



**SECTION 020720
PCB REMEDIATION OF BUILDING MATERIALS**

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the Contract and General Conditions and all Sections within Division 1 - General Requirements that are hereby made a part of this Section of the Specifications.
- B. Equality of material, article assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of the Contract and General Conditions.
- C. [Suspect materials are assumed to contain polychlorinated biphenyls (PCBs) at *PROPERTY NAME*] [Bulk samples of specific non-liquid building materials at *PROPERTY NAME* have been collected and tested for PCBs by *PCB CONSULTANT NAME*, as described in their report *REPORT TITLE AND DATE*. This report provides information on the materials that were tested, analytical results, and locations of confirmed PCB-containing materials. A copy of this report is included herewith as part of this specification section.]
- D. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligations to furnish all labor and materials necessary to perform the Work.
- E. The Contractor, or remediation Subcontractor, is responsible for conducting all Work as part of the PCB Remediation portion of the [*PROPERTY NAME*] in accordance with this specification, with all referenced documents included as part of this specification, with the standards and guidance documents listed below, and with all Federal, state and local regulations.

1.02 DESCRIPTION OF WORK

- A. It is the intent of the Work described in this section to segregate and remediate any [ASSUMED] PCB-containing materials that are scheduled to be removed or encapsulated in place as part of the overall [*PROPERTY NAME*]. As described in 40 CFR Part 761, the continued use of caulking/sealants containing PCBs at concentrations greater than 50 parts per million (ppm) is prohibited. If materials [ASSUMED TO CONTAIN] containing greater than or equal to 50 ppm PCBs are generated as waste, they would be defined as PCB Bulk Product Waste and would require disposal per 40 CFR 761.62. These materials within the project work areas include: [DESCRIBE MATERIAL] [as described in the EPA Approved PCB Remediation Plan IF USED].



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- B. If the Contractor, or remediation Subcontractor, encounters any previously unidentified and/or untested material that is suspected to be PCB-containing, the Contractor shall stop all work in the affected area and notify the Owner who will arrange for sampling and testing of the suspect material. If the material in question is in fact PCB-containing then the Contractor, or remediation Subcontractor, shall remove and dispose of the material in accordance with this specification, with all referenced documents included as part of this specification, and with all Federal, state and local regulations. Removal and disposal of any previously unidentified PCB-containing materials shall be performed by the Contractor at the unit prices bid for in this Contract.
- C. The work of this Section consists of, but is not limited to:
1. Furnishing of all labor, materials, facilities, equipment, services, and insurance necessary to perform the work;
 2. Maintenance of work area/site security;
 3. Preparation of work area, including installation of containment and decontamination areas as required;
 4. Removal, segregation, and/or containment of any PCB-containing materials encountered during the project work;
 5. Clean-up and final decontamination of all work areas;
 6. Implementation of a worker protection program in compliance with all applicable regulations;
 7. Proper storage, wrapping/bagging, labeling, transportation and [, unless otherwise arranged for by the Owner,] disposal of all waste generated as part of PCB remediation activities.
- D. The Contractor shall utilize all means possible to prevent PCB-containing materials from migrating out of the work area(s). This shall include, at a minimum, ground cover or staging/lift covers consisting of fire retardant polyethylene sheeting or equivalent, engineering controls to minimize dust (i.e., wetting the material prior to cutting).
- E. The Contractor, or remediation Sub-contractor, will clean all work areas at the end of each workday and will collect and store all PCB-containing waste as specified in Part 3 of this section.

1.03 RELATED WORK

- A. Section 013529 – HAZARDOUS MATERIALS HEALTH AND SAFETY
- B. Section 013543 – ENVIRONMENTAL PROTECTION
- C. Section 107419- CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT AND DISPOSAL
- D. Section 026000 – MISCELLANEOUS HAZARDOUS MATERIALS REMOVAL



- E. Section 026100 – EXCAVATED SOIL AND MATERIALS MANAGEMENT PLAN
- F. Section 028200 – ASBESTOS ABATEMENT AND RELATED WORK
- G. Section 028300 – LEAD-BASED PAINT REMOVAL AND RELATED WORK

1.04 PERMITS AND APPLICABLE STANDARDS

- A. The Contractor, or remediation Sub-contractor, must maintain current licenses or registrations pursuant to EPA and DEP regulations for all Work related to this Project, including the removal, handling, transport, and disposal of hazardous and industrial waste.
- B. The Contractor shall perform all work in accordance with these specifications, the USEPA and OSHA regulations, [the conditions of the USEPA Approval of the PCB Remediation Plan,] NIOSH recommendations, MassDEP and MassDOS regulations, local statutes, local ordinances, local codes and any other applicable federal, state and local government regulations and guidelines.
- C. The Contractor shall obtain all permits required to complete the work, including but not limited to utility work permits, discharge permits, or any other permits required by local government regulations as applicable.

1.05 REFERENCES

Perform Work in accordance with all applicable regulations, including but not limited to the publications listed below, which form a part of this specification to the extent referenced. The publications are referenced in text by basic designation only. The list provided below is not intended to be all inclusive of each regulation prevailing over the work. The latest version of the document listed shall govern the work performed. Where more stringent requirements are specified, adhere to the more stringent requirements.

- A. Environmental Protection Agency
 - 1. Polychlorinated Biphenyls (PCBs), Environmental Protection Agency, Toxic Substance Control Act, 40 CFR 761.
 - 2. Solid Wastes, Title 40, Subchapter 1, 40 CFR 240-299.
- B. Occupational Safety and Health Administration (OSHA)
 - 1. Respiratory Protection, 29 CFR 1910.134.
 - 2. Specification for Accident Prevention Signs and Tags, 29 CFR 1910.145.
 - 3. Hazard Communication, 29 CFR 1910.1200.
 - 4. Construction Industry, 29 CFR 1926.
- C. U.S. Department of Transportation (USDOT)



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1. Transportation Standard, 49 CFR 171-173.

D. Massachusetts Department of Environmental Protection

1. Hazardous Waste Regulations, 310 CMR 30.000.

2. Massachusetts Contingency Plan, 310 CMR 40.000.

3. Massachusetts Solid Waste Management Regulations, 310 CMR 19.000.

E. American National Standard Institute (ANSI)

1. Practices for Respiratory Protection, Z88.2-80.

2. Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-79.

F. City of Cambridge [City of Boston], Board of Health

G. Harvard University, Construction Environmental Health and Safety Standard.

1.06 DEFINITIONS

All terms not defined herein shall have the meaning given in the applicable publications and regulations.

A. PCB Remediation: Procedures to control releases from PCB-containing materials. Includes encapsulation, enclosure, and removal.

B. Air Monitoring: The process of measuring contaminant content of a specific volume of air in a stated period of time.

C. ANSI: American National Safety Institute

D. Remediation Contractor: Contractor responsible for conducting the work associated with the removal, handling, packaging, transportation and disposal of PCB waste materials.

E. Authorized Visitors: Any visitor authorized by Harvard, the Engineer or any representative of a regulatory agency or other agency having jurisdiction over the project.

F. Barrier: Any surface that seals off the work area to inhibit the movement of contaminated media.

G. Contractor: Refers to the General Contractor and/or Subcontractor responsible for the Work under contract with Project Manager.

H. Critical Barrier: An impermeable partition erected to constitute a work area closure.

I. Encapsulation: All herein specified procedures necessary to coat and seal surfaces containing residual PCB-containing materials to control the possible release of contaminated media into the ambient air.



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- J. Enclosure: All herein specified procedures necessary to conduct abatement of PCBs behind an airtight impermeable permanent barrier to prevent the release of contaminated media into the ambient air.
- K. Engineer: Authorized representative of the Harvard Project Manager. Engineer shall be the Architect or Designer of Record for the project.
- L. Harvard Project Manager: A representative of the Property Owner, President and Fellows of Harvard College.
- M. Harvard EH&S: Harvard University, Environmental Health and Safety Department
- N. HEPA Filter: Equipment with a High Efficiency Particulate Air (HEPA) filter, greater than 99.97 percent efficiency by 0.3-micron DOP test, and complying with ANSI Z9.2 (1979).
- O. Mass DEP: Massachusetts Department of Environmental Protection.
- P. Mass DOS: Massachusetts Department of Occupational Safety.
- Q. SDS: Safety Data Sheet
- R. MSHA: Mine Safety and Health Administration
- S. NESHAP: National Emission Standards for Hazardous Air Pollutants
- T. NIOSH: National Institute of Occupational Safety and Health
- U. OSHA: Occupational, Safety and Health Administration.
- V. PCB: Polychlorinated Biphenyls
- W. PCB Bulk Product Waste: Materials as defined by the USEPA Memorandum regarding PCB Bulk Product Waste Reinterpretation date October 24, 2012
- X. PCB Remediation Plan: [*PCB CONSULTANT NAME*] [*DATE OF REPORT*] Plan governing the removal and/or encapsulation of PCB wastes at the Site. [Reference to this Plan implicitly includes the conditions of EPA's Approval of the Plan.]
- Y. PCB Wastes: Building materials and debris, soil, disposable clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, or any remediation equipment that is or has been contaminated with PCBs and cannot be completely cleaned by vacuuming or by washing.
- Z. Removal: All herein specified procedures necessary to strip all PCBs from designated areas and to dispose of these materials at a permitted facility.
- AA. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
- BB. Subcontractor: Any contractor working for the General Contractor.



CC. USDOT: United States Department of Transportation

DD. USEPA: United States Environmental Protection Agency

1.07 TRAINING

- A. The Contractor, or remediation Sub-contractor, is responsible for ensuring that all remediation worker personnel shall receive appropriate training and information regarding the potential hazards of PCBs, safety and health precautions, and the use and requirements of protective clothing and equipment prior to the start of any remediation work. Note that the safety requirements specified within this section are due to the presence of PCB containing materials within the Work Areas and may exceed the minimum safety requirements set forth in the Harvard University's Construction Environmental Health and Safety Standard detailed in the Contract Documents. The requirements of this section do not abrogate the Contractor's responsibility to adhere to this manual; wherever there is a conflict or overlap of requirements, the most stringent provisions shall apply.
- B. The Contractor is responsible for establishing a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134. The Contractor shall provide respirator training and fit testing, and medical surveillance for those workers conducting removal or remediation activities that require the use of a respirator.

1.08 PROJECT MONITORING

- A. The Owner will contract directly with a Harvard EH&S approved independent consultant to perform construction oversight and testing services. These activities may include perimeter dust monitoring with a particulate dust meter during removal work to verify the effectiveness of the engineering controls and containment/controls and the collection of verification samples to document remediation completeness. In addition, Contractor personnel might be requested to wear personal sampling equipment by Harvard's consultant as a means to identify contaminant concentrations in the regulated workspace.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers.
- B. Store and handle materials in compliance with manufacturer's recommendations.

1.10 SUBMITTALS

- A. The Contractor shall submit each item in this Article according to the conditions of the Contract, for information only, unless otherwise indicated.
- B. All Contractor submittals shall be submitted to the Engineer at least [NUMBER] days prior to the start of Work.
- C. The Contractor shall submit a Remediation Plan to the Engineer clearly indicating the following:



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1. All work areas/containments;
2. Locations and types of all decontamination enclosures;
3. A description of the procedures to be used to contain, treat and dispose of water run-off and power-wash water;
4. Description of air monitoring locations, equipment, and procedures;
5. A description of the proposed packaging procedures;
6. Entrances and exits to the work areas/containments;
7. Type of remediation activity/technique for each work area/containment;
8. Sequence of Work activities;
9. Proposed location and construction of storage facilities and field office;
10. Location of utility connections to building services;
11. Waste storage locations (must be coordinated with EHS);
12. Waste transport routes to the waste storage containers;
13. Products, equipment, and materials to be used on the project, including specifications and Material Safety Data Sheets for all products used on the Project.

[The Contractor's Remediation Plan may require submittal to EPA as part of the Agency's Approval of this Work. Harvard EHS must review all documents prior to submittal to EPA.]

- D. A list of similar projects performed by the Contractor within the past two (2) years. The name, address, phone number and contact person shall be provided for each project reference.
- E. Site specific Health & Safety Plan, indicating the means and methods by which the Contractor will follow applicable Federal and State regulations regarding the work activities, including but not limited to OSHA regulations, fall protection standards, respiratory protection, ladder/scaffolding safety, personal protective equipment, etc.
- F. Handling and management of disposable protective clothing to be used on this Project.
- G. Treatment, Storage or Disposal Facility permits from applicable regulatory agency. The Contractor shall provide all information as required in Section 026100 Excavated Soil and Materials Management Plan, Part 1 – General, Item 1.09.
- H. Waste transporter permits and other transportation documentation. Harvard EHS must review all Waste Profiles and Shipping Manifests prior to shipment. Only an authorized representative of Harvard may sign shipping documents.
- I. Certification of compliance with OSHA requirements including but not limited to medical surveillance, record keeping and personal monitoring.



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Documentation of worker training, respiratory protection and medical examination.

- J. The Contractor shall submit Certificates of Insurance (COI) naming “The President and Fellows of Harvard College” as an additionally insured. The COI shall be sent directly to the Harvard University Insurance Office, 1033 Massachusetts Avenue, Cambridge, MA 02138 with copies provided to the Harvard Project Manager and the EH&S representative. Harvard shall be notified at least 10 days prior to any cancellation of the coverage. The Contractor shall provide evidence of the following insurance policies and at the following minimum limits:

1. General Liability: \$1,000,000 each occurrence/\$2,000,000 aggregate
2. Commercial Automobile Liability: \$1,000,000
3. Workers Compensation: \$1,000,000
4. Pollution Liability: \$2,000,000 each occurrence/\$5,000,000 aggregate
5. Excess Liability: \$2,000,000 each occurrence & aggregate

- K. Project Close-out Submittals:

1. The Contractor shall provide the originals of all waste disposal manifests, disposal logs, and Certifications of Disposal within 30 days of waste shipment.
2. The Contractor shall provide within 30 days of project completion all daily progress log, including the entry/exit log.

1.11 PROJECT SUPERVISOR

- A. The Contractor shall designate a Project Supervisor who shall meet the following qualifications:
1. The Project Supervisor shall be trained in PCB removal and hazardous waste management via an OSHA 40-hour HAZWOPER training and OSHA 8-hour Supervisor training.
 2. The Project Supervisor shall have a minimum of one year experience as a supervisor.
- B. The Project Supervisor must be on-site at all times during the execution of the Work of this section. The Project Supervisor shall be responsible for the performance of the Work of this section and shall be the primary point of contact for the Owner.
- C. The Site Safety Officer with the above-listed training can fulfill this role.

1.12 AUTHORITY TO STOP WORK

- A. Harvard has the authority to stop the work at any time it determines either personally or through the services of Harvard’s Engineer that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of Harvard’s Engineer. Standby time required to resolve



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violations shall be at the Contractor's expense, and any fines, etc., for hazardous conditions or non-compliance will be at the Contractor's expense, and will not be grounds for change orders or time extension.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner which shall not interfere with operation of others at the site, student's or employee's access and safety.
- B. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises. Materials that become contaminated with PCB-containing material shall be thoroughly cleaned, or sealed in plastic bags or sheeting, labeled, and legally disposed of in an approved, secure landfill.
- C. All materials and equipment shall comply, at a minimum, with all sections of this specification, applicable federal, state, and local codes, and industry standards.

2.02 REMEDIATION EQUIPMENT & SUPPLIES

- A. All plastic sheeting ("poly") and bags used on the Project (including but not limited to sheeting used for barriers, fixed objects, walls, floors, ceilings, and waste containers) shall be polyethylene or equivalent with a thickness of at least 6 mil for all applications.
- B. Tools used for the removal of caulking or other PCB materials shall be used in a manner that minimizes dust generation, as appropriate. Tools used to apply coatings shall be as recommended by the manufacturer.
- C. All dry vacuuming performed under this contract shall be performed with High Efficiency Particulate Absolute (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.
- D. Any power tools used to drill, cut into, or otherwise disturb PCB material shall be manufacturer equipped with HEPA filtered local exhaust ventilation.

2.03 SAFETY SUPPLIES AND PROTECTIVE CLOTHING

- A. All personnel must utilize proper PPE during all work activities. Proper PPE may vary depending on the job task, but may include disposable gloves, disposable rubber boots, steel-toe boots, Tyvek suits, protective vests, respirators, including replacement cartridges, hard hats, hearing protection, and eye protection.
- B. Respiratory Protection
 - 1. The Contractor shall provide all workers with a full or half face piece respirator which is approved by NIOSH/MSHA for protection against PCBs and dust and which meets the requirements of the OSHA Standard



under 29 CFR 1910.134.

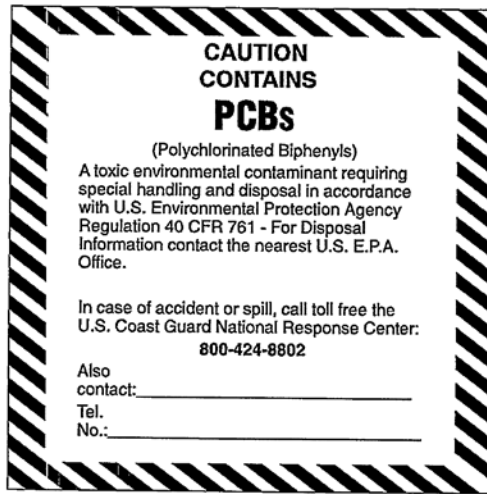
2. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist on a yearly basis. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual. The Contractor shall maintain fit-test records for each employee using a respirator.
 3. No respirators shall be issued to personnel without such personnel participating in a respirator training program.
 4. The Contractor shall provide a storage area where respirators will be kept in a clean environment.
 5. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process at a frequency at least as often as recommended by the manufacturer's specifications. Filters cannot be reused. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134.
 6. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.
- C. The Contractor shall provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing remediation Work.
- D. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
- E. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area. Authorized visitors will not enter a Work Area where respiratory protection is required unless the visitor has been approved and individually fit-tested for respirator use.

2.04 SIGNS, LABELS, AND CONTAINERS

- A. Provide warning signs and barrier tapes at all approaches to the PCB-designated Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area. If necessary, signs should be legible in the language(s) of the workers.
- B. Provide the appropriate "Large PCB Marking" or "Small PCB Marking" (M_L or M_S per 40 CFR 761) as shown below, of sufficient size to be clearly legible, for display on waste containers (bags, boxes, rolloffs or drums) which will be used to contain or transport PCB contaminated material, in accordance with 40 CFR 761. In addition, U.S. Department of Transportation (DOT) 49 CFR Parts 171 and 172 requires the name and UN number of the material to be on the bags or drums, and, if shipped in bulk (rolloffs, Gaylord boxes, etc) the bulk container must also be

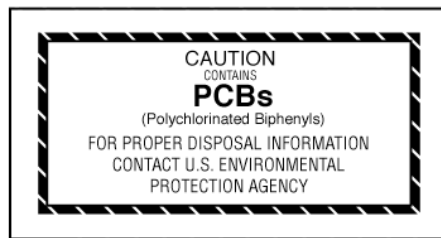


labeled: Polychlorinated biphenyl, solid mixture UN 3432, if designated as hazardous waste.



M_L

M_S



- C. Some PCB materials may also be Hazardous Waste and must have a label stating the following on each container :

HAZARDOUS WASTE--Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority, or the U.S. Environmental Protection Agency.

Generator's Name and Address:

Generator's EPA Identification Number:

Manifest Tracking Number:

- D. Provide 6 mil polyethylene disposal bags with PCB caution labels.
1. The "Small PCB Label" (M_S per 40 CFR 761) may be used as shown above. Bags shall also be labeled with U.S. DOT required markings per 49 CFR 172, Polychlorinated biphenyl, solid mixture UN 3432.
 2. Labeled PCB waste containers or bags shall not be used for non-PCB waste or trash. Any material placed in labeled containers or bags, whether turned inside out or not shall be handled and disposed of as PCB waste.



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- E. A secure, lined, and covered waste container (roll-off or equivalent), 55-gallon DOT-approved steel containers, or equivalent will be staged for the collection of PCB wastes generated during the work activities in accordance with 40 CFR 761.65.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. The work of this section consists of, but is not limited to:
 - 1. Furnishing of all labor, materials, facilities, equipment, services, and insurance necessary to perform the work;
 - 2. Maintenance of work area/site security;
 - 3. Preparation of work area, including installation of containment and decontamination areas as required;
 - 4. Removal, segregation, and/or containment of PCB-containing materials;
 - 5. Clean-up and final decontamination of all work areas;
 - 6. Implementation of a worker protection program in compliance with all applicable regulations;
 - 7. Proper storage, wrapping/bagging, labeling, transportation and disposal of all waste generated as part of PCB remediation activities..

- B. All remediation activities are to be conducted in accordance with the [REPORT DATE] [REPORT NAME] [and the conditions of the EPA's Approval].

- C. The Contractor shall provide a description of the means and methods, which will adhere to these specifications, of all aspects of the remediation activities to the Owner prior to commencing remedial activities, which will be subject to Owner review and approval.

- D. The Contractor shall develop a Site-Specific Health & Safety Plan (HASP) for their workers and specific to the work activities as described in Paragraph 1.05E of this Section.

- E. The Contractor is responsible for immediately reporting any breach in containment, health and safety incidents, and/or any on-site visits by a regulatory agency to the Owner.



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- F. The following documentation shall be maintained on-site by the Contractor during remediation activities:
1. Medical approval, fit test reports, Worker Acknowledgments, and Training certificates
 2. Project documents (PCB Remediation Plan, contractor work plan, drawings, specifications, etc.)
 3. Material Safety Data Sheets
 4. List of Emergency Contact Information
 5. Project logs (as applicable)

3.02 WORK AREA PREPARATION

- A. Access to the active work areas will be controlled through the use of controlled access points, fire retardant polyethylene containments, and/or signage.
- B. [Polyethylene containments will be constructed to enclose each work area prior to conducting remediation work in that work area. All polyethylene (plastic) sheeting used on the Project shall be at least 6-mil fire retardant sheeting as described in Paragraph 2.02 of this Section.]
- C. All movable objects shall be removed from the work area prior to conducting work. All non-movable objects shall be covered with 6-mil fire retardant polyethylene sheeting and sealed at the edges.
- D. All work areas and work area perimeters will be kept free from debris and maintained in a safe condition. At the end of each work day, the work areas will be inspected and all dust and debris cleaned and placed in appropriate disposal containers.

3.03 REMOVAL OF PCB CONTAINING BUILDING MATERIALS

- A. This work includes the removal and off-site disposal of the following PCB-containing materials in accordance with the [PROPERTY NAME] PCB Remediation Plan: [DEFINE SCOPE OF WORK]
- B. [PCB-containing materials subject to removal and off-site disposal shall be removed through a combination of mechanical and physical means. Proper removal techniques and engineering controls shall be utilized to minimize the generation and spread of dust and debris throughout the work area:
1. Caulking removal will be conducted using hand tools or mechanized caulking removal guns; [no grinding or sawcutting is permitted to remove or pulverize caulking from interior or exterior locations]. All tools will be used in a manner that minimizes dust generation.
 2. [Concrete removal in areas requiring remediation or repairs will generally consist of:



- i. Sawcutting around sections of damaged concrete to achieve a repair surface bounded by smooth and straight edges;
 - ii. Chipping out the block of cut concrete;
 - iii. Grinding out and replacing corroded rebar as needed; and,
 - iv. Patching the surface with new concrete.]
 3. [PROVIDE A DESCRIPTION AS TO THE EXTENT OF REMOVAL OF PCB-CONTAMINATED CONCRETE/BRICK/MORTAR]
 4. [All powered tools will be manufacturer equipped with appropriate tool guards and dust/debris collection systems (i.e., HEPA filters). Wet wiping and vacuuming of all tools and equipment in the work area will be performed at the completion of the work activity.]
 5. [All dry vacuuming performed under this contract shall be performed with High Efficiency Particulate Absolute (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.]
- C. Air monitoring within the support work zone and perimeter to this zone will be conducted during the active removal of caulking and concrete. To reduce dust levels and exposures to dust, a combination of engineered controls (e.g., wetting, work zone enclosures), equipment equipped with HEPA filters and dust controls, and personal protective equipment (PPE – respirators) will be implemented as part of the work activities. Air monitoring will be conducted [in accordance with the EPA approved PCB Remediation Plan.]
- D. PCB containing materials shall be transported in appropriate containers (polyethylene bags, drums, etc.) from the Work Area along a designated route to the proper waste disposal containers.

[3.04 APPLICATION OF ENCAPSULANT COATING

- A. Surfaces subject to encapsulation shall be prepared as described in the PCB Remediation Plan and as recommended by the product specifications. Estimated Area = XXXXX ft².
- B. The encapsulation of building materials shall be conducted using the coatings specified in the PCB Remediation Plan, including Sikagard 62, Sikagard 670W, Sikadur 35, BASF Sonoguard, or approved equivalents;
- C. The application of each encapsulating product is to be conducted in accordance with the manufacturer's specifications must be included in the PCB Remediation Plan.



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3.05 INSPECTION AND VERIFICATION

- A. At the end of each work day, the Contractor is responsible for inspecting and verifying the work areas are clean and free from dust and debris and secured to prevent unauthorized access.
- B. Following removal of PCB containing materials and encapsulant application, inspection and verification testing will be performed by Owner's consultant to verify completion of the EPA approved remediation activities.
- C. The Contractor is responsible for inspection of all waste storage containers and waste transport routes to verify proper waste handling, storage, and labeling in accordance with all applicable federal and state regulations.
- D. Prior to removal of the containment structures, the Contractor is responsible for verifying all remedial actions have been completed in accordance with the Remediation Plan.
- E. To verify task completion, sample collection and analytical testing may require up to a **XXXX** business day turnaround time prior to receiving verification results. Appropriate project planning and scheduling should be incorporated into the overall project plans.

3.06 EQUIPMENT AND WORK AREA DECONTAMINATION

- A. The Contractor, or remediation Subcontractor, will clean all work areas at the end of each workday and will collect and store all waste generated from the remediation process (e.g., removed PCB containing material, dust from HEPA filters, etc.) in secure, closed containers that are properly labeled.
- B. When remediation of PCB materials is completed via verification inspections and/or sampling, the decontamination process shall consist of vacuuming (with a HEPA filter), wet wiping/mopping and a repeated vacuuming (with a HEPA filter) of the entire interior work area. All surfaces in and around the work area must be free of dust generated during the work. Final cleaning shall be performed only after all PCB-waste is packaged and removed, but before reinstalling or demolishing any equipment, or dismantling any barrier, decontamination facilities, or protective coverings. Cleaning shall be subject to the approval of Owner's Engineer based on a visual inspection and air testing.
- C. Decontaminate all tools and equipment before removal from the work area in accordance with EPA guidelines.
- D. If dust or debris has migrated to areas of the building other than the immediate work area, those areas shall be incorporated into the work area and thoroughly decontaminated to ensure all visible dust generated by the activity is eliminated.
- E. Remove containment barriers and any other protective sheeting. Place in disposable construction bags (6-mil poly) and dispose of as PCB waste.
- F. Visually inspect the area for any remaining dust or debris. Vacuum (with HEPA filter) and wet wipe until space is clean.



- G. After completing decontamination and removing containment barriers, a final inspection shall be performed by the Contractor and Owner. If the visual inspection reveals that additional cleaning is needed, the Contractor will clean or re-clean the affected areas at no additional expense to the Owner.
- H. The Contractor, or remediation Subcontractor, shall not stockpile any PCB waste on-site that is not properly containerized and labeled in accordance with this Section.
- I. The Owner will designate a temporary 'hazardous waste storage' area for the storage of PCB waste. The location will be determined prior to the start of Work.

3.07 PCB WASTE DISPOSAL

- A. **General Requirements** - All PCB wastes must be handled, packaged, stored, transported, and disposed of as specified in this subsection, and in compliance with all federal, state and local regulations and codes. The Contractor, or the remediation subcontractor, is responsible for the disposal of all PCB waste and other solid waste debris generated at the Project. The Contractor shall give seventy-two (72) hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor and Harvard EH&S representative are present and the Harvard EH&S representative authorizes the release of the waste as described herein.
- B. **Waste Labeling** - All waste shall be labeled using the labels described in Section 2.04. If waste containers are not already so preprinted, warning labels having waterproof print and permanent adhesive shall be affixed to the lid and/or sides of the containers, whether or not these containers are further packaged. Warning labels shall be conspicuous and legible, and conform to the latest OSHA, EPA and DOT labeling requirements. The Contractor shall properly wrap/bag all waste from the remediation process (e.g., removed PCB-containing material, dust from HEPA filters, etc.) within the work area. Wrapped/bagged waste shall be stored in secure, closed containers (e.g., drums, roll-off containers) and labeled.
- C. **Waste Packaging** - The Contractor shall inspect each bag, drum or container to ensure that the package is secure. The secure drum/container shall then be placed in the designated temporary storage area.
- D. **Waste Container Removal and Disposal Documentation**
 - 1. All waste generated as part of the PCB remediation work shall be removed from the Site within [NUMBER] calendar days after successful completion of all PCB remediation work.
 - 2. It is the responsibility of the Contractor to determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The Contractor and its subcontractors must comply fully with these documents and all DOT and EPA requirements.
 - 3. The Contractor shall only make arrangements with and dispose PCB waste at a Harvard approved facility.



4. The Contractor, transporter and landfill shall document generation, transport and disposal of the waste by use of the Hazardous Waste Manifest. This record is a legally required document, which identifies the generator, transporter(s), temporary storage location(s) and disposal site for any PCB-waste material. The waste management facility shall also provide the Owner with a copy of the Certificate of Disposal.