



SECTION 026000
MISCELLANEOUS HAZARDOUS MATERIALS REMOVAL

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, which 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.

1.02 DESCRIPTION OF THE WORK

- A. Certain building components at [PROPERTY NAME] have been identified as requiring proper removal and disposal before any general demolition/renovation activities occur. This section specifies requirements for removing, handling, storing, transporting, and ultimate disposal of all light fixture ballasts, fluorescent lamps, mercury containing thermostats, Freon containing devices and batteries.
- B. The results of a hazardous materials survey of [PROPERTY NAME] are contained in the report, [REPORT TITLE AND DATE], prepared by [HAZARDOUS MATERIALS CONSULTANT NAME]. The information regarding light fixture ballasts, fluorescent lamps, mercury containing thermostats, Freon containing devices and batteries is not all-inclusive and shall not be considered as a complete and accurate inventory. The Contractor shall be responsible to quantify any previously unidentified ballasts, fluorescent lamps, mercury containing thermometers, Freon containing devices, and batteries from [PROPERTY NAME] and shall deliver a full list of any inventory additions to the Harvard Project Manager immediately upon identification. The Contractor shall remove and properly recycle or dispose of these previously unidentified items in accordance with Table 026000-1 at the end of this Section.
- C. The Contractor shall provide labor, materials, equipment and insurance to complete the work specified in this Section including, but not limited to, the removal and lawful disposal of hazardous materials, hazardous wastes,



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and special wastes. Work shall be performed in accordance with this specification, all referenced documents included as part of this specification, and with all Federal, state and local regulations. Wherever there is a conflict or overlap of requirements, the most stringent provisions will apply. Generally, the management of miscellaneous hazardous materials shall include, but not be limited to:

1. Characterization (any testing that may be required by the off-site materials management facility), removal, and disposal of hazardous materials or potentially hazardous materials.
2. Characterization (any testing that may be required by the off-site materials management facility), removal, and disposal of contained gear oils, hydraulic oils and refrigeration liquids, etc. from various pieces of machinery and equipment, throughout [project site].
3. Characterization (any testing that may be required by the off-site materials management facility), removal, and disposal of all containers, drums, and unknown materials throughout [project site].
4. Characterization (any testing that may be required by the off-site materials management facility), removal, and disposal of loose paint chips and flaking and peeling paint from walls and floors throughout [project site].
5. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction. The Contractor shall deliver a copy of all permits, approvals and notifications to the Harvard Project Manager at least 5 days before beginning the work.
6. Perform all sampling and testing required to properly profile the material for waste reuse, recycling or disposal. This shall also include all testing required by the recycling or disposal facility.
7. All costs for the testing shall be borne by the Contractor.
8. Comply with the Contractor's submitted Health and Safety Plan.

1.03 RELATED WORK



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- A. Section 013529 – HAZARDOUS MATERIALS HEALTH AND SAFETY
- B. Section 017419 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
- C. Section 024100 – BUILDING AND ANCILLARY STRUCTURES DEMOLITION
- D. Section 026500 – REMOVAL AND DISPOSAL OF FUEL STORAGE TANKS
- E. Section 028200 – ASBESTOS ABATEMENT AND RELATED WORK
- F. Section 028300 – LEAD-BASED PAINT ABATEMENT AND RELATED WORK
- G. Section 020720 – PCB REMEDIATION OF BUILDING MATERIALS

1.04 REFERENCES

The publications listed below 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.

- A. Code of Federal Regulations (CFR)
 - 1. 29 CFR 1910, “Occupational Safety and Health Standards” (General Industry Standards)
 - 2. 29 CFR 1926, “Safety and Health Regulations for Construction” (Construction Industry Standards)
 - 3. 40 CFR 50, “National Primary and Secondary Ambient Air Quality Standards”
 - 4. 40 CFR 60, “Standards of Performance for New Stationary Sources,” Appendix B, “Test Methods”
 - 5. 40 CFR 117, “Determination of Reportable Quantities for Hazardous Substances”



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6. 40 CFR 122, “USEPA Administered Permit Program: The National Pollutant Discharge Elimination System”
 7. 40 CFR 172, “Hazardous Waste Transportation”
 8. 40 CFR 261, “Identification and Listing of Hazardous Waste”
 9. 40 CFR 262, “Standards Applicable to Generators of Hazardous Waste”
 10. 40 CFR 263, “Standards Applicable to Transporters of Hazardous Waste”
 11. 40 CFR 268, “Land Disposal Restrictions”
 12. 40 CFR 273, “Universal Waste Rule”
 13. 40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan”
 14. 40 CFR 302, “Designation, Reportable Quantities, and Notification”
- B. Occupational Safety and Health Administration (OSHA) Booklet 3126 “Working with Lead in the Construction Industry”
- C. National Institute for Occupational Health and Safety (NIOSH)
1. NIOSH Method 7082, “Lead”
- D. American Society for Testing and Materials (ASTM)
1. ASTM D3335, “Test Method for Low Concentration for Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy”
- E. USEPA Publications
1. SW-846, “Test Methods for Evaluating Solid Waste – Physical/Chemical Methods”



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2. USEPA Method 3050, “Acid Digestion of Sediments, Sludges, and Soils”

F. Steel Structures Painting Council (SSPC)

1. SSPC Guide 61 (CON) Guide for Containing Debris Generated During Paint Removal Operations
2. SSPC Guide 71 (DIS) Guide for the Disposal of Lead Contaminated Surface Preparation Debris

G. Massachusetts Department of Environmental Protection

1. 310 CMR 40.0000, Massachusetts Contingency Plan
2. 310 CMR 30.000, Massachusetts Hazardous Waste Regulations
3. 310 CMR 10.00, Massachusetts Wetland Protection Act
4. 314 CMR 4.00, Massachusetts Surface Water Quality Standards
5. 310 CMR 16.00, Site Assignment for Solid Waste Facilities
6. 310 CMR 19.000, Solid Waste Management Facility Regulations
7. 310 CMR 6.00 - 8.00, Air Pollution Control Regulations
8. 314 CMR 6.00, Massachusetts Groundwater Quality Standards

H. Other

1. 454 CMR 10-23, Division of Industrial Safety

1.05 DEFINITIONS

- A. Harvard Project Manager: A representative of the Property Owner, President and Fellows of Harvard College



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- B. Engineer: Authorized representative of the Harvard Project Manager. Engineer shall be the Architect or Designer of Record for the project.²
- C. CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
- D. CFC: Chlorinated Fluorocarbons
- E. DOT: U.S. Department of Transportation
- F. HDPE: High Density Polyethylene
- G. HVAC: Heating, Ventilation, and Air-Conditioning
- H. Mass DEP: Massachusetts Department of Environmental Protection
- I. MCP: Massachusetts Contingency Plan
- J. OSHA: Occupational Safety and Health Administration
- K. PCB: Polychlorinated Biphenyls
- L. RCRA: Resource Control and Recovery Act
- M. RQ: Reportable Quantity
- N. TCLP: Toxicity Characteristic Leachate Procedure
- O. TSCA: Toxic Substance Control Act
- P. TSDF: Treatment, Storage, and Disposal Facility
- Q. USEPA: United States Environmental Protection Agency

1.06 QUALITY ASSURANCE

- A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for hazardous waste identification, handling, removal, and disposal requirements and provisions for new work.



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- B. Hazardous Waste Removal and Transportation Firm Qualifications: An experienced firm that has specialized in hazardous waste work similar in material and extent to that indicated for this Project. Asbestos and PCB abatement firms shall be from the Harvard EH&S approved list of abatement contractors.
- C. Refrigerant Recovery Technician Qualifications: Certified by an USEPA-approved certification program.
- D. Regulatory Requirements: Comply with governing USEPA and Mass DEP notification regulations before beginning removal of any hazardous waste materials. Comply with hauling and disposal regulations of authorities having jurisdiction

1.07 SCHEDULING AND SEQUENCING

- A. The Contractor and the Engineer shall develop a hazardous materials removal schedule at the Pre-Construction Conference. The Engineer may choose to alter the work sequence as they see fit.
- B. The Contractor shall update the schedule and submit any schedule changes for review by the Engineer at the weekly construction meetings.

1.08 PERMITTING

- A. The use and disposal of hazardous materials (broken fluorescent lamps, leaking or damaged batteries, mercury thermostats, and PCB ballasts) is highly regulated and compliance with all requirements set forth by authorities having jurisdiction is an essential condition of the Work. The Contractor shall be fully aware of all such requirements and ensure that all regulatory conditions are met, including those required of any Sub-contractors.
- B. The Contractor is responsible for ensuring that all personnel performing work under this section shall be properly trained in accordance with all Federal, state and local regulations. The Contractor is required to provide proof of training and licensing of any and all employees completing the work of this section at least 5 days prior to the start of Work.

1.09 LOCATION OF WORK



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- A. The results of a hazardous materials survey of [PROPERTY NAME] are contained in the report, [*REPORT TITLE AND DATE*], prepared by [HAZARDOUS MATERIALS CONSULTANT NAME]. The information regarding light fixture ballasts, fluorescent lamps, mercury containing thermostats, Freon containing devices and batteries is not all-inclusive and shall not be considered as a complete and accurate inventory. The Contractor shall be responsible to quantify any previously unidentified ballasts, fluorescent lamps, mercury containing thermometers, Freon containing devices, and batteries from [PROPERTY NAME] and shall deliver a full list of any inventory additions to the Project Manager immediately upon identification. The Contractor shall remove and properly dispose of these previously unidentified items at the unit prices bid for this section.
- B. Location of work areas, descriptions, estimated types and quantities of hazardous materials are described in the HAZARDOUS MATERIALS SCHEDULE appended to this Section. If additional hazardous materials are encountered, the Contractor shall notify Harvard Project Manager immediately and be prepared to remediate the material.
- C. The HAZARDOUS MATERIALS SCHEDULE identifies hazardous materials encountered and enumerated during the survey. The quantities are provided for general guidance and may not correspond exactly to the quantity to be removed. The Contractor is responsible to investigate all structures for the presence of all hazardous materials. The Contractor shall determine quantities of hazardous materials for bidding purposes.
- D. Handling, containerizing, packaging, re-handling, hauling and disposal of all items identified are to be included in the lump sum bid item of the Contract. Any hazardous materials encountered that are not identified will be paid for as a Change Order.

1.10 SUBMITTALS

- A. The Contractor shall submit each item in this Article according to the Conditions of the Contract and Section 013300 - SUBMITTALS, for information only, unless otherwise indicated.
- B. The Contractor shall submit a Waste Management Plan as specified in Section 017419 – CONSTRUCTION AND DEMOLITION WASTE



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MANAGEMENT. The Plan shall identify the proposed waste hauler and off-site waste management facility with copies of all applicable licenses, registrations and approvals.

- C. The Contractor shall provide copies of all worker certifications associated with OSHA 40-Hour Hazardous Waste Site Health and Safety Training in accordance with 29 CFR 1910.120.
- D. After completion of the hazardous materials removal, the Contractor shall provide a final report documenting removal, transportation and recycling, treatment, disposal, or incineration activities. The document shall include copies of manifests, shipping slips, permits, and licenses for this Project.

PART 2 – PRODUCTS

2.01 PROTECTIVE EQUIPMENT

- A. Provide health and safety equipment required to protect workers and to comply with the Health and Safety Plan and OSHA requirements.

2.02 DISPOSAL BAGS

- A. Disposal Bags: Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags.

2.03 DRUMS

- A. DOT Hazardous Waste Disposal Drums: Provide DOT 17-H Open -Top Drums (55 gallon) in accordance with DOT regulations title 49 CFR Parts 173, 178, and 179.

2.04 LABELS

- A. DOT Hazardous Waste Labels: in accordance with DOT regulations, Title 49 CFR parts 173, 178, and 179.
- B. Universal Waste Labeling. USEPA 40 CFR 273.14



PART 3 – EXECUTION

3.01 GENERAL WORK AREA SET UP

- A. Signage: Prior to the preparation for work that will disturb hazardous materials; the Contractor shall place warning signs immediately outside all entrances and exits to the area.
- B. Access to Work Areas: The Contractor shall allow only authorized personnel into the work area. Barrier tape shall be used to limit access to the exterior work area.

3.02 GENERAL HAZARDOUS MATERIALS/HAZARDOUS WASTE MANAGEMENT

- A. Do not mix potentially hazardous waste streams. Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction debris.
- B. Segregate, package, label, transport and dispose of Hazardous Materials/Hazardous Waste in accordance with DOT, USEPA, State and local regulations.
- C. The Engineer shall identify materials considered to be a listed or characteristic hazardous waste prior to initiating this project. A schedule of materials that must be managed as hazardous waste is attached as an Appendix to this specification.
- D. The following wastes are designated as Hazardous Wastes and are non-salvageable. This is not a comprehensive listing of hazardous wastes and the Contractor is directed to the Massachusetts Hazardous Waste Regulations at 310 CMR 30.000.
 - 1. Waste Type A: PCB waste to include PCB-containing ballasts from fluorescent light fixtures.
 - 2. Waste Type B: lead base paint debris to include containers of paint and paint chips/debris.
 - 3. Waste Type C: HVAC and refrigerator refrigerant.
- E. In the event of an apparent conflict between the requirements of these



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specifications and the requirements of the Massachusetts Hazardous Waste Regulations (310 CMR 30.000), the Contractor shall bring the apparent conflict to the attention of the Engineer for resolution. The Contractor shall not seek to review the apparent conflict with other parties prior to resolution with the Engineer.

- F. Hazardous waste storage shall be in accordance with The Massachusetts Hazardous Waste Regulations (310 CMR 30.000).

3.03 HAZARDOUS MATERIALS/HAZARDOUS WASTE PACKAGING AND LABELING

- A. Package each segregated Hazardous Waste Type A, B, and C, in separate specified containers as follows. **IMPORTANT: Do Not Mix Waste Streams**
 - 1. Waste Type A to be packaged in DOT 17-H open-top drums. Fill to capacity only with Waste Type A. Install gasket on lid, apply lock ring, and seal. Apply Hazardous Waste Label to drum side. Enter DOT Shipping Data as follows: RQ Waste Polychlorinated Biphenyls, 9, UN-2315, PG-II, (M001). Adjacent to each label, enter the date indicating when waste was first placed in each drum.
 - 2. Waste Type B to be packaged in DOT 17-H Open-Top Drums. Fill to capacity only with Waste Type B. Install gasket on lid, apply lock ring, and seal. Apply Hazardous Waste Label to drum side. Enter DOT Shipping Data as follows: RQ Hazardous Waste Solid, NOS, 9, NA3 077, PG-III, (~D009). Adjacent to each label, enter the date indicating when waste was first placed in each drum.
 - 3. Waste Type C to be packaged in DOT 17-H open-top drums. Fill to capacity only with Waste Type C. Install gasket on lid, apply lock ring, and seal. Apply Hazardous Waste Label to drum side. Enter DOT Shipping Data as follows: RQ Hazardous Waste Solid, NOS, 9, NA3077, PG-III, (D009). Adjacent to each label, enter the date indicating when waste was first placed in each drum.
- B. Maintain all containers in a continuously sealed condition after they have been filled. Do not reopen sealed containers or place additional waste in previously sealed containers. Storage of containers must be in a secure location.



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3.04 HANDLING AND DISPOSAL OF BATTERIES, FLUORESCENT LAMPS & MERCURY THERMOSTATS

- A. The Contractor is responsible for removing all fluorescent lamps from fixtures, intact, prior to demolition. Fluorescent lamps shall be recycled and managed in accordance with the Universal Waste Management Standards (310 CMR 30.1034). If fluorescent lamps become broken or damaged during removal and/or handling, broken lamps shall be managed as hazardous waste as specified below.
- B. The Contractor is responsible for recycling and managing intact, non-leaking batteries (lead-acid, nickel cadmium, and lithium) in accordance with the Universal Waste Management Standards (310 CMR 30.1034). If batteries are, or become damaged or are leaking during removal and/or handling, such batteries shall be managed as hazardous waste as specified below.
- C. The Contractor shall manage intact fluorescent lamps and intact batteries in the following manner:
 - 1. Do not break or crush spent lamps or batteries or damage them in any way.
 - 2. Store intact lamps and batteries in a secure area(s) protected from physical damage. Storage area(s) should be identified within an easily read sign stating “Universal Waste Area - Spent Fluorescent Lamps” or “Universal Waste Area – Batteries” as appropriate.
 - 3. Store lamps and batteries in packaging or containers that are designed to minimize breakage/damage during both storage and shipping. Label containers as “Universal Waste – Spent Fluorescent Lamps” or “Universal Waste – Batteries” as appropriate and mark each container with the date on which you first began storing the waste.
 - 4. Use a Bill of Lading that contains the following information when shipping to the recycler: name and address of generator, transporter, and recycler; number of lamps shipped; date of shipment and date of receipt by recycler; and, dated signature of recycler. Deliver a copy of the Bill of Lading to the Project Manager within 5 days of shipment of the materials.
- D. Broken fluorescent lamps shall be placed in sealed, vapor-tight containers/drums that are compatible with the waste being stored for disposal as mercury-containing hazardous waste. The waste shall be



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classified as RCRA characteristic hazardous waste and shall be labeled and stored in accordance with all applicable regulations.

- E. Leaking or damaged batteries shall be placed in appropriate non-metal containers/drums that are compatible with the waste being stored for disposal as hazardous waste and shall be labeled and stored in accordance with all applicable regulations.
- F. Mercury thermostats shall be placed in sealed, vapor-tight drums (55-gallons or less) for disposal as mercury-containing hazardous waste and shall be classified as RCRA characteristic hazardous waste (note, thermostats can be co-mingled with broken fluorescent lamps as appropriate).
- G. The Contractor shall deliver to the Project Manager information relating to the transportation and recycling or disposal of batteries, fluorescent lamps, and mercury thermostats before the start of the Work. This information shall include:
 - 1. Name and address of fluorescent lamp recycler or dismantler that will accept fluorescent lamps, intact;
 - 2. Name and address of the battery recycler that will accept batteries, intact;
 - 3. Name and address of the RCRA TSDF that will accept leaking batteries, broken fluorescent lamps and mercury thermostats as hazardous waste;
 - 4. Copies of all authorization letters, licenses, and permits to operate for the facilities, to confirm that they are permitted to accept the batteries and fluorescent lamps; and,
 - 5. Name and address of hazardous waste transporter that will transport leaking batteries and/or broken fluorescent lamps to RCRA TSDF including USEPA Identification Number and proof of permit, license, or authorization to transport hazardous waste in all affected areas.

3.05 HANDLING AND DISPOSAL OF BALLASTS

- A. Prior to removal of any ballasts, the Contractor shall uncover and inspect the label on the ballast. All ballasts designated as 'No PCBs' shall be marked with green paint; all other ballasts shall be assumed to contain PCBs and shall be marked with red paint. Similar color-coding shall be used for the receiving drums.



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- B. Removal shall be performed using approved methods and tools that will minimize damage to the fluorescent lamp and ensure a quick, neat removal with the ballast intact and undamaged.
- C. Once removed, the ballasts shall be placed in a corresponding color-coded 55-gallon drum.
- D. Once filled, the 55-gallon drums shall be closed and properly labeled for temporary storage, transport, and disposal in accordance with all applicable regulations.
- E. The Contractor shall submit to the Project Manager written confirmation from the disposal facility stating which type of ballasts the facility will accept. The letter shall also state that the facility agrees to submit to the Contractor, by fax, within 48 hours of receipt of material, signed manifests and/or Bills of Lading.
- F. Drums containing PCB ballasts that are marked red, and other PCB contaminated materials shall be incinerated at a TSCA/RCRA and Harvard-approved utilized incineration facility. Contractor shall submit documentation verifying removal, transportation, and disposal at the approved facilities.
- G. Drums containing “no PCB” fluids, ballasts and capacities that are marked green shall be disposed of at a legally permitted disposal facility. Contractor shall submit documentation verifying removal, transportation, and disposal at the approved disposal facility.
- H. Upon completion of the destruction of PCB ballasts, the Contractor shall deliver to the Project Manager:
 - 1. Written certification from the incineration facility that the items were delivered to, accepted, and destroyed by the facility. Certificate shall be signed by the person authorized by the facility to accept PCB items for disposal.
 - 2. Copies of all manifests.
 - 3. Certificates of Destruction of Materials.



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3.06 HANDLING AND DISPOSAL OF FREON CONTAINING AIR CONDITIONERS AND FOUNTAINS

- A. Freon gas from roof and window air conditioners and drinking fountains must be evacuated from their units to the vacuum level required by the USEPA prior to opening the units and/or transporting the units within the site and/or off-site disposal.
- B. All Federal, state and local regulations must be complied with when abating Freon-containing devices.
- C. Technicians who perform Freon removal must be licensed for CFC refrigerant recycling/recovery with USEPA. In addition, all equipment used in the recycling/recovery process must have a current USEPA Registration.
- D. The Contractor must send reclaimed refrigerant to an USEPA-certified refrigerant reclaimer and must provide: name and address of transporter and refrigerant reclaimer; amount of refrigerant recovered and shipped; and, date of shipment and date of receipt by reclaimer.

3.07 HAZARDOUS MATERIALS/CONTAINERIZED WASTE

- A. All hazardous materials shall be characterized and disposed of in accordance with applicable federal, state, and local regulations. Hazardous waste manifests shall be completed for all off-site waste management.
- B. Workers who handle hazardous materials shall be licensed and trained in safe and proper hazardous materials handling procedures. At a minimum, this shall include OSHA 40-Hour Hazardous Waste Site Health and Safety Training in accordance with 29 CFR 1910.120.
- C. Any hazardous materials containers in poor condition shall be removed as soon as possible.
- D. Handling Hazardous Waste
 - 1. The Contractor shall place waste in DOT approved containers and label the containers for transport to a licensed disposal site.



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2. The Contractor shall use an authorized hazardous waste transporter to haul waste to a Harvard-approved hazardous waste facility.
 3. The Contractor is responsible to prepare, maintain and track all record keeping, chain-of-custody and reporting requirements including a copy of the hazardous waste manifest.
 4. The Contractor shall accurately measure and weigh the volume of each container or load of waste removed from the site. Submit records of waste volumes to the Harvard Project Manager and the Engineer.
 5. The Contractor shall not place paint debris on the unprotected ground and paint debris shall be shielded to prevent dispersion of the debris by wind or precipitation.
 6. The Contractor shall provide legal transportation of the waste to the recycling, disposal, treatment, or incineration facility, and complete or obtain all required licenses, manifests, receiving facility waste profiles, or other forms. Copies of all forms or licenses, and the signed original of the Waste Manifest for each waste load, shall be given to the Engineer and Harvard Project Manager.
- E. The Project Manager shall provide appropriate notifications to regulatory agencies if there is a release to the environment exceeding the CERCLA/MCP reporting requirements (e.g., lead - 1 pound).
- F. Any evidence of improper storage shall be cause for immediate shutdown of the project until corrective action is taken.

3.08 LEAD-BASED PAINT

- A. Lead-based paint may be present on many surfaces throughout the building. The Contractor shall assume that all painted surfaces contain lead-based paint. Any of the Contractor activities that may generate leaded dust or impact a leaded surface shall be responsible for regulating his/her work area so that dust migration is contained properly within the regulated area. Once the work is complete, the Contractor shall be



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responsible for the proper clean up and disposal of leaded dust and materials.

- B. All lead based paint work must be reflected in the lump sum bid of this contract and be performed in accordance with Section 028300 – LEAD-BASED PAINT ABATEMENT AND RELATED WORK.
- C. In areas where lead based paint is co-mingled with ceiling and wall plaster materials, Contractor shall dispose of co-mingled materials as hazardous waste.
- D. The Contractor shall make every effort to segregate lead-based paint and asbestos debris. In areas where lead based paint is co-mingled with asbestos debris, the Contractor shall remove paint chips from asbestos debris to the extent feasible, and dispose the material as asbestos waste. Paint chips shall be tested and disposed as a solid or hazardous waste, dependant upon the test results. The Contractor shall provide the Harvard Project Manager with the analytical test results.
- E. All painted or coated building components shall be disposed of off site, including brick and concrete as solid waste debris, unless determined to be a hazardous waste as described below.
- F. All visible paint and painted debris shall be removed from the ground within and surrounding the work site prior to building demolition. All material shall be properly disposed of off-site.
- G. Lead-containing material, including painted or coated building debris (i.e. windows, doors, sashes, etc.) that exceeds the TCLP criteria shall be disposed in accordance with applicable Massachusetts Hazardous Waste Regulations, 310 CMR 30.000. The off-site management of lead-containing material shall be at a Harvard-approved facility.

3.09 MACHINERY FLUIDS AND POWER PLANT SYSTEMS FLUIDS

- A. Drain all equipment containing hydraulic fluids, lubricating oils, fuel oil, antifreeze, and all other types of fluids. Decontaminate all systems, including piping, by means of steam cleaning or triple rinsing, or both, with a compatible fluid to remove all visible contamination.
- B. Collect and drum all fluids, including decontamination fluids drained from the above described equipment.



- C. Label drums for transport and disposal.
- D. After removal of all hazardous components, dispose of remaining equipment carcasses and piping in accordance with applicable regulations. The Contractor shall submit documentation verifying removal, transportation, and disposal at the approved disposal facility.
- E. Harvard shall not pay for disposal until complete documentation of the proper recycling, reclamation, treatment or disposal is received by the Harvard Project Manager.

3.10 WHITE GOODS AND OTHER ITEMS

- A. Remove and properly dispose of all environmentally hazardous items and systems components installed in white good item before proper disposal of the unit. This work includes, but is not limited to:
 - 1. Water coolers.
 - 2. Air conditioners.
 - 3. Refrigerators.
- B. White good items which do not contain environmentally hazardous materials, and white good item carcasses from which the Contractor has removed environmentally hazardous materials prior to removal from the building, shall be removed, transported and disposed of at an appropriate facility(ies).
- C. Harvard shall not pay for disposal until complete documentation of the proper recycling, reclamation, treatment or disposal is received by the Harvard Project Manager.

3.11 REMOVAL OF TRANSFORMERS

- A. All transformers shall be handled with appropriate personal protective equipment. Unless otherwise noted, the Contractor, shall assume that all unmarked transformers contain oil with >50 ppm PCBs.



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- B. Prepare each transformer to be electrically disconnected in compliance with the National Electrical Safety Code, the National Electric Code, and OSHA regulations.
- C. Transformers labeled “dry-type” shall be handled and disposed of as white goods, in compliance with the Massachusetts Solid Waste Management Regulations at 310 CMR 19.017.
- D. Transformers identified as not containing PCBs or labeled “No PCBs” shall be drained, if necessary, and shall be marked with green paint. The fluid shall be placed in properly sealed drums and painted green, and shall be sampled and analyzed by the Contractor, as required, for transportation and disposal purposes.
- E. Each transformer not positively identified as containing “No PCBs” shall be sampled in place to determine the concentration of PCBs prior to any removal activities, as required for transportation and disposal/incineration purposes.
- F. Before sampling transformers, the Contractor shall take the following preparatory and precautionary measures. These measures shall remain in effect for the duration of the transformer sampling and removal process.
 - 1. Cover and seal all drains, manholes, and other openings that may lead to waterways in such a manner to prevent any migration of the contaminants.
 - 2. Provide temporary containment designed to contain the entire contents of the fluid to be removed. This containment shall encompass the transformer and any areas designated for temporary storage. In addition, absorbents in the amounts adequate to absorb a spill from one complete equipment failure shall be placed within the containment area.
 - 3. Provide adequate spill cleanup equipment within the containment area.
- G. The laboratory proposed by the Contractor shall be certified for such analyses by the Commonwealth of Massachusetts, and shall be capable of demonstrating skill and experience in similar projects. The laboratory shall forward copies of all reports and technical correspondence directly to the Project Manager and Engineer. All reports shall completely and positively identify each transformer sampled.



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- H. Following the disconnection of the electrical power source, pump PCB fluids in place from the equipment into specified containers before moving to minimize the accidental release of fluids. The PCB-filled type of electrical equipment is not intended for use as transport vessels and, therefore, must be drained of fluids before removal and transport. Following draining and drumming of fluids, transformers shall be move from the existing location to the loading area where they will be loaded onto a truck and transported to the disposal facilities. Each drum shall be properly labeled and sealed.
- I. Any transformers identified shall be marked with paint as follows:
 - 1. Green: No PCBs.
 - 2. Red: Containing PCBs.
- J. Transformers shall then be ready to be moved and transported to the applicable disposal facility.
- K. Unless otherwise indicated on the plans, all transformers shall be removed and disposed of by the Contractor in accordance with the applicable laws and regulations. The Contractor shall assume that all transformers identified contain oil with concentrations of PCBs greater than 50 ppm, unless otherwise noted.

3.12 FIRE EXTINGUISHERS

- A. Fire extinguishers may contain corrosive agents (monoammonium phosphate, ammonium phosphate) and may be reactive in water.
- B. De-pressurize prior to disposal.
- C. Fire extinguishers and their contents shall be landfilled in accordance with regulatory requirements. Do not discharge to the ground or to surface water. Do not cross contaminant with other fire extinguisher agents.
- D. Submit proof of disposal to the Project Manager and Engineer.

3.13 TEMPORARY STORAGE



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- A. Partially filled containers of hazardous waste may be stored at the work site for intermittent packaging provided that:
 - 1. Each container is properly labeled when it is first placed in service;
 - 2. Each container remains closed at all times except when compatible waste types are added; and
 - 3. When moved from site to site, each container remains within the geographic boundaries of the facility without moving or crossing public access highways.
- B. All items classes of waste identified as part of this section, once removed, shall be stored on-site in accordance with all applicable regulations for no more than 30 Days. At the conclusion of each day's work, drums containing hazardous waste (broken fluorescent lamps, leaking or damaged batteries, mercury thermostats, and PCB ballasts) shall be securely stored in regulatory-compliant locations (i.e., properly marked/signed, proper secondary containment, etc.) under lock and key.
- C. Hazardous waste shall be stored and loaded from secure areas that are impervious and contained. At a minimum, the area shall be lined with 6-mil HDPE overlaid with absorbent paper.

3.14 TRANSPORTATION OF HAZARDOUS WASTES

- A. The Contractor shall continuously maintain custody of all hazardous waste materials generated at the work site. Provide security, short-term storage, transportation and disposition until custody is transferred to an approved properly permitted treatment, storage, disposal or site or recycling center. Document continuous chain-of custody.
- B. Do not remove, or cause to be removed, hazardous waste from Harvard's property without a legally executed Uniform Hazardous Waste manifest.
- C. All haulers shall be properly licensed to transport hazardous waste (broken fluorescent lamps, leaking or damaged batteries, mercury thermostats, and PCB ballasts) in Massachusetts and all other states traversed in transporting the ballasts to approved disposal sites. Haulers shall be under the direct control of the Contractor at all times. Any spills during transport shall remain the responsibility of the Contractor. Any damage of



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costs incurred as a result of a spill and the required cleanup process shall be borne by the Contractor.

1. Vehicles used for the transportation of PCB items and asbestos shall be plainly marked as required by DOT and state regulations.
 2. All drums and equipment carcasses shall be secured to the transport vehicle to prevent movement during transport.
- D. The Contractor shall be responsible for preparing all manifests and other required shipping documents and for acquiring the necessary signatures for transport. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill/incineration receipt to the Project Manager and Engineer.

3.15 DISPOSAL OF HAZARDOUS WASTE

- A. The Contractor is responsible for completing all disposal documents, which may include, but are not limited to, waste profiles, hazardous waste manifests and land ban restriction forms. Harvard University (EH&S Department, 46 Blackstone Street, Cambridge, MA 02139) shall be designated as the Generator on all documents and shall sign the documents as such. Note that Harvard University is registered as a generator of hazardous waste under several USEPA ID numbers; the Contractor shall refer to the EH&S website for the appropriate USEPA # and Generator Status. Copies of all disposal documents shall be delivered to the Project Manager for review at least 5 days prior to shipment. Coordination for the Project Manager/Generator's signature on hazardous waste disposal documents shall be made through the Project Manager. Materials shall be disposed of at a Harvard approved Hazardous Waste Disposal facility. A list is provided on the EH&S website.
- B. For hazardous waste which is shipped off-site using a hazardous waste manifest, the Contractor shall provide the bottom three copies of the manifest to the Project Manager at the time of shipment for distribution to the appropriate agencies.

3.16 DISCOVERY OF HAZARDOUS MATERIALS

- A. If hazardous materials, such as chemicals, or other hazardous materials are discovered during the course of the work other than those identified in the Plans and Specifications, the Contractor shall cease work in affected area



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only and immediately notify the Engineer and Harvard Project Manager of such discovery. Do not proceed with work in such areas until instructions are issued by the Engineer. Continue work in other areas.

- B. If unmarked containers are discovered during the course of the work other than those identified in the plans and Specifications cease work in the affected area only and immediately notify the Engineer and the Harvard Project Manager of such discovery. The Contractor shall not proceed with work in such areas until instructions are issued by the Engineer. Take immediate precautions to prohibit endangering the containers integrity. Work can continue in other areas.