The Contractor is responsible for verifying all existing conditions at these facilities.

1.06 **DESCRIPTION OF WORK FOR PROJECT COORDINATION**

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

1.07 Administrative and Supervisory Personnel
1.08 Special Reports

1.07 **ADMINISTRATIVE AND SUPERVISORY PERSONNEL**

A. The titles and requirements of the administrative and supervisory personnel need to be in accordance with titles and requirements set forth in Tennessee Rule 1200-01-20-.03 “Accreditation of Persons and Firms Engaged in Asbestos Activities”. Definition and practices of each can be found in Tennessee Rule 1200-01-20-.01(2) “Asbestos Accreditation Requirements: General”. All workers and supervisors must be accredited by the State of Tennessee.

B. General Superintendent: Maintain a full-time General Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Competent Person as required by OSHA in 29 CFR 1926 for the Contractor and is the Contractor’s representative responsible for compliance with all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials. This person must have completed a course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, have had a minimum of two years on-the-job training and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person.

C. Head Foreman: Maintain one Head Foreman who is accredited as an asbestos abatement supervisor by the State of Tennessee and is experienced in supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall have not less than two years of full-time experience in responsible charge of asbestos removal operations similar in scope and magnitude to this project. Head Foreman must remain inside the Work Area at all times the Work is in progress.

D. Crew Leader: For every six asbestos removal workers (laborers) utilized on this project, provide one experienced Tennessee accredited Supervisor having one year minimum experience in successful asbestos removal operations similar in scope and magnitude to this Project. Crew leader(s) will remain inside of Work Area(s) during all times Work is in progress.

1.08 **SPECIAL REPORTS**

A. General: Except as otherwise indicated, submit special reports directly to Owner within one day of occurrence requiring special report, with copy to the Owner’s Representative, and others affected by occurrence.
B. Reporting Unusual Events and Inspections by Regulatory Officials: When an event of unusual and significant nature occurs or inspection by an outside party, etc. prepare and submit a special report listing chain of events, persons participating, response by Contractors' personnel, evaluation of results or effects, and similar pertinent information. When such events are predictable, advise Owner at earliest possible date.

C. Reporting Accidents: Prepare and submit reports of significant accidents, at site and anywhere else Work is in progress. Record and document data and action; 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 poses a significant threat of loss or personal injury.

D. Contingency Plan: Prior to commencing work, prepare 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 abridgement of decontamination or Work Area isolation procedures. Include in plan, specific procedures for decontamination or Work Area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.

1.09 DEFINITIONS

Adequately Wet: To sufficiently mix or penetrate with liquid to prevent the potential release of particulates.

Aerosol: A system consisting of particles, solids or liquids, suspended in air.

Airlock: System for permitting ingress and egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways protected by two overlapping polyethylene sheets and separated by a sufficient distance such that one passes through one doorway into the chamber, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway. The airlock maintains a pressure differential between the contaminated and uncontaminated areas thereby further minimizing flow-through contamination.

Air Monitoring: The process of measuring the fiber content of a specific volume of air.

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

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.

Asbestos-Containing Material (ACM): Any material containing more than 1 percent by weight of asbestos of any type or mixture of types.

Asbestos-Containing Waste Material: Any material which 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.

Authorized Visitor: The Owner, the Designer, the Asbestos Abatement Consultant, the Testing Laboratory or a representative of any federal, state and local regulatory or other agency having authority over the project.
Barrier: Any surface that seals off the Work Area to inhibit the movement of fibers.

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

Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

Clean Room: An uncontaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of workers’ street clothes and protective equipment. Also known as the “Change Room.”

Clearance Monitoring: Area air sampling performed using aggressive clearance sampling techniques to determine the airborne concentrations of residual fibers upon conclusion of asbestos abatement.

Curtained Doorway: A device to allow ingress and egress from one room to another while minimizing air movement between the rooms. Typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway and securing each along the top of the doorway, with the vertical edge of one along one vertical side of the doorway, and the vertical edge of the other along the opposite vertical side. Two curtained doorways spaced a minimum of three feet apart for an airlock.

Decontamination Enclosure System: A series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A decontamination enclosure system always contains airlocks.

Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operation.

Disposal Bag: 6 mil thick leak-tight plastic bags used for transporting asbestos waste from Work Area to disposal site.

    Each is labeled as follows:

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

    and

    R.Q. Hazardous Substance
    Solid, N.O.S. (asbestos)
    ORM/E, NA-9188

    and

    Name of Waste Generator:
    (Name of Contractor and Owner)

    Location of Waste Generated:

Encapsulation: A form of abatement involving the treatment of regulated asbestos-containing material (RACM) with a liquid which covers the surface with a protective coating (bridging) or embeds fibers in an adhesive matrix (penetrating) to prevent the release of asbestos fibers.
Enclosure: The construction of an airtight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.

Equipment Decontamination Enclosure System: A decontamination enclosure system for materials and equipment, typically consisting of a designated area of the Work Area, a washroom, and an uncontaminated area.

Equipment Room: A contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.

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

Friable Asbestos-containing Material: Any material that when dry can be or has been crumbled, pulverized, or reduced to powder, and contains more than 1 percent asbestos.

Grind: To reduce to powder or small fragments. Grinding includes mechanical chipping or drilling.

HEPA Filter: A High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns in length.

HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High Efficiency Particulate Absolute filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97 percent efficiency for retaining fibers of 0.3 microns or larger.

Holding Area: A chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area constitutes an airlock.

Local Exhaust Ventilation System: A local exhaust system, 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.

Lockdown: A procedure whereby the surface of the Work Area are coated with latex paint or other suitable sealant, using an airless sprayer, after final visual clearance from the Testing Laboratory to fix in place and render non-friable, any traces of asbestos material that may remain.

Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (Work Area).

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.

Owner/Operator: Any person or contractor, who owns, leases, operates, controls, or supervises a facility being demolished or renovated, or any person who operates, controls, or supervises the demolition or renovation operation, or both.

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

Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.
1.10 CODES, REGULATIONS, AND STANDARDS

A. General Applicability of Codes, Regulations, and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, 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. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations. The Contractor shall hold harmless the Owner, Owner's Representative, Asbestos Abatement Consultant, or the Testing Laboratory 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.
C. Federal Requirements: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

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

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

Respiratory Protection
Title 29, Part 1910, Section 134 of the Code of Federal Regulations

Construction Industry
Title 29, Part 1926, of the Code of Federal Regulations

Access of Employee Exposure and Medical Records
Title 29, Part 1910, Section 2 of the Code of Federal Regulations

Asbestos Hazard Emergency Response Act
40 CFR Part 763 (The Final Rule)

Hazard Communication
Title 29, Part 1910, Section 1200 of the Code of Federal Regulations

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

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

Asbestos Abatement Projects Rule
40 CFR Part 762
CPTS 62044, FRL 2843-9
Federal Register, Vol. 50 No. 134, July 12, 1985
P28530-28540

Regulation for Asbestos
Title 40, Part 61, Sub-part A of the Code of Federal Regulations

National Emission Standard for Asbestos
Title 40, Part 61, Sub-part M (Revised Sub-part B) of the Code of Federal Regulations

D. EPA Guidance Documents: which discuss asbestos abatement work or hauling and disposal of asbestos waste materials are listed below for the contractor's information only. These documents do not describe the Work and are not a part of the Work of this contract. EPA maintains an information number (800) 334-8571; publications can be ordered from (800) 424-9065 554-1404 in Washington, DC):


CONSTRUCTION DOCUMENTS PACKAGE
31-AUG-15


Asbestos Waste Management Guidance. EPA 530-SW-85-007.


Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials.

E. State Requirements: Abide by all state rules, regulations, ordinances, etc. which govern the specified asbestos abatement work, licensing or hauling and disposal of asbestos waste material.

   TN – Division of Air Pollution Control –
   Rule 1200-03-11-.01 & .02,
   “Hazardous Air Contaminants – Asbestos”

   TN – Division of Solid and Hazardous Waste Management
   Toxic Substances Program
   Rule 1200-01-20,
   “Asbestos Accreditation Requirements”

F. Local Requirements: Abide by all local rules, regulations, ordinances, etc. which govern the specified asbestos abatement work, licensing, or hauling and disposal of asbestos waste removal.

1.11 SUBMITTALS

A. General: The required submittals are identified in this section and/or elsewhere in the Specification. Make submittals to the Owner and Owner's Representative in a timely manner and at appropriate times in the execution of the Work to allow for sufficient and prompt review by the Owner and the Owner's Representative. Removal work will not commence until submittals are received by the Owner and the Owner’s Representative. Revise and resubmit as necessary.

1. Submit complete, bound, sets of the submittals as required in the Contract Documents. Submit separate sets, in two copies. Submit complete sets to the Owner’s Representative and Owner for his review, in the required number of copies, of "Pre-Job Submittals" on or before the date of the pre-construction meeting. The Work may not proceed until the complete pre-job submittal package has been reviewed and approved by the Owner and the Owner’s Representative.

2. Submit complete sets to the Owner for his review, in the required number of copies, of "Post-Job Submittals" following the final completion of the Work. Once the Owner has logged these documents in, they will be passed onto the Owner’s Representative for review. Request for final payment will not be approved until the post-job submittal package has been reviewed by the Owner and the Owner’s Representative.
3. Identify individual submittals by name and include a table of contents in each submittal package.

4. Provide three complete, bound sets of each submittal package to the Owner and Owner's Representative for review.

B. Pre-Job Submittals:

1. Permits: Permits required for the removal, encapsulation, handling of asbestos-containing materials, and general contracting will be obtained by the Owner prior to contract award.
   a. The Contractor shall obtain all permits required by state and/or local regulatory agencies or jurisdictions for the transportation and disposal of asbestos-containing waste.
   b. Post one copy of all permits at the Work site. Keep on file in the Contractor's office one copy of each and provide a current copy of each to the Owner.

2. Submit complete information relative to the following:
   a. Submit copies of valid Tennessee Accreditations for workers and supervisors participating on the project.
   c. Submit names of Supervisory personnel including superintendent, head foreman, and crew leader(s) and their qualifications and training including:
      i. Individually signed Respiratory Training Form or equivalent for each and every worker to be utilized on the project.
      ii. Individually signed Certificates of Worker Training or equivalent for each and every worker to be utilized on the project.
   d. Submit Contractor’s affidavit that all Contractors employees on this project have successfully completed medical surveillance as required by 29 CFR 1926 and the statement by a medical doctor.

3. For each Work Area, submit a plan of action: Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the abatement plan, a contingency emergency plan, the location and layout of the decontamination areas, the sequencing of asbestos work, methods to be used to assure the safety of site visitors, disposal plan, including location of approved disposal site, and a detailed description of the methods to be used to control pollution and ensure site security. Expand upon the use of portable HEPA ventilation systems, closing out of the building's HVAC system, method of removal to prevent visible emissions from the Work Area, and packaging of removed asbestos debris. Include sequencing and schedule for installation of architectural finishes/materials. The plan must be approved by the Owner’s Representative prior to commencement of Work.

4. Submit written description and/or sketch of Personnel and Equipment Decontamination Units.
C. Submittals During the Work and Post Job Submittals:

1. Submit to the Owner and Owner’s Representative training certificates for all new or additional employees before their assignment to the project.

2. A copy of daily security, worker, and visitor log signed by the superintendent.

3. Submit a copy of employee air monitoring results relative to OSHA respiratory protection level compliance.

4. Transport manifests and landfill receipts including the Asbestos Waste Shipment Record (CN-1054) as required by TN Rule 1200-03-11-.02 within two weeks after completion of the asbestos abatement.

D. All post job submittals must be turned over to the Owner and Owner’s Representative no later than ten working days after completion of Work and prior to the final request for payment.

1.12 MANUFACTURER’S LITERATURE

A. Where contents of submitted literature from manufacturers’ include data not pertinent to the submittal, clearly show which portions of the contents is being submitted for review.

B. Submit a minimum of two copies to Owner for review and file.

1.13 QUALITY ASSURANCE

A. Coordination of Submittals

1. Carefully review all aspects of each item being submitted.

2. Verify that each item and its appropriate submittals conform in all respects with the specified requirements.

3. Certify, by affixing signature of Contractor’s authorized representative to the corner of each submittal package, that this coordination has taken place.

1.14 IDENTIFICATION OF SUBMITTALS

A. Number consecutively and clearly identify all submittals. Show identification information on at least the first page of each submittal and elsewhere as necessary for positive identification of submittal.

B. Accompany each submittal package with a letter of transmittal showing all information required for identification and checking.

1.15 GROUPING OF SUBMITTALS

A. Group submittals into packages identified as "Pre-Job Submittals” and "Post-Job Submittals" as the title package to certify and account for submittal data.

B. Partial submittals may be rejected for noncompliance with the Contract Documents.
1.16 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for commencement, execution or installation to provide time required for review, for securing necessary approvals, for possible revisions and re-submittals and for placing orders and securing delivery.

B. The Design Team will use their best efforts to review submittals within five days of receipt of submittals.

C. Contractor will be held responsible for delays occasioned by in-complete submittals packages.

1.17 SUBMITTAL REVIEW

A. The Contractor will be solely responsible for the means, methods, techniques, sequences, and procedures involved in the execution of the Work. Review by the Owner or Owner’s Representative does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

B. Make revisions as required by the Owner and or Owner’s Representative and resubmit for approval.

1.18 COORDINATION OF SCHEDULES, MEETINGS, REPORTS - ASBESTOS ABATEMENT

A. Be competently represented at all meetings and submit schedules and reports as required by provisions of this section to enable orderly review of the progress of the Work and to provide for a systematic discussion of problems that may be encountered.

1.19 SCHEDULES

A. The contractor shall provide a schedule upon bid submittal. Contractor may propose a shorter schedule with all General and Supplemental Conditions applying. Contractor will provide detailed schedule including work dates, work shift time, number of employees, dates of start and completion including dates of preparation work, removals and final inspection dates. Revised schedules shall be provided at each meeting high-lighting any changes since the previously submitted schedule.

1.20 PRE-CONSTRUCTION MEETING

A. Attend pre-construction meeting as scheduled prior to the start of the Work to clarify construction contract administration procedures and address potential problems and satisfy requirements of items below:

-- Submittal of executed bonds and insurance certification.
-- Execution of the Owner-Contractor Agreement.
-- Submittal of Pre-Job Submittals.
-- Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, material suppliers.
-- Channels and procedures for communications.
-- Construction schedule, including sequence of critical work.
-- Distribution of the Contract Documents.
1.21 REPORTS

A. Contractor will maintain, at each Work Area, a daily log documenting the dates and time of, but not limited to, the following items:
   -- Visitations; authorized and unauthorized.
   -- Personnel, by name, entering and leaving the Work Area.
   -- Air monitoring test results and Manometer recordings.

B. Provide two copies of each daily log in the "Post Job" submittal package.

PART 2 - PRODUCTS

2.01 AIR MONITORING DESCRIPTION OF THE WORK

A. For this project, a Testing Laboratory will serve as the air monitoring firm. This section describes air monitoring (if requested by the Owner or Owner’s Representative) that can be performed during non-friable removal to verify that the outside environment remains uncontaminated if concerns are raised by the Owner, or other parties. This section also sets forth airborne fiber levels 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 the responsibility of the Contractor and is not covered in this section.

2.02 TEMPORARY FACILITIES DESCRIPTION OF REQUIREMENTS

A. General: Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the Work.
2.03 MATERIALS AND EQUIPMENT

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

2.04 WORKER PROTECTION DESCRIPTION OF WORK

A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other work place hazards except for respiratory.

2.05 RESPIRATORY PROTECTION DESCRIPTION OF WORK

A. Instruct and train each worker involved in abatement in proper respiratory use and require that each worker always wear a respirator, properly fitted on the face in the Work Area from the start of any operation which may cause airborne asbestos fibers until the Work Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place.

2.06 RESPIRATORY STANDARDS

A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.


NIOSH - National Institute for Occupational Safety and Health.

B. All respiratory protection systems shall be approved by NIOSH. Provide at a minimum, HEPA type filters. Also, additional cartridge selections may be added, if required, for solvents, etc., in use.

2.07 DECONTAMINATION UNITS DESCRIPTION OF WORK (IF APPLICABLE)

A. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

2.08 DECONTAMINATION UNITS

A. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6 mils thick, clear, or frosted.
B. Reinforced Polyethylene Sheet: Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6 mils thick, or frosted.

C. Duct Tape: Provide duct tape in 2 or 3 inch widths, with an adhesive specifically formulated to stick tenaciously to sheet polyethylene.

D. Shower Pan: Provide one-piece waterproof shower pan.

E. Shower Walls: Provide walls fabricated from rigid, impervious, waterproof material. Structural support as necessary for stability.

F. Shower Head and Controls: Provide a factory made showerhead. Feed shower with water mixed from hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid.

G. Filters: Provide filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposal dual filter elements with the primary filter allowing 20 microns and smaller and secondary to pass particles 5 microns and smaller.

H. Shower Stall: For Wash Down Station, provide leak tight shower enclosure with integrated drain pan. Structurally support as necessary for stability.

I. Sump Pump: Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump.

2.09 EQUIPMENT DECONTAMINATION UNITS (IF APPLICABLE)

A. Provide an Equipment Decontamination Unit for work areas over 1000 square feet consisting of a serial arrangement of rooms, Clean Room, Holding Room, Wash Room for removal of equipment and material from Work Area. Do not allow personnel to enter or exit Work Area through Equipment Decontamination Unit.

B. Wash Down Station: Provide an enclosed wash down unit located in Work Area just outside Wash Room as an equipment, bag, and container cleaning station.

C. Holding Room: Provide Holding Room as a drop location for tagged asbestos-containing materials passed from the Wash Room. Waste material and equipment will be re-bagged here. Construct Holding Room of 2" x 4" wood framing and polyethylene sheeting, at least 6 mil in thickness and 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 Wash Room with an airlock as described previously.

D. Clean Room: Provide Clean Room to isolate the Holding Room from the building exterior. Construct Clean Room of 2" x 4" wood framing and polyethylene sheeting, at least 6 mil in thickness and locate to provide access to the Holding Room from the building exterior. Separate this room from the exterior by a single flap of 6 mil polyethylene sheeting and from the Holding Room by a door as described previously.

E. Equipment or Material: Take all equipment or material from the Work Area through the Equipment Decontamination Unit according to the following procedure:
1. At wash down station, thoroughly wet-clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.

2. When passing equipment or containers into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the doorway between the Wash down Station and the Wash Room. Keep all outside personnel clear of the Equipment Decontamination Unit.

3. Once inside the Wash Room, wet-clean the bags and/or equipment.

4. When cleaning is complete, pass items into Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room.

5. Workers from the building exterior enter Holding Area and rebag and remove decontaminated equipment and/or containers for disposal. Waste material may be drummed at this point.

6. Require these workers to wear full protective clothing and wear appropriate respiratory protection.

7. At no time is worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

2.10 SIGNS

A. Post an approximately 20 inch by 14 inch manufactured sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101.

Legend

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

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

C. Post an approximately 10 inch by 14 inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

Legend

No Food, Beverages, or Tobacco Permitted 3/4" Block

All Persons Shall Don Protective Clothing (Coverings) 3/4" Block
Before Entering the Work Area

All Persons Shall Shower Immediately After Leaving 3/4" Block
Work Area and Before Entering the Changing Area

CONSTRUCTION DOCUMENTS PACKAGE
31-AUG-15
PART 3 - EXECUTION

3.01 AIR MONITORING

A. The air monitoring professional shall be accredited by the State of Tennessee as a Project Monitor. The individual performing microscopic analysis of the air samples will be NIOSH 582 certified or equivalent.

B. The purpose of the Testing Laboratory air monitoring will be to detect:
   1. Work Area Airborne Fiber Count: The Testing Laboratory will monitor airborne fiber counts inside and outside the Work Area. The purpose of this air monitoring will be to detect airborne fiber counts which may significantly challenge the ability of the Work Area isolation procedures to protect the outside of the building from contamination by airborne fibers.
   2. Work Area Clearance: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to an acceptable level, the Testing Laboratory will sample and analyze air.

C. The Testing Laboratory will be conducting air monitoring as necessary during the course of the project. Non-friable removal methods may not warrant air monitoring. The Owner may elect for monitoring during non-friable removals.

3.02 ANALYTICAL METHODS

A. All area and personal air samples will be analyzed by Phase Contrast Microscopy (PCM) using NIOSH, 7400 Method.

3.03 SCHEDULE OF AIR SAMPLES

A. General: The sampling will be in response to concerns from the Owner, Owner’s Representative, or others. The number and location of air samples will be determined by the Asbestos Abatement Consultant as provided herein.

B. If air samples are requested by the owner for non-friable removal of asbestos-containing materials; daily air sampling during asbestos abatement removal, final visual assessment, and final clearance testing will be conducted by the Testing Laboratory. Unless otherwise approved by the Owner or Owner’s Representative, Contractor shall schedule final testing at least twenty-four hours prior to the desired time of testing.

C. Clearance Testing:
   1. The Testing Laboratory will secure the following air samples for final clearance testing:

<table>
<thead>
<tr>
<th>Location Sampled</th>
<th>Number of Samples</th>
<th>Analytical Method</th>
<th>Minimum Detection Limit (Fibers/cc)</th>
<th>Minimum Volume (L)</th>
<th>Flow Rate (LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the Work Area after acceptable visual clearance</td>
<td>5/containment</td>
<td>NIOSH 7400</td>
<td>0.01</td>
<td>1200</td>
<td>4.0-12.0</td>
</tr>
</tbody>
</table>
If interior airborne fiber counts exceed 0.1 f/cc, additional samples will be taken as necessary to monitor fiber levels.

D. A clearance criteria of less than 0.01 fibers per cubic centimeter (f/cc) for PCM analysis is required for final clearance testing and area air testing. If any air samples taken outside of the Work Area exceed the clearance criteria of less than 0.01 f/cc then Contractor will be required to immediately and automatically stop all Work and take remedial action.

3.04 AIR MONITORING RESULTS

A. All testing and analysis will be performed promptly and results issued expeditiously in order to minimize any possible delay in the progress of the Work.

B. Test results will be available to Owner and Contractor as follows:

1. Air sample results by Phase Contrast Microscopy: 24 hours from sample collection time.

2. Results of other tests deemed necessary by Testing Laboratory: as quickly as possible but not later than three days following completion of test(s) and receipt of results.

3.06 PERSONNEL MONITORING

A. Contractor shall be responsible for OSHA air monitoring requirements to be performed by an independent laboratory. Owner will not be performing air monitoring to meet these requirements. The Contractor shall provide a copy of the results to the Owner.

3.07 WATER SERVICE

A. Temporary Water Service Connection: The Contractor is responsible for providing connections to the local water utility system. All connections to the water system shall include backflow protection.

B. Water Hoses: Employ hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each area and to each Decontamination Unit.

C. Hot Water: Contractor is responsible for providing hot water.

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

3.08 ELECTRICAL SERVICE

A. General: Provide a weatherproof, grounded temporary power service and distribution system of sufficient size, capacity, and power characteristic to accommodate performance of Work during the construction period. An electrical ground fault circuit interrupter shall be utilized between the power source and the site of containment usage. Install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of Work.

B. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general, run wiring overhead and rise vertically where wiring will be least exposed to damage from construction operations.
3.09 FIRE EXTINGUISHERS

A. Fire Extinguisher: Locate fire extinguisher(s) where they are most convenient and effective for their intended purpose, but provide not less than one extinguisher in each Work Area.

3.10 WORKER TRAINING

A. Train, in accordance with 29 CFR 1926.1101 and 40 CFR 763, all workers in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. Include but do not limit the topics covered in the course to the following:

1. Methods of recognizing asbestos.
2. Health effects associated with asbestos.
3. Relationship between smoking and asbestos in producing lung cancer.
4. Nature of operations that could result in exposure to asbestos.
5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
   -- Engineering controls
   -- Work practices
   -- Respirators
   -- Housekeeping procedures
   -- Hygiene facilities
   -- Protective clothing
   -- Decontamination procedures
   -- Emergency procedures
   -- Waste disposal procedures
   -- Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134
   -- Appropriate work practices for the Work
   -- Requirements of medical surveillance program
   -- Review of 29 CFR 1926
   -- Exhaust ventilation systems
   -- Work practices including hands on or on-job training
   -- Personal decontamination procedures
   -- Air monitoring, personnel and area

3.11 PROTECTIVE CLOTHING

A. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.

B. Hard Hats: Provide head protection (hard hats) as required by OSHA for all workers. Require hard hats to be worn at all times that Work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the Work. Thoroughly clean, decontaminate and bag hats before removing them from the Work Area at the end of the Work.
C. Footwear: Provide foot covers and footwear with non-skid soles, and where required by OSHA, foot protection for all workers. Do not allow this footwear to be removed from the Work Area for any reason other than disposal of contaminated waste or transfer to another asbestos Work Area.

D. Goggles: Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Goggles will not be worn with full face respirators.

E. Gloves: Provide work gloves.

3.12 ADDITIONAL PROTECTIVE EQUIPMENT

A. Disposable coveralls, head covers, and footwear covers, and Type C respiratory protection with backup supplied air, if utilized, shall be provided by the Contractor for the Owner, Asbestos Abatement Consultant, Testing Laboratory, and other authorized representatives who may inspect the job site.

3.13 GENERAL EXECUTION

A. Contractor shall assume sole responsibility and provide worker protection as required by the most stringent OSHA standards applicable to the Work.

B. Each time the Work Area is entered, all workers shall wear a disposable whole body suit. The worker may wear this suit over their street cloths during non-friable removal.

3.14 DECONTAMINATION PROCEDURES

A. Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:

1. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in a regulated area with a polyethylene floor sheeting.
2. Place discarded protective clothing in an appropriately marked disposal container.
3. Provide an area where workers can wash their hands and face.

3.15 WITHIN WORK AREA

A. Workers MAY NOT eat, drink, smoke, apply cosmetics, chew gum or use tobacco products in the Work Area. To eat, chew, apply cosmetics, drink or smoke, workers shall follow the procedure described above, then dress in street clothes before entering the non-Work Areas of the building.

3.16 GENERAL RESPIRATOR EXECUTION

A. Respirators: Select respirators approved by NIOSH, Department of Health and Human Services, for use in atmospheres containing asbestos fibers. Furnish personnel engaged in the removal and demolition of asbestos materials with appropriate respiratory protection.

3.17 FIT TESTING

A. The contractor shall perform fit testing in accordance with OSHA 29 CFR 1910.134 Respiratory Protection Standard.
3.18 **TYPE OF RESPIRATORY PROTECTION REQUIRED**

A. After reducing contaminant levels to the lowest feasible level with engineering controls and work practices, provide respiratory protection as necessary to ensure that workers are not exposed to airborne contaminants in excess of the OSHA Permissible Exposure Limits (PEL).

B. Determine the proper level of respiratory protection. Respirator selection shall be based on contaminant levels, filter selection, and respiratory protection factor. A minimum half mask respirator with N, P or R 100 filters is required.

<table>
<thead>
<tr>
<th>RESPIRATOR</th>
<th>PROTECTION FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half-mask air purifying respirator equipped with high-efficiency filters</td>
<td>10</td>
</tr>
<tr>
<td>Full face piece air-purifying respirator equipped with high-efficiency filters</td>
<td>50</td>
</tr>
<tr>
<td>Powered air-purifying respirator (PAPR) equipped with high-efficiency filters, or supplied-air respirator operated in continuous flow mode</td>
<td>1,000</td>
</tr>
</tbody>
</table>

3.19 **PERSONNEL DECONTAMINATION UNIT (IF APPLICABLE)**

A. Provide a Personnel Decontamination Unit consisting of a serial arrangement of the following connected rooms or spaces: Changing Room, Airlock, Shower Room, Airlock, and Equipment Room.

B. Require all persons without exception to pass through this decontamination unit for entry into and exiting from the Work Area for any purpose. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100-foot candles.

C. **Changing Room (Clean Room):** Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing. 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. Locate so that access to Work Area from Changing Room is through Shower Room. Separate Changing Room from the building by a sheet polyethylene flapped doorway.

1. Require workers to remove all street clothes in this room, dress in clean disposable coveralls, and on respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require workers to enter this room either from outside the structure dressed in street clothes, or naked (or with a bathing suit) from the showers.

2. An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workmen may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic. Authorization for this must be obtained from the Owner in writing prior to start of construction.

3. Maintain floor of Changing Room dry and clean at all times. Do not allow overflow water from shower to wet floor in the Changing Room.
4. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

5. Provide a continuously adequate supply of disposable bath towels.

6. Provide posted information for all emergency phone numbers and procedures.

7. Provide one storage facility per employee.

D. Shower Room: Provide 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 undressing in the Equipment Room.

E. Construct room by providing a shower pan and two shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining wooden floor in shower pan at elevation of top of pan.

1. Separate this room from the rest of the building with airtight walls fabricated of 6 mil polyethylene.

2. Separate this room from the Changing and Equipment Rooms with airlocks fabricated of 6 mil polyethylene, at least three feet wide. Two airlocks are required, one between the Shower and Equipment Room, and one between the Shower and Changing Room.

3. Provide splash proof entrances to Changing and Equipment Rooms.

F. Provide showerhead and controls.

G. Provide temporary extensions of existing hot and cold water and drainage as necessary for a complete and operable shower.

H. Provide a soap dish and a continuously adequate supply of soap and maintain in sanitary condition.

I. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.

J. Arrange shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the Work Area.

K. Provide flexible showerhead.

L. Pump waste to drain or to storage for disposal. If pumped to drain, provide 20 micron and 5 micron wastewater filters in line to drain or waste water storage. Change filters daily or more often if necessary. Locate filters inside shower unit so that water lost during filter changes is caught by shower pan.

M. Provide Hose Bib.

N. Equipment Room (Contaminated Area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers. Separate this room from the Work Area by a curtained doorway consisting of three sheets of overlapping 6 mil polyethylene sheeting. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet on the top and left side. All sheets have weights attached to the bottom to insure that the sheets hang straight and maintain a seal over the doorway when not in use.
O. Work Area: Separate Work Area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the Work Area is expected to be high, as in dry removal, add an inter-mEDIATE cleaning space between the Equipment Room and the Work Area. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil polyethylene per shift change and remove contaminated layer after each shift.

P. Airlocks: Airlocks are small rooms in the decontamination area, at least three feet wide, separated from the rest of the Work Area by at least 6 mil polyethylene walls. Airlocks must be placed between the Equipment Room and the Shower and between the shower and the Change Room. Each has two doors and in no case shall each of these doors be opened at the same time.

Q. Construction:

1. Walls and Ceiling: Construct airtight walls and ceiling using two layers of clear polyethylene sheeting, at least 4 mil in thickness. Attach to existing building components or a temporary framework.

2. Floors: Use two layers (minimum) of clear 6 mil polyethylene sheeting to cover floors in the Equipment, Shower (underneath shower pan), and Changing Rooms. Provide an additional layer in the Equipment Room for every shift change expected.

3. Roll one layer of plastic from Equipment Room into Work Area after each shift change. Provide a minimum of two layers of plastic at all times. Use only clear plastic to cover floors.

4. Doors: Fabricate from three overlapping sheets with openings a minimum of three feet wide. Configure so that sheeting overlaps adjacent surfaces. Sheets shall close after being released. Put arrows on sheets to indicate direction of overlap and travel. Provide a minimum length of three feet between entrance and exit of any room or airlock.

5. If the decontamination area is located on the exterior of a facility or within an area requiring abatement over the unit, construct the decontamination unit(s) with a minimum 1/4” plywood or acceptable solid construction for all exterior surfaces.

6. Visual Barrier: Where the decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/3” thick hardboard or 1/4” plywood. Where the solid barrier is provided, sheeting need not be opaque.

R. Electrical: Provide sub panel at Changing Room to accommodate all removal equipment. Power sub panel directly from Contractor’s electrical panel. Connect all electrical branch circuits in decontamination unit and particularly any pumps in Shower Room to a ground-fault circuit protection device.
3.20 DECONTAMINATION SEQUENCE (IF APPLICABLE)

A. Entering Work Area:

1. Worker enters Changing Room and removes street clothing, puts on clean disposable coveralls and respirator, and passes through the Shower Room into the Equipment Room.

2. Any additional clothing and equipment left in Equipment Room needed by the worker in the area shall be put on in the Equipment Room.

3. Worker proceeds to Work Area.

B. Exiting Work Area:

1. Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment (or bathing suit). Extra work clothing may be stored in contaminated end of the Equipment Room. Disposable coveralls are placed in a bag for disposal with other material.

2. The worker then proceeds to the shower, still wearing the respirator, and, using soap, washes off completely, paying special attention to the hair.

3. The worker washes off the respirator in the shower, then pulls it from his face and washes the face piece to face seal area of the face and the respirator.

4. The worker then washes his hair again.

5. After completion of the shower, the worker removes the wet filters and discards them as contaminated waste, and proceeds to the clean room.

6. The worker then dresses in his street clothes, properly cleans and stores his respirator and exits the decontamination unit. Decontamination procedures shall be followed by all individuals leaving the Work Area.

3.21 CLEANING OF DECONTAMINATION UNITS (IF APPLICABLE)

A. Clean debris and residue from inside of Decontamination Units on a daily basis. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

END OF SECTION
SECTION 02.82.16
ENGINEERING CONTROL OF ASBESTOS-CONTAINING MATERIALS

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 Work of this section.

PART 2 - PRODUCTS

2.01 EXHAUST MACHINES

A. General: A static negative air pressure of at least 0.02 inches water column shall be maintained at all times in the Work Area enclosure where asbestos is removed to ensure that contaminated air does not enter non-contaminated areas. Contractor is responsible for all patent requirements related to exhaust and shall provide a continuously operating manometer with alarm to measure static pressure differential.

PART 3 - EXECUTION

3.01 GENERAL

A. The negative air pressure shall be monitored by the onsite air monitoring professional. Record the manometer readings a minimum of four (4) times per eight (8) hour shift at a minimum.

3.02 PREPARATION OF THE WORK AREA

A. Determining the Ventilation Requirements: Provide fully operational local exhaust systems supplying a minimum of one air change every 15 minutes. Determine the volume in cubic feet of the Work Area by multiplying floor area by ceiling height. Determine total ventilation requirement in cubic feet per minute (cfm) for the Work Area by dividing this volume by the air change rate.

B. Ventilation Required (CFM) = Volume of Work Area (cu. ft.)/15 min. Determine Number of Units needed to achieve 15 minute change rate by dividing the ventilation requirement (CFM) above by capacity of exhaust unit(s) used. Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters in the machines labeled operating characteristics.

Number of Units Needed =

Ventilation Requirement (CFM)/
Capacity of Unit with Loaded Filters (CFM)

C. Add one additional unit as a backup in case of equipment failure or machine shutdown for filter changing.
D. Location of Exhaust Units: Locate exhaust unit(s) so that makeup air enters Work Area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the exhaust unit(s) at a minimum distance from the worker access opening or other makeup air sources.

E. 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 sealed with tape and caulk as required.

F. Vent Exhaust Units away from occupied areas unless otherwise authorized in writing by the Owner’s Representative and/or Owner.

3.03 USE OF THE LOCAL EXHAUST SYSTEM

A. General: Each unit shall be serviced by a dedicated minimum 115V-20A circuit.

B. Testing the System: Test local exhaust system before any asbestos-containing material is wetted or removed. After the Work Area has been prepared, the decontamination facility set up, and the exhaust unit(s) installed, start the unit(s) one at a time.

C. Demonstrate operation to Owner and/or Testing Laboratory.

D. Demonstrate Operation of the local exhaust system to the Owner and/or Testing Laboratory including, but not be limited to, the following:

1. Plastic barriers and sheeting move lightly in toward Work Area,

2. Curtain of decontamination units move lightly in toward Work Area,

3. There is a noticeable movement of air through the decontamination unit. Use smoke tube to demonstrate air movement from Clean Room to Shower Room, from Shower Room to Equipment Room, and from Equipment Room to Work Area.

E. Use smoke tubes to demonstrate a positive motion of air across all areas in which Work is to be performed.

F. Modify the Local Exhaust System as necessary to successfully demonstrate the above.

G. Use of System During Abatement Operations:

1. Start exhaust units before beginning Work (before any asbestos-containing material is disturbed). If more than one unit is installed, they should be turned on one at a time, checking the integrity of wall barriers for secure attachment and need for additional support. After abatement work has begun, run units continuously to maintain a constant negative pressure until decontamination of the Work Area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.

2. Do not shut down local exhaust system during lockdown procedures, unless authorized by the Owner’s Representative in writing.
H. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and all exhaust units are operating again. At completion of abatement work, allow exhaust units to run, to remove airborne fibers that may have been generated during abatement work and cleanup and purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

END OF SECTION
SECTION 02.82.33
REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. General: The Contractor will perform removal of the following asbestos-containing materials:
   1. vinyl flooring with pebble pattern Building 151
   2. black sink coating Building 151
   3. drywall and joint compound (<1%) Building 151
   4. exterior window caulk on 2’ x 4’ windows Building 151
   5. exterior door caulk caulking Building 151
   6. brown floor tile Building 150
   7. vinyl flooring with square and leaf pattern (2 layers) Building 150
   8. gray sink coating Building 150
   9. explosion proof lights with gaskets

B. The Contractor will perform removal of asbestos-containing flooring, sinks, drywall and joint compound, window caulking, door caulking and explosion proof light with gaskets considered to be Category I and Category II, Non-Friable materials.

   Note: If non-friable materials are rendered friable at any time, the Contractor will immediately stop work and notify the Owner, Owner’s Representative, Consultant, and Testing Laboratory. Materials that cannot be removed using non-friable removal must be removed using friable removal methods.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Contractor must furnish all labor, materials, equipment, and subcontractors necessary for removal and disposal of ACM in a manner consistent with these specifications. These materials include but are not limited to:

   1. Clear polyethylene sheeting (6 mil minimum thicknesses).
   2. Staples, nails, spray cement, and tape capable of sealing joints and securing polyethylene to all necessary surfaces.
   3. Surfactant mixed in recommended proportions.
   4. Containers to receive and retain ACM with appropriate labels.
   5. Warning signs and labels.
   6. Glove bags specifically designed for its application.
7. Encapsulants.

8. Other Materials: All necessary materials for removal and disposal of asbestos in compliance with all applicable codes and regulations, and these specifications.

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

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

D. Damaged or deteriorated materials shall not be used and must be removed from the job site. Materials that become contaminated with asbestos must be disposed of in accordance with the applicable regulations.

2.02 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos removal, including but not limited to scrapers, brushes, razor knives, wrenches, tools for constructing containment and decontamination units, brooms, carts, and safety equipment.

B. Provide suitable air moving and exhaust equipment, including but not limited to:

1. A method for maintaining pressure differential of 0.02 inches of water column inside containment than outside.

2. HEPA-filtered vacuums.

3. Recording manometers for monitoring the pressure inside containment relative to outside.

C. Thermal equipment utilizing controlled infrared radiant heat to make the resilient floor tiles and adhesive soft and pliable for removal.

D. No equipment shall cause suspension of ACM within work area or discharge of asbestos fibers outside of work area.

E. Transportation: As required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property.

F. Disposal Bags and Impermeable Containers: Provide 6 mil thick leak-tight polyethylene bags. Provide containers suitable to receive and retain asbestos-containing or contaminated material until proper disposal. Use one of two types of impermeable containers: 1) 6 mil polyethylene disposal bags to fit within the drum, 2) metal or fiber reinforced drums with tightly fitting lids. Disposal bags and impermeable containers must be labeled with two labels, with text as follows:
First Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA’s Hazard Communication standard:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING AIRBORNE ASBESTOS, TREMOLITE, ANTHOPHYLLITE, OR ACTINOLITE FIBERS IS HAZARDOUS TO YOUR HEALTH

Second Label: Provided in accordance with DOT regulations:

RQ HAZARDOUS SUBSTANCE SOLID,
N.O.S. (ASBESTOS) ORM/E,
NA - 2212

Third Label: Provided in accordance with 40 CFR Part 61 of NESHAP revision:

NAME OF WASTE GENERATOR:
(Name of Contractor and Owner)

LOCATION OF WASTE GENERATED:

G. Disposal Containers: Provide locked and labeled leak tight containers for transportation and disposal of waste. Disposal containers must be labeled in the same manner as specified under “Disposal bags” (see above).

H. Transportation: As required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property.

PART 3 - EXECUTION

3.01 PREPARATION OF WORK AREAS

A. Work Area: Is the location where asbestos abatement work occurs. It is a variable of the extent of Work of the contract. For this project a “Work Area” is defined as the area in which asbestos removal is being performed. 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-abatement work.

B. Completely isolate the Work Area from the outside so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area(s) become contaminated with asbestos-containing dust or debris as a consequence of the Work, immediately stop all abatement work and clean those areas. Perform all such required cleaning or decontamination at no additional cost to the Owner.

C. Completely separate the Work Area from the outside by sheet plastic barriers (critical barriers) at least 6 mil in thickness, or by sealing with duct tape.

D. Asbestos Abatement Work Will Not Commence Until:

1. Arrangements have been made for disposal of waste at a properly licensed and accredited landfill.

CONSTRUCTION DOCUMENTS PACKAGE
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2. Work Areas and decontamination enclosure systems and parts of the building required to remain in use are effectively segregated.

3. Tools, equipment and material waste receptors are on hand.

4. Proper notification has been made to the appropriate regulatory agency.

5. All other preparatory steps have been taken and applicable notices posted and permits obtained.

6. All worker training has been completed.

3.02 ASBESTOS REMOVAL (PREPARATION)

A. Work Area Preparation for Non-friable Materials and Glove Bags

1. Post Warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to personnel approved by Contractor, Testing Laboratory or Consultant.

2. Contractor shall establish an equipment room or area that is adjacent to the work area for the decontamination of workers and equipment contaminated with asbestos. The decontamination area shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface, and be of sufficient size as to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area.

3. Seal off all openings with critical barriers. Critical barriers must be placed on penetrations that include but are not limited to; heating and ventilation ducts, doorways, corridors, windows, skylights, and lighting, with plastic sheeting taped securely in place. A polyethylene splash guard shall be placed on all walls or other surfaces adjacent to where floor tile mastic are being removed. The splash guard shall extend up the wall a minimum of three feet from the floor. Entrances and exists from the work area will have triple flap barriers of plastic sheeting.

4. All building ventilation air systems connected to the work area shall remain off and sealed during preparation and until the area has passed final visual inspection and final air sampling.

5. Clean and cover fixed surfaces in the proposed work area with polyethylene sheeting.

6. Install HEPA-filtered exhaust units in work area. A pressure differential is not required.

7. The Contractor shall implement an electrical practice protocol that includes, but is not limited to, lockout and GFCI shutdown as described in OSHA Construction Standard 29 CFR 1926.417. All electrical powered equipment utilized during the project shall have ground-fault protection as described in OSHA Construction Standards. All equipment and wiring shall be in compliance with National Fire Protection Association Standard 70, and the National Electrical Code.

8. Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to the fire code.
B. Work Area Preparation for Exterior Asbestos Material Removal

1. Post Warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to personnel approved by Contractor Testing Laboratory or Consultant.

2. All building ventilation air systems connected to the work area shall remain off and sealed during preparation and until the area has passed final visual inspection.

3. The Contractor shall implement an electrical practice protocol that includes, but is not limited to, lockout and GFCI shutdown as described in OSHA Construction Standard 29 CFR 1926.417. All electrical powered equipment utilized during the project shall have ground-fault protection as described in OSHA Construction Standards. All equipment and wiring shall be in compliance with National Fire Protection Association Standard 70, and the National Electrical Code.

4. Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to the fire code.

3.03 ASBESTOS REMOVAL (METHODS)

A. Method of Removal for Non-friable Floor Tile and Mastic

1. Prior to asbestos removal, the Contractor’s equipment, work area will be inspected and approved by the Testing Laboratory.

2. Remove binding strips or other restrictive molding from doorways, walls, etc. Clean and dispose of as non-asbestos waste.

3. The asbestos floor tile shall be removed with an infrared heat machine, dry ice, or other methods approved by the Owner. Torches or open flame devices are prohibited.

4. The asbestos material shall be removed intact by heating the floor tile until it becomes soft and releases from the substrate. Gently pry the tile up without breaking the tile. When the tile is cool, place material in approved containers. Bags and containers shall be marked with labels prescribed by the OSHA and NESHAP regulations referenced in these specifications.

5. All loose asbestos material removed in the work area shall be bagged, sealed, and labeled properly before personnel breaks or end of shift.

6. Remove mastic residue using approved mastic removal solvents. Use solvents in accordance with manufacturers’ instructions. Provide worker protection as required by material safety data sheet (MSDS) for any material used. Ensure solvent does not interfere with adherence with new flooring materials.

7. Mop floor with removal solvent as required by manufacturer’s directions as required to completely remove all residue of mastic. No buffing machines shall be used.

8. All plastic sheeting, tape, cleaning material, clothing, and all other disposable material or items used in the work area shall be packed into sealable plastic bags (6 mil minimum).
B. Method of Removal for Other Non-friable Materials

1. Prior to asbestos removal, the Contractor’s equipment, work area will be inspected and approved by the Testing Laboratory.

2. Wet non-friable material with amended water and remove with appropriate equipment. Spray the asbestos material during the removal to maintain a wet condition and minimize asbestos fiber dispersion.

3. Remove material in small sections. As it is removed place material in sealable 6 mil polyethylene bags and place in appropriately labeled container for transport. Dispose of as specified in Section 02 82 33, Section 3.06.

4. Remove window caulking using non-friable methods. Windows with caulking shall be removed in whole and placed intact in lined container for disposal. Where asbestos containing materials are not encased by the item removed, the items shall be wrapped in poly prior to placement in the lined container for disposal. All efforts shall be made to keep from disturbing the asbestos-containing materials during removal of these items.

3.04 FINAL ASSESSMENTS AND CLEARANCE

A. If the Testing Laboratory finds visible accumulations of asbestos debris in the work area after the abatement, Contractor shall repeat wet-cleaning until work area is in compliance, at Contractor’s expense. All repeat visual inspections will be conducted only after all surfaces are dry. This shall be at the Contractor’s expense.

B. When an inspection by the Testing Laboratory in the presence of Contractor determines that the area is free of accumulations of dust and visible debris, an encapsulant may be applied prior to final air testing.

C. Only critical barriers and negative air exhaust units shall remain in the work area prior to initiating final clearance. The Testing Laboratory will, for this project, test final air quality clearance sampling by phase contrast microscopy (PCM) analysis upon notice and confirmation from Contractor that Work Areas and all other decontaminated and cleaned areas are ready. Sufficient time shall be allowed by the contractor for surfaces to dry. A clearance criteria of less than 0.01 fibers per cubic centimeter (f/cc) for PCM analysis is required for final clearance testing.

D. Re-clean at Contractor's expense all areas which do not comply with the standard of cleaning for final clearance. Continue cleaning until the specified clearance is achieved. Contractor shall bear cost of all follow-up inspections necessitated by the failure to meet the specified final clearance level. Owner will deduct the cost of such follow-up inspections from whatever monies remain due to the Contractor.

E. After the Testing Laboratory determines Work Area(s) to be visually decontaminated and acceptance of clearance level test results, the Contractor shall dismantle decontamination enclosure systems and thoroughly wet clean immediate areas. The Contractor shall dispose of debris, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials as contaminated and dispose of.

3.05 SITE WORK COMPLETION

A. Asbestos abatement work is complete upon meeting the Work Area clearance criteria and fulfilling the following:
1. Remove all equipment, materials, debris from the Work site.

2. Remove all residue from adhesives used. Damage to furnishings or equipment during construction activities shall be restored to existing condition or better at the expense of the Contractor.

4. Dispose of all asbestos-containing waste material.

3.06 DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

A. Asbestos-containing waste material and debris which is packaged in accordance with the provisions of this specification may be disposed of at designated landfills when certain precautions are taken. Include copy of Asbestos Waste Shipment Record (CN-1054) as required by TN Rule 1200-03-11-.02 in post-job submittals.

3.07 GENERAL

A. Remove sealed and labeled containers of contaminated material and wastes and dispose of accordingly in approved landfill as follows:

1. Notify Testing Laboratory not less than 48 hours, prior to the proposed time of removing and delivery of contaminated waste to the landfill. The Testing Laboratory may elect to observe this operation and provide photo documentation.

2. All containers (bags, drums, wrapped components) are labeled so that labels have the appearance of or are designed in accordance with OSHA 29 CFR 1926.1101, August 10, 1994, as amended, and any subsequent amendments and editions, and EPA 40 CFR 61.150, November 20, 1990, as amended, and any subsequent amendments and editions.

3. Asbestos waste must be transported and disposed of in a manner that will not permit the release of asbestos fibers into the air.

4. The cargo area of the transport vehicle shall be free of debris and lined with 6 mil polyethylene sheeting. Floor sheeting shall be installed first and shall extend up the side walls at least 12 inches and shall be taped securely into place. Wall sheeting shall overlap by at least 6 inches and be taped into place. Ceiling sheeting shall extend down the side of the walls at least 6 inches and be taped into place.

5. If asbestos waste is transported exclusively in leak-tight clean drums, then polyethylene sheeting is not required.

6. Drums, bags and wrapped components that have been removed from the work area shall be loaded into an appropriate vehicle for transportation.

7. Any debris or residue observed on containers or surfaces outside of the work area resulting from abatement activities shall immediately be cleaned using wet methods and vacuum equipment with a HEPA filter.

8. Containers shall be carefully placed and not thrown into the truck cargo area. Drums shall be placed on a level surface in the cargo area and packed tightly or blocked and braced to prevent shifting and tipping. Large structural components shall be secured to prevent shifting.
9. Asbestos waste shall be transported directly to an approved landfill and shall not be stored at a location other than the abatement site.

10. Metal dumpsters or containers in which asbestos waste is temporarily stored at the abatement site shall be lined with 6 mil polyethylene sheeting to prevent contamination, and shall have doors and tops. The doors and tops shall be closed and locked except during loading or unloading asbestos waste.

11. Metal dumpsters or containers used for waste storage shall be labeled in accordance with OSHA 29 CFR 1926.1101, August 10, 1994 as amended, and any subsequent amendments and additions.

12. Bags shall be free of splits, rips and tears, and shall be carefully placed, not thrown, into the transport vehicle.

13. The vehicle used to transport asbestos wastes shall be labeled in accordance with 40 CFR 61.149(d)(1)(i, ii, and iii) as amended, and any subsequent amendments and editions.

14. Upon reaching the landfill, vehicles shall approach the dump location as closely as possible to unload asbestos waste.

15. Bags, drums and wrapped components shall be inspected when unloaded at the disposal site. Material in damaged containers shall be rewrapped, or shall be repacked in empty drums or bags.

16. Waste containers shall be place on the ground at the disposal site, not dropped or thrown out.

17. Following the removal of all containerized waste, polyethylene sheeting shall be removed and discarded in bags or drums along with contaminated cleaning materials and protective clothing.

18. After the asbestos waste has been unloaded, the truck cargo area, including the floor, walls and ceiling, shall be decontaminated using wet methods or a vacuum equipped with a HEPA filter until no visible residues remain.

19. A waste shipment record shall be used and shall include the names of the facility owner, contractor and disposal site, the estimated quantity of asbestos waste, and the type and number of containers used. Each time the material changes custody, the record shall be signed by the persons receiving the waste. If a separate hauler is used, the hauler’s name, address, telephone number and the driver’s signature shall also appear on the record.

20. Commercial rental vehicles shall not be used to transport any asbestos or asbestos-containing waste.

END OF SECTION
NOTE:
The joint compound was found to contain 3% asbestos and the composite of the wall system was found to contain <1% asbestos.

REFERENCE:
Figure was adopted from figures provided by McCARTY HOLSAPE McCARTY.
REFERENCE:
FIGURE WAS ADOPTED FROM FIGURES PROVIDED BY
McCARTY HOLSAPLE McCARTY.

LEGEND
- ACM EXTERIOR WINDOW CAULKING
- ACM 9-INCH BROWN FLOOR TILE

ASBESTOS CONTAINING MATERIALS IDENTIFIED
BUILDING 150 - BASEMENT
ETSU NEW FOOTBALL STADIUM
SBC NO. 166/005-20-2013
JOHNSON CITY, TENNESSEE
ASBESTOS CONTAINING MATERIALS IDENTIFIED
BUILDING 150 1ST FLOOR
ETSU NEW FOOTBALL STADIUM
SBC NO. 166/005-20-2013
JOHNSON CITY, TENNESSEE

LEGEND
- ACM EXTERIOR WINDOW CAULKING
- ACM EXTERIOR DOOR CAULKING
- ACM VINYL FLOOR WITH SQUARE AND LEAF PATTERN (2 LAYERS)
- ACM GRAY SINK COATING

REFERENCE:
FIGURE WAS ADOPTED FROM FIGURES PROVIDED BY McCARTY HOLSAPE McCARTY.
ASBESTOS CONTAINING MATERIALS IDENTIFIED
BUILDING 150 2ND FLOOR
ETSU NEW FOOTBALL STADIUM
SBC NO. 166/005-20-2013
JOHNSON CITY, TENNESSEE

REFERENCE:
FIGURE WAS ADOPTED FROM FIGURES PROVIDED BY
McCARTY HOLSAPLE McCARTY.

LEGEND
ACM EXTERIOR
WINDOW CAULKING
REFERENCE: FIGURE WAS ADOPTED FROM FIGURES PROVIDED BY McCARTY HOLSAPLE McCARTY.

LEGEND
- ASSUMED ACM
- EXPLOSION PROOF LIGHT GASKETS

ASBESTOS CONTAINING MATERIALS ASSUMED
BUILDING 45
ETSU NEW FOOTBALL STADIUM
SBC NO. 166/005-20-2013
JOHNSON CITY, TENNESSEE
PART 1 - GENERAL

1.01 PROJECT/WORK IDENTIFICATION

A. Furnishing of and paying for all labor, services, appliances, materials, equipment, insurance, permits, patents and decontamination facilities necessary to carry out the safe handling and/or removal of “other hazardous materials” during the demolition. For this project, “other hazardous materials” are as follows:

1. Chlorofluorocarbons (CFC) – Refrigeration and air conditioning units commonly contain chlorofluorocarbons (e.g. Freon).

2. Mercury-containing equipment – Fluorescent, High Intensity Discharge (HID), Sodium and Mercury Vapor light tubes, electrical/mechanical thermostats, switches and manometers commonly contain small amounts of mercury.

3. PCB-containing equipment – Transformers, fluorescent light ballasts, and other electrical devices commonly contain Polychlorinated Biphenyls (PCBs).

   a. Thermostats and fluorescent light tubes throughout the project site should be considered as mercury-containing waste. Likewise, ballasts observed in fluorescent fixtures throughout the project site should be presumed to contain PCBs.

4. Batteries - Emergency lighting, smoke detectors and rechargeable batteries for emergency lighting potentially operate on cells containing heavy toxic metals (e.g. Lithium, Nickel, Cadmium, and/or Lead) and/or Acid-containing battery cells which may contain hazardous and/or regulated materials.

5. Smoke Detection Devices – Both photoelectric and ionization-type smoke alarms contain may contain batteries (alkaline or lithium). Ionization technology detectors also typically include a chamber containing radioactive materials (usually Americium-241).

B. It is the responsibility of the Contractor to identify, document the location, remove, and properly dispose of PCB, CFC, Mercury, Lead/Acid, Lithium, and Nickel/Cadmium containing equipment and fixtures prior to building demolition.

1.02 TRAINING, PERMITS, FEES, LICENSES AND ROYALTIES

A. The Contractor shall be responsible for obtaining all training, permits, certifications and notifications required for the safe removal, handling, disposal and/or recycling of these materials. All Contractor and Subcontractor personnel must have completed all required federal, state and local training and hazard communication prior to work. The Contractor shall also obtain and submit documentation that disposal and recycling facilities have all required permits and certifications, as required by federal, state and local laws and regulations.
1.03 SUBMITTALS

A. The Contractor shall submit a detailed plan of action describing the methods to be utilized to accomplish the work. Plan shall include, at a minimum:

1. Emergency Spill Procedures,
2. Hazard Communication Training,
3. Personal protective equipment,
4. Removal, handling, staging, packaging, disposal and/or recycling procedures,
5. List of disposal/recycling facilities,
6. Location of staging area,
7. Signage and control procedures.

B. Contractor shall coordinate signing of all manifests with the Owner and shall provide copies upon request of all manifests, weight tickets, receipts and/or statements that all materials have been properly disposed and/or recycled.

1.04 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

The Contractor shall take all necessary precautions to ensure that employees are not exposed to hazardous materials. Employees shall utilize personal protective clothing, eye protection and hand protection when handling hazardous materials as outlined in the Contractor’s project Health and Safety Plan. Contractor shall provide suitable hand/face and eye wash stations or equivalent.

1.05 WASTE DISPOSAL

Relative to mercury, PCB, CFC, and Lead/Acid, Lithium, and Nickel/Cadmium containing devices, the Contactor shall be responsible for all costs associated with disposal (recycling) including, but not limited to, removal/segregation, packaging, transportation, and disposal (recycling). The Contractor shall dispose of mercury, PCB, CFC, and Lead/Acid, Lithium, and Nickel/Cadmium containing devices from the job site at a recycling facility approved and/or licensed for such waste. A current list of recycling facilities can be found on the Tennessee Department of Environment and Conservation (TDEC) website (http://www.tn.gov/environment/solid-waste/solid-waste_hazardous-waste.shtml).

No hazardous wastes will be stored at the project site for more than 90 days from the date of first accumulation.

1.06 CONTRACTOR’S ADDITIONAL RESPONSIBILITIES

A. The Contractor shall comply with codes, standards, ordinances, rules, regulations, orders and other legal requirements of public authorities (including The Environmental Protection Agency (EPA), The Occupational Safety and Health Administration (OSHA), The Federal and State Departments of Transportation (DOT), TDEC, and local requirements/regulations which bear on performance of the work. Where conflicts occur between these Contract Documents and/or the above-mentioned regulations, the more stringent shall govern.
B. If the Contractor observes that any of the Contract Documents are at variance with the above-mentioned regulations and/or requirements in any respect, Contractor shall promptly inform the Owner's representative, in writing, and any necessary changes shall be accomplished by appropriate modification. It is not the Contractor's additional responsibility to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. However, if the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Owner's representative, the Contractor shall assume full responsibility therefore and shall bear all cost attributable thereto.

C. Use the best available technology, procedures, and methods for preparation, execution, cleanup, disposal, and safety. This compliance is the sole responsibility of the Contractor.

D. Be responsible for the safe and proper execution of the work. Contractor shall also be responsible for site security relative to their employees and equipment and public safety related to exposure to debris contained and/or stored onsite after Notice to Proceed of the contract documents and until submission and approval of final close out documents.

PART 2 - PRODUCTS: NOT USED

PART 3 - EXECUTION

3.01 Phasing of Work

A. Salvage operations (includes removal and recycling), shall commence prior to abatement and demolition.

B. Shut down and lock out electric power to all work areas as necessary. The Contractor shall provide temporary power and lighting, and ensure safe installation of temporary power services and equipment, as specified in applicable electrical code requirements.

C. The Contractor shall use a licensed electrician to isolate all electrical sources from lighting fixtures, emergency lighting, switches, and mechanical equipment, etc. prior to removal of ballast's, light tubes, etc. Isolation and disconnect of any other equipment/system to accomplish work shall be the responsibility of the Contractor.

D. Establish a designated staging area(s) for temporary placement of hazardous materials. Cover the floor with one (1) layer of 6-mil plastic sheeting, taped down.

E. Materials shall be segregated based on constituent, condition and proposed disposal/recycling point.
3.02 PCB Ballast and Fluorescent Light Tubes

A. The Contractor shall remove lamps from fixtures. Lamps shall remain intact (unbroken) and shall be placed carefully into cardboard containers designed to hold lamps (preferably obtained from the manufacturer or lamp recycling facility). Special care shall be taken not to break tubes during, removal, handling and transport.

B. The Contractor shall HEPA vacuum and thoroughly decontaminate any areas where lamps are accidentally broken.

C. The Contractor shall visually inspect light ballasts and transformers. Ballasts and transformers will be placed into appropriate containers supplied by recycling facility and appropriately labeled in accordance with EPA and DOT regulations.

D. The Contractor shall wrap any leaking ballasts in 6-mill plastic disposal bags and place in a separate container. Leaking ballasts shall be placed in a disposal drum with a sufficient amount of oil absorbent material placed in the bottom to contain any oil from ballast’s that may leak during transport.

E. Any material that comes in contact with leaking ballasts shall be considered contaminated and disposed of as PCB waste.

F. Transport all properly containerized lamps, ballasts and transformers to an approved recycling facility.

G. The Contractor shall be responsible for determining and complying with all current applicable regulations pertaining to waste handling and transport of PCB-containing ballast’s, transformers and mercury containing lamps.

H. The original waste shipment record documenting proper transport, recycling, and/or disposal shall be completed and submitted to Owner upon project completion.

3.03 CFCs

A. Perform work in accordance with EPA 40 CFR Part 82, Refrigeration Recycling Regulation for Venting Prohibition.

B. This work shall be performed by individuals trained and certified in accordance with EPA 40 CFR Part 82.

3.04 Mercury

A. Carefully remove fluorescent, high intensity discharge, mercury vapor, and sodium lamps and mercury-containing electrical/mechanical equipment and place them in a secure area free of vehicle, falling object hazards, etc.

B. Should mercury leaks be detected during the equipment removal process see the following steps for guidance on work procedures:

1. While wearing PPE, isolate the mercury by applying Amalgam powder to the contaminated surface and remove the mercury from the subject surface using a HEPA-filtered mercury vacuum.
2. Upon completion of the clean-up, dispose of the contaminated debris and vacuum filter in accordance with EPA 40 CFR 261 and TDEC’s Division of Solid Waste Management regulations.

3. Should mercury inadvertently contact the worker’s skin or eyes, the worker should immediately refer to the Contractor’s Management Plan for decontamination procedures (see subparagraph 1.03).

3.05 Lead/Acid, Lithium, and Nickel/Cadmium batteries

A. Segregate and dispose of at appropriate recycling facility.

END OF SECTION