

The following standard specification is intended to be edited according to the specifics of the project. Brackets [ ] and areas shaded in gray [e.g. format] indicate requirements that are optional depending upon the type of system being provided or per instructions associated with the [ ] and project requirements. Consult with University's Representative and campus stakeholders.

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Make sure that your authorization indicates that the University's hazardous materials consultant will be performing the services indicated.

## SECTION 02 84 00 PCB REMEDIATION

### PART 1 - GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. General: Remove and dispose of PCB insulated and PCB contaminated construction material and electrical equipment. Specific items of equipment include:
1. Transformers - Where listed in the Contract Documents or as listed in 02 82 00 Asbestos Remediation. Specific items include one transformer with switchgears on the east side of the site.
  2. PCB light ballasts - Where scheduled in the Contract Documents or as listed in 02 82 00 Asbestos Remediation. Specific items include 420 assumed PCB lighting ballasts.
- B. Procedure: The work of removing and disposing of PCB insulated and contaminated equipment shall be performed by a Contractor licensed in the State of California, having a special Hazardous Classification, and in general, consists of the following:
1. The Contractor will perform tests on all oil-filled transformers scheduled for removal to confirm levels of PCB contamination prior to removing equipment. All testing shall be performed by a State certified laboratory.
  2. Insulating Liquid: Drain all PCB and/or PCB contaminated liquids from the equipment into containers suitable for transport to the disposal site.
  3. Equipment Carcass: Seal the drained equipment carcass adequately to prevent leakage of PCB or PCB contaminated liquids from the carcass during handling and transport to the disposal site.
  4. Remove from the Campus: Remove the liquids and equipment carcass from the Campus. Transport with the use of drip pans and/or secondary containers to ensure that liquids or contaminated solids are not dripped or spilled onto the Campus improvements, roadways, or on the surfaces on which the carcass and liquids are transported.
- C. Transport: Shall be by a Contractor licensed by the State of California to transport extremely hazardous waste. The following specific requirements apply:
1. The driver of the transportation vehicle shall be trained in the laws, rules, and regulations governing PCB's.
  2. Vehicles used for transportation of PCB's and PCB contaminated material must be licensed, and marked, as required by DOT for transport of extremely hazardous waste.
- D. Disposal: Disposal of all waste must be at a site, and all subsequent sites, which are approved by all Federal and State Authorities having jurisdiction, and the University. Disposal in a chemical waste landfill is not permitted. Disposal shall be accomplished in the following manner:

1. General: The Contractor shall dispose of all materials removed in compliance with the requirements of 40 CFR Part 761, Subpart D, except as otherwise specified herein.
2. Disposal of PCB and PCB Contaminated Fluids: Fluids containing PCB's in a concentration of 5 ppm, or greater, shall be disposed of by destructive incineration.
3. Combustible Solids: Shall be disposed of by incineration in an EPA approved manner at an EPA approved facility.
4. Metallic Components: Shall be smelted after cleaning and decontamination to below the EPA Standard for PCB free material. Smelting shall be in compliance with EPA Regulations.

## 1.2 STANDARDS AND CODES

- A. General: Comply with all laws, ordinances, rules and regulations of Federal, State, Regional, and local authorities, having jurisdiction, concerning the handling, storage, transporting, and disposing of PCBs and PCB contaminated liquids and solids. Comply with all applicable requirements of the Federal EPA.
- B. Specific Reference: Work and materials shall be in compliance with and according to the requirements of the latest revision of the following standards and codes:
  1. Federal EPA: All Applicable Codes, Regulations, and Interpretations
  2. Code of Federal Regulations (CFR) Publications
    - a. Section 6, TSCA 1976 Toxic Substances Control Act
    - b. 29 CFR 1910.145 Specifications for Accident Prevention Signs & Tags
    - c. AD-AO63 271/1 Polychlorinated biphenyl's PB-288410/4 Method for sampling & analysis of PCB in ambient air
    - d. 40 CFR 260 Hazardous Waste Management Systems: General
    - e. 40 CFR 263 Regulations for Hazardous Waste Generators
    - f. 40 CFR 271 Requirements for Authorization of State Hazardous Waste Programs
    - g. 40 CFR 761 PCB Manufacturing, Processing, Distribution, Commerce and Use Prohibition
  3. Department of Transportation (DOT) Publications
    - a. 49 CFR 178 Regulations for Shipping Container Specifications
  4. State of California Code of Regulations (CCR)
    - a. Title 8 Department of Industrial Relations
    - b. Title 22 Department of Health Services C. Interpretation: Submit matters of interpretation of standards, codes, and regulations to the University prior to starting the work.
- C. Priority of Application: Where the requirements of this Specification and of the referenced documents differ, the most stringent requirement shall apply.

## 1.3 SUBMITTALS

- A. General: In accordance with 01 33 23 Shop Drawings Product Data and Samples submit the following to the University for review and approval. Work affected by these submittals may not be started, or proceed, until the relevant submittal is approved by the University.

- B. Submit Prior To Beginning Work:
  - 1. Proof of Licensing and Experience: Submit written proof of licensing and experience as specified in this Section.
  - 2. Work Plan and Project Schedule: Submit plan as specified in this Section.
  - 3. Health and Safety Contingency Plan: Submit plan as specified in this Section.
  - 4. Material Submittal: List of material to be used, with the manufacturer and specification for each item.
  - 5. Supervisor: Name and Qualifications of the PCB Supervisor specified in this Section.
- C. Submit on Completion of Work:
  - 1. Completion Records: Records as specified under "Record Keeping", hereafter.
  - 2. Disposal Certificates: Certificates as specified in this Section.

#### 1.4 ENVIRONMENTAL HEALTH AND SAFETY OFFICE REQUIREMENTS

- A. The University's Environmental Health and Safety (UCDEH&S) Office is responsible for maintaining the database for all PCB containing equipment on the Campus as well as for the proper removal and disposal of PCB containing equipment. Contractor shall coordinate with all requirements of the UCDEH&S office to provide necessary documentation and to perform work in accordance with required safety practices and guidelines.

#### 1.5 QUALITY ASSURANCE

- A. General: The quality assurance requirements are intended to enhance the achievement of removal of the PCB equipment without spill or contamination of other materials than those specified to be removed.
- B. Experience: The firms for this work must be licensed, by the authorities having appropriate jurisdiction, to offer to provide the work specified. This requirement applies to the removal, the hauling, and disposal.
- C. The firm for each of these categories of work must have, as a main business activity, not less than 5 years experience in the work they are offering to perform.
- D. Single Party Responsibility: The Contractor shall be responsible for accomplishing all work related to the removal, handling, and disposal of polychlorinated biphenyl's (PCB) containing articles and PCB contaminated articles as indicated on the Drawings and as specified herein.
- E. Observation by the University of the Work in Progress: To verify that the work complies with the requirements herein, and good practice.

#### 1.6 WORK PLAN

- A. Description: Narrative of the step-by-step procedure to be employed in draining, removing and disposal of the PCB equipment specified under "Description of Work", heretofore.
- B. Specific Activities: Those described shall include the following for each location of PCB contaminated equipment.
  - 1. Securing of the Work Area at each contaminated equipment location. Description includes barricades, roping, warning signs, and other measures to identify the work area and prevent unauthorized entry to it.
  - 2. All activities involved in all phases of the operation, including securing draining, handling, loading, and transportation.
- C. List and Description: List and description of all vehicles, equipment and personnel to be used in accomplishing the work. Include the name and location of the disposal facility at

which the equipment carcasses, the drained PCB liquids and PCB solvents or waste are to be destroyed. Submit evidence that a current valid permit has been issued by the EPA authorizing the facility to dispose of PCB wastes.

- D. Precautions: Precautions and other measures required to protect employees and the general public from exposure to PCB liquids, solids, and vapors.
- E. Submit for Approval: Submit the plan to the University for approval prior to beginning any work in the work area. Work may not be started until the plan is approved by the University.
  - 1. The plan shall be used as a checklist by the Contractor and the University to ensure that proper procedures and precautions are taken in removal of the contaminated equipment.

#### 1.7 HEALTH AND SAFETY CONTINGENCY PLAN

- A. Description: Develop a Health and Safety Contingency Plan to prevent and control spills of PCB materials. Plan shall include:
  - 1. All steps and measures the Contractor will take in the event of a spill or other emergency.
  - 2. Safety procedures and measures to be employed in all phases of the work.
  - 3. First aid and personnel decontamination measures.
- B. Submit for Approval: Submit the plan to the University for approval prior to beginning any work in the work area. Work may not be started until the plan is approved by the University.
  - 1. The plan shall be used as a checklist by the Contractor and the University to ensure that proper procedures and precautions are taken in removal of the contaminated equipment.

#### 1.8 REQUIRED SAFETY PRACTICES

- A. Work Area Security: After removal of PCB contaminated fluids from contaminated equipment has begun, the work area shall not be left unattended until all fluids and solids which have come in contact with PCB's are properly sealed in EPA specified non-leaking drums and the work area is secured.
- B. Scheduling of Activities: PCB related activities shall be scheduled such that all PCB articles and items are transported to the approved disposal and/or servicing/storage facility as soon as the PCB and/or PCB contaminated fluid is removed and sealed in EPA specified containers as identified herein.
- C. Contained in Work Area: All equipment such as pumps, containers, etc., shall be confined to the work area until containers are sealed and equipment such as pumps are decontaminated in accordance with EPA regulations and properly secured for transport.
- D. Wear Protective Clothing: At all times when PCB or PCB contaminated fluids, in any volume, are not sealed in drums, containers, or electrical equipment, all workers shall wear protective clothing. Clothing shall include:
  - 1. Disposable non-porous gloves, disposable coveralls, and disposable shoe covers.
  - 2. Eye protection to ensure that eyes are protected from liquid splatter or exposure to concentrated vapors or fumes.
  - 3. In confined areas, breathing apparatus shall be worn to provide protection from exposure to vapors or fumes.

4. Upon exiting the work area, all disposable protective clothing shall be placed in EPA specified containers; containers sealed, and disposed of with other PCB solids.
5. All pumping of PCB or PCB contaminated fluid shall be done under vacuum (negative pressure). No pressure hoses shall be permitted.

#### 1.9 LICENSE, FEES, AND PERMITS

- A. Hazardous Waste Transport: The Contractor shall be, or shall employ the services of, a Hazardous Waste Hauler, licensed by the California Department of Health Services for transportation of PCB and PCB contaminated material.
- B. Applications for Permits: The Contractor shall, at the University's option, prepare applications for permits and licenses required for performance of work covered by the Specifications. The Contractor shall, under no circumstances, apply for any license or permit on behalf of the University, nor shall the Contractor sign any manifest, application, or any other legal documentation on behalf of the University.
- C. Shipping Hazardous Waste: At least 3 working days prior to shipping any hazardous waste, the Contractor shall provide the University's Representative with a legible copy of any and all State manifest documents to be used for shipping of the waste. The University's Representative through the University's Environmental Health and Safety (UCDEH&S) Office shall be responsible for reviewing these manifests. Arrangements for signing the shipping documents must be coordinated with UCDEH&S at least 3 working days in advance of the shipment.

#### 1.10 RECORD KEEPING

- A. Record Required: During the course of the work the Contractor shall maintain a legible written record of his activities. This record shall be available for inspection by the University's Representative at all times. The record shall include the following data:
  1. PCB Supervisor Data: Name, organization, position and phone number of the PCB supervisor.
  2. Equipment Data Recorded: This record shall include the following data:
    - a. Equipment manufacturer, serial number and weight.
    - b. Date removed from service.
    - c. Date drained and flushed.
    - d. Date transported to the servicing facility.
    - e. Date destroyed.
  3. Container Data Recorded: Type, size, weight, contents and date transported to servicing or disposal facility.
  4. Name, license, number, address, phone number, and contact person for each firm involved in the following:
    - a. Removal of PCB fluids.
    - b. Handling and rigging of PCB contaminated equipment.
    - c. Transportation of PCB fluids and contaminated equipment.
    - d. Service of PCB containers.
    - e. Preparation of PCB contaminated equipment carcass for destruction.
    - f. Incineration of PCB fluids and other materials incinerated.
    - g. Smelting of metallic parts of the carcass.
    - h. Disposal of other decontaminated materials.
    - i. Submit to University: At the completion of the Work the Contractor shall submit to the University 3 typed or printed copies of the completed record, completeness and accuracy attested, and signed by the PCB supervisor.

#### 1.11 CERTIFICATES

- A. Required Certificates: Provide the following written certificates and submit them to the University:
  - 1. That PCB fluids are removed from the equipment.
  - 2. That PCB equipment is disassembled and decontaminated.
  - 3. That metals are smelted.
  - 4. That all combustible materials are incinerated.
  - 5. That all other materials are PCB free and properly disposed of.
- B. Combining Certificates: Two or more of the required certificates may be combined in one document, at the option of the Contractor.
- C. Required Information: Each certificate shall include the following information:
  - 1. Description of the material that is the subject of the certificate, including any serial number or identifying marks.
  - 2. Agency involved in the certification and their license number.
  - 3. Method of disposal, where appropriate.
  - 4. Individual signing and their position and function in the agency involved.

#### 1.12 PCB SUPERVISOR

- A. Supervisor of PCB Related Activities: The Contractor shall provide the services of a qualified PCB services supervisor.
- B. Duties: All PCB related work shall be under the direct supervision of the PCB supervisor; including, draining, flushing, pumping and handling of PCB fluids and PCB contaminated equipment.
- C. Qualifications: Shall include the following:
  - 1. Have completed a formal EPA approved course on PCB handling regulations; and the handling, marking, transportation, disposal, spill prevention, spill cleanup, safety precautions, and testing of PCB fluids and PCB contaminated equipment.
  - 2. Awareness of the obligation to and responsibility for protection of people, property, and the environment from exposure to hazardous materials.
  - 3. A minimum of 2 years successful experience in PCB handling, disposal, and/or cleanup.
  - 4. Qualifications of the supervisor shall be subject to review by, and approval of, the University.

### PART 2 - PRODUCTS

#### 2.1 CONTAINERS

- A. Description: As specified by the appropriate EPA regulations for the storage and/or transporting of PCB liquids and solids.

#### 2.2 SOLVENTS AND CLEANERS

- A. Description: Kerosene, or other fluids in which PCB's are highly soluble, as permitted by EPA regulations.

#### 2.3 SORBENTS

- A. Description: Granular material, powdered dry clay, blankets and pillows of non-woven fiber, amorphous inorganic foam particle pillows, or equal.

#### 2.4 PUMPS

- A. Description: Where used for draining of PCB equipment, shall be as appropriate, equipped with an automatic shutoff device sensing drum fluid level, and directly controllable for on/off by the drum filling operator.

- B. Max Flow Rate: The maximum pump flow rate for pumping into drums, or other storage container, shall be less than 16 gpm.
- C. Automatic Bypass: Each pump shall be equipped with an automatic pressure operated bypass, operated to cause bypass of the pump discharge connection to the pump intake at a pressure of 40 psi maximum.

## 2.5 HOSES

- A. Description: Shall be as required and appropriate, compatible with the material pumped, and of reinforced construction, rated for 120 psi (min) operating pressure.

## 2.6 VALVES

- A. Description: Provide quick shutoff valves on the drain fittings of equipment to be drained. Valves shall be 90 degree ball valves.

## 2.7 PROTECTIVE COVERING

- A. Description: Two layers of continuous, non-woven, plastic membrane. Each membrane 4 mils thick, except membranes applied to floor areas shall be 6 mils thick.
- B. Membrane Joints: Shall butt and membranes shall be connected and then joint sealed with a continuously applied self-adhesive plastic tape of thickness equal to the membrane.
- C. Fastening to Surface Protected: Affix to the surface with continuous tape applied to the membranes and to the cleaned surface.

## PART 3 - EXECUTION

### 3.1 LABELING

- A. Description: Provide contamination labels affixed to all PCB contaminated materials.
- B. Labels: Shall be as specified by EPA.

### 3.2 CONTROL AREA

- A. Control Area Required: Establish a PCB control area at each PCB equipment location, encompassing the area of work. The area shall be designed to restrict PCB material and handling activities, and to prevent the entrance of unauthorized persons into the area of PCB contamination, and of removal work.
- B. Barricades and Screening: Define and barricade the Control Area by portable panels, curtains, barricades, and other barriers that will prevent people and animals coming in contact with PCB contaminated materials and will prevent PCB contaminated liquids, vapors, mists, or solids from leaving the Control Area.
- C. Signing: Provide warning and control signs at all entrances to the Control Area. Locate the signs at such a distance from the Control Area that they may be read and appropriately reacted to prior to entering the area.
  - 1. Signs shall warn persons approaching the Control Area and shall clearly instruct them how to avoid contamination and avoid entering the area.
  - 2. Removal of Signs: Remove the signs only after all work is completed, PCB contaminated materials have been removed, and final cleanup completed.
- D. Protective Coverings: Provide protective covering of walls, floors, ceilings, and equipment in and adjacent to the control area. Floor covering shall extend not less than 12 inches up walls in, or immediately adjacent to, the Control Area. At completion of the work, coverings shall be disposed of in sealed EPA specified containers as PCB contaminated material.

- E. Cleanliness: Maintain the Control Area clean at all times, free of debris, cloths, trash, and contaminated material.
- F. Cleanup: Do not hose down the area. Clean and maintain cleanliness with mechanical procedures and the use of appropriate solvents. Any concrete, or other porous surface that has been contaminated shall be scrubbed with sorbents, solvents and cleaners, with appropriate cleaning devices. The area shall be cleaned and left in immaculately clean, PCB free, condition.

### 3.3 EQUIPMENT DECONTAMINATION

- A. Description: After completion of the Work, all pumps, hoses, drip pans, tools, and equipment used shall be decontaminated in accordance with applicable EPA regulations. Any contamination on the surfaces of any equipment shall be removed prior to the equipment being removed from the Control Area.

### 3.4 CONTAMINATED FLUID HANDLING

- A. Containment: Prior to commencing any pumping operation, secondary containment shall be provided around the drums to be filled.
- B. Equipment Integrity: Prior to commencing any pumping operation, the functionality and integrity of the pumping system, the pump shutdown equipment, and all hoses shall be verified.
- C. Preparation: Prior to commencing any pumping operations, sorbents in an amount adequate to absorb a multi-gallon spill shall be placed within the work area, immediately available.
- D. Monitoring: During all pumping operations, trained personnel shall be continuously present and properly equipped to clean up any spills.
- E. Drum Handling: Drums shall not be filled in excess of 95% of their capacity to provide room for expansion after sealing. PCB fluid filled drums shall be handled by one of the following methods:
  - 1. By a hoist or lift truck utilizing a two point drum lifter, only.
  - 2. By a hoist or lift truck provided with a band around type drum lifter.
  - 3. By a lift truck lifting the drums from underneath by a pallet attached to the drum by a banding arrangement.
  - 4. By a hoist or lift truck lifting the drums by means of a specially designed and self-tightening flexible drum harness.
- F. Into Containers: All liquids generated as a result of this work and of cleanup operations shall be placed in EPA specified containers. All solids generated, such as sorbents, rags, protective clothing, and other materials, shall be placed in EPA specified containers. All containers shall be properly sealed, marked, labeled, and dated.

### 3.5 EQUIPMENT FLUSHING & DISASSEMBLY

- A. Flushing & Disassembly Required: Equipment shall be flushed, torn down, and decontaminated after removal from the site and before final disposal. All materials shall be incinerated or decontaminated to PCB free status at a special facility. Procedure shall include the following:
  - 1. Work at Permitted Facility: Equipment flushing, disassembly, and teardown shall be done at a service facility permitted to perform such activities, complying with all governmental regulations and requirements. Equipment flushing and teardown shall not be done on-site.

PROJECT TITLE  
CONTRACT TITLE  
UNIVERSITY OF CALIFORNIA, DAVIS  
CITY, CALIFORNIA

PROJECT NO: 0000000  
GRANT NO: 0000000

2. Equipment Disassembly: After preliminary cleaning, equipment shall be disassembled to the basic component level to permit incineration or decontamination of each individual component part.
  3. Metals Decontamination: Metal parts and components shall be processed through several decontamination/cleaning stages until the material PCB contamination is less than 10 #gmcG/100 CM2 - the EPA standard for PCB free metal.
  4. Combustible Solids: Shall be collected and placed in EPA specified containers, ready for incineration.
  5. Segregated Containers: All materials, parts, and components shall be placed in EPA specified containers, segregated by type of material and disposal method. Combustibles, PCB fluids, and flushing/decontamination fluids to be segregated for incineration. Metals to be segregated for decontamination.
- B. Container Identification: Embossed metal tags shall be affixed to each container specifying material contained, date and source of origin.

END OF SECTION 02 84 00