NC STATE UNIVERSITY

MANAGEMENT OF BUILDING DEMOLITION DEBRIS

Hazardous Waste Management
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SECTION I
INTRODUCTION

The most important regulation governing hazardous waste is the Resource Conservation and Recovery Act (RCRA), whose primary goals are "to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner." The basic tenet of this regulation is a "cradle-to-grave" tracking system, meaning that hazardous waste generators (users of hazardous materials who generate hazardous waste) must track waste from the moment it enters the site as a hazardous material to the eventual treatment or disposal of that material. This regulation requires hazardous waste generators to bear the responsibility of dealing with hazardous materials in a responsible way. Interesting to note is that the responsibility of hazardous waste may go beyond the grave, making the waste generator responsible (in part) for the waste handler's actions. Thus, if the handler does a poor job and pollutes the environment, the generator may be responsible for cleanup.

The University cannot "contract away" its responsibilities for management of hazardous/universal waste. Therefore, the University Hazardous Waste Project Manager (HWPM) needs to be involved with the entire waste identification and the decision-making process. For hazardous/universal wastes the HWPM needs to approve of all aspects of managing that waste, including container selection, labeling, and management and accumulation area management. The HWPM must sign all documents necessary for removal of hazardous/universal waste. Manifests and certificates of disposal/destruction, treatment or recycling are returned to the HWPM.

The demolition process generates a wide variety of solid waste. This document is to provide the procedure for how this waste is managed. The North Carolina State University (NCSU) Construction Project Manager has ultimate responsibility for the implementation of the project. The NCSU Hazardous Waste Program Manager has responsibility for decisions and actions controlling the determination and management of hazardous and universal waste.

CPU	Central Processing Unit
EH&S	Environmental Health and Safety
EPA	Environmental Protection Agency
Hazardous material	An item that is harmful to the environment.
Hazardous waste	Unwanted by-products remaining in the environment and posing an immediate potential hazard to human life.
HVAC	Heating, Ventilation and Air Conditioning
HWPM	Hazardous Waste Project Manager
MCE	Mercury-Containing Equipment
NCSU	North Carolina State University
DEP	Department of Environmental Protection
DOT	Department of Transportation
RCRA	Resource Conservation and Recovery Act
Solid waste	Unwanted or discarded solid, liquid, semisolid or contained gaseous material, including, but not limited to: demolition debris; material burned or otherwise processed at a resources recovery facility or incinerator; material processed at a recycling facility; and sludges or other residue from a water pollution abatement facility, water supply treatment plant or air pollution control facility
Universal Waste	Low risk hazardous waste generated by a variety of people. This waste has three categories: electronics, batteries (not auto), and mercury containing equipment (fluorescent tubes, discharge lamps, mercury vapor lamps, and mercury thermostats). This waste must be disposed of properly.
WMP	Waste Management Plan

A) The NCSU Hazardous Waste Manager will approve the Hazardous Waste Management Plan prior to beginning demolition. You may use the Waste Management Plan Form which includes all the requirements listed in part B below.

B) Waste management plans (WMP) will vary depending on the scale and scope of the project. However, all plans shall include the following:

1. Contractor's emergency contact information.
2. Discussion of expected wastes: Identify the general types of wastes that may be encountered for each phase of the project (see Section IV of this document). All environmental testing must be coordinated with the NCSU HWM.
3. The collection and accumulation strategy: All plans should indicate the location (for example a room number may be listed) of waste storage awaiting pickup. All Hazardous wastes must be stored in the appropriate DOT shipping container. You may obtain your own containers or North Carolina State University (NCSU) Environmental Health and Safety (EH&S) can deliver them to your site upon request. Indicate container type in your WMP for approval.
4. Marking and identification requirements: All containers must at least be marked with the word "Waste" followed by a description of the contents and the date materials are first added.
5. Procedures for appropriate removal of wastes from the site: Contact NCSU EH&S as soon as a container is ready for removal, several pick-up dates may be necessary for each project. If materials are being sent to an outside recycling/reclamation facility include the companies information in your HWMP.
6. Decontamination of structures and equipment: General description of materials used for decontaminated purposes. These materials may be collected and disposed through the University Hazardous Waste Program. Cleaning liquids should in no circumstance be allowed to enter the storm water system through floor drains or other wise.
7. The project WMP should delineate specific project responsibilities.

C) Waste management issues were outlined in the request for bids and forms the basis for waste management plans that are required for the project. The contractor is most knowledgeable regarding the sequence of events, the scale and scope of the project, and materials likely to be necessary for project completion. In some instances, a general site safety and health plan may be appropriate, identifying hazard zones, safe work practices, location of safety equipment, access controls, etc. The HWMP will be approved/disapproved at the discretion of the HWPM.

The inspection and evaluation of building components for the purpose of worker protection is described in the referenced Construction Guidelines.

Construction Guidelines, 01302 Contractor Safety Notifications
Construction Guidelines, 01900 Decommissioning – Decontamination

SECTION IV
IDENTIFICATION OF HAZARDOUS/UNIVERSAL WASTE

The attached provides an outline on the identification of hazardous/universal waste, which may be generated during the demolition of university buildings.

Asbestos

The survey contractor will refer to the University-provided asbestos inventory, and supplement as necessary, as a basis for surveying the renovated area for the presence of asbestos-containing materials. Any asbestos-containing building debris can be managed, implementing the necessary procedures, as construction and demolition debris. See Construction Guidelines 01302 and 01900.

The survey contractor should recognize the limitations of the University-provided asbestos survey data.

Decontamination/Cleaning Liquids

Materials used for decontamination of structures and equipment may be collected and disposed of through the University Hazardous Waste Program. Cleaning liquids should in no circumstance be allowed to enter the storm water system through floor drains or other wise.

Lead

The hazardous waste program uses the lead paint survey data to determine the appropriate waste management approach for general building demolition debris. The identification of lead integrated into the building components is discussed in Construction Guideline 01302.

Lead, which is a constituent of the metal waste debris being recycled, does not present a problem for that action.

All building demolition debris that is not suitable for recycling/reclamation should be placed in waste containers (e. g., roll offs). The NCSU Hazardous Waste Program Manger will make a determination as to the waste management approach for this waste using the lead survey data prior to removal from the work site.

Paint chips will be collected in the correct DOT-compliant shipping container and sampled for lead content by the NCSU Hazardous Waste Program Manager. The results of that analysis will determine the waste management approach for this waste type.

Fluorescent Lamps

Carefully remove fluorescent lamps in order to minimize exposure to mercury vapor. Store lamps in drums or well taped boxes out of the weather. NCSU has boxes available if needed. Reuse of scrap boxes is encouraged when available. Broken lamps will be collected in appropriate wax-lined fiber drums or boxes and labeled as "Universal Waste". Fluorescent lamps will be recycled, and shipments coordinated with the NCSU Hazardous Waste Program Manager.

Light Ballasts

Fluorescent light ballasts that do not display a "No PCBs" label, or have a manufacture date before 1980, will be assumed to contain PCBs at a level that causes them to be managed as a PCB-containing article. These PCB-containing articles will be placed in proper DOT containers. Shipping and disposal will be coordinated through the NCSU Hazardous Waste Program Manager.

Electrical Equipment (Excluding computer and peripherals)

Electrical equipment removed from the building may include fluid-containing equipment, such as capacitors and transformers. All fluid-containing electrical equipment will be inventoried and segregated for evaluation prior to disposal. The evaluation will be coordinated with the NCSU Hazardous Waste Program Manger and appropriate power distribution or electrical personnel in Facilities Operations.

Other electrical equipment, such as motors and switches will be segregated for disposal or recycling, as the item dictates. The criteria for making this determination will be outlined in the project waste management plan.

Computers and Peripherals

Buildings scheduled for renovation may contain computers and peripheral equipment, left behind during the process of vacating the building. The removal of all computer-related equipment (e.g., monitors, CPU's and printers) needs to be coordinated with the NCSU Hazardous Waste Program Manager.

Mercury-Containing Equipment (MCE)

Mercury-containing equipment includes thermostats, thermometers, switches, relays, sprinkler heads, gauges, and printed circuit boards. These waste items may be removed from the buildings subject to renovation or be abandoned within the subject buildings. The management of subject MCE waste will be coordinated with the NCSU Hazardous Waste Program Manager.

Batteries

Batteries removed from the building during renovation are to be segregated for evaluation and management as either hazardous or universal waste. The management of batteries for disposal will be coordinated with the NCSU Hazardous Waste Program Manager.

Caulking

Some old caulk contains PCB's. When removing pre 1980's building materials sealed with caulk, the caulk must be separated and collected for disposal by EH&S. PCB testing will be preformed by EH&S after caulk is removed.

Ducts

Metal air handling ducts removed from the building, associated with either laboratory fume hoods or building HVAC systems, are to be collected for recycling as scrap metal. When visible contamination is observed, the ductwork should be brought to the attention of the NCSU Hazardous Waste Program Manager.

Metal Piping

Metal piping, including lead, copper and iron, removed from the building will be collected for recycling as scrap metal.

Hazardous Material Storage Cabinets and Gas Cabinets

Hazardous material storage cabinets should be checked for residues from spills, etc. If these residues exist, they should be removed, with the removed residue and removal materials being managed as potentially hazardous waste. The NCSU Hazardous Waste Program Manager will make this determination.

The cleaned cabinets should be sent out for metals recovery (scrap metal), salvage after confirmation that the cabinets are not suitable for campus reuse.

Refrigeration Equipment

Refrigeration equipment to be removed for the renovation will be evaluated to ensure that each device has been drained of refrigerants. If a piece of equipment is found to contain refrigerants, then the NCSU Construction Project Manager will coordinate the removal of the refrigerants.

Refrigeration equipment removed from the building will be managed as scrap metal for recycling.

Roofing Materials

PCB concentrations have been found in some roofing materials. The rubberized membrane on Pre 1980's flat roofs will be tested by EH&S to determine proper disposal. This testing must be scheduled well in advance of demolition.

Sink Trap Sludge

The following procedure describes the collection of sludge from lab sink traps (and other system traps, as necessary) for isolation of mercury.

Laboratory tap water will be run through all wastewater lines and traps prior to removal of traps, breakage of lines or the commencement of demolition activities in the area where these pipes could be disturbed. Prior to disconnection of wastewater system traps, secondary containment, such as a bucket, shall be placed beneath the trap to be removed. The contractor will disassemble the lab wastewater system beginning with the traps at the lab sinks and potentially elsewhere. Trap contents (sludge) will be removed for visual evaluation. All sludge, as well as piping and debris, containing mercury will be segregated from the non-mercury contaminated sludge and piping and debris. Both types of sludge and piping and debris associated with piping which contained visible mercury, will be collected in DOT-approved drums. The NCSU Hazardous Waste Program Manager will remove this waste from the job-site.

Smoke Detectors

Smoke detectors may contain a radioactive source and must be collected for proper disposal.

Emergency Exit Signs

Emergency exit signs, which have no electrical connection, contain a radioactive source and must be collected for proper disposal.

Oil

Waste oils should be collected in the appropriate "closed head" DOT container. Oils that contain PCB's should be labeled as such.

Other

Scrap metal may be present in forms other than those described above. All metals should be set aside for recycling, including aluminum, copper, brass, lead, galvanized, iron, and steel (stainless and other).

Residual wastes are materials or contaminants found during the course of demolition and area evaluation. This may include articles or chemicals in areas that were previously inaccessible (e.g., under cabinets), and contaminants washed or wiped from fume hoods. These residual wastes are to be collected, evaluated, and disposed of in coordination with the NCSU Hazardous Waste Program Manager.

Based on the liability provisions of environmental laws, once the University generates a hazardous waste, the University retains permanent liability for the management and appropriate disposal of that waste. As a means of ensuring compliance with the law, the DEP and EPA may perform unannounced inspections at any time. Operations that do not meet regulatory requirements can result in substantial penalties, including fines of up to $25,000, per day, per violation. Over the past few years numerous universities and colleges have been fined millions of dollars for violating these hazardous waste requirements

SECTION VI
POINTS OF CONTACT

The University Hazardous Waste Program Manager is Rob Pecarina, 515-6863. E-mail, rob_pecarina@ncsu.edu

The person representing the Hazardous Waste Program on specific projects (at the job-site) is Ellen Buckner, 515-6850. E-mail, ellen_buckner@ncsu.edu