S T A T E **O F** **T E N N E S S EE**

Rev. 07-07-14 January 1, 2021

SPECIAL PROVISION

REGARDING

REMOVAL OF ASBESTOS CONTAINING MATERIAL (ACM)

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SECTION 011100

SUMMARY OF WORK

1.0. PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Description

This Special Provision addresses the abatement of Asbestos-Containing Materials (ACM) in various structures on TDOT projects. The location and type of ACM will be defined in the contract plans. TDOT may provide estimated quantities based on an inspection for ACM by a licensed Tennessee Asbestos Inspector. The contractor is required to verify ACM quantities and confirm location.

Engineering controls which include, but are not limited to, negative pressure enclosures, amended water, and wet-cleaning methods, shall be utilized to prevent airborne asbestos fibers from migrating to other areas within or surrounding the work area(s) during all removal activities.

B. Location

The work is located as shown on contract plans.

C. Method of Measurement

The work shall be completed on a lump sum for completion of all work or measurement shall be square foot area and/or linear foot of pipe insulation, as follows:

1. Work Area A, Floor Tile and Mastic, Sq. Ft.

2. Work Area B, Roofing and Roof Flashing, Sq. Ft.

3. Work Area C, Thermal System Insulation, Linear Feet.

4. Work Area D, Cementitious Deck Drains (located in situ on existing bridge), Linear Feet.

5. Work Area E, Cementitious Deck Drains (located in rubble), Linear Feet.

6. Work Area F, Guardrail Caulking, Linear Feet.

7. Work Area G, Beam Bearing Pads, Sq. Ft.

8. Work Area H, Bridge Coatings and/or Concrete Bridge Components, Sq. Ft.

D. Basis of Payment

ACM abatement, complete, in accordance with this document, shall be paid for on a lump sum basis or by the unit described in the contract plans.

1.2 EXISTING FINISHES AND FACILITIES

Perform all work in such a manner as to prevent injury or damage to any portions of existing finishes, or any other portions of the building structure, which are to remain. Repair or replace portions of existing finishes which have been damaged or altered during construction operations to match existing or adjoining work, as approved by the Engineer. At the completion of operations, existing finishes shall be in a condition equal to or better than that which existed before new work started, unless otherwise specified in the contract documents.

1.3 DEFINITION OF WORK AREAS

A. Asbestos-Containing Materials

9. Work Area A is defined as the removal of all asbestos-containing Floor Tile and Mastic.

10. Work Area B is defined as the removal of all asbestos-containing Roofing and Roof Flashing.

11. Work Area C is defined as the removal of all asbestos-containing Thermal System Insulation.

12. Work Area D is defined as the removal of all asbestos-containing Cementitious Deck Drains (located in situ on existing bridge).

13. Work Area E is defined as the removal of all asbestos-containing Cementitious Deck Drains (located in rubble).

14. Work Area F is defined as the removal of all asbestos-containing Guardrail Caulking.

15. Work Area G is defined as the removal of all asbestos-containing Beam Bearing Pads.

16. Work Area H is defined as the removal of all asbestos-containing Bridge Coatings and/or Concrete Bridge Components.

END OF SECTION

SECTION 013300

SUBMITTALS

1.0. PART 1 - GENERAL

1.1. WORK INCLUDED

Make submittals required by the Contract Documents in a timely manner and at approximate times in the execution of the Work to allow for sufficient and prompt review by the Engineer and distribution to the TDOT Environmental Division. Revise and resubmit as necessary to establish compliance with the specified requirements.

A. Related Work

1. Section 014529 – Testing Laboratory Services

2. Section 028200 – Asbestos-Containing Materials Abatement

1.2. DESCRIPTION

A. Submittals

1. At the Pre-construction Conference, the successful bidder(s) shall submit three three-ring bound sets of "Pre-Job Submittals" to the Engineer for review.

2. Submit three, three-ring bound sets of any new or additional Pre-Job Submittals to the Engineer for his review prior to mobilization at the project site. The Work may not proceed until the complete Pre-Job Submittal package has been reviewed and approved in writing by the Engineer.

3. Submit three, three-ring bound sets of "Post-Job Submittals" to the Engineer for his review following the final completion of the Work.

4. Identify individual submittals by name and include a table of contents in each submittal package.

1.3. NUMBER OF COPIES

Provide three, three-ring bound sets of each submittal package to the Engineer for his review and distribution. Contractor shall also maintain one full set of pre-job submittals at each job site for the duration of the work.

1.4. QUALITY ASSURANCE

A. Coordination of Submittals

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

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

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

1.5. SUMMARY OF WORK

A. Pre-Job Submittals

1. Submit complete information relative to the following:

   NOTIFICATIONS
   PERMITS
   SAMPLE DAILY LOG

   As detailed below:

   a. Notice of impending commencement of asbestos removal work, where required, in writing to the appropriate regulatory agency:

      Using SF – 1 of these specifications, not fewer than thirty days before work commences on the Project. Include copy of notification in submittal package.

   b. All required permits and arrangements for transport and disposal of asbestos-containing or contaminated materials, supplies, etc.

   c. A sample copy of daily in/out log form to be used.

2. Submit complete information relative to the following:

   DECONTAMINATION UNIT
   SECURITY PROCEDURES
   WORK PROCEDURES
   NEGATIVE EXPOSURE ASSESSMENT
   MATERIALS CERTIFICATIONS
   EQUIPMENT CERTIFICATIONS

As detailed below:

a. Written description and/or sketch of the plans for construction of a worker and barrel/equipment decontamination enclosure system and for isolation of the work areas.

b. Written description and/or sketch of the security procedures plan to be utilized. Work procedures or practices to be utilized on the Project.

c. Submit a written, detailed plan of how the Contractor intends to remove asbestos-containing material from each work area. Details are to include wetting methods, visible emission minimization methods, segregation criteria, any cutting, abrading or physical methods, and all transport and disposal methods.

d. Negative Exposure Assessment (NEA): Provide a negative exposure assessment (NEA) as described in 29 CFR 1926.1101 for each work activity, including, but not limited to, work area preparation, removal of ACM, work area cleaning(s) and disposal at the landfill. In order to generate the NEA, obtain both PEL and excursion limit air sampling results from either prior asbestos projects within the last 12 months or from initial exposure monitoring from this project.

   Note that air sample data must include documentation indicating that the data was obtained during activities which closely resemble the processes, type of ACM, control methods, work practices and environmental conditions associated with this project. Also, include documentation that the training and experience of the workers on the prior asbestos projects was no more extensive than that of the workers to be used on this project. Documentation shall be sufficient to determine that the prevailing conditions on this project will, with a high degree of certainty, not result in employee exposures above the PEL or excursion limit.

e. Manufacturer's certification or independent test reports confirming that materials to be utilized on this Project meet or exceed all performance criteria specified in the Contract Documents. Contractor’s and Manufacturer’s affidavits stating that all materials replaced on the project do not contain asbestos or lead.

f. Certification that the diminished air filtration system to be utilized meets the requirements of the Contract Documents.

g. All special equipment, techniques, etc. to be used on the Project.

3. Submit complete information relative to the following:

   SUPERVISOR NAMES AND TRAINING
   WORKER TRAINING
   WORKER'S RELEASE
   RESPIRATORY TRAINING
   MEDICAL SURVEILLANCE

   As detailed below:

   a. Names of supervisory personnel and their qualifications and training. Refer to Sections 028200 for additional details.

   b. Alphabetized list of workers and their training. Refer to Sections 028200 for additional details.

   c. Individually signed Worker's Release forms for each and every worker to be utilized on the project by the Contractor or subcontractor (Form SF-3).

   d. Individually signed forms by each and every worker to be utilized on the Project by the Contractor or subcontractor documenting that each is actively involved in a company employee respiratory protection program and has had appropriate training in respiratory protection (Form SF-2).

   e. Individually signed forms by each and every worker to be utilized on the Project by the Contractor or subcontractor documenting that each is actively involved in a company employee medical surveillance program for asbestos (Form SF-4). Include copies of medical examination records (Doctor's respirator opinion, spirometry, radiograph, interpretation, etc.).

   f. Copies of each individual’s (working on the project) training certificate(s) with accompanying update certificates in accordance with state and federal statutes.

It shall be the responsibility of the Contractor to translate in writing all special forms requiring an individual signature (Special Forms SF-2, SF-3, SF-4) into a language that the individual worker can understand, if other than English, and to make sure that the individual worker fully understands the contents of the special form prior to signing.

B. Post-Job Submittals

Submit complete information relative to the following:

1. All submittals required by the General Requirements.

2. Waste shipment record as required by state and federal regulations. In addition, submit landfill receipts.

3. Copies of daily logs showing the following: date, entering and leaving time, company or agency represented, and reason for entry for all persons entering the work area.

4. Copies of employee air monitoring results relative to OSHA respiratory protection level compliance.

5. An alphabetized list of all employees utilized on the project.

6. Copies of pressure differential recordings the negative pressure abatement work areas. These recordings shall be clearly marked with location, pressure levels and dates and time of day, on an hourly basis, from start of removal until acceptance of clearance air testing by Testing Laboratory.

C. "Or Equivalent," "Approved Equivalent," "Other As Approved," etc.

1. Where the phrases "or equivalent," or "equivalent as approved by the Engineer," or similar wording occurs in the Contract Documents, specific materials, equipment, or methods will not be considered as equivalent unless the item has been specifically so approved for this Work by the Engineer.

2. Wherever a particular item is listed by manufacturer's name, model number or other identifying information, it shall be interpreted to include equivalent products of other manufacturers whether "approved equivalent," etc. is stated or not.

3. Whenever a manufacturer's product is specified to the exclusion of all other products, it shall be so identified and declared.

4. Decision of the Engineer shall be final.

2.0. PART 2 - PRODUCTS

2.1. SAMPLES

If requested by the Engineer, provide samples of all materials or articles proposed to be installed as a part of the Work. Identify as described under "Identification of Submittals" below.

2.2. MANUFACTURER'S LITERATURE

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. Submit a minimum of three copies to the Engineer for his review and file.

3.0 PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

Number consecutively and clearly identify all submittals. Show on at least the first page of each submittal and elsewhere as necessary for positive identification of the submittal. Accompany each submittal package with a letter of transmittal showing all information required for identification and checking.

3.2 GROUPING OF SUBMITTALS

Group submittals into packages identified as "Pre-Job Submittals" and "Post-Job Submittals". Partial submittals may be rejected for noncompliance with the Contract Documents.

3.3 TIMING OF SUBMITTALS

Make submittals not less than 14 days prior to scheduled dates for commencement, execution or installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery. Allow in scheduling, at least five working days for review by the Engineer following his receipt of pre-job submittals. Contractor will be held responsible for delays occasioned by incomplete submittal packages.

3.4 ENGINEER'S REVIEW

Review by the Engineer does not relieve the Contractor from responsibility for errors which may exist in the submitted data. Make revisions if required by the Engineer and resubmit for approval.

END OF SECTION

SECTION 014529

TESTING LABORATORY SERVICES

1.0. PART 1 - GENERAL

1.1 DESCRIPTION

Contractor will provide a qualified Testing Laboratory to perform routine and special testing of the Work performed under the Contract Documents and to monitor general compliance therewith. The Testing Laboratory employed by the Contractor shall perform testing for compliance with applicable codes, regulations, and requirements as specified in this Section and elsewhere in the Contract Documents. The Testing Laboratory employed by the Contractor shall be responsible for employee air monitoring relative to OSHA respiratory protection level compliance, daily area air monitoring to determine effectiveness of engineering controls, and negative pressure enclosure readings and documentation, and final clearance sampling, if required by these specifications.

The Contractor shall cooperate with the Testing Laboratory in all aspects of the testing in order to expedite testing and results. Provide Testing Laboratory access to the Work at all times and in all locations requested as necessary to perform testing.

The Engineer reserves the right to hire, direct, and compensate his own Testing Laboratory, separate and distinct from the Contractor. The Engineer's test results may be made available to Contractor at the Engineer's sole discretion.

A. Related Work

1. Section 013300 – Submittals

2. Section 028200 – Asbestos-Containing Material Abatement

1.2 QUALITY ASSURANCE

All asbestos air testing shall be performed in general accordance with the procedures outlined in the National Institute for Occupational Safety and Health (NIOSH) methods 7400 for samples analyzed by Phase Contrast Microscopy (PCM) and in general accordance with the EPA AHERA protocols for samples analyzed by Transmission Electron Microscopy (TEM) and also guidelines issued by EPA for detection limits. Consider work areas clean and ready for reoccupancy when air testing shows 0.01 or less fibers per cubic centimeter of air (f/cc), for each sample obtained using standard NIOSH Method No. 7400 for PCM. This standard must be met for the work area to pass clearance.

A. Payment for Testing

Testing Services shall be paid for as follows:

1. Initial Services: Contractor will pay for initial air clearance testing services required by Contract Documents.

2. Retesting: When initial air clearance tests indicate noncompliance with the Contract Documents, subsequent retesting shall be performed by the same testing agency, and costs will be absorbed by the Contractor.

B. Scheduling

1. Testing by the Testing Laboratory shall be performed in areas and at times during the Work as deemed necessary by the Engineer or as specified in the Contract Documents.

2. Contractor shall schedule, and make the Engineer aware of, air clearance testing at least 24 hours prior to desired time of testing.

3. Coordinate scheduling with Testing Laboratory as necessary.

C. Results

1. 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.

2. Test results will be made available to the Engineer as follows:

    a. Air sample results for Asbestos (Phase Contrast Microscopy) - as quickly as possible but not later than 24 hours following conclusion of sampling event.

    b. Results of other tests deemed necessary - as quickly as possible but not later than 24 hours following completion of test(s).

END OF SECTION

SECTION 028200

ASBESTOS-CONTAINING MATERIAL ABATEMENT

1.0. PART 1 - GENERAL

1.1 DESCRIPTION

A. Responsibilities of the Contractor

1. Perform all planning, administrative, execution, and cleaning requirements necessary to safely remove all asbestos-containing materials from all Work Areas indicated in the Contract Documents. Approval of or acceptance by the Engineer of various construction activities or methods proposed by the Contractor does not constitute an assumption of liability by the Engineer for inadequacy or adverse consequences of said activities or methods.

2. Contractor (or subcontractor engaged to perform the Work of this Section) shall:

   a. Be a licensed asbestos abatement contractor in accordance with State of Tennessee Statutes. Submit documentation confirming current licensure.

   b. Have a record of not less than five years successful experience in asbestos removal and related work similar in scope and magnitude to this Project. Submit list of successfully completed projects for verification.

3. Maintain on site a Superintendent and one Head Foreman, each on permanent staff and each having no less than two years of full-time experience in responsible charge of asbestos removal operations similar in scope and magnitude to this Project within the three year period preceding start of Project. Adequate evidence of experience and skill of the Superintendent and Head Foreman must be demonstrated prior to the start of the Work and shall not be changed. Head Foreman shall remain inside of the work area at all times the Work is in progress. Submit experience of Superintendent and Head Foreman in the pre-job submittal package.

4. Provide one experienced Job Foreman with a minimum of two years successful experience in asbestos removal operations similar in scope and magnitude to this Project for every ten asbestos removal workers (laborers) utilized on the Project. Foreman shall remain inside of work area(s) at all times that the Work is in progress. Submit notarized experience of each Job Foreman in the pre-job submittal package.

5. Submit certification for each and every worker to be utilized on the project by the Contractor or subcontractor(s) documenting that each has successfully completed (including examinations and applicable refresher courses) a training course for asbestos abatement workers approved by the State of Tennessee. Contractor shall also submit documentation confirming federal approval for each training center represented in the submittals.

6. Submit certification for each and every supervisor to be utilized on the project by the Contractor or subcontractor(s) documenting that each has successfully completed (including examinations and applicable refresher courses) a training course approved by EPA and State of Tennessee for asbestos abatement supervisors.

B. Reference Standards

1. Acknowledge, by the executing of the Contract, awareness and familiarity with the contents and requirements of the following regulations, codes, and standards, and assume responsibility for the performance of the Work in strict compliance therewith and for every instance of failure to comply therewith.

2. The current issue of each document shall govern. Where conflict among requirements or with the Contract Documents exists, the more stringent requirements shall apply.

    a. U.S. Environmental Protection Agency (EPA) Regulations for Asbestos (Code of Federal Regulations Title 40, Part 61, Subparts A and B).

    b. U.S. EPA Regulations for Asbestos in Schools, Asbestos Hazard Emergency Response Act (AHERA), (Code of Federal Regulations Title 40, part 763, Subpart E).

    c. U.S. EPA Regional National Emissions Standards for Hazardous Air Pollutants (NESHAPS).

    d. U.S. Occupational and Safety and Health Administration (OSHA) Asbestos Regulations (Code of Federal Regulations Title 29, Part 1926, Section 1926.1101).

    e. U.S. EPA Office of Pesticide and Toxic Substances Guidance Document, "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings", EPA 56015-85-024, June, 1985.

    f. U.S. Department of Transportation, Hazardous Substances: Final Rule (Code of Federal Regulations Title 49 Parts 171 and 172), Federal Register November 21, 1986 and corrected February 17, 1987.

    g. All state, county, and city codes and ordinances as applicable. Make available for review at the site one copy of EPA, OSHA, and applicable State, County, and City Regulations governing the Work.

    h. U.S. Environmental Protection Agency – 40 CFR, Part 763, Subpart G – Asbestos Worker Protection

    i. U.S. Environmental Protection Agency – 40 CFR, Park 61, Subpart M – National Emission Standards for Hazardous Air Pollutants

j. U.S. Occupational Safety and Health Administration – 29 CFR, Part 1910.1001 – Asbestos Standard for Industry

k. Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Air Pollution Control – Chapter 1200-03-11, Hazardous Air Contaminants.

l. Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Air Pollution Control – Chapter 1200-01-20, Asbestos Accreditation Requirements.

m. Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Solid and Hazardous Waste Management – Chapter 1200-01-07, Solid Waste Processing and Disposal

n. Tennessee Department of Labor and Workforce Development, Division of Occupational Safety and Health (TOSHA) – Chapter 0800-01-01, Occupational Safety and Health Standards for General Industry.

o. Tennessee Department of Labor and Workforce Development, Division of Occupational Safety and Health (TOSHA) – Chapter 0800-01-06, Occupational Safety and Health Standards for Construction.

C. Patent/Copyright Compliance

The Contractor shall fully comply with patent and copyright requirements associated with this Contract. The Contractor shall defend all suits for or claims of infringement of said patent rights and shall save the Engineer and Testing Laboratory harmless from loss on account thereof, fully indemnifying the Engineer and Testing Laboratory from same and any and all associated claims without exception or limitation.

D. Test Reports

1. Results of tests of asbestos-containing materials (which are specifically excluded as a part of this Contract) taken from surfaces within the scope of this Project are available for review at the office of the Engineer.

   However, the Contractor or subcontractor is cautioned that, should interpretations be made, opinions be formed, and conclusions be drawn as a result of examining the test results, those interpretations, opinions, and

conclusions will be those made, formed, and drawn solely by the Contractor or subcontractor.

2. In as much as randomly and/or arbitrarily selected areas were sampled, the Department makes no representation, warranty, nor guarantee that the conditions indicated by the test reports either are representative of those conditions existing throughout the area, or that unforeseen developments may not occur, or that materials other than, or in proportions different from, those indicated may not exist.

1.2. SUMMARY OF WORK

A. Work Covered by Contract Documents

The Contractor shall inform himself of the conditions for the project, and is responsible for verifying the quantities and locations of all work to be performed as outlined in this section. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract.

1. **SCOPE OF WORK**: The scope of work to be performed is the removal and disposal of asbestos-containing materials as defined and quantified in the Drawings. The work of the contract shall be performed in compliance with the specifications.

2. **START OF WORK**: Work shall be started no earlier than the date indicated on written authorization from the Engineer and shall be performed only during the hours as stated below.

3. **WORKING HOURS**: All work by the abatement contractor shall be performed during the days and hour as defined in the contract documents.

B. Definitions

1. Abatement - procedures to decrease or eliminate fiber release from asbestos- containing building materials. Includes encapsulation, enclosure and removal.
2. AHERA - Asbestos Hazard Emergency Response Act (40CFR763).

3. 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 at least three feet apart.
4. Amended water - water to which a surfactant is added.

5. Air Monitoring - the process of measuring the fiber content of a specific volume of air in a stated period of time.

6. 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".

7. 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 form an airlock.

8. 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 an airlock.

9. Encapsulation - the sealing of asbestos surfaces involving application of a material (encapsulant/sealant) that will envelop or coat the fiber matrix and minimize fiber fallout and protect against contact damage.

10. Enclosure - procedures necessary to completely enclose material containing asbestos behind airtight, impermeable, permanent barriers.

11. Engineer – where the word Engineer is used, the word Architect shall be interchangeable.

12. EPA - United States Environmental Protection Agency.

13. 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.

14. 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.

15. Fixed Object (immovable object) - a unit of equipment or furniture in the work area which cannot be removed from the work area.

16. Glove Bag - A relatively small, clear plastic enclosure which can completely encompass short sections of pipe. It shall be capable of allowing the removal of asbestos- containing materials without any of the materials escaping from the enclosure.

17. HEPA Filter - a High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of asbestos thermally generated DOP particles 0.3 microns in diameter.

18. HEPA Vacuum Equipment - High Efficiency Particulate Air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be 99.97 percent efficient for retaining thermally generated DOP particles 0.3 microns in diameter.

19. Holding Area - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.

20. Movable Object - a unit of equipment or furniture in the work area which can be removed from the work area.

21. NIOSH - National Institute for Occupational Safety and Health.

22. OSHA - Occupational Safety & Health Administration.

23. Plastic Sheeting - plastic sheet material used for protection of walls, floors, etc. and used to seal openings into work areas. The thickness of the material shall be as specified.

24. Asbestos Containing Material (ACM) Removal - the act of removing asbestos-containing or contaminated materials from a structure and depositing in a suitable disposal site.

25. Scaffolding - self-supporting and load bearing temporary structure.

26. Shower Room - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitably arranged for complete showering during decontamination.

27. Surfactant - a chemical wetting agent added to water to improve its penetrating ability, thus reducing the quantity of water required to saturate asbestos- containing materials.

28. Waste Generator - a source covered by EPA NESHAP regulations whose act or process produces asbestos-containing waste.

29. Wet Cleaning - the process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.

30. Washroom - a room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an airlock.

31. Work Area - area or areas of project which undergo "abatement" or are contaminated.

32. Worker Decontamination Enclosure System - a decontamination enclosure system for workers, typically consisting of a clean room, a shower room, and an equipment room.

1.3. WORKSITE CONDITIONS

Worker and Visitor Procedures: The Contractor is hereby advised that asbestos has been determined by the U.S. Government to be a CANCER-CAUSING AGENT and Contractor shall provide workers and visitors with respirators which as a minimum shall meet the requirements of OSHA 29CFR 1926.1101, and protective clothing during preparation of system of enclosures, prior to commencing, during actual asbestos removal, and until final clean-up is completed.

1.4 PERSONNEL PROTECTION

Prior to commencement of work, all workers shall be instructed by the Contractor and shall be knowledgeable, in the appropriate procedures of personnel protection and asbestos removal. Contractor acknowledges and agrees that he is solely responsible for enforcing worker protection requirements at least equal to those required by federal regulations.

A. Respiratory Protection

1. Contractor shall provide workers with personally issued and marked respiratory equipment approved by NIOSH and OSHA and as a minimum

suitable for the asbestos exposure level in the work areas according to OSHA Standard 29 CFR 1926.1101.

2. Where respirators with disposable filters are used, provide sufficient filters for replacement as necessary by the workers, or as required by applicable regulations.

3. Provide respiratory protection from the time the first operations involved in the Project require contact with asbestos-containing materials (including construction of airtight barriers/barricades, and placing of plastic sheeting on walls) until acceptance of final air test results by Testing Laboratory. Should conditions be encountered where the exposure level, after application of the appropriate protection factor of the respiratory equipment in use, exceeds 0.01 fibers per cubic centimeter of air (f/cc), substitute respiratory equipment with protection factors which reduce worker exposure levels below 0.01 f/cc. As a minimum, Contractor shall use respirators as follows:

	ACTIVITY	MIN. RESPIRATORY PROTECTION
a.	Construction of Airtight Barriers/Barricades	Half-Mask Air Purifying
b.	Placing of Plastic Sheeting	Half-Mask Air Purifying
c.	Pre-cleaning	Half-Mask Air Purifying
d.	Removal Using Glovebag Procedures	Half-Mask Air Purifying
e.	Removal of Non-Friable Materials	Half-Mask Air Purifying
f.	Removal of Friable Materials	Powered Air Purifying (PAPR)
g.	Second Phase Cleaning	Half-Mask Air Purifying
h.	Anytime fiber concentrations reach or exceed 0.10 f/cc by NIOSH Method #7400 regardless of activity being performed.	Type C, Supplied Air, Pressure Demand

4. Provide emergency backup air supply for each worker in work area at all times when "Type C" (supplied air) respirators are required. Provide emergency backup equipment with air supply of sufficient duration for all workers to safely exit work area. Locate emergency equipment so that it is readily accessible to each worker in work area following interruption of normal air supply.

5. All supplied air (Type C) respiratory equipment shall supply as a minimum, Grade D air. Contractor shall maintain on- site documentation and submit certified test results that air supplied to work area is Grade D or better. Documentation will include, as a minimum, equipment serial numbers, or panel numbers, and shall have been certified within the six months prior to project startup date.

6. Ambient air pumps shall not be used for Type C supplied air systems.

B. Additional Protective Measures

1. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Engineer, in the work areas after commencement of asbestos disturbance or removal. Provide authorized visitors with suitable respirators.

2. Provide workers with sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers; of sizes to properly fit individual workers.

3. Provide authorized visitors with a set of suitable protective disposable clothing, headgear, eye protection, and footwear of sizes to properly fit visitors whenever they are required to enter the work area, to a maximum of six sets per day.

4. Provide, in addition to respirators and protective clothing provided for authorized visitors, protective clothing and respirators for use by Testing Laboratory's representative. Furnish protective clothing in as many sets as required for full-time monitoring by Testing Laboratory.

5. Provide and post in the Equipment Room and the Clean Room the asbestos removal decontamination and work procedures to be followed by workers.

2.0. PRODUCTS

2.1 MATERIALS

A. Material Requirements

Materials to be used by the Contractor shall meet the following requirements:

1. Plastic sheeting - shall be of the thicknesses specified, in sizes to minimize the frequency of joints. Opaque plastic sheeting shall be utilized, in thicknesses specified, where work areas are adjacent to public access areas.

2. Tape - shall be glass fiber or other type capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions.

3. Surfactant (wetting agent) - Shall consist of resin materials in water base which have been tested to indicate material is nontoxic and nonirritating to skin and eyes, and noncarcinogenic. Approved Materials and Manufacturers:

    a. "Dust-Set Amended Water Base" and its sprayer mixing head amended water generator manufactured by Matheson Chemical Corporation, 1025 East Montgomery Avenue, Philadelphia, PA, 19125, telephone (215) 423-3200.

    b. Equivalent products by other manufacturers will be considered for approval if submitted with appropriate information not later than five days prior to the scheduled time for the material to be used. Minimum information shall include Material Safety Data Sheet, OSHA Form No. 20; toxicological reports, and installation recommendations for use on asbestos- containing materials.

4. Tile Adhesive Removal Solvent: - Provide a water based slow drying solvent intended to remove tile adhesive. The chemical shall, at a minimum, have a closed cup flash point of greater than 140 degrees F., contain no chlorinated compounds, and contain no compounds which could render the waste as a hazardous waste for disposal. Specifically, the mastic removal chemical shall not contain any ingredient which is subject to the reporting requirements of Section 313 Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) or 40 CFR 372. Contractor shall, whenever feasible, use "low odor" products in an effort to minimize complaints during the project and following demobilization. Approved materials and manufacturers:

a. "De-Solv-It", manufactured by Orange Sol, Inc., P.O. Box 306, Chandler, Arizona 85244, Telephone (602) 497-8822. "De-Solv-It" is formulated for the removal of asphaltic and multi-purpose adhesives.

b. "ADL-1" manufactured by Orange Sol, Inc., P.O. Box 306, Chandler, Arizona 85244, Telephone (602) 497-8822. "ADL-1" is formulated for latex adhesive removal.

c. Equivalent products by other manufacturers will be considered for approval if submitted with appropriate information not later than five days prior to the scheduled time for the material to be used. Minimum information shall include Material Safety Data Sheet, OSHA Form No. 20; toxicological reports, and installation recommendations for use on asbestos-containing materials.

5. Sealant (encapsulant) - Shall be manufactured by reputable, established manufacturer of encapsulant/sealant materials and be approved specifically for use in asbestos-contaminated environments. Shall be compatible with the temperature conditions on surfaces to which sealant is to be applied. It is the responsibility of the Contractor to determine compatibility of the sealant with materials and conditions.

6. Impermeable containers - Shall be suitable to receive and retain asbestos-containing or contaminated materials until disposal at an approved site and shall be labeled in accordance with OSHA Regulation 29 CFR 1926.1101, and U.S. DOT 49 CFR 171 and 172, containers shall be both air and water- tight. Use a minimum of two types of impermeable containers: 1) six mil plastic bags sized to fit within the drum 2) metal or fiber drums with tightly fitting lids.

7. Warning labels and signs - Shall be as required by OSHA regulation 29 CFR 1926.1101 (and U.S. DOT 49CFR 171 and 172 for impermeable containers).

8. Other materials - Provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area(s).

9. Caulking - Shall be non-shrinking caulk to be used where insulated pipes continue through walls, ceilings, etc. Contractor shall determine and submit proof that caulk proposed for use is compatible with the temperature conditions and fire ratings of the surfaces to which it is to be applied. Caulking shall be certified as not containing asbestos in any amounts.

2.2 PRODUCT HANDLING

A. Product Delivery and Storage

1. Deliver all materials as described in Part 2 in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

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

3. Remove from the premises all damaged or deteriorating materials. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards.

2.3 TOOLS AND EQUIPMENT

A. Suitable tools for asbestos removal

1. Water sprayer - Use airless or other low pressure sprayer for amended water application.

2. Air purifying equipment (for internal recirculation in the work area) - Shall be HEPA Filtration Systems or Electronic Precipitators. Ensure that no internal air movement system or purification equipment exhausts contaminated air from the work area(s) outside the work area.

3. Diminished air pressure equipment - comply with ANSI 29.2-7, local exhaust ventilation.

4. Scaffolding - Shall be as required to accomplish the specified work and shall meet all applicable safety regulations.

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

6. Communication equipment - Shall be suitable for interroom communications, such as "walkie-talkies".

7. First Aid Supplies - Comply with governing regulations and recognized recommendations within the construction industry.

8. Fire Extinguishers - Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or

grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.

9. Water Hoses - Employ either rigid copper tubing or heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each work area and to each Decontamination Unit.

10. Water Heater - Provide UL rated electric water heater to supply hot water for the Decontamination Unit shower. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip on floor. Wiring of the water heater shall be in compliance with NEMA, NEC, and UL standards.

11. Electrical Distribution Equipment - Provide circuit and branch wiring, with area distribution boxes located as necessary to perform the Work. Wiring shall be in compliance with NEMA, NEC and UL standards. All branch circuits shall originate from a ground fault circuit interrupter located outside the containment(s).

12. Lighting - Provide adequate artificial lighting for all areas of the Work.

13. Extension Cords - Use only grounded extension cords. Use "hard-service" cords where exposed to abrasion or traffic. Use single lengths or water proof connectors to connect separate lengths when single lengths do not suffice.

14. Temporary Cooling and Heating - Provide temporary cooling and heating as necessary to maintain adequate environmental conditions to facilitate the progress of the work, to meet specified minimum conditions for material installation, and to protect materials and finishes from damage due to temperature or humidity.

3.0. EXECUTION

3.1. PREPARATION AND WORK AREA ENCLOSURE

A. Preparation Procedure A - For use with the full enclosure, gross removal of the following asbestos-containing materials:

- Floor Tile and Mastic (Contractor shall remove all floor tile and mastic from work area(s). Non-asbestos tile and multiple layers of tile may be present in some areas. All floor tile and mastic shall be treated as asbestos-containing.)

1. Coordinate with the Engineer to disable heating, ventilating and air conditioning (HVAC) systems or any other systems bringing air into or out of the work area(s). These systems shall remain disabled for the duration of abatement activities.

2. Temporary electrical power must be obtained from outside the work area(s) and shall be equipped with ground fault circuit interrupt protection. The Contractor is to provide generators for temporary electrical power and all water required by the job. All costs associated with providing temporary power and water shall be the responsibility of the Contractor.

3. Completely segregate the work area(s) from all other portions of the complex with temporary partitions. Partitions shall be of softwall construction as explained further in this section:

    a. Softwall partitions shall be constructed of a 6 mil minimum thickness plastic sheeting attached to a 2" x 4" enclosure framework using 2" x 4" supports where necessary to prevent collapse of the enclosure system.

    b. All partitions shall be removed at the conclusion of the work and all surfaces shall be restored to original condition, unless otherwise approved by the Engineer. All locations and configurations of softwall partitions shall be reviewed by the Engineer prior to installation.

    c. Ensure that all barriers and plastic enclosures remain effectively sealed and taped for the duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning and end of each work period. Use smoke methods to test the effectiveness of barriers when directed by the Engineer.

4. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work area(s) not previously removed by the Department.

5. Identify location and amount of all asbestos-containing materials to be removed.

6. Isolate the work areas until clearance testing is accepted by the Contractor’s Testing Laboratory, by completely sealing off with critical barriers all openings such as doorways, skylights, crawlspace openings, ducts, grills, diffusers, plenum areas and any other penetrations of the work areas with two layers of six mil plastic sheeting sealed with tape.

7. Seal wall-mounted electrical panels, switchboxes, etc. with minimum two layers of six mil plastic sheeting prior to placement of wall plastic.

8. Clean, prior to placing plastic sheeting on walls, the work area(s) using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filtration. The Engineer shall be notified for observation of the critical barrier placement and cleaning of the work area prior to application of additional plastic sheeting.

9. Preclean immovable objects within the proposed work area(s), using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Following cleaning, completely seal all immovable items with two layers of six mil plastic sheeting.

10. Construct worker and barrel/equipment decontamination units in compliance with EPA guidelines concerning number, size and placement of airlocks, etc. Shower in worker decontamination unit shall open on two sides and open into airlock on both contaminated and uncontaminated sides. Construct decontamination units of appropriate materials including plastic sheeting (to provide airtight barriers) and plywood or other suitable rigid materials to allow continuous diminished pressure to be maintained in work areas. Supply sufficient number of lockers, in worker decontamination unit change or "clean" room, for workers' clothing. Reserve one locker for Testing Laboratory personnel. Post OSHA decontamination procedures in change room for duration of Project.

11. Plastic Enclosures

    a. In work areas where asbestos-containing floor coverings are to be removed, Contractor shall place six mil plastic "splash guards" on walls at perimeter of work area(s). Plastic sheeting "splash guards" shall extend, from floor level, a minimum of four feet up wall areas.

    b. Ensure that all barriers and plastic enclosures remain effectively sealed and taped for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning of each work period. Use smoke methods to test effectiveness of barriers when directed by the Engineer.

12. Diminished Pressure

    a. Place each work area under diminished air pressure utilizing HEPA filtration systems which comply with 028200, Part 2.02, A,3.

Allow no air movement system or air filtering equipment to discharge unfiltered air outside the work area. Maintain a diminished air pressure on the work area continuously (24 hours per day) from the start of asbestos removal and until the area has been decontaminated and certified as such by the required air testing. Accomplish a minimum of eight air changes per hour in the work area and maintain a minimum of 0.02 inches of water diminished pressure. Demonstrate diminished air pressure compliance during the removal of friable materials by monitoring and recording the pressure differential with a continuous read-out, strip-chart differential pressure recorder. Exhaust all filtered and discharged air outside the building away from any air intake devices.

b. Exhaust ducts from diminished air machines shall be flexible polyethylene ducts manufactured for this purpose and sized to fit the outlet of the machines. Ducts field fabricated from plastic sheeting will not be permitted. If direction of discharge from fan unit is not aligned with duct, use sheet metal elbow to change direction.

c. Supplemental Make-Up Air Inlets: Where required for proper air flow through the work area(s), install HEPA-filtered make-up air inlet(s) at the perimeter of the enclosure(s) that allows air from outside into the work area. Locate make-up air inlets as far as possible from the exhaust unit(s). Air inlets shall be designed to reseal automatically if the diminished pressure system should shut down for any reason. Location of make-up air inlets must be approved by the Project Engineer.

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

14. Provide temporary power, lighting and heating, utilizing ground fault protection devices, to maintain a comfortable work environment and to keep utilities from freezing. Normal water and electric utilities to be supplied by the Engineer.

15. Notify the Engineer for observation of the preparation of jobsite prior to any removal of asbestos-containing material. Prior to notification, complete plasticizing of work area(s) and construction of worker and barrel/equipment decontamination enclosure systems, and store all equipment required for Project.

16. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the

immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

17. Trap, filter using filters having a pore size of not larger than five microns, and drain shower wastewater into a sanitary sewer. Replace contaminated filters when they become clogged but not less than every third day. Dispose of filters as contaminated waste. Contractor may dispose of as contaminated material, at his option, rather than filtering and draining into sanitary sewer.

B. Preparation Procedure B - For use with the following asbestos-containing materials:

- Roofing and Roof Flashing

1. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work areas not previously removed by the Department.

2. Identify location and amount of all asbestos- containing materials to be removed.

3. Preclean exhaust vents, fan hoods, etc. in the vicinity of the proposed work area(s), using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Following cleaning, completely seal in plastic.

4. Perimeter Enclosure

   a. Erect warning tape at perimeter of work area to establish caution barrier.

   b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect perimeter of the work area at the beginning and end of each work period.

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

6. Notify the Engineer for observation of the preparation of jobsite prior to any removal of asbestos-containing material. Prior to notification complete plasticizing of work area(s) and construction of remote worker and barrel/equipment decontamination enclosure systems, and store all equipment required for Project.

7. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

C. Preparation Procedure C - For use with the following asbestos-containing materials:

- Thermal Systems Insulation (TSI) – Using Glovebag Procedure:

1. Disable and lock out applicable utility services to and through the work area(s) (if present) for the duration of abatement activities. Temporary electrical power shall be obtained from outside the work area(s) and shall be equipped with ground fault circuit interrupt protection.

2. Identify location and amount of all asbestos-containing materials to be removed. Confirm with the Engineer that the materials to be removed are suitably located so as to facilitate glovebag removal.

3. Isolate the work area(s) until clearance testing is accepted by the Contractor's Testing Laboratory, by completely sealing off work area(s) with one layer of six mil plastic sheeting sealed with tape.

4. Clean, prior to placing plastic sheeting on floors and walls (if applicable), the work area(s) using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filtration. The Engineer shall be notified for observation of the critical barrier placement and cleaning of the work area prior to application of additional plastic sheeting.

5. Preclean immovable objects within the proposed work area(s), using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Following cleaning, completely seal in plastic all immovable items with one layer of six mil plastic sheeting.

6. Perimeter Enclosure

   a. Erect warning tape at perimeter of work area to establish caution barrier.

   b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually

inspect perimeter of the work area at the beginning and end of each work period.

c. Place one layer of six mil plastic sheeting on ground areas beneath work area(s). Width shall not be less than material height from ground or ten feet, whichever is greater.

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

8. Notify the Engineer for observation of the preparation of jobsite prior to any removal of asbestos-containing material. Prior to notification complete plasticizing of work area(s) and construction of remote worker and barrel/equipment decontamination enclosure systems, and store all equipment required for Project.

9. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

D. Preparation Procedure D - For use with the following asbestos-containing materials:

- Cementitious Deck Drains (located in situ on existing bridge)

1. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work areas not previously removed by the Department.

2. Identify location and amount of all asbestos- containing materials to be removed.

3. Perimeter Enclosure

    a. Erect warning tape at perimeter of work area to establish caution barrier.

    b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect perimeter of the work area at the beginning and end of each work period.

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

5. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

E. Preparation Procedure E - For use with the following asbestos-containing materials:

- Cementitious Deck Drains (located in rubble)

1. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work areas not previously removed by the Department.

2. Identify location and amount of all asbestos- containing materials to be removed.

3. Perimeter Enclosure

a. Erect warning tape at perimeter of work area to establish caution barrier.

b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect perimeter of the work area at the beginning and end of each work period.

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

5. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

F. Preparation Procedure F - For use with the following asbestos-containing materials:

- Guardrail Caulking

1. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work areas not previously removed by the Department.

2. Identify location and amount of all asbestos- containing materials to be removed.

3. Perimeter Enclosure

a. Erect warning tape at perimeter of work area to establish caution barrier.

b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect perimeter of the work area at the beginning and end of each work period.

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

5. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

G. Preparation Procedure G - For use with the following asbestos-containing materials:

- Beam Bearing Pads

1. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work areas not previously removed by the Department.

2. Identify location and amount of all asbestos- containing materials to be removed.

3. Perimeter Enclosure

   a. Erect warning tape at perimeter of work area to establish caution barrier.

   b. Ensure that all barriers remain in good condition for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect perimeter of the work area at the beginning and end of each work period.

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

5. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

H. Preparation Procedure H - For use with the following asbestos-containing materials:

- Bridge Coatings and/or Concrete Bridge Components

1. Completely segregate the work area(s) from all other portions of the complex with temporary partitions. Partitions shall be of softwall construction as explained further in this section:

   a. Softwall partitions shall be constructed of a 6 mil minimum thickness plastic sheeting attached to a 2" x 4" enclosure framework using 2" x 4" supports where necessary to prevent collapse of the enclosure system.

   b. All partitions shall be removed at the conclusion of the work and all surfaces shall be restored to original condition. All locations and configurations of softwall partitions shall be reviewed by the Engineer prior to installation.

   c. Ensure that all barriers and plastic enclosures remain effectively sealed and taped for the duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning and end of each work period. Use smoke methods to test the effectiveness of barriers when directed by the Engineer.

2. Remove, properly decontaminate using wet-cleaning and HEPA vacuuming as appropriate, and inventory any and all movable items remaining in the work area(s) not previously removed by the Department.

3. Identify location and amount of all asbestos-containing materials to be removed.

4. Isolate the work areas until final air clearance testing conducted by the Contractor’s Testing Laboratory, by completely sealing off the work area(s) with two layers of six mil plastic sheeting sealed with tape.

5. Seal all active wall-mounted electrical panels, switchboxes, etc. with minimum two layers of six mil plastic sheeting prior to placement of wall plastic.

6. Clean the work area(s) using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filtration. The Engineer shall be notified for observation of the critical barrier placement and cleaning of the work area prior to application of additional plastic sheeting.

7. Preclean immovable objects within the proposed work area(s), using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Following

cleaning, completely seal all immovable items with two layers of six mil plastic sheeting.

8. Construct worker and barrel/equipment decontamination units in compliance with EPA guidelines concerning number, size and placement of airlocks, etc. Shower in worker decontamination unit shall open on two sides and open into airlock on both contaminated and uncontaminated sides. Construct decontamination units of appropriate materials including plastic sheeting (to provide airtight barriers) and plywood or other suitable rigid materials to allow continuous diminished pressure to be maintained in work areas. Supply sufficient number of lockers, in worker decontamination unit change or "clean" room, for workers' clothing. Reserve one locker for Testing Laboratory personnel. Post OSHA decontamination procedures in change room for duration of Project.

9. Plastic Enclosures

   a. In work areas where asbestos-containing floor coverings are to be removed, Contractor shall place six mil plastic "splash guards" on walls at perimeter of work area(s). Plastic sheeting "splash guards" shall extend, from floor level, a minimum of four feet up wall areas.

   b. Ensure that all barriers and plastic enclosures remain effectively sealed and taped for duration of asbestos removal and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning of each work period. Use smoke methods to test effectiveness of barriers when directed by the Engineer.

10. Diminished Pressure

   a. Place each work area under diminished air pressure utilizing HEPA filtration systems which comply with 028200, Part 2.02, A,3. Allow no air movement system or air filtering equipment to discharge unfiltered air outside the work area. Maintain a diminished air pressure on the work area continuously (24 hours per day) from the start of asbestos removal and until the area has been decontaminated and certified as such by the required air testing. Accomplish a minimum of eight air changes per hour in the work area and maintain a minimum of 0.02 inches of water diminished pressure. Demonstrate diminished air pressure compliance during the removal of friable materials by monitoring and recording the pressure differential with a continuous read-out, strip-chart differential pressure recorder. Exhaust all filtered and

discharged air outside the building away from any air intake devices.

b. Exhaust ducts from diminished air machines shall be flexible polyethylene ducts manufactured for this purpose and sized to fit the outlet of the machines. Ducts field fabricated from plastic sheeting will not be permitted. If direction of discharge from fan unit is not aligned with duct, use sheet metal elbow to change direction.

c. Supplemental Make-Up Air Inlets: Where required for proper air flow through the work area(s), install HEPA-filtered make-up air inlet(s) at the perimeter of the enclosure(s) that allows air from outside into the work area. Locate make-up air inlets as far as possible from the exhaust unit(s). Air inlets shall be designed to reseal automatically if the diminished pressure system should shut down for any reason. Location of make-up air inlets must be approved by the Engineer.

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

12. Provide temporary power, lighting and heating, utilizing ground fault protection devices, to maintain a comfortable work environment and to keep utilities from freezing. Normal water and electric utility service to be supplied by the Deparment.

13. Notify the Engineer for observation of the preparation of jobsite prior to any removal of asbestos-containing material. Prior to notification, complete plasticizing of work area(s) and construction of worker and barrel/equipment decontamination enclosure systems, and store all equipment required for Project.

14. Maintain for the duration of the Project from the first activity requiring disturbance of asbestos-containing materials, a sign in/out log in the immediate area of the change room. Log shall be utilized by every person and each time upon entering and leaving the work area(s). Submit copies of this log to the Engineer for permanent file upon completion of Project.

15. Trap, filter using filters having a pore size of not larger than five microns, and drain shower wastewater into a sanitary sewer. Replace contaminated filters when they become clogged but not less than every third day. Dispose of filters as contaminated waste. Contractor may dispose of as contaminated material, at his option, rather than filtering and draining into sanitary sewer.

3.2. REMOVAL OF ASBESTOS-CONTAINING MATERIAL

Properly remove and dispose of all asbestos-containing materials indicated to be removed as described in the Contract Documents in accordance with the methods and procedures outlined in the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Asbestos Regulation (Code of Federal Regulations Title 29, Part 1926, Section 1926.1101) or as more stringently specified herein.

If asbestos-containing materials are made to become friable during removal activities, or additional friable materials are encountered during removal activities, the Contractor will be required to stop work and contact the Engineer immediately. Removal work shall resume only after approval is given by the Engineer.

A. Removal Procedure A - For use with the removal of the following asbestos-containing materials:

- Floor Tile and Mastic

1. Prepare Work Areas as previously specified.

2. Spray areas of resilient floor covering material and/or adhesive backing with amended water, using spray equipment recommended by surfactant manufacturer capable of providing a "mist" application to reduce the release of fibers. Wet the material sufficiently to saturate it but do not allow water to accumulate or travel on floor. Spray the asbestos material repeatedly during removal to maintain wet condition but do not use excessive amounts of water.

3. Where carpeting is present in floor tile and, or adhesive backing work area(s), remove and properly dispose of carpeting as contaminated material. Following carpet removal, or in areas containing no carpet, remove individual tiles by wedging a scraper under one edge of the tile and exerting a prying, twisting force as it is moved under the tile until the tile releases from the floor. Do not break tiles. If tiles do not release easily, a mallet or hammer may be used to strike the scraper and force it under the tile. Place tiles immediately in disposal containers as they are removed. Ensure that containers are not subject to penetration by sharp edges of floor tile.

4. As small areas are cleared of tile, scrape up remaining adhesive backing and deposit scrapings in disposal bags. Clean floor of all adhesive residue by repeated wet mopping with an approved solvent.

B. Removal Procedure B - For use with the removal of the following asbestos-containing materials:

- Roofing and Roof Flashing

1. Prepare Work Areas as previously specified.

2. The contractor will spray asbestos materials with amended water, using airless spray equipment capable of providing a "mist" application to reduce the release of fibers. The asbestos material will be sprayed with water mist containing a wetting agent to enhance penetration. The wetting agent will be a commercial product produced specifically as an asbestos wetting agent. A fine spray of the amended water will be applied to reduce fiber release preceding the removal of the asbestos material.

3. In order to maintain asbestos concentrations at a minimum, the wet asbestos will be removed in manageable sections. Materials will not be allowed to dry out. Material drop will not exceed 8 feet. For heights up to 15 feet provide inclined chutes or scaffolding to intercept drop. For heights exceeding 15 feet provide enclosed dust-proof chutes.

4. The contractor will place danger labels on containers in accordance with OSHA standard 29 CFR 1910.1001 (g) (2) if not already pre-printed on containers.

C. Removal Procedure C - For use with the removal of the following asbestos-containing materials:

- Thermal Systems Insulation (TSI) – Using Glovebag Procedure

1. Wrap any damaged areas of pipe insulation in one layer of 6-mil plastic. Seal seams and ends with duct tape.

2. Place one layer of duct tape around pipe insulation at points where glovebag will be attached.

3. Attach and use glovebag in accordance with manufacturer's instructions, unless more stringently specified herein.

4. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage.

5. Use smoke tube and aspirator bulb to test seal. Gently squeeze glovebag and look for smoke leaks. Seal leaks and retest. Perform test in presence of the Engineer.

6. Wet the asbestos-containing material within the glovebag with amended water prior to removal. Utilize two (2) asbestos workers per glovebag.

7. Carefully cut and remove asbestos-containing materials within the glove bag. Exercise care while cutting asbestos-containing materials from piping.

8. Thoroughly wet removed material, bag and piping with amended water. Scrub exposed piping with a bristle or nylon brush. Remove visual accumulations of debris from piping. Allow mist to settle.

9. Seal exposed ends of pipe insulation not removed and exposed piping in glove bag with encapsulant.

10. Remove tools, through gloves or tool pouch by inverting, twisting glove, taping at twist to seal, and severing glove at midpoint of tape.

11. Collapse glove bag by inserting HEPA-vacuum. Twist bag several times at the top of bag. Twist and tape to secure.

12. Place appropriately labeled 6-mil bag around glove bag. Score glovebag above taped seal to remove from pipe and place inside 6-mil bag. Seal 6-mil bag around disassembled glove bag.

D. Removal Procedure D - For use with the removal of the following asbestos-containing materials:

- Cementitious Deck Drains (located in situ on existing bridge)

1. Saw cut full depth concrete sections a minimum of twelve inches away from ACM so as to separate deck drains from non-ACM without contacting ACM. Separate saw cut pieces from bridge.

2. Do not allow material to fall. Handle carefully and continuously wet.

3. Continually spray all debris matrix created by saw cutting activities with water as needed to minimize dust.

4. A designated, trained worker (minimum OSHA Class I, 40-hour worker training) shall continuously observe the matrix for readily identifiable fragments of asbestos-containing deck drain.

5. The designated worker will remove any identifiable fragments from the matrix and separate them safely away from the existing bridge decking.

6. Wrap all pieces of ACM encased in concrete after saw cutting with two layers of polyethylene sheeting. Contractor shall load these wrapped pieces directly into dump trucks. The designated worker will observe continuously for other fragments and remove any that are found.

7. In areas in which the matrix or large, intact pieces of concrete have been freed of the bridge decking, similar steps will be taken to segregate pieces containing ACM from those that do not. Segregating shall be done by a trained worker, as described above.

8. Contractor shall load pieces (not already bagged or in a drum) of concrete or other debris matrix, visually verified to contain asbestos-containing deck drain, directly into a dump truck for transport. All such trucks must be prepared for such use by pre-lining the bed and all four sides of the truck with two layers of six mil poly. All seams and overlaps (minimum 12 inches) shall be sealed with duct tape so as to prevent contaminated water migration. Once loaded, poly is to be folded over and a leak-tight seal created over all the debris matrix. This poly "cocoon", created for transport, is to be deposited in its entirety in the landfill, without being breached.

E. Removal Procedure E - For use with the removal of the following asbestos-containing materials:

- Cementitious Deck Drains (located in rubble)

Before being transported off site for any use or purpose, concrete decking debris known to contain or suspected of containing fragments of asbestos-containing deck drain pipe will be sorted to remove visibly identifiable fragments of the pipe from the matrix. The procedure to be followed is generally as follows:

1. Handle carefully and continuously wet. Continually spray all debris matrix created by saw cutting activities with water as needed to minimize dust.

2. A designated, trained worker (minimum OSHA Class I, 40-hour worker training) shall observe the debris field for readily identifiable fragments of asbestos-containing deck drain.

3. The designated worker will remove any identifiable fragments from the matrix and separate them safely away from the existing bridge decking.

4. Identify, segregate, and wrap all pieces of ACM encased in concrete with two layers of polyethylene sheeting. Contractor shall load these wrapped pieces directly into dump trucks. The designated worker will observe continuously for other fragments and remove any that are found.

5. In areas in which the matrix or large, intact pieces of concrete have been freed of the bridge decking, similar steps will be taken to segregate pieces containing ACM from those that do not. Segregating shall be done by a trained worker, as described above.

6. Contractor shall load pieces (not already bagged or in a drum) of concrete or other debris matrix, visually verified to contain asbestos-containing deck drain, directly into a dump truck for transport. All such trucks must be prepared for such use by pre-lining the bed and all four sides of the truck with two layers of six mil poly. All seams and overlaps (minimum 12 inches) shall be sealed with duct tape so as to prevent contaminated water migration. Once loaded, poly is to be folded over and a leak-tight seal created over all the debris matrix. This poly “cocoon”, created for transport, is to be deposited in its entirety in the landfill, without being breached.

F. Removal Procedure F - For use with the removal of the following asbestos-containing materials:

- Guardrail Caulking

1. The contractor will spray asbestos materials with amended water, using airless spray equipment capable of providing a "mist" application to reduce the release of fibers. The asbestos material will be sprayed with water mist containing a wetting agent to enhance penetration. The wetting agent will be a commercial product produced specifically as an asbestos wetting agent. A fine spray of the amended water will be applied to reduce fiber release preceding the removal of the asbestos material.

2. In order to maintain asbestos concentrations at a minimum, the wet asbestos will be removed in manageable sections.

3. The contractor will place danger labels on containers in accordance with OSHA standard 29 CFR 1910.1001 (g) (2) if not already pre-printed on containers.

4. Wrap all pieces of removed ACM with two layers of polyethylene sheeting.

G. Removal Procedure G - For use with the removal of the following asbestos-containing materials:

- Beam Bearing Pads

1. The contractor will spray asbestos materials with amended water, using airless spray equipment capable of providing a "mist" application to reduce the release of fibers. The asbestos material will be sprayed with water mist containing a wetting agent to enhance penetration. The wetting agent will be a commercial product produced specifically as an asbestos wetting agent. A fine spray of the amended water will be applied to reduce fiber release preceding the removal of the asbestos material.

2. In order to maintain asbestos concentrations at a minimum, the wet asbestos will be removed in manageable sections. Materials will not be allowed to dry out.

3. The contractor will place danger labels on containers in accordance with OSHA standard 29 CFR 1910.1001 (g) (2) if not already pre-printed on containers.

4. Wrap all pieces of removed ACM with two layers of polyethylene sheeting.

H. Removal Procedure H - For use with the removal of the following asbestos-containing materials:

- Bridge Coatings and/or Concrete Bridge Components

1. Spray areas of asbestos-containing material with amended water, using spray equipment recommended by surfactant manufacturer capable of providing a "mist" application to reduce the release of fibers. Wet the material sufficiently to saturate it but do not allow water to accumulate or travel on floor. Spray the asbestos material repeatedly during removal to maintain wet condition but do not use excessive amounts of water.

2. In order to maintain asbestos concentrations at a minimum, the wet asbestos will be removed in manageable sections. Materials will not be allowed to dry out.

3. The contractor will place danger labels on containers in accordance with OSHA standard 29 CFR 1910.1001 (g) (2) if not already pre-printed on containers.

3.3 CLEAN-UP AND CLEARANCE TESTING

Aggressive clearance air testing will be conducted in accordance with EPA Guide Document (EPA 600/4-85-049) "Measuring Airborne Asbestos Following An Abatement Action." for all Work Areas for which an enclosure has been erected and negative air pressure has been established. Before sampling pumps are started, the Contractor's Testing Laboratory representative will sweep the exhaust from forced air equipment (leaf blower with at least 1 horsepower electric motor) against walls, ceilings, floors, ledges and

other surfaces (temporary or permanent) in the work area(s). This procedure will be continued for approximately 5 minutes per 5,000 cubic feet of work area volume. In addition, the use of 20 inch diameter box fans will be placed one per 5,000 cubic feet of work area volume. The Contractor shall provide all forced air equipment required to facilitate aggressive clearance air testing.

A. Equipment

The Contractor shall supply the following equipment for his Testing Laboratory's use during the Work:

1. Electric Leaf Blowers; Minimum one horsepower, 110 mile per hour air velocity, 280 cubic feet per minute.

2. Ground Fault Interrupter (GFI) Protected Extension Cords: In lengths and locations sufficient for clearance testing.

3. Fans; 20-inch standard window box fans. All other test equipment and supplies.

Clearance testing for work areas shall be conducted using phase contrast microscopy (PCM) in general accordance with NIOSH 7400 method. Consider enclosed work areas placed under negative air pressure and all other decontaminated and cleaned areas clean and ready for reoccupancy when air testing performed by the Contractor's Testing Laboratory, shows 0.01 or less fibers per cubic centimeter of air (f/cc), for each sample obtained using standard NIOSH Method No. 7400 for PCM.

B. Clean Up Sequence A - For use with enclosed Work Areas for which negative air pressure has been established.

1. Remove all visible accumulations of asbestos material and debris.

2. Wet clean and/or HEPA vacuum all surfaces in the work area(s). Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.

3. Clean all sealed impermeable containers and all equipment (excluding that which will be needed for further cleaning) used in the work area(s) and remove from work area(s) via the equipment decontamination enclosure system.

4. After determining that the area is free of standing water and that surfaces are dry to the touch, notify the Engineer. This step may be waived if non-friable materials were removed and were not rendered friable during the removal process.

5. Following cleaning and acceptance of cleanliness by Contractor’s Testing Laboratory, all surfaces shall receive one coat of sealant to seal existing surfaces as follows:

    a. Misting, spraying and pumping equipment, as recommended by the encapsulant material's manufacturer, shall be used.

    b. Encapsulant, compatible with finish material and conditions specified in other Divisions, shall be installed in procedures as recommended by the manufacturer's written instructions if found to be compatible with temperature conditions.

6. Contractor shall not use sealant sprayed into the air as a means of reducing fiber levels after plastic sheeting is removed.

7. Allow sealant sufficient time to dry prior to proceeding with clearance air testing.

8. Clearance Air Testing

    a. Contractor’s Testing Laboratory will test for Air Quality Clearance in the Work Area(s) upon notice from Contractor that the Work Areas and all other decontaminated and cleaned areas are ready. The standard for Clearance will be as is set forth in paragraph 3.3.A of this section.

    b. Reclean at Contractor's expense all areas which do not comply with the standard of cleaning for Clearance. Continue cleaning until the specified final air quality clearance level is achieved by the Contractor’s Testing Laboratory. Contractor shall bear cost of all follow-up tests necessitated by failure to meet the specified standard of cleaning for clearance.

9. Following acceptance of the Air Quality Clearance test results and after Contractor finds areas to be visually decontaminated:

    a. Dismantle and remove sturdy barriers and plastic seals on all openings and wet clean immediate areas.

    b. Dismantle decontamination enclosure systems and thoroughly wet clean immediate areas.

    c. Dispose of debris, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials.

C. Clean Up Sequence B - For use in Work Areas for which no enclosure has been built, nor any negative air pressure established.

1. Remove all visible accumulations of asbestos material and debris.

2. Following acceptance of visual inspection of removal by the Contractor's Testing Laboratory, and the Contractor's Testing Laboratory finds areas to be visually decontaminated:

   a. Wet clean immediate areas.

   b. Dispose of debris, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials.

3. Acceptance of Work Area to be documented by Contractor's Testing Laboratory. Acceptance of removal practices and results to be based on visual observation only.

3.4. STORAGE AND DISPOSAL OF CONTAMINATED WASTE

A. Waste Storage and Disposal Requirements

1. No less frequently than at the end of each work day, the designated worker(s) shall place all collected ACM into an appropriate container (6-mil poly bags, drums, or closed roll-off box), which shall be stored in a secure location pending disposal. Periodically, the container or containers of collected ACM shall be transported to and disposed in a licensed landfill that is authorized to receive such materials. The contractor shall submit a copy of each waste disposal manifest to TDOT.

2. In handling, transporting and disposing of ACM waste, the contractor shall segregate friable ACM waste from non-friable ACM waste and manage each waste type as required by applicable regulations. Remove sealed and labeled containers of contaminated material and wastes and dispose of in approved sanitary landfill as follows:

3. Notify the Engineer not less than 48 hours prior to the proposed time of removing and delivery of contaminated waste to the landfill. The Engineer may elect to observe this operation.

4. Provide completed Asbestos Waste Shipment Record (as required by 40 CFR 61, Subpart M) including, but not limited to, the following information:

   - The name, address, and telephone number of the waste generator.

- The name and address of the local, state, or EPA Regional office responsible for administering the asbestos NESHAP program.

- The approximate quantity in cubic yards.

- The name and telephone number of the disposal site operator.

- The name and physical site location of the disposal site.

- The date transported.

- The name, address, and telephone number of the transporter(s).

- A certification that the contents of the consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

5. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled as follows:

a.

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

OR

b.

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

and, in addition to fulfilling the above labeling requirements, the Contractor shall also fulfill all applicable Department of Transportation requirements and label each waste disposal bag/container with the name of the waste generator and the location at which the waste was generated.

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

- Two 6 mil thick disposal bags, or

- One 6 mil thick disposal bags and a fiberboard drum, or

- Sealed steel drum with no bag.

7. Protect interior of truck or dumpster with Critical and Primary Barriers.

8. Do not store bagged waste material adjacent to the Work Area. Take bags from the Work Area directly to a sealed truck or storage container.

9. No material, other than properly packaged ACM waste, shall be placed in the waste storage container.

10. Transport bagged ACM waste from the Work site to the transportation vehicle or storage container in a covered cart or vehicle. Mark vehicles during loading and unloading of waste so that the signs are visible. The markings must conform to the requirements Section 61.149(d) of the appropriate NESHAP section for asbestos.

11. All ACM waste storage containers, including transportation vehicles, shall remain secure or guarded at all times while containing ACM waste.

12. Exercise care during storage and transport, to insure that no unauthorized persons have access to the material.

13. Do not transport waste in open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as asbestos-containing waste and dispose of in accordance with this specification

14. Provide a completed copy of the waste shipment record to the disposal site Manager at the same time as the asbestos-containing waste material is delivered to the disposal site. A copy of this waste shipment record, signed by the Manager of the designated disposal site will then, within 35 days of the initial transport date, be returned to the waste generator.

15. At the disposal site, sealed plastic bags and other containerized waste may be carefully unloaded from the truck. Rebag broken or damaged bags. Do not throw bags.

16. Retain receipts from landfill or processor for materials disposed of.

3.5. FIELD QUALITY CONTROL

A. Quality Control Requirements

1. A Testing Laboratory shall be provided by the Contractor to perform final clearance air monitoring and visual observations to document completion.

The Contractor will supply his own testing agency for personnel air monitoring.

2. The Testing Laboratory will conduct area final clearance air monitoring following removal and cleaning operations.

3. The Testing Laboratory will perform air sampling in general accordance with methods prescribed by Section 1926.1101 of OSHA CFR Title 29 and analyze the samples in general accordance with the procedures outlined by NIOSH Method #7400 for Phase Contrast Microscopy (PCM).

4. The Testing Laboratory employed by the Contractor will perform Final Air Clearance testing only following removal activities. Such testing does not relieve the Contractor of providing necessary testing required by other regulations, codes, and standards for the protection of his workers, or for any other purposes.

5. The Testing Laboratory will conduct Final Air Clearance Tests inside of work areas following removal activities, and test results will be made available to the Engineer or other designated entities. The Contractor will be responsible for performing air tests required for his evaluation of the safety of his employees.

6. A preliminary visual observation will be performed in the work areas by the Contractor when said areas have been properly cleaned. Areas will be observed for the presence of visible dust, dirt and debris.

7. Tests will be performed inside work areas after clean up, execution of final clearance monitoring and visual observation to document compliance with specifications.

8. Test results will be reported in terms of total fiber count per cubic centimeter of air (f/cc) for air samples analyzed by Phase Contrast Microscopy (PCM).

9. All air samples collected during final clean-up operations will be collected within 48 hours after completion of the final cleaning when possible.

10. A visual observation may be performed by the Engineer after cleanup to inspect for visible dust, dirt, debris and areas of damage.

11. Contractor shall perform additional cleaning of area(s) if, in the sole opinion of the Engineer, previous clean-up operations were determined to be inadequate.

12. Any area whose air test results fail will be retested following recleaning of the area(s). Contractor shall pay all costs associated with retesting.

END OF SECTION

State of Tennessee
Department of Environment and Conservation
Division of Air Pollution Control
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243-1531

NOTIFICATION OF DEMOLITION AND/OR ASBESTOS RENOVATION

SUBMIT 10 WORKING DAYS PRIOR TO ACTIVITY

Email to **Asbestos.NESHAP.Program@tn.gov**

Operator Project #	Postmark	Date Received	Notification #

I. TYPE OF NOTIFICATION ☐ Original ☐ Revision ☐ Courtesy ☐ Annual ☐ Cancellation

II. FACILITY INFORMATION

Owner Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

Asbestos Removal Contractor: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

Other Contractor/Operator: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

III. TYPE OF OPERATION ☐ Demolition ☐ Renovation ☐ Ordered Demolition ☐ Emergency Renovation

IV. IS ASBESTOS PRESENT? ☐ Yes ☐ No **Please provide a copy of inspection report.**

V. FACILITY DESCRIPTION

Building Name: _____

Address: _____

City: _____ State: TN Zip Code: _____ County: _____

Site Location: _____

Building Size (square feet) _____ # of Floors: _____ Age in years: _____

Present Use: _____ Prior Use: _____

VI. PROCEDURE AND ANALYTICAL METHOD USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL

(Identify any consultant or inspector involved in building inspection)

VII. AMOUNT OF ASBESTOS MATERIALS:

	RACM to be Removed	Nonfriable Asbestos Material			
		To be Removed		NOT to be removed	
		Category I	Category II	Category I	Category II
Pipes (linear feet)					
Surface Area (square feet)					
Facility Components (cubic feet)					
Other					

VIII. SCHEDULED DATES FOR PREPARATION Start: _____ Complete: _____

SCHEDULED DATES FOR ASBESTOS REMOVAL Start: _____ Complete: _____

Days of the Week:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Hours of Operation:							

IX. SCHEDULED DATES FOR DEMOLITION OR RENOVATION Start: _____ Complete: _____

Failure to notify the Division of a change in the start date (sections VIII and IX above) prior to activity may result in enforcement action.

X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION ACTIVITIES:

XI. DESCRIPTION OF WORK PRACTICES & ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS:

XII. WASTE TRANSPORTER #1

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

WASTE TRANSPORTER #2

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

XIII. TEMPORARY WASTE STORAGE LOCATION: _____

WASTE DISPOSAL SITE

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Telephone: (_____) _____

XIV. ORDERED DEMOLITION

1. Attach a copy of the government issued order.
2. Name of authority issuing order: _____ Title: _____
3. Date of Order: _____ Date Ordered to Begin: _____

XV. EMERGENCY RENOVATION (Attach a separate sheet with the following information.)

1. Date and Hour of the emergency.
2. Description of the Sudden, Unexpected Event
3. Explanation of how the event caused unsafe conditions, equipment damage, and/or an unreasonable financial burden.

XVI. DESCRIBE THE PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED RACM IS FOUND. EXPLAIN HOW NONFRIABLE ACM WILL BE REMOVED WITHOUT RENDERING IT FRIABLE (CRUMBLED, PULVERIZED, OR REDUCED TO POWDER).

XVII. I CERTIFY THAT AN INDIVIDUAL TRAINED IN ACCORDANCE WITH 40 CFR PART 61, SUBPART M WILL BE ONSITE DURING THE STRIPPING AND REMOVAL DESCRIBED BY THIS NOTIFICATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN COMPLETED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION.

Printed Name of Owner or Operator: _____

Signed Name of Owner or Operator: _____ Date: _____

XVIII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT. AS SPECIFIED IN TENNESSEE CODE ANNOTATED SECTION 39-16-702(a)(4), THIS DECLARATION IS MADE UNDER PENALTY OF PERJURY.

Printed Name of Owner or Operator: _____

Signed Name of Owner or Operator: _____ Date: _____

Submit completed form to **Asbestos.NESHAP.Program@tn.gov**. Call (615) 532-0554 with any questions.

INSTRUCTIONS

NOTIFICATION OF DEMOLITION OR ASBESTOS RENOVATION ACTIVITY (FORM CN-1055)

This form serves as a written notification of a facility demolition and/or an asbestos renovation as defined and required by 40 CFR 61.145 and Tennessee Division of Air Pollution Control Regulation 1200-03-11-.02(2)(d). This notification form is required for the following activities:

1. All demolition projects (including intentional burning). Demolition means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations. **This form is required for a demolition project even if no asbestos is present at the site.**

2. All renovation projects that include the removal of regulated asbestos containing material (RACM) equaling or exceeding 260 linear feet on pipes, 160 square feet on facility components, or 35 cubic feet where the amount of RACM could not be measured prior to the renovation.

All demolition and renovation projects are subject to the regulations insofar as owners and operators must determine if and how much asbestos is present at the site. All information pertinent to the removal, renovation and/or demolition must be completed by the building owner/operator or designee and mailed electronically to Asbestos.NESHAP.Program@tn.gov or delivered to the following address by at least 10 working days prior to commencement of activity:

Department of Environment and Conservation
Division of Air Pollution Control
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243-1531

Holidays that fall between Monday and Friday count as "working days." Saturday and Sunday does not count as a working day.

If information contained in the original notice has changed, a notification must be revised as soon as possible after it is realized a revision is necessary. For example, you must revise the notification if you change the start date of an operation. If the change relates to the amount of material involved, you need only revise the notification if the amount changes by more than 20 percent. If you revise the start date of a project, the revised notification must be postmarked or delivered no later than the original start date, and at least 10 working days before the revised start date.

Include the following in the notice:

(I) TYPE OF NOTIFICATION: Indicate original, revision, courtesy, annual, or cancellation.

(II) FACILITY INFORMATION: Identify the owner of the facility, address, telephone number, and contact person.

ASBESTOS REMOVAL CONTRACTOR: If RACM is to be removed, identify the name, address and telephone number of the asbestos removal contractor.

OTHER CONTRACTOR/OPERATOR: Where demolition of the facility immediately follows the removal of RACM, or when no asbestos removal is required prior to demolition, identify the demolition contractor's name, address and telephone number.

(III) TYPE OF OPERATION: Demolition, Ordered Demolition, Renovation, or Emergency Renovation.

(IV) Indicate whether or not asbestos is present in the building. **Provide a copy of the inspection report.**

(V) FACILITY DESCRIPTION: Identify the building name of the facility to be renovated or demolished, the physical address including street number, street name, city, state, and county. Asbestos removal site location should include the building number, floor and room number(s). Include the building size in square feet, number of floors, age, and present and prior use of the facility.

(VI) Describe the procedure, including analytical methods, used to detect the presence of RACM, category I and category II nonfriable ACM. **If an asbestos survey was conducted, please submit a copy of it with the notification form.** Materials may be assumed to be RACM and therefore handled as such.

(VII) AMOUNT OF ASBESTOS IN WORK AREA: Indicate the approximate amount of RACM to be removed from the facility in terms of linear feet for pipes, square feet for surface area, or cubic feet if otherwise not measurable. Also, estimate the amount of Category I and Category II nonfriable ACM in the affected part of the facility that will or will not be removed during renovation or before demolition.

(VIII) SCHEDULED DATES - ASBESTOS REMOVAL: Indicate the scheduled starting and completion dates of asbestos removal work. Include dates for any other activity, such as site preparation, that would break up, dislodge, or similarly disturb asbestos material in a demolition or renovation. Planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period. **This notification is required to be submitted at least 10 working days prior to the start date.** Circle all days when asbestos removal activities are to occur. Indicate the working hours that asbestos removal activities will be conducted (i.e., 7:00 AM – 5:00 PM).

(IX) SCHEDULED DATES – DEMOLITION: Indicate the scheduled starting and completion dates of demolition or renovation. **This notification is required to be submitted at least 10 working days prior to the start date.**

(X) Describe the planned work methods to be performed and types of machinery to be used during demolition or renovation.

(XI) Describe the work practices and engineering controls to be used to prevent emissions of asbestos during asbestos removal and waste-handling at the demolition/renovation site.

(XII) ASBESTOS WASTE TRANSPORTER: Identify the name, address, phone number and contact of the firm who will transport the asbestos material to the waste disposal site. If a second transporter is involved, also list this firm.

(XIII) ASBESTOS WASTE DISPOSAL SITE: Identify the name, location, and telephone number of the waste disposal site where the asbestos-containing waste material will be deposited.

(XIV) IF DEMOLITION ORDERED BY GOVERNMENT AGENCY: Identify the name, title, and authority of the state or local government representative who has ordered the demolition, the date that the order was issued, and the date on which the demolition was ordered to begin. A copy of the order shall be attached to the notification.

(XV) EMERGENCY RENOVATIONS: Attach a separate sheet that Indicates the date and hour that the emergency occurred. Describe the sudden, unexpected event resulting in the emergency. Explain how the event caused an unsafe condition or would cause equipment damage or an unreasonable financial burden.

(XVI) Describe the procedures to be followed in the event that unexpected RACM is found. Explain how nonfriable ACM will be removed without rendering it friable (crumbled, pulverized, or reduced to powder) during a renovation or demolition operation.

(XVII) A certification that only a person trained as required by Division Rule 1200-3-11-.02(2)(d)3(viii) will supervise the stripping and removal described by this notification.

(XVIII) The signature of the Owner/Operator and the date certifying that the notification information is correct.

RESPIRATOR TRAINING CERTIFICATION

I hereby certify that I have been trained in the use each type of respiratory protection equipment required for use on this Project. The training included the following:

1. Explanation of dangers related to misuse.
2. Instruction on putting on, fitting, testing and wearing the respirator.
3. Instruction on inspection, cleaning and maintaining respirator.
4. Instruction on emergency situations.

I further certify that I understand the use, care and inspection of the respirator and have tested and worn the unit.

Name: _____
(Please Type or Print)

Signed: _____

Date: _____

Notary: _____
(Signature)

(Submit one copy for each employee prior to starting work)

CERTIFICATE OF WORKER'S RELEASE (ASBESTOS)

DATE: _____

TO:

RE: _____
(Insert Project Name and Address)

1. In consideration of my employment by _____in connection with the removal
(Contractor)
and disposal of asbestos, or other work in asbestos-contaminated and lead-contaminated work areas, and in consideration of the sum of ONE AND NO/100 ($1.00) DOLLAR and other good and valuable consideration in hand paid, at and before the sealing and delivery of these presents, the receipt, sufficiency, and adequacy of which are hereby acknowledged, the undersigned does hereby acknowledge, warrant, represent, covenant, and agree as follows:

(a) I acknowledge and understand that I have been or will be employed in connection with the removal of, disposal of, or other work in asbestos-contaminated and lead-contaminated work areas, and I acknowledge that I have been advised of and I understand the dangers inherent in handling asbestos and breathing asbestos dust, including, but not limited to, THE FACT THAT ASBESTOS CAN CAUSE ASBESTOSIS AND IS A KNOWN CARCINOGEN AND CAN, THEREFORE, CAUSE VARIOUS TYPES OF CANCER.

(b) I acknowledge and understand that ANY CONTACT WITH ASBESTOS, WHETHER IT CAN BE SEEN OR NOT, MAY CAUSE ASBESTOSIS AND VARIOUS FORMS OF CANCER, WHICH MAY NOT SHOW UP FOR MANY YEARS, and I covenant and agree faithfully to take all precautions required of me.

_____
Signature of Worker
(as acknowledgement of reading this
Page 1 of this two-page Certificate)

(c) I knowingly assume all risks in connection with potential exposure to asbestos and I do hereby covenant not to sue, and to release and forever discharge the Engineer, Testing Laboratory or Architects and Engineers employed by the Project Engineer or Testing Laboratory and all of their directors, officers, employees, nominees, personal representatives, affiliates, successors, and assigns for, from and against any and all liability whatsoever, at common law or otherwise, except any rights which the undersigned may have under the provision of the applicable workmen's compensation laws. Except as specifically set forth herein I hereby waive and relinquish any and all claims of every nature which I now have or may have or claim to have which are in any way, directly or indirectly, related to exposure to asbestos and asbestos-containing materials.

(d) I hereby warrant and represent that I have not been disabled, laid-off, or compensated in damages or otherwise, because of the disease of asbestosis.

(e) I represent that I can read the English language, or that I have had someone read this instrument to me, and that I understand the meaning of all the provisions contained herein.

Name/SS#: _____
(Please Type or Print)

Signature _____

Signed in presence of_____

Notary _____
(Signature)

CERTIFICATE OF INVOLVEMENT IN

MEDICAL SURVEILLANCE PROGRAM (ASBESTOS)

I hereby certify that I am actively involved in the employee medical surveillance program in conformity with U. S. Department of Labor, Occupation Safety and Health Administration, Title 29 CFR Part 1926.1101.

By my signature below, I acknowledge receipt of the following documents pertaining to my physical examination(s):

1. Physicians' Written Opinion Form
2. Physical Examination Record
3. Roentgenographic Interpretation
4. Asbestos Initial Medical Questionnaire
5. Spirometer Data Record

Name of Contracting Firm: (Please Print) _____

Employee Name: (Please Print) _____

_____
Employee Signature

_____
Notary

Date:_____