

## SECTION 02 82 00 ASBESTOS ABATEMENT SPECIFICATION

### PART 1 - GENERAL

#### 1.1 SUMMARY OF THE WORK

##### 1.1.1 CONTRACT DOCUMENTS AND RELATED REQUIREMENTS

Drawings, general provisions of the contract, including general and supplementary conditions and other specifications, shall apply to the work of this section. The contract documents show the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial Owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Owner for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Owner shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.

##### 1.1.2 EXTENT OF WORK

The Fayette County Public School (Owner) has acquired the residential property located at 1345 Greendale Road in Lexington, Kentucky. The property consist of the following features which will be demolished:

- The residential project site is located at 1345 Greendale Road in Lexington, Fayette County, Kentucky and consists of an approximately 4,300 square foot single-story residential home with a basement, attic space, and an attached two-car garage. The property also features an inground swimming pool, a 200 square foot shed, and a 100 square foot shed. The date of construction of each site features was unknown to Terracon Consultants, Inc.

An asbestos inspection for the aforementioned site features was conducted by Terracon Consultants, Inc. in August of 2023. The report can be found in **Attachment 6**. Asbestos was not detected samples collected from the two sheds or from the inground swimming pool thus these features are not included in this asbestos abatement extent of work. Regarding asbestos abatement for this project, the following is a summary of the extent of work to be completed. A detailed list of asbestos-containing materials (ACM) is included in **Attachment #5** to this specification. The Abatement Contractor is solely responsible for determining their opinion of quantities of materials to be properly removed and disposed for this project. Any quantities presented are for general information purposes only.

**Regarding this project, the Asbestos Abatement Contractor shall properly remove and dispose of the following materials, which have been identified to contain asbestos, in accordance with all applicable federal, state, and local asbestos regulations, as well as in accordance this specification document.**

- All asbestos-containing textured wall (1.5% Chrysotile) and ceiling (1.3% Chrysotile) materials located within the residential structure at 1345 Greendale Road, Lexington, Fayette County, Kentucky. The textured wall and ceiling materials are regulated asbestos-containing materials (RACM) under the federal NESHAP asbestos regulation and state asbestos regulations and shall be properly removed and disposed prior to building demolition.
- All drywall system materials (walls and ceilings) located within the residential structure at 1345 Greendale Road, Lexington, Fayette County, Kentucky. The drywall system materials (drywall and joint compound) were composite analyzed and determined to be 0.09% Chrysotile (by PLM with point count); however, the joint compound layer was determined to contain 1.5% Chrysotile. Although the drywall system would not be considered as regulated under NESHAP given the composite result of <1% asbestos, the joint compound layer with >1% asbestos is considered as OSHA Class II Asbestos Work and shall be properly removed and disposed prior to building demolition.

There will be no electricity, water, or sanitary facilities available for us or connection at the site. The Asbestos Abatement Contractor will be responsible for providing sufficient water and electric supply necessary to conduct and successfully complete the abatement work, as the electricity and water supplies to the property have been disconnected. Portable electricity generators must be of sufficient size and number to handle the power load necessary to continuously operate abatement equipment including negative air machines to achieve -0.02 inches of water column, and the third-party consultant's final air testing equipment. The Abatement Contractor will be responsible for fueling and any fees necessary to maintain constant power supply during abatement activities. Portable electricity generators may be shut off at the end of each work shift, provided that any and all openings regarding the abatement work areas, including the decontamination unit, are tightly sealed at the end of each shift to prevent any escape of air outside the contained work areas. The Asbestos Abatement Contractor shall also be responsible for providing ample sanitary facilities (e.g., portalets) at the property for employees to utilize given that the water and sanitary utilities have been disconnected. The Abatement Contractor will be responsible for securing all equipment, materials, and waste at the end of each work shift (no open top dumpsters with unsecured waste shall be permitted).

The Asbestos Abatement Contractor is responsible for all apply for and retaining all necessary and required notifications, permits, and associated fees to successfully start and complete the abatement extent of work in compliance with all applicable federal, state, and local asbestos regulations, as well as in accordance with this specification document. This shall include the required 10-business day NESHAP notification prior to removal of RACM exceeding 160 square feet or 260 linear feet.

The Owner reserves the right to oversee/monitor asbestos abatement activities during the project, including retaining the services of a third-party consultant. The Owner and/or third-party consultant (i.e., Owner's Representative) may make random, unscheduled site visits to the project site for observations of the work for compliance with applicable federal, state, and local asbestos regulations, as well as compliance with this specification document.

The Owner will retain the services of a third-party consultant (i.e., Owner's Representative) to conduct a final visual inspection and air clearance testing to confirm completion of indoor asbestos abatement activities. The Asbestos Abatement Contractor shall provide

a minimum of 5-business day notice to the Owner of when the abatement project is expected to be completed so that the Owner may notify the third-party consultant of when to expect to be onsite to conduct the final visual inspection and air clearance activities. The visual inspection must be acceptable to the third-party consultant, and indoor air clearance shall be less than 0.01 f/cc for each of 5 PCM samples before the Asbestos Abatement Contractor shall be permitted to remove critical barriers and asbestos abatement demarcations.

All other work shall be done during normal business hours (7:00 AM to 5:00 PM) Monday - Friday excluding Federal Holidays. The Asbestos Abatement Contractor must coordinate with the Owner (and General Contractor, if applicable) on all work and scheduling as necessary to facilitate the successful completion of the asbestos abatement project. Any change in the work schedule must be approved in writing by the Owner.

### 1.1.3 TASKS

The work tasks are summarized briefly as follows:

- A. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, work-site preparations, emergency procedures arrangements, and standard operating procedures for asbestos abatement work.
- B. Abatement activities including removal, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
- C. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.

### 1.1.4 ABATEMENT CONTRACTOR USE OF PREMISES

- A. The Abatement Contractor and Abatement Contractor's personnel shall cooperate fully with the Owner and the Owner's representative (i.e., third-party consultant) to facilitate efficient use of buildings and areas within buildings. The Abatement Contractor shall perform the work in accordance with the specifications, drawings, phasing plan and in compliance with any/all applicable Federal, State and Local regulations and requirements.
- B. The Abatement Contractor shall use the existing facilities in the buildings strictly within the limits indicated in contract documents. Any variation from the arrangements in contract documents shall be secured in writing from the Owner through the pre-abatement plan of action.

### 1.2 QUANTITIES

The ACM quantities listed in **Attachment #5** are for informational purposes only. The Abatement Contractor is solely responsible for determining their opinion of actual quantities of the materials to be removed. If newly discovered suspect ACM (e.g. previously concealed) is discovered during the course of abatement and determined to actually be asbestos-containing as verified through sampling by the Owner's Representative (certified asbestos inspector) and analysis by a NVLAP-accredited laboratory, the Abatement Contractor will be requested by the Owner or Owner's Representative to provide a detailed cost break-down, including an expected duration in hours, for removal of newly discovered ACM.

### 1.3 STOP ASBESTOS REMOVAL

If the Owner; their field representative; (the Safety Officer/Manager or their designee, or the third-party consultant (Owner's Representative) presents a verbal **Stop Asbestos Removal Order**, the Abatement Contractor/Personnel shall immediately stop all asbestos removal and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the Owner shall follow-up with a written order to the Abatement Contractor as soon as practicable. The Abatement Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the Owner. A stop asbestos removal order may be issued at any time the Owner or his/her Representative determines abatement conditions/activities are not within specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the Owner and his/her Representative. Standby time and costs for corrective actions will be borne by the Abatement Contractor, including the third-party consultant (Owner's Representative) time. The occurrence of any of the following events shall be reported immediately by the Abatement Contractor's competent person to the Owner or Owner's Representative using the most expeditious means (e.g., verbal, email, or telephonic), followed up with written notification to the Owner as soon as it is practical. The Abatement Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities:

- A. Airborne PCM analysis results equal to or greater than 0.05 f/cc outside a regulated area;
- B. breach or break in any regulated area containment barrier(s);
- C. serious injury/death at the site;
- D. fire/safety emergency at the site;
- E. respiratory protection system failure;
- F. power failure or loss of wetting agent; or
- G. any visible emissions observed outside the regulated area.

### 1.4 DEFINITIONS

#### 1.4.1 GENERAL

Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

#### 1.4.2 GLOSSARY

**Abatement** – Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

**Abatement Contractor (or Contractor)** – Per this specification, shall mean a state-licensed, experienced, and qualified asbestos abatement contractor.

**Aerosol** – Solid or liquid particulate suspended in air.

**Adequately wet** – Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

**Aggressive method** – Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

**Aggressive sampling** – EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

**AHERA** – Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

**Aircell** – Pipe or duct insulation made of corrugated cardboard which contains asbestos.

**Air monitoring** – The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 2 is used to determine the fiber levels in air. For personal samples and clearance air testing using Phase Contrast Microscopy (PCM) analysis. NIOSH Method 7402 can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the Owner and/or Owner's Representative as appropriate.

**Air sample filter** – The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester membrane for PCM (Phase Contrast Microscopy) and polycarbonate for TEM (Transmission Electron Microscopy)

**Amended water** – Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

**Asbestos** – Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

**Asbestos Hazard Abatement Plan (AHAP)** – Asbestos work procedures required to be submitted by the Abatement Contractor before work begins.

**Asbestos-containing material (ACM)** – Any material containing more than one percent of asbestos.

**Asbestos contaminated elements (ACE)** – Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

**Asbestos-contaminated soil (ACS)** – Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

**Asbestos-containing waste (ACW) material** – Asbestos-containing material or asbestos contaminated objects requiring disposal.

**Asbestos Project Monitor** – Some states require that any person conducting asbestos abatement clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

**Asbestos waste decontamination facility** – A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment leaving the regulated area. In an emergency, it may be used to evacuate personnel.

**Authorized person** – Any person authorized by the Owner, the Abatement Contractor, or Owner's Representative and required by work duties to be present in regulated areas.

**Authorized visitor** – Any person approved by the Owner; the Abatement Contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

**Barrier** – Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

**Containment Barrier** – An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

**Critical Barrier** – The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of plastic sheeting secured in place at openings such as doors, windows, or any other opening into the regulated area.

**Primary Barrier** – Plastic barriers placed over critical barriers and exposed directly to abatement work.

**Secondary Barrier** – Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

**Breathing zone** – The hemisphere forward of the shoulders with a radius of about 150 – 225 mm (6 – 9 inches) from the worker's nose.

**Bridging encapsulant** – An encapsulant that forms a layer on the surface of the ACM.

**Building/facility Owner** – The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

**Bulk testing** – The collection and analysis of suspect asbestos containing materials.

**Certified Industrial Hygienist (CIH)** – A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

**Class I asbestos work** – Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

**Class II asbestos work** – Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

**Clean room/Changing room** – An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

**Clearance sample** – The final air sample taken after all asbestos work has been done and visually inspected. Performed by the Owner's Representative (professional industrial hygiene consultant).

**Closely resemble** – The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

**Competent person** – In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

**Count** – Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

**Crawlpace** – An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

**Decontamination area/unit** – An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

**Demolition** – The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

**Disposal bag** – Typically 6 mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each

bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

**Disturbance** – Activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag which shall not exceed 60 inches in length or width.

**Drum** – A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

**Employee exposure** – The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

**Encapsulant** – A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

**Encapsulation** – Treating ACM with an encapsulant.

**Enclosure** – The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

**Equipment room** – A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

**Fiber** – A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

**Fibers per cubic centimeter (f/cc)** – Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

**Filter** – Media used in respirators, vacuums, or other machines to remove particulate from air.

**Firestopping** – Material used to close the open parts of a structure in order to prevent a fire from spreading.

**Friable asbestos containing material** – Any material containing more than one (1) percent or asbestos as determined using the method specified in appendix A, Subpart F, 40 CFR 763, section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

**Glovebag** – Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

**High efficiency particulate air (HEPA) filter** – An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

**HEPA vacuum** – Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

**Homogeneous area** – An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

**HVAC** – Heating, Ventilation and Air Conditioning

**Industrial hygienist (IH)** – A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

**Industrial hygienist technician (IH Technician; Owner's Representative)** – A person working under the direction the Owner who has special training, experience, certifications

and licenses required for the industrial hygiene work assigned. Some states require that an industrial hygienist technician conducting asbestos abatement clearance inspection and clearance air sampling be licensed as an asbestos project monitor.

**Intact** – The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

**Lockdown** – Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

**National Emission Standards for Hazardous Air Pollutants (NESHAP)** – EPA's rule to control emissions of asbestos to the environment (40 CFR Part 61, Subpart M).

**Negative initial exposure assessment** – A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL's.

**Negative pressure** – Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02" water column gauge inside the negative pressure enclosure.

**Negative pressure respirator** – A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

**Non-friable ACM** – Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

**Organic vapor cartridge** – The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

**Outside air** – The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

**Owner/operator** – Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

**Owner's representative** – a third-party industrial hygiene consultant hired by the Owner to oversee abatement work for compliance with applicable federal and state asbestos regulations and this specification, and conduct final visual inspection and final air clearance testing.

**Penetrating encapsulant** - Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

**Personal protective equipment (PPE)** – equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, and respirators.

**Personal sampling/monitoring** - Representative air samples obtained in the breathing zone for one or workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

**Permissible exposure limit (PEL)** - The level of exposure OSHA allows for an 8 hour time weighted average. For asbestos fibers, the eight (8) hour time weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit is 1.0 fibers per cubic centimeter (1 f/cc).

**Pipe tunnel** – An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, or asbestos-contaminated soil.

**Polarized light microscopy (PLM)** - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type(s) of asbestos present in a bulk sample.



**Polyethylene sheeting** - Strong plastic barrier material 4 to 6 mils thick, semi-transparent, flame retardant per NFPA 241.

**Positive/negative fit check** - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator respectively.

**Presumed ACM (PACM)** - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building Owner has actual knowledge or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (b).

**Professional IH** - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH.

**Project designer** - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Appendix C, Part I; (B)(5).

**Assigned Protection factor** - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

**Qualitative fit test (QLFT)** - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

**Quantitative fit test (QNFT)** - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

**Regulated area** - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

**Regulated ACM (RACM)** - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

**Removal** - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

**Renovation** - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

**Repair** - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

**Shower room** - The portion of the PDF where personnel shower before leaving the regulated area.

**Supplied air respirator (SAR)** - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989.

**Surfacing ACM** - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, fireproofing and other purposes.

**Surfactant** - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

**Thermal system ACM** - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

**Transmission electron microscopy (TEM)** - A microscopy method that can identify and count asbestos fibers.

**Visible emissions** - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

**Waste/Equipment decontamination facility (W/EDF) – The area in which equipment is decontaminated before removal from the regulated area.**

**Waste generator** - Any Owner or operator whose act or process produces asbestos-containing waste material.

**Waste shipment record** - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

**Wet cleaning** - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

#### 1.4.3 REFERENCED STANDARDS ORGANIZATIONS

The following acronyms or abbreviations as referenced in contract/ specification documents are defined to mean the associated names. Names and addresses may be subject to change.

- A. AIHA American Industrial Hygiene Association  
2700 Prosperity Avenue, Suite 250  
Fairfax, VA 22031  
703-849-8888
- B. ANSI American National Standards Institute  
1430 Broadway  
New York, NY 10018  
212-354-3300
- C. ASTM American Society for Testing and Materials  
1916 Race St.  
Philadelphia, PA 19103  
215-299-5400
- D. CFR Code of Federal Regulations  
Government Printing Office  
Washington, DC 20420
- E. CGA Compressed Gas Association

1235 Jefferson Davis Highway  
Arlington, VA 22202  
703-979-0900

- F. CS Commercial Standard of the National Institute of Standards and Technology (NIST)  
U. S. Department of Commerce  
Government Printing Office  
Washington, DC 20420
- G. EPA Environmental Protection Agency  
401 M St., SW  
Washington, DC 20460  
202-382-3949
- H. MIL-STD Military Standards/Standardization Division  
Office of the Assistant Secretary of Defense  
Washington, DC 20420
- I. NIST National Institute for Standards and Technology  
U. S. Department of Commerce  
Gaithersburg, MD 20234  
301-921-1000
- J. NEC National Electrical Code (by NFPA)
- K. NEMA National Electrical Manufacturer's Association  
2101 L Street, NW  
Washington, DC 20037
- L. NFPA National Fire Protection Association  
1 Batterymarch Park  
P.O. Box 9101  
Quincy, MA 02269-9101  
800-344-3555
- M. NIOSH National Institutes for Occupational Safety and Health  
4676 Columbia Parkway  
Cincinnati, OH 45226  
513-533-8236
- N. OSHA Occupational Safety and Health Administration  
U.S. Department of Labor  
Government Printing Office  
Washington, DC 20402
- O. UL Underwriters Laboratory  
333 Pfingsten Rd.  
Northbrook, IL 60062  
312-272-8800

## 1.5 APPLICABLE CODES AND REGULATIONS

### 1.5.1 GENERAL APPLICABILITY OF CODES, REGULATIONS, AND STANDARDS

- A. All work under this contract shall be done in strict accordance with all applicable Federal, State, and local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
- B. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
- C. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite.

### 1.5.2 CONTRACTOR RESPONSIBILITY

The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE) including respiratory protection including respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the Owner and third-party consultant (Owner's Representative) harmless for any Contractor's failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the third-party consultant (Owner's Representative), including all sampling/analytical costs to assure compliance with OSHA/EPA/State requirements related to failure to comply with the regulations applicable to the work.

### 1.5.3 FEDERAL REQUIREMENTS

Federal requirements which govern some aspect of asbestos abatement include, but are not limited to, the following regulations.

- A. Occupational Safety and Health Administration (**OSHA**)
  - 1. Title 29 CFR 1926.1101 - Construction Standard for Asbestos
  - 2. Title 29 CFR 1910.132 - Personal Protective Equipment
  - 3. Title 29 CFR 1910.134 - Respiratory Protection
  - 4. Title 29 CFR 1926 - Construction Industry Standards
  - 5. Title 29 CFR 1910.20 - Access to Employee Exposure and Medical Records
  - 6. Title 29 CFR 1910.1200 - Hazard Communication
  - 7. Title 29 CFR 1910.151 - Medical and First Aid
- B. Environmental Protection Agency (EPA)
  - 1. 40 CFR 61 Subpart A and M (Revised Subpart B) - National Emission Standard for Hazardous Air Pollutants - Asbestos.
  - 2. 40 CFR 763.80 - Asbestos Hazard Emergency Response Act (AHERA)
- C. Department of Transportation (DOT)
  - Title 49 CFR 100 - 185 – Transportation

#### 1.5.4 STATE REQUIREMENTS

State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

- 401 Kentucky Administrative Regulation (KAR) 58:025
- 401 KAR 58:040
- 401 KAR 58:005

Kentucky Division for Air Quality, 200 Fair Oaks Lane, 1st Floor, Frankfort, KY 40601.

Kentucky Division for Air Quality, Frankfort Regional Office, 300 Sower Blvd., 1<sup>st</sup> Floor, Frankfort, KY 40601, Attention Mr. Eli Caudill (Phone Number 502-564-3358).

Kentucky Division of Waste Management, Solid Waste Branch, 200 Fair Oaks Lane, 2<sup>nd</sup> Floor, Frankfort, KY 40601, Phone Number 502-564-6716.

#### 1.5.5 LOCAL REQUIREMENTS

If local requirements are more stringent than federal or state standards, the local standards are to be followed.

#### 1.5.6 STANDARDS

- A. Standards which govern asbestos abatement activities include, but are not limited to, the following:
  - 1. American National Standards Institute (ANSI) Z9.2-79 – Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI Z88.2 – Practices for Respiratory Protection.
  - 2. Underwriters Laboratories (UL)586-90 – UL Standard for Safety of HEPA filter Units, 7<sup>th</sup> Edition.
- B. Standards which govern encapsulation work include, but are not limited to, the following:
  - 1. American Society for Testing and Materials (ASTM)
- C. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
  - 1. National Fire Protection Association (NFPA) 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations.
  - 2. NFPA 701 – Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
  - 3. NFPA 101 – Life Safety Code

#### 1.5.7 EPA GUIDANCE DOCUMENTS

- A. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference. EPA publications can be ordered from (800) 424-9065.
- B. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024
- C. Asbestos Waste Management Guidance EPA 530-SW-85-007
- D. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001
- E. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

### 1.5.8 NOTICES

- A. State and Local agencies: Send written notification as required by state and local regulations including the local fire department prior to beginning any work on ACM.
- B. Copies of notifications shall be submitted to the Owner for the facility's records at the same time frame notification is given to EPA, State, and Local authorities.

### 1.5.9 PERMITS/LICENSES

- A. The Abatement Contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations. This includes the required 10-day NESHAP notification prior to the start of RACM abatement.

### 1.5.10 POSTING AND FILING OF REGULATIONS

- A. Maintain two (2) copies of applicable federal, state, and local regulations. Post one copy of each at the regulated area where workers will have daily access to the regulations and keep another copy in the Abatement Contractor's onsite office.

### 1.5.11 OWNER RESPONSIBILITIES

Prior to commencement of work:

- A. Notify any occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. **Note: Notification of adjacent personnel is required by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area.**
- B. Submit to the Abatement Contractor results of any background air sampling, if available; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Abatement Contractor, results of bulk material analysis and air sampling data collected during the course of the abatement. This information shall not release the Abatement Contractor from any responsibility for OSHA compliance.

### 1.5.12 SITE SECURITY

- A. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Abatement Contractor's employees, employees of Subcontractors, Owner employees and representatives, State and local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and be posted at entry to the regulated work area.
- B. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent person shall immediately notify the Owner.
- C. A log book shall be maintained at the entry to the regulated work area. Anyone who enters the regulated area must record their name, affiliation, time in, and time out for each entry.
- D. The Abatement Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel.

- F. The Abatement Contractor will have the Owner's assistance in notifying adjacent personnel of the presence, location and quantity of ACM in the regulated area and enforcement of restricted access by the Owner's employees.
- G. The regulated area shall be locked during non-working hours and secured by Owner or Competent Person.

#### **1.5.13 EMERGENCY ACTION PLAN AND ARRANGEMENTS**

- A. An Emergency Action Plan shall be developed by prior to commencing abatement activities and shall be agreed to by the Abatement Contractor and the Owner. The Plan shall meet the requirements of 29 CFR 1910.38 (a);(b).
- B. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.
- C. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.
- D. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
- E. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
  - 1. For non-life-threatening situations – employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
  - 2. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, remove them from the regulated area, and secure proper medical treatment.
- F. Telephone numbers of any/all emergency response personnel shall be prominently posted at the entry to the regulated work area, along with the location of the nearest telephone.
- G. The Abatement Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.
- H. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the standard operating procedures during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure. The Abatement Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.

#### **1.5.14 PRE-CONSTRUCTION MEETING**

Prior to commencing the work, the Abatement Contractor shall meet with the Owner and/or Owner's Representative to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in

the pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project.

- A. Proof of Abatement Contractor licensing by the Commonwealth of Kentucky.
- B. Proof the Competent Person is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person shall also be presented.
- C. A list of all workers who will participate in the project, including experience and verification of training and accreditation.
- D. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.
- E. Current medical written opinions for all personnel working on-site meeting the requirements of 29 CFR 1926.1101(m).
- F. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101(h) and Appendix C.
- G. A copy of the Abatement Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project.
  - 1. Regulated area preparation procedures;
  - 2. Notification requirements procedure of Abatement Contractor as required in 29 CFR 1926.1101(d);
  - 3. If required, decontamination area set-up/layout and decontamination procedures for employees;
  - 4. Abatement methods/procedures and equipment to be used; and
  - 5. Personal protective equipment to be used.
- H. At this meeting, the Abatement Contractor shall provide all submittals as required.
- I. Procedures for handling, packaging and disposal of asbestos waste.
- J. Emergency Action Plan and Contingency Plan Procedures.

## 1.6 PROJECT COORDINATION

The following are the minimum administrative and supervisory personnel necessary for coordination of the work.

### 1.6.1 PERSONNEL

- A. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard. These employees are the Abatement Contractor's representatives responsible for compliance with these specifications and all other applicable requirements.
- B. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the Owner and/or Owner's Representative. A request for approval shall be submitted for any person to be employed during the project giving the person's name; social security number; qualifications; accreditation card with color picture; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.
- C. Minimum qualifications for the Abatement Contractor and assigned personnel are:
  - 1. The Abatement Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of federal (and state as applicable) EPA and OSHA asbestos regulations in the past three (3) years; has adequate liability/occurrence



- insurance for asbestos work as required by the state; is licensed in applicable states; has adequate and qualified personnel available to complete the work; has comprehensive standard operating procedures for asbestos work; and has adequate materials, equipment and supplies to perform the work.
2. The Competent Person has three (3) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.
  3. The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the standard operating procedures of the Abatement Contractor; has applicable medical and respiratory protection documentation; and has certificate of training/current refresher and State accreditation/license.

All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

## **1.7 RESPIRATORY PROTECTION**

### **1.7.1 GENERAL – RESPIRATORY PROTECTION PROGRAM**

The Abatement Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is in compliance with the January 8, 1998 OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.Subpart I;134. ANSI Standard Z88.2-1992 provides excellent guidance for developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 I(1)– i – i) – Respiratory Protection Program.

### **1.7.2 RESPIRATORY PROTECTION PROGRAM COORDINATOR**

The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have three (3) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.

### **1.7.3 SELECTION AND USE OF RESPIRATORS**

The procedure for the selection and use of respirators must be submitted to the Owner as part of the Abatement Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available at the entry to the regulated work area for reference by employees or authorized visitors.

### **1.7.4 MINIMUM RESPIRATORY PROTECTION**

Minimum respiratory protection shall be a half face, HEPA filtered, air purifying respirator when fiber levels are maintained consistently at or below 0.1 f/cc based on an 8-hour time weighted average. A higher level of respiratory protection may be provided or required, depending on fiber levels. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h); Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

### **1.7.5 MEDICAL WRITTEN OPINION**

No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination that they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress

### **1.7.6 RESPIRATOR FIT TEST**

All personnel wearing respirators shall have a current quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Fit tests shall be done for PAPRs which have been put into a failure mode.

### **1.7.7 RESPIRATOR FIT CHECK**

The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from wearing a respirator inside the regulated area until resolution of the problem.

### **1.7.8 MAINTENANCE AND CARE OF RESPIRATORS**

The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) Maintenance and care of respirators.

## **1.8 WORKER PROTECTION**

### **1.8.1 TRAINING OF ABATEMENT PERSONNEL**

Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

### **1.8.2 MEDICAL EXAMINATIONS**

Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the medical opinion the person has been evaluated for working in a heat and cold stress environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.

### **1.8.3 PERSONAL PROTECTIVE EQUIPMENT**

Provide whole body clothing, head coverings, foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by

OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle. Worker protection shall meet the most stringent requirements.

#### **1.8.4 REGULATED AREA ENTRY PROCEDURE**

The Competent Person shall ensure that each time workers enter the regulated area, they remove ALL street clothes in the designated decontamination area (per OSHA requirements) and put on new disposable coveralls, head coverings, and a clean respirator.

#### **1.8.5 DECONTAMINATION PROCEDURE**

The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

- A. When exiting the regulated area, remove all disposable PPE and dispose of in a disposal bag provided in the regulated area.
- B. Carefully decontaminate and clean the respirator. Put in a clean container/bag.
- C. Where containment is not required for ACM removal, an adequate decontamination/changing/washing station which meets OSHA requirements must be provided for the employees for removal of disposable PPE and to clean the respirator.

#### **1.8.6 REGULATED AREA REQUIREMENTS**

The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all OSHA requirements for regulated areas at 29 CFR 1926.1101 are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

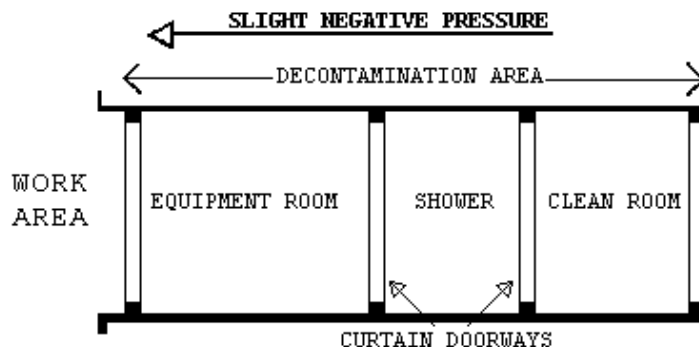
### **1.9 DECONTAMINATION FACILITIES**

#### **1.9.1 DESCRIPTION:**

- A. Description: Provide each regulated area with separate personnel decontamination facilities (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF are the only means of ingress and egress to the regulated area and that all equipment, bagged waste, and other material exit the regulated area only through the W/EDF.
- B. General Requirements: All personnel entering or exiting a regulated area must go through the PDF and shall follow the requirements at 29 CFR 1926.1101 (j)(1) and these specifications. All waste, equipment and contaminated materials must exit the regulated area through the W/EDF and be decontaminated in accordance with these specifications. Walls and ceilings of the PDF and W/EDF must be constructed of a minimum of 3 layers of 6-mil opaque fire retardant polyethylene sheeting and be securely attached to existing building components and/or an adequate temporary framework. A minimum of 3 layers of 6-mil poly shall also be used to cover the floor under the PDF and W/EDF units. Construct doors so that they overlap and secure to adjacent surfaces. Weight inner doorway sheets with layers of duct tape or approved equivalent so that they close quickly after release. Put arrows on sheets so they show direction of travel and overlap. If the building adjacent area is occupied, construct a solid barrier on the occupied side(s) to protect the sheeting and reduce potential for non-authorized personnel entering the regulated area.

- C. Temporary Facilities to the PDF and W/EDF: The Competent Person shall provide temporary water service connections to the PDF and W/EDF. Backflow prevention must be provided at the point of connection to the VA system. Water supply must be of adequate pressure and meet requirements of 29 CFR 1910.141(d)(3). Provide adequate temporary overhead electric power with ground fault circuit interruption (GFCI) protection. Provide a sub-panel equipped with GFCI protection for all temporary power in the clean room. Provide adequate lighting to provide a minimum of 50 foot candles in the PDF and W/EDF. Provide temporary heat, if needed, to maintain 70 degrees F throughout the PDF and W/EDF.
- D. Personnel Decontamination Facility (PDF): The Competent Person shall provide a PDF consisting of shower room which is contiguous to a clean room and equipment room which is connected to the regulated area. The PDF must be sized to accommodate the number of personnel scheduled for the project. The shower room, located in the center of the PDF, shall be fitted with as many portable showers as necessary to insure all employees can complete the entire decontamination procedure within 15 minutes. The PDF shall be constructed of opaque poly for privacy. The PDF shall be constructed to eliminate any parallel routes of egress without showering.
1. Clean Room: The clean room must be physically and visually separated from the rest of the building to protect the privacy of personnel changing clothes. The clean room shall be constructed of at least 3 layers of 6-mil opaque fire retardant poly to provide an air tight room. Provide a minimum of 2 – 900 mm (3 foot) wide 6-mil poly opaque fire retardant doorways. One doorway shall be the entry from outside the PDF and the second doorway shall be to the shower room of the PDF. The floor of the clean room shall be maintained in a clean, dry and sanitary condition. Shower overflow shall not be allowed into the clean room. Provide 1 storage locker per person. A portable fire extinguisher, minimum 10 pounds capacity, Type ABC, shall be provided in accordance with OSHA and NFPA Standard 10. All persons entering the regulated area shall remove all street clothing in the clean room and dress in disposable protective clothing and respiratory protection. Any person entering the clean room does so either from the outside with street clothing on or is coming from the shower room completely naked and thoroughly washed. Male/Females required to enter the regulated area shall be ensured of their privacy throughout the entry/exit process by posting guards at both entry points to the PDF so no male/female can enter or exit the PDF during his/her stay in the PDF.
  2. Shower Room: The Competent Person shall assure that the shower room is a completely water tight compartment to be used for the movement of all personnel from the clean room to the equipment room and for the showering of all personnel going from the equipment room to the clean room. Each shower shall be constructed so water runs down the walls of the shower and into a drip pan. Install a freely draining smooth floor on top of the shower pan. The shower room shall be separated from the rest of the building and from the clean room and equipment room using air tight walls made from at least 3 layers of 6-mil opaque fire retardant poly. The shower shall be equipped with a shower head and controls, hot and cold water, drainage, soap dish and continuous supply of soap, and shall be maintained in a sanitary condition throughout its use. The controls shall be arranged so an individual can shower without assistance. Provide a flexible hose shower head, hose bibs and all other items shown on Shower Schematic. Waste water will be pumped to a drain after being filtered through a minimum of a 100 micron sock in the shower drain; a 20 micron filter; and a final 5 micron filter. Filters will be changed a minimum of daily or more often as needed. Filter changes must be done in the shower to prevent loss of contaminated water.

- Hose down all shower surfaces after each shift and clean any debris from the shower pan. Residue is to be disposed of as asbestos waste.
3. Equipment Room: The Competent Person shall provide an equipment room which shall be an air tight compartment for the storage of work equipment/tools, reusable personal protective equipment, except for a respirator and for use as a gross decontamination area for personnel exiting the regulated area. The Competent Person shall ensure that most gross contamination is removed from the outside of PPE, suits and respirators in the regulated work area, prior to entering the Equipment Room. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made with 2 layers of 6-mil opaque fire retardant poly. The equipment room shall be separated from the regulated area, the shower room and the rest of the building by air tight walls and ceiling constructed of a minimum of 3 layers of 6-mil opaque fire retardant poly. Damp wipe all surfaces of the equipment room after each shift change. Provide an additional loose layer of 6-mil fire retardant poly per shift change and remove this layer after each shift. If needed, provide a temporary electrical sub-panel equipped with GFCI in the equipment room to accommodate any equipment required in the regulated area.
  4. The PDF shall be as follows: Clean room at the entrance followed by a shower room followed by an equipment room leading to the regulated area. Each doorway in the PDF shall be a minimum of 2 layers of 6-mil opaque fire retardant poly.

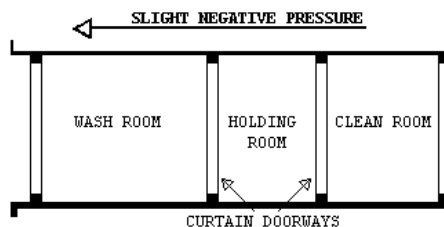


**NOTE: Kentucky regulations require a 5-stage personnel decontamination facility; the personnel decontamination facility shall meet Kentucky requirements. A worker decontamination enclosure system shall be provided, consisting of a clean room, shower room, and equipment room, each separated from each other and from the work area by air locks and accessible through doorways protected with two (2) overlapping 6-mil polyethylene sheets. "Air lock" means a system of enclosures within the containment area consisting of two (2) doorways, curtained with 6-mil polyethylene sheeting, at least three (3) feet apart.**

- E. Waste/Equipment Decontamination Facility (W/EDF):
1. The Competent Person shall provide a W/EDF consisting of a wash room, holding room, and clean room for removal of waste, equipment and contaminated material from the regulated area. Personnel shall not enter or exit the W/EDF except in the event of an emergency. Clean debris and residue in the W/EDF daily. All surfaces in

the W/EDF shall be wiped/hosed down after each shift and all debris shall be cleaned from the shower pan. The W/EDF shall consist of the following:

- a. Wash Down Station: Provide an enclosed shower unit in the regulated area just outside the Wash Room as an equipment bag and container cleaning station.
- b. Wash Room: Provide a wash room for cleaning of bagged or containerized asbestos containing waste materials passed from the regulated area. Construct the wash room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. Locate the wash room so that packaged materials, after being wiped clean, can be passed to the Holding Room. Doorways in the wash room shall be constructed of 2 layers of 6-mil fire retardant poly.
- c. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. The holding room shall be located so that bagged material cannot be passed from the wash room to the clean room unless it goes through the holding room. Doorways in the holding room shall be constructed of 2 layers of 6-mil fire retardant poly.
- d. Clean Room: Provide a clean room to isolate the holding room from the exterior of the regulated area. Construct the clean room using 2 inches x 4 inches wood framing or approved equivalent and 2 layers of 6-mil fire retardant poly. The clean room shall be located so as to provide access to the holding room from the building exterior. Doorways to the clean room shall be constructed of 2 layers of 6-mil fire retardant poly. When a negative pressure differential system is used, a rigid enclosure separation between the W/EDF clean room and the adjacent areas shall be provided.
- e. The W/EDF shall be as follows: Wash Room leading to a Holding Room followed by a Clean Room leading to outside the regulated area. See diagram.



**2. Waste/Equipment Decontamination Procedures:** At the washdown station in the regulated area, thoroughly wet clean contaminated equipment and/or sealed polyethylene bags and pass into Wash Room after visual inspection. When passing anything into the Wash Room, close all doorways of the W/EDF, other than the doorway between the washdown station and the Wash Room. Keep all outside personnel clear of the W/EDF. Once inside the Wash Room, wet clean the equipment and/or bags. After cleaning and inspection, pass items into the Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room. Workers from the Clean Room/Exterior shall enter the Holding Room and remove the decontaminated/cleaned equipment/bags for removal and disposal. At no time shall personnel from the clean side be allowed to enter the Wash Room.

## **PART 2 – PRODUCTS, MATERIALS AND EQUIPMENT**

### **2.1 MATERIALS AND EQUIPMENT**

#### **2.1.1 GENERAL REQUIREMENTS (ALL ABATEMENT PROJECTS)**

Prior to the start of work, the Abatement Contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the Abatement Contractor's Competent Person has verified all necessary materials and equipment are onsite.

- A. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
- B. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.
- C. The Abatement Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the Owner in partially occupied buildings by placing materials/equipment in any unauthorized location.
- D. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
- E. As applicable, polyethylene sheeting for any walls in the regulated area shall be a minimum of 4-mils. For floors and all other uses, sheeting of at least 6-mil shall be used in widths selected to minimize the frequency of joints. Fire retardant poly shall be used throughout.
- F. As applicable, the method of attaching polyethylene sheeting shall be agreed upon in advance by the Abatement Contractor and the Owner and selected to minimize damage to equipment and surfaces. Method of attachment may include any combination of moisture resistant duct tape furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or other effective procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.
- G. Polyethylene sheeting utilized for the PDF shall be opaque white or black in color, 6 mil fire retardant poly.
- H. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Abatement Contractor.
- I. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.
- J. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).
- K. Disposal bags – 2 layers of 6 mil poly for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.
- L. The Owner shall be provided an advance copy of the SDS as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-project submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.

- M. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101 shall be provided and placed by the Competent Person. All other posters and notices required by Federal and State regulations shall be posted in the Clean Room.
- N. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d).

### **2.1.2. OUTDOOR ABATEMENT WORK**

- A. Outdoor Work Areas (when applicable): On some projects, work must be performed on exterior areas of the building. Outdoor abatement work is to be performed, all applicable EPA, OSHA, state, and local regulations must be followed to ensure that outdoor work areas are in compliance so that workers, the general public and the environment are protected. All regulated areas must be properly demarcated, and a decontamination unit shall be placed at the regulated work area. Place 6-mil polyethylene sheeting 25 feet in all possible horizontal surfaces from the building to aid in cleaning material debris that may fall off building.
- B. Scaffold Fall Protection (when applicable): Each employee more than 6 feet above the base work level shall be protected from falls by guardrails or a fall arrest system. Fall arrest system includes harnesses, components of the harness/belt such as Dee-rings, and snap hooks, lifelines, and anchorage points. Lifelines must be independent of supports lines and suspension ropes and not attached to the same anchorage point as the support or suspension rope. OSHA's scaffolding standard defines a competent person as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous to employees, and who has authorization to take prompt corrective measures to eliminate them." The competent person will determine if it is safe for employees to work on or from a scaffold or roof during storms or high winds and to ensure that a personal fall arrest system will protect the employees. The competent person will also inspect the scaffold and scaffold components for visible defects before each work shift and after any occurrence which could affect the structural integrity and to authorize prompt corrective measures.
- C. Roof/Elevated Work Area Protection (when applicable): The competent person shall determine if the walking/working surfaces on which the employees are to work on have the strength and structural integrity to support the employees safely. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest system.
- D. Excavation/Trenching Work Area Protection (when applicable): Each employee who is working in excavation/trenching work areas to alter or remove materials such as underground piping shall be protected from hazards arising from such work areas. A competent person who is OSHA trained in excavation/trenching operations must be present on site at all time in which work in these areas occurs. The competent person will determine if it is safe for employees to work on or in excavation/trenching work areas and to ensure that all applicable safety measures will protect the employees. The competent person will also inspect the excavation/trenching areas for visible defects before each work shift and after any occurrence which could affect the structural integrity of the excavation/trenching areas and to authorize prompt corrective measures.
- E. Removal of Outdoor ACM:
  - 1. All outdoor ACM must be wetted prior to removal. Unfasten materials in a manner that prevents disturbance if feasible, keep materials intact to the extent feasible.



2. All waste must be wrapped and tightly sealed in two individual layers of 6-mil poly or placed in two individual 6-mil poly disposal bags, tightly sealed, and lowered carefully to the ground.
3. Materials may not be dropped from any height. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist.

### **2.1.3 NEGATIVE PRESSURE FILTRATION SYSTEM**

For all interior building work, the Abatement Contractor shall provide enough HEPA negative air machines to continuously maintain a pressure differential of -0.02" water column gauge. The Competent Person shall determine the number of units needed for the regulated area by dividing the cubic feet in the regulated area by 15 and then dividing that result by the cubic feet per minute (CFM) for each unit to determine the number of units needed to continuously maintain a pressure differential of -0.02" WCG. Provide a standby unit in the event of machine failure and/or emergency in an adjacent area. NIOSH has done extensive studies and has determined that negative air machines typically operate at ~50% efficiency. The Abatement Contractor shall consider this in their determination of number of units needed to continuously maintain a pressure differential of -0.02" water column gauge. The Abatement Contractor shall use 8 air changes per hour or double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2" pressure drop across the filters.

### **2.1.4 DESIGN AND LAYOUT**

- A. Before start of work, submit the design and layout of the regulated area and the negative air machines. The submittal shall indicate the number of, location of and size of negative air machines. The point(s) of exhaust, air flow within the regulated area, anticipated negative pressure differential, and supporting calculations for sizing shall be provided. In addition, submit the following:
  1. Method of supplying power to the units and designation/location of the panels.
  2. Description of testing method(s) for correct air volume and pressure differential.
  3. If auxiliary power supply is to be provided for the negative air machines, provide a schematic diagram of the power supply and manufacturer's data on the generator and switch.

### **2.1.5 NEGATIVE AIR MACHINES (HEPA UNITS)**

- A. Negative Air Machine Cabinet: The cabinet shall be constructed of steel or other durable material capable of withstanding potential damage from rough handling and transportation. The width of the cabinet shall be less than 30" in order to fit in standard doorways. The cabinet must be factory sealed to prevent asbestos fibers from being released during use, transport, or maintenance. Any access to and replacement of filters shall be from the inlet end. The unit must be on casters or wheels.
- B. Negative Air Machine Fan: The rating capacity of the fan must indicate the CFM under actual operating conditions. Manufacturer's typically use "free-air" (no resistance) conditions when rating fans. The fan must be a centrifugal type fan.
- C. Negative Air Machine Final Filter: The final filter shall be a HEPA filter. The filter media must be completely sealed on all edges within a structurally rigid frame. The filter shall align with a continuous flexible gasket material in the negative air machine housing to form an air tight seal. Each HEPA filter shall be certified by the manufacturer to have an efficiency of not less than 99.97%. Testing shall have been done in accordance with

Military Standard MIL-STD-282 and Army Instruction Manual 136-300-175A. Each filter must bear a UL586 label to indicate ability to perform under specified conditions. Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

- D. Negative Air Machine Pre-filters: The pre-filters, which protect the final HEPA filter by removing larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. A first stage pre-filter shall be a low efficiency type for particles 10 µm or larger. A second stage pre-filter shall have a medium efficiency effective for particles down to 5 µm or larger. Pre-filters shall be installed either on or in the intake opening of the negative air machine and the second stage filter must be held in place with a special housing or clamps.
- E. Negative Air Machine Instrumentation: Each unit must be equipped with a gauge to measure the pressure drop across the filters and to indicate when filters have become loaded and need to be changed. A table indicating the cfm for various pressure readings on the gauge shall be affixed near the gauge for reference or the reading shall indicate at what point the filters shall be changed, noting cfm delivery. The unit must have an elapsed time meter to show total hours of operation.
- F. Negative Air Machine Safety and Warning Devices: An electrical/ mechanical lockout must be provided to prevent the fan from being operated without a HEPA filter. Units must be equipped with an automatic shutdown device to stop the fan in the event of a rupture in the HEPA filter or blockage in the discharge of the fan. Warning lights are required to indicate normal operation; too high a pressure drop across filters; or too low of a pressure drop across filters.
- G. Negative Air Machine Electrical: All electrical components shall be approved by the National Electrical Manufacturer's Association (NEMA) and Underwriters Laboratories (UL). Each unit must be provided with overload protection and the motor, fan, fan housing, and cabinet must be grounded.
- H. It is essential that replacement HEPA filters be tested using an "in-line" testing method, to ensure the seal around the periphery was not damaged during replacement. Damage to the outer HEPA filter seal could allow contaminated air to bypass the HEPA filter and be discharged to an inappropriate location. The Abatement Contractor will provide written documentation of test results for negative air machine units with HEPA filters changed by the Abatement Contractor.

#### **2.1.6 PRESSURE DIFFERENTIAL**

For all interior building work, the fully operational negative air system within the regulated area shall continuously maintain a pressure differential of -0.02" water column gauge. Before any disturbance of any asbestos material, this shall be demonstrated to the Owner and/or Owner's Representative by use of a pressure differential meter/manometer as required by OSHA 29 CFR 1926.1101(e)(5)(i). The Competent Person shall be responsible for providing, maintaining, and documenting the negative pressure and air changes as required by OSHA and this specification.

#### **2.1.7 MONITORING**

The pressure differential shall be continuously monitored and recorded between the regulated area and the area outside the regulated area with a monitoring device that incorporates a strip chart recorder. The strip chart recorder shall become part of the project log and shall indicate at least -0.02" water column gauge for the duration of the project.

### **2.1.8 SUPPLEMENTAL MAKE-UP AIR INLETS**

Provide, as needed for proper air flow in the regulated area, in a location approved by the Owner and/or Owner's Representative, openings in the plastic sheeting to allow outside air to flow into the regulated area. Auxiliary makeup air inlets must be located as far from the negative air machines as possible, off the floor near the ceiling, and away from the barriers that separate the regulated area from the occupied clean areas. Cover the inlets with weighted flaps which will seal in the event of failure of the negative pressure system.

### **2.1.9 TESTING THE SYSTEM**

The negative pressure system must be tested before any ACM is disturbed in any way. After the regulated area has been completely prepared, the decontamination units set up, and the negative air machines installed, start the units up one at a time. Demonstrate and document the operation and testing of the negative pressure system to the Owner and/or Owner's Representative using smoke tubes and a negative pressure gauge. Verification and documentation of adequate negative pressure differential across each barrier must be done at the start of each work shift.

### **2.1.10 DEMONSTRATION OF THE NEGATIVE AIR PRESSURE SYSTEM**

The demonstration of the operation of the negative pressure system to the Owner and/or Owner's Representative shall include, but not be limited to, the following:

- A. Plastic barriers and sheeting move lightly in toward the regulated area.
- B. Curtains of the decontamination units move in toward regulated area.
- C. There is a noticeable movement of air through the decontamination units. Use the smoke tube to demonstrate air movement from the clean room to the shower room to the equipment room to the regulated area.
- D. Use smoke tubes to demonstrate air is moving across all areas in which work is to be done. Use a differential pressure gauge to indicate a negative pressure of at least -0.02" across every barrier separating the regulated area from the rest of the building. Modify the system as necessary to meet the above requirements.

### **2.1.11 USE OF SYSTEM DURING ABATEMENT OPERATIONS**

- A. Start units before beginning any disturbance of ACM occurs. After work begins, the units shall run continuously, maintaining 4 actual air changes per hour at a negative pressure differential of -0.02" water column gauge, for the duration of the work until a final visual clearance and final air clearance has been successfully completed.  
No negative air units shall be shut down at any time unless authorized by the Owner and/or Owner's Representative, verbally and in writing. The only time when negative air units may be shut off is when no electricity is available at the site and portable electricity generators must be used. In this case, negative air units may be shut off at the end of each work shift provided that any and all openings to the work area containment are tightly sealed shut until the next shift's work resumes.
- B. Abatement work shall begin at a location farthest from the units and proceed towards them. If an electric failure occurs, the Competent Person shall stop all abatement work and immediately begin wetting all exposed asbestos materials for the duration of the power outage. Abatement work shall not resume until power is restored and all units are operating properly again.

- C. The negative air machines shall continue to run after all work is completed and until a final visual clearance and a final air clearance has been successfully completed for that regulated area.

## **2.2 CONTAINMENT BARRIERS AND COVERINGS IN THE REGULATED AREA**

### **2.2.1 GENERAL**

Demarcate the regulated work area per OSHA requirements. Any and all HVAC intakes in the regulated area (whether indoor or outdoor work) must be covered with 2 layers of 6 mil fire retardant poly. Should adjacent areas become contaminated, immediately stop work and clean up the contamination at no additional cost to the Owner.

### **2.2.2 PREPARATION PRIOR TO SEALING THE REGULATED AREA**

Place all tools, scaffolding, materials, and equipment needed for working in the regulated area prior to erecting any plastic sheeting. Remove all uncontaminated removable furniture, equipment and/or supplies from the regulated area before commencing work, or completely cover with 2 layers of 6-mil fire retardant poly sheeting and secure with duct tape. Lock out and tag out any HVAC systems in the regulated area.

### **2.2.3 CONTROLLING ACCESS TO THE REGULATED AREA**

Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated, and OSHA Danger demarcation signs posted as required by OSHA. If the regulated area is adjacent to or within view of an occupied area, provide a visual barrier of 6 mil opaque fire retardant poly sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

### **2.2.4 CRITICAL BARRIERS**

Individually seal with two layers of 6 mil poly and duct tape any and all HVAC openings and any and all openings to the building interior inside the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects in the regulated area. Heat must be shut off any objects covered with poly.

For outdoor work, if there are any openings into the interior of the building, and for HVAC air intakes, completely separate any openings in the regulated area from adjacent areas using fire retardant poly at least 6 mils thick and duct tape.

### **2.2.5 PRIMARY BARRIERS**

- A. Cover the regulated area with two layers of 6 mil fire retardant poly on the floors and two layers of 6 mil, fire retardant poly on the walls, unless otherwise directed in writing by the VA representative. Floor layers must form a right angle with the wall and turn up the wall at least 300 mm (12"). Seams must overlap at least 1800 mm (6') and must be spray glued and taped. Install sheeting so that layers can be removed independently from each other. Carpeting shall be covered with three layers of 6 mil poly. Corrugated cardboard sheets must be placed between the bottom and middle layers of poly. Mechanically support and seal with duct tape and glue all wall layers.
- B. Elevator doors, if applicable, must be covered with 2 layers of 6 mil fire retardant poly. The elevator door must be in a positively pressurized area outside the clean room of the PDF.

- C. If stairs and ramps are covered with 6 mil plastic, two layers must be used. Provide 19 mm (3/4") exterior grade plywood treads held in place with duct tape/glue on the plastic. Do not cover rungs or rails with any isolation materials.

### **2.2.6 SECONDARY BARRIERS:**

A loose layer of 6 mil fire retardant poly shall be used as a drop cloth to protect the floor/horizontal surfaces from debris generated during the Class I and Class II OSHA Asbestos Work, except for floor tile/floor mastic and roofing material abatement. This layer shall be replaced as needed during the work.

### **2.2.7 EXTENSION OF THE REGULATED AREA**

If the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. If the affected area cannot be added to the regulated area, decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

## **2.3 MONITORING, INSPECTION AND TESTING**

### **2.3.1 GENERAL**

- A. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the Employee exposure to asbestos must not exceed 0.1 fiber per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift and 1.0 f/cc for a 30-minute excursion. The Abatement Contractor's Competent Person shall be responsible for and shall inspect and oversee the performance of the work for compliance with this specification and applicable federal and state asbestos regulations. The Competent Person shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the Abatement Contractor's Competent Person shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples to satisfy OSHA requirements. Additional inspection and testing requirements are also indicated in other parts of this specification.
- B. The Owner may employ an independent a third-party consultant (Owner's Representative). The Owner's Representative may conduct random site visits and will conduct final visual/ air clearance to ensure that that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the Owner's Representative consultant in no way relieves the Abatement Contractor from their responsibility to perform the work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the Owner's Representative and their services will be borne by the Owner except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final inspections and/or testing, if required, will be paid for by the Abatement Contractor.

### **2.3.2 SCOPE OF SERVICES OF THE OWNER'S REPRESENTATIVE (THIRD-PARTY CONSULTANT)**

- A. The Owner reserves the right to utilize and provide third-party consultant services during the asbestos abatement project. The purpose of the work of the Owner's Representative (Third-Party Consultant) is to: assure quality; resolve problems; and prevent the spread of contamination beyond the regulated area. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM. The Owner's Representative may and/or shall perform the following tasks:
  - 1. May perform unannounced site visits to spot check overall compliance of work with contract/specifications. These visits may include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.
  - 4. May provide support to the Owner such as evaluation of submittals from the Contractor, resolution of unforeseen developments, etc.
  - 5. Perform a final visual inspection and air clearance testing of decontaminated regulated areas or building at the conclusion of the abatement and clean-up work to certify compliance with all regulations and the Owner requirements/specifications.
  - 6. May issue a final monitoring report.
- B. All documentation, inspection results and testing results generated by the Owner's Representative will be available to the Abatement Contractor for information and consideration. The Abatement Contractor shall cooperate with and support the Owner's Representative for efficient and smooth performance of their work.
- C. Any monitoring and inspection results of the Owner's Representative will be used by the Owner to issue any Stop Removal orders to the Abatement Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.

### **2.3.3 MONITORING, INSPECTION AND TESTING BY CONTRACTOR**

The Abatement Contractor is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The Abatement Contractor is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Abatement Contractor's personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated area is the exclusive responsibility of the Abatement Contractor/Competent Person. The analytic laboratory used by the Abatement Contractor to analyze the personal samples shall be AIHA accredited for asbestos PAT and approved by the Owner prior to start of the project. A daily log, shall be maintained by the Abatement Contractor, documenting all OSHA requirements for air personal monitoring for asbestos in 29 CFR 1926.1101(f), (g) and Appendix A. This log shall be made available to the Owner and/or the Owner's Representative upon request. The log will contain, at a minimum, information on personnel or area samples, other persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The Abatement Contractor shall collect and analyze samples for each representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. No fewer than 25% of the work crew shall be sampled for asbestos exposure per 29 CFR 1926.1101. The Contractor will perform inspection and testing at the final stages of abatement for each regulated area as specified in the Abatement Contractor responsibilities. Additionally, the Abatement Contractor will monitor and record pressure

readings, for negative pressure containments if applicable, daily with a minimum of two readings at the beginning and at the end of a shift and submit the data in the daily report.

## **2.4 ASBESTOS HAZARD ABATEMENT PLAN**

The Abatement Contractor shall have established Asbestos Hazard Abatement Plan (AHAP) in printed form and loose-leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the ways and procedures to be followed during all phases of the work by the Abatement Contractor's personnel. The AHAP must be modified as needed to address specific requirements of the project. The AHAP shall be submitted for review and approval prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAP(s) are:

- A. Minimum Personnel Qualifications
- B. Contingency Plans and Arrangements
- C. Security and Safety Procedures
- D. Respiratory Protection/Personal Protective Equipment Program and Training
- E. Medical Surveillance Program and Recordkeeping
- F. Regulated Area Requirements for Abatement
- G. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)
- H. Monitoring, Inspections, and Testing
- I. Disposal of ACM waste
- J. Regulated Area Decontamination/Clean-up
- K. Regulated Area Visual and Air Clearance
- L. Project Completion/Closeout

## **2.5 SUBMITTALS**

### **2.5.1 PRE-START MEETING SUBMITTALS**

Submit to the Owner a minimum of 10 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:

- A. Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.
- B. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the signed "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person – see attached for forms.
- C. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the Abatement Contractor.
- D. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
  - 1. Supplied air system, negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
  - 2. Wastewater filtration system, shower system, containment barriers.
  - 3. Encapsulants, surfactants, handheld sprayers, airless sprayers, and fire extinguishers.
  - 4. Respirators, protective clothing, personal protective equipment.
  - 5. Fire safety equipment to be used in the regulated area.

- E. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of sub-contractor, if used.
- F. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.
- G. Submit the name, location, and verification of the laboratory and/or personnel to be used for analysis of personal air samples. Personal air monitoring must be done in accordance with OSHA 29 CFR 1926.1101 (f) and Appendix A.
- H. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.
  - 1. Asbestos Abatement Company: Project experience within the past 2 years; listing projects first most similar to this project: Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; and Completion Date
  - 2. List of project(s) halted by owner, A/E, IH, regulatory agency in the last 1 years, if any: Project Name; Reason; Date; Reference Name/Number; Resolution
  - 3. List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal and state EPA), penalties, and legal actions taken against the company including and of the company's officers (including damages paid) in the last 2 years, if any. Provide copies and all information needed for verification.
- I. Submit information on personnel: provide a resume; address each item completely; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the Competent Person stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and 29 CFR 1910.20 and that the company has implemented a medical surveillance program and written respiratory protection program and maintains recordkeeping in accordance with the above regulations. Submit the phone number and doctor/clinic/hospital used for medical evaluations.
  - 1. Competent Person(s)/Supervisor(s): Number; names; social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
  - 2. Workers: Numbers; names; social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
- J. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of AHAP(s) incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and standard operating procedures; and copies of monitoring results of the five referenced projects listed and analytical method(s) used.
- K. Rented equipment must be decontaminated prior to returning to the rental agency.



- L. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS, and application instructions.

### **2.5.2 SUBMITTALS DURING ABATEMENT**

- A. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; representative air monitoring and results/TWAs/ELs. This information must be available daily upon request by the Owner and/or Owner's Representative.

### **2.5.3 SUBMITTALS AT COMPLETION OF ABATEMENT**

The Abatement Contractor shall submit a project report consisting of the daily logbook requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the regulated work areas and transportation of waste from the work areas with applicable Chain of Custody forms. All personnel air sample results shall be included. The report shall include a certificate of completion, signed, and dated by the Abatement Contractor in accordance with Attachment #1 (see attached).

## **PART 3 - EXECUTION**

### **3.1 PRE-ABATEMENT ACTIVITIES**

#### **3.1.1 PRE-ABATEMENT MEETING**

The Owner and/or Owner's Representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the Contractor that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Abatement Contractor, the Competent Person(s), the Owner's representative(s), and the Owner. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Abatement Contractor shall be prepared to provide any supplemental information/documentation to the Owner and/or Owner's Representative regarding any submittals, documentation, materials, or equipment. Upon satisfactory resolution of any outstanding issues, the Owner's will issue a written order to proceed to the Abatement Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the Owner's written order to proceed.

#### **3.1.2 PRE-ABATEMENT INSPECTIONS AND PREPARATIONS**

Before any work begins on the construction of the regulated area, the Abatement Contractor will:

- A. For renovation projects, conduct a space-by-space inspection with the Owner and/or Owner's Representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed as accurate by the Owner and the Abatement Contractor. For demolition projects, this may not be necessary per Owner requirements.

- B. Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.
- C. If present and required, remove, and dispose of carpeting from floors in the regulated area.

### **3.1.3 PRE-ABATEMENT CONSTRUCTION AND OPERATIONS**

- A. Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.
- B. Upon completion of all preparatory work, the Abatement Contractor will inspect the work and systems and will notify the Owner and/or Owner's Representative when the work is completed in accordance with this specification. The Owner and/or Owner's Representative may inspect the regulated area and the systems with the Abatement Contractor and may require that upon satisfactory inspection, the Abatement Contractor's employees perform all major aspects of the approved SOP's, especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation.
- C. The Abatement Contractor shall document the pre-abatement activities described above and include in the final report documentation.
- D. Upon satisfactory inspection of the installation of and operation of systems, the Owner and/or Owner's Representative may conduct an inspection and notify the Abatement Contractor to proceed with the asbestos abatement work in accordance with this specification.

## **3.2 REGULATED AREA PREPARATIONS**

### **3.2.1 OSHA DANGER SIGNS**

Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.

### **3.2.2 SHUT DOWN - LOCK OUT ELECTRICAL**

When electricity service is still connected/available and energized, shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting when electricity is shut down/locked out, and when no electricity exists at that site. Ensure safe installation including GFCI of temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. Electricity (e.g., portable electrical generators) shall be provided by the Abatement Contractor when no electricity services exist. Portable electrical generators must be safely maintained in accordance with the manufacturer's recommendations and in accordance with all applicable federal, state, and local regulations. Portable generating equipment shall be provided to sufficiently and continuously maintain and operate negative air machines at -0.02 inches of water column as well as sufficient to also maintain the use of other equipment necessary to facilitate and complete the work.

### **3.2.3 SHUT DOWN - LOCK OUT HVAC**

If electricity service is available and HVAC equipment is energized, shut down and lock out/tag out heating, cooling, and air conditioning system (HVAC) components that are in, supply or pass through the regulated area.

Investigate the regulated area and agree on pre-abatement conditions with the Owner and/or Owner's Representative. Regardless of the presence or lack of electrical service, seal all intake and exhaust vents in the regulated area with duct tape and 2 layers of 6-mil poly. Also, seal any seams in system components that pass through the regulated area. If present, remove all contaminated HVAC system filters and place in labeled 6-mil poly disposal bags for disposal as asbestos waste.

### **3.2.4 SANITARY FACILITIES**

If no sanitary facilities are available onsite for use as may be noted per the Extent of Work Section 1.1.2, the Abatement Contractor shall provide sufficient sanitary facilities (e.g., portalets) for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

### **3.2.5 WATER FOR ABATEMENT**

If no water source is available for connection and use at the site as may be noted per the Extent of Work Section 1.1.2, the Abatement Contractor must provide sufficient water at the site for abatement purposes. If applicable to the system, the service to the regulated work area shall be supplied with backflow prevention.

### **3.2.6 ELECTRICITY**

If no electricity is available for connection and use at the site as may be noted per the Extent of Work Section 1.1.2, the Asbestos Abatement Contractor must provide sufficient and adequate electricity for the project. Electricity (e.g., portable electrical generators) shall be provided by the Abatement Contractor when no electricity services exist. Portable electrical generators must be safely maintained in accordance with the manufacturer's recommendations and in accordance with all applicable federal, state, and local regulations. Portable generating equipment shall be provided to sufficiently and continuously maintain and operate negative air machines at -0.02 inches of water column as well as sufficient to also maintain the use of other equipment necessary to facilitate and complete the work.

### **3.2.7 PRE-CLEANING MOVABLE OBJECTS**

Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.

Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location.

### **3.2.8 PRE-CLEANING FIXED OBJECTS**

Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult, but contamination may be significant. Also, pay particular attention to wall, floor and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2 layers of 6-mil poly and seal securely in place with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with specified means of protection. Contact the manufacturer for special protection requirements.

### **3.2.9 PRE-CLEANING SURFACES IN THE REGULATED AREA**

Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. PPE must be donned during all pre-cleaning activities. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase.

## **3.3 BARRIERS AND COVERINGS FOR THE REGULATED AREA**

### **3.3.1 GENERAL**

The perimeter of the regulated area shall meet and be clearly demarcated per OSHA requirements. Two layers of 6 mil fire retardant poly shall be used to cover any openings into the interior of the building and any HVAC air intakes to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated, immediately stop work and clean up the contamination at no additional cost to the Owner.

### **3.3.2 PREPARATION PRIOR TO SEALING OFF**

Place all tools, scaffolding, materials, and equipment needed for working in the regulated area prior to erecting any plastic sheeting. Remove all uncontaminated removable furniture, equipment and/or supplies from the regulated area before commencing work, or completely cover with 2 layers of 6-mil fire retardant poly sheeting and secure with duct tape. Lock out and tag out any HVAC systems in the regulated area.

### **3.3.3 CONTROLLING ACCESS TO THE REGULATED AREA**

Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated, and OSHA Danger demarcation signs posted as required by OSHA. If the regulated area is adjacent to or within view of an occupied area, provide a visual barrier of 6 mil opaque fire retardant poly sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

### 3.3.4 CRITICAL BARRIERS

Indoor regulated areas must be completely separated from the adjacent areas, and the outside by at least 2 layers of 6 mil, fire retardant poly and duct tape/spray adhesive. Individually seal all supply and exhaust ventilation openings, lighting fixtures, clocks, doorways, windows, convectors, speakers, and other openings into the regulated area with 2 layers of 6 mil fire retardant poly and taped securely in place with duct tape/spray adhesive. Critical barriers must remain in place until all work and clearances have been completed. Light fixtures shall not be operational during abatement. Auxiliary lighting shall be provided. If needed, provide plywood squares 6" x 6" x 3/8" (150mm x 150mm x 18mm) held in place with one 6d smooth masonry/galvanized nail driven through the center of the plywood square and duct tape on the poly so as to clamp the poly to the wall/surface. Locate plywood squares at each end, corner, and 4' (1200mm) maximum on centers.

### 3.3.5 PRIMARY/SECONDARY BARRIERS

- A. Floors: Cover the floor of the regulated area with at least two layers of 6 mil, fire retardant poly, turning up the walls at least 12" (300mm). The poly must form a right angle at the floor-wall juncture so there is no radius which can be stepped on, possibly causing detachment of the poly. Spray glue and duct tape must both be used for floor seams. Floor seams must overlap a minimum of 6 feet (1800mm) or be at right angles to each other. The top sheet of poly must be able to be removed independently of the bottom layer. A third loose layer of 6 mil poly shall be used in the area of removal and periodically picked up to reduce contamination of the initial layers.
- B. Walls: All walls in the regulated area, including critical barriers, shall be covered with 2 layers of 6 mil fire retardant poly, mechanically supported and sealed with duct tape and/or spray glue. Tape all joints, including the floor-wall joint, with duct tape/spray glue. All wall joints must overlap at least 6 feet (1800mm).
- C. Stairs and Ramps: Stairs or ramps covered in poly must be provided with 3/4" (36mm) exterior grade plywood treads securely held in place over the poly. Do not cover stairs or ramps with unsecured poly. Do not cover rungs or rails with any protective materials.

### 3.3.6 EXTENSION OF THE REGULATED AREA

If the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. If the affected area cannot be added to the regulated area, decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

### 3.3.7 FLOOR BARRIERS

Except for floor/floor mastic all floors in the regulated area shall be covered with 2 layers of 6 mil fire retardant poly and brought up the wall 12 inches. An additional 6 mil layer of poly shall be used as a drop cloth beneath all Class I and Class II OSHA Asbestos Work.

## 3.4 REMOVAL

### 3.4.1 GENERAL

The Owner and/or Owner's Representative must be notified at least 24 hours in advance of any waste removed from the containment. All applicable requirements of OSHA, EPA, and DOT shall be followed during removal. Keep materials intact; do not disturb; wet while working with it; wrap as soon as possible with 2 layers of 6 mil plastic for disposal.

### 3.4.2 WET REMOVAL OF ACM

**In no event shall dry removal occur; all materials must be adequately wetted prior to its removal. In no event shall any removed wetted material be allowed to accumulate and dry-out. All removed wetted materials must be containerized and sealed once the container is full immediately upon its removal.**

- A. Use amended water for the wetting of ACM prior to removal. The Competent Person shall assure the wetting of ACM meets the definition of "adequately wet" in the EPA NESHAP regulation and OSHA's "wet methods" for the duration of the project. A removal encapsulant may be used instead of amended water with written approval of the Owner.
- B. Amended Water: Provide water to which a surfactant has been added shall be used to wet the ACM and reduce the potential for fiber release during disturbance of ACM. The mixture must be equal to or greater than the wetting provided by water amended by a surfactant consisting of one ounce of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with 5 gallons (19L) of water.
- C. Removal Encapsulant: When authorized by Owner's Representative, provide a penetrating encapsulant designed specifically for the removal of ACM. The material must, when used, result in adequate wetting of the ACM and retard fiber release during removal.
- D. Adequately and thoroughly wet the ACM to be removed prior to removal to reduce/prevent fiber release to the air. Adequate time must be allowed for the amended water to saturate the ACM. Abatement personnel must not disturb dry ACM. Use a fine spray of amended water or removal encapsulant. Saturate the material sufficiently to wet to the substrate without causing excessive dripping. The material must be sprayed repeatedly/continuously during the removal process in order to maintain adequately wet conditions. Removal encapsulants must be applied in accordance with the manufacturer's written instructions. Perforate or carefully separate, using wet methods, an outer covering that is painted or jacketed in order to allow penetration and wetting of the material. Where necessary, carefully remove covering while wetting to minimize fiber release. **In no event shall dry removal occur except in the case of electrical hazards or a greater safety issue is possible.**
- E. If ACM does not wet well with amended water due to coating or jacketing, remove as follows:
  - 1. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.
  - 2. Remove saturated ACM in small sections. Do not allow material to dry out. As material is removed, bag material, while still wet into disposal bags. Twist the bag neck tightly, bend over (gooseneck) and seal with a minimum of three tight wraps of duct tape. Clean /decontaminate the outside of the bag of any residue and move to washdown station adjacent to W/EDF.

### 3.4.9 LOCKDOWN ENCAPSULATION

General: Lockdown encapsulation is an integral part of the ACM removal. At the conclusion of ACM removal and before removal of the primary barriers, all surfaces shall be encapsulated with an asbestos lockdown encapsulant.

### 3.5 DISPOSAL OF WASTE MATERIAL

#### 3.5.1 GENERAL

Any waste stored temporarily onsite prior to being transported to the landfill, must be stored in a fully enclosed, locked container and labeled according to all applicable federal, state, and local regulations. **No unsecured storage, open-top storage, or open-top dumpsters storage shall be permitted onsite or permitted to transport waste.**

Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA, and DOT. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 100–185 regulations. Disposal shall be done at an approved landfill in accordance with applicable federal, state, and local regulations.

#### 3.5.2 PROCEDURES

- A. The Owner and/or Owner's Representative must be notified at least 24 hours in advance of any waste to be removed from containments.
- B. Asbestos waste shall be packaged and moved through the W/EDF into a covered transport container in accordance with procedures in this specification. Waste shall be double-bagged and wetted with amended water prior to disposal. Wetted waste can be very heavy. Bags shall not be overfilled. Bags shall be securely sealed to prevent accidental opening and/or leakage. The top shall be tightly twisted and goose necked prior to tightly sealing with at least three wraps of duct tape. Ensure that unauthorized persons do not have access to the waste material once it is outside the regulated area. All transport containers must be covered at all times when not in use. NESHAP/OSHA signs must be on containers during loading and unloading. Waste shall not be permitted to be stored or transported in open top vehicles or open top dumpsters. If drums are used for packaging, the drums shall be labeled properly and shall not be re-used.
- C. Waste Load Out: Waste load out shall be done in accordance with the procedures in W/EDF Decontamination Procedures. Sealed waste bags shall be decontaminated on exterior surfaces by wet cleaning and/or HEPA vacuuming before being placed in the second waste bag and sealed, which then must also be wet wiped or HEPA vacuumed.
- D. Asbestos waste with sharp edged components, i.e., nails, screws, lath, strapping, tin sheeting, jacketing, metal mesh, etc., which might tear poly bags shall be wrapped securely in burlap before packaging and, if needed, use a poly lined fiber drum as the second container, prior to disposal.

### 3.6 PROJECT DECONTAMINATION

#### 3.6.1 GENERAL

- A. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the Abatement Contractor's Competent Person.
- B. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.
- C. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

### **3.6.2 REGULATED AREA CLEARANCE**

Visual inspection and other requirements which must be met before release of the Abatement Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures.

### **3.6.3 WORK DESCRIPTION**

Decontamination includes the cleaning and clearance of the air in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities.

### **3.6.4 PRE-DECONTAMINATION CONDITIONS**

- A. Before decontamination starts, all ACM waste from the regulated area shall be removed, all waste collected and removed, and the secondary barrier of poly removal and disposed of along with any gross debris generated by the work.
- B. At the start of decontamination, the following shall be in place:
  1. Critical barriers over all openings consisting of two layers of 6 mil poly which is the sole barrier between the regulated area and the rest of the building or outside.
  2. Decontamination facilities, if required for personnel and equipment in operating condition.

### **3.6.5. CLEANING**

Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and/or HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in operation during this time. Additional cleaning(s) may be needed as determined by the Owner's Representative.

## **3.7 VISUAL INSPECTION AND AIR CLEARANCE TESTING**

### **3.7.1 GENERAL**

Notify the Owner at least 5 business days in advance when all abatement activities are anticipated to be complete. The Owner will notify the third-party consultant (i.e., Owner's Representative) in advance to be available on the anticipated date to conduct a final visual inspection and final air clearance testing. The final visual inspection and final air clearance testing will be performed by the Owner's Representative after all final cleaning and lockdown encapsulant has been completed.

### **3.7.2 VISUAL INSPECTION**

Final visual inspection will include the entire regulated area, all poly sheeting, seals over HVAC openings, doorways, windows, and any other openings. If any debris, residue, dust, or any other suspect material is detected, the cleaning shall be repeated at no cost to the Owner. When the regulated area is visually clean the final air clearance testing can be conducted.



### **3.7.3 AIR CLEARANCE TESTING**

- A. For indoor abatement work, air clearance testing will be conducted after successfully meeting with the Owner's Representative's visual inspection approval. For outdoor abatement work, only a final visual inspection will be conducted by the Owner's Representative (air clearance testing is not required outdoors). If no electricity is available within the building for connection and use for high volume air sampling pumps, the Abatement Contractor shall be required to provide the Owner's Representative with sufficient connection to their portable electrical generator source and electrical cords of sufficient length to power 5 high volume air sampling pumps for a duration of approximately 120 minutes. .

### **3.7.4 FINAL AIR CLEARANCE PROCEDURES**

- A. Contractor's Release Criteria for Indoor Work: Work in an indoor regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by PCM protocol.
- B. Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the Owner's Representative will secure 5 PCM air samples and analyze them according to the following procedures:
  - 1. Fibers Counted: "Fibers" referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.
  - 2. All final air testing samples collected on 0.8 $\mu$  MCE filters for PCM analysis. A minimum of 1,200 Liters of using calibrated pumps shall be collected for clearance samples. Air samples will be collected in areas subject to normal air circulation away from corners, obstructed locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off. The negative pressure system shall continue to operate.

### **3.6.5 CLEARANCE SAMPLING USING PCM:**

- A. The Owner's Representative will perform clearance sampling as indicated by the specification.
- B. The NIOSH 7400 PCM method will be used for clearance sampling with a minimum collection volume of 1,200 liters of air. A minimum of 5 PCM clearance samples shall be collected per work area. Each of the 5 air samples must have a result of equal to or less than 0.01 f/cc to clear the regulated area.

### **3.6.7 LABORATORY TESTING OF PCM CLEARANCE SAMPLES**

The accredited laboratory shall be successfully participating in the AIHA Proficiency Analytical Testing (PAT) program. Once received, the Owner's Representative will share the results with the Owner and the Abatement Contractor. Failed clearance tests will require the Contractor to reclean the work area at their own expense until passing results have been successfully achieved.

### **3.8 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE**

#### **3.8.1 COMPLETION OF ABATEMENT WORK**

- A. After thorough decontamination, complete asbestos abatement work upon meeting the regulated area clearance criteria (visual inspection clearance) and fulfilling the following:
1. Remove all equipment, materials, and debris from the project area.
  2. Package and dispose of all asbestos waste as required.
  3. Repair or replace all interior finishes damaged during the abatement work.
  4. Fulfill other project closeout requirements as specified elsewhere in this specification.

#### **3.8.2 CERTIFICATE OF COMPLETION BY CONTRACTOR**

The Contractor shall complete and sign the "Certificate of Completion" in accordance with Attachment 1 at the completion of the abatement and decontamination of the regulated areas.

#### **3.8.3 WORK SHIFTS**

All other work shall be done during normal business hours (7:00 AM to 5:00 PM) Monday - Friday excluding Federal Holidays. The Asbestos Abatement Contractor must coordinate with the General Contractor (if applicable) and Owner on work areas and scheduling. Any change in the work schedule must be approved in writing by the Owner.

**ATTACHMENT #1  
CERTIFICATE OF COMPLETION**

DATE: \_\_\_\_\_ Owner's Project #: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_ Abatement Contractor: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):  
which took place from    /    /    to    /    /
2. That throughout the work all applicable requirements/regulations and the specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and Owner specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer's recommendations.

Abatement Contractor Signature/Date: \_\_\_\_\_

Abatement Contractor Print Name: \_\_\_\_\_

## ATTACHMENT #2

### CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

PROJECT ADDRESS: \_\_\_\_\_

ABATEMENT CONTRACTOR'S NAME: \_\_\_\_\_

**WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.**

Your employer's contract with the Owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate, you are indicating to the Owner that your employer has met these obligations.

**RESPIRATORY PROTECTION:** I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

**TRAINING COURSE:** I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32 hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

**MEDICAL EXAMINATION:** I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

**ATTACHMENT #3**

**AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND TRAINING/ACCREDITATION**

PROJECT NAME AND NUMBER: \_\_\_\_\_

FACILITY: \_\_\_\_\_

ABATEMENT CONTRACTOR'S NAME AND ADDRESS: \_\_\_\_\_

1. I verify that the following individual

Name: \_\_\_\_\_

who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101 (m)(n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.

Address: \_\_\_\_\_

2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.
3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.
4. I verify that I meet the minimum qualifications criteria of the specifications.

Signature of Abatement Contractor: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name of Abatement Contractor: \_\_\_\_\_

## ATTACHMENT #4

### ABATEMENT CONTRACTOR REVIEW AND ACCEPTANCE OF THE OWNER'S ASBESTOS SPECIFICATIONS

Project Location: \_\_\_\_\_

Owner's Project #: \_\_\_\_\_

Project Description: \_\_\_\_\_

This form shall be signed by the Asbestos Abatement Contractor prior to any start of work at the site related to this Specification. If the Asbestos Abatement Contractor has not signed this form, they shall not be allowed to work on-site.

I, the undersigned, have read the Asbestos Abatement Specification regarding the asbestos abatement requirements. I understand the requirements of the Owner's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements. I have been given ample opportunity to read the Asbestos Abatement Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the Asbestos Abatement Specification.

At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the Asbestos Abatement Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Signature \_\_\_\_\_ Date \_\_\_\_\_

Abatement Contractor Printed Name \_\_\_\_\_

**ATTACHMENT #5: EXTENT OF ABATEMENT WORK**

**Fayette County Public School  
 134 Greendale Road  
 Lexington, Kentucky 40511**

<b>Material Description</b>	<b>Material Location</b>	<b>% and Type Asbestos</b>	<b>EPA NESHAP Classification</b>	<b>Condition</b>	<b>Estimated Quantity*</b>
Textured Ceiling	Garage Ceiling	1.3% Chrysotile by Point Count (PC)	Regulated Asbestos-Containing Material (RACM)	Good	~ 775 Square Feet (SF)
Textured Walls	Garage Walls	1.5% Chrysotile by PC	RACM	Good	~ 700 SF
Textured Ceiling	Livingroom Ceiling	1.5% Chrysotile by PC	RACM	Good	~ 450 SF
Joint Compound within the Drywall System	Throughout House	Drywall: None Detected Joint Compound: 1.5% Chrysotile by Point Count (PC), Composite: 0.09% Chrysotile by PC	Not Regulated by NESHAP (composite <1% by point count); Joint Compound Layer is Regulated by OSHA (Class II Asbestos Work)	Good	~ 25,000 SF

\* Quantities are for informational purposes only, the Abatement Contractor is solely responsible for determining their opinion of quantities to be removed.

Fayette County Public School  
1345 Greendale Road, Lexington, KY

**ATTACHMENT #6: ASBESTOS INSPECTION REPORT AUGUST 2023**



# Asbestos Inspection Report

Residential Property – Lexington, Kentucky

1345 Greendale Road

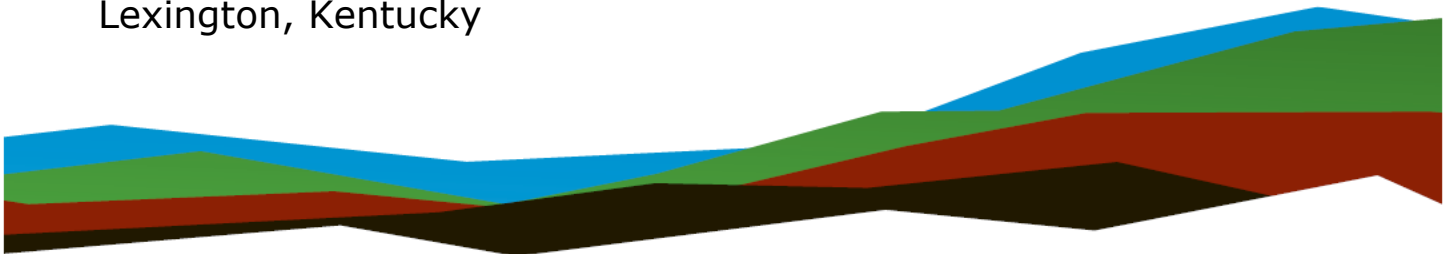
Lexington, Kentucky 40511

August 14, 2023 | Report Number: N1237356



**Prepared for:**

Fayette County Public Schools  
Lexington, Kentucky



**Prepared by:**

Terracon Consultants, Inc.  
Cincinnati, Ohio



Nationwide  
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- Geotechnical
- Materials



611 Lunken Park Drive  
Cincinnati, OH 45226  
P (513) 321-5816  
[Terracon.com](http://Terracon.com)

August 14, 2023

Fayette County Public Schools  
128 Walton Avenue  
Lexington, Kentucky 40511

Attn: Mr. Jeff Harris  
T: (859) 281-0703  
E: [jeff.harris@fayette.kyschools.us](mailto:jeff.harris@fayette.kyschools.us)

Re: Asbestos Inspection Report  
Residential Property – Lexington, Kentucky  
1345 Greendale Road  
Lexington, Kentucky 40511  
Terracon Project No. N1237356

Dear Mr. Harris:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached asbestos inspection report for the above-referenced project to Fayette County Public Schools (Client). The purpose of this report is to present the results of an asbestos inspection which was performed at the site on August 2, 2023. The asbestos inspection was conducted under Environmental Health and Safety Contract #10929 (dated July 1, 2023; between Terracon and Fayette County Public Schools) and purchase order number 44000506. We understand that this inspection was requested for the purpose of the future planned demolition of the structures at located at 1345 Greendale Road in Lexington, Kentucky.

Asbestos-containing materials (ACM) were identified as a result of this inspection. Please refer to the attached report for further detail.

Terracon appreciates the opportunity to provide this service to Fayette County Public Schools. If you have any questions regarding this report, please contact the undersigned at 513-321-5816.

Sincerely,  
**Terracon Consultants, Inc.**

A handwritten signature in blue ink that reads 'Joshua Vogel'.

Joshua Vogel  
Group Manager

A handwritten signature in blue ink that reads 'Joseph A. Tussey'.

Joseph A. Tussey, CHMM  
Principal

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**APPENDIX A IDENTIFIED ASBESTOS-CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)**

**APPENDIX B ASBESTOS INSPECTION SAMPLE & RESULTS SUMMARY**

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# **ASBESTOS INSPECTION REPORT**

**Residential Property  
1345 Greendale Road  
Lexington, Kentucky 40511  
Terracon Project No. N1237356  
August 14, 2023**

## **1.0 INTRODUCTION**

Terracon Consultants, Inc. (Terracon) conducted an asbestos inspection regarding the existing residential structures located at 1345 Greendale Road in Lexington, Kentucky. The inspection was conducted on August 2, 2023 by Kentucky Department of Environmental Protection (KY DEP) Division of Air Quality (DAQ)-licensed asbestos management planners. Accessible building components were inspected, and homogeneous areas of suspect accessible asbestos-containing materials (ACM) were visually identified and documented. Although reasonable effort was made to inspect for accessible suspect materials, additional suspect but un-sampled materials could be located in walls, in voids, in equipment, or in other concealed areas. Bulk samples from suspect ACM were collected in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763, Subpart E, known as the Asbestos Hazard Emergency Response Act (AHERA). Collected bulk samples were delivered to an accredited laboratory for asbestos content analysis by polarized light microscopy (PLM).

### **1.1 Project Objective**

We understand that this inspection was requested for the future planned demolition of the existing residential structures located at 1345 Greendale Road in Lexington, Kentucky. Asbestos inspections are required prior to renovation and demolition activities to satisfy requirements of the USEPA 40 CFR Part 61, Subpart M, the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation and Kentucky Administrative Regulation (KAR) 401 58:025.

### **1.2 Reliance**

This report is for the exclusive use of Fayette County Public Schools (Client) for the project being discussed. Reliance by any other party on this report is prohibited without written authorization of Terracon and the Client. Reliance on this report by the Client and all authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, this report, and the Agreement between Terracon and the Client. The limitations of liability defined in the Agreement is the aggregate limit of Terracon's liability to the Client.

## 2.0 SITE DESCRIPTION

The residential project site located at 1345 Greendale Road in Lexington, Kentucky consists of an approximately 4,300 square foot single-story home with a basement, attic space, and attached two-car garage. The property also features an inground swimming pool, a 200 square foot shed, and a 100 square foot shed. The date of construction of each site structure was unknown to Terracon.

**Appendix E** includes general floor plan diagrams (not to scale) of the site structures.

## 3.0 FIELD ACTIVITIES

The inspection was conducted by Mr. Lem Weyer and Mr. Joshua Vogel who are KY DEP DAQ-licensed asbestos management planners. Copies of their current KY DEP DAQ credentials are attached in **Appendix D**. The inspection was conducted in general accordance with the sample collection protocols established in USEPA 40 CFR Part 763, Subpart E, Section 763.86, AHERA. A summary of inspection activities is provided below.

### 3.1 Visual Assessment

Inspection activities were initiated with visual observation of the accessible interior and exterior areas of the subject buildings to identify homogeneous areas of accessible suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application.

Please note that suspect ACMs were not observed in association with the 100 square foot storage shed.

Electrical equipment, electrical lines, and active equipment were not included in this inspection as such items present a safety hazard to the inspectors.

### 3.2 Physical Assessment

A physical assessment of each HA of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

### 3.3 Sample Collection

Based on results of the visual observation, bulk samples from suspect ACM were collected in general accordance with USEPA AHERA sampling protocols. Samples of suspect materials

were collected from randomly selected locations in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

The selection of sample locations and frequency of sampling were based on Terracon's observations and the assumption that like materials in the same area are homogeneous in content.

Terracon collected a total of 107 bulk samples from 33 homogeneous areas of suspect ACM. A summary table of samples collected from homogenous areas of suspect ACM is included in **Appendix B**. Sample locations are indicated on diagrams included in **Appendix E**.

### **3.4 Sample Analysis**

Bulk samples were submitted under chain of custody to Eurofins CEI of Cary, North Carolina for analysis by PLM with dispersion staining techniques per USEPA methodology 600/R-93/116. The percentage of asbestos, where applicable, was determined by microscopic visual estimation using PLM. When applicable for samples from friable materials determined by PLM to have a low asbestos-content, the additional point count (PC) method (400 points) was utilized for a more accurate quantification of asbestos. For drywall system materials (drywall/gypsum board and joint compound), samples were composite analyzed (drywall/gypsum board and joint compound analyzed together) when a layer was identified to contain asbestos. Composite analysis of drywall system samples is permitted under NESHAP and the state NESHAP-equivalent regulation. However, the Occupational Safety and Health Administration (OSHA) only recognizes layer results, therefore, analysis for each individual drywall system sample layer was also conducted and the result per layer presented.

Eurofins CEI is accredited for bulk asbestos analysis by PLM under the National Voluntary Laboratory Accreditation Program (NVLAP), accreditation number 101768-0. A summary of results is included with the summary of collected samples in **Appendix B**. The laboratory analytical report is included in **Appendix C**.

## **4.0 REGULATORY OVERVIEW**

The federal asbestos NESHAP (40 CFR Part 61, Subpart M) regulates asbestos fiber emissions and asbestos waste disposal practices. The asbestos NESHAP regulation also requires the identification and classification of existing ACM according to friability prior to demolition or renovation activity. Friable ACM is a material containing more than 1% asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. All friable ACM is considered regulated asbestos containing material (RACM).

## Asbestos Inspection Report

Residential Property | 1345 Greendale Rd., Lexington, KY  
August 14, 2023 | Terracon Report No. N1237356



The asbestos NESHAP regulation classifies material subject to demolition or renovation as either RACM, Category I non-friable ACM, or Category II non-friable ACM. RACM includes all friable ACM (pre-disturbance), along with Category I non-friable ACM that becomes friable (during disturbance), and Category I non-friable ACM subject to sanding, grinding, cutting, or abrading, or Category II non-friable ACM with a high probability of becoming crumbled, pulverized, or reduced to powder by forces expected to act on the material during disturbance. Category I non-friable ACM are exclusively asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products that contain more than 1% asbestos. Category II non-friable ACM are all other non-friable materials (other than Category I non-friable ACM) that contain more than 1% asbestos. Category II non-friable ACM generally includes (but is not limited to) cementitious material such as: cement pipes, cement siding (Transite™), cement panels, glazing, mortar, and grouts.

In Kentucky, the federal NESHAP regulation has been delegated to the state EPA and is administered under 401 Kentucky Administrative Regulation (KAR) 58:025. The Kentucky Department for Environmental Protection (DEP), Division for Air Quality (DAQ) is responsible for administering and enforcing the federal and state NESHAP regulations as well as administering accreditations for asbestos professionals. NESHAP pre-abatement notifications (where >160 SF / 260 LF of friable ACM is removed) and pre-demolition notifications are sent to the regional state EPA DAQ office 10 business days prior to project commencement. The Kentucky local regional DAQ office for the subject project site is the Frankfort Region; 300 Sower Boulevard, 1<sup>st</sup> Floor, Frankfort, Kentucky 40601; telephone (502-564-3358); contact Mr. Eli Caudill (jamese.caudill@ky.gov). Additional information regarding asbestos regulations and prior notifications in Kentucky can be found at the following web address: <https://eec.ky.gov/Environmental-Protection/Air/asbestos/Pages/default.aspx>.

The United States Occupational Safety and Health Administration (USOSHA) asbestos standard for construction (29 CFR 1926.1101) regulates workplace exposure to asbestos. The USOSHA standard requires that employee exposure to airborne asbestos must not exceed 0.1 fibers per cubic centimeter of air (0.1 f/cc) as an eight-hour time weighted average (TWA) and not exceed 1.0 fibers per cubic centimeter of air (1.0 f/cc) over a 30-minute time period known as an excursion limit (EL). The TWA and EL are known as USOSHA's asbestos permissible exposure limits (PELs). The USOSHA standard classifies construction and maintenance activities which could disturb ACM and specifies work practices and precautions which employers must follow when engaging in each class of regulated work.

## 5.0 FINDINGS AND RECOMMENDATIONS

With respect to this asbestos inspection, asbestos was identified by laboratory in the following materials listed below:

**Asbestos Inspection Report**Residential Property | 1345 Greendale Rd., Lexington, KY  
August 14, 2023 | Terracon Report No. N1237356

ACM Description	Material Location	% and Type Asbestos	EPA NESHAP Category	Estimated Quantity*
Textured Ceiling Material	Garage Ceiling	1.3% Chrysotile by Point Count (PC)	Regulated Asbestos-Containing Material (RACM)	~ 775 Square Feet (SF)
Textured Wall Material	Garage Walls	1.5% Chrysotile by PC	RACM	~ 700 SF
Textured Ceiling Material	Livingroom Ceiling	21.5% Chrysotile by PC	RACM	~ 450 SF
Joint Compound within the Drywall System	Throughout House	Drywall: None Detected Joint Compound: 1.5% Chrysotile by Point Count (PC), Composite: 0.09% Chrysotile by PC	Not Regulated (composite <1% by point count); However, Joint Compound Layer is Regulated by OSHA	~ 25,000 SF

**\*Estimated quantities** listed above are based on a cursory field evaluation, and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this inspection. **This is not a bidding document and contractors would be responsible for drawing their own conclusions regarding quantities present.**

Asbestos was not identified by laboratory analysis in the samples collected from the 200 square foot shed or regarding the inground swimming pool. No suspect ACM were identified to sample regarding the 100 square foot shed.

The identified ACMs which contain >1% asbestos will must be addressed by the owner and operator (of the demolition) per the federal NESHAP and state-equivalent NESHAP regulations. Under these regulations, it's the owner's and operator's responsibility to properly address Regulated Asbestos-Containing Materials (RACM), Category I Non-Friable ACM, and Category II Non-Friable ACM for federal and state regulatory compliance regarding demolition activities. The federal and state-equivalent NESHAP regulation requires all RACM (friable ACM) to be removed by a state-licensed asbestos abatement contractor before demolition activities. The state-licensed abatement contractor must provide the Kentucky Department of Environmental Protection Division of Air Quality (KY DEP DAQ) 10-business day notice prior to removal of RACM exceeding 160 total square feet or 260 total linear feet and the owner or operator must also provide KY DEP DAQ with a 10-business day notice prior to demolition activities. Additionally, the operator (contractor) must comply with Occupational Safety and Health Administration (OSHA) asbestos regulations, when disturbing any material containing any amount asbestos.

The identified materials are reiterated in a table included in **Appendix A**. A summary of samples collected along with summarized results is included in **Appendix B**. The laboratory analytical report is attached in **Appendix C**. Sample location diagrams (not to scale) are included in **Appendix E**. A photo log with example photos of identified ACM is included in **Appendix F**.



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If any unsampled suspect material are discovered during the course of demolition activities (e.g., materials concealed/hidden in walls; materials not listed in **Appendix B**), these materials must be assumed as asbestos-containing unless sampled by an accredited asbestos inspector and laboratory analysis refutes the positive assumption.

## **6.0 LIMITATIONS/GENERAL COMMENTS**

Reasonable efforts to access suspect materials within known areas of restricted access (e.g., crawl spaces) were made; however, confined spaces or areas which may pose a health or safety risk to Terracon personnel were not sampled. This asbestos inspection was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our inspection of the buildings. The information contained in this report is relevant to the date on which this inspection was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by Fayette County Public Schools for specific application to their project as discussed. This report is not a bidding document. **Contractors or consultants reviewing this report must draw their own conclusions regarding quantities and any further investigation or remediation deemed necessary.** Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

## APPENDIX A

**Residential Property  
1345 Greendale Road  
Lexington, Kentucky 40511  
Terracon Project No. N1237356**

HA No's.	ACM Description	Material Location	% and Type Asbestos	EPA NESHAP Classification	Condition/ Friability	Estimated Quantity*
02	Textured Ceiling	Garage Ceiling	1.3% Chrysotile by Point Count (PC)	Regulated Asbestos-Containing Material (RACM)	Good	~ 775 Square Feet (SF)
03	Textured Walls	Garage Walls	1.5% Chrysotile by PC	RACM	Good	~ 700 SF
08	Textured Ceiling	Livingroom Ceiling	1.5% Chrysotile by PC	RACM	Good	~ 450 SF
23	Joint Compound within the Drywall System	Throughout House	Drywall: None Detected Joint Compound: 1.5% Chrysotile by Point Count (PC), Composite: 0.09% Chrysotile by PC	Not Regulated (composite <1% by point count); Joint Compound Layer is Regulated by OSHA	Good	~ 25,000 SF

\***Estimated quantities** listed above are based on a cursory field evaluation, and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this inspection. **This is not a bidding document and contractors would be responsible for drawing their own conclusions regarding quantities present.**

See **Appendix B** for a summary of samples collected with respective analytical results, **Appendix C** for the laboratory analytical report, **Appendix E** for sample location diagrams, and **Appendix F** for photo examples of the above identified materials.

It should be noted that inaccessible/concealed suspect materials, other than those identified during this inspection, may exist. Should additional suspect materials be uncovered prior to or during demolition activities, those materials must be assumed asbestos-containing until sampled by a state-licensed asbestos inspector and analysis refutes the positive assumption.

## APPENDIX B

**Residential Property  
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Lexington, Kentucky 40511  
Terracon Project No. N1237356**

### ASBESTOS INSPECTION SAMPLE & RESULTS SUMMARY

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
01	01	2"x2" Tan Ceramic Floor Tile with Mortar White Mastic, and Grout	Doorway	Garage Restroom	Ceramic: None Detected (ND), Mortar: ND, Mastic: ND, Grout: ND
	02		Doorway		Ceramic: ND, Mortar: ND, Mastic: ND, Grout: ND
	03		Southwest Corner		Ceramic: ND, Mortar: ND, Mastic: ND, Grout: ND
02	04	Textured Ceilings	At Attic	Garage Ceiling	<b>1.3% Chrysotile by Point Count (PC)</b>
	05		Northwest Corner		<b>2% Chrysotile</b>
	06		Southeast Corner		<b>2% Chrysotile</b>
03	07	Textured Walls	Northwest Corner	Garage Ceiling	<b>1.5% Chrysotile by Point Count (PC)</b>
	08		Northeast Corner		<b>2% Chrysotile</b>
	09		Southeast Corner		<b>2% Chrysotile</b>
04	10	Blown-In Brown Insulation	Northwest Corner	Attic	ND
	11		Northeast Corner		ND
	12		Northwest Corner of Walkway		ND

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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	13		Northeast Corner of Walkway		ND
	14		Southeast Corner of Walkway		ND
	15		Southwest Corner of Walkway		ND
	16		Middle South Side		ND
05	17	Fiberboard	North Wall of Master Bedroom North Wall	Behind Wood Paneling throughout House	ND
	18		Southeast Corner		ND
	19		North End of Attic Walkway		ND
06	20	White Mortar	Southwest Corner	Associated with Garage Brick Steps	ND
	21		Southwest Corner		ND
	22		Southwest Corner		ND
07	23	Brick and Grout	West Side of Living Room Fireplace	Living Room and Basement Fireplaces	Brick: ND Mortar: ND
	24		East side of Living Room Fireplace		Brick: ND, Mortar: ND
	25		West Side of Basement Fireplace		Brick: ND, Mortar: ND
08	26	Textured Ceilings	Northwest Corner	Living Room Ceiling	<b>1.5% Chrysotile by Point Count (PC)</b>
	27		Northeast Corner		<b>2% Chrysotile</b>
	28		Southwest Corner		<b>2% Chrysotile</b>

**Asbestos Inspection Report**Residential Property | 1345 Greendale Rd., Lexington, KY  
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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
09	29	24"x12" White Ceramic Floor Tile with Gray Mortar and Gray Grout	Northwest Corner	Kitchen Flooring	Ceramic: ND, Mortar: ND, Grout: ND
	30		Northeast Corner		Ceramic: ND, Mortar: ND, Grout: ND
	31		Southwest Corner		Ceramic: ND, Mortar: ND, Grout: ND
10	32	Gray Sink Undercoating	Kitchen Sink	Kitchen Sink	ND
	33		Kitchen Sink		ND
	34		Kitchen Sink		ND
11	35	12"x12" Off-White Ceramic Floor Tile with Gray Mortar, Gray Grout and Gray Floor Leveler	Northeast Corner	Foyer and Front Hallway	Ceramic: ND, Mortar: ND, Grout: ND, Leveler: ND
	36		Southeast Corner		Ceramic: ND, Mortar: ND, Grout: ND, Leveler: ND
	37		Southeast Corner		Ceramic: ND, Mortar: ND, Grout: ND, Leveler: ND
12	38	White Hexagon Ceramic Floor Tile with Gray Grout, Yellow Mastic, and Gray Mortar	At Floor Vent	Hallway Bathroom Flooring-Entrance	Ceramic: ND, Mortar: ND, Grout: ND, Mastic: ND
	39		At Floor Vent		Ceramic: ND, Mortar: ND, Grout: ND, Mastic: ND
	40		Southeast Corner		Ceramic: ND, Mortar: ND, Grout: ND, Mastic: ND
13	41	1"x4" Blue Ceramic Floor Tile with Mortar and Grout	At Entrance to Toilet Area	Hallway Bathroom Flooring- Shower Area	Ceramic: ND, Mortar: ND, Grout: ND
	42		Southwest Corner		Ceramic: ND, Mortar: ND, Grout: ND
	43		Southwest Corner		Ceramic: ND, Mortar: ND, Grout: ND
14	44	4"x4" Blue Ceramic Wall Tile with White	Doorway	Hallway Bathroom	Ceramic: ND, Mortar: ND, Grout: ND

**Asbestos Inspection Report**Residential Property | 1345 Greendale Rd., Lexington, KY  
August 14, 2023 | Terracon Report No. N1237356

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	45	Grout and Gray Mortar	Doorway	Restroom Walls in Toilet/Shower Area	Ceramic: ND, Mortar: ND, Grout: ND
	46		Northeast Corner of Shower		Ceramic: ND, Mortar: ND, Grout: ND
15	47	Textured Ceilings	Southwest Corner	Hallway Restroom	ND
	48		Northwest Corner		ND
	49		At Entrance		ND
16	50	12"x24" Tan Ceramic Floor Tile with Mortar and Grout	At HVAC Vent	Master Bathroom	Ceramic: ND, Mortar: ND, Grout: ND
	51		At HVAC Vent		Ceramic: ND, Mortar: ND, Grout: ND
	52		At HVAC Vent		Ceramic: ND, Mortar: ND, Grout: ND
17	53	12"x24" Tan Ceramic Wall Tile with Mortar and Grout	Northwest Corner of Shower	Master Bathroom	Ceramic: ND, Mortar: ND, Grout: ND
	54		Northwest Corner of Shower		Ceramic: ND, Mortar: ND, Grout: ND
	55		Northwest Corner of Shower		Ceramic: ND, Mortar: ND, Grout: ND
18	56	12"x12" Tan Ceramic Floor Tile with Mortar and Grout	Northeast Corner of Laundry Room	Laundry Room and Screened Porch Area	Ceramic: ND, Mortar: ND, Grout: ND
	57		Northwest Corner of Laundry Room		Ceramic: ND, Mortar: ND, Grout: ND
	58		Northeast Corner of Screened Porch Area		Ceramic: ND, Mortar: ND, Grout: ND
19	59	Replaced Drywall System: Drywall and Joint Compound	Near Entrance to Garage	Kitchen Walls	Drywall: ND, Joint Compound: ND
	60		Northwest Corner		Drywall: ND, Joint Compound: ND

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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	61		Near Entrance to Screened Porch		Drywall: ND, Joint Compound: ND
20	62	Tar Paper	Northeast Corner of Electrical Room	Under Beams in Basement	ND
	63		Middle west Side of Southwest Room		ND
	64		Southwest Corner of Southwest Room		ND
21	65	Textured Concrete	North Wall of Electrical Room	On CMU Block Walls of Southeast Room of Basement	Textured: ND, Concrete: ND
	66		Middle West Wall of Southwest Room		Textured: ND, Concrete: ND
	67		Southwest Corner of Southwest Room		Textured: ND, Concrete: ND
22	68	White Exterior Window Glazing	Garage Restroom Window	Associated with Exterior Original Windows throughout the House	ND
	69		South Living Room Window		ND
	70		Kitchen Window		ND
23	71	<b>Drywall System: Drywall and Joint Compound</b>	<b>Northwest Corner of Garage Restroom</b>	<b>Throughout House</b>	Drywall: ND, <b>Joint Compound: 1.5% Chrysotile by PC, Composite: 0.08% Chrysotile by PC</b>
	72		<b>On Soffit near Basement Fireplace</b>		Drywall: No Layer Present, <b>Joint Compound: 1.5% Chrysotile by PC</b>
	73		Near Window of Southeast Corner Room of Basement		Drywall: ND, Joint Compound: ND
	74		<b>Southeast Corner of Front Entrance</b>		Drywall: ND, <b>Joint Compound: 1.8% Chrysotile by PC, Composite: 0.09% Chrysotile by PC</b>

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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	75		Northeast Corner of Southeast Bedroom		Drywall: ND, Joint Compound: ND
	76		Southwest Corner of South Middle Bedroom		Drywall: ND, Joint Compound: ND
	77		Southwest Corner of Master Bedroom		Drywall: ND, Joint Compound: ND
24	78	Tar Paper	Southeast Corner of Room at Vent	Living Room-Under Floor Board	ND
	79		Southeast Corner of Room at Vent		ND
	80		Southeast Corner of Room at Vent		ND
25	81	Tar Paper	North Hallway Vent	Hallway, Dining Room, Formal Living Room-Under Floor Boards	ND
	82		South Hallway Vent		ND
	83		Dining Room Vent		ND
26	84	White Interior Window Caulking	Southwest Corner	Associated with Windows of Screened in Porch Area	ND
	85		Northwest Corner		ND
	86		Northeast Corner		ND
27	87	White Exterior Window Caulking	Window South of Garage Door	Associated with the Original Exterior Windows throughout the House	ND
	88		Northeast Corner Window		ND
	89		Southeast Corner Window		ND
28	90	White Caulking	Vent Near Garage	Associated with Vent from	ND



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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	91		Vent Near Garage	Garage Bathroom	ND
	92		Vent Near Garage		ND
29	93	Gray Asphalt Shingles with Tar and Tar Paper	Northwest Corner	Roof of House	Shingles: ND Tar: ND Tar Paper: ND
	94		Northeast Corner		Shingles: ND Tar: ND Tar Paper: ND
	95		Southeast Corner		Shingles: ND Tar: ND Tar Paper: ND
30	96	White Exterior Door Caulking	Basement Door	Associated with the Exterior Side of the Basement Exit Door	ND
	97		Basement Door		ND
	98		Basement Door		ND
31	99	White Exterior Door Caulking	Front Door	Associated with the Exterior Side of the Front Entrance Door	ND
	100		Front Door		ND
	101		Front Door		ND
32	102	Tan Textured Light-Weight Concrete	Northwest Corner	Concrete Around Swimming Pool	ND
	103		Northwest Corner		ND
	104		Northwest Corner		ND
33	105	Gray Asphalt Shingles	Northwest Corner	200 Square Foot Southwest Shed	ND
	106		Southwest Corner		ND

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Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	107		Southeast Corner		ND

**Asbestos Inspection Report**

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## **APPENDIX C**

### **ASBESTOS ANALYTICAL LABORATORY DATA**

August 14, 2023

Terracon Consultants, Inc.  
611 Lunken Park Drive  
Cincinnati, OH 45226

**CLIENT PROJECT:** Greendale, N1237356  
**CEI LAB CODE:** B2316797v2

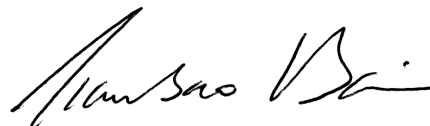
Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on August 4, 2023. The samples were analyzed for asbestos using polarizing light microscopy (PLM) per the EPA 600 Method.

Sample results containing >1% asbestos are considered asbestos-containing materials (ACMs) per EPA regulatory requirements. The detection limit for the EPA 600 Method is <1% asbestos by weight as determined by visual estimation.

Thank you for your business and we look forward to continuing good relations.

Kind Regards,



Tianbao Bai, Ph.D., CIH  
Laboratory Director



CEI

---

# ASBESTOS ANALYTICAL REPORT

## By: Polarized Light Microscopy

Prepared for

**Terracon Consultants, Inc.**

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CLIENT PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

TEST METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORT DATE: 08/14/23

TOTAL SAMPLES ANALYZED: 107

# SAMPLES >1% ASBESTOS: 18



CEI

# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
01-01	Layer 1	B2316797.001A	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.001A	Gray	Mortar	None Detected
	Layer 1	B2316797.001B	White	Mastic	None Detected
	Layer 2	B2316797.001B	Gray	Grout	None Detected
01-02	Layer 1	B2316797.002A	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.002A	Gray	Mortar	None Detected
	Layer 1	B2316797.002B	White	Mastic	None Detected
	Layer 2	B2316797.002B	Gray	Grout	None Detected
01-03	Layer 1	B2316797.003A	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.003A	Gray	Mortar	None Detected
	Layer 1	B2316797.003B	White	Mastic	None Detected
	Layer 2	B2316797.003B	Gray	Grout	None Detected
02-04		B2316797.004A	White	Textured Ceiling	<b>Chrysotile 2%</b>
		B2316797.004B		Textured Ceiling (400 Point Count)	<b>Chrysotile 1.3%</b>
02-05		B2316797.005	White	Textured Ceiling	<b>Chrysotile 2%</b>
02-06		B2316797.006	White	Textured Ceiling	<b>Chrysotile 2%</b>
03-07		B2316797.007A	White	Textured Wall	<b>Chrysotile 2%</b>
		B2316797.007B		Textured Wall (400 Point Count)	<b>Chrysotile 1.5%</b>
03-08		B2316797.008	White	Textured Wall	<b>Chrysotile 2%</b>
03-09		B2316797.009	White	Textured Wall	<b>Chrysotile 2%</b>
04-10		B2316797.010	Brown	Blown-in Insulation	None Detected
04-11		B2316797.011	Brown	Blown-in Insulation	None Detected
04-12		B2316797.012	Brown	Blown-in Insulation	None Detected
04-13		B2316797.013	Brown	Blown-in Insulation	None Detected
04-14		B2316797.014	Brown	Blown-in Insulation	None Detected
04-15		B2316797.015	Brown	Blown-in Insulation	None Detected
04-16		B2316797.016	Brown	Blown-in Insulation	None Detected
05-17		B2316797.017	Brown	Fiberboard	None Detected
05-18		B2316797.018	Brown	Fiberboard	None Detected
05-19		B2316797.019	Brown	Fiberboard	None Detected



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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
06-20		B2316797.020	White	Mortar	None Detected
06-21		B2316797.021	White	Mortar	None Detected
06-22		B2316797.022	White	Mortar	None Detected
07-23	Layer 1	B2316797.023	Tan	Brick	None Detected
	Layer 2	B2316797.023	Gray	Grout	None Detected
07-24	Layer 1	B2316797.024	Tan	Brick	None Detected
	Layer 2	B2316797.024	Gray	Grout	None Detected
07-25	Layer 1	B2316797.025	Tan	Brick	None Detected
	Layer 2	B2316797.025	Gray	Grout	None Detected
08-26		B2316797.026A	White	Textured Ceiling	<b>Chrysotile 2%</b>
		B2316797.026B		Textured Ceiling (400 Point Count)	<b>Chrysotile 1.5%</b>
08-27		B2316797.027	White	Textured Ceiling	<b>Chrysotile 2%</b>
08-28		B2316797.028	White	Textured Ceiling	<b>Chrysotile 2%</b>
09-29	Layer 1	B2316797.029	White,Gray	Ceramic Tile	None Detected
	Layer 2	B2316797.029	Gray	Grout	None Detected
	Layer 3	B2316797.029	Gray	Mortar	None Detected
09-30	Layer 1	B2316797.030	White,Gray	Ceramic Tile	None Detected
	Layer 2	B2316797.030	Gray	Grout	None Detected
	Layer 3	B2316797.030	Gray	Mortar	None Detected
09-31	Layer 1	B2316797.031	White,Gray	Ceramic Tile	None Detected
	Layer 2	B2316797.031	Gray	Grout	None Detected
	Layer 3	B2316797.031	Gray	Mortar	None Detected
10-32		B2316797.032	Gray,Black	Sink Undercoating	None Detected
10-33		B2316797.033	Gray,Black	Sink Undercoating	None Detected
10-34		B2316797.034	Gray,Black	Sink Undercoating	None Detected
11-35	Layer 1	B2316797.035	Off-white	Ceramic Tile	None Detected
	Layer 2	B2316797.035	Gray	Grout	None Detected
	Layer 3	B2316797.035	Gray	Mortar	None Detected
	Layer 4	B2316797.035	Gray	Floor Leveler	None Detected
11-36	Layer 1	B2316797.036	Off-white	Ceramic Tile	None Detected



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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
	Layer 2	B2316797.036	Gray	Grout	None Detected
	Layer 3	B2316797.036	Gray	Mortar	None Detected
	Layer 4	B2316797.036	Gray	Floor Leveler	None Detected
11-37	Layer 1	B2316797.037	Off-white	Ceramic Tile	None Detected
	Layer 2	B2316797.037	Gray	Grout	None Detected
	Layer 3	B2316797.037	Gray	Mortar	None Detected
	Layer 4	B2316797.037	Gray	Floor Leveler	None Detected
12-38	Layer 1	B2316797.038A	White	Ceramic Tile	None Detected
	Layer 2	B2316797.038A	Gray	Grout	None Detected
	Layer 3	B2316797.038A	Gray	Mortar	None Detected
		B2316797.038B	Yellow	Mastic	None Detected
12-39	Layer 1	B2316797.039A	White	Ceramic Tile	None Detected
	Layer 2	B2316797.039A	Gray	Grout	None Detected
	Layer 3	B2316797.039A	Gray	Mortar	None Detected
		B2316797.039B	Yellow	Mastic	None Detected
12-40	Layer 1	B2316797.040A	White	Ceramic Tile	None Detected
	Layer 2	B2316797.040A	Gray	Grout	None Detected
	Layer 3	B2316797.040A	Gray	Mortar	None Detected
		B2316797.040B	Yellow	Mastic	None Detected
13-41	Layer 1	B2316797.041	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.041	White	Grout	None Detected
	Layer 3	B2316797.041	Gray	Mortar	None Detected
13-42	Layer 1	B2316797.042	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.042	White	Grout	None Detected
	Layer 3	B2316797.042	Gray	Mortar	None Detected
13-43	Layer 1	B2316797.043	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.043	White	Grout	None Detected
	Layer 3	B2316797.043	Gray	Mortar	None Detected
14-44	Layer 1	B2316797.044	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.044	Gray	Grout	None Detected
	Layer 3	B2316797.044	White	Mortar	None Detected





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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
14-45	Layer 1	B2316797.045	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.045	Gray	Grout	None Detected
	Layer 3	B2316797.045	White	Mortar	None Detected
14-46	Layer 1	B2316797.046	Blue	Ceramic Tile	None Detected
	Layer 2	B2316797.046	White	Grout	None Detected
	Layer 3	B2316797.046	Gray	Mortar	None Detected
15-47		B2316797.047	White	Textured Ceiling	None Detected
15-48		B2316797.048	White	Textured Ceiling	None Detected
15-49		B2316797.049	White	Textured Ceiling	None Detected
16-50	Layer 1	B2316797.050	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.050	Tan	Grout	None Detected
	Layer 3	B2316797.050	White	Mortar	None Detected
16-51	Layer 1	B2316797.051	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.051	Tan	Grout	None Detected
	Layer 3	B2316797.051	White	Mortar	None Detected
16-52	Layer 1	B2316797.052	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.052	Tan	Grout	None Detected
	Layer 3	B2316797.052	White	Mortar	None Detected
17-53	Layer 1	B2316797.053	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.053	White	Grout	None Detected
	Layer 3	B2316797.053	White	Mortar	None Detected
17-54	Layer 1	B2316797.054	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.054	White	Grout	None Detected
	Layer 3	B2316797.054	White	Mortar	None Detected
17-55	Layer 1	B2316797.055	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.055	White	Grout	None Detected
	Layer 3	B2316797.055	White	Mortar	None Detected
18-56	Layer 1	B2316797.056	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.056	Gray	Grout	None Detected
	Layer 3	B2316797.056	White	Mortar	None Detected
18-57	Layer 1	B2316797.057	Tan	Ceramic Tile	None Detected



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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
	Layer 2	B2316797.057	Gray	Grout	None Detected
	Layer 3	B2316797.057	White	Mortar	None Detected
18-58	Layer 1	B2316797.058	Tan	Ceramic Tile	None Detected
	Layer 2	B2316797.058	Gray	Grout	None Detected
	Layer 3	B2316797.058	White	Mortar	None Detected
19-59	Layer 1	B2316797.059	White	Joint Compound	None Detected
	Layer 2	B2316797.059	White,Purple	Drywall	None Detected
19-60	Layer 1	B2316797.060	White	Joint Compound	None Detected
	Layer 2	B2316797.060	White,Purple	Drywall	None Detected
19-61	Layer 1	B2316797.061	White	Joint Compound	None Detected
	Layer 2	B2316797.061	White,Purple	Drywall	None Detected
20-62		B2316797.062	Black	Tarpaper	None Detected
20-63		B2316797.063	Black	Tarpaper	None Detected
20-64		B2316797.064	Black	Tarpaper	None Detected
21-65	Layer 1	B2316797.065	White	Texture	None Detected
	Layer 2	B2316797.065	Gray	Concrete	None Detected
21-66	Layer 1	B2316797.066	White	Texture	None Detected
	Layer 2	B2316797.066	Gray	Concrete	None Detected
21-67	Layer 1	B2316797.067	White	Texture	None Detected
	Layer 2	B2316797.067	Gray	Concrete	None Detected
22-68		B2316797.068	White	Window Glazing	None Detected
22-69		B2316797.069	White	Window Glazing	None Detected
22-70		B2316797.070	White	Window Glazing	None Detected
23-71	Layer 1	B2316797.071A	White,Brown	Joint Compound	Chrysotile 2%
	Layer 2	B2316797.071A	White,Tan	Drywall	None Detected
	Layer 3	B2316797.071A	White,Tan	Drywall/Joint Compound	Chrysotile <1%
	Layer 1	B2316797.071B		Joint Compound (400 Point Count)	Chrysotile 1.5%
	Layer 2	B2316797.071B		Drywall/Joint Compound (Composite Result from Point Count)	Chrysotile 0.08%
23-72	Layer 1	B2316797.072A	White	Joint Compound	Chrysotile 2%



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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
	Layer 2	B2316797.072A	White	Joint Compound	None Detected
		B2316797.072B		Joint Compound (400 Point Count)	Chrysotile 1.5%
23-73	Layer 1	B2316797.073	White	Joint Compound	None Detected
	Layer 2	B2316797.073	White,Tan	Drywall	None Detected
23-74	Layer 1	B2316797.074A	White	Joint Compound	Chrysotile 2%
	Layer 2	B2316797.074A	White,Tan	Drywall	None Detected
	Layer 3	B2316797.074A	White,Tan	Drywall/Joint Compound	Chrysotile <1%
	Layer 1	B2316797.074B		Joint Compound (400 Point Count)	Chrysotile 1.8%
	Layer 2	B2316797.074B		Drywall/Joint Compound (Composite Result from Point Count)	Chrysotile 0.09%
23-75	Layer 1	B2316797.075	White	Joint Compound	None Detected
	Layer 2	B2316797.075	White,Tan	Drywall	None Detected
23-76	Layer 1	B2316797.076	White	Joint Compound	None Detected
	Layer 2	B2316797.076	White,Tan	Drywall	None Detected
23-77	Layer 1	B2316797.077	White	Joint Compound	None Detected
	Layer 2	B2316797.077	White,Tan	Drywall	None Detected
24-78		B2316797.078	Black	Tarpaper	None Detected
24-79		B2316797.079	Black	Tarpaper	None Detected
24-80		B2316797.080	Black	Tarpaper	None Detected
25-81		B2316797.081	Black	Tarpaper	None Detected
25-82		B2316797.082	Black	Tarpaper	None Detected
25-83		B2316797.083	Black	Tarpaper	None Detected
26-84	Layer 1	B2316797.084	White	Window Caulking	None Detected
	Layer 2	B2316797.084	Off-white	Window Caulking	None Detected
26-85	Layer 1	B2316797.085	White	Window Caulking	None Detected
	Layer 2	B2316797.085	Off-white	Window Caulking	None Detected
26-86		B2316797.086	White	Window Caulking	None Detected
27-87		B2316797.087	White	Window Caulking	None Detected
27-88		B2316797.088	White	Window Caulking	None Detected



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# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Greendale, N1237356

LAB CODE: B2316797v2

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
27-89		B2316797.089	White	Window Caulking	None Detected
28-90		B2316797.090	White	Caulking	None Detected
28-91		B2316797.091	White	Caulking	None Detected
28-92		B2316797.092	White	Caulking	None Detected
29-93	Layer 1	B2316797.093	Black,Gray	Asphalt Shingle	None Detected
	Layer 2	B2316797.093	Black	Tar	None Detected
	Layer 3	B2316797.093	Black	Tarpaper	None Detected
29-94	Layer 1	B2316797.094	Black,Gray	Asphalt Shingle	None Detected
	Layer 2	B2316797.094	Black	Tar	None Detected
	Layer 3	B2316797.094	Black	Tarpaper	None Detected
29-95	Layer 1	B2316797.095	Black,Gray	Asphalt Shingle	None Detected
	Layer 2	B2316797.095	Black	Tar	None Detected
	Layer 3	B2316797.095	Black	Tarpaper	None Detected
30-96		B2316797.096	White	Door Caulking	None Detected
30-97		B2316797.097	White	Door Caulking	None Detected
30-98		B2316797.098	White	Door Caulking	None Detected
31-99		B2316797.099	White	Door Caulking	None Detected
31-100		B2316797.100	White	Door Caulking	None Detected
31-101		B2316797.101	White	Door Caulking	None Detected
32-102		B2316797.102	Tan	Textured Concrete	None Detected
32-103		B2316797.103	Tan	Textured Concrete	None Detected
32-104		B2316797.104	Tan	Textured Concrete	None Detected
33-105		B2316797.105	Black,Gray	Asphalt Shingle	None Detected
33-106		B2316797.106	Black,Gray	Asphalt Shingle	None Detected
33-107		B2316797.107	Black,Gray	Asphalt Shingle	None Detected

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS		
			Fibrous	Non-Fibrous	%		
<b>01-01</b> Layer 1 B2316797.001 A	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected		
		Tan	25%	Binder			
			Non-fibrous				
			Tightly Bound				
Layer 2 B2316797.001 A	Mortar	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray	35%	Binder			
			Non-fibrous				
			Tightly Bound				
Layer 1 B2316797.001 B	Mastic	Homogeneous	100%	Mastic	None Detected		
		White					
		Non-fibrous Bound					
Layer 2 B2316797.001 B	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray	35%	Binder			
			Non-fibrous				
			Tightly Bound				
<b>01-02</b> Layer 1 B2316797.002 A	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected		
		Tan	25%	Binder			
			Non-fibrous				
			Tightly Bound				
Layer 2 B2316797.002 A	Mortar	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray	35%	Binder			
			Non-fibrous				
			Tightly Bound				
Layer 1 B2316797.002 B	Mastic	Homogeneous	100%	Mastic	None Detected		
		White					
		Non-fibrous Bound					

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

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**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
Layer 2 B2316797.002 B	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>01-03</b> Layer 1 B2316797.003 A	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.003 A	Mortar	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 1 B2316797.003 B	Mastic	Homogeneous White Non-fibrous Bound			100%	Mastic	None Detected
Layer 2 B2316797.003 B	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>02-04</b> B2316797.004 A	Textured Ceiling	Heterogeneous White Non-fibrous Bound			65%	Binder	<b>2% Chrysotile</b>
					28%	Calc Carb	
B2316797.004 B	Textured Ceiling (400 Point Count)				5%	Paint	<b>1.3% Chrysotile</b>
	(5 asbestos points / 400 total) x 100.						
<b>02-05</b> B2316797.005	Textured Ceiling	Heterogeneous White Non-fibrous Bound			65%	Binder	<b>2% Chrysotile</b>
					28%	Calc Carb	
					5%	Paint	

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>02-06</b> B2316797.006	Textured Ceiling	Heterogeneous White Non-fibrous Bound	65% 28% 5%	Binder Calc Carb Paint	<b>2% Chrysotile</b>
<b>03-07</b> B2316797.007 A	Textured Wall	Heterogeneous White Non-fibrous Bound	65% 28% 5%	Binder Calc Carb Paint	<b>2% Chrysotile</b>
B2316797.007 B	Textured Wall (400 Point Count) (6 asbestos points / 400 total) x 100.				<b>1.5% Chrysotile</b>
<b>03-08</b> B2316797.008	Textured Wall	Heterogeneous White Non-fibrous Bound	65% 28% 5%	Binder Calc Carb Paint	<b>2% Chrysotile</b>
<b>03-09</b> B2316797.009	Textured Wall	Heterogeneous White Non-fibrous Bound	65% 28% 5%	Binder Calc Carb Paint	<b>2% Chrysotile</b>
<b>04-10</b> B2316797.010	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>04-11</b> B2316797.011	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	95% 5%	Cellulose Fiberglass	None Detected
<b>04-12</b> B2316797.012	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
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**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>04-13</b> B2316797.013	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>04-14</b> B2316797.014	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>04-15</b> B2316797.015	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>04-16</b> B2316797.016	Blown-in Insulation	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>05-17</b> B2316797.017	Fiberboard	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>05-18</b> B2316797.018	Fiberboard	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected
<b>05-19</b> B2316797.019	Fiberboard	Heterogeneous Brown Fibrous Loose	100%	Cellulose	None Detected





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# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
611 Lunken Park Drive  
Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous	Non-Fibrous			
<b>06-20</b> B2316797.020	Mortar	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>06-21</b> B2316797.021	Mortar	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>06-22</b> B2316797.022	Mortar	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>07-23</b> Layer 1 B2316797.023	Brick	Heterogeneous Tan Non-fibrous Bound	<1%	Cellulose	70%	Silicates 30% Binder	None Detected
Layer 2 B2316797.023	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>07-24</b> Layer 1 B2316797.024	Brick	Heterogeneous Tan Non-fibrous Bound	<1%	Cellulose	70%	Silicates 30% Binder	None Detected
Layer 2 B2316797.024	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected

# ASBESTOS BULK ANALYSIS

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**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
07-25 Layer 1 B2316797.025	Brick	Heterogeneous	<1%	Cellulose	70%	Silicates	None Detected
		Tan			30%	Binder	
		Non-fibrous Bound					
Layer 2 B2316797.025	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray			35%	Binder	
		Non-fibrous Bound					
08-26 B2316797.026 A	Textured Ceiling	Heterogeneous			65%	Binder	2% Chrysotile
		White			28%	Calc Carb	
		Non-fibrous Bound			5%	Paint	
B2316797.026 B	Textured Ceiling (400 Point Count)						1.5% Chrysotile
(6 asbestos points / 400 total) x 100.							
08-27 B2316797.027	Textured Ceiling	Heterogeneous			65%	Binder	2% Chrysotile
		White			28%	Calc Carb	
		Non-fibrous Bound			5%	Paint	
08-28 B2316797.028	Textured Ceiling	Heterogeneous			65%	Binder	2% Chrysotile
		White			28%	Calc Carb	
		Non-fibrous Bound			5%	Paint	
09-29 Layer 1 B2316797.029	Ceramic Tile	Heterogeneous			75%	Silicates	None Detected
		White, Gray			25%	Binder	
		Non-fibrous Tightly Bound					
Layer 2 B2316797.029	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray			35%	Binder	
		Non-fibrous Tightly Bound					

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## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID	Lab	Lab	NON-ASBESTOS COMPONENTS				ASBESTOS
Lab ID	Description	Attributes	Fibrous	Non-Fibrous		%	
Layer 3 B2316797.029	Mortar	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
				35%	Binder		
<b>09-30</b> Layer 1 B2316797.030	Ceramic Tile	Heterogeneous White, Gray Non-fibrous Tightly Bound		75%	Silicates		None Detected
				25%	Binder		
Layer 2 B2316797.030	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
				35%	Binder		
Layer 3 B2316797.030	Mortar	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
				35%	Binder		
<b>09-31</b> Layer 1 B2316797.031	Ceramic Tile	Heterogeneous White, Gray Non-fibrous Tightly Bound		75%	Silicates		None Detected
				25%	Binder		
Layer 2 B2316797.031	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
				35%	Binder		
Layer 3 B2316797.031	Mortar	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
				35%	Binder		

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Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %	
			Fibrous	Non-Fibrous		
<b>10-32</b> B2316797.032	Sink Undercoating	Heterogeneous Gray,Black Non-fibrous Bound	100%	Binder	None Detected	
<b>10-33</b> B2316797.033	Sink Undercoating	Heterogeneous Gray,Black Non-fibrous Bound	100%	Binder	None Detected	
<b>10-34</b> B2316797.034	Sink Undercoating	Heterogeneous Gray,Black Non-fibrous Bound	100%	Binder	None Detected	
<b>11-35</b> Layer 1 B2316797.035	Ceramic Tile	Heterogeneous Off-white Non-fibrous Bound	75%	Silicates	None Detected	
			25%	Binder		
Layer 2 B2316797.035	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	None Detected
					35%	
Layer 3 B2316797.035	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	60%	None Detected
					40%	
Layer 4 B2316797.035	Floor Leveler	Heterogeneous Gray Fibrous Bound	30%	Cellulose	70%	None Detected



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Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>11-36</b> Layer 1 B2316797.036	Ceramic Tile	Heterogeneous			75%	Silicates	None Detected
		Off-white			25%	Binder	
		Non-fibrous					
		Bound					
Layer 2 B2316797.036	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray			35%	Binder	
		Non-fibrous					
		Bound					
Layer 3 B2316797.036	Mortar	Heterogeneous	<1%	Cellulose	60%	Silicates	None Detected
		Gray			40%	Binder	
		Non-fibrous					
		Bound					
Layer 4 B2316797.036	Floor Leveler	Heterogeneous	30%	Cellulose	70%	Binder	None Detected
		Gray					
		Fibrous					
		Bound					
<b>11-37</b> Layer 1 B2316797.037	Ceramic Tile	Heterogeneous			75%	Silicates	None Detected
		Off-white			25%	Binder	
		Non-fibrous					
		Bound					
Layer 2 B2316797.037	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray			35%	Binder	
		Non-fibrous					
		Bound					
Layer 3 B2316797.037	Mortar	Heterogeneous	<1%	Cellulose	60%	Silicates	None Detected
		Gray			40%	Binder	
		Non-fibrous					
		Bound					



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			Fibrous		Non-Fibrous		
Layer 4 B2316797.037	Floor Leveler	Heterogeneous Gray Fibrous Bound	30%	Cellulose	70%	Binder	None Detected
<b>12-38</b> Layer 1 B2316797.038 A	Ceramic Tile	Heterogeneous White Non-fibrous Bound			75%	Silicates	None Detected
			25%			Binder	
Layer 2 B2316797.038 A	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.038 A	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
B2316797.038 B	Mastic	Homogeneous Yellow Non-fibrous Bound			100%	Mastic	None Detected
<b>12-39</b> Layer 1 B2316797.039 A	Ceramic Tile	Heterogeneous White Non-fibrous Bound			75%	Silicates	None Detected
			25%			Binder	
Layer 2 B2316797.039 A	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	



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			Fibrous		Non-Fibrous		
Layer 3 B2316797.039 A	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
B2316797.039 B	Mastic	Homogeneous Yellow Non-fibrous Bound			100%	Mastic	None Detected
<b>12-40</b> Layer 1 B2316797.040 A	Ceramic Tile	Heterogeneous White Non-fibrous Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.040 A	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.040 A	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
B2316797.040 B	Mastic	Homogeneous Yellow Non-fibrous Bound			100%	Mastic	None Detected
<b>13-41</b> Layer 1 B2316797.041	Ceramic Tile	Heterogeneous Blue Non-fibrous Bound			75%	Silicates	None Detected
					25%	Binder	



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			Fibrous		Non-Fibrous		
Layer 2 B2316797.041	Grout	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.041	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>13-42</b> Layer 1 B2316797.042	Ceramic Tile	Heterogeneous Blue Non-fibrous Bound			75%	Silicates 25% Binder	None Detected
Layer 2 B2316797.042	Grout	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.042	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>13-43</b> Layer 1 B2316797.043	Ceramic Tile	Heterogeneous Blue Non-fibrous Bound			75%	Silicates 25% Binder	None Detected
Layer 2 B2316797.043	Grout	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected





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			Fibrous		Non-Fibrous		
Layer 3 B2316797.043	Mortar	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>14-44</b> Layer 1 B2316797.044	Ceramic Tile	Heterogeneous Blue Non-fibrous Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.044	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.044	Mortar	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>14-45</b> Layer 1 B2316797.045	Ceramic Tile	Heterogeneous Blue Non-fibrous Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.045	Grout	Heterogeneous Gray Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.045	Mortar	Heterogeneous White Non-fibrous Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	

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## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>14-46</b> Layer 1 B2316797.046	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected
		Blue	25%	Binder	
		Non-fibrous Bound			
Layer 2 B2316797.046	Grout	Heterogeneous	<1%	Cellulose	None Detected
		White	65%	Silicates	
		Non-fibrous Bound	35%	Binder	
Layer 3 B2316797.046	Mortar	Heterogeneous	<1%	Cellulose	None Detected
		Gray	65%	Silicates	
		Non-fibrous Bound	35%	Binder	
<b>15-47</b> B2316797.047	Textured Ceiling	Heterogeneous	65%	Binder	None Detected
		White	30%	Calc Carb	
		Non-fibrous Bound	5%	Paint	
<b>15-48</b> B2316797.048	Textured Ceiling	Heterogeneous	65%	Binder	None Detected
		White	30%	Calc Carb	
		Non-fibrous Bound	5%	Paint	
<b>15-49</b> B2316797.049	Textured Ceiling	Heterogeneous	65%	Binder	None Detected
		White	30%	Calc Carb	
		Non-fibrous Bound	5%	Paint	
<b>16-50</b> Layer 1 B2316797.050	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected
		Tan	25%	Binder	
		Non-fibrous Tightly Bound			



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			Fibrous		Non-Fibrous		
Layer 2 B2316797.050	Grout	Heterogeneous Tan Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.050	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>16-51</b> Layer 1 B2316797.051	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates 25% Binder	None Detected
Layer 2 B2316797.051	Grout	Heterogeneous Tan Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.051	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>16-52</b> Layer 1 B2316797.052	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates 25% Binder	None Detected
Layer 2 B2316797.052	Grout	Heterogeneous Tan Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected



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Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
Layer 3 B2316797.052	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>17-53</b> Layer 1 B2316797.053	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.053	Grout	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.053	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
<b>17-54</b> Layer 1 B2316797.054	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates	None Detected
					25%	Binder	
Layer 2 B2316797.054	Grout	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	
Layer 3 B2316797.054	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates	None Detected
					35%	Binder	



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			Fibrous	Non-Fibrous	%		
<b>17-55</b> Layer 1 B2316797.055	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected		
		Tan	25%	Binder			
		Non-fibrous Tightly Bound					
Layer 2 B2316797.055	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White			35%	Binder	
		Non-fibrous Tightly Bound					
Layer 3 B2316797.055	Mortar	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White			35%	Binder	
		Non-fibrous Tightly Bound					
<b>18-56</b> Layer 1 B2316797.056	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected		
		Tan	25%	Binder			
		Non-fibrous Tightly Bound					
Layer 2 B2316797.056	Grout	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray			35%	Binder	
		Non-fibrous Tightly Bound					
Layer 3 B2316797.056	Mortar	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White			35%	Binder	
		Non-fibrous Tightly Bound					
<b>18-57</b> Layer 1 B2316797.057	Ceramic Tile	Heterogeneous	75%	Silicates	None Detected		
		Tan	25%	Binder			
		Non-fibrous Tightly Bound					



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			Fibrous		Non-Fibrous		
Layer 2 B2316797.057	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.057	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>18-58</b> Layer 1 B2316797.058	Ceramic Tile	Heterogeneous Tan Non-fibrous Tightly Bound			75%	Silicates 25% Binder	None Detected
Layer 2 B2316797.058	Grout	Heterogeneous Gray Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
Layer 3 B2316797.058	Mortar	Heterogeneous White Non-fibrous Tightly Bound	<1%	Cellulose	65%	Silicates 35% Binder	None Detected
<b>19-59</b> Layer 1 B2316797.059	Joint Compound	Heterogeneous White Non-fibrous Bound			65%	Binder 35% Calc Carb	None Detected
Layer 2 B2316797.059	Drywall	Heterogeneous White,Purple Fibrous Bound	20%	Cellulose	80%	Gypsum	None Detected

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			Fibrous		Non-Fibrous		
<b>19-60</b> Layer 1 B2316797.060	Joint Compound	Heterogeneous			65%	Binder	None Detected
		White Non-fibrous Bound			35%	Calc Carb	
<b>19-60</b> Layer 2 B2316797.060	Drywall	Heterogeneous	20%	Cellulose	80%	Gypsum	None Detected
		White,Purple Fibrous Bound					
<b>19-61</b> Layer 1 B2316797.061	Joint Compound	Heterogeneous			65%	Binder	None Detected
		White Non-fibrous Bound			35%	Calc Carb	
<b>19-61</b> Layer 2 B2316797.061	Drywall	Heterogeneous	20%	Cellulose	80%	Gypsum	None Detected
		White,Purple Fibrous Bound					
<b>20-62</b> B2316797.062	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black Fibrous Bound					
<b>20-63</b> B2316797.063	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black Fibrous Bound					
<b>20-64</b> B2316797.064	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black Fibrous Bound					

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>21-65</b> Layer 1 B2316797.065	Texture	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White Non-fibrous Bound			35%	Binder	
Layer 2 B2316797.065	Concrete	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray Non-fibrous Bound			35%	Binder	
<b>21-66</b> Layer 1 B2316797.066	Texture	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White Non-fibrous Bound			35%	Binder	
Layer 2 B2316797.066	Concrete	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray Non-fibrous Bound			35%	Binder	
<b>21-67</b> Layer 1 B2316797.067	Texture	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		White Non-fibrous Bound			35%	Binder	
Layer 2 B2316797.067	Concrete	Heterogeneous	<1%	Cellulose	65%	Silicates	None Detected
		Gray Non-fibrous Bound			35%	Binder	
<b>22-68</b> B2316797.068	Window Glazing	Heterogeneous			70%	Binder	None Detected
		White			30%	Calc Carb	
		Non-fibrous			<1%	Paint	
		Bound					





CEI

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

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611 Lunken Park Drive  
Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
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**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS			ASBESTOS %
			Fibrous	Non-Fibrous		
<b>22-69</b> B2316797.069	Window Glazing	Heterogeneous	70%	Binder	None Detected	
		White	30%	Calc Carb		
		Non-fibrous	<1%	Paint		
		Bound				
<b>22-70</b> B2316797.070	Window Glazing	Heterogeneous	70%	Binder	None Detected	
		White	30%	Calc Carb		
		Non-fibrous	<1%	Paint		
		Bound				
<b>23-71</b> Layer 1 B2316797.071 A	Joint Compound	Heterogeneous	65%	Binder	<b>2% Chrysotile</b>	
		White,Brown	28%	Calc Carb		
		Non-fibrous	5%	Paint		
		Bound				
Layer 2 B2316797.071 A	Drywall	Heterogeneous	20%	Cellulose	None Detected	
		White,Tan	80%	Gypsum		
		Fibrous				
		Bound				
Layer 3 B2316797.071 A	Drywall/Joint Compound	Heterogeneous	20%	Cellulose	<b>&lt;1% Chrysotile</b>	
		White,Tan	75%	Gypsum		
		Fibrous	5%	Calc Carb		
		Bound	<1%	Paint		
2% chrysotile in joint compound only; <1% overall						
Layer 1 B2316797.071 B	Joint Compound (400 Point Count)					<b>1.5% Chrysotile</b>
		(6 asbestos points / 400 total) x 100.				
Layer 2 B2316797.071 B	Drywall/Joint Compound (Composite Result from Point Count)					<b>0.08% Chrysotile</b>
Sample contains 5% joint compound						



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# ASBESTOS BULK ANALYSIS

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611 Lunken Park Drive  
Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS			ASBESTOS %			
			Fibrous	Non-Fibrous					
<b>23-72</b> Layer 1 B2316797.072 A No drywall present.	Joint Compound	Heterogeneous White Non-fibrous Bound	65%	Binder	28%	Calc Carb	5%	Paint	<b>2% Chrysotile</b>
Layer 2 B2316797.072 A	Joint Compound	Heterogeneous White Non-fibrous Bound	65%	Binder	35%	Calc Carb	None Detected		
B2316797.072 B (6 asbestos points / 400 total) x 100.	Joint Compound (400 Point Count)								<b>1.5% Chrysotile</b>
<b>23-73</b> Layer 1 B2316797.073	Joint Compound	Heterogeneous White Non-fibrous Bound	65%	Binder	30%	Calc Carb	5%	Paint	None Detected
Layer 2 B2316797.073	Drywall	Heterogeneous White, Tan Fibrous Bound	20%	Cellulose	80%	Gypsum	None Detected		
<b>23-74</b> Layer 1 B2316797.074 A	Joint Compound	Heterogeneous White Non-fibrous Bound	65%	Binder	28%	Calc Carb	5%	Paint	<b>2% Chrysotile</b>
Layer 2 B2316797.074 A	Drywall	Heterogeneous White, Tan Fibrous Bound	20%	Cellulose	80%	Gypsum	None Detected		



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# ASBESTOS BULK ANALYSIS

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611 Lunken Park Drive  
Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
Layer 3 B2316797.074 A	Drywall/Joint Compound	Heterogeneous White, Tan Fibrous Bound	20%	Cellulose	75%	Gypsum 5% Calc Carb <1% Paint	<1% Chrysotile
2% chrysotile in joint compound only; <1% overall							
Layer 1 B2316797.074 B	Joint Compound (400 Point Count)						1.8% Chrysotile
(7 asbestos points / 400 total) x 100.							
Layer 2 B2316797.074 B	Drywall/Joint Compound (Composite Result from Point Count)						0.09% Chrysotile
Sample contains 5% joint compound							
<b>23-75</b> Layer 1 B2316797.075	Joint Compound	Heterogeneous White Non-fibrous Bound			65% 30% 5%	Binder Calc Carb Paint	None Detected
Layer 2 B2316797.075	Drywall	Heterogeneous White, Tan Fibrous Bound	20%	Cellulose	80%	Gypsum	None Detected
<b>23-76</b> Layer 1 B2316797.076	Joint Compound	Heterogeneous White Non-fibrous Bound			65% 30% 5%	Binder Calc Carb Paint	None Detected
Layer 2 B2316797.076	Drywall	Heterogeneous White, Tan Fibrous Bound	20%	Cellulose	80%	Gypsum	None Detected

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>23-77</b> Layer 1 B2316797.077	Joint Compound	Heterogeneous	65%	Cellulose	40%	Binder	None Detected
		White	30%	Calc Carb	5%	Paint	
		Non-fibrous					
		Bound					
<b>23-77</b> Layer 2 B2316797.077	Drywall	Heterogeneous	20%	Cellulose	80%	Gypsum	None Detected
		White, Tan					
		Fibrous					
		Bound					
<b>24-78</b> B2316797.078	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black					
		Fibrous					
		Bound					
<b>24-79</b> B2316797.079	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black					
		Fibrous					
		Bound					
<b>24-80</b> B2316797.080	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black					
		Fibrous					
		Bound					
<b>25-81</b> B2316797.081	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black					
		Fibrous					
		Bound					
<b>25-82</b> B2316797.082	Tarpaper	Heterogeneous	60%	Cellulose	40%	Tar	None Detected
		Black					
		Fibrous					
		Bound					

# ASBESTOS BULK ANALYSIS

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 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>25-83</b> B2316797.083	Tarpaper	Heterogeneous Black Fibrous Bound	60%	Cellulose	40%	Tar	None Detected
<b>26-84</b> Layer 1 B2316797.084	Window Caulking	Heterogeneous White Non-fibrous Bound			100%	Caulk	None Detected
Layer 2 B2316797.084	Window Caulking	Heterogeneous Off-white Non-fibrous Bound			100%	Caulk	None Detected
<b>26-85</b> Layer 1 B2316797.085	Window Caulking	Heterogeneous White Non-fibrous Bound			100%	Caulk	None Detected
Layer 2 B2316797.085	Window Caulking	Heterogeneous Off-white Non-fibrous Bound			100%	Caulk	None Detected
<b>26-86</b> B2316797.086	Window Caulking	Heterogeneous White Non-fibrous Bound			100%	Caulk	None Detected
<b>27-87</b> B2316797.087	Window Caulking	Heterogeneous White Non-fibrous Bound			100%	Caulk <1% Paint	None Detected

# ASBESTOS BULK ANALYSIS

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 611 Lunken Park Drive  
 Cincinnati, OH 45226

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**Date Received:** 08-04-23  
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**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>27-88</b> B2316797.088	Window Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>27-89</b> B2316797.089	Window Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>28-90</b> B2316797.090	Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>28-91</b> B2316797.091	Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>28-92</b> B2316797.092	Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>29-93</b> Layer 1 B2316797.093	Asphalt Shingle	Heterogeneous Black, Gray Fibrous Bound	50% 40%	Fiberglass Tar 10% Gravel	None Detected
Layer 2 B2316797.093	Tar	Heterogeneous Black Non-fibrous Bound	100%	Tar	None Detected



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# ASBESTOS BULK ANALYSIS

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611 Lunken Park Drive  
Cincinnati, OH 45226

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**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
Layer 3 B2316797.093	Tarpaper	Heterogeneous Black Fibrous Bound	60%	Cellulose	40%	Tar	None Detected
<b>29-94</b> Layer 1 B2316797.094	Asphalt Shingle	Heterogeneous Black,Gray Fibrous Bound	50%	Fiberglass	40%	Tar 10% Gravel	None Detected
Layer 2 B2316797.094	Tar	Heterogeneous Black Non-fibrous Bound			100%	Tar	None Detected
Layer 3 B2316797.094	Tarpaper	Heterogeneous Black Fibrous Bound	60%	Cellulose	40%	Tar	None Detected
<b>29-95</b> Layer 1 B2316797.095	Asphalt Shingle	Heterogeneous Black,Gray Fibrous Bound	50%	Fiberglass	40%	Tar 10% Gravel	None Detected
Layer 2 B2316797.095	Tar	Heterogeneous Black Non-fibrous Bound			100%	Tar	None Detected
Layer 3 B2316797.095	Tarpaper	Heterogeneous Black Fibrous Bound	60%	Cellulose	40%	Tar	None Detected

# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Terracon Consultants, Inc.  
 611 Lunken Park Drive  
 Cincinnati, OH 45226

**Lab Code:** B2316797v2  
**Date Received:** 08-04-23  
**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>30-96</b> B2316797.096	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>30-97</b> B2316797.097	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>30-98</b> B2316797.098	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>31-99</b> B2316797.099	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>31-100</b> B2316797.100	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>31-101</b> B2316797.101	Door Caulking	Heterogeneous White Non-fibrous Bound	100% <1%	Caulk Paint	None Detected
<b>32-102</b> B2316797.102	Textured Concrete	Heterogeneous Tan Non-fibrous Bound	<1% 70% 30%	Cellulose Silicates Binder	None Detected





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# ASBESTOS BULK ANALYSIS

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**Date Analyzed:** 08-11-23  
**Date Reported:** 08-11-23

**Project:** Greendale, N1237356

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>32-103</b> B2316797.103	Textured Concrete	Heterogeneous Tan Non-fibrous Bound	<1%	Cellulose	70%	Silicates 30% Binder	None Detected
<b>32-104</b> B2316797.104	Textured Concrete	Heterogeneous Tan Non-fibrous Bound	<1%	Cellulose	70%	Silicates 30% Binder	None Detected
<b>33-105</b> B2316797.105	Asphalt Shingle	Heterogeneous Black,Gray Fibrous Bound	50%	Fiberglass	40%	Tar 10% Gravel	None Detected
<b>33-106</b> B2316797.106	Asphalt Shingle	Heterogeneous Black,Gray Fibrous Bound	50%	Fiberglass	40%	Tar 10% Gravel	None Detected
<b>33-107</b> B2316797.107	Asphalt Shingle	Heterogeneous Black,Gray Fibrous Bound	50%	Fiberglass	40%	Tar 10% Gravel	None Detected

---

**LEGEND:** Non-Anth = Non-Asbestiform Anthophyllite  
Non-Trem = Non-Asbestiform Tremolite  
Calc Carb = Calcium Carbonate

---

**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

---

**REPORTING LIMIT:** <1% by visual estimation

---

**REPORTING LIMIT FOR POINT COUNTS:** 0.25% by 400 Points or 0.1% by 1,000 Points

---

**REGULATORY LIMIT:** >1% by weight

---

Due to the limitations of the EPA 600 method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarized light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation. *Estimated measurement of uncertainty is available on request.*


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Information provided by customer includes customer sample ID and sample description.

**ANALYST:**

  
Regan Kerns

**APPROVED BY:**

  
Tianbao Bai, Ph.D., CIH  
Laboratory Director



A version indicated by 'v' after the Lab ID# with a value greater than 1 indicates an amendment has occurred. The revised sample/description/ID is indicated by an \*



# CHAIN OF CUSTODY

107

CEI

730 SE Maynard Road, Cary, NC 27511  
Tel: 866-481-1412; Fax: 919-481-1442

<b>LAB USE ONLY:</b>	
CEI Lab Code:	B2316797
CEI Lab I.D. Range:	

COMPANY INFORMATION	PROJECT INFORMATION
CEI CLIENT #:	Job Contact:
Company: Terraces Consultants	Email / Tel:
Address: 611 Lunkenpark Dr. Cincinnati, OH	Project Name: Greendale
Email: Joshua.Vogel@Terraces.com	Project ID#: N1237356
Tel: (513) 612-9002 Fax:	PO #: N1237356
	STATE SAMPLES COLLECTED IN: KY

IF TAT IS NOT MARKED STANDARD 3 DAY TAT APPLIES.

ASBESTOS	METHOD	TURN AROUND TIME					
		4 HR	8 HR	1 DAY	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM BULK	CARB 435	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCM AIR	NIOSH 7400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	EPA AHERA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	NIOSH 7402	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR (PCME)	ISO 10312	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	ASTM 6281-15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST WIPE	ASTM D6480-05 (2010)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST MICROVAC	ASTM D5755-09 (2014)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM SOIL	ASTM D7521-16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM VERMICULITE	CINCINNATI METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM QUALITATIVE	IN-HOUSE METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS / SPECIAL INSTRUCTIONS:		<input checked="" type="checkbox"/> Accept Samples <input type="checkbox"/> Reject Samples	
Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	08/3/23	<i>[Signature]</i>	8/4 9:40

Samples will be disposed of 30 days after analysis

818019 35 9491

## SUSPECT ACM - BULK MATERIAL SAMPLE LOG

Page \_\_\_\_\_ of \_\_\_\_\_

**Date:** 8/2/23  
**Inspector:** Lem Weyer and Josh Vogel  
**Project:** 1345 Greendale -Lexington  
**Project #** \_\_\_\_\_



611 Lunken Park Drive  
 Cincinnati, Ohio 45226  
 (513) 321.5816

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
01	01	2"x2" Tan Ceramic Floor Tile with Mortar and Grout	Doorway	Garage Restroom	
	02		Doorway		
	03		Southwest Corner		
02	04	Textured Ceilings	At Attic	Garage Ceiling	
	05		Northwest Corner		
	06		Southeast Corner		
03	07	Textured Walls	Northwest Corner	Garage Ceiling	
	08		Northeast Corner		
	09		Southeast Corner		
04	10	Blown-In Brown Insulation	Northwest Corner	Attic	
	11		Northeast Corner		
	12		Northwest Corner of Walkway		
	13		Northeast Corner of Walkway		
	14		Southeast Corner of Walkway		
	15		Southwest Corner of Walkway		

20

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	16		Middle South Side		
05	17	Fiberboard	North Wall of Master Bedroom North Wall	Behind Wood Paneling throughout House	
	18		Southeast Corner Corner		
	19		North End of Attic Walkway		
06	20	White Mortar	Southwest Corner	Associated with Garage Steps	
	21		Southwest Corner		
	22		Southwest Corner		
07	23	Brick and Grout	West Side of Living Room Fireplace	Living Room and Basement Fireplaces	
	24		East side of Living Room Fireplace		
	25		West Side of Basement Fireplace		
08	26	Textured Ceilings	Northwest Corner	Living Room Ceiling	
	27		Northeast Corner		
	28		Southwest Corner		
09	29	24"x12" White Ceramic Floor Tile with Gray Mortar and Gray Grout	Northwest Corner	Kitchen Flooring	
	30		Northeast Corner		
	31		Southwest Corner		
10	32	Gray Sink Undercoating	Kitchen Sink	Kitchen Sink	
	33		Kitchen Sink		

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	34		Kitchen Sink		
11	35	12"x12" Off-White Ceramic Floor Tile with Gray Mortar, Gray Grout and Gray Floor Leveler	Northeast Corner	Foyer and Front Hallway	
	36		Southeast Corner		
	37		Southeast Corner		
12	38	White Hexagon Ceramic Floor Tile with Gray Grout and Gray Mortar	At Floor Vent	Hallway Bathroom Flooring- Entrance	
	39		At Floor Vent		
	40		Southeast Corner		
13	41	1"x4" Blue Ceramic Floor Tile with Mortar and Grout	At Entrance to Toilet Area	Hallway Bathroom Flooring- Shower Area	
	42		Southwest Corner		
	43		Southwest Corner		
14	44	4"x4" Blue Ceramic Wall Tile with White Grout and Gray Mortar	Doorway	Hallway Bathroom Restroom Walls in Toilet/Shower Area	
	45		Doorway		
	46		Northeast Corner of Shower		
15	47	Textured Ceilings	Southwest Corner	Hallway Restroom	
	48		Northwest Corner		
	49		At Entrance		
16	50	12"x24" Tan Ceramic Floor Tile with Mortar and Grout	At HVAC Vent	Master Bathroom	
	51		At HVAC Vent		

40

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	52		At HVAC Vent		
17	53	12"x24" Tan Ceramic Wall Tile with Mortar and Grout	Northwest Corner of Shower	Master Bathroom	
	54		Northwest Corner of Shower		
	55		Northwest Corner of Shower		
18	56	12"X12" Tan Ceramic Floor Tile with Mortar and Grout	Northeast Corner of Laundry Room	Laundry Room and Screened Porch Area	
	57		Northwest Corner of Laundry Room		
	58		Northeast Corner of Screened Porch Area		
19	59	Replaced Drywall System: Drywall and Joint Compound	Near Entrance to Garage	Kitchen Walls	
	60		Northwest Corner		
	61		Near Entrance to Screened Porch		
20	62	Tar Paper	Northeast Corner of Electrical Room	Under Beams in Basement	
	63		Middle west Side of Southwest Room		
	64		Southwest Corner of Southwest Room		
21	65	Textured Concrete	North Wall of Electrical Room	On CMU Block Walls of Southeast Room of Basement	
	66		Middle West Wall of Southwest Room		
	67		Southwest Corner of Southwest Room		
22	68	White Exterior Window Glazing	Garage Restroom Window	Associated with Exterior Original Windows throughout the House	
	69		South Living Room Window		

52

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	70		Kitchen Window		
23	71	Drywall System: Drywall and Joint Compound	Northwest Corner of Garage Restroom	Throughout House	
	72		On Soffit near Basement Fire Place		
	73		Near Window of Southeast Corner Room of Basement		
	74		Southeast Corner of Front Entrance		
	75		Northeast Corner of Southeast Bedroom		
	76		Southwest Corner of South Middle Bedroom		
	77		Southwest Corner of Master Bedroom		
	24		78		Tar Paper
79		Southeast Corner of Room at Vent			
80		Southeast Corner of Room at Vent			
25	81	Tar Paper	North Hallway Vent	Hallway, Dining Room, Formal Living Room-Under Floor Boards	
	82		South Hallway Vent		
	83		Dining Room Vent		
26	84	White Interior Window Caulking	Southwest Corner	Associated with Windows of Sceened in Porch Area	
	85		Northwest Corner		
	86		Northeast Corner		
27	87	White Exterior Window Caulking	Window South of Garage Door	Associated with the Original Exterior Windows	

10



Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	88		Northeast Corner Window	throughout the House	
	89		Southeast Corner Window		
28	90	White Caulking	Vent Near Garage	Associated with Vent from Garage Bathroom	
	91		Vent Near Garage		
	92		Vent Near Garage		
29	93	Gray Asphalt Shingles with Tar and Tar Paper	Northwest Corner	Roof of House	
	94		Northeast Corner		
	95		Southeast Corner		
30	96	White Exterior Door Caulking	Basement Door	Associated with the Exterior Side of the Basement Exit Door	
	97		Basement Door		
	98		Basement Door		
31	99	White Exterior Door Caulking	Front Door	Associated with the Exterior Side of the Front Entrance Door	
	100		Front Door		
	101		Front Door		
32	102	Tan Textured Light-Weight Concrete	Northwest Corner	Concrete Around Swimming Pool	
	103		Northwest Corner		
	104		Northwest Corner		
33	105	Gray Asphalt Shingles	Northwest Corner	Southwest Shed Room	

107

Sample #		Sample Material Description	Sample Location	HA Location(s)	Results (% / Type of Asbestos)
HA #	SEQ. #				
	106		Southwest Corner		
	107		Southeast Corner		

**Asbestos Inspection Report**

Residential Property | 1345 Greendale Rd., Lexington, KY  
August 14, 2023 | Terracon Report No. N1237356



## **APPENDIX D**

### **LICENSES AND CERTIFICATIONS**



ANDY BESHEAR  
GOVERNOR

REBECCA W. GOODMAN  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET**  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

ANTHONY R. HATTON  
COMMISSIONER

300 SOWER BOULEVARD  
FRANKFORT, KENTUCKY 40601

December 8, 2022

Joshua Vogel  
611 Lunken Park Dr  
Cincinnati, Ohio 45226

Asbestos Management Planner  
AI Number: 140568  
License Number: 63334  
Expires: November 16, 2023

Dear Joshua Vogel:

This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is \$100.00 per person per discipline, except for abatement worker (\$20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a \$10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

Sincerely,

Emma Moreo  
Field Support Section  
Field Operations Branch

**Commonwealth of Kentucky**  
Department for Environmental Protection  
Division for Air Quality

**Joshua Vogel**

Has met the requirements of 401 KAR 58:005 and is accredited as an:

**Asbestos Management Planner**

Agency Interest Id: **140568**  
License Number: **63334**  
Issue Date: **12/07/2022**  
Expiration Date: **11/16/2023**





Andy Beshear  
GOVERNOR

**ENERGY AND ENVIRONMENT CABINET**  
**DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 Sower Boulevard  
Frankfort, Kentucky 40601  
Phone: (502) 564-2150  
Fax: 502-564-4245

Rebecca W. Goodman  
SECRETARY

Anthony R. Hatton  
COMMISSIONER

May 26, 2023

Lemuel Weyer  
611 Lunken Park Dr  
Cincinnati, Ohio 45226

Asbestos Management Planner  
AI Number: 159668  
License Number: 61040  
Expires: May 17, 2024

Dear Lemuel Weyer:

This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is \$100.00 per person per discipline, except for abatement worker (\$20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a \$10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

**Commonwealth of Kentucky**  
Department for Environmental Protection  
Division for Air Quality

**Lemuel Weyer**  
Has met the requirements of 401 KAR 58:005 and is accredited as an:

**Asbestos Management Planner**

Agency Interest Id: **159668**  
License Number: **61040**  
Issue Date: **05/23/2023**  
Expiration Date: **05/17/2024**



Sincerely,

Emma Moreo  
Field Support Section  
Field Operations Branch

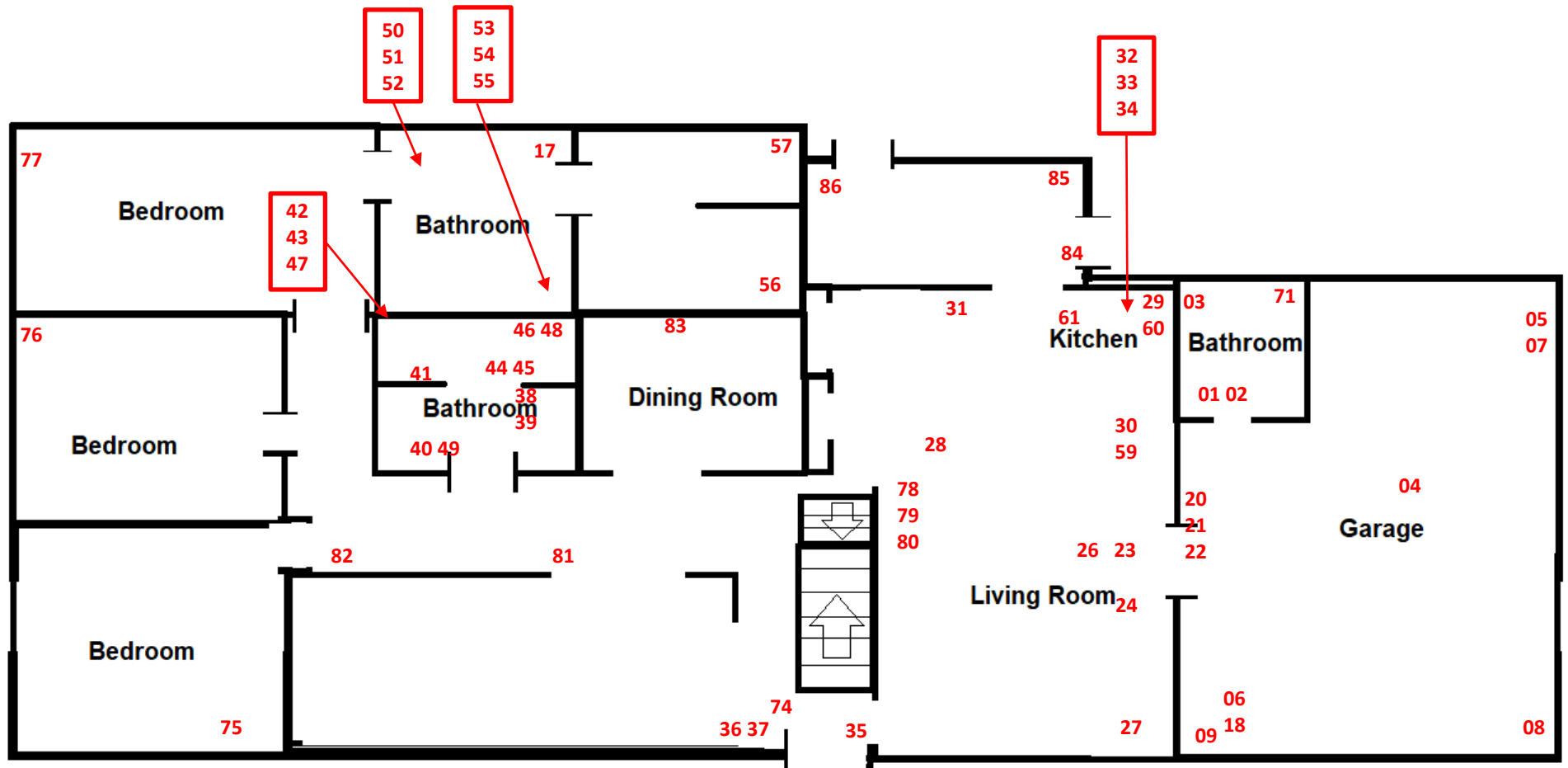
**Asbestos Inspection Report**

Residential Property | 1345 Greendale Rd., Lexington, KY  
August 14, 2023 | Terracon Report No. N1237356



## **APPENDIX E**

### **SAMPLE LOCATION DIAGRAMS**

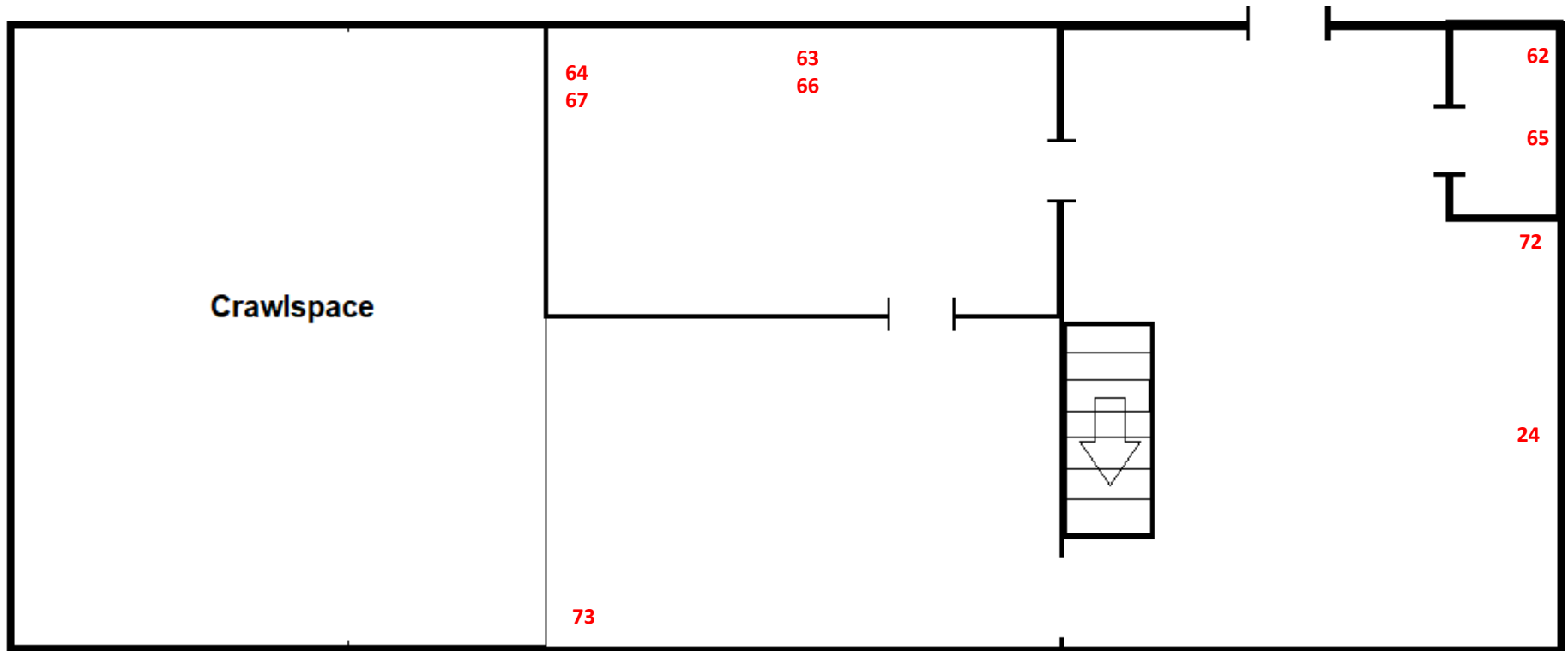


Project No. N1237356
Inspection Date: August 2, 2023
Project Manager: Josh Vogel
APR: Joe Tussey

  
 Consulting Engineers and Scientists  
 611 Lunken Park Drive  
 Cincinnati, Ohio 45226  
 PH. (513) 321-05816  
 FAX (513) 321-0294

<b>1<sup>st</sup> Floor Interior Sample Location Diagram</b>
Residential House 1345 Greendale Road Lexington, Kentucky

<b>Exhibit</b>
1



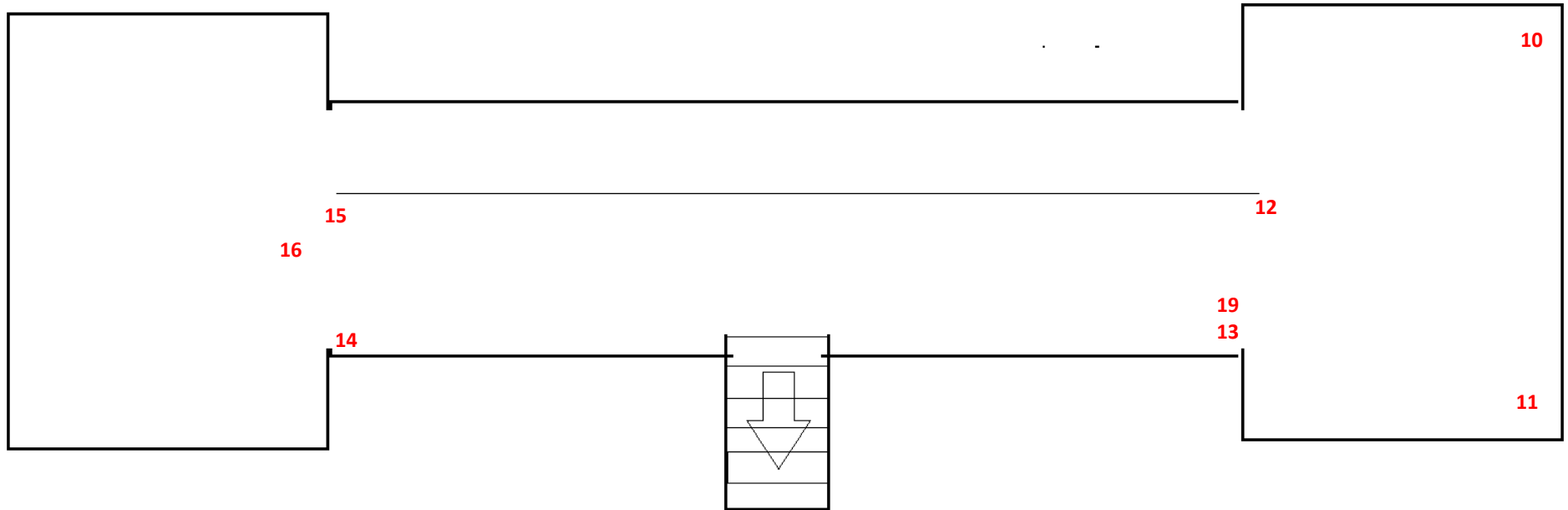
Project No. N1237356
Inspection Date: August 2, 2023
Project Manager: Josh Vogel
APR: Joe Tussey

  
 Consulting Engineers and Scientists  
 611 Lunken Park Drive  
 Cincinnati, Ohio 45226  
 PH. (513) 321-05816  
 FAX (513) 321-0294

<b>Basement Sample Location Diagram</b>
Residential House 1345 Greendale Road Lexington, Kentucky

<b>Exhibit</b>
2





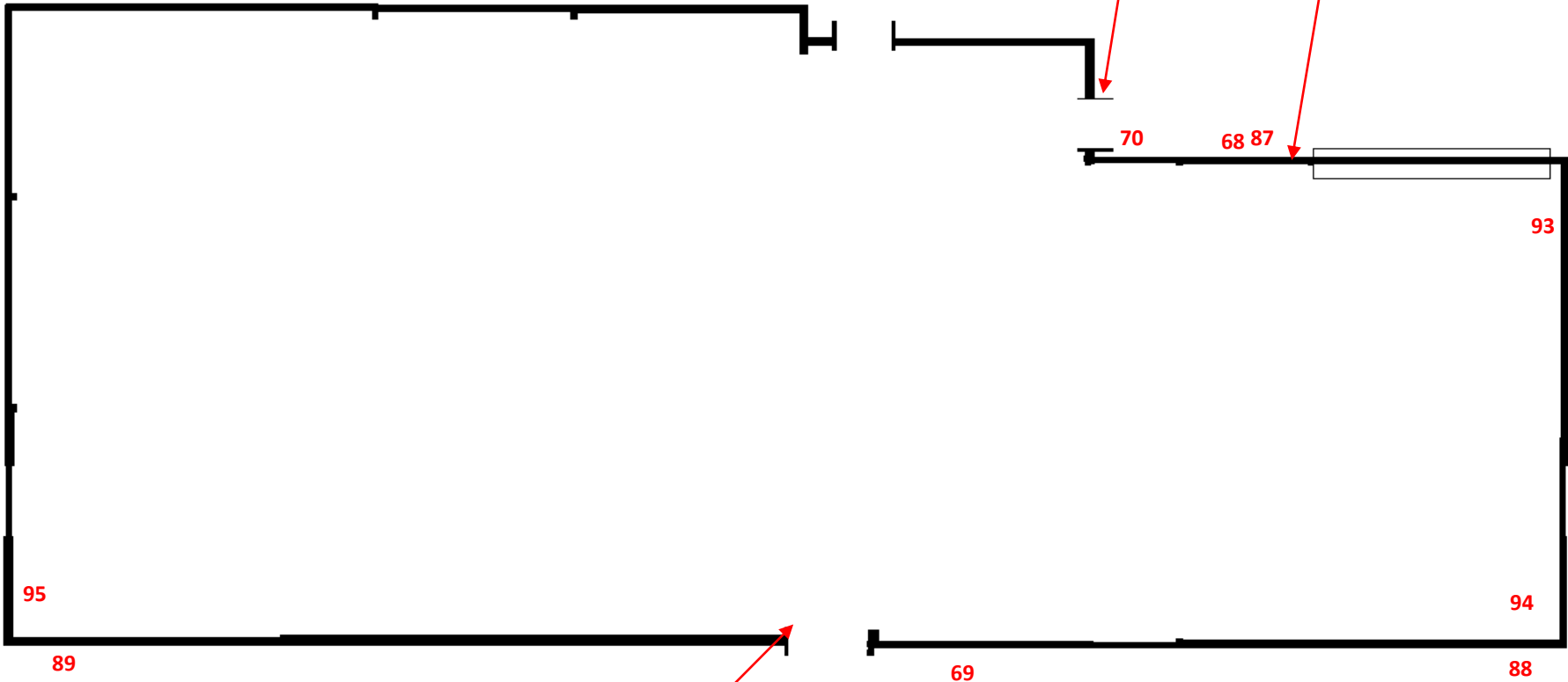
Project No. N1237356
Inspection Date: August 2, 2023
Project Manager: Josh Vogel
APR: Joe Tussey

  
 Consulting Engineers and Scientists  
 611 Lunken Park Drive  
 Cincinnati, Ohio 45226  
 PH. (513) 321-05816  
 FAX (513) 321-0294

<b>Attic Sample Location Diagram</b>
Residential House 1345 Greendale Road Lexington, Kentucky

<b>Exhibit</b>
3

102  
103  
104



99  
100  
101



Project No. N1237356

Inspection Date: August 2, 2023

Project Manager: Josh Vogel

APR: Joe Tussey



Consulting Engineers and Scientists

611 Lunken Park Drive  
Cincinnati, Ohio 45226  
PH. (513) 321-05816  
FAX (513) 321-0294

### Exterior House Sample Location Diagram

Residential House  
1345 Greendale Road  
Lexington, Kentucky

Exhibit

4



Project No. N1237356	 <p>Consulting Engineers and Scientists</p> <p>611 Lunken Park Drive Cincinnati, Ohio 45226 PH. (513) 321-05816 FAX (513) 321-0294</p>	<b>Inground Swimming Pool Sample Location Diagram</b>	<b>Exhibit</b>
Inspection Date: August 2, 2023		Residential House 1345 Greendale Road Lexington, Kentucky	5
Project Manager: Josh Vogel			
APR: Joe Tussey			



Project No. N1237356	 <p>Consulting Engineers and Scientists</p> <p>611 Lunken Park Drive Cincinnati, Ohio 45226 PH. (513) 321-05816 FAX (513) 321-0294</p>	<p><b>200 Square Foot (Southwest) Shed Sample Location Diagram</b></p>	<p><b>Exhibit</b></p>
Inspection Date: August 2, 2023		<p>Residential House 1345 Greendale Road Lexington, Kentucky</p>	<p>6</p>
Project Manager: Josh Vogel			
APR: Joe Tussey			

## APPENDIX F

### PHOTO LOG

	
<p><b>Photo 1 HA 02:</b> Asbestos-Containing Textured Ceiling Material (Garage Ceiling)</p>	<p><b>Photo 2 HA 03:</b> Asbestos-Containing Textured Wall Material (Garage Walls)</p>
	
<p><b>Photo 3 HA 08:</b> Asbestos-containing Textured Ceiling Material (Living Room)</p>	<p><b>Photo 4 HA 23:</b> Asbestos-Containing Joint Compound within the Drywall system (&lt;0.09% by Composite with Point Count, 1.5% Chrysotile In Joint Compound Layer)</p>