

## ATTACHMENT D

### Technical Specifications Lead-based Paint Abatement Tennessee Technological University

#### REMOVAL & DISPOSAL OF LEAD-BASED PAINTED SURFACES

#### LEAD-BASED PAINT WORK PLAN

- A. The Contractor shall specify the renovation/demolition procedures and methods to be used and shall prepare a detailed LBP Work Plan to be submitted to the Tennessee Technological University (Owner) prior to the start of work. To be accepted, the work plan shall meet the requirements of OSHA as specified in their Lead, Construction Standard, 29 CFR 1926.62(e) and this specification.
1. Key Elements of Work Plan (Required):
    - a. Methods to cordon-off areas of lead-based paint disturbance;
    - b. Procedures used when preparing surfaces for re-painting, to include procedures for minimizing worker exposure to lead and other project-related health and safety hazards;
    - c. Procedures used during demolition activities; to include procedures for minimizing worker exposure to lead and other project-related health and safety hazards;
    - d. Description of the exposure air monitoring program, to include personal and area sampling;
    - e. Placement of employee decontamination unit;
    - f. Capture and disposal of lead-contaminated water used during renovation/demolition activities;
    - g. Name of Competent Person;
    - h. Protocols for sampling the waste debris;
    - i. Name of personal air monitoring firm and name and accreditation certificate of Inductively Coupled Plasma (ICP) laboratory; and Name and accreditation certificate of Toxicity Characteristic Leaching Procedure (TCLP) laboratory.

#### DEFINITIONS

AL	Action Level. An exposure level established by OSHA, of 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of lead in air. The Action Level is the level at which initial monitoring, record-keeping, medical surveillance and training is initiated. The Action Level shall also be used as the during renovation and clearance level for area air monitoring. The clearance level is the airborne lead-dust concentration level that should not be exceeded at the conclusion of the renovation procedures within a specified area prior to re-occupancy of that area by unprotected (no personal protective equipment) building occupants.
Controlled Areas	Areas that are restricted to persons directly associated with the work. These areas are identified by signs and restrictive tape. Controlled areas will be areas where lead-based paint renovation is being performed.
Control of	Lead-based paint must be controlled to the extent that the

Lead-based Contractor is in compliance with federal, state and local regulations regarding worker exposure and environmental impact.

Critical Barrier A double layer of polyethylene (6-mil minimum) sheet used to separate the controlled area and HVAC systems from other portions of the building and outside of the building

LBP Lead-based Paint

OSHA Occupational Safety and Health Administration

PEL Permissible Exposure Limit. An 8-hour time weighted average (TWA) exposure limit established by OSHA. The PEL-TWA for lead is 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).

Stabilization of Leaded Surfaces The elimination of paint chips, chaps and bubbles by mechanical or chemical means.

USEPA United States Environmental Protection Agency

#### DISPOSAL SITES

##### A. Wall Preparation for Re-Application of Finish:

1. The waste generated while preparing the walls for reapplication of finish shall be tested to determine whether the material must be disposed of as hazardous waste or construction waste. The contractor shall collect composite debris samples for testing by TCLP analysis to determine proper disposal requirements. Protocols for sampling the debris shall be outlined in the LBP Work Plan. Results shall be submitted and approved by the Owner prior to the disposal of the waste debris.
2. The lead-based paint waste must be kept secured and labeled in accordance with 29 CFR §1910.145 Signs and Tags until analyzed by the TCLP test. If it is characterized as hazardous, the waste must be labeled in accordance with 49 CFR §172, 173, 178 and 179 Regulations for Labeling, Mailing and Transporting Hazardous Waste.
3. After the waste is characterized, it will be disposed of in accordance with all applicable local, federal, state and/or county regulations.
4. All entities and/or individuals involved in the work must possess valid permits and/or licenses required under the Resource Conservation and Recovery Act (RCRA) as well as any other federal, state or local permits or licenses required for removal, packaging, transportation and disposal of hazardous waste.
5. The hazardous waste removed must be disposed by the Contractor at an Environmental Protection Agency (EPA) permitted Treatment, Storage and Disposal Facility (TSD).

##### B. Minor Demolition:

1. Should substrates be demolished with the lead-based paint and/or stain, the debris generated from the minor demolition process shall be disposed of as construction and demolition debris in a Class III or IV landfill.

## QUALITY ASSURANCE

- A. Contractor - The Contractor shall certify that they or their subcontractor providing the services of this section has prior experience on LBP building material renovation projects, similar in nature and extent to perform the work in a satisfactory manner.
- B. Competent Person - The Contractor shall certify that they or their subcontractor that is providing the services of this section employ a full-time, onsite Competent Person that meets the requirements of 29 CFR §1926.62 and is experienced in the administration and supervision of LBP building material renovation.
- C. Testing Laboratory - The contractor shall provide the name, address, and telephone number of the independent testing laboratory that will be used to perform analysis of air and waste samples. Documentation that the laboratory performing the analysis is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT) will also be provided.
- D. Training - Contractor personnel working on the site shall meet applicable federal, state and local training requirements for lead renovation projects.
- E. Licenses and Permits - Copies of licenses and permits required by applicable federal, state, and local regulations shall be obtained at least 20 days before the start of the renovation process.

## REGULATORY REQUIREMENTS

- A. All work shall be performed in strict compliance with the current issues of federal, state and local regulations, codes and standards as listed below:
  - 1. Occupational Safety and Health Administration:
    - 29 CFR §1910 General Industry Standard
    - 29 CFR §1910.1025 Lead Hazard Standard
    - 29 CFR §1910.134 Respiratory Protection
    - 29 CFR §1910.1200 Hazard Communication
    - 29 CFR §1910.145 Signs and Tags
    - 29 CFR §1926 Construction Industry Standard
    - 29 CFR §1926.62 Lead Standard for the Construction Industry
  - 2. Environmental Protection Agency:
    - 40 CFR §260, 261, 262, 263, 264 and 265 Hazardous Waste Regulations
  - 3. Department of Transportation:
    - 49 CFR §172, 173, 178 and 179 Regulations for Labeling, Mailing and Transporting Hazardous Waste
  - 4. Tennessee Department of Environment and Conservation:

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5. Any other state, county and city codes and ordinances as applicable.

**SUBMITTALS**

**A. Pre-Job Submittals**

1. All required permits, site location, and arrangements for transport and disposal of lead contaminated debris. Submit certification that the proposed landfill site meets all Environmental Protection Agency regulatory standards.
2. Product data and Material Safety Data sheets for any materials to be used.
3. LBP Work Plan.

**B. Post-Job Submittals**

1. For abatement disposal, lead waste disposal manifest showing date, type of container removed from the controlled area, signature of recorder, time of day, and general location of the waste material in landfill.
2. For demolition disposal, a copy of the Construction and demolition (C & D) landfill receipts showing date, time and amount of materials disposed.
3. A copy of the controlled area Sign In/Out Logs showing the following: date, name, employee identification number, entry and exit times, company or agency represented and reason for entry into the controlled area(s).
4. Copies of laboratory analysis results.

**GENERAL PROTECTION OF PERSONS**

- A. Prior to commencing work, all workers shall be instructed and knowledgeable in appropriate procedures of personnel protection for lead-based paint renovation work.
- B. Contractor shall be solely responsible for enforcing worker protection requirements and job safety.
- C. Contractor shall provide workers with personally issued respiratory protective equipment approved by NIOSH. The respiratory equipment shall be suitable for protecting against lead exposures in the Controlled Areas according to OSHA Standard 29 CFR §1926.62 and OSHA 29 CFR §1910.134, Respiratory Protection. Filter cartridges that meet the criteria established in NIOSH 42 CFR 84 shall be selected, provided and replaced as required.
- D. Contractor shall provide workers, Owner or Owner's representative and authorized visitors with protective disposable clothing, head covers, gloves, eye protection and foot covers of various sizes to enter Controlled

Areas. Provide a minimum of four sets per day for visitors and sufficient sets as required for workers and the Owner or Owner's representative.

- E. Reporting Unusual Events: When an event of unusual and significant nature occurs at the site, a report listing the chain of events, persons participating, response and similar pertinent information shall be prepared and submitted to the Owner. When such events are known or predictable in advance, the Owner will be notified in advance, at the earliest possible date.
- F. Reporting Accidents: Prepare and submit reports of significant accidents at the site. A significant accident includes events where an OSHA recordable event occurs, non-contractor personnel are injured, and/or property loss of substance is sustained.
- G. Post telephone numbers and locations of emergency services including, but not limited to, fire, ambulance, hospital and police at the entrance to the decontamination unit. Post directions to the nearest emergency medical facility.

#### SIGN IN/OUT LOG

- A. Contractor shall maintain a Sign In/Out Log at the entrance to the Controlled Area(s). The log shall be maintained from the time the first lead-based paint activity is performed until the project is complete. All persons entering the Controlled Area, including the Contractor's workers, Owner's representative and Government Officials shall be required to sign in and out upon entering and exiting the Controlled Area. All persons shall record their name, time, company or agency represented and reason for entering the control area.
- B. Except for Governmental Inspectors having jurisdiction, no visitors shall be allowed in any Controlled Area, except as authorized by the Owner or his representative.

#### SAFETY AND PROTECTION, OSHA COMPLIANCE

- A. The Competent Person shall be the onsite person responsible for coordination, safety, security and execution of the work. The Competent Person shall be able to identify existing and predictable lead hazards and shall have the authority to take corrective measures to eliminate them.

#### PERSONAL PROTECTION, SPECIFIC

- A. The Contractor shall document that lead renovation airborne exposure levels are below the OSHA established Action Level. This may be accomplished by establishing an airborne concentration baseline (minimum of 3 days of air sampling on-site) or by providing documentation (pre-job submittal) that renovation activities will not cause the airborne levels to exceed regulated limits. The baseline shall be established using a minimum of 25% of the employees for each type of work task performed where lead-based paint is being impacted.
- B. The following personal protective equipment (PPE) shall be used for work with lead-based paint until the above requirements are met:
  - 1. Tyvec Outer Coveralls
  - 2. Cotton Inner Gloves
  - 3. Impermeable, Abrasion Resistant Outer Gloves
  - 4. Impermeable Safety Footwear (Rubber)

5. Filters - Lead – P or R-Series filter cartridges with an efficiency rating of 100%

Note: Should lead-in-air concentrations exceed the protection factor of the above-referenced respirator, respirators with the appropriate protection factor must be used.

C. Personal Protection & Decontamination – The following shall be performed while the airborne concentration baseline is being established and if an acceptable airborne concentration baseline is not obtained:

1. Workers shall always wear a respirator properly fitted on the face while in the renovation areas. Workers wearing tight-fitting face pieces shall be clean-shaven to the extent that the hair does not interfere with the sealing surface of the respirator. This must be documented by a standard respirator fit test.
2. The Contractor shall instruct and train workers in proper respirator use.
3. Workers shall wear disposable, full-body cover-alls and disposable head covers and footwear suitable for lead-based paint abatement work in the removal areas.
4. Workers shall not eat, drink, smoke, chew gum, tobacco, or apply cosmetics in the removal areas.
5. The Contractor shall provide a fit tested respirator and disposable cover-alls, head cover, and footwear to any official representative of the Owner.
6. All persons entering the removal areas shall wear an approved respirator and disposable cover-alls, head cover and footwear.
7. The Contractor shall instruct and train workers in the nature of lead-based paint and the hazards related to lead dust exposure during renovation activities.
8. The Contractor shall set up a decontamination unit as follows:
  - a. Set-up a unit consisting of a change room, shower and equipment room, enclosed and separated by triple-flap polyethylene air locks, connected to the controlled areas. All workers, without exception, shall:
    - 1) Remove and properly store street clothes in the change room and put on new disposable cover-alls, head covers, footwear and cleaned respirators before entering the controlled area.
    - 2) Upon leaving the controlled area, remove the disposable cover-alls, head covers and footwear in the equipment room and dispose of them in an appropriate waste container. Still wearing their respirators, workers shall proceed to the shower and remove their respirators while showering with soap and tempered water. Wetted respirator cartridges shall be disposed of in appropriate containers.
    - 3) This procedure shall be followed each time a worker enters or leaves the controlled area.

MATERIAL

- A. Containers: Air and water-tight, suitable to receive and retain any lead containing or contaminated materials until disposal at an approved site, and labeled in accordance with OSHA Regulation 29 CFR §1926.62, 29 CFR §1910.145, and/or 49 CFR §172, 173, 178 and 179. Three (3) types of containers may be used:
1. Six mil plastic bags/sheet sized to fit within a drum or waste dumpster;
  2. Metal or fiber drums with tightly fitting lids; and
  3. Waste dumpsters with lids.
- B. Warning Labels and Signs: Will conform to OSHA regulation 29 CFR §1926.62 (Lead), DOT regulation 49 CFR §172, 173, 178 and 179 Regulations for Labeling, Mailing and Transporting Hazardous Waste, and/or EPA regulation 40 CFR §260, 261, 262, 263, 264 and 265 Hazardous Waste Regulations.

#### CONTROLLED AREA PREPARATION

- A. In Controlled Areas where Abatement and/or Removal by Scraping and/or Other Mechanical Means will occur, the Contractor shall:
1. Ensure that all ventilating systems or any other system bringing air into or out of the controlled area are disabled. Disable systems by disconnecting wires, removing circuit breakers, lockable switches or other positive means that will prevent accidental restarting of the equipment.
  2. Lockout power to circuits running through the controlled area whenever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation, "DANGER circuits being worked on." Lock panel and have all keys under control of Contractor's superintendent. If circuits cannot be shut down for any reason, label at intervals 4-foot 0-inches on center with tags reading, "DANGER live electric circuit. Electrocutation Hazard." Label circuits that are in hidden locations but which may be affected by the work in a similar manner.
  3. Construct any and all necessary temporary walls to completely isolate the area of lead-based paint disturbance.
  4. Critical Barriers: Seal all openings (doors, windows, etc.) with a 6-mil (minimum) flame resistant polyethylene containment barrier to prevent leakage of air into the outside environment or other portions of the building not being renovated.
  5. Cover the floor of the renovation areas with a minimum of one (1) layer of clear polyethylene sheeting, at least 6-mil in thickness.
  6. The Contractor shall set up a decontamination facility connected to the controlled area as indicated in subparagraph 1.12. This shall be done in accordance with OSHA Regulations 29 CFR 1926.1101.
  7. Any water discharged shall be filtered utilizing a filter with a maximum porosity of 5 microns prior to discharging the water into a drainage system. The drainage system shall be the closest available drainage system to the controlled area. The Contractor is responsible for making all necessary temporary utility connections to support his work and returning the building systems

to its original condition at the conclusion of the project. Measures shall be taken by the Contractor to prevent leaks.

8. All connections to Owner's water system shall include backflow prevention. The hoses used shall have a minimum pressure rating of 100 PSI. The pressure exiting any hose within the controlled area shall not exceed 30 PSI.
9. The Contractor shall maintain the polyethylene enclosure at a static pressure lower than the static pressure of the environment outside the polyethylene enclosure. The negative pressure differential between the polyethylene enclosure and the outside environment shall be achieved by moving air from the polyethylene enclosure to the outside environment via powered fan units exhausting through HEPA filters ("fan-filter units"). The Contractor shall furnish the fan-filter units. The enclosure must be smoke tested by the Contractor prior to lead-based paint work. A minimum pressure differential of -0.02 inches of water will be maintained across the barriers erected in the controlled area. A sufficient number of fan-filter units shall be utilized to maintain this pressure differential and maintain airflow of at least four air changes per hour in the removal area. The Contractor shall use a calibrated magnahelic gauge or anemometer to measure the pressure differential equipped with strip chart recorder, a copy of which will be incorporated in the post submittals by the Contractor. Collection of this data is the sole responsibility of the Contractor.
10. Each HEPA filter must be certified by the manufacturer to have an efficiency of not less than 99.97% when challenged with 0.3- $\mu$ m dioctylphthalate particles. The Contractor shall furnish a copy of the certification to the Owner.
11. The filtered exhaust air from the fan units will be exhausted outside the building ducted through a window. The exhaust duct shall pass through a polyethylene lined 1/2-inch sheet of plywood or comparable material to cover the opening. Ensure placement of exhaust air is not near or in close proximity to an air intake which supplies the building or adjacent buildings.
12. Ensure that barriers and plastic enclosures remain effectively sealed and taped. Inadvertent tears in plastic shall be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by six inches on all sides.
13. The Contractor shall establish emergency exits and procedures for the renovation area, satisfactory to fire officials.

#### LEAD-BASED PAINT WORK

- A. Abatement and/or Removal by Scraping and/or Other Mechanical Means (Minimum Requirements):
  1. Utilize water delivered in a fine mist from a hose or garden sprayer during scraping or agitating of the painted surfaces. The mist should cover the immediate abatement areas and should not be excessive to a point where standing or ponding water is present.



2. Remove the paint in a manner that will minimize airborne emissions of lead dust. The use of hand scrapers, needle guns, and like equipment will be acceptable. Materials should not be sanded.
  3. Upon abatement, immediately place the paint waste into a 6-mil bag and seal the bag opening with duct or fiber tape.
  4. After abatement of the lead-based paint, surfaces shall be wet-cleaned to remove residual accumulated material. After wet-cleaning, surfaces shall appear free of that flaking, chipping, and peeling paint and shall be ready for re-application of paint.
- B. Solvent Abatement and/or Removal (Minimum Requirements):
1. Solvent abatement methods shall be performed in strict compliance with manufacturer instructions.
- C. Minor Demolition of Lead-based Painted/Stained Surfaces with Paint/Stain In-place (Component Demolition, Minimum Requirements):
1. Spray a fine mist of water using a sprinkler-type sprayer during the renovation process. The mist should cover the immediate renovation area and should not be excessive to the point where there is surface run-off from the area of renovation.
  2. Upon demolition, immediately place the lead-based painted building materials into an appropriate disposal container (dump truck, dumpster, etc.). Cover and remove the debris from the site.

#### SAFETY AND HEALTH PROCEDURES

- A. The Competent Person shall be present on the work site throughout the renovation process to supervise, monitor, and document the project's health and safety provisions. A daily log shall be maintained that provides the results of any testing performed.
1. Safety and Health Responsibilities
    - a. The Competent Person shall:
      - 1) Verify that training meets applicable requirements.
      - 2) Ensure compliance with the LBP Work Plan.
      - 3) Enforce work practices to minimize airborne concentrations of lead.
      - 4) Ensure that workers are not exposed to airborne lead concentrations in excess of the PEL established by 29 CFR §1926.62.

#### MONITORING

- A. Personal Air Monitoring - Airborne concentrations of lead shall be monitored and analyzed in accordance with 29 CFR §1926.62. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls and work practices, the adequacy of PPE and air clearance

requirements. The Owner shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air and the Contractor shall take immediate steps to reduce the airborne concentration.

- B. Area Air Monitoring - Area air monitoring shall be performed in accordance with the contractor's LBP Work Plan. Air monitoring shall be performed while the airborne concentration baseline is being established and if an acceptable airborne concentration baseline is not obtained: Samples will be collected and analyzed in accordance with 29 CFR §1926.62. The Contractor shall provide the Owner with the results of area air monitoring within 48 hours after completion of the sampling.
- C. Clearance Air Monitoring – Personal and Area Air Monitoring results may be used for satisfactory compliance with clearance requirements if all of the results from the samples collected are below the Action level. Should any of the sample results be at or above the Action Level, independent clearance monitoring shall be performed in compliance with subparagraph 3.06.B.
- D. Clearance Wipe Samples – A minimum of three clearance wipe samples shall be collected using the following protocol:
1. Use a 4" x 4" or 8" x 2" clean plastic template to collect the wipe samples from the surfaces. While handling the template from the outside edge, carefully secure template to the surface to be sampled by taping the outside edge to the surface.
  2. Make a small tear in a clean dust wipe packet (Ghost Wipe™, or equivalent) and place it near the area to be sampled being careful not to contaminate the wipe.
  3. Put on clean disposable gloves being careful to only touch gloves at the wrist to avoid contaminating them (use a new pair of gloves for each sample collected).
  4. Remove dust wipe from its packet, open it fully, then refold it in half two times.
  5. With the fingers together, press down firmly beginning in one interior corner of the template and wipe down one side. Being careful to keep wipe within the perimeter of the template, repeat the process on the opposite side. Wipe along the top, inside perimeter of the template then from side to side in as many "S-like" motions as needed to cover the entire wipe area. At the end of the last "S", sweep toward the middle of the surface and pinch debris into the wipe, folding it once so that contaminants are trapped in the wipe.
  - f. Repeat the above procedure using the same wipe and S-like motion, but at a 90° angle to the first. Attempt to remove all visible dust or paint chips. Fold contaminated side inward again and insert wipe into a polyethylene bag for transport to the laboratory for analysis by Atomic Absorption Spectroscopy (AAS).

The following clearance criteria must be met prior to releasing the area to unprotected and untrained personnel:

Floors – 200 micrograms per square foot ( $\mu\text{g}/\text{sf}$ )  
Windows Sills (if applicable) – 500  $\mu\text{g}/\text{sf}$   
Window Wells (if applicable) – 800  $\mu\text{g}/\text{sf}$

Should the residual lead levels in a dust sample exceed the above clearance levels, all the components represented by the failed sample shall be re-cleaned and retested until clearance levels are met. Until all applicable clearance levels for the tested surfaces are found to be at or below the clearance levels, the area shall not be cleared for re-occupancy.

#### CLEAN-UP FOR CONTROLLED AREAS

- A. After the abatement of lead-based painted surfaces has been completed, the Contractor shall notify the Owner. The Owner shall visually observe the areas. Upon completion of the observation, and subsequent approval, the requirements of subparagraph 3.04.C shall be accomplished either by previous air monitoring results or by employing an independent testing firm to perform final clearance air sampling as identified in subparagraph 3.06.B. Upon successful completion of the final clearance requirements, the Contractor shall remove the decontamination unit. The remaining barriers between controlled and clean areas and all seals on openings into the controlled area shall be removed, packed into sealable plastic bags (6-mil minimum) and disposed of appropriately.
- B. All plastic sheeting tape, cleaning material, clothing, and all other disposable material used in the lead-based paint abatement process shall be packed into sealable plastic bags (6-mil minimum) and disposed of appropriately.

#### FIELD QUALITY CONTROL

- A. The Contractor is responsible for performing area and personal (OSHA compliance) air monitoring until the requirements of subparagraph 1.12.A. are successfully accomplished. The Contractor must also perform any other necessary tests required by regulations or codes and standards for the protection of his workers.
- B. The Contractor shall be responsible for area air monitoring (during and post abatement) until the requirements of subparagraph 1.12.A. are successfully accomplished. The minimum frequency of area air sampling shall be as follows:

##### During Renovation

2 per Controlled Area  
2 Outside Controlled Area

##### Final Clearance

2 per Controlled Area