1.3.12 Friable Asbestos Material

Greater than one percent asbestos containing material that can be crumbled, pulverized or reduced to powder by hand pressure when dry.

1.3.13 Glovebag Technique

Those asbestos control techniques put forth in 40 CFR 763, Subpart E, Appendix B.

1.3.14 High Efficiency Particulate Air (HEPA)

A high efficiency particulate air filter capable of retaining 99.97% of solid or liquid particles 0.3 microns or larger in diameter, including oil-based particles.

1.3.15 Negative Pressure Enclosure (NPE)

That engineering control technique described in 29 CFR 1926.1101.

1.3.16 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and may not be crumbled, pulverized, or reduced to powder by hand pressure, when dry.

1.3.17 Permissible Exposure Limit (PEL)

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101.

1.3.18 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.3.19 Phase Contrast Microscopy (PCM)

A method of analysis for overall airborne fiber concentration by use of an optical microscope.

1.3.20 Project Manager

A licensed individual who acts in the capacity of the owner's representative to evaluate the quality of the work performed during an asbestos abatement project.

1.3.21 Regulated Area

The demarcated area in which asbestos abatement activities take place and in which the possibility of exceeding the PEL exists.

1.3.22 Renovation

Additions to or alterations of a building for the purposes of restoration by removal, repairing and rebuilding, excluding the removal of load-supporting structural members.

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1.3.23 Texas Asbestos Health Protection Act (TAHPA)

Texas Asbestos Health Protection Act, Texas Civil Statutes, Article 4477-3a, 25 TAC §295.31-§295.73, regulating the conduct of asbestos abatement projects in public buildings and facilities in Texas.

1.3.24 Texas Natural Resource Conservation Commission (TNRCC)

The state agency responsible for approving landfills to accept asbestos containing debris.

1.3.25 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.3.26 Transmission Electron Microscopy (TEM)

A method of analysis for overall airborne asbestos fiber concentration by use of an electron microscope.

1.3.27 Wetting Agent

A chemical added to water to reduce the surface tension thereby increasing the water's ability to soak into the material to which it is applied.

1.4 SCOPE OF WORK

1.4.1 Description of Work

The asbestos abatement work includes the removal of 1,152 SF of floor tile and mastic located in the Huntsville Unit, Building #1141. Provide negative pressure enclosure techniques as outlined in this specification. The TDCJ will evacuate the work area during the asbestos abatement work.

1.4.2 Project Manager Authority

The Project Manager shall ensure the Contractor's compliance with TAHPA and these specifications. The Project Manager shall have the authority to issue a stop work order to be in effect immediately and until the violation is resolved. The Project Manager shall contact the Consultant immediately upon any work stoppage. The Project Manager shall conduct the visual inspection of the asbestos containment area with the Project Supervisor prior to clearance by air monitoring and provide written, signed documentation of said inspection to the Project Supervisor before clearance monitoring commences. The Project Manager shall also provide the Project Supervisor written, signed documentation of the final clearance by air monitoring prior to re-occupancy.

David R. Hall

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**Texas Department of Criminal Justice**
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Frank M. Parker III

**FRANK M. PARKER, III**
**Asbestos Consultant, TDH #10-5301**
**Environmental Technologies, Inc.**
**Consultant Agency # 10-0009**

1.5 SUBMITTALS

Submit a valid copy of the below-itemized documents to the Project Manager/Consultant.

1.5.1 License and Accreditation

Each employee's TDH license and asbestos accreditation certificate in the applicable discipline, prior to the commencement of the project.

1.5.2 Medical Examinations

Each employee's TDH Physician's Written Statement, prior to the commencement of the project.

1.5.3 Respirator Fit Test

Each employee's respirator fit test for each type of respirator, prior to the commencement of the project.

1.5.4 Air Monitoring Results

All air monitoring results upon project completion.

1.5.5 Pressure Differential Recordings for Local Exhaust System

Pressure differential recordings for local exhaust system upon project completion.

1.5.6 TDH Notification

TDH Demolition/Renovation Form prior to the commencement of the project.

1.5.7 Supervisor Project Field Notes

The project supervisor's field notes upon project completion.

1.5.8 Asbestos Waste Disposal Manifest

The Generator's first copy and the original, upon its return from the landfill facility.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

| Requirement | Test Standard |
|---|---|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96 |

2.1.2 Bridging Encapsulant

| Requirement | Test Standard |
|---|---|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96 |
| Fire Resistance - Negligible affect on fire resistance rating over 3 hour test | ASTM E 119 |
| Impact Resistance - Minimum 245.5 mm/N (43 in/lb) | ASTM D 2794<br>Gardner Impact Test |
| Flexibility - no rupture or cracking | ASTM D 522 |

2.1.3 Penetrating Encapsulant

| Requirement | Test Standard |
|---|---|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96 |
| Cohesion/Adhesion Test - 729.5 N of force/meter (50 pounds of force/foot) | ASTM E 736 |
| Fire Resistance - Negligible affect on fire resistance rating over 3 hour test | ASTM E 119 |
| Impact Resistance - Minimum 245.5 mm/N (43 in/lb) | ASTM D 2794<br>Gardner Impact Test |
| Flexibility - no rupture or cracking | ASTM D 522 |

2.1.4 Lock-down Encapsulant

| Requirement | Test Standard |
|---|---|
| Flame Spread: 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy: 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability: Minimum 0.4 perms | ASTM E 96 |
| Fire Resistance: Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member) | ASTM E 119 |
| Bond Strength: 1459 N of force/meter (100 pounds of force/foot) | ASTM E 736 |

PART 3 EXECUTION

3.1 EQUIPMENT

3.1.1 Respirators for Handling Asbestos

Provide personnel engaged in the pre-cleaning, removal or handling of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 40 CFR 763, Subpart G. Any change in respiratory protection shall be approved by the Project Manager or Consultant, based on both personal and area air samples.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable, "non-breathable," whole body protective clothing, head coverings, gloves, and non-skid footwear. Provide disposable gloves to protect hands. Make sleeves secure at the wrists, footwear secure at the ankles and clothing secure at the neck by the use of tape.

3.1.2.2 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination room and clean room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) for personnel required to wear whole body protective clothing. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area. Seal in impermeable bags or containers for disposal. Locate showers between the decontamination room and the clean room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Decontamination unit shall be physically attached to the asbestos containment area, unless otherwise noted.

3.1.2.3 Eye Protection

Provide goggles or safety glasses to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide warning signs [printed in English and Spanish] at all approaches to asbestos regulated areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all containerized asbestos waste and debris.

3.1.3.1 Warning Sign

Provide vertical format conforming to 40 CFR 61, Subpart M, minimum 20 by 14 inches displaying the following legend in the lower panel:

| Legend | Notation |
|---|---|
| Danger | 1-inch Sans Serif Gothic or Block |

| | |
|---|---|
| Asbestos | 1-inch Sans Serif Gothic or Block |
| Cancer and Lung Disease Hazard | 1/4-inch Sans Serif Gothic or Block |
| Authorized Personnel Only | 1/4-inch Gothic |
| Respirators and Protective Clothing are Required in this Area | 1/4-inch Gothic |

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING ASBESTOS DUST MAY
CAUSE SERIOUS BODILY HARM

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos regulated area in accordance with 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment shall be operated 24 hours per day, until the asbestos regulated area is removed and shall be leak proof to the filter and equipped with P100 filters. Maintain a minimum pressure differential in the containment area of minus 0.02 inches of water column relative to adjacent, unsealed areas. Provide for continuous 24 hours per day monitoring of the pressure differential with an automatic, pressure differential recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos containment area. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak-proof to the filter and equipped with P100 filters. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral P100-filtered exhaust ventilation system. Remove all residual asbestos from reusable tools prior to storage or reuse. Insure safe installation (including ground faulting) of temporary power sources in compliance with all applicable electrical code requirements using licensed tradesmen. At least one fire extinguisher with a minimum National Fire Protection Association rating of 10BC (dry chemical) shall be placed within each containment area for every 1,000 square feet, or fraction thereof, of containment area.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with40 CFR 763, Subpart E, 40 CFR 61-Subpart M, TAHPA and as specified herein. Use wet and negative pressure enclosure techniques. Personnel shall wear and utilize the protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos regulated or containment areas. Personnel of other trades shall not be exposed at any time to airborne concentrations of asbestos. Shut down the building heating, ventilating, and air conditioning system and cap the openings to the

system, prior to the commencement of asbestos work. [Disconnect the electrical service when wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water or solvent.] Seal all seams in system components that pass through the regulated area. If an asbestos fiber release or spill occurs [outside of the asbestos containment area], stop work immediately, correct the condition to the satisfaction of the Project Manager or Consultant including clearance sampling, prior to resumption of work.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where the Contractor damages such work, as verified by the Project Manager/Consultant using visual inspection or sample analysis, the Contractor shall restore it to its original condition. This includes inadvertent spills of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained, work may proceed at the discretion of the Project Manager or Consultant.

3.2.2 Furnishings

Furniture and equipment will be removed from the area of work by the TDCJ before asbestos work begins.

3.2.3 Pre-cleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of a negative pressure enclosure.

3.2.4 Asbestos Containment Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with a continuous membrane of two layers of minimum 6-mil plastic sheeting sealed with tape to prevent water or other damage. Provide two layers of 6-mil plastic sheeting over walls and ceilings. Seal all joints with tape. Provide local exhaust system in the asbestos containment area. Openings will be allowed in enclosures of asbestos containment areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 6-mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with a continuous application of wetting agent in such a manner that no asbestos material is disturbed prior to being adequately wetted. Where unusual circumstances prohibit the use of 6-mil plastic bags, submit an alternate proposal for reduction of asbestos fibers to TDH for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing materials shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Handle asbestos containing material as indicated in 40 CFR 61-Subpart M.

3.2.6 Air Sampling

TDCJ contract vendor, Environmental Technologies, Inc. (ETI), shall perform the sampling of airborne concentrations of asbestos fibers in accordance with 29 CFR 1926.1101 and as specified herein. ETI shall use current NIOSH Method 7400 "A" Count Rules for sampling and analysis.

3.2.6.1 Baseline Sampling

ETI shall provide area air sampling and establish the baseline with a minimum of three samples prior to the masking and sealing operations for each removal site. Establish the background by performing area sampling in similar but uncontaminated sites in the building. The minimum sample volume shall be 1,250 liters collected at a rate between 5 and less than 16 liters per minute.

3.2.6.2 Ambient Sampling

ETI shall provide full-period, consecutive personal sampling as indicated in 29 CFR 1926.1101. ETI shall also provide full period, consecutive area sampling every work shift close to the work inside the enclosure, outside the enclosure but inside the building, at the discharge opening of the local exhaust system, immediately outside the entrance to the decontamination unit and outside the bag-out facility. The minimum volume shall be 550 liters or a maximum of 2,500 liters collected at a rate of between 5 and less than 10 liters per minute. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Consultant immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately reflect the airborne asbestos levels.

3.2.6.3 Clearance Sampling

ETI shall provide area sampling of asbestos fibers [using aggressive air sampling techniques as defined in TAHPA. The minimum volume shall be 1,250 liters collected at a rate of between 0.5 and less than 16 liters per minute. ETI shall use [phase contrast microscopy (PCM) to analyze clearance samples and report the results in accordance with current NIOSH criteria. Clearance will be established when an airborne asbestos concentration of less than 0.01 fibers per cubic centimeter is recorded on all samples. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and PCM analysis. All air sampling shall be documented on Daily Activity Logs, Air Sampling Logs, Air Monitoring Diagrams and Analysis Worksheets.

3.2.7 Lock-Down

After clean-up of gross removal in the asbestos containment area but prior to clearance air sampling, the Project Supervisor and Project Manager shall perform a visual inspection to ensure that the asbestos containment and work area are free of any accumulations of dirt, dust or debris. The Project Manager shall provide written, signed documentation of this inspection. A post removal encapsulant shall then be spray applied to ceiling, walls, floors and other areas exposed in the removal area.

3.2.8 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Project Manager, Consultant and authorized visitors. If the work is found to be in violation of this specification, the Project Manager or Consultant will issue a

stop work order to be in effect immediately and until the violation is resolved. The Contractor and the Consultant shall make a final visual inspection once air monitoring has cleared the project and all containment and other materials have been removed from the project site.

## 3.3 CLEAN-UP AND DISPOSAL

### 3.3.1 Housekeeping

Maintain surfaces of the asbestos containment area free of accumulations of asbestos fibers. Give special attention to restricting the spread of dust and debris; keep wastes from being distributed over the general area. When asbestos removal is complete, all asbestos waste is removed from the work site and final clean-up is completed, the Project Manager or Consultant will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish the HVAC, mechanical, and electrical systems in proper working order

### 3.3.2 Title to Materials

All waste materials shall remain the property of the TDCJ.

### 3.3.3 Procedure for Disposal

Collect asbestos waste, debris, bags, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6-mils thick). Waste within the containers must be adequately wet in accordance with 40 CFR 61-Subpart M. Affix a warning and Department of Transportation (DOT) label to each container or use at least 6-mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle. These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure). Dispose of waste asbestos material at a TNRCC approved asbestos landfill. Procedure for hauling and disposal shall comply with 40 CFR 61 Subpart M and TDH standards

### 3.3.4 Asbestos Waste Manifest

The Contractor shall complete and sign a TNRCC Form 0311 (Uniform Hazardous Waste Manifest) indicating the amount of asbestos containing material removed and released for disposal.



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